Israel Testing Laboratories

ACCREDITED
Cert. No. 1152.01
Electrical (EMC)

DATE: 04 June 2009

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

Supplemental FCC Radio Test Report

for

Mobile Access Networks

Equipment under test:

VOASIS Distributed Antenna System

VOASIS PCS

Written by: _____
D. Shidlowsky, Documentation

Approved by: _____
I. Raz, Test Engineer

Approved by: _____
I. Raz, EMC Laboratory Manager

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Measurement/Technical Report for

Mobile Access Networks

VOASIS Distributed Antenna System

FCC ID: OJFVPCS

This report concerns:	Original Grant: X Class II change: Class I change:
Equipment type:	PCS Licensed Transmitter

Limits used:
47CFR Parts 2; 24

Measurement procedure used is ANSI C63.4-2003.
Substitution Method used as in ANSI/TIA-603-B: 2002

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")

Steve Blum
Mobile Access Networks
8391 Old Courthouse Rd., Suite #300
Vienna, VA. 22182
U.S.A.
Tel: +1-541-758-2880
Fax: +1-703-848-0260
e-mail: sblum@mobileaccess.com

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1. General Information

1.1 Administrative Information

Manufacturer:	Mobile Access Networks
Manufacturer's Address:	8391 Old Courthouse Rd. Suite #300 Vienna, VA 22182 U.S.A. Tel: +1-541-758-2880 Fax: +1-703-848-0260
Manufacturer's Representative:	Steve Blum
Equipment Under Test (E.U.T):	VOASIS Distributed Antenna System
Equipment Model No.:	VOASIS PCS
Equipment Serial No.:	Not Designated
Date of Receipt of E.U.T:	03.06.09
Start of Test:	03.06.09
End of Test:	03.06.09
Test Laboratory Location:	I.T.L (Product Testing) Ltd. Kfar Bin Nun, ISRAEL 99780
Test Specifications:	FCC Part 24, Sub-part E

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), IC File No.: 46405-4025; Site No. IC 4025B-1.
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 MobileAccess Voasis™ Single Band solution provides low-cost, self-installable UMTS and PCS/DCS in-building coverage for small and medium size enterprises (SMEs), multi-tenant buildings, and multi-unit dwellings.

This plug-and-play solution is easily self-installed over the customer's existing Ethernet Cat-5/6 cabling infrastructure - no RF specialist required.

The Voasis™ Solution

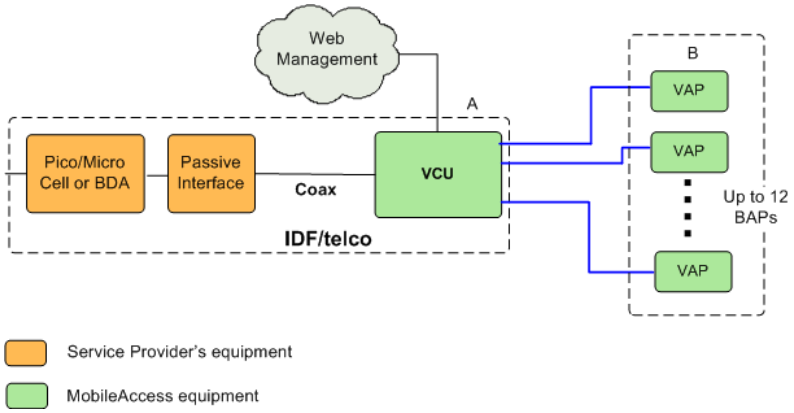
The Voasis solution consists of two main types of components:

A single Voasis Control Unit (VCU) – interfaces to the service provider's EF equipment (BTS/Pico/Femto-cell or BDA), distributes the UMTS/PCS/DCS signal and provides secure, central management to the VAPs.

UP to 12 VAPs – distributed at strategic locations over one or more floors.

The VCU distributes the UMTS/PCS/DCS signal from the service provider's equipment to the VAPs via a *dedicated* Ethernet LAN CAT-5/6 cabling infrastructure.

The VAPs distribute the service via integrated internal antennas.



