



IMPINJ, INCORPORATED TEST REPORT

FOR THE

SPEEDWAY READER, IPJ-R1000

**FCC PART 15 SUBPART B SECTIONS 15.107 & 15.109 CLASS B,
SUBPART C SECTIONS 15.207, 15.209 & 15.247 AND RSS-210**

COMPLIANCE

DATE OF ISSUE: JANUARY 27, 2006

PREPARED FOR:

Impinj, Incorporated
701 N. 34th Street, Suite 300
Seattle, WA 98103

PREPARED BY:

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

P.O. No.: 01143
W.O. No.: 83127

Date of test: January 25-26, 2006

Report No.: FC06-010

This report contains a total of 67 pages and may be reproduced in full only. Partial reproduction may only be done with the written consent of CKC Laboratories, Inc. The results in this report apply only to the items tested, as identified herein.

TABLE OF CONTENTS

Administrative Information	4
FCC to Canada Transmitter Standard Correlation Matrix	5
Conditions for Compliance	5
Approvals	5
Equipment Under Test (EUT) Description	6
FCC 15.31(e) Voltage Variation	6
FCC 15.31(m) Number Of Channels	6
FCC 15.33(a) Frequency Ranges Tested	6
FCC 15.35 Analyzer Bandwidth Settings	6
FCC 15.203 Antenna Requirements	6
FCC 15.205 Restricted Bands	7
EUT Operating Frequency	7
Equipment Under Test	7
Peripheral Devices	7
Report of Measurements	8
Table 1: FCC 15.107 Six Highest Conducted Emission Levels	8
Table 2: FCC 15.109 Six Highest Radiated Emission Levels	9
Table 3: FCC 15.207 Six Highest Conducted Emission Levels	10
Table 4: FCC 15.209 Six Highest Radiated Emission Levels: 10-30 MHz	11
Table 5: FCC 15.209/15.247 Six Highest Radiated Emission Levels	12
FCC 15.247(a)(1) 20dB Bandwidth	13
FCC 15.247(a)(1) Frequency Separation	16
FCC 15.247(a)(1) Number Of Hopping Channels	17
FCC 15.247(a)(1) Dwell Time Per Hop	18
FCC 15.247(a)(1) (i) Average Time Of Occupancy	20
RSS-210 Average Time Of Occupancy – 10 Seconds	22
Table 6: FCC 15.247(b)(2) Fundamental Emission Levels	23
FCC 15.247(d) Bandedge	24
RSS-210 99% Bandwidth	26
Temperature And Humidity During Testing	29
EUT Setup	29
Correction Factors	29
Table A: Sample Calculations	29
Test Instrumentation and Analyzer Settings	30
Spectrum Analyzer Detector Functions	30
Peak	30
Quasi-Peak	30
Average	30
EUT Testing	31
Mains Conducted Emissions	31
Antenna Conducted Emissions	31
Radiated Emissions	31

Appendix A: Test Setup Photographs.....	32
Photograph Showing Voltage Variations.....	33
Photograph Showing Mains Conducted Emissions	34
Photograph Showing Mains Conducted Emissions	35
Photograph Showing Radiated Emissions	36
Photograph Showing Radiated Emissions	37
Photograph Showing Radiated Emissions	38
Photograph Showing Direct Connect Power	39
Photograph Showing Direct Connect Spurious Emissions.....	40
Appendix B: Test Equipment List	41
Appendix C: Measurement Data Sheets	42

ADMINISTRATIVE INFORMATION

DATE OF TEST: January 25-26, 2006

DATE OF RECEIPT: January 25, 2006

MANUFACTURER: Impinj, Incorporated
701 N. 34th Street, Suite 300
Seattle, WA 98103

REPRESENTATIVE: William Ashley

TEST LOCATION: CKC Laboratories, Inc.
110 Olinda Place
Brea, CA 92823

TEST METHOD: ANSI C63.4 (2003), DA 02-2138 August 30, 2002, DA 00-705 March 30, 2000, KDB Publication No. 558074, RSS-210, RSS-310 and RSS-GEN

PURPOSE OF TEST: To demonstrate the compliance of the Speedway Reader, IPJ-R1000, with the requirements for FCC part 15 Subpart B sections 15.107 & 15.109 Class B, Subpart C Sections 15.207, 15.209 & 15.247 and RSS-210 devices.

FCC TO CANADA TRANSMITTER STANDARD CORRELATION MATRIX

Canadian Standard	Canadian Section	FCC Standard	FCC Section	Test Description
RSS GEN	7.1.4	47CFR	15.203	Antenna Connector Requirements
RSS GEN	7.2.1	47CFR	15.35(c)	Pulsed Operation
RSS GEN	7.2.2	47CFR	15.207	AC Mains Conducted Emissions Requirement
RSS 210	2.1	47CFR	15.215(c)	Frequency Stability Recommendation
RSS 210	2.2	47CFR	15.205	Restricted Bands of Operation
RSS 210	2.6	47CFR	15.209	General Radiated Emissions Requirement
RSS 210	A8.1	47CFR	15.247(a)(1)	Definition of FHSS
RSS 210	A8.1	47CFR	15.247(h)	Incorporation of Intelligence
RSS 210	A8.1(1)	47CFR	15.247(a)(1)	Minimum Channel Bandwidth
RSS 210	A8.1(1)	47CFR	15.247(g)	Hopping Sequence
RSS 210	A8.1(2)	47CFR	15.247(a)(1)	Carrier Separation
RSS 210	A8.1(3)	47CFR	15.247(a)(1)(i)	Carrier Separation
RSS 210	A8.1(3)	47CFR	15.247(a)(1)(i)	Average Time of Occupancy
RSS 210	A8.1(3)	47CFR	15.247(a)(1)(i)	Number of Hopping Channels
RSS 210	A8.4(1)	47CFR	15.247(b)(2)	RF Power Output
RSS 210	A8.5	47CFR	15.247(d)	Spurious Emissions
	IC 3172-D		100638	Site File No.

CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply.

APPROVALS

Steve Behm, Director of Engineering Services

QUALITY ASSURANCE:



Joyce Walker, Quality Assurance Administrative Manager

TEST PERSONNEL:



Septimiu Apahidean, EMC Test Engineer

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The customer declares the EUT tested by CKC Laboratories was representative of a production unit. The EUT is a commercial RFID fixed transceiver (duplex) using FHSS.

FCC 15.31(e) Voltage Variations

FREQUENCY MHz	CORRECTED READING	CORRECTED READING	CORRECTED READING	SPEC LIMIT dBm
	dBm 85%	dBm 100%	dBm 115%	
902.75	29.7	29.7	29.8	30.0
915.25	29.8	29.8	29.8	30.0
927.25	29.7	29.9	29.9	30.0

Test Method: ANSI C63.4 (2003)
 Spec Limit: FCC Part 15 Subpart C Section 15.247(b)(1)/15.31(e)
 Test Distance: No Distance

FCC 15.31(m) Number Of Channels

This device operates on 50 channels and 3 channels were tested. Channels span the frequency range of 902.75 MHz to 927.75 MHz at 500 kHz spacing. Low (902.75), middle (915.25) and high (927.25) channels were tested.

FCC 15.33(a) Frequency Ranges Tested

15.107 Conducted Emissions: 150 kHz – 30 MHz
 15.109 Radiated Emissions: 30 MHz – 1000 MHz
 15.207 Conducted Emissions: 150 kHz – 30 MHz
 15.209/15.247 Radiated Emissions: 10 MHz – 10 GHz

FCC SECTION 15.35: ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	10 MHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	10 GHz	1 MHz

FCC 15.203 Antenna Requirements

The Speedway reader uses reverse-polarity TNC female connectors for its antenna ports. The reverse-polarity connector is a non-standard RF connector type. The use of these connectors prohibits connection to a RF antenna with standard RF connectors (e.g. N-type). Speedway certified antennas possess a female reverse-polarity TNC connector and can be connected directly to the reader. The antenna gain is 6 dBi.

FCC 15.205 Restricted Bands

The fundamental operating frequency lies outside the restricted bands and therefore complies with the requirements of Section 15.205 of the FCC rules. Any spurious emission coming from the EUT was investigated to determine if any portion lies inside the restricted band. If any portion of a spurious emissions signal was found to be within a restricted band, investigation was performed to ensure compliance with Section 15.209.

EUT Operating Frequency

The EUT is a frequency hopping device operating in the 902 – 928 MHz band.

EQUIPMENT UNDER TEST

UHF RFID

Manuf: Impinj, Incorporated
Model: IPJ-R1000
Serial: 40306020043
FCC ID: TWYIPJR1000 (pending)

Antenna

Manuf: Cushcraft
Model: S9028PCL
Serial: NA
FCC ID: DoC

Power Supply

Manuf: CUI Inc.
Model: DSA-60W-20 1 24060
Mfg. P/N: DTS240259U-P11P-DB
Serial: NA
FCC ID: NA

PERIPHERAL DEVICES

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

Laptop

Manuf: Compaq
Model: Presario V2000
Serial: CNF5391NBO
FCC ID: DoC

REPORT OF MEASUREMENTS

The following tables report the six highest worst case levels recorded during the tests performed on the EUT. All readings taken are peak readings unless otherwise noted. The data sheets from which these tables were compiled are contained in Appendix C.

Table 1: FCC 15.107 Six Highest Conducted Emission Levels									
FREQUENCY MHz	METER READING dB μ V	CORRECTION FACTORS				CORRECTED READING dB μ V	SPEC LIMIT dB μ V	MARGIN dB	NOTES
		Att dB	Cable dB	HPF dB	Lisn dB				
0.168180	38.1	5.8	0.0	0.3	0.1	44.3	55.0	-10.7	W
0.360890	31.9	5.8	0.0	0.2	0.1	38.0	48.7	-10.7	W
0.362708	30.9	5.8	0.0	0.2	0.1	37.0	48.7	-11.7	B
0.420884	31.2	5.8	0.0	0.2	0.1	37.3	47.4	-10.1	W
0.422702	29.2	5.8	0.0	0.2	0.1	35.3	47.4	-12.1	B
0.659044	28.2	5.8	0.1	0.3	0.1	34.5	46.0	-11.5	W

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart B Section 15.107 Class B

NOTES: B = Black Lead
W = White Lead

COMMENTS: EUT is connected to the remote laptop via ethernet cable, connected to the EUT is the antenna on port one, a DB9 cable connected to the serial port and a DB25 cable connected to the GPIO port. The EUT is powered by an external AC/DC power adapter. The remote laptop is controlling the EUT. Frequency range tested: 150 kHz – 30 MHz.

Table 2: FCC 15.109 Six Highest Radiated Emission Levels

FREQUENCY MHz	METER READING dB μ V	CORRECTION FACTORS				CORRECTED READING dB μ V/m	SPEC LIMIT dB μ V/m	MARGIN dB	NOTES
		Cable dB	Ant dB	Amp dB	HPF dB				
1252.925	45.5	3.5	24.1	-40.3	16.1	48.9	54.0	-5.1	H
3661.050	52.4	6.7	29.9	-39.3	0.5	50.2	54.0	-3.8	VA
3661.063	51.2	6.7	29.9	-39.3	0.5	49.0	54.0	-5.0	H
4575.712	48.3	7.4	31.4	-39.1	0.9	48.9	54.0	-5.1	H
4576.375	47.2	7.4	31.4	-39.1	0.9	47.8	54.0	-6.2	V
6405.950	42.5	8.9	33.2	-38.4	1.0	47.2	54.0	-6.8	V

Test Method: ANSI C63.4 (2003)
 Spec Limit: FCC Part 15 Subpart B Section 15.109 Class B
 Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
 V = Vertical Polarization
 A = Average Reading

COMMENTS: EUT is connected to the remote laptop via ethernet cable, connected to the EUT is the antenna on port one, a DB9 cable connected to the serial port and a DB25 cable connected to the GPIO port. The EUT is powered by an external AC/DC power adapter. The remote laptop is controlling the EUT. Frequency range tested: 30-1000 MHz.

Table 3: FCC 15.207 Six Highest Conducted Emission Levels

FREQUENCY MHz	METER READING dB μ V	CORRECTION FACTORS				CORRECTED READING dB μ V	SPEC LIMIT dB μ V	MARGIN dB	NOTES
		Att dB	Cable dB	HPF dB	Lisn dB				
0.151818	38.9	5.8	0.0	2.8	0.0	47.5	55.9	-8.4	B
0.360890	30.6	5.8	0.0	0.2	0.1	36.7	48.7	-12.0	W
0.540873	28.0	5.8	0.1	0.2	0.1	34.2	46.0	-11.8	W
0.544509	28.7	5.8	0.1	0.2	0.1	34.9	46.0	-11.1	B
0.666316	29.4	5.8	0.1	0.3	0.1	35.7	46.0	-10.3	W
2.591480	28.7	5.8	0.1	0.1	0.2	34.9	46.0	-11.1	W

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart C Section 15.207

NOTES: B = Black Lead
W = White Lead

COMMENTS: EUT is connected to the remote laptop via ethernet cable, connected to the EUT is the antenna on port one, a DB9 cable connected to the serial port and a DB25 cable connected to the GPIO port. The EUT is powered by an external AC/DC power adapter. The remote laptop is controlling the EUT. Frequency range tested: 150 kHz – 30 MHz.

Table 4: FCC 15.209 Six Highest Radiated Emission Levels: 10-30 MHz

FREQUENCY MHz	METER READING dB μ V	CORRECTION FACTORS				CORRECTED READING dB μ V/m	SPEC LIMIT dB μ V/m	MARGIN dB	NOTES
		Ant dB	Amp dB	Cable dB	Dist dB				
10.002	67.3	10.9	-27.2	0.7		51.7	69.5	-17.8	PA-H
10.002	65.8	10.9	-27.2	0.7		50.2	69.5	-19.3	PA-M
10.004	66.7	10.9	-27.2	0.7		51.1	69.5	-18.4	PE-L
10.005	66.1	10.9	-27.2	0.7		50.5	69.5	-19.0	PA-L
10.060	66.6	10.9	-27.2	0.7		51.0	69.5	-18.5	PE-M
10.060	61.6	10.9	-27.2	0.7		46.0	69.5	-23.5	PE-H

Test Method: ANSI C63.4 (2003)
 Spec Limit: FCC Part 15 Subpart C Section 15.209
 Test Distance: 3 Meters

NOTES: PA = Parallel
 PE = Perpendicular
 L = Low
 M = Middle
 H = High

COMMENTS: EUT is connected to the remote laptop via ethernet cable, connected to the EUT is the antenna on port one, a DB9 cable connected to the serial port and a DB25 cable connected to the GPIO port. The EUT is powered by an external AC/DC power adapter. The remote laptop is controlling the EUT. Frequency range tested: 10 MHz – 30 MHz.

Table 5: FCC 15.209/15.247 Six Highest Radiated Emission Levels

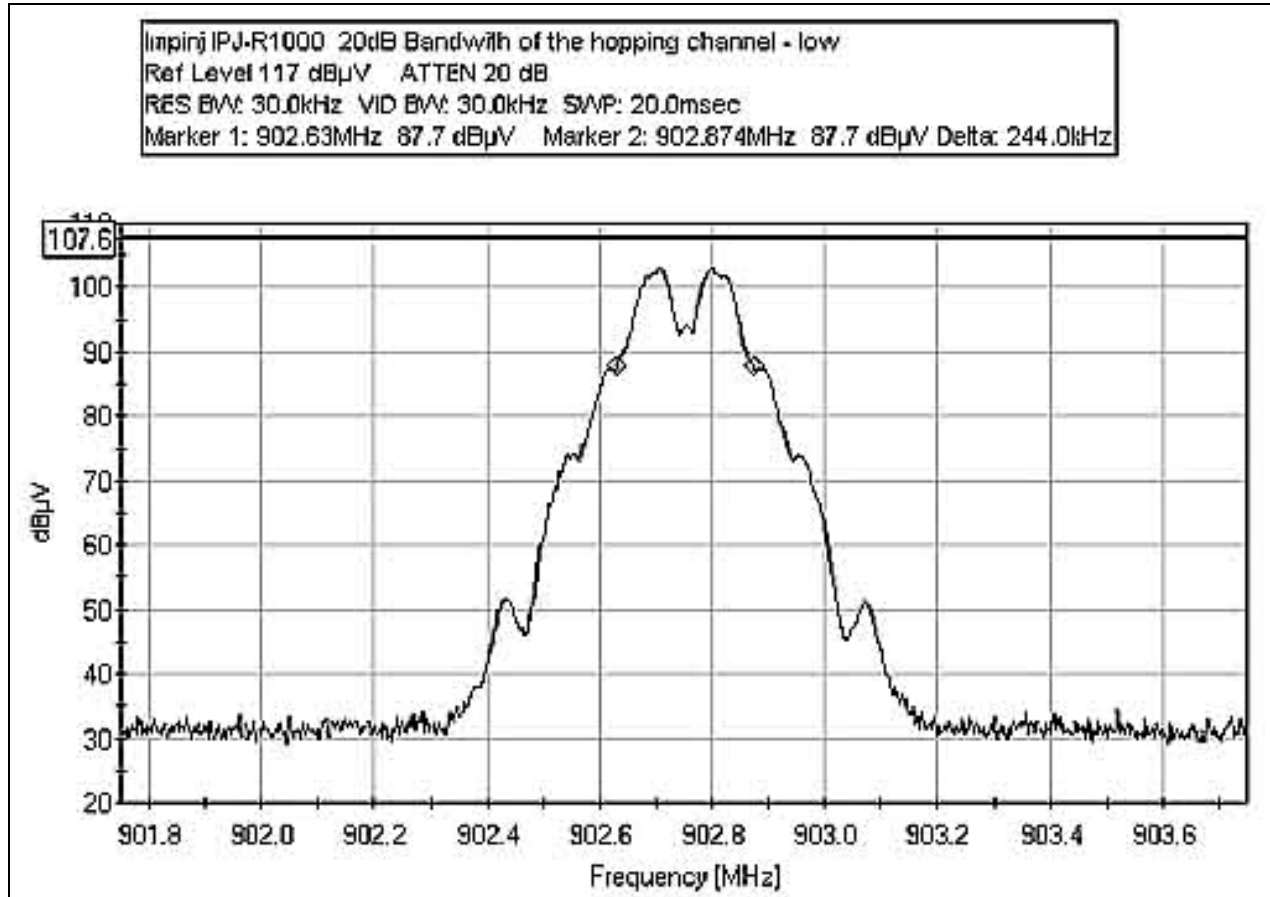
FREQUENCY MHz	METER READING dB μ V	CORRECTION FACTORS				CORRECTED READING dB μ V/m	SPEC LIMIT dB μ V/m	MARGIN dB	NOTES
		Cable dB	Ant dB	Amp dB	HPF dB				
1252.925	45.5	3.5	24.1	-40.3	16.1	48.9	54.0	-5.1	H
3661.050	52.4	6.7	29.9	-39.3	0.5	50.2	54.0	-3.8	VA
3661.063	51.2	6.7	29.9	-39.3	0.5	49.0	54.0	-5.0	H
4575.712	48.3	7.4	31.4	-39.1	0.9	48.9	54.0	-5.1	H
4576.375	47.2	7.4	31.4	-39.1	0.9	47.8	54.0	-6.2	V
6405.950	42.5	8.9	33.2	-38.4	1.0	47.2	54.0	-6.8	V

