



TESTING

CERT #803.01, 803.02, 803.05, 803.06

IMPINJ INC TEST REPORT

FOR THE

RFID READER, IPJ-REV

FCC PART 15 SUBPART C SECTIONS 15.207 & 15.247

AND RSS-210 ISSUE 7

TESTING

DATE OF ISSUE: FEBRUARY 23, 2009

PREPARED FOR:

Impinj, Inc.
701 N. 34th Street
Seattle, WA 98103

P.O. No.: 100974
W.O. No.: 89028

PREPARED BY:

Mary Ellen Clayton
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Date of test: February 9-12, 2009

Report No.: FC09-014

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ADMINISTRATIVE INFORMATION

DATE OF TEST: February 9-12, 2009

DATE OF RECEIPT: February 9, 2009

REPRESENTATIVE: Mike Thomas

MANUFACTURER:

Impinj, Inc.
701 N. 34th Street
Seattle, WA 98103

TEST LOCATION:

CKC Laboratories, Inc.
110 Olinda Place
Brea, CA 92823

TEST METHOD: ANSI C63.4 (2003), RSS-210 Issue 7 and RSS GEN Issue 2

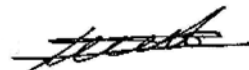
PURPOSE OF TEST: To perform the testing of the RFID Reader, IPJ-REV with the requirements for FCC Part 15 Subpart C Sections 15.207 & 15.247 and RSS-210 devices.

APPROVALS

QUALITY ASSURANCE:

Steve Behm, Director of Engineering
Services

TEST PERSONNEL:



Armando Del Angel, Test Engineer



Donald Jones, Senior EMC Engineer / Lab
Manager

SUMMARY OF RESULTS

| Test | Specification | Results |
|--------------------------------------|-------------------------------------|---------|
| Voltage Variation | FCC Part 15.31(e) | Pass |
| Conducted Emissions | FCC Part 15.207 | Pass |
| 20dB Bandwidth | FCC Part 15.247(a) | Pass |
| Frequency Separation | FCC Part 15.247(a) | Pass |
| Number of Hopping Channels | FCC Part 15.247(a) | Pass |
| Average Time of Occupancy | FCC Part 15.247(a) | Pass |
| RF Power Output | FCC Part 15.247(b) | Pass |
| Antenna Conducted Spurious Emissions | FCC Part 15.247(d) | Pass |
| OATS Spurious Emissions | FCC Part 15.209/15.247(d) | Pass |
| Bandedge | | Pass |
| 99% Bandwidth | RSS-210 Issue 7 and RSS GEN Issue 2 | Pass |

CONDITIONS DURING TESTING

No modifications to the EUT were necessary during testing.

FCC 15.31(m) Number Of Channels

This device was tested on three channels.

FCC 15.33(a) Frequency Ranges Tested

15.207 Conducted Emissions: 150 kHz – 30 MHz

15.209/15.247 Radiated Emissions: 9 kHz – 19 GHz

EUT Operating Frequency

The EUT was operating in the 902-928 MHz band.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The customer declares the EUT tested by CKC Laboratories was representative of a production unit.

EQUIPMENT UNDER TEST

Circular Patch Antenna

Manuf: Cushcraft
Model: S90289CLJ
Serial: 092436

RFID Reader

Manuf: Impinj Inc.
Model: IPJ-REV
Serial: 940-08-21-0006

AC/DC Adaptor

Manuf: CUI
Model: DSA-60W-20
Serial: ETS240250UC-P11P-DB

Antenna Cable

Manuf: Manhattan/CDT
Model: M4213
Serial: 1354 E12091

Mini-Guardrail

Manuf: Impinj Inc.
Model: IPJ-A0303-0000E
Serial: 0069

Brickyard Antenna

Manuf: CSL
Model: CS777-2
Serial: V25078 EP00090

Guardwall Antenna

Manuf: Impinj Inc.
Model: IPJ-A0402-USA
Serial: 0116

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

Wireless G Router

Manuf: Belkin
Model: F5D7230-4
Serial: 2028723009696

Laptop Computer

Manuf: Dell
Model: Latitude
Serial: 6497402833

Switch POE

Manuf: NETGEAR
Model: FS108P
Serial: 1DL1863H0073E

REPORT OF EMISSIONS MEASUREMENTS

TESTING PARAMETERS

TEMPERATURE AND HUMIDITY DURING TESTING

The temperature during testing was within +15°C and + 35°C.

The relative humidity was between 20% and 75%.

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dB μ V/m, the spectrum analyzer reading in dB μ V was corrected by using the following formula. This reading was then compared to the applicable specification limit.

| SAMPLE CALCULATIONS | | |
|---------------------|---------------------|----------------|
| | Meter reading | (dB μ V) |
| + | Antenna Factor | (dB) |
| + | Cable Loss | (dB) |
| - | Distance Correction | (dB) |
| - | Preamplifier Gain | (dB) |
| = | Corrected Reading | (dB μ V/m) |

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. The following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used. When conducted emissions testing was performed, a 10 dB external attenuator was used with internal offset correction in the analyzer.

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the highest readings, this is indicated as a "QP" or an "Ave" on the appropriate rows of the data sheets. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer/receiver readings were recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the measuring device called "peak hold," the measuring device had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the quasi-peak detector.

Average

For certain frequencies, average measurements may be made using the spectrum analyzer/receiver. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.

FCC 15.31(e) - VOLTAGE VARIATIONS

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------------------|-------------------------|------------------|--------------|----------|
| Mag Loop | 2156 | 06/04/2008 | 06/04/2010 | AN00052 |
| Antenna | 2453 | 12/22/2008 | 12/22/2010 | AN01994 |
| EMCO 3115 Horn | 9606-4854 | 11/12/2007 | 11/12/2009 | AN01412 |
| Horn Antenna, Active 18-26GHz | 1114018 | 11/13/2008 | 11/13/2010 | 2742 |
| Helix cable | N/A | 07/22/2008 | 07/22/2010 | AN05545 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03123 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03122 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03121 |
| Cable 30' | 11 | 11/05/2008 | 11/05/2010 | ANP05366 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Cable 20' | 16 | 11/10/2008 | 11/10/2010 | ANP05360 |
| Cable 6' | 51 | 12/30/2008 | 12/30/2010 | ANP05361 |
| Pasternack Coax | | 07/20/2007 | 07/20/2009 | AN05425 |
| HP 8447D Preamp | 2944A08601 | 07/08/2008 | 07/08/2010 | AN01517 |
| HP 83017A Pre-amp | 3123A00464 | 10/02/2007 | 10/02/2009 | AN01271 |
| Filter | 2 | 05/01/2008 | 05/01/2010 | 2750 |
| Filter | 311SH10-3000/T10000-0/0 | 12/02/2008 | 12/02/2010 | 3116 |
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

The Unit is an RF reader. It is connected directly to the spectrum analyzer through a special cable provided by the customer due to the fact that it will provide the required attenuation for the unit to comply with the limit in this situation.

The EUT will be in transmitting mode throughout the test in the LOW, MEDIUM and HIGH channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 32.5 dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 902.75, 915.25 & 927.25

Test Setup Photos



AC/DC converter

| Frequency (MHz) | Voltage | 30dBm | 32.5dBm w/ cable | Limit (dBuV) |
|-----------------|---------|-----------|------------------|--------------|
| 902.75 | +15% | 136.5dBuV | 136.6dBuV | 137.0 |
| 902.75 | Nominal | 136.8dBuV | 136.6dBuV | 137.0 |
| 902.75 | -15% | 136.5dBuV | 136.6dBuV | 137.0 |
| 915.25 | +15% | 137.0dBuV | 136.9dBuV | 137.0 |
| 915.25 | Nominal | 136.6dBuV | 136.9dBuV | 137.0 |
| 915.25 | -15% | 136.9dBuV | 136.6dBuV | 137.0 |
| 927.25 | +15% | 136.8dBuV | 136.4dBuV | 137.0 |
| 927.25 | Nominal | 136.7dBuV | 136.4dBuV | 137.0 |
| 927.25 | -15% | 136.8dBuV | 136.4dBuV | 137.0 |

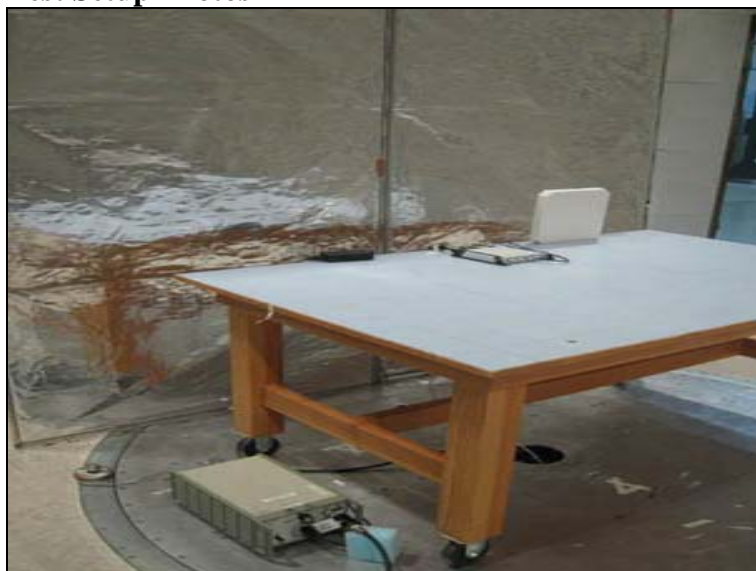
POE

| Frequency (MHz) | Voltage | 30dBm | Limit (dBuV) |
|-----------------|---------|-----------|--------------|
| 902.75 | +15% | 136.5dBuV | 137.0 |
| 902.75 | Nominal | 136.5dBuV | 137.0 |
| 902.75 | -15% | 136.4dBuV | 137.0 |
| 915.25 | +15% | 136.6dBuV | 137.0 |
| 915.25 | Nominal | 136.6dBuV | 137.0 |
| 915.25 | -15% | 136.6dBuV | 137.0 |
| 927.25 | +15% | 136.6dBuV | 137.0 |
| 927.25 | Nominal | 136.7dBuV | 137.0 |
| 927.25 | -15% | 136.7dBuV | 137.0 |

Notes: The unit is connected directly to the PSA and depending on the power output the measurement will be taken in the RF port or in the end of the cable. The unit's AC/DC converter & POE will be connected to a programmable power supply so we can vary the voltage from 85% to 115% of the nominal voltage.

FCC 15.207 – AC CONDUCTED EMISSIONS

Test Setup Photos





Test Data Sheets

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.207 - AVE**
 Work Order #: **89028**
 Test Type: **Conducted Emissions**
 Equipment: **RFID Reader**
 Manufacturer: **Impinj**
 Model: **IPJ-REV**
 S/N: **940-08-21-0006**

Date: 2/12/2009
 Time: 10:32:49 AM
 Sequence#: 2
 Tested By: Armando Del Angel
 110V 60Hz

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|----------------|------------|------------------|--------------|----------|
| Cable 20' | 16 | 11/10/2008 | 11/10/2010 | ANP05360 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Cable 30' | 11 | 11/05/2008 | 11/05/2010 | ANP05366 |
| Agilent E4440A | MY46186330 | 01/31/2008 | 01/31/2010 | AN02872 |
| Attenuator | 9912 | 03/21/2008 | 03/21/2010 | ANP05503 |
| Filter | G7752 | 07/21/2008 | 07/21/2010 | AN02611 |
| EMCO LISN | 9606-1049 | 06/01/2007 | 06/01/2009 | AN01492 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|------------------------|---------------|------------|---------------------|
| Circular patch antenna | Cushcraft | S90289CLJ | 092436 |
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |
| Antenna cable | Manhattan/CDT | M4213 | 1354 E12091 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |
| Laptop Computer | Dell | Latitude | 6497402833 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing AC conducted emissions per FCC 15.207.

The Unit is an RF reader. It is located in the back edge of the test table.

All its ports are being exercised. It is being powered by an AC/DC converter.

It is connected to a laptop outside the chamber through a shielded ethernet cable.

The antenna is located on the wooden table.

The EUT will be in transmitter mode throughout the test.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting: 32.5 dBm

Operating frequency: 902-928MHz.

Frequency range of measurement = 150kHz - 30MHz, RBW=1kHz, VBW=1kHz.

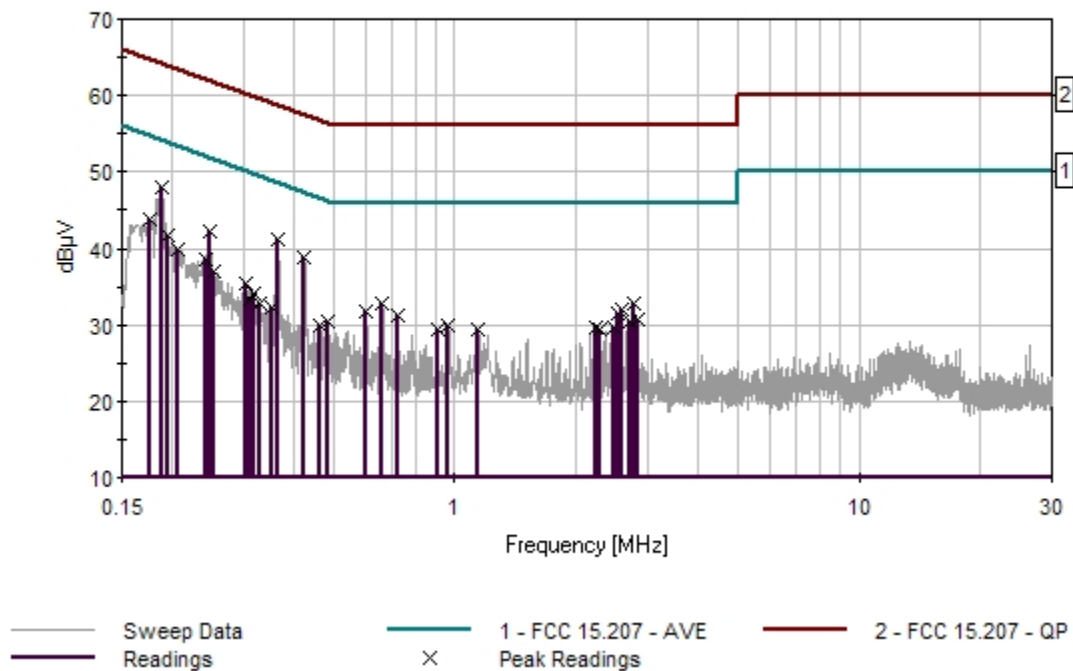
Transducer Legend:

| | |
|-----------------|---------------------------------|
| T1=CAB-ANP05371 | T2=FIL-AN02611-072108 |
| T3=CAB-ANP05366 | T4=ATT-ANP5503-032108 |
| T5=CAB-ANP05360 | T6=CDN-AN01492-060107 - Neutral |

| Measurement Data: | | Reading listed by margin. | | | | | Test Lead: Neutral | | | | |
|--------------------------|----------|---------------------------|--------------|--------------|------|-------|--------------------|------------|------------|--------|-------|
| # | Freq | Rdng | T1 T5 | T2 T6 | T3 | T4 | Dist | Corr | Spec | Margin | Polar |
| | MHz | dB μ V | dB | dB | dB | dB | Table | dB μ V | dB μ V | dB | Ant |
| 1 | 187.815k | 37.5 | +0.0 +0.0 | +0.2 +0.2 | +0.0 | +10.1 | +0.0 | 48.0 | 54.1 | -6.1 | Neutr |
| 2 | 363.071k | 30.6 | +0.1 +0.1 | +0.1 +0.2 | +0.0 | +10.1 | +0.0 | 41.2 | 48.7 | -7.5 | Neutr |
| 3 | 423.429k | 28.3 | +0.1 +0.1 | +0.1 +0.2 | +0.0 | +10.1 | +0.0 | 38.9 | 47.4 | -8.5 | Neutr |
| 4 | 247.446k | 31.6 | +0.0 +0.0 | +0.2 +0.2 | +0.0 | +10.1 | +0.0 | 42.1 | 51.8 | -9.7 | Neutr |
| 5 | 176.907k | 33.3 | +0.0 +0.0 | +0.3 +0.2 | +0.0 | +10.1 | +0.0 | 43.9 | 54.6 | -10.7 | Neutr |
| 6 | 195.814k | 31.3 | +0.0 +0.0 | +0.2 +0.2 | +0.0 | +10.1 | +0.0 | 41.8 | 53.8 | -12.0 | Neutr |
| 7 | 661.953k | 22.1 | +0.1 +0.1 | +0.2 +0.2 | +0.0 | +10.1 | +0.0 | 32.8 | 46.0 | -13.2 | Neutr |
| 8 | 207.449k | 29.5 | +0.0 +0.0 | +0.2 +0.2 | +0.0 | +10.1 | +0.0 | 40.0 | 53.3 | -13.3 | Neutr |
| 9 | 2.774M | 22.0 | +0.1 +0.1 | +0.1 +0.2 | +0.1 | +10.1 | +0.0 | 32.7 | 46.0 | -13.3 | Neutr |
| 10 | 240.901k | 28.1 | +0.0 +0.0 | +0.2 +0.2 | +0.0 | +10.1 | +0.0 | 38.6 | 52.1 | -13.5 | Neutr |
| 11 | 2.591M | 21.2 | +0.1 +0.1 | +0.1 +0.2 | +0.1 | +10.1 | +0.0 | 31.9 | 46.0 | -14.1 | Neutr |
| 12 | 602.322k | 21.0 | +0.1 +0.1 | +0.2 +0.2 | +0.0 | +10.1 | +0.0 | 31.7 | 46.0 | -14.3 | Neutr |
| 13 | 254.718k | 26.6 | +0.0 +0.0 | +0.2 +0.2 | +0.0 | +10.1 | +0.0 | 37.1 | 51.6 | -14.5 | Neutr |
| 14 | 2.532M | 20.8 | +0.1 +0.1 | +0.1 +0.2 | +0.1 | +10.1 | +0.0 | 31.5 | 46.0 | -14.5 | Neutr |
| 15 | 305.622k | 25.0 | +0.0 +0.0 | +0.1 +0.2 | +0.0 | +10.1 | +0.0 | 35.4 | 50.1 | -14.7 | Neutr |
| 16 | 723.766k | 20.5 | +0.0 +0.1 | +0.2 +0.2 | +0.1 | +10.1 | +0.0 | 31.2 | 46.0 | -14.8 | Neutr |
| 17 | 2.833M | 19.9 | +0.1 +0.1 | +0.1 +0.2 | +0.1 | +10.1 | +0.0 | 30.6 | 46.0 | -15.4 | Neutr |
| 18 | 317.257k | 23.6 | +0.1 +0.1 | +0.1 +0.2 | +0.0 | +10.1 | +0.0 | 34.2 | 49.8 | -15.6 | Neutr |
| 19 | 2.714M | 19.7 | +0.1 +0.1 | +0.1 +0.2 | +0.1 | +10.1 | +0.0 | 30.4 | 46.0 | -15.6 | Neutr |
| 20 | 485.242k | 19.8 | +0.1 +0.1 | +0.2 +0.2 | +0.0 | +10.1 | +0.0 | 30.5 | 46.2 | -15.7 | Neutr |
| 21 | 962.260k | 19.1 | +0.0 +0.1 | +0.2 +0.2 | +0.1 | +10.1 | +0.0 | 29.8 | 46.0 | -16.2 | Neutr |
| 22 | 2.230M | 18.9 | +0.1 +0.1 | +0.1 +0.2 | +0.1 | +10.1 | +0.0 | 29.6 | 46.0 | -16.4 | Neutr |

| | | | | | | | | | | | |
|----|----------|------|------|------|------|-------|------|------|------|-------|-------|
| 23 | 2.468M | 18.9 | +0.1 | +0.1 | +0.1 | +10.1 | +0.0 | 29.6 | 46.0 | -16.4 | Neutr |
| | | | +0.1 | +0.2 | | | | | | | |
| 24 | 902.721k | 18.8 | +0.0 | +0.2 | +0.1 | +10.1 | +0.0 | 29.5 | 46.0 | -16.5 | Neutr |
| | | | +0.1 | +0.2 | | | | | | | |
| 25 | 310.713k | 23.0 | +0.0 | +0.1 | +0.0 | +10.1 | +0.0 | 33.4 | 50.0 | -16.6 | Neutr |
| | | | +0.0 | +0.2 | | | | | | | |
| 26 | 327.438k | 22.3 | +0.1 | +0.1 | +0.0 | +10.1 | +0.0 | 32.9 | 49.5 | -16.6 | Neutr |
| | | | +0.1 | +0.2 | | | | | | | |
| 27 | 465.607k | 19.3 | +0.1 | +0.2 | +0.0 | +10.1 | +0.0 | 30.0 | 46.6 | -16.6 | Neutr |
| | | | +0.1 | +0.2 | | | | | | | |
| 28 | 1.145M | 18.7 | +0.0 | +0.2 | +0.1 | +10.1 | +0.0 | 29.4 | 46.0 | -16.6 | Neutr |
| | | | +0.1 | +0.2 | | | | | | | |
| 29 | 2.293M | 18.7 | +0.1 | +0.1 | +0.1 | +10.1 | +0.0 | 29.4 | 46.0 | -16.6 | Neutr |
| | | | +0.1 | +0.2 | | | | | | | |
| 30 | 354.345k | 21.6 | +0.1 | +0.1 | +0.0 | +10.1 | +0.0 | 32.2 | 48.9 | -16.7 | Neutr |
| | | | +0.1 | +0.2 | | | | | | | |

CKC Laboratories Date: 2/12/2009 Time: 10:32:49 AM Impinj Inc WO#: 89028
FCC 15.207 - AVE Test Lead: Neutral 110V 60Hz Sequence#: 2 Polarity: Neutral
Notes:



Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.207 - AVE**
 Work Order #: **89028**
 Test Type: **Conducted Emissions**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/12/2009
 Time: 11:32:45
 Sequence#: 3
 Tested By: Armando Del Angel
 110V 60Hz

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|----------------|------------|------------------|--------------|----------|
| Cable 20' | 16 | 11/10/2008 | 11/10/2010 | ANP05360 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Cable 30' | 11 | 11/05/2008 | 11/05/2010 | ANP05366 |
| Agilent E4440A | MY46186330 | 01/31/2008 | 01/31/2010 | AN02872 |
| Attenuator | 9912 | 03/21/2008 | 03/21/2010 | ANP05503 |
| Filter | G7752 | 07/21/2008 | 07/21/2010 | AN02611 |
| EMCO LISN | 9606-1049 | 06/01/2007 | 06/01/2009 | AN01492 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|------------------------|--------------|-----------|----------------|
| Circular patch antenna | Cushcraft | S90289CLJ | 092436 |
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |
| Laptop Computer | Dell | Latitude | 6497402833 |
| Switch POE | NETGEAR | FS108P | 1DL1863H0073E |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing AC conducted emissions per FCC 15.207.

The Unit is an RF reader. It is located in the back edge of the test table.

All its ports are being exercised. It is being powered by POE.

It is connected to a laptop outside the chamber through a shielded ethernet cable.

The antenna is located on the wooden table.

The EUT will be in transmitter mode throughout the test.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting: 30.0 dBm

Operating frequency: 902-928MHz.

Frequency range of measurement = 150kHz - 30MHz, RBW=1kHz, VBW=1kHz.

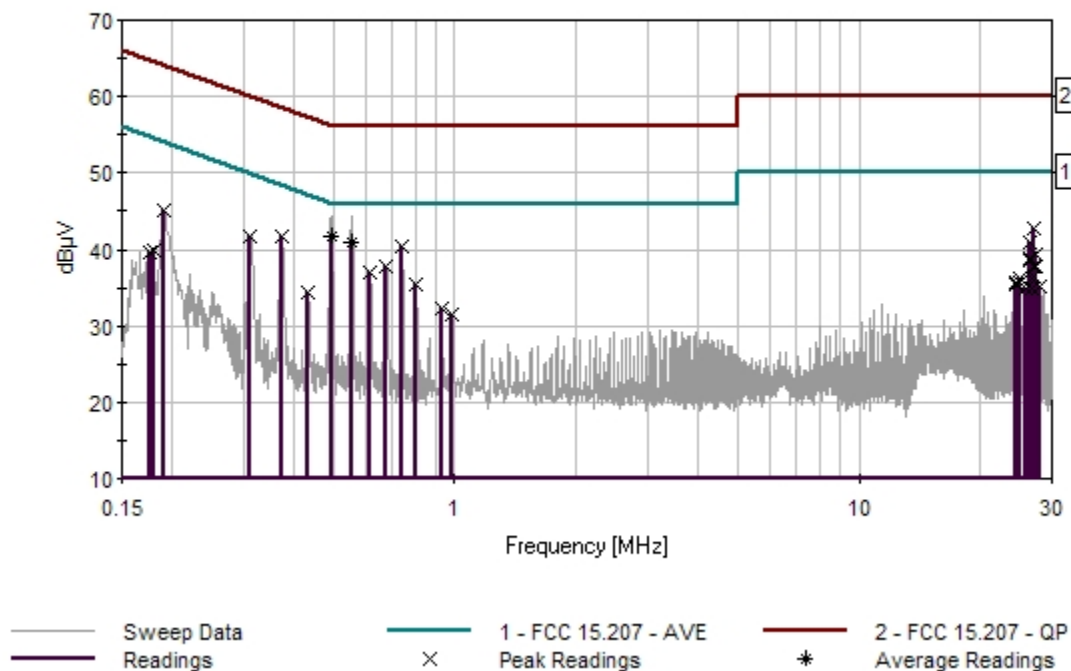
Transducer Legend:

| | |
|-----------------|------------------------------|
| T1=CAB-ANP05371 | T2=FIL-AN02611-072108 |
| T3=CAB-ANP05366 | T4=ATT-ANP5503-032108 |
| T5=CAB-ANP05360 | T6=CDN-AN01492-060107 - Line |

| Measurement Data: | | Reading listed by margin. | | | | | Test Lead: Line | | | | |
|--------------------------|----------|---------------------------|----------|----------|------|-------|-----------------|------------|------------|--------|-------|
| # | Freq | Rdng | T1 | T2 | T3 | T4 | Dist | Corr | Spec | Margin | Polar |
| | MHz | dB μ V | T5 dB | T6 dB | dB | dB | Table | dB μ V | dB μ V | dB | Ant |
| 1 | 494.048k | 31.1 | +0.1 | +0.2 | +0.0 | +10.1 | +0.0 | 41.7 | 46.1 | -4.4 | Line |
| | Ave | | +0.1 | +0.1 | | | | | | | |
| ^ | 494.048k | 34.0 | +0.1 | +0.2 | +0.0 | +10.1 | +0.0 | 44.6 | 46.1 | -1.5 | Line |
| | | | +0.1 | +0.1 | | | | | | | |
| 3 | 556.911k | 30.4 | +0.1 | +0.2 | +0.0 | +10.1 | +0.0 | 41.0 | 46.0 | -5.0 | Line |
| | Ave | | +0.1 | +0.1 | | | | | | | |
| ^ | 556.911k | 34.0 | +0.1 | +0.2 | +0.0 | +10.1 | +0.0 | 44.6 | 46.0 | -1.4 | Line |
| | | | +0.1 | +0.1 | | | | | | | |
| 5 | 741.219k | 29.8 | +0.0 | +0.2 | +0.1 | +10.1 | +0.0 | 40.4 | 46.0 | -5.6 | Line |
| | | | +0.1 | +0.1 | | | | | | | |
| 6 | 372.525k | 31.3 | +0.1 | +0.1 | +0.0 | +10.1 | +0.0 | 41.8 | 48.4 | -6.6 | Line |
| | | | +0.1 | +0.1 | | | | | | | |
| 7 | 27.163M | 30.8 | +0.2 | +0.2 | +0.3 | +10.1 | +0.0 | 42.8 | 50.0 | -7.2 | Line |
| | | | +0.3 | +0.9 | | | | | | | |
| 8 | 312.167k | 31.5 | +0.0 | +0.1 | +0.0 | +10.1 | +0.0 | 41.8 | 49.9 | -8.1 | Line |
| | | | +0.0 | +0.1 | | | | | | | |
| 9 | 678.679k | 27.2 | +0.1 | +0.2 | +0.0 | +10.1 | +0.0 | 37.8 | 46.0 | -8.2 | Line |
| | | | +0.1 | +0.1 | | | | | | | |
| 10 | 190.724k | 34.6 | +0.0 | +0.2 | +0.0 | +10.1 | +0.0 | 45.0 | 54.0 | -9.0 | Line |
| | | | +0.0 | +0.1 | | | | | | | |
| 11 | 617.593k | 26.4 | +0.1 | +0.2 | +0.0 | +10.1 | +0.0 | 37.0 | 46.0 | -9.0 | Line |
| | | | +0.1 | +0.1 | | | | | | | |
| 12 | 26.608M | 28.9 | +0.2 | +0.2 | +0.3 | +10.1 | +0.0 | 40.9 | 50.0 | -9.1 | Line |
| | | | +0.3 | +0.9 | | | | | | | |
| 13 | 803.031k | 24.8 | +0.0 | +0.2 | +0.1 | +10.1 | +0.0 | 35.4 | 46.0 | -10.6 | Line |
| | | | +0.1 | +0.1 | | | | | | | |
| 14 | 27.341M | 27.3 | +0.2 | +0.2 | +0.3 | +10.1 | +0.0 | 39.3 | 50.0 | -10.7 | Line |
| | | | +0.3 | +0.9 | | | | | | | |
| 15 | 26.492M | 26.8 | +0.2 | +0.2 | +0.3 | +10.1 | +0.0 | 38.8 | 50.0 | -11.2 | Line |
| | | | +0.3 | +0.9 | | | | | | | |
| 16 | 26.553M | 26.5 | +0.2 | +0.2 | +0.3 | +10.1 | +0.0 | 38.5 | 50.0 | -11.5 | Line |
| | | | +0.3 | +0.9 | | | | | | | |
| 17 | 27.218M | 25.8 | +0.2 | +0.2 | +0.3 | +10.1 | +0.0 | 37.8 | 50.0 | -12.2 | Line |
| | | | +0.3 | +0.9 | | | | | | | |
| 18 | 27.410M | 25.7 | +0.2 | +0.2 | +0.3 | +10.1 | +0.0 | 37.8 | 50.0 | -12.2 | Line |
| | | | +0.3 | +1.0 | | | | | | | |
| 19 | 432.883k | 23.7 | +0.1 | +0.2 | +0.0 | +10.1 | +0.0 | 34.3 | 47.2 | -12.9 | Line |
| | | | +0.1 | +0.1 | | | | | | | |
| 20 | 26.944M | 24.4 | +0.2 | +0.2 | +0.3 | +10.1 | +0.0 | 36.4 | 50.0 | -13.6 | Line |
| | | | +0.3 | +0.9 | | | | | | | |
| 21 | 923.985k | 21.7 | +0.0 | +0.2 | +0.1 | +10.1 | +0.0 | 32.3 | 46.0 | -13.7 | Line |
| | | | +0.1 | +0.1 | | | | | | | |
| 22 | 24.902M | 24.3 | +0.2 | +0.2 | +0.3 | +10.1 | +0.0 | 36.2 | 50.0 | -13.8 | Line |
| | | | +0.3 | +0.8 | | | | | | | |

| | | | | | | | | | | | |
|----|----------|------|--------------|--------------|------|-------|------|------|------|-------|------|
| 23 | 26.855M | 24.2 | +0.2 +0.3 | +0.2 +0.9 | +0.3 | +10.1 | +0.0 | 36.2 | 50.0 | -13.8 | Line |
| 24 | 24.532M | 23.9 | +0.2 +0.3 | +0.2 +0.8 | +0.3 | +10.1 | +0.0 | 35.8 | 50.0 | -14.2 | Line |
| 25 | 987.776k | 21.0 | +0.0 +0.1 | +0.2 +0.1 | +0.1 | +10.1 | +0.0 | 31.6 | 46.0 | -14.4 | Line |
| 26 | 24.964M | 23.7 | +0.2 +0.3 | +0.2 +0.8 | +0.3 | +10.1 | +0.0 | 35.6 | 50.0 | -14.4 | Line |
| 27 | 179.815k | 29.4 | +0.0 +0.0 | +0.3 +0.1 | +0.0 | +10.1 | +0.0 | 39.9 | 54.5 | -14.6 | Line |
| 28 | 24.354M | 23.5 | +0.2 +0.3 | +0.2 +0.8 | +0.3 | +10.1 | +0.0 | 35.4 | 50.0 | -14.6 | Line |
| 29 | 27.896M | 23.1 | +0.2 +0.3 | +0.2 +1.0 | +0.3 | +10.1 | +0.0 | 35.2 | 50.0 | -14.8 | Line |
| 30 | 176.907k | 29.2 | +0.0 +0.0 | +0.3 +0.1 | +0.0 | +10.1 | +0.0 | 39.7 | 54.6 | -14.9 | Line |
| 31 | 25.875M | 22.9 | +0.2 +0.3 | +0.2 +0.9 | +0.3 | +10.1 | +0.0 | 34.9 | 50.0 | -15.1 | Line |
| 32 | 26.670M | 22.9 | +0.2 +0.3 | +0.2 +0.9 | +0.3 | +10.1 | +0.0 | 34.9 | 50.0 | -15.1 | Line |

CKC Laboratories Date: 2/12/2009 Time: 11:32:45 Impinj Inc WO#: 89028
FCC 15.207 - AVE Test Lead: Line 110V 60Hz Sequence#: 3 Polarity: Line
Notes:



Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.207 - AVE**
 Work Order #: **89028**
 Test Type: **Conducted Emissions**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/12/2009
 Time: 11:37:34
 Sequence#: 4
 Tested By: Armando Del Angel
 110V 60Hz

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|----------------|------------|------------------|--------------|----------|
| Cable 20' | 16 | 11/10/2008 | 11/10/2010 | ANP05360 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Cable 30' | 11 | 11/05/2008 | 11/05/2010 | ANP05366 |
| Agilent E4440A | MY46186330 | 01/31/2008 | 01/31/2010 | AN02872 |
| Attenuator | 9912 | 03/21/2008 | 03/21/2010 | ANP05503 |
| Filter | G7752 | 07/21/2008 | 07/21/2010 | AN02611 |
| EMCO LISN | 9606-1049 | 06/01/2007 | 06/01/2009 | AN01492 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|------------------------|--------------|-----------|----------------|
| Circular patch antenna | Cushcraft | S90289CLJ | 092436 |
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |
| Laptop Computer | Dell | Latitude | 6497402833 |
| Switch POE | NETGEAR | FS108P | 1DL1863H0073E |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing AC conducted emissions per FCC 15.207.

The Unit is an RF reader. It is located in the back edge of the test table.

All its ports are being exercised. It is being powered by POE.

It is connected to a laptop outside the chamber through a shielded ethernet cable.

The antenna is located on the wooden table.

The EUT will be in transmitter mode throughout the test.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting: 30.0 dBm

Operating frequency: 902-928MHz.

Frequency range of measurement = 150kHz - 30MHz, RBW=1kHz, VBW=1kHz.

