

**Axlon Electronics Corp.  
FCC Part 15, Certification Application  
PLW-01**

**UST Project No: 99-775  
February 6, 2000**

# MEASUREMENT/TECHNICAL REPORT

COMPANY NAME: **Axlon Electronics Corp.**

MODEL: **PLW-01**

FCC ID: **NYM-PLW-01**

DATE: **February 6, 2000**

This report concerns (check one): Original grant   
Class II change\_\_\_\_\_

Equipment type: \_\_\_\_\_

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? yes \_\_\_\_\_ No

If yes, defer until: \_\_\_\_\_  
date

N.A. agrees to notify the Commission by N.A.  
date

of the intended date of announcement of the product so that the grant can be issued  
on that date.

Report prepared by:

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#### AGENCY AGREEMENT

Federal Communications Commission  
P.O. Box 429  
Columbia, MD 21045

Oct. 28, 1999

Gentlemen:

I hereby appoint United States Technologies to act as our agent in the preparation of an application for equipment authorization of PalmPal-lite under Part 15 of the FCC Rules and Regulations. I certify that Exhibits 1 and 4 properly describe the device or system for which authorization is sought, that the information described in the User's Manual will be provided with each item manufactured or distributed by the applicant, and that the labels described by Exhibit 2 will be affixed to each item manufactured or distributed by the applicant. I further certify that appropriate arrangements have been made to assure that production units of this equipment bearing the name and FCC IDENTIFIER listed in this application will contribute to comply with the Commission's requirements.

I further certify by signature below that no party (per 47 CFR 1.2002(b)) to the application is subject to a denial of Federal benefits, including FCC benefits, pursuant to Section 404 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 853(a).

This appointment includes the authority to complete FCC Form 731 on our behalf and sign the application as an authorized agent.

Name: Ken Hsu

Signature: 

Title: VP of Marketing and Sales

Date: Oct. 28, 1999

# SECTION 1

## GENERAL INFORMATION

## GENERAL INFORMATION

### 1.1 Product Description

The Equipment Under Test (EUT) is a Axlom Electronics Corp., Model PLW-01. The EUT is a 900 MHz Direct Sequence Spread Spectrum mobile unit and is part of the Palm Pal-lite home automation system. The system, with all of its resources provides a powerful and convenient control interface between the user and a wide range of automated systems such as security, lighting, HVAC, or personal computer. The EUT is used in this system as a wireless voice communications to the Mobile Unit and can also be programmed for various types of macro functions which are activated via a Dallas Touch Key.

The transceiver is designed to operate on the following frequencies:

| Channel | Frequency (MHz) |
|---------|-----------------|
| 1       | 905.728         |
| 2       | 907.776         |
| 3       | 909.824         |
| 4       | 911.872         |
| 5       | 913.920         |
| 6       | 915.968         |
| 7       | 918.016         |
| 8       | 920.064         |
| 9       | 922.112         |
| 10      | 924.160         |

## 1.2 Related Submittal(s)/Grant(s)

The EUT will be used with part of a system to send/receive data. The transceiver presented in this report will be used with another transceiver which has been submitted under FCC ID: NYM-PLM-01

The EUT is subject to the following authorizations:

- a) Certification as a transceiver
- b) Verification as a receiver and digital device

The information contained in this report is presented for the Certification & Verification authorization(s) for the EUT.

## **SECTION 2**

# **TESTS AND MEASUREMENTS**

## TEST AND MEASUREMENTS

### 2.1 Configuration of Tested System

The sample was tested per ANSI C63.4, Methods of Measurement from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (1992). Conducted and radiated emissions data were taken with the test receiver or spectrum analyzer's resolution bandwidth adjusted to 9 kHz and 120 kHz, respectively. All measurements are peak unless stated otherwise. The video filter associated with the spectrum analyzer was off throughout the evaluation process. Interconnecting cables were manipulated as necessary to maximize emissions. A block diagram of the tested system is shown in Figure 1. Test configuration photographs for spurious and fundamental emissions are shown in Figure 2.

