Impinj, Inc.

Indy RS1000

FCC 15.207:2017

FCC 15.247:2017

RFID Transceiver

Report # 7LAY0128

NVLAP Lab Code: 200629-0

CERTIFICATE OF TEST

2017-1-25

Last Date of Test: November 22, 2017
Impinj, Inc.
Model: Indy RS1000

Radio Equipment Testing

Standards

Specification	Method
FCC 15.207:2017	ANSI C63.10:2013
FCC 15.247:2017	

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	Yes	Pass	
6.5, 6.6	Spurious Radiated Emissions	Yes	Pass	
7.5	Duty Cycle	Yes	N/A	
7.8.2	Carrier Frequency Separation	Yes	Pass	
7.8.3	Number of Hopping Frequencies	Yes	Pass	
7.8.4	Dwell Time	Yes	Pass	
7.8.5	Output Power	Yes	Pass	
7.8.6	Band Edge Compliance	Yes	Pass	
7.8.6	Band Edge Compliance - Hopping Mode	Yes	Pass	
7.8.7	Occupied Bandwidth	Yes	Pass	
7.8.8	Spurious Conducted Emissions	Yes	Pass	
11.10.2	Power Spectral Density	No	N/A	Not required for FHSS devices.

Deviations From Test Standards

None

Approved By:

Rod Munro, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information.

REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		

ACCREDITATIONS AND AUTHORIZATIONS

2017.6.12

United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Accredited by A2LA to ISO / IEC 17065 as a product certifier. This allows Element to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with ISED.

European Union

European Commission – Within Element, we have a EU Notified Body validated for the EMCD and RED Directives.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

MSIP / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Israel

MOC – Recognized by MOC as a CAB for the acceptance of test data.

Hong Kong

OFCA – Recognized by OFCA as a CAB for the acceptance of test data.

Vietnam

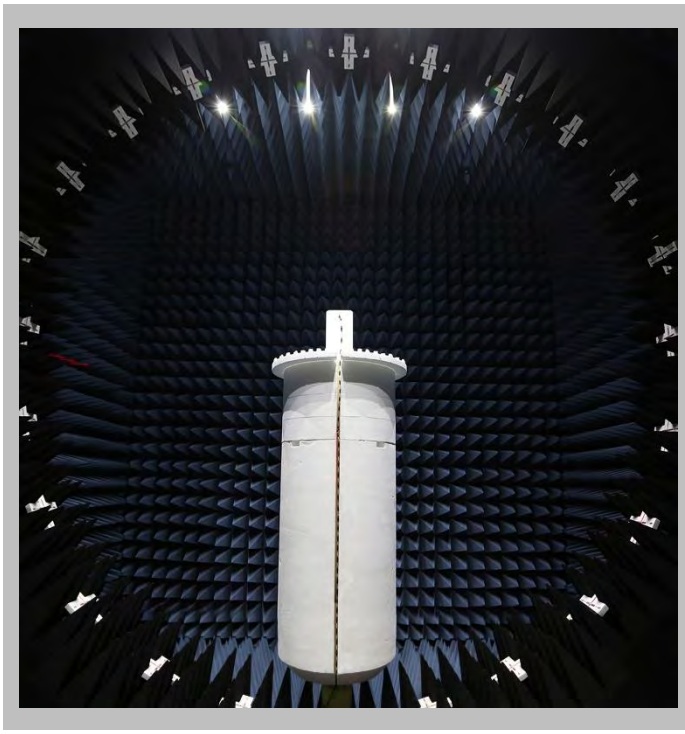
MIC – Recognized by MIC as a CAB for the acceptance of test data.

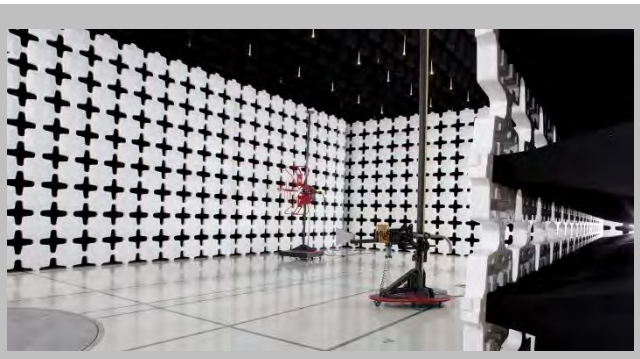
SCOPE

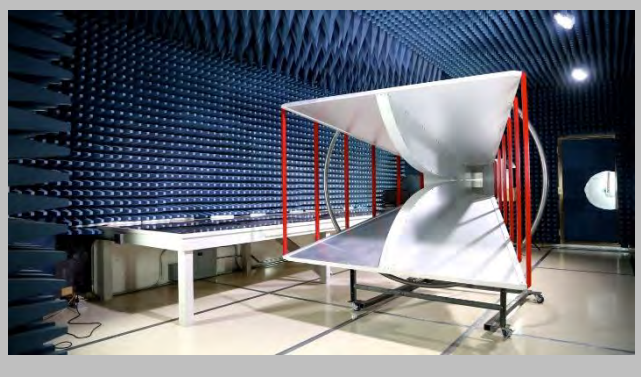
For details on the Scopes of our Accreditations, please visit:
http://portlandcustomer.element.com/ts/scope/scope.htm
http://gsi.nist.gov/global/docs/cabs/designations.html

FACILITIES

California	Minnesota	New York	Oregon	Texas	Washington
Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-08, MN10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120th Ave NE Bothell, WA 98011 (425)984-6600
NVLAP					
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0
Innovation, Science and Economic Development Canada					
2834B-1, 2834B-3	2834E-1, 2834E-3	N/A	2834D-1, 2834D-*2*	2834G-1	2834F-1
BSMI					
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI					
A-0029	A-0109	N/A	A-0108	A-0201	A-0110
Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	US0017	US0191	US0157







MEASUREMENT UNCERTAINTY

TMU.2015.07.10

Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

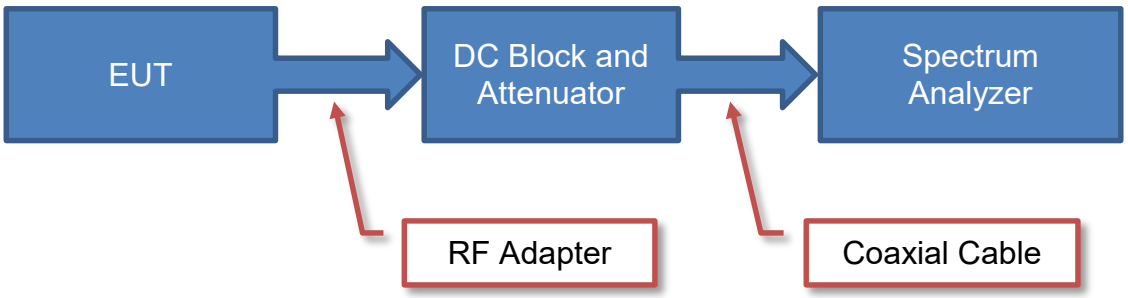
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable test description page. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

