Impinj, Inc.

ADDENDUM TEST REPORT FOR 93909-18

Impinj IPJ-RS500 23dBm Reader SIP
Model: IPJ-RS500GX

Tested To The Following Standards:

FCC Part 15 Subpart C Sections 15.247
&
RSS-210 Issue 8

Report No.: 93909-18B

Date of issue: Feburary 7, 2014

ACCREDITED
Testing Certificates:
803.01, 803.02, 803.05, 803.06

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

Testing the Future
CKC LABORATORIES, INC.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

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

REPRESENTATIVE: Mike Thomas
Customer Reference Number: 111063-1

REPORT PREPARED BY:

Morgan Tramontin
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 93909

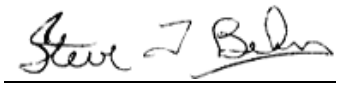
DATE OF EQUIPMENT RECEIPT: July 16, 2013
DATE(S) OF TESTING: July 16 – November 8, 2013

Revision History

Original: Testing of the Impinj IPJ-RS500 23dBm Reader SIP, IPJ-RS500GX to FCC Part 15 Subpart C Sections 15.247 & RSS-210 Issue 8.
Addendum A: To add Conducted Emissions, Conducted Band Edge, Carrier frequency Separation, Channel Separation / Hopping and Time of Occupancy sections and data to the report. To replace RF Power Output data with updated data.
Addendum B: Corrected Conducted Emissions test equipment.

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.



Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information

Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
22116 23rd Drive S.E., Suite A
Bothell, WA 98021-4413

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.00.14
Immunity	5.00.07

Site Registration & Accreditation Information

Location	CB #	TAIWAN	CANADA	FCC	JAPAN
Bothell	US0081	SL2-IN-E-1145R	3082C-1	318736	A-0148

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15.247 & RSS-210 Issue 8

Description	Test Procedure/Method	Results
Conducted Emissions	FCC Part 15 Subpart C Section 15.207 / DA 00-705	Pass
20dB & 99% Occupied Bandwidth	FCC Part 15 Subpart C Section 15.247(a)(1)(I) / DA 00-705 RSS-210	Pass
Carrier Frequency Separation	FCC Part 15 Subpart C Section 15.247(a)(1) / DA 00-705	Pass
Channel Separation / Hopping	FCC Part 15 Subpart C Section 15.247(a)(1 / DA 00-705	Pass
Average Time of Occupancy	FCC Part 15 Subpart C Section 15.247 (a)(1)(i) / DA 00-705	Pass
RF Power Output	FCC Part 15 Subpart C Section 15.247 (b)(2) / DA 00-705	Pass
Conducted Spurious Emissions & Band Edge	FCC Part 15 Subpart C Section15.247(d) / DA 00-705 RSS-210	Pass
Radiated Spurious Emissions & Band Edge	FCC Part 15 Subpart C Section15.247(d) / DA 00-705 RSS-210	Pass

Conditions During Testing

This list is a summary of the conditions noted for or modifications made to the equipment during testing.

Summary of Conditions
None

EQUIPMENT UNDER TEST (EUT)

EQUIPMENT UNDER TEST

Impinj IPJ-RS500 23dBm Reader SIP
Manuf: Impinj Inc.
Model: IPJ-RS500GX
Serial: IMPH12000100051210

Impinj IPJ-RS500 23dBm Reader SIP
Manuf: Impinj Inc.
Model: IPJ-RS500GX
Serial: 010137130071

Mini Guardrail Antenna
Manuf: Impinj, Inc.
Model: IMP-A0303-000
Serial: None

Antenna
Manuf: Laird Technologies
Model: S9025PR
Serial: None

PERIPHERAL DEVICES

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

Development Platform
Manuf: Impinj, Inc.
Model: IPJ-E4000 Rev 2.01
Serial: None

Battery
Manuf: Tenergy
Model: 18650
Serial: None

Battery Pack
Manuf: Tenergy
Model: TN270
Serial: None

Battery
Manuf: Tenergy
Model: 18650
Serial: None

Laptop
Manuf: Dell
Model: Latitude D610
Serial: CN-0M7181-48643-662-2613

DC Power Supply
Manuf: Agilent
Model: E3631A
Serial: None

FCC PART 15 SUBPART C

This report contains EMC emissions test results under United States Federal Communications Commission (FCC) 47 CFR 15C requirements for Unlicensed Radio Frequency Devices, Subpart C - Intentional Radiators.

15.207 AC Conducted Emissions

Test Data Sheets

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer:	**Impinj Inc.**		
Specification:	**15.207 AC Mains - Average**		
Work Order #:	**93909**	Date:	11/8/2013
Test Type:	**Conducted Emissions**	Time:	11:34:17
Equipment:	**Impinj IPJ-RS500 23dBm Reader SIP**	Sequence#:	12
Manufacturer:	Impinj Inc.	Tested By:	Steven Pittsford
Model:	IPJ-RS500GX		120V 60Hz
S/N:	010137130071		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP05435	Attenuator	PE7015-10	10/5/2012	10/5/2014
T2	ANP05546	Cable	Heliax	3/27/2013	3/27/2015
T3	ANP05547	Cable	Heliax	9/7/2012	9/7/2014
T4	AN01311	50uH LISN-Line	3816/2	12/9/2011	12/9/2013
	AN01311	50uH LISN-Neutral	3816/2	12/9/2011	12/9/2013
	AN02871	Spectrum Analyzer	E4440A	4/11/2013	4/11/2015
T5	AN02611	High Pass Filter	HE9615-150K-50-720B	4/18/2012	4/18/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Impinj IPJ-RS500 23dBm Reader SIP*	Impinj Inc.	IPJ-RS500GX	010137130071

Support Devices:

Function	Manufacturer	Model #	S/N
Development platform	Impinj, Inc.	IPJ-E4000 Rev 2.01	
Laptop	Dell	Latitude D610	CN-0M7181-48643-662-2613
DC Power Supply	Agilent	E3631A	

Test Conditions / Notes:

The EUT seeking modular approval is placed in the center of the turntable on a table 80cm above the ground plane, installed on a support host PCB as intended for final installation.
A laptop located inside the chamber sends test command to the EUT via the support host PCB. The EUT is set in constant transmit mode.
EUT is powered by a power supply connected to the mains network.

Emission profile of the EUT rotated along three orthogonal axes was investigated. Recorded data represent worse case emission.

Test method in accordance with FCC document: DA 00-705

Temperature: 23°C
Pressure: 102.4kPa
Humidity: 37%
Freq: 0.15-30MHz

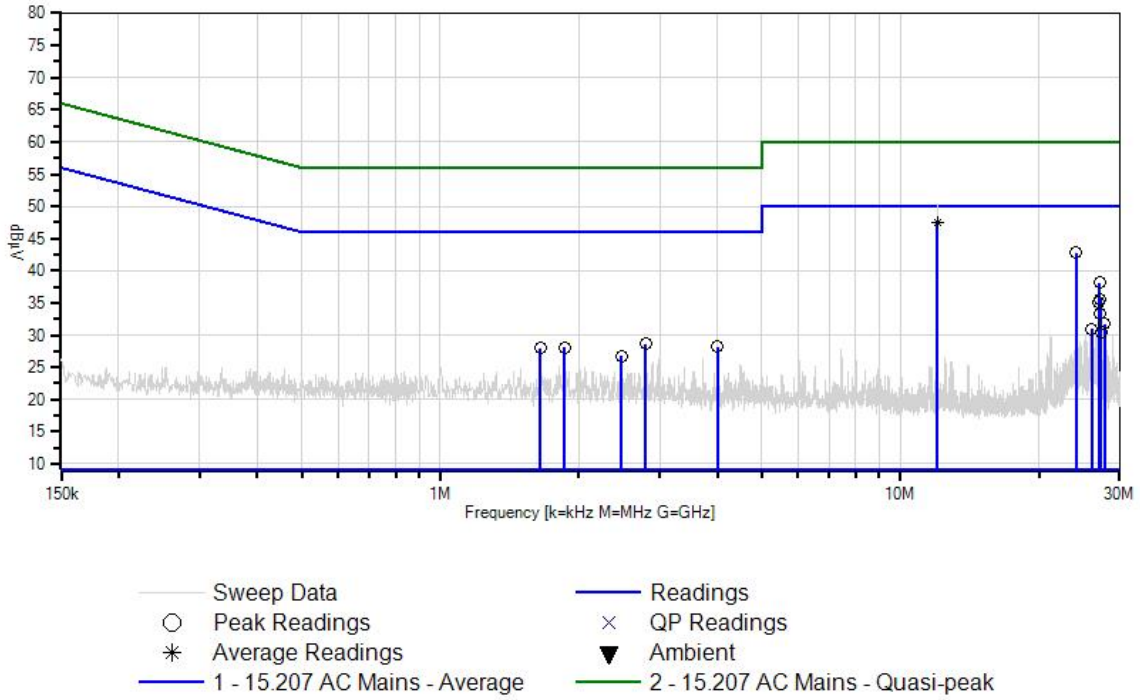
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: Line

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	12.037M Ave	37.8	+9.0 +0.0	+0.1	+0.1	+0.4	+0.0	47.4	50.0	-2.6	Line
^	12.040M	40.9	+9.0 +0.0	+0.1	+0.1	+0.4	+0.0	50.5	50.0	+0.5	Line
3	24.066M	32.8	+9.1 +0.1	+0.0	+0.1	+0.7	+0.0	42.8	50.0	-7.2	Line
4	27.074M	27.9	+9.1 +0.2	+0.0	+0.1	+0.8	+0.0	38.1	50.0	-11.9	Line
5	27.184M	25.4	+9.1 +0.2	+0.0	+0.1	+0.8	+0.0	35.6	50.0	-14.4	Line
6	26.965M	25.0	+9.1 +0.1	+0.0	+0.1	+0.8	+0.0	35.1	50.0	-14.9	Line
7	27.170M	23.2	+9.1 +0.2	+0.0	+0.1	+0.8	+0.0	33.4	50.0	-16.6	Line
8	27.115M	23.1	+9.1 +0.2	+0.0	+0.1	+0.8	+0.0	33.3	50.0	-16.7	Line
9	2.799M	19.2	+9.0 +0.2	+0.0	+0.1	+0.1	+0.0	28.6	46.0	-17.4	Line
10	4.011M	18.8	+9.0 +0.1	+0.0	+0.1	+0.2	+0.0	28.2	46.0	-17.8	Line
11	1.864M	18.7	+9.0 +0.2	+0.0	+0.1	+0.1	+0.0	28.1	46.0	-17.9	Line
12	1.651M	18.6	+9.0 +0.2	+0.0	+0.1	+0.1	+0.0	28.0	46.0	-18.0	Line

13	27.766M	21.4	+9.1 +0.2	+0.1	+0.1	+0.8	+0.0	31.7	50.0	-18.3	Line
14	26.074M	20.9	+9.1 +0.1	+0.0	+0.1	+0.8	+0.0	31.0	50.0	-19.0	Line
15	2.480M	17.4	+9.0 +0.2	+0.0	+0.1	+0.1	+0.0	26.8	46.0	-19.2	Line
16	27.259M	20.2	+9.1 +0.2	+0.0	+0.1	+0.8	+0.0	30.4	50.0	-19.6	Line

CKC Laboratories, Inc. Date: 11/8/2013 Time: 11:34:17 Impinj Inc. WO#: 93909
Test Lead: Line 120V 60Hz Sequence#: 12 Line
Impinj Inc. Impinj IPJ-RS500 23dBm Reader SIP P/N: IPJ-RS500GX



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer:	**Impinj Inc.**		
Specification:	**15.207 AC Mains - Average**		
Work Order #:	**93909**	Date:	11/8/2013
Test Type:	**Conducted Emissions**	Time:	11:40:20
Equipment:	**Impinj IPJ-RS500 23dBm Reader SIP**	Sequence#:	13
Manufacturer:	Impinj Inc.	Tested By:	Steven Pittsford
Model:	IPJ-RS500GX		120V 60Hz
S/N:	010137130071		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP05435	Attenuator	PE7015-10	10/5/2012	10/5/2014
T2	ANP05546	Cable	Heliax	3/27/2013	3/27/2015
T3	ANP05547	Cable	Heliax	9/7/2012	9/7/2014
	AN01311	50uH LISN-Line	3816/2	12/9/2011	12/9/2013
T4	AN01311	50uH LISN-Neutral	3816/2	12/9/2011	12/9/2013
T5	AN02871	Spectrum Analyzer	E4440A	4/11/2013	4/11/2015
T6	AN02611	High Pass Filter	HE9615-150K-50-720B	4/18/2012	4/18/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Impinj IPJ-RS500 23dBm Reader SIP*	Impinj Inc.	IPJ-RS500GX	010137130071

Support Devices:

Function	Manufacturer	Model #	S/N
Development platform	Impinj, Inc.	IPJ-E4000 Rev 2.01	
Laptop	Dell	Latitude D610	CN-0M7181-48643-662-2613
DC Power Supply	Agilent	E3631A	

Test Conditions / Notes:

The EUT seeking modular apporval is placed in the center of the turntable on a table 80cm above the ground plane, installed on a support host PCB as intended for final installation.
A laptop located inside the chamber sends test command to the EUT via the support host PCB. The EUT is set in constant transmit mode.
EUT is powered by a power supply connected to the mains network.

Emission profile of the EUT rotated along three orthogonal axes was investigated. Recorded data represent worse case emission.

Test method in accordance with FCC document: DA 00-705

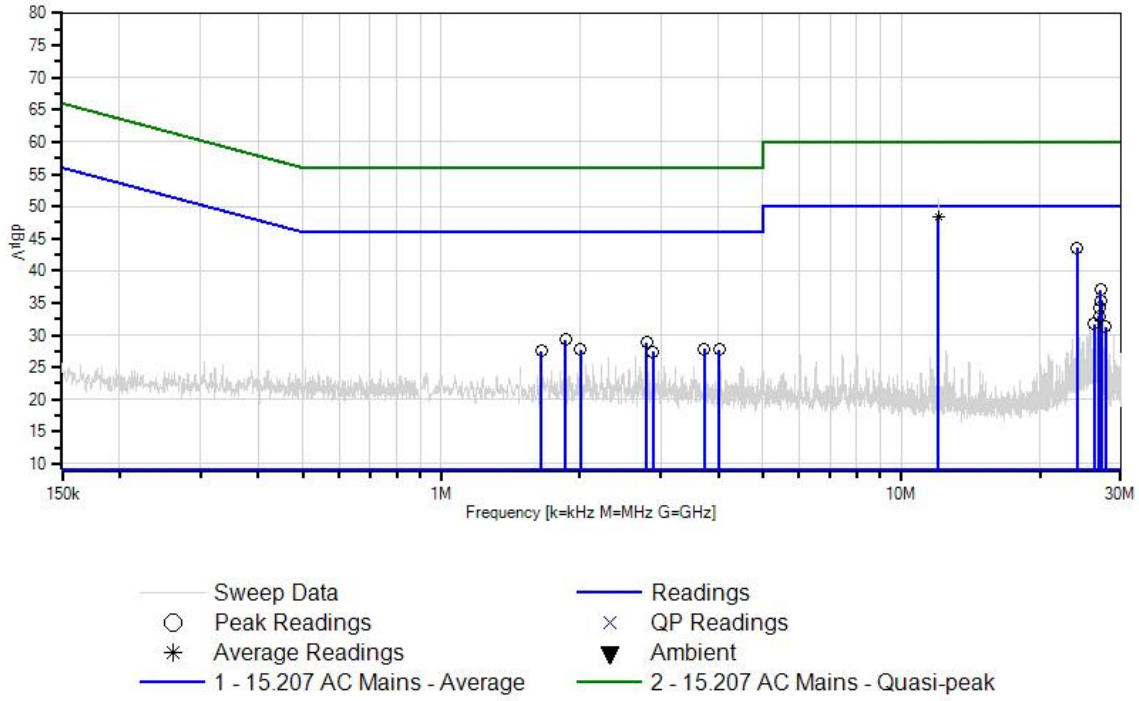
Temperature: 23°C
Pressure: 102.4kPa
Humidity: 37%
Freq: 0.15-30MHz

Ext Attn: 0 dB

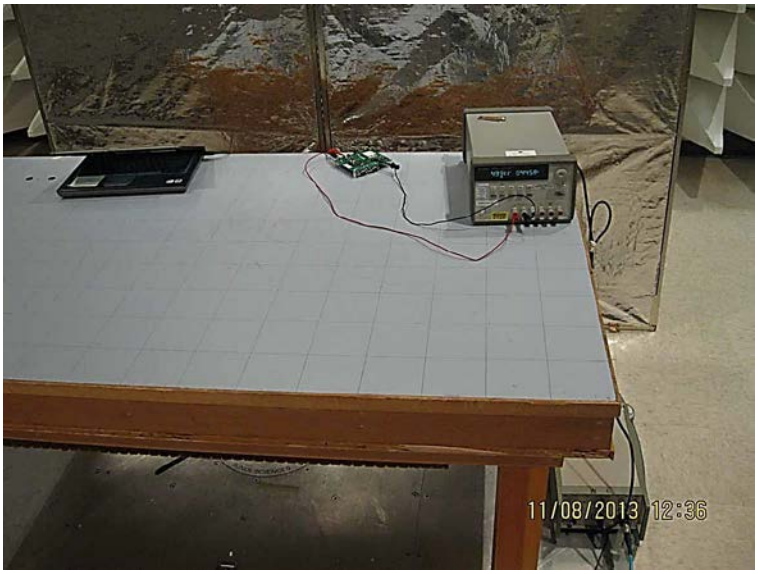
Measurement Data: Reading listed by margin. Test Lead: Neutral

#	Freq	Rdng	T1 T5	T2 T6	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	12.040M	38.7	+9.0	+0.1	+0.1	+0.4	+0.0	48.3	50.0	-1.7	Neutr
	Ave		+0.0	+0.0							
^	12.040M	41.6	+9.0	+0.1	+0.1	+0.4	+0.0	51.2	50.0	+1.2	Neutr
			+0.0	+0.0							
3	24.080M	33.6	+9.1	+0.0	+0.1	+0.7	+0.0	43.6	50.0	-6.4	Neutr
			+0.0	+0.1							
4	27.074M	26.8	+9.1	+0.0	+0.1	+0.8	+0.0	37.0	50.0	-13.0	Neutr
			+0.0	+0.2							
5	27.184M	25.2	+9.1	+0.0	+0.1	+0.8	+0.0	35.4	50.0	-14.6	Neutr
			+0.0	+0.2							
6	26.971M	24.2	+9.1	+0.0	+0.1	+0.8	+0.0	34.3	50.0	-15.7	Neutr
			+0.0	+0.1							
7	1.860M	19.9	+9.0	+0.0	+0.1	+0.1	+0.0	29.3	46.0	-16.7	Neutr
			+0.0	+0.2							
8	26.889M	22.8	+9.1	+0.0	+0.1	+0.8	+0.0	32.9	50.0	-17.1	Neutr
			+0.0	+0.1							
9	2.795M	19.5	+9.0	+0.0	+0.1	+0.1	+0.0	28.9	46.0	-17.1	Neutr
			+0.0	+0.2							
10	3.727M	18.5	+9.0	+0.0	+0.1	+0.2	+0.0	27.9	46.0	-18.1	Neutr
			+0.0	+0.1							
11	2.008M	18.4	+9.0	+0.0	+0.1	+0.1	+0.0	27.8	46.0	-18.2	Neutr
			+0.0	+0.2							
12	26.225M	21.6	+9.1	+0.0	+0.1	+0.8	+0.0	31.7	50.0	-18.3	Neutr
			+0.0	+0.1							
13	4.016M	18.3	+9.0	+0.0	+0.1	+0.2	+0.0	27.7	46.0	-18.3	Neutr
			+0.0	+0.1							
14	1.651M	18.1	+9.0	+0.0	+0.1	+0.1	+0.0	27.5	46.0	-18.5	Neutr
			+0.0	+0.2							
15	2.889M	18.0	+9.0	+0.0	+0.1	+0.1	+0.0	27.4	46.0	-18.6	Neutr
			+0.0	+0.2							
16	27.766M	21.0	+9.1	+0.1	+0.1	+0.8	+0.0	31.3	50.0	-18.7	Neutr
			+0.0	+0.2							

CKC Laboratories, Inc. Date: 11/8/2013 Time: 11:40:20 Impinj Inc. WO#: 93909
Test Lead: Neutral 120V 60Hz Sequence#: 13 Neutral
Impinj Inc. Impinj IPJ-RS500 23dBm Reader SIP P/N: IPJ-RS500GX



Test Setup Photos



20dB & 99% Occupied Bandwidth

Test Data

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **Impinj Inc.**
Specification: **FCC15.247 -20dB Bandwidth.**
Work Order #: **93909** Date: 7/16/2013
Test Type: **Conducted Emissions** Time: 09:02:21
Equipment: **Impinj IPJ-RS500 23dBm Reader SIP** Sequence#: 1
Manufacturer: Impinj Inc. Tested By: Steven Pittsford
Model: IPJ-RS500GX 3.7VDC
S/N: IMPH12000100051210

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	ANP06130	Attenuator	18N20W-10	8/18/2011	8/18/2013
	ANP06217	Attenuator	768-10	3/22/2012	3/22/2014
	AN03227	Cable	32026-29080-29080-84	3/29/2013	3/29/2015
	AN02673	Spectrum Analyzer	E4446A	5/11/2012	5/11/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Impinj IPJ-RS500 23dBm Reader SIP*	Impinj Inc.	IPJ-RS500GX	IMPH12000100051210

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D610	CN-0M7181-48643-662-2613
Development platform	Impinj, Inc.	IPJ-E4000 Rev 2.01	
Battery Pack	Tenergy	TN270	
Battery	Tenergy	18650	
Battery	Tenergy	18650	

Summary

Channel	OBW -20dB	99% OBW
Low	81.4kHz	79.0kHz
Mid	82.2kHz	79.7kHz
High	81.0kHz	79.0kHz

Test Conditions / Notes:

The EUT is seeking modular approval and is placed on the test bench, installed on a support host PCB. The laptop sends test command to the EUT via the support host PCB. The EUT is set in constant transmit mode.

Transmit Frequencies: 902.75MHz, 915.25MHz, 927.25MHz
Firmware setting = 23dBm, 23dBm, 23dBm
Emission profile evaluated at the antenna port.
Test method in accordance with FCC document: DA 00-705.
15.31(e) compliance: a freshly charged battery is installed.
Temperature: 23°C
Pressure: 101.6kPa
Humidity: 38%

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **Impinj Inc.**
Specification: **RSS-210 99% Bandwidth.**
Work Order #: **93909** Date: 7/16/2013
Test Type: **Conducted Emissions** Time: 09:02:21
Equipment: **Impinj IPJ-RS500 23dBm Reader SIP** Sequence#: 1
Manufacturer: Impinj Inc. Tested By: Steven Pittsford
Model: IPJ-RS500GX 3.7VDC
S/N: IMPH12000100051210

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	ANP06130	Attenuator	18N20W-10	8/18/2011	8/18/2013
	ANP06217	Attenuator	768-10	3/22/2012	3/22/2014
	AN03227	Cable	32026-29080-29080-84	3/29/2013	3/29/2015
	AN02673	Spectrum Analyzer	E4446A	5/11/2012	5/11/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Impinj IPJ-RS500 23dBm Reader SIP*	Impinj Inc.	IPJ-RS500GX	IMPH12000100051210

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D610	CN-0M7181-48643-662-2613
Development platform	Impinj, Inc.	IPJ-E4000 Rev 2.01	
Battery Pack	Tenergy	TN270	
Battery	Tenergy	18650	
Battery	Tenergy	18650	

Summary

Channel	OBW -20dB	99% OBW
Low	81.4kHz	79.0kHz
Mid	82.2kHz	79.7kHz
High	81.0kHz	79.0kHz

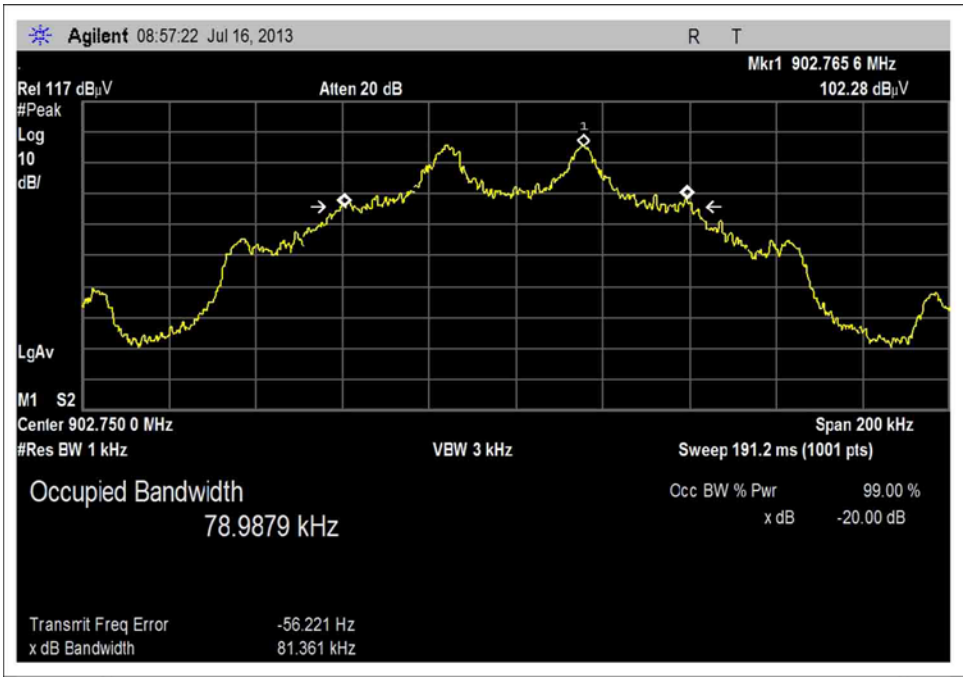
Test Conditions / Notes:

The EUT is seeking modular approval and is placed on the test bench, installed on a support host PCB. The laptop sends test command to the EUT via the support host PCB. The EUT is set in constant transmit mode.

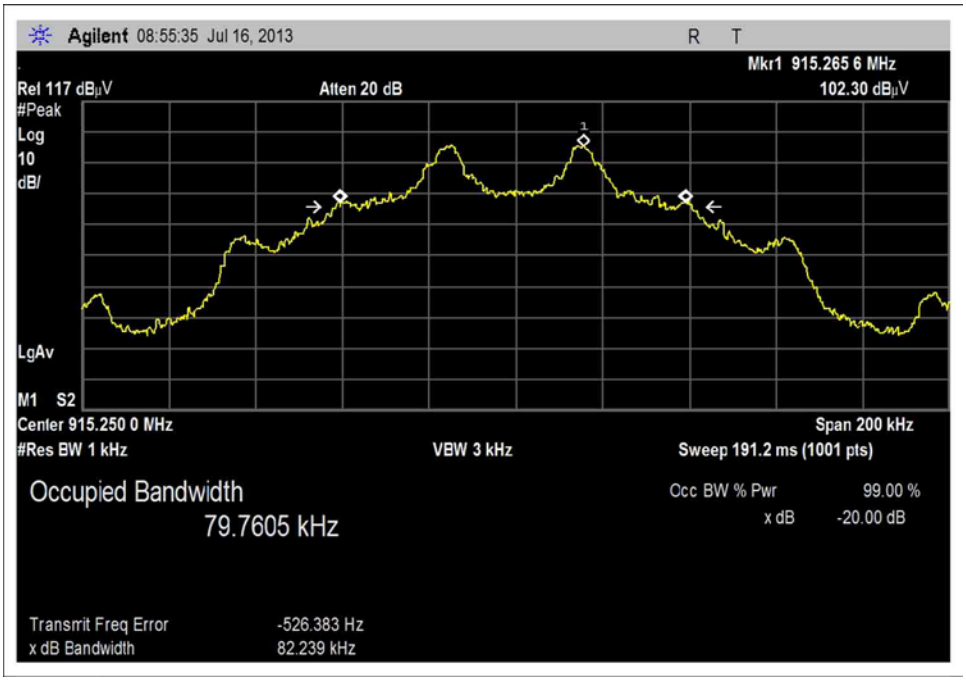
Transmit Frequencies: 902.75MHz, 915.25MHz, 927.25MHz
Firmware setting = 23dBm, 23dBm, 23dBm
Emission profile evaluated at the antenna port.