The sample used for testing was received by U.S. Technologies on October 29, 1999 in good condition.

### 2.2 Test Facility

Testing was performed at US Tech's measurement facility at 3505 Francis Circle, Alpharetta, GA. This site has been fully described and submitted to the FCC, and accepted in their letter marked 31040/SIT. Additionally this site has also been fully described and submitted to Industry Canada (IC), and has been approved under file number IC2982.

### 2.3 Test Equipment

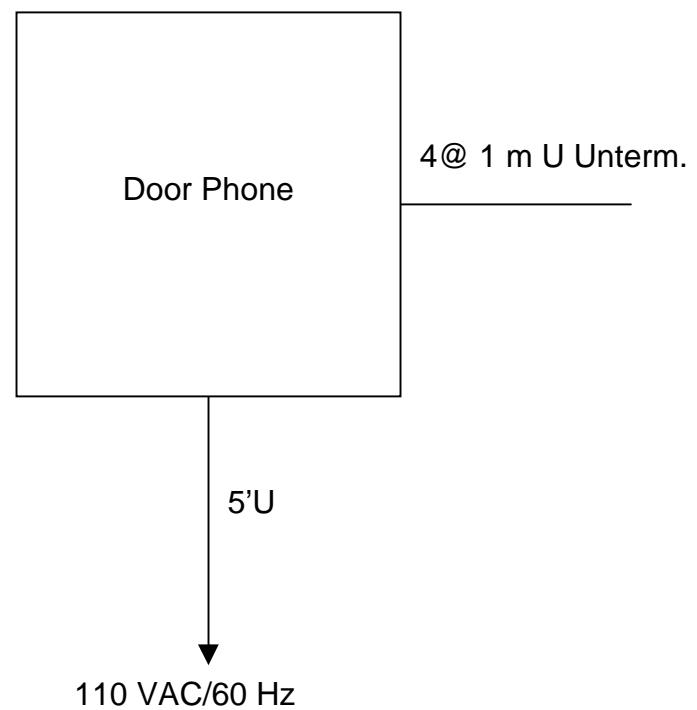
Table 2 describes test equipment used to evaluate this product.

### 2.4 Modifications

The following modifications were made by Axlon Electronics Corp. to bring the EUT into compliance with FCC Part 15 limits for the transmitter portion of the EUT:

- 1) Conductive Coating was applied to the inside of both halves of the plastic chassis and a shield was placed between the antenna and the digital device boards.

**FIGURE 1**  
**TEST CONFIGURATION**



**Test Date:** December 8, 1999  
**UST Project:** 99-775  
**Customer:** Axlon Electronics Corp.  
**Model:** PLW-01

**FIGURE 2a**

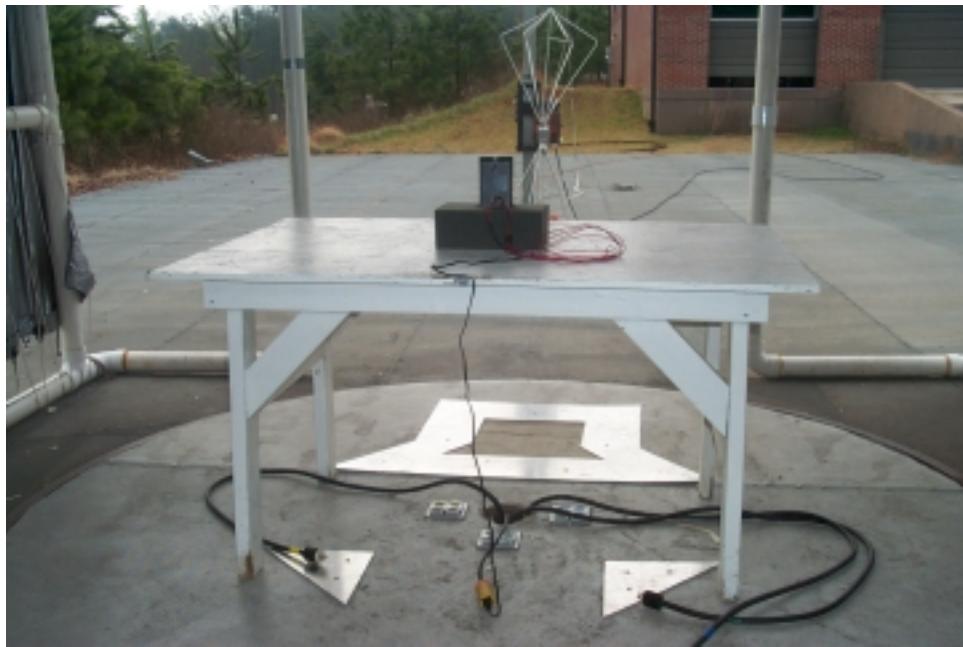
**Photograph(s) for Spurious Emissions (Front)**



