# FCC CFR47 PART 15 SUBPART C
# INDUSTRY CANADA RSS-210 ISSUE 7

## CERTIFICATION TEST REPORT

## FOR

## PRE INDUCTIVE CHARGER BACKCOVER

**MODEL NUMBER: 180-10704-00**

**REPORT NUMBER: 09U12925-1**

**FCC ID: O8F-CABC1**
**IC: 3905A-CABC1**

**ISSUE DATE: JANUARY 7, 2010**

*Prepared for*
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**950 WEST MAUDE AVENUE**
**SUNNYVALE, CA 94085**
**U.S.A.**

*Prepared by*
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NVLAP LAB CODE 200065-0

Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| -- | 1/7/2010 | Initial Issue | M. Heckrotte |

# TABLE OF CONTENTS

**1. ATTESTATION OF TEST RESULTS ..... 4**

**2. TEST METHODOLOGY ..... 5**

**3. FACILITIES AND ACCREDITATION ..... 5**

**4. CALIBRATION AND UNCERTAINTY ..... 5**

***4.1. MEASURING INSTRUMENT CALIBRATION ..... 5***

***4.2. SAMPLE CALCULATION ..... 5***

***4.3. MEASUREMENT UNCERTAINTY ..... 5***

**5. EQUIPMENT UNDER TEST ..... 6**

***5.1. DESCRIPTION OF EUT ..... 6***

***5.2. MAXIMUM FIELD STRENGTH ..... 6***

***5.3. DESCRIPTION OF AVAILABLE ANTENNAS ..... 6***

***5.4. SOFTWARE AND FIRMWARE ..... 6***

***5.5. MODE(S) OF OPERATION ..... 6***

***5.6. TEST CONFIGURATIONS ..... 7***

***5.7. WORST-CASE CONFIGURATION AND MODE ..... 7***

***5.8. MODIFICATIONS ..... 7***

***5.9. DESCRIPTION OF TEST SETUP ..... 8***

**6. TEST AND MEASUREMENT EQUIPMENT ..... 11**

**7. RADIATED EMISSION TEST RESULTS ..... 12**

***7.1. LIMITS AND PROCEDURE ..... 12***

***7.2. SPURIOUS EMISSIONS 0.15 TO 30 MHz (WORST CASE CONFIGURATION) ..... 13***

***7.3. SPURIOUS EMISSION 30 TO 1000 MHz (WORST CASE CONFIGURATION) ..... 14***

**8. AC MAINS LINE CONDUCTED EMISSIONS (WORST CASE CONFIGURATION) ..... 17**

***8.1. LIMITS AND PROCEDURE ..... 17***

**9. MAXIMUM PERMISSIBLE EXPOSURE ..... 21**

**10. SETUP PHOTOS ..... 22**

***10.1. RADIATED EMISSION BELOW 30 MHz ..... 22***

***10.2. RADIATED EMISSION ABOVE 30 MHz ..... 24***

***10.3. AC MAINS LINE CONDUCTED EMISSION ..... 26***

# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** PALM, INC.
950 WEST MAUDE AVENUE
SUNNYVALE, CA 94085, U.S.A.

**EUT DESCRIPTION:** PRE INDUCTIVE CHARGER BACKCOVER

**MODEL:** 180-10704-00

**SERIAL NUMBER:** AD14P9R97364

**DATE TESTED:** NOVEMBER 11 to 13, 2009

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULTS** |
| FCC PART 15 SUBPART C | Pass |
| INDUSTRY CANADA RSS-210 Issue 7 | Pass |
| INDUSTRY CANADA RSS-GEN Issue 2 | Pass |

Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For CCS By: Tested By:

MICHAEL HECKROTTE
DIRECTOR OF ENGINEERING
COMPLIANCE CERTIFICATION SERVICES

DOUGLAS ANDERSON
EMC TECHNICIAN
COMPLIANCE CERTIFICATION SERVICES

# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 2, and RSS-210 Issue 7.

# 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

# 4. CALIBRATION AND UNCERTAINTY

## 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

## 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

## 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| PARAMETER | UNCERTAINTY |
|---|---|
| Conducted Disturbance, 0.15 to 30 MHz | 3.52 dB |
| Radiated Disturbance, 30 to 1000 MHz | 4.94 dB |

Uncertainty figures are valid to a confidence level of 95%.

# 5. EQUIPMENT UNDER TEST

## 5.1. DESCRIPTION OF EUT

The EUT is the accessory back cover portion of an inductively coupled battery charger system intended for charging batteries in cell phones. The companion portion of the system is a power supply and base. The EUT receives power from the base, senses the state of the battery and sends battery state information to the base.