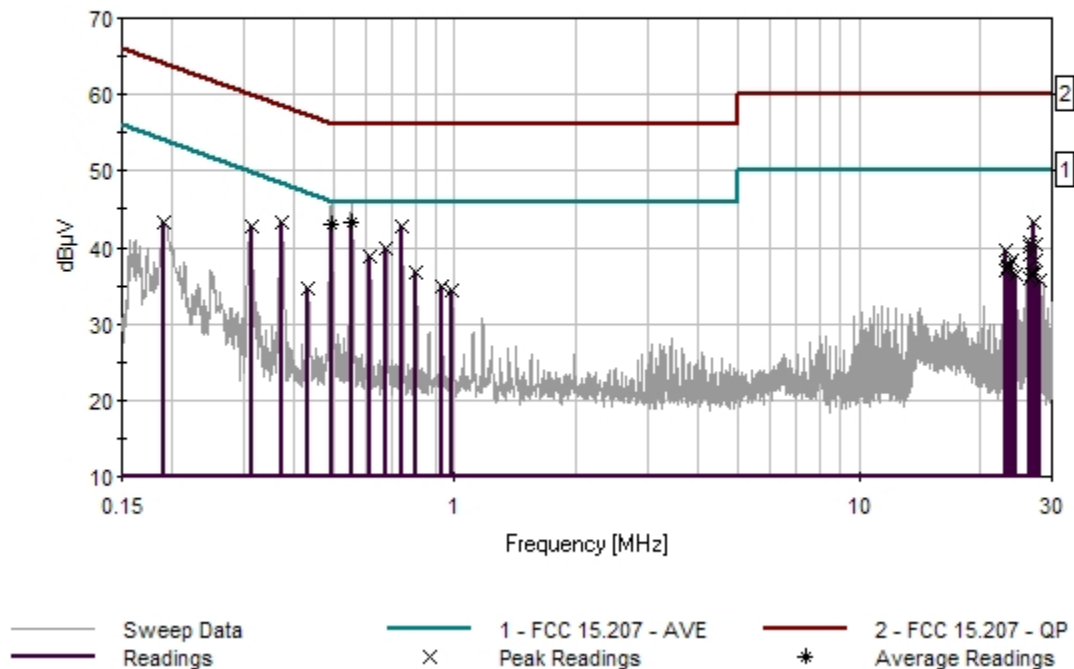
Transducer Legend:

| | |
|-----------------|---------------------------------|
| T1=CAB-ANP05371 | T2=FIL-AN02611-072108 |
| T3=CAB-ANP05366 | T4=ATT-ANP5503-032108 |
| T5=CAB-ANP05360 | T6=CDN-AN01492-060107 - Neutral |

| Measurement Data: | | Reading listed by margin. | | | | | Test Lead: Neutral | | | | |
|--------------------------|----------|---------------------------|----------|----------|------|-------|--------------------|------------|------------|--------|-------|
| # | Freq | Rdng | T1 | T2 | T3 | T4 | Dist | Corr | Spec | Margin | Polar |
| | MHz | dB μ V | T5 dB | T6 dB | dB | dB | Table | dB μ V | dB μ V | dB | Ant |
| 1 | 554.840k | 32.6 | +0.1 | +0.2 | +0.0 | +10.1 | +0.0 | 43.3 | 46.0 | -2.7 | Neutr |
| | Ave | | +0.1 | +0.2 | | | | | | | |
| ^ | 554.840k | 35.5 | +0.1 | +0.2 | +0.0 | +10.1 | +0.0 | 46.2 | 46.0 | +0.2 | Neutr |
| | | | +0.1 | +0.2 | | | | | | | |
| 3 | 493.487k | 32.2 | +0.1 | +0.2 | +0.0 | +10.1 | +0.0 | 42.9 | 46.1 | -3.2 | Neutr |
| | Ave | | +0.1 | +0.2 | | | | | | | |
| ^ | 493.487k | 35.2 | +0.1 | +0.2 | +0.0 | +10.1 | +0.0 | 45.9 | 46.1 | -0.2 | Neutr |
| | | | +0.1 | +0.2 | | | | | | | |
| 5 | 739.763k | 32.1 | +0.0 | +0.2 | +0.1 | +10.1 | +0.0 | 42.8 | 46.0 | -3.2 | Neutr |
| | | | +0.1 | +0.2 | | | | | | | |
| 6 | 372.524k | 32.6 | +0.1 | +0.1 | +0.0 | +10.1 | +0.0 | 43.2 | 48.4 | -5.2 | Neutr |
| | | | +0.1 | +0.2 | | | | | | | |
| 7 | 677.223k | 29.2 | +0.1 | +0.2 | +0.0 | +10.1 | +0.0 | 39.9 | 46.0 | -6.1 | Neutr |
| | | | +0.1 | +0.2 | | | | | | | |
| 8 | 27.163M | 31.0 | +0.2 | +0.2 | +0.3 | +10.1 | +0.0 | 43.3 | 50.0 | -6.7 | Neutr |
| | | | +0.3 | +1.2 | | | | | | | |
| 9 | 312.893k | 32.3 | +0.0 | +0.1 | +0.0 | +10.1 | +0.0 | 42.7 | 49.9 | -7.2 | Neutr |
| | | | +0.0 | +0.2 | | | | | | | |
| 10 | 615.411k | 28.0 | +0.1 | +0.2 | +0.0 | +10.1 | +0.0 | 38.7 | 46.0 | -7.3 | Neutr |
| | | | +0.1 | +0.2 | | | | | | | |
| 11 | 803.030k | 26.0 | +0.0 | +0.2 | +0.1 | +10.1 | +0.0 | 36.7 | 46.0 | -9.3 | Neutr |
| | | | +0.1 | +0.2 | | | | | | | |
| 12 | 26.608M | 28.4 | +0.2 | +0.2 | +0.3 | +10.1 | +0.0 | 40.7 | 50.0 | -9.3 | Neutr |
| | | | +0.3 | +1.2 | | | | | | | |
| 13 | 27.341M | 28.1 | +0.2 | +0.2 | +0.3 | +10.1 | +0.0 | 40.4 | 50.0 | -9.6 | Neutr |
| | | | +0.3 | +1.2 | | | | | | | |
| 14 | 26.492M | 27.9 | +0.2 | +0.2 | +0.3 | +10.1 | +0.0 | 40.2 | 50.0 | -9.8 | Neutr |
| | | | +0.3 | +1.2 | | | | | | | |
| 15 | 23.130M | 27.5 | +0.2 | +0.2 | +0.3 | +10.1 | +0.0 | 39.7 | 50.0 | -10.3 | Neutr |
| | | | +0.3 | +1.1 | | | | | | | |
| 16 | 191.450k | 32.9 | +0.0 | +0.2 | +0.0 | +10.1 | +0.0 | 43.4 | 54.0 | -10.6 | Neutr |
| | | | +0.0 | +0.2 | | | | | | | |
| 17 | 26.553M | 26.8 | +0.2 | +0.2 | +0.3 | +10.1 | +0.0 | 39.1 | 50.0 | -10.9 | Neutr |
| | | | +0.3 | +1.2 | | | | | | | |
| 18 | 923.985k | 24.2 | +0.0 | +0.2 | +0.1 | +10.1 | +0.0 | 34.9 | 46.0 | -11.1 | Neutr |
| | | | +0.1 | +0.2 | | | | | | | |
| 19 | 23.867M | 26.2 | +0.2 | +0.2 | +0.3 | +10.1 | +0.0 | 38.4 | 50.0 | -11.6 | Neutr |
| | | | +0.3 | +1.1 | | | | | | | |
| 20 | 27.403M | 26.0 | +0.2 | +0.2 | +0.3 | +10.1 | +0.0 | 38.4 | 50.0 | -11.6 | Neutr |
| | | | +0.3 | +1.3 | | | | | | | |
| 21 | 987.776k | 23.6 | +0.0 | +0.2 | +0.1 | +10.1 | +0.0 | 34.3 | 46.0 | -11.7 | Neutr |
| | | | +0.1 | +0.2 | | | | | | | |
| 22 | 23.744M | 25.5 | +0.2 | +0.2 | +0.3 | +10.1 | +0.0 | 37.7 | 50.0 | -12.3 | Neutr |
| | | | +0.3 | +1.1 | | | | | | | |

| | | | | | | | | | | | |
|----|----------|------|--------------|--------------|------|-------|------|------|------|-------|-------|
| 23 | 433.609k | 24.0 | +0.1 +0.1 | +0.2 +0.2 | +0.0 | +10.1 | +0.0 | 34.7 | 47.2 | -12.5 | Neutr |
| 24 | 23.436M | 25.3 | +0.2 +0.3 | +0.2 +1.1 | +0.3 | +10.1 | +0.0 | 37.5 | 50.0 | -12.5 | Neutr |
| 25 | 23.374M | 25.1 | +0.2 +0.3 | +0.2 +1.1 | +0.3 | +10.1 | +0.0 | 37.3 | 50.0 | -12.7 | Neutr |
| 26 | 23.067M | 24.9 | +0.2 +0.3 | +0.2 +1.1 | +0.3 | +10.1 | +0.0 | 37.1 | 50.0 | -12.9 | Neutr |
| 27 | 27.218M | 24.8 | +0.2 +0.3 | +0.2 +1.2 | +0.3 | +10.1 | +0.0 | 37.1 | 50.0 | -12.9 | Neutr |
| 28 | 26.923M | 24.2 | +0.2 +0.3 | +0.2 +1.2 | +0.3 | +10.1 | +0.0 | 36.5 | 50.0 | -13.5 | Neutr |
| 29 | 24.354M | 24.2 | +0.2 +0.3 | +0.2 +1.1 | +0.3 | +10.1 | +0.0 | 36.4 | 50.0 | -13.6 | Neutr |
| 30 | 26.855M | 24.1 | +0.2 +0.3 | +0.2 +1.2 | +0.3 | +10.1 | +0.0 | 36.4 | 50.0 | -13.6 | Neutr |
| 31 | 26.457M | 23.6 | +0.2 +0.3 | +0.2 +1.2 | +0.3 | +10.1 | +0.0 | 35.9 | 50.0 | -14.1 | Neutr |
| 32 | 27.876M | 23.3 | +0.2 +0.3 | +0.2 +1.3 | +0.3 | +10.1 | +0.0 | 35.7 | 50.0 | -14.3 | Neutr |

CKC Laboratories Date: 2/12/2009 Time: 11:37:34 Impinj Inc WO#: 89028
FCC 15.207 - AVE Test Lead: Neutral 110V 60Hz Sequence#: 4 Polarity: Neutral
Notes:



Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.207 - AVE**
 Work Order #: **89028**
 Test Type: **Conducted Emissions**
 Equipment: **RFID Reader**
 Manufacturer: **Impinj**
 Model: **IPJ-REV**
 S/N: **940-08-21-0006**

Date: 2/12/2009
 Time: 10:28:14 AM
 Sequence#: 1
 Tested By: Armando Del Angel
 110V 60Hz

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|----------------|------------|------------------|--------------|----------|
| Cable 20' | 16 | 11/10/2008 | 11/10/2010 | ANP05360 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Cable 30' | 11 | 11/05/2008 | 11/05/2010 | ANP05366 |
| Agilent E4440A | MY46186330 | 01/31/2008 | 01/31/2010 | AN02872 |
| Attenuator | 9912 | 03/21/2008 | 03/21/2010 | ANP05503 |
| Filter | G7752 | 07/21/2008 | 07/21/2010 | AN02611 |
| EMCO LISN | 9606-1049 | 06/01/2007 | 06/01/2009 | AN01492 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|------------------------|---------------|------------|---------------------|
| Circular patch antenna | Cushcraft | S90289CLJ | 092436 |
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |
| Antenna cable | Manhattan/CDT | M4213 | 1354 E12091 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |
| Laptop Computer | Dell | Latitude | 6497402833 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing AC conducted emissions per FCC 15.207.

The Unit is an RF reader. It is located in the back edge of the test table.

All its ports are being exercised. It is being powered by an AC/DC converter.

It is connected to a laptop outside the chamber through a shielded ethernet cable.

The antenna is located on the wooden table.

The EUT will be in transmitter mode throughout the test.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting: 32.5 dBm

Operating frequency: 902-928MHz.

Frequency range of measurement = 150kHz - 30MHz, RBW=1kHz, VBW=1kHz.

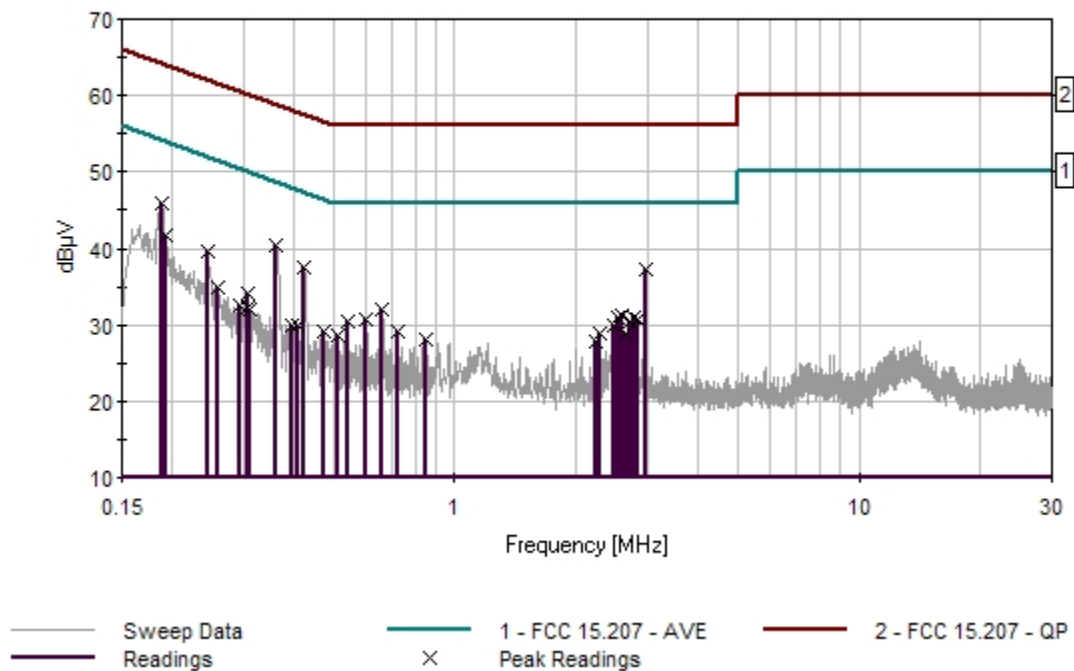
Transducer Legend:

| | |
|-----------------|------------------------------|
| T1=CAB-ANP05371 | T2=FIL-AN02611-072108 |
| T3=CAB-ANP05366 | T4=ATT-ANP5503-032108 |
| T5=CAB-ANP05360 | T6=CDN-AN01492-060107 - Line |

| Measurement Data: | | Reading listed by margin. | | | | | Test Lead: Line | | | | |
|--------------------------|----------|---------------------------|--------------|--------------|------|-------|-----------------|------------|------------|--------|-------|
| # | Freq | Rdng | T1 T5 | T2 T6 | T3 | T4 | Dist | Corr | Spec | Margin | Polar |
| | MHz | dB μ V | dB | dB | dB | dB | Table | dB μ V | dB μ V | dB | Ant |
| 1 | 188.542k | 35.4 | +0.0 +0.0 | +0.2 +0.1 | +0.0 | +10.1 | +0.0 | 45.8 | 54.1 | -8.3 | Line |
| 2 | 362.344k | 29.9 | +0.1 +0.1 | +0.1 +0.1 | +0.0 | +10.1 | +0.0 | 40.4 | 48.7 | -8.3 | Line |
| 3 | 2.965M | 26.7 | +0.1 +0.1 | +0.1 +0.1 | +0.1 | +10.1 | +0.0 | 37.3 | 46.0 | -8.7 | Line |
| 4 | 423.429k | 27.1 | +0.1 +0.1 | +0.1 +0.1 | +0.0 | +10.1 | +0.0 | 37.6 | 47.4 | -9.8 | Line |
| 5 | 192.178k | 31.4 | +0.0 +0.0 | +0.2 +0.1 | +0.0 | +10.1 | +0.0 | 41.8 | 53.9 | -12.1 | Line |
| 6 | 245.264k | 29.2 | +0.0 +0.0 | +0.2 +0.1 | +0.0 | +10.1 | +0.0 | 39.6 | 51.9 | -12.3 | Line |
| 7 | 662.680k | 21.5 | +0.1 +0.1 | +0.2 +0.1 | +0.0 | +10.1 | +0.0 | 32.1 | 46.0 | -13.9 | Line |
| 8 | 2.591M | 20.5 | +0.1 +0.1 | +0.1 +0.1 | +0.1 | +10.1 | +0.0 | 31.1 | 46.0 | -14.9 | Line |
| 9 | 2.532M | 20.3 | +0.1 +0.1 | +0.1 +0.1 | +0.1 | +10.1 | +0.0 | 30.9 | 46.0 | -15.1 | Line |
| 10 | 2.778M | 20.3 | +0.1 +0.1 | +0.1 +0.1 | +0.1 | +10.1 | +0.0 | 30.9 | 46.0 | -15.1 | Line |
| 11 | 602.322k | 20.2 | +0.1 +0.1 | +0.2 +0.1 | +0.0 | +10.1 | +0.0 | 30.8 | 46.0 | -15.2 | Line |
| 12 | 2.833M | 20.1 | +0.1 +0.1 | +0.1 +0.1 | +0.1 | +10.1 | +0.0 | 30.7 | 46.0 | -15.3 | Line |
| 13 | 542.691k | 19.9 | +0.1 +0.1 | +0.2 +0.1 | +0.0 | +10.1 | +0.0 | 30.5 | 46.0 | -15.5 | Line |
| 14 | 2.714M | 19.8 | +0.1 +0.1 | +0.1 +0.1 | +0.1 | +10.1 | +0.0 | 30.4 | 46.0 | -15.6 | Line |
| 15 | 307.077k | 23.7 | +0.0 +0.0 | +0.1 +0.1 | +0.0 | +10.1 | +0.0 | 34.0 | 50.0 | -16.0 | Line |
| 16 | 2.472M | 19.3 | +0.1 +0.1 | +0.1 +0.1 | +0.1 | +10.1 | +0.0 | 29.9 | 46.0 | -16.1 | Line |
| 17 | 259.808k | 24.4 | +0.0 +0.0 | +0.2 +0.1 | +0.0 | +10.1 | +0.0 | 34.8 | 51.4 | -16.6 | Line |
| 18 | 723.766k | 18.5 | +0.0 +0.1 | +0.2 +0.1 | +0.1 | +10.1 | +0.0 | 29.1 | 46.0 | -16.9 | Line |
| 19 | 2.293M | 18.3 | +0.1 +0.1 | +0.1 +0.1 | +0.1 | +10.1 | +0.0 | 28.9 | 46.0 | -17.1 | Line |
| 20 | 2.651M | 18.3 | +0.1 +0.1 | +0.1 +0.1 | +0.1 | +10.1 | +0.0 | 28.9 | 46.0 | -17.1 | Line |
| 21 | 471.425k | 18.6 | +0.1 +0.1 | +0.2 +0.1 | +0.0 | +10.1 | +0.0 | 29.2 | 46.5 | -17.3 | Line |
| 22 | 511.421k | 18.0 | +0.1 +0.1 | +0.2 +0.1 | +0.0 | +10.1 | +0.0 | 28.6 | 46.0 | -17.4 | Line |

| | | | | | | | | | | | |
|----|----------|------|------|------|------|-------|------|------|------|-------|------|
| 23 | 308.531k | 22.1 | +0.0 | +0.1 | +0.0 | +10.1 | +0.0 | 32.4 | 50.0 | -17.6 | Line |
| | | | +0.0 | +0.1 | | | | | | | |
| 24 | 408.158k | 19.5 | +0.1 | +0.1 | +0.0 | +10.1 | +0.0 | 30.0 | 47.7 | -17.7 | Line |
| | | | +0.1 | +0.1 | | | | | | | |
| 25 | 410.340k | 19.3 | +0.1 | +0.1 | +0.0 | +10.1 | +0.0 | 29.8 | 47.6 | -17.8 | Line |
| | | | +0.1 | +0.1 | | | | | | | |
| 26 | 294.714k | 22.2 | +0.0 | +0.1 | +0.0 | +10.1 | +0.0 | 32.5 | 50.4 | -17.9 | Line |
| | | | +0.0 | +0.1 | | | | | | | |
| 27 | 310.713k | 21.7 | +0.0 | +0.1 | +0.0 | +10.1 | +0.0 | 32.0 | 50.0 | -18.0 | Line |
| | | | +0.0 | +0.1 | | | | | | | |
| 28 | 844.482k | 17.4 | +0.0 | +0.2 | +0.1 | +10.1 | +0.0 | 28.0 | 46.0 | -18.0 | Line |
| | | | +0.1 | +0.1 | | | | | | | |
| 29 | 395.068k | 19.4 | +0.1 | +0.1 | +0.0 | +10.1 | +0.0 | 29.9 | 48.0 | -18.1 | Line |
| | | | +0.1 | +0.1 | | | | | | | |
| 30 | 2.230M | 17.3 | +0.1 | +0.1 | +0.1 | +10.1 | +0.0 | 27.9 | 46.0 | -18.1 | Line |
| | | | +0.1 | +0.1 | | | | | | | |

CKC Laboratories Date: 2/12/2009 Time: 10:28:14 AM Impinj Inc WO#: 89028
FCC 15.207 - AVE Test Lead: Line 110V 60Hz Sequence#: 1 Polarity: Line
Notes:



FCC 15.247(a) – 20dB BANDWIDTH

Test Equipment

| Asset # | Name | Manufacturer | Model | Serial | Cal date | Cal Due |
|---------|-------------------|--------------|-----------|------------|------------|------------|
| P05747 | Attenuator | Pasternack | PE7004-20 | NA | 4/3/2008 | 4/3/2010 |
| P05748 | Attenuator | Pasternack | PE7004-20 | NA | 4/3/2008 | 4/3/2010 |
| P05371 | Cable 6' | Belden | RG-214 | RG214 49 | 11/10/2008 | 11/10/2010 |
| 2872 | Spectrum Analyzer | Agilent | E4440A | MY46186330 | 1/31/2008 | 1/31/2010 |

Test Conditions

EUT is transmitting at maximum rate. PSA is on max hold, marker-to-peak function is set on the peak of each channel (LOW, MID, HIGH), and then the marker will be positioned 20dB below the peak on one side and then on the other side. The separation between those two is the 20dB bandwidth.

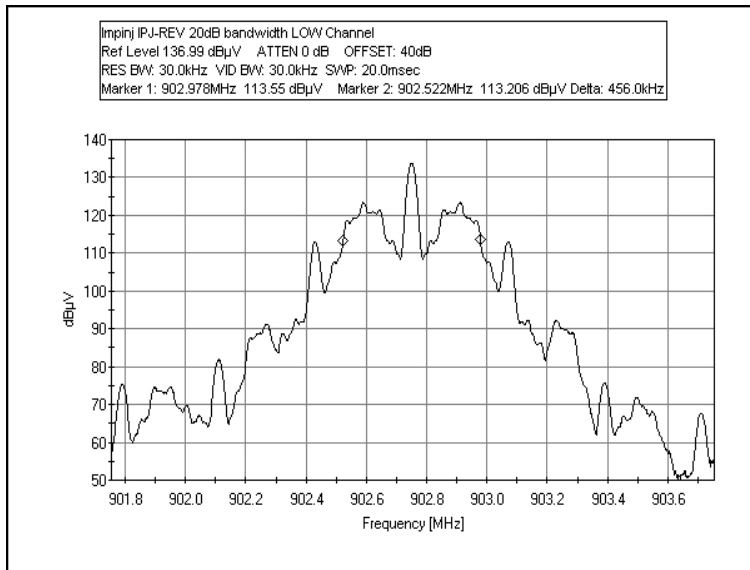
Test Setup Photos



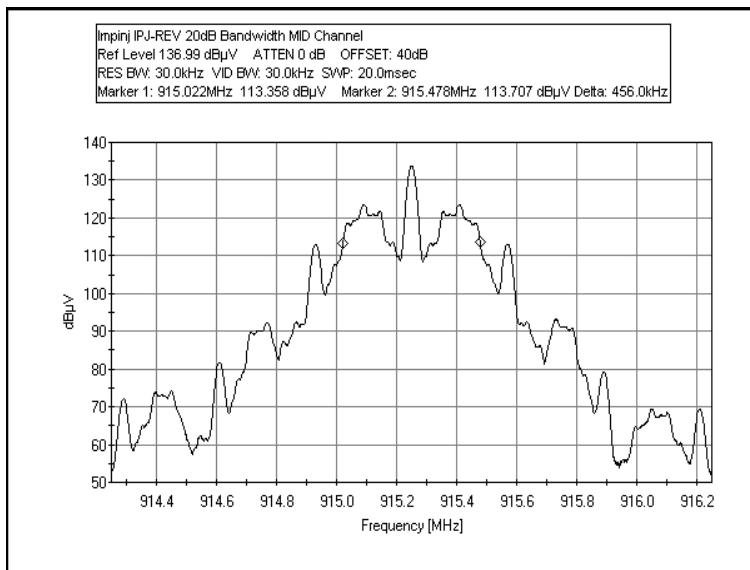
Test Data

| Channel | Frequency | 20dB Bandwidth | Limit |
|---------|-----------|----------------|--------|
| LOW | 902.75MHz | 456.0 kHz | 500kHz |
| MID | 915.25MHz | 456.0kHz | 500kHz |
| HIGH | 927.25MHz | 454.0kHz | 500kHz |

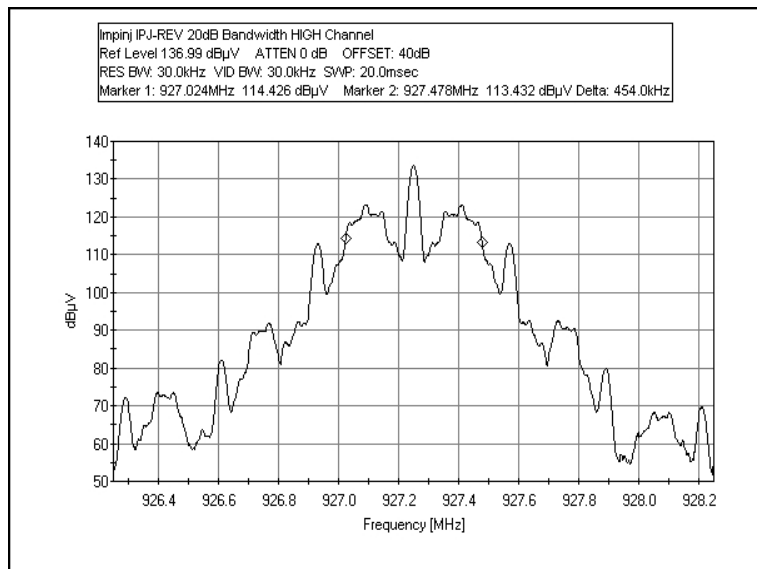
FCC 15.247(a)(1) - 20dB BANDWIDTH - LOW CHANNEL



FCC 15.247(a)(1) - 20dB BANDWIDTH - MID CHANNEL



FCC 15.247(a)(1) - 20dB BANDWIDTH - HIGH CHANNEL



FCC 15.247(a) – FREQUENCY SEPARATION

Test Equipment

| Asset # | Name | Manufacturer | Model | Serial | Cal date | Cal Due |
|---------|-------------------|--------------|-----------|------------|------------|------------|
| P05747 | Attenuator | Pasternack | PE7004-20 | NA | 4/3/2008 | 4/3/2010 |
| P05748 | Attenuator | Pasternack | PE7004-20 | NA | 4/3/2008 | 4/3/2010 |
| P05371 | Cable 6' | Belden | RG-214 | RG214 49 | 11/10/2008 | 11/10/2010 |
| 2872 | Spectrum Analyzer | Agilent | E4440A | MY46186330 | 1/31/2008 | 1/31/2010 |

Test Conditions

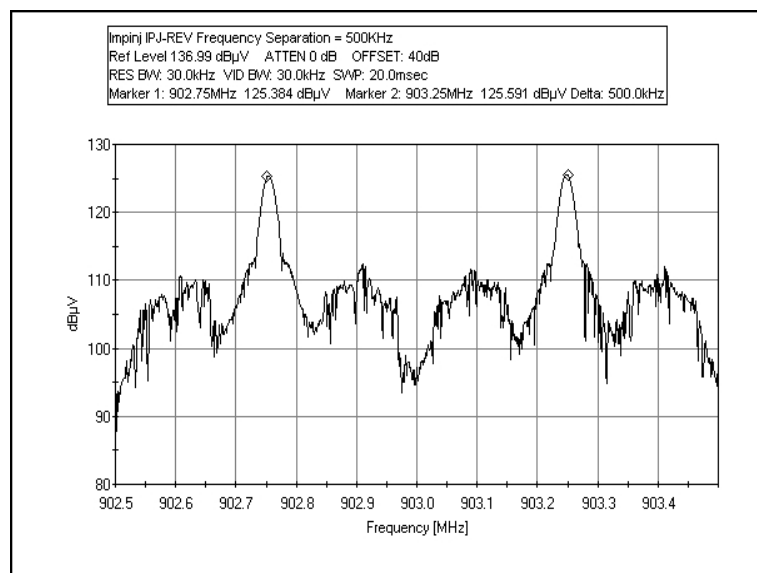
EUT is transmitting with the Hopping function enabled at maximum rate, PSA is on max hold and the span is wide enough to capture two adjacent signals. Two markers are positioned in the peak of each signal and the delta of those two markers is the frequency separation between signals.

Test Setup Photos



Test Data

Result: 500 kHz



FCC 15.247(a) – NUMBER OF HOPPING CHANNELS

Test Equipment

| Asset # | Name | Manufacturer | Model | Serial | Cal date | Cal Due |
|---------|-------------------|--------------|-----------|------------|------------|------------|
| P05747 | Attenuator | Pasternack | PE7004-20 | NA | 4/3/2008 | 4/3/2010 |
| P05748 | Attenuator | Pasternack | PE7004-20 | NA | 4/3/2008 | 4/3/2010 |
| P05371 | Cable 6' | Belden | RG-214 | RG214 49 | 11/10/2008 | 11/10/2010 |
| 2872 | Spectrum Analyzer | Agilent | E4440A | MY46186330 | 1/31/2008 | 1/31/2010 |

Test Conditions

EUT is transmitting with the Hopping function enabled at maximum rate, PSA is on max hold and the span is wide enough to capture all the channels (902-928MHz at least). All the signals within the screen are the number of hopping channels.

Result: 50 Channels

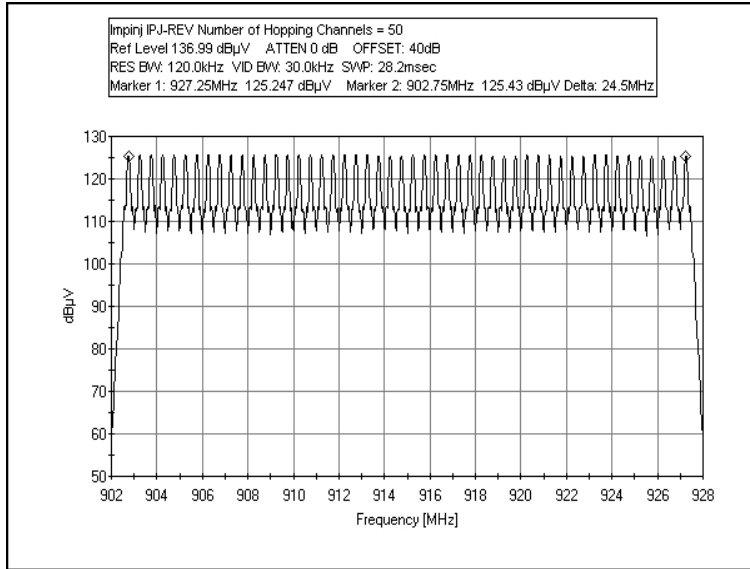
Notes: The setup included 16 RFID tags coupled to the transmitter to operate with maximum transmitter duty cycle during hopping tests.

Test Setup Photos



Test Data

FCC 15.247(a)(1) - NUMBER OF HOPPING CHANNELS



FCC 15.247(a) – AVERAGE TIME OF OCCUPANCY

Test Equipment

| Asset # | Name | Manufacturer | Model | Serial | Cal date | Cal Due |
|---------|-------------------|--------------|-----------|------------|------------|------------|
| P05747 | Attenuator | Pasternack | PE7004-20 | NA | 4/3/2008 | 4/3/2010 |
| P05748 | Attenuator | Pasternack | PE7004-20 | NA | 4/3/2008 | 4/3/2010 |
| P05371 | Cable 6' | Belden | RG-214 | RG214 49 | 11/10/2008 | 11/10/2010 |
| 2872 | Spectrum Analyzer | Agilent | E4440A | MY46186330 | 1/31/2008 | 1/31/2010 |

Test Conditions

EUT is transmitting with the Hopping function enabled at maximum rate; PSA is on oscilloscope mode (0Hz span) and on max hold. Frequency is centered in a channel and the sweep time long enough to capture the dwell time (500ms). The sweep time is then increased to view the number of hops over a 10 second period. The combination of these measurements yields the total on time per channel over a 10 second period. A total of 10 sets of measurements were taken and the average was calculated to determine the result.

Test Setup Photos

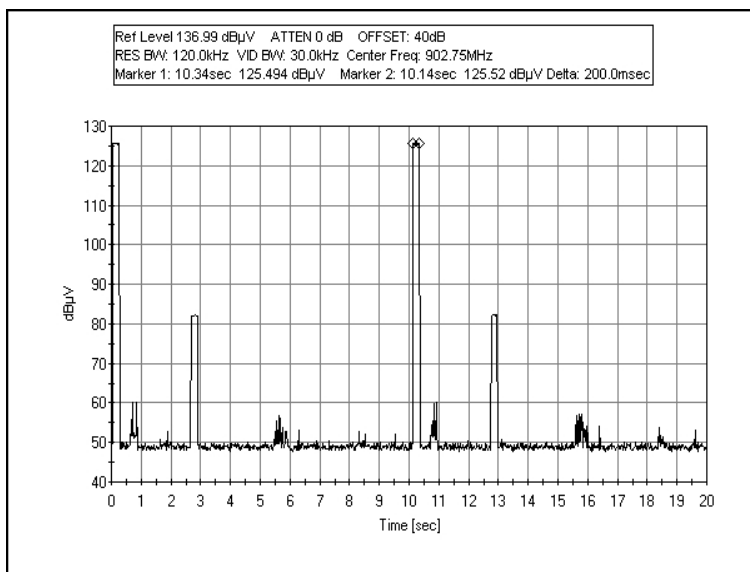


Test Data

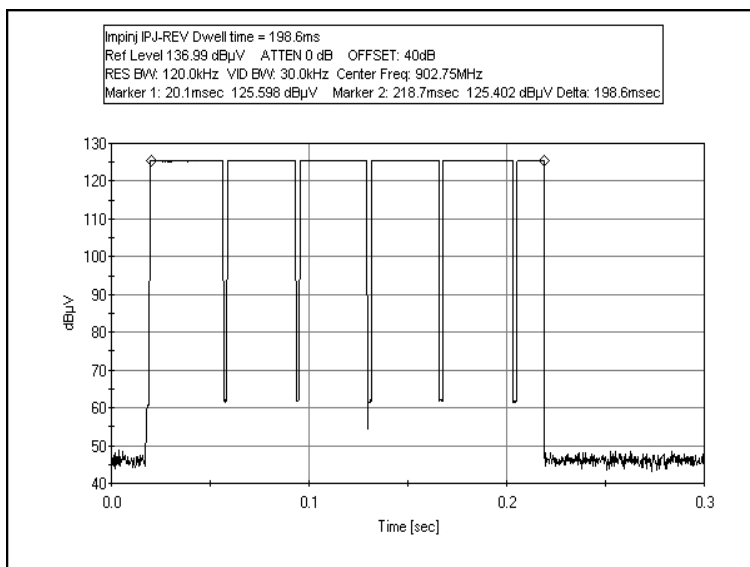
| Dwell time per hop | Number of signals in a 20 seconds span | Result | Limit |
|--------------------|--|---------|-------|
| 198.6ms | 2 | 397.2ms | 400ms |

Notes: 10 measurements were taken to determine the dwell time per hop, and ten measurements were taken to determine how many times the hop would repeat in a 20 seconds interval. Manufacturer declares one operational mode which has occupied bandwidth less than 250 kHz. Therefore, the more stringent requirement was employed.