**Test Date:** December 8, 1999  
**UST Project:** 99-775  
**Customer:** Axlon Electronics Corp.  
**Model:** PLW-01

**FIGURE 2b**

**Photograph(s) for Spurious Emissions (Back)**



**Test Date:** December 16 - December 28, 1999  
**UST Project:** 99-775  
**Customer:** Axlon Electronics Corp.  
**Model:** PLW-01

**FIGURE 2c**

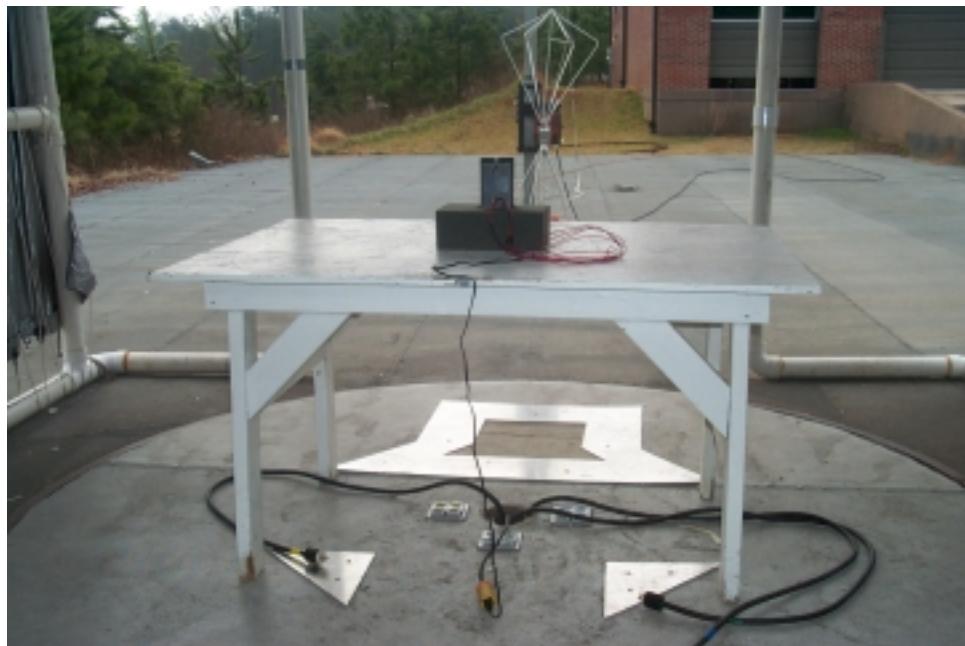
**Photograph(s) for Digital Device Emissions (Front)**



**Test Date:** December 16 - December 28, 1999  
**UST Project:** 99-775  
**Customer:** Axlon Electronics Corp.  
**Model:** PLW-01