Test Method: ANSI C63.4 (2003)
 Spec Limit: FCC Part 15 Subpart C Sections 15.209 and 15.247
 Test Distance: 3 Meters

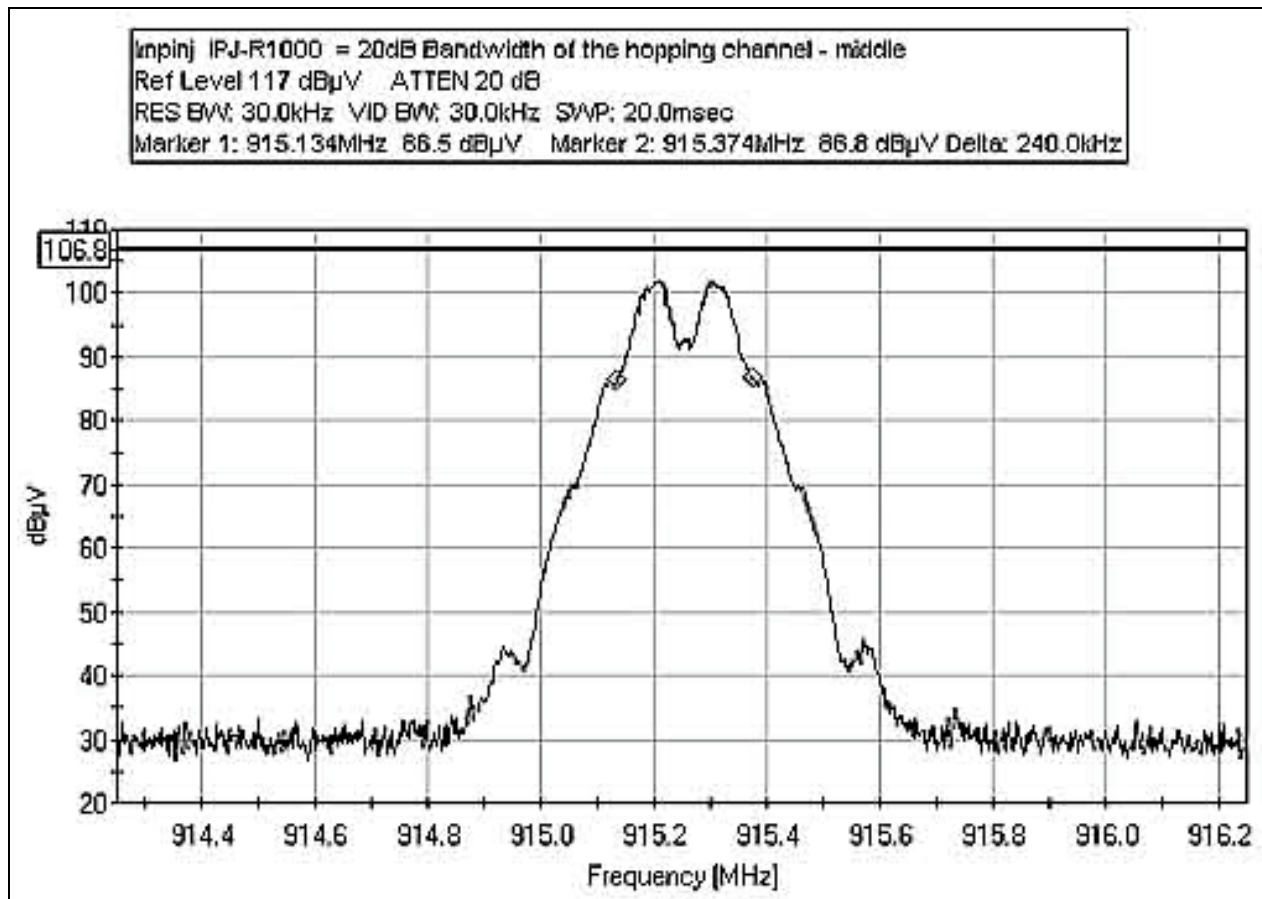
NOTES: H = Horizontal Polarization
 V = Vertical Polarization
 A = Average Reading

COMMENTS: EUT is connected to the remote laptop via ethernet cable, connected to the EUT is the antenna on port one, a DB9 cable connected to the serial port and a DB25 cable connected to the GPIO port. The EUT is powered by an external AC/DC power adapter. The remote laptop is controlling the EUT. Frequency range tested: 30 MHz – 10 GHz.

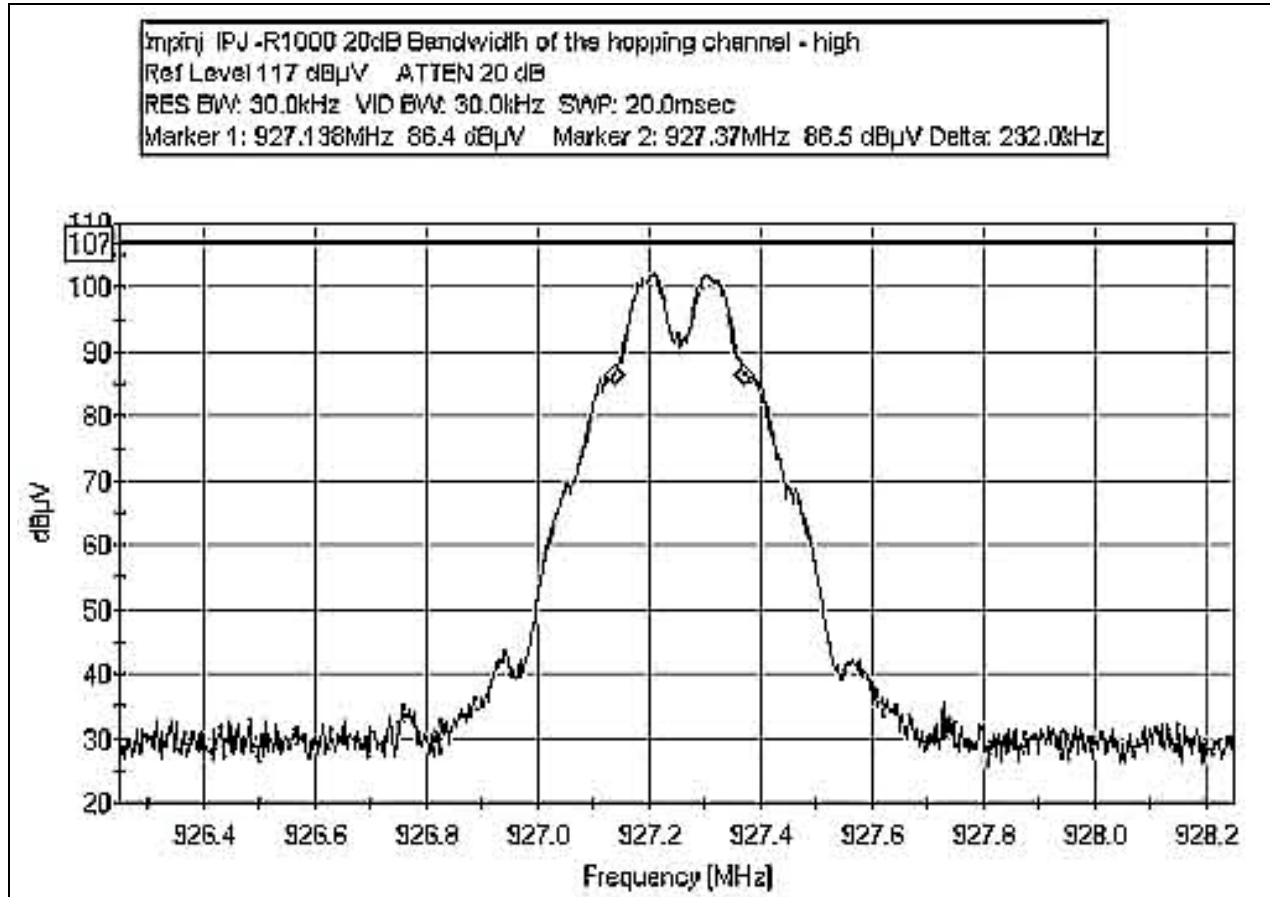
FCC 15.247(a)(1) 20dB BANDWIDTH - LOW CHANNEL



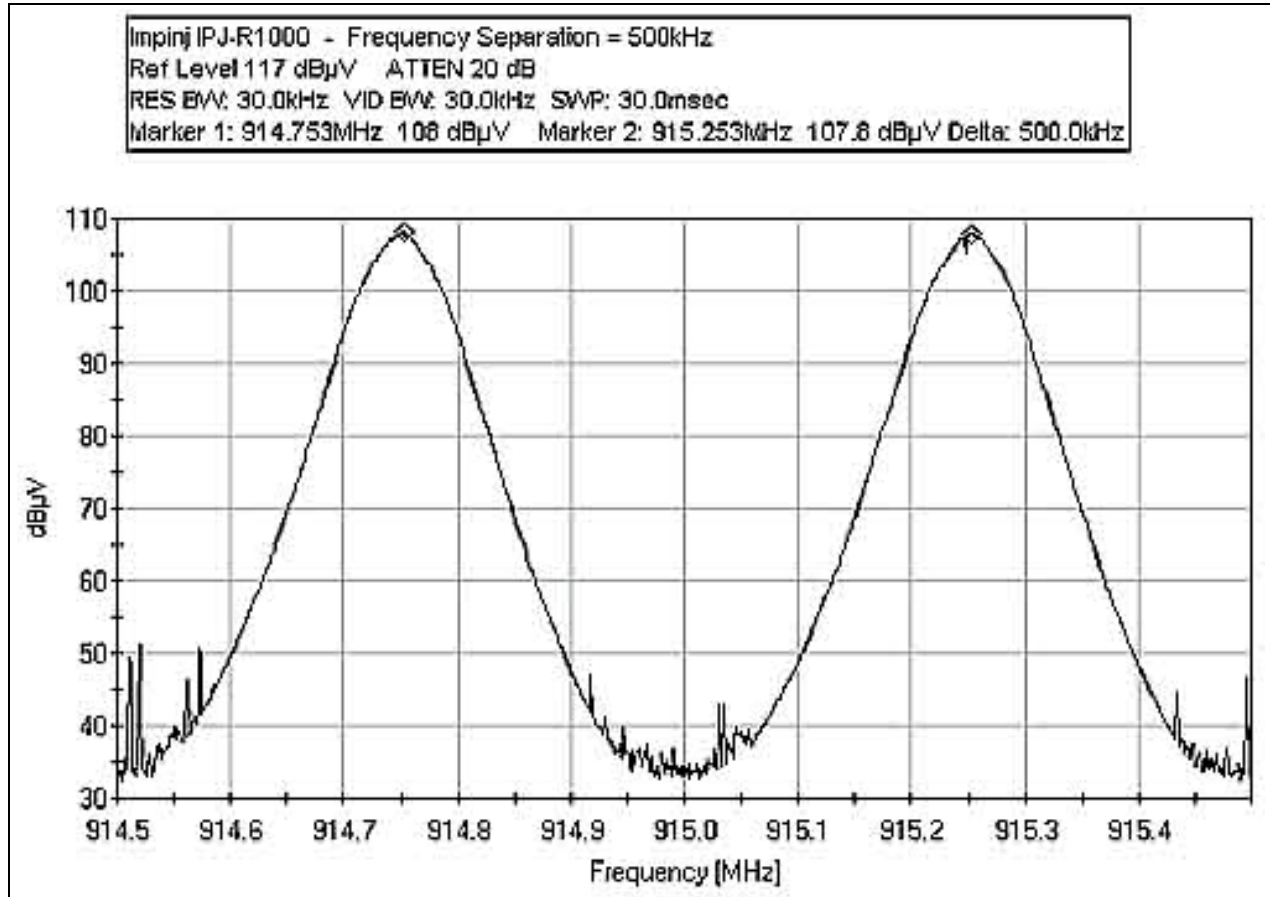
FCC 15.247(a)(1) 20dB BANDWIDTH - MIDDLE CHANNEL



