DATE: 21 October 2010

I.T.L. (PRODUCT TESTING) LTD.

FCC Radio Test Report

for

Orpak Systems Ltd.

Equipment under test:

Orpak Secure Payment Terminal (OrSPT)

OrSPT Single Box, OrSPT Stand Alone*

* See customer's declaration on pages 5 to 9.

Written by: _____

D. Shidlowsky, Documentation

Approved by: _____

A. Sharabi, Test Engineer

Approved by: _____

I. Raz, EMC Laboratory Manager

Measurement/Technical Report for

Orpak Systems Ltd.

Orpak Secure Payment Terminal (OrSPT)

OrSPT Single Box

FCC ID: W8F800926209

This report concerns: Original Grant:
Class I change:
Class II change: X

Equipment type: Part 15 Low Power Communication Device Transmitter

47CFR15 Section 15.225

Measurement procedure used is ANSI C63.4-2003.

Application for Certification
prepared by:
Ishaishou Raz
ITL (Product Testing) Ltd.
Kfar Bin Nun
D.N. Shimshon 99780
Israel
e-mail Sraz@itl.co.il

Applicant for this device:
(different from "prepared by")
Gideon Segal
Orpak Systems Ltd.
31 Lechi St.
P.O.B. 1461
Bnei-Brak 5114
Israel
Tel: +972- 3 - 577 - 6868
Fax: +972- 6 - 579 - 6310
e-mail: gidi@orpak .com

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1. General Information

1.1 Administrative Information

Manufacturer:	Orpak Systems Ltd.
Manufacturer's Address:	31 Lechi St. Bnei-Brak 51114 Israel Tel: +972-3-577-6868 Fax: +972-3-579-6310
Manufacturer's Representative:	Rami Zamir
Equipment Under Test (E.U.T):	Orpak Secure Payment Terminal (OrSPT)
Equipment Model No.:	OrSPT Single Box , OrSPT Stand Alone (See customer's declaration on following pages)
Equipment Serial No.:	800926209
Date of Receipt of E.U.T:	23.06.10
Start of Test:	23.06.10
End of Test:	01.07.10
Test Laboratory Location:	I.T.L (Product Testing) Ltd. Kfar Bin Nun, ISRAEL 99780
Test Specifications:	FCC Part 15 Subpart C

ORPAK Systems Ltd., 31 Lechi St., P.O.Box 1461 Bnei Brak 51114 Israel
Tel: 972-3-577-6868 ● Fax: 972-3-579-6310 ● www.orpak.com

Date: 20/9/2010

DECLARATION

I HEREBY DECLARE THAT

OrSPT P/N 800926209

IS A FULL CONFIGURATION MODEL including:

OTHER MODELS WHICH INCLUDE

PN	Description
OrSPT Single Box	OrSPT in packaging configuration
800926100	OrSPT (OR,MIF,OR,WW,SIN)
800926101	OrSPT (CA,MIF,OR,WW,SIN)
800926102	OrSPT (US,MIF,OR,WW,SIN)
800926103	OrSPT (OR,OR,WW,SIN) LC
800926104	OrSPT (CA,OR,WW,SIN)
800926105	OrSPT (US,OR,WW,SIN)
800926109	OrSPT (OR,MIF,BC,OR,WW,SIN)
800926110	OrSPT (CA,MIF,BC,OR,WW,SIN)
800926111	OrSPT (US,MIF,BC,OR,WW,SIN)
800926112	OrSPT (OR,BC,OR,WW,SIN)
800926113	OrSPT (CA,BC,OR,WW,SIN)
800926114	OrSPT (US,BC,OR,WW,SIN)
800926118	OrSPT (OR,MIF,ING,WW,SIN)
800926119	OrSPT (CA,MIF,ING,WW,SIN)
800926120	OrSPT (US,MIF,ING,WW,SIN)
800926121	OrSPT (OR,ING,WW,SIN)
800926122	OrSPT (CA,ING,WW,SIN)

PN	Description
800926123	OrSPT (US,ING,WW,SIN)
800926127	OrSPT (OR,MIF,BC,ING,WW,SIN)
800926128	OrSPT (CA,MIF,BC,ING,WW,SIN)
800926129	OrSPT (US,MIF,BC,ING,WW,SIN)
800926130	OrSPT (OR,BC,ING,WW,SIN)
800926131	OrSPT (CA,BC,ING,WW,SIN)
800926132	OrSPT (US,BC,ING,WW,SIN)
800926136	OrSPT (OR,MIF,OR,NAR,SIN)
800926137	OrSPT (CA,MIF,OR,NAR,SIN)
800926138	OrSPT (US,MIF,OR,NAR,SIN)
800926139	OrSPT (OR,OR,NAR,SIN)
800926140	OrSPT (CA,OR,NAR,SIN)
800926141	OrSPT (US,OR,NAR,SIN)
800926145	OrSPT (OR,MIF,BC,OR,NAR,SIN)
800926146	OrSPT (CA,MIF,BC,OR,NAR,SIN)
800926147	OrSPT (US,MIF,BC,OR,NAR,SIN)
800926148	OrSPT (OR,BC,OR,NAR,SIN)
800926149	OrSPT (CA,BC,OR,NAR,SIN)
800926150	OrSPT (US,BC,OR,NAR,SIN)
800926154	OrSPT (OR,MIF,ING,NAR,SIN)
800926155	OrSPT (CA,MIF,ING,NAR,SIN)
800926156	OrSPT (US,MIF,ING,NAR,SIN)
800926157	OrSPT (OR,ING,NAR,SIN)
800926158	OrSPT (CA,ING,NAR,SIN)
800926159	OrSPT (US,ING,NAR,SIN)
800926163	OrSPT (OR,MIF,BC,ING,NAR,SIN)
800926164	OrSPT (CA,MIF,BC,ING,NAR,SIN)
800926165	OrSPT (US,MIF,BC,ING,NAR,SIN)
800926166	OrSPT (OR,BC,ING,NAR,SIN)
800926167	OrSPT (CA,BC,ING,NAR,SIN)
800926168	OrSPT (US,BC,ING,NAR,SIN)
800926200	OrSPT (OR,MIF,OR,WW,SIN,G2)
800926201	OrSPT (CA,MIF,OR,WW,SIN,G2)
800926202	OrSPT (US,MIF,OR,WW,SIN,G2)
800926203	OrSPT (OR,OR,WW,SIN,G2) LC
800926204	OrSPT (CA,OR,WW,SIN,G2)
800926205	OrSPT (US,OR,WW,SIN,G2)
800926209	OrSPT (OR,MIF,BC,OR,WW,SIN,G2)
800926210	OrSPT (CA,MIF,BC,OR,WW,SIN,G2)
800926211	OrSPT (US,MIF,BC,OR,WW,SIN,G2)
800926212	OrSPT (OR,BC,OR,WW,SIN,G2)
800926213	OrSPT (CA,BC,OR,WW,SIN,G2)
800926214	OrSPT (US,BC,OR,WW,SIN,G2)
800926218	OrSPT (OR,MIF,ING,WW,SIN,G2)