The accessory back cover receives on a frequency of approximately 118.5 kHz and transmits on a frequency of approximately 3.1 MHz.

## 5.2. MAXIMUM FIELD STRENGTH

The transmitter has a maximum radiated field strength as follows:

| Frequency (MHz) | Field Strength (dBuV/m @ 30 m) | Field Strength (uV/m @ 30 m) |
|---|---|---|
| 3.1 | -9.88 | 0.321 |

## 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an integral loop antenna.

## 5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was Palm Airboard Firmware, rev. 13C.

## 5.5. MODE(S) OF OPERATION

When the accessory cover is within asproximately 0.2 mm of, and properly aligned with, the base the transmitters on both the base and the cover will operate.

The base provides power for charging the battery and for operating the radio devices in both the base and the cover.

## 5.6. TEST CONFIGURATIONS

The following configurations were investigated during preliminary testing:

| EUT Configuration | Description |
|---|---|
| Configurations 1-4 | Configurations 1 through 4 have no battery therefore draw the least current. |
| Configuration 1 | Pre Airboard, Touchstone, and AC Adapter1, 2, 3 |
| Configuration 2 | N/A |
| Configuration 3 | Second Source Pre Airboard, Touchstone, and AC Adapter 3 |
| Configuration 4 | N/A |
| Configurations 5-6 | Configurations 5 and 6 were tested with a dead battery therefore draw the most current. |
| Configuration 5 | Cell Phone with Pre Airboard, Touchstone, and AC Adapter 1 |
| Configuration 6 | N/A |

## 5.7. WORST-CASE CONFIGURATION AND MODE

Configuration 1 with AC Adapter 3 was the worst-case for radiated emissions. Configuration 1 with AC Adapter 1 was the worst-case for AC Mains conducted emissions.

## 5.8. MODIFICATIONS

No modifications were made during testing.