Test method in accordance with FCC document: DA 00-705.
15.31(e) compliance: a freshly charged battery is installed.
Temperature: 23°C
Pressure: 101.6kPa
Humidity: 38%

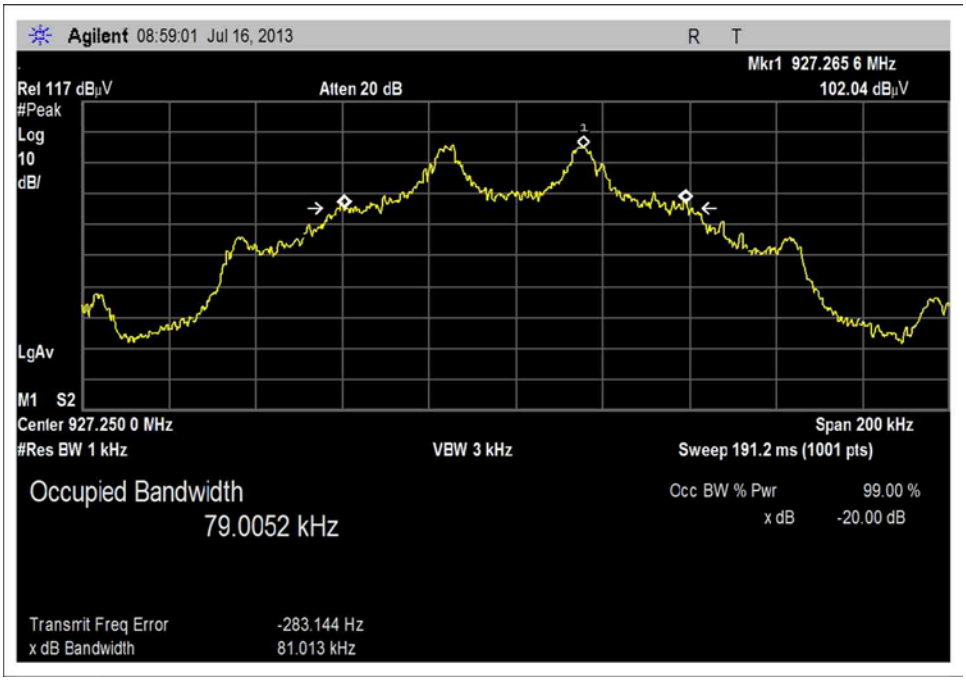
Test Plots



Low Channel



Mid Channel



High Channel

Test Setup Photos

Overall Test Setup

15.247(a)(1) Carrier Frequency Separation

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer:	**Impinj Inc.**		
Specification:	**15.247(a)(1)**		
Work Order #:	**93909**	Date:	7/16/2012
Test Type:	**Conducted Emissions**	Time:	09:02:21
Equipment:	**Impinj IPJ-RS500 23dBm Reader SIP**	Sequence#:	1
Manufacturer:	Impinj Inc.	Tested By:	Steven Pittsford
Model:	IPJ-RS500GX		3.7VDC
S/N:	IMPH12000100051210		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	ANP06130	Attenuator	18N20W-10	8/18/2011	8/18/2013
	ANP06217	Attenuator	768-10	3/22/2012	3/22/2014
	AN03227	Cable	32026-29080-29080-84	3/29/2013	3/29/2015
	AN02673	Spectrum Analyzer	E4446A	5/11/2012	5/11/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Impinj IPJ-RS500 23dBm Reader SIP*	Impinj Inc.	IPJ-RS500GX	IMPH12000100051210

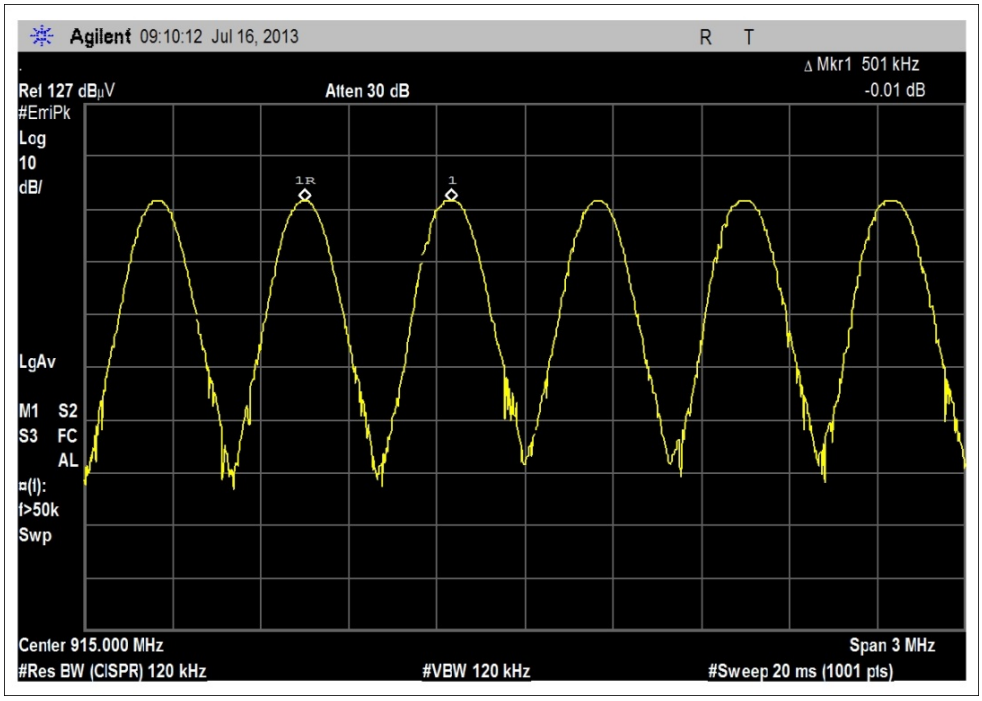
Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D610	CN-0M7181-48643-662-2613
Development platform	Impinj, Inc.	IPJ-E4000 Rev 2.01	
Battery Pack	Tenergy	TN270	
Battery	Tenergy	18650	
Battery	Tenergy	18650	

Test Conditions / Notes:

The EUT seeking modular approval is placed on the test bench, installed on a support host PCB. A laptop sends test command to the EUT via the support host PCB.
Frequency: 902-928MHz, Firmware setting = 23dBm
Emission profile evaluated at the antenna port.
Test method in accordance with FCC document: DA 00-705
15.31(e) compliance: a freshly charged battery is installed
Temperature: 24°C, Pressure: 101.5kPa, Humidity: 38%
15.247(a)(1) For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

Test Data



Frequency Separation, Channel Separation = 500kHz

Test Setup Photos

15.247(a)(1) Channel Separation / Hopping

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer:	**Impinj Inc.**		
Specification:	**15.247(a)(1)**		
Work Order #:	**93909**	Date:	7/16/2012
Test Type:	**Conducted Emissions**	Time:	09:02:21
Equipment:	**Impinj IPJ-RS500 23dBm Reader SIP**	Sequence#:	1
Manufacturer:	Impinj Inc.	Tested By:	Steven Pittsford
Model:	IPJ-RS500GX		3.7VDC
S/N:	IMPH12000100051210		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	ANP06130	Attenuator	18N20W-10	8/18/2011	8/18/2013
	ANP06217	Attenuator	768-10	3/22/2012	3/22/2014
	AN03227	Cable	32026-29080-29080-84	3/29/2013	3/29/2015
	AN02673	Spectrum Analyzer	E4446A	5/11/2012	5/11/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Impinj IPJ-RS500 23dBm Reader SIP*	Impinj Inc.	IPJ-RS500GX	IMPH12000100051210

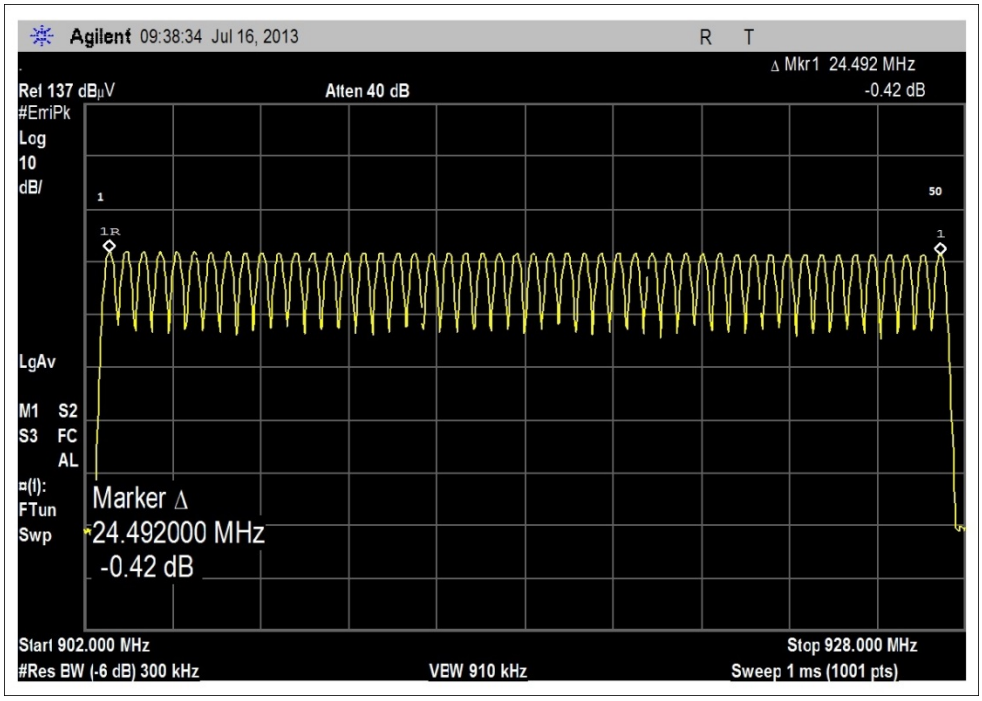
Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D610	CN-0M7181-48643-662-2613
Development platform	Impinj, Inc.	IPJ-E4000 Rev 2.01	
Battery Pack	Tenergy	TN270	
Battery	Tenergy	18650	
Battery	Tenergy	18650	

Test Conditions / Notes:

The EUT seeking modular approval is placed on the test bench, installed on a support host PCB. A laptop sends test command to the EUT via the support host PCB.
Frequency: 902-928MHz Firmware setting = 23dBm
Emission profile evaluated at the antenna port. Test method in accordance with FCC document: DA 00-705.
15.31(e) compliance: a freshly charged battery is installed
Temperature: 24°C, Pressure: 101.5kPa, Humidity: 38%
15.247(a)(1) For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

Test Data



Total number of hopping channel = 50

Test Setup Photos

15.247(a)(1)(i) Average Time of Occupancy

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer:	**Impinj Inc.**		
Specification:	**15.247(a)(1)(i)**		
Work Order #:	**93909**	Date:	7/16/2012
Test Type:	**Conducted Emissions**	Time:	09:02:21
Equipment:	**Impinj IPJ-RS500 23dBm Reader SIP**	Sequence#:	1
Manufacturer:	Impinj Inc.	Tested By:	Steven Pittsford
Model:	IPJ-RS500GX		3.7VDC
S/N:	IMPH12000100051210		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	ANP06130	Attenuator	18N20W-10	8/18/2011	8/18/2013
	ANP06217	Attenuator	768-10	3/22/2012	3/22/2014
	AN03227	Cable	32026-29080-29080-84	3/29/2013	3/29/2015
	AN02673	Spectrum Analyzer	E4446A	5/11/2012	5/11/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Impinj IPJ-RS500 23dBm Reader SIP*	Impinj Inc.	IPJ-RS500GX	IMPH12000100051210

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D610	CN-0M7181-48643-662-2613
Development platform	Impinj, Inc.	IPJ-E4000 Rev 2.01	
Battery Pack	Tenergy	TN270	
Battery	Tenergy	18650	
Battery	Tenergy	18650	

Test Conditions / Notes:

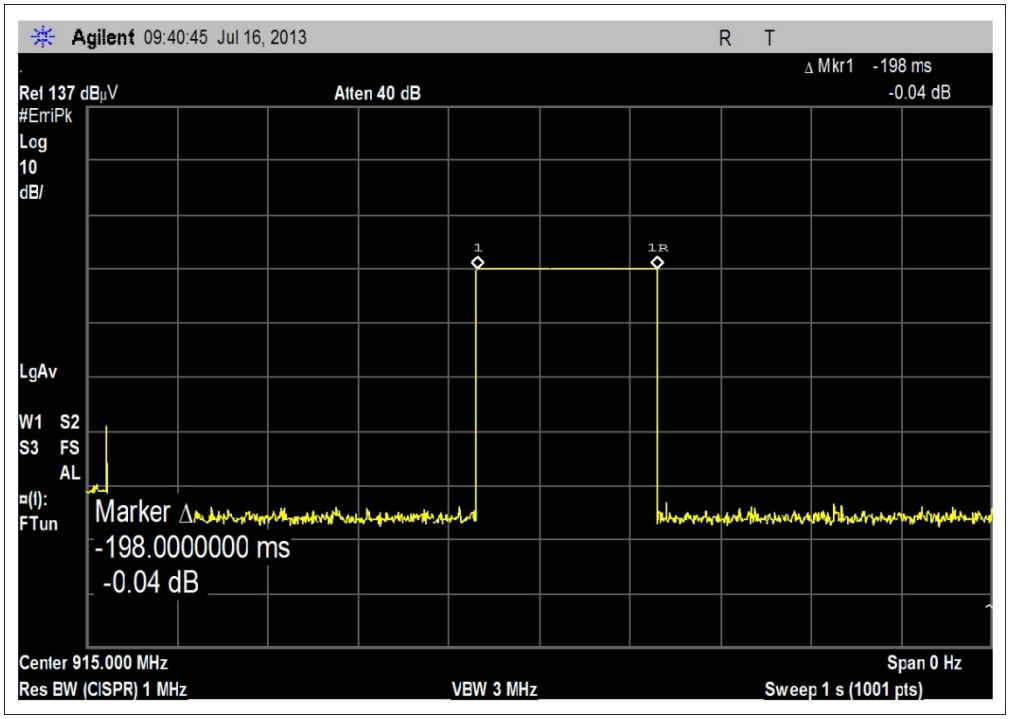
The EUT is seeking modular approval and is placed on the test bench, installed on a support host PCB. The laptop sends test command to the EUT via the support host PCB.

Frequency: 902-928MHz
Firmware setting = 23dBm
Emission profile evaluated at the antenna port.
Test method in accordance with FCC document: DA 00-705.
15.31(e) compliance: a freshly charged battery is installed.

Temperature: 24°C
Pressure: 101.5kPa
Humidity: 38%

15.247(a)(1) For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

Test Data



Average Time of Occupancy
Event duration = 198ms

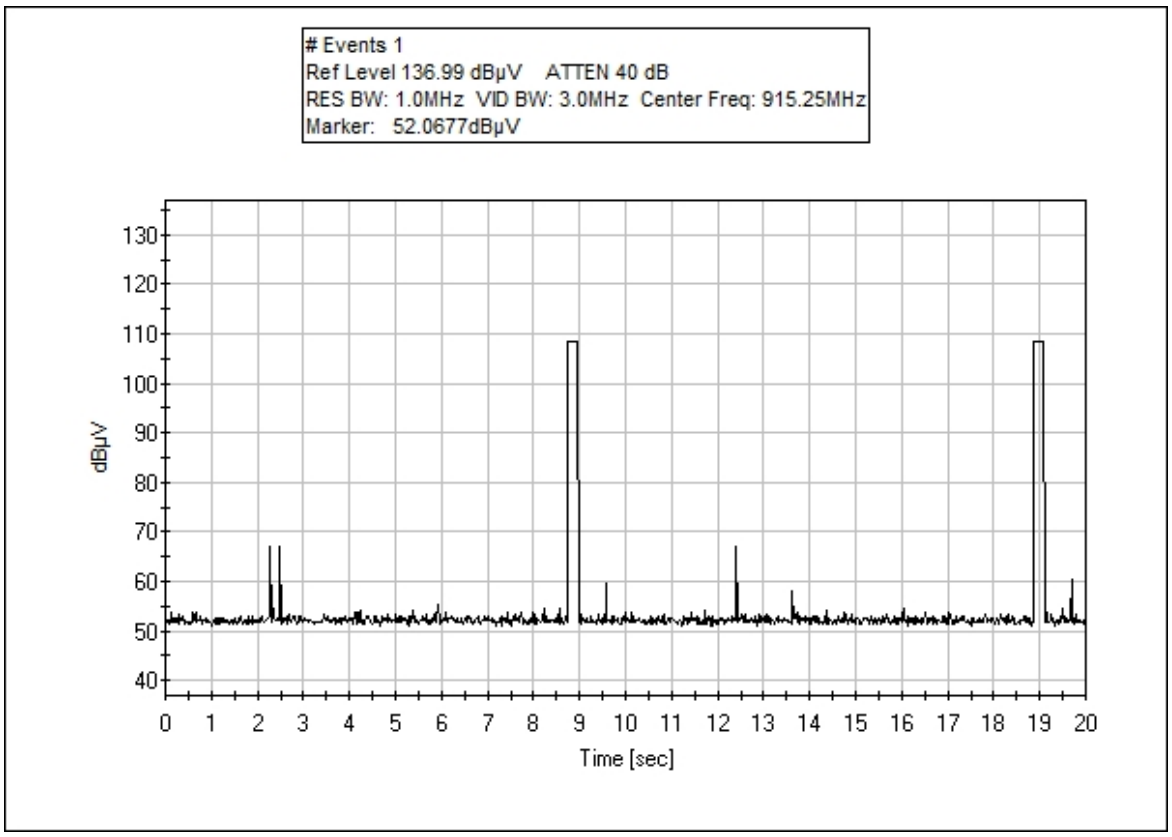


Figure 1: Number of events in 20sec

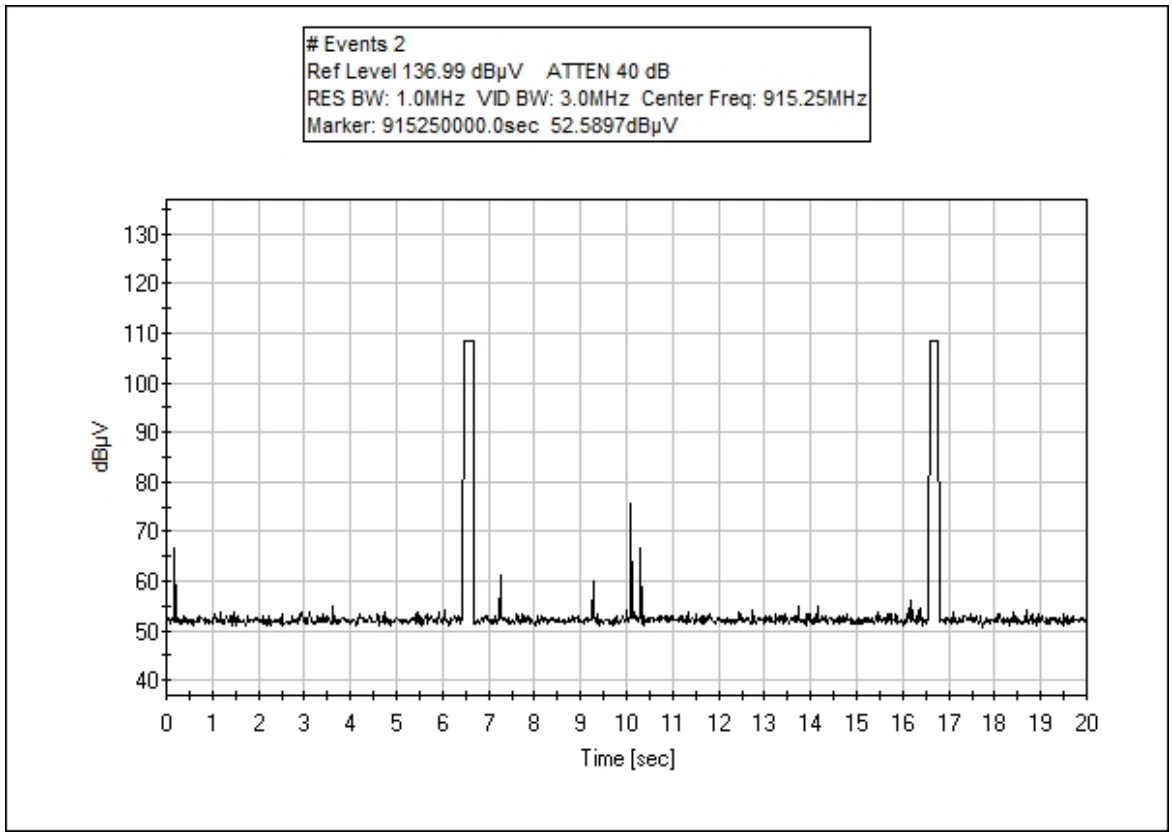


Figure 2: Number of events in 20sec

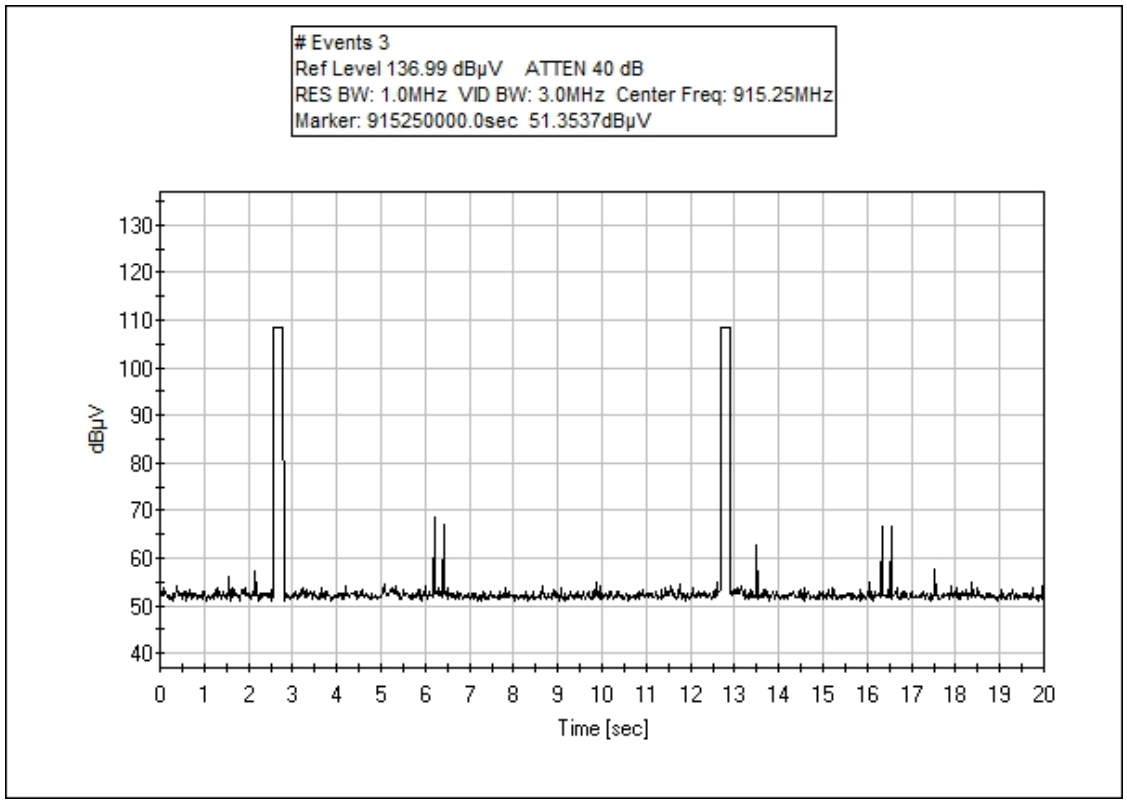


Figure 3: Number of events in 20sec

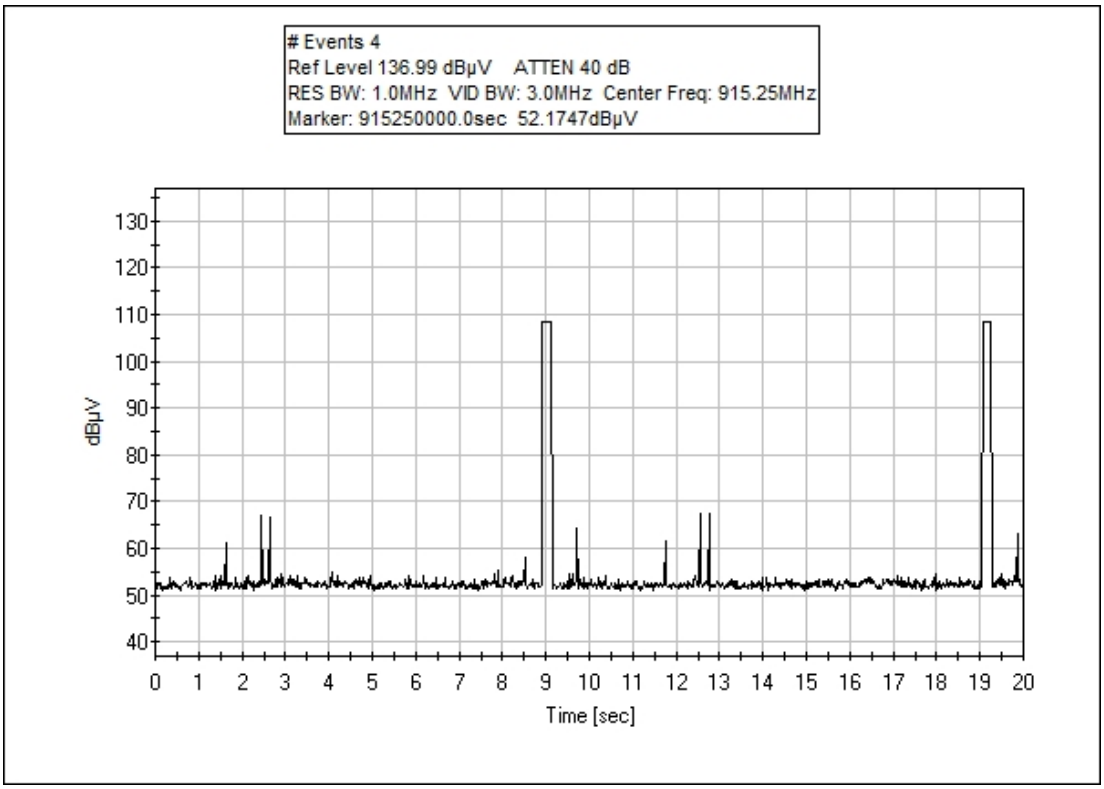


Figure 4: Number of events in 20sec

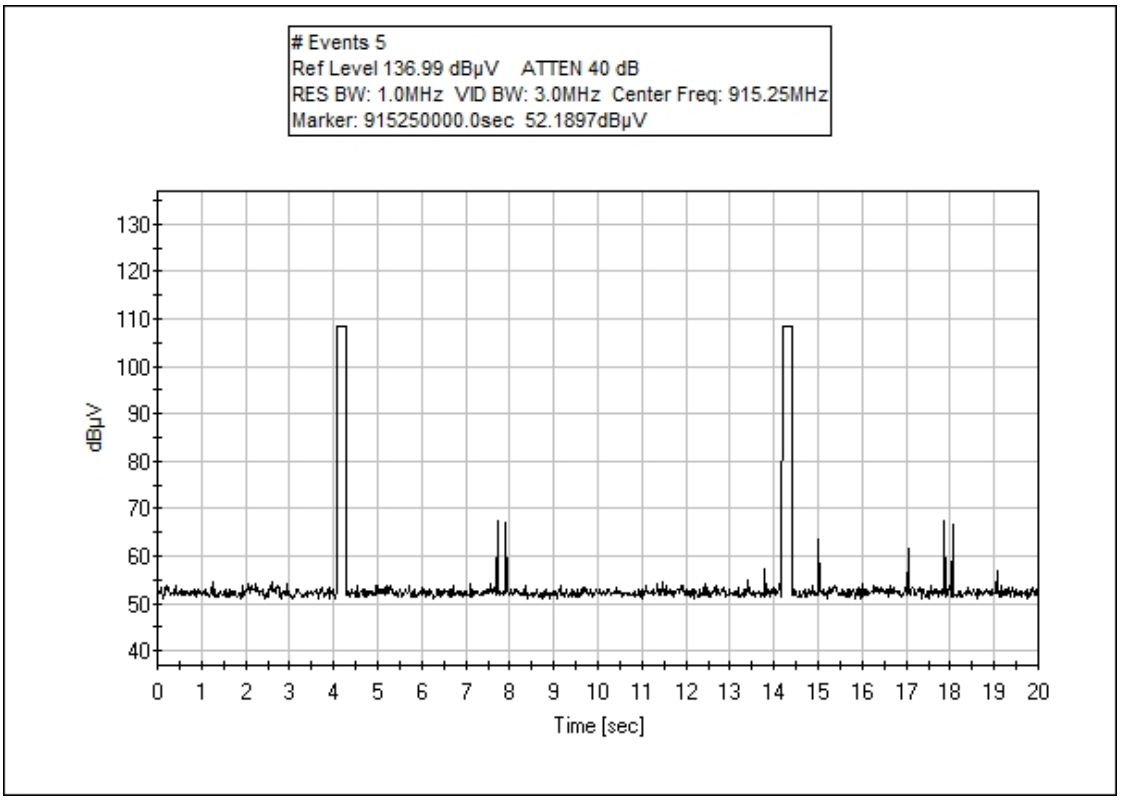


Figure 5: Number of events in 20sec

Limit: On time **shall not exceed 0.4 second**, per 20sec interval

Five separate sweeps at 20 second were acquired, averaging 2 events per 20 second sweep.

Each events on time = 198ms,

$$Ave\ Time\ of\ occupancy = \frac{0.198sec}{event} * \frac{2\ evnets}{20\ \mathrm{sec}\ interval} = \frac{0.396sec}{20\ \mathrm{sec}\ interval}$$

Test Setup Photos

Overall Test Setup

15.247(b)(2) RF Power Output

Test Data

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **Impinj Inc.**
Specification: **15.247(b)(2) RF Output power**

Work Order #: **93090** Date: 11/8/2013
Test Type: **Conducted Emissions** Time: 09:02:21
Equipment: **Impinj IPJ-RS500 23dBm Reader SIP** Sequence#: 1
Manufacturer: Impinj Inc. Tested By: Steven Pittsford
Model: IPJ-RS500GX 3.7VDC
S/N: 010137130071

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN03181	Attenuator	PE7015-20	1/4/2012	1/4/2014
	ANP05749	Attenuator	PE7010-20	1/4/2012	1/4/2014
	AN03227	Cable	32026-29080-29080-84	3/29/2013	3/29/2015
	AN02673	Spectrum Analyzer	E4446A	5/11/2012	5/11/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Impinj IPJ-RS500 23dBm Reader SIP*	Impinj Inc.	IPJ-RS500GX	010137130071

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D610	CN-0M7181-48643-662-2613
Development platform	Impinj, Inc.	IPJ-E4000 Rev 2.01	
DC Power Supply	Agilent	E3631A	

Summary: No change in power while varying supply voltage from 85% to 115% of the nominal rated supply voltage.

	Power (dBm)	**Power (Watts)**
Low channel	23.0dBm	0.200W
Mid channel	23.0dBm	0.200W
High channel	22.4dBm	0.174W

Test Conditions / Notes:

The EUT seeking modular approval is placed on the test bench, installed on a support host PCB. A laptop sends test command to the EUT via the support host PCB. The EUT is set in constant transmit mode.

Transmit Frequencies: 902.75MHz, 915.25MHz, 927.25MHz
Firmware setting = 23dBm, 23dBm, 23dBm

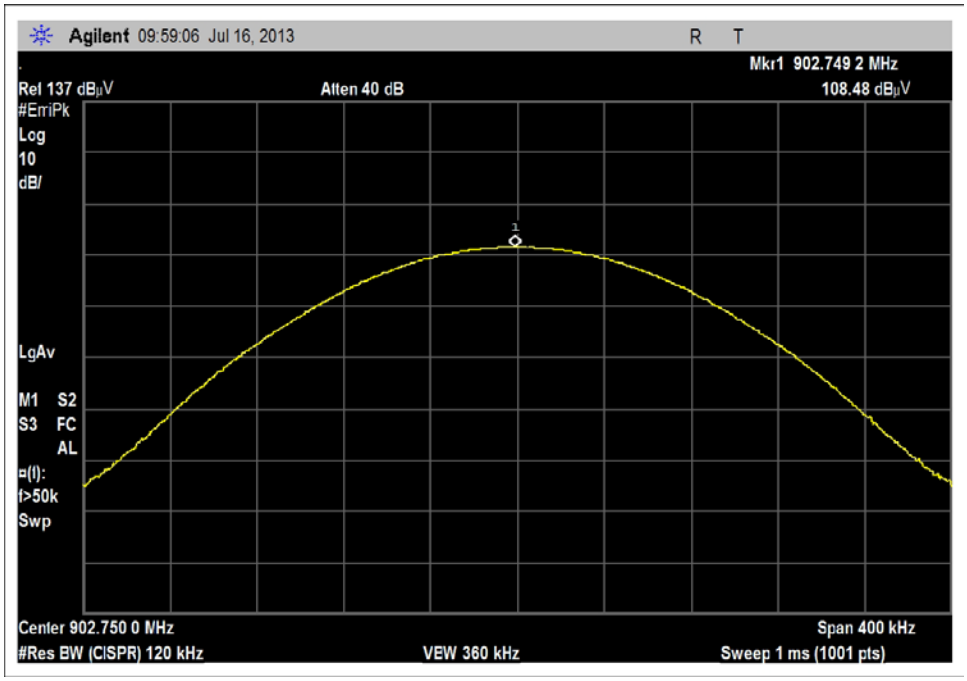
Emission profile evaluated at the antenna port.

Evaluated per 15.31(e): supply voltage varied between 85% and 115% of the nominal rated supply voltage.