PN	Description
800926219	OrSPT (CA,MIF,ING,WW,SIN,G2)
800926220	OrSPT (US,MIF,ING,WW,SIN,G2)
800926221	OrSPT (OR,ING,WW,SIN,G2)
800926222	OrSPT (CA,ING,WW,SIN,G2)
800926223	OrSPT (US,ING,WW,SIN,G2)
800926227	OrSPT (OR,MIF,BC,ING,WW,SIN,G2)
800926228	OrSPT (CA,MIF,BC,ING,WW,SIN,G2)
800926229	OrSPT (US,MIF,BC,ING,WW,SIN,G2)
800926230	OrSPT (OR,BC,ING,WW,SIN,G2)
800926231	OrSPT (CA,BC,ING,WW,SIN,G2)
800926232	OrSPT (US,BC,ING,WW,SIN,G2)
800926236	OrSPT (OR,MIF,OR,NAR,SIN,G2)
800926237	OrSPT (CA,MIF,OR,NAR,SIN,G2)
800926238	OrSPT (US,MIF,OR,NAR,SIN,G2)
800926239	OrSPT (OR,OR,NAR,SIN,G2)
800926240	OrSPT (CA,OR,NAR,SIN,G2)
800926241	OrSPT (US,OR,NAR,SIN,G2)
800926245	OrSPT (OR,MIF,BC,OR,NAR,SIN,G2)
800926246	OrSPT (CA,MIF,BC,OR,NAR,SIN,G2)
800926247	OrSPT (US,MIF,BC,OR,NAR,SIN,G2)
800926248	OrSPT (OR,BC,OR,NAR,SIN,G2)
800926249	OrSPT (CA,BC,OR,NAR,SIN,G2)
800926250	OrSPT (US,BC,OR,NAR,SIN,G2)
800926254	OrSPT (OR,MIF,ING,NAR,SIN,G2)
800926255	OrSPT (CA,MIF,ING,NAR,SIN,G2)
800926256	OrSPT (US,MIF,ING,NAR,SIN,G2)
800926257	OrSPT (OR,ING,NAR,SIN,G2)
800926258	OrSPT (CA,ING,NAR,SIN,G2)
800926259	OrSPT (US,ING,NAR,SIN,G2)
800926263	OrSPT (OR,MIF,BC,ING,NAR,SIN,G2)
800926264	OrSPT (CA,MIF,BC,ING,NAR,SIN,G2)
800926265	OrSPT (US,MIF,BC,ING,NAR,SIN,G2)
800926266	OrSPT (OR,BC,ING,NAR,SIN,G2)
800926267	OrSPT (CA,BC,ING,NAR,SIN,G2)
800926268	OrSPT (US,BC,ING,NAR,SIN,G2)

And

PN	Description
OrSPT stand alone	
800923500	OrSPT (OR,MIF,OR,WW)
800923501	OrSPT (CA,MIF,OR,WW)
800923502	OrSPT (US,MIF,OR,WW)
800923503	OrSPT (OR,OR,WW) LC
800923504	OrSPT (CA,OR,WW)
800923505	OrSPT (US,OR,WW)

PN	Description
800923509	OrSPT (OR,MIF,BC,OR,WW)
800923510	OrSPT (CA,MIF,BC,OR,WW)
800923511	OrSPT (US,MIF,BC,OR,WW)
800923512	OrSPT (OR,BC,OR,WW)
800923513	OrSPT (CA,BC,OR,WW)
800923514	OrSPT (US,BC,OR,WW)
800923518	OrSPT (OR,MIF,ING,WW)
800923519	OrSPT (CA,MIF,ING,WW)
800923520	OrSPT (US,MIF,ING,WW)
800923521	OrSPT (OR,ING,WW)
800923522	OrSPT (CA,ING,WW)
800923523	OrSPT (US,ING,WW)
800923527	OrSPT (OR,MIF,BC,ING,WW)
800923528	OrSPT (CA,MIF,BC,ING,WW)
800923529	OrSPT (US,MIF,BC,ING,WW)
800923530	OrSPT (OR,BC,ING,WW)
800923531	OrSPT (CA,BC,ING,WW)
800923532	OrSPT (US,BC,ING,WW)
800923536	OrSPT (OR,MIF,OR,NAR)
800923537	OrSPT (CA,MIF,OR,NAR)
800923538	OrSPT (US,MIF,OR,NAR)
800923539	OrSPT (OR,OR,NAR)
800923540	OrSPT (CA,OR,NAR)
800923541	OrSPT (US,OR,NAR)
800923545	OrSPT (OR,MIF,BC,OR,NAR)
800923546	OrSPT (CA,MIF,BC,OR,NAR)
800923547	OrSPT (US,MIF,BC,OR,NAR)
800923548	OrSPT (OR,BC,OR,NAR)
800923549	OrSPT (CA,BC,OR,NAR)
800923550	OrSPT (US,BC,OR,NAR)
800923554	OrSPT (OR,MIF,ING,NAR)
800923555	OrSPT (CA,MIF,ING,NAR)
800923556	OrSPT (US,MIF,ING,NAR)
800923557	OrSPT (OR,ING,NAR)
800923558	OrSPT (CA,ING,NAR)
800923559	OrSPT (US,ING,NAR)
800923563	OrSPT (OR,MIF,BC,ING,NAR)
800923564	OrSPT (CA,MIF,BC,ING,NAR)
800923565	OrSPT (US,MIF,BC,ING,NAR)
800923566	OrSPT (OR,BC,ING,NAR)
800923567	OrSPT (CA,BC,ING,NAR)
800923568	OrSPT (US,BC,ING,NAR)

ORPAK Systems Ltd., 31 Lechi St., P.O.Box 1461 Bnei Brak 51114 Israel
Tel: 972-3-577-6868 ● Fax: 972-3-579-6310 ● www.orpak.com

DIFFER FROM THE OrSPT ONLY BY SOFTWARE AND/OR EXTRACTED COMPONENTS/ASSEMBLIES.