**FIGURE 2d**

**Photograph(s) for Digital Device Emissions (Back)**



**Test Date:** December 16, 1999  
**UST Project:** 99-775  
**Customer:** Axlon Electronics Corp.  
**Model:** PLW-01

**FIGURE 2e**  
**Photograph(s) for Conducted Emissions**



**TABLE 1**  
**EUT and Peripherals**

| PERIPHERAL<br>MANUFACTURER            | MODEL<br>NUMBER | SERIAL<br>NUMBER | FCC ID:                 | CABLES<br>P/D                       |
|---------------------------------------|-----------------|------------------|-------------------------|-------------------------------------|
| Handset<br>Axlon Electronics<br>Corp. | PLW-01          | 1                | NYM-PLW-01<br>(Pending) | 4 @ 1m u unterm.<br>5' u Power Cord |

**TABLE 2**  
**TEST INSTRUMENTS**

| TYPE                 | MANUFACTURER    | MODEL  | SN.           |
|----------------------|-----------------|--------|---------------|
| SPECTRUM ANALYZER    | HEWLETT-PACKARD | 8593E  | 3205A00124    |
| SPECTRUM ANALYZER    | HEWLETT-PACKARD | 8558B  | 2332A09900    |
| S A DISPLAY          | HEWLETT-PACKARD | 853A   | 2404A02387    |
| COMB GENERATOR       | HEWLETT-PACKARD | 8406A  | 1632A01519    |
| RF PREAMP            | HEWLETT-PACKARD | 8447D  | 1937A03355    |
| RF PREAMP            | HEWLETT-PACKARD | 8449B  | 3008A00480    |
| HORN ANTENNA         | EMCO            | 3115   | 3723          |
| BICONICAL ANTENNA    | EMCO            | 3110   | 9307-1431     |
| LOG PERIODIC ANTENNA | EMCO            | 3146   | 9110-3600     |
| LISN                 | SOLAR ELE.      | 8012   | 865577        |
| LISN                 | SOLAR ELE.      | 8028   | 910494        |
| LISN                 | SOLAR ELE.      | 8028   | 910495        |
| THERMOMETER          | FLUKE           | 52     | 5215250       |
| MULTIMETER           | FLUKE           | 85     | 53710469      |
| FUNCTION GENERATOR   | TEKTRONIX       | CFG250 | CFG250TW15059 |
| PLOTTER              | HEWLETT-PACKARD | 7475A  | 2325A65394    |

## 2.6 Antenna Description (Paragraph 15.203)

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

The Model Axlon Electronics Corp. PLW-01 incorporates an external antenna.

Manufacturer: Joymax Electronic Corp  
17 Hsin-Jung Rd.  
Ping-Chen  
Tao-Yuan, Taiwan, R.O.C