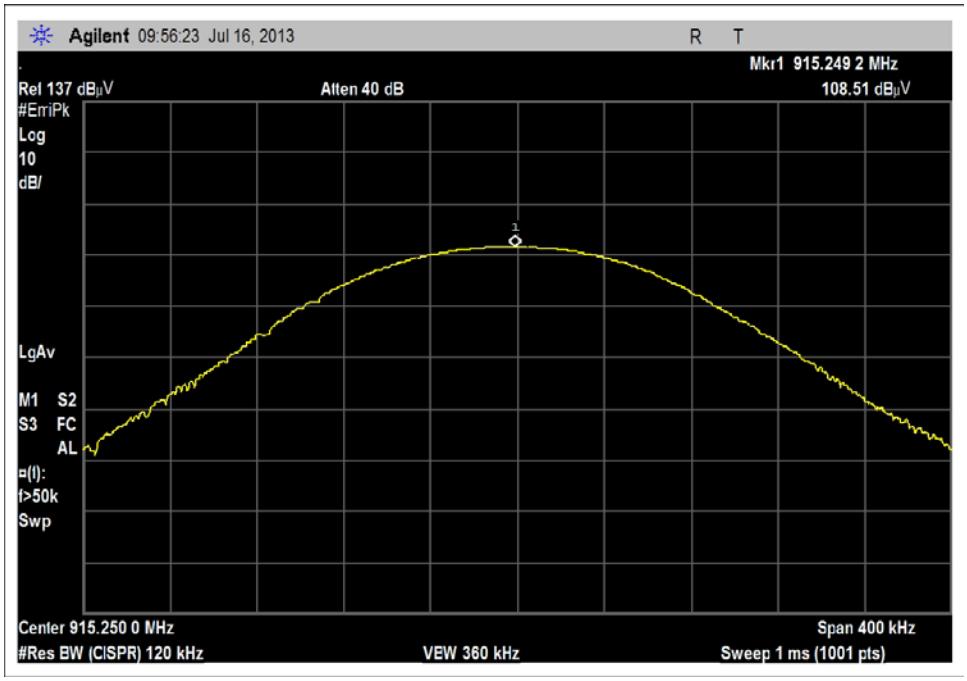
Test method in accordance with FCC document: DA 00-705

Temperature: 23°C
Pressure: 102.4kPa
Humidity: 35%

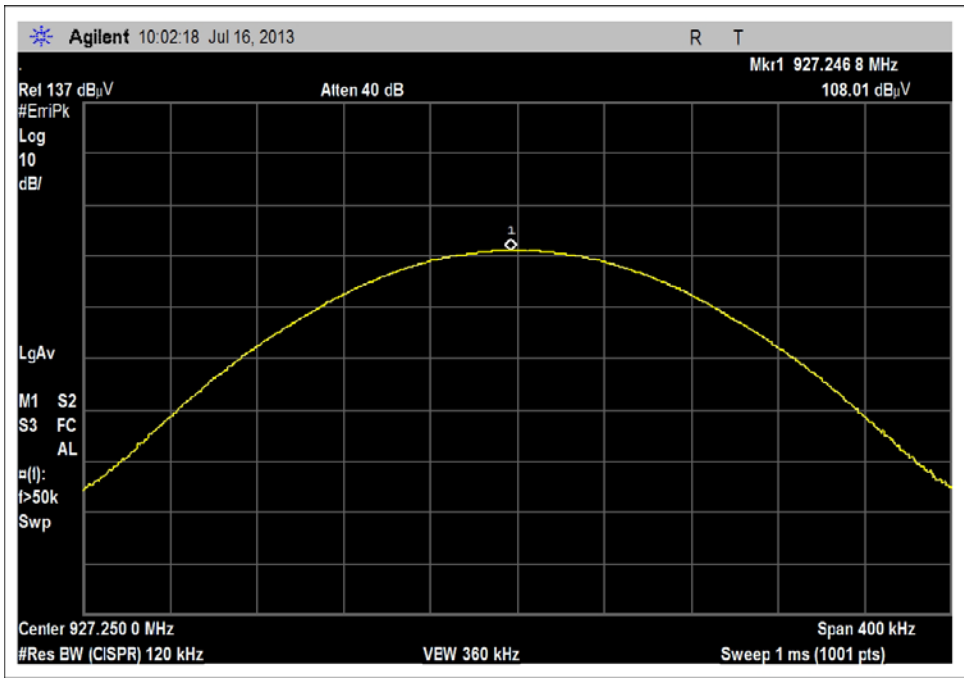
Test Plots



Low

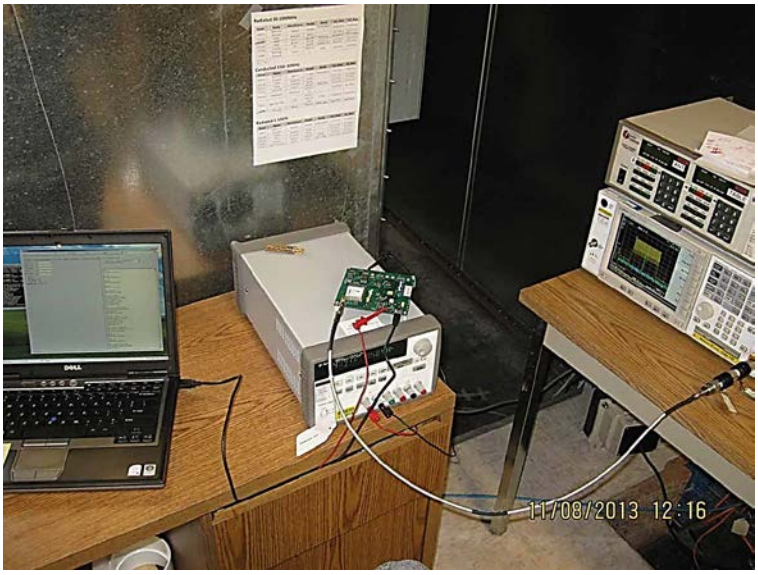

Agilent 09:56:23 Jul 16, 2013
R T
Mkr1 915.249 2 MHz
Rel 137 dBµV
Atten 40 dB
108.51 dBµV
#EnrPk
Log
10
dB/
LgAv
M1 S2
S3 FC
AL
¤(f):
f>50k
Swp
Center 915.250 0 MHz
Span 400 kHz
#Res BW (CISPR) 120 kHz
VEW 360 kHz
Sweep 1 ms (1001 pts)

Mid


Agilent 10:02:18 Jul 16, 2013
R T
Mkr1 927.246 8 MHz
Rel 137 dBµV
Atten 40 dB
108.01 dBµV
#EnrPk
Log
10
dB/
LgAv
M1 S2
S3 FC
AL
¤(f):
f>50k
Swp
Center 927.250 0 MHz
Span 400 kHz
#Res BW (CISPR) 120 kHz
VEW 360 kHz
Sweep 1 ms (1001 pts)

High

Test Setup Photos



15.247(d) / RSS-210 Conducted Spurious Emissions

Test Data Sheets

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer:	**Impinj Inc.**		
Specification:	**FCC Part 15.247(d) & RSS-210 Conducted Spurious emission.**		
Work Order #:	**93909**	Date:	7/16/2013
Test Type:	**Conducted Emissions**	Time:	09:02:21
Equipment:	**Impinj IPJ-RS500 23dBm Reader SIP**	Sequence#:	1
Manufacturer:	Impinj Inc.	Tested By:	Steven Pittsford
Model:	IPJ-RS500GX		3.7VDC
S/N:	IMPH12000100051210		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	ANP06130	Attenuator	18N20W-10	8/18/2011	8/18/2013
	ANP06217	Attenuator	768-10	3/22/2012	3/22/2014
	AN03227	Cable	32026-29080-29080-84	3/29/2013	3/29/2015
	AN02673	Spectrum Analyzer	E4446A	5/11/2012	5/11/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Impinj IPJ-RS500 23dBm Reader SIP*	Impinj Inc.	IPJ-RS500GX	IMPH12000100051210

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D610	CN-0M7181-48643-662-2613
Development platform	Impinj, Inc.	IPJ-E4000 Rev 2.01	
Battery Pack	Tenergy	TN270	
Battery	Tenergy	18650	
Battery	Tenergy	18650	

Test Conditions / Notes:

The EUT is seeking modular approval and is placed on the test bench, installed on a support host PCB. The laptop sends test command to the EUT via the support host PCB.

Frequency: 9kHz-9.28GHz: RBW=100k VBW=300k
Transmit Frequencies evaluated: 902.75MHz, 915.25MHz, 927.25MHz & All channels hopping.
Firmware setting = 23dBm, 23dBm, 23dBm
Emission profile evaluated at the antenna port.
Test method in accordance with FCC document: DA 00-705.
15.31(e) compliance: a freshly charged battery is installed.
Temperature: 24°C
Pressure: 101.5kPa
Humidity: 38%

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer:	**Impinj Inc.**		
Specification:	**Band Edge Compliance FCC Part 15.247 & RSS-210**		
Work Order #:	**93909**	Date:	11/8/2013
Test Type:	**Conducted Emissions**	Time:	10:56:00
Equipment:	**Impinj IPJ-RS500 23dBm Reader SIP**	Sequence#:	1
Manufacturer:	Impinj Inc.	Tested By:	Steven Pittsford
Model:	IPJ-RS500GX		3.7VDC
S/N:	010137130071		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN03181	Attenuator	PE7015-20	1/4/2012	1/4/2014
	ANP05749	Attenuator	PE7010-20	1/4/2012	1/4/2014
	AN03227	Cable	32026-29080-29080-84	3/29/2013	3/29/2015
	AN02673	Spectrum Analyzer	E4446A	5/11/2012	5/11/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Impinj IPJ-RS500 23dBm Reader SIP*	Impinj Inc.	IPJ-RS500GX	010137130071

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Dell	Latitude D610	CN-0M7181-48643-662-2613
Development platform	Impinj, Inc.	IPJ-E4000 Rev 2.01	
DC Power Supply	Agilent	E3631A	

Test Conditions / Notes:

The EUT seeking modular approval is placed on the test bench, installed on a support host PCB. A laptop sends test command to the EUT via the support host PCB.

Frequency: 9kHz-9.28GHz: RBW=100k VBW=300k

Transmit Frequencies evaluated: All channels hopping

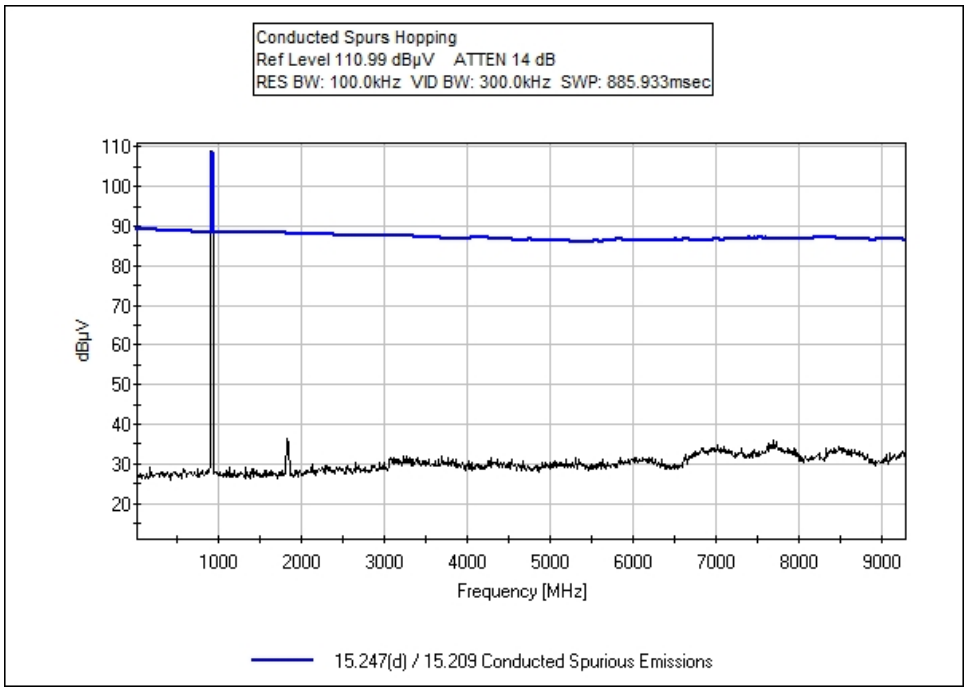
Emission profile evaluated at the antenna port.

Test method in accordance with FCC document: DA 00-705

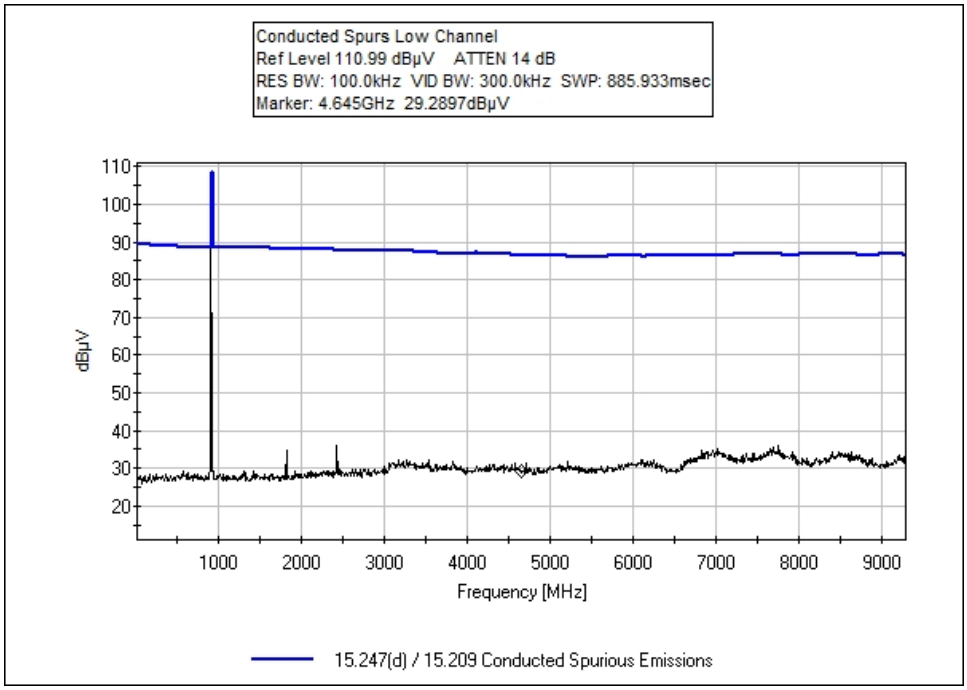
Evaluated per 15.31(e): supply voltage varied between 85% and 115% of the nominal rated supply voltage.

Temperature: 23°C
Pressure: 102.4kPa
Humidity: 36%

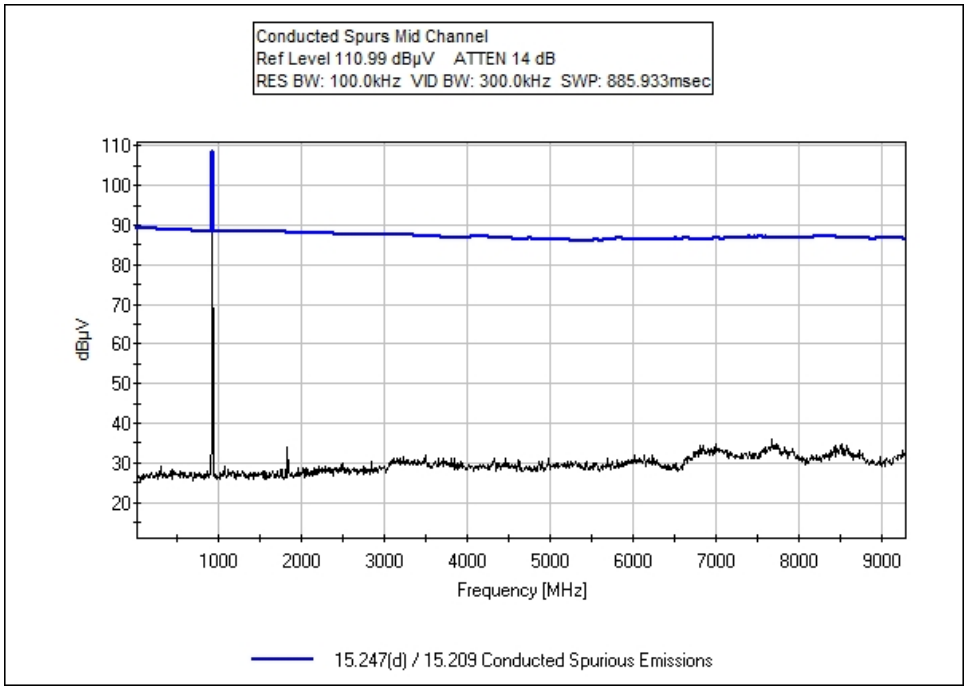
Test Plots



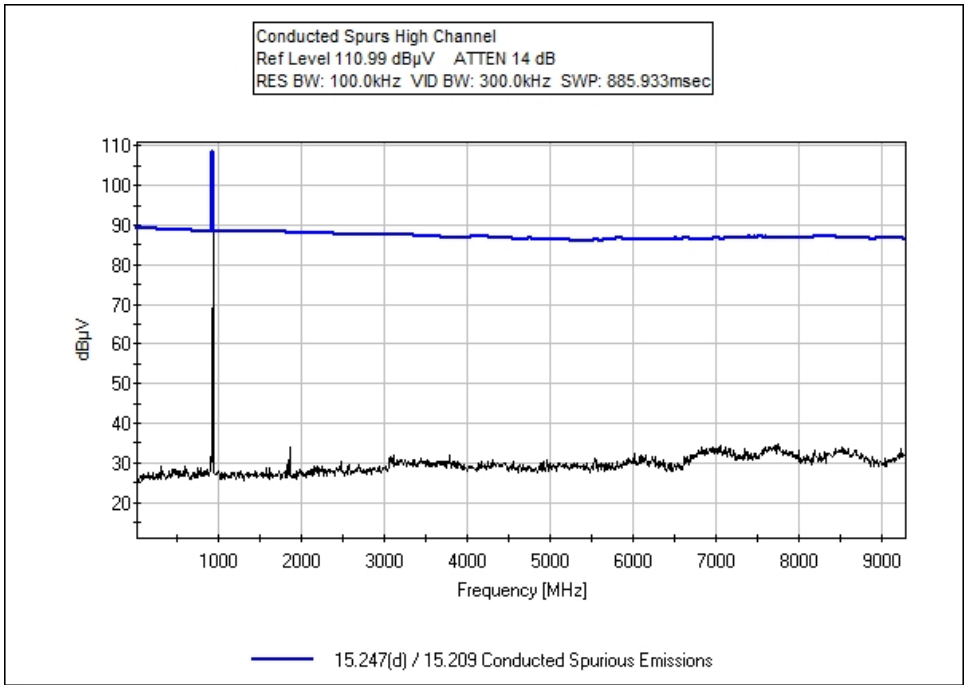
Conducted Spurs Hopping



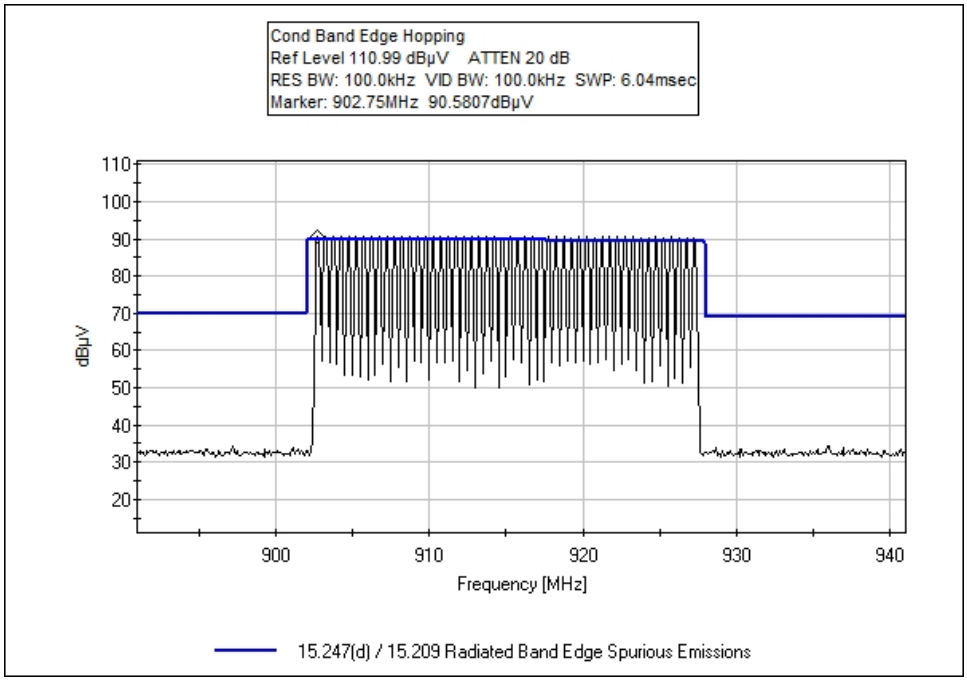
Low Channel



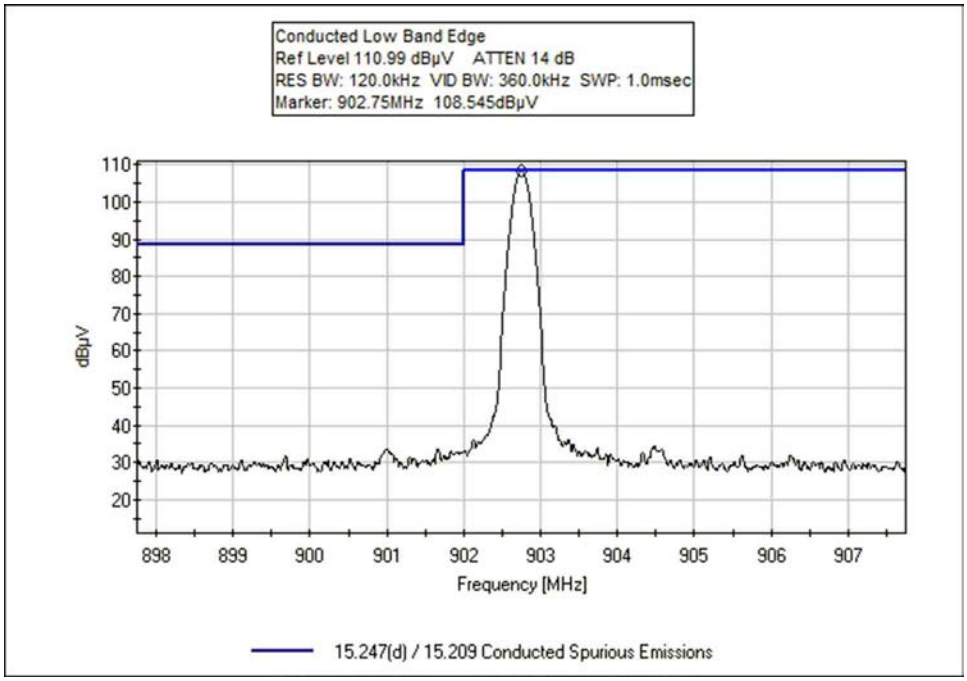
Mid Channel



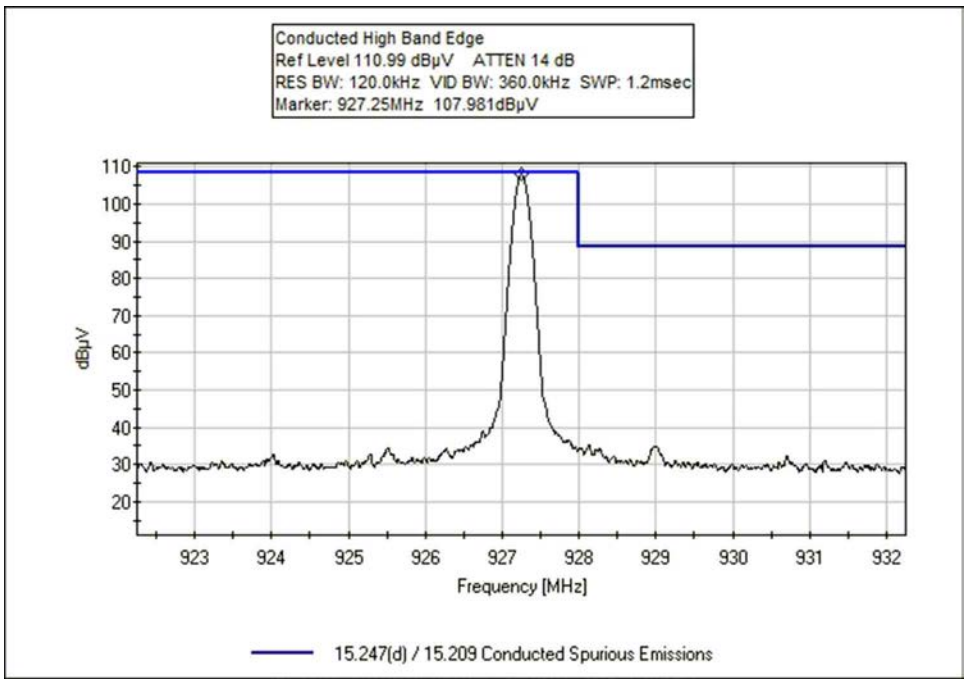
High Channel



Conducted Band Edge Hopping



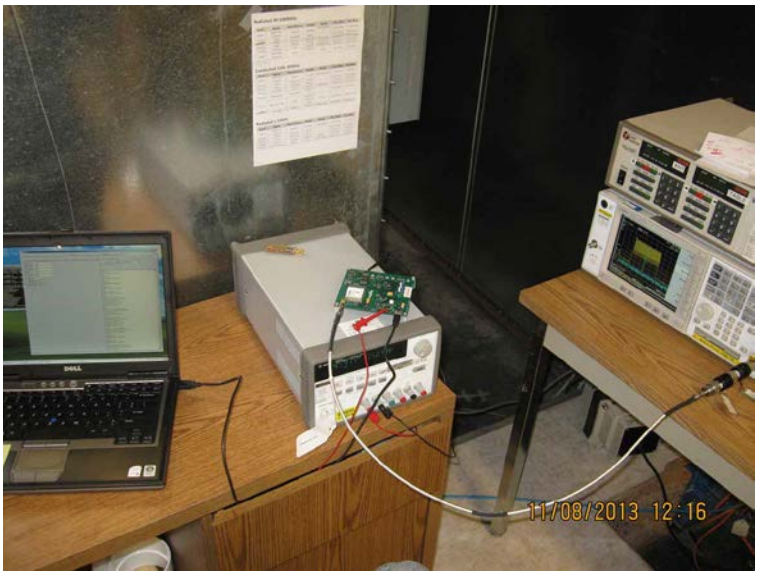
Low Band Edge



High Band Edge

Test Setup Photos

Overall Test Setup Photo



Conducted Band Edge

15.247(d) / RSS-210 Radiated Spurious Emissions

Test Data Sheets

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **Impinj Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **93909** Date: 7/17/2013
Test Type: **Maximized Emissions** Time: 10:57:55
Equipment: **Impinj IPJ-RS500 23dBm Reader SIP** Sequence#: 11
Manufacturer: Impinj Inc. Tested By: Steven Pittsford
Model: IPJ-RS500GX
S/N:

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02308	Preamp	8447D	4/3/2012	4/3/2014
T2	AN01996	Biconilog Antenna	CBL6111C	3/2/2012	3/2/2014
T3	ANP05360	Cable	RG214	12/3/2012	12/3/2014
T4	ANP05366	Cable	RG-214	10/14/2011	10/14/2013
T5	AN02673	Spectrum Analyzer	E4446A	5/11/2012	5/11/2014
T6	ANP05435	Attenuator	PE7015-10	10/5/2012	10/5/2014
T7	ANP05546	Cable	Heliax	3/27/2013	3/27/2015
T8	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	10/19/2011	10/19/2013
T9	AN03123	Cable	32026-2-29801-12	10/14/2011	10/14/2013
T10	ANP05965	Cable	Various	8/26/2011	8/26/2013
T11	AN03170	High Pass Filter	HM1155-11SS	9/6/2011	9/6/2013
T12	AN02115	Preamp	83051A	11/12/2012	11/12/2014
T13	AN00052	Loop Antenna	6502	5/16/2012	5/16/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Impinj IPJ-RS500 23dBm Reader SIP*	Impinj Inc.	IPJ-RS500GX	
Antenna	Laird Technologies	S9025PR	

Support Devices:

Function	Manufacturer	Model #	S/N
Development platform	Impinj, Inc.	IPJ-E4000 Rev 2.01	
Battery	Tenergy	18650	
Battery Pack	Tenergy	TN270	
Battery	Tenergy	18650	

Test Conditions / Notes:

The EUT is seeking modular approval and is placed in the center of the turntable on a Styrofoam table 80cm above the ground plane, installed on a support host PCB as intended for final installation. The laptop located outside the chamber sends test command to the EUT via the support host PCB. The EUT is set in constant transmit mode.

Freq: 902.75MHz, 915.25MHz, 927.25MHz
Measured Power= 23.0dBm, 23.0dBm, 22.6dBm
Firmware setting = 23dBm, 23dBm, 23dBm

Emission profile evaluated with Laird Antenna 5.5dBi with a 30cm cable between EUT and the antenna.

Frequency range of measurement = 9 kHz- 10GHz.
9 kHz -150 kHz;RBW=200 Hz=VBW
150 kHz-30 MHz;RBW=9 kHz=VBW
30 MHz-1000 MHz;RBW=120 kHz=VBWz,
1000 MHz-10,000 MHz;RBW=1 MHz=VBW

15.31(e) compliance: a freshly charged battery is installed.

Emission profile of the EUT rotated along three orthogonal axes was investigated. Recorded data represent worse case emission.

