



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

CERTIFICATION TEST REPORT

FOR

TOUCHSTONE INDUCTIVE CHARGER BASE

MODEL NUMBER: 157-10123-00

REPORT NUMBER: 09U13000-1

FCC ID: O8F-TST1

IC: 3905A-TST1

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
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1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: TOUCHSTONE INDUCTIVE CHARGER BASE

MODEL: 157-10123-00

SERIAL NUMBER: P29831Q4C2A

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:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamplifier Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

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

The base transmits on a frequency of 118.5 kHz and receives on a frequency of approximately 3.1 MHz.

5.2. MAXIMUM FIELD STRENGTH

The transmitter has a maximum peak radiated field strength as follows:

Frequency (kHz)	Field Strength (dBuV/m @ 300 m)	Field Strength (uV/m @ 300 m)
118.5	-5.50	0.531

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 Touchstone Firmware, rev. 19.

5.5. MODE(S) OF OPERATION

When the accessory cover is within approximately 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 Adapter 1, 2, 3
Configuration 2	Pixi Airboard, Touchstone, and AC Adapter 1, 2, 3
Configuration 3	Second Source Pre Airboard, Touchstone, and AC Adapter 3
Configuration 4	Second Source Touchstone, Pre Airboard, and AC Adapter 3
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	Cell Phone with Pixi Airboard, Touchstone, and AC Adapter 1

5.7. WORST-CASE CONFIGURATION AND MODE

Configuration 2 with AC Adapter 1 was the worst-case for radiated emissions. Configuration 2 with AC Adapter 2 was the worst-case for AC Mains conducted emissions.

5.8. MODIFICATIONS

No modifications were made during testing.

5.9. DESCRIPTION OF TEST SETUP

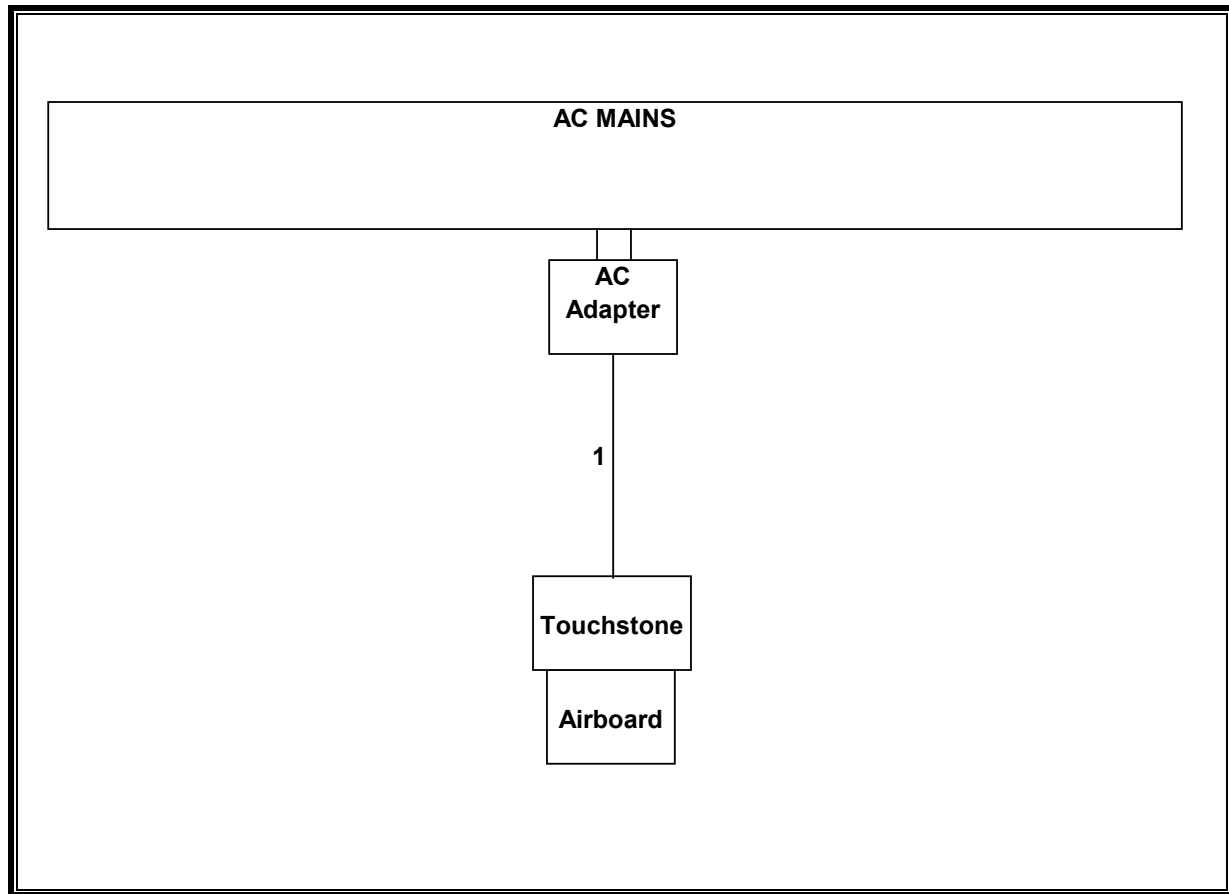
SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Touchstone	Palm, Inc.	157-10123-00	P29831Q4C2A	08F-TST1 (Pending)
Second Source Touchstone	Palm, Inc.	157-10123-00	T19AG052C21	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
Pre Airboard	Palm, Inc.	180-10704-00	AD14P9E97364	08F-CABC1 (Pending)
Second Source Pre Airboard	Palm, Inc.	180-10704-00	T19810UQC31	08F-CABC1 (Pending)
Cell Phone (Palm Pre)	Palm, Inc.	P100EWW	AD14P9E97364	O8F-CASC
Pixie Airboard	Palm, Inc.	180-10721-00	P29840TCC4A	08F-PABC1 (Pending)
Cell Phone (Palm Pixi)	Palm, Inc.	P120EWW	PD1CS8N92027	O8F-PIXE