Type: ½ wave toroidal Antenna

Model Number: GL-900

Gain: 0 dBi

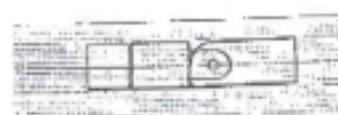
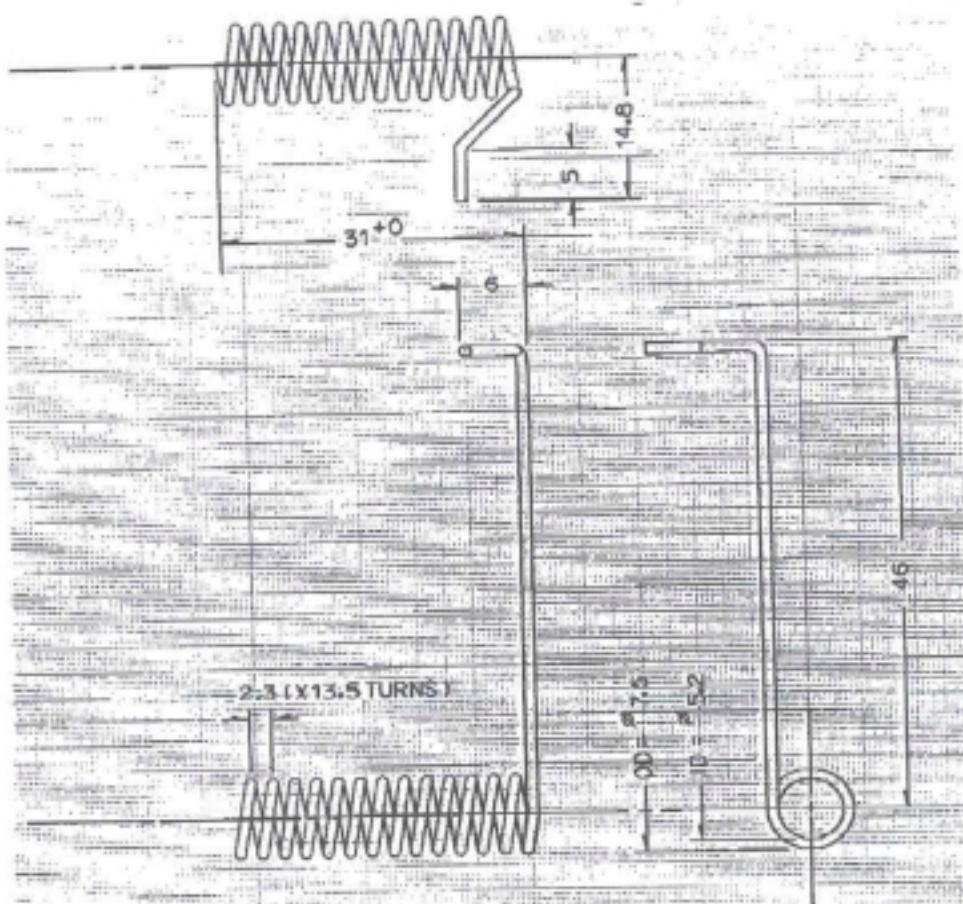
Connector: Internal to product

(Please refer to the following descriptions provided by Axlon Electronics Corp.).

## SPECIFICATION

### GENERAL

1. DESCRIPTION: Helicoid antenna
2. CUSTOMER : AXLON ELECTRONICS CORPORATION
3. MODEL NO : GL-900
4. FREQUENCY : 902~928MHz
5. IMPEDANCE : 50 Ohms nominal
6. S.W.R. : Less than 2.0:1
7. GAIN : 0 dbi
8. ADMITTED POWER RADIATION : 5 W
9. TYPE OF RADIATION : Toroidal
10. POLARIZATION : Vertical
11. ELECTRICAL LENGTH : 1/2  $\lambda$
12. APPEARANCE/DIMENSION : See fig.1.
13. OPERATING TEMPERATURE RANGE : -20°C ~ +65°C
14. STORAGE TEMPERATURE RANGE : -30°C ~ +75°C



## 2.7 Peak Power Within the Band 902 - 928 MHz per FCC Section 15.247(b)

Since the EUT contains an integrated antenna, the peak power within the band 902 - 928 MHz has been measured by placing the EUT on an OAT's site and maximizing the fundamental emissions as shown in Figure 3a through 3c. The transmitters peak power was then calculated as shown in table 3

The EUT did not incorporate any antennas of directional gain greater than 6 dBi, therefore the output power has not been reduced as required by 15.247(b)(3).

**TABLE 3**  
**PEAK POWER OUTPUT**

**Test Date:** January 2, 2000  
**UST Project:** 99-775  
**Customer:** Axlon Electronics Corp.  
**Model:** PLW-01

| Frequency (MHz) | Receiver Reading (dBm) @3m | Correction Factor (dB) | Corrected Reading (V/m) @3m | Measured Power (Watt) | FCC Limit (Watt) |
|-----------------|----------------------------|------------------------|-----------------------------|-----------------------|------------------|
| 905.728         | -37.3                      | 30.7                   | 0.058760                    | 0.001                 | 1.0              |
| 913.920         | -35.7                      | 30.8                   | 0.128097                    | 0.005                 | 1.0              |
| 924.160         | -42.6                      | 31.0                   | 0.104558                    | 0.003                 | 1.0              |

Transmitters peak power calculated using:

$$P (W) = \frac{(E \cdot d)^2}{30 \cdot G}$$

where d = 3 meters, E = corrected measured field strength in V/m, and G = numeric gain of transmitting antenna (1.0 for 0 dBi).