Test method in accordance with FCC document: DA 00-705

Temperature: 24°C
Pressure: 101.5kPa
Humidity: 37%

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9 T13	T2 T6 T10	T3 T7 T11	T4 T8 T12	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	928.000M	34.2	-27.3	+23.0	+2.1	+2.3	+0.0	44.7	46.0	-1.3	Vert
	QP		+0.0	+9.6	+0.8	+0.0	360		X-Axis		150
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	928.000M	38.5	+0.0	+0.0	+0.0	+0.0	+0.0	40.4	46.0	-5.6	Vert
			+0.0	+0.0	+0.8	+0.0			X-Axis		131
			+0.0	+1.1	+0.0	+0.0					
			+0.0								
3	336.420M	42.1	-27.3	+14.3	+1.1	+1.2	+0.0	41.5	46.0	-4.5	Horiz
	QP		+0.0	+9.7	+0.4	+0.0	360		Z-Axis		150
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	336.420M	48.8	-27.3	+14.3	+1.1	+1.2	+0.0	48.2	46.0	+2.2	Horiz
			+0.0	+9.7	+0.4	+0.0	360		Z-Axis		100
			+0.0	+0.0	+0.0	+0.0					
			+0.0								

5	642.800M	35.2	-28.3	+20.3	+1.7	+1.8	+0.0	41.0	46.0	-5.0	Vert
			+0.0	+9.7	+0.6	+0.0	255		X-Axis		101
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
6	3614.650M	47.6	+0.0	+0.0	+0.0	+0.0	+0.0	48.2	54.0	-5.8	Vert
			+0.0	+0.0	+1.7	+29.3	360		Low X-Axis		118
			+0.4	+2.2	+0.3	-33.3					
			+0.0								
7	8344.840M	35.0	+0.0	+0.0	+0.0	+0.0	+0.0	48.0	54.0	-6.0	Vert
			+0.0	+0.0	+3.0	+36.4	376		High X-Axis		124
			+0.9	+3.8	+0.2	-31.3					
			+0.0								
8	341.700M	40.3	-27.3	+14.5	+1.1	+1.2	+0.0	39.9	46.0	-6.1	Horiz
	QP		+0.0	+9.7	+0.4	+0.0	360		Z-Axis		150
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	341.700M	45.3	-27.3	+14.5	+1.1	+1.2	+0.0	44.9	46.0	-1.1	Horiz
			+0.0	+9.7	+0.4	+0.0	41		Z-Axis		100
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
10	8128.895M	35.4	+0.0	+0.0	+0.0	+0.0	+0.0	47.9	54.0	-6.1	Vert
			+0.0	+0.0	+3.2	+36.0			Low X-Axis		114
			+0.7	+3.7	+0.2	-31.3					
			+0.0								
11	3610.660M	47.2	+0.0	+0.0	+0.0	+0.0	+0.0	47.8	54.0	-6.2	Horiz
			+0.0	+0.0	+1.7	+29.3			Low X-Axis		118
			+0.4	+2.2	+0.3	-33.3					
			+0.0								
12	7417.290M	35.6	+0.0	+0.0	+0.0	+0.0	+0.0	47.8	54.0	-6.2	Vert
			+0.0	+0.0	+3.2	+36.0	264		High Z-Axis		124
			+0.6	+3.6	+0.2	-31.4					
			+0.0								
13	9273.030M	35.0	+0.0	+0.0	+0.0	+0.0	+0.0	47.6	54.0	-6.4	Horiz
			+0.0	+0.0	+3.3	+35.8	376		High X-Axis		124
			+0.8	+4.0	+0.2	-31.5					
			+0.0								
14	336.200M	40.2	-27.3	+14.3	+1.1	+1.2	+0.0	39.6	46.0	-6.4	Horiz
	QP		+0.0	+9.7	+0.4	+0.0	44		X-Axis		105
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	336.200M	46.5	-27.3	+14.3	+1.1	+1.2	+0.0	45.9	46.0	-0.1	Horiz
			+0.0	+9.7	+0.4	+0.0	43		X-Axis		99
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
16	8345.045M	34.3	+0.0	+0.0	+0.0	+0.0	+0.0	47.3	54.0	-6.7	Horiz
			+0.0	+0.0	+3.0	+36.4	370		High Z-Axis		124
			+0.9	+3.8	+0.2	-31.3					
			+0.0								
17	991.800M	35.0	-27.1	+24.2	+2.2	+2.5	+0.0	47.3	54.0	-6.7	Vert
			+0.0	+9.6	+0.9	+0.0	375		Z-Axis		99
			+0.0	+0.0	+0.0	+0.0					
			+0.0								

18	678.400M QP	32.9	-28.2 +0.0 +0.0 +0.0	+20.6 +9.7 +0.0	+1.7 +0.6 +0.0	+1.9 +0.0 +0.0	+0.0 360	39.2	46.0 Z-Axis	-6.8	Vert 150
^	678.400M	35.7	-28.2 +0.0 +0.0 +0.0	+20.6 +9.7 +0.0	+1.7 +0.6 +0.0	+1.9 +0.0 +0.0	+0.0 375	42.0	46.0 Z-Axis	-4.0	Vert 99
20	9273.140M	34.6	+0.0 +0.0 +0.8 +0.0	+0.0 +0.0 +4.0	+0.0 +3.3 +0.2	+0.0 +35.8 -31.5	+0.0 376	47.2	54.0 High Z-Axis	-6.8	Horiz 124
21	7418.310M	34.6	+0.0 +0.0 +0.6 +0.0	+0.0 +0.0 +3.6	+0.0 +3.2 +0.2	+0.0 +36.0 -31.4	+0.0 376	46.8	54.0 High X-Axis	-7.2	Vert 124
22	517.500M	34.9	-28.2 +0.0 +0.0 +0.0	+18.4 +9.7 +0.0	+1.5 +0.5 +0.0	+1.6 +0.0 +0.0	+0.0	38.4	46.0 Y-Axis	-7.6	Vert 126
23	334.765M QP	38.9	-27.3 +0.0 +0.0 +0.0	+14.3 +9.7 +0.0	+1.1 +0.4 +0.0	+1.2 +0.0 +0.0	+0.0 360	38.3	46.0 Z-Axis	-7.7	Horiz 100
^	334.820M	46.4	-27.3 +0.0 +0.0 +0.0	+14.3 +9.7 +0.0	+1.1 +0.4 +0.0	+1.2 +0.0 +0.0	+0.0 360	45.8	46.0 Z-Axis	-0.2	Horiz 100
^	334.700M	43.5	-27.3 +0.0 +0.0 +0.0	+14.3 +9.7 +0.0	+1.1 +0.4 +0.0	+1.2 +0.0 +0.0	+0.0 23	42.9	46.0 Y-Axis	-3.1	Horiz 99
26	381.500M QP	37.6	-27.7 +0.0 +0.0 +0.0	+15.7 +9.7 +0.0	+1.2 +0.4 +0.0	+1.3 +0.0 +0.0	+0.0 360	38.2	46.0 Z-Axis	-7.8	Horiz 150
^	381.500M	43.1	-27.7 +0.0 +0.0 +0.0	+15.7 +9.7 +0.0	+1.2 +0.4 +0.0	+1.3 +0.0 +0.0	+0.0 41	43.7	46.0 Z-Axis	-2.3	Horiz 100
28	343.200M QP	37.6	-27.3 +0.0 +0.0 +0.0	+14.5 +9.7 +0.0	+1.1 +0.4 +0.0	+1.2 +0.0 +0.0	+0.0 360	37.2	46.0 Y-Axis	-8.8	Horiz 150
^	343.200M	42.8	-27.3 +0.0 +0.0 +0.0	+14.5 +9.7 +0.0	+1.1 +0.4 +0.0	+1.2 +0.0 +0.0	+0.0 23	42.4	46.0 Y-Axis	-3.6	Horiz 99
30	8128.895M	32.6	+0.0 +0.0 +0.7 +0.0	+0.0 +0.0 +3.7	+0.0 +3.2 +0.2	+0.0 +36.0 -31.3	+0.0	45.1	54.0 Low X-Axis	-8.9	Horiz 114

31	9025.380M	31.3	+0.0	+0.0	+0.0	+0.0	+0.0	44.8	54.0	-9.2	Horiz
			+0.0	+0.0	+3.0	+37.0	360		Low Z-Axis		112
			+0.8	+3.9	+0.2	-31.4					
			+0.0								
32	411.200M	35.4	-27.9	+16.4	+1.3	+1.4	+0.0	36.8	46.0	-9.2	Horiz
			+0.0	+9.7	+0.5	+0.0	28		Y-Axis		99
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
33	335.399M	37.3	-27.3	+14.3	+1.1	+1.2	+0.0	36.7	46.0	-9.3	Horiz
	QP		+0.0	+9.7	+0.4	+0.0	44		X-Axis		99
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	335.396M	42.4	-27.3	+14.3	+1.1	+1.2	+0.0	41.8	46.0	-4.2	Horiz
			+0.0	+9.7	+0.4	+0.0	44		X-Axis		99
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
35	334.819M	36.9	-27.3	+14.3	+1.1	+1.2	+0.0	36.3	46.0	-9.7	Vert
	QP		+0.0	+9.7	+0.4	+0.0			Z-Axis		145
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	334.800M	41.1	-27.3	+14.3	+1.1	+1.2	+0.0	40.5	46.0	-5.5	Vert
			+0.0	+9.7	+0.4	+0.0	285		Z-Axis		160
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
37	9031.645M	30.8	+0.0	+0.0	+0.0	+0.0	+0.0	44.2	54.0	-9.8	Vert
			+0.0	+0.0	+3.0	+36.9	324		Low X-Axis		103
			+0.8	+3.9	+0.2	-31.4					
			+0.0								
38	9027.870M	30.7	+0.0	+0.0	+0.0	+0.0	+0.0	44.2	54.0	-9.8	Horiz
			+0.0	+0.0	+3.0	+37.0	360		Low Y-Axis		116
			+0.8	+3.9	+0.2	-31.4					
			+0.0								
39	6490.495M	34.7	+0.0	+0.0	+0.0	+0.0	+0.0	44.0	54.0	-10.0	Horiz
			+0.0	+0.0	+2.4	+34.4	376		High X-Axis		119
			+0.5	+3.4	+0.3	-31.7					
			+0.0								
40	335.276M	36.6	-27.3	+14.3	+1.1	+1.2	+0.0	36.0	46.0	-10.0	Horiz
	QP		+0.0	+9.7	+0.4	+0.0	69		Y-Axis		99
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
41	119.600M	38.5	-27.8	+11.6	+0.7	+0.6	+0.0	33.1	43.5	-10.4	Horiz
			+0.0	+9.3	+0.2	+0.0	360		Z-Axis		100
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
42	123.000M	38.2	-27.8	+11.7	+0.7	+0.6	+0.0	32.9	43.5	-10.6	Horiz
			+0.0	+9.3	+0.2	+0.0	43		X-Axis		118
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
43	7322.540M	31.0	+0.0	+0.0	+0.0	+0.0	+0.0	42.9	54.0	-11.1	Vert
			+0.0	+0.0	+3.1	+35.9			Mid Y-Axis		116
			+0.5	+3.6	+0.2	-31.4					
			+0.0								

44	6491.185M	33.6	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +3.4	+0.0 +2.4 +0.3	+0.0 +34.4 -31.7	+0.0 129	42.9	54.0 High Z-Axis	-11.1	Vert 115
45	5416.500M Ave	35.6	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.9	+0.0 +2.4 +0.3	+0.0 +33.2 -32.2	+0.0 237	42.7	54.0 Low X-Axis	-11.3	Vert 118
^	5416.500M	45.7	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.9	+0.0 +2.4 +0.3	+0.0 +33.2 -32.2	+0.0	52.8	54.0 Low X-Axis	-1.2	Vert 118
47	123.000M	37.4	-27.8 +0.0 +0.0 +0.0	+11.7 +9.3 +0.0	+0.7 +0.2 +0.0	+0.6 +0.0 +0.0	+0.0 23	32.1	43.5 Y-Axis	-11.4	Horiz 99
48	9151.099M	29.4	+0.0 +0.0 +0.8 +0.0	+0.0 +0.0 +3.9	+0.0 +3.1 +0.2	+0.0 +36.4 -31.4	+0.0	42.4	54.0 Mid Z-Axis	-11.6	Horiz 116
49	9031.645M	28.8	+0.0 +0.0 +0.8 +0.0	+0.0 +0.0 +3.9	+0.0 +3.0 +0.2	+0.0 +36.9 -31.4	+0.0 85	42.2	54.0 Low X-Axis	-11.8	Horiz 111
50	964.600M QP	30.5	-27.2 +0.0 +0.0 +0.0	+23.7 +9.6 +0.0	+2.1 +0.8 +0.0	+2.4 +0.0 +0.0	+0.0 360	41.9	54.0 X-Axis	-12.1	Vert 150
^	964.600M	35.3	-27.2 +0.0 +0.0 +0.0	+23.7 +9.6 +0.0	+2.1 +0.8 +0.0	+2.4 +0.0 +0.0	+0.0 360	46.7	54.0 X-Axis	-7.3	Vert 101
52	7419.180M	29.7	+0.0 +0.0 +0.6 +0.0	+0.0 +0.0 +3.6	+0.0 +3.2 +0.2	+0.0 +36.0 -31.4	+0.0 239	41.9	54.0 High Y-Axis	-12.1	Horiz 119
53	5563.960M	34.2	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.9	+0.0 +2.4 +0.3	+0.0 +33.5 -32.1	+0.0	41.6	54.0 High Y-Axis	-12.4	Vert 119
54	7321.763M	29.4	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +3.6	+0.0 +3.1 +0.2	+0.0 +35.9 -31.4	+0.0 239	41.3	54.0 Mid Z-Axis	-12.7	Vert 116
55	7321.170M	29.2	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +3.6	+0.0 +3.1 +0.2	+0.0 +35.9 -31.4	+0.0 8	41.1	54.0 Mid X-Axis	-12.9	Horiz 120
56	8344.560M	28.1	+0.0 +0.0 +0.9 +0.0	+0.0 +0.0 +3.8	+0.0 +3.0 +0.2	+0.0 +36.4 -31.3	+0.0 341	41.1	54.0 High Y-Axis	-12.9	Horiz 119

57	7221.920M	29.3	+0.0 +0.0 +0.6 +0.0	+0.0 +0.0 +3.6	+0.0 +3.0 +0.3	+0.0 +35.7 -31.5	+0.0 214	41.0	54.0 Low Z-Axis	-13.0	Horiz 116
58	5562.635M	33.6	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.9	+0.0 +2.4 +0.3	+0.0 +33.5 -32.1	+0.0 -16	41.0	54.0 High Z-Axis	-13.0	Vert 116
59	7220.140M	29.4	+0.0 +0.0 +0.6 +0.0	+0.0 +0.0 +3.6	+0.0 +3.0 +0.3	+0.0 +35.6 -31.5	+0.0 190	41.0	54.0 Low Y-Axis	-13.0	Horiz 116
60	7226.145M	29.2	+0.0 +0.0 +0.6 +0.0	+0.0 +0.0 +3.6	+0.0 +3.0 +0.3	+0.0 +35.7 -31.5	+0.0 267	40.9	54.0 Low X-Axis	-13.1	Horiz 111
61	9151.549M	27.7	+0.0 +0.0 +0.8 +0.0	+0.0 +0.0 +3.9	+0.0 +3.1 +0.2	+0.0 +36.4 -31.4	+0.0	40.7	54.0 Mid Y-Axis	-13.3	Horiz 116
62	6491.210M	31.3	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +3.4	+0.0 +2.4 +0.3	+0.0 +34.4 -31.7	+0.0 52	40.6	54.0 High Y-Axis	-13.4	Horiz 119
63	6405.868M	31.3	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +3.3	+0.0 +2.4 +0.4	+0.0 +34.4 -31.7	+0.0 129	40.6	54.0 Mid X-Axis	-13.4	Horiz 120
64	8125.030M	27.9	+0.0 +0.0 +0.7 +0.0	+0.0 +0.0 +3.7	+0.0 +3.2 +0.2	+0.0 +36.0 -31.3	+0.0 360	40.4	54.0 Low Y-Axis	-13.6	Vert 116
65	7226.145M	28.7	+0.0 +0.0 +0.6 +0.0	+0.0 +0.0 +3.6	+0.0 +3.0 +0.3	+0.0 +35.7 -31.5	+0.0 349	40.4	54.0 Low X-Axis	-13.6	Vert 114
66	8122.810M	27.6	+0.0 +0.0 +0.7 +0.0	+0.0 +0.0 +3.7	+0.0 +3.2 +0.2	+0.0 +36.0 -31.3	+0.0 360	40.1	54.0 Low Z-Axis	-13.9	Vert 116
67	9151.690M	26.9	+0.0 +0.0 +0.8 +0.0	+0.0 +0.0 +3.9	+0.0 +3.1 +0.2	+0.0 +36.4 -31.4	+0.0 73	39.9	54.0 Mid X-Axis	-14.1	Horiz 116
68	4514.000M	36.4	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +2.6	+0.0 +1.9 +0.3	+0.0 +31.2 -32.8	+0.0	39.9	54.0 Low X-Axis	-14.1	Horiz 118
69	9272.440M	27.2	+0.0 +0.0 +0.8 +0.0	+0.0 +0.0 +4.0	+0.0 +3.3 +0.2	+0.0 +35.8 -31.5	+0.0 360	39.8	54.0 High Y-Axis	-14.2	Vert 119

70	8235.813M	27.1	+0.0 +0.0 +0.8 +0.0	+0.0 +0.0 +3.7	+0.0 +3.1 +0.2	+0.0 +36.2 -31.3	+0.0 120	39.8	54.0 Mid Z-Axis	-14.2	Vert 116
71	8236.440M	27.0	+0.0 +0.0 +0.8 +0.0	+0.0 +0.0 +3.7	+0.0 +3.1 +0.2	+0.0 +36.2 -31.3	+0.0	39.7	54.0 Mid X-Axis	-14.3	Vert 116
72	6406.807M	30.4	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +3.3	+0.0 +2.4 +0.4	+0.0 +34.4 -31.7	+0.0 360	39.7	54.0 Mid Z-Axis	-14.3	Horiz 116
73	5563.245M	32.2	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.9	+0.0 +2.4 +0.3	+0.0 +33.5 -32.1	+0.0	39.6	54.0 High X-Axis	-14.4	Horiz 119
74	2723.400M	40.8	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.1	+0.0 +1.4 +0.3	+0.0 +27.2 -32.7	+0.0	39.6	54.0 Low X-Axis	-14.4	Horiz 113
75	4636.080M	35.6	+0.0 +0.0 +0.1 +0.0	+0.0 +0.0 +2.6	+0.0 +2.0 +0.3	+0.0 +31.5 -32.6	+0.0	39.5	54.0 High X-Axis	-14.5	Horiz 119
76	2708.650M	40.7	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.1	+0.0 +1.4 +0.3	+0.0 +27.1 -32.7	+0.0	39.4	54.0 Low X-Axis	-14.6	Vert 99
77	8237.340M	26.4	+0.0 +0.0 +0.8 +0.0	+0.0 +0.0 +3.7	+0.0 +3.1 +0.2	+0.0 +36.2 -31.3	+0.0	39.1	54.0 Mid Y-Axis	-14.9	Horiz 116
78	6323.395M	29.5	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +3.3	+0.0 +2.4 +0.4	+0.0 +34.5 -31.8	+0.0 70	38.8	54.0 Low X-Axis	-15.2	Horiz 111
79	6319.965M	29.5	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +3.3	+0.0 +2.4 +0.4	+0.0 +34.5 -31.8	+0.0 8	38.8	54.0 Low Z-Axis	-15.2	Vert 116
80	4637.705M	34.8	+0.0 +0.0 +0.1 +0.0	+0.0 +0.0 +2.6	+0.0 +2.0 +0.3	+0.0 +31.5 -32.6	+0.0 27	38.7	54.0 High Y-Axis	-15.3	Vert 119
81	6405.814M	29.4	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +3.3	+0.0 +2.4 +0.4	+0.0 +34.4 -31.7	+0.0 360	38.7	54.0 Mid Y-Axis	-15.3	Vert 120
82	5492.307M	31.4	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.9	+0.0 +2.4 +0.3	+0.0 +33.3 -32.1	+0.0 360	38.6	54.0 Mid Z-Axis	-15.4	Horiz 116

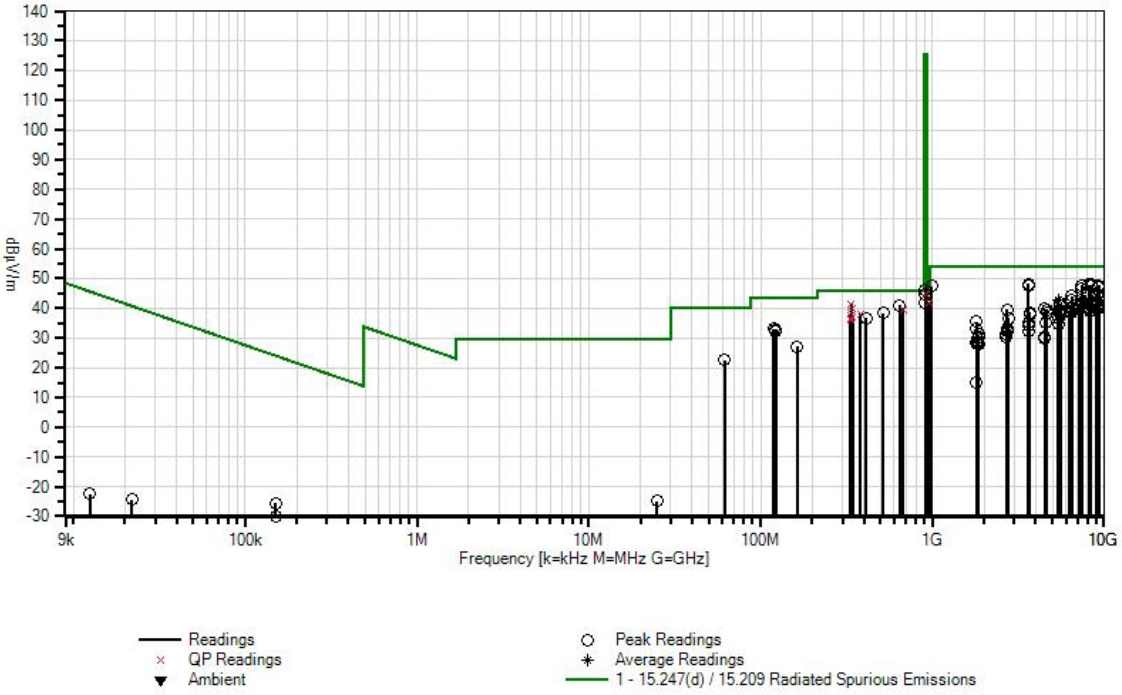
83	3708.720M	37.6	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.1	+0.0 +1.7 +0.4	+0.0 +29.6 -33.2	+0.0	38.6	54.0 High X-Axis	-15.4	Horiz 119
84	6319.410M	29.3	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +3.3	+0.0 +2.4 +0.3	+0.0 +34.5 -31.8	+0.0	38.5	54.0 Low Y-Axis	-15.5	Vert 104
85	4636.150M	34.5	+0.0 +0.0 +0.1 +0.0	+0.0 +0.0 +2.6	+0.0 +2.0 +0.3	+0.0 +31.5 -32.6	+0.0 -16	38.4	54.0 High Z-Axis	-15.6	Horiz 116
86	3707.935M	37.2	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.1	+0.0 +1.7 +0.4	+0.0 +29.6 -33.2	+0.0 -16	38.2	54.0 High Z-Axis	-15.8	Horiz 116
87	5491.288M	30.9	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.9	+0.0 +2.4 +0.3	+0.0 +33.3 -32.1	+0.0 360	38.1	54.0 Mid X-Axis	-15.9	Vert 120
88	5490.567M	30.9	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.9	+0.0 +2.4 +0.3	+0.0 +33.3 -32.1	+0.0 360	38.1	54.0 Mid Y-Axis	-15.9	Vert 120
89	3708.980M	36.8	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.1	+0.0 +1.7 +0.4	+0.0 +29.6 -33.2	+0.0 226	37.8	54.0 High Y-Axis	-16.2	Horiz 119
90	162.800M	33.0	-27.5 +0.0 +0.0 +0.0	+10.2 +9.4 +0.0	+0.8 +0.3 +0.0	+0.8 +0.0 +0.0	+0.0 23	27.0	43.5 Y-Axis	-16.5	Horiz 99
91	2781.155M	37.6	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.1	+0.0 +1.5 +0.3	+0.0 +27.4 -32.7	+0.0 360	36.7	54.0 High Y-Axis	-17.3	Horiz 115
92	2782.990M	37.6	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.1	+0.0 +1.5 +0.3	+0.0 +27.4 -32.7	+0.0	36.7	54.0 High X-Axis	-17.3	Vert 119
93	5416.180M	29.4	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.9	+0.0 +2.4 +0.3	+0.0 +33.2 -32.2	+0.0	36.5	54.0 Low Z-Axis	-17.5	Vert 116
94	61.800M	34.8	-28.0 +0.0 +0.0 +0.0	+5.4 +9.2 +0.0	+0.5 +0.2 +0.0	+0.4 +0.0 +0.0	+0.0 362	22.5	40.0 Y-Axis	-17.5	Vert 295
95	2782.005M	37.4	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.1	+0.0 +1.5 +0.3	+0.0 +27.4 -32.7	+0.0 -14	36.5	54.0 High Z-Axis	-17.5	Vert 116

96	1805.900M	41.5	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +1.6	+0.0 +1.2 +0.5	+0.0 +24.7 -34.3	+0.0 360	35.5	54.0 Low X-Axis	-18.5	Horiz 99
97	4575.308M	31.5	+0.0 +0.0 +0.1 +0.0	+0.0 +0.0 +2.6	+0.0 +2.0 +0.3	+0.0 +31.4 -32.7	+0.0 360	35.2	54.0 Mid X-Axis	-18.8	Vert 120
98	4575.512M	31.5	+0.0 +0.0 +0.1 +0.0	+0.0 +0.0 +2.6	+0.0 +2.0 +0.3	+0.0 +31.4 -32.7	+0.0 360	35.2	54.0 Mid Y-Axis	-18.8	Horiz 120
99	4575.188M	31.4	+0.0 +0.0 +0.1 +0.0	+0.0 +0.0 +2.6	+0.0 +2.0 +0.3	+0.0 +31.4 -32.7	+0.0 360	35.1	54.0 Mid Z-Axis	-18.9	Horiz 116
100	3660.588M	34.5	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.1	+0.0 +1.7 +0.3	+0.0 +29.4 -33.3	+0.0 360	35.1	54.0 Mid X-Axis	-18.9	Horiz 120
101	3659.620M	34.4	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.1	+0.0 +1.7 +0.3	+0.0 +29.4 -33.3	+0.0 360	35.0	54.0 Mid Y-Axis	-19.0	Horiz 120
102	5416.750M	27.3	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.9	+0.0 +2.4 +0.3	+0.0 +33.2 -32.2	+0.0	34.4	54.0 Low Y-Axis	-19.6	Horiz 104
103	3659.938M	33.4	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.1	+0.0 +1.7 +0.3	+0.0 +29.4 -33.3	+0.0 360	34.0	54.0 Mid Z-Axis	-20.0	Vert 116
104	1805.500M	39.4	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +1.6	+0.0 +1.2 +0.5	+0.0 +24.7 -34.3	+0.0 360	33.4	54.0 Low X-Axis	-20.6	Vert 120
105	2744.766M	34.1	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.1	+0.0 +1.4 +0.3	+0.0 +27.3 -32.7	+0.0 341	33.0	54.0 Mid X-Axis	-21.0	Vert 112
106	2744.691M	33.8	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.1	+0.0 +1.4 +0.3	+0.0 +27.3 -32.7	+0.0 360	32.7	54.0 Mid Z-Axis	-21.3	Vert 116
107	2745.453M	33.3	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.1	+0.0 +1.4 +0.3	+0.0 +27.3 -32.7	+0.0 360	32.2	54.0 Mid Y-Axis	-21.8	Vert 120
108	3612.560M	31.6	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.2	+0.0 +1.7 +0.3	+0.0 +29.3 -33.3	+0.0 360	32.2	54.0 Low Y-Axis	-21.8	Horiz 121

109	3612.730M	31.4	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.2	+0.0 +1.7 +0.3	+0.0 +29.3 -33.3	+0.0 164	32.0	54.0 Low Z-Axis	-22.0	Vert 194
110	2705.900M	32.6	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.1	+0.0 +1.4 +0.3	+0.0 +27.1 -32.7	+0.0 92	31.3	54.0 Low Y-Axis	-22.7	Vert 110
111	1854.335M	36.3	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +1.6	+0.0 +1.2 +0.4	+0.0 +25.2 -33.9	+0.0 360	31.1	54.0 High Y-Axis	-22.9	Vert 119
112	2707.085M	31.8	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.1	+0.0 +1.4 +0.3	+0.0 +27.1 -32.7	+0.0 295	30.5	54.0 Low Z-Axis	-23.5	Vert 283
113	4511.690M	27.0	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +2.6	+0.0 +1.9 +0.3	+0.0 +31.2 -32.8	+0.0	30.5	54.0 Low Z-Axis	-23.5	Horiz 112
114	1855.655M	35.5	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +1.6	+0.0 +1.2 +0.4	+0.0 +25.2 -33.9	+0.0 272	30.3	54.0 High X-Axis	-23.7	Vert 119
115	4514.000M	26.5	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +2.6	+0.0 +1.9 +0.3	+0.0 +31.2 -32.8	+0.0	30.0	54.0 Low Y-Axis	-24.0	Horiz 121
116	1828.815M	35.4	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +1.6	+0.0 +1.2 +0.4	+0.0 +24.9 -34.1	+0.0 360	29.7	54.0 Mid X-Axis	-24.3	Horiz 99
117	1829.966M	34.5	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +1.6	+0.0 +1.2 +0.4	+0.0 +24.9 -34.1	+0.0 218	28.8	54.0 Mid Z-Axis	-25.2	Horiz 116
118	1805.570M	34.2	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +1.6	+0.0 +1.2 +0.5	+0.0 +24.7 -34.3	+0.0	28.2	54.0 Low Y-Axis	-25.8	Vert 103
119	1854.675M	33.4	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +1.6	+0.0 +1.2 +0.4	+0.0 +25.2 -33.9	+0.0 360	28.2	54.0 High Z-Axis	-25.8	Horiz 116
120	1830.203M	33.6	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +1.6	+0.0 +1.2 +0.4	+0.0 +24.9 -34.1	+0.0 41	27.9	54.0 Mid Y-Axis	-26.1	Horiz 116
121	1803.950M	21.0	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +1.6	+0.0 +1.2 +0.5	+0.0 +24.7 -34.3	+0.0 360	15.0	54.0 Low Z-Axis	-39.0	Horiz 400

122	150.000k	45.0	+0.0 +0.0 +0.0 +9.5	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	-80.0 360	-25.5	24.1	-49.6	Perpe 123
123	150.000k	40.5	+0.0 +0.0 +0.0 +9.5	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	-80.0 360	-30.0	24.1	-54.1	Paral 123
124	24.980M	9.3	+0.0 +0.0 +0.0 +5.8	+0.0 +0.0 +0.2	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	-40.0 360	-24.7	29.5	-54.2	Paral 123
125	21.925k	43.8	+0.0 +0.0 +0.0 +11.8	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	-80.0 360	-24.4	40.8	-65.2	Paral 123
126	12.525k	42.3	+0.0 +0.0 +0.0 +15.2	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	-80.0 360	-22.5	45.6	-68.1	Perpe 123
127	912.000M	36.3	-27.4 +0.0 +0.0 +0.0	+22.6 +9.6 +0.0	+2.1 +0.7 +0.0	+2.3 +0.0 +0.0	+0.0 360	46.2	125.2 X-Axis	-79.0	Vert 101
128	911.900M	34.8	-27.4 +0.0 +0.0 +0.0	+22.6 +9.6 +0.0	+2.1 +0.7 +0.0	+2.3 +0.0 +0.0	+0.0	44.7	125.2 Y-Axis	-80.5	Vert 126
129	911.900M	32.1	-27.4 +0.0 +0.0 +0.0	+22.6 +9.6 +0.0	+2.1 +0.7 +0.0	+2.3 +0.0 +0.0	+0.0 28	42.0	125.2 Y-Axis	-83.2	Horiz 99

CKC Laboratories, Inc. Date: 7/17/2013 Time: 10:57:55 Impinj Inc. WO#: 93909
Test Distance: 3 Meters Sequence#: 11 Horiz
Impinj Inc. Impinj IPJ-RS500 23dBm Reader SIP P/N: IPJ-RS500GX



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **Impinj Inc.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **93909** Date: 7/17/2013
Test Type: **Maximized Emissions** Time: 10:56:25
Equipment: **Impinj IPJ-RS500 23dBm Reader SIP** Sequence#: 10
Manufacturer: Impinj Inc. Tested By: Steven Pittsford
Model: IPJ-RS500GX
S/N: IMPH12000100051210

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02308	Preamp	8447D	4/3/2012	4/3/2014
T2	AN01996	Biconilog Antenna	CBL6111C	3/2/2012	3/2/2014
T3	ANP05360	Cable	RG214	12/3/2012	12/3/2014
T4	ANP05366	Cable	RG-214	10/14/2011	10/14/2013
T5	AN02673	Spectrum Analyzer	E4446A	5/11/2012	5/11/2014
T6	ANP05546	Cable	Heliax	3/27/2013	3/27/2015
T7	AN02115	Preamp	83051A	11/12/2012	11/12/2014
T8	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	10/19/2011	10/19/2013
T9	AN03123	Cable	32026-2-29801-12	10/14/2011	10/14/2013
T10	ANP05965	Cable	Various	8/26/2011	8/26/2013
T11	AN00052	Loop Antenna	6502	5/16/2012	5/16/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Mini Guardrail Antenna	Impinj, Inc.	IMP-A0303-000	
Impinj IPJ-RS500 23dBm Reader SIP	Impinj Inc.	IPJ-RS500GX	

Support Devices:

Function	Manufacturer	Model #	S/N
Battery	Tenergy	18650	
Battery Pack	Tenergy	TN270	
Battery	Tenergy	18650	
Development platform	Impinj, Inc.	IPJ-E4000 Rev 2.01	

Test Conditions / Notes:

The EUT is seeking modular approval and is placed in the center of the turntable on a Styrofoam table 80cm above the ground plane, installed on a support host PCB as intended for final installation. The laptop located outside the chamber sends test command to the EUT via the support host PCB. The EUT is set in constant transmit mode.

