



**FCC CFR47 PART 22 CERTIFICATION
TEST REPORT**

FOR

869-894MHz RACK MOUNTABLE MULTI-CHANNEL AMPLIFIER

MODEL: G3S-800-140-030

FCC ID: E675JS0051

REPORT NUMBER: 01U0659-1

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Prepared for
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TABLE OF CONTENTS	PAGE
1. FCC CERTIFICATION INFORMATION	1
2. TEST FACILITY.....	2
3. ACCREDITATION AND LISTING	2
4. MEASUREMENT INSTRUMENTATION.....	2
5. MEASURING INSTRUMENT CALIBRATION.....	2
6. UNITS OF MEASUREMENT	3
7. EQUIPMENT MODIFICATIONS	3
8. TEST EQUIPMENT LIST.....	4
9. EUT SETUP PHOTOS	5
10. EXTERNAL I/O CABLE CONSTRUCTION DESCRIPTION.....	9
11. CONFIGURATION BLOCK DIAGRAM	9
12. PART 2: CERTIFICATION TEST REQUIREMENT:	10
SECTION 2.1046: RF POWER OUTPUT	10
SECTION 2.1047: MODULATION CHARACTERISTICS	11
SECTION 2.1049: OCCUPIED BANDWIDTH.....	11
SECTION 2.1051: SPURIOUS EMISSION AT ANTENNA TERMINALS	23
SUBSTITUTION METHOD: (RADIATED EMISSIONS)	64
SECTION 2.1055: FREQUENCY STABILITY	67

1. FCC CERTIFICATION INFORMATION

The following information is in accordance with FCC Rules, 47CFR Part2, Subpart J, Sections 2.1033 – 2.1055.

2.1033(c)(1) Applicant: POWERWAVE TECHNOLOGIES, INC.
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IRVINE, CA 92614
Contact person: Jeff Dale
Telephone number: (949) 809-1466

2.1033(c)(2) FCC ID: E675JS0051

2.1033(c)(6) Range of Operation Power

180 Watts

2.1033(c)(7) Maximum Power Rating

180 Watts

Section 22.913(a); Maximum ERP. The effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts.

TYPE OF EQUIPMENT:	Cellular Amplifier
MEASUREMENT DISTANCE:	3 METER
TECHNICAL LIMIT:	FCC 22.359, 22.917
FCC RULES:	PART 22
EQUIPMENT AUTHORIZATION PROCEDURE	CERTIFICATION / PERMISSIVE CHANGE
MODIFICATIONS MADE ON EUT	☐ YES (REFER TO PAGE 7) ☒ NO

The above equipment was tested by Compliance Certification Services for compliance with the requirements set forth in the FCC CFR 47, PART 22. The results of testing in this report apply to the product/system, which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested and/or Reviewed By:

RELEASED FOR CCS BY:

PETE KREBILL
ASSOCIATE EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

TOM COKENIAS
DIRECTOR OF ENGINEERING
COMPLIANCE CERTIFICATION SERVICES

2. TEST FACILITY

The open area test sites and conducted measurement facilities used to collect the radiated data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

3. ACCREDITATION AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code:200065-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (reference no: 31040/SIT (1300B3) and 31040/SIT(1300F2))

4. MEASUREMENT INSTRUMENTATION

Radiated emissions were measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, ridged waveguide liner horn. EMI receivers were used for line conducted readings, spectrum analyzers with pre-selectors and quasi-peak detectors were used to perform radiated measurements. Receiving equipment (i.e., receiver, analyzer, quasi-peak adapter, pre-selector) and LISNs conform to CISPR specification for "Radio Interference Measuring Apparatus and Measurement Methods," Publication 16.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

5. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

6. UNITS OF MEASUREMENT

Measurements of radiated interference are reported in terms of dB(μ V/m) at a specified distance. The indicated readings on the spectrum analyzer were converted to dB(μ V/m) by use of appropriate conversion factors. Measurements of conducted interference are reported in terms of dB(μ V).