## 5.9. DESCRIPTION OF TEST SETUP

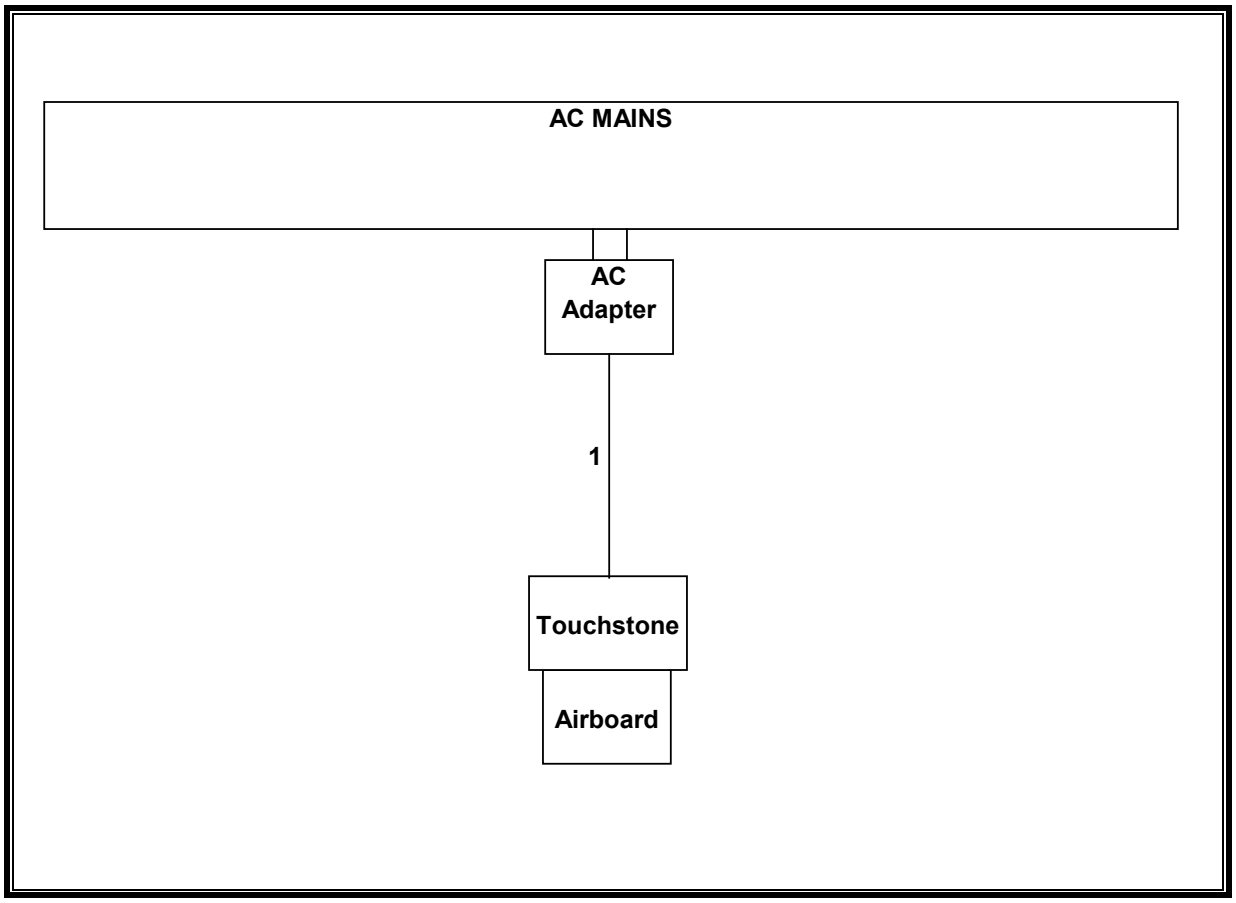
**SUPPORT EQUIPMENT**

| PERIPHERAL SUPPORT EQUIPMENT LIST | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Serial Number** | **FCC ID** |
| Cell Phone (Palm Pre) | Palm, Inc. | P100EWW | AD14P9E97364 | O8F-CASC |
| Pre Airboard | Palm, Inc. | 180-10704-00 | AD14P9E97364 | 08F-CABC1 (Pending) |
| Second Source Pre Airboard | Palm, Inc. | 180-10704-00 | T19810UQC31 | 08F-CABC1 (Pending) |
| Touchstone | Palm, Inc. | 157-10123-00 | P29831Q4C2A | 08F-TST1 (Pending) |
| AC Adapter 1 | Palm, Inc. | 157-10124-00 | 02121 | DoC |
| AC Adapter 2 | Palm, Inc. | 157-10130-00 | 02122 | DoC |
| AC Adapter 3 | Palm, Inc. | 157-10108-00 | 02123 | DoC |