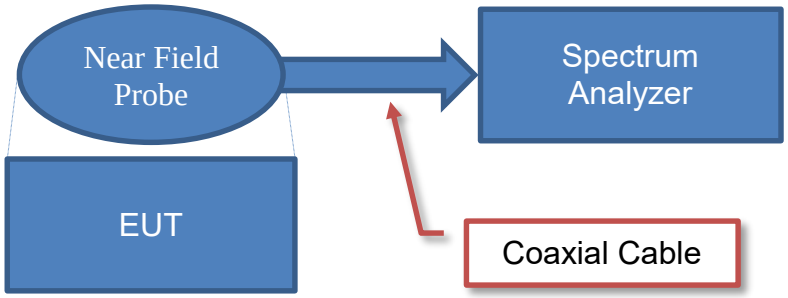
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	0	0
AC Powerline Conducted Emissions (dB)	0	0

Test Setup Block Diagrams

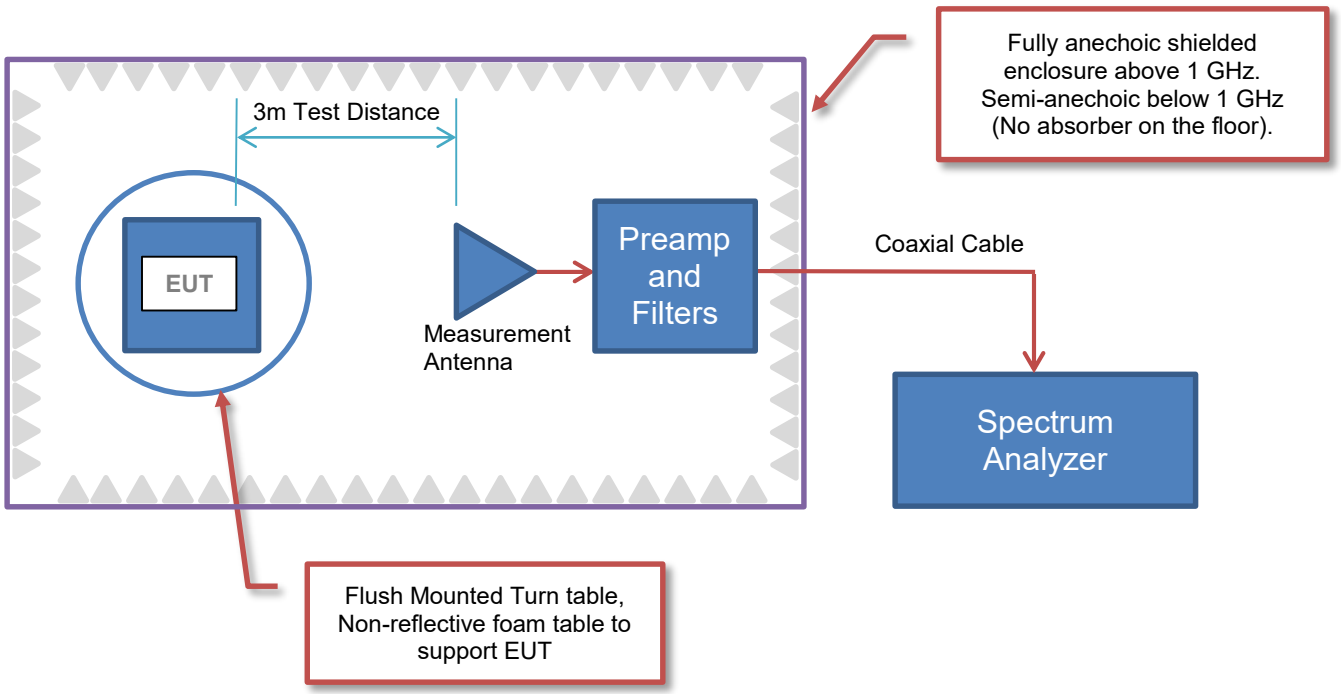
Antenna Port Conducted Measurements



Near Field Test Fixture Measurements



Spurious Radiated Emissions



PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	Impinj, Inc.
Address:	400 Fairview Ave N
City, State, Zip:	Seattle WA 90109
Test Requested By:	Bill Ashley
Model:	Indy RS1000
First Date of Test:	November 21, 2017
Last Date of Test:	November 22, 2017
Receipt Date of Samples:	November 21, 2017
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Indy RS1000 is a completely integrated surface-mount RAIN RFID reader module.

Testing Objective:
Seeking to demonstrate compliance under FCC 15.247 for operation in the 902-928 MHz Band.

CONFIGURATIONS

Configuration 7LAY0128- 1

Software/Firmware Running during test	
Description	**Version**
Indy Demo Tool	1.6.8.14

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
RFID Reader Module	Impinj, Inc.	Indy RS1000	110121170091

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Dell	Latitude E7240	N/A
AC Power Adapter	ITE Power Supply	HK-AB-050A400-D5	N/A

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB Cable	No	1.0m	No	Laptop	RFID Reader Module
DC Power	No	1.2m	Yes	AC Power Adapter	RFID Reader Module
AC Power	No	1.7m	No	AC Mains	AC Power Adapter

CONFIGURATIONS

Configuration 7LAY0128- 2

Software/Firmware Running during test	
Description	**Version**
Indy Demo Tool	1.6.8.14

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
RFID Reader Module	Impinj, Inc.	Indy RS1000	110121170091

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Dell	Latitude E7240	N/A
AC Power Adapter	ITE Power Supply	HK-AB-050A400-D5	N/A
AC Power Adapter (Laptop)	Dell	LA55NM130	N/A
9 dBic Panel Antenna	Laird	S9028PCLJ-IP1	N/A

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB Cable	No	1.0m	No	Laptop	RFID Reader Module
DC Power	No	1.2m	Yes	AC Power Adapter	RFID Reader Module
AC Power	No	1.7m	No	AC Mains	AC Power Adapter
AC Power (Laptop)	No	0.9m	No	AC Mains	AC Power Adapter (Laptop)
DC Power (Laptop)	No	1.9m	No	AC Power Adapter (Laptop)	Laptop
RF Cable	Yes	2.4m	No	RFID Reader Module	Panel Antenna

