

FCC PART 90

EMI MEASUREMENT AND TEST REPORT

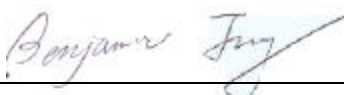
For

OPISYS Incorporated

9201 Irvine Blvd.
Irvine, CA 92618

FCC ID: Q4EUSHR-800NI

2003-06-23

This Report Concerns: ☒ Original Report	Equipment Type: Bi-Directional Amplifier
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Report No.: R0306102	
Test Date: 2003-06-18	
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Note: This test report is specially limited to the above client company and the product model only. It may not be duplicated without prior written consent of Bay Area Compliance Laboratory Corporation. This report **must not** be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

The *OPISYS Incorporated's* product, model: *USHR-800NI* or the "EUT" as referred to in this report is a bi-directional amplifier. The EUT measures approximately 3.1"L x 3.8"W x 1.54"H.

The EUT operates at the frequency range of 851-866MHz and 806-821MHz for both the modulation of TDMA and AMPS. The output power is 0.005W.

The system was fed by ACE AC/DC adapter, M/N: DRS-051200.

** The test data gathered are from typical production samples provided by the manufacturer.*

1.2 Objective

This report is prepared on behalf of *OPISYS Incorporated* in accordance with Part 90 Subpart A, and Subpart I of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC rules for conducted output power, emission bandwidth, spurious emission at antenna terminal, two-tone test, radiated spurious emissions, modulation characteristics, frequency stability, conducted emission and RF exposure.

1.3 Related Submittal(s)/Grant(s)

No Related Submittals

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-1992 and TIA/EIA 603A, 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.

All radiated and conducted emissions measurement was performed by Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

1.5 Test Facility

The Open Area Test site used by BACL to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Sunnyvale, California, USA.

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-1992.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The scope of the accreditation covers the FCC Method – 47 CFR Part – Digital Devices, CISPER 22: 1997: Electromagnetic Interference – Limits and Methods of Measurement of Information Technology Equipment test methods.

1.6 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Due Date
HP	Spectrum Analyzer	8565EC	2517A01610	2005-01-22
HP	Spectrum Analyzer	8593A	29190A00242	2004-05-01
HP	Amplifier	8447E	1937A01054	2004-05-01
HP	Quasi-Peak Adapter	85650A	2521A00718	2004-05-01
Com-Power	Biconical Antenna	AB-100	14012	2004-05-01
Com-Power	Log Periodic Antenna	AL-100	16091	2004-05-01
Com-Power	Log Periodic Antenna	AB-900	15049	2004-05-01
Rohde & Schwarz	EMI Test Receiver	ESPI	1147 8007 07	2003-12-03
HP	Spectrum Analyzer (9KHz – 40GHz)	8564E	08303	2003-08-01
HP	Spectrum Analyzer (9KHz – 50GHz)	8565EC	06042	2004-05-03
HP	Amplifier (1-26.5GHz)	8449B	3147A00400	2004-03-14
A.H.System	Horn Antenna (700MHz-18GHz)	SAS-200/571	261	2004-05-31
KIKUSUI	Voltmeter	PL2303W	N/A	2003-07-28
Electro Impulse	1000W Attenuator	AX-1000-30	N/A	2003-07-29
Rohde & Schwarz	Generator	SMIQ03	N/A	2003-07-05
Rohde & Schwarz	I/Q Modulation	AMIQ02	N/A	2003-07-05
Tektronix	Storage Scope	TDS7104	N/A	2003-10-31
Versa	Temperature Chamber	DPSG-PI	124318	2004-04-23
HP	Plotter	7470A	N/A	Not Required

Statement of Traceability: Bay Area Compliance Laboratory Corp. declares that all equipment has been performed calibration using suitable standard traceable to National Institute of Standard and Technology (NIST).

1.7 External I/O Cabling List and Details

Cable Description	Length (M)	Port/From	To
RF Cable	1.0	RF Port/EUT	RF Port/SMIQ03