The OrSPT Stand alone has the same plastic panel as the OrSPT Single Box and is constructed with metal covers in the rear.

Please relate to them all (from an EMC point of view) as the same product.

Thank you,

Signature……Gidi Segal……
Quality Assurance Director

1.2 List of Accreditations

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), Registration No. 90715.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers: C-1350, R-1285.
5. Industry Canada (Canada), File No. IC 4025.
6. TUV Product Services, England, ASLLAS No. 97201.
7. Nemko (Norway), Authorization No. ELA 207.

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.

1.3 Product Description

The EUT comprises of OrSPT Stand Alone unit and an Orpak Outdoor Printer,

Secured OrSPT overview

The Secured OrPT is an outdoor payment terminal that can accept a variety of payment types: smart cards, magnetic cards and contactless cards. Its ergonomic design, as well as its user friendly operation, enables fast and accurate service for the customer in the gas station.

The terminal is controlled by the Station Controller (FCC) or Point of Sale (POS) and runs a separate payment application to perform bank payments like EMV, PIN based debit, etc Secured OrPT represents a new generation of terminals designed to address new challenges in transaction security at the forecourt. This terminal is equipped with advanced security mechanisms in card identification and protection to prevent fraud at the fuel station. It complies with payment standards: EMV (Europay, MasterCard and Visa) and PCI PED security. This versatile payment terminal also provides several "on the isle" services besides its core function of accepting all payment methods.

Secured OrPT is encased in a sealed housing designed to sustain the harsh environment of a gas station. Its modular design enables adding features as requested, and can be upgraded as new capabilities are developed.

Secured OrPT is equipped with a graphic LCD and a keyboard on its front panel enabling it to perform as a payment terminal. The device has several types of readers including: hybrid card reader, an optional contactless card/tag and a barcode reader. These readers enable accepting all common payment methods such as; credit card, debit card, fuelling card, contactless card/tag, barcode coupons, attendant authorization tag as well as cash with receipt.

The keyboard includes functional (F#) keys. These context sensitive keys and the messages on the panel enable interaction with the terminal and navigation between applications.

The keyboard has a PCI approved privacy shield to prevent snooping from third parties when typing the PIN, or entering data. The privacy shield is equipped with soft blue lighting to illuminate the keyboard.

Secured OrPT can interface with the Station Controller on two types of communication:

• RS-485

• TCP/IP over Ethernet (which is the preferred connectivity for speed and efficiency)

Orpak Outdoor Printer

Printer Module G2 is a compact, ruggedized thermal printer suitable for the harsh environment of the gas station. It uses thermal printer paper only (55 gr., 40m x 57 mm).

The Printer Module G2 is connected to the Station Controller via an RS-485 link. Usually, one printer module is provided for each pump in the gas station. The Printer Module G2 requires a 24 VDC power supply input.

The Printer Module G2 is packed in a compact aluminum enclosure. The Printer Module G2 enclosure is designed to survive the harsh forecourt environment. It uses Spark Gaps protection

for the links and 1.5 KV isolation between the forecourt devices.

The printer includes two sensors for paper usage alerts:

• Low paper sensor - activated when there is approximately 25% of the paper roll

left

• End paper sensor - activated when printer paper runs out completely

The paper usage and receipt indications include a buzzer sound, LED indicators or the combination of both, dependent on the station controller.

1.4 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4: 2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.5 Test Facility

The radiated emissions tests were performed at I.T.L.'s testing facility at Kfar Bin-Nun, Israel. This site is a FCC listed test laboratory (FCC Registration No. 90715, date of listing September 3, 2009).
I.T.L.'s EMC Laboratory is also accredited by A2LA, certificate No. 1152.01.

1.6 Measurement Uncertainty

Conducted Emission

The uncertainty for this test is ±2 dB.

Radiated Emission

The Open Site complies with the ±4 dB Normalized Site Attenuation requirements of ANSI C63.4-2003. In accordance with Paragraph 5.4.6.1 of this standard, this tolerance includes instrumentation calibration errors, measurement technique errors, and errors due to site anomalies.

2. System Test Configuration

2.1 Justification

The E.U.T. was tested on a table in vertical position simulating normal operation.

2.2 EUT Exercise Software

The E.U.T. was operated using the following software during the tests:

Host OrPT (LAN); Hyper Terminal (RS485); RScom (RS232).

2.3 Special Accessories

No special accessories were needed in order to achieve compliance.