The field strength is calculated by adding the Antenna Factor and Cable Factors, then by subtracting the Amplifier Gain from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

Where FS = Field Strength
 RA = Receiver Amplitude
 AF = Antenna Factor
 CF = Cable Attenuation Factor
 AG = Amplifier Gain

Assume a receiver reading of 52.5 dBuV is obtained. The Antenna Factor of 7.4dB/m and a Cable Factor of 1.1dB is added. The Amplifier Gain of 29 dB is subtracted, giving a field strength of 32 dBuV/m. The 32 dB μ V/m value was mathematically converted to its corresponding level in uV/m.

$$FS = 52.5 + 7.4 + 1.1 - 29 = 32 \text{ dBuV/m}$$

$$\text{Level in uV/m} = \text{Common Antilogarithm} [(32 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$

7. EQUIPMENT MODIFICATIONS

To achieve compliance for FCC PART 22 requirement, the following change(s) were made during compliance testing:

No changes were required in order to achieve compliance to FCC Part 22.

8. TEST EQUIPMENT LIST

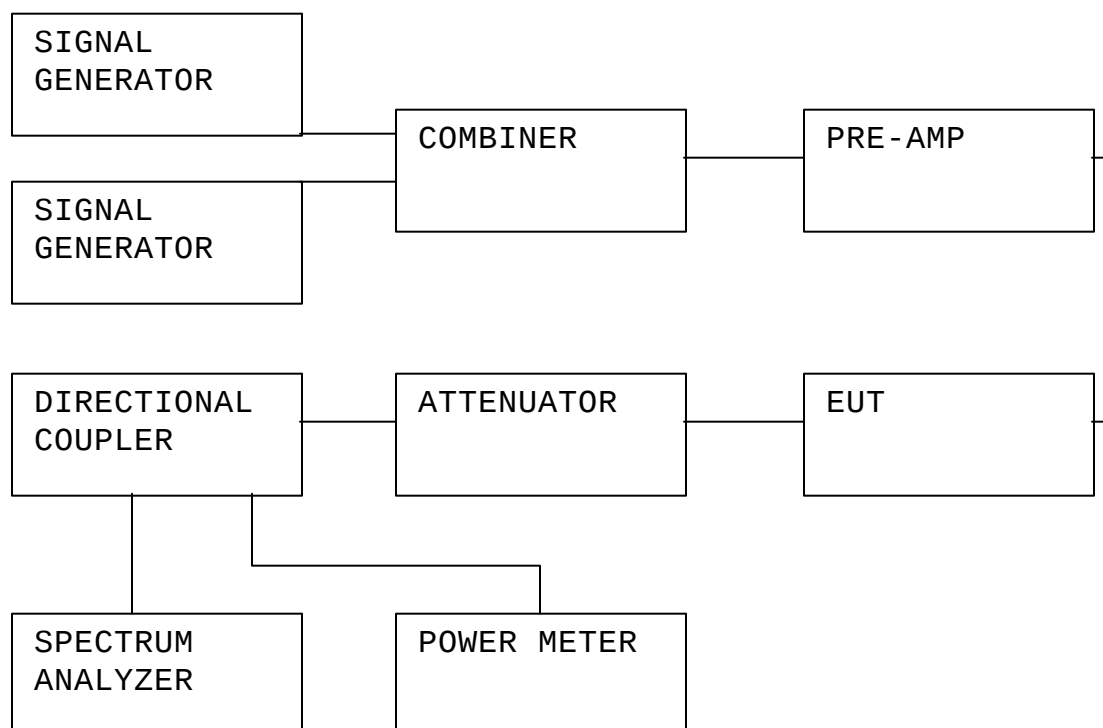
Equipment	Manufacturer	Model No.	Serial No.	Site	Cal Date	Due Date
Bilog Antenna	CHASE	CBL6112	2049	A	01/23/00	01/23/01
Spectrum Analyzer	H.P.	8566B	3014A06685	N/A	06/11/00	06/16/01
Spectrum Analyzer	H.P.	8593EM	3710A00205	N/A	05/25/00	05/25/01
Horn Antenna	EMCO	3115	9001-3245	N/A	01/05/99	01/05/02
Pre-Amp	H.P. (1-26.5GHz)	8449B	3008A00369	N/A	04/12/00	04/12/01
Power Meter	H.P.	438A	2709A29209	N/A	02/08/00	02/08/01
Horn Antenna	Emco	3115	2238	N/A	09/24/99	09/24/02
Signal Generator	H.P.	83732B	US3440599	N/A	02/11/00	02/11/01