FCC 15.247(a)(1) - AVERAGE TIME



FCC 15.247(a)(1) - DWELL TIME



FCC 15.247(b) – RF POWER OUTPUT

Test Setup Photos



Test Data

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **15.247(b)(2) RF power Output**
 Work Order #: **89028** Date: 2/9/2009
 Test Type: **Radiated Scan** Time: 10:19:06
 Equipment: **RFID Reader** Sequence#: 1
 Manufacturer: Impinj Tested By: Armando Del Angel
 Model: IPJ-REV
 S/N: 940-08-21-0006

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|------------|-----|------------------|--------------|----------|
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Attenuator | | 04/03/2008 | 04/03/2010 | 5747 |
| Attenuator | | 04/03/2008 | 04/03/2010 | 5748 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|---------------|--------------|------------|---------------------|
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.
 RF Output Power FCC 15.247(b)(2).
 The Unit is an RF reader. It is connected directly to the spectrum analyzer.
 The EUT will be in transmitting mode throughout the test in the LOW, MEDIUM and HIGH channel.
 Remote support computer sends commands to the EUT to exercise the intended functionalities.
 Power setting = 30 dBm
 Operating Frequency range = 902 - 928MHz
 Frequency under test = 902.75, 915.25 & 927.25

Transducer Legend:

| | |
|------------------------|------------------------|
| T1=CAB-ANP05371 | T2=ATT-ANP05747-040308 |
| T3=ATT-ANP05748-040308 | |

Measurement Data: Reading listed by margin. Test Distance: No Distance

| # | Freq MHz | Rdng dBμV | T1 dB | T2 dB | T3 dB | dB | Dist Table | Corr dBμV | Spec dBμV | Margin dB | Polar Ant |
|---|-------------|--------------|----------|----------|----------|----|---------------|--------------|--------------|--------------|--------------|
| 1 | 927.246M | 95.9 | +0.5 | +20.0 | +19.9 | | +0.0 | 136.3 | 137.0 | -0.7 | Condu |
| | | | | | | | | | High Channel | | |
| 2 | 902.754M | 96.0 | +0.3 | +20.0 | +19.9 | | +0.0 | 136.2 | 137.0 | -0.8 | Condu |
| | | | | | | | | | Low Channel | | |
| 3 | 915.234M | 95.9 | +0.4 | +20.0 | +19.9 | | +0.0 | 136.2 | 137.0 | -0.8 | Condu |
| | | | | | | | | | Mid Channel | | |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **15.247(b)(2) RF power Output**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: **Impinj**
 Model: **IPJ-REV**
 S/N: **940-08-21-0006**

Date: 2/9/2009
 Time: 09:57:17
 Sequence#: 2
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|------------|-----|------------------|--------------|---------|
| Attenuator | | 04/03/2008 | 04/03/2010 | 5747 |
| Attenuator | | 04/03/2008 | 04/03/2010 | 5748 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|---------------|---------------|------------|---------------------|
| Antenna cable | Manhattan/CDT | M4213 | 1354 E12091 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |

Test Conditions / Notes:

| |
|---|
| 20C / 26% relative humidity / 102.3 kPa. |
| RF Output Power FCC 15.247(b)(2) |
| The Unit is an RF reader. It is connected directly to the spectrum analyzer through a special cable provided by the customer due to the fact that it will provide the required attenuation for the unit to comply with the limit in this situation. |
| The EUT will be in transmitting mode throughout the test in the LOW, MEDIUM and HIGH channel. |
| Remote support computer sends commands to the EUT to exercise the intended functionalities. |
| Power setting = 32.5 dBm |
| Operating Frequency range = 902 - 928MHz |
| Frequency under test = 902.75, 915.25 & 927.25 |

Transducer Legend:

| | |
|------------------------|------------------------|
| T1=ATT-ANP05747-040308 | T2=ATT-ANP05748-040308 |
|------------------------|------------------------|

| Measurement Data: | | | Reading listed by margin. | | | | Test Distance: No Distance | | | | |
|-------------------|-------------|--------------|---------------------------|----------|----|----|----------------------------|--------------|--------------|--------------|--------------|
| # | Freq MHz | Rdng dBμV | T1 dB | T2 dB | dB | dB | Dist Table | Corr dBμV | Spec dBμV | Margin dB | Polar Ant |
| 1 | 902.754M | 96.3 | +20.0 | +19.9 | | | +0.0 | 136.2 | 137.0 | -0.8 | Condu |
| Low Channel | | | | | | | | | | | |
| 2 | 915.260M | 96.3 | +20.0 | +19.9 | | | +0.0 | 136.2 | 137.0 | -0.8 | Condu |
| Mid Channel | | | | | | | | | | | |
| 3 | 927.246M | 96.1 | +20.0 | +19.9 | | | +0.0 | 136.0 | 137.0 | -1.0 | Condu |
| High Channel | | | | | | | | | | | |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **15.247(b)(2) RF power Output**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: **Impinj**
 Model: **IPJ-REV**
 S/N: **940-08-21-0006**

Date: 2/12/2009
 Time: 14:11:16
 Sequence#: 3
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|------------|-----|------------------|--------------|----------|
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Attenuator | | 04/03/2008 | 04/03/2010 | 5747 |
| Attenuator | | 04/03/2008 | 04/03/2010 | 5748 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|--------------|--------------|---------|----------------|
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |
| Switch POE | NETGEAR | FS108P | 1DL1863H0073E |

Test Conditions / Notes:

20C / 26% relative humidity / 102.3 kPa.

RF Output Power FCC 15.247(b)(2)

The Unit is an RF reader. It is connected directly to the spectrum analyzer through a special cable provided by the customer due to the fact that it will provide the required attenuation for the unit to comply with the limit in this situation.
 The EUT will be in transmitting mode throughout the test in the LOW, MEDIUM and HIGH channel.
 Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 30.0dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 902.75, 915.25 & 927.25

Transducer Legend:

| | |
|------------------------|------------------------|
| T1=CAB-ANP05371 | T2=ATT-ANP05747-040308 |
| T3=ATT-ANP05748-040308 | |

Measurement Data:

Reading listed by margin.

Test Distance: No Distance

| # | Freq MHz | Rdng dBμV | T1 dB | T2 dB | T3 dB | dB | Dist Table | Corr dBμV | Spec dBμV | Margin dB | Polar Ant |
|---|-------------|--------------|----------|----------|----------|----|---------------|--------------|---------------------|--------------|--------------|
| 1 | 927.250M | 96.3 | +0.5 | +20.0 | +19.9 | | +0.0 179 | 136.7 | 137.0 100% Power | -0.3 HIGH | Condu 101 |
| 2 | 915.250M | 96.3 | +0.4 | +20.0 | +19.9 | | +0.0 179 | 136.6 | 137.0 100% Power | -0.4 MID | Condu 101 |
| 3 | 902.750M | 96.3 | +0.3 | +20.0 | +19.9 | | +0.0 179 | 136.5 | 137.0 100% Power | -0.5 LOW | Condu 101 |

FCC 15.247(d) – ANTENNA CONDUCTED SPURIOUS EMISSIONS

Test Setup Photos



Test Data Sheets

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247(d) Conducted**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/9/2009
 Time: 17:18:53
 Sequence#: 6
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------|------------|------------------|--------------|----------|
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |
| Attenuator | | 04/03/2008 | 04/03/2010 | 05747 |
| Attenuator | 9912 | 03/21/2008 | 03/21/2010 | ANP05503 |
| Cable 6' | RG214 49 | 11/10/2008 | 11/10/2010 | P05371 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|---------------|--------------|------------|---------------------|
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Conducted Spurious Emissions per FCC 15.247(d).

The Unit is an RF reader. The measurements will be taken from the RF port.
 The EUT will be in transmitting mode throughout the test in the LOW channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 30.0 dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 902.75MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz
 150kHz-30MHz RBW= 9kHz, VBW = 9kHz
 30MHz - 1GHz RBW= 120kHz, VBW=120kHz
 1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

T1=CAB-ANP05371

T2=ATT-ANP05747-040308

T3=ATT-ANP5503-032108

Measurement Data:

Reading listed by margin.

Test Distance: No Distance

| # | Freq MHz | Rdng dB μ V | T1 dB | T2 dB | T3 dB | dB | Dist Table | Corr dB μ V | Spec dB μ V | Margin dB | Polar Ant |
|----|----------------|--------------------|----------|----------|----------|----|---------------|--------------------|--------------------|--------------|--------------|
| 1 | 902.750M | 104.1 | +0.3 | +20.0 | +10.1 | | +0.0 360 | 134.5 | 137.0 | -2.5 | Condu 157 |
| 2 | 3992.000M | 45.6 | +0.0 | +20.0 | +10.2 | | +0.0 360 | 75.8 | 117.0 | -41.2 | Condu 157 |
| 3 | 3128.000M | 44.5 | +0.0 | +20.0 | +10.2 | | +0.0 360 | 74.7 | 117.0 | -42.3 | Condu 157 |
| 4 | 12400.000 M | 54.2 | +0.0 | +20.1 | +0.0 | | +0.0 360 | 74.3 | 117.0 | -42.7 | Condu 157 |
| 5 | 16216.000 M | 48.5 | +0.0 | +20.3 | +0.0 | | +0.0 360 | 68.8 | 117.0 | -48.2 | Condu 157 |
| 6 | 14845.000 M | 48.3 | +0.0 | +20.3 | +0.0 | | +0.0 360 | 68.6 | 117.0 | -48.4 | Condu 157 |
| 7 | 7300.000M | 46.2 | +0.0 | +20.0 | +0.0 | | +0.0 360 | 66.2 | 117.0 | -50.8 | Condu 157 |
| 8 | 778.500M | 32.6 | +0.5 | +20.0 | +10.1 | | +0.0 360 | 63.2 | 117.0 | -53.8 | Condu 157 |
| 9 | 581.000M | 31.2 | +0.4 | +20.0 | +10.1 | | +0.0 360 | 61.7 | 117.0 | -55.3 | Condu 157 |
| 10 | 187.200M | 23.8 | +0.2 | +20.0 | +10.1 | | +0.0 360 | 54.1 | 117.0 | -62.9 | Condu 157 |
| 11 | 270.800M | 23.5 | +0.3 | +20.0 | +10.1 | | +0.0 360 | 53.9 | 117.0 | -63.1 | Condu 157 |
| 12 | 57.020M | 19.6 | +0.1 | +20.0 | +10.0 | | +0.0 360 | 49.7 | 117.0 | -67.3 | Condu 157 |
| 13 | 999.995k | 14.1 | +0.0 | +20.0 | +10.1 | | +0.0 360 | 44.2 | 117.0 | -72.8 | Condu 157 |
| 14 | 1.319M | 12.3 | +0.0 | +20.0 | +10.1 | | +0.0 360 | 42.4 | 117.0 | -74.6 | Condu 157 |
| 15 | 12.194M | 11.7 | +0.1 | +20.0 | +10.0 | | +0.0 360 | 41.8 | 117.0 | -75.2 | Condu 157 |
| 16 | 10.902k | 6.8 | +0.0 | +20.0 | +10.1 | | +0.0 360 | 36.9 | 117.0 | -80.1 | Condu 157 |
| 17 | 44.567k | 3.0 | +0.0 | +20.0 | +10.1 | | +0.0 360 | 33.1 | 117.0 | -83.9 | Condu 157 |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247(d) Conducted**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/9/2009
 Time: 17:12:46
 Sequence#: 5
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------|------------|------------------|--------------|----------|
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |
| Attenuator | NA | 04/03/2008 | 04/03/2010 | 05747 |
| Attenuator | 9912 | 03/21/2008 | 03/21/2010 | ANP05503 |
| Cable 6' | RG214 49 | 11/10/2008 | 11/10/2010 | P05371 |
| Cable | NA | 12/2/2008 | 12/2/2010 | 03121 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|---------------|--------------|------------|---------------------|
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Conducted Spurious Emissions per FCC 15.247(d).

The Unit is an RF reader. The measurements will be taken from the RF port.
 The EUT will be in transmitting mode throughout the test in the MID channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 30.0 dBm
 Operating Frequency range = 902 - 928MHz
 Frequency under test = 927.25MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz
 150kHz-30MHz RBW= 9kHz, VBW = 9kHz
 30MHz - 1GHz RBW= 120kHz, VBW=120kHz
 1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

| | |
|------------------------|------------------------|
| T1=CAB-ANP05371 | T2=CAB-ANP03121-120208 |
| T3=ATT-ANP05747-040308 | T4=ATT-ANP5503-032108 |

| Measurement Data: | | | Reading listed by margin. | | | | Test Distance: No Distance | | | | |
|--------------------------|----------------|--------------------|---------------------------|----------|----------|----------|----------------------------|--------------------|--------------------|--------------|--------------|
| # | Freq MHz | Rdng dB μ V | T1 dB | T2 dB | T3 dB | T4 dB | Dist Table | Corr dB μ V | Spec dB μ V | Margin dB | Polar Ant |
| 1 | 915.250M | 104.1 | +0.4 | +0.0 | +20.0 | +10.1 | +0.0 360 | 134.6 | 137.0 | -2.4 | Condu 157 |
| 2 | 2746.000M | 46.2 | +0.0 | +1.4 | +20.1 | +10.2 | +0.0 360 | 77.9 | 117.0 | -39.1 | Condu 157 |
| 3 | 4564.000M | 52.5 | +0.0 | +2.0 | +20.0 | +0.0 | +0.0 360 | 74.5 | 117.0 | -42.5 | Condu 157 |
| 4 | 16174.000 M | 50.1 | +0.0 | +2.9 | +20.3 | +0.0 | +0.0 360 | 73.3 | 117.0 | -43.7 | Condu 157 |
| 5 | 7930.000M | 46.8 | +0.0 | +2.5 | +20.0 | +0.0 | +0.0 360 | 69.3 | 117.0 | -47.7 | Condu 157 |
| 6 | 12484.000 M | 45.2 | +0.0 | +3.1 | +20.2 | +0.0 | +0.0 360 | 68.5 | 117.0 | -48.5 | Condu 157 |
| 7 | 431.200M | 24.0 | +0.5 | +0.0 | +20.0 | +10.1 | +0.0 360 | 54.6 | 117.0 | -62.4 | Condu 157 |
| 8 | 333.000M | 23.9 | +0.3 | +0.0 | +20.0 | +10.1 | +0.0 360 | 54.3 | 117.0 | -62.7 | Condu 157 |
| 9 | 216.000M | 23.5 | +0.3 | +0.0 | +20.0 | +10.1 | +0.0 360 | 53.9 | 117.0 | -63.1 | Condu 157 |
| 10 | 113.500M | 23.4 | +0.3 | +0.0 | +20.0 | +10.1 | +0.0 360 | 53.8 | 117.0 | -63.2 | Condu 157 |
| 11 | 52.890M | 23.2 | +0.1 | +0.0 | +20.0 | +10.0 | +0.0 360 | 53.3 | 117.0 | -63.7 | Condu 157 |
| 12 | 186.100k | 18.4 | +0.0 | +0.0 | +20.0 | +10.1 | +0.0 360 | 48.5 | 117.0 | -68.5 | Condu 157 |
| 13 | 135.000k | 18.2 | +0.0 | +0.0 | +20.0 | +10.1 | +0.0 360 | 48.3 | 117.0 | -68.7 | Condu 157 |
| 14 | 2.305M | 13.5 | +0.1 | +0.0 | +20.0 | +10.1 | +0.0 360 | 43.7 | 117.0 | -73.3 | Condu 157 |
| 15 | 10.811k | 6.6 | +0.0 | +0.0 | +20.0 | +10.1 | +0.0 360 | 36.7 | 117.0 | -80.3 | Condu 157 |
| 16 | 32.166k | -0.8 | +0.0 | +0.0 | +20.0 | +10.1 | +0.0 360 | 29.3 | 117.0 | -87.7 | Condu 157 |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247(d) Conducted**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/9/2009
 Time: 17:08:28
 Sequence#: 4
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------|------------|------------------|--------------|----------|
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |
| Attenuator | | 04/03/2008 | 04/03/2010 | 05747 |
| Attenuator | 9912 | 03/21/2008 | 03/21/2010 | ANP05503 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03121 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|---------------|--------------|------------|---------------------|
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Conducted Spurious Emissions per FCC 15.247(d).

The Unit is an RF reader. The measurements will be taken from the RF port.
 The EUT will be in transmitting mode throughout the test in the HIGH channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 30.0 dBm
 Operating Frequency range = 902 - 928MHz
 Frequency under test = 927.25MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz
 150kHz-30MHz RBW= 9kHz, VBW = 9kHz
 30MHz - 1GHz RBW= 120kHz, VBW=120kHz
 1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

| | |
|------------------------|------------------------|
| T1=CAB-ANP05371 | T2=CAB-ANP03121-120208 |
| T3=ATT-ANP05747-040308 | T4=ATT-ANP5503-032108 |

| Measurement Data: | | | Reading listed by margin. | | | | Test Distance: No Distance | | | | |
|--------------------------|----------------|--------------------|---------------------------|----------|----------|----------|----------------------------|--------------------|--------------------|--------------|--------------|
| # | Freq MHz | Rdng dB μ V | T1 dB | T2 dB | T3 dB | T4 dB | Dist Table | Corr dB μ V | Spec dB μ V | Margin dB | Polar Ant |
| 1 | 927.250M | 104.1 | +0.5 | +0.0 | +20.0 | +10.1 | +0.0 360 | 134.7 | 137.0 | -2.3 | Condu 157 |
| 2 | 2724.000M | 53.6 | +0.0 | +1.4 | +20.1 | +10.1 | +0.0 360 | 85.2 | 117.0 | -31.8 | Condu 157 |
| 3 | 3156.000M | 45.2 | +0.0 | +1.6 | +20.1 | +10.2 | +0.0 360 | 77.1 | 117.0 | -39.9 | Condu 157 |
| 4 | 14235.000 M | 49.0 | +0.0 | +3.3 | +20.1 | +0.0 | +0.0 360 | 72.4 | 117.0 | -44.6 | Condu 157 |
| 5 | 16160.000 M | 48.9 | +0.0 | +2.9 | +20.3 | +0.0 | +0.0 360 | 72.1 | 117.0 | -44.9 | Condu 157 |
| 6 | 7020.000M | 46.7 | +0.0 | +2.2 | +20.0 | +0.0 | +0.0 360 | 68.9 | 117.0 | -48.1 | Condu 157 |
| 7 | 972.400M | 34.0 | +0.5 | +0.0 | +20.0 | +10.0 | +0.0 360 | 64.5 | 117.0 | -52.5 | Condu 157 |
| 8 | 212.500M | 33.9 | +0.3 | +0.0 | +20.0 | +10.1 | +0.0 360 | 64.3 | 117.0 | -52.7 | Condu 157 |
| 9 | 113.800M | 33.4 | +0.3 | +0.0 | +20.0 | +10.1 | +0.0 360 | 63.8 | 117.0 | -53.2 | Condu 157 |
| 10 | 68.010M | 32.5 | +0.2 | +0.0 | +20.0 | +10.0 | +0.0 360 | 62.7 | 117.0 | -54.3 | Condu 157 |
| 11 | 1.870M | 23.0 | +0.1 | +0.0 | +20.0 | +10.1 | +0.0 360 | 53.2 | 117.0 | -63.8 | Condu 157 |
| 12 | 114.600k | 17.9 | +0.0 | +0.0 | +20.0 | +10.1 | +0.0 360 | 48.0 | 117.0 | -69.0 | Condu 157 |
| 13 | 12.546k | 8.3 | +0.0 | +0.0 | +20.0 | +10.1 | +0.0 360 | 38.4 | 117.0 | -78.6 | Condu 157 |
| 14 | 58.599k | 1.5 | +0.0 | +0.0 | +20.0 | +10.1 | +0.0 360 | 31.6 | 117.0 | -85.4 | Condu 157 |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247(d) Conducted**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: **Impinj**
 Model: **IPJ-REV**
 S/N: **940-08-21-0006**

Date: 2/9/2009
 Time: 16:36:30
 Sequence#: 1
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------|------------|------------------|--------------|----------|
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |
| Attenuator | | 04/03/2008 | 04/03/2010 | 05747 |
| Attenuator | 9912 | 03/21/2008 | 03/21/2010 | ANP05503 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|---------------|---------------|------------|---------------------|
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |
| Antenna cable | Manhattan/CDT | M4213 | 1354 E12091 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Conducted Spurious Emissions per FCC 15.247(d).

The Unit is an RF reader. It will be connected to the PSA through a special cable provided by the customer.
 The EUT will be in transmitting mode throughout the test in the LOW channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 32.5 dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 902.75MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz
 150kHz-30MHz RBW= 9kHz, VBW = 9kHz
 30MHz - 1GHz RBW= 120kHz, VBW=120kHz
 1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

T1=ATT-ANP05747-040308

T2=ATT-ANP5503-032108

Measurement Data:

Reading listed by margin.

Test Distance: No Distance

| # | Freq MHz | Rdng dB μ V | T1 dB | T2 dB | dB | | Dist Table | Corr dB μ V | Spec dB μ V | Margin dB | Polar Ant |
|----|----------------|--------------------|----------|----------|----|--|---------------|--------------------|--------------------|--------------|--------------|
| 1 | 903.000M | 104.5 | +20.0 | +10.1 | | | +0.0 360 | 134.6 | 137.0 | -2.4 | Condu 157 |
| 2 | 1798.000M | 39.3 | +20.0 | +10.2 | | | +0.0 360 | 69.5 | 117.0 | -47.5 | Condu 157 |
| 3 | 2710.000M | 37.4 | +20.1 | +10.1 | | | +0.0 360 | 67.6 | 117.0 | -49.4 | Condu 157 |
| 4 | 10842.000 M | 42.1 | +20.1 | +0.0 | | | +0.0 360 | 62.2 | 117.0 | -54.8 | Condu 157 |
| 5 | 15003.000 M | 39.0 | +20.3 | +0.0 | | | +0.0 360 | 59.3 | 117.0 | -57.7 | Condu 157 |
| 6 | 13198.000 M | 37.9 | +20.1 | +0.0 | | | +0.0 360 | 58.0 | 117.0 | -59.0 | Condu 157 |
| 7 | 7289.000M | 36.9 | +20.0 | +0.0 | | | +0.0 360 | 56.9 | 117.0 | -60.1 | Condu 157 |
| 8 | 450.000M | 25.6 | +20.0 | +10.1 | | | +0.0 360 | 55.7 | 117.0 | -61.3 | Condu 157 |
| 9 | 10348.000 M | 35.4 | +20.0 | +0.0 | | | +0.0 360 | 55.4 | 117.0 | -61.6 | Condu 157 |
| 10 | 602.300M | 24.2 | +20.0 | +10.1 | | | +0.0 360 | 54.3 | 117.0 | -62.7 | Condu 157 |
| 11 | 5313.000M | 34.2 | +20.0 | +0.0 | | | +0.0 360 | 54.2 | 117.0 | -62.8 | Condu 157 |
| 12 | 82.400M | 23.8 | +20.0 | +10.1 | | | +0.0 360 | 53.9 | 117.0 | -63.1 | Condu 157 |
| 13 | 129.900k | 16.9 | +20.0 | +10.1 | | | +0.0 360 | 47.0 | 117.0 | -70.0 | Condu 157 |
| 14 | 1.002M | 13.4 | +20.0 | +10.1 | | | +0.0 360 | 43.5 | 117.0 | -73.5 | Condu 157 |
| 15 | 17.562M | 12.7 | +20.0 | +10.1 | | | +0.0 360 | 42.8 | 117.0 | -74.2 | Condu 157 |
| 16 | 7.246M | 12.1 | +20.0 | +10.1 | | | +0.0 360 | 42.2 | 117.0 | -74.8 | Condu 157 |
| 17 | 16.784M | 10.9 | +20.0 | +10.1 | | | +0.0 360 | 41.0 | 117.0 | -76.0 | Condu 157 |
| 18 | 22.313k | 3.8 | +20.0 | +10.1 | | | +0.0 360 | 33.9 | 117.0 | -83.1 | Condu 157 |
| 19 | 77.627k | 2.7 | +20.0 | +10.1 | | | +0.0 360 | 32.8 | 117.0 | -84.2 | Condu 157 |
| 20 | 9.076k | 8.5 | +0.0 | +0.0 | | | +0.0 360 | 8.5 | 117.0 | -108.5 | Condu 157 |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247(d) Conducted**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: **Impinj**
 Model: **IPJ-REV**
 S/N: **940-08-21-0006**

Date: 2/9/2009
 Time: 16:47:27
 Sequence#: 2
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------|------------|------------------|--------------|----------|
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |
| Attenuator | | 04/03/2008 | 04/03/2010 | 05747 |
| Attenuator | 9912 | 03/21/2008 | 03/21/2010 | ANP05503 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|---------------|---------------|------------|---------------------|
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |
| Antenna cable | Manhattan/CDT | M4213 | 1354 E12091 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Conducted Spurious Emissions per FCC 15.247(d).

The Unit is an RF reader. It will be connected to the PSA through a special cable provided by the customer.
 The EUT will be in transmitting mode throughout the test in the MID channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 32.5 dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 915.25MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz
 150kHz-30MHz RBW= 9kHz, VBW = 9kHz
 30MHz - 1GHz RBW= 120kHz, VBW=120kHz
 1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

T1=ATT-ANP05747-040308

T2=ATT-ANP5503-032108

Measurement Data:

Reading listed by margin.

Test Distance: No Distance

| # | Freq MHz | Rdng dB μ V | T1 dB | T2 dB | dB | | Dist Table | Corr dB μ V | Spec dB μ V | Margin dB | Polar Ant |
|----|----------------|--------------------|----------|----------|----|--|---------------|--------------------|--------------------|--------------|--------------|
| 1 | 915.251M | 104.9 | +20.0 | +10.1 | | | +0.0 360 | 135.0 | 137.0 | -2.0 | Condu 157 |
| 2 | 2744.000M | 41.5 | +20.1 | +10.1 | | | +0.0 360 | 71.7 | 117.0 | -45.3 | Condu 157 |
| 3 | 1832.000M | 39.5 | +20.0 | +10.2 | | | +0.0 360 | 69.7 | 117.0 | -47.3 | Condu 157 |
| 4 | 13665.000 M | 38.9 | +20.1 | +0.0 | | | +0.0 360 | 59.0 | 117.0 | -58.0 | Condu 157 |
| 5 | 17415.000 M | 38.4 | +20.3 | +0.0 | | | +0.0 360 | 58.7 | 117.0 | -58.3 | Condu 157 |
| 6 | 16220.000 M | 38.3 | +20.3 | +0.0 | | | +0.0 360 | 58.6 | 117.0 | -58.4 | Condu 157 |
| 7 | 7700.000M | 36.9 | +20.0 | +0.0 | | | +0.0 360 | 56.9 | 117.0 | -60.1 | Condu 157 |
| 8 | 11895.000 M | 35.9 | +20.1 | +0.0 | | | +0.0 360 | 56.0 | 117.0 | -61.0 | Condu 157 |
| 9 | 837.800M | 25.2 | +20.0 | +10.1 | | | +0.0 360 | 55.3 | 117.0 | -61.7 | Condu 157 |
| 10 | 7005.000M | 35.2 | +20.0 | +0.0 | | | +0.0 360 | 55.2 | 117.0 | -61.8 | Condu 157 |
| 11 | 442.300M | 24.6 | +20.0 | +10.1 | | | +0.0 360 | 54.7 | 117.0 | -62.3 | Condu 157 |
| 12 | 241.200M | 24.6 | +20.0 | +10.1 | | | +0.0 360 | 54.7 | 117.0 | -62.3 | Condu 157 |
| 13 | 571.300M | 24.2 | +20.0 | +10.1 | | | +0.0 360 | 54.3 | 117.0 | -62.7 | Condu 157 |
| 14 | 312.200M | 23.9 | +20.0 | +10.1 | | | +0.0 360 | 54.0 | 117.0 | -63.0 | Condu 157 |
| 15 | 633.200M | 23.4 | +20.0 | +10.1 | | | +0.0 360 | 53.5 | 117.0 | -63.5 | Condu 157 |
| 16 | 125.400M | 23.0 | +20.0 | +10.1 | | | +0.0 360 | 53.1 | 117.0 | -63.9 | Condu 157 |
| 17 | 138.800k | 17.1 | +20.0 | +10.1 | | | +0.0 360 | 47.2 | 117.0 | -69.8 | Condu 157 |
| 18 | 545.400k | 14.9 | +20.0 | +10.1 | | | +0.0 360 | 45.0 | 117.0 | -72.0 | Condu 157 |
| 19 | 2.653M | 13.1 | +20.0 | +10.1 | | | +0.0 360 | 43.2 | 117.0 | -73.8 | Condu 157 |
| 20 | 20.778M | 11.3 | +20.0 | +10.1 | | | +0.0 360 | 41.4 | 117.0 | -75.6 | Condu 157 |
| 21 | 11.267k | 6.1 | +20.0 | +10.1 | | | +0.0 360 | 36.2 | 117.0 | -80.8 | Condu 157 |

| | | | | | | | | | |
|----|---------|-----|-------|-------|-------------|------|-------|-------|--------------|
| 22 | 15.102k | 5.8 | +20.0 | +10.1 | +0.0 360 | 35.9 | 117.0 | -81.1 | Condu 157 |
| 23 | 73.714k | 3.2 | +20.0 | +10.1 | +0.0 360 | 33.3 | 117.0 | -83.7 | Condu 157 |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247(d) Conducted**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/9/2009
 Time: 16:54:28
 Sequence#: 3
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------|------------|------------------|--------------|----------|
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |
| Attenuator | | 04/03/2008 | 04/03/2010 | 05747 |
| Attenuator | 9912 | 03/21/2008 | 03/21/2010 | ANP05503 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|---------------|---------------|------------|---------------------|
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |
| Antenna cable | Manhattan/CDT | M4213 | 1354 E12091 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Conducted Spurious Emissions per FCC 15.247(d).

The Unit is an RF reader. It will be connected to the PSA through a special cable provided by the customer.
 The EUT will be in transmitting mode throughout the test in the HIGH channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 32.5 dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 927.25MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz
 150kHz-30MHz RBW= 9kHz, VBW = 9kHz
 30MHz - 1GHz RBW= 120kHz, VBW=120kHz
 1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

T1=ATT-ANP05747-040308

T2=ATT-ANP5503-032108

Measurement Data:

Reading listed by margin.

Test Distance: No Distance

| # | Freq MHz | Rdng dB μ V | T1 dB | T2 dB | dB | | Dist Table | Corr dB μ V | Spec dB μ V | Margin dB | Polar Ant |
|----|----------------|--------------------|----------|----------|----|--|---------------|--------------------|--------------------|--------------|--------------|
| 1 | 927.249M | 104.3 | +20.0 | +10.1 | | | +0.0 360 | 134.4 | 137.0 | -2.6 | Condu 157 |
| 2 | 3980.000M | 55.5 | +20.0 | +10.2 | | | +0.0 360 | 85.7 | 117.0 | -31.3 | Condu 157 |
| 3 | 15728.000 M | 58.6 | +20.4 | +0.0 | | | +0.0 360 | 79.0 | 117.0 | -38.0 | Condu 157 |
| 4 | 14155.000 M | 58.8 | +20.1 | +0.0 | | | +0.0 360 | 78.9 | 117.0 | -38.1 | Condu 157 |
| 5 | 7155.000M | 57.1 | +20.0 | +0.0 | | | +0.0 360 | 77.1 | 117.0 | -39.9 | Condu 157 |
| 6 | 432.700M | 24.6 | +20.0 | +10.1 | | | +0.0 360 | 54.7 | 117.0 | -62.3 | Condu 157 |
| 7 | 130.700M | 24.1 | +20.0 | +10.1 | | | +0.0 360 | 54.2 | 117.0 | -62.8 | Condu 157 |
| 8 | 226.000M | 23.9 | +20.0 | +10.1 | | | +0.0 360 | 54.0 | 117.0 | -63.0 | Condu 157 |
| 9 | 78.090M | 23.6 | +20.0 | +10.1 | | | +0.0 360 | 53.7 | 117.0 | -63.3 | Condu 157 |
| 10 | 124.800k | 19.4 | +20.0 | +10.1 | | | +0.0 360 | 49.5 | 117.0 | -67.5 | Condu 157 |
| 11 | 2.566M | 12.4 | +20.0 | +10.1 | | | +0.0 360 | 42.5 | 117.0 | -74.5 | Condu 157 |
| 12 | 21.010M | 12.1 | +20.0 | +10.1 | | | +0.0 360 | 42.2 | 117.0 | -74.8 | Condu 157 |
| 13 | 12.272k | 6.7 | +20.0 | +10.1 | | | +0.0 360 | 36.8 | 117.0 | -80.2 | Condu 157 |
| 14 | 43.929k | 0.9 | +20.0 | +10.1 | | | +0.0 360 | 31.0 | 117.0 | -86.0 | Condu 157 |

FCC 15.247(d) – OATS RADIATED SPURIOUS EMISSIONS

Test Setup Photos



Test Data Sheets

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247/15.209**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/11/2009
 Time: 10:37:19
 Sequence#: 1
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------------------|-------------------------|------------------|--------------|----------|
| Mag Loop | 2156 | 06/04/2008 | 06/04/2010 | AN00052 |
| Antenna | 2453 | 12/22/2008 | 12/22/2010 | AN01994 |
| EMCO 3115 Horn | 9606-4854 | 11/12/2007 | 11/12/2009 | AN01412 |
| Horn Antenna, Active 18-26GHz | 1114018 | 11/13/2008 | 11/13/2010 | 2742 |
| Helix cable | N/A | 07/22/2008 | 07/22/2010 | AN05545 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03123 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03122 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03121 |
| Cable 30' | 11 | 11/05/2008 | 11/05/2010 | ANP05366 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Cable 20' | 16 | 11/10/2008 | 11/10/2010 | ANP05360 |
| Cable 6' | 51 | 12/30/2008 | 12/30/2010 | ANP05361 |
| Pasternack Coax | | 07/20/2007 | 07/20/2009 | AN05425 |
| HP 8447D Preamp | 2944A08601 | 07/08/2008 | 07/08/2010 | AN01517 |
| HP 83017A Pre-amp | 3123A00464 | 10/02/2007 | 10/02/2009 | AN01271 |
| Filter | 2 | 05/01/2008 | 05/01/2010 | 2750 |
| Filter | 311SH10-3000/T10000-0/0 | 12/02/2008 | 12/02/2010 | 3116 |
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|------------------------|---------------|------------|---------------------|
| Circular patch antenna | Cushcraft | S90289CLJ | 092436 |
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |
| Antenna cable | Manhattan/CDT | M4213 | 1354 E12091 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |
| Laptop Computer | Dell | Latitude | 6497402833 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Radiated Spurious Emissions per FCC 15.247(d).