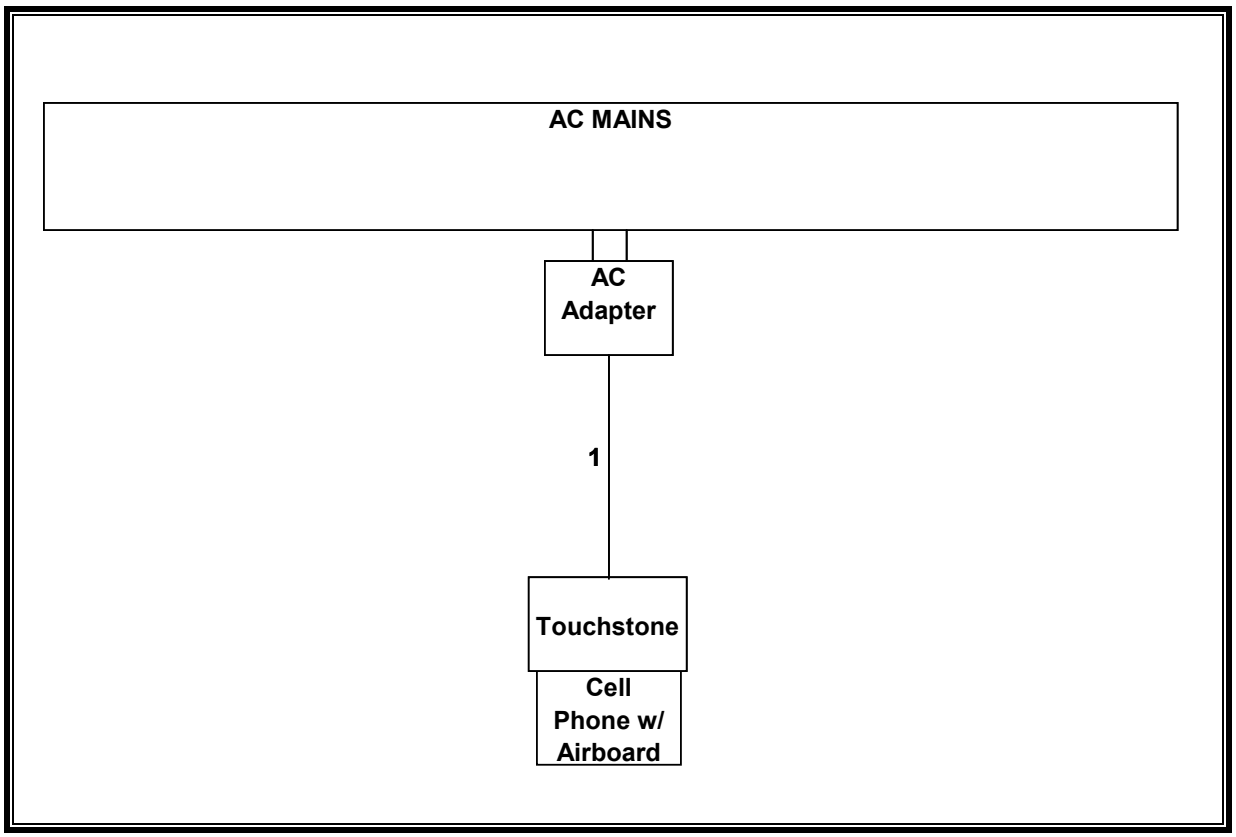
**I/O CABLES**

| I/O CABLE LIST | | | | | | |
|---|---|---|---|---|---|---|
| **Cable No.** | **Port** | **# of Identical Ports** | **Connector Type** | **Cable Type** | **Cable Length** | **Remarks** |
| 1 | USB | 1 | Micro USB | Shielded | 1m | |

**SETUP DIAGRAM FOR TEST CONFIGURATIONS WITHOUT BATTERY**



**SETUP DIAGRAM FOR TEST CONFIGURATIONS WITH DEAD BATTERY**



# 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

| TEST EQUIPMENT LIST | | | | | |
|---|---|---|---|---|---|
| Description | Manufacturer | Model | Asset or Serial Number | Cal Date | Cal Due |
| Antenna, Loop, 30 MHz | EMCO | 6502 | 0035798 | 10/28/09 | 10/28/10 |
| EMI Receiver, 2.9 GHz | Agilent / HP | 8542E | C00957 | 09/24/09 | 03/24/11 |
| RF Filter Section, 2.9 GHz | Agilent / HP | 85420E | C00958 | 09/24/09 | 03/24/11 |
| Spectrum Analyzer, 26.5 GHz | Agilent / HP | E4440A | C01178 | 08/31/09 | 08/31/10 |
| Antenna, Bilog, 2 GHz | Sunol Sciences | JB1 | C01016 | 01/14/09 | 01/14/10 |
| Preamplifier, 1300 MHz | Agilent / HP | 8447D | C00778 | 12/16/08 | 12/16/09 |
| EMI Test Receiver, 30 MHz | R & S | ESHS 20 | N02396 | 08/06/09 | 05/06/11 |
| LISN, 30 MHz | FCC | LISN-50/250-25-2 | N02625 | 11/05/09 | 11/05/10 |
| LISN, 10 kHz ~ 30 MHz | Solar | 8012-50-R-24-BNC | N02481 | 11/05/09 | 11/05/10 |

# 7. RADIATED EMISSION TEST RESULTS

## 7.1. LIMITS AND PROCEDURE

**LIMITS**

FCC §15.209 (a)
IC RSS-210, Section 2.6
IC RSS-GEN, Section 6

| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement Distance (m) |
|---|---|---|
| 0.009–0.490 | 2400/F(kHz) | 300 |
| 0.490–1.705 | 24000/F(kHz) | 30 |
| 1.705–30.0 | 30 | 30 |
| 30–88 | 100 | 3 |
| 88 to 216 | 150 | 3 |
| 216 to 960 | 200 | 3 |
| Above 960 MHz | 500 | 3 |
| Note: The lower limit shall apply at the transition frequency. | | |

**TEST PROCEDURE**

ANSI C63.4

The transmitter and receiver of the EUT are measured simultaneously.

# 7.2. SPURIOUS EMISSIONS 0.15 TO 30 MHz (WORST CASE CONFIGURATION)

**FCC Part 15.209**
**Loop Antenna Measurement At Open Field below 30 MHz**

**Company:** Palm, Inc.
**Project #:** 09U12925
**Model #:** Pre Airboard / Touchstone / AC Adapter 3 WW
**Tester:** Doug Anderson
**Date:** 11/12/09