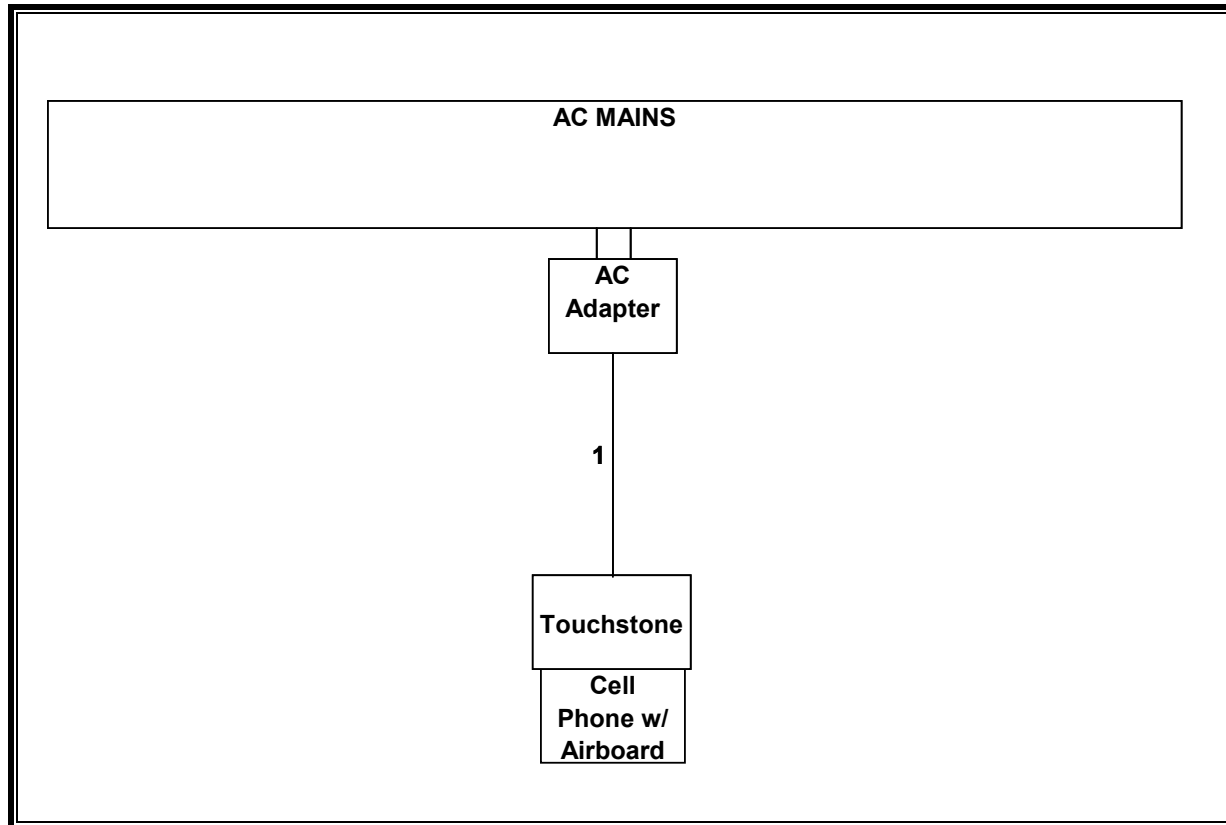
I/O CABLES

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	Sundt 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 #: Pixie Airboard / Touchstone / AC Adapter 1

Tester: Doug Anderson

Date: 11/12/09

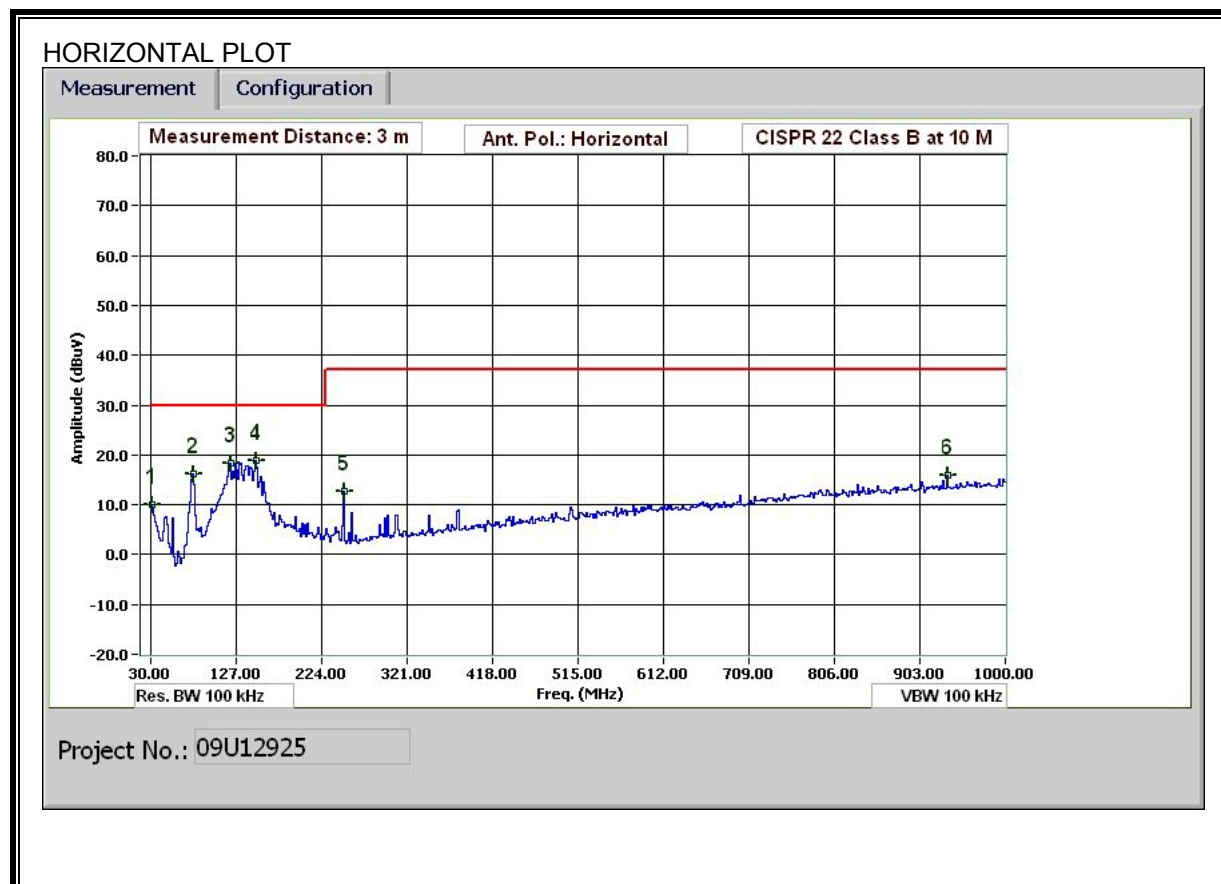
Frequency	Reading	Measurement	Field Strength	Reading	Measurement	Field Strength	Antenna	Distance	Limit	Field Strength	Limit	Delta	Notes
(MHz)	A	Distance A	A	B	Distance B	B	Factor	Factor	Distance	at Limit Distance			(Pk/QP/AV, etc.)
	(dBuV)	(m)	(dBuV/m)	(dBuV)	(m)	(dBuV/m)	(dB/m)	(dB/decade)	(m)	(dBuV/m)	(dBuV/m)	(dB)	
Loop Antenna Maximized over Vertical and Horizontal:													
0.1185	83.1	1	93.59				10.49	40.00	300	-5.50	26.13	-31.8	PK
0.23811	51.4	1	61.80				10.40	40.00	300	-37.29	20.07	-57.4	PK
0.3569	62.1	1	72.41				10.31	40.00	300	-26.68	16.55	-43.2	PK
0.4775	40.1	1	50.32				10.22	40.00	300	-48.77	14.02	-62.8	PK
0.5953	57	1	67.22				10.22	40.00	30	8.13	32.11	-24.0	PK