2.4 Equipment Modifications

No modifications were needed in order to achieve compliance

2.5 Configuration of Tested System

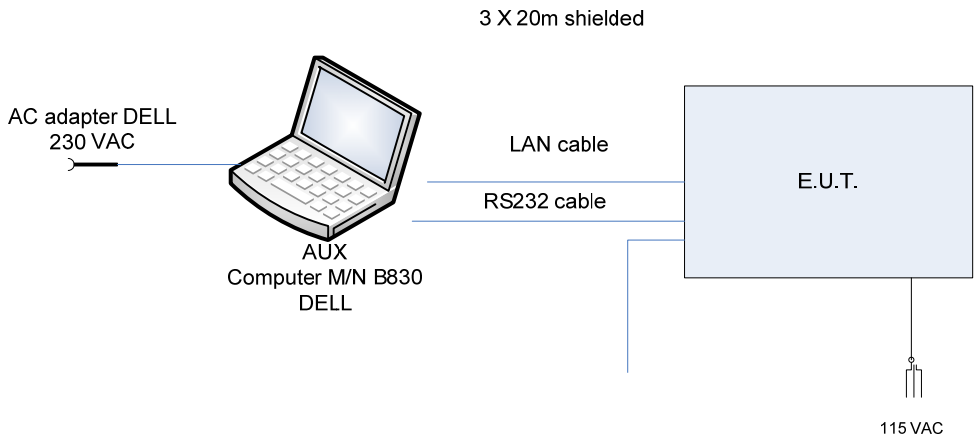


Figure 1. Configuration of Tested System

3. Test Set-up Photos

Figure 2. Conducted Emission Test

Figure 3. Radiated Emission Test 9 kHz – 30 MHz

Figure 4. Radiated Emission Test 30 MHz – 1000 MHz

Figure 5. Frequency Stability Test

4. Conducted Emission Data

4.1 Test Specification

F.C.C., Part 15, Subpart C

4.2 Test Procedure

The E.U.T operation mode and test set-up are as described in Section 3. In order to minimize background noise interference, the conducted emission testing was performed inside a shielded room, with the E.U.T placed on an 0.8 meter high wooden table, 0.4 meter from the room's vertical wall.

The E.U.T was powered from 115 V AC / 60 Hz via a 50 Ohm / 50 µHn Line Impedance Stabilization Network (LISN) on the phase and neutral lines. The LISN's were grounded to the shielded room ground plane (floor), and were kept at least 0.8 meters from the nearest boundary of the E.U.T

The center of the E.U.T AC cable was folded back and forth, in order to form a bundle less than 0.40 meters and a total cable length of 1 meter.

The emission voltages at the LISN's outputs were measured using a computerized receiver, complying with CISPR 16 requirements. The specification limits are loaded to the receiver via a 3.5" floppy disk and are displayed on the receiver's spectrum display.

A frequency scan between 0.15 and 30 MHz was performed at 9 kHz I.F. band width, and using peak detection.

The spectral components having the highest level on each line were measured using a quasi-peak and average detector.

4.3 Measured Data

JUDGEMENT: Passed by 8.6 dB

The margin between the emission levels and the specification limit is, in the worst case, 8.7 dB for the phase line at 18.33 MHz and 8.6 dB at 0.20 MHz for the neutral line.

The EUT met the F.C.C. Part 15, Subpart C specification requirements.

The details of the highest emissions are given in *Figure 6* to *Figure 9*.

TEST PERSONNEL:

Tester Signature: _____ Date: 14.10.10

Typed/Printed Name: A. Sharabi

Conducted Emission

E.U.T Description	Orpak Secure Payment Terminal (OrSPT)
Type	OrSPT Single Box
Part Number:	800926209

Specification:	F.C.C., Part 15, Subpart C
Lead:	Phase
Detectors:	Peak, Quasi-peak, Average

Signal Number	Frequency (MHz)	Peak (dBuV)	QP (dBuV)	QP Delta L 1 (dB)	Avg (dBuV)	Av Delta L 2 (dB)
1	0.201424	50.3	49.4	-14.2	43.6	-10.0
2	0.261396	38.8	36.5	-25.0	-60.0	-111.4
3	0.472803	25.6	9.3	-47.2	-60.0	-106.5
4	8.362538	24.4	21.7	-38.3	16.1	-33.9
5	18.326034	48.7	47.0	-13.0	41.3	-8.7
6	22.942889	48.3	44.5	-15.4	33.3	-16.7

Figure 6. Detectors: Peak, Quasi-peak, AVERAGE .

Note: QP Delta/Av Delta refer to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Conducted Emission

E.U.T Description	Orpak Secure Payment Terminal (OrSPT)
Type	OrSPT Single Box
Part Number:	800926209

Specification:	F.C.C., Part 15, Subpart C
Lead:	Phase
Detectors:	Peak, Quasi-peak, Average

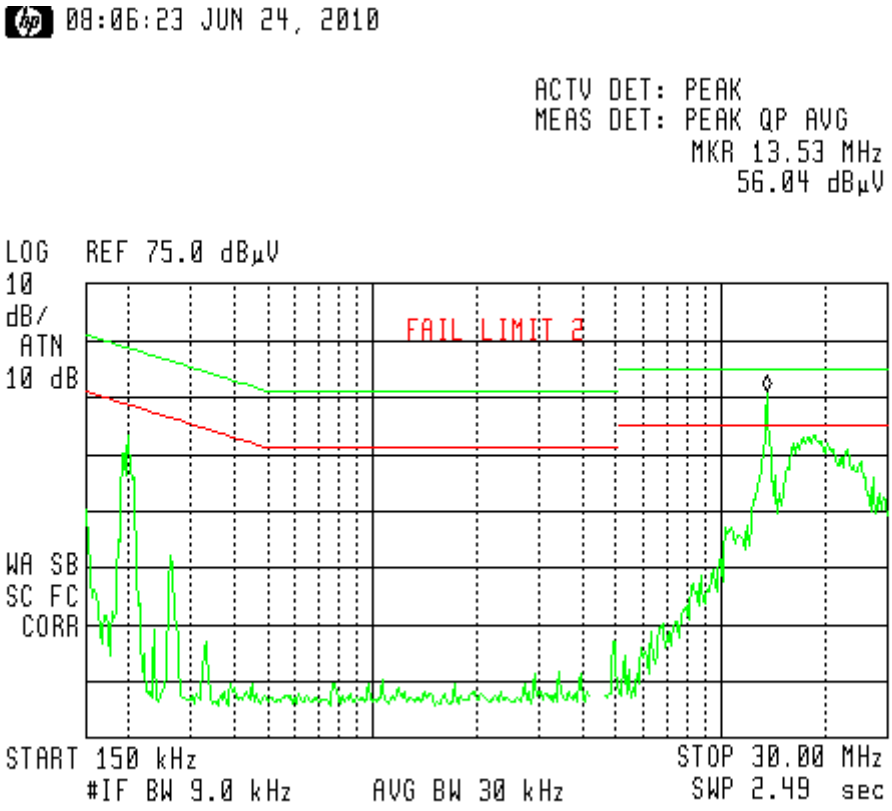


Figure 7. Detectors: Peak, Quasi-peak, Average

Note: Fail indication on the spectral plot results from peak detector level reading above the limit. This indication is for information only and it should not be interpreted as a test failure.