Key Features and Benefits

Low Deployment Cost

Connects over existing structured cabling infrastructure (Cat 5/6)

Utilizes existing Ethernet jacks

Simple to Install and Maintain

Plug-and-play installation

No skilled IT staff, RF experts, or installers required

Flexible Architecture

Connects to all carrier equipment: BTS, Pico-cell, Femto-cell and BDAs

Special VAP models with support for external antenna connections (VAP-PCS-EXTAN)

VAPs can be easily relocated for coverage modification

Access Pods use Power-over-Ethernet (PoE) – no local power

Simple Management

"Quick-Start" provisioning simplifies initial deployment

Remote monitoring, management, and configuration using a standard web browser over TCP/IP

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 August 22, 2006).
I.T.L.'s EMC Laboratory is also accredited by A2LA, certificate No. 1152.01.

1.6 Measurement Uncertainty

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 EUT consists of the VCU and VAP. The cellular signal is represented in the setup by the PCS portion of the setup.

An "Exercise" SW on the computer was used to enable/disable transmission of the VAP, while the EUT output was connected to the spectrum analyzer

2.2 EUT Exercise Software

The Voasis VCU and VAP units were delivered commands via Eng GUI Suite ver. 1.2 B00.

These commands are used to enable/disable transmission of the VAP.

VCU Version 1.2 B01, VAP Version 1.2 B01.

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

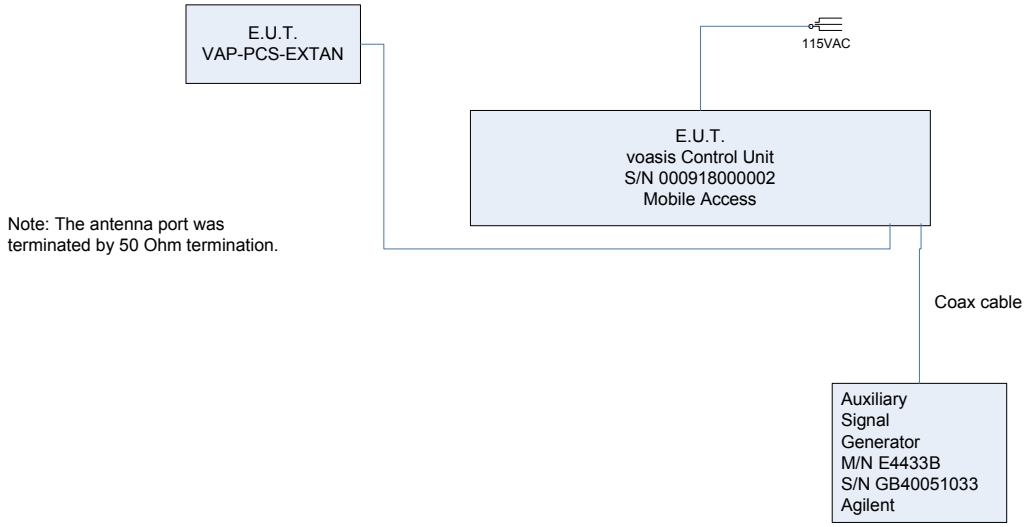


Figure 1. Tests Set-up

3. Test Set-up Photos

Figure 2.

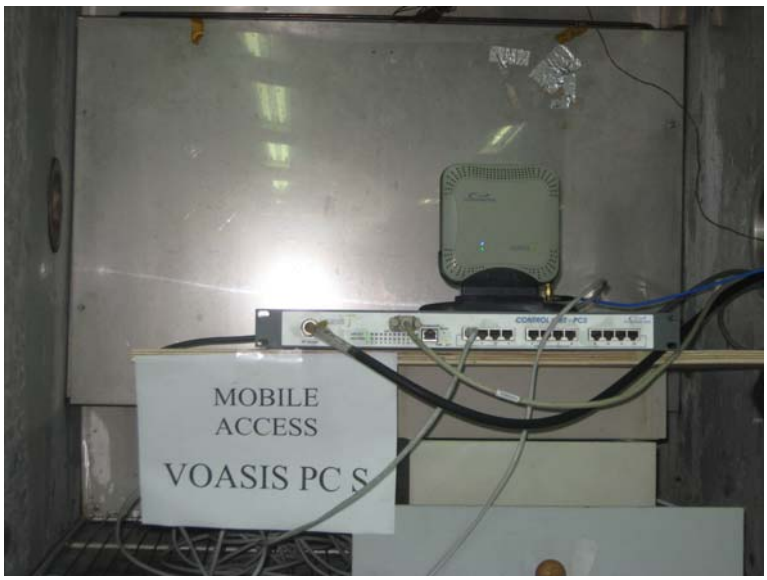


Figure 3.

4. Frequency Stability

4.1 Test Specification

Part 24 Sub-part D Section 24.135

4.2 Test Procedure

The E.U.T operation mode and test setup are as described in Section 2. The E.U.T. was operated with a CW signal in the downlink path.