No other emissions observed up to 30 MHz

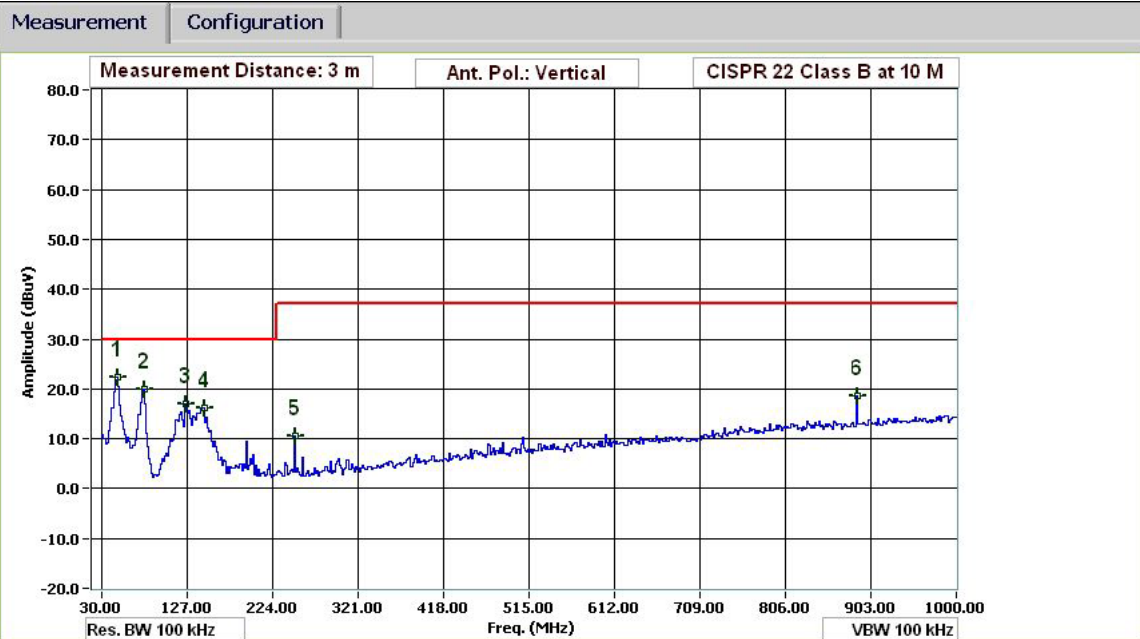
Notes: In accordance with 15.31 (f) (2):