CONFIGURATIONS

Configuration 7LAY0128- 3

Software/Firmware Running during test	
Description	**Version**
Indy Demo Tool	1.6.8.14

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
RFID Reader Module	Impinj, Inc.	Indy RS1000	110121170091

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Dell	Latitude E7240	N/A
9 dBic Panel Antenna	Laird	S9028PCLJ-IP1	N/A

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB Cable	No	1.0m	No	Laptop	RFID Reader Module
RF Cable	Yes	2.4m	No	RFID Reader Module	Panel Antenna
DC Power	No	1.0m	No	DC Mains	RFID Reader Module

MODIFICATIONS

2017-1-25

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	11/21/2017	Carrier Frequency Separation	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	11/21/2017	Number of Hopping Frequencies	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	11/21/2017	Dwell Time	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	11/21/2017	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
5	11/21/2017	Band Edge Compliance - Hopping Mode	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	11/21/2017	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
7	11/21/2017	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
8	11/21/2017	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
9	11/22/2017	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
10	11/22/2017	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

POWERLINE CONDUCTED EMISSIONS

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Per the standard, an insulating material was also added to ground plane between the EUT's power and remote I/O cables. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50ohm measuring port is terminated by a 50ohm EMI meter or a 50ohm resistive load. All 50ohm measuring ports of the LISN are terminated by 50ohm. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Receiver	Rohde & Schwarz	ESCI	ARE	8/23/2017	8/23/2018
LISN	Solar Electronics	9252-50-R-24-BNC	LIM	8/16/2017	8/16/2018
Cable - Conducted Cable Assembly	Element	NC4, HHF, TYL	NC4A	4/17/2017	4/17/2018

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.4 dB	-2.4 dB

CONFIGURATIONS INVESTIGATED

7LAY0128-3

MODES INVESTIGATED

Continuously Transmitting RFID at Default Power = 27 dBm, Very Fast Mode, Mid Channel 26, 915.25 MHz.

POWERLINE CONDUCTED EMISSIONS

EUT:	Indy RS1000	Work Order:	7LAY0128
Serial Number:	110121170091	Date:	11/22/2017
Customer:	Impinj, Inc.	Temperature:	22°C
Attendees:	Paul Archer	Relative Humidity:	58%
Customer Project:	None	Bar. Pressure:	1017 mb
Tested By:	Richard Mellroth	Job Site:	NC05
Power:	5 VDC	Configuration:	7LAY0128-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2017	ANSI C63.10:2013

TEST PARAMETERS

Run #:	1	Line:	Positive Lead	Add. Ext. Attenuation (dB):	0

COMMENTS

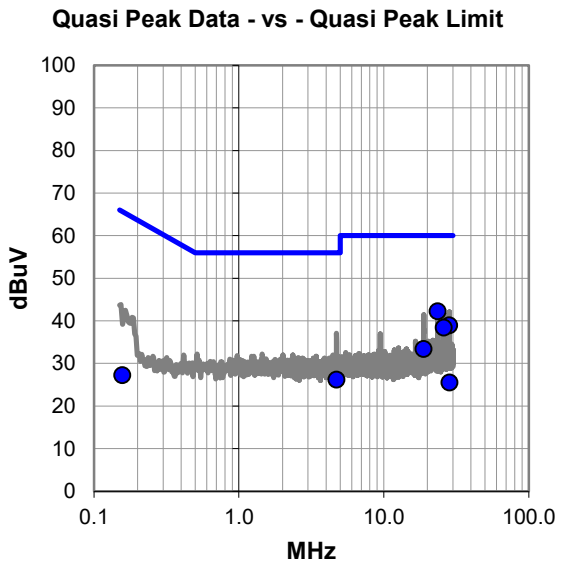
None

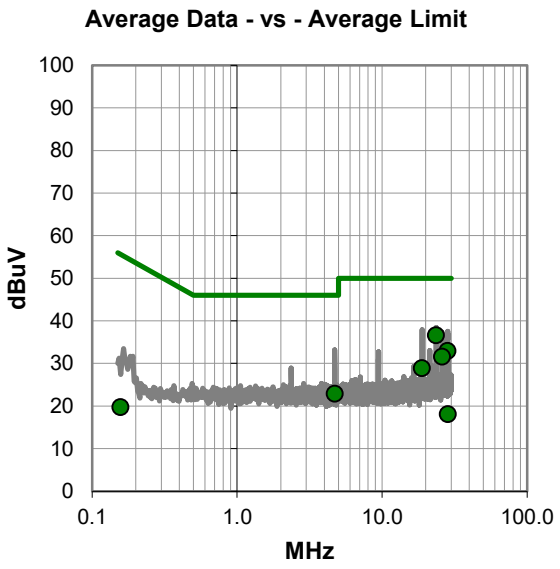
EUT OPERATING MODES

Continuously Transmitting RFID at Default Power = 27 dBm, Very Fast Mode, Mid Channel 26, 915.25 MHz.

DEVIATIONS FROM TEST STANDARD

None





POWERLINE CONDUCTED EMISSIONS

WTD.2017.07.11.1

RESULTS - Run #1

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
23.592	20.2	22.0	42.2	60.0	-17.8
28.309	16.4	22.5	38.9	60.0	-21.1
25.947	16.1	22.3	38.4	60.0	-21.6
18.874	11.8	21.6	33.4	60.0	-26.6
4.718	5.7	20.5	26.2	56.0	-29.8
28.478	2.9	22.6	25.5	60.0	-34.5
0.157	6.9	20.3	27.2	65.6	-38.4

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
23.592	14.6	22.0	36.6	50.0	-13.4
28.309	10.4	22.5	32.9	50.0	-17.1
25.947	9.3	22.3	31.6	50.0	-18.4
18.874	7.3	21.6	28.9	50.0	-21.1
4.718	2.4	20.5	22.9	46.0	-23.1
28.478	-4.5	22.6	18.1	50.0	-31.9
0.157	-0.6	20.3	19.7	55.6	-35.9

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	Indy RS1000	Work Order:	7LAY0128
Serial Number:	110121170091	Date:	11/22/2017
Customer:	Impinj, Inc.	Temperature:	22°C
Attendees:	Paul Archer	Relative Humidity:	58%
Customer Project:	None	Bar. Pressure:	1017 mb
Tested By:	Richard Mellroth	Job Site:	NC05
Power:	5 VDC	Configuration:	7LAY0128-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2017	ANSI C63.10:2013