Freq: 902.75MHz, 915.25MHz, 927.25MHz
Measured Power= 23.0dBm, 23.0dBm, 22.6dBm
Firmware setting = 23dBm, 23dBm, 23dBm

Emission profile evaluated with Mini Guardrail Antenna -20dBi with a 30cm cable between EUT and the antenna.

Frequency range of measurement = 9 kHz- 10 GHz.
9 kHz -150 kHz;RBW=200 Hz=VBW
150 kHz-30 MHz;RBW=9 kHz=VBW
30 MHz-1000 MHz;RBW=120 kHz=VBWz,
1000 MHz-10,000 MHz;RBW=1 MHz=VBW

15.31(e) compliance: a freshly charged battery is installed
Emission profile of the EUT rotated along three orthogonal axes was investigated. Recorded data represent worse case emission.
Test method in accordance with FCC document: DA 00-705.

Temperature: 24°C
Pressure: 101.5kPa
Humidity: 37%

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7 T11	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	338.420M	50.7	-27.3	+14.4	+1.1	+1.2	+0.0	40.5	46.0	-5.5	Horiz
	QP		+0.0	+0.4	+0.0	+0.0	44		X-Axis		99
			+0.0	+0.0	+0.0						
^	338.420M	55.4	-27.3	+14.4	+1.1	+1.2	+0.0	45.2	46.0	-0.8	Horiz
			+0.0	+0.4	+0.0	+0.0	138		X-Axis		99
			+0.0	+0.0	+0.0						
3	394.800M	48.3	-27.8	+16.1	+1.3	+1.4	+0.0	39.8	46.0	-6.2	Horiz
			+0.0	+0.5	+0.0	+0.0			Z-Axis		100
			+0.0	+0.0	+0.0						
4	344.320M	48.8	-27.4	+14.6	+1.1	+1.2	+0.0	38.7	46.0	-7.3	Horiz
	QP		+0.0	+0.4	+0.0	+0.0			Z-Axis		100
			+0.0	+0.0	+0.0						
^	344.300M	55.0	-27.4	+14.6	+1.1	+1.2	+0.0	44.9	46.0	-1.1	Horiz
			+0.0	+0.4	+0.0	+0.0			Z-Axis		100
			+0.0	+0.0	+0.0						
6	406.400M	46.6	-27.9	+16.3	+1.3	+1.4	+0.0	38.2	46.0	-7.8	Horiz
			+0.0	+0.5	+0.0	+0.0	287		Y-Axis		100
			+0.0	+0.0	+0.0						
7	338.920M	48.3	-27.3	+14.4	+1.1	+1.2	+0.0	38.1	46.0	-7.9	Horiz
	QP		+0.0	+0.4	+0.0	+0.0	5		Y-Axis		99
			+0.0	+0.0	+0.0						

^	338.900M	53.5	-27.3	+14.4	+1.1	+1.2	+0.0	43.3	46.0	-2.7	Horiz
			+0.0	+0.4	+0.0	+0.0	355		Y-Axis		100
			+0.0	+0.0	+0.0						
9	124.600M	48.6	-27.8	+11.7	+0.7	+0.6	+0.0	34.0	43.5	-9.5	Horiz
			+0.0	+0.2	+0.0	+0.0	288		Z-Axis		99
			+0.0	+0.0	+0.0						
10	122.680M	47.8	-27.8	+11.7	+0.7	+0.6	+0.0	33.2	43.5	-10.3	Horiz
			+0.0	+0.2	+0.0	+0.0	360		X-Axis		152
			+0.0	+0.0	+0.0						
11	339.100M	45.7	-27.3	+14.4	+1.1	+1.2	+0.0	35.5	46.0	-10.5	Vert
			+0.0	+0.4	+0.0	+0.0	89		Y-Axis		100
			+0.0	+0.0	+0.0						
12	129.700M	46.9	-27.8	+11.7	+0.7	+0.6	+0.0	32.4	43.5	-11.1	Horiz
			+0.0	+0.3	+0.0	+0.0	360		Y-Axis		99
			+0.0	+0.0	+0.0						
13	9272.505M	30.3	+0.0	+0.0	+0.0	+0.0	+0.0	42.7	54.0	-11.3	Horiz
			+0.0	+3.3	-31.5	+35.8	360		High Y-Axis		121
			+0.8	+4.0	+0.0						
14	8345.780M	29.8	+0.0	+0.0	+0.0	+0.0	+0.0	42.6	54.0	-11.4	Vert
			+0.0	+3.0	-31.3	+36.4	360		High Z-Axis		121
			+0.9	+3.8	+0.0						
15	8345.620M	29.6	+0.0	+0.0	+0.0	+0.0	+0.0	42.4	54.0	-11.6	Horiz
			+0.0	+3.0	-31.3	+36.4	290		High Y-Axis		115
			+0.9	+3.8	+0.0						
16	9026.790M	29.0	+0.0	+0.0	+0.0	+0.0	+0.0	42.3	54.0	-11.7	Horiz
			+0.0	+3.0	-31.4	+37.0	360		Low Y-Axis		119
			+0.8	+3.9	+0.0						
17	9273.640M	29.9	+0.0	+0.0	+0.0	+0.0	+0.0	42.3	54.0	-11.7	Horiz
			+0.0	+3.3	-31.5	+35.8			High Z-Axis		121
			+0.8	+4.0	+0.0						
18	8346.505M	29.1	+0.0	+0.0	+0.0	+0.0	+0.0	41.9	54.0	-12.1	Horiz
			+0.0	+3.0	-31.3	+36.4	262		High X-Axis		114
			+0.9	+3.8	+0.0						
19	7418.120M	29.7	+0.0	+0.0	+0.0	+0.0	+0.0	41.7	54.0	-12.3	Horiz
			+0.0	+3.2	-31.4	+36.0	360		High Y-Axis		115
			+0.6	+3.6	+0.0						
20	7416.520M	29.5	+0.0	+0.0	+0.0	+0.0	+0.0	41.5	54.0	-12.5	Vert
			+0.0	+3.2	-31.4	+36.0	360		High Z-Axis		121
			+0.6	+3.6	+0.0						
21	9152.040M	28.5	+0.0	+0.0	+0.0	+0.0	+0.0	41.3	54.0	-12.7	Horiz
			+0.0	+3.1	-31.4	+36.4	360		Mid Z-Axis		119
			+0.8	+3.9	+0.0						
22	9271.825M	28.8	+0.0	+0.0	+0.0	+0.0	+0.0	41.3	54.0	-12.7	Horiz
			+0.0	+3.3	-31.5	+35.8	335		High X-Axis		114
			+0.9	+4.0	+0.0						
23	342.600M	43.3	-27.3	+14.5	+1.1	+1.2	+0.0	33.2	46.0	-12.8	Vert
			+0.0	+0.4	+0.0	+0.0	358		Z-Axis		102
			+0.0	+0.0	+0.0						
24	9152.515M	28.4	+0.0	+0.0	+0.0	+0.0	+0.0	41.2	54.0	-12.8	Vert
			+0.0	+3.1	-31.4	+36.4	105		Mid X-Axis		121
			+0.8	+3.9	+0.0						

25	165.800M	46.2	-27.5	+10.0	+0.8	+0.8	+0.0	30.6	43.5	-12.9	Horiz
			+0.0	+0.3	+0.0	+0.0	360		X-Axis		152
			+0.0	+0.0	+0.0						
26	7418.600M	29.0	+0.0	+0.0	+0.0	+0.0	+0.0	41.0	54.0	-13.0	Vert
			+0.0	+3.2	-31.4	+36.0			High X-Axis		124
			+0.6	+3.6	+0.0						
27	7222.380M	29.6	+0.0	+0.0	+0.0	+0.0	+0.0	41.0	54.0	-13.0	Vert
			+0.0	+3.0	-31.5	+35.7	108		Low Y-Axis		119
			+0.6	+3.6	+0.0						
28	9151.215M	28.2	+0.0	+0.0	+0.0	+0.0	+0.0	41.0	54.0	-13.0	Vert
			+0.0	+3.1	-31.4	+36.4	360		Mid Y-Axis		119
			+0.8	+3.9	+0.0						
29	7322.540M	29.2	+0.0	+0.0	+0.0	+0.0	+0.0	40.9	54.0	-13.1	Vert
			+0.0	+3.1	-31.4	+35.9			Mid Z-Axis		119
			+0.5	+3.6	+0.0						
30	9026.115M	27.6	+0.0	+0.0	+0.0	+0.0	+0.0	40.9	54.0	-13.1	Vert
			+0.0	+3.0	-31.4	+37.0			Low X-Axis		123
			+0.8	+3.9	+0.0						
31	8237.265M	28.3	+0.0	+0.0	+0.0	+0.0	+0.0	40.8	54.0	-13.2	Vert
			+0.0	+3.1	-31.3	+36.2	268		Mid Z-Axis		119
			+0.8	+3.7	+0.0						
32	8236.000M	28.2	+0.0	+0.0	+0.0	+0.0	+0.0	40.7	54.0	-13.3	Horiz
			+0.0	+3.1	-31.3	+36.2			Mid X-Axis		121
			+0.8	+3.7	+0.0						
33	7222.410M	29.2	+0.0	+0.0	+0.0	+0.0	+0.0	40.6	54.0	-13.4	Vert
			+0.0	+3.0	-31.5	+35.7			Low X-Axis		123
			+0.6	+3.6	+0.0						
34	9026.775M	27.2	+0.0	+0.0	+0.0	+0.0	+0.0	40.5	54.0	-13.5	Horiz
			+0.0	+3.0	-31.4	+37.0	360		Low Z-axis		119
			+0.8	+3.9	+0.0						
35	7222.480M	29.0	+0.0	+0.0	+0.0	+0.0	+0.0	40.4	54.0	-13.6	Horiz
			+0.0	+3.0	-31.5	+35.7	360		Low Z-axis		119
			+0.6	+3.6	+0.0						
36	8125.525M	28.0	+0.0	+0.0	+0.0	+0.0	+0.0	40.3	54.0	-13.7	Horiz
			+0.0	+3.2	-31.3	+36.0			Low X-Axis		123
			+0.7	+3.7	+0.0						
37	8237.225M	27.7	+0.0	+0.0	+0.0	+0.0	+0.0	40.2	54.0	-13.8	Vert
			+0.0	+3.1	-31.3	+36.2	360		Mid Y-Axis		119
			+0.8	+3.7	+0.0						
38	8126.040M	27.9	+0.0	+0.0	+0.0	+0.0	+0.0	40.2	54.0	-13.8	Vert
			+0.0	+3.2	-31.3	+36.0	360		Low Z-axis		119
			+0.7	+3.7	+0.0						
39	7321.130M	28.4	+0.0	+0.0	+0.0	+0.0	+0.0	40.1	54.0	-13.9	Vert
			+0.0	+3.1	-31.4	+35.9			Mid X-Axis		121
			+0.5	+3.6	+0.0						
40	7321.665M	28.2	+0.0	+0.0	+0.0	+0.0	+0.0	39.9	54.0	-14.1	Horiz
			+0.0	+3.1	-31.4	+35.9	360		Mid Y-Axis		119
			+0.5	+3.6	+0.0						
41	397.900M	39.3	-27.8	+16.1	+1.3	+1.4	+0.0	30.8	46.0	-15.2	Vert
			+0.0	+0.5	+0.0	+0.0	360		Z-Axis		102
			+0.0	+0.0	+0.0						

42	8124.040M	26.4	+0.0 +0.0 +0.7	+0.0 +3.2 +3.7	+0.0 -31.3 +0.0	+0.0 +36.0	+0.0 360	38.7	54.0 Low Y-Axis	-15.3	Vert 119
43	6492.080M	29.0	+0.0 +0.0 +0.5	+0.0 +2.4 +3.4	+0.0 -31.7 +0.0	+0.0 +34.4	+0.0	38.0	54.0 High X-Axis	-16.0	Vert 124
44	5415.280M	31.2	+0.0 +0.0 +0.5	+0.0 +2.4 +2.9	+0.0 -32.2 +0.0	+0.0 +33.2	+0.0 268	38.0	54.0 Low Z-axis	-16.0	Vert 119
45	343.900M	40.0	-27.4 +0.0 +0.0	+14.6 +0.4 +0.0	+1.1 +0.0 +0.0	+1.2 +0.0	+0.0 228	29.9	46.0 X-Axis	-16.1	Vert 100
46	5416.250M	31.1	+0.0 +0.0 +0.5	+0.0 +2.4 +2.9	+0.0 -32.2 +0.0	+0.0 +33.2	+0.0	37.9	54.0 Low Y-Axis	-16.1	Horiz 119
47	164.400M	42.7	-27.5 +0.0 +0.0	+10.1 +0.3 +0.0	+0.8 +0.0 +0.0	+0.8 +0.0	+0.0 360	27.2	43.5 Z-Axis	-16.3	Horiz 99
48	5563.795M	30.1	+0.0 +0.0 +0.4	+0.0 +2.4 +2.9	+0.0 -32.1 +0.0	+0.0 +33.5	+0.0	37.2	54.0 High X-Axis	-16.8	Horiz 120
49	5416.360M	30.4	+0.0 +0.0 +0.5	+0.0 +2.4 +2.9	+0.0 -32.2 +0.0	+0.0 +33.2	+0.0	37.2	54.0 Low X-Axis	-16.8	Horiz 123
50	5490.445M	30.3	+0.0 +0.0 +0.4	+0.0 +2.4 +2.9	+0.0 -32.1 +0.0	+0.0 +33.3	+0.0	37.2	54.0 Mid Y-Axis	-16.8	Horiz 117
51	5564.040M	30.1	+0.0 +0.0 +0.4	+0.0 +2.4 +2.9	+0.0 -32.1 +0.0	+0.0 +33.5	+0.0	37.2	54.0 High Z-Axis	-16.8	Vert 126
52	6405.455M	28.2	+0.0 +0.0 +0.5	+0.0 +2.4 +3.3	+0.0 -31.7 +0.0	+0.0 +34.4	+0.0	37.1	54.0 Mid X-Axis	-16.9	Vert 121
53	6489.270M	28.1	+0.0 +0.0 +0.5	+0.0 +2.4 +3.4	+0.0 -31.7 +0.0	+0.0 +34.4	+0.0	37.1	54.0 High Z-Axis	-16.9	Horiz 126
54	221.170M	43.5	-27.2 +0.0 +0.0	+10.6 +0.3 +0.0	+0.9 +0.0 +0.0	+0.9 +0.0	+0.0 136	29.0	46.0 X-Axis	-17.0	Horiz 121
55	5491.365M	30.1	+0.0 +0.0 +0.4	+0.0 +2.4 +2.9	+0.0 -32.1 +0.0	+0.0 +33.3	+0.0	37.0	54.0 Mid X-Axis	-17.0	Horiz 114
56	6405.960M	28.0	+0.0 +0.0 +0.5	+0.0 +2.4 +3.3	+0.0 -31.7 +0.0	+0.0 +34.4	+0.0 248	36.9	54.0 Mid Y-Axis	-17.1	Vert 119
57	6319.000M	28.0	+0.0 +0.0 +0.5	+0.0 +2.4 +3.3	+0.0 -31.8 +0.0	+0.0 +34.5	+0.0	36.9	54.0 Low X-Axis	-17.1	Vert 123
58	6407.180M	28.0	+0.0 +0.0 +0.5	+0.0 +2.4 +3.3	+0.0 -31.7 +0.0	+0.0 +34.4	+0.0	36.9	54.0 Mid X-Axis	-17.1	Horiz 114

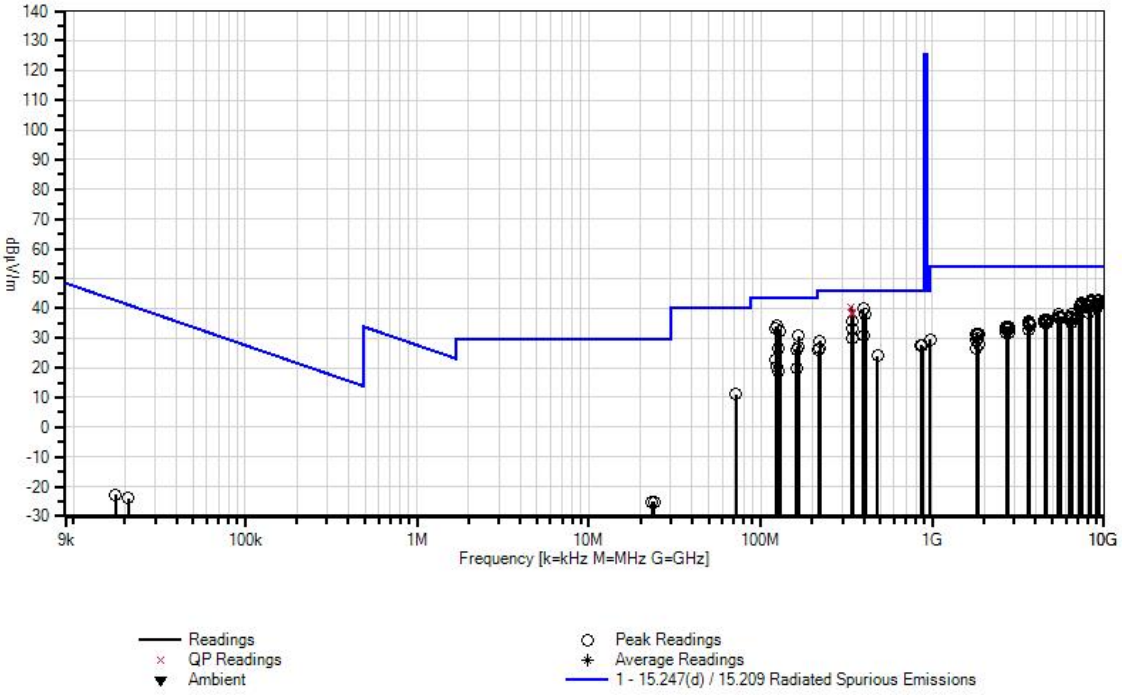
59	128.000M	40.8	-27.8	+11.7	+0.7	+0.6	+0.0	26.3	43.5	-17.2	Vert
			+0.0	+0.3	+0.0	+0.0	195		Y-Axis		100
			+0.0	+0.0	+0.0						
60	6318.435M	27.9	+0.0	+0.0	+0.0	+0.0	+0.0	36.8	54.0	-17.2	Horiz
			+0.0	+2.4	-31.8	+34.5	360		Low Z-axis		119
			+0.5	+3.3	+0.0						
61	162.500M	41.4	-27.5	+10.3	+0.8	+0.8	+0.0	26.1	43.5	-17.4	Horiz
			+0.0	+0.3	+0.0	+0.0	244		Y-Axis		99
			+0.0	+0.0	+0.0						
62	5563.480M	29.5	+0.0	+0.0	+0.0	+0.0	+0.0	36.6	54.0	-17.4	Horiz
			+0.0	+2.4	-32.1	+33.5			High Y-Axis		115
			+0.4	+2.9	+0.0						
63	5490.745M	29.6	+0.0	+0.0	+0.0	+0.0	+0.0	36.5	54.0	-17.5	Vert
			+0.0	+2.4	-32.1	+33.3			Mid Z-Axis		119
			+0.4	+2.9	+0.0						
64	6318.890M	27.5	+0.0	+0.0	+0.0	+0.0	+0.0	36.4	54.0	-17.6	Vert
			+0.0	+2.4	-31.8	+34.5			Low Y-Axis		119
			+0.5	+3.3	+0.0						
65	4515.205M	32.9	+0.0	+0.0	+0.0	+0.0	+0.0	36.1	54.0	-17.9	Horiz
			+0.0	+1.9	-32.8	+31.2			Low X-Axis		119
			+0.3	+2.6	+0.0						
66	4637.335M	32.5	+0.0	+0.0	+0.0	+0.0	+0.0	36.1	54.0	-17.9	Horiz
			+0.0	+2.0	-32.6	+31.5			High Z-Axis		118
			+0.1	+2.6	+0.0						
67	4637.435M	32.4	+0.0	+0.0	+0.0	+0.0	+0.0	36.0	54.0	-18.0	Vert
			+0.0	+2.0	-32.6	+31.5	219		High Z-Axis		120
			+0.1	+2.6	+0.0						
68	6406.405M	27.0	+0.0	+0.0	+0.0	+0.0	+0.0	35.9	54.0	-18.1	Horiz
			+0.0	+2.4	-31.7	+34.4			Mid Z-Axis		119
			+0.5	+3.3	+0.0						
69	3612.445M	35.4	+0.0	+0.0	+0.0	+0.0	+0.0	35.7	54.0	-18.3	Vert
			+0.0	+1.7	-33.3	+29.3	297		Low Z-axis		119
			+0.4	+2.2	+0.0						
70	4512.995M	32.5	+0.0	+0.0	+0.0	+0.0	+0.0	35.7	54.0	-18.3	Horiz
			+0.0	+1.9	-32.8	+31.2			Low Y-Axis		119
			+0.3	+2.6	+0.0						
71	855.400M	28.1	-27.6	+22.2	+2.0	+2.2	+0.0	27.6	46.0	-18.4	Horiz
			+0.0	+0.7	+0.0	+0.0	323		X-Axis		101
			+0.0	+0.0	+0.0						
72	4577.055M	32.1	+0.0	+0.0	+0.0	+0.0	+0.0	35.5	54.0	-18.5	Vert
			+0.0	+2.0	-32.7	+31.4			Mid X-Axis		114
			+0.1	+2.6	+0.0						
73	4577.250M	32.0	+0.0	+0.0	+0.0	+0.0	+0.0	35.4	54.0	-18.6	Vert
			+0.0	+2.0	-32.7	+31.4	2		Mid Z-Axis		119
			+0.1	+2.6	+0.0						
74	872.700M	27.6	-27.5	+22.3	+2.0	+2.2	+0.0	27.3	46.0	-18.7	Vert
			+0.0	+0.7	+0.0	+0.0	79		X-Axis		101
			+0.0	+0.0	+0.0						
75	3610.400M	35.0	+0.0	+0.0	+0.0	+0.0	+0.0	35.3	54.0	-18.7	Horiz
			+0.0	+1.7	-33.3	+29.3	360		Low X-Axis		119
			+0.4	+2.2	+0.0						

76	6490.730M	26.3	+0.0 +0.0 +0.5	+0.0 +2.4 +3.4	+0.0 -31.7 +0.0	+0.0 +34.4	+0.0 342	35.3	54.0 High Y-Axis	-18.7	Vert 115
77	4576.215M	31.8	+0.0 +0.0 +0.1	+0.0 +2.0 +2.6	+0.0 -32.7 +0.0	+0.0 +31.4	+0.0 32	35.2	54.0 Mid Y-Axis	-18.8	Horiz 117
78	4575.320M	31.8	+0.0 +0.0 +0.1	+0.0 +2.0 +2.6	+0.0 -32.7 +0.0	+0.0 +31.4	+0.0 227	35.2	54.0 Mid Z-Axis	-18.8	Horiz 124
79	4637.325M	31.6	+0.0 +0.0 +0.1	+0.0 +2.0 +2.6	+0.0 -32.6 +0.0	+0.0 +31.5	+0.0 99	35.2	54.0 High Y-Axis	-18.8	Vert 115
80	4514.190M	31.9	+0.0 +0.0 +0.3	+0.0 +1.9 +2.6	+0.0 -32.8 +0.0	+0.0 +31.2	+0.0	35.1	54.0 Low Z-axis	-18.9	Vert 119
81	3610.745M	34.8	+0.0 +0.0 +0.4	+0.0 +1.7 +2.2	+0.0 -33.3 +0.0	+0.0 +29.3	+0.0	35.1	54.0 Low Y-Axis	-18.9	Vert 119
82	4637.100M	31.4	+0.0 +0.0 +0.1	+0.0 +2.0 +2.6	+0.0 -32.6 +0.0	+0.0 +31.5	+0.0	35.0	54.0 High X-Axis	-19.0	Vert 120
83	3609.775M	34.6	+0.0 +0.0 +0.4	+0.0 +1.7 +2.2	+0.0 -33.3 +0.0	+0.0 +29.3	+0.0 360	34.9	54.0 Low Z-axis	-19.1	Horiz 119
84	3661.545M	34.4	+0.0 +0.0 +0.4	+0.0 +1.7 +2.1	+0.0 -33.3 +0.0	+0.0 +29.4	+0.0 297	34.7	54.0 Mid Z-Axis	-19.3	Horiz 124
85	3660.360M	34.4	+0.0 +0.0 +0.4	+0.0 +1.7 +2.1	+0.0 -33.3 +0.0	+0.0 +29.4	+0.0 220	34.7	54.0 Mid Y-Axis	-19.3	Vert 117
86	3707.885M	34.0	+0.0 +0.0 +0.4	+0.0 +1.7 +2.1	+0.0 -33.2 +0.0	+0.0 +29.6	+0.0 353	34.6	54.0 High Y-Axis	-19.4	Vert 112
87	221.300M	41.0	-27.2 +0.0 +0.0	+10.6 +0.3 +0.0	+0.9 +0.0 +0.0	+0.9 +0.0	+0.0 360	26.5	46.0 Y-Axis	-19.5	Horiz 99
88	3708.525M	33.7	+0.0 +0.0 +0.4	+0.0 +1.7 +2.1	+0.0 -33.2 +0.0	+0.0 +29.6	+0.0	34.3	54.0 High Z-Axis	-19.7	Horiz 118
89	3709.200M	33.6	+0.0 +0.0 +0.4	+0.0 +1.7 +2.1	+0.0 -33.2 +0.0	+0.0 +29.6	+0.0 9	34.2	54.0 High X-Axis	-19.8	Vert 120
90	218.000M	40.7	-27.2 +0.0 +0.0	+10.4 +0.3 +0.0	+0.9 +0.0 +0.0	+0.9 +0.0	+0.0 360	26.0	46.0 Z-Axis	-20.0	Horiz 99
91	3709.570M	33.4	+0.0 +0.0 +0.4	+0.0 +1.7 +2.1	+0.0 -33.2 +0.0	+0.0 +29.6	+0.0 324	34.0	54.0 High Z-Axis	-20.0	Vert 120
92	2745.830M	35.2	+0.0 +0.0 +0.5	+0.0 +1.4 +2.1	+0.0 -32.7 +0.0	+0.0 +27.3	+0.0 360	33.8	54.0 Mid Y-Axis	-20.2	Horiz 121

93	2782.680M	35.0	+0.0	+0.0	+0.0	+0.0	+0.0	33.8	54.0	-20.2	Horiz
			+0.0	+1.5	-32.7	+27.4	64		High Y-Axis		112
			+0.5	+2.1	+0.0						
94	2706.920M	35.3	+0.0	+0.0	+0.0	+0.0	+0.0	33.7	54.0	-20.3	Vert
			+0.0	+1.4	-32.7	+27.1	360		Low X-Axis		119
			+0.5	+2.1	+0.0						
95	122.610M	37.5	-27.8	+11.7	+0.7	+0.6	+0.0	22.9	43.5	-20.6	Vert
			+0.0	+0.2	+0.0	+0.0	125		X-Axis		99
			+0.0	+0.0	+0.0						
96	2781.670M	34.6	+0.0	+0.0	+0.0	+0.0	+0.0	33.4	54.0	-20.6	Horiz
			+0.0	+1.5	-32.7	+27.4	360		High Z-Axis		120
			+0.5	+2.1	+0.0						
97	2708.150M	34.7	+0.0	+0.0	+0.0	+0.0	+0.0	33.1	54.0	-20.9	Vert
			+0.0	+1.4	-32.7	+27.1	65		Low Y-Axis		119
			+0.5	+2.1	+0.0						
98	2745.725M	34.5	+0.0	+0.0	+0.0	+0.0	+0.0	33.1	54.0	-20.9	Horiz
			+0.0	+1.4	-32.7	+27.3	360		Mid X-Axis		114
			+0.5	+2.1	+0.0						
99	3660.975M	32.3	+0.0	+0.0	+0.0	+0.0	+0.0	32.6	54.0	-21.4	Vert
			+0.0	+1.7	-33.3	+29.4	360		Mid X-Axis		114
			+0.4	+2.1	+0.0						
100	2744.855M	33.9	+0.0	+0.0	+0.0	+0.0	+0.0	32.5	54.0	-21.5	Horiz
			+0.0	+1.4	-32.7	+27.3	360		Mid Z-Axis		119
			+0.5	+2.1	+0.0						
101	479.400M	31.0	-28.2	+17.7	+1.4	+1.5	+0.0	23.9	46.0	-22.1	Vert
			+0.0	+0.5	+0.0	+0.0			Y-Axis		100
			+0.0	+0.0	+0.0						
102	2708.035M	33.2	+0.0	+0.0	+0.0	+0.0	+0.0	31.6	54.0	-22.4	Vert
			+0.0	+1.4	-32.7	+27.1	360		Low Z-axis		119
			+0.5	+2.1	+0.0						
103	2781.730M	32.8	+0.0	+0.0	+0.0	+0.0	+0.0	31.6	54.0	-22.4	Vert
			+0.0	+1.5	-32.7	+27.4	266		High X-Axis		120
			+0.5	+2.1	+0.0						
104	1806.275M	37.8	+0.0	+0.0	+0.0	+0.0	+0.0	31.3	54.0	-22.7	Horiz
			+0.0	+1.2	-34.3	+24.7	360		Low Y-Axis		119
			+0.3	+1.6	+0.0						
105	1854.480M	36.8	+0.0	+0.0	+0.0	+0.0	+0.0	31.2	54.0	-22.8	Horiz
			+0.0	+1.2	-33.9	+25.2	360		High X-Axis		120
			+0.3	+1.6	+0.0						
106	1829.975M	37.3	+0.0	+0.0	+0.0	+0.0	+0.0	31.2	54.0	-22.8	Vert
			+0.0	+1.2	-34.1	+24.9	360		Mid Y-Axis		121
			+0.3	+1.6	+0.0						
107	1853.620M	36.7	+0.0	+0.0	+0.0	+0.0	+0.0	31.1	54.0	-22.9	Vert
			+0.0	+1.2	-33.9	+25.2	323		High Y-Axis		112
			+0.3	+1.6	+0.0						
108	1829.995M	36.7	+0.0	+0.0	+0.0	+0.0	+0.0	30.6	54.0	-23.4	Horiz
			+0.0	+1.2	-34.1	+24.9	360		Mid X-Axis		114
			+0.3	+1.6	+0.0						
109	124.600M	34.7	-27.8	+11.7	+0.7	+0.6	+0.0	20.1	43.5	-23.4	Vert
			+0.0	+0.2	+0.0	+0.0	360		Z-Axis		102
			+0.0	+0.0	+0.0						