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)



VERTICAL PLOT



Project No.: 09U12925

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 / Pixie Airboard/ Adapter 1

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
Pixie Airboard with Adapter 1: Vertical															
47.783	3.0	52.6	9.3	0.6	29.6	-10.5	0.0	22.4	30.0	-7.6	V	P			
78.500	3.0	51.7	7.7	0.8	29.6	-10.5	0.0	20.1	30.0	-9.9	V	P			
125.383	3.0	42.0	13.8	1.0	29.4	-10.5	0.0	17.0	30.0	-13.0	V	P			
146.400	3.0	42.0	12.8	1.1	29.3	-10.5	0.0	16.1	30.0	-13.9	V	P			
249.867	3.0	36.6	11.8	1.4	28.8	-10.5	0.0	10.6	37.0	-26.4	V	P			
888.450	3.0	33.2	21.5	3.0	28.6	-10.5	0.0	18.5	37.0	-18.5	V	P			
Pixie Airboard with Adapter 1: Horizontal															
31.617	3.0	30.1	19.6	0.5	29.7	-10.5	0.0	10.1	30.0	-19.9	H	P			
78.500	3.0	47.8	7.7	0.8	29.6	-10.5	0.0	16.2	30.0	-13.8	H	P			
120.533	3.0	43.5	13.7	1.0	29.5	-10.5	0.0	18.3	30.0	-11.7	H	P			
149.633	3.0	45.0	12.6	1.1	29.3	-10.5	0.0	19.0	30.0	-11.1	H	P			
249.867	3.0	38.8	11.8	1.4	28.8	-10.5	0.0	12.8	37.0	-24.2	H	P			
935.333	3.0	30.0	21.9	3.1	28.5	-10.5	0.0	16.1	37.0	-20.9	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
0.25	53.21	--	42.25	0.00	61.66	51.66	-8.45	-9.41	L1
0.50	49.55	--	43.48	0.00	56.00	46.00	-6.45	-2.52	L1
0.76	43.08	--	35.88	0.00	56.00	46.00	-12.92	-10.12	L1
0.25	50.73	--	40.97	0.00	61.79	51.79	-11.06	-10.82	L2
0.50	51.95	--	42.97	0.00	56.02	46.02	-4.07	-3.05	L2
1.49	49.12	--	33.19	0.00	56.00	46.00	-6.88	-12.81	L2
6 Worst Data									