TEST PARAMETERS

Run #:	2	Line:	Negative Lead	Add. Ext. Attenuation (dB):	0

COMMENTS

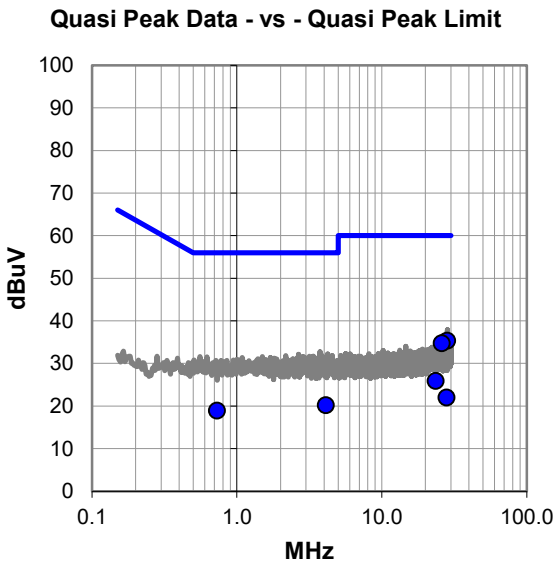
None

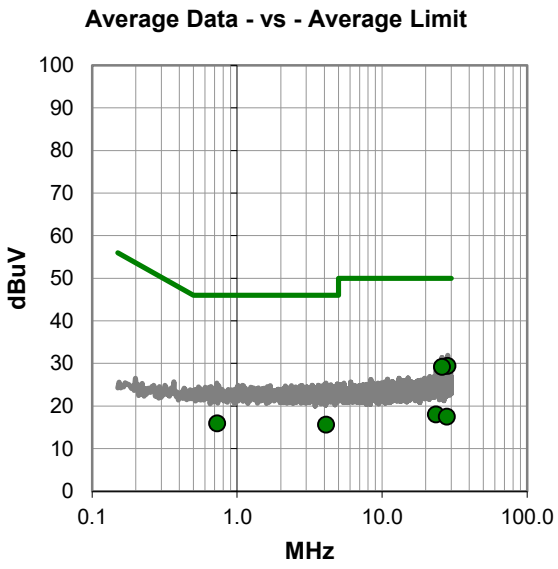
EUT OPERATING MODES

Continuously Transmitting RFID at Default Power = 27 dBm, Very Fast Mode, Mid Channel 26, 915.25 MHz.

DEVIATIONS FROM TEST STANDARD

None





POWERLINE CONDUCTED EMISSIONS

WTD.2017.07.11.1

RESULTS - Run #2

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
28.315	12.8	22.5	35.3	60.0	-24.7
25.954	12.4	22.3	34.7	60.0	-25.3
23.585	3.9	22.0	25.9	60.0	-34.1
4.119	-0.3	20.5	20.2	56.0	-35.8
0.729	-1.3	20.2	18.9	56.0	-37.1
27.981	-0.5	22.5	22.0	60.0	-38.0

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
28.315	6.9	22.5	29.4	50.0	-20.6
25.954	6.9	22.3	29.2	50.0	-20.8
0.729	-4.3	20.2	15.9	46.0	-30.1
4.119	-4.9	20.5	15.6	46.0	-30.4
23.585	-4.0	22.0	18.0	50.0	-32.0
27.981	-5.0	22.5	17.5	50.0	-32.5

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS

PSA-ESCI 2017.09.18

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Dense Reader Mode, PR-ASK
Very Fast Mode, DSB-ASK
Very Sensitive Mode, DSB-ASK

CHANNELS TESTED

Low Channel 1, 902.75 MHz
Mid Channel 26, 915.25 MHz
High Channel 50, 927.25 MHz

POWER SETTINGS INVESTIGATED

5 VDC

CONFIGURATIONS INVESTIGATED

7LAY0128 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	12.4 GHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	24-Jun-2017	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AYL	11-Aug-2017	24 mo
Antenna - Double Ridge	EMCO	3115	AHM	10-Jun-2016	24 mo
Antenna - Standard Gain	EMCO	3160-07	AHP	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	PAB	11-Jul-2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	19-May-2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	18-Aug-2017	12 mo
Cable	Element	Bilog Cables	NC1	11-Jul-2017	12 mo
Cable	Element	3115 Horn Cable	NC2	19-May-2017	12 mo
Cable	Element	Standard Gain Horn Cable	NC3	19-May-2017	12 mo
Filter - Low Pass	Micro-Tronics	LPM50003	LFE	19-Oct-2017	12 mo
Filter - High Pass	Micro-Tronics	HPM50114	HFN	27-Dec-2016	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	LFF	27-Dec-2016	12 mo
Filter - Band Pass/Notch	K&L Microwave	3TNF-500/1000-N/N	HHO	17-Apr-2017	12 mo

MEASUREMENT BANDWIDTHS

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These “pre-scans” are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