**Test Results**

**Reviewed By**

**Signature:** \_\_\_\_\_ **Name:** Tim R. Johnson

Figure 3a.  
Peak Power per FCC Section 15.247(b) (Low)

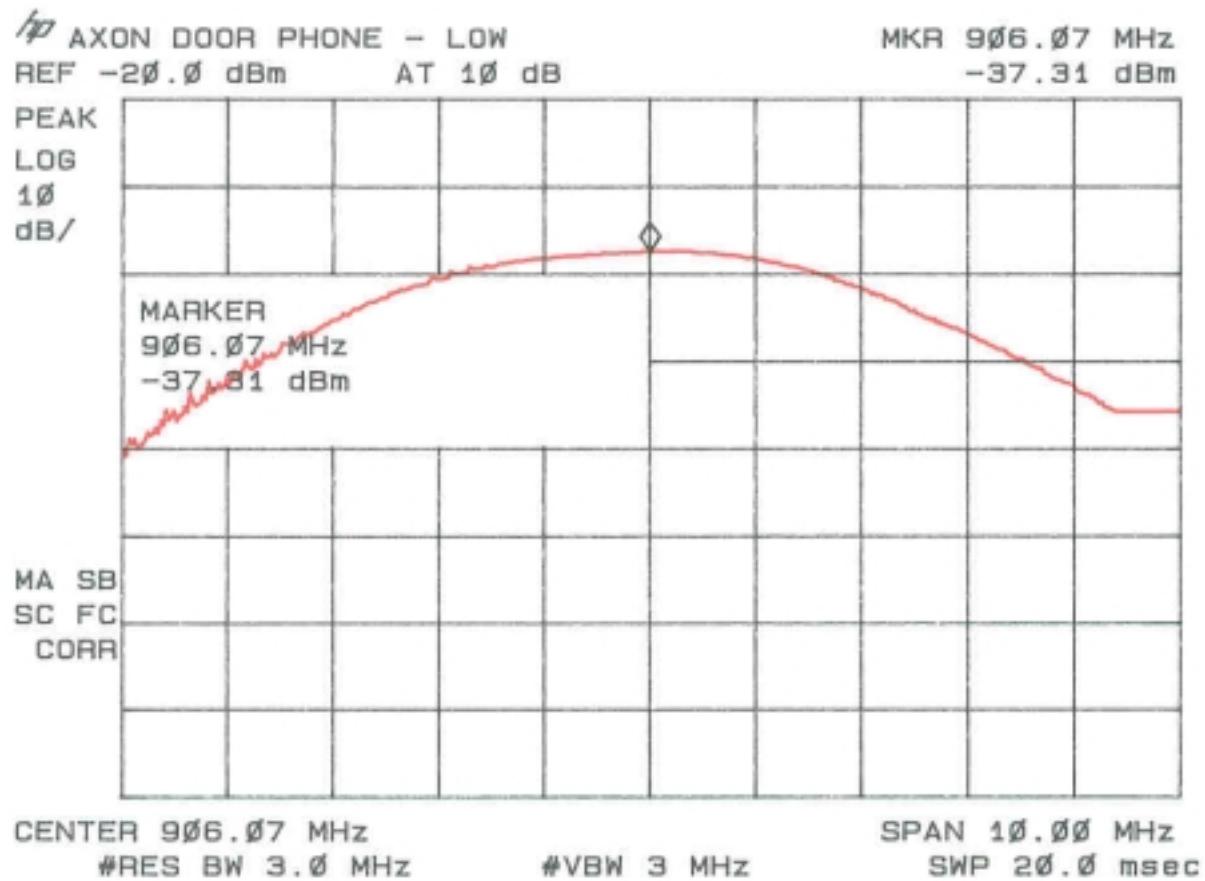


Figure 3b.  
Peak Power per FCC Section 15.247(b) (Mid)