Conducted Emission

E.U.T Description	Orpak Secure Payment Terminal (OrSPT)
Type	OrSPT Single Box
Part Number:	800926209

Specification:	F.C.C., Part 15, Subpart C
Lead:	Neutral
Detectors:	Peak, Quasi-peak, Average

Signal Number	Frequency (MHz)	Peak (dBuV)	QP (dBuV)	QP Delta L 1 (dB)	Avg (dBuV)	Av Delta L 2 (dB)
1	0.200712	51.6	50.5	-13.1	45.0	-8.6
2	0.296389	14.1	3.8	-56.6	-10.5	-60.9
3	0.343399	39.1	20.6	-38.6	-27.7	-76.9
4	7.887838	22.8	20.8	-39.2	14.4	-35.6
5	11.227739	34.8	32.0	-28.0	26.4	-23.6
6	18.164158	48.4	47.2	-12.8	31.7	-18.3

Figure 8. Detectors: Peak, Quasi-peak, AVERAGE

Note: QP Delta/Av Delta refer to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Conducted Emission

E.U.T Description	Orpak Secure Payment Terminal (OrSPT)
Type	OrSPT Single Box
Part Number:	800926209

Specification:	F.C.C., Part 15, Subpart C
Lead:	Neutral
Detectors:	Peak, Quasi-peak, Average

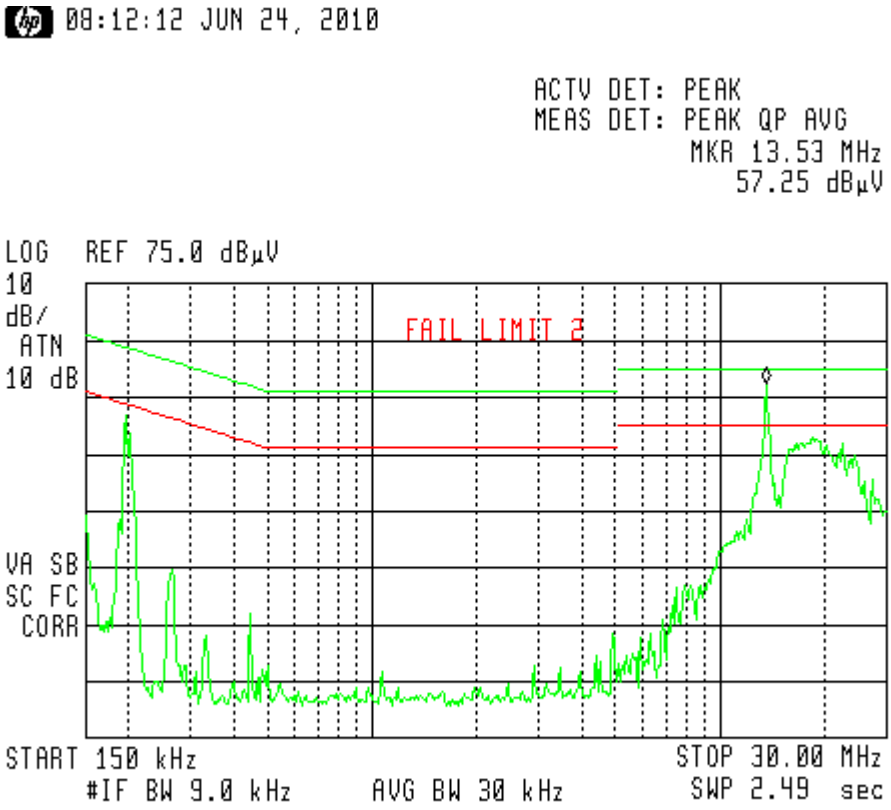


Figure 9 Conducted Emission: NEUTRAL
Detectors: Peak, Quasi-peak, Average

Note: Fail indication on the spectral plot results from peak detector level reading above the limit. This indication is for information only and it should not be interpreted as a test failure.

4.4 Test Instrumentation Used, Conducted Measurement

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Period
LISN	Fischer	FCC-LISN-2A	127	March 3, 2010	1 Year
LISN	Fischer	FCC-LISN-2A	128	March 3, 2010	1 Year
EMI Receiver	HP	85422E	3906A00276	November 10, 2009	1Year
RF Filter Section	HP	85420E	3705A00248	November 10, 2009	1Year
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

5. Field Strength of Fundamental

5.1 Test Specification

F.C.C., Part 15, Subpart C, Section 15.225(a) (b)

5.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.

The E.U.T. was placed on a non-conductive table, 0.8 meters above the O.A.T.S. ground plane.
The EMI receiver was set to the E.U.T. Fundamental Frequency (13.56 MHz) and Peak Detection.
The distance between the E.U.T. and test antenna was 3 meters.

The turntable and antenna were adjusted for maximum level reading on the EMI receiver. The loop antenna was rotated on its vertical axis. The antenna height (center of loop) was 1 meter.

The average result is:

Peak Level(dBµV/m) + E.U.T. Duty Cycle Factor, in 100msec time window (dB)

5.3 Measured Data

JUDGEMENT: Passed by 65.88 dB (Section 15.225(a))
Passed by 32.38 dB (Section 15.225(b))
Passed by 22.38 dB (Section 15.225(c)
Passed by 11.38 dB (Section 15.209)

The EUT met the FCC Part 15, Subpart C, Sections 15.225(a); (b); (c); Section 15.209; specifications requirements.

The details of the highest emissions are given in Figure 10.