110	162.500M	35.1	-27.5 +0.0 +0.0	+10.3 +0.3 +0.0	+0.8 +0.0 +0.0	+0.8 +0.0	+0.0 322	19.8	43.5 Y-Axis	-23.7	Vert 100
111	1831.330M	36.0	+0.0 +0.0 +0.3	+0.0 +1.2 +1.6	+0.0 -34.1 +0.0	+0.0 +24.9	+0.0 360	29.9	54.0 Mid Z-Axis	-24.1	Vert 119
112	1806.100M	36.1	+0.0 +0.0 +0.3	+0.0 +1.2 +1.6	+0.0 -34.3 +0.0	+0.0 +24.7	+0.0 360	29.6	54.0 Low X-Axis	-24.4	Horiz 119
113	973.700M	27.7	-27.2 +0.0 +0.0	+23.8 +0.8 +0.0	+2.1 +0.0 +0.0	+2.4 +0.0	+0.0 168	29.6	54.0 X-Axis	-24.4	Vert 101
114	127.900M	33.5	-27.8 +0.0 +0.0	+11.7 +0.3 +0.0	+0.7 +0.0 +0.0	+0.6 +0.0	+0.0 42	19.0	43.5 X-Axis	-24.5	Vert 100
115	1854.420M	33.5	+0.0 +0.0 +0.3	+0.0 +1.2 +1.6	+0.0 -33.9 +0.0	+0.0 +25.2	+0.0 360	27.9	54.0 High Z-Axis	-26.1	Horiz 120
116	1805.285M	33.1	+0.0 +0.0 +0.3	+0.0 +1.2 +1.6	+0.0 -34.3 +0.0	+0.0 +24.7	+0.0 360	26.6	54.0 Low Z-axis	-27.4	Horiz 119
117	71.720M	31.8	-28.0 +0.0 +0.0	+6.1 +0.2 +0.0	+0.5 +0.0 +0.0	+0.4 +0.0	+0.0 360	11.0	40.0 X-Axis	-29.0	Vert 99
118	200.000k	40.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +9.5	+0.0 +0.0	-80.0 360	-30.5	21.6	-52.1	Paral 123
119	23.280M	8.2	+0.0 +0.0 +0.0	+0.0 +0.0 +0.2	+0.0 +0.0 +6.4	+0.0 +0.0	-40.0 360	-25.2	29.5	-54.7	Paral 123
120	24.030M	8.4	+0.0 +0.0 +0.0	+0.0 +0.0 +0.2	+0.0 +0.0 +6.2	+0.0 +0.0	-40.0 360	-25.2	29.5	-54.7	Perpe 123
121	150.000k	39.9	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +9.5	+0.0 +0.0	-80.0 360	-30.6	24.1	-54.7	Perpe 123
122	20.985k	44.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +12.1	+0.0 +0.0	-80.0 360	-23.9	41.2	-65.1	Paral 123
123	17.695k	44.3	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +13.1	+0.0 +0.0	-80.0 230	-22.6	42.6	-65.2	Perpe 123

CKC Laboratories, Inc. Date: 7/17/2013 Time: 10:56:25 Impinj Inc. WO#: 93909
Test Distance: 3 Meters Sequence#: 10 Perpendicular
Impinj Inc. Impinj IPJ-RS500 23dBm Reader SIP P/N: IPJ-RS500GX



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **Impinj Inc.**
Specification: **RSS-210 Radiated Spurious Emissions**
Work Order #: **93909** Date: 7/17/2013
Test Type: **Maximized Emissions** Time: 10:57:55
Equipment: **Impinj IPJ-RS500 23dBm Reader SIP** Sequence#: 11
Manufacturer: Impinj Inc. Tested By: Steven Pittsford
Model: IPJ-RS500GX
S/N:

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02308	Preamp	8447D	4/3/2012	4/3/2014
T2	AN01996	Biconilog Antenna	CBL6111C	3/2/2012	3/2/2014
T3	ANP05360	Cable	RG214	12/3/2012	12/3/2014
T4	ANP05366	Cable	RG-214	10/14/2011	10/14/2013
T5	AN02673	Spectrum Analyzer	E4446A	5/11/2012	5/11/2014
T6	ANP05435	Attenuator	PE7015-10	10/5/2012	10/5/2014
T7	ANP05546	Cable	Heliax	3/27/2013	3/27/2015
T8	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	10/19/2011	10/19/2013
T9	AN03123	Cable	32026-2-29801-12	10/14/2011	10/14/2013
T10	ANP05965	Cable	Various	8/26/2011	8/26/2013
T11	AN03170	High Pass Filter	HM1155-11SS	9/6/2011	9/6/2013
T12	AN02115	Preamp	83051A	11/12/2012	11/12/2014
T13	AN00052	Loop Antenna	6502	5/16/2012	5/16/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Impinj IPJ-RS500 23dBm Reader SIP*	Impinj Inc.	IPJ-RS500GX	
Antenna	Laird Technologies	S9025PR	

Support Devices:

Function	Manufacturer	Model #	S/N
Development platform	Impinj, Inc.	IPJ-E4000 Rev 2.01	
Battery	Tenergy	18650	
Battery Pack	Tenergy	TN270	
Battery	Tenergy	18650	

Test Conditions / Notes:

The EUT is seeking modular approval is placed in the center of the turntable on a Styrofoam table 80cm above the ground plane , installed on a support host PCB as intended for final installation. The laptop located outside the chamber sends test command to the EUT via the support host PCB. The EUT is set in constant transmit mode.

Freq: 902.75MHz, 915.25MHz, 927.25MHz
Measured Power= 23.0dBm, 23.0dBm, 22.6dBm
Firmware setting = 23dBm, 23dBm, 23dBm

Emission profile evaluated with Laird Antenna 5.5dBi with a 30cm cable between EUT and the antenna

Frequency range of measurement = 9 kHz- 10GHz.
9 kHz -150 kHz;RBW=200 Hz=VBW
150 kHz-30 MHz;RBW=9 kHz=VBW
30 MHz-1000 MHz;RBW=120 kHz=VBWz,
1000 MHz-10,000 MHz;RBW=1 MHz=VBW

15.31(e) compliance: a freshly charged battery is installed
Emission profile of the EUT rotated along three orthogonal axes was investigated. Recorded data represent worse case emission.
Test method in accordance with FCC document: DA 00-705

Temperature: 24°C
Pressure: 101.5kPa
Humidity: 37%

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9 T13	T2 T6 T10	T3 T7 T11	T4 T8 T12	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	928.000M	34.2	-27.3	+23.0	+2.1	+2.3	+0.0	44.7	46.0	-1.3	Vert
	QP		+0.0	+9.6	+0.8	+0.0	360		X-Axis		150
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	928.000M	38.5	+0.0	+0.0	+0.0	+0.0	+0.0	40.4	46.0	-5.6	Vert
			+0.0	+0.0	+0.8	+0.0			X-Axis		131
			+0.0	+1.1	+0.0	+0.0					
			+0.0								
3	336.420M	42.1	-27.3	+14.3	+1.1	+1.2	+0.0	41.5	46.0	-4.5	Horiz
	QP		+0.0	+9.7	+0.4	+0.0	360		Z-Axis		150
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	336.420M	48.8	-27.3	+14.3	+1.1	+1.2	+0.0	48.2	46.0	+2.2	Horiz
			+0.0	+9.7	+0.4	+0.0	360		Z-Axis		100
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
5	642.800M	35.2	-28.3	+20.3	+1.7	+1.8	+0.0	41.0	46.0	-5.0	Vert
			+0.0	+9.7	+0.6	+0.0	255		X-Axis		101
			+0.0	+0.0	+0.0	+0.0					
			+0.0								

6	3614.650M	47.6	+0.0	+0.0	+0.0	+0.0	+0.0	48.2	54.0	-5.8	Vert
			+0.0	+0.0	+1.7	+29.3	360		Low X-Axis		118
			+0.4	+2.2	+0.3	-33.3					
			+0.0								
7	8344.840M	35.0	+0.0	+0.0	+0.0	+0.0	+0.0	48.0	54.0	-6.0	Vert
			+0.0	+0.0	+3.0	+36.4	376		High X-Axis		124
			+0.9	+3.8	+0.2	-31.3					
			+0.0								
8	341.700M	40.3	-27.3	+14.5	+1.1	+1.2	+0.0	39.9	46.0	-6.1	Horiz
	QP		+0.0	+9.7	+0.4	+0.0	360		Z-Axis		150
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	341.700M	45.3	-27.3	+14.5	+1.1	+1.2	+0.0	44.9	46.0	-1.1	Horiz
			+0.0	+9.7	+0.4	+0.0	41		Z-Axis		100
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
10	8128.895M	35.4	+0.0	+0.0	+0.0	+0.0	+0.0	47.9	54.0	-6.1	Vert
			+0.0	+0.0	+3.2	+36.0			Low X-Axis		114
			+0.7	+3.7	+0.2	-31.3					
			+0.0								
11	3610.660M	47.2	+0.0	+0.0	+0.0	+0.0	+0.0	47.8	54.0	-6.2	Horiz
			+0.0	+0.0	+1.7	+29.3			Low X-Axis		118
			+0.4	+2.2	+0.3	-33.3					
			+0.0								
12	7417.290M	35.6	+0.0	+0.0	+0.0	+0.0	+0.0	47.8	54.0	-6.2	Vert
			+0.0	+0.0	+3.2	+36.0	264		High Z-Axis		124
			+0.6	+3.6	+0.2	-31.4					
			+0.0								
13	9273.030M	35.0	+0.0	+0.0	+0.0	+0.0	+0.0	47.6	54.0	-6.4	Horiz
			+0.0	+0.0	+3.3	+35.8	376		High X-Axis		124
			+0.8	+4.0	+0.2	-31.5					
			+0.0								
14	336.200M	40.2	-27.3	+14.3	+1.1	+1.2	+0.0	39.6	46.0	-6.4	Horiz
	QP		+0.0	+9.7	+0.4	+0.0	44		X-Axis		105
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	336.200M	46.5	-27.3	+14.3	+1.1	+1.2	+0.0	45.9	46.0	-0.1	Horiz
			+0.0	+9.7	+0.4	+0.0	43		X-Axis		99
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
16	8345.045M	34.3	+0.0	+0.0	+0.0	+0.0	+0.0	47.3	54.0	-6.7	Horiz
			+0.0	+0.0	+3.0	+36.4	370		High Z-Axis		124
			+0.9	+3.8	+0.2	-31.3					
			+0.0								
17	991.800M	35.0	-27.1	+24.2	+2.2	+2.5	+0.0	47.3	54.0	-6.7	Vert
			+0.0	+9.6	+0.9	+0.0	375		Z-Axis		99
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
18	678.400M	32.9	-28.2	+20.6	+1.7	+1.9	+0.0	39.2	46.0	-6.8	Vert
	QP		+0.0	+9.7	+0.6	+0.0	360		Z-Axis		150
			+0.0	+0.0	+0.0	+0.0					
			+0.0								

^	678.400M	35.7	-28.2 +0.0 +0.0 +0.0	+20.6 +9.7 +0.0	+1.7 +0.6 +0.0	+1.9 +0.0 +0.0	+0.0 375	42.0	46.0 Z-Axis	-4.0	Vert 99
20	9273.140M	34.6	+0.0 +0.0 +0.8 +0.0	+0.0 +0.0 +4.0	+0.0 +3.3 +0.2	+0.0 +35.8 -31.5	+0.0 376	47.2	54.0 High Z-Axis	-6.8	Horiz 124
21	7418.310M	34.6	+0.0 +0.0 +0.6 +0.0	+0.0 +0.0 +3.6	+0.0 +3.2 +0.2	+0.0 +36.0 -31.4	+0.0 376	46.8	54.0 High X-Axis	-7.2	Vert 124
22	517.500M	34.9	-28.2 +0.0 +0.0 +0.0	+18.4 +9.7 +0.0	+1.5 +0.5 +0.0	+1.6 +0.0 +0.0	+0.0	38.4	46.0 Y-Axis	-7.6	Vert 126
23	334.765M QP	38.9	-27.3 +0.0 +0.0 +0.0	+14.3 +9.7 +0.0	+1.1 +0.4 +0.0	+1.2 +0.0 +0.0	+0.0 360	38.3	46.0 Z-Axis	-7.7	Horiz 100
^	334.820M	46.4	-27.3 +0.0 +0.0 +0.0	+14.3 +9.7 +0.0	+1.1 +0.4 +0.0	+1.2 +0.0 +0.0	+0.0 360	45.8	46.0 Z-Axis	-0.2	Horiz 100
^	334.700M	43.5	-27.3 +0.0 +0.0 +0.0	+14.3 +9.7 +0.0	+1.1 +0.4 +0.0	+1.2 +0.0 +0.0	+0.0 23	42.9	46.0 Y-Axis	-3.1	Horiz 99
26	381.500M QP	37.6	-27.7 +0.0 +0.0 +0.0	+15.7 +9.7 +0.0	+1.2 +0.4 +0.0	+1.3 +0.0 +0.0	+0.0 360	38.2	46.0 Z-Axis	-7.8	Horiz 150
^	381.500M	43.1	-27.7 +0.0 +0.0 +0.0	+15.7 +9.7 +0.0	+1.2 +0.4 +0.0	+1.3 +0.0 +0.0	+0.0 41	43.7	46.0 Z-Axis	-2.3	Horiz 100
28	343.200M QP	37.6	-27.3 +0.0 +0.0 +0.0	+14.5 +9.7 +0.0	+1.1 +0.4 +0.0	+1.2 +0.0 +0.0	+0.0 360	37.2	46.0 Y-Axis	-8.8	Horiz 150
^	343.200M	42.8	-27.3 +0.0 +0.0 +0.0	+14.5 +9.7 +0.0	+1.1 +0.4 +0.0	+1.2 +0.0 +0.0	+0.0 23	42.4	46.0 Y-Axis	-3.6	Horiz 99
30	8128.895M	32.6	+0.0 +0.0 +0.7 +0.0	+0.0 +0.0 +3.7	+0.0 +3.2 +0.2	+0.0 +36.0 -31.3	+0.0	45.1	54.0 Low X-Axis	-8.9	Horiz 114
31	9025.380M	31.3	+0.0 +0.0 +0.8 +0.0	+0.0 +0.0 +3.9	+0.0 +3.0 +0.2	+0.0 +37.0 -31.4	+0.0 360	44.8	54.0 Low Z-Axis	-9.2	Horiz 112

32	411.200M	35.4	-27.9	+16.4	+1.3	+1.4	+0.0	36.8	46.0	-9.2	Horiz
			+0.0	+9.7	+0.5	+0.0	28		Y-Axis		99
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
33	335.399M	37.3	-27.3	+14.3	+1.1	+1.2	+0.0	36.7	46.0	-9.3	Horiz
	QP		+0.0	+9.7	+0.4	+0.0	44		X-Axis		99
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	335.396M	42.4	-27.3	+14.3	+1.1	+1.2	+0.0	41.8	46.0	-4.2	Horiz
			+0.0	+9.7	+0.4	+0.0	44		X-Axis		99
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
35	334.819M	36.9	-27.3	+14.3	+1.1	+1.2	+0.0	36.3	46.0	-9.7	Vert
	QP		+0.0	+9.7	+0.4	+0.0			Z-Axis		145
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
^	334.800M	41.1	-27.3	+14.3	+1.1	+1.2	+0.0	40.5	46.0	-5.5	Vert
			+0.0	+9.7	+0.4	+0.0	285		Z-Axis		160
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
37	9031.645M	30.8	+0.0	+0.0	+0.0	+0.0	+0.0	44.2	54.0	-9.8	Vert
			+0.0	+0.0	+3.0	+36.9	324		Low X-Axis		103
			+0.8	+3.9	+0.2	-31.4					
			+0.0								
38	9027.870M	30.7	+0.0	+0.0	+0.0	+0.0	+0.0	44.2	54.0	-9.8	Horiz
			+0.0	+0.0	+3.0	+37.0	360		Low Y-Axis		116
			+0.8	+3.9	+0.2	-31.4					
			+0.0								
39	6490.495M	34.7	+0.0	+0.0	+0.0	+0.0	+0.0	44.0	54.0	-10.0	Horiz
			+0.0	+0.0	+2.4	+34.4	376		High X-Axis		119
			+0.5	+3.4	+0.3	-31.7					
			+0.0								
40	335.276M	36.6	-27.3	+14.3	+1.1	+1.2	+0.0	36.0	46.0	-10.0	Horiz
	QP		+0.0	+9.7	+0.4	+0.0	69		Y-Axis		99
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
41	119.600M	38.5	-27.8	+11.6	+0.7	+0.6	+0.0	33.1	43.5	-10.4	Horiz
			+0.0	+9.3	+0.2	+0.0	360		Z-Axis		100
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
42	123.000M	38.2	-27.8	+11.7	+0.7	+0.6	+0.0	32.9	43.5	-10.6	Horiz
			+0.0	+9.3	+0.2	+0.0	43		X-Axis		118
			+0.0	+0.0	+0.0	+0.0					
			+0.0								
43	7322.540M	31.0	+0.0	+0.0	+0.0	+0.0	+0.0	42.9	54.0	-11.1	Vert
			+0.0	+0.0	+3.1	+35.9			Mid Y-Axis		116
			+0.5	+3.6	+0.2	-31.4					
			+0.0								
44	6491.185M	33.6	+0.0	+0.0	+0.0	+0.0	+0.0	42.9	54.0	-11.1	Vert
			+0.0	+0.0	+2.4	+34.4	129		High Z-Axis		115
			+0.5	+3.4	+0.3	-31.7					
			+0.0								

45	5416.500M Ave	35.6	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.9	+0.0 +2.4 +0.3	+0.0 +33.2 -32.2	+0.0 237	42.7	54.0 Low X-Axis	-11.3	Vert 118
^	5416.500M	45.7	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.9	+0.0 +2.4 +0.3	+0.0 +33.2 -32.2	+0.0	52.8	54.0 Low X-Axis	-1.2	Vert 118
47	123.000M	37.4	-27.8 +0.0 +0.0 +0.0	+11.7 +9.3 +0.0	+0.7 +0.2 +0.0	+0.6 +0.0 +0.0	+0.0 23	32.1	43.5 Y-Axis	-11.4	Horiz 99
48	9151.099M	29.4	+0.0 +0.0 +0.8 +0.0	+0.0 +0.0 +3.9	+0.0 +3.1 +0.2	+0.0 +36.4 -31.4	+0.0	42.4	54.0 Mid Z-Axis	-11.6	Horiz 116
49	9031.645M	28.8	+0.0 +0.0 +0.8 +0.0	+0.0 +0.0 +3.9	+0.0 +3.0 +0.2	+0.0 +36.9 -31.4	+0.0 85	42.2	54.0 Low X-Axis	-11.8	Horiz 111
50	964.600M QP	30.5	-27.2 +0.0 +0.0 +0.0	+23.7 +9.6 +0.0	+2.1 +0.8 +0.0	+2.4 +0.0 +0.0	+0.0 360	41.9	54.0 X-Axis	-12.1	Vert 150
^	964.600M	35.3	-27.2 +0.0 +0.0 +0.0	+23.7 +9.6 +0.0	+2.1 +0.8 +0.0	+2.4 +0.0 +0.0	+0.0 360	46.7	54.0 X-Axis	-7.3	Vert 101
52	7419.180M	29.7	+0.0 +0.0 +0.6 +0.0	+0.0 +0.0 +3.6	+0.0 +3.2 +0.2	+0.0 +36.0 -31.4	+0.0 239	41.9	54.0 High Y-Axis	-12.1	Horiz 119
53	5563.960M	34.2	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.9	+0.0 +2.4 +0.3	+0.0 +33.5 -32.1	+0.0	41.6	54.0 High Y-Axis	-12.4	Vert 119
54	7321.763M	29.4	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +3.6	+0.0 +3.1 +0.2	+0.0 +35.9 -31.4	+0.0 239	41.3	54.0 Mid Z-Axis	-12.7	Vert 116
55	7321.170M	29.2	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +3.6	+0.0 +3.1 +0.2	+0.0 +35.9 -31.4	+0.0 8	41.1	54.0 Mid X-Axis	-12.9	Horiz 120
56	8344.560M	28.1	+0.0 +0.0 +0.9 +0.0	+0.0 +0.0 +3.8	+0.0 +3.0 +0.2	+0.0 +36.4 -31.3	+0.0 341	41.1	54.0 High Y-Axis	-12.9	Horiz 119
57	7221.920M	29.3	+0.0 +0.0 +0.6 +0.0	+0.0 +0.0 +3.6	+0.0 +3.0 +0.3	+0.0 +35.7 -31.5	+0.0 214	41.0	54.0 Low Z-Axis	-13.0	Horiz 116

58	5562.635M	33.6	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.9	+0.0 +2.4 +0.3	+0.0 +33.5 -32.1	+0.0 -16	41.0	54.0 High Z-Axis	-13.0	Vert 116
59	7220.140M	29.4	+0.0 +0.0 +0.6 +0.0	+0.0 +0.0 +3.6	+0.0 +3.0 +0.3	+0.0 +35.6 -31.5	+0.0 190	41.0	54.0 Low Y-Axis	-13.0	Horiz 116
60	7226.145M	29.2	+0.0 +0.0 +0.6 +0.0	+0.0 +0.0 +3.6	+0.0 +3.0 +0.3	+0.0 +35.7 -31.5	+0.0 267	40.9	54.0 Low X-Axis	-13.1	Horiz 111
61	9151.549M	27.7	+0.0 +0.0 +0.8 +0.0	+0.0 +0.0 +3.9	+0.0 +3.1 +0.2	+0.0 +36.4 -31.4	+0.0	40.7	54.0 Mid Y-Axis	-13.3	Horiz 116
62	6491.210M	31.3	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +3.4	+0.0 +2.4 +0.3	+0.0 +34.4 -31.7	+0.0 52	40.6	54.0 High Y-Axis	-13.4	Horiz 119
63	6405.868M	31.3	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +3.3	+0.0 +2.4 +0.4	+0.0 +34.4 -31.7	+0.0 129	40.6	54.0 Mid X-Axis	-13.4	Horiz 120
64	8125.030M	27.9	+0.0 +0.0 +0.7 +0.0	+0.0 +0.0 +3.7	+0.0 +3.2 +0.2	+0.0 +36.0 -31.3	+0.0 360	40.4	54.0 Low Y-Axis	-13.6	Vert 116
65	7226.145M	28.7	+0.0 +0.0 +0.6 +0.0	+0.0 +0.0 +3.6	+0.0 +3.0 +0.3	+0.0 +35.7 -31.5	+0.0 349	40.4	54.0 Low X-Axis	-13.6	Vert 114
66	8122.810M	27.6	+0.0 +0.0 +0.7 +0.0	+0.0 +0.0 +3.7	+0.0 +3.2 +0.2	+0.0 +36.0 -31.3	+0.0 360	40.1	54.0 Low Z-Axis	-13.9	Vert 116
67	9151.690M	26.9	+0.0 +0.0 +0.8 +0.0	+0.0 +0.0 +3.9	+0.0 +3.1 +0.2	+0.0 +36.4 -31.4	+0.0 73	39.9	54.0 Mid X-Axis	-14.1	Horiz 116
68	4514.000M	36.4	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +2.6	+0.0 +1.9 +0.3	+0.0 +31.2 -32.8	+0.0	39.9	54.0 Low X-Axis	-14.1	Horiz 118
69	9272.440M	27.2	+0.0 +0.0 +0.8 +0.0	+0.0 +0.0 +4.0	+0.0 +3.3 +0.2	+0.0 +35.8 -31.5	+0.0 360	39.8	54.0 High Y-Axis	-14.2	Vert 119
70	8235.813M	27.1	+0.0 +0.0 +0.8 +0.0	+0.0 +0.0 +3.7	+0.0 +3.1 +0.2	+0.0 +36.2 -31.3	+0.0 120	39.8	54.0 Mid Z-Axis	-14.2	Vert 116

71	8236.440M	27.0	+0.0 +0.0 +0.8 +0.0	+0.0 +0.0 +3.7	+0.0 +3.1 +0.2	+0.0 +36.2 -31.3	+0.0	39.7	54.0 Mid X-Axis	-14.3	Vert 116
72	6406.807M	30.4	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +3.3	+0.0 +2.4 +0.4	+0.0 +34.4 -31.7	+0.0 360	39.7	54.0 Mid Z-Axis	-14.3	Horiz 116
73	5563.245M	32.2	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.9	+0.0 +2.4 +0.3	+0.0 +33.5 -32.1	+0.0	39.6	54.0 High X-Axis	-14.4	Horiz 119
74	2723.400M	40.8	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.1	+0.0 +1.4 +0.3	+0.0 +27.2 -32.7	+0.0	39.6	54.0 Low X-Axis	-14.4	Horiz 113
75	4636.080M	35.6	+0.0 +0.0 +0.1 +0.0	+0.0 +0.0 +2.6	+0.0 +2.0 +0.3	+0.0 +31.5 -32.6	+0.0	39.5	54.0 High X-Axis	-14.5	Horiz 119
76	2708.650M	40.7	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.1	+0.0 +1.4 +0.3	+0.0 +27.1 -32.7	+0.0	39.4	54.0 Low X-Axis	-14.6	Vert 99
77	8237.340M	26.4	+0.0 +0.0 +0.8 +0.0	+0.0 +0.0 +3.7	+0.0 +3.1 +0.2	+0.0 +36.2 -31.3	+0.0	39.1	54.0 Mid Y-Axis	-14.9	Horiz 116
78	6323.395M	29.5	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +3.3	+0.0 +2.4 +0.4	+0.0 +34.5 -31.8	+0.0 70	38.8	54.0 Low X-Axis	-15.2	Horiz 111
79	6319.965M	29.5	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +3.3	+0.0 +2.4 +0.4	+0.0 +34.5 -31.8	+0.0 8	38.8	54.0 Low Z-Axis	-15.2	Vert 116
80	4637.705M	34.8	+0.0 +0.0 +0.1 +0.0	+0.0 +0.0 +2.6	+0.0 +2.0 +0.3	+0.0 +31.5 -32.6	+0.0 27	38.7	54.0 High Y-Axis	-15.3	Vert 119
81	6405.814M	29.4	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +3.3	+0.0 +2.4 +0.4	+0.0 +34.4 -31.7	+0.0 360	38.7	54.0 Mid Y-Axis	-15.3	Vert 120
82	5492.307M	31.4	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.9	+0.0 +2.4 +0.3	+0.0 +33.3 -32.1	+0.0 360	38.6	54.0 Mid Z-Axis	-15.4	Horiz 116
83	3708.720M	37.6	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.1	+0.0 +1.7 +0.4	+0.0 +29.6 -33.2	+0.0	38.6	54.0 High X-Axis	-15.4	Horiz 119

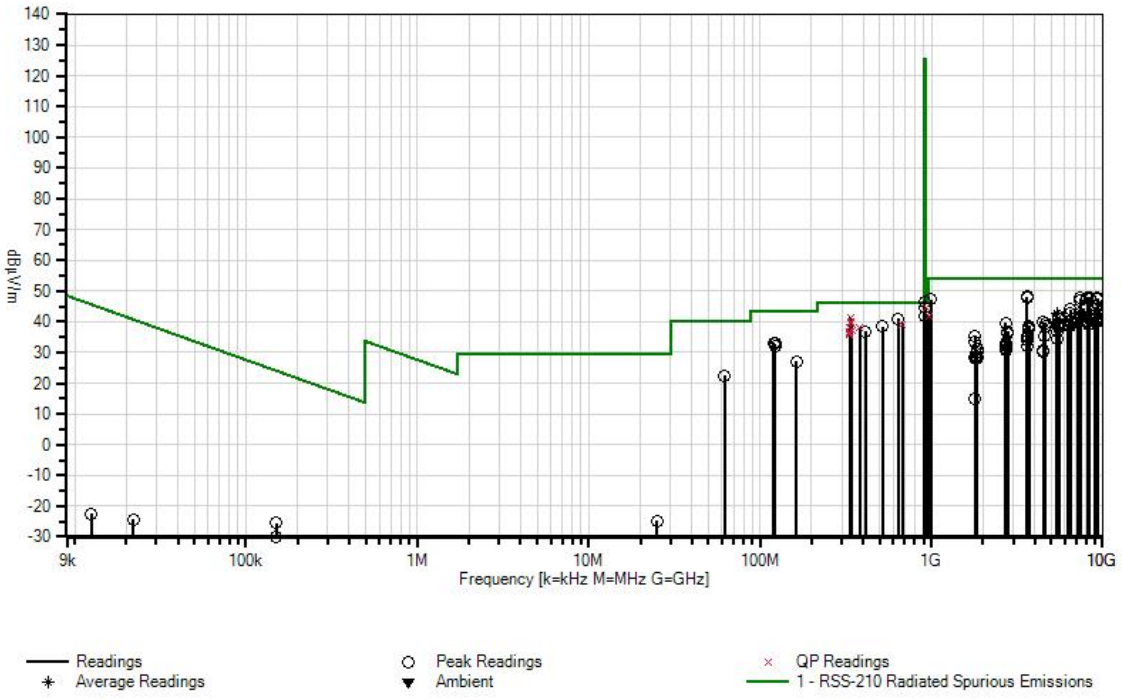
84	6319.410M	29.3	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +3.3	+0.0 +2.4 +0.3	+0.0 +34.5 -31.8	+0.0	38.5	54.0 Low Y-Axis	-15.5	Vert 104
85	4636.150M	34.5	+0.0 +0.0 +0.1 +0.0	+0.0 +0.0 +2.6	+0.0 +2.0 +0.3	+0.0 +31.5 -32.6	+0.0 -16	38.4	54.0 High Z-Axis	-15.6	Horiz 116
86	3707.935M	37.2	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.1	+0.0 +1.7 +0.4	+0.0 +29.6 -33.2	+0.0 -16	38.2	54.0 High Z-Axis	-15.8	Horiz 116
87	5491.288M	30.9	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.9	+0.0 +2.4 +0.3	+0.0 +33.3 -32.1	+0.0 360	38.1	54.0 Mid X-Axis	-15.9	Vert 120
88	5490.567M	30.9	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.9	+0.0 +2.4 +0.3	+0.0 +33.3 -32.1	+0.0 360	38.1	54.0 Mid Y-Axis	-15.9	Vert 120
89	3708.980M	36.8	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.1	+0.0 +1.7 +0.4	+0.0 +29.6 -33.2	+0.0 226	37.8	54.0 High Y-Axis	-16.2	Horiz 119
90	162.800M	33.0	-27.5 +0.0 +0.0 +0.0	+10.2 +9.4 +0.0	+0.8 +0.3 +0.0	+0.8 +0.0 +0.0	+0.0 23	27.0	43.5 Y-Axis	-16.5	Horiz 99
91	2781.155M	37.6	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.1	+0.0 +1.5 +0.3	+0.0 +27.4 -32.7	+0.0 360	36.7	54.0 High Y-Axis	-17.3	Horiz 115
92	2782.990M	37.6	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.1	+0.0 +1.5 +0.3	+0.0 +27.4 -32.7	+0.0	36.7	54.0 High X-Axis	-17.3	Vert 119
93	5416.180M	29.4	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.9	+0.0 +2.4 +0.3	+0.0 +33.2 -32.2	+0.0	36.5	54.0 Low Z-Axis	-17.5	Vert 116
94	61.800M	34.8	-28.0 +0.0 +0.0 +0.0	+5.4 +9.2 +0.0	+0.5 +0.2 +0.0	+0.4 +0.0 +0.0	+0.0 362	22.5	40.0 Y-Axis	-17.5	Vert 295
95	2782.005M	37.4	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.1	+0.0 +1.5 +0.3	+0.0 +27.4 -32.7	+0.0 -14	36.5	54.0 High Z-Axis	-17.5	Vert 116
96	1805.900M	41.5	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +1.6	+0.0 +1.2 +0.5	+0.0 +24.7 -34.3	+0.0 360	35.5	54.0 Low X-Axis	-18.5	Horiz 99