The Unit is an RF reader. It is located in the back edge of the test table.

All its ports are being exercised. It is being powered by the AC/DC converter.

It is connected to a laptop outside the chamber through a shielded ethernet cable.

The antenna is suspended 10cm above the wooden table with styrofoam.

The EUT will be in transmitting mode throughout the test in the LOW channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 32.5 dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 902.75MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz

150kHz-30MHz RBW= 9kHz, VBW = 9kHz

30MHz - 1GHz RBW= 120kHz, VBW=120kHz

1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

T1=ANT- AN00052-06042008

T3=ANT AN01994 25-1000MHz

T5=CAB-ANP05361

T7=CAB-ANP05371

T9=CAB-ANP03123-120208

T11=Filter 1GHz HP AN02750

T13=AMP-AN01517-070808

T2=ANT-AN01412-111207

T4=CAB-ANP05360

T6=CAB-ANP05366

T8=CAB-ANP03121-120208

T10=CAB-ANP05545-072208

T12=FIL-AN03116-120208

T14=AMP-AN01271-100207 - .5-26.5 GHz

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 T5 T9 T13 | T2 T6 T10 T14 | T3 T7 T11 | T4 T8 T12 | Dist | Corr | Spec | Margin | Polar |
|---|-----------|------|-----------------------|------------------------|-----------------|-----------------|-------|------|------------|--------|-------|
| | MHz | dBμV | dB | dB | dB | dB | Table | dBμV | dBμV | dB | Ant |
| 1 | 7222.023M | 39.7 | +0.0 | +36.3 | +0.0 | +0.0 | +0.0 | 49.8 | 54.0 | -4.2 | Vert |
| | Ave | | +0.0 | +0.0 | +0.0 | +2.3 | 337 | | | | 109 |
| | | | +1.1 | +4.7 | +0.0 | +0.4 | | | | | |
| | | | +0.0 | -34.7 | | | | | | | |
| ^ | 7222.023M | 47.4 | +0.0 | +36.3 | +0.0 | +0.0 | +0.0 | 57.5 | 54.0 | +3.5 | Vert |
| | | | +0.0 | +0.0 | +0.0 | +2.3 | 337 | | | | 109 |
| | | | +1.1 | +4.7 | +0.0 | +0.4 | | | | | |
| | | | +0.0 | -34.7 | | | | | | | |
| 3 | 5.902M | 15.3 | +9.9 | +0.0 | +0.0 | +0.2 | +0.0 | 25.7 | 30.0 | -4.3 | 90deg |
| | Ambient | | +0.0 | +0.2 | +0.1 | +0.0 | 175 | | Noisefloor | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 4 | 15544.000 | 30.6 | +0.0 | +38.6 | +0.0 | +0.0 | +0.0 | 49.6 | 54.0 | -4.4 | Vert |
| | M | | +0.0 | +0.0 | +0.0 | +3.4 | | | | | |
| | Ambient | | +1.4 | +7.3 | +0.0 | +0.5 | 180 | | Noisefloor | | 112 |
| | | | +0.0 | -32.2 | | | | | | | |

| | | | | | | | | | | | |
|----|---------------------------|------|-------------------------------|--------------------------------|-------------------------------|------------------------------|-------------------------|------|--------------------|-------|---------------|
| 5 | 100.040M | 55.6 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.2 +0.2 +0.0 +0.0 | +0.6 +0.0 +0.0 +0.0 | +0.0 360 | 38.2 | 44.0 | -5.8 | Vert 99 |
| 6 | 9027.462M Ave | 32.5 | +0.0 +0.0 +1.6 +0.0 | +38.9 +0.0 +5.3 -33.8 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.1 +0.5 | +0.0 360 | 48.1 | 54.0 | -5.9 | Vert 130 |
| ^ | 9027.462M | 38.8 | +0.0 +0.0 +1.6 +0.0 | +38.9 +0.0 +5.3 -33.8 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.1 +0.5 | +0.0 360 | 54.4 | 54.0 | +0.4 | Vert 130 |
| 8 | 1805.493M Ave | 17.0 | +0.0 +0.0 +0.5 +0.0 | +26.5 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.4 +0.0 | +0.0 +1.1 +0.0 | +0.0 180 | 47.7 | 54.0 | -6.3 | Vert 126 |
| ^ | 1805.493M | 22.7 | +0.0 +0.0 +0.5 +0.0 | +26.5 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.4 +0.0 | +0.0 +1.1 +0.0 | +0.0 180 | 53.4 | 54.0 | -0.6 | Vert 126 |
| 10 | 16.899M Ambient | 12.6 | +8.5 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 287 | 21.9 | 30.0 Noisefloor | -8.1 | 180deg 100 |
| 11 | 102.551M | 53.0 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.4 +0.2 +0.0 +0.0 | +0.6 +0.0 +0.0 +0.0 | +0.0 308 | 35.8 | 44.0 | -8.2 | Horiz 150 |
| 12 | 802.640M | 39.9 | +0.0 +0.4 +0.0 -29.5 | +0.0 +2.0 +0.0 +0.0 | +22.5 +0.5 +0.0 +0.0 | +1.9 +0.0 +0.0 +0.0 | +0.0 248 | 37.7 | 46.0 | -8.3 | Vert 150 |
| 13 | 918.890M | 37.8 | +0.0 +0.5 +0.0 -29.3 | +0.0 +2.0 +0.0 +0.0 | +23.4 +0.4 +0.0 +0.0 | +1.9 +0.0 +0.0 +0.0 | +0.0 180 | 36.7 | 46.0 | -9.3 | Vert 150 |
| 14 | 481.100M | 44.6 | +0.0 +0.3 +0.0 -29.5 | +0.0 +1.6 +0.0 +0.0 | +17.8 +0.3 +0.0 +0.0 | +1.4 +0.0 +0.0 +0.0 | +0.0 284 | 36.5 | 46.0 | -9.5 | Horiz 151 |
| 15 | 17500.000 M Ambient | 20.8 | +0.0 +0.0 +1.6 +0.0 | +42.4 +0.0 +8.2 -33.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.4 +0.6 | +0.0 352 | 44.0 | 54.0 Noisefloor | -10.0 | Vert 112 |
| 16 | 800.200M | 38.1 | +0.0 +0.4 +0.0 -29.5 | +0.0 +2.0 +0.0 +0.0 | +22.5 +0.5 +0.0 +0.0 | +1.9 +0.0 +0.0 +0.0 | +0.0 164 | 35.9 | 46.0 | -10.1 | Horiz 151 |
| 17 | 16.903M Ambient | 9.7 | +8.5 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 199 | 19.0 | 30.0 Noisefloor | -11.0 | 90deg 100 |

| | | | | | | | | | | | |
|----|---------------------------|------|-------------------------------|--------------------------------|-------------------------------|----------------------|--------------|------|--------------------|-------|--------------|
| 18 | 5416.584M Ave | 32.7 | +0.0 +0.0 +1.0 +0.0 | +34.5 +0.0 +3.9 -33.1 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.5 | +0.0 352 | 41.8 | 54.0 | -12.2 | Vert 112 |
| ^ | 5416.584M | 39.9 | +0.0 +0.0 +1.0 +0.0 | +34.5 +0.0 +3.9 -33.1 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.5 | +0.0 352 | 49.0 | 54.0 | -5.0 | Vert 112 |
| 20 | 24.300M Ambient | 9.4 | +6.8 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 | +0.0 200 | 17.0 | 30.0 Noisefloor | -13.0 | 180de 100 |
| 21 | 11483.010 M Ambient | 34.6 | +0.0 +0.0 +1.5 +0.0 | +39.1 +0.0 +5.8 -43.3 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.9 +0.4 | +0.0 231 | 41.0 | 54.0 Noisefloor | -13.0 | Horiz 99 |
| 22 | 5416.471M Ave | 31.0 | +0.0 +0.0 +1.0 +0.0 | +34.5 +0.0 +3.9 -33.1 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.5 | +0.0 336 | 40.1 | 54.0 | -13.9 | Horiz 111 |
| ^ | 5416.471M | 37.2 | +0.0 +0.0 +1.0 +0.0 | +34.5 +0.0 +3.9 -33.1 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.5 | +0.0 336 | 46.3 | 54.0 | -7.7 | Horiz 111 |
| 24 | 7222.100M Ave | 30.0 | +0.0 +0.0 +1.1 +0.0 | +36.3 +0.0 +4.7 -34.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.4 | +0.0 352 | 40.1 | 54.0 | -13.9 | Horiz 99 |
| ^ | 7222.100M | 40.3 | +0.0 +0.0 +1.1 +0.0 | +36.3 +0.0 +4.7 -34.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.4 | +0.0 352 | 50.4 | 54.0 | -3.6 | Horiz 99 |
| 26 | 9027.463M Ave | 24.4 | +0.0 +0.0 +1.6 +0.0 | +38.9 +0.0 +5.3 -33.8 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.1 +0.5 | +0.0 | 40.0 | 54.0 | -14.0 | Horiz 99 |
| ^ | 9027.463M | 36.0 | +0.0 +0.0 +1.6 +0.0 | +38.9 +0.0 +5.3 -33.8 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.1 +0.5 | +0.0 | 51.6 | 54.0 | -2.4 | Horiz 99 |
| 28 | 160.280k | 73.3 | +10.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 | -80.0 199 | 3.3 | 23.8 | -20.5 | 180de 100 |
| 29 | 972.925M Ambient | 31.6 | +0.0 +0.5 +0.0 -29.1 | +0.0 +2.2 +0.0 +0.0 | +24.1 +0.5 +0.0 +0.0 | +1.8 +0.0 +0.0 | +0.0 360 | 31.6 | 54.0 Noisefloor | -22.4 | Horiz 151 |
| 30 | 640.500k | 38.1 | +9.9 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.1 +0.0 +0.0 | +0.1 +0.0 +0.0 | -40.0 200 | 8.2 | 31.6 | -23.4 | 180de 100 |

| | | | | | | | | | | | |
|----|----------|------|-------|------|------|------|-------|------|------|-------|-------|
| 31 | 319.370k | 62.6 | +9.9 | +0.0 | +0.0 | +0.1 | -80.0 | -7.3 | 17.7 | -25.0 | 90deg |
| | | | +0.0 | +0.0 | +0.1 | +0.0 | 175 | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 32 | 101.900k | 67.4 | +10.0 | +0.0 | +0.0 | +0.0 | -80.0 | -2.6 | 27.8 | -30.4 | 90deg |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 175 | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 33 | 15.755k | 67.8 | +14.2 | +0.0 | +0.0 | +0.0 | -80.0 | 2.0 | 44.1 | -42.1 | 90deg |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 174 | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 34 | 12.006k | 65.7 | +15.6 | +0.0 | +0.0 | +0.0 | -80.0 | 1.3 | 46.5 | -45.2 | 90deg |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 174 | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 35 | 23.030k | 60.2 | +12.4 | +0.0 | +0.0 | +0.0 | -80.0 | -7.4 | 40.8 | -48.2 | 180de |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 199 | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 36 | 11.982k | 59.5 | +15.6 | +0.0 | +0.0 | +0.0 | -80.0 | -4.9 | 46.5 | -51.4 | 180de |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 187 | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247/15.209**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/11/2009
 Time: 13:36:09
 Sequence#: 6
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------------------|-------------------------|------------------|--------------|----------|
| Mag Loop | 2156 | 06/04/2008 | 06/04/2010 | AN00052 |
| Antenna | 2453 | 12/22/2008 | 12/22/2010 | AN01994 |
| EMCO 3115 Horn | 9606-4854 | 11/12/2007 | 11/12/2009 | AN01412 |
| Horn Antenna, Active 18-26GHz | 1114018 | 11/13/2008 | 11/13/2010 | 2742 |
| Helix cable | N/A | 07/22/2008 | 07/22/2010 | AN05545 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03123 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03122 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03121 |
| Cable 30' | 11 | 11/05/2008 | 11/05/2010 | ANP05366 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Cable 20' | 16 | 11/10/2008 | 11/10/2010 | ANP05360 |
| Cable 6' | 51 | 12/30/2008 | 12/30/2010 | ANP05361 |
| Pasternack Coax | | 07/20/2007 | 07/20/2009 | AN05425 |
| HP 8447D Preamp | 2944A08601 | 07/08/2008 | 07/08/2010 | AN01517 |
| HP 83017A Pre-amp | 3123A00464 | 10/02/2007 | 10/02/2009 | AN01271 |
| Filter | 2 | 05/01/2008 | 05/01/2010 | 2750 |
| Filter | 311SH10-3000/T10000-0/0 | 12/02/2008 | 12/02/2010 | 3116 |
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|------------------------|--------------|------------|---------------------|
| Circular patch antenna | Cushcraft | S90289CLJ | 092436 |
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Radiated Spurious Emissions per FCC 15.247(d)

The Unit is an RF reader. It is located in the back edge of the test table.

All its ports are being exercised. It is being powered by the AC/DC converter

It is connected to a laptop outside the chamber through a shielded ethernet cable.

The antenna is suspended 10cm above the wooden table with styrofoam.

The EUT will be in transmitting mode throughout the test in the LOW channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 30.0 dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 902.75MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz

150kHz-30MHz RBW= 9kHz, VBW = 9kHz

30MHz - 1GHz RBW= 120kHz, VBW=120kHz

1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

T1=ANT- AN00052-06042008

T3=ANT AN01994 25-1000MHz

T5=CAB-ANP05361

T7=CAB-ANP05371

T9=CAB-ANP03123-120208

T11=Filter 1GHz HP AN02750

T13=AMP-AN01517-070808

T2=ANT-AN01412-111207

T4=CAB-ANP05360

T6=CAB-ANP05366

T8=CAB-ANP03121-120208

T10=CAB-ANP05545-072208

T12=FIL-AN03116-120208

T14=AMP-AN01271-100207 - .5-26.5 GHz

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 T5 T9 T13 | T2 T6 T10 T14 | T3 T7 T11 | T4 T8 T12 | Dist | Corr | Spec | Margin | Polar |
|---|---------------------------|------|------------------------------|--------------------------------|------------------------------|----------------------|-------------|------|--------------------|--------|--------------|
| | MHz | dBμV | dB | dB | dB | dB | Table | dBμV | dBμV | dB | Ant |
| 1 | 17152.010 M Ambient | 32.0 | +0.0 +0.0 +1.2 +0.0 | +40.8 +0.0 +8.0 -32.8 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.4 +0.4 | +0.0 42 | 53.0 | 54.0 NOISEFLOOR | -1.0 | Vert 119 |
| 2 | 1947.000M Ambient | 20.7 | +0.0 +0.0 +0.4 +0.0 | +27.2 +0.0 +2.3 +0.0 | +0.0 +0.0 +0.3 +0.0 | +0.0 +1.1 +0.0 | +0.0 205 | 52.0 | 54.0 NOISEFLOOR | -2.0 | Vert 115 |
| 3 | 1947.000M Ambient | 20.1 | +0.0 +0.0 +0.4 +0.0 | +27.2 +0.0 +2.3 +0.0 | +0.0 +0.0 +0.3 +0.0 | +0.0 +1.1 +0.0 | +0.0 205 | 51.4 | 54.0 NOISEFLOOR | -2.6 | Horiz 115 |
| 4 | 15346.530 M Ambient | 31.6 | +0.0 +0.0 +1.2 +0.0 | +39.1 +0.0 +7.2 -32.5 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.2 +0.4 | +0.0 251 | 50.2 | 54.0 NOISEFLOOR | -3.8 | Horiz 125 |

| | | | | | | | | | | | |
|----|---------------------------|------|-------------------------------|--------------------------------|-------------------------------|------------------------------|-------------|------|--------------------|-------|--------------|
| 5 | 18.313M | 15.8 | +8.4 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 205 | 25.0 | 30.0 | -5.0 | 180de 160 |
| 6 | 100.065M | 56.0 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.2 +0.2 +0.0 +0.0 | +0.6 +0.0 +0.0 +0.0 | +0.0 360 | 38.6 | 44.0 | -5.4 | Vert 111 |
| 7 | 802.445M | 42.2 | +0.0 +0.4 +0.0 -29.5 | +0.0 +2.0 +0.0 +0.0 | +22.5 +0.5 +0.0 +0.0 | +1.9 +0.0 +0.0 +0.0 | +0.0 360 | 40.0 | 46.0 | -6.0 | Vert 111 |
| 8 | 13.093M | 14.2 | +8.9 +0.0 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.0 +0.1 +0.0 +0.0 | +0.2 +0.0 +0.0 +0.0 | +0.0 205 | 23.6 | 30.0 | -6.4 | 180de 160 |
| 9 | 102.660M | 54.6 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.4 +0.2 +0.0 +0.0 | +0.6 +0.0 +0.0 +0.0 | +0.0 360 | 37.4 | 44.0 | -6.6 | Horiz 160 |
| 10 | 9027.590M Ave | 30.5 | +0.0 +0.0 +1.6 +0.0 | +38.9 +0.0 +5.3 -33.8 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.1 +0.5 | +0.0 42 | 46.1 | 54.0 | -7.9 | Vert 119 |
| ^ | 9027.590M | 38.2 | +0.0 +0.0 +1.6 +0.0 | +38.9 +0.0 +5.3 -33.8 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.1 +0.5 | +0.0 42 | 53.8 | 54.0 | -0.2 | Vert 119 |
| 12 | 24.900M Ambient | 14.5 | +6.6 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 168 | 21.9 | 30.0 NOISEFLOOR | -8.1 | 90deg 160 |
| 13 | 799.850M | 39.2 | +0.0 +0.4 +0.0 -29.5 | +0.0 +2.0 +0.0 +0.0 | +22.5 +0.5 +0.0 +0.0 | +1.9 +0.0 +0.0 +0.0 | +0.0 360 | 37.0 | 46.0 | -9.0 | Horiz 160 |
| 14 | 10832.880 M Ambient | 31.6 | +0.0 +0.0 +1.2 +0.0 | +38.6 +0.0 +5.6 -35.1 | +0.0 +0.0 +0.0 +0.1 | +0.0 +2.8 +0.1 | +0.0 251 | 44.8 | 54.0 NOISEFLOOR | -9.2 | Horiz 125 |
| 15 | 7222.001M | 33.8 | +0.0 +0.0 +1.1 +0.0 | +36.3 +0.0 +4.7 -34.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.4 | +0.0 156 | 43.9 | 54.0 | -10.1 | Vert 119 |
| 16 | 455.580M | 43.6 | +0.0 +0.3 +0.0 -29.3 | +0.0 +1.6 +0.0 +0.0 | +17.3 +0.5 +0.0 +0.0 | +1.6 +0.0 +0.0 +0.0 | +0.0 360 | 35.6 | 46.0 | -10.4 | Horiz 160 |
| 17 | 913.150M Ambient | 35.6 | +0.0 +0.5 +0.0 -29.3 | +0.0 +2.0 +0.0 +0.0 | +23.3 +0.4 +0.0 +0.0 | +1.9 +0.0 +0.0 +0.0 | +0.0 253 | 34.4 | 46.0 NOISEFLOOR | -11.6 | Vert 111 |

| | | | | | | | | | | | |
|----|---------------------------|------|-------------------------------|--------------------------------|-------------------------------|----------------------|-------------|------|------|-------|--------------|
| 18 | 5416.514M Ave | 32.9 | +0.0 +0.0 +1.0 +0.0 | +34.5 +0.0 +3.9 -33.1 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.5 | +0.0 156 | 42.0 | 54.0 | -12.0 | Vert 172 |
| ^ | 5416.514M | 39.8 | +0.0 +0.0 +1.0 +0.0 | +34.5 +0.0 +3.9 -33.1 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.5 | +0.0 156 | 48.9 | 54.0 | -5.1 | Vert 172 |
| 20 | 17152.010 M Ambient | 20.9 | +0.0 +0.0 +1.2 +0.0 | +40.8 +0.0 +8.0 -32.8 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.4 +0.4 | +0.0 42 | 41.9 | 54.0 | -12.1 | Vert 119 |
| 21 | 169.265M | 48.0 | +0.0 +0.2 +0.0 -28.8 | +0.0 +0.9 +0.0 +0.0 | +9.8 +0.2 +0.0 +0.0 | +0.8 +0.0 +0.0 | +0.0 360 | 31.1 | 44.0 | -12.9 | Horiz 160 |
| 22 | 15346.530 M Ambient | 21.6 | +0.0 +0.0 +1.2 +0.0 | +39.1 +0.0 +7.2 -32.5 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.2 +0.4 | +0.0 251 | 40.2 | 54.0 | -13.8 | Horiz 125 |
| 23 | 3611.033M Ave | 33.3 | +0.0 +0.0 +0.6 +0.0 | +31.8 +0.0 +3.0 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.6 +0.7 | +0.0 254 | 38.3 | 54.0 | -15.7 | Horiz 125 |
| ^ | 3611.033M | 40.3 | +0.0 +0.0 +0.6 +0.0 | +31.8 +0.0 +3.0 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.6 +0.7 | +0.0 254 | 45.3 | 54.0 | -8.7 | Horiz 125 |
| 25 | 3611.052M Ave | 28.6 | +0.0 +0.0 +0.6 +0.0 | +31.8 +0.0 +3.0 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.6 +0.7 | +0.0 42 | 33.6 | 54.0 | -20.4 | Vert 119 |
| ^ | 3611.052M | 37.6 | +0.0 +0.0 +0.6 +0.0 | +31.8 +0.0 +3.0 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.6 +0.7 | +0.0 42 | 42.6 | 54.0 | -11.4 | Vert 119 |
| 27 | 990.100M Ambient | 33.0 | +0.0 +0.5 +0.0 -29.0 | +0.0 +2.1 +0.0 +0.0 | +24.3 +0.3 +0.0 +0.0 | +2.0 +0.0 +0.0 | +0.0 | 33.2 | 54.0 | -20.8 | Horiz 160 |
| 28 | 5416.514M Ave | 24.0 | +0.0 +0.0 +1.0 +0.0 | +34.5 +0.0 +3.9 -33.1 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.5 | +0.0 156 | 33.1 | 54.0 | -20.9 | Horiz 172 |
| ^ | 5416.514M | 36.9 | +0.0 +0.0 +1.0 +0.0 | +34.5 +0.0 +3.9 -33.1 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.5 | +0.0 156 | 46.0 | 54.0 | -8.0 | Horiz 172 |
| ^ | 5416.494M | 34.6 | +0.0 +0.0 +1.0 +0.0 | +34.5 +0.0 +3.9 -33.1 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.5 | +0.0 191 | 43.7 | 54.0 | -10.3 | Horiz 125 |

| | | | | | | | | | | | |
|----|----------|------|-------------------------------|------------------------------|------------------------------|------------------------------|--------------|-------|------|-------|--------------|
| 31 | 149.360k | 72.9 | +10.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 160 | 2.9 | 24.4 | -21.5 | 90deg 160 |
| 32 | 159.890k | 69.5 | +10.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 30 | -0.5 | 23.8 | -24.3 | 180de 160 |
| 33 | 1.076M | 28.7 | +10.0 +0.0 +0.0 +0.0 | +0.0 +0.1 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.1 +0.0 +0.0 +0.0 | -40.0 160 | -1.1 | 27.1 | -28.2 | 90deg 160 |
| 34 | 1.000M | 27.2 | +10.0 +0.0 +0.0 +0.0 | +0.0 +0.1 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.1 +0.0 +0.0 +0.0 | -40.0 205 | -2.6 | 27.7 | -30.3 | 180de 160 |
| 35 | 320.700k | 55.8 | +9.9 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.1 +0.0 +0.0 | +0.1 +0.0 +0.0 +0.0 | -80.0 160 | -14.1 | 17.7 | -31.8 | 90deg 160 |
| 36 | 480.240k | 51.3 | +9.9 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.1 +0.0 +0.0 | +0.1 +0.0 +0.0 +0.0 | -80.0 205 | -18.6 | 14.2 | -32.8 | 180de 160 |
| 37 | 318.960k | 53.4 | +9.9 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.1 +0.0 +0.0 | +0.1 +0.0 +0.0 +0.0 | -80.0 168 | -16.5 | 17.8 | -34.3 | 180de 160 |
| 38 | 101.900k | 60.9 | +10.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 152 | -9.1 | 27.8 | -36.9 | 90deg 160 |
| 39 | 15.790k | 62.0 | +14.2 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 159 | -3.8 | 44.1 | -47.9 | 90deg 160 |
| 40 | 12.006k | 60.8 | +15.6 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 159 | -3.6 | 46.5 | -50.1 | 90deg 160 |
| 41 | 15.715k | 58.7 | +14.2 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 205 | -7.1 | 44.1 | -51.2 | 180de 160 |
| 42 | 12.024k | 57.2 | +15.6 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 205 | -7.2 | 46.5 | -53.7 | 180de 160 |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247/15.209**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/11/2009
 Time: 10:42:00
 Sequence#: 2
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------------------|-------------------------|------------------|--------------|----------|
| Mag Loop | 2156 | 06/04/2008 | 06/04/2010 | AN00052 |
| Antenna | 2453 | 12/22/2008 | 12/22/2010 | AN01994 |
| EMCO 3115 Horn | 9606-4854 | 11/12/2007 | 11/12/2009 | AN01412 |
| Horn Antenna, Active 18-26GHz | 1114018 | 11/13/2008 | 11/13/2010 | 2742 |
| Helix cable | N/A | 07/22/2008 | 07/22/2010 | AN05545 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03123 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03122 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03121 |
| Cable 30' | 11 | 11/05/2008 | 11/05/2010 | ANP05366 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Cable 20' | 16 | 11/10/2008 | 11/10/2010 | ANP05360 |
| Cable 6' | 51 | 12/30/2008 | 12/30/2010 | ANP05361 |
| Pasternack Coax | | 07/20/2007 | 07/20/2009 | AN05425 |
| HP 8447D Preamp | 2944A08601 | 07/08/2008 | 07/08/2010 | AN01517 |
| HP 83017A Pre-amp | 3123A00464 | 10/02/2007 | 10/02/2009 | AN01271 |
| Filter | 2 | 05/01/2008 | 05/01/2010 | 2750 |
| Filter | 311SH10-3000/T10000-0/0 | 12/02/2008 | 12/02/2010 | 3116 |
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|------------------------|---------------|------------|---------------------|
| Circular patch antenna | Cushcraft | S90289CLJ | 092436 |
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |
| Antenna cable | Manhattan/CDT | M4213 | 1354 E12091 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |
| Laptop Computer | Dell | Latitude | 6497402833 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Radiated Spurious Emissions per FCC 15.247(d)

The Unit is an RF reader. It is located in the back edge of the test table.

All its ports are being exercised. It is being powered by the AC/DC converter

It is connected to a laptop outside the chamber through a shielded ethernet cable.

The antenna is suspended 10cm above the wooden table with styrofoam.

The EUT will be in transmitting mode throughout the test in the MID channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 32.5 dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 915.25MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz

150kHz-30MHz RBW= 9kHz, VBW = 9kHz

30MHz - 1GHz RBW= 120kHz, VBW=120kHz

1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

T1=ANT- AN00052-06042008

T3=ANT AN01994 25-1000MHz

T5=CAB-ANP05361

T7=CAB-ANP05371

T9=CAB-ANP03123-120208

T11=Filter 1GHz HP AN02750

T13=AMP-AN01517-070808

T2=ANT-AN01412-111207

T4=CAB-ANP05360

T6=CAB-ANP05366

T8=CAB-ANP03121-120208

T10=CAB-ANP05545-072208

T12=FIL-AN03116-120208

T14=AMP-AN01271-100207 - .5-26.5 GHz

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 T5 T9 T13 | T2 T6 T10 T14 | T3 T7 T11 | T4 T8 T12 | Dist | Corr | Spec | Margin | Polar |
|---|---------------------------|------|------------------------------|--------------------------------|------------------------------|----------------------|-------------|------|------------|--------|-------------|
| | MHz | dBμV | dB | dB | dB | dB | Table | dBμV | dBμV | dB | Ant |
| 1 | 13885.000 M Ambient | 32.5 | +0.0 +0.0 +1.3 +0.0 | +40.9 +0.0 +6.9 -32.8 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.3 +0.5 | +0.0 | 52.6 | 54.0 | -1.4 | Horiz |
| 2 | 1830.468M Ave | 20.9 | +0.0 +0.0 +0.5 +0.0 | +26.6 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.4 +0.0 | +0.0 +1.1 +0.0 | +0.0 195 | 51.7 | 54.0 | -2.3 | Vert 125 |
| ^ | 1830.468M | 28.4 | +0.0 +0.0 +0.5 +0.0 | +26.6 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.4 +0.0 | +0.0 +1.1 +0.0 | +0.0 195 | 59.2 | 54.0 | +5.2 | Vert 125 |
| 4 | 16932.000 M Ambient | 30.7 | +0.0 +0.0 +0.9 +0.0 | +40.0 +0.0 +7.9 -32.8 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.4 +0.4 | +0.0 299 | 50.5 | 54.0 | -3.5 | Horiz |
| | | | | | | | | | Noisefloor | | 130 |

| | | | | | | | | | | | |
|----|---------------------------|------|-------------------------------|--------------------------------|-------------------------------|------------------------------|-------------|------|------|-------|--------------|
| 5 | 12500.000 M Ambient | 31.2 | +0.0 +0.0 +1.7 +0.0 | +38.8 +0.0 +6.5 -33.6 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.1 +0.3 | +0.0 | 48.0 | 54.0 | -6.0 | Vert 130 |
| 6 | 99.500M | 54.6 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.1 +0.2 +0.0 +0.0 | +0.6 +0.0 +0.0 +0.0 | +0.0 | 37.1 | 44.0 | -6.9 | Vert 99 |
| 7 | 9030.984M Ambient | 31.4 | +0.0 +0.0 +1.6 +0.0 | +38.9 +0.0 +5.3 -33.8 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.1 +0.5 | +0.0 | 47.0 | 54.0 | -7.0 | Vert 130 |
| 8 | 18.244M Ambient | 12.7 | +8.4 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 75 | 21.9 | 30.0 | -8.1 | 90deg 100 |
| 9 | 102.200M | 52.8 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.4 +0.2 +0.0 +0.0 | +0.6 +0.0 +0.0 +0.0 | +0.0 282 | 35.6 | 44.0 | -8.4 | Horiz 151 |
| 10 | 478.800M | 45.2 | +0.0 +0.3 +0.0 -29.4 | +0.0 +1.6 +0.0 +0.0 | +17.7 +0.4 +0.0 +0.0 | +1.5 +0.0 +0.0 +0.0 | +0.0 282 | 37.3 | 46.0 | -8.7 | Horiz 151 |
| 11 | 7322.005M Ave | 33.1 | +0.0 +0.0 +1.1 +0.0 | +36.4 +0.0 +4.7 -34.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.3 | +0.0 15 | 43.2 | 54.0 | -10.8 | Vert 200 |
| ^ | 7322.005M | 41.7 | +0.0 +0.0 +1.1 +0.0 | +36.4 +0.0 +4.7 -34.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.3 | +0.0 15 | 51.8 | 54.0 | -2.2 | Vert 200 |
| 13 | 67.000M | 50.7 | +0.0 +0.1 +0.0 -29.2 | +0.0 +0.4 +0.0 +0.0 | +5.9 +0.1 +0.0 +0.0 | +0.4 +0.0 +0.0 +0.0 | +0.0 | 28.4 | 40.0 | -11.6 | Vert 99 |
| 14 | 17395.000 M Ambient | 19.6 | +0.0 +0.0 +1.3 +0.0 | +41.9 +0.0 +8.1 -32.9 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.3 +0.6 | +0.0 360 | 41.9 | 54.0 | -12.1 | Vert 130 |
| 15 | 167.300M | 46.8 | +0.0 +0.2 +0.0 -28.8 | +0.0 +0.9 +0.0 +0.0 | +10.0 +0.2 +0.0 +0.0 | +0.8 +0.0 +0.0 +0.0 | +0.0 282 | 30.1 | 44.0 | -13.9 | Horiz 151 |
| 16 | 23.550M Ambient | 7.9 | +7.1 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 179 | 15.8 | 30.0 | -14.2 | 180de 100 |
| 17 | 16.900M Ave | 4.9 | +8.5 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 1 | 14.2 | 30.0 | -15.8 | 180de 100 |

| | | | | | | | | | | | |
|----|---------------------|------|-------|-------|-------|------|-------|-------|--------------------|-------|---------------|
| ^ | 16.900M | 15.8 | +8.5 | +0.0 | +0.0 | +0.3 | +0.0 | 25.1 | 30.0 | -4.9 | 180deg 100 |
| | | | +0.0 | +0.3 | +0.2 | +0.0 | 1 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 19 | 5491.440M Ave | 29.6 | +0.0 | +34.7 | +0.0 | +0.0 | +0.0 | 38.2 | 54.0 | -15.8 | Vert 111 |
| | | | +0.0 | +0.0 | +0.0 | +2.0 | 6 | | | | |
| | | | +0.8 | +3.9 | +0.0 | +0.5 | | | | | |
| | | | +0.0 | -33.3 | | | | | | | |
| ^ | 5491.440M | 37.7 | +0.0 | +34.7 | +0.0 | +0.0 | +0.0 | 46.3 | 54.0 | -7.7 | Vert 111 |
| | | | +0.0 | +0.0 | +0.0 | +2.0 | 6 | | | | |
| | | | +0.8 | +3.9 | +0.0 | +0.5 | | | | | |
| | | | +0.0 | -33.3 | | | | | | | |
| 21 | 5491.612M Ave | 28.3 | +0.0 | +34.7 | +0.0 | +0.0 | +0.0 | 36.9 | 54.0 | -17.1 | Horiz 122 |
| | | | +0.0 | +0.0 | +0.0 | +2.0 | 339 | | | | |
| | | | +0.8 | +3.9 | +0.0 | +0.5 | | | | | |
| | | | +0.0 | -33.3 | | | | | | | |
| ^ | 5491.612M | 38.3 | +0.0 | +34.7 | +0.0 | +0.0 | +0.0 | 46.9 | 54.0 | -7.1 | Horiz 122 |
| | | | +0.0 | +0.0 | +0.0 | +2.0 | 339 | | | | |
| | | | +0.8 | +3.9 | +0.0 | +0.5 | | | | | |
| | | | +0.0 | -33.3 | | | | | | | |
| 23 | 25.000M Ambient | 5.1 | +6.6 | +0.0 | +0.0 | +0.3 | +0.0 | 12.5 | 30.0 Noisefloor | -17.5 | 90deg 100 |
| | | | +0.0 | +0.3 | +0.2 | +0.0 | 310 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 24 | 7321.941M Ave | 25.7 | +0.0 | +36.4 | +0.0 | +0.0 | +0.0 | 35.8 | 54.0 | -18.2 | Horiz 200 |
| | | | +0.0 | +0.0 | +0.0 | +2.3 | 89 | | | | |
| | | | +1.1 | +4.7 | +0.0 | +0.3 | | | | | |
| | | | +0.0 | -34.7 | | | | | | | |
| ^ | 7321.941M | 37.5 | +0.0 | +36.4 | +0.0 | +0.0 | +0.0 | 47.6 | 54.0 | -6.4 | Horiz 200 |
| | | | +0.0 | +0.0 | +0.0 | +2.3 | 89 | | | | |
| | | | +1.1 | +4.7 | +0.0 | +0.3 | | | | | |
| | | | +0.0 | -34.7 | | | | | | | |
| 26 | 960.880M | 30.4 | +0.0 | +0.0 | +23.9 | +1.8 | +0.0 | 30.1 | 54.0 | -23.9 | Vert 99 |
| | | | +0.5 | +2.2 | +0.5 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.2 | +0.0 | | | | | | | |
| 27 | 960.800M | 29.6 | +0.0 | +0.0 | +23.9 | +1.8 | +0.0 | 29.3 | 54.0 | -24.7 | Horiz 151 |
| | | | +0.5 | +2.2 | +0.5 | +0.0 | 282 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.2 | +0.0 | | | | | | | |
| 28 | 159.477k | 54.8 | +10.0 | +0.0 | +0.0 | +0.0 | -80.0 | -15.2 | 23.8 | -39.0 | 90deg 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 171 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 29 | 141.450k Ambient | 48.3 | +9.9 | +0.0 | +0.0 | +0.0 | -80.0 | -21.8 | 24.9 Noisefloor | -46.7 | 90deg 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 209 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 30 | 159.010k | 47.1 | +10.0 | +0.0 | +0.0 | +0.0 | -80.0 | -22.9 | 23.9 | -46.8 | 180deg 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 169 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |

| | | | | | | | | | | | |
|----|---------------------|------|-------|------|------|------|-------|-------|------------|-------|-------|
| 31 | 12.288k | 44.1 | +15.5 | +0.0 | +0.0 | +0.0 | -80.0 | -20.4 | 46.3 | -66.7 | 180de |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 360 | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 32 | 11.862k Ambient | 44.0 | +15.7 | +0.0 | +0.0 | +0.0 | -80.0 | -20.3 | 46.6 | -66.9 | 90deg |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 360 | | Noisefloor | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 33 | 119.153k Ambient | 28.7 | +10.1 | +0.0 | +0.0 | +0.0 | -80.0 | -41.2 | 26.4 | -67.6 | 90deg |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 360 | | Noisefloor | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247/15.209**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/11/2009
 Time: 13:48:54
 Sequence#: 5
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------------------|-------------------------|------------------|--------------|----------|
| Mag Loop | 2156 | 06/04/2008 | 06/04/2010 | AN00052 |
| Antenna | 2453 | 12/22/2008 | 12/22/2010 | AN01994 |
| EMCO 3115 Horn | 9606-4854 | 11/12/2007 | 11/12/2009 | AN01412 |
| Horn Antenna, Active 18-26GHz | 1114018 | 11/13/2008 | 11/13/2010 | 2742 |
| Helix cable | N/A | 07/22/2008 | 07/22/2010 | AN05545 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03123 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03122 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03121 |
| Cable 30' | 11 | 11/05/2008 | 11/05/2010 | ANP05366 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Cable 20' | 16 | 11/10/2008 | 11/10/2010 | ANP05360 |
| Cable 6' | 51 | 12/30/2008 | 12/30/2010 | ANP05361 |
| Pasternack Coax | | 07/20/2007 | 07/20/2009 | AN05425 |
| HP 8447D Preamp | 2944A08601 | 07/08/2008 | 07/08/2010 | AN01517 |
| HP 83017A Pre-amp | 3123A00464 | 10/02/2007 | 10/02/2009 | AN01271 |
| Filter | 2 | 05/01/2008 | 05/01/2010 | 2750 |
| Filter | 311SH10-3000/T10000-0/0 | 12/02/2008 | 12/02/2010 | 3116 |
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|------------------------|--------------|------------|---------------------|
| Circular patch antenna | Cushcraft | S90289CLJ | 092436 |
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Radiated Spurious Emissions per FCC 15.247(d).