The E.U.T. was placed inside a temperature chamber. The E.U.T. was operated from 115 VAC at normal temperature and the chamber temperature was set to +20°C.

The spectrum analyzer was set to 50.0 kHz span and 1.0 kHz resolution B.W.

The carrier frequency was measured and recorded (reference frequency reading).

The carrier frequency measurement was repeated for:

(a). +20°C and 97.5 VAC

(b). +20°C and 132.5 VAC

(c). -30°C and 115 VAC

(d). -30°C and 97.5 VAC

(e). -30°C and 132.5 VAC

(f). +50°C and 115 VAC

(g). +50°C and 97.5 VAC

(h). +50°C and 132.5 VAC

The carrier frequency was measured and recorded after at least 20 minutes of exposing the E.U.T. to the temperature.

The E.U.T. was operated at 1932.50, 1960.00, and 1987.5 MHz.

4.3 Test Results

The E.U.T met the requirements of Part 24 Sub-part D, Section 24.135 specification.

The details of the results are given in *Figure 4* to *Figure 6*.

For the operation frequency of 1932.50 MHz:

The frequency offset between the frequency measured under extreme conditions and the reference carrier frequency measured under normal test conditions, is in the worst case, 0.2 kHz at -30 °C.

For the operation frequency of 1960.00 MHz:

The frequency offset between the frequency measured under extreme conditions and the reference carrier frequency measured under normal test conditions, is in the worst case, 0.4 kHz at -30 °C.

For the operation frequency of 1987.50:

The frequency offset between the frequency measured under extreme conditions and the reference carrier frequency measured under normal test conditions, is in the worst case, 0.4 kHz at -30 °C for 1987.50 MHz.

JUDGEMENT: Passed by + 0.4 kHz

TEST PERSONNEL:

Tester Signature: _____ Date: 04.06.09

Typed/Printed Name: I. Raz

Frequency Stability

E.U.T Description VOASIS Distributed Antenna System
Type VOASIS PCS
Serial Number: Not Designated

Specification: FCC Part 24 Sub-part D Section 24.135

Operation Frequency (MHz)	Frequency Readings (MHz)			Δ f(max) (kHz)	Spec. (kHz)
	97.5 (VAC)	115 (VAC)	132.5 (VAC)		
1932.50	1932.4992	1932.4993	1932.4993	+ 0.2	± 1.9
1960.00	1959.9992	1959.9992	1959.9993	+ 0.4	± 1.9
1987.50	1987.4992	1987.4992	1987.4992	+ 0.4	± 1.9

Figure 4. Frequency Stability -30°C

Operation Frequency (MHz)	Frequency Readings (MHz)			Δ f(max) (kHz)	Spec. (kHz)
	97.5 (VAC)	115 (VAC)	132.5 (VAC)		
1932.50	1932.4995	1932.4994	1932.4994	+ 0.1	± 1.9
1960.00	1959.9995	1959.9995	1959.9995	+ 0.1	± 1.9
1987.50	1987.4995	1987.4995	1987.4996	+ 0.1	± 1.9

Figure 5. Frequency Stability +50°C

Notes:

1. Δ f = Reference frequency – frequency reading.
2. Reference reading measured at 115 VAC, + 20°C.
3. Specification: spec: ± 1 ppm = ± 1.9 kHz

Frequency Stability

E.U.T Description VOASIS Distributed Antenna System
Type VOASIS PCS
Serial Number: Not Designated

Specification: FCC Part 24 Sub-part D Section 24.135

Operation Frequency (MHz)	Frequency Readings (MHz)			Δ f(max) (kHz)	Spec. (kHz)
	97.5 (VAC)	115 (VAC)	132.5 (VAC)		
1932.50	1932.4993	1932.4994	1932.4994	+ 0.1	± 1.9
1960.00	1959.9995	1959.9996	1959.9995	+ 0.1	± 1.9
1987.50	1987.4996	1987.4996	1987.4995	+ 0.1	± 1.9

Figure 6. Frequency Stability 20°C

Notes:

1. Δ f = Reference frequency – frequency reading.
2. Reference reading measured at 115 VAC, + 20°C.
3. Specification: spec: ± 1 ppm = ± 1.9 kHz

4.4 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
Environmental Chamber	THERMOTRON CORP	SM 32C Mini Max	25-1030	March 04, 2009	1 Year
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	February 26, 2009	1 Year