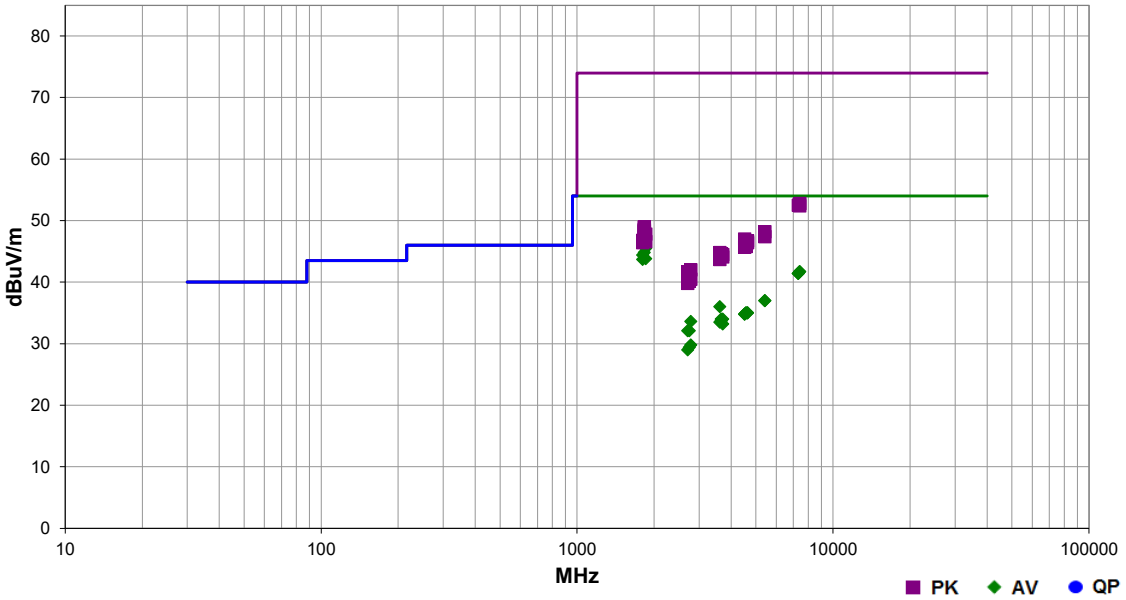
SPURIOUS RADIATED EMISSIONS

EmiR5 2017.07.11 PSA-ESCI 2017.09.18

Work Order:	7LAY0128	**Date:**	22-Nov-2017		
Project:	None	**Temperature:**	22 °C		
Job Site:	NC01	**Humidity:**	53% RH		
Serial Number:	110121170091	**Barometric Pres.:**	1018 mbar	**Tested by:**	Richard Mellroth
EUT:	Indy RS1000				
Configuration:	2				
Customer:	Impinj, Inc.				
Attendees:	Paul Archer				
EUT Power:	5 VDC				
Operating Mode:	Continuously Transmitting RFID at Default Power = 27 dBm. See comments next to data points for EUT channel, orientation, and data rate				
Deviations:	None				
Comments:	None				

Test Specifications	**Test Method**
FCC 15.247:2017	ANSI C63.10:2013

Run #	15	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
1830.495	49.3	-2.3	1.1	45.0	3.0	0.0	Horz	AV	0.0	47.0	54.0	-7.0	Mid Ch, Dense Reader, EUT Horz
1830.510	49.2	-2.3	1.1	45.0	3.0	0.0	Horz	AV	0.0	46.9	54.0	-7.1	Mid Ch, Very Fast, EUT Horz
1830.510	48.9	-2.3	1.2	44.0	3.0	0.0	Horz	AV	0.0	46.6	54.0	-7.4	Mid Ch, Very Sensitive, EUT Horz
1830.530	48.7	-2.3	2.7	44.0	3.0	0.0	Vert	AV	0.0	46.4	54.0	-7.6	Mid Ch, Very Fast, EUT Horz
1830.480	48.6	-2.3	1.2	51.0	3.0	0.0	Horz	AV	0.0	46.3	54.0	-7.7	Mid Ch, Very Fast, EUT Vert
1830.485	48.5	-2.3	1.6	57.0	3.0	0.0	Horz	AV	0.0	46.2	54.0	-7.8	Mid Ch, Very Fast, EUT Flat
1830.470	48.4	-2.3	2.1	29.0	3.0	0.0	Vert	AV	0.0	46.1	54.0	-7.9	Mid Ch, Very Fast, EUT Flat
1854.465	47.5	-2.0	2.2	64.0	3.0	0.0	Vert	AV	0.0	45.5	54.0	-8.5	High Ch, Very Fast, EUT Horz
1830.465	47.1	-2.3	1.7	148.0	3.0	0.0	Vert	AV	0.0	44.8	54.0	-9.2	Mid Ch, Very Fast, EUT Vert
1805.515	47.0	-2.6	2.2	57.0	3.0	0.0	Vert	AV	0.0	44.4	54.0	-9.6	Low Ch, Very Fast, EUT Horz
1854.490	45.8	-2.0	2.2	156.0	3.0	0.0	Horz	AV	0.0	43.8	54.0	-10.2	High Ch, Very Fast, EUT Horz
1805.510	46.3	-2.6	1.0	159.0	3.0	0.0	Horz	AV	0.0	43.7	54.0	-10.3	Low Ch, Very Fast, EUT Horz
7416.555	27.7	14.0	1.6	329.0	3.0	0.0	Horz	AV	0.0	41.7	54.0	-12.3	High Ch, Very Fast, EUT Horz
7416.735	27.7	14.0	1.6	129.0	3.0	0.0	Vert	AV	0.0	41.7	54.0	-12.3	High Ch, Very Fast, EUT Horz
7320.615	27.9	13.5	1.6	89.0	3.0	0.0	Horz	AV	0.0	41.4	54.0	-12.6	Mid Ch, Very Fast, EUT Horz
7321.050	27.9	13.5	1.6	87.0	3.0	0.0	Vert	AV	0.0	41.4	54.0	-12.6	Mid Ch, Very Fast, EUT Horz
5416.345	27.0	10.0	1.6	324.0	3.0	0.0	Horz	AV	0.0	37.0	54.0	-17.0	Low Ch, Very Fast, EUT Horz
5415.895	27.0	10.0	1.6	342.0	3.0	0.0	Vert	AV	0.0	37.0	54.0	-17.0	Low Ch, Very Fast, EUT Horz
3610.995	32.7	3.3	2.0	181.0	3.0	0.0	Horz	AV	0.0	36.0	54.0	-18.0	Low Ch, Very Fast, EUT Horz
4576.080	27.6	7.4	1.6	360.0	3.0	0.0	Horz	AV	0.0	35.0	54.0	-19.0	Mid Ch, Very Fast, EUT Horz
4576.680	27.6	7.4	2.6	65.0	3.0	0.0	Vert	AV	0.0	35.0	54.0	-19.0	Mid Ch, Very Fast, EUT Horz
4635.050	27.4	7.6	1.6	342.0	3.0	0.0	Horz	AV	0.0	35.0	54.0	-19.0	High Ch, Very Fast, EUT Horz
4635.535	27.4	7.6	1.6	53.0	3.0	0.0	Vert	AV	0.0	35.0	54.0	-19.0	High Ch, Very Fast, EUT Horz

