

FCC PART 22 TYPE APPROVAL EMI MEASUREMENT AND TEST REPORT

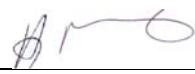
For

OPISYS Incorporated

9201 Irvine Blvd.
Irvine, CA 92618

FCC ID: Q4EUSHR-800

2003-04-22

This Report Concerns: ☒ Original Report	Equipment Type: Bi-Directional Amplifier
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Report No.: R0303201	
Test Date: 2003-04-16	
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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-800* or the "EUT" as referred to in this report is a bi-directional amplifier. The EUT measures approximately 3.8"L x 3.1"W x 1.2"H.

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

** The test data was only good for test sample. It may have deviation for other product samples.*

1.2 Objective

This type approval report is prepared on behalf of *OPISYS Incorporated* in accordance with Part 2, Subpart J, Part 15, Subparts A and B, and Part 22 of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC Part 2, Part 15 and Part 22.

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	8568B	2517A01610	2003-10-30
HP	Spectrum Analyzer	8593A	29190A00242	2003-05-01
HP	Amplifier	8447E	1937A01054	2003-05-01
HP	Quasi-Peak Adapter	85650A	2521A00718	2003-05-01
Com-Power	Biconical Antenna	AB-100	14012	2003-05-01
Com-Power	LISN	LI-200	12005	2004-03-28
Com-Power	LISN	LI-200	12008	2004-03-28
Com-Power	Log Periodic Antenna	AL-100	16091	2003-05-01
Com-Power	Log Periodic Antenna	AB-900	15049	2003-05-01
Rohde & Schwarz	EMI Test Receiver	ESPI	1147 8007 07	2003-12-03
Agilent	Spectrum Analyzer (9KHz – 40GHz)	8564E	08303	2003-08-01
Agilent	Spectrum Analyzer (9KHz – 50GHz)	8565EC	06042	2003-05-03
HP	Amplifier (1-26.5GHz)	8449B	3147A00400	2004-03-14
A.H.System	Horn Antenna (700MHz-18GHz)	SAS-200/571	261	2003-05-31

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 Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Rohde & Schwarz	Signal Generator	SMIQ03	1125.555.03	DoC
Rohde & Schwarz	I/Q Modulation	AMIQ02	1110.2003.02	DoC

1.8 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

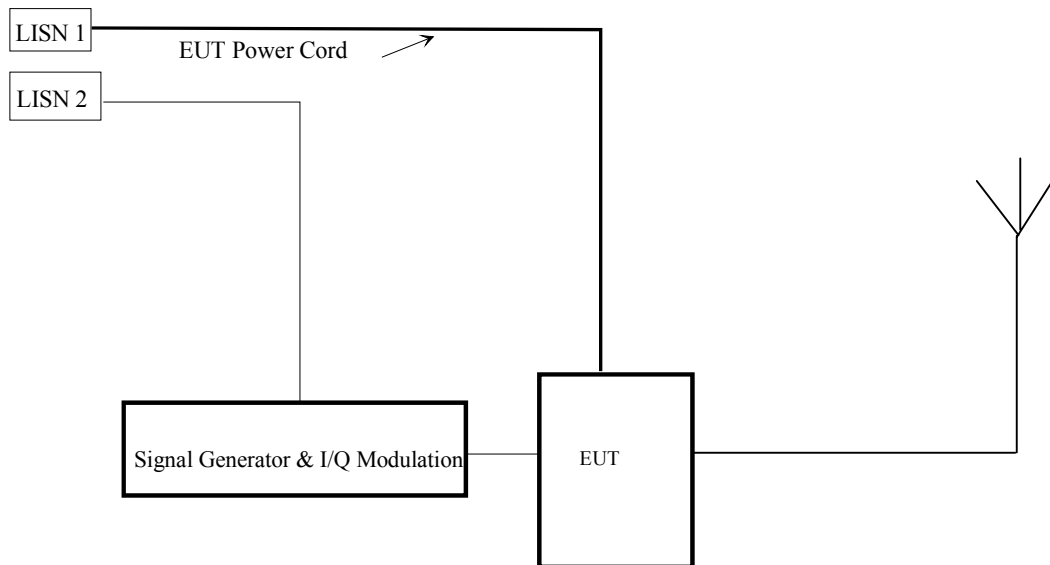
The EUT was configured for testing in a typical fashion (as normally used in a typical application).

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 § 22.913(a)	Conducted Output Power	0.00502 W	Compliant
§ 2.1049 § 22.917(b)	Emission Bandwidth	CDMA: 1608kHz GSM: 573kHz TDMA: 450kHz	Compliant
2.1051 § 22.917(a)	Spurious emissions at antenna terminals	<-13dBm	Compliant
2.1051	Two-Tone Test (Spurious emissions at antenna terminals)	<-13dBm	Compliant
2.1053 § 22.917 (a)	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

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

4.2 Test Procedure

The antenna was removed and SMA connector was connected to the transmitter output. The transmitter output was connected to a calibrated coaxial attenuator (50 Ohm), the other end of which was connected to a spectrum analyzer. Transmitter output was read off the spectrum analyzer in dBm. The power output at the transmitter 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 transmitter.

4.3 Test equipment

Hewlett Packard HP8564E Spectrum Analyzer
Hewlett Packard HP 7470A Plotter
Rohde & Schwarz SMIQ03 Signal Generator
Rohde & Schwarz AMIQ I/Q Modulation Generator

4.4 Test Results

Modulation	Mode	Channel	Input Power in dBm	Output Power in dBm	Output Power in W
CDMA	Up-link	Low	-43	6.91	0.00490
		Mid	-43	6.95	0.00495
		High	-43	6.87	0.00486
	Down-link	Low	-43	6.87	0.00486
		Mid	-43	6.93	0.00493
		High	-43	6.81	0.00480
GSM	Up-link	Low	-43	6.94	0.00493
		Mid	-43	7.01	0.00502
		High	-43	6.85	0.00484
	Down-link	Low	-43	6.93	0.00493
		Mid	-43	6.99	0.00500
		High	-43	6.77	0.00475
TDMA	Up-link	Low	-43	6.88	0.00488
		Mid	-43	6.96	0.00497
		High	-43	6.82	0.00481
	Down-link	Low	-43	6.85	0.00484
		Mid	-43	6.87	0.00486
		High	-43	6.79	0.00478

Note: When the input drive level exceeds -43 dBm, control circuits shut down the output.

5 - EMISSION BANDWIDTH

5.1 Applicable Standards

According to FCC §2.1049 and §22.917 (b), the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

5.2 Test Procedure

The RF output of the transmitter 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 HP8566B Spectrum Analyzer
Hewlett Packard HP 7470A Plotter
Rohde & Schwarz SMIQ03B Signal Generator
Rohde & Schwarz AMIQ I/Q Modulation Generator

5.4 Plots of Occupied Bandwidth

Please refer to plots hereinafter.

Test Data Summary

Modulation	Mode	Channel	Emission Bandwidth in kHz
CDMA	Up-link	Low	1600
		Mid	1575
		High	1600
	Down-link	Low	1600
		Mid	1608
		High	1600
GSM	Up-link	Low	560
		Mid	573
		High	553
	Down-link	Low	533
		Mid	560
		High	563
TDMA	Up-link	Low	433
		Mid	450
		High	433
	Down-link	Low	442
		Mid	442
		High	442