97	4575.308M	31.5	+0.0 +0.0 +0.1 +0.0	+0.0 +0.0 +2.6	+0.0 +2.0 +0.3	+0.0 +31.4 -32.7	+0.0 360	35.2	54.0 Mid X-Axis	-18.8	Vert 120
98	4575.512M	31.5	+0.0 +0.0 +0.1 +0.0	+0.0 +0.0 +2.6	+0.0 +2.0 +0.3	+0.0 +31.4 -32.7	+0.0 360	35.2	54.0 Mid Y-Axis	-18.8	Horiz 120
99	4575.188M	31.4	+0.0 +0.0 +0.1 +0.0	+0.0 +0.0 +2.6	+0.0 +2.0 +0.3	+0.0 +31.4 -32.7	+0.0 360	35.1	54.0 Mid Z-Axis	-18.9	Horiz 116
100	3660.588M	34.5	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.1	+0.0 +1.7 +0.3	+0.0 +29.4 -33.3	+0.0 360	35.1	54.0 Mid X-Axis	-18.9	Horiz 120
101	3659.620M	34.4	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.1	+0.0 +1.7 +0.3	+0.0 +29.4 -33.3	+0.0 360	35.0	54.0 Mid Y-Axis	-19.0	Horiz 120
102	5416.750M	27.3	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.9	+0.0 +2.4 +0.3	+0.0 +33.2 -32.2	+0.0	34.4	54.0 Low Y-Axis	-19.6	Horiz 104
103	3659.938M	33.4	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.1	+0.0 +1.7 +0.3	+0.0 +29.4 -33.3	+0.0 360	34.0	54.0 Mid Z-Axis	-20.0	Vert 116
104	1805.500M	39.4	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +1.6	+0.0 +1.2 +0.5	+0.0 +24.7 -34.3	+0.0 360	33.4	54.0 Low X-Axis	-20.6	Vert 120
105	2744.766M	34.1	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.1	+0.0 +1.4 +0.3	+0.0 +27.3 -32.7	+0.0 341	33.0	54.0 Mid X-Axis	-21.0	Vert 112
106	2744.691M	33.8	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.1	+0.0 +1.4 +0.3	+0.0 +27.3 -32.7	+0.0 360	32.7	54.0 Mid Z-Axis	-21.3	Vert 116
107	2745.453M	33.3	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.1	+0.0 +1.4 +0.3	+0.0 +27.3 -32.7	+0.0 360	32.2	54.0 Mid Y-Axis	-21.8	Vert 120
108	3612.560M	31.6	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.2	+0.0 +1.7 +0.3	+0.0 +29.3 -33.3	+0.0 360	32.2	54.0 Low Y-Axis	-21.8	Horiz 121
109	3612.730M	31.4	+0.0 +0.0 +0.4 +0.0	+0.0 +0.0 +2.2	+0.0 +1.7 +0.3	+0.0 +29.3 -33.3	+0.0 164	32.0	54.0 Low Z-Axis	-22.0	Vert 194

110	2705.900M	32.6	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.1	+0.0 +1.4 +0.3	+0.0 +27.1 -32.7	+0.0 92	31.3	54.0 Low Y-Axis	-22.7	Vert 110
111	1854.335M	36.3	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +1.6	+0.0 +1.2 +0.4	+0.0 +25.2 -33.9	+0.0 360	31.1	54.0 High Y-Axis	-22.9	Vert 119
112	2707.085M	31.8	+0.0 +0.0 +0.5 +0.0	+0.0 +0.0 +2.1	+0.0 +1.4 +0.3	+0.0 +27.1 -32.7	+0.0 295	30.5	54.0 Low Z-Axis	-23.5	Vert 283
113	4511.690M	27.0	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +2.6	+0.0 +1.9 +0.3	+0.0 +31.2 -32.8	+0.0	30.5	54.0 Low Z-Axis	-23.5	Horiz 112
114	1855.655M	35.5	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +1.6	+0.0 +1.2 +0.4	+0.0 +25.2 -33.9	+0.0 272	30.3	54.0 High X-Axis	-23.7	Vert 119
115	4514.000M	26.5	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +2.6	+0.0 +1.9 +0.3	+0.0 +31.2 -32.8	+0.0	30.0	54.0 Low Y-Axis	-24.0	Horiz 121
116	1828.815M	35.4	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +1.6	+0.0 +1.2 +0.4	+0.0 +24.9 -34.1	+0.0 360	29.7	54.0 Mid X-Axis	-24.3	Horiz 99
117	1829.966M	34.5	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +1.6	+0.0 +1.2 +0.4	+0.0 +24.9 -34.1	+0.0 218	28.8	54.0 Mid Z-Axis	-25.2	Horiz 116
118	1805.570M	34.2	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +1.6	+0.0 +1.2 +0.5	+0.0 +24.7 -34.3	+0.0	28.2	54.0 Low Y-Axis	-25.8	Vert 103
119	1854.675M	33.4	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +1.6	+0.0 +1.2 +0.4	+0.0 +25.2 -33.9	+0.0 360	28.2	54.0 High Z-Axis	-25.8	Horiz 116
120	1830.203M	33.6	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +1.6	+0.0 +1.2 +0.4	+0.0 +24.9 -34.1	+0.0 41	27.9	54.0 Mid Y-Axis	-26.1	Horiz 116
121	1803.950M	21.0	+0.0 +0.0 +0.3 +0.0	+0.0 +0.0 +1.6	+0.0 +1.2 +0.5	+0.0 +24.7 -34.3	+0.0 360	15.0	54.0 Low Z-Axis	-39.0	Horiz 400
122	150.000k	45.0	+0.0 +0.0 +0.0 +9.5	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	-80.0 360	-25.5	24.1	-49.6	Perpe 123

123	150.000k	40.5	+0.0 +0.0 +0.0 +9.5	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	-80.0 360	-30.0	24.1	-54.1	Paral 123
124	24.980M	9.3	+0.0 +0.0 +0.0 +5.8	+0.0 +0.0 +0.2	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	-40.0 360	-24.7	29.5	-54.2	Paral 123
125	21.925k	43.8	+0.0 +0.0 +0.0 +11.8	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	-80.0 360	-24.4	40.8	-65.2	Paral 123
126	12.525k	42.3	+0.0 +0.0 +0.0 +15.2	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	+0.0 +0.0 +0.0	-80.0 360	-22.5	45.6	-68.1	Perpe 123
127	912.000M	36.3	-27.4 +0.0 +0.0 +0.0	+22.6 +9.6 +0.0	+2.1 +0.7 +0.0	+2.3 +0.0 +0.0	+0.0 360	46.2	125.2 X-Axis	-79.0	Vert 101
128	911.900M	34.8	-27.4 +0.0 +0.0 +0.0	+22.6 +9.6 +0.0	+2.1 +0.7 +0.0	+2.3 +0.0 +0.0	+0.0	44.7	125.2 Y-Axis	-80.5	Vert 126
129	911.900M	32.1	-27.4 +0.0 +0.0 +0.0	+22.6 +9.6 +0.0	+2.1 +0.7 +0.0	+2.3 +0.0 +0.0	+0.0 28	42.0	125.2 Y-Axis	-83.2	Horiz 99

CKC Laboratories, Inc. Date: 7/17/2013 Time: 10:57:55 Impinj Inc. WO#: 93909
Test Distance: 3 Meters Sequence#: 11 Horiz
Impinj Inc. Impinj IPJ-RS500 23dBm Reader SIP P/N: IPJ-RS500GX



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **Impinj Inc.**
Specification: **RSS-210 Radiated Spurious Emissions**
Work Order #: **93909** Date: 7/17/2013
Test Type: **Maximized Emissions** Time: 10:56:25
Equipment: **Impinj IPJ-RS500 23dBm Reader SIP** Sequence#: 10
Manufacturer: Impinj Inc. Tested By: Steven Pittsford
Model: IPJ-RS500GX
S/N: IMPH12000100051210

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02308	Preamp	8447D	4/3/2012	4/3/2014
T2	AN01996	Biconilog Antenna	CBL6111C	3/2/2012	3/2/2014
T3	ANP05360	Cable	RG214	12/3/2012	12/3/2014
T4	ANP05366	Cable	RG-214	10/14/2011	10/14/2013
T5	AN02673	Spectrum Analyzer	E4446A	5/11/2012	5/11/2014
T6	ANP05546	Cable	Heliax	3/27/2013	3/27/2015
T7	AN02115	Preamp	83051A	11/12/2012	11/12/2014
T8	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	10/19/2011	10/19/2013
T9	AN03123	Cable	32026-2-29801-12	10/14/2011	10/14/2013
T10	ANP05965	Cable	Various	8/26/2011	8/26/2013
T11	AN00052	Loop Antenna	6502	5/16/2012	5/16/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Mini Guardrail Antenna	Impinj, Inc.	IMP-A0303-000	
Impinj IPJ-RS500 23dBm Reader SIP	Impinj Inc.	IPJ-RS500GX	

Support Devices:

Function	Manufacturer	Model #	S/N
Battery	Tenergy	18650	
Battery Pack	Tenergy	TN270	
Battery	Tenergy	18650	
Development platform	Impinj, Inc.	IPJ-E4000 Rev 2.01	

Test Conditions / Notes:

The EUT is seeking modular approval and is placed in the center of the turntable on a Styrofoam table 80cm above the ground plane, installed on a support host PCB as intended for final installation. The laptop located outside the chamber sends test command to the EUT via the support host PCB. The EUT is set in constant transmit mode.

Freq: 902.75MHz, 915.25MHz, 927.25MHz
Measured Power= 23.0dBm, 23.0dBm, 22.6dBm
Firmware setting = 23dBm, 23dBm, 23dBm

Emission profile evaluated with Mini Guardrail Antenna -20dBi with a 30cm cable between EUT and the antenna.

Frequency range of measurement = 9 kHz- 10 GHz.
9 kHz -150 kHz;RBW=200 Hz=VBW
150 kHz-30 MHz;RBW=9 kHz=VBW
30 MHz-1000 MHz;RBW=120 kHz=VBWz,
1000 MHz-10,000 MHz;RBW=1 MHz=VBW

15.31(e) compliance: a freshly charged battery is installed.

Emission profile of the EUT rotated along three orthogonal axes was investigated. Recorded data represent worse case emission.

Test method in accordance with FCC document: DA 00-705.

Temperature: 24°C
Pressure: 101.5kPa
Humidity: 37%

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7 T11	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	338.420M	50.7	-27.3	+14.4	+1.1	+1.2	+0.0	40.5	46.0	-5.5	Horiz
	QP		+0.0	+0.4	+0.0	+0.0	44		X-Axis		99
			+0.0	+0.0	+0.0						
^	338.420M	55.4	-27.3	+14.4	+1.1	+1.2	+0.0	45.2	46.0	-0.8	Horiz
			+0.0	+0.4	+0.0	+0.0	138		X-Axis		99
			+0.0	+0.0	+0.0						
3	394.800M	48.3	-27.8	+16.1	+1.3	+1.4	+0.0	39.8	46.0	-6.2	Horiz
			+0.0	+0.5	+0.0	+0.0			Z-Axis		100
			+0.0	+0.0	+0.0						
4	344.320M	48.8	-27.4	+14.6	+1.1	+1.2	+0.0	38.7	46.0	-7.3	Horiz
	QP		+0.0	+0.4	+0.0	+0.0			Z-Axis		100
			+0.0	+0.0	+0.0						
^	344.300M	55.0	-27.4	+14.6	+1.1	+1.2	+0.0	44.9	46.0	-1.1	Horiz
			+0.0	+0.4	+0.0	+0.0			Z-Axis		100
			+0.0	+0.0	+0.0						
6	406.400M	46.6	-27.9	+16.3	+1.3	+1.4	+0.0	38.2	46.0	-7.8	Horiz
			+0.0	+0.5	+0.0	+0.0	287		Y-Axis		100
			+0.0	+0.0	+0.0						

7	338.920M	48.3	-27.3	+14.4	+1.1	+1.2	+0.0	38.1	46.0	-7.9	Horiz
	QP		+0.0	+0.4	+0.0	+0.0	5		Y-Axis		99
			+0.0	+0.0	+0.0						
^	338.900M	53.5	-27.3	+14.4	+1.1	+1.2	+0.0	43.3	46.0	-2.7	Horiz
			+0.0	+0.4	+0.0	+0.0	355		Y-Axis		100
			+0.0	+0.0	+0.0						
9	124.600M	48.6	-27.8	+11.7	+0.7	+0.6	+0.0	34.0	43.5	-9.5	Horiz
			+0.0	+0.2	+0.0	+0.0	288		Z-Axis		99
			+0.0	+0.0	+0.0						
10	122.680M	47.8	-27.8	+11.7	+0.7	+0.6	+0.0	33.2	43.5	-10.3	Horiz
			+0.0	+0.2	+0.0	+0.0	360		X-Axis		152
			+0.0	+0.0	+0.0						
11	339.100M	45.7	-27.3	+14.4	+1.1	+1.2	+0.0	35.5	46.0	-10.5	Vert
			+0.0	+0.4	+0.0	+0.0	89		Y-Axis		100
			+0.0	+0.0	+0.0						
12	129.700M	46.9	-27.8	+11.7	+0.7	+0.6	+0.0	32.4	43.5	-11.1	Horiz
			+0.0	+0.3	+0.0	+0.0	360		Y-Axis		99
			+0.0	+0.0	+0.0						
13	9272.505M	30.3	+0.0	+0.0	+0.0	+0.0	+0.0	42.7	54.0	-11.3	Horiz
			+0.0	+3.3	-31.5	+35.8	360		High Y-Axis		121
			+0.8	+4.0	+0.0						
14	8345.780M	29.8	+0.0	+0.0	+0.0	+0.0	+0.0	42.6	54.0	-11.4	Vert
			+0.0	+3.0	-31.3	+36.4	360		High Z-Axis		121
			+0.9	+3.8	+0.0						
15	8345.620M	29.6	+0.0	+0.0	+0.0	+0.0	+0.0	42.4	54.0	-11.6	Horiz
			+0.0	+3.0	-31.3	+36.4	290		High Y-Axis		115
			+0.9	+3.8	+0.0						
16	9026.790M	29.0	+0.0	+0.0	+0.0	+0.0	+0.0	42.3	54.0	-11.7	Horiz
			+0.0	+3.0	-31.4	+37.0	360		Low Y-Axis		119
			+0.8	+3.9	+0.0						
17	9273.640M	29.9	+0.0	+0.0	+0.0	+0.0	+0.0	42.3	54.0	-11.7	Horiz
			+0.0	+3.3	-31.5	+35.8			High Z-Axis		121
			+0.8	+4.0	+0.0						
18	8346.505M	29.1	+0.0	+0.0	+0.0	+0.0	+0.0	41.9	54.0	-12.1	Horiz
			+0.0	+3.0	-31.3	+36.4	262		High X-Axis		114
			+0.9	+3.8	+0.0						
19	7418.120M	29.7	+0.0	+0.0	+0.0	+0.0	+0.0	41.7	54.0	-12.3	Horiz
			+0.0	+3.2	-31.4	+36.0	360		High Y-Axis		115
			+0.6	+3.6	+0.0						
20	7416.520M	29.5	+0.0	+0.0	+0.0	+0.0	+0.0	41.5	54.0	-12.5	Vert
			+0.0	+3.2	-31.4	+36.0	360		High Z-Axis		121
			+0.6	+3.6	+0.0						
21	9152.040M	28.5	+0.0	+0.0	+0.0	+0.0	+0.0	41.3	54.0	-12.7	Horiz
			+0.0	+3.1	-31.4	+36.4	360		Mid Z-Axis		119
			+0.8	+3.9	+0.0						
22	9271.825M	28.8	+0.0	+0.0	+0.0	+0.0	+0.0	41.3	54.0	-12.7	Horiz
			+0.0	+3.3	-31.5	+35.8	335		High X-Axis		114
			+0.9	+4.0	+0.0						
23	342.600M	43.3	-27.3	+14.5	+1.1	+1.2	+0.0	33.2	46.0	-12.8	Vert
			+0.0	+0.4	+0.0	+0.0	358		Z-Axis		102
			+0.0	+0.0	+0.0						

24	9152.515M	28.4	+0.0 +0.0 +0.8	+0.0 +3.1 +3.9	+0.0 -31.4 +0.0	+0.0 +36.4	+0.0 105	41.2	54.0 Mid X-Axis	-12.8	Vert 121
25	165.800M	46.2	-27.5 +0.0 +0.0	+10.0 +0.3 +0.0	+0.8 +0.0 +0.0	+0.8 +0.0	+0.0 360	30.6	43.5 X-Axis	-12.9	Horiz 152
26	7222.380M	29.6	+0.0 +0.0 +0.6	+0.0 +3.0 +3.6	+0.0 -31.5 +0.0	+0.0 +35.7	+0.0 108	41.0	54.0 Low Y-Axis	-13.0	Vert 119
27	7418.600M	29.0	+0.0 +0.0 +0.6	+0.0 +3.2 +3.6	+0.0 -31.4 +0.0	+0.0 +36.0	+0.0	41.0	54.0 High X-Axis	-13.0	Vert 124
28	9151.215M	28.2	+0.0 +0.0 +0.8	+0.0 +3.1 +3.9	+0.0 -31.4 +0.0	+0.0 +36.4	+0.0 360	41.0	54.0 Mid Y-Axis	-13.0	Vert 119
29	7322.540M	29.2	+0.0 +0.0 +0.5	+0.0 +3.1 +3.6	+0.0 -31.4 +0.0	+0.0 +35.9	+0.0	40.9	54.0 Mid Z-Axis	-13.1	Vert 119
30	9026.115M	27.6	+0.0 +0.0 +0.8	+0.0 +3.0 +3.9	+0.0 -31.4 +0.0	+0.0 +37.0	+0.0	40.9	54.0 Low X-Axis	-13.1	Vert 123
31	8237.265M	28.3	+0.0 +0.0 +0.8	+0.0 +3.1 +3.7	+0.0 -31.3 +0.0	+0.0 +36.2	+0.0 268	40.8	54.0 Mid Z-Axis	-13.2	Vert 119
32	8236.000M	28.2	+0.0 +0.0 +0.8	+0.0 +3.1 +3.7	+0.0 -31.3 +0.0	+0.0 +36.2	+0.0	40.7	54.0 Mid X-Axis	-13.3	Horiz 121
33	7222.410M	29.2	+0.0 +0.0 +0.6	+0.0 +3.0 +3.6	+0.0 -31.5 +0.0	+0.0 +35.7	+0.0	40.6	54.0 Low X-Axis	-13.4	Vert 123
34	9026.775M	27.2	+0.0 +0.0 +0.8	+0.0 +3.0 +3.9	+0.0 -31.4 +0.0	+0.0 +37.0	+0.0 360	40.5	54.0 Low Z-axis	-13.5	Horiz 119
35	7222.480M	29.0	+0.0 +0.0 +0.6	+0.0 +3.0 +3.6	+0.0 -31.5 +0.0	+0.0 +35.7	+0.0 360	40.4	54.0 Low Z-axis	-13.6	Horiz 119
36	8125.525M	28.0	+0.0 +0.0 +0.7	+0.0 +3.2 +3.7	+0.0 -31.3 +0.0	+0.0 +36.0	+0.0	40.3	54.0 Low X-Axis	-13.7	Horiz 123
37	8126.040M	27.9	+0.0 +0.0 +0.7	+0.0 +3.2 +3.7	+0.0 -31.3 +0.0	+0.0 +36.0	+0.0 360	40.2	54.0 Low Z-axis	-13.8	Vert 119
38	8237.225M	27.7	+0.0 +0.0 +0.8	+0.0 +3.1 +3.7	+0.0 -31.3 +0.0	+0.0 +36.2	+0.0 360	40.2	54.0 Mid Y-Axis	-13.8	Vert 119
39	7321.130M	28.4	+0.0 +0.0 +0.5	+0.0 +3.1 +3.6	+0.0 -31.4 +0.0	+0.0 +35.9	+0.0	40.1	54.0 Mid X-Axis	-13.9	Vert 121
40	7321.665M	28.2	+0.0 +0.0 +0.5	+0.0 +3.1 +3.6	+0.0 -31.4 +0.0	+0.0 +35.9	+0.0 360	39.9	54.0 Mid Y-Axis	-14.1	Horiz 119

41	397.900M	39.3	-27.8	+16.1	+1.3	+1.4	+0.0	30.8	46.0	-15.2	Vert
			+0.0	+0.5	+0.0	+0.0	360		Z-Axis		102
			+0.0	+0.0	+0.0						
42	8124.040M	26.4	+0.0	+0.0	+0.0	+0.0	+0.0	38.7	54.0	-15.3	Vert
			+0.0	+3.2	-31.3	+36.0	360		Low Y-Axis		119
			+0.7	+3.7	+0.0						
43	6492.080M	29.0	+0.0	+0.0	+0.0	+0.0	+0.0	38.0	54.0	-16.0	Vert
			+0.0	+2.4	-31.7	+34.4			High X-Axis		124
			+0.5	+3.4	+0.0						
44	5415.280M	31.2	+0.0	+0.0	+0.0	+0.0	+0.0	38.0	54.0	-16.0	Vert
			+0.0	+2.4	-32.2	+33.2	268		Low Z-axis		119
			+0.5	+2.9	+0.0						
45	5416.250M	31.1	+0.0	+0.0	+0.0	+0.0	+0.0	37.9	54.0	-16.1	Horiz
			+0.0	+2.4	-32.2	+33.2			Low Y-Axis		119
			+0.5	+2.9	+0.0						
46	343.900M	40.0	-27.4	+14.6	+1.1	+1.2	+0.0	29.9	46.0	-16.1	Vert
			+0.0	+0.4	+0.0	+0.0	228		X-Axis		100
			+0.0	+0.0	+0.0						
47	164.400M	42.7	-27.5	+10.1	+0.8	+0.8	+0.0	27.2	43.5	-16.3	Horiz
			+0.0	+0.3	+0.0	+0.0	360		Z-Axis		99
			+0.0	+0.0	+0.0						
48	5416.360M	30.4	+0.0	+0.0	+0.0	+0.0	+0.0	37.2	54.0	-16.8	Horiz
			+0.0	+2.4	-32.2	+33.2			Low X-Axis		123
			+0.5	+2.9	+0.0						
49	5564.040M	30.1	+0.0	+0.0	+0.0	+0.0	+0.0	37.2	54.0	-16.8	Vert
			+0.0	+2.4	-32.1	+33.5			High Z-Axis		126
			+0.4	+2.9	+0.0						
50	5490.445M	30.3	+0.0	+0.0	+0.0	+0.0	+0.0	37.2	54.0	-16.8	Horiz
			+0.0	+2.4	-32.1	+33.3			Mid Y-Axis		117
			+0.4	+2.9	+0.0						
51	5563.795M	30.1	+0.0	+0.0	+0.0	+0.0	+0.0	37.2	54.0	-16.8	Horiz
			+0.0	+2.4	-32.1	+33.5			High X-Axis		120
			+0.4	+2.9	+0.0						
52	6489.270M	28.1	+0.0	+0.0	+0.0	+0.0	+0.0	37.1	54.0	-16.9	Horiz
			+0.0	+2.4	-31.7	+34.4			High Z-Axis		126
			+0.5	+3.4	+0.0						
53	6405.455M	28.2	+0.0	+0.0	+0.0	+0.0	+0.0	37.1	54.0	-16.9	Vert
			+0.0	+2.4	-31.7	+34.4			Mid X-Axis		121
			+0.5	+3.3	+0.0						
54	221.170M	43.5	-27.2	+10.6	+0.9	+0.9	+0.0	29.0	46.0	-17.0	Horiz
			+0.0	+0.3	+0.0	+0.0	136		X-Axis		121
			+0.0	+0.0	+0.0						
55	5491.365M	30.1	+0.0	+0.0	+0.0	+0.0	+0.0	37.0	54.0	-17.0	Horiz
			+0.0	+2.4	-32.1	+33.3			Mid X-Axis		114
			+0.4	+2.9	+0.0						
56	6405.960M	28.0	+0.0	+0.0	+0.0	+0.0	+0.0	36.9	54.0	-17.1	Vert
			+0.0	+2.4	-31.7	+34.4	248		Mid Y-Axis		119
			+0.5	+3.3	+0.0						
57	6319.000M	28.0	+0.0	+0.0	+0.0	+0.0	+0.0	36.9	54.0	-17.1	Vert
			+0.0	+2.4	-31.8	+34.5			Low X-Axis		123
			+0.5	+3.3	+0.0						

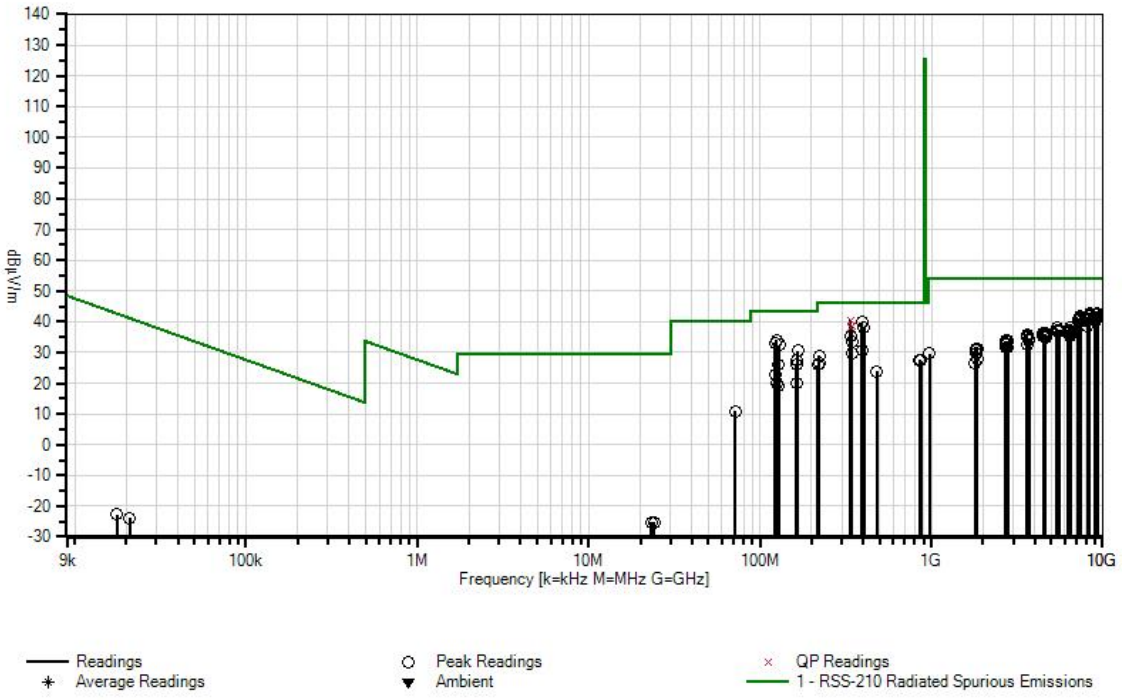
58	6407.180M	28.0	+0.0 +0.0 +0.5	+0.0 +2.4 +3.3	+0.0 -31.7 +0.0	+0.0 +34.4	+0.0	36.9	54.0 Mid X-Axis	-17.1	Horiz 114
59	6318.435M	27.9	+0.0 +0.0 +0.5	+0.0 +2.4 +3.3	+0.0 -31.8 +0.0	+0.0 +34.5	+0.0 360	36.8	54.0 Low Z-axis	-17.2	Horiz 119
60	128.000M	40.8	-27.8 +0.0 +0.0	+11.7 +0.3 +0.0	+0.7 +0.0 +0.0	+0.6 +0.0	+0.0 195	26.3	43.5 Y-Axis	-17.2	Vert 100
61	5563.480M	29.5	+0.0 +0.0 +0.4	+0.0 +2.4 +2.9	+0.0 -32.1 +0.0	+0.0 +33.5	+0.0	36.6	54.0 High Y-Axis	-17.4	Horiz 115
62	162.500M	41.4	-27.5 +0.0 +0.0	+10.3 +0.3 +0.0	+0.8 +0.0 +0.0	+0.8 +0.0	+0.0 244	26.1	43.5 Y-Axis	-17.4	Horiz 99
63	5490.745M	29.6	+0.0 +0.0 +0.4	+0.0 +2.4 +2.9	+0.0 -32.1 +0.0	+0.0 +33.3	+0.0	36.5	54.0 Mid Z-Axis	-17.5	Vert 119
64	6318.890M	27.5	+0.0 +0.0 +0.5	+0.0 +2.4 +3.3	+0.0 -31.8 +0.0	+0.0 +34.5	+0.0	36.4	54.0 Low Y-Axis	-17.6	Vert 119
65	4637.335M	32.5	+0.0 +0.0 +0.1	+0.0 +2.0 +2.6	+0.0 -32.6 +0.0	+0.0 +31.5	+0.0	36.1	54.0 High Z-Axis	-17.9	Horiz 118
66	4515.205M	32.9	+0.0 +0.0 +0.3	+0.0 +1.9 +2.6	+0.0 -32.8 +0.0	+0.0 +31.2	+0.0	36.1	54.0 Low X-Axis	-17.9	Horiz 119
67	4637.435M	32.4	+0.0 +0.0 +0.1	+0.0 +2.0 +2.6	+0.0 -32.6 +0.0	+0.0 +31.5	+0.0 219	36.0	54.0 High Z-Axis	-18.0	Vert 120
68	6406.405M	27.0	+0.0 +0.0 +0.5	+0.0 +2.4 +3.3	+0.0 -31.7 +0.0	+0.0 +34.4	+0.0	35.9	54.0 Mid Z-Axis	-18.1	Horiz 119
69	3612.445M	35.4	+0.0 +0.0 +0.4	+0.0 +1.7 +2.2	+0.0 -33.3 +0.0	+0.0 +29.3	+0.0 297	35.7	54.0 Low Z-axis	-18.3	Vert 119
70	4512.995M	32.5	+0.0 +0.0 +0.3	+0.0 +1.9 +2.6	+0.0 -32.8 +0.0	+0.0 +31.2	+0.0	35.7	54.0 Low Y-Axis	-18.3	Horiz 119
71	855.400M	28.1	-27.6 +0.0 +0.0	+22.2 +0.7 +0.0	+2.0 +0.0 +0.0	+2.2 +0.0	+0.0 323	27.6	46.0 X-Axis	-18.4	Horiz 101
72	4577.055M	32.1	+0.0 +0.0 +0.1	+0.0 +2.0 +2.6	+0.0 -32.7 +0.0	+0.0 +31.4	+0.0	35.5	54.0 Mid X-Axis	-18.5	Vert 114
73	4577.250M	32.0	+0.0 +0.0 +0.1	+0.0 +2.0 +2.6	+0.0 -32.7 +0.0	+0.0 +31.4	+0.0 2	35.4	54.0 Mid Z-Axis	-18.6	Vert 119
74	872.700M	27.6	-27.5 +0.0 +0.0	+22.3 +0.7 +0.0	+2.0 +0.0 +0.0	+2.2 +0.0	+0.0 79	27.3	46.0 X-Axis	-18.7	Vert 101