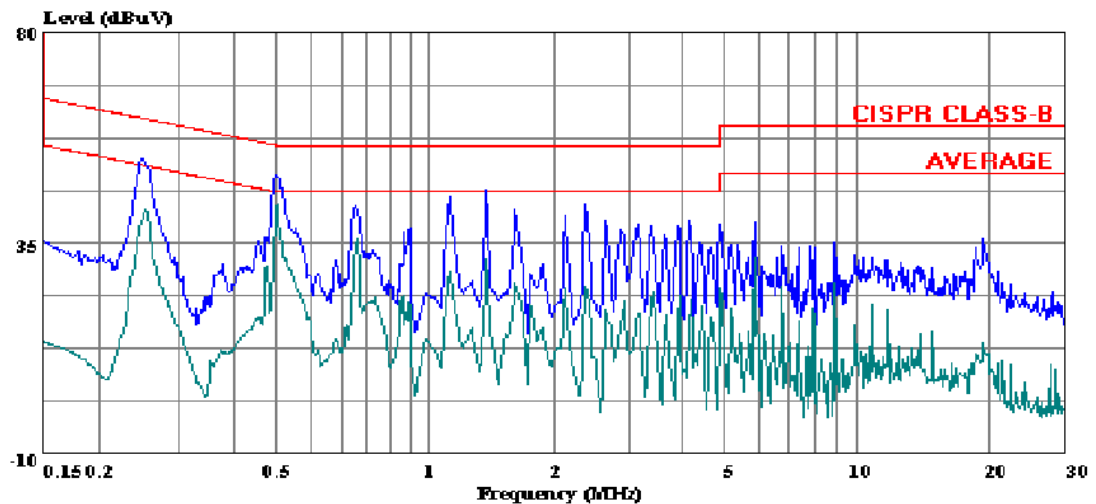
LINE 1 RESULTS



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

Data#: 63 File#: 09U12925LC_Pixie Airboard.EMI

Date: 11-13-2009 Time: 13:38:53



(Line Conduction)

Trace: 61

Ref Trace:

Condition: CISPR CLASS-B
Test Operator: : Doug Anderson
Project #: : 09U12925
Company: : Palm, Inc.
EUT Description: : Pixie Airboard
Configuration: : EUT with Puck and AC Adapter 2
Mode: : 120kHz and 3MHz Tx
Target: : FCC Class B
Voltage: : 115VAC / 60Hz
: L1: Peak (Blue), Average (Green)

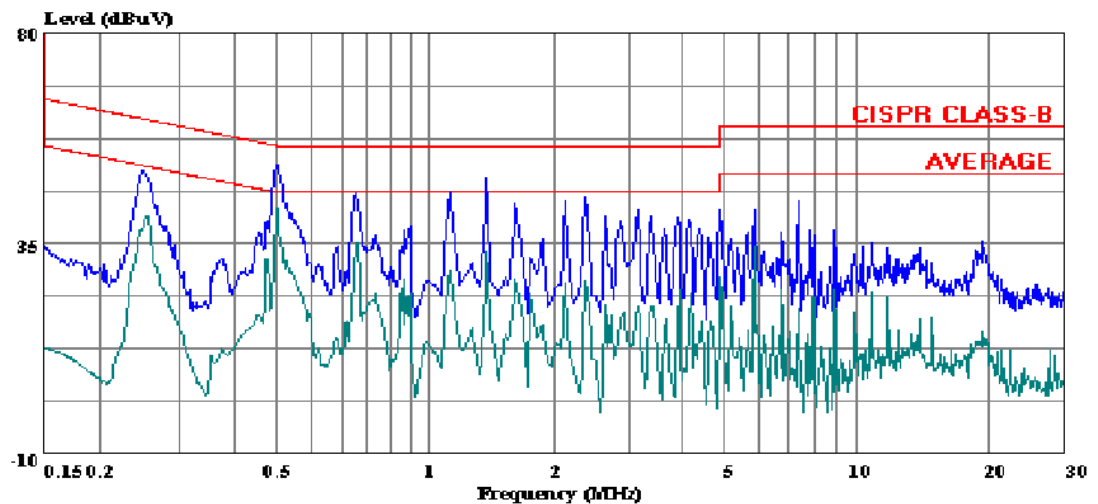
LINE 2 RESULTS



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

Data#: 70 File#: 09U12925LC_Pixie Airboard.EMI

Date: 11-13-2009 Time: 13:48:03



(Line Conduction)

Trace: 68

Ref Trace:

Condition: CISPR CLASS-B
Test Operator: : Doug Anderson
Project #: : 09U12925
Company: : Palm, Inc.
EUT Description: : Pixie Airboard
Configuration: : EUT with Puck and AC Adapter 2
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)
0.1185	83.1	1	93.59	10.49	40.00	3	74.50	-20.70