TEST PERSONNEL:

Tester Signature: _____ Date: 21.10.10

Typed/Printed Name: A. Sharabi

Field Strength of Fundamental

E.U.T Description	Orpak Secure Payment Terminal (OrSPT)
Model Number	OrSPT Single Box
Part Number:	800926209

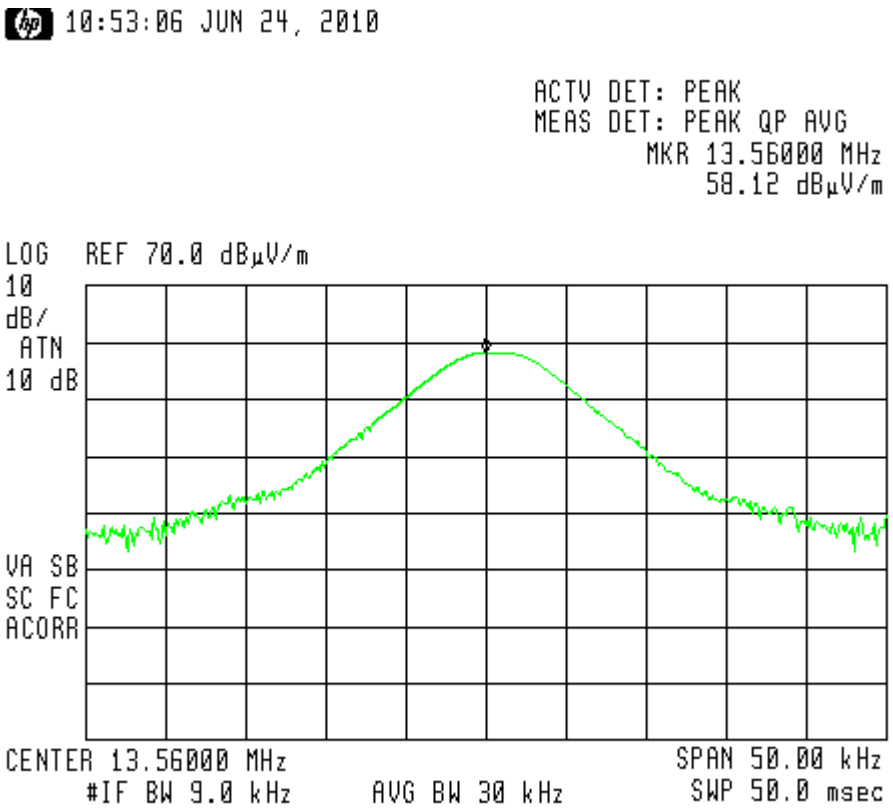


Figure 10. Field Strength of Fundamental
Detector: Peak

Section 15.225 (a): L_{im30m} = 15848.00 µV/m = 84.0 dBµV/m

Section 15.225(a): L_{im3m} = 40 + 84.0 dBµV/m = 124.0 dBµV/m)

Section 15.225 (b): L_{im30m} = 334.00 µV/m = 50.50 dBµV/m

Section 15.225 (b): L_{im3m} = 40 + 50.50 dBµV/m = 90.50 dBµV/m

Section 15.225 (c): L_{im30m} = 106.00 µV/m = 40.50 dBµV/m

Section 15.225 (c) L_{im3m} = 40 + 40.50 dBµV/m = 80.50 dBµV/m

Section 15.209: L_{im30m} = 30.00 µV/m = 29.50 dBµV/m

Section 15.209: L_{im3m} = 40 + 29.50 dBµV/m = 69.50 dBµV/m

5.4 Test Instrumentation Used, Field Strength of Fundamental

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3411A00102	November 10, 2009	1 year
EMI Receiver Filter Section	HP	85420E	3427A00103	November 10, 2009	1 year
Active Loop Antenna	EMCO	6502	9506-2950	October 19, 2009	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A

6. Spurious Radiated Emission, 9 kHz – 30 MHz

6.1 Test Specification

9 kHz-30 MHz, FCC, Part 15, Subpart C, Section 209

6.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 2.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 1.

The frequency range 9 kHz-30 MHz was scanned.

The emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

In the frequency range 9 kHz-30MHz, the loop antenna was rotated on its vertical axis. The antenna height (center of loop) was 1 meter at a distance of 3 meters.

The E.U.T. was operated at the frequency of 13.56 MHz. This frequency was measured using a peak detector.

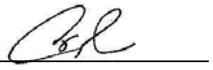
6.3 Measured Data

JUDGEMENT: Passed

The EUT met the requirements of the F.C.C. Part 15, Subpart C, Section 209 specification.

No emissions were detected in the frequency range of 9 kHz – 30 MHz.

TEST PERSONNEL:

Tester Signature:  Date: 14.10.10

Typed/Printed Name: A. Sharabi

6.4 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	November 10, 2009	1 year
RF Section	HP	85420E	3705A00248	November 10, 2009	1 year
Active Loop Antenna	EMCO	6502	9506-2950	October 19, 2009	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

6.5 Field Strength Calculation

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$FS = RA + AF + CF$$

FS: Field Strength [dBμv/m]
RA: Receiver Amplitude [dBμv]
AF: Receiving Antenna Correction Factor [dB/m]
CF: Cable Attenuation Factor [dB]

Example: FS = 30.7 dBμV (RA) + 14.0 dB (AF) + 0.9 dB (CF) = 45.6 dBμV

No external pre-amplifiers are used.

7. Spurious Radiated Emission 30 – 1000 MHz

7.1 Test Specification

30 MHz-1000 MHz, F.C.C., Part 15, Subpart C

7.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 2.
See Section 2.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.
A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The configuration tested is shown in Figure 1.
The frequency range 30 MHz-1000 MHz was scanned, and the list of the highest emissions was verified and updated accordingly.
The levels of the emissions within the frequency ranges of the restricted bands (Section 15.205 of FCC Part 15) were compared to the limits of the table in Section 15.209 (a), General Requirements.
The emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.
In the frequency range 30-1000 MHz, the readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.
Verification of the E.U.T emissions was based on the following methods:

Turning the E.U.T on and off.
Using a frequency span less than 10 MHz.
Observation of the signal level during turntable rotation. Background noise is not affected by the rotation of the E.U.T.

7.3 Test Data

JUDGEMENT: Passed

The EUT met the requirements of the F.C.C. Part 15, Subpart C, specification.

No emissions were detected in the frequency range of 30 – 1000 MHz.

TEST PERSONNEL:
Tester Signature: _____ Date: 14.10.10
Typed/Printed Name: A. Sharabi

7.4 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	November 10, 2009	1 year
RF Section	HP	85420E	3705A00248	November 10, 2009	1 year
Antenna Bioconical	ARA	BCD 235/B	1041	August 3, 2009	1 year
Antenna Log Periodic	ARA	LPD-2010/A	1038	March 24, 2010	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

7.5 Field Strength Calculation

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$[dB\mu v/m]\ FS = RA + AF + CF$$

FS: Field Strength [dBμv/m]
RA: Receiver Amplitude [dBμv]
AF: Receiving Antenna Correction Factor [dB/m]
CF: Cable Attenuation Factor [dB]

Example: FS = 30.7 dBμV (RA) + 14.0 dB (AF) + 0.9 dB (CF) = 45.6 dBμV

No external pre-amplifiers are used.