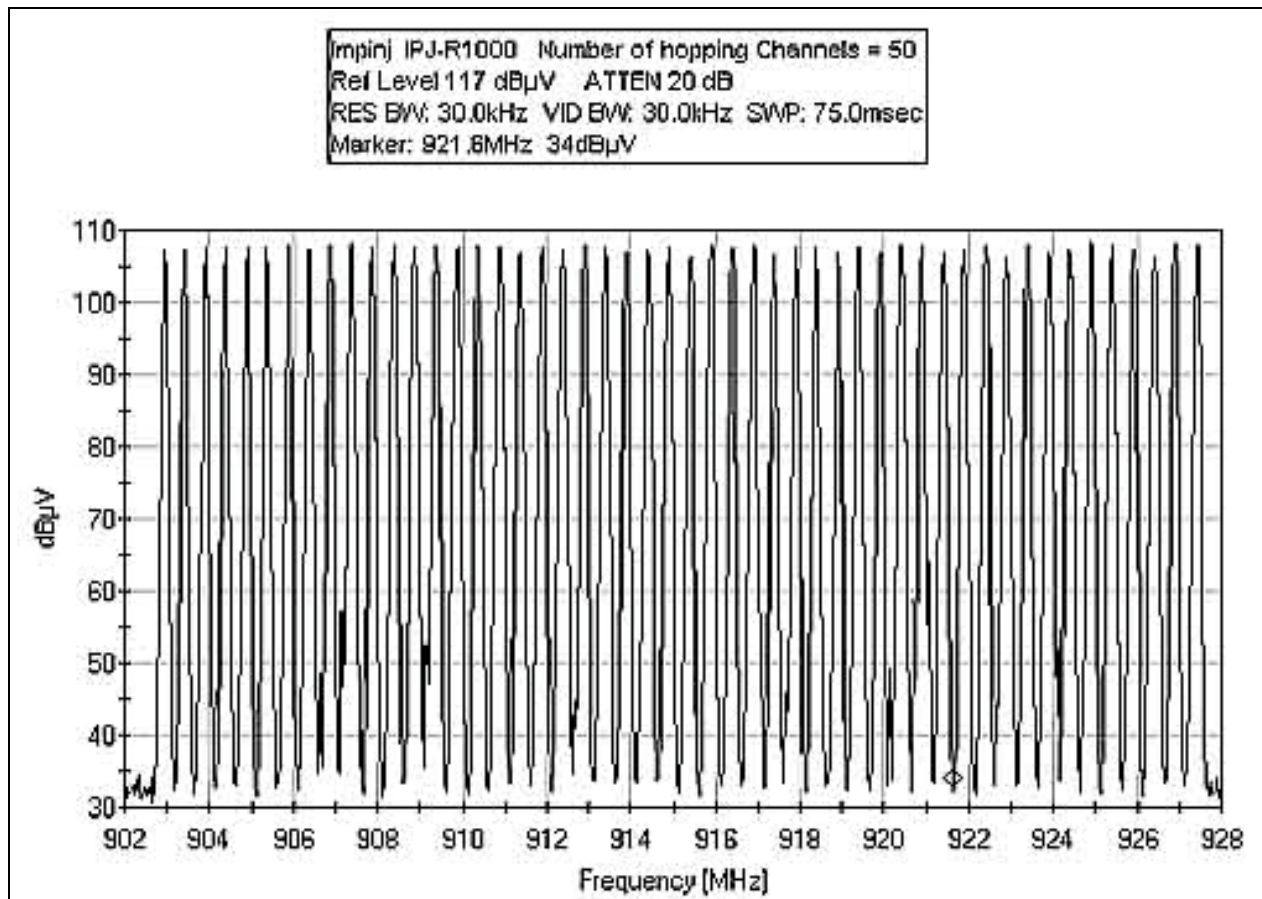
FCC 15.247(a)(1) 20dB BANDWIDTH - HIGH



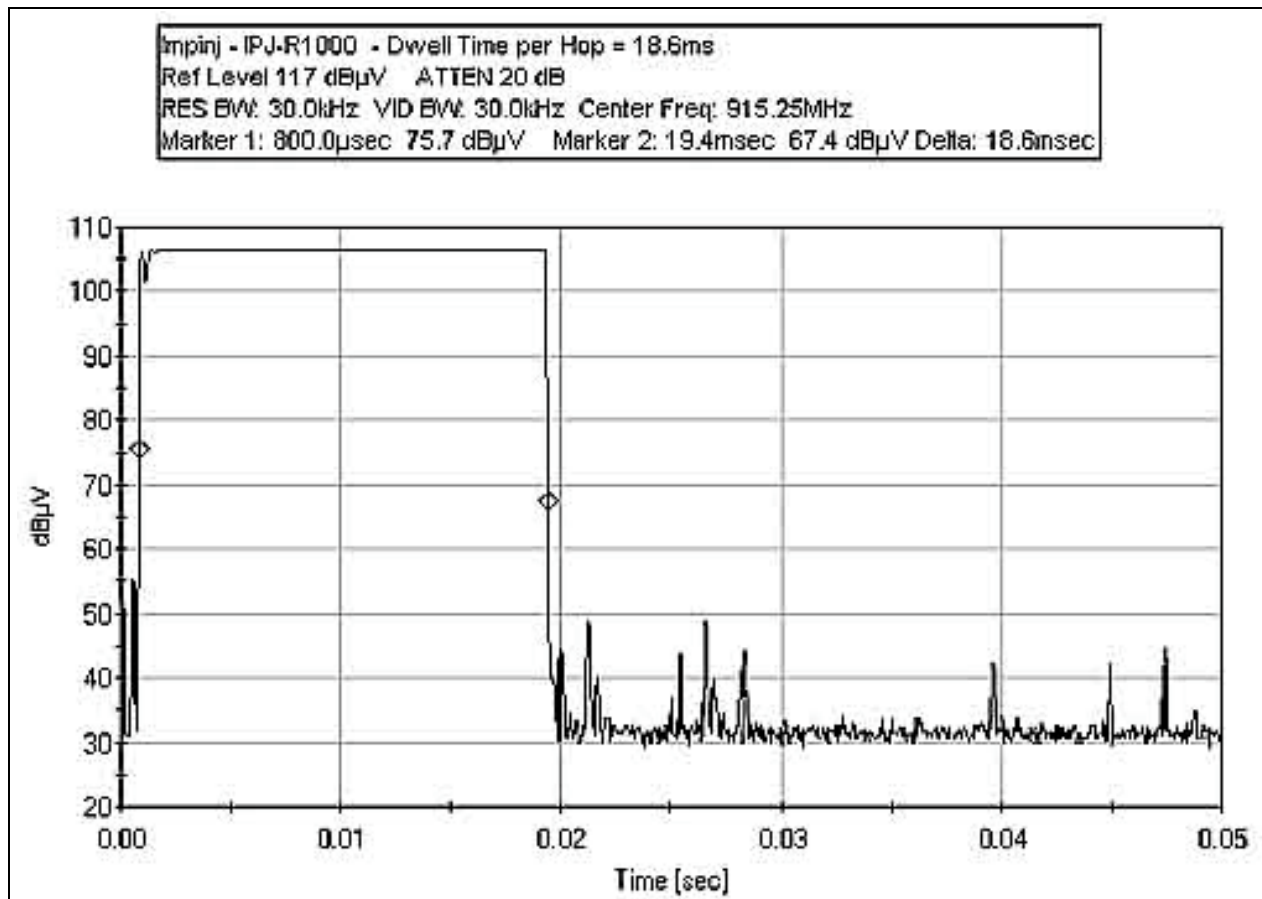
FCC 15.247(a)(1) FREQUENCY SEPARATION



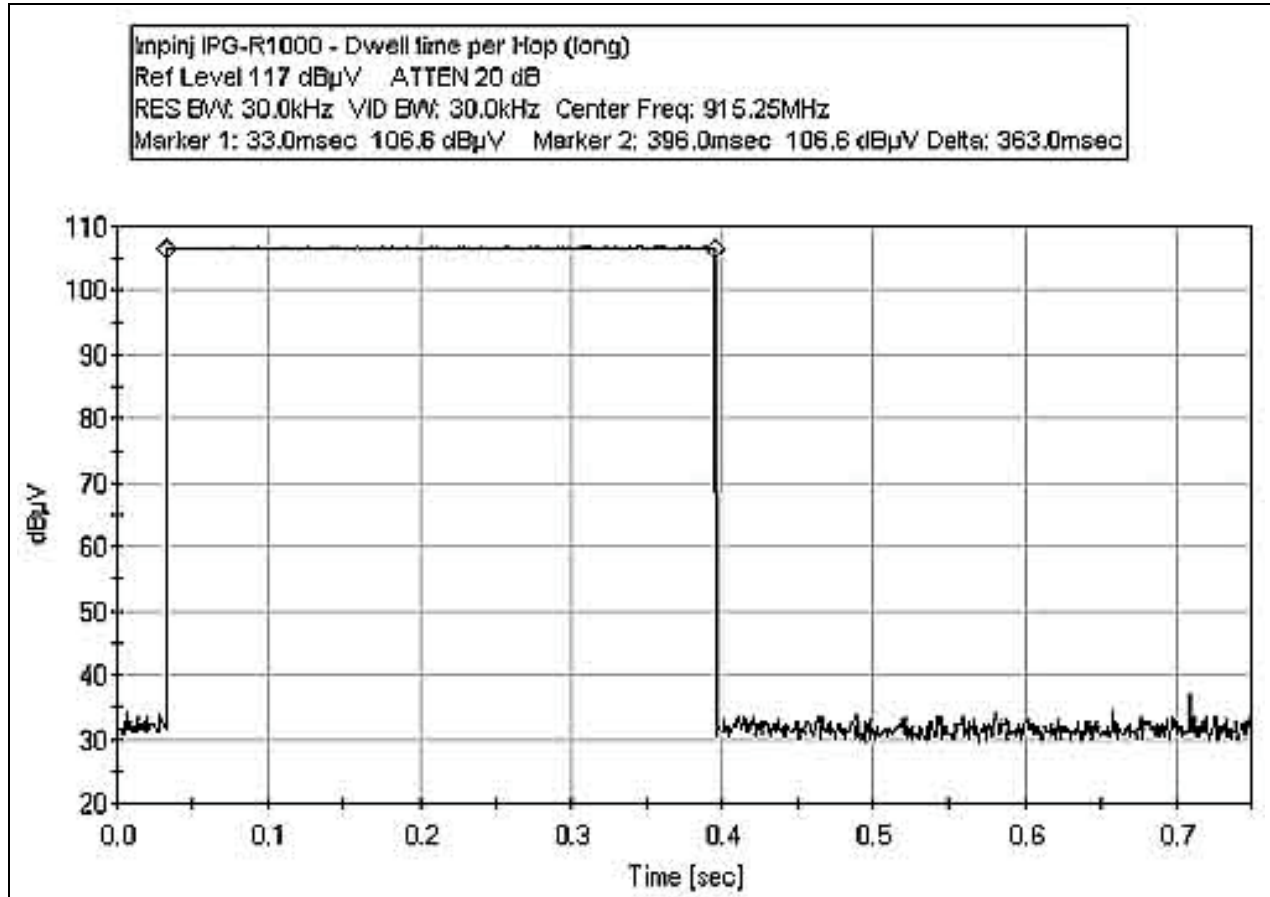
FCC 15.247(a)(1) NUMBER OF HOPPING CHANNELS



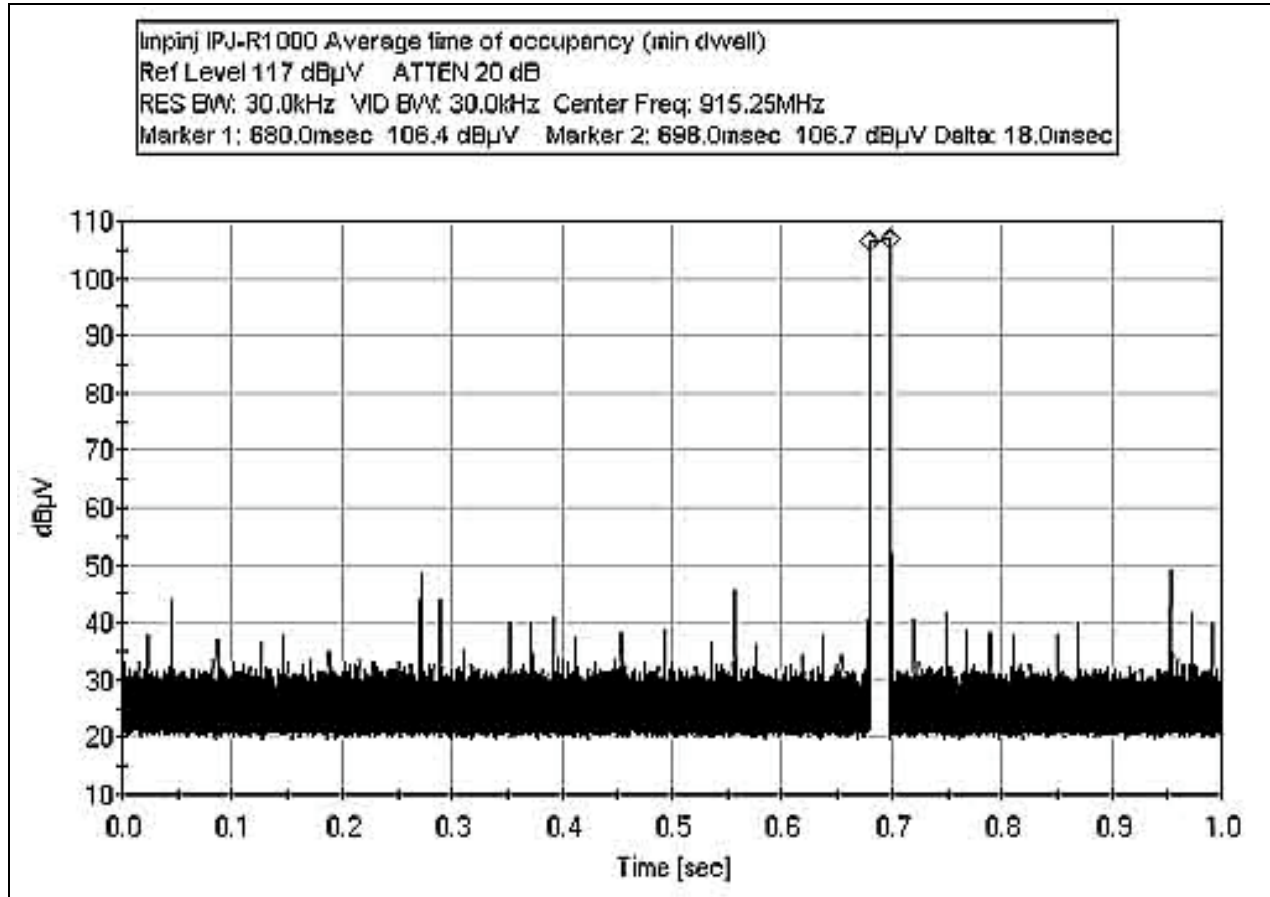
FCC 15.247(a)(1) DWELL TIME PER HOP - SHORT



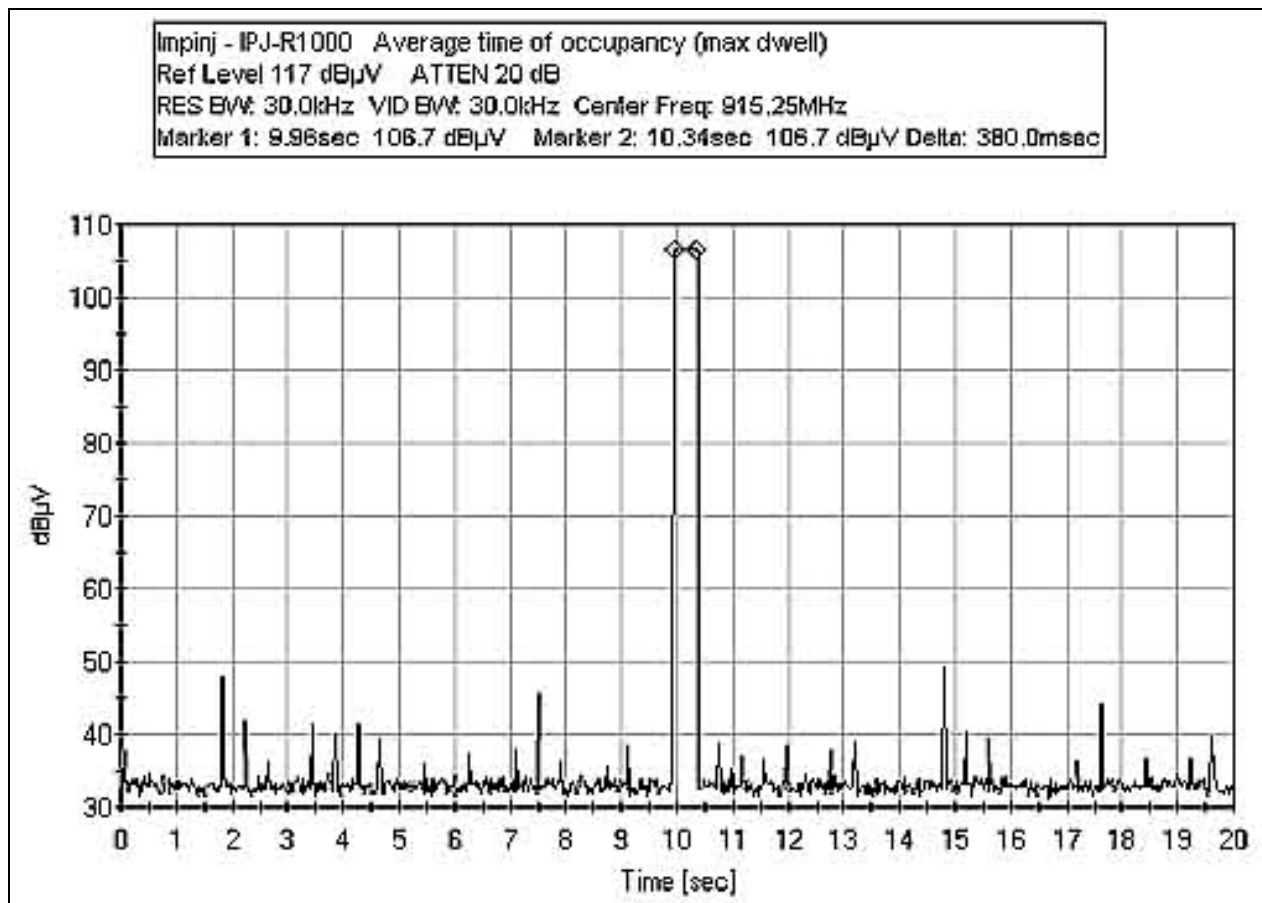
FCC 15.247(a)(1) DWELL TIME PER HOP - LONG



FCC 15.247(a)(1) (i) AVERAGE TIME OF OCCUPANCY - MIN DWELL



FCC 15.247(a)(1) (i) AVERAGE TIME OF OCCUPANCY - MAX DWELL



RSS-210 AVERAGE TIME OF OCCUPANCY – 10 SECONDS

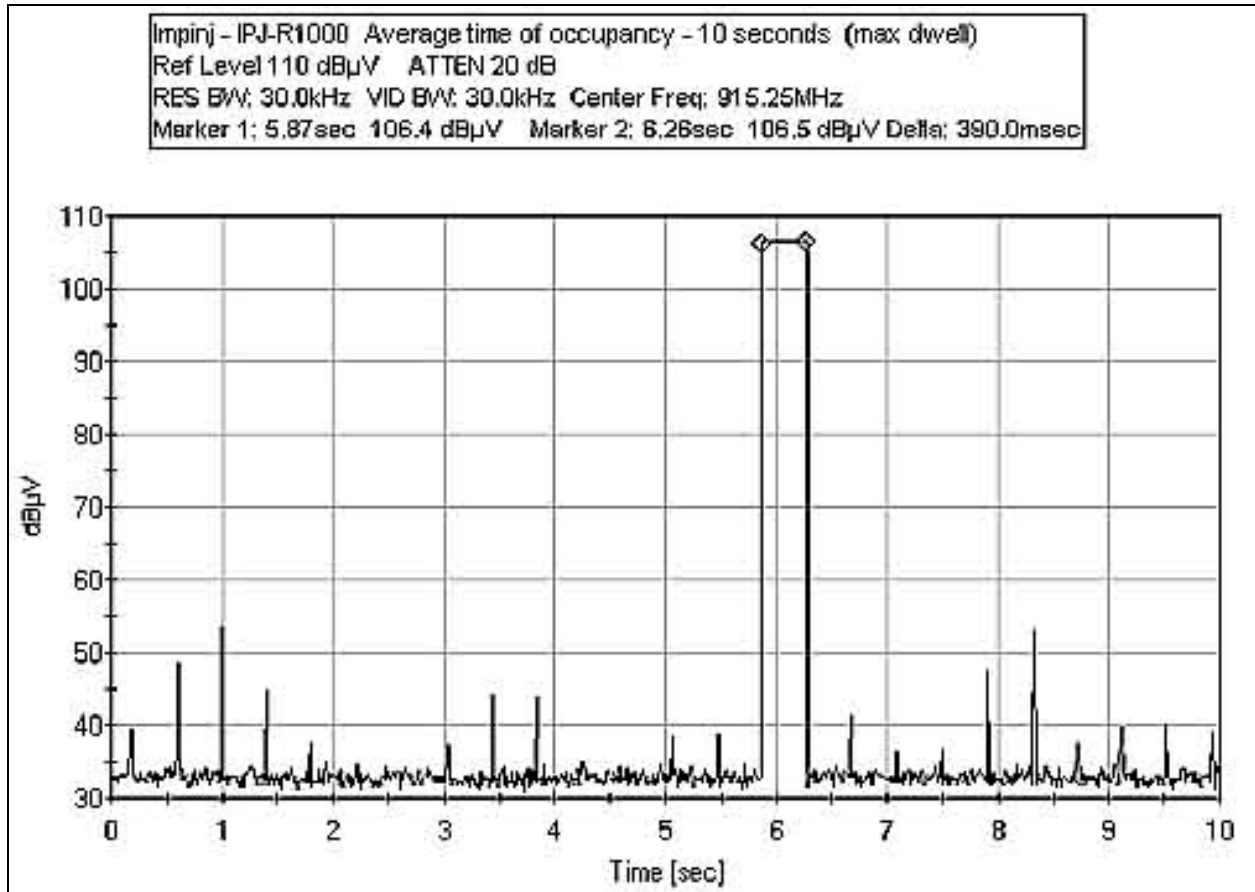


Table 6: FCC 15.247(b)(2) Fundamental Emission Levels

FREQUENCY MHz	METER READING dBm	CORRECTION FACTORS				CORRECTED READING dBm	SPEC LIMIT dBm	MARGIN dB	NOTES
		Ant dB	Amp dB	Cable dB	Dist dB				
902.690	28.9	0.0		0.8		29.7	30.0	-0.3	N
915.280	29.0	0.0		0.8		29.8	30.0	-0.2	N
927.280	29.1	0.0		0.8		29.9	30.0	-0.1	N