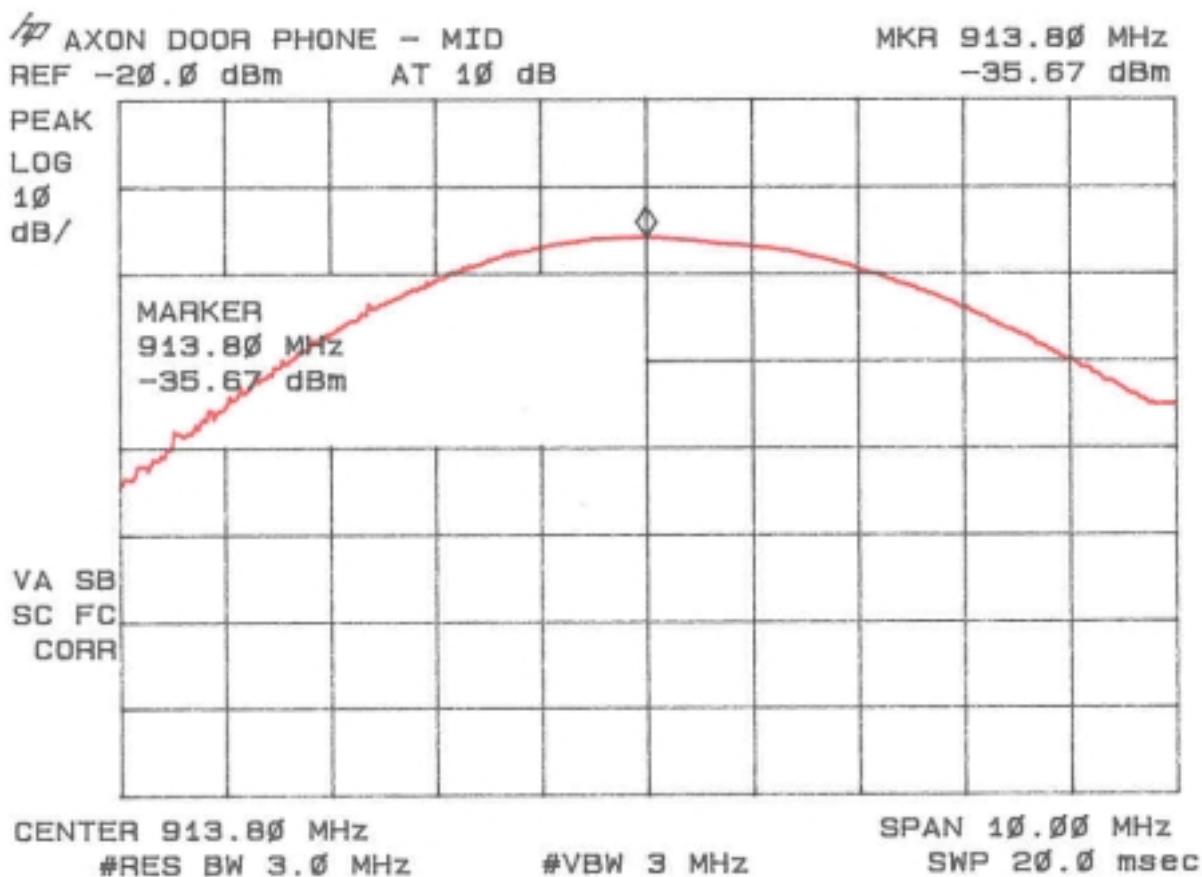


Figure 3c.  
Peak Power per FCC Section 15.247(b) (High)