The Unit is an RF reader. It is located in the back edge of the test table.

All its ports are being exercised. It is being powered by the AC/DC converter.

It is connected to a laptop outside the chamber through a shielded ethernet cable.

The antenna is suspended 10cm above the wooden table with styrofoam.

The EUT will be in transmitting mode throughout the test in the MID channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 30.0 dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 915.25MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz

150kHz-30MHz RBW= 9kHz, VBW = 9kHz

30MHz - 1GHz RBW= 120kHz, VBW=120kHz

1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

T1=ANT- AN00052-06042008

T3=ANT AN01994 25-1000MHz

T5=CAB-ANP05361

T7=CAB-ANP05371

T9=CAB-ANP03123-120208

T11=Filter 1GHz HP AN02750

T13=AMP-AN01517-070808

T2=ANT-AN01412-111207

T4=CAB-ANP05360

T6=CAB-ANP05366

T8=CAB-ANP03121-120208

T10=CAB-ANP05545-072208

T12=FIL-AN03116-120208

T14=AMP-AN01271-100207 - .5-26.5 GHz

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 T5 T9 T13 | T2 T6 T10 T14 | T3 T7 T11 | T4 T8 T12 | Dist | Corr | Spec | Margin | Polar |
|---|-----------|------|-----------------------|------------------------|-----------------|-----------------|-------|------|------------|--------|-------|
| | MHz | dBμV | dB | dB | dB | dB | Table | dBμV | dBμV | dB | Ant |
| 1 | 14.623M | 14.9 | +8.7 | +0.0 | +0.0 | +0.2 | +0.0 | 24.1 | 30.0 | -5.9 | 90deg |
| | Ambient | | +0.0 | +0.2 | +0.1 | +0.0 | | | NOISEFLOOR | | 160 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 2 | 9152.437M | 32.0 | +0.0 | +38.8 | +0.0 | +0.0 | +0.0 | 47.8 | 54.0 | -6.2 | Vert |
| | Ave | | +0.0 | +0.0 | +0.0 | +3.1 | 27 | | | | 115 |
| | | | +1.7 | +5.3 | +0.0 | +0.5 | | | | | |
| | | | +0.0 | -33.6 | | | | | | | |
| ^ | 9152.437M | 38.5 | +0.0 | +38.8 | +0.0 | +0.0 | +0.0 | 54.3 | 54.0 | +0.3 | Vert |
| | | | +0.0 | +0.0 | +0.0 | +3.1 | 27 | | | | 115 |
| | | | +1.7 | +5.3 | +0.0 | +0.5 | | | | | |
| | | | +0.0 | -33.6 | | | | | | | |
| 4 | 100.400M | 55.2 | +0.0 | +0.0 | +10.2 | +0.6 | +0.0 | 37.8 | 44.0 | -6.2 | Vert |
| | | | +0.1 | +0.6 | +0.2 | +0.0 | 360 | | | | 111 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.1 | +0.0 | | | | | | | |

| | | | | | | | | | | | |
|----|---------------------------|------|-------------------------------|--------------------------------|-------------------------------|------------------------------|-------------|------|--------------------|-------|--------------|
| 5 | 815.000M | 41.7 | +0.0 +0.4 +0.0 -29.4 | +0.0 +2.0 +0.0 +0.0 | +22.6 +0.5 +0.0 +0.0 | +1.9 +0.0 +0.0 +0.0 | +0.0 360 | 39.7 | 46.0 | -6.3 | Vert 111 |
| 6 | 18.252M | 14.2 | +8.4 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 360 | 23.4 | 30.0 | -6.6 | 180de 160 |
| 7 | 478.900M | 47.3 | +0.0 +0.3 +0.0 -29.4 | +0.0 +1.6 +0.0 +0.0 | +17.7 +0.4 +0.0 +0.0 | +1.5 +0.0 +0.0 +0.0 | +0.0 | 39.4 | 46.0 | -6.6 | Horiz 160 |
| 8 | 25.880M Ambient | 14.5 | +6.7 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 360 | 22.0 | 30.0 NOISEFLOOR | -8.0 | 90deg 160 |
| 9 | 1830.497M Ave | 15.1 | +0.0 +0.0 +0.5 +0.0 | +26.6 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.4 +0.0 | +0.0 +1.1 +0.0 +0.0 | +0.0 205 | 45.9 | 54.0 | -8.1 | Vert 115 |
| ^ | 1830.497M | 25.7 | +0.0 +0.0 +0.5 +0.0 | +26.6 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.4 +0.0 | +0.0 +1.1 +0.0 +0.0 | +0.0 205 | 56.5 | 54.0 | +2.5 | Vert 115 |
| 11 | 102.200M | 53.1 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.4 +0.2 +0.0 +0.0 | +0.6 +0.0 +0.0 +0.0 | +0.0 39 | 35.9 | 44.0 | -8.1 | Horiz 160 |
| 12 | 12.019M Ambient | 11.5 | +9.0 +0.0 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.0 +0.1 +0.0 +0.0 | +0.2 +0.0 +0.0 +0.0 | +0.0 | 21.0 | 30.0 NOISEFLOOR | -9.0 | 180de 160 |
| 13 | 941.040M Ambient | 37.5 | +0.0 +0.5 +0.0 -29.2 | +0.0 +2.1 +0.0 +0.0 | +23.7 +0.5 +0.0 +0.0 | +1.9 +0.0 +0.0 +0.0 | +0.0 360 | 37.0 | 46.0 NOISEFLOOR | -9.0 | Horiz 160 |
| 14 | 17390.140 M Ambient | 21.5 | +0.0 +0.0 +1.3 +0.0 | +41.9 +0.0 +8.1 -32.9 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.3 +0.6 +0.0 | +0.0 360 | 43.8 | 54.0 NOISEFLOOR | -10.2 | Horiz 115 |
| 15 | 169.200M | 47.9 | +0.0 +0.2 +0.0 -28.8 | +0.0 +0.9 +0.0 +0.0 | +9.8 +0.2 +0.0 +0.0 | +0.8 +0.0 +0.0 +0.0 | +0.0 | 31.0 | 44.0 | -13.0 | Horiz 160 |
| 16 | 1830.497M Ave | 10.0 | +0.0 +0.0 +0.5 +0.0 | +26.6 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.4 +0.0 | +0.0 +1.1 +0.0 +0.0 | +0.0 205 | 40.8 | 54.0 | -13.2 | Horiz 115 |
| ^ | 1830.497M | 22.5 | +0.0 +0.0 +0.5 +0.0 | +26.6 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.4 +0.0 | +0.0 +1.1 +0.0 +0.0 | +0.0 205 | 53.3 | 54.0 | -0.7 | Horiz 115 |

| | | | | | | | | | | | |
|----|-----------|------|-------|-------|-------|------|------|------|------------|-------|-------|
| 18 | 134.700M | 46.1 | +0.0 | +0.0 | +11.7 | +0.7 | +0.0 | 30.7 | 44.0 | -13.3 | Vert |
| | | | +0.2 | +0.7 | +0.3 | +0.0 | 360 | | | | 111 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.0 | +0.0 | | | | | | | |
| 19 | 7321.991M | 28.8 | +0.0 | +36.4 | +0.0 | +0.0 | +0.0 | 38.9 | 54.0 | -15.1 | Vert |
| | Ave | | +0.0 | +0.0 | +0.0 | +2.3 | 342 | | | | 114 |
| | | | +1.1 | +4.7 | +0.0 | +0.3 | | | | | |
| | | | +0.0 | -34.7 | | | | | | | |
| ^ | 7321.991M | 37.3 | +0.0 | +36.4 | +0.0 | +0.0 | +0.0 | 47.4 | 54.0 | -6.6 | Vert |
| | | | +0.0 | +0.0 | +0.0 | +2.3 | 342 | | | | 114 |
| | | | +1.1 | +4.7 | +0.0 | +0.3 | | | | | |
| | | | +0.0 | -34.7 | | | | | | | |
| 21 | 3661.005M | 32.7 | +0.0 | +31.9 | +0.0 | +0.0 | +0.0 | 37.9 | 54.0 | -16.1 | Horiz |
| | Ave | | +0.0 | +0.0 | +0.0 | +1.7 | 253 | | | | 125 |
| | | | +0.6 | +3.0 | +0.0 | +0.7 | | | | | |
| | | | +0.0 | -32.7 | | | | | | | |
| ^ | 3661.005M | 41.2 | +0.0 | +31.9 | +0.0 | +0.0 | +0.0 | 46.4 | 54.0 | -7.6 | Horiz |
| | | | +0.0 | +0.0 | +0.0 | +1.7 | 253 | | | | 125 |
| | | | +0.6 | +3.0 | +0.0 | +0.7 | | | | | |
| | | | +0.0 | -32.7 | | | | | | | |
| 23 | 3661.005M | 32.3 | +0.0 | +31.9 | +0.0 | +0.0 | +0.0 | 37.5 | 54.0 | -16.5 | Vert |
| | Ave | | +0.0 | +0.0 | +0.0 | +1.7 | 249 | | | | 125 |
| | | | +0.6 | +3.0 | +0.0 | +0.7 | | | | | |
| | | | +0.0 | -32.7 | | | | | | | |
| ^ | 3661.005M | 39.8 | +0.0 | +31.9 | +0.0 | +0.0 | +0.0 | 45.0 | 54.0 | -9.0 | Vert |
| | | | +0.0 | +0.0 | +0.0 | +1.7 | 249 | | | | 125 |
| | | | +0.6 | +3.0 | +0.0 | +0.7 | | | | | |
| | | | +0.0 | -32.7 | | | | | | | |
| 25 | 982.480M | 35.8 | +0.0 | +0.0 | +24.2 | +1.9 | +0.0 | 35.9 | 54.0 | -18.1 | Vert |
| | Ambient | | +0.5 | +2.2 | +0.4 | +0.0 | 247 | | NOISEFLOOR | | 111 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.1 | +0.0 | | | | | | | |
| 26 | 7321.991M | 25.2 | +0.0 | +36.4 | +0.0 | +0.0 | +0.0 | 35.3 | 54.0 | -18.7 | Horiz |
| | Ave | | +0.0 | +0.0 | +0.0 | +2.3 | 24 | | | | 114 |
| | | | +1.1 | +4.7 | +0.0 | +0.3 | | | | | |
| | | | +0.0 | -34.7 | | | | | | | |
| ^ | 7321.991M | 36.0 | +0.0 | +36.4 | +0.0 | +0.0 | +0.0 | 46.1 | 54.0 | -7.9 | Horiz |
| | | | +0.0 | +0.0 | +0.0 | +2.3 | 24 | | | | 114 |
| | | | +1.1 | +4.7 | +0.0 | +0.3 | | | | | |
| | | | +0.0 | -34.7 | | | | | | | |
| 28 | 5491.545M | 26.3 | +0.0 | +34.7 | +0.0 | +0.0 | +0.0 | 34.9 | 54.0 | -19.1 | Horiz |
| | Ave | | +0.0 | +0.0 | +0.0 | +2.0 | 325 | | | | 152 |
| | | | +0.8 | +3.9 | +0.0 | +0.5 | | | | | |
| | | | +0.0 | -33.3 | | | | | | | |
| ^ | 5491.545M | 37.5 | +0.0 | +34.7 | +0.0 | +0.0 | +0.0 | 46.1 | 54.0 | -7.9 | Horiz |
| | | | +0.0 | +0.0 | +0.0 | +2.0 | 325 | | | | 152 |
| | | | +0.8 | +3.9 | +0.0 | +0.5 | | | | | |
| | | | +0.0 | -33.3 | | | | | | | |
| 30 | 5491.545M | 25.8 | +0.0 | +34.7 | +0.0 | +0.0 | +0.0 | 34.4 | 54.0 | -19.6 | Vert |
| | Ave | | +0.0 | +0.0 | +0.0 | +2.0 | 234 | | | | 125 |
| | | | +0.8 | +3.9 | +0.0 | +0.5 | | | | | |
| | | | +0.0 | -33.3 | | | | | | | |

| | | | | | | | | | | | |
|----|---------------------|------|-------|-------|------|------|-------|-------|------------|-------|-------|
| ^ | 5491.545M | 36.6 | +0.0 | +34.7 | +0.0 | +0.0 | +0.0 | 45.2 | 54.0 | -8.8 | Vert |
| | | | +0.0 | +0.0 | +0.0 | +2.0 | 234 | | | | 125 |
| | | | +0.8 | +3.9 | +0.0 | +0.5 | | | | | |
| | | | +0.0 | -33.3 | | | | | | | |
| 32 | 935.160k | 32.7 | +9.9 | +0.0 | +0.0 | +0.1 | -40.0 | 2.8 | 28.3 | -25.5 | 90deg |
| | | | +0.0 | +0.1 | +0.0 | +0.0 | 150 | | | | 160 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 33 | 172.170k | 51.5 | +10.0 | +0.0 | +0.0 | +0.0 | -80.0 | -18.5 | 23.2 | -41.7 | 90deg |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 150 | | | | 160 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 34 | 150.000k Ambient | 46.5 | +10.0 | +0.0 | +0.0 | +0.0 | -80.0 | -23.5 | 24.4 | -47.9 | 180de |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 360 | | NOISEFLOOR | | 160 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 35 | 61.600k | 38.8 | +10.1 | +0.0 | +0.0 | +0.0 | -80.0 | -31.1 | 32.2 | -63.3 | 90deg |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 244 | | | | 160 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 36 | 14.508k | 45.6 | +14.6 | +0.0 | +0.0 | +0.0 | -80.0 | -19.8 | 44.8 | -64.6 | 90deg |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 144 | | | | 160 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 37 | 17.753k | 44.6 | +13.5 | +0.0 | +0.0 | +0.0 | -80.0 | -21.9 | 43.1 | -65.0 | 90deg |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 160 | | | | 160 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 38 | 18.313k Ambient | 43.5 | +13.4 | +0.0 | +0.0 | +0.0 | -80.0 | -23.1 | 42.8 | -65.9 | 180de |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 159 | | NOISEFLOOR | | 160 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247/15.209**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/11/2009
 Time: 10:47:00
 Sequence#: 3
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------------------|-------------------------|------------------|--------------|----------|
| Mag Loop | 2156 | 06/04/2008 | 06/04/2010 | AN00052 |
| Antenna | 2453 | 12/22/2008 | 12/22/2010 | AN01994 |
| EMCO 3115 Horn | 9606-4854 | 11/12/2007 | 11/12/2009 | AN01412 |
| Horn Antenna, Active 18-26GHz | 1114018 | 11/13/2008 | 11/13/2010 | 2742 |
| Helix cable | N/A | 07/22/2008 | 07/22/2010 | AN05545 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03123 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03122 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03121 |
| Cable 30' | 11 | 11/05/2008 | 11/05/2010 | ANP05366 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Cable 20' | 16 | 11/10/2008 | 11/10/2010 | ANP05360 |
| Cable 6' | 51 | 12/30/2008 | 12/30/2010 | ANP05361 |
| Pasternack Coax | | 07/20/2007 | 07/20/2009 | AN05425 |
| HP 8447D Preamp | 2944A08601 | 07/08/2008 | 07/08/2010 | AN01517 |
| HP 83017A Pre-amp | 3123A00464 | 10/02/2007 | 10/02/2009 | AN01271 |
| Filter | 2 | 05/01/2008 | 05/01/2010 | 2750 |
| Filter | 311SH10-3000/T10000-0/0 | 12/02/2008 | 12/02/2010 | 3116 |
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|------------------------|---------------|------------|---------------------|
| Circular patch antenna | Cushcraft | S90289CLJ | 092436 |
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |
| Antenna cable | Manhattan/CDT | M4213 | 1354 E12091 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |
| Laptop Computer | Dell | Latitude | 6497402833 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Radiated Spurious Emissions per FCC 15.247(d)

The Unit is an RF reader. It is located in the back edge of the test table.

All its ports are being exercised. It is being powered by the AC/DC converter.

It is connected to a laptop outside the chamber through a shielded ethernet cable.

The antenna is suspended 10cm above the wooden table with styrofoam.

The EUT will be in transmitting mode throughout the test in the High channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 32.5 dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 927.25MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz

150kHz-30MHz RBW= 9kHz, VBW = 9kHz

30MHz - 1GHz RBW= 120kHz, VBW=120kHz

1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

T1=ANT- AN00052-06042008

T3=ANT AN01994 25-1000MHz

T5=CAB-ANP05361

T7=CAB-ANP05371

T9=CAB-ANP03123-120208

T11=Filter 1GHz HP AN02750

T13=AMP-AN01517-070808

T2=ANT-AN01412-111207

T4=CAB-ANP05360

T6=CAB-ANP05366

T8=CAB-ANP03121-120208

T10=CAB-ANP05545-072208

T12=FIL-AN03116-120208

T14=AMP-AN01271-100207 - .5-26.5 GHz

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 T5 T9 T13 | T2 T6 T10 T14 | T3 T7 T11 | T4 T8 T12 | Dist | Corr | Spec | Margin | Polar |
|---|---------------------------|------|-------------------------------|--------------------------------|-------------------------------|----------------------|-------------|------|--------------------|--------|--------------|
| | MHz | dBμV | dB | dB | dB | dB | Table | dBμV | dBμV | dB | Ant |
| 1 | 17707.000 M Ambient | 28.5 | +0.0 +0.0 +1.4 +0.0 | +43.4 +0.0 +8.1 -33.1 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.6 +0.9 | +0.0 360 | 52.8 | 54.0 Noisefloor | -1.2 | Horiz 118 |
| 2 | 11959.810 M Ambient | 35.6 | +0.0 +0.0 +1.9 +0.0 | +39.4 +0.0 +6.2 -35.5 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.2 +0.5 | +0.0 83 | 51.3 | 54.0 Noisefloor | -2.7 | Horiz 99 |
| 3 | 1855.000M | 18.7 | +0.0 +0.0 +0.5 +0.0 | +26.8 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.4 +0.0 | +0.0 +1.1 +0.0 | +0.0 195 | 49.7 | 54.0 | -4.3 | Vert 126 |
| 4 | 102.090M | 54.8 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.4 +0.2 +0.0 +0.0 | +0.6 +0.0 +0.0 | +0.0 360 | 37.6 | 44.0 | -6.4 | Vert 99 |

| | | | | | | | | | | | |
|----|------------|------|-------|-------|-------|------|------|------|------------|-------|-------|
| 5 | 15584.450M | 28.7 | +0.0 | +38.6 | +0.0 | +0.0 | +0.0 | 46.9 | 54.0 | -7.1 | Vert |
| | Ambient | | +0.0 | +0.0 | +0.0 | +3.2 | | | | | |
| | | | +0.9 | +7.3 | +0.0 | +0.5 | 236 | | Noisefloor | | 118 |
| | | | +0.0 | -32.3 | | | | | | | |
| 6 | 7418.061M | 36.4 | +0.0 | +36.5 | +0.0 | +0.0 | +0.0 | 46.8 | 54.0 | -7.2 | Horiz |
| | | | +0.0 | +0.0 | +0.0 | +2.3 | 180 | | | | 113 |
| | | | +1.1 | +4.7 | +0.0 | +0.3 | | | | | |
| | | | +0.0 | -34.5 | | | | | | | |
| 7 | 826.550M | 40.7 | +0.0 | +0.0 | +22.7 | +1.8 | +0.0 | 38.6 | 46.0 | -7.4 | Vert |
| | | | +0.4 | +2.0 | +0.4 | +0.0 | 360 | | | | 99 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.4 | +0.0 | | | | | | | |
| 8 | 5563.488M | 37.6 | +0.0 | +34.7 | +0.0 | +0.0 | +0.0 | 46.0 | 54.0 | -8.0 | Horiz |
| | | | +0.0 | +0.0 | +0.0 | +1.9 | 23 | | | | 112 |
| | | | +0.8 | +4.0 | +0.0 | +0.4 | | | | | |
| | | | +0.0 | -33.4 | | | | | | | |
| 9 | 102.090M | 52.9 | +0.0 | +0.0 | +10.4 | +0.6 | +0.0 | 35.7 | 44.0 | -8.3 | Horiz |
| | | | +0.1 | +0.6 | +0.2 | +0.0 | | | | | 160 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.1 | +0.0 | | | | | | | |
| 10 | 27.070M | 13.5 | +6.9 | +0.0 | +0.0 | +0.3 | +0.0 | 21.2 | 30.0 | -8.8 | 180de |
| | Ave | | +0.0 | +0.3 | +0.2 | +0.0 | 111 | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| ^ | 27.070M | 22.9 | +6.9 | +0.0 | +0.0 | +0.3 | +0.0 | 30.6 | 30.0 | +0.6 | 180de |
| | | | +0.0 | +0.3 | +0.2 | +0.0 | 111 | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 12 | 8386.000M | 31.7 | +0.0 | +37.7 | +0.0 | +0.0 | +0.0 | 45.2 | 54.0 | -8.8 | Vert |
| | Ambient | | +0.0 | +0.0 | +0.0 | +2.8 | | | Noisefloor | | 123 |
| | | | +1.4 | +5.2 | +0.0 | +0.5 | | | | | |
| | | | +0.0 | -34.1 | | | | | | | |
| 13 | 1855.000M | 14.0 | +0.0 | +26.8 | +0.0 | +0.0 | +0.0 | 45.0 | 54.0 | -9.0 | Horiz |
| | | | +0.0 | +0.0 | +0.0 | +1.1 | 195 | | | | 126 |
| | | | +0.5 | +2.2 | +0.4 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 14 | 2781.750M | 8.7 | +0.0 | +30.0 | +0.0 | +0.0 | +0.0 | 43.9 | 54.0 | -10.1 | Vert |
| | | | +0.0 | +0.0 | +0.0 | +1.4 | 195 | | | | 126 |
| | | | +0.5 | +2.7 | +0.6 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 15 | 22.840M | 10.9 | +7.3 | +0.0 | +0.0 | +0.3 | +0.0 | 19.0 | 30.0 | -11.0 | 180de |
| | Ave | | +0.0 | +0.3 | +0.2 | +0.0 | | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| ^ | 22.840M | 18.0 | +7.3 | +0.0 | +0.0 | +0.3 | +0.0 | 26.1 | 30.0 | -3.9 | 180de |
| | | | +0.0 | +0.3 | +0.2 | +0.0 | | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 17 | 466.100M | 43.0 | +0.0 | +0.0 | +17.5 | +1.5 | +0.0 | 34.9 | 46.0 | -11.1 | Horiz |
| | | | +0.3 | +1.6 | +0.4 | +0.0 | | | | | 160 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.4 | +0.0 | | | | | | | |

| | | | | | | | | | | | |
|----|------------------|------|-------------------------------|--------------------------------|-------------------------------|------------------------------|-------------|------|------|-------|--------------|
| 18 | 68.270M | 50.0 | +0.0 +0.1 +0.0 -29.2 | +0.0 +0.5 +0.0 +0.0 | +6.1 +0.2 +0.0 +0.0 | +0.5 +0.0 +0.0 +0.0 | +0.0 360 | 28.2 | 40.0 | -11.8 | Vert 99 |
| 19 | 2781.750M | 7.0 | +0.0 +0.0 +0.5 +0.0 | +30.0 +0.0 +2.7 +0.0 | +0.0 +0.0 +0.6 +0.0 | +0.0 +1.4 +0.0 +0.0 | +0.0 195 | 42.2 | 54.0 | -11.8 | Horiz 126 |
| 20 | 956.180M | 33.6 | +0.0 +0.5 +0.0 -29.2 | +0.0 +2.1 +0.0 +0.0 | +23.8 +0.5 +0.0 +0.0 | +1.9 +0.0 +0.0 +0.0 | +0.0 321 | 33.2 | 46.0 | -12.8 | Horiz 160 |
| 21 | 5563.473M Ave | 31.4 | +0.0 +0.0 +0.8 +0.0 | +34.7 +0.0 +4.0 -33.4 | +0.0 +0.0 +0.0 +0.4 | +0.0 +1.9 +0.0 +0.4 | +0.0 344 | 39.8 | 54.0 | -14.2 | Vert 133 |
| ^ | 5563.473M | 39.5 | +0.0 +0.0 +0.8 +0.0 | +34.7 +0.0 +4.0 -33.4 | +0.0 +0.0 +0.0 +0.4 | +0.0 +1.9 +0.0 +0.4 | +0.0 344 | 47.9 | 54.0 | -6.1 | Vert 133 |
| 23 | 167.060M | 46.0 | +0.0 +0.2 +0.0 -28.8 | +0.0 +0.9 +0.0 +0.0 | +10.0 +0.2 +0.0 +0.0 | +0.8 +0.0 +0.0 +0.0 | +0.0 | 29.3 | 44.0 | -14.7 | Horiz 160 |
| 24 | 7417.934M Ave | 28.3 | +0.0 +0.0 +1.1 +0.0 | +36.5 +0.0 +4.7 -34.5 | +0.0 +0.0 +0.0 +0.3 | +0.0 +2.3 +0.3 +0.3 | +0.0 180 | 38.7 | 54.0 | -15.3 | Vert 123 |
| ^ | 7417.934M | 38.8 | +0.0 +0.0 +1.1 +0.0 | +36.5 +0.0 +4.7 -34.5 | +0.0 +0.0 +0.0 +0.3 | +0.0 +2.3 +0.3 +0.3 | +0.0 180 | 49.2 | 54.0 | -4.8 | Vert 123 |
| 26 | 18.244M Ave | 3.2 | +8.4 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 360 | 12.4 | 30.0 | -17.6 | 90deg 100 |
| ^ | 18.244M | 14.5 | +8.4 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 360 | 23.7 | 30.0 | -6.3 | 90deg 100 |
| 28 | 23.131M Ave | 0.7 | +7.2 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 360 | 8.7 | 30.0 | -21.3 | 90deg 100 |
| ^ | 23.131M | 10.8 | +7.2 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 355 | 18.8 | 30.0 | -11.2 | 90deg 100 |
| 30 | 992.650M | 30.7 | +0.0 +0.5 +0.0 -29.0 | +0.0 +2.1 +0.0 +0.0 | +24.3 +0.3 +0.0 +0.0 | +2.0 +0.0 +0.0 +0.0 | +0.0 360 | 30.9 | 54.0 | -23.1 | Vert 99 |

| | | | | | | | | | | | |
|----|----------|------|-------|------|------|------|-------|-------|------|-------|-------|
| 31 | 146.720k | 46.9 | +10.0 | +0.0 | +0.0 | +0.0 | -80.0 | -23.1 | 24.6 | -47.7 | 90deg |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 337 | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 32 | 150.000k | 46.1 | +10.0 | +0.0 | +0.0 | +0.0 | -80.0 | -23.9 | 24.4 | -48.3 | 180de |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 81 | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 33 | 35.120k | 42.4 | +11.0 | +0.0 | +0.0 | +0.0 | -80.0 | -26.6 | 37.1 | -63.7 | 180de |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 34 | 13.988k | 43.5 | +14.8 | +0.0 | +0.0 | +0.0 | -80.0 | -21.7 | 45.1 | -66.8 | 90deg |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 111 | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 35 | 9.550k | 43.2 | +0.0 | +0.0 | +0.0 | +0.0 | -80.0 | -36.8 | 48.5 | -85.3 | 180de |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 39 | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247/15.209**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/11/2009
 Time: 14:00:00
 Sequence#: 4
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------------------|-------------------------|------------------|--------------|----------|
| Mag Loop | 2156 | 06/04/2008 | 06/04/2010 | AN00052 |
| Antenna | 2453 | 12/22/2008 | 12/22/2010 | AN01994 |
| EMCO 3115 Horn | 9606-4854 | 11/12/2007 | 11/12/2009 | AN01412 |
| Horn Antenna, Active 18-26GHz | 1114018 | 11/13/2008 | 11/13/2010 | 2742 |
| Helix cable | N/A | 07/22/2008 | 07/22/2010 | AN05545 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03123 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03122 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03121 |
| Cable 30' | 11 | 11/05/2008 | 11/05/2010 | ANP05366 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Cable 20' | 16 | 11/10/2008 | 11/10/2010 | ANP05360 |
| Cable 6' | 51 | 12/30/2008 | 12/30/2010 | ANP05361 |
| Pasternack Coax | | 07/20/2007 | 07/20/2009 | AN05425 |
| HP 8447D Preamp | 2944A08601 | 07/08/2008 | 07/08/2010 | AN01517 |
| HP 83017A Pre-amp | 3123A00464 | 10/02/2007 | 10/02/2009 | AN01271 |
| Filter | 2 | 05/01/2008 | 05/01/2010 | 2750 |
| Filter | 311SH10-3000/T10000-0/0 | 12/02/2008 | 12/02/2010 | 3116 |
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|------------------------|--------------|------------|---------------------|
| Circular patch antenna | Cushcraft | S90289CLJ | 092436 |
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Radiated Spurious Emissions per FCC 15.247(d)

The Unit is an RF reader. It is located in the back edge of the test table.

All its ports are being exercised. It is being powered by the AC/DC converter.

It is connected to a laptop outside the chamber through a shielded ethernet cable.

The antenna is suspended 10cm above the wooden table with styrofoam.