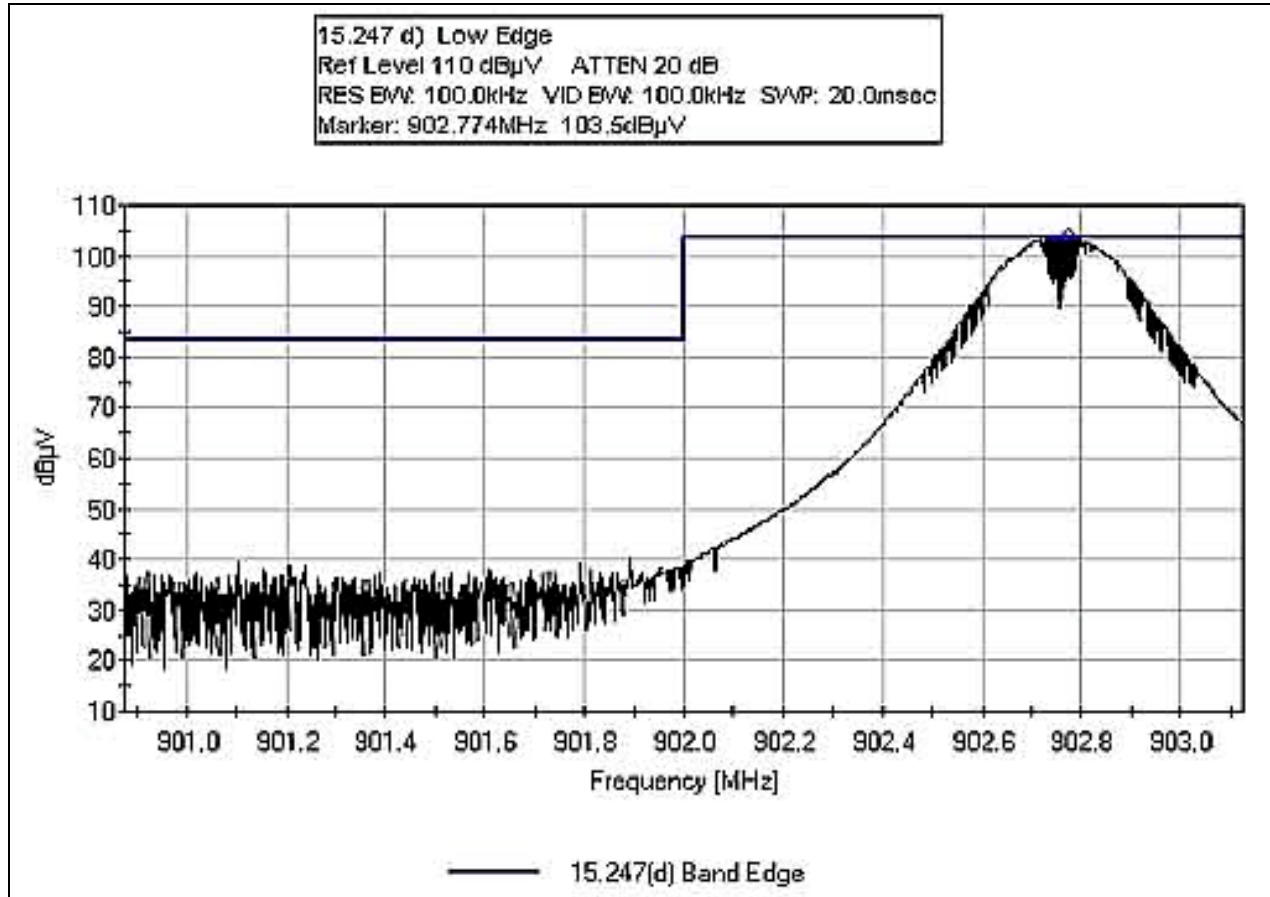
Test Method: ANSI C63.4 (2003)

NOTES: N = No Polarization

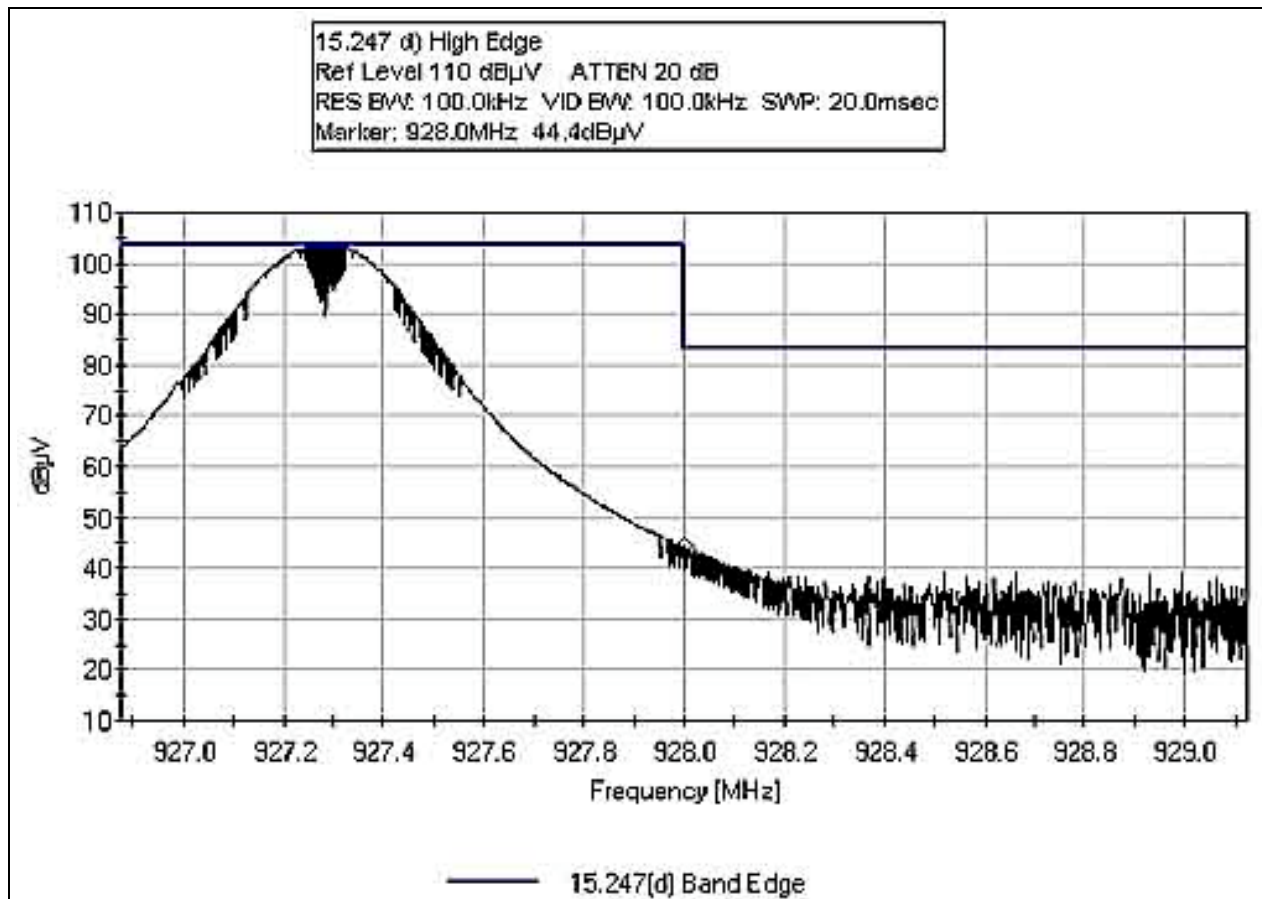
Spec Limit: FCC Part 15 Subpart C Sections 15.247(b)(2)

COMMENTS: EUT is connected to the remote laptop via ethernet cable, connected to the EUT is the antenna on port one, a DB9 cable connected to the serial port and a DB25 cable connected to the GPIO port. The EUT is powered by an external AC/DC power adapter. The remote laptop is controlling the EUT. RF power Output for Low, Middle and High. Frequency range: Fundamental.

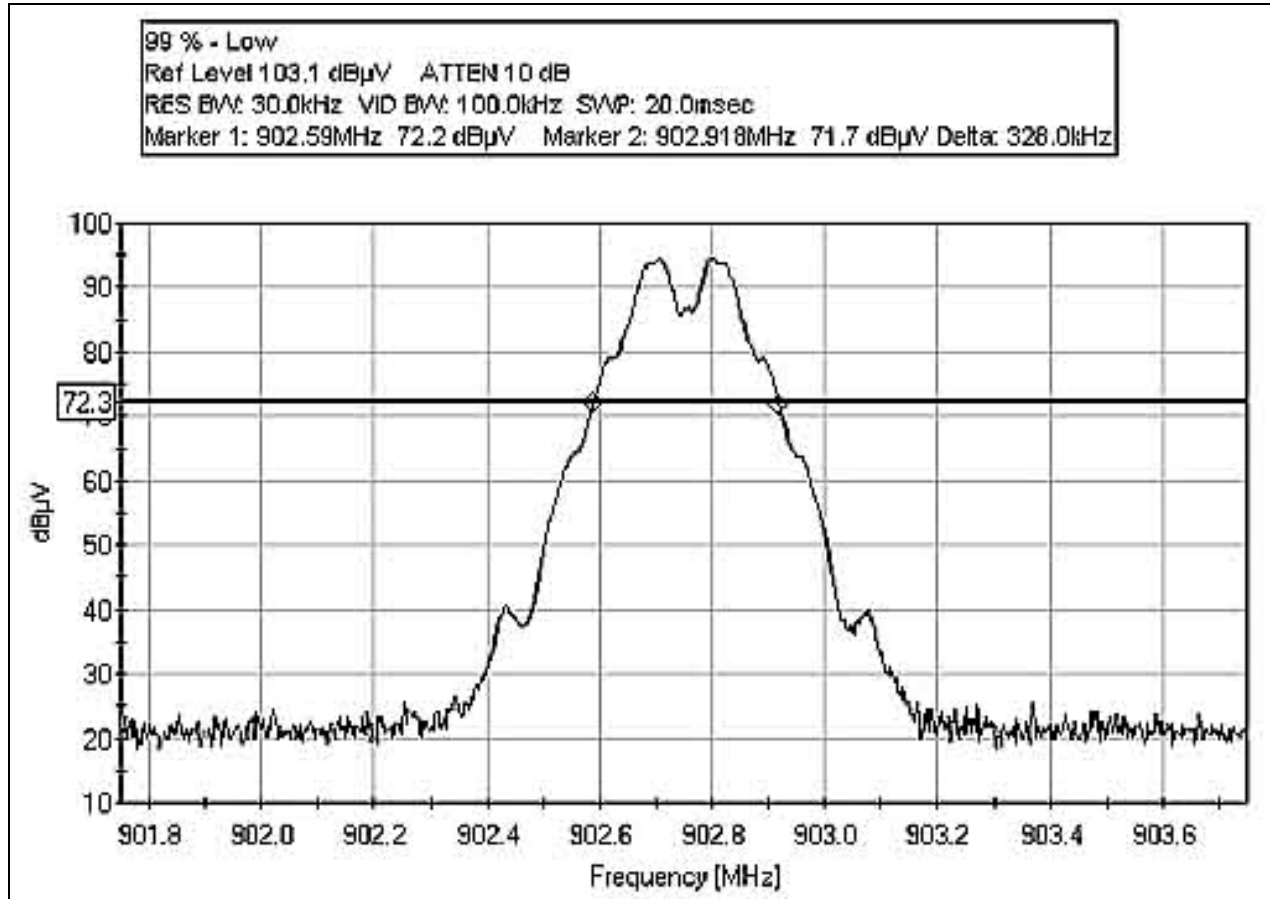
FCC 15.247(d) BANDEDGE - LOW EDGE



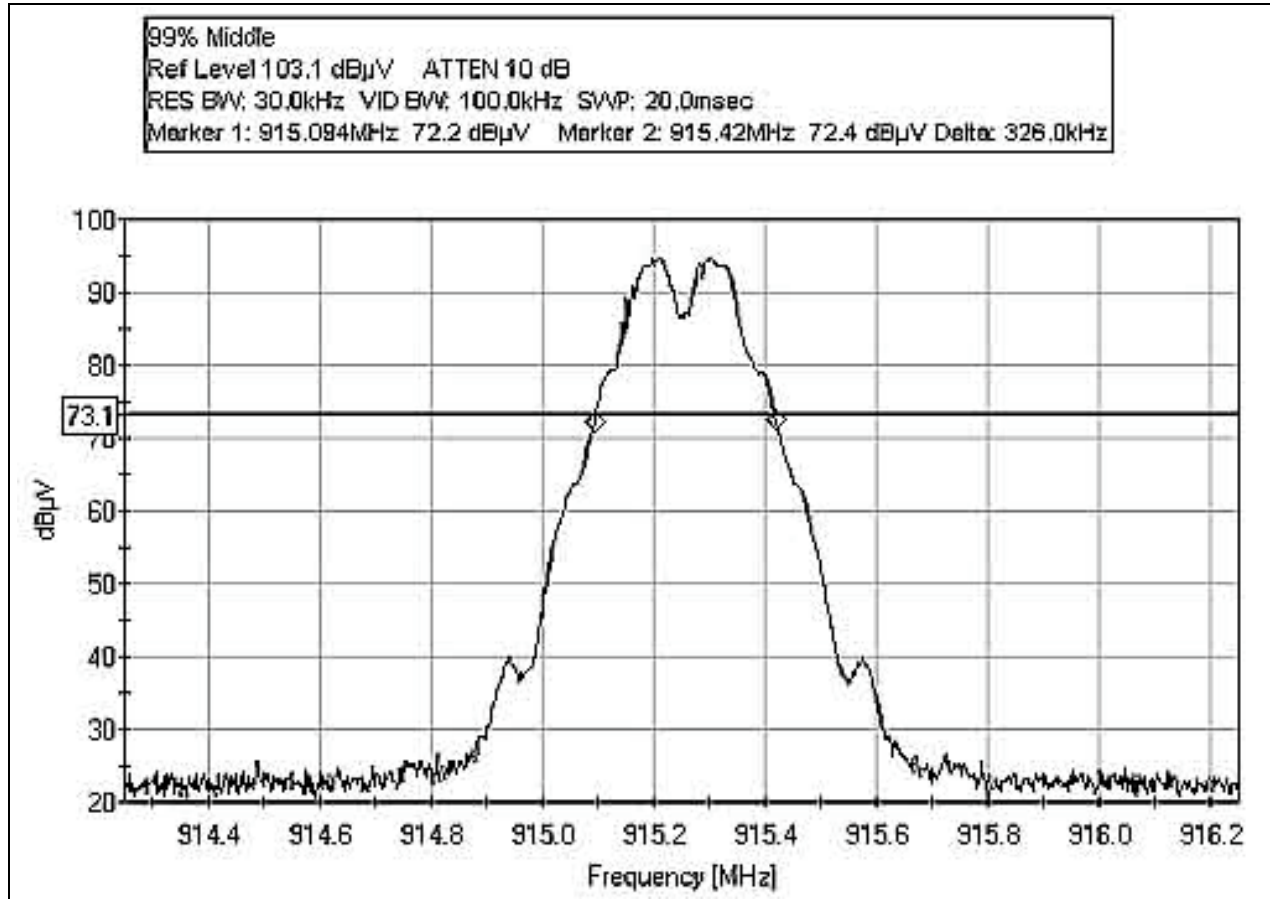
FCC 15.247(d) BANDEDGE - HIGH EDGE



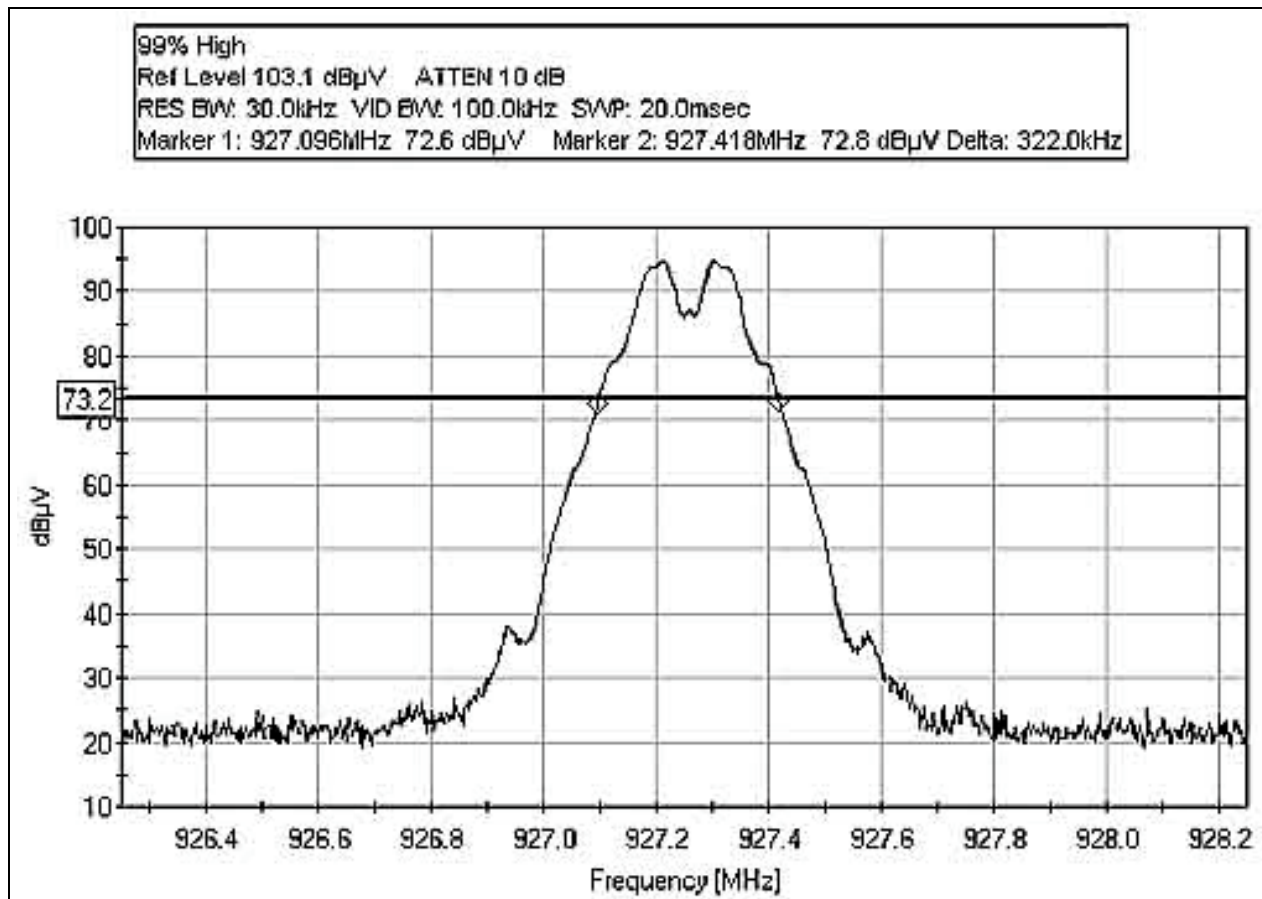
RSS-210 99% BANDWIDTH - LOW



RSS-210 99% BANDWIDTH - MIDDLE



RSS-210 99% BANDWIDTH - HIGH



TEMPERATURE AND HUMIDITY DURING TESTING

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

The relative humidity was between 20% and 75%.

EUT SETUP

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the photographs in Appendix A. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables. The corrected data was then compared to the applicable emission limits to determine compliance.

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

The radiated and conducted emissions data of the EUT was taken with the HP Spectrum Analyzer. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in Table A.

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 in Table A. This reading was then compared to the applicable specification limit to determine compliance.

TABLE A: 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 in Table A were used to collect both the radiated and conducted emissions data for the EUT. For radiated measurements from 10 MHz to 30 MHz, the magnetic loop antenna was used. For radiated measurements from 30 to 1000 MHz, the biconilog antenna was used. The horn antenna was used for frequencies above 1000 MHz. Conducted emissions tests required the use of the FCC type LISNs.