2 - SYSTEM TEST CONFIGURATION

2.1 Justification

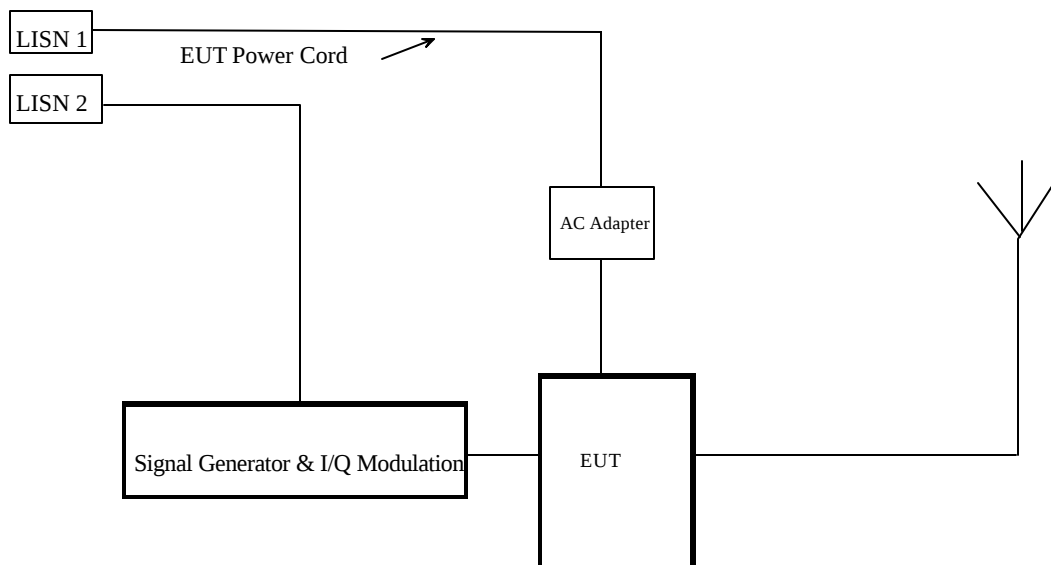
The EUT was configured for testing in a typical fashion (as normally used in a typical application).

The final qualification test was performed with the EUT operating at normal mode.

2.2 Schematics/Block Diagram

Please refer to Exhibit D.

2.3 Test Setup Block Diagram



2.4 Equipment Modifications

No modifications were necessary for the EUT to comply with the applicable standard and limit.

3 - SUMMARY OF TEST RESULTS

FCC RULE	DESCRIPTION OF TEST	Measured	Result
§2.1046 § 90.205	Conducted Output Power	6.99dBm	Compliant
§ 2.1049 § 90.209	Emission Bandwidth	TDMA: 137kHz AMPS: 11.5kHz	Compliant
2.1051 § 90.210	Spurious emissions at antenna terminals	<-13dBm	Compliant
2.1051	Two-Tone Test (Spurious emissions at antenna terminals)	<-13dBm	Compliant
2.1053 § 90.210	Radiated Spurious Emission	Section 8	Compliant
§ 2.1055 (a) § 2.1055 (d)	Frequency stability vs. temperature Frequency stability vs. voltage	N/A	Compliant
§ 2.1047	Modulation Characteristics	N/A	Compliant

4 – CONDUCTED OUTPUT POWER

4.1 Applicable Standard

Per FCC §2.1046, §90.205: the maximum amplifier output power depends on HAAT and service area radius.

4.2 Test Procedure

The antenna was removed and SMA connector was connected to the amplifier output. The amplifier output was connected to a calibrated coaxial attenuator (50 Ohm), the other end of which was connected to a spectrum analyzer. Amplifier output was read off the spectrum analyzer in dBm. The power output at the amplifier was determined by adding the value of the attenuator to the spectrum analyzer reading.

The test was performed at three frequencies (low, middle, and high channels) and on all power levels which can be setup on the amplifier.

4.3 Test equipment

Hewlett Packard HP8564E Spectrum Analyzer, Cal. Due Date: 2003-08-01

Rohde & Schwarz SMIQ03 Signal Generator, Cal. Due Date: 2003-07-05

Rohde & Schwarz AMIQ I/Q Modulation Generator, Cal. Due Date: 2003-07-05

4.4 Test Results

Modulation	Mode	Channel	Frequency MHz	Input Power in dBm	Output Power in dBm
TDMA	Forward (Down-link)	Low	855	-43	6.87
		Mid	860	-43	6.95
		High	865	-43	6.91
	Reverse (Up-link)	Low	810	-43	6.88
		Mid	815	-43	6.99
		High	820	-43	6.97
AMPS	Forward (Down-link)	Low	855	-43	6.92
		Mid	860	-43	6.95
		High	865	-43	6.98
	Reverse (Up-link)	Low	810	-43	6.93
		Mid	815	-43	6.95
		High	820	-43	6.86

5 - EMISSION BANDWIDTH

5.1 Applicable Standards

Per FCC §2.1049, §90.209

5.2 Test Procedure

The RF output of the amplifier was connected to the input of the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 30 KHz and the spectrum was recorded.

5.3 Test Equipment

Hewlett Packard HP8568B Spectrum Analyzer, Cal. Due Date: 2003-10-30

Rohde & Schwarz SMIQ03B Signal Generator, Cal. Due Date: 2003-07-05

Rohde & Schwarz AMIQ I/Q Modulation Generator, Cal. Due Date: 2003-07-05

5.4 Plots of Occupied Bandwidth

Please refer to plots hereinafter.

Test Data Summary

Modulation	Mode	Channel	Frequency (MHz)	Emission Bandwidth in kHz
TDMA	Forward (Down-link)	Low	855	133
		Mid	860	133
		High	865	133
	Reverse (Up-link)	Low	810	137
		Mid	815	133
		High	820	137
AMPS	Forward (Down-link)	Low	855	11.42
		Mid	860	11.50
		High	865	11.50
	Reverse (Up-link)	Low	810	11.42
		Mid	815	11.50
		High	820	11.50