The EUT will be in transmitting mode throughout the test in the HIGH channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 30.0 dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 927.25MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz

150kHz-30MHz RBW= 9kHz, VBW = 9kHz

30MHz - 1GHz RBW= 120kHz, VBW=120kHz

1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

T1=ANT- AN00052-06042008

T3=ANT AN01994 25-1000MHz

T5=CAB-ANP05361

T7=CAB-ANP05371

T9=CAB-ANP03123-120208

T11=Filter 1GHz HP AN02750

T13=AMP-AN01517-070808

T2=ANT-AN01412-111207

T4=CAB-ANP05360

T6=CAB-ANP05366

T8=CAB-ANP03121-120208

T10=CAB-ANP05545-072208

T12=FIL-AN03116-120208

T14=AMP-AN01271-100207 - .5-26.5 GHz

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 T5 T9 T13 | T2 T6 T10 T14 | T3 T7 T11 | T4 T8 T12 | Dist | Corr | Spec | Margin | Polar |
|---|-----------|------|-----------------------|------------------------|-----------------|-----------------|-------|------|------|--------|-------|
| | MHz | dBμV | dB | dB | dB | dB | Table | dBμV | dBμV | dB | Ant |
| 1 | 1854.500M | 18.1 | +0.0 | +26.8 | +0.0 | +0.0 | +0.0 | 49.1 | 54.0 | -4.9 | Vert |
| | Ave | | +0.0 | +0.0 | +0.0 | +1.1 | 204 | | | | 119 |
| | | | +0.5 | +2.2 | +0.4 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| ^ | 1854.500M | 27.2 | +0.0 | +26.8 | +0.0 | +0.0 | +0.0 | 58.2 | 54.0 | +4.2 | Vert |
| | | | +0.0 | +0.0 | +0.0 | +1.1 | 204 | | | | 119 |
| | | | +0.5 | +2.2 | +0.4 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 3 | 827.440M | 42.0 | +0.0 | +0.0 | +22.7 | +1.8 | +0.0 | 39.9 | 46.0 | -6.1 | Vert |
| | | | +0.4 | +2.0 | +0.4 | +0.0 | | | | | 125 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.4 | +0.0 | | | | | | | |
| 4 | 100.310M | 55.0 | +0.0 | +0.0 | +10.2 | +0.6 | +0.0 | 37.6 | 44.0 | -6.4 | Vert |
| | | | +0.1 | +0.6 | +0.2 | +0.0 | 47 | | | | 125 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.1 | +0.0 | | | | | | | |

| | | | | | | | | | | | |
|----|------------------|------|-------------------------------|--------------------------------|-------------------------------|------------------------------|-------------|------|------|-------|--------------|
| 5 | 23.130M | 14.5 | +7.2 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 241 | 22.5 | 30.0 | -7.5 | 180de 160 |
| 6 | 100.310M | 53.8 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.2 +0.2 +0.0 +0.0 | +0.6 +0.0 +0.0 +0.0 | +0.0 | 36.4 | 44.0 | -7.6 | Horiz 160 |
| 7 | 15.345M | 13.0 | +8.7 +0.0 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.0 +0.1 +0.0 +0.0 | +0.2 +0.0 +0.0 +0.0 | +0.0 185 | 22.2 | 30.0 | -7.8 | 180de 160 |
| 8 | 453.640M | 45.6 | +0.0 +0.3 +0.0 -29.3 | +0.0 +1.6 +0.0 +0.0 | +17.3 +0.5 +0.0 +0.0 | +1.6 +0.0 +0.0 +0.0 | +0.0 | 37.6 | 46.0 | -8.4 | Horiz 160 |
| 9 | 15.877M | 12.1 | +8.6 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 185 | 21.5 | 30.0 | -8.5 | 90deg 160 |
| 10 | 25.880M | 13.2 | +6.7 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 185 | 20.7 | 30.0 | -9.3 | 90deg 160 |
| 11 | 17617.760 M | 19.9 | +0.0 +0.0 +1.5 +0.0 | +42.9 +0.0 +8.2 -33.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.6 +0.7 +0.0 | +0.0 215 | 43.8 | 54.0 | -10.2 | Vert 113 |
| 12 | 5563.505M | 34.5 | +0.0 +0.0 +0.8 +0.0 | +34.7 +0.0 +4.0 -33.4 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.9 +0.4 +0.0 | +0.0 211 | 42.9 | 54.0 | -11.1 | Vert 113 |
| 13 | 3709.000M | 35.6 | +0.0 +0.0 +0.7 +0.0 | +32.1 +0.0 +2.9 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.8 +0.7 +0.0 | +0.0 169 | 41.1 | 54.0 | -12.9 | Horiz 118 |
| 14 | 1854.191M Ave | 10.1 | +0.0 +0.0 +0.5 +0.0 | +26.8 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.4 +0.0 | +0.0 +1.1 +0.0 +0.0 | +0.0 204 | 41.1 | 54.0 | -12.9 | Horiz 119 |
| ^ | 1854.191M | 22.6 | +0.0 +0.0 +0.5 +0.0 | +26.8 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.4 +0.0 | +0.0 +1.1 +0.0 +0.0 | +0.0 204 | 53.6 | 54.0 | -0.4 | Horiz 119 |
| 16 | 67.380M | 48.8 | +0.0 +0.1 +0.0 -29.2 | +0.0 +0.5 +0.0 +0.0 | +6.0 +0.2 +0.0 +0.0 | +0.5 +0.0 +0.0 +0.0 | +0.0 | 26.9 | 40.0 | -13.1 | Vert 125 |
| 17 | 169.730M | 47.6 | +0.0 +0.2 +0.0 -28.8 | +0.0 +0.9 +0.0 +0.0 | +9.8 +0.2 +0.0 +0.0 | +0.8 +0.0 +0.0 +0.0 | +0.0 | 30.7 | 44.0 | -13.3 | Horiz 160 |

| | | | | | | | | | | | |
|----|------------------|------|-------------------------------|--------------------------------|-------------------------------|------------------------------|------------------------------|-------|------|-------|--------------|
| 18 | 9272.503M Ave | 23.9 | +0.0 +0.0 +1.7 +0.0 | +38.8 +0.0 +5.3 -33.5 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.2 +0.0 +0.4 | +0.0 215 +0.0 +0.0 | 39.8 | 54.0 | -14.2 | Vert 113 |
| ^ | 9272.503M | 32.5 | +0.0 +0.0 +1.7 +0.0 | +38.8 +0.0 +5.3 -33.5 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.2 +0.0 +0.4 | +0.0 215 +0.0 +0.0 | 48.4 | 54.0 | -5.6 | Vert 113 |
| 20 | 3709.000M Ave | 31.3 | +0.0 +0.0 +0.7 +0.0 | +32.1 +0.0 +2.9 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.8 +0.7 +0.0 | +0.0 169 +0.0 +0.0 | 36.8 | 54.0 | -17.2 | Vert 118 |
| ^ | 3709.000M | 39.1 | +0.0 +0.0 +0.7 +0.0 | +32.1 +0.0 +2.9 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.8 +0.7 +0.0 | +0.0 169 +0.0 +0.0 | 44.6 | 54.0 | -9.4 | Vert 118 |
| 22 | 992.720M | 34.7 | +0.0 +0.5 +0.0 -29.0 | +0.0 +2.1 +0.0 +0.0 | +24.3 +0.3 +0.0 +0.0 | +2.0 +0.0 +0.0 +0.0 | +0.0 360 +0.0 +0.0 | 34.9 | 54.0 | -19.1 | Vert 125 |
| 23 | 962.200M | 33.2 | +0.0 +0.5 +0.0 -29.2 | +0.0 +2.2 +0.0 +0.0 | +23.9 +0.5 +0.0 +0.0 | +1.8 +0.0 +0.0 +0.0 | +0.0 360 +0.0 +0.0 | 32.9 | 54.0 | -21.1 | Horiz 160 |
| 24 | 650.480k | 36.7 | +10.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.1 +0.0 +0.0 | +0.1 +0.0 +0.0 +0.0 | -40.0 185 +0.0 +0.0 | 6.9 | 31.5 | -24.6 | 180de 160 |
| 25 | 835.090k | 33.2 | +10.0 +0.0 +0.0 +0.0 | +0.0 +0.1 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.1 +0.0 +0.0 +0.0 | -40.0 185 +0.0 +0.0 | 3.4 | 29.3 | -25.9 | 90deg 160 |
| 26 | 1.171M | 28.2 | +10.1 +0.0 +0.0 +0.0 | +0.0 +0.1 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.1 +0.0 +0.0 +0.0 | -40.0 185 +0.0 +0.0 | -1.5 | 26.3 | -27.8 | 180de 160 |
| 27 | 1.000M | 27.4 | +10.0 +0.0 +0.0 +0.0 | +0.0 +0.1 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.1 +0.0 +0.0 +0.0 | -40.0 185 +0.0 +0.0 | -2.4 | 27.7 | -30.1 | 90deg 160 |
| 28 | 39.220k | 54.5 | +10.7 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 185 +0.0 +0.0 | -14.8 | 36.1 | -50.9 | 90deg 160 |
| 29 | 141.200k | 34.0 | +9.9 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 185 +0.0 +0.0 | -36.1 | 24.9 | -61.0 | 180de 160 |
| 30 | 15.545k | 45.0 | +14.2 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 185 +0.0 +0.0 | -20.8 | 44.2 | -65.0 | 180de 160 |

| | | | | | | | | | | | |
|----|---------|------|-------|------|------|------|-------|-------|------|-------|---------------|
| 31 | 11.172k | 46.0 | +16.0 | +0.0 | +0.0 | +0.0 | -80.0 | -18.0 | 47.1 | -65.1 | 180deg 160 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 111 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 32 | 58.600k | 37.3 | +10.1 | +0.0 | +0.0 | +0.0 | -80.0 | -32.6 | 32.6 | -65.2 | 180deg 160 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 185 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 33 | 16.526k | 43.3 | +13.9 | +0.0 | +0.0 | +0.0 | -80.0 | -22.8 | 43.7 | -66.5 | 90deg 160 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 185 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 34 | 11.916k | 44.2 | +15.7 | +0.0 | +0.0 | +0.0 | -80.0 | -20.1 | 46.5 | -66.6 | 90deg 160 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247/15.209**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/12/2009
 Time: 09:09:29
 Sequence#: 11
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------------------|-------------------------|------------------|--------------|----------|
| Mag Loop | 2156 | 06/04/2008 | 06/04/2010 | AN00052 |
| Antenna | 2453 | 12/22/2008 | 12/22/2010 | AN01994 |
| EMCO 3115 Horn | 9606-4854 | 11/12/2007 | 11/12/2009 | AN01412 |
| Horn Antenna, Active 18-26GHz | 1114018 | 11/13/2008 | 11/13/2010 | 2742 |
| Helix cable | N/A | 07/22/2008 | 07/22/2010 | AN05545 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03123 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03122 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03121 |
| Cable 30' | 11 | 11/05/2008 | 11/05/2010 | ANP05366 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Cable 20' | 16 | 11/10/2008 | 11/10/2010 | ANP05360 |
| Cable 6' | 51 | 12/30/2008 | 12/30/2010 | ANP05361 |
| Pasternack Coax | | 07/20/2007 | 07/20/2009 | AN05425 |
| HP 8447D Preamp | 2944A08601 | 07/08/2008 | 07/08/2010 | AN01517 |
| HP 83017A Pre-amp | 3123A00464 | 10/02/2007 | 10/02/2009 | AN01271 |
| Filter | 2 | 05/01/2008 | 05/01/2010 | 2750 |
| Filter | 311SH10-3000/T10000-0/0 | 12/02/2008 | 12/02/2010 | 3116 |
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|------------|---------------------|
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |
| Brickyard Antenna | CSL | CS777-2 | V25078 EP00090 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Radiated Spurious Emissions per FCC 15.247(d)

The Unit is an RF reader. It is located in the back edge of the test table.

All its ports are being exercised. It is being powered by the AC/DC converter

It is connected to a laptop outside the chamber through a shielded ethernet cable.

The antenna is suspended 10cm above the wooden table with styrofoam.

The EUT will be in transmitting mode throughout the test in the MID channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 30.0 dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 915.25MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz

150kHz-30MHz RBW= 9kHz, VBW = 9kHz

30MHz - 1GHz RBW= 120kHz, VBW=120kHz

1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

T1=ANT- AN00052-06042008

T3=ANT AN01994 25-1000MHz

T5=CAB-ANP05361

T7=CAB-ANP05371

T9=CAB-ANP03123-120208

T11=Filter 1GHz HP AN02750

T13=AMP-AN01517-070808

T2=ANT-AN01412-111207

T4=CAB-ANP05360

T6=CAB-ANP05366

T8=CAB-ANP03121-120208

T10=CAB-ANP05545-072208

T12=FIL-AN03116-120208

T14=AMP-AN01271-100207 - .5-26.5 GHz

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 T5 T9 T13 | T2 T6 T10 T14 | T3 T7 T11 | T4 T8 T12 | Dist | Corr | Spec | Margin | Polar |
|---|---------------------------|------------|-------------------------------|--------------------------------|------------------------------|----------------------|-------------|------------|--------------------|--------|--------------|
| | MHz | dB μ V | dB | dB | dB | dB | Table | dB μ V | dB μ V | dB | Ant |
| 1 | 14190.000 M Ambient | 33.4 | +0.0 +0.0 +1.2 +0.0 | +41.2 +0.0 +6.8 -32.9 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.4 +1.0 | +0.0 360 | 54.1 | 54.0 NOISEFLOOR | +0.1 | Vert 141 |
| 2 | 2570.000M Ambient | 16.3 | +0.0 +0.0 +0.5 +0.0 | +29.3 +0.0 +2.6 +0.0 | +0.0 +0.0 +0.5 +0.0 | +0.0 +1.3 +0.0 | +0.0 | 50.5 | 54.0 NOISEFLOOR | -3.5 | Horiz 116 |
| 3 | 904.700M | 43.2 | +0.0 +0.5 +0.0 -29.3 | +0.0 +2.0 +0.0 +0.0 | +23.2 +0.3 +0.0 | +1.9 +0.0 +0.0 | +0.0 360 | 41.8 | 46.0 | -4.2 | Vert 100 |
| 4 | 100.400M | 56.4 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.2 +0.2 +0.0 | +0.6 +0.0 +0.0 | +0.0 360 | 39.0 | 44.0 | -5.0 | Vert 100 |

| | | | | | | | | | | | |
|----|---------------------------|------|-------------------------------|--------------------------------|-------------------------------|------------------------------|-------------|------|--------------------|-------|---------------|
| 5 | 12.077M | 14.6 | +9.0 +0.0 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.0 +0.1 +0.0 +0.0 | +0.2 +0.0 +0.0 +0.0 | +0.0 360 | 24.1 | 30.0 | -5.9 | 180deg 101 |
| 6 | 904.700M | 41.5 | +0.0 +0.5 +0.0 -29.3 | +0.0 +2.0 +0.0 +0.0 | +23.2 +0.3 +0.0 +0.0 | +1.9 +0.0 +0.0 +0.0 | +0.0 | 40.1 | 46.0 | -5.9 | Horiz 175 |
| 7 | 99.500M | 54.8 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.1 +0.2 +0.0 +0.0 | +0.6 +0.0 +0.0 +0.0 | +0.0 | 37.3 | 44.0 | -6.7 | Horiz 175 |
| 8 | 11.507M Ambient | 13.6 | +9.1 +0.0 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.0 +0.1 +0.0 +0.0 | +0.2 +0.0 +0.0 +0.0 | +0.0 360 | 23.2 | 30.0 NOISEFLOOR | -6.8 | 90deg 101 |
| 9 | 7322.003M | 36.6 | +0.0 +0.0 +1.1 +0.0 | +36.4 +0.0 +4.7 -34.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.0 +0.3 | +0.0 360 | 46.7 | 54.0 | -7.3 | Horiz 141 |
| 10 | 7322.004M | 36.2 | +0.0 +0.0 +1.1 +0.0 | +36.4 +0.0 +4.7 -34.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.0 +0.3 | +0.0 | 46.3 | 54.0 | -7.7 | Vert 140 |
| 11 | 10760.000 M Ambient | 32.1 | +0.0 +0.0 +1.2 +0.0 | +38.5 +0.0 +5.6 -34.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.8 +0.0 +0.0 | +0.0 360 | 45.5 | 54.0 NOISEFLOOR | -8.5 | Vert 141 |
| 12 | 5491.494M | 36.3 | +0.0 +0.0 +0.8 +0.0 | +34.7 +0.0 +3.9 -33.3 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.0 +0.5 +0.0 | +0.0 339 | 44.9 | 54.0 | -9.1 | Horiz 137 |
| 13 | 167.300M | 50.9 | +0.0 +0.2 +0.0 -28.8 | +0.0 +0.9 +0.0 +0.0 | +10.0 +0.2 +0.0 +0.0 | +0.8 +0.0 +0.0 +0.0 | +0.0 | 34.2 | 44.0 | -9.8 | Horiz 175 |
| 14 | 1506.000M Ambient | 15.3 | +0.0 +0.0 +0.6 +0.0 | +24.7 +0.0 +2.0 +0.0 | +0.0 +0.0 +0.5 +0.0 | +0.0 +1.1 +0.0 +0.0 | +0.0 | 44.2 | 54.0 NOISEFLOOR | -9.8 | Horiz 116 |
| 15 | 5491.496M | 35.3 | +0.0 +0.0 +0.8 +0.0 | +34.7 +0.0 +3.9 -33.3 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.0 +0.5 +0.0 | +0.0 160 | 43.9 | 54.0 | -10.1 | Vert 125 |
| 16 | 14190.000 M Ambient | 21.3 | +0.0 +0.0 +1.2 +0.0 | +41.2 +0.0 +6.8 -32.9 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.4 +1.0 +0.0 | +0.0 360 | 42.0 | 54.0 NOISEFLOOR | -12.0 | Vert 141 |
| 17 | 3661.005M Ave | 33.1 | +0.0 +0.0 +0.6 +0.0 | +31.9 +0.0 +3.0 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.7 +0.7 +0.0 | +0.0 191 | 38.3 | 54.0 | -15.7 | Vert 140 |

| | | | | | | | | | | | |
|----|--------------------|------|-------|-------|-------|------|-------|-------|--------------------|-------|--------------|
| ^ | 3661.005M | 40.1 | +0.0 | +31.9 | +0.0 | +0.0 | +0.0 | 45.3 | 54.0 | -8.7 | Vert 140 |
| | | | +0.0 | +0.0 | +0.0 | +1.7 | 191 | | | | |
| | | | +0.6 | +3.0 | +0.0 | +0.7 | | | | | |
| | | | +0.0 | -32.7 | | | | | | | |
| 19 | 3660.996M Ave | 32.9 | +0.0 | +31.9 | +0.0 | +0.0 | +0.0 | 38.1 | 54.0 | -15.9 | Horiz 140 |
| | | | +0.0 | +0.0 | +0.0 | +1.7 | 358 | | | | |
| | | | +0.6 | +3.0 | +0.0 | +0.7 | | | | | |
| | | | +0.0 | -32.7 | | | | | | | |
| ^ | 3660.996M | 39.9 | +0.0 | +31.9 | +0.0 | +0.0 | +0.0 | 45.1 | 54.0 | -8.9 | Horiz 140 |
| | | | +0.0 | +0.0 | +0.0 | +1.7 | 358 | | | | |
| | | | +0.6 | +3.0 | +0.0 | +0.7 | | | | | |
| | | | +0.0 | -32.7 | | | | | | | |
| 21 | 162.000M | 44.3 | +0.0 | +0.0 | +10.5 | +0.8 | +0.0 | 28.0 | 44.0 | -16.0 | Vert 100 |
| | | | +0.2 | +0.9 | +0.2 | +0.0 | 360 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -28.9 | +0.0 | | | | | | | |
| 22 | 437.541k | 41.6 | +9.8 | +0.0 | +0.0 | +0.1 | -80.0 | -28.4 | 15.0 | -43.4 | 180de 101 |
| | | | +0.0 | +0.0 | +0.1 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 23 | 16.281k Ambient | 47.6 | +14.0 | +0.0 | +0.0 | +0.0 | -80.0 | -18.4 | 43.8 NOISEFLOOR | -62.2 | 90deg 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 14 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 24 | 10.884k Ambient | 45.9 | +16.1 | +0.0 | +0.0 | +0.0 | -80.0 | -18.0 | 47.3 NOISEFLOOR | -65.3 | 180de 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 25 | 11.940k Ambient | 45.0 | +15.7 | +0.0 | +0.0 | +0.0 | -80.0 | -19.3 | 46.5 NOISEFLOOR | -65.8 | 90deg 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 360 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247/15.209**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/12/2009
 Time: 08:59:35
 Sequence#: 12
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------------------|-------------------------|------------------|--------------|----------|
| Mag Loop | 2156 | 06/04/2008 | 06/04/2010 | AN00052 |
| Antenna | 2453 | 12/22/2008 | 12/22/2010 | AN01994 |
| EMCO 3115 Horn | 9606-4854 | 11/12/2007 | 11/12/2009 | AN01412 |
| Horn Antenna, Active 18-26GHz | 1114018 | 11/13/2008 | 11/13/2010 | 2742 |
| Helix cable | N/A | 07/22/2008 | 07/22/2010 | AN05545 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03123 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03122 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03121 |
| Cable 30' | 11 | 11/05/2008 | 11/05/2010 | ANP05366 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Cable 20' | 16 | 11/10/2008 | 11/10/2010 | ANP05360 |
| Cable 6' | 51 | 12/30/2008 | 12/30/2010 | ANP05361 |
| Pasternack Coax | | 07/20/2007 | 07/20/2009 | AN05425 |
| HP 8447D Preamp | 2944A08601 | 07/08/2008 | 07/08/2010 | AN01517 |
| HP 83017A Pre-amp | 3123A00464 | 10/02/2007 | 10/02/2009 | AN01271 |
| Filter | 2 | 05/01/2008 | 05/01/2010 | 2750 |
| Filter | 311SH10-3000/T10000-0/0 | 12/02/2008 | 12/02/2010 | 3116 |
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|------------|---------------------|
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |
| Brickyard Antenna | CSL | CS777-2 | V25078 EP00090 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Radiated Spurious Emissions per FCC 15.247(d)

The Unit is an RF reader. It is located in the back edge of the test table.

All its ports are being exercised. It is being powered by the AC/DC converter.

It is connected to a laptop outside the chamber through a shielded ethernet cable.

The antenna is suspended 10cm above the wooden table with styrofoam.

The EUT will be in transmitting mode throughout the test in the HIGH channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 30.0 dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 927.25MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz

150kHz-30MHz RBW= 9kHz, VBW = 9kHz

30MHz - 1GHz RBW= 120kHz, VBW=120kHz

1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

T1=ANT- AN00052-06042008

T3=ANT AN01994 25-1000MHz

T5=CAB-ANP05361

T7=CAB-ANP05371

T9=CAB-ANP03123-120208

T11=Filter 1GHz HP AN02750

T13=AMP-AN01517-070808

T2=ANT-AN01412-111207

T4=CAB-ANP05360

T6=CAB-ANP05366

T8=CAB-ANP03121-120208

T10=CAB-ANP05545-072208

T12=FIL-AN03116-120208

T14=AMP-AN01271-100207 - .5-26.5 GHz

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 T5 T9 T13 | T2 T6 T10 T14 | T3 T7 T11 | T4 T8 T12 | Dist | Corr | Spec | Margin | Polar |
|---|-----------|------|-----------------------|------------------------|-----------------|-----------------|-------|------|------------|--------|-------|
| | MHz | dBμV | dB | dB | dB | dB | Table | dBμV | dBμV | dB | Ant |
| 1 | 1854.495M | 20.3 | +0.0 | +26.8 | +0.0 | +0.0 | +0.0 | 51.3 | 54.0 | -2.7 | Vert |
| | Ambient | | +0.0 | +0.0 | +0.0 | +1.1 | 112 | | NOISEFLOOR | | 116 |
| | | | +0.5 | +2.2 | +0.4 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 2 | 916.440M | 42.8 | +0.0 | +0.0 | +23.3 | +1.9 | +0.0 | 41.6 | 46.0 | -4.4 | Vert |
| | | | +0.5 | +2.0 | +0.4 | +0.0 | | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.3 | +0.0 | | | | | | | |
| 3 | 100.310M | 56.9 | +0.0 | +0.0 | +10.2 | +0.6 | +0.0 | 39.5 | 44.0 | -4.5 | Vert |
| | | | +0.1 | +0.6 | +0.2 | +0.0 | | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.1 | +0.0 | | | | | | | |
| 4 | 100.310M | 55.1 | +0.0 | +0.0 | +10.2 | +0.6 | +0.0 | 37.7 | 44.0 | -6.3 | Horiz |
| | | | +0.1 | +0.6 | +0.2 | +0.0 | 360 | | | | 175 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.1 | +0.0 | | | | | | | |

| | | | | | | | | | | | |
|----|---------------------------|------|-------------------------------|--------------------------------|-------------------------------|------------------------------|-------------|------|--------------------|-------|--------------|
| 5 | 26.490M | 15.3 | +6.8 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 | 22.9 | 30.0 | -7.1 | 180de 101 |
| 6 | 11.811M | 13.2 | +9.1 +0.0 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.0 +0.1 +0.0 +0.0 | +0.2 +0.0 +0.0 +0.0 | +0.0 357 | 22.8 | 30.0 | -7.2 | 180de 101 |
| 7 | 853.250M | 40.5 | +0.0 +0.5 +0.0 -29.3 | +0.0 +2.0 +0.0 +0.0 | +22.8 +0.3 +0.0 +0.0 | +1.7 +0.0 +0.0 +0.0 | +0.0 360 | 38.5 | 46.0 | -7.5 | Horiz 175 |
| 8 | 25.690M Ambient | 14.3 | +6.7 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 360 | 21.8 | 30.0 NOISEFLOOR | -8.2 | 90deg 101 |
| 9 | 17752.000 M Ambient | 20.1 | +0.0 +0.0 +1.7 +0.0 | +43.6 +0.0 +8.1 -33.1 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.6 +0.9 +0.0 | +0.0 209 | 44.9 | 54.0 NOISEFLOOR | -9.1 | Horiz 109 |
| 10 | 5563.505M | 35.7 | +0.0 +0.0 +0.8 +0.0 | +34.7 +0.0 +4.0 -33.4 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.9 +0.4 +0.0 | +0.0 360 | 44.1 | 54.0 | -9.9 | Horiz 151 |
| 11 | 5563.505M | 35.5 | +0.0 +0.0 +0.8 +0.0 | +34.7 +0.0 +4.0 -33.4 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.9 +0.4 +0.0 | +0.0 159 | 43.9 | 54.0 | -10.1 | Vert 113 |
| 12 | 3709.000M | 38.1 | +0.0 +0.0 +0.7 +0.0 | +32.1 +0.0 +2.9 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.8 +0.7 +0.0 | +0.0 197 | 43.6 | 54.0 | -10.4 | Vert 113 |
| 13 | 167.060M | 49.8 | +0.0 +0.2 +0.0 -28.8 | +0.0 +0.9 +0.0 +0.0 | +10.0 +0.2 +0.0 +0.0 | +0.8 +0.0 +0.0 +0.0 | +0.0 360 | 33.1 | 44.0 | -10.9 | Horiz 175 |
| 14 | 3709.000M | 36.4 | +0.0 +0.0 +0.7 +0.0 | +32.1 +0.0 +2.9 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.8 +0.7 +0.0 | +0.0 290 | 41.9 | 54.0 | -12.1 | Horiz 109 |
| 15 | 9272.500M Ave | 24.1 | +0.0 +0.0 +1.7 +0.0 | +38.8 +0.0 +5.3 -33.5 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.2 +0.4 +0.0 | +0.0 209 | 40.0 | 54.0 | -14.0 | Horiz 109 |
| ^ | 9272.500M | 33.3 | +0.0 +0.0 +1.7 +0.0 | +38.8 +0.0 +5.3 -33.5 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.2 +0.4 +0.0 | +0.0 209 | 49.2 | 54.0 | -4.8 | Horiz 109 |
| 17 | 136.800M | 44.9 | +0.0 +0.2 +0.0 -29.0 | +0.0 +0.7 +0.0 +0.0 | +11.7 +0.3 +0.0 +0.0 | +0.7 +0.0 +0.0 +0.0 | +0.0 | 29.5 | 44.0 | -14.5 | Vert 100 |

| | | | | | | | | | | | |
|----|----------|------|-------|------|-------|------|-------|-------|------------|-------|-------|
| 18 | 438.510M | 37.4 | +0.0 | +0.0 | +17.0 | +1.5 | +0.0 | 29.0 | 46.0 | -17.0 | Horiz |
| | | | +0.3 | +1.6 | +0.5 | +0.0 | 360 | | | | 175 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.3 | +0.0 | | | | | | | |
| 19 | 173.920k | 46.5 | +10.0 | +0.0 | +0.0 | +0.0 | -80.0 | -23.5 | 23.1 | -46.6 | 90deg |
| | Ambient | | +0.0 | +0.0 | +0.0 | +0.0 | | | NOISEFLOOR | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 20 | 14.460k | 45.2 | +14.6 | +0.0 | +0.0 | +0.0 | -80.0 | -20.2 | 44.8 | -65.0 | 90deg |
| | Ambient | | +0.0 | +0.0 | +0.0 | +0.0 | | | NOISEFLOOR | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 21 | 11.526k | 45.4 | +15.8 | +0.0 | +0.0 | +0.0 | -80.0 | -18.8 | 46.8 | -65.6 | 180de |
| | Ambient | | +0.0 | +0.0 | +0.0 | +0.0 | 360 | | NOISEFLOOR | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247/15.209**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/12/2009
 Time: 09:29:27
 Sequence#: 10
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------------------|-------------------------|------------------|--------------|----------|
| Mag Loop | 2156 | 06/04/2008 | 06/04/2010 | AN00052 |
| Antenna | 2453 | 12/22/2008 | 12/22/2010 | AN01994 |
| EMCO 3115 Horn | 9606-4854 | 11/12/2007 | 11/12/2009 | AN01412 |
| Horn Antenna, Active 18-26GHz | 1114018 | 11/13/2008 | 11/13/2010 | 2742 |
| Helix cable | N/A | 07/22/2008 | 07/22/2010 | AN05545 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03123 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03122 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03121 |
| Cable 30' | 11 | 11/05/2008 | 11/05/2010 | ANP05366 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Cable 20' | 16 | 11/10/2008 | 11/10/2010 | ANP05360 |
| Cable 6' | 51 | 12/30/2008 | 12/30/2010 | ANP05361 |
| Pasternack Coax | | 07/20/2007 | 07/20/2009 | AN05425 |
| HP 8447D Preamp | 2944A08601 | 07/08/2008 | 07/08/2010 | AN01517 |
| HP 83017A Pre-amp | 3123A00464 | 10/02/2007 | 10/02/2009 | AN01271 |
| Filter | 2 | 05/01/2008 | 05/01/2010 | 2750 |
| Filter | 311SH10-3000/T10000-0/0 | 12/02/2008 | 12/02/2010 | 3116 |
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|------------|---------------------|
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |
| Brickyard Antenna | CSL | CS777-2 | V25078 EP00090 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Radiated Spurious Emissions per FCC 15.247(d)

The Unit is an RF reader. It is located in the back edge of the test table.

All its ports are being exercised. It is being powered by the AC/DC converter.

It is connected to a laptop outside the chamber through a shielded ethernet cable.

The antenna is suspended 10cm above the wooden table with styrofoam.

The EUT will be in transmitting mode throughout the test in the LOW channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 30.0 dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 902.75MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz

150kHz-30MHz RBW= 9kHz, VBW = 9kHz

30MHz - 1GHz RBW= 120kHz, VBW=120kHz

1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

T1=ANT- AN00052-06042008

T3=ANT AN01994 25-1000MHz

T5=CAB-ANP05361

T7=CAB-ANP05371

T9=CAB-ANP03123-120208

T11=Filter 1GHz HP AN02750

T13=AMP-AN01517-070808

T2=ANT-AN01412-111207

T4=CAB-ANP05360

T6=CAB-ANP05366

T8=CAB-ANP03121-120208

T10=CAB-ANP05545-072208

T12=FIL-AN03116-120208

T14=AMP-AN01271-100207 - .5-26.5 GHz

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 T5 T9 T13 | T2 T6 T10 T14 | T3 T7 T11 | T4 T8 T12 | Dist | Corr | Spec | Margin | Polar |
|---|---------------------------|------|-------------------------------|--------------------------------|------------------------------|----------------------|-------------|------|--------------------|--------|--------------|
| | MHz | dBμV | dB | dB | dB | dB | Table | dBμV | dBμV | dB | Ant |
| 1 | 14070.000 M Ambient | 32.2 | +0.0 +0.0 +1.3 +0.0 | +41.1 +0.0 +6.8 -33.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.4 +0.6 | +0.0 312 | 52.4 | 54.0 NOISEFLOOR | -1.6 | Horiz 116 |
| 2 | 2518.000M Ambient | 16.9 | +0.0 +0.0 +0.5 +0.0 | +29.2 +0.0 +2.6 +0.0 | +0.0 +0.0 +0.5 +0.0 | +0.0 +1.3 +0.0 | +0.0 360 | 51.0 | 54.0 NOISEFLOOR | -3.0 | Horiz 116 |
| 3 | 892.405M | 44.4 | +0.0 +0.5 +0.0 -29.3 | +0.0 +2.0 +0.0 +0.0 | +23.1 +0.2 +0.0 | +1.8 +0.0 | +0.0 | 42.7 | 46.0 | -3.3 | Vert 99 |
| 4 | 100.065M | 56.5 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.2 +0.2 +0.0 | +0.6 +0.0 +0.0 | +0.0 4 | 39.1 | 44.0 | -4.9 | Vert 99 |

| | | | | | | | | | | | |
|----|---------------------------|------|-------------------------------|--------------------------------|-------------------------------|------------------------------|-------------|------|------|-------|--------------|
| 5 | 100.065M | 55.6 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.2 +0.2 +0.0 +0.0 | +0.6 +0.0 +0.0 +0.0 | +0.0 360 | 38.2 | 44.0 | -5.8 | Horiz 175 |
| 6 | 10635.000 M Ambient | 34.7 | +0.0 +0.0 +1.1 +0.0 | +38.4 +0.0 +5.6 -34.5 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.9 +0.0 +0.0 | +0.0 312 | 48.2 | 54.0 | -5.8 | Horiz 116 |
| 7 | 802.445M | 42.3 | +0.0 +0.4 +0.0 -29.5 | +0.0 +2.0 +0.0 +0.0 | +22.5 +0.5 +0.0 +0.0 | +1.9 +0.0 +0.0 +0.0 | +0.0 360 | 40.1 | 46.0 | -5.9 | Horiz 175 |
| 8 | 26.610M Ambient | 15.7 | +6.8 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 103 | 23.3 | 30.0 | -6.7 | 90deg 101 |
| 9 | 24.350M | 15.5 | +6.8 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 352 | 23.1 | 30.0 | -6.9 | 180de 101 |
| 10 | 9087.282M Ambient | 31.0 | +0.0 +0.0 +1.6 +0.0 | +38.9 +0.0 +5.3 -33.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.1 +0.0 +0.5 | +0.0 312 | 46.7 | 54.0 | -7.3 | Vert 116 |
| 11 | 1832.000M Ambient | 14.7 | +0.0 +0.0 +0.5 +0.0 | +26.6 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.4 +0.0 | +0.0 +1.1 +0.0 +0.0 | +0.0 360 | 45.5 | 54.0 | -8.5 | Vert 116 |
| 12 | 166.670M | 51.0 | +0.0 +0.2 +0.0 -28.8 | +0.0 +0.9 +0.0 +0.0 | +10.1 +0.2 +0.0 +0.0 | +0.8 +0.0 +0.0 +0.0 | +0.0 360 | 34.4 | 44.0 | -9.6 | Horiz 175 |
| 13 | 3610.990M | 39.0 | +0.0 +0.0 +0.6 +0.0 | +31.8 +0.0 +3.0 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.6 +0.7 +0.0 | +0.0 224 | 44.0 | 54.0 | -10.0 | Vert 147 |
| 14 | 3610.990M | 37.1 | +0.0 +0.0 +0.6 +0.0 | +31.8 +0.0 +3.0 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.6 +0.7 +0.0 | +0.0 184 | 42.1 | 54.0 | -11.9 | Horiz 147 |
| 15 | 5416.494M | 32.8 | +0.0 +0.0 +1.0 +0.0 | +34.5 +0.0 +3.9 -33.1 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.5 +0.0 | +0.0 128 | 41.9 | 54.0 | -12.1 | Horiz 116 |
| 16 | 5416.494M Ave | 32.1 | +0.0 +0.0 +1.0 +0.0 | +34.5 +0.0 +3.9 -33.1 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.5 +0.0 | +0.0 155 | 41.2 | 54.0 | -12.8 | Vert 116 |
| ^ | 5416.494M | 37.3 | +0.0 +0.0 +1.0 +0.0 | +34.5 +0.0 +3.9 -33.1 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.5 +0.0 | +0.0 155 | 46.4 | 54.0 | -7.6 | Vert 116 |

| | | | | | | | | | | | |
|----|-------------------|------|-------------------------------|------------------------------|-------------------------------|------------------------------|--------------|-------|--------------------|-------|--------------|
| 18 | 136.395M | 44.8 | +0.0 +0.2 +0.0 -29.0 | +0.0 +0.7 +0.0 +0.0 | +11.7 +0.3 +0.0 +0.0 | +0.7 +0.0 +0.0 +0.0 | +0.0 | 29.4 | 44.0 | -14.6 | Vert 99 |
| 19 | 1.114M Ambient | 32.0 | +10.1 +0.0 +0.0 +0.0 | +0.0 +0.1 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.1 +0.0 +0.0 +0.0 | -40.0 360 | 2.3 | 26.8 NOISEFLOOR | -24.5 | 90deg 101 |
| 20 | 149.360k | 64.5 | +10.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 156 | -5.5 | 24.4 | -29.9 | 180de 101 |
| 21 | 119.850k | 62.9 | +10.1 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 110 | -7.0 | 26.3 | -33.3 | 90deg 101 |
| 22 | 319.830k | 48.1 | +9.9 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.1 +0.0 +0.0 | +0.1 +0.0 +0.0 +0.0 | -80.0 156 | -21.8 | 17.7 | -39.5 | 180de 101 |
| 23 | 111.700k | 52.5 | +9.9 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 185 | -17.6 | 26.9 | -44.5 | 180de 101 |
| 24 | 15.790k | 54.3 | +14.2 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 60 | -11.5 | 44.1 | -55.6 | 180de 101 |
| 25 | 12.024k | 52.8 | +15.6 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 185 | -11.6 | 46.5 | -58.1 | 180de 101 |
| 26 | 17.823k | 50.6 | +13.5 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 360 | -15.9 | 43.0 | -58.9 | 90deg 101 |
| 27 | 31.309k | 47.0 | +11.3 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 360 | -21.7 | 38.1 | -59.8 | 90deg 101 |
| 28 | 9.792k | 50.3 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 | -29.7 | 48.3 | -78.0 | 90deg 101 |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247/15.209**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/12/2009
 Time: 08:35:48
 Sequence#: 14
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------------------|-------------------------|------------------|--------------|----------|
| Mag Loop | 2156 | 06/04/2008 | 06/04/2010 | AN00052 |
| Antenna | 2453 | 12/22/2008 | 12/22/2010 | AN01994 |
| EMCO 3115 Horn | 9606-4854 | 11/12/2007 | 11/12/2009 | AN01412 |
| Horn Antenna, Active 18-26GHz | 1114018 | 11/13/2008 | 11/13/2010 | 2742 |
| Helix cable | N/A | 07/22/2008 | 07/22/2010 | AN05545 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03123 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03122 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03121 |
| Cable 30' | 11 | 11/05/2008 | 11/05/2010 | ANP05366 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Cable 20' | 16 | 11/10/2008 | 11/10/2010 | ANP05360 |
| Cable 6' | 51 | 12/30/2008 | 12/30/2010 | ANP05361 |
| Pasternack Coax | | 07/20/2007 | 07/20/2009 | AN05425 |
| HP 8447D Preamp | 2944A08601 | 07/08/2008 | 07/08/2010 | AN01517 |
| HP 83017A Pre-amp | 3123A00464 | 10/02/2007 | 10/02/2009 | AN01271 |
| Filter | 2 | 05/01/2008 | 05/01/2010 | 2750 |
| Filter | 311SH10-3000/T10000-0/0 | 12/02/2008 | 12/02/2010 | 3116 |
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|----------------|--------------|-----------------|---------------------|
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |
| Mini-Guardrail | Impinj | IPJ-A0303-0000E | 0069 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Radiated Spurious Emissions per FCC 15.247(d)

The Unit is an RF reader. It is located in the back edge of the test table.