The HP spectrum analyzer was used for all measurements. Table B shows the analyzer bandwidth settings that were used in designated frequency bands. For conducted emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used. A 10 dB external attenuator was also used during conducted tests, with internal offset correction in the analyzer. During radiated testing, the measurements were made with 0 dB of attenuation, a reference level of 97 dB μ V, and a vertical scale of 10 dB per division.

SPECTRUM ANALYZER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the 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 six highest readings, this is indicated as a "Q" or an "A" in the appropriate table. 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 or test engineer recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the analyzer called "peak hold," the analyzer had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the analyzer 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 HP Quasi-Peak Adapter for the HP Spectrum Analyzer. The detailed procedure for making quasi peak measurements contained in the HP Quasi-Peak Adapter manual were followed.

Average

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

EUT TESTING

Mains Conducted Emissions

During conducted emissions testing, the EUT was located on a wooden table measuring approximately 80 cm high, 1 meter deep, and 1.5 meters in length. One wall of the room where the EUT was located has a minimum 2 meter by 2 meter conductive plane. The EUT was mounted on the wooden table 40 cm away from the conductive plane, and 80 cm from any other conductive surface.

The vertical metal plane used for conducted emissions was grounded to the earth. Power to the EUT was provided through a LISN. The LISN was grounded to the ground plane. All other objects were kept a minimum of 80 cm away from the EUT during the conducted test.

The LISNs used were 50 μ H/+50 ohms. A 30 to 50 second sweep time was used for automated measurements in the frequency bands of 150 kHz to 500 kHz, and 500 kHz to 30 MHz. All readings within 20 dB of the limit were recorded, and those within 6 dB of the limit were examined with additional measurements using a slower sweep time.

Antenna Conducted Emissions

For measuring the signal strength on the RF output port of the EUT, the spectrum analyzer was connected directly to the EUT. The sweep time of the analyzer was adjusted so that the spectrum analyzer readings were always in a calibrated range. All readings within 20 dB of the limit were recorded.

Radiated Emissions

The EUT was mounted on a nonconductive, rotating table 80 cm above the conductive grid. The nonconductive table dimensions were 1 meter by 1.5 meters.

During the preliminary radiated scan, the EUT was powered up and operating in its defined FCC test mode. For radiated measurements from 10 MHz to 30 MHz, the magnetic loop antenna was used. The frequency range of 30 MHz to 1000 MHz was scanned with the biconilog antenna located about 1.5 meter above the ground plane in the vertical polarity. During this scan, the turntable was rotated and all peaks at or near the limit were recorded. A scan of the FM band from 88 to 110 MHz was then made using a reduced resolution bandwidth and frequency span. The biconilog antenna was changed to the horizontal polarity and the above steps were repeated. For frequencies exceeding 1000 MHz, the horn antenna was used. Care was taken to ensure that no frequencies were missed within the FM and TV bands. An analysis was performed to determine if the signals that were at or near the limit were caused by an ambient transmission. If unable to determine by analysis, the equipment was powered down to make the final determination if the EUT was the source of the emission.

A thorough scan of all frequencies was made manually using a small frequency span, rotating the turntable and raising and lowering the antenna from one to four meters as needed. The test engineer maximized the readings with respect to the table rotation, antenna height and configuration of EUT. Maximizing of the EUT was achieved by monitoring the spectrum analyzer on a closed circuit television monitor.

APPENDIX A

TEST SETUP PHOTOGRAPHS

PHOTOGRAPH SHOWING VOLTAGE VARIATIONS



PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS



Mains Conducted Emissions - Front View

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS



Mains Conducted Emissions - Side View

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Front View

PHOTOGRAPH SHOWING RADIATED EMISSIONS



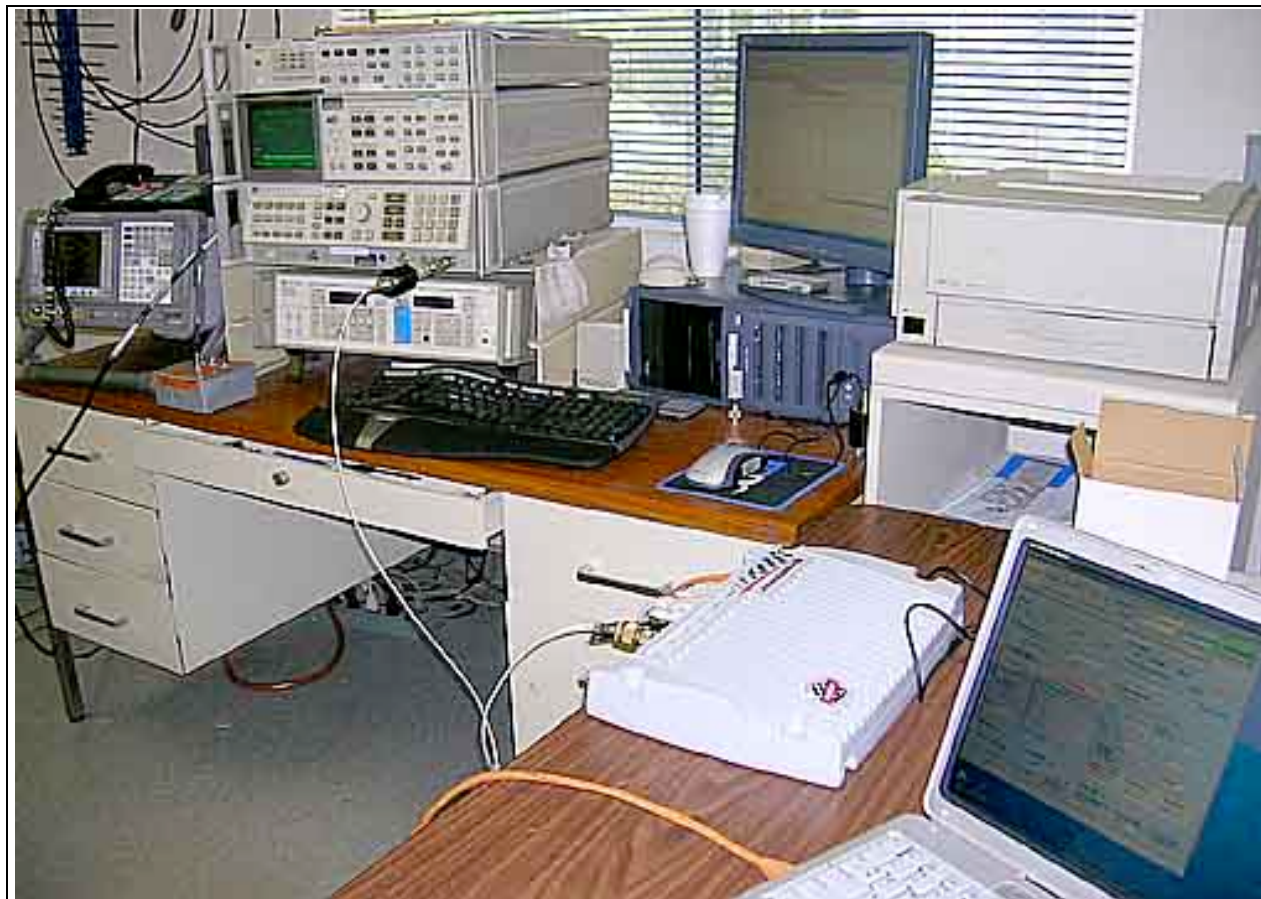
Radiated Emissions - Back View

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Back View

PHOTOGRAPH SHOWING DIRECT CONNECT POWER



PHOTOGRAPH SHOWING DIRECT CONNECT SPURIOUS EMISSIONS



APPENDIX B

TEST EQUIPMENT LIST

Radiated Emissions

Spectrum Analyzer RF Section	02462	HP	8568B	2928A04874	100804	100806
Spectrum Analyzer Display Section	02472	HP	85662A	3001A18430	100804	100806
QP Adapter	01437	HP	85650A	3303A01884	100804	100806
Bilog Antenna	00851	Schaffner-Chase EMC	CBL6111C	2629	031604	031606
Antenna cable (10 meter site D)	NA	Andrew	LDF1-50	Cable#17	100204	100207
Antenna cable from bulkhead to antenna	N/A	Pasternack	RG-214/U	Cable #33	040105	040106
Preamp to SA Cable (3 feet)	NA	Pasternack	E100316-I	Cable #22	080904	080906
Pre-amp	00010	HP	8447D	2727A05392	070204	070206
Antenna cable (Heliac)	NA	Andrew	LDF1-50	P05348 (Cable#19)	092805	092807
Horn Antenna	01646	EMCO	3115	9603-4683	072204	072206
Microwave Pre-amp	00787	HP	83017A	3123A00282	052705	052707
Spectrum Analyzer	02467	Agilent	E7405A	US40240225	032505	032507
24" SMA Cable (White)	P5183	Pasterneck	NA	1-40GHz_white	122304	122306
Loop Antenna	00314	EMCO	6502	2014	062804	062806

Conducted emissions

Spectrum Analyzer RF Section	02462	HP	8568B	2928A04874	100804	100806
Spectrum Analyzer Display Section	02472	HP	85662A	3001A18430	100804	100806
QP Adapter	01437	HP	85650A	3303A01884	100804	100806
Coaxial Cable	-	Harbour Industries	M17/60-RG142	Cable #8	070204	070206
LISN	02128	EMCO	3816/2	1090	051605	051607
150kHz HPF	02610	TTE	HB9615-150k-50-720	G7755	041604	041606
6dB Attenuator	P05268	Weinschel	18W	(none)	092805	092807

APPENDIX C
MEASUREMENT DATA SHEETS

Test Location: CKC Laboratories, Inc. 110 North Olinda Place Brea, CA 92823

Customer: **Impinj, Incorporated**
 Specification: **FCC 15.107 Class B COND [AVE]**
 Work Order #: **83127**
 Test Type: **Conducted Emissions**
 Equipment: **UHF RFID**
 Manufacturer: Impinj Inc
 Model: IPJ-R1000
 S/N: 40306020043

Date: 1/25/2006
 Time: 1:25:41 PM
 Sequence#: 2
 Tested By: Septimiu Apahidean
 120V 60Hz

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
UHF RFID*	Impinj Inc	IPJ-R1000	40306020043
Antenna	Cushcraft	S9028PCL	-
Power Supply	CUI Inc.	DSA-60W-20 1 24060	

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Compaq	Presario V2000	CNF5391NBO

Test Conditions / Notes:

EUT is connected to the remote laptop via ethernet cable, connected to the EUT is the antenna on port one, a DB9 cable connected to the serial port and a DB25 cable connected to the GPIO port. The EUT is powered by an external AC/DC power adapter. The remote laptop is controlling the EUT. Frequency range tested: 150 kHz – 30 MHz.

Transducer Legend:

T1=6dB Attenuator P05268_092807	T2=Cable #8 Conducted Site D
T3=HP Filter AN 02343	T4=(L1) LISN Insertion Loss 02128

Measurement Data:

Reading listed by margin.

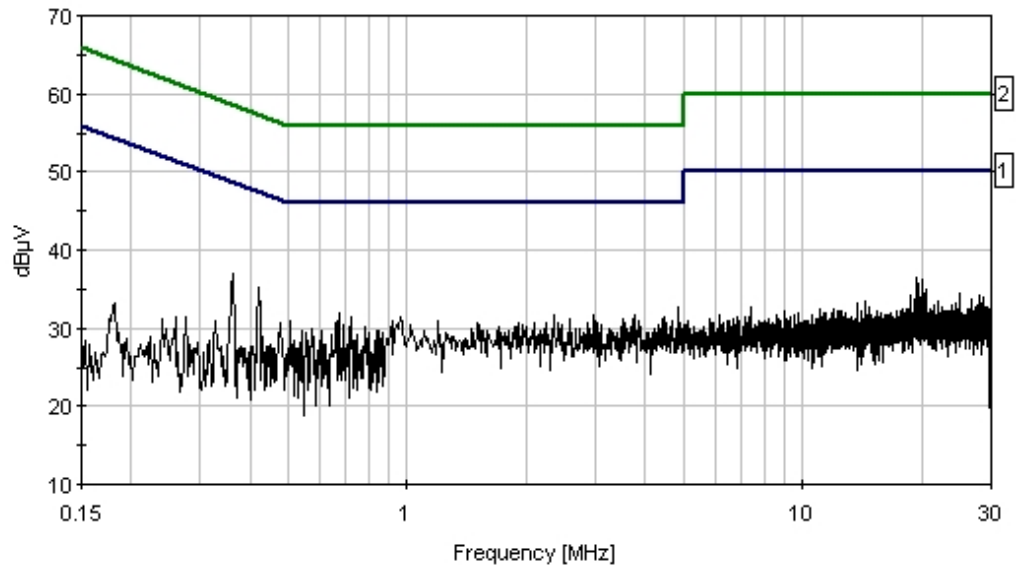
Test Lead: Black

#	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	362.708k	30.9	+5.8	+0.0	+0.2	+0.1	+0.0	37.0	48.7	-11.7	Black
2	422.702k	29.2	+5.8	+0.0	+0.2	+0.1	+0.0	35.3	47.4	-12.1	Black
3	4.865M	26.4	+5.8	+0.1	+0.1	+0.2	+0.0	32.6	46.0	-13.4	Black
4	19.418M	29.0	+5.8	+0.4	+0.2	+1.1	+0.0	36.5	50.0	-13.5	Black
5	20.032M	28.7	+5.8	+0.4	+0.2	+1.1	+0.0	36.2	50.0	-13.8	Black
6	671.770k	25.7	+5.8	+0.1	+0.3	+0.0	+0.0	31.9	46.0	-14.1	Black
7	2.952M	25.7	+5.8	+0.1	+0.1	+0.1	+0.0	31.8	46.0	-14.2	Black
8	3.782M	25.5	+5.8	+0.1	+0.2	+0.2	+0.0	31.8	46.0	-14.2	Black
9	19.482M	28.3	+5.8	+0.4	+0.2	+1.1	+0.0	35.8	50.0	-14.2	Black
10	2.348M	25.5	+5.8	+0.1	+0.1	+0.1	+0.0	31.6	46.0	-14.4	Black

11	19.698M	28.1	+5.8	+0.4	+0.2	+1.1	+0.0	35.6	50.0	-14.4	Black
12	958.407k	25.4	+5.8	+0.1	+0.2	+0.0	+0.0	31.5	46.0	-14.5	Black
13	722.675k	25.2	+5.8	+0.1	+0.3	+0.0	+0.0	31.4	46.0	-14.6	Black
14	4.477M	25.2	+5.8	+0.1	+0.1	+0.2	+0.0	31.4	46.0	-14.6	Black
15	2.591M	25.2	+5.8	+0.1	+0.1	+0.1	+0.0	31.3	46.0	-14.7	Black
16	662.680k	24.8	+5.8	+0.1	+0.3	+0.0	+0.0	31.0	46.0	-15.0	Black
17	20.564M	27.5	+5.8	+0.4	+0.2	+1.1	+0.0	35.0	50.0	-15.0	Black
18	508.149k	24.7	+5.8	+0.0	+0.2	+0.1	+0.0	30.8	46.0	-15.2	Black
19	913.294k	24.6	+5.8	+0.1	+0.2	+0.1	+0.0	30.8	46.0	-15.2	Black
20	1.202M	24.7	+5.8	+0.1	+0.2	+0.0	+0.0	30.8	46.0	-15.2	Black
21	1.509M	24.5	+5.8	+0.1	+0.2	+0.1	+0.0	30.7	46.0	-15.3	Black
22	1.906M	24.5	+5.8	+0.1	+0.1	+0.1	+0.0	30.6	46.0	-15.4	Black
23	2.249M	24.5	+5.8	+0.1	+0.1	+0.1	+0.0	30.6	46.0	-15.4	Black
24	19.626M	27.0	+5.8	+0.4	+0.2	+1.1	+0.0	34.5	50.0	-15.5	Black
25	20.239M	26.9	+5.8	+0.4	+0.2	+1.1	+0.0	34.4	50.0	-15.6	Black
26	25.076M	26.7	+5.8	+0.4	+0.2	+1.3	+0.0	34.4	50.0	-15.6	Black
27	689.950k	24.1	+5.8	+0.1	+0.3	+0.0	+0.0	30.3	46.0	-15.7	Black
28	18.805M	26.9	+5.8	+0.4	+0.2	+1.0	+0.0	34.3	50.0	-15.7	Black
29	20.104M	26.8	+5.8	+0.4	+0.2	+1.1	+0.0	34.3	50.0	-15.7	Black
30	475.425k	24.5	+5.8	+0.0	+0.2	+0.1	+0.0	30.6	46.4	-15.8	Black
31	20.429M	26.7	+5.8	+0.4	+0.2	+1.1	+0.0	34.2	50.0	-15.8	Black
32	780.851k	24.1	+5.8	+0.1	+0.1	+0.0	+0.0	30.1	46.0	-15.9	Black
33	1.698M	23.9	+5.8	+0.1	+0.2	+0.1	+0.0	30.1	46.0	-15.9	Black
34	27.990M	26.2	+5.8	+0.5	+0.2	+1.4	+0.0	34.1	50.0	-15.9	Black
35	19.951M	26.5	+5.8	+0.4	+0.2	+1.1	+0.0	34.0	50.0	-16.0	Black

36	28.775M	26.0	+5.8	+0.5	+0.2	+1.4	+0.0	33.9	50.0	-16.1	Black
37	575.416k	23.6	+5.8	+0.1	+0.3	+0.0	+0.0	29.8	46.0	-16.2	Black
38	839.028k	23.7	+5.8	+0.1	+0.1	+0.0	+0.0	29.7	46.0	-16.3	Black
39	20.050M	26.2	+5.8	+0.4	+0.2	+1.1	+0.0	33.7	50.0	-16.3	Black
40	539.055k	23.4	+5.8	+0.1	+0.2	+0.1	+0.0	29.6	46.0	-16.4	Black
41	609.958k	23.4	+5.8	+0.1	+0.3	+0.0	+0.0	29.6	46.0	-16.4	Black
42	849.936k	23.4	+5.8	+0.1	+0.2	+0.1	+0.0	29.6	46.0	-16.4	Black
43	1.798M	23.5	+5.8	+0.1	+0.1	+0.1	+0.0	29.6	46.0	-16.4	Black
44	26.600M	25.9	+5.8	+0.4	+0.2	+1.3	+0.0	33.6	50.0	-16.4	Black
45	797.213k	23.5	+5.8	+0.1	+0.1	+0.0	+0.0	29.5	46.0	-16.5	Black
46	19.752M	26.0	+5.8	+0.4	+0.2	+1.1	+0.0	33.5	50.0	-16.5	Black
47	553.599k	23.2	+5.8	+0.1	+0.3	+0.0	+0.0	29.4	46.0	-16.6	Black
48	866.298k	23.2	+5.8	+0.1	+0.2	+0.1	+0.0	29.4	46.0	-16.6	Black
49	14.384M	26.4	+5.8	+0.3	+0.2	+0.7	+0.0	33.4	50.0	-16.6	Black
50	22.098M	25.8	+5.8	+0.4	+0.2	+1.2	+0.0	33.4	50.0	-16.6	Black

Date: 1/25/2006 Time: 1:25:41 PM Impinj Inc. WO#: 83127
 FCC 15.107 Class B COND [AVE] Test Lead: Black 120V 60Hz Sequence#: 2



— Sweep Data
 — 2 - FCC 15.107 Class B COND [QP]
 — 1 - FCC 15.107 Class B COND [AVE]

Test Location: CKC Laboratories, Inc. 110 North Olinda Place Brea, CA 92823

Customer: **Impinj, Incorporated**
 Specification: **FCC 15.107 Class B COND [AVE]**
 Work Order #: **83127**
 Test Type: **Conducted Emissions**
 Equipment: **UHF RFID**
 Manufacturer: Impinj Inc
 Model: IPJ-R1000
 S/N: 40306020043

Date: 1/25/2006
 Time: 1:27:39 PM
 Sequence#: 3
 Tested By: Septimiu Apahidean
 120V 60Hz

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
UHF RFID*	Impinj Inc	IPJ-R1000	40306020043
Antenna	Cushcraft	S9028PCL	-
Power Supply	CUI Inc.	DSA-60W-20 1 24060	

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Compaq	Presario V2000	CNF5391NBO

Test Conditions / Notes:

EUT is connected to the remote laptop via ethernet cable, connected to the EUT is the antenna on port one, a DB9 cable connected to the serial port and a DB25 cable connected to the GPIO port. The EUT is powered by an external AC/DC power adapter. The remote laptop is controlling the EUT. Frequency range tested: 150 kHz – 30 MHz.