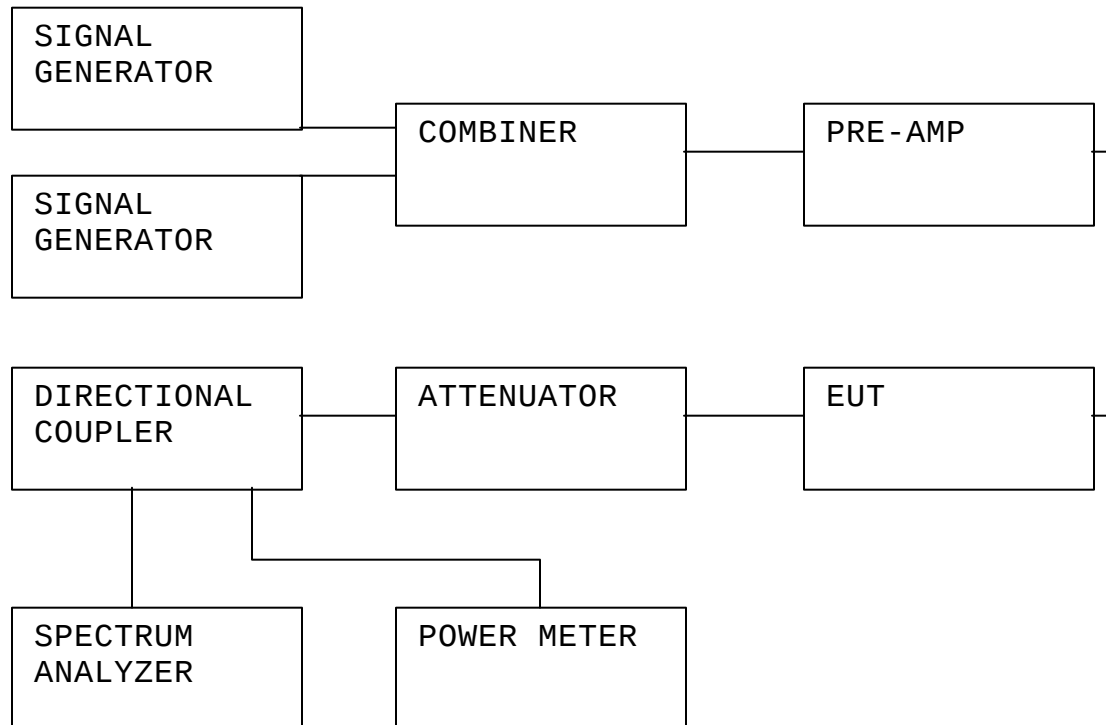
B) SUPPORT EQUIPMENT

Device Type	Manufacturer	Model Number	Serial No.	Cal Due
Signal Generator	Agilent	E4433B	US40051338	4/17/01
Signal Generator	Agilent	E4433B	US40051337	4/24/01
Power Meter	HP	438A	3513U04242	4/24/01
Power Sensor	HP	8481A	US37298530	7/28/01
Dual Directional Coupler	HP	778D	18748	N/A
500W Attenuator	Weinschel	53-20-34	LK446	N/A
Pre-Amp	Mini-Circuits	ZHL-10423	D061698-4	N/A
Combiner	KDI	D336LS	64537	N/A

10. EXTERNAL I/O CABLE CONSTRUCTION DESCRIPTION

CABLE NO: All	
I/O Port: ALL	Number of I/O ports of this type: ALL
Number of Conductors: 2	Connector Type: N-TYPE TO N-TYPE
Capture Type: SCREW-IN	Type of Cable used: SHIELDED
Cable Connector Type: METAL	Cable Length: 1.0 to 2.0 Meter
Bundled During Tests: NO	Data Traffic Generated: YES
Remark: Similar cables used for all in setup below.	

11. CONFIGURATION BLOCK DIAGRAM

12. PART 2: CERTIFICATION TEST REQUIREMENT:**SECTION 2.1046: RF POWER OUTPUT****TEST SETUP:****Minimum requirement:****Section 22.913(a); Maximum ERP.**

The effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts.

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

Test procedure:

The EUT was setup as shown above. The EUT was setup according to the manufacturer's tune-up procedure to give maximum output power of 180 Watts.

Test Result:

The EUT's measured output power was 180 Watts.