All its ports are being exercised. It is being powered by the AC/DC converter

It is connected to a laptop outside the chamber through a shielded ethernet cable.

The antenna is suspended 10cm above the wooden table with styrofoam.

The EUT will be in transmitting mode throughout the test in the LOW channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 30.0 dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 902.75MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz

150kHz-30MHz RBW= 9kHz, VBW = 9kHz

30MHz - 1GHz RBW= 120kHz, VBW=120kHz

1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

T1=ANT- AN00052-06042008

T3=ANT AN01994 25-1000MHz

T5=CAB-ANP05361

T7=CAB-ANP05371

T9=CAB-ANP03123-120208

T11=Filter 1GHz HP AN02750

T13=AMP-AN01517-070808

T2=ANT-AN01412-111207

T4=CAB-ANP05360

T6=CAB-ANP05366

T8=CAB-ANP03121-120208

T10=CAB-ANP05545-072208

T12=FIL-AN03116-120208

T14=AMP-AN01271-100207 - .5-26.5 GHz

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 T5 T9 T13 | T2 T6 T10 T14 | T3 T7 T11 | T4 T8 T12 | Dist | Corr | Spec | Margin | Polar |
|---|---------------------------|------|------------------------------|--------------------------------|------------------------------|----------------------|-------------|------|--------------------|--------|--------------|
| | MHz | dBμV | dB | dB | dB | dB | Table | dBμV | dBμV | dB | Ant |
| 1 | 13016.000 M Ambient | 33.1 | +0.0 +0.0 +1.5 +0.0 | +39.4 +0.0 +6.9 -32.4 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.2 +0.4 | +0.0 155 | 52.1 | 54.0 NOISEFLOOR | -1.9 | Vert 116 |
| 2 | 2817.000M Ambient | 15.7 | +0.0 +0.0 +0.5 +0.0 | +30.1 +0.0 +2.7 +0.0 | +0.0 +0.0 +0.7 +0.0 | +0.0 +1.4 +0.0 | +0.0 360 | 51.1 | 54.0 NOISEFLOOR | -2.9 | Horiz 116 |
| 3 | 1786.000M Ambient | 19.5 | +0.0 +0.0 +0.5 +0.0 | +26.4 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.5 +0.0 | +0.0 +1.1 +0.0 | +0.0 | 50.2 | 54.0 NOISEFLOOR | -3.8 | Vert 116 |
| 4 | 16288.000 M Ambient | 31.1 | +0.0 +0.0 +0.9 +0.0 | +38.9 +0.0 +7.6 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.0 +0.5 | +0.0 155 | 49.3 | 54.0 NOISEFLOOR | -4.7 | Horiz 116 |

| | | | | | | | | | | | |
|----|------------------|------|-------------------------------|--------------------------------|-------------------------------|------------------------------|-------------|------|------|-------|--------------|
| 5 | 100.065M | 56.2 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.2 +0.2 +0.0 +0.0 | +0.6 +0.0 +0.0 +0.0 | +0.0 360 | 38.8 | 44.0 | -5.2 | Vert 101 |
| 6 | 3610.986M | 41.0 | +0.0 +0.0 +0.6 +0.0 | +31.8 +0.0 +3.0 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.6 +0.7 | +0.0 224 | 46.0 | 54.0 | -8.0 | Vert 147 |
| 7 | 100.065M | 52.2 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.2 +0.2 +0.0 +0.0 | +0.6 +0.0 +0.0 +0.0 | +0.0 | 34.8 | 44.0 | -9.2 | Horiz 175 |
| 8 | 5416.606M | 35.4 | +0.0 +0.0 +1.0 +0.0 | +34.5 +0.0 +3.9 -33.1 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.5 | +0.0 127 | 44.5 | 54.0 | -9.5 | Horiz 116 |
| 9 | 3611.134M | 38.5 | +0.0 +0.0 +0.6 +0.0 | +31.8 +0.0 +3.0 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.6 +0.7 | +0.0 184 | 43.5 | 54.0 | -10.5 | Horiz 147 |
| 10 | 67.195M | 50.2 | +0.0 +0.1 +0.0 -29.2 | +0.0 +0.5 +0.0 +0.0 | +5.9 +0.2 +0.0 +0.0 | +0.5 +0.0 +0.0 +0.0 | +0.0 360 | 28.2 | 40.0 | -11.8 | Vert 101 |
| 11 | 169.265M | 48.7 | +0.0 +0.2 +0.0 -28.8 | +0.0 +0.9 +0.0 +0.0 | +9.8 +0.2 +0.0 +0.0 | +0.8 +0.0 +0.0 +0.0 | +0.0 | 31.8 | 44.0 | -12.2 | Horiz 175 |
| 12 | 18.305M Ave | 6.8 | +8.4 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 111 | 16.0 | 30.0 | -14.0 | 180de 101 |
| ^ | 18.305M | 17.8 | +8.4 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 111 | 27.0 | 30.0 | -3.0 | 180de 101 |
| 14 | 169.265M | 46.5 | +0.0 +0.2 +0.0 -28.8 | +0.0 +0.9 +0.0 +0.0 | +9.8 +0.2 +0.0 +0.0 | +0.8 +0.0 +0.0 +0.0 | +0.0 360 | 29.6 | 44.0 | -14.4 | Vert 101 |
| 15 | 5416.435M Ave | 30.4 | +0.0 +0.0 +1.0 +0.0 | +34.5 +0.0 +3.9 -33.1 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.5 | +0.0 155 | 39.5 | 54.0 | -14.5 | Vert 116 |
| ^ | 5416.435M | 38.1 | +0.0 +0.0 +1.0 +0.0 | +34.5 +0.0 +3.9 -33.1 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.5 | +0.0 155 | 47.2 | 54.0 | -6.8 | Vert 116 |
| 17 | 24.352M Ave | 6.2 | +6.8 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 360 | 13.8 | 30.0 | -16.2 | 90deg 101 |

| | | | | | | | | | | | |
|----|---------------------|------|-------|------|-------|------|-------|-------|--------------------|-------|--------------|
| ^ | 24.352M | 17.4 | +6.8 | +0.0 | +0.0 | +0.3 | +0.0 | 25.0 | 30.0 | -5.0 | 90deg 101 |
| | | | +0.0 | +0.3 | +0.2 | +0.0 | 360 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 19 | 790.335M | 27.6 | +0.0 | +0.0 | +22.3 | +1.8 | +0.0 | 25.1 | 46.0 | -20.9 | Vert 101 |
| | | | +0.4 | +2.0 | +0.5 | +0.0 | 360 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.5 | +0.0 | | | | | | | |
| 20 | 794.660M | 25.5 | +0.0 | +0.0 | +22.4 | +1.8 | +0.0 | 23.1 | 46.0 | -22.9 | Horiz 175 |
| | | | +0.4 | +2.0 | +0.5 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.5 | +0.0 | | | | | | | |
| 21 | 1.114M | 29.1 | +10.1 | +0.0 | +0.0 | +0.1 | -40.0 | -0.6 | 26.8 | -27.4 | 180de 101 |
| | | | +0.0 | +0.1 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 22 | 154.620k Ambient | 48.5 | +10.0 | +0.0 | +0.0 | +0.0 | -80.0 | -21.5 | 24.1 NOISEFLOOR | -45.6 | 180de 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 360 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 23 | 50.900k Ambient | 38.4 | +10.4 | +0.0 | +0.0 | +0.0 | -80.0 | -31.2 | 33.8 NOISEFLOOR | -65.0 | 180de 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 24 | 11.544k Ambient | 45.6 | +15.8 | +0.0 | +0.0 | +0.0 | -80.0 | -18.6 | 46.8 NOISEFLOOR | -65.4 | 90deg 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 360 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 25 | 21.607k Ambient | 43.2 | +12.6 | +0.0 | +0.0 | +0.0 | -80.0 | -24.2 | 41.3 NOISEFLOOR | -65.5 | 180de 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 26 | 9.624k Ambient | 45.3 | +0.0 | +0.0 | +0.0 | +0.0 | -80.0 | -34.7 | 48.4 NOISEFLOOR | -83.1 | 180de 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | -16 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247/15.209**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/12/2009
 Time: 08:46:50
 Sequence#: 14
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------------------|-------------------------|------------------|--------------|----------|
| Mag Loop | 2156 | 06/04/2008 | 06/04/2010 | AN00052 |
| Antenna | 2453 | 12/22/2008 | 12/22/2010 | AN01994 |
| EMCO 3115 Horn | 9606-4854 | 11/12/2007 | 11/12/2009 | AN01412 |
| Horn Antenna, Active 18-26GHz | 1114018 | 11/13/2008 | 11/13/2010 | 2742 |
| Helix cable | N/A | 07/22/2008 | 07/22/2010 | AN05545 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03123 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03122 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03121 |
| Cable 30' | 11 | 11/05/2008 | 11/05/2010 | ANP05366 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Cable 20' | 16 | 11/10/2008 | 11/10/2010 | ANP05360 |
| Cable 6' | 51 | 12/30/2008 | 12/30/2010 | ANP05361 |
| Pasternack Coax | | 07/20/2007 | 07/20/2009 | AN05425 |
| HP 8447D Preamp | 2944A08601 | 07/08/2008 | 07/08/2010 | AN01517 |
| HP 83017A Pre-amp | 3123A00464 | 10/02/2007 | 10/02/2009 | AN01271 |
| Filter | 2 | 05/01/2008 | 05/01/2010 | 2750 |
| Filter | 311SH10-3000/T10000-0/0 | 12/02/2008 | 12/02/2010 | 3116 |
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|----------------|--------------|-----------------|---------------------|
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |
| Mini-Guardrail | Impinj | IPJ-A0303-0000E | 0069 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Radiated Spurious Emissions per FCC 15.247(d)

The Unit is an RF reader. It is located in the back edge of the test table.

All its ports are being exercised. It is being powered by the AC/DC converter.

It is connected to a laptop outside the chamber through a shielded ethernet cable.

The antenna is suspended 10cm above the wooden table with styrofoam.

The EUT will be in transmitting mode throughout the test in the MID channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 30.0 dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 915.25MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz

150kHz-30MHz RBW= 9kHz, VBW = 9kHz

30MHz - 1GHz RBW= 120kHz, VBW=120kHz

1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

T1=ANT- AN00052-06042008

T3=ANT AN01994 25-1000MHz

T5=CAB-ANP05361

T7=CAB-ANP05371

T9=CAB-ANP03123-120208

T11=Filter 1GHz HP AN02750

T13=AMP-AN01517-070808

T2=ANT-AN01412-111207

T4=CAB-ANP05360

T6=CAB-ANP05366

T8=CAB-ANP03121-120208

T10=CAB-ANP05545-072208

T12=FIL-AN03116-120208

T14=AMP-AN01271-100207 - .5-26.5 GHz

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 | T2 | T3 | T4 | Dist | Corr | Spec | Margin | Polar |
|---|-----------|------|-------|-------|-------|------|-------|------|------------|--------|-------|
| | | | T5 | T6 | T7 | T8 | | | | | |
| | | | T9 | T10 | T11 | T12 | | | | | |
| | | | T13 | T14 | | | | | | | |
| | MHz | dBμV | dB | dB | dB | dB | Table | dBμV | dBμV | dB | Ant |
| 1 | 11976.000 | 33.9 | +0.0 | +39.4 | +0.0 | +0.0 | +0.0 | 49.7 | 54.0 | -4.3 | Vert |
| | M | | +0.0 | +0.0 | +0.0 | +3.2 | | | | | |
| | Ambient | | +1.9 | +6.2 | +0.0 | +0.5 | 360 | | NOISEFLOOR | | 100 |
| | | | +0.0 | -35.4 | | | | | | | |
| 2 | 16112.000 | 31.1 | +0.0 | +38.6 | +0.0 | +0.0 | +0.0 | 49.0 | 54.0 | -5.0 | Vert |
| | M | | +0.0 | +0.0 | +0.0 | +3.1 | | | | | |
| | Ambient | | +0.9 | +7.5 | +0.0 | +0.4 | 360 | | NOISEFLOOR | | 100 |
| | | | +0.0 | -32.6 | | | | | | | |
| 3 | 99.500M | 55.8 | +0.0 | +0.0 | +10.1 | +0.6 | +0.0 | 38.3 | 44.0 | -5.7 | Vert |
| | | | +0.1 | +0.6 | +0.2 | +0.0 | | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.1 | +0.0 | | | | | | | |

| | | | | | | | | | | | |
|----|-----------------------|------|-------------------------------|--------------------------------|-------------------------------|----------------------|-------------|------|--------------------|-------|--------------|
| 4 | 1864.000M | 16.7 | +0.0 +0.0 +0.5 +0.0 | +26.8 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.4 +0.0 | +0.0 +1.1 +0.0 | +0.0 311 | 47.7 | 54.0 | -6.3 | Vert 116 |
| 5 | 7322.002M | 35.8 | +0.0 +0.0 +1.1 +0.0 | +36.4 +0.0 +4.7 -34.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.3 | +0.0 359 | 45.9 | 54.0 | -8.1 | Horiz 140 |
| 6 | 99.500M | 53.3 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.1 +0.2 +0.0 +0.0 | +0.6 +0.0 +0.0 | +0.0 360 | 35.8 | 44.0 | -8.2 | Horiz 175 |
| 7 | 24.540M Ambient | 14.0 | +6.7 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 | +0.0 24 | 21.5 | 30.0 NOISEFLOOR | -8.5 | 90deg 101 |
| 8 | 5491.467M | 36.4 | +0.0 +0.0 +0.8 +0.0 | +34.7 +0.0 +3.9 -33.3 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.0 +0.5 | +0.0 339 | 45.0 | 54.0 | -9.0 | Horiz 136 |
| 9 | 17624.000 M Ave | 20.2 | +0.0 +0.0 +1.5 +0.0 | +43.0 +0.0 +8.2 -33.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.6 +0.7 | +0.0 360 | 44.2 | 54.0 | -9.8 | Horiz 100 |
| 10 | 5491.675M | 35.6 | +0.0 +0.0 +0.8 +0.0 | +34.7 +0.0 +3.9 -33.3 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.0 +0.5 | +0.0 160 | 44.2 | 54.0 | -9.8 | Vert 125 |
| 11 | 3.337M Ambient | 8.3 | +10.5 +0.0 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.0 +0.1 +0.0 +0.0 | +0.2 +0.0 +0.0 | +0.0 360 | 19.3 | 30.0 NOISEFLOOR | -10.7 | 180de 101 |
| 12 | 67.000M | 51.0 | +0.0 +0.1 +0.0 -29.2 | +0.0 +0.4 +0.0 +0.0 | +5.9 +0.1 +0.0 +0.0 | +0.4 +0.0 +0.0 | +0.0 | 28.7 | 40.0 | -11.3 | Vert 100 |
| 13 | 167.300M | 48.6 | +0.0 +0.2 +0.0 -28.8 | +0.0 +0.9 +0.0 +0.0 | +10.0 +0.2 +0.0 +0.0 | +0.8 +0.0 +0.0 | +0.0 360 | 31.9 | 44.0 | -12.1 | Horiz 175 |
| 14 | 169.000M | 46.2 | +0.0 +0.2 +0.0 -28.8 | +0.0 +0.9 +0.0 +0.0 | +9.8 +0.2 +0.0 +0.0 | +0.8 +0.0 +0.0 | +0.0 | 29.3 | 44.0 | -14.7 | Vert 100 |
| 15 | 3660.930M Ave | 32.8 | +0.0 +0.0 +0.6 +0.0 | +31.9 +0.0 +3.0 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.7 +0.7 | +0.0 190 | 38.0 | 54.0 | -16.0 | Vert 140 |
| ^ | 3660.930M | 42.3 | +0.0 +0.0 +0.6 +0.0 | +31.9 +0.0 +3.0 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.7 +0.7 | +0.0 201 | 47.5 | 54.0 | -6.5 | Vert 140 |

| | | | | | | | | | | | |
|----|--------------------|------|-------------------------------|--------------------------------|-------------------------------|------------------------------|--------------|-------|--------------------|-------|--------------|
| 17 | 7321.995M Ave | 26.5 | +0.0 +0.0 +1.1 +0.0 | +36.4 +0.0 +4.7 -34.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.3 | +0.0 359 | 36.6 | 54.0 | -17.4 | Vert 140 |
| ^ | 7321.995M | 36.8 | +0.0 +0.0 +1.1 +0.0 | +36.4 +0.0 +4.7 -34.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.3 | +0.0 359 | 46.9 | 54.0 | -7.1 | Vert 140 |
| 19 | 3661.011M Ave | 31.1 | +0.0 +0.0 +0.6 +0.0 | +31.9 +0.0 +3.0 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.7 +0.7 | +0.0 360 | 36.3 | 54.0 | -17.7 | Horiz 140 |
| ^ | 3661.011M | 40.8 | +0.0 +0.0 +0.6 +0.0 | +31.9 +0.0 +3.0 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.7 +0.7 | +0.0 360 | 46.0 | 54.0 | -8.0 | Horiz 140 |
| 21 | 828.200M | 27.0 | +0.0 +0.4 +0.0 -29.4 | +0.0 +2.0 +0.0 +0.0 | +22.7 +0.4 +0.0 +0.0 | +1.8 +0.0 +0.0 +0.0 | +0.0 360 | 24.9 | 46.0 | -21.1 | Horiz 175 |
| 22 | 807.900M | 26.4 | +0.0 +0.4 +0.0 -29.5 | +0.0 +2.0 +0.0 +0.0 | +22.6 +0.5 +0.0 +0.0 | +1.9 +0.0 +0.0 +0.0 | +0.0 | 24.3 | 46.0 | -21.7 | Vert 100 |
| 23 | 68.700k Ambient | 38.2 | +10.1 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 360 | -31.7 | 31.2 NOISEFLOOR | -62.9 | 180de 101 |
| 24 | 29.769k Ambient | 41.9 | +11.4 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 | -26.7 | 38.5 NOISEFLOOR | -65.2 | 180de 101 |
| 25 | 10.740k Ambient | 46.0 | +16.2 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 | -17.8 | 47.5 NOISEFLOOR | -65.3 | 90deg 101 |
| 26 | 15.440k Ambient | 43.9 | +14.3 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 174 | -21.8 | 44.3 NOISEFLOOR | -66.1 | 90deg 101 |
| 27 | 9.186k Ambient | 44.6 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | +0.0 +0.0 +0.0 +0.0 | -80.0 336 | -35.4 | 48.8 NOISEFLOOR | -84.2 | 180de 101 |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247/15.209**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/12/2009
 Time: 08:51:33
 Sequence#: 13
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------------------|-------------------------|------------------|--------------|----------|
| Mag Loop | 2156 | 06/04/2008 | 06/04/2010 | AN00052 |
| Antenna | 2453 | 12/22/2008 | 12/22/2010 | AN01994 |
| EMCO 3115 Horn | 9606-4854 | 11/12/2007 | 11/12/2009 | AN01412 |
| Horn Antenna, Active 18-26GHz | 1114018 | 11/13/2008 | 11/13/2010 | 2742 |
| Helix cable | N/A | 07/22/2008 | 07/22/2010 | AN05545 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03123 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03122 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03121 |
| Cable 30' | 11 | 11/05/2008 | 11/05/2010 | ANP05366 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Cable 20' | 16 | 11/10/2008 | 11/10/2010 | ANP05360 |
| Cable 6' | 51 | 12/30/2008 | 12/30/2010 | ANP05361 |
| Pasternack Coax | | 07/20/2007 | 07/20/2009 | AN05425 |
| HP 8447D Preamp | 2944A08601 | 07/08/2008 | 07/08/2010 | AN01517 |
| HP 83017A Pre-amp | 3123A00464 | 10/02/2007 | 10/02/2009 | AN01271 |
| Filter | 2 | 05/01/2008 | 05/01/2010 | 2750 |
| Filter | 311SH10-3000/T10000-0/0 | 12/02/2008 | 12/02/2010 | 3116 |
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|----------------|--------------|-----------------|---------------------|
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |
| Mini-Guardrail | Impinj | IPJ-A0303-0000E | 0069 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Radiated Spurious Emissions per FCC 15.247(d)

The Unit is an RF reader. It is located in the back edge of the test table.
All its ports are being exercised. It is being powered by the AC/DC converter.
It is connected to a laptop outside the chamber through a shielded ethernet cable.
The antenna is suspended 10cm above the wooden table with styrofoam.
The EUT will be in transmitting mode throughout the test in the HIGH channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 30.0 dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 927.25MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz
150kHz-30MHz RBW= 9kHz, VBW = 9kHz
30MHz - 1GHz RBW= 120kHz, VBW=120kHz
1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

| | |
|----------------------------|--------------------------------------|
| T1=ANT- AN00052-06042008 | T2=ANT-AN01412-111207 |
| T3=ANT AN01994 25-1000MHz | T4=CAB-ANP05360 |
| T5=CAB-ANP05361 | T6=CAB-ANP05366 |
| T7=CAB-ANP05371 | T8=CAB-ANP03121-120208 |
| T9=CAB-ANP03123-120208 | T10=CAB-ANP05545-072208 |
| T11=Filter 1GHz HP AN02750 | T12=FIL-AN03116-120208 |
| T13=AMP-AN01517-070808 | T14=AMP-AN01271-100207 - .5-26.5 GHz |

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 T5 T9 T13 | T2 T6 T10 T14 | T3 T7 T11 | T4 T8 T12 | Dist | Corr | Spec | Margin | Polar |
|---|-----------|------|-----------------------|------------------------|-----------------|-----------------|-------|------|------------|--------|-------|
| | MHz | dBμV | dB | dB | dB | dB | Table | dBμV | dBμV | dB | Ant |
| 1 | 2704.000M | 17.2 | +0.0 | +29.7 | +0.0 | +0.0 | +0.0 | 52.1 | 54.0 | -1.9 | Horiz |
| | Ambient | | +0.0 | +0.0 | +0.0 | +1.4 | 360 | | NOISEFLOOR | | 116 |
| | | | +0.5 | +2.7 | +0.6 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 2 | 16232.000 | 33.1 | +0.0 | +38.8 | +0.0 | +0.0 | +0.0 | 51.1 | 54.0 | -2.9 | Vert |
| | M | | +0.0 | +0.0 | +0.0 | +2.9 | | | | | |
| | Ambient | | +0.8 | +7.6 | +0.0 | +0.5 | 209 | | NOISEFLOOR | | 109 |
| | | | +0.0 | -32.6 | | | | | | | |
| 3 | 100.310M | 55.8 | +0.0 | +0.0 | +10.2 | +0.6 | +0.0 | 38.4 | 44.0 | -5.6 | Vert |
| | | | +0.1 | +0.6 | +0.2 | +0.0 | 360 | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.1 | +0.0 | | | | | | | |
| 4 | 25.700M | 16.1 | +6.7 | +0.0 | +0.0 | +0.3 | +0.0 | 23.6 | 30.0 | -6.4 | 90deg |
| | | | +0.0 | +0.3 | +0.2 | +0.0 | 360 | | | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |

| | | | | | | | | | | | |
|----|---------------------------|------|-------------------------------|--------------------------------|-------------------------------|------------------------------|-------------|------|--------------------|-------|--------------|
| 5 | 24.350M Ambient | 16.0 | +6.8 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 +0.0 | +0.0 242 | 23.6 | 30.0 NOISEFLOOR | -6.4 | 180de 101 |
| 6 | 1868.000M Ambient | 16.5 | +0.0 +0.0 +0.5 +0.0 | +26.8 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.4 +0.0 | +0.0 +1.1 +0.0 | +0.0 | 47.5 | 54.0 NOISEFLOOR | -6.5 | Vert 116 |
| 7 | 17922.000 M Ambient | 20.0 | +0.0 +0.0 +1.6 +0.0 | +44.3 +0.0 +8.1 -33.1 | +0.0 +0.0 +0.0 +1.1 | +0.0 +3.7 +0.0 | +0.0 209 | 45.7 | 54.0 NOISEFLOOR | -8.3 | Horiz 109 |
| 8 | 100.310M | 52.4 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.2 +0.2 +0.0 +0.0 | +0.6 +0.0 +0.0 | +0.0 | 35.0 | 44.0 | -9.0 | Horiz 175 |
| 9 | 5563.769M | 36.6 | +0.0 +0.0 +0.8 +0.0 | +34.7 +0.0 +4.0 -33.4 | +0.0 +0.0 +0.0 +0.4 | +0.0 +1.9 +0.0 | +0.0 360 | 45.0 | 54.0 | -9.0 | Horiz 151 |
| 10 | 5563.619M | 36.6 | +0.0 +0.0 +0.8 +0.0 | +34.7 +0.0 +4.0 -33.4 | +0.0 +0.0 +0.0 +0.4 | +0.0 +1.9 +0.0 | +0.0 158 | 45.0 | 54.0 | -9.0 | Vert 114 |
| 11 | 3708.994M | 37.0 | +0.0 +0.0 +0.7 +0.0 | +32.1 +0.0 +2.9 -32.7 | +0.0 +0.0 +0.0 +0.7 | +0.0 +1.8 +0.7 | +0.0 197 | 42.5 | 54.0 | -11.5 | Vert 113 |
| 12 | 67.380M | 50.0 | +0.0 +0.1 +0.0 -29.2 | +0.0 +0.5 +0.0 +0.0 | +6.0 +0.2 +0.0 +0.0 | +0.5 +0.0 +0.0 | +0.0 360 | 28.1 | 40.0 | -11.9 | Vert 100 |
| 13 | 167.060M | 48.7 | +0.0 +0.2 +0.0 -28.8 | +0.0 +0.9 +0.0 +0.0 | +10.0 +0.2 +0.0 +0.0 | +0.8 +0.0 +0.0 | +0.0 | 32.0 | 44.0 | -12.0 | Horiz 175 |
| 14 | 3709.000M | 35.5 | +0.0 +0.0 +0.7 +0.0 | +32.1 +0.0 +2.9 -32.7 | +0.0 +0.0 +0.0 +0.7 | +0.0 +1.8 +0.7 | +0.0 290 | 41.0 | 54.0 | -13.0 | Horiz 107 |
| 15 | 16232.000 M Ambient | 21.3 | +0.0 +0.0 +0.8 +0.0 | +38.8 +0.0 +7.6 -32.6 | +0.0 +0.0 +0.0 +0.5 | +0.0 +2.9 +0.0 | +0.0 209 | 39.3 | 54.0 NOISEFLOOR | -14.7 | Vert 109 |
| 16 | 9272.394M Ave | 23.4 | +0.0 +0.0 +1.7 +0.0 | +38.8 +0.0 +5.3 -33.5 | +0.0 +0.0 +0.0 +0.4 | +0.0 +3.2 +0.0 | +0.0 209 | 39.3 | 54.0 | -14.7 | Vert 109 |
| ^ | 9272.394M | 35.5 | +0.0 +0.0 +1.7 +0.0 | +38.8 +0.0 +5.3 -33.5 | +0.0 +0.0 +0.0 +0.4 | +0.0 +3.2 +0.0 | +0.0 209 | 51.4 | 54.0 | -2.6 | Vert 109 |

| | | | | | | | | | | | |
|----|----------|------|-------|------|-------|------|-------|-------|------------|-------|-------|
| 18 | 168.840M | 45.3 | +0.0 | +0.0 | +9.9 | +0.8 | +0.0 | 28.5 | 44.0 | -15.5 | Vert |
| | | | +0.2 | +0.9 | +0.2 | +0.0 | 360 | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -28.8 | +0.0 | | | | | | | |
| 19 | 799.850M | 27.4 | +0.0 | +0.0 | +22.5 | +1.9 | +0.0 | 25.2 | 46.0 | -20.8 | Vert |
| | | | +0.4 | +2.0 | +0.5 | +0.0 | 360 | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.5 | +0.0 | | | | | | | |
| 20 | 37.227k | 40.1 | +10.8 | +0.0 | +0.0 | +0.0 | -80.0 | -29.1 | 36.6 | -65.7 | 180de |
| | Ambient | | +0.0 | +0.0 | +0.0 | +0.0 | 360 | | NOISEFLOOR | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 21 | 11.922k | 44.5 | +15.7 | +0.0 | +0.0 | +0.0 | -80.0 | -19.8 | 46.5 | -66.3 | 180de |
| | Ambient | | +0.0 | +0.0 | +0.0 | +0.0 | | | NOISEFLOOR | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247/15.209**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/12/2009
 Time: 09:43:21
 Sequence#: 9
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------------------|-------------------------|------------------|--------------|----------|
| Mag Loop | 2156 | 06/04/2008 | 06/04/2010 | AN00052 |
| Antenna | 2453 | 12/22/2008 | 12/22/2010 | AN01994 |
| EMCO 3115 Horn | 9606-4854 | 11/12/2007 | 11/12/2009 | AN01412 |
| Horn Antenna, Active 18-26GHz | 1114018 | 11/13/2008 | 11/13/2010 | 2742 |
| Helix cable | N/A | 07/22/2008 | 07/22/2010 | AN05545 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03123 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03122 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03121 |
| Cable 30' | 11 | 11/05/2008 | 11/05/2010 | ANP05366 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Cable 20' | 16 | 11/10/2008 | 11/10/2010 | ANP05360 |
| Cable 6' | 51 | 12/30/2008 | 12/30/2010 | ANP05361 |
| Pasternack Coax | | 07/20/2007 | 07/20/2009 | AN05425 |
| HP 8447D Preamp | 2944A08601 | 07/08/2008 | 07/08/2010 | AN01517 |
| HP 83017A Pre-amp | 3123A00464 | 10/02/2007 | 10/02/2009 | AN01271 |
| Filter | 2 | 05/01/2008 | 05/01/2010 | 2750 |
| Filter | 311SH10-3000/T10000-0/0 | 12/02/2008 | 12/02/2010 | 3116 |
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|---------------|---------------------|
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |
| Guardwall antenna | Impinj | IPJ-A0402-USA | 0116 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Radiated Spurious Emissions per FCC 15.247(d)

The Unit is an RF reader. It is located in the back edge of the test table.

All its ports are being exercised. It is being powered by the AC/DC converter.

It is connected to a laptop outside the chamber through a shielded ethernet cable.

The antenna is suspended 10cm above the wooden table with styrofoam.