Transducer Legend:

T1=6dB Attenuator P05268_092807	T2=Cable #8 Conducted Site D
T3=HP Filter AN 02343	T4=(L2) LISN Insertion Loss 02128

Measurement Data:

Reading listed by margin.

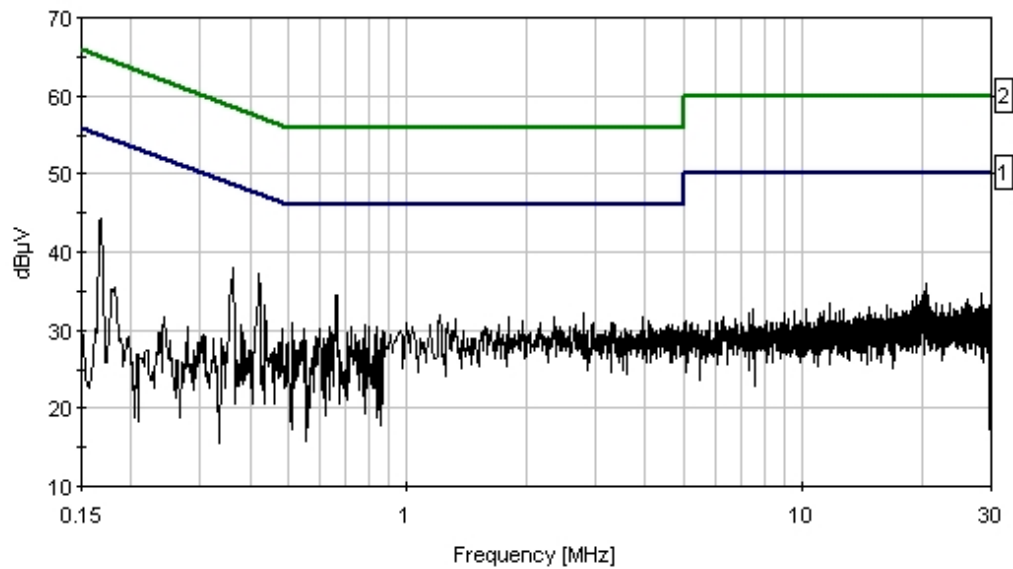
Test Lead: White

#	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	420.884k	31.2	+5.8	+0.0	+0.2	+0.1	+0.0	37.3	47.4	-10.1	White
2	168.180k	38.1	+5.8	+0.0	+0.3	+0.1	+0.0	44.3	55.0	-10.7	White
3	360.890k	31.9	+5.8	+0.0	+0.2	+0.1	+0.0	38.0	48.7	-10.7	White
4	659.044k	28.2	+5.8	+0.1	+0.3	+0.1	+0.0	34.5	46.0	-11.5	White
5	437.246k	27.2	+5.8	+0.0	+0.2	+0.1	+0.0	33.3	47.1	-13.8	White
6	2.781M	26.0	+5.8	+0.1	+0.1	+0.2	+0.0	32.2	46.0	-13.8	White
7	1.211M	25.8	+5.8	+0.1	+0.2	+0.1	+0.0	32.0	46.0	-14.0	White
8	2.808M	25.8	+5.8	+0.1	+0.1	+0.2	+0.0	32.0	46.0	-14.0	White
9	20.655M	28.4	+5.8	+0.4	+0.2	+1.2	+0.0	36.0	50.0	-14.0	White
10	2.339M	25.6	+5.8	+0.1	+0.1	+0.2	+0.0	31.8	46.0	-14.2	White

11	3.927M	25.5	+5.8	+0.1	+0.2	+0.2	+0.0	31.8	46.0	-14.2	White
12	1.807M	25.6	+5.8	+0.1	+0.1	+0.1	+0.0	31.7	46.0	-14.3	White
13	1.319M	25.2	+5.8	+0.1	+0.2	+0.1	+0.0	31.4	46.0	-14.6	White
14	1.951M	25.2	+5.8	+0.1	+0.1	+0.1	+0.0	31.3	46.0	-14.7	White
15	20.546M	27.6	+5.8	+0.4	+0.2	+1.2	+0.0	35.2	50.0	-14.8	White
16	1.265M	24.8	+5.8	+0.1	+0.2	+0.1	+0.0	31.0	46.0	-15.0	White
17	3.331M	24.8	+5.8	+0.1	+0.1	+0.2	+0.0	31.0	46.0	-15.0	White
18	994.497k	24.7	+5.8	+0.1	+0.2	+0.1	+0.0	30.9	46.0	-15.1	White
19	2.943M	24.7	+5.8	+0.1	+0.1	+0.2	+0.0	30.9	46.0	-15.1	White
20	20.321M	27.3	+5.8	+0.4	+0.2	+1.2	+0.0	34.9	50.0	-15.1	White
21	513.603k	24.7	+5.8	+0.0	+0.2	+0.1	+0.0	30.8	46.0	-15.2	White
22	2.167M	24.7	+5.8	+0.1	+0.1	+0.1	+0.0	30.8	46.0	-15.2	White
23	28.270M	26.6	+5.8	+0.5	+0.3	+1.6	+0.0	34.8	50.0	-15.2	White
24	780.851k	24.6	+5.8	+0.1	+0.1	+0.1	+0.0	30.7	46.0	-15.3	White
25	2.655M	24.5	+5.8	+0.1	+0.1	+0.2	+0.0	30.7	46.0	-15.3	White
26	3.367M	24.5	+5.8	+0.1	+0.1	+0.2	+0.0	30.7	46.0	-15.3	White
27	4.558M	24.5	+5.8	+0.1	+0.1	+0.2	+0.0	30.7	46.0	-15.3	White
28	1.698M	24.4	+5.8	+0.1	+0.2	+0.1	+0.0	30.6	46.0	-15.4	White
29	2.925M	24.4	+5.8	+0.1	+0.1	+0.2	+0.0	30.6	46.0	-15.4	White
30	20.249M	27.0	+5.8	+0.4	+0.2	+1.2	+0.0	34.6	50.0	-15.4	White
31	802.667k	24.4	+5.8	+0.1	+0.1	+0.1	+0.0	30.5	46.0	-15.5	White
32	1.031M	24.3	+5.8	+0.1	+0.2	+0.1	+0.0	30.5	46.0	-15.5	White
33	1.572M	24.2	+5.8	+0.1	+0.2	+0.1	+0.0	30.4	46.0	-15.6	White
34	2.573M	24.2	+5.8	+0.1	+0.1	+0.2	+0.0	30.4	46.0	-15.6	White
35	19.382M	26.8	+5.8	+0.4	+0.2	+1.2	+0.0	34.4	50.0	-15.6	White

36	20.050M	26.8	+5.8	+0.4	+0.2	+1.2	+0.0	34.4	50.0	-15.6	White
37	20.799M	26.7	+5.8	+0.4	+0.2	+1.3	+0.0	34.4	50.0	-15.6	White
38	639.046k	24.0	+5.8	+0.1	+0.3	+0.1	+0.0	30.3	46.0	-15.7	White
39	719.039k	24.0	+5.8	+0.1	+0.3	+0.1	+0.0	30.3	46.0	-15.7	White
40	839.028k	24.2	+5.8	+0.1	+0.1	+0.1	+0.0	30.3	46.0	-15.7	White
41	19.446M	26.7	+5.8	+0.4	+0.2	+1.2	+0.0	34.3	50.0	-15.7	White
42	20.158M	26.7	+5.8	+0.4	+0.2	+1.2	+0.0	34.3	50.0	-15.7	White
43	599.050k	23.9	+5.8	+0.1	+0.3	+0.1	+0.0	30.2	46.0	-15.8	White
44	549.963k	23.8	+5.8	+0.1	+0.3	+0.1	+0.0	30.1	46.0	-15.9	White
45	480.879k	24.1	+5.8	+0.0	+0.2	+0.1	+0.0	30.2	46.3	-16.1	White
46	864.480k	23.7	+5.8	+0.1	+0.2	+0.1	+0.0	29.9	46.0	-16.1	White
47	26.149M	26.0	+5.8	+0.4	+0.2	+1.5	+0.0	33.9	50.0	-16.1	White
48	2.862M	23.6	+5.8	+0.1	+0.1	+0.2	+0.0	29.8	46.0	-16.2	White
49	20.591M	26.2	+5.8	+0.4	+0.2	+1.2	+0.0	33.8	50.0	-16.2	White
50	18.958M	26.2	+5.8	+0.4	+0.2	+1.1	+0.0	33.7	50.0	-16.3	White

Date: 1/25/2006 Time: 1:27:39 PM Impinj Inc. WO#: 83127
 FCC 15.107 Class B COND [AVE] Test Lead: White 120V 60Hz Sequence#: 3



— Sweep Data
 — 1 - FCC 15.107 Class B COND [AVE]
 — 2 - FCC 15.107 Class B COND [QP]

Test Location: CKC Laboratories, Inc. 110 North Olinda Place Brea, CA 92823

Customer: **Impinj, Incorporated**

Specification: **FCC 15.109 Class B**

Work Order #: **83127**

Date: 1/25/2006

Test Type: **Radiated Scan**

Time: 12:19:19

Equipment: **UHF RFID**

Sequence#: 1

Manufacturer: Impinj Inc

Tested By: Septimiu Apahidean

Model: IPJ-R1000

S/N: 40306020043

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
UHF RFID*	Impinj Inc	IPJ-R1000	40306020043
Antenna	Cushcraft	S9028PCL	-
Power Supply	CUI Inc.	DSA-60W-20 1 24060	

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Compaq	Presario V2000	CNF5391NBO

Test Conditions / Notes:

EUT is connected to the remote laptop via ethernet cable, connected to the EUT is the antenna on port one, a DB9 cable connected to the serial port and a DB25 cable connected to the GPIO port. The EUT is powered by an external AC/DC power adapter. The remote laptop is controlling the EUT. Frequency range tested: 30-1000 MHz.

Transducer Legend:

T1=Chase bilog a/n 00851, s/n 2629	T2=Cable #22 080905 Preamp to SA
T3=Cable #33 44ft RG-214(ant to Bulkhead)	T4=Cable Heliacx #17 84ft(10 meter) 100205
T5=Preamp 8447D Asset 00010	T6=-----
T7=Cable #19, 54' Heliacx, Site D OATs	T8=DRG Horn_01646_072206
T9=HF Preamp Cal. HP-83017A,S/N- 3123A00282	T10=1-40 GHz Cable_122306
T11=HPF_AN02116_1.5GHz_062707	

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1	T2	T3	T4	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
			T5	T6	T7	T8					
1	3661.050M Ave	52.4	+0.0	+0.0	+0.0	+0.0	+0.0	50.2	54.0	-3.8	Vert
			+0.0	+0.0	+5.0	+29.9					
			-39.3	+1.7	+0.5						
^	3661.063M	55.7	+0.0	+0.0	+0.0	+0.0	+0.0	53.5	54.0	-0.5	Vert
			+0.0	+0.0	+5.0	+29.9					
			-39.3	+1.7	+0.5						
3	3661.063M	51.2	+0.0	+0.0	+0.0	+0.0	+0.0	49.0	54.0	-5.0	Horiz
			+0.0	+0.0	+5.0	+29.9					
			-39.3	+1.7	+0.5						
4	1252.925M	45.5	+0.0	+0.0	+0.0	+0.0	+0.0	48.9	54.0	-5.1	Horiz
			+0.0	+0.0	+2.5	+24.1					
			-40.3	+1.0	+16.1						
5	4575.712M	48.3	+0.0	+0.0	+0.0	+0.0	+0.0	48.9	54.0	-5.1	Horiz
			+0.0	+0.0	+5.5	+31.4					
			-39.1	+1.9	+0.9						

6	4576.375M	47.2	+0.0	+0.0	+0.0	+0.0	+0.0	47.8	54.0	-6.2	Vert
			+0.0	+0.0	+5.5	+31.4					
			-39.1	+1.9	+0.9						
7	6405.950M	42.5	+0.0	+0.0	+0.0	+0.0	+0.0	47.2	54.0	-6.8	Vert
			+0.0	+0.0	+6.7	+33.2					
			-38.4	+2.2	+1.0						
8	1277.000M	46.9	+0.0	+0.0	+0.0	+0.0	+0.0	47.1	54.0	-6.9	Horiz
			+0.0	+0.0	+2.5	+24.2					
			-40.2	+1.0	+12.7						
9	2354.962M	53.5	+0.0	+0.0	+0.0	+0.0	+0.0	46.6	54.0	-7.4	Vert
			+0.0	+0.0	+3.5	+27.0					
			-39.4	+1.3	+0.7						
10	9149.600M	36.5	+0.0	+0.0	+0.0	+0.0	+0.0	46.3	54.0	-7.7	Vert
			+0.0	+0.0	+8.6	+35.6					
			-38.0	+2.8	+0.8						
11	2355.075M	53.0	+0.0	+0.0	+0.0	+0.0	+0.0	46.1	54.0	-7.9	Horiz
			+0.0	+0.0	+3.5	+27.0					
			-39.4	+1.3	+0.7						
12	8234.850M	37.6	+0.0	+0.0	+0.0	+0.0	+0.0	45.9	54.0	-8.1	Vert
			+0.0	+0.0	+7.7	+35.3					
			-38.1	+2.7	+0.7						
13	383.624M	45.7	+14.4	+0.4	+2.1	+2.3	+0.0	37.9	46.0	-8.1	Horiz
			-27.0								
14	5491.175M	41.2	+0.0	+0.0	+0.0	+0.0	+0.0	45.2	54.0	-8.8	Vert
			+0.0	+0.0	+6.5	+32.1					
			-38.2	+2.1	+1.5						
15	7319.650M	38.1	+0.0	+0.0	+0.0	+0.0	+0.0	45.0	54.0	-9.0	Vert
			+0.0	+0.0	+7.4	+34.6					
			-38.4	+2.5	+0.8						
16	119.700M	47.1	+11.5	+0.2	+1.1	+1.3	+0.0	34.4	43.5	-9.1	Vert
			-26.8								
17	2745.875M	48.5	+0.0	+0.0	+0.0	+0.0	+0.0	43.7	54.0	-10.3	Vert
			+0.0	+0.0	+4.2	+28.3					
			-39.3	+1.4	+0.6						
18	1830.657M	50.6	+0.0	+0.0	+0.0	+0.0	+0.0	41.8	54.0	-12.2	Horiz
			+0.0	+0.0	+3.3	+25.6					
			-39.4	+1.2	+0.5						
19	125.076M	43.5	+11.6	+0.2	+1.1	+1.3	+0.0	30.9	43.5	-12.6	Vert
			-26.8								
20	1830.595M	49.8	+0.0	+0.0	+0.0	+0.0	+0.0	41.0	54.0	-13.0	Vert
			+0.0	+0.0	+3.3	+25.6					
			-39.4	+1.2	+0.5						
21	85.754M	43.7	+8.1	+0.1	+1.0	+1.2	+0.0	27.0	40.0	-13.0	Horiz
			-27.1								
22	173.183M	42.4	+11.4	+0.2	+1.4	+1.5	+0.0	30.2	43.5	-13.3	Vert
			-26.7								

23	225.308M	44.8	+10.3 -26.6	+0.3	+1.6	+1.7	+0.0	32.1	46.0	-13.9	Vert
24	220.716M	44.2	+10.2 -26.6	+0.3	+1.6	+1.7	+0.0	31.4	46.0	-14.6	Horiz
25	80.531M	42.0	+7.7 -27.0	+0.1	+0.9	+1.1	+0.0	24.8	40.0	-15.2	Horiz
26	151.728M	39.9	+12.2 -26.8	+0.2	+1.3	+1.4	+0.0	28.2	43.5	-15.3	Vert
27	263.662M	42.3	+10.6 -26.5	+0.3	+1.7	+2.0	+0.0	30.4	46.0	-15.6	Horiz
28	450.245M	36.1	+15.7 -27.7	+0.4	+2.4	+2.4	+0.0	29.3	46.0	-16.7	Vert
29	139.459M	38.1	+12.0 -26.8	+0.2	+1.2	+1.4	+0.0	26.1	43.5	-17.4	Vert
30	110.448M	39.3	+10.8 -26.9	+0.1	+1.1	+1.2	+0.0	25.6	43.5	-17.9	Horiz
31	1190.950M	46.4	+0.0 +0.0 -40.5	+0.0 +0.0 +0.9	+0.0 +2.4 +0.0	+0.0 +23.9 +0.0	+0.0	33.1	54.0	-20.9	Vert
32	300.072M	36.4	+10.7 -26.4	+0.3	+1.8	+2.0	+0.0	24.8	46.0	-21.2	Vert
33	1253.150M	45.0	+0.0 +0.0 -40.3	+0.0 +0.0 +1.0	+0.0 +2.5 +0.0	+0.0 +24.1 +0.0	+0.0	32.3	54.0	-21.7	Vert
34	1277.150M	44.6	+0.0 +0.0 -40.2	+0.0 +0.0 +1.0	+0.0 +2.5 +0.0	+0.0 +24.2 +0.0	+0.0	32.1	54.0	-21.9	Vert
35	300.002M	21.1	+10.7 -26.4	+0.3	+1.8	+2.0	+0.0	9.5	46.0	-36.5	Vert

Test Location: CKC Laboratories, Inc. 110 North Olinda Place Brea, CA 92823

Customer: **Impinj, Incorporated**
 Specification: **FCC 15.207 COND [AVE]**
 Work Order #: **83127**
 Test Type: **Conducted Emissions**
 Equipment: **UHF RFID**
 Manufacturer: Impinj Inc
 Model: IPJ-R1000
 S/N: 40306020043

Date: 1/25/2006
 Time: 1:34:55 PM
 Sequence#: 5
 Tested By: Septimiu Apahidean
 120V 60Hz

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
UHF RFID*	Impinj Inc	IPJ-R1000	40306020043
Antenna	Cushcraft	S9028PCL	-
Power Supply	CUI Inc.	DSA-60W-20 1 24060	

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Compaq	Presario V2000	CNF5391NBO

Test Conditions / Notes:

EUT is connected to the remote laptop via ethernet cable, connected to the EUT is the antenna on port one, a DB9 cable connected to the serial port and a DB25 cable connected to the GPIO port. The EUT is powered by an external AC/DC power adapter. The remote laptop is controlling the EUT. Frequency range tested: 150 kHz – 30 MHz.