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4512.705	27.5	7.3	1.6	287.0	3.0	0.0	Horz	AV	0.0	34.8	54.0	-19.2	Low Ch, Very Fast, EUT Horz
4512.400	27.5	7.3	1.6	337.0	3.0	0.0	Vert	AV	0.0	34.8	54.0	-19.2	Low Ch, Very Fast, EUT Horz
3661.045	30.3	3.7	1.6	32.0	3.0	0.0	Horz	AV	0.0	34.0	54.0	-20.0	Mid Ch, Very Fast, EUT Horz
3708.980	30.1	3.9	1.6	170.0	3.0	0.0	Vert	AV	0.0	34.0	54.0	-20.0	High Ch, Very Fast, EUT Horz
3660.980	30.0	3.7	1.6	80.0	3.0	0.0	Vert	AV	0.0	33.7	54.0	-20.3	Mid Ch, Very Fast, EUT Horz
2781.745	33.7	-0.1	2.0	14.0	3.0	0.0	Vert	AV	0.0	33.6	54.0	-20.4	High Ch, Very Fast, EUT Horz
3610.995	30.2	3.3	1.6	85.0	3.0	0.0	Vert	AV	0.0	33.5	54.0	-20.5	Low Ch, Very Fast, EUT Horz
3709.070	29.3	3.9	1.6	97.0	3.0	0.0	Horz	AV	0.0	33.2	54.0	-20.8	High Ch, Very Fast, EUT Horz
7418.165	38.8	14.0	1.6	129.0	3.0	0.0	Vert	PK	0.0	52.8	74.0	-21.2	High Ch, Very Fast, EUT Horz
7321.635	39.0	13.5	1.6	89.0	3.0	0.0	Horz	PK	0.0	52.5	74.0	-21.5	Mid Ch, Very Fast, EUT Horz
7321.555	39.0	13.5	1.6	87.0	3.0	0.0	Vert	PK	0.0	52.5	74.0	-21.5	Mid Ch, Very Fast, EUT Horz
7416.945	38.4	14.0	1.6	329.0	3.0	0.0	Horz	PK	0.0	52.4	74.0	-21.6	High Ch, Very Fast, EUT Horz
2745.695	32.3	-0.2	2.0	3.0	3.0	0.0	Vert	AV	0.0	32.1	54.0	-21.9	Mid Ch, Very Fast, EUT Horz
2708.205	32.3	-0.2	1.6	343.0	3.0	0.0	Vert	AV	0.0	32.1	54.0	-21.9	Low Ch, Very Fast, EUT Horz
2781.840	29.9	-0.1	1.6	58.0	3.0	0.0	Horz	AV	0.0	29.8	54.0	-24.2	High Ch, Very Fast, EUT Horz
2745.700	29.6	-0.2	3.5	238.0	3.0	0.0	Horz	AV	0.0	29.4	54.0	-24.6	Mid Ch, Very Fast, EUT Horz
1830.600	51.3	-2.3	1.1	45.0	3.0	0.0	Horz	PK	0.0	49.0	74.0	-25.0	Mid Ch, Dense Reader, EUT Horz
2708.150	29.2	-0.2	1.6	33.0	3.0	0.0	Horz	AV	0.0	29.0	54.0	-25.0	Low Ch, Very Fast, EUT Horz
1830.485	51.2	-2.3	1.1	45.0	3.0	0.0	Horz	PK	0.0	48.9	74.0	-25.1	Mid Ch, Very Fast, EUT Horz
1830.350	50.9	-2.3	1.2	44.0	3.0	0.0	Horz	PK	0.0	48.6	74.0	-25.4	Mid Ch, Very Sensitive, EUT Horz
1830.500	50.8	-2.3	1.2	51.0	3.0	0.0	Horz	PK	0.0	48.5	74.0	-25.5	Mid Ch, Very Fast, EUT Vert
1830.575	50.7	-2.3	2.7	44.0	3.0	0.0	Vert	PK	0.0	48.4	74.0	-25.6	Mid Ch, Very Fast, EUT Horz
1830.415	50.6	-2.3	1.6	57.0	3.0	0.0	Horz	PK	0.0	48.3	74.0	-25.7	Mid Ch, Very Fast, EUT Flat
1830.480	50.5	-2.3	2.1	29.0	3.0	0.0	Vert	PK	0.0	48.2	74.0	-25.8	Mid Ch, Very Fast, EUT Flat
5417.920	38.2	10.0	1.6	324.0	3.0	0.0	Horz	PK	0.0	48.2	74.0	-25.8	Low Ch, Very Fast, EUT Horz
1854.575	49.8	-2.0	2.2	64.0	3.0	0.0	Vert	PK	0.0	47.8	74.0	-26.2	High Ch, Very Fast, EUT Horz
1830.520	49.7	-2.3	1.7	148.0	3.0	0.0	Vert	PK	0.0	47.4	74.0	-26.6	Mid Ch, Very Fast, EUT Vert
5417.880	37.4	10.0	1.6	342.0	3.0	0.0	Vert	PK	0.0	47.4	74.0	-26.6	Low Ch, Very Fast, EUT Horz
4514.290	39.7	7.3	1.6	337.0	3.0	0.0	Vert	PK	0.0	47.0	74.0	-27.0	Low Ch, Very Fast, EUT Horz
1805.425	49.4	-2.6	2.2	57.0	3.0	0.0	Vert	PK	0.0	46.8	74.0	-27.2	Low Ch, Very Fast, EUT Horz
4636.935	39.1	7.6	1.6	342.0	3.0	0.0	Horz	PK	0.0	46.7	74.0	-27.3	High Ch, Very Fast, EUT Horz
1854.480	48.6	-2.0	2.2	156.0	3.0	0.0	Horz	PK	0.0	46.6	74.0	-27.4	High Ch, Very Fast, EUT Horz
1805.555	49.0	-2.6	1.0	159.0	3.0	0.0	Horz	PK	0.0	46.4	74.0	-27.6	Low Ch, Very Fast, EUT Horz
4576.195	39.0	7.4	2.6	65.0	3.0	0.0	Vert	PK	0.0	46.4	74.0	-27.6	Mid Ch, Very Fast, EUT Horz
4636.950	38.8	7.6	1.6	53.0	3.0	0.0	Vert	PK	0.0	46.4	74.0	-27.6	High Ch, Very Fast, EUT Horz
4576.515	38.4	7.4	1.6	360.0	3.0	0.0	Horz	PK	0.0	45.8	74.0	-28.2	Mid Ch, Very Fast, EUT Horz
4513.400	38.4	7.3	1.6	287.0	3.0	0.0	Horz	PK	0.0	45.7	74.0	-28.3	Low Ch, Very Fast, EUT Horz
3611.140	41.5	3.3	2.0	181.0	3.0	0.0	Horz	PK	0.0	44.8	74.0	-29.2	Low Ch, Very Fast, EUT Horz
3661.190	40.9	3.7	1.6	80.0	3.0	0.0	Vert	PK	0.0	44.6	74.0	-29.4	Mid Ch, Very Fast, EUT Horz
3660.635	40.8	3.7	1.6	32.0	3.0	0.0	Horz	PK	0.0	44.5	74.0	-29.5	Mid Ch, Very Fast, EUT Horz
3708.495	40.6	3.9	1.6	170.0	3.0	0.0	Vert	PK	0.0	44.5	74.0	-29.5	High Ch, Very Fast, EUT Horz
3709.305	40.2	3.9	1.6	97.0	3.0	0.0	Horz	PK	0.0	44.1	74.0	-29.9	High Ch, Very Fast, EUT Horz
3611.240	40.4	3.3	1.6	85.0	3.0	0.0	Vert	PK	0.0	43.7	74.0	-30.3	Low Ch, Very Fast, EUT Horz
2781.790	42.1	-0.1	2.0	14.0	3.0	0.0	Vert	PK	0.0	42.0	74.0	-32.0	High Ch, Very Fast, EUT Horz
2709.090	41.9	-0.2	1.6	343.0	3.0	0.0	Vert	PK	0.0	41.7	74.0	-32.3	Low Ch, Very Fast, EUT Horz
2745.300	41.0	-0.2	2.0	3.0	3.0	0.0	Vert	PK	0.0	40.8	74.0	-33.2	Mid Ch, Very Fast, EUT Horz
2782.075	40.6	-0.1	1.6	58.0	3.0	0.0	Horz	PK	0.0	40.5	74.0	-33.5	High Ch, Very Fast, EUT Horz
2744.735	40.4	-0.2	3.5	238.0	3.0	0.0	Horz	PK	0.0	40.2	74.0	-33.8	Mid Ch, Very Fast, EUT Horz
2708.365	40.0	-0.2	1.6	33.0	3.0	0.0	Horz	PK	0.0	39.8	74.0	-34.2	Low Ch, Very Fast, EUT Horz