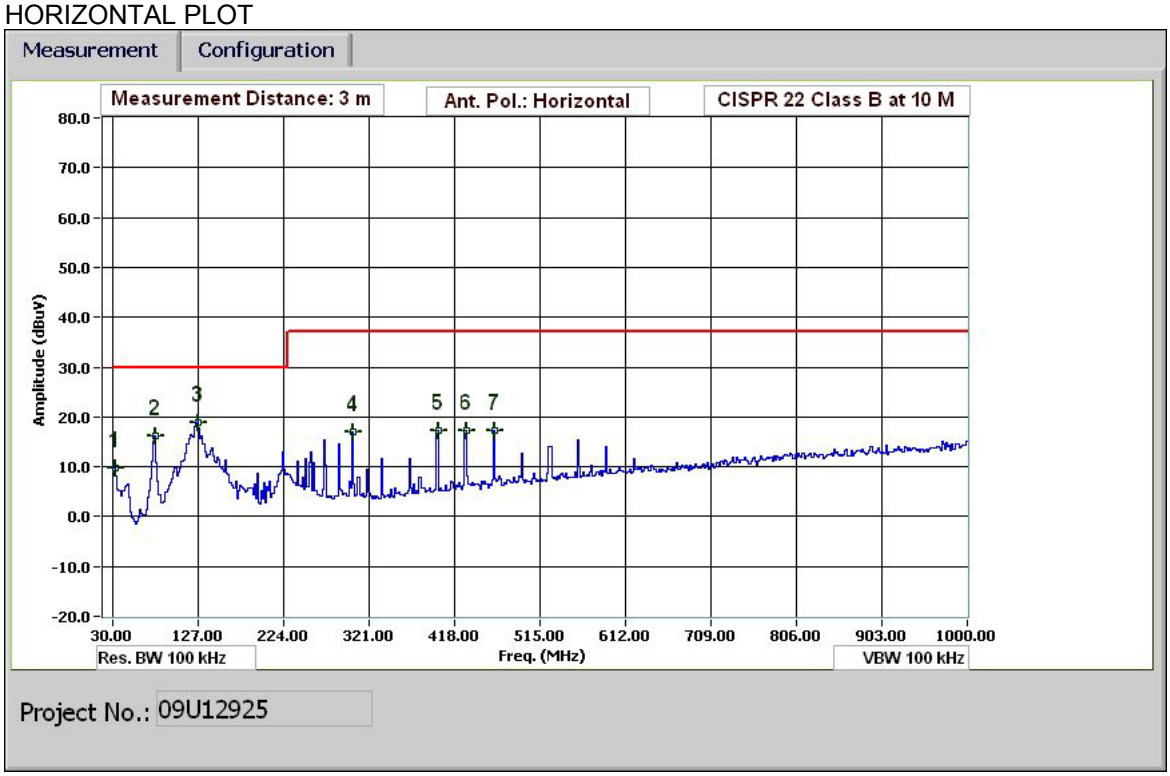
| Frequency | Reading | Measurement | Field Strength | Reading | Measurement | Field Strength | Antenna | Distance | Limit | Field Strength | Limit | Delta | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | Distance A | A | B | Distance B | B | Factor | Factor | Distance | at Limit Distance | | | (Pk/QP/AV, etc.) |
| (MHz) | (dBuV) | (m) | (dBuV/m) | (dBuV) | (m) | (dBuV/m) | (dB/m) | (dB/decade) | (m) | (dBuV/m) | (dBuV/m) | (dB) | |
| Loop Antenna Maximized over Vertical and Horizontal: | | | | | | | | | | | | | |
| 3.103 | 39.0 | 1 | 49.20 | | | | 10.20 | 40.00 | 30 | -9.88 | 29.54 | -39.4 | PK |