Transducer Legend:

T1=6dB Attenuator P05268_092807	T2=Cable #8 Conducted Site D
T3=HP Filter AN 02343	T4=(L1) LISN Insertion Loss 02128

Measurement Data:

Reading listed by margin.

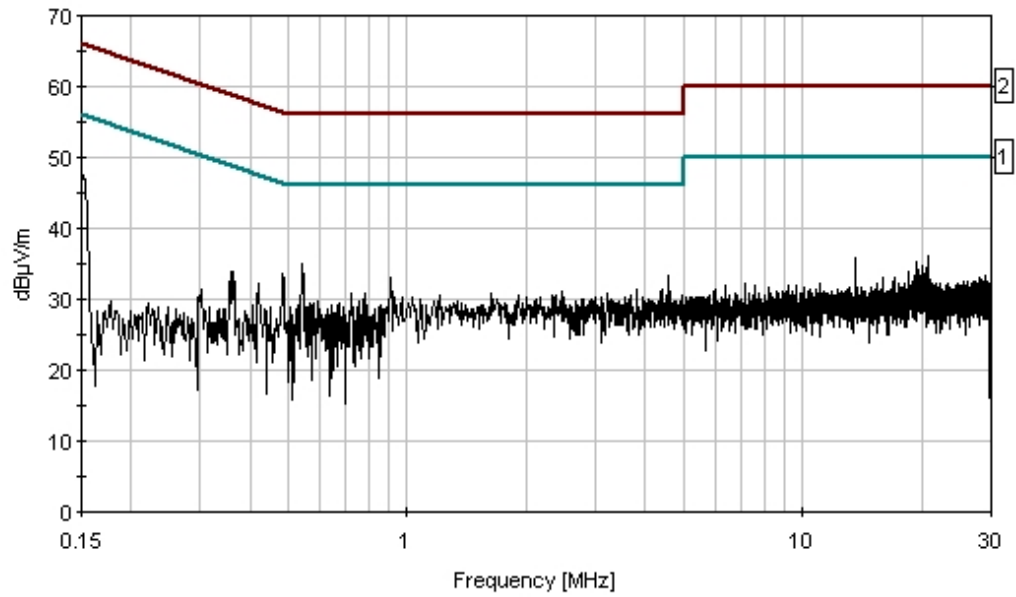
Test Lead: Black

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	151.818k	38.9	+5.8	+0.0	+2.8	+0.0	+0.0	47.5	55.9	-8.4	Black
2	544.509k	28.7	+5.8	+0.1	+0.2	+0.1	+0.0	34.9	46.0	-11.1	Black
3	4.585M	27.1	+5.8	+0.1	+0.1	+0.2	+0.0	33.3	46.0	-12.7	Black
4	484.515k	27.4	+5.8	+0.0	+0.2	+0.1	+0.0	33.5	46.3	-12.8	Black
5	904.272k	26.8	+5.8	+0.1	+0.2	+0.1	+0.0	33.0	46.0	-13.0	Black
6	20.673M	28.6	+5.8	+0.4	+0.2	+1.1	+0.0	36.1	50.0	-13.9	Black
7	13.617M	28.8	+5.8	+0.3	+0.2	+0.7	+0.0	35.8	50.0	-14.2	Black
8	4.414M	25.3	+5.8	+0.1	+0.1	+0.2	+0.0	31.5	46.0	-14.5	Black
9	3.819M	25.1	+5.8	+0.1	+0.2	+0.2	+0.0	31.4	46.0	-14.6	Black
10	19.473M	27.9	+5.8	+0.4	+0.2	+1.1	+0.0	35.4	50.0	-14.6	Black

11	364.526k	27.7	+5.8	+0.0	+0.2	+0.1	+0.0	33.8	48.6	-14.8	Black
12	4.640M	24.9	+5.8	+0.1	+0.1	+0.2	+0.0	31.1	46.0	-14.9	Black
13	2.474M	24.9	+5.8	+0.1	+0.1	+0.1	+0.0	31.0	46.0	-15.0	Black
14	3.196M	24.8	+5.8	+0.1	+0.1	+0.1	+0.0	30.9	46.0	-15.1	Black
15	724.493k	24.7	+5.8	+0.1	+0.2	+0.0	+0.0	30.8	46.0	-15.2	Black
16	1.626M	24.6	+5.8	+0.1	+0.2	+0.1	+0.0	30.8	46.0	-15.2	Black
17	419.066k	26.1	+5.8	+0.0	+0.2	+0.1	+0.0	32.2	47.5	-15.3	Black
18	782.669k	24.7	+5.8	+0.1	+0.1	+0.0	+0.0	30.7	46.0	-15.3	Black
19	1.906M	24.5	+5.8	+0.1	+0.1	+0.1	+0.0	30.6	46.0	-15.4	Black
20	4.964M	24.4	+5.8	+0.1	+0.1	+0.2	+0.0	30.6	46.0	-15.4	Black
21	20.140M	27.1	+5.8	+0.4	+0.2	+1.1	+0.0	34.6	50.0	-15.4	Black
22	1.211M	24.4	+5.8	+0.1	+0.2	+0.0	+0.0	30.5	46.0	-15.5	Black
23	3.665M	24.3	+5.8	+0.1	+0.1	+0.2	+0.0	30.5	46.0	-15.5	Black
24	967.429k	24.3	+5.8	+0.1	+0.2	+0.0	+0.0	30.4	46.0	-15.6	Black
25	20.068M	26.9	+5.8	+0.4	+0.2	+1.1	+0.0	34.4	50.0	-15.6	Black
26	931.339k	24.1	+5.8	+0.1	+0.2	+0.1	+0.0	30.3	46.0	-15.7	Black
27	2.988M	24.2	+5.8	+0.1	+0.1	+0.1	+0.0	30.3	46.0	-15.7	Black
28	3.539M	24.1	+5.8	+0.1	+0.1	+0.2	+0.0	30.3	46.0	-15.7	Black
29	1.031M	24.1	+5.8	+0.1	+0.2	+0.0	+0.0	30.2	46.0	-15.8	Black
30	3.115M	24.1	+5.8	+0.1	+0.1	+0.1	+0.0	30.2	46.0	-15.8	Black
31	2.772M	24.0	+5.8	+0.1	+0.1	+0.1	+0.0	30.1	46.0	-15.9	Black
32	3.647M	23.9	+5.8	+0.1	+0.1	+0.2	+0.0	30.1	46.0	-15.9	Black
33	19.707M	26.6	+5.8	+0.4	+0.2	+1.1	+0.0	34.1	50.0	-15.9	Black
34	1.076M	23.9	+5.8	+0.1	+0.2	+0.0	+0.0	30.0	46.0	-16.0	Black
35	2.790M	23.9	+5.8	+0.1	+0.1	+0.1	+0.0	30.0	46.0	-16.0	Black

36	3.277M	23.9	+5.8	+0.1	+0.1	+0.1	+0.0	30.0	46.0	-16.0	Black
37	777.215k	23.9	+5.8	+0.1	+0.1	+0.0	+0.0	29.9	46.0	-16.1	Black
38	595.414k	23.6	+5.8	+0.1	+0.3	+0.0	+0.0	29.8	46.0	-16.2	Black
39	3.449M	23.6	+5.8	+0.1	+0.1	+0.2	+0.0	29.8	46.0	-16.2	Black
40	18.597M	26.4	+5.8	+0.4	+0.2	+1.0	+0.0	33.8	50.0	-16.2	Black
41	20.483M	26.3	+5.8	+0.4	+0.2	+1.1	+0.0	33.8	50.0	-16.2	Black
42	1.166M	23.6	+5.8	+0.1	+0.2	+0.0	+0.0	29.7	46.0	-16.3	Black
43	755.399k	23.5	+5.8	+0.1	+0.2	+0.0	+0.0	29.6	46.0	-16.4	Black
44	2.682M	23.5	+5.8	+0.1	+0.1	+0.1	+0.0	29.6	46.0	-16.4	Black
45	577.234k	23.3	+5.8	+0.1	+0.3	+0.0	+0.0	29.5	46.0	-16.5	Black
46	671.770k	23.3	+5.8	+0.1	+0.3	+0.0	+0.0	29.5	46.0	-16.5	Black
47	20.402M	26.0	+5.8	+0.4	+0.2	+1.1	+0.0	33.5	50.0	-16.5	Black
48	566.325k	23.2	+5.8	+0.1	+0.3	+0.0	+0.0	29.4	46.0	-16.6	Black
49	3.602M	23.2	+5.8	+0.1	+0.1	+0.2	+0.0	29.4	46.0	-16.6	Black
50	19.193M	26.0	+5.8	+0.4	+0.2	+1.0	+0.0	33.4	50.0	-16.6	Black

Date: 1/25/2006 Time: 1:34:55 PM Impinj Inc. WO#: 83127
FCC 15.207 COND [AVE] Test Lead: Black 120V 60Hz Sequence#: 5



— Sweep Data — 1 - FCC 15.207 COND [AVE] — 2 - FCC 15.207 COND [QP]

Test Location: CKC Laboratories, Inc. 110 North Olinda Place Brea, CA 92823

Customer: **Impinj, Incorporated**
 Specification: **FCC 15.207 COND [AVE]**
 Work Order #: **83127**
 Test Type: **Conducted Emissions**
 Equipment: **UHF RFID**
 Manufacturer: Impinj Inc
 Model: IPJ-R1000
 S/N: 40306020043

Date: 1/25/2006
 Time: 1:32:35 PM
 Sequence#: 4
 Tested By: Septimiu Apahidean
 120V 60Hz

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
UHF RFID*	Impinj Inc	IPJ-R1000	40306020043
Antenna	Cushcraft	S9028PCL	-
Power Supply	CUI Inc.	DSA-60W-20 1 24060	

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Compaq	Presario V2000	CNF5391NBO

Test Conditions / Notes:

EUT is connected to the remote laptop via ethernet cable, connected to the EUT is the antenna on port one, a DB9 cable connected to the serial port and a DB25 cable connected to the GPIO port. The EUT is powered by an external AC/DC power adapter. The remote laptop is controlling the EUT. Frequency range tested: 150 kHz – 30 MHz.

Transducer Legend:

T1=6dB Attenuator P05268_092807	T2=Cable #8 Conducted Site D
T3=HP Filter AN 02343	T4=(L2) LISN Insertion Loss 02128

Measurement Data:

Reading listed by margin.

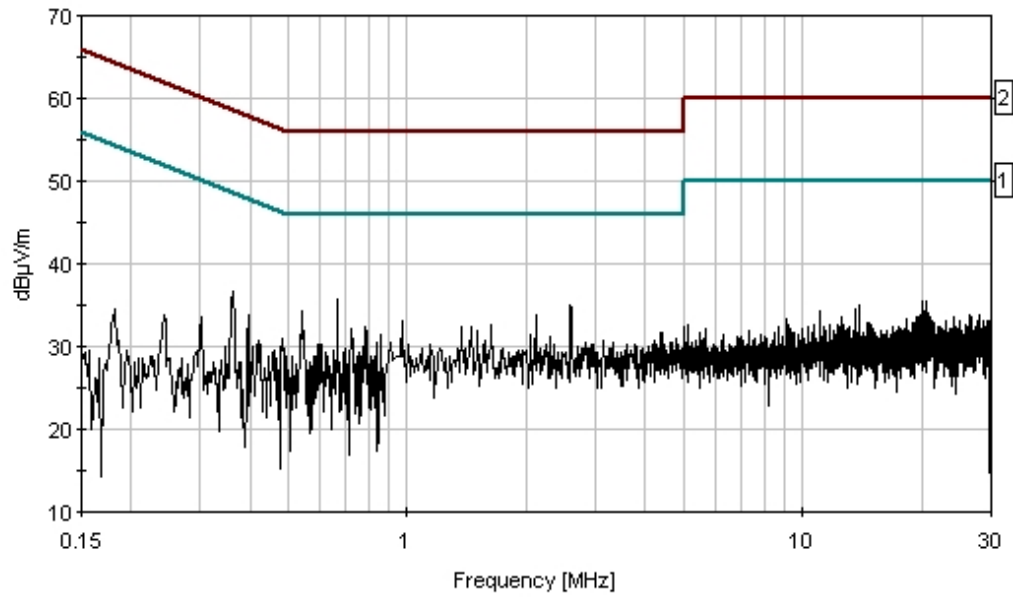
Test Lead: White

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	666.316k	29.4	+5.8	+0.1	+0.3	+0.1	+0.0	35.7	46.0	-10.3	White
2	2.591M	28.7	+5.8	+0.1	+0.1	+0.2	+0.0	34.9	46.0	-11.1	White
3	540.873k	28.0	+5.8	+0.1	+0.2	+0.1	+0.0	34.2	46.0	-11.8	White
4	360.890k	30.6	+5.8	+0.0	+0.2	+0.1	+0.0	36.7	48.7	-12.0	White
5	2.113M	27.8	+5.8	+0.1	+0.1	+0.1	+0.0	33.9	46.0	-12.1	White
6	967.429k	26.9	+5.8	+0.1	+0.2	+0.1	+0.0	33.1	46.0	-12.9	White
7	1.635M	26.5	+5.8	+0.1	+0.2	+0.1	+0.0	32.7	46.0	-13.3	White
8	784.487k	26.4	+5.8	+0.1	+0.1	+0.1	+0.0	32.5	46.0	-13.5	White
9	1.364M	26.3	+5.8	+0.1	+0.2	+0.1	+0.0	32.5	46.0	-13.5	White
10	1.446M	26.2	+5.8	+0.1	+0.2	+0.1	+0.0	32.4	46.0	-13.6	White

11	720.857k	25.8	+5.8	+0.1	+0.3	+0.1	+0.0	32.1	46.0	-13.9	White
12	395.432k	27.6	+5.8	+0.0	+0.2	+0.1	+0.0	33.7	47.9	-14.2	White
13	1.509M	25.6	+5.8	+0.1	+0.2	+0.1	+0.0	31.8	46.0	-14.2	White
14	4.423M	25.5	+5.8	+0.1	+0.1	+0.2	+0.0	31.7	46.0	-14.3	White
15	4.351M	25.4	+5.8	+0.1	+0.1	+0.2	+0.0	31.6	46.0	-14.4	White
16	853.572k	25.2	+5.8	+0.1	+0.2	+0.1	+0.0	31.4	46.0	-14.6	White
17	2.050M	25.3	+5.8	+0.1	+0.1	+0.1	+0.0	31.4	46.0	-14.6	White
18	20.014M	27.8	+5.8	+0.4	+0.2	+1.2	+0.0	35.4	50.0	-14.6	White
19	20.519M	27.8	+5.8	+0.4	+0.2	+1.2	+0.0	35.4	50.0	-14.6	White
20	2.294M	25.1	+5.8	+0.1	+0.1	+0.2	+0.0	31.3	46.0	-14.7	White
21	13.852M	28.0	+5.8	+0.3	+0.2	+0.8	+0.0	35.1	50.0	-14.9	White
22	4.811M	24.7	+5.8	+0.1	+0.1	+0.2	+0.0	30.9	46.0	-15.1	White
23	3.142M	24.6	+5.8	+0.1	+0.1	+0.2	+0.0	30.8	46.0	-15.2	White
24	482.697k	24.8	+5.8	+0.0	+0.2	+0.1	+0.0	30.9	46.3	-15.4	White
25	4.207M	24.3	+5.8	+0.1	+0.2	+0.2	+0.0	30.6	46.0	-15.4	White
26	13.626M	27.5	+5.8	+0.3	+0.2	+0.8	+0.0	34.6	50.0	-15.4	White
27	20.167M	27.0	+5.8	+0.4	+0.2	+1.2	+0.0	34.6	50.0	-15.4	White
28	20.564M	26.9	+5.8	+0.4	+0.2	+1.2	+0.0	34.5	50.0	-15.5	White
29	837.210k	24.3	+5.8	+0.1	+0.1	+0.1	+0.0	30.4	46.0	-15.6	White
30	11.073M	27.4	+5.8	+0.3	+0.2	+0.7	+0.0	34.4	50.0	-15.6	White
31	597.232k	24.0	+5.8	+0.1	+0.3	+0.1	+0.0	30.3	46.0	-15.7	White
32	20.366M	26.7	+5.8	+0.4	+0.2	+1.2	+0.0	34.3	50.0	-15.7	White
33	604.504k	23.9	+5.8	+0.1	+0.3	+0.1	+0.0	30.2	46.0	-15.8	White
34	1.004M	24.0	+5.8	+0.1	+0.2	+0.1	+0.0	30.2	46.0	-15.8	White
35	1.148M	24.0	+5.8	+0.1	+0.2	+0.1	+0.0	30.2	46.0	-15.8	White

