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RF Exposure Evaluation Report

APPLICANT	CODAN RADIO COMMUNICATIONS
	43 ERIE STREET VICTORIA, BC V8V 1P8 CANADA
FCC ID	H4JAMP-4-800
MODEL NUMBER	AMP-4-800-30
PRODUCT DESCRIPTION	30W AMPLIFIER
STANDARD APPLIED	CFR 47 Part 2.1091
PREPARED BY	Cory Leverett

We, TIMCO ENGINEERING, INC. would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091 and meets the requirements.

The attached report shall not be reproduced except in full without the written approval of TIMCO ENGINEERING, INC.

GENERAL REMARKS

Attestations

This equipment has been evaluated in accordance with the standards identified in this report. To the best of my knowledge and belief, these evaluations were performed using the procedures described in this report.

I attest that the necessary evaluations were made, under my supervision, at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669

Authorized Signatory Name:

Cory Leverett

Engineering Project Manager

Date: 6/17/14



GENERAL INFORMATION

EUT Description	30W 800 MHz AMPLIFIER
FCC ID	H4JAMP-4-800
Model Number	AMP-4-800-30
Frequency Range	768-869MHz
Type of Emission	F3E, F1E
Modulation	FM
EUT Power Source	<input type="checkbox"/> 110–120Vac/50– 60Hz
	<input checked="" type="checkbox"/> DC Power 12V
	<input type="checkbox"/> Battery Operated Exclusively
Test Item	<input type="checkbox"/> Prototype
	<input checked="" type="checkbox"/> Pre-Production
	<input type="checkbox"/> Production
Type of Equipment	<input checked="" type="checkbox"/> Fixed
	<input type="checkbox"/> Mobile
	<input type="checkbox"/> Portable
Test Conditions	The temperature was 26°C with a relative humidity of 64%.
Revision History to the EUT	None
Test Facility	Timco Engineering Inc. at 849 NW State Road 45 Newberry, FL 32669 USA.

RF Exposure Requirements

General information

Device type: Part 90 RF amplifier designed to increase the RF output power of a push to talk type of radio.

Devices that operate under Part 90 of this chapter are subject to RF exposure evaluation prior to equipment authorization or use.

Antenna

The manufacturer does not specify an antenna, but a typical antenna has a gain of 0 dBi.

Configuration	Antenna p/n	Type	Max. Gain (dBi)
Fixed mounted	Any	omni	0

Operating configuration and exposure conditions:

The conducted output power is shown in the table below. Typical use qualifies for a maximum duty cycle factor of 100%.

Operation: A typical installation consists of an antenna system with a 10 meter coaxial cable of the type RG 213/ U type which has a loss as follows;

Nom. Attenuation for RG 213/U:

Frequency MHz	Attenuation per 100ft. dB
1	.27
10	.55
50	1.3
100	1.9
200	2.7
400	4.1
700	6.5
900	7.6
1000	8.0
4000	21.5

MPE Calculation:

Applicant: CODAN RADIO COMMUNICATIONS
FCC ID: H4JAMP-4-800
Report: C:\CODAN_H4J\RF Exposure Rpt

The minimum separation distance is calculated as follows:

$$E(V/m) = \frac{\sqrt{30 \times P \times G}}{d}$$

$$\text{Power density: } P_d(mW/cm^2) = \frac{E^2}{3770}$$

The limit for general uncontrolled exposure environment is shown in FCC rule Part 1.11310, Table 1.

Minimum Separation Distance for Mobile or Fixed Devices General Population/Uncontrolled Exposure						
Insert values in yellow highlighted boxes to determine Minimum Separation Distance						
Max Power	42	W	equals	Max Power	42000	mW
Duty Cycle	100	%	equals	Duty Factor	1	numeric
Antenna Gain	0	dBi	equals	Gain numeric	1	numeric
Coax Loss	2.6	dB		Gain - Coax Loss	0.549541	numeric
Power Density	0.6	mW/cm ²				
Enter power Density from the chart to the right				Rule Part 1.1310, Table 1		
Frequency	869	MHz		Frequency range	Power density	Enter this value
				MHz	mW/cm ²	mW/cm ²
				0.3-1.34	100	100
				1.34-30	180/f ²	0.0
				30-300	0.2	0.2
				300-1,500	f/1500	0.6
				1,500-100,000	1	1
				f = frequency in MHz		
Minimum Separation Distance				55 cm		0.55 m
Minimum Separation in Inches	21.76599 Inches					