75	3610.400M	35.0	+0.0 +0.0 +0.4	+0.0 +1.7 +2.2	+0.0 -33.3 +0.0	+0.0 +29.3	+0.0 360	35.3	54.0 Low X-Axis	-18.7	Horiz 119
76	6490.730M	26.3	+0.0 +0.0 +0.5	+0.0 +2.4 +3.4	+0.0 -31.7 +0.0	+0.0 +34.4	+0.0 342	35.3	54.0 High Y-Axis	-18.7	Vert 115
77	4637.325M	31.6	+0.0 +0.0 +0.1	+0.0 +2.0 +2.6	+0.0 -32.6 +0.0	+0.0 +31.5	+0.0 99	35.2	54.0 High Y-Axis	-18.8	Vert 115
78	4576.215M	31.8	+0.0 +0.0 +0.1	+0.0 +2.0 +2.6	+0.0 -32.7 +0.0	+0.0 +31.4	+0.0 32	35.2	54.0 Mid Y-Axis	-18.8	Horiz 117
79	4575.320M	31.8	+0.0 +0.0 +0.1	+0.0 +2.0 +2.6	+0.0 -32.7 +0.0	+0.0 +31.4	+0.0 227	35.2	54.0 Mid Z-Axis	-18.8	Horiz 124
80	4514.190M	31.9	+0.0 +0.0 +0.3	+0.0 +1.9 +2.6	+0.0 -32.8 +0.0	+0.0 +31.2	+0.0	35.1	54.0 Low Z-axis	-18.9	Vert 119
81	3610.745M	34.8	+0.0 +0.0 +0.4	+0.0 +1.7 +2.2	+0.0 -33.3 +0.0	+0.0 +29.3	+0.0	35.1	54.0 Low Y-Axis	-18.9	Vert 119
82	4637.100M	31.4	+0.0 +0.0 +0.1	+0.0 +2.0 +2.6	+0.0 -32.6 +0.0	+0.0 +31.5	+0.0	35.0	54.0 High X-Axis	-19.0	Vert 120
83	3609.775M	34.6	+0.0 +0.0 +0.4	+0.0 +1.7 +2.2	+0.0 -33.3 +0.0	+0.0 +29.3	+0.0 360	34.9	54.0 Low Z-axis	-19.1	Horiz 119
84	3661.545M	34.4	+0.0 +0.0 +0.4	+0.0 +1.7 +2.1	+0.0 -33.3 +0.0	+0.0 +29.4	+0.0 297	34.7	54.0 Mid Z-Axis	-19.3	Horiz 124
85	3660.360M	34.4	+0.0 +0.0 +0.4	+0.0 +1.7 +2.1	+0.0 -33.3 +0.0	+0.0 +29.4	+0.0 220	34.7	54.0 Mid Y-Axis	-19.3	Vert 117
86	3707.885M	34.0	+0.0 +0.0 +0.4	+0.0 +1.7 +2.1	+0.0 -33.2 +0.0	+0.0 +29.6	+0.0 353	34.6	54.0 High Y-Axis	-19.4	Vert 112
87	221.300M	41.0	-27.2 +0.0 +0.0	+10.6 +0.3 +0.0	+0.9 +0.0 +0.0	+0.9 +0.0	+0.0 360	26.5	46.0 Y-Axis	-19.5	Horiz 99
88	3708.525M	33.7	+0.0 +0.0 +0.4	+0.0 +1.7 +2.1	+0.0 -33.2 +0.0	+0.0 +29.6	+0.0	34.3	54.0 High Z-Axis	-19.7	Horiz 118
89	3709.200M	33.6	+0.0 +0.0 +0.4	+0.0 +1.7 +2.1	+0.0 -33.2 +0.0	+0.0 +29.6	+0.0 9	34.2	54.0 High X-Axis	-19.8	Vert 120
90	3709.570M	33.4	+0.0 +0.0 +0.4	+0.0 +1.7 +2.1	+0.0 -33.2 +0.0	+0.0 +29.6	+0.0 324	34.0	54.0 High Z-Axis	-20.0	Vert 120
91	218.000M	40.7	-27.2 +0.0 +0.0	+10.4 +0.3 +0.0	+0.9 +0.0 +0.0	+0.9 +0.0	+0.0 360	26.0	46.0 Z-Axis	-20.0	Horiz 99

92	2745.830M	35.2	+0.0	+0.0	+0.0	+0.0	+0.0	33.8	54.0	-20.2	Horiz
			+0.0	+1.4	-32.7	+27.3	360		Mid Y-Axis		121
			+0.5	+2.1	+0.0						
93	2782.680M	35.0	+0.0	+0.0	+0.0	+0.0	+0.0	33.8	54.0	-20.2	Horiz
			+0.0	+1.5	-32.7	+27.4	64		High Y-Axis		112
			+0.5	+2.1	+0.0						
94	2706.920M	35.3	+0.0	+0.0	+0.0	+0.0	+0.0	33.7	54.0	-20.3	Vert
			+0.0	+1.4	-32.7	+27.1	360		Low X-Axis		119
			+0.5	+2.1	+0.0						
95	2781.670M	34.6	+0.0	+0.0	+0.0	+0.0	+0.0	33.4	54.0	-20.6	Horiz
			+0.0	+1.5	-32.7	+27.4	360		High Z-Axis		120
			+0.5	+2.1	+0.0						
96	122.610M	37.5	-27.8	+11.7	+0.7	+0.6	+0.0	22.9	43.5	-20.6	Vert
			+0.0	+0.2	+0.0	+0.0	125		X-Axis		99
			+0.0	+0.0	+0.0						
97	2708.150M	34.7	+0.0	+0.0	+0.0	+0.0	+0.0	33.1	54.0	-20.9	Vert
			+0.0	+1.4	-32.7	+27.1	65		Low Y-Axis		119
			+0.5	+2.1	+0.0						
98	2745.725M	34.5	+0.0	+0.0	+0.0	+0.0	+0.0	33.1	54.0	-20.9	Horiz
			+0.0	+1.4	-32.7	+27.3	360		Mid X-Axis		114
			+0.5	+2.1	+0.0						
99	3660.975M	32.3	+0.0	+0.0	+0.0	+0.0	+0.0	32.6	54.0	-21.4	Vert
			+0.0	+1.7	-33.3	+29.4	360		Mid X-Axis		114
			+0.4	+2.1	+0.0						
100	2744.855M	33.9	+0.0	+0.0	+0.0	+0.0	+0.0	32.5	54.0	-21.5	Horiz
			+0.0	+1.4	-32.7	+27.3	360		Mid Z-Axis		119
			+0.5	+2.1	+0.0						
101	479.400M	31.0	-28.2	+17.7	+1.4	+1.5	+0.0	23.9	46.0	-22.1	Vert
			+0.0	+0.5	+0.0	+0.0			Y-Axis		100
			+0.0	+0.0	+0.0						
102	2781.730M	32.8	+0.0	+0.0	+0.0	+0.0	+0.0	31.6	54.0	-22.4	Vert
			+0.0	+1.5	-32.7	+27.4	266		High X-Axis		120
			+0.5	+2.1	+0.0						
103	2708.035M	33.2	+0.0	+0.0	+0.0	+0.0	+0.0	31.6	54.0	-22.4	Vert
			+0.0	+1.4	-32.7	+27.1	360		Low Z-axis		119
			+0.5	+2.1	+0.0						
104	1806.275M	37.8	+0.0	+0.0	+0.0	+0.0	+0.0	31.3	54.0	-22.7	Horiz
			+0.0	+1.2	-34.3	+24.7	360		Low Y-Axis		119
			+0.3	+1.6	+0.0						
105	1854.480M	36.8	+0.0	+0.0	+0.0	+0.0	+0.0	31.2	54.0	-22.8	Horiz
			+0.0	+1.2	-33.9	+25.2	360		High X-Axis		120
			+0.3	+1.6	+0.0						
106	1829.975M	37.3	+0.0	+0.0	+0.0	+0.0	+0.0	31.2	54.0	-22.8	Vert
			+0.0	+1.2	-34.1	+24.9	360		Mid Y-Axis		121
			+0.3	+1.6	+0.0						
107	1853.620M	36.7	+0.0	+0.0	+0.0	+0.0	+0.0	31.1	54.0	-22.9	Vert
			+0.0	+1.2	-33.9	+25.2	323		High Y-Axis		112
			+0.3	+1.6	+0.0						
108	1829.995M	36.7	+0.0	+0.0	+0.0	+0.0	+0.0	30.6	54.0	-23.4	Horiz
			+0.0	+1.2	-34.1	+24.9	360		Mid X-Axis		114
			+0.3	+1.6	+0.0						

109	124.600M	34.7	-27.8	+11.7	+0.7	+0.6	+0.0	20.1	43.5	-23.4	Vert
			+0.0	+0.2	+0.0	+0.0	360		Z-Axis		102
			+0.0	+0.0	+0.0						
110	162.500M	35.1	-27.5	+10.3	+0.8	+0.8	+0.0	19.8	43.5	-23.7	Vert
			+0.0	+0.3	+0.0	+0.0	322		Y-Axis		100
			+0.0	+0.0	+0.0						
111	1831.330M	36.0	+0.0	+0.0	+0.0	+0.0	+0.0	29.9	54.0	-24.1	Vert
			+0.0	+1.2	-34.1	+24.9	360		Mid Z-Axis		119
			+0.3	+1.6	+0.0						
112	973.700M	27.7	-27.2	+23.8	+2.1	+2.4	+0.0	29.6	54.0	-24.4	Vert
			+0.0	+0.8	+0.0	+0.0	168		X-Axis		101
			+0.0	+0.0	+0.0						
113	1806.100M	36.1	+0.0	+0.0	+0.0	+0.0	+0.0	29.6	54.0	-24.4	Horiz
			+0.0	+1.2	-34.3	+24.7	360		Low X-Axis		119
			+0.3	+1.6	+0.0						
114	127.900M	33.5	-27.8	+11.7	+0.7	+0.6	+0.0	19.0	43.5	-24.5	Vert
			+0.0	+0.3	+0.0	+0.0	42		X-Axis		100
			+0.0	+0.0	+0.0						
115	1854.420M	33.5	+0.0	+0.0	+0.0	+0.0	+0.0	27.9	54.0	-26.1	Horiz
			+0.0	+1.2	-33.9	+25.2	360		High Z-Axis		120
			+0.3	+1.6	+0.0						
116	1805.285M	33.1	+0.0	+0.0	+0.0	+0.0	+0.0	26.6	54.0	-27.4	Horiz
			+0.0	+1.2	-34.3	+24.7	360		Low Z-axis		119
			+0.3	+1.6	+0.0						
117	71.720M	31.8	-28.0	+6.1	+0.5	+0.4	+0.0	11.0	40.0	-29.0	Vert
			+0.0	+0.2	+0.0	+0.0	360		X-Axis		99
			+0.0	+0.0	+0.0						
118	200.000k	40.0	+0.0	+0.0	+0.0	+0.0	-80.0	-30.5	21.6	-52.1	Paral
			+0.0	+0.0	+0.0	+0.0	360				123
			+0.0	+0.0	+9.5						
119	24.030M	8.4	+0.0	+0.0	+0.0	+0.0	-40.0	-25.2	29.5	-54.7	Perpe
			+0.0	+0.0	+0.0	+0.0	360				123
			+0.0	+0.2	+6.2						
120	23.280M	8.2	+0.0	+0.0	+0.0	+0.0	-40.0	-25.2	29.5	-54.7	Paral
			+0.0	+0.0	+0.0	+0.0	360				123
			+0.0	+0.2	+6.4						
121	150.000k	39.9	+0.0	+0.0	+0.0	+0.0	-80.0	-30.6	24.1	-54.7	Perpe
			+0.0	+0.0	+0.0	+0.0	360				123
			+0.0	+0.0	+9.5						
122	20.985k	44.0	+0.0	+0.0	+0.0	+0.0	-80.0	-23.9	41.2	-65.1	Paral
			+0.0	+0.0	+0.0	+0.0	360				123
			+0.0	+0.0	+12.1						
123	17.695k	44.3	+0.0	+0.0	+0.0	+0.0	-80.0	-22.6	42.6	-65.2	Perpe
			+0.0	+0.0	+0.0	+0.0	230				123
			+0.0	+0.0	+13.1						

CKC Laboratories, Inc. Date: 7/17/2013 Time: 10:56:25 Impinj Inc. WO#: 93909
Test Distance: 3 Meters Sequence#: 10 Perpendicular
Impinj Inc. Impinj IPJ-RS500 23dBm Reader SIP P/N: IPJ-RS500GX



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer:	**Impinj Inc.**		
Specification:	**Band Edge Compliance FCC Part 15.247 & RSS-210**		
Work Order #:	**93909**	Date:	7/16/2013
Test Type:	**Maximized Emissions**	Time:	11:32:01
Equipment:	**Impinj IPJ-RS500 23dBm Reader SIP**	Sequence#:	5
Manufacturer:	Impinj Inc.	Tested By:	Steven Pittsford
Model:	IPJ-RS500GX		
S/N:	IMPH12000100051210		

Test Conditions / Notes:

The EUT is seeking modular approval is placed in the center of the turntable on a Styrofoam table 80cm above the ground plane, installed on a support host PCB as intended for final installation. The laptop located outside the chamber sends test command to the EUT via the support host PCB.

Frequency: 902-928MHz

Freq: 902.75MHz, 915.25MHz, 927.25MHz
Firmware setting = 23dBm, 23dBm, 23dBm

Emission profile evaluated with Laird Antenna 5.5dBi and Mini Guardrail Antenna with a 30cm cable between EUT and the antenna.

30MHz-1000 MHz;RBW=120 kHz,VBW=120 kHz

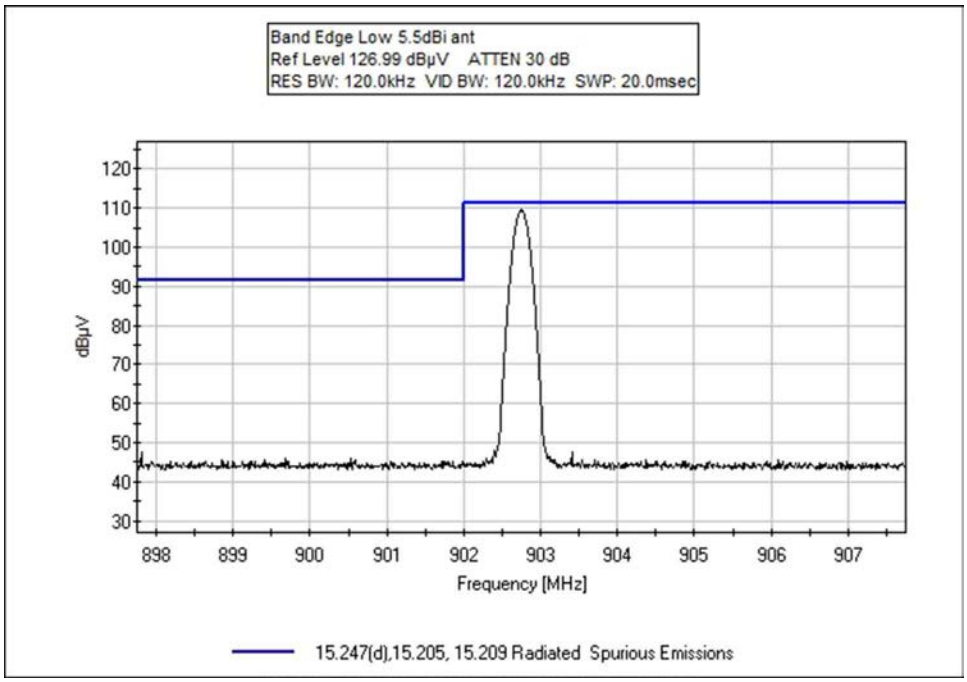
15.31(e) compliance: a freshly charged battery is installed.

Emission profile of the EUT rotated along three orthogonal axes was investigated. Recorded data represent worse case emission.

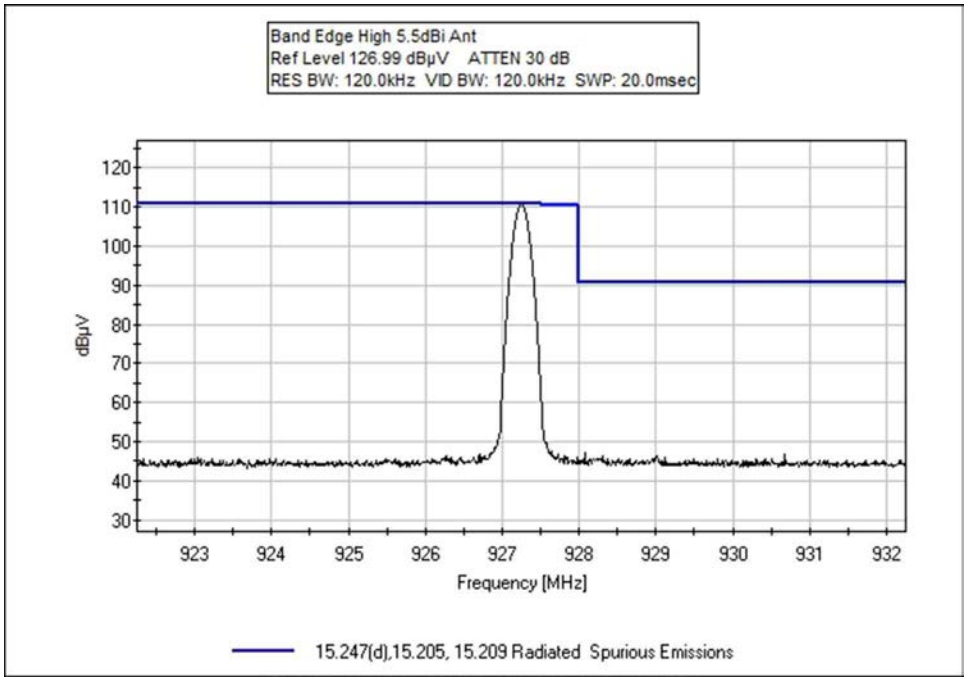
Test method in accordance with FCC document: DA 00-705.

Temperature: 24°C
Pressure: 101.5kPa
Humidity: 37%

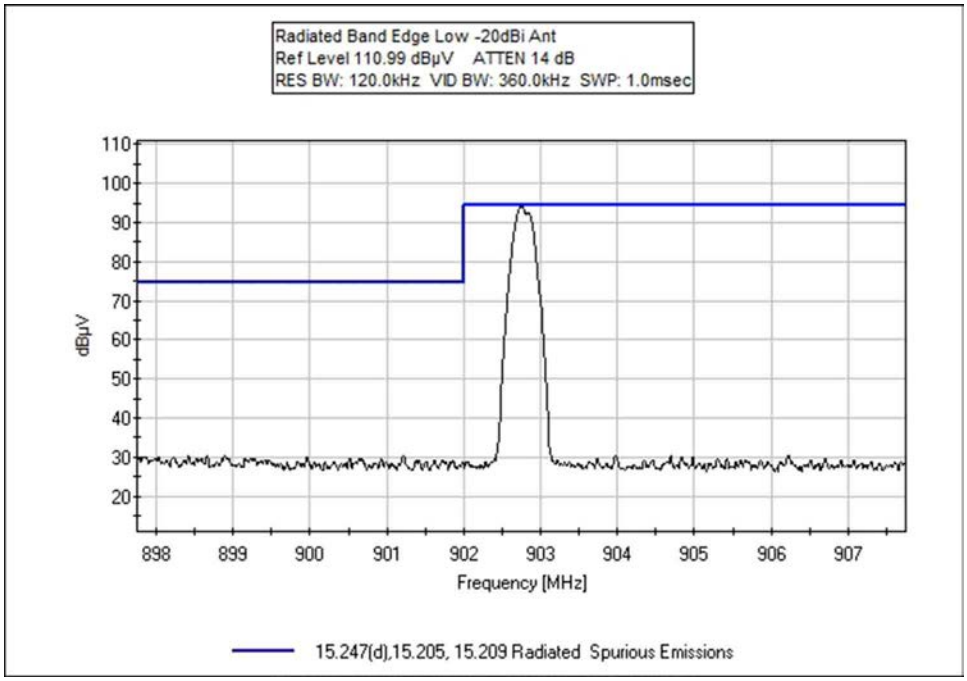
Test Plots



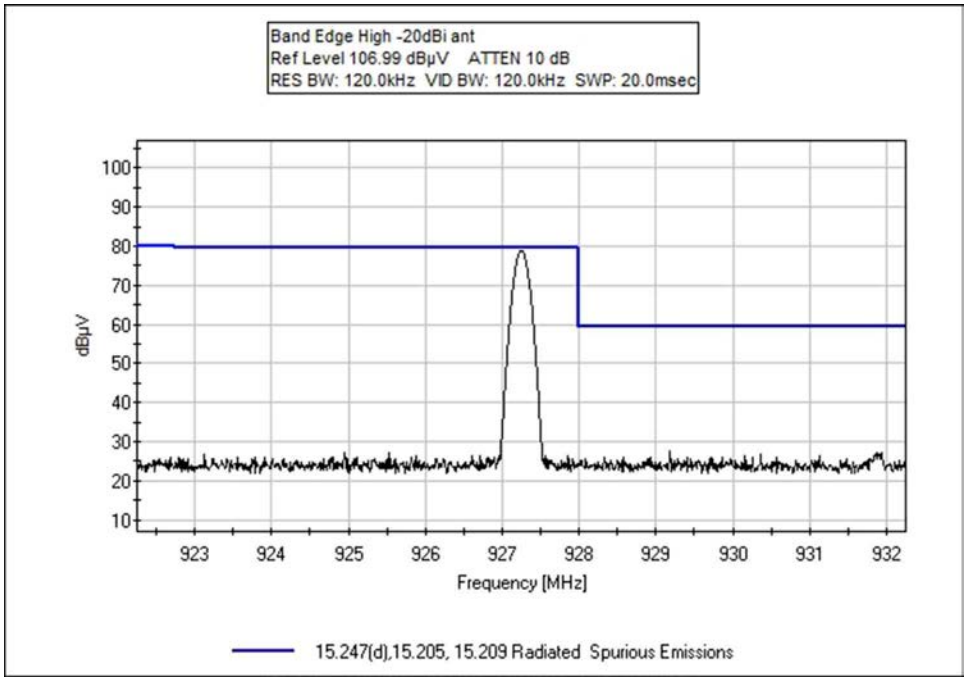
Low 5.5dBi Band Edge



High 5.5dBi Band Edge



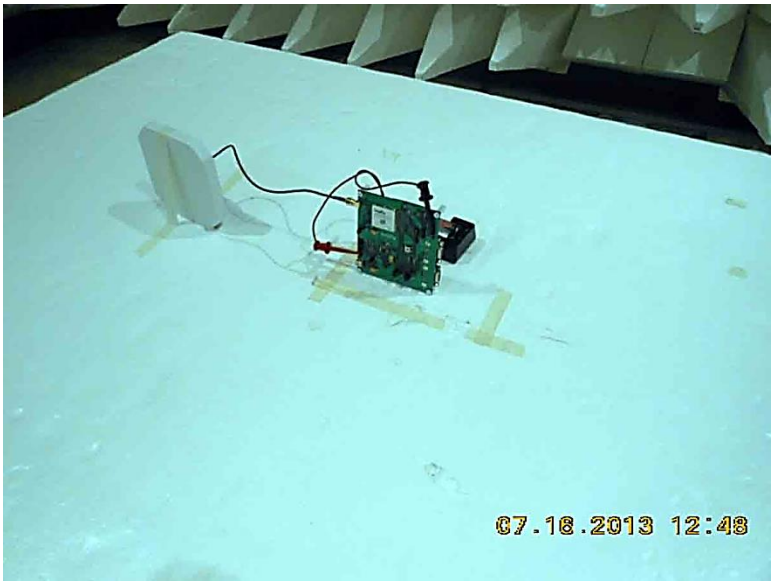
Low -20dBi Band Edge



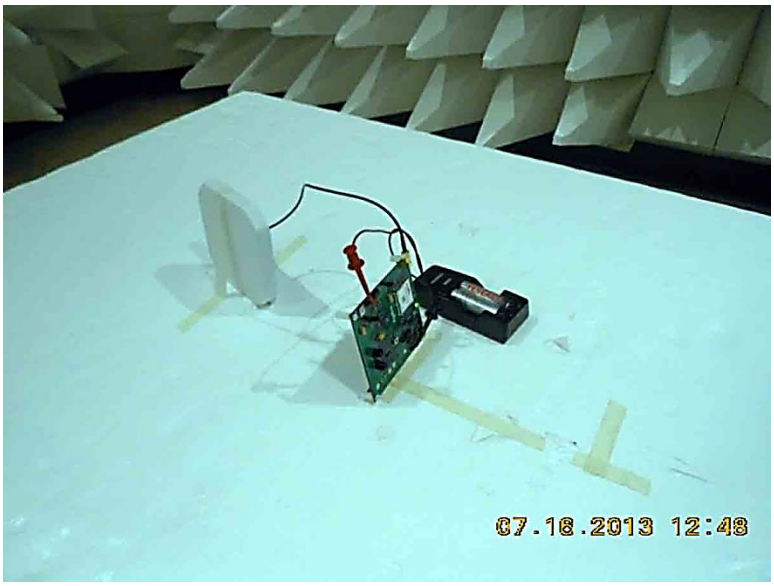
High -20dBi Band Edge

Test Setup Photos

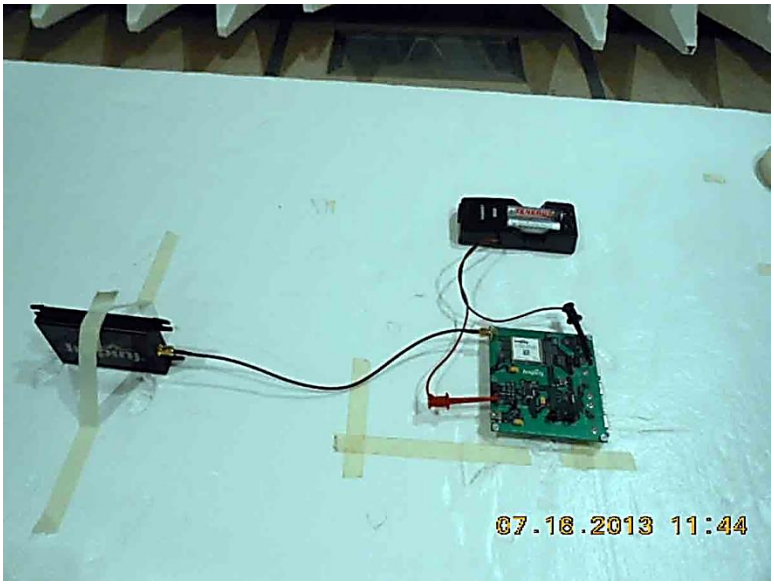
5.5dBi, X-Axis



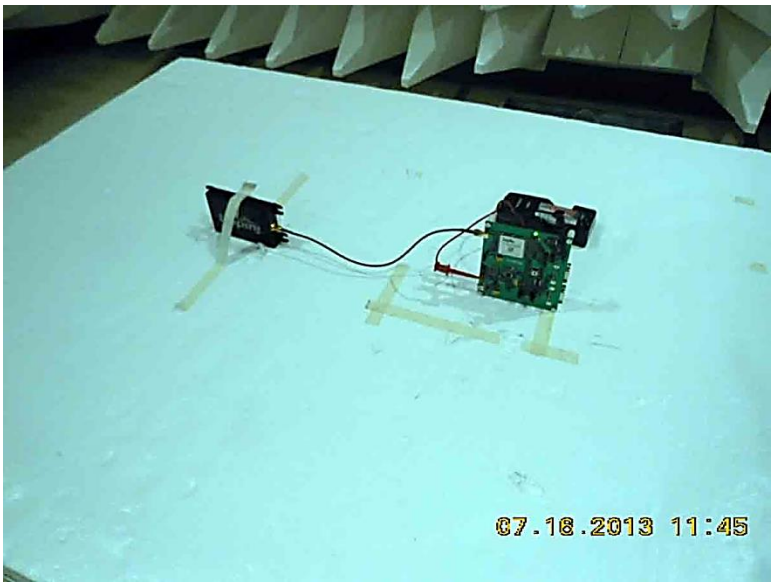
5.5dBi, Y-Axis



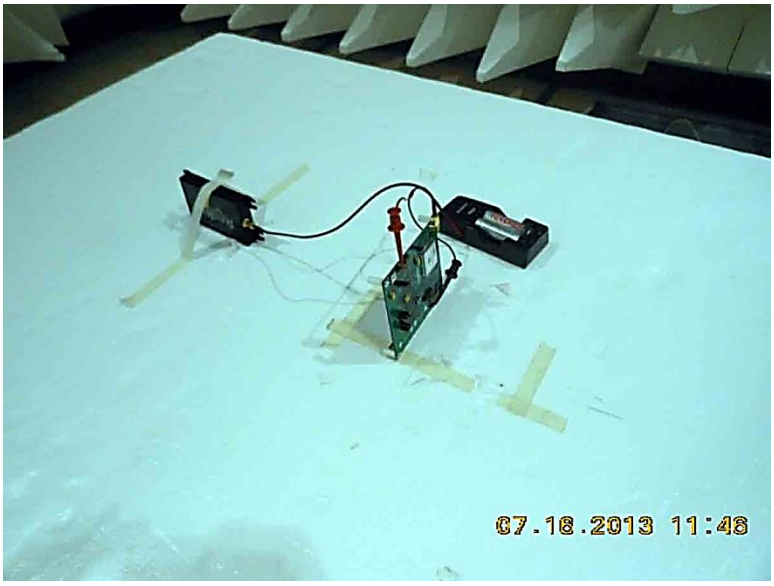
5.5dBi, Z-Axis



-20dBi, X-Axis



-20dBi, Y-Axis



-20dBi, Z-Axis

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

The reported measurement uncertainties are calculated based on the worst case of all laboratory environments from CKC Laboratories, Inc. test sites. Only those parameters which require estimation of measurement uncertainty are reported. The reported worst case measurement uncertainty is less than the maximum values derived in CISPR 16-4-2. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

Unless otherwise indicated, the following configuration parameters are used for equipment setup: 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 dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula. This reading was then compared to the applicable specification limit.

SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/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. Unless otherwise specified, 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.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

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 "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or carrot ("^") was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. 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 receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent 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

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. 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.