36	2.357M	24.0	+5.8	+0.1	+0.1	+0.2	+0.0	30.2	46.0	-15.8	White
37	3.593M	24.0	+5.8	+0.1	+0.1	+0.2	+0.0	30.2	46.0	-15.8	White
38	20.230M	26.6	+5.8	+0.4	+0.2	+1.2	+0.0	34.2	50.0	-15.8	White
39	20.853M	26.3	+5.8	+0.4	+0.2	+1.3	+0.0	34.0	50.0	-16.0	White
40	20.627M	26.3	+5.8	+0.4	+0.2	+1.2	+0.0	33.9	50.0	-16.1	White
41	26.294M	25.9	+5.8	+0.4	+0.2	+1.6	+0.0	33.9	50.0	-16.1	White
42	27.854M	25.8	+5.8	+0.5	+0.2	+1.6	+0.0	33.9	50.0	-16.1	White
43	3.927M	23.5	+5.8	+0.1	+0.2	+0.2	+0.0	29.8	46.0	-16.2	White
44	19.743M	26.2	+5.8	+0.4	+0.2	+1.2	+0.0	33.8	50.0	-16.2	White
45	695.405k	23.4	+5.8	+0.1	+0.3	+0.1	+0.0	29.7	46.0	-16.3	White
46	1.085M	23.5	+5.8	+0.1	+0.2	+0.1	+0.0	29.7	46.0	-16.3	White
47	1.752M	23.6	+5.8	+0.1	+0.1	+0.1	+0.0	29.7	46.0	-16.3	White
48	19.427M	26.0	+5.8	+0.4	+0.2	+1.2	+0.0	33.6	50.0	-16.4	White
49	21.124M	25.9	+5.8	+0.4	+0.2	+1.3	+0.0	33.6	50.0	-16.4	White
50	26.880M	25.6	+5.8	+0.4	+0.2	+1.6	+0.0	33.6	50.0	-16.4	White

Date: 1/25/2006 Time: 1:32:35 PM Impinj Inc. WO#: 83127
 FCC 15.207 COND [AVE] Test Lead: White 120V 60Hz Sequence#: 4



— Sweep Data — 1 - FCC 15.207 COND [AVE] — 2 - FCC 15.207 COND [QP]

Test Location: CKC Laboratories, Inc. 110 North Olinda Place Brea, CA 92823

Customer: **Impinj, Incorporated**
 Specification: **FCC 15.209**
 Work Order #: **83127**
 Test Type: **Radiated Scan**
 Equipment: **UHF RFID**
 Manufacturer: Impinj Inc
 Model: IPJ-R1000
 S/N: 40306020043

Date: 1/25/2006
 Time: 15:04:29
 Sequence#: 5
 Tested By: Septimiu Apahidean

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
UHF RFID*	Impinj Inc	IPJ-R1000	40306020043
Antenna	Cushcraft	S9028PCL	-
Power Supply	CUI Inc.	DSA-60W-20 1 24060	

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Compaq	Presario V2000	CNF5391NBO

Test Conditions / Notes:

EUT is connected to the remote laptop via ethernet cable, connected to the EUT is the antenna on port one, a DB9 cable connected to the serial port and a DB25 cable connected to the GPIO port. The EUT is powered by an external AC/DC power adapter. The remote laptop is controlling the EUT. Frequency range tested: 10 MHz – 30 MHz.

Transducer Legend:

T1=6502 Active Loop Antenna_062806	T2=Cable #22 080905 Preamp to SA
T3=Cable #33 44ft RG-214(ant to Bulkhead)	T4=Cable Helix #17 84ft(10 meter) 100205
T5=Preamp 8447D Asset 00010	

Measurement Data:

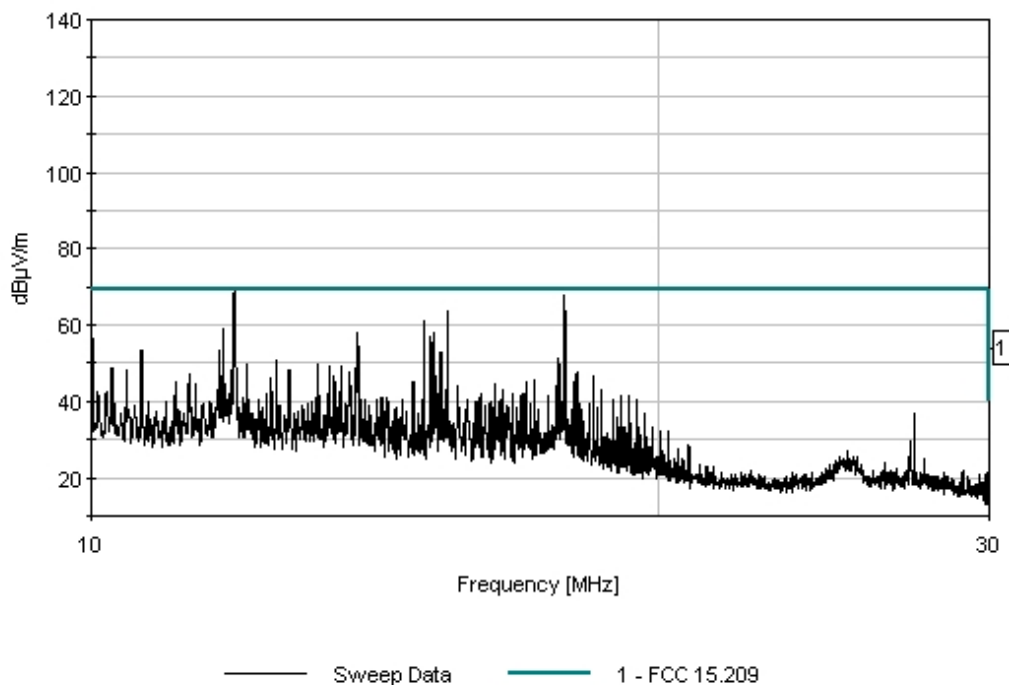
Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	T1 T5 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	10.002M	67.3	+10.9 -27.2	+0.0	+0.3	+0.4	+0.0	51.7	69.5 HIGH	-17.8	Paral
2	10.004M	66.7	+10.9 -27.2	+0.0	+0.3	+0.4	+0.0	51.1	69.5 LOW	-18.4	Perpe
3	10.060M	66.6	+10.9 -27.2	+0.0	+0.3	+0.4	+0.0	51.0	69.5 MID	-18.5	Perpe
4	10.005M	66.1	+10.9 -27.2	+0.0	+0.3	+0.4	+0.0	50.5	69.5 LOW	-19.0	Paral
5	10.002M	65.8	+10.9 -27.2	+0.0	+0.3	+0.4	+0.0	50.2	69.5 MID	-19.3	Paral
6	10.060M	61.6	+10.9 -27.2	+0.0	+0.3	+0.4	+0.0	46.0	69.5 HIGH	-23.5	Perpe
7	19.850M	53.1	+10.2 -27.2	+0.0	+0.4	+0.5	+0.0	37.0	69.5 MID	-32.5	Paral
8	24.904M	48.0	+9.6 -27.2	+0.1	+0.5	+0.6	+0.0	31.6	69.5 LOW	-37.9	Perpe
9	19.854M	47.5	+10.2 -27.2	+0.0	+0.4	+0.5	+0.0	31.4	69.5 HIGH	-38.1	Paral

10	20.382M	45.9	+10.1 -27.2	+0.0	+0.4	+0.5	+0.0	29.7	69.5 MID	-39.8	Paral
11	19.985M	44.6	+10.2 -27.2	+0.0	+0.4	+0.5	+0.0	28.5	69.5 LOW	-41.0	Perpe
12	20.389M	44.4	+10.1 -27.2	+0.0	+0.4	+0.5	+0.0	28.2	69.5 HIGH	-41.3	Paral
13	20.420M	44.1	+10.1 -27.2	+0.0	+0.4	+0.5	+0.0	27.9	69.5 HIGH	-41.6	Perpe
14	24.840M	43.1	+9.6 -27.2	+0.1	+0.5	+0.6	+0.0	26.7	69.5 MID	-42.8	Perpe
15	20.384M	42.2	+10.1 -27.2	+0.0	+0.4	+0.5	+0.0	26.0	69.5 LOW	-43.5	Paral
16	24.902M	41.7	+9.6 -27.2	+0.1	+0.5	+0.6	+0.0	25.3	69.5 LOW	-44.2	Paral
17	25.090M	40.2	+9.6 -27.2	+0.1	+0.5	+0.6	+0.0	23.8	69.5 HIGH	-45.7	Perpe
18	20.320M	39.4	+10.2 -27.2	+0.0	+0.4	+0.5	+0.0	23.3	69.5 MID	-46.2	Perpe
19	20.013M	38.5	+10.2 -27.2	+0.0	+0.4	+0.5	+0.0	22.4	69.5 LOW	-47.1	Paral
20	24.903M	35.7	+9.6 -27.2	+0.1	+0.5	+0.6	+0.0	19.3	69.5 MID	-50.2	Paral

Date: 1/25/2006 Time: 15:04:29 Impinj Inc. WVO#: 83127
FCC 15.209 Test Distance: 3 Meters Sequence#: 5



Test Location: CKC Laboratories, Inc. 110 North Olinda Place Brea, CA 92823

Customer: **Impinj, Incorporated**

Specification: **FCC 15.209/15.247**

Work Order #: **83127**

Date: 1/25/2006

Test Type: **Radiated Scan**

Time: 12:19:19

Equipment: **UHF RFID**

Sequence#: 10

Manufacturer: Impinj Inc

Tested By: Septimiu Apahidean

Model: IPJ-R1000

S/N: 40306020043

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
UHF RFID*	Impinj Inc	IPJ-R1000	40306020043
Antenna	Cushcraft	S9028PCL	-
Power Supply	CUI Inc.	DSA-60W-20 1 24060	

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Compaq	Presario V2000	CNF5391NBO

Test Conditions / Notes:

EUT is connected to the remote laptop via ethernet cable, connected to the EUT is the antenna on port one, a DB9 cable connected to the serial port and a DB25 cable connected to the GPIO port. The EUT is powered by an external AC/DC power adapter. The remote laptop is controlling the EUT. Frequency range tested: 30 MHz – 10 GHz.

Transducer Legend:

T1=Chase bilog a/n 00851, s/n 2629	T2=Cable #22 080905 Preamp to SA
T3=Cable #33 44ft RG-214(ant to Bulkhead)	T4=Cable Heliax #17 84ft(10 meter) 100205
T5=Preamp 8447D Asset 00010	T6=-----
T7=Cable #19, 54' Heliax, Site D OATs	T8=DRG Horn_01646_072206
T9=HF Preamp Cal. HP-83017A,S/N- 3123A00282	T10=1-40 GHz Cable_122306
T11=HPF_AN02116_1.5GHz_062707	

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dB μ V	T1	T2	T3	T4	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant	
			T5	T6	T7	T8						
			T9	T10	T11							
			dB	dB	dB	dB						
1	3661.050M	52.4	+0.0	+0.0	+0.0	+0.0	+0.0	50.2	54.0	-3.8	Vert	
	Ave		+0.0	+0.0	+5.0	+29.9						
			-39.3	+1.7	+0.5							
^	3661.063M	55.7	+0.0	+0.0	+0.0	+0.0	+0.0	53.5	54.0	-0.5	Vert	
			+0.0	+0.0	+5.0	+29.9						
			-39.3	+1.7	+0.5							
3	3661.063M	51.2	+0.0	+0.0	+0.0	+0.0	+0.0	49.0	54.0	-5.0	Horiz	
			+0.0	+0.0	+5.0	+29.9						
			-39.3	+1.7	+0.5							
4	4575.712M	48.3	+0.0	+0.0	+0.0	+0.0	+0.0	48.9	54.0	-5.1	Horiz	
			+0.0	+0.0	+5.5	+31.4						
			-39.1	+1.9	+0.9							

5	1252.925M	45.5	+0.0 +0.0 -40.3	+0.0 +0.0 +1.0	+0.0 +2.5 +16.1	+0.0 +24.1	+0.0	48.9	54.0	-5.1	Horiz
6	4576.375M	47.2	+0.0 +0.0 -39.1	+0.0 +0.0 +1.9	+0.0 +5.5 +0.9	+0.0 +31.4	+0.0	47.8	54.0	-6.2	Vert
7	6405.950M	42.5	+0.0 +0.0 -38.4	+0.0 +0.0 +2.2	+0.0 +6.7 +1.0	+0.0 +33.2	+0.0	47.2	54.0	-6.8	Vert
8	1277.000M	46.9	+0.0 +0.0 -40.2	+0.0 +0.0 +1.0	+0.0 +2.5 +12.7	+0.0 +24.2	+0.0	47.1	54.0	-6.9	Horiz
9	2354.962M	53.5	+0.0 +0.0 -39.4	+0.0 +0.0 +1.3	+0.0 +3.5 +0.7	+0.0 +27.0	+0.0	46.6	54.0	-7.4	Vert
10	9149.600M	36.5	+0.0 +0.0 -38.0	+0.0 +0.0 +2.8	+0.0 +8.6 +0.8	+0.0 +35.6	+0.0	46.3	54.0	-7.7	Vert
11	2355.075M	53.0	+0.0 +0.0 -39.4	+0.0 +0.0 +1.3	+0.0 +3.5 +0.7	+0.0 +27.0	+0.0	46.1	54.0	-7.9	Horiz
12	8234.850M	37.6	+0.0 +0.0 -38.1	+0.0 +0.0 +2.7	+0.0 +7.7 +0.7	+0.0 +35.3	+0.0	45.9	54.0	-8.1	Vert
13	383.624M	45.7	+14.4 -27.0	+0.4	+2.1	+2.3	+0.0	37.9	46.0	-8.1	Horiz
14	5491.175M	41.2	+0.0 +0.0 -38.2	+0.0 +0.0 +2.1	+0.0 +6.5 +1.5	+0.0 +32.1	+0.0	45.2	54.0	-8.8	Vert
15	7319.650M	38.1	+0.0 +0.0 -38.4	+0.0 +0.0 +2.5	+0.0 +7.4 +0.8	+0.0 +34.6	+0.0	45.0	54.0	-9.0	Vert
16	119.700M	47.1	+11.5 -26.8	+0.2	+1.1	+1.3	+0.0	34.4	43.5	-9.1	Vert
17	2745.875M	48.5	+0.0 +0.0 -39.3	+0.0 +0.0 +1.4	+0.0 +4.2 +0.6	+0.0 +28.3	+0.0	43.7	54.0	-10.3	Vert
18	1830.657M	50.6	+0.0 +0.0 -39.4	+0.0 +0.0 +1.2	+0.0 +3.3 +0.5	+0.0 +25.6	+0.0	41.8	54.0	-12.2	Horiz
19	125.076M	43.5	+11.6 -26.8	+0.2	+1.1	+1.3	+0.0	30.9	43.5	-12.6	Vert
20	1830.595M	49.8	+0.0 +0.0 -39.4	+0.0 +0.0 +1.2	+0.0 +3.3 +0.5	+0.0 +25.6	+0.0	41.0	54.0	-13.0	Vert
21	85.754M	43.7	+8.1 -27.1	+0.1	+1.0	+1.2	+0.0	27.0	40.0	-13.0	Horiz

22	173.183M	42.4	+11.4 -26.7	+0.2	+1.4	+1.5	+0.0	30.2	43.5	-13.3	Vert
23	225.308M	44.8	+10.3 -26.6	+0.3	+1.6	+1.7	+0.0	32.1	46.0	-13.9	Vert
24	220.716M	44.2	+10.2 -26.6	+0.3	+1.6	+1.7	+0.0	31.4	46.0	-14.6	Horiz
25	80.531M	42.0	+7.7 -27.0	+0.1	+0.9	+1.1	+0.0	24.8	40.0	-15.2	Horiz
26	151.728M	39.9	+12.2 -26.8	+0.2	+1.3	+1.4	+0.0	28.2	43.5	-15.3	Vert
27	263.662M	42.3	+10.6 -26.5	+0.3	+1.7	+2.0	+0.0	30.4	46.0	-15.6	Horiz
28	450.245M	36.1	+15.7 -27.7	+0.4	+2.4	+2.4	+0.0	29.3	46.0	-16.7	Vert
29	139.459M	38.1	+12.0 -26.8	+0.2	+1.2	+1.4	+0.0	26.1	43.5	-17.4	Vert
30	110.448M	39.3	+10.8 -26.9	+0.1	+1.1	+1.2	+0.0	25.6	43.5	-17.9	Horiz
31	1190.950M	46.4	+0.0 +0.0 -40.5	+0.0 +0.0 +0.9	+0.0 +2.4 +0.0	+0.0 +23.9 +0.0	+0.0	33.1	54.0	-20.9	Vert
32	300.072M	36.4	+10.7 -26.4	+0.3	+1.8	+2.0	+0.0	24.8	46.0	-21.2	Vert
33	1253.150M	45.0	+0.0 +0.0 -40.3	+0.0 +0.0 +1.0	+0.0 +2.5 +0.0	+0.0 +24.1 +0.0	+0.0	32.3	54.0	-21.7	Vert
34	1277.150M	44.6	+0.0 +0.0 -40.2	+0.0 +0.0 +1.0	+0.0 +2.5 +0.0	+0.0 +24.2 +0.0	+0.0	32.1	54.0	-21.9	Vert
35	300.002M	21.1	+10.7 -26.4	+0.3	+1.8	+2.0	+0.0	9.5	46.0	-36.5	Vert

Test Location: CKC Laboratories, Inc. 110 North Olinda Place Brea, CA 92823

Customer: **Impinj, Incorporated**

Specification: **15.247(b)(2)**

Work Order #: **83127**

Date: 1/26/2006

Test Type: **Radiated Scan**

Time: 11:03:48

Equipment: **UHF RFID**

Sequence#: 15

Manufacturer: Impinj Inc

Tested By: Septimiu Apahidean

Model: IPJ-R1000

S/N: 40306020043

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
UHF RFID*	Impinj Inc	IPJ-R1000	40306020043
Antenna	Cushcraft	S9028PCL	-
Power Supply	CUI Inc.	DSA-60W-20 1 24060	

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Compaq	Presario V2000	CNF5391NBO

Test Conditions / Notes:

EUT is connected to the remote laptop via ethernet cable, connected to the EUT is the antenna on port one, a DB9 cable connected to the serial port and a DB25 cable connected to the GPIO port. The EUT is powered by an external AC/DC power adapter. The remote laptop is controlling the EUT. ; RF power Output for Low , Middle and High. Frequency range: Fundamental.

Transducer Legend:

T1=1-40 GHz Cable_122306

Measurement Data: Reading listed by margin. Test Distance: None

#	Freq MHz	Rdng dBm	T1 dB				Dist Table	Corr dBm	Spec dBm	Margin dB	Polar Ant
1	927.280M	29.1	+0.8				+0.0	29.9	30.0	-0.1	None
2	915.280M	29.0	+0.8				+0.0	29.8	30.0	-0.2	None
3	902.690M	28.9	+0.8				+0.0	29.7	30.0	-0.3	None