8. Frequency Tolerance

8.1 Test Specification

Part 15 Subpart C Section 15.225(e)

8.2 Test Procedure

The E.U.T operation mode and test setup are as described in Section 2.

The E.U.T. was placed in a test fixture enabling coupling from the E.U.T. to the spectrum analyzer.

The E.U.T. and test fixture were placed inside a temperature chamber. The E.U.T. was operated from 115 VAC at normal temperature (25°C).

The chamber temperature was set to +25°C.

The spectrum analyzer was set to 1.0 kHz span and 1.0 kHz resolution B.W.

The carrier frequency was measured and recorded.

The carrier frequency measurement was repeated for:

(a). +25°C

(b). -20°C

(c). +50°C

The carrier frequency was measured and recorded after at least 10 minutes of exposing the E.U.T. to the temperature.

The configuration tested is shown in photograph Figure 5.

8.3 Test Results

The E.U.T met the requirements of Part 15 Subpart C, Section 225(e) specification.

The frequency offset between the frequency measured under extreme conditions and the nominal carrier frequency measured under normal test conditions, is in the worst case, 1 kHz at -10 °C (spec: +/-1.356 kHz).

The details of the highest emissions are given in Figure 11 to Figure 16.

TEST PERSONNEL:

Tester Signature: _____ Date: 14.10.10

Typed/Printed Name: A. Sharabi

Frequency Tolerance

E.U.T Description Orpak Secure Payment Terminal (OrSPT)
Model Number OrSPT Single Box
Part Number: 800926209

Specification: FCC Part 15 Subpart C Section 15.225(e)

Temperature	Voltage	Measured Carrier Frequency	Nominal Carrier Frequency	Δ	Specification	Pass/Fail
(°C)	(VAC)	(MHz)	(MHz)	(kHz)	(kHz)	
+25	115	13.56063	13.56063	-	-	-
+55	90	13.56040	13.56063	-0.23	+/-1.356	Pass
+55	130	13.56038	13.56063	-0.25	+/-1.356	Pass
-20	90	13.56038	13.56063	-0.25	+/-1.356	Pass
-20	130	13.56043	13.56063	-0.2	+/-1.356	Pass