DUTY CYCLE

XMit 2017.09.21

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	19-May-17	19-May-18
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	20-Apr-17	20-Apr-18
Attenuator	Weinschel	54A-6	TYQ	25-Oct-17	25-Oct-18
Attenuator	Fairview Microwave	SA4014-20	TKV	9-Mar-17	9-Mar-18
Block - DC	Fairview Microwave	SD3379	AMU	20-Apr-17	20-Apr-18
Generator - Signal	Agilent	N5183A	TIA	6-Apr-16	6-Apr-18

TEST DESCRIPTION

The Duty Cycle (x) of the single channel operation of the radio as controlled by the provided test software was measured for each of the EUT operating modes.

There is no compliance requirement to be met by this test, so therefore no Pass / Fail criteria.

The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum.

The test software provided for operation in a fixed, single channel mode allows the EUT to operate continuously at 100% Duty Cycle.

CARRIER FREQUENCY SEPARATION

XMit 2017.09.21

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TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
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Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	20-Apr-17	20-Apr-18
Attenuator	Weinschel	54A-6	TYQ	25-Oct-17	25-Oct-18
Attenuator	Fairview Microwave	SA4014-20	TKV	9-Mar-17	9-Mar-18
Block - DC	Fairview Microwave	SD3379	AMU	20-Apr-17	20-Apr-18
Generator - Signal	Agilent	N5183A	TIA	6-Apr-16	6-Apr-18

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The channel carrier frequencies in the 902-928 MHz band must be separated by 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. The EUT was operated in pseudorandom hopping mode. The spectrum was scanned across two adjacent peaks. The separation between the peaks of these channels was measured.

CARRIER FREQUENCY SEPARATION

NweTx 2016.09.14.2 XMit 2017.09.21

EUT:	Indy RS1000			**Work Order:**	7LAY0128
Serial Number:	110121170091			**Date:**	21-Nov-17
Customer:	Impinj, Inc.			**Temperature:**	21.6 °C
Attendees:	Paul Archer			**Humidity:**	41.2% RH
Project:	None			**Barometric Pres.:**	1013 mbar
Tested by:	Richard Mellroth	**Power:**	5 VDC	**Job Site:**	NC02

TEST SPECIFICATIONS	Test Method
FCC 15.247:2017	ANSI C63.10:2013

COMMENTS

Transmitting at Defaut Power Setting = 27dBm

DEVIATIONS FROM TEST STANDARD

None

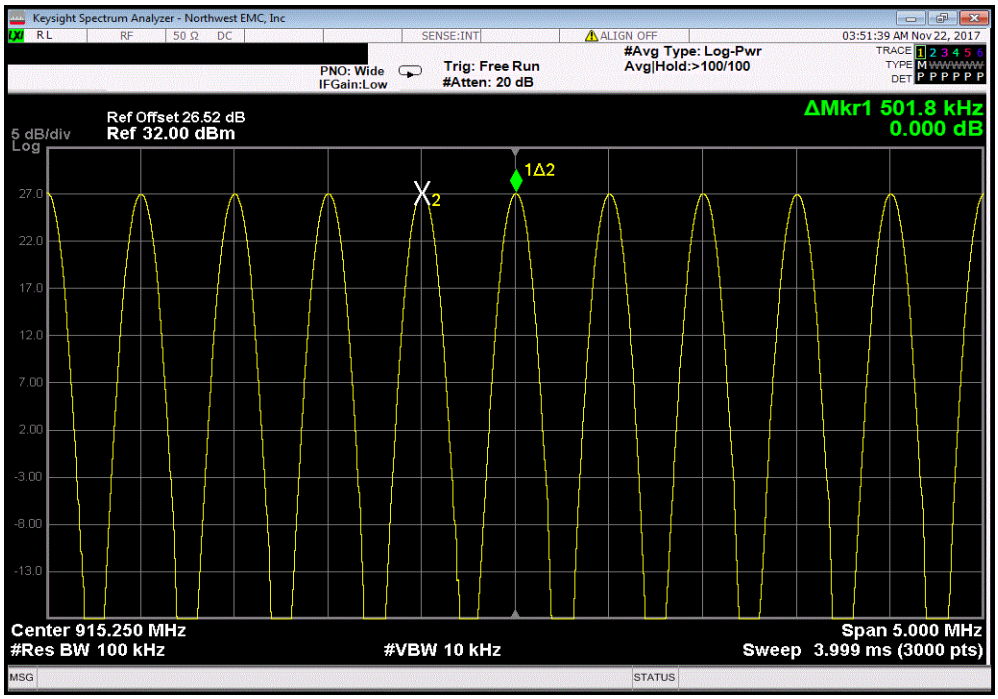
Configuration #	1	Signature

		Value	Limit (≥)	Results
Hopping Mode				
	Dense Reader, PR-ASK			
	Mid Channel, 915.25 MHz	0.5 MHz	45 kHz	Pass
	Very Fast, DSB-ASK			
	Mid Channel, 915.25 MHz	0.5 MHz	385 kHz	Pass
	Very Sensitive, DSB-ASK			
	Mid Channel, 915.25 MHz	0.5 MHz	83 kHz	Pass

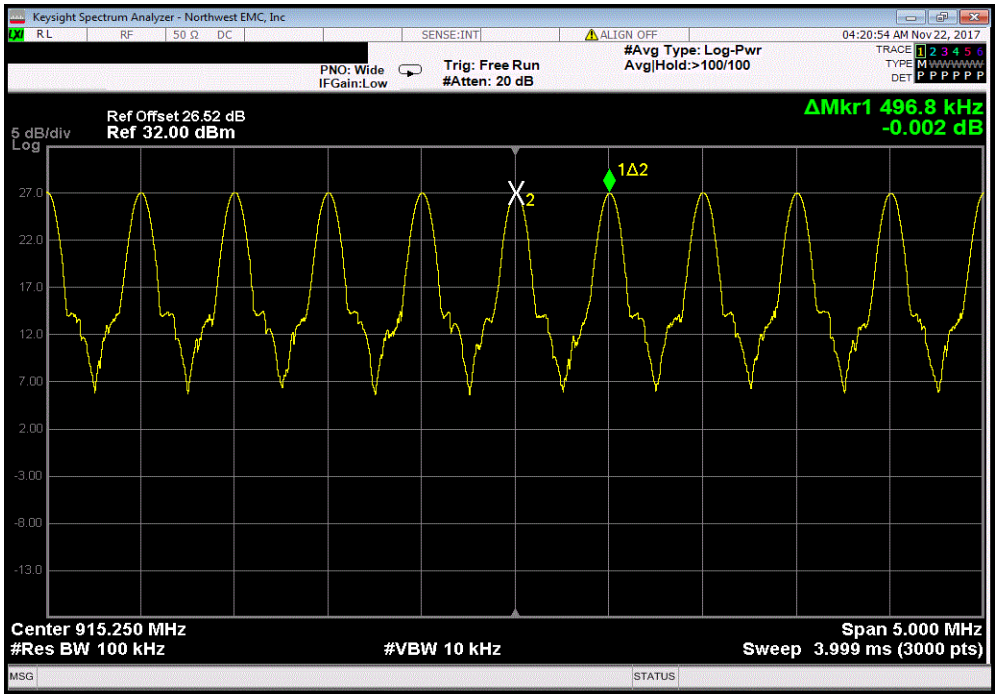
CARRIER FREQUENCY SEPARATION

NweTx 2016.09.14.2 XMit 2017.09.21

Hopping Mode, Dense Reader, PR-ASK, Mid Channel, 915.25 MHz						
				Value	Limit (≥)	Results
				0.5 MHz	45 kHz	Pass



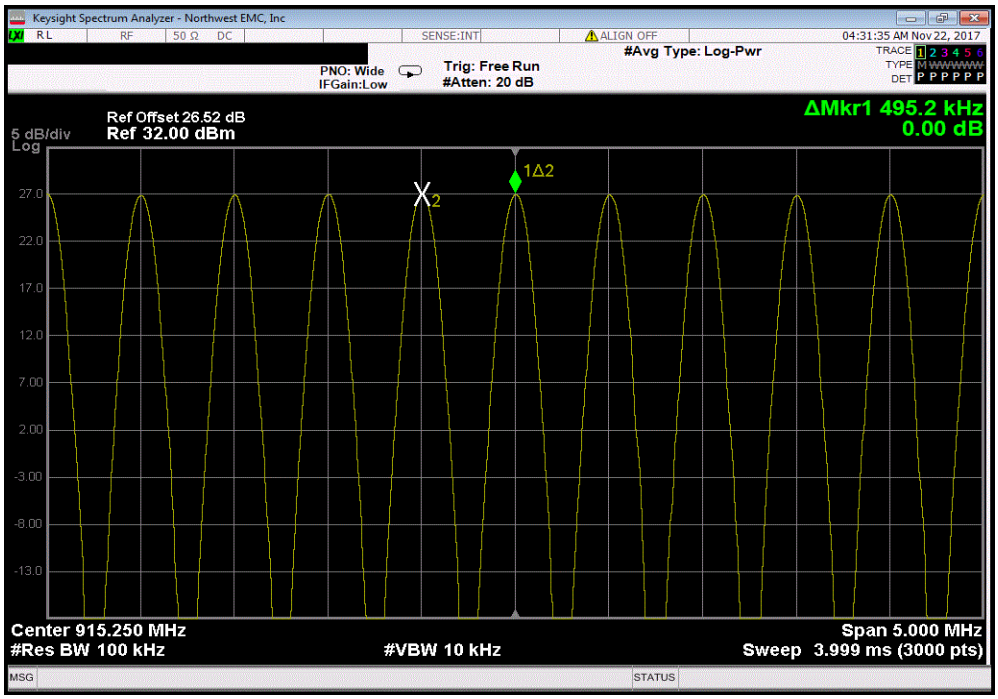
Hopping Mode, Very Fast, DSB-ASK, Mid Channel, 915.25 MHz						
				Value	Limit (≥)	Results
				0.5 MHz	385 kHz	Pass



CARRIER FREQUENCY SEPARATION

NweTx 2016.09.14.2 XMit 2017.09.21

Hopping Mode, Very Sensitive, DSB-ASK, Mid Channel, 915.25 MHz						
				Value	Limit (≥)	Results
				0.5 MHz	83 kHz	Pass



NUMBER OF HOPPING FREQUENCIES

XMit 2017.09.21

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
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Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	20-Apr-17	20-Apr-18
Attenuator	Weinschel	54A-6	TYQ	25-Oct-17	25-Oct-18
Attenuator	Fairview Microwave	SA4014-20	TKV	9-Mar-17	9-Mar-18
Block - DC	Fairview Microwave	SD3379	AMU	20-Apr-17	20-Apr-18
Generator - Signal	Agilent	N5183A	TIA	6-Apr-16	6-Apr-18

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The number of hopping frequencies was measured across the authorized band. The hopping function of the EUT was enabled.

NUMBER OF HOPPING FREQUENCIES

NweTx 2016.09.14.2 XMit 2017.09.21

EUT:	Indy RS1000			Work Order:	7LAY0128
Serial Number:	110121170091			Date:	21-Nov-17
Customer:	Impinj, Inc.			Temperature:	21.6 °C
Attendees:	Paul Archer			Humidity:	41.2% RH
Project:	None			Barometric Pres.:	1013 mbar
Tested by:	Richard Mellroth	Power:	5 VDC	Job Site:	NC02

TEST SPECIFICATIONS	Test Method
FCC 15.247:2017	ANSI C63.10:2013

COMMENTS

Transmitting at Defaut Power Setting = 27dBm

DEVIATIONS FROM TEST STANDARD

None