The EUT will be in transmitting mode throughout the test in the LOW channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 30.0 dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 902.75MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz

150kHz-30MHz RBW= 9kHz, VBW = 9kHz

30MHz - 1GHz RBW= 120kHz, VBW=120kHz

1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

T1=ANT- AN00052-06042008

T3=ANT AN01994 25-1000MHz

T5=CAB-ANP05361

T7=CAB-ANP05371

T9=CAB-ANP03123-120208

T11=Filter 1GHz HP AN02750

T13=AMP-AN01517-070808

T2=ANT-AN01412-111207

T4=CAB-ANP05360

T6=CAB-ANP05366

T8=CAB-ANP03121-120208

T10=CAB-ANP05545-072208

T12=FIL-AN03116-120208

T14=AMP-AN01271-100207 - .5-26.5 GHz

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 T5 T9 T13 | T2 T6 T10 T14 | T3 T7 T11 | T4 T8 T12 | Dist | Corr | Spec | Margin | Polar |
|---|---------------------------|------|-------------------------------|--------------------------------|-------------------------------|----------------------|-------------|------|------------|--------|-------|
| | MHz | dBμV | dB | dB | dB | dB | Table | dBμV | dBμV | dB | Ant |
| 1 | 14145.000 M Ambient | 32.3 | +0.0 +0.0 +1.2 +0.0 | +41.1 +0.0 +6.8 -32.9 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.4 +0.8 | +0.0 | 52.7 | 54.0 | -1.3 | Horiz |
| | | | | | | | | | NOISEFLOOR | | 147 |
| 2 | 2743.600M Ambient | 16.2 | +0.0 +0.0 +0.5 +0.0 | +29.9 +0.0 +2.7 +0.0 | +0.0 +0.0 +0.6 +0.0 | +0.0 +1.4 +0.0 | +0.0 360 | 51.3 | 54.0 | -2.7 | Horiz |
| | | | | | | | | | NOISEFLOOR | | 116 |
| 3 | 16500.000 M Ambient | 32.3 | +0.0 +0.0 +1.0 +0.0 | +39.3 +0.0 +7.7 -33.1 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.3 +0.4 | +0.0 34 | 50.9 | 54.0 | -3.1 | Vert |
| | | | | | | | | | NOISEFLOOR | | 147 |
| 4 | 892.405M | 43.8 | +0.0 +0.5 +0.0 -29.3 | +0.0 +2.0 +0.0 +0.0 | +23.1 +0.2 +0.0 +0.0 | +1.8 +0.0 +0.0 | +0.0 360 | 42.1 | 46.0 | -3.9 | Vert |
| | | | | | | | | | | | 99 |

| | | | | | | | | | | | |
|----|---------------------------|------|-------------------------------|--------------------------------|-------------------------------|------------------------------|-------------|------|--------------------|-------|--------------|
| 5 | 892.405M | 42.9 | +0.0 +0.5 +0.0 -29.3 | +0.0 +2.0 +0.0 +0.0 | +23.1 +0.2 +0.0 +0.0 | +1.8 +0.0 +0.0 +0.0 | +0.0 | 41.2 | 46.0 | -4.8 | Horiz 175 |
| 6 | 100.065M | 54.4 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.2 +0.2 +0.0 +0.0 | +0.6 +0.0 +0.0 +0.0 | +0.0 360 | 37.0 | 44.0 | -7.0 | Vert 99 |
| 7 | 1817.200M Ambient | 14.8 | +0.0 +0.0 +0.5 +0.0 | +26.6 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.4 +0.0 | +0.0 +1.1 +0.0 +0.0 | +0.0 360 | 45.6 | 54.0 NOISEFLOOR | -8.4 | Vert 116 |
| 8 | 10480.000 M Ambient | 31.6 | +0.0 +0.0 +1.1 +0.0 | +38.2 +0.0 +5.5 -34.3 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.8 +0.0 +0.0 | +0.0 360 | 44.9 | 54.0 NOISEFLOOR | -9.1 | Vert 147 |
| 9 | 5416.504M | 35.4 | +0.0 +0.0 +1.0 +0.0 | +34.5 +0.0 +3.9 -33.1 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.3 +0.5 +0.0 | +0.0 199 | 44.5 | 54.0 | -9.5 | Vert 123 |
| 10 | 166.670M | 50.4 | +0.0 +0.2 +0.0 -28.8 | +0.0 +0.9 +0.0 +0.0 | +10.1 +0.2 +0.0 +0.0 | +0.8 +0.0 +0.0 +0.0 | +0.0 | 33.8 | 44.0 | -10.2 | Horiz 175 |
| 11 | 11310.000 M Ambient | 31.9 | +0.0 +0.0 +1.6 +0.0 | +39.0 +0.0 +5.8 -39.2 | +0.0 +0.0 +0.0 +0.0 | +0.0 +2.9 +0.2 +0.0 | +0.0 | 42.2 | 54.0 NOISEFLOOR | -11.8 | Horiz 147 |
| 12 | 100.930M | 49.2 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.3 +0.2 +0.0 +0.0 | +0.6 +0.0 +0.0 +0.0 | +0.0 | 31.9 | 44.0 | -12.1 | Horiz 175 |
| 13 | 14790.000 M Ave | 21.2 | +0.0 +0.0 +1.4 +0.0 | +40.8 +0.0 +7.2 -32.8 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.2 +0.5 +0.0 | +0.0 360 | 41.5 | 54.0 | -12.5 | Vert 147 |
| ^ | 14790.000 M | 32.3 | +0.0 +0.0 +1.4 +0.0 | +40.8 +0.0 +7.2 -32.8 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.2 +0.5 +0.0 | +0.0 360 | 52.6 | 54.0 | -1.4 | Vert 147 |
| 15 | 14145.000 M Ambient | 21.1 | +0.0 +0.0 +1.2 +0.0 | +41.1 +0.0 +6.8 -32.9 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.4 +0.8 +0.0 | +0.0 | 41.5 | 54.0 NOISEFLOOR | -12.5 | Horiz 147 |
| 16 | 3610.989M | 36.4 | +0.0 +0.0 +0.6 +0.0 | +31.8 +0.0 +3.0 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.6 +0.7 +0.0 | +0.0 247 | 41.4 | 54.0 | -12.6 | Horiz 99 |
| 17 | 9027.502M Ave | 23.5 | +0.0 +0.0 +1.6 +0.0 | +38.9 +0.0 +5.3 -33.8 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.1 +0.5 +0.0 | +0.0 180 | 39.1 | 54.0 | -14.9 | Vert 123 |

| | | | | | | | | | | | |
|----|------------------|------|-------|-------|-------|------|-------|-------|------|-------|--------------|
| ^ | 9027.500M | 32.8 | +0.0 | +38.9 | +0.0 | +0.0 | +0.0 | 48.4 | 54.0 | -5.6 | Vert 123 |
| | | | +0.0 | +0.0 | +0.0 | +3.1 | 180 | | | | |
| | | | +1.6 | +5.3 | +0.0 | +0.5 | | | | | |
| | | | +0.0 | -33.8 | | | | | | | |
| 19 | 9027.502M Ave | 22.9 | +0.0 | +38.9 | +0.0 | +0.0 | +0.0 | 38.5 | 54.0 | -15.5 | Horiz 124 |
| | | | +0.0 | +0.0 | +0.0 | +3.1 | 209 | | | | |
| | | | +1.6 | +5.3 | +0.0 | +0.5 | | | | | |
| | | | +0.0 | -33.8 | | | | | | | |
| ^ | 9027.502M | 32.4 | +0.0 | +38.9 | +0.0 | +0.0 | +0.0 | 48.0 | 54.0 | -6.0 | Horiz 124 |
| | | | +0.0 | +0.0 | +0.0 | +3.1 | 209 | | | | |
| | | | +1.6 | +5.3 | +0.0 | +0.5 | | | | | |
| | | | +0.0 | -33.8 | | | | | | | |
| 21 | 3610.989M Ave | 33.5 | +0.0 | +31.8 | +0.0 | +0.0 | +0.0 | 38.5 | 54.0 | -15.5 | Vert 99 |
| | | | +0.0 | +0.0 | +0.0 | +1.6 | 170 | | | | |
| | | | +0.6 | +3.0 | +0.0 | +0.7 | | | | | |
| | | | +0.0 | -32.7 | | | | | | | |
| ^ | 3610.989M | 39.5 | +0.0 | +31.8 | +0.0 | +0.0 | +0.0 | 44.5 | 54.0 | -9.5 | Vert 99 |
| | | | +0.0 | +0.0 | +0.0 | +1.6 | 170 | | | | |
| | | | +0.6 | +3.0 | +0.0 | +0.7 | | | | | |
| | | | +0.0 | -32.7 | | | | | | | |
| 23 | 169.265M | 44.8 | +0.0 | +0.0 | +9.8 | +0.8 | +0.0 | 27.9 | 44.0 | -16.1 | Vert 99 |
| | | | +0.2 | +0.9 | +0.2 | +0.0 | 360 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -28.8 | +0.0 | | | | | | | |
| 24 | 5416.492M | 28.5 | +0.0 | +34.5 | +0.0 | +0.0 | +0.0 | 37.6 | 54.0 | -16.4 | Horiz 123 |
| | | | +0.0 | +0.0 | +0.0 | +2.3 | 196 | | | | |
| | | | +1.0 | +3.9 | +0.0 | +0.5 | | | | | |
| | | | +0.0 | -33.1 | | | | | | | |
| 25 | 452.985M | 37.3 | +0.0 | +0.0 | +17.3 | +1.6 | +0.0 | 29.3 | 46.0 | -16.7 | Horiz 175 |
| | | | +0.3 | +1.6 | +0.5 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.3 | +0.0 | | | | | | | |
| 26 | 16.162M Ave | 2.8 | +8.6 | +0.0 | +0.0 | +0.3 | +0.0 | 12.2 | 30.0 | -17.8 | 90deg 101 |
| | | | +0.0 | +0.3 | +0.2 | +0.0 | 190 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| ^ | 16.162M | 15.5 | +8.6 | +0.0 | +0.0 | +0.3 | +0.0 | 24.9 | 30.0 | -5.1 | 90deg 101 |
| | | | +0.0 | +0.3 | +0.2 | +0.0 | 190 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 28 | 119.850k | 77.7 | +10.1 | +0.0 | +0.0 | +0.0 | -80.0 | 7.8 | 26.3 | -18.5 | 90deg 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 190 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 29 | 319.080k | 58.3 | +9.9 | +0.0 | +0.0 | +0.1 | -80.0 | -11.6 | 17.8 | -29.4 | 90deg 101 |
| | | | +0.0 | +0.0 | +0.1 | +0.0 | 190 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 30 | 123.780k | 63.4 | +10.1 | +0.0 | +0.0 | +0.0 | -80.0 | -6.5 | 26.0 | -32.5 | 180de 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 179 | | | | |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |

| | | | | | | | | | | | |
|----|----------|------|-------|------|------|------|-------|-------|------|-------|--------|
| 31 | 319.080k | 47.7 | +9.9 | +0.0 | +0.0 | +0.1 | -80.0 | -22.2 | 17.8 | -40.0 | 180deg |
| | | | +0.0 | +0.0 | +0.1 | +0.0 | 179 | | | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 32 | 15.755k | 64.1 | +14.2 | +0.0 | +0.0 | +0.0 | -80.0 | -1.7 | 44.1 | -45.8 | 90deg |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 190 | | | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 33 | 26.021k | 61.5 | +11.9 | +0.0 | +0.0 | +0.0 | -80.0 | -6.6 | 39.7 | -46.3 | 90deg |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 190 | | | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 34 | 12.018k | 62.6 | +15.6 | +0.0 | +0.0 | +0.0 | -80.0 | -1.8 | 46.5 | -48.3 | 90deg |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 190 | | | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 35 | 15.790k | 52.6 | +14.2 | +0.0 | +0.0 | +0.0 | -80.0 | -13.2 | 44.1 | -57.3 | 180deg |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 180 | | | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 36 | 12.030k | 51.7 | +15.6 | +0.0 | +0.0 | +0.0 | -80.0 | -12.7 | 46.5 | -59.2 | 180deg |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 180 | | | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247/15.209**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/12/2009
 Time: 09:50:20
 Sequence#: 8
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------------------|-------------------------|------------------|--------------|----------|
| Mag Loop | 2156 | 06/04/2008 | 06/04/2010 | AN00052 |
| Antenna | 2453 | 12/22/2008 | 12/22/2010 | AN01994 |
| EMCO 3115 Horn | 9606-4854 | 11/12/2007 | 11/12/2009 | AN01412 |
| Horn Antenna, Active 18-26GHz | 1114018 | 11/13/2008 | 11/13/2010 | 2742 |
| Helix cable | N/A | 07/22/2008 | 07/22/2010 | AN05545 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03123 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03122 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03121 |
| Cable 30' | 11 | 11/05/2008 | 11/05/2010 | ANP05366 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Cable 20' | 16 | 11/10/2008 | 11/10/2010 | ANP05360 |
| Cable 6' | 51 | 12/30/2008 | 12/30/2010 | ANP05361 |
| Pasternack Coax | | 07/20/2007 | 07/20/2009 | AN05425 |
| HP 8447D Preamp | 2944A08601 | 07/08/2008 | 07/08/2010 | AN01517 |
| HP 83017A Pre-amp | 3123A00464 | 10/02/2007 | 10/02/2009 | AN01271 |
| Filter | 2 | 05/01/2008 | 05/01/2010 | 2750 |
| Filter | 311SH10-3000/T10000-0/0 | 12/02/2008 | 12/02/2010 | 3116 |
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|---------------|---------------------|
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |
| Guardwall antenna | Impinj | IPJ-A0402-USA | 0116 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Radiated Spurious Emissions per FCC 15.247(d)

The Unit is an RF reader. It is located in the back edge of the test table.

All its ports are being exercised. It is being powered by the AC/DC converter.

It is connected to a laptop outside the chamber through a shielded ethernet cable.

The antenna is suspended 10cm above the wooden table with styrofoam.

The EUT will be in transmitting mode throughout the test in the MID channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 30.0 dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 915.25MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz

150kHz-30MHz RBW= 9kHz, VBW = 9kHz

30MHz - 1GHz RBW= 120kHz, VBW=120kHz

1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

T1=ANT- AN00052-06042008

T3=ANT AN01994 25-1000MHz

T5=CAB-ANP05361

T7=CAB-ANP05371

T9=CAB-ANP03123-120208

T11=Filter 1GHz HP AN02750

T13=AMP-AN01517-070808

T2=ANT-AN01412-111207

T4=CAB-ANP05360

T6=CAB-ANP05366

T8=CAB-ANP03121-120208

T10=CAB-ANP05545-072208

T12=FIL-AN03116-120208

T14=AMP-AN01271-100207 - .5-26.5 GHz

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 T5 T9 T13 | T2 T6 T10 T14 | T3 T7 T11 | T4 T8 T12 | Dist | Corr | Spec | Margin | Polar |
|---|---------------------------|------|-------------------------------|--------------------------------|-------------------------------|----------------------|-------------|------|--------------------|--------|--------------|
| | MHz | dBμV | dB | dB | dB | dB | Table | dBμV | dBμV | dB | Ant |
| 1 | 15414.000 M Ambient | 31.6 | +0.0 +0.0 +1.1 +0.0 | +38.9 +0.0 +7.2 -32.3 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.1 +0.4 | +0.0 375 | 50.0 | 54.0 Noisefloor | -4.0 | Horiz 115 |
| 2 | 904.700M | 43.1 | +0.0 +0.5 +0.0 -29.3 | +0.0 +2.0 +0.0 +0.0 | +23.2 +0.3 +0.0 +0.0 | +1.9 +0.0 +0.0 | +0.0 360 | 41.7 | 46.0 | -4.3 | Horiz 175 |
| 3 | 904.700M | 42.8 | +0.0 +0.5 +0.0 -29.3 | +0.0 +2.0 +0.0 +0.0 | +23.2 +0.3 +0.0 +0.0 | +1.9 +0.0 +0.0 | +0.0 | 41.4 | 46.0 | -4.6 | Vert 139 |
| 4 | 9248.500M Ambient | 30.9 | +0.0 +0.0 +1.7 +0.0 | +38.8 +0.0 +5.3 -33.5 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.2 +0.4 | +0.0 134 | 46.8 | 54.0 Noisefloor | -7.2 | Vert 115 |

| | | | | | | | | | | | |
|----|---------------------------|------|-------------------------------|--------------------------------|-------------------------------|----------------------|-------------|------|--------------------|-------|--------------|
| 5 | 1817.200M | 15.1 | +0.0 +0.0 +0.5 +0.0 | +26.6 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.4 +0.0 | +0.0 +1.1 +0.0 | +0.0 | 45.9 | 54.0 | -8.1 | Vert 128 |
| 6 | 100.400M | 53.0 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.2 +0.2 +0.0 +0.0 | +0.6 +0.0 +0.0 | +0.0 3 | 35.6 | 44.0 | -8.4 | Vert 139 |
| 7 | 24.880M Ambient | 13.5 | +6.6 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 | +0.0 162 | 20.9 | 30.0 Noisefloor | -9.1 | 180de 101 |
| 8 | 21.220M Ambient | 12.3 | +7.8 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 | +0.0 189 | 20.9 | 30.0 Noisefloor | -9.1 | 90deg 101 |
| 9 | 16.466M Ambient | 11.0 | +8.6 +0.0 +0.0 +0.0 | +0.0 +0.3 +0.0 +0.0 | +0.0 +0.2 +0.0 +0.0 | +0.3 +0.0 +0.0 | +0.0 226 | 20.4 | 30.0 Noisefloor | -9.6 | 180de 101 |
| 10 | 17655.000 M Ave | 20.0 | +0.0 +0.0 +1.3 +0.0 | +43.1 +0.0 +8.2 -33.1 | +0.0 +0.0 +0.0 +0.0 | +0.0 +3.5 +0.8 | +0.0 -11 | 43.8 | 54.0 | -10.2 | Vert 115 |
| 11 | 169.000M | 50.5 | +0.0 +0.2 +0.0 -28.8 | +0.0 +0.9 +0.0 +0.0 | +9.8 +0.2 +0.0 +0.0 | +0.8 +0.0 +0.0 | +0.0 360 | 33.6 | 44.0 | -10.4 | Horiz 175 |
| 12 | 11103.000 M Ambient | 30.8 | +0.0 +0.0 +1.5 +0.0 | +38.9 +0.0 +5.7 -36.6 | +0.0 +0.0 +0.0 +0.2 | +0.0 +2.9 +0.0 | +0.0 134 | 43.4 | 54.0 Noisefloor | -10.6 | Horiz 115 |
| 13 | 99.500M | 48.5 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.1 +0.2 +0.0 +0.0 | +0.6 +0.0 +0.0 | +0.0 360 | 31.0 | 44.0 | -13.0 | Horiz 175 |
| 14 | 3660.996M Ave | 33.1 | +0.0 +0.0 +0.6 +0.0 | +31.9 +0.0 +3.0 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.7 +0.7 | +0.0 217 | 38.3 | 54.0 | -15.7 | Vert 109 |
| ^ | 3660.996M | 40.5 | +0.0 +0.0 +0.6 +0.0 | +31.9 +0.0 +3.0 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.7 +0.7 | +0.0 217 | 45.7 | 54.0 | -8.3 | Vert 109 |
| 16 | 452.400M | 37.9 | +0.0 +0.3 +0.0 -29.3 | +0.0 +1.6 +0.0 +0.0 | +17.2 +0.5 +0.0 +0.0 | +1.6 +0.0 +0.0 | +0.0 360 | 29.8 | 46.0 | -16.2 | Horiz 175 |
| 17 | 3661.001M Ave | 28.2 | +0.0 +0.0 +0.6 +0.0 | +31.9 +0.0 +3.0 -32.7 | +0.0 +0.0 +0.0 +0.0 | +0.0 +1.7 +0.7 | +0.0 202 | 33.4 | 54.0 | -20.6 | Horiz 115 |

| | | | | | | | | | | | |
|----|--------------------|------|-------|-------|------|------|-------|-------|------------|-------|-------|
| ^ | 3661.001M | 39.4 | +0.0 | +31.9 | +0.0 | +0.0 | +0.0 | 44.6 | 54.0 | -9.4 | Horiz |
| | | | +0.0 | +0.0 | +0.0 | +1.7 | 202 | | | | 115 |
| | | | +0.6 | +3.0 | +0.0 | +0.7 | | | | | |
| | | | +0.0 | -32.7 | | | | | | | |
| 19 | 1.038M Ambient | 28.2 | +10.0 | +0.0 | +0.0 | +0.1 | -40.0 | -1.6 | 27.4 | -29.0 | 180de |
| | | | +0.0 | +0.1 | +0.0 | +0.0 | 226 | | Noisefloor | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 20 | 17.507k Ambient | 44.5 | +13.6 | +0.0 | +0.0 | +0.0 | -80.0 | -21.9 | 43.2 | -65.1 | 90deg |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 189 | | Noisefloor | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 21 | 9.834k Ambient | 46.3 | +0.0 | +0.0 | +0.0 | +0.0 | -80.0 | -33.7 | 48.2 | -81.9 | 180de |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 226 | | Noisefloor | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 22 | 9.540k Ambient | 45.8 | +0.0 | +0.0 | +0.0 | +0.0 | -80.0 | -34.2 | 48.5 | -82.7 | 90deg |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | 298 | | Noisefloor | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |

Test Location: CKC Laboratories • 22116 23rd Dr SE • Bothell, WA 98021-4413 • 425-402-1717

Customer: **Impinj Inc**
 Specification: **FCC 15.247/15.209**
 Work Order #: **89028**
 Test Type: **Radiated Scan**
 Equipment: **RFID Reader**
 Manufacturer: Impinj
 Model: IPJ-REV
 S/N: 940-08-21-0006

Date: 2/12/2009
 Time: 09:57:54
 Sequence#: 7
 Tested By: Armando Del Angel

Test Equipment:

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|-------------------------------|-------------------------|------------------|--------------|----------|
| Mag Loop | 2156 | 06/04/2008 | 06/04/2010 | AN00052 |
| Antenna | 2453 | 12/22/2008 | 12/22/2010 | AN01994 |
| EMCO 3115 Horn | 9606-4854 | 11/12/2007 | 11/12/2009 | AN01412 |
| Horn Antenna, Active 18-26GHz | 1114018 | 11/13/2008 | 11/13/2010 | 2742 |
| Helix cable | N/A | 07/22/2008 | 07/22/2010 | AN05545 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03123 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03122 |
| High freq. Cable | N/A | 12/02/2008 | 12/02/2010 | AN03121 |
| Cable 30' | 11 | 11/05/2008 | 11/05/2010 | ANP05366 |
| Cable 6' | 49 | 11/10/2008 | 11/10/2010 | ANP05371 |
| Cable 20' | 16 | 11/10/2008 | 11/10/2010 | ANP05360 |
| Cable 6' | 51 | 12/30/2008 | 12/30/2010 | ANP05361 |
| Pasternack Coax | | 07/20/2007 | 07/20/2009 | AN05425 |
| HP 8447D Preamp | 2944A08601 | 07/08/2008 | 07/08/2010 | AN01517 |
| HP 83017A Pre-amp | 3123A00464 | 10/02/2007 | 10/02/2009 | AN01271 |
| Filter | 2 | 05/01/2008 | 05/01/2010 | 2750 |
| Filter | 311SH10-3000/T10000-0/0 | 12/02/2008 | 12/02/2010 | 3116 |
| Spectrum Analyzer | MY46186330 | 03/10/2007 | 03/10/2009 | 2872 |

Equipment Under Test (* = EUT):

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|---------------|---------------------|
| RFID Reader* | Impinj | IPJ-REV | 940-08-21-0006 |
| AC/DC adaptor | CUI | DSA-60W-20 | ETS240250UC-P11P-DB |
| Guardwall antenna | Impinj | IPJ-A0402-USA | 0116 |

Support Devices:

| Function | Manufacturer | Model # | S/N |
|-------------------|--------------|-----------|---------------|
| Laptop Computer | Dell | Latitude | 6497402833 |
| Wireless G Router | Belkin | F5D7230-4 | 2028723009696 |

Test Conditions / Notes:

20°C / 26% relative humidity / 102.3 kPa.

Testing Radiated Spurious Emissions per FCC 15.247(d).

The Unit is an RF reader. It is located in the back edge of the test table.

All its ports are being exercised. It is being powered by the AC/DC converter.

It is connected to a laptop outside the chamber through a shielded ethernet cable.

The antenna is suspended 10cm above the wooden table with styrofoam.

The EUT will be in transmitting mode throughout the test in the HIGH channel.

Remote support computer sends commands to the EUT to exercise the intended functionalities.

Power setting = 30.0 dBm

Operating Frequency range = 902 - 928MHz

Frequency under test = 927.25MHz

Frequency range of measurement = 9kHz - 19GHz.

Frequency: 9kHz - 150kHz RBW= 200Hz, VBW= 200Hz

150kHz-30MHz RBW= 9kHz, VBW = 9kHz

30MHz - 1GHz RBW= 120kHz, VBW=120kHz

1GHz-19GHz RBW= 1 MHz, VBW=1 MHz.

Transducer Legend:

T1=ANT- AN00052-06042008

T3=ANT AN01994 25-1000MHz

T5=CAB-ANP05361

T7=CAB-ANP05371

T9=CAB-ANP03123-120208

T11=Filter 1GHz HP AN02750

T13=AMP-AN01517-070808

T2=ANT-AN01412-111207

T4=CAB-ANP05360

T6=CAB-ANP05366

T8=CAB-ANP03121-120208

T10=CAB-ANP05545-072208

T12=FIL-AN03116-120208

T14=AMP-AN01271-100207 - .5-26.5 GHz

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 T5 T9 T13 | T2 T6 T10 T14 | T3 T7 T11 | T4 T8 T12 | Dist | Corr | Spec | Margin | Polar |
|---|-----------|------|-----------------------|------------------------|-----------------|-----------------|-------|------|------------|--------|-------|
| | MHz | dBμV | dB | dB | dB | dB | Table | dBμV | dBμV | dB | Ant |
| 1 | 9272.507M | 34.2 | +0.0 | +38.8 | +0.0 | +0.0 | +0.0 | 50.1 | 54.0 | -3.9 | Horiz |
| | Ambient | | +0.0 | +0.0 | +0.0 | +3.2 | 212 | | NOISEFLOOR | | 109 |
| | | | +1.7 | +5.3 | +0.0 | +0.4 | | | | | |
| | | | +0.0 | -33.5 | | | | | | | |
| 2 | 916.440M | 43.2 | +0.0 | +0.0 | +23.3 | +1.9 | +0.0 | 42.0 | 46.0 | -4.0 | Vert |
| | | | +0.5 | +2.0 | +0.4 | +0.0 | | | | | 100 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.3 | +0.0 | | | | | | | |
| 3 | 15936.000 | 30.8 | +0.0 | +38.4 | +0.0 | +0.0 | +0.0 | 48.7 | 54.0 | -5.3 | Vert |
| | M | | +0.0 | +0.0 | +0.0 | +3.2 | | | | | |
| | Ambient | | +1.0 | +7.4 | +0.0 | +0.5 | 212 | | NOISEFLOOR | | 109 |
| | | | +0.0 | -32.6 | | | | | | | |
| 4 | 916.440M | 41.3 | +0.0 | +0.0 | +23.3 | +1.9 | +0.0 | 40.1 | 46.0 | -5.9 | Horiz |
| | | | +0.5 | +2.0 | +0.4 | +0.0 | 360 | | | | 159 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | -29.3 | +0.0 | | | | | | | |

| | | | | | | | | | | | |
|----|---------------------------|------|-------------------------------|--------------------------------|-------------------------------|----------------------|-------------|------|------|-------|--------------|
| 5 | 1854.499M Ave | 17.0 | +0.0 +0.0 +0.5 +0.0 | +26.8 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.4 +0.0 | +0.0 +1.1 +0.0 | +0.0 209 | 48.0 | 54.0 | -6.0 | Horiz 144 |
| ^ | 1854.499M | 22.4 | +0.0 +0.0 +0.5 +0.0 | +26.8 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.4 +0.0 | +0.0 +1.1 +0.0 | +0.0 209 | 53.4 | 54.0 | -0.6 | Horiz 144 |
| 7 | 100.310M | 54.9 | +0.0 +0.1 +0.0 -29.1 | +0.0 +0.6 +0.0 +0.0 | +10.2 +0.2 +0.0 +0.0 | +0.6 +0.0 +0.0 | +0.0 37 | 37.5 | 44.0 | -6.5 | Vert 100 |
| 8 | 1854.516M Ave | 13.7 | +0.0 +0.0 +0.5 +0.0 | +26.8 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.4 +0.0 | +0.0 +1.1 +0.0 | +0.0 170 | 44.7 | 54.0 | -9.3 | Vert 128 |
| ^ | 1854.516M | 20.3 | +0.0 +0.0 +0.5 +0.0 | +26.8 +0.0 +2.2 +0.0 | +0.0 +0.0 +0.4 +0.0 | +0.0 +1.1 +0.0 | +0.0 170 | 51.3 | 54.0 | -2.7 | Vert 128 |
| 10 | 168.840M | 50.8 | +0.0 +0.2 +0.0 -28.8 | +0.0 +0.9 +0.0 +0.0 | +9.9 +0.2 +0.0 +0.0 | +0.8 +0.0 +0.0 | +0.0 360 | 34.0 | 44.0 | -10.0 | Horiz 159 |
| 11 | 17688.000 M Ambient | 19.9 | +0.0 +0.0 +1.3 +0.0 | +43.3 +0.0 +8.2 -33.1 | +0.0 +0.0 +0.0 +0.8 | +0.0 +3.5 +0.0 | +0.0 212 | 43.9 | 54.0 | -10.1 | Horiz 109 |
| 12 | 451.860M | 40.0 | +0.0 +0.3 +0.0 -29.3 | +0.0 +1.6 +0.0 +0.0 | +17.2 +0.5 +0.0 +0.0 | +1.6 +0.0 +0.0 | +0.0 360 | 31.9 | 46.0 | -14.1 | Horiz 159 |
| 13 | 9272.507M Ave | 23.9 | +0.0 +0.0 +1.7 +0.0 | +38.8 +0.0 +5.3 -33.5 | +0.0 +0.0 +0.0 +0.4 | +0.0 +3.2 +0.0 | +0.0 212 | 39.8 | 54.0 | -14.2 | Vert 109 |
| ^ | 9272.507M | 34.4 | +0.0 +0.0 +1.7 +0.0 | +38.8 +0.0 +5.3 -33.5 | +0.0 +0.0 +0.0 +0.4 | +0.0 +3.2 +0.0 | +0.0 212 | 50.3 | 54.0 | -3.7 | Vert 109 |
| 15 | 162.610M | 45.3 | +0.0 +0.2 +0.0 -28.8 | +0.0 +0.9 +0.0 +0.0 | +10.4 +0.2 +0.0 +0.0 | +0.8 +0.0 +0.0 | +0.0 | 29.0 | 44.0 | -15.0 | Vert 100 |
| 16 | 3708.999M Ave | 30.4 | +0.0 +0.0 +0.7 +0.0 | +32.1 +0.0 +2.9 -32.7 | +0.0 +0.0 +0.0 +0.7 | +0.0 +1.8 +0.0 | +0.0 197 | 35.9 | 54.0 | -18.1 | Vert 113 |
| ^ | 3708.999M | 38.2 | +0.0 +0.0 +0.7 +0.0 | +32.1 +0.0 +2.9 -32.7 | +0.0 +0.0 +0.0 +0.7 | +0.0 +1.8 +0.0 | +0.0 197 | 43.7 | 54.0 | -10.3 | Vert 113 |

| | | | | | | | | | | | |
|----|-----------|------|-------|-------|------|------|-------|-------|------------|-------|-------|
| 18 | 5563.495M | 27.0 | +0.0 | +34.7 | +0.0 | +0.0 | +0.0 | 35.4 | 54.0 | -18.6 | Vert |
| | | | +0.0 | +0.0 | +0.0 | +1.9 | 197 | | | | 114 |
| | | | +0.8 | +4.0 | +0.0 | +0.4 | | | | | |
| | | | +0.0 | -33.4 | | | | | | | |
| 19 | 1.087M | 29.4 | +10.0 | +0.0 | +0.0 | +0.1 | -40.0 | -0.4 | 27.0 | -27.4 | 180de |
| | Ambient | | +0.0 | +0.1 | +0.0 | +0.0 | | | NOISEFLOOR | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 20 | 135.550k | 46.7 | +9.9 | +0.0 | +0.0 | +0.0 | -80.0 | -23.4 | 25.3 | -48.7 | 180de |
| | Ambient | | +0.0 | +0.0 | +0.0 | +0.0 | 190 | | NOISEFLOOR | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 21 | 11.862k | 45.2 | +15.7 | +0.0 | +0.0 | +0.0 | -80.0 | -19.1 | 46.6 | -65.7 | 90deg |
| | Ambient | | +0.0 | +0.0 | +0.0 | +0.0 | 352 | | NOISEFLOOR | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 22 | 18.454k | 42.6 | +13.3 | +0.0 | +0.0 | +0.0 | -80.0 | -24.1 | 42.7 | -66.8 | 180de |
| | Ambient | | +0.0 | +0.0 | +0.0 | +0.0 | | | NOISEFLOOR | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |
| 23 | 11.928k | 40.8 | +15.7 | +0.0 | +0.0 | +0.0 | -80.0 | -23.5 | 46.5 | -70.0 | 180de |
| | Ambient | | +0.0 | +0.0 | +0.0 | +0.0 | 328 | | NOISEFLOOR | | 101 |
| | | | +0.0 | +0.0 | +0.0 | +0.0 | | | | | |
| | | | +0.0 | +0.0 | | | | | | | |

RSS-210 – 99% BANDWIDTH

Test Equipment

| Asset # | Name | Manufacturer | Model | Serial | Cal date | Cal Due |
|---------|-------------------|--------------|-----------|------------|------------|------------|
| P05747 | Attenuator | Pasternack | PE7004-20 | NA | 4/3/2008 | 4/3/2010 |
| P05748 | Attenuator | Pasternack | PE7004-20 | NA | 4/3/2008 | 4/3/2010 |
| P05371 | Cable 6' | Belden | RG-214 | RG214 49 | 11/10/2008 | 11/10/2010 |
| 2872 | Spectrum Analyzer | Agilent | E4440A | MY46186330 | 1/31/2008 | 1/31/2010 |

Test Conditions

EUT is transmitting at maximum rate. PSA is on max hold, Agilent procedure is used where the Occupied Bandwidth option is used in three channels (LOW, MID, HIGH), and the span is set to 1MHz and the RBW to 1 kHz.

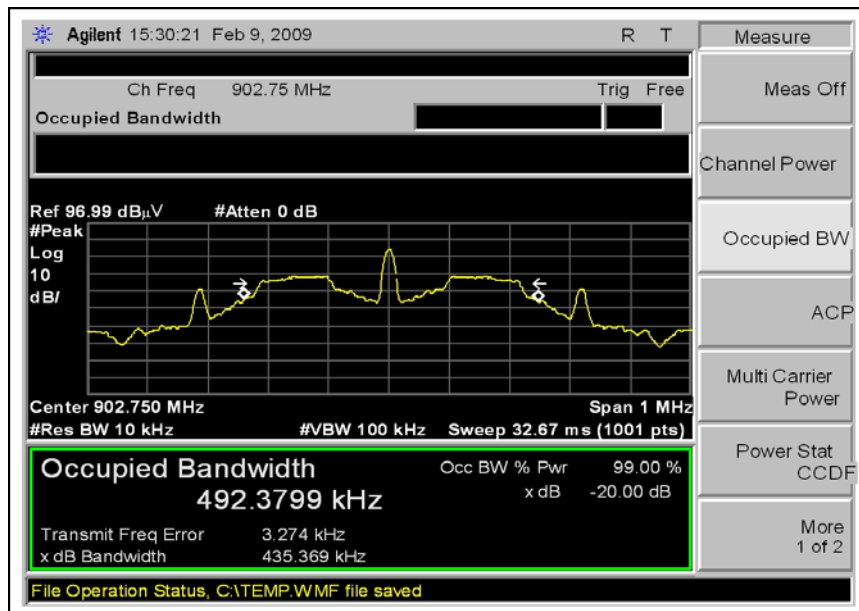
Result: Less than 500 kHz

Test Setup Photos

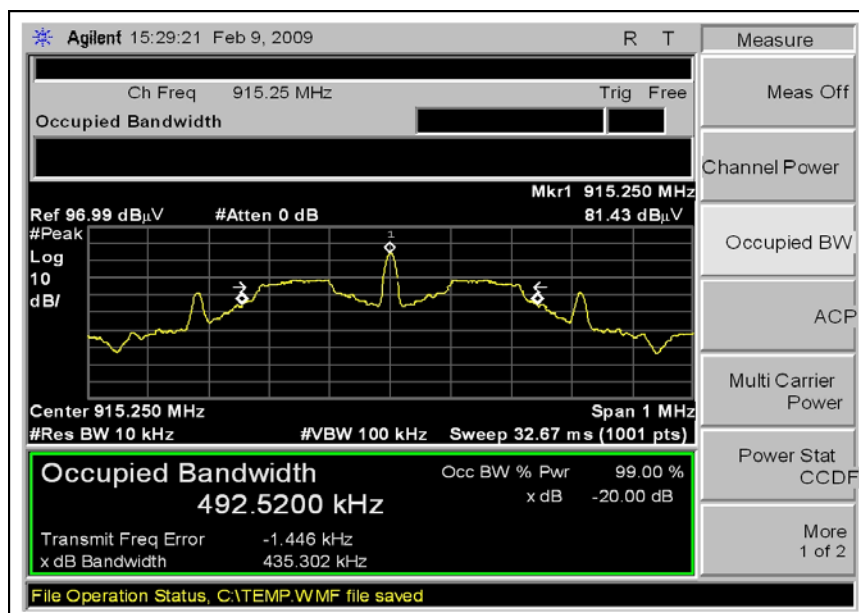


Test Plots

RSS-210 – LOW CHANNEL



RSS-210 – MID CHANNEL



RSS-210 – HIGH CHANNEL