Figure 11. Frequency Error

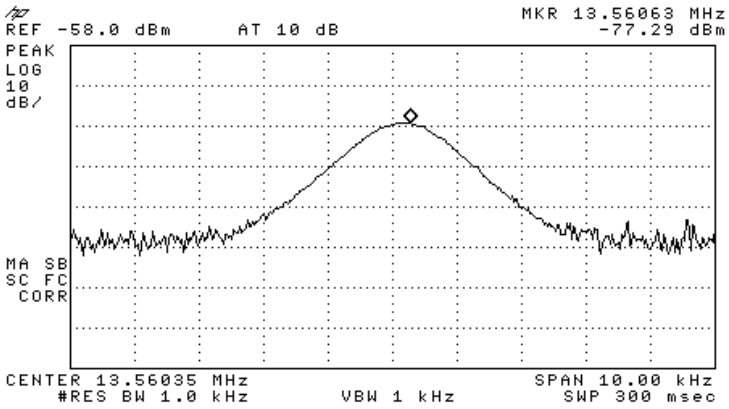


Figure 12. 115 VAC, 25°C

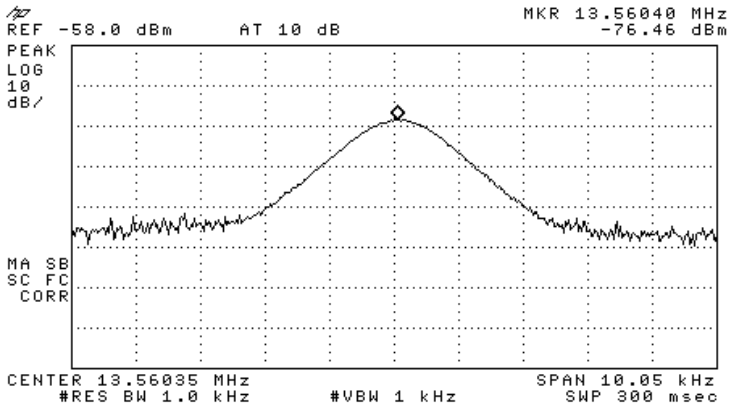


Figure 13. 90 VAC, 55°C

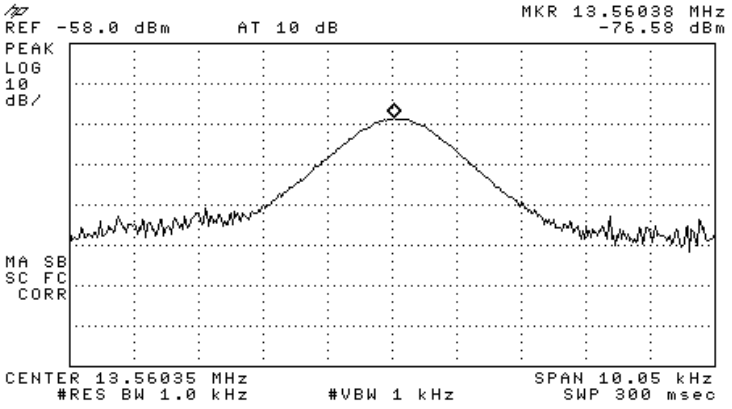


Figure 14. 130 VAC, 55°C

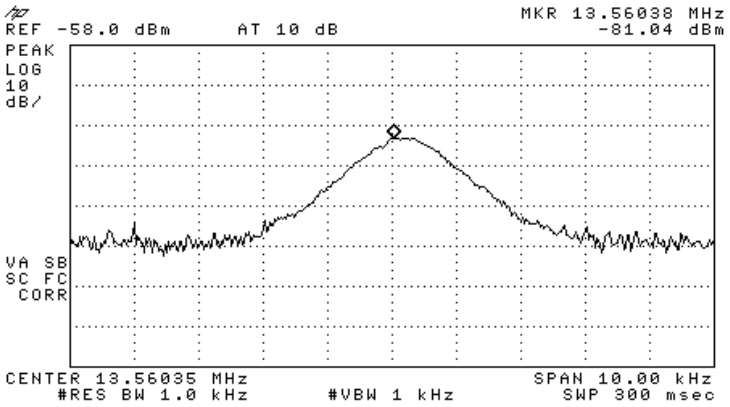


Figure 15. 90 VAC, - 20°C

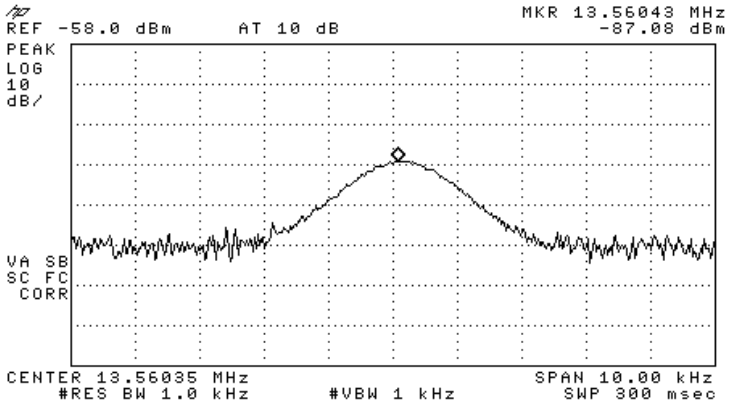


Figure 16. 130 VAC, - 20°C

8.1 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
Environmental Chamber	THERMOTRON CORP	SM 32C Mini Max	25-1030	March 4, 2009	2 Years
Digital Voltage Meter	Escort	EDM1111A	10313121	November 3, 2008	2 Years
Variable Voltage Transformer	Variac Voltage Co.	-	-	N/A	N/A
Spectrum Analyzer	HP	8594E	3809U03785	March 8, 2010	2 Year

9. APPENDIX A - CORRECTION FACTORS

9.1 Correction factors for CABLE

from EMI receiver to test antenna at 3 meter range.

FREQUENCY (MHz)	CORRECTION FACTOR (dB)
10.0	0.3
20.0	0.6
30.0	0.8
40.0	0.9
50.0	1.1
60.0	1.2
70.0	1.3
80.0	1.4
90.0	1.6
100.0	1.7
150.0	2.0
200.0	2.3
250.0	2.7
300.0	3.1
350.0	3.4
400.0	3.7
450.0	4.0
500.0	4.3
600.0	4.7
700.0	5.3
800.0	5.9
900.0	6.3
1000.0	6.7

FREQUENCY (MHz)	CORRECTION FACTOR (dB)
1200.0	7.3
1400.0	7.8
1600.0	8.4
1800.0	9.1
2000.0	9.9
2300.0	11.2
2600.0	12.2
2900.0	13.0

NOTES:

1. *The cable type is RG-214.*
2. *The overall length of the cable is 27 meters.*
3. *The above data is located in file 27MO3MO.CBL on the disk marked "Radiated Emission Tests EMI Receiver".*

9.2 Correction factors for CABLE

from EMI receiver to test antenna at 3 meter range.

FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.2
2.0	1.6
3.0	2.0
4.0	2.4
5.0	3.0
6.0	3.4
7.0	3.8
8.0	4.2
9.0	4.6
10.0	5.0
12.0	5.8

NOTES:

1. The cable type is RG-8.

2. The overall length of the cable is 10 meters.

9.3 Correction factors for LOG PERIODIC ANTENNA

Type LPD 2010/A
at 3 and 10 meter ranges.

Distance of 3 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.1
250.0	10.2
300.0	12.5
400.0	15.4
500.0	16.1
600.0	19.2
700.0	19.4
800.0	19.9
900.0	21.2
1000.0	23.5

Distance of 10 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.0
250.0	10.1
300.0	11.8
400.0	15.3
500.0	15.6
600.0	18.7
700.0	19.1
800.0	20.2
900.0	21.1
1000.0	23.2

NOTES:

1. *Antenna serial number is 1038.*
2. *The above lists are located in file number 38M3O.ANT for a 3 meter range, and file number 38M100.ANT for a 10 meter range.*
3. *The files mentioned above are located on the disk marked "Radiated Emission Test EMI Receiver".*

9.4 Correction factors for BICONICAL ANTENNA

Type BCD-235/B, at 3 meter range

FREQUENCY (MHz)	AFE (dB/m)
20.0	19.4
30.0	14.8
40.0	11.9
50.0	10.2
60.0	9.1
70.0	8.5
80.0	8.9
90.0	9.6
100.0	10.3
110.0	11.0
120.0	11.5
130.0	11.7
140.0	12.1
150.0	12.6
160.0	12.8
170.0	13.0
180.0	13.5
190.0	14.0
200.0	14.8
210.0	15.3
220.0	15.8
230.0	16.2
240.0	16.6
250.0	17.6
260.0	18.2
270.0	18.4
280.0	18.7
290.0	19.2
300.0	19.9
310	20.7
320	21.9
330	23.4
340	25.1
350	27.0

NOTES:

1. Antenna serial number is 1041.

2. The above list is located in file 19BC10M1.ANT on the disk marked "Radiated Emissions Tests EMI Receiver".

9.5 Correction factors for ACTIVE LOOP ANTENNA

Model 6502
S/N 9506-2950

FREQUENCY	Magnetic Antenna Factor	Electric Antenna Factor
(MHz)	(dB)	(dB)
.009	-35.1	16.4
.010	-35.7	15.8
.020	-38.5	13.0
.050	-39.6	11.9
.075	-39.8	11.8
.100	-40.0	11.6
.150	-40.0	11.5
.250	-40.0	11.6
.500	-40.0	11.5
.750	-40.1	11.5
1.000	-39.9	11.7
2.000	-39.5	12.0
3.000	-39.4	12.1
4.000	-39.7	11.9
5.000	-39.7	11.8
10.000	40.2	11.3
15.000	-40.7	10.8
20.000	-40.5	11.0
25.000	-41.3	10.2
30.000	42.3	9.2