No other emissions observed up to 30 MHz

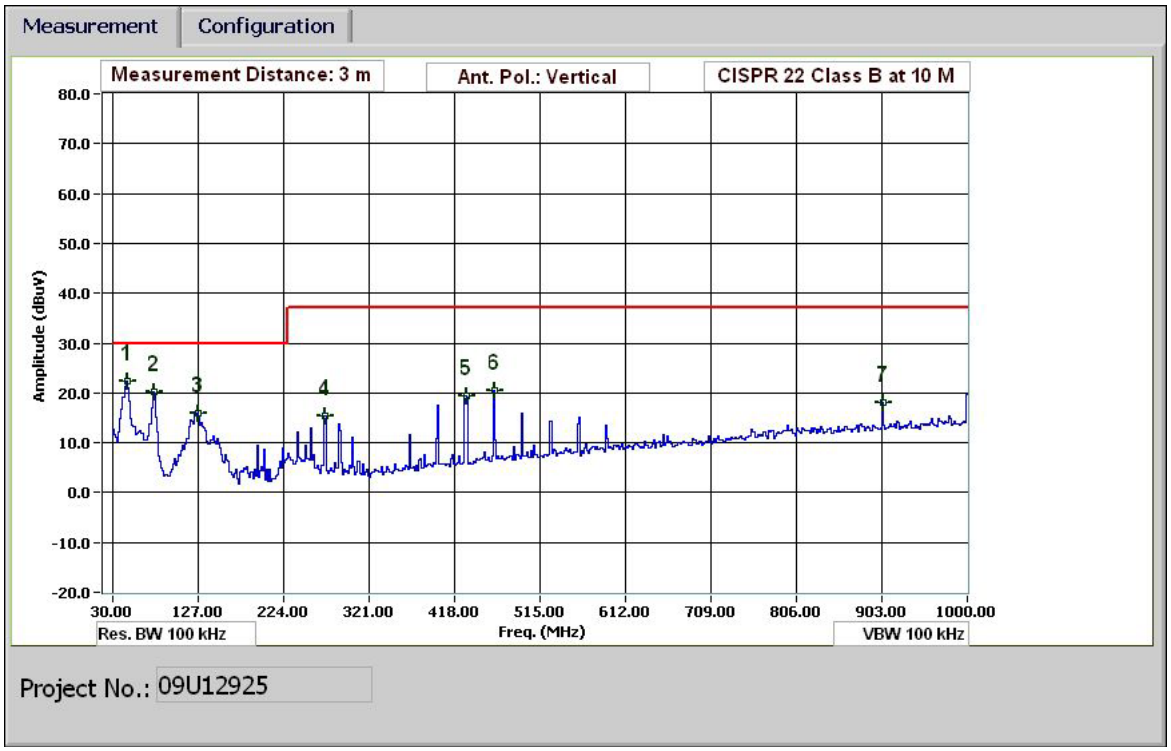
Notes: In accordance with 15.31 (f) (2):
For each frequency at which a measurement is made at only one distance, the square of an inverse linear distance extrapolation factor (40 dB/decade) is applied.
For each frequency at which measurements are made at two distances, the applied extrapolation factor is calculated from these two measurements.

## 7.3. SPURIOUS EMISSION 30 TO 1000 MHz (WORST CASE CONFIGURATION)

HORIZONTAL PLOT



VERTICAL PLOT



## TABULATED DATA

**30-1000MHz Frequency Measurement**
**Compliance Certification Services, Fremont 5m Chamber**

**Test Engr: Doug Anderson**
**Date: 11/12/09**
**Project #: 09U12925**
**Company: Palm**
**EUT Description: Puck / Pre Airboard/ Adapter 3**
**EUT M/N:**
**Test Target: EN55022 Class B**
**Mode Oper: 120kHz and 3MHz Tx**

| | | | | | |
|---|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | Margin | Margin vs. Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | | |
| Read | Analyzer Reading | Filter | Filter Insert Loss | | |
| AF | Antenna Factor | Corr. | Calculated Field Strength | | |
| CL | Cable Loss | Limit | Field Strength Limit | | |

| f MHz | Dist (m) | Read dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Filter dB | Corr. dBuV/m | Limit dBuV/m | Margin dB | Ant. Pol. V/H | Det. P/A/QP | Ant. High cm | Table Angle Degree | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Pre Airboard With Adapter 3: Vertical** | | | | | | | | | | | | | | | |
| 46.167 | 3.0 | 51.5 | 10.3 | 0.6 | 29.6 | -10.5 | 0.0 | 22.3 | 30.0 | -7.7 | V | P | | | |
| 76.883 | 3.0 | 51.7 | 7.8 | 0.8 | 29.6 | -10.5 | 0.0 | 20.2 | 30.0 | -9.8 | V | P | | | |
| 127.000 | 3.0 | 40.9 | 13.8 | 1.0 | 29.4 | -10.5 | 0.0 | 15.8 | 30.0 | -14.2 | V | P | | | |
| 270.883 | 3.0 | 40.6 | 12.4 | 1.5 | 28.8 | -10.5 | 0.0 | 15.3 | 37.0 | -21.7 | V | P | | | |
| 430.933 | 3.0 | 41.9 | 15.6 | 2.0 | 29.4 | -10.5 | 0.0 | 19.5 | 37.0 | -17.5 | V | P | | | |
| 463.267 | 3.0 | 42.2 | 16.2 | 2.1 | 29.6 | -10.5 | 0.0 | 20.4 | 37.0 | -16.7 | V | P | | | |
| 904.617 | 3.0 | 32.4 | 21.6 | 3.0 | 28.6 | -10.5 | 0.0 | 18.0 | 37.0 | -19.0 | V | P | | | |
| **Pre Airboard with Adapter 3: Horizontal** | | | | | | | | | | | | | | | |
| 33.233 | 3.0 | 30.6 | 18.9 | 0.5 | 29.7 | -10.5 | 0.0 | 9.8 | 30.0 | -20.2 | H | P | | | |
| 78.500 | 3.0 | 47.7 | 7.7 | 0.8 | 29.6 | -10.5 | 0.0 | 16.1 | 30.0 | -13.9 | H | P | | | |
| 127.000 | 3.0 | 44.0 | 13.8 | 1.0 | 29.4 | -10.5 | 0.0 | 18.9 | 30.0 | -11.1 | H | P | | | |
| 303.217 | 3.0 | 41.2 | 13.3 | 1.6 | 28.8 | -10.5 | 0.0 | 16.9 | 37.0 | -20.1 | H | P | | | |
| 400.217 | 3.0 | 40.0 | 15.0 | 1.9 | 29.3 | -10.5 | 0.0 | 17.2 | 37.0 | -19.8 | H | P | | | |
| 430.933 | 3.0 | 39.7 | 15.6 | 2.0 | 29.4 | -10.5 | 0.0 | 17.3 | 37.0 | -19.7 | H | P | | | |
| 463.267 | 3.0 | 39.0 | 16.2 | 2.1 | 29.6 | -10.5 | 0.0 | 17.2 | 37.0 | -19.8 | H | P | | | |

**Rev. 1.27.09**
**Note: No other emissions were detected above the system noise floor.**

# 8. AC MAINS LINE CONDUCTED EMISSIONS (WORST CASE CONFIGURATION)

## 8.1. LIMITS AND PROCEDURE

**LIMITS**

§15.207 (a)
IC RSS-GEN, Section 7.2.2

| Frequency of emission (MHz) | Conducted Limit (dBµV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 to 0.50 | 66 to 56* | 56 to 46* |
| 0.50 to 5 | 56 | 46 |
| 5 to 30 | 60 | 50 |
| * Decreases with the logarithm of the frequency. | | |

**TEST PROCEDURE**

ANSI C63.4

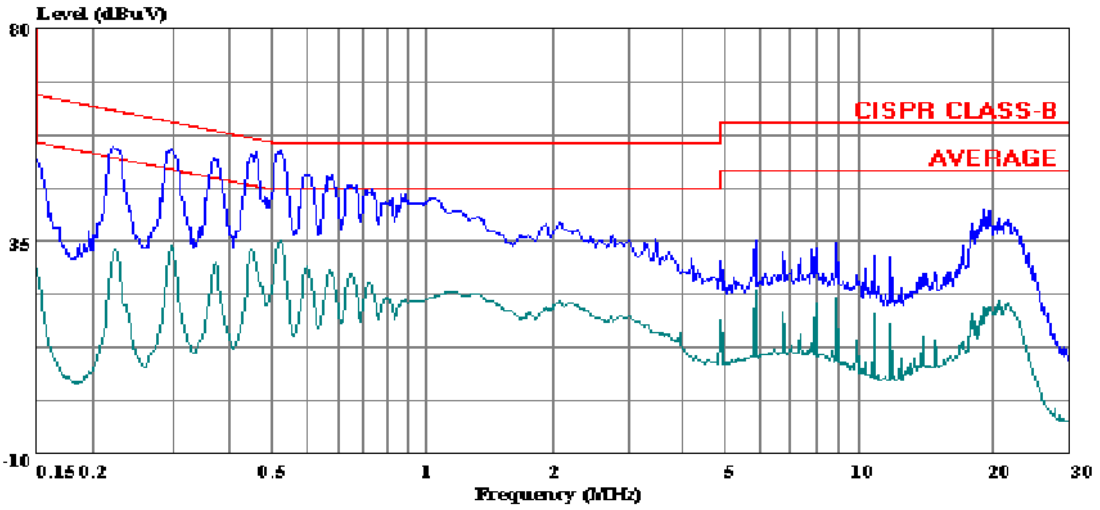
## 6 WORST EMISSIONS

| CONDUCTED EMISSIONS DATA (115VAC 60Hz) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Freq. | Reading | | | Closs | Limit | | Margin | | Remark |
| (MHz) | PK (dBuV) | QP (dBuV) | AV (dBuV) | (dB) | QP | AV | QP (dB) | AV (dB) | L1 / L2 |
| 0.30 | 54.78 | -- | 33.90 | 0.00 | 60.33 | 50.33 | -5.55 | -16.43 | L1 |
| 0.46 | 53.92 | -- | 33.43 | 0.00 | 56.67 | 46.67 | -2.75 | -13.24 | L1 |
| 0.52 | -- | 48.40 | 35.28 | 0.00 | 56.00 | 46.00 | -7.60 | -10.72 | L1 |
| 0.38 | 50.21 | -- | 33.87 | 0.00 | 58.30 | 48.30 | -8.09 | -14.43 | L2 |
| 0.46 | 51.44 | -- | 40.15 | 0.00 | 56.77 | 46.77 | -5.33 | -6.62 | L2 |
| 0.51 | 52.77 | -- | 39.78 | 0.00 | 56.00 | 46.00 | -3.23 | -6.22 | L2 |
| 6 Worst Data | | | | | | | | | |

**LINE 1 RESULTS**

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 7 File#: 09U12925LC_Pre Airboard.EMI
Date: 11-13-2009 Time: 09:54:08



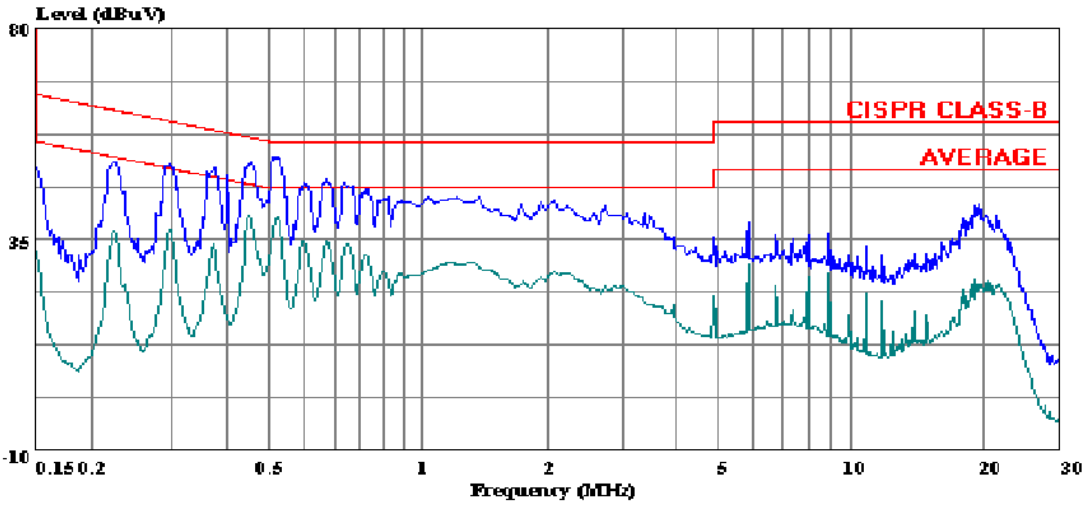

(Line Conduction)
Trace: 5 Ref Trace:

Condition: CISPR CLASS-B
Test Operator: : Doug Anderson
Project #: : 09U12925
Company: : Palm, Inc.
EUT Description:: Pre Airboard
Configuration: : EUT with Puck and AC Adapter 1
Mode: : 120kHz and 3MHz Tx
Target: : FCC Class B
Voltage: : 115VAC / 60Hz
: L1: Peak (Blue), Average (Green)

**LINE 2 RESULTS**

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 14 File#: 09U12925LC_Pre Airboard.EMI
Date: 11-13-2009 Time: 09:04:07




(Line Conduction)
Trace: 12 Ref Trace:

Condition: CISPR CLASS-B
Test Operator: : Doug Anderson
Project #: : 09U12925
Company: : Palm, Inc.
EUT Description:: Pre Airboard
Configuration: : EUT with Puck and AC Adapter 1
Mode: : 120kHz and 3MHz Tx
Target: : FCC Class B
Voltage: : 115VAC / 60Hz
: L2: Peak (Blue), Average (Green)

# 9. MAXIMUM PERMISSIBLE EXPOSURE

**IC RULES**

RSS-102 Clause 2.5.2 Exemption from Routine Evaluation Limits – RF Exposure Evaluation

RF exposure evaluation is required if the separation distance between the user and the device is greater than 20 cm, except when the device operates:

• below 1.5 GHz and its e.i.r.p. is equal to or less than 2.5 W;
• at or above 1.5 GHz and the e.i.r.p. of the device is equal to or less than 5 W.

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

**RESULTS**

The frequency of operation is below 1.5 GHz and the EIRP is less than 2.5 W (33.98 dBm), therefore this device is exempt from Routine Evaluation.

| Frequency (MHz) | Reading A (dBuV) | Measurement Distance A (m) | Field Strength A (dBuV/m) | Antenna Factor (dB/m) | Distance Factor (dB/decade) | Extrapolated Distance (m) | Field Strength at 3 m Distance (dBuV/m) | EIRP (dBm) |
|---|---|---|---|---|---|---|---|---|
| 3.103 | 39 | 1 | 49.20 | 10.20 | 40.00 | 3 | 30.12 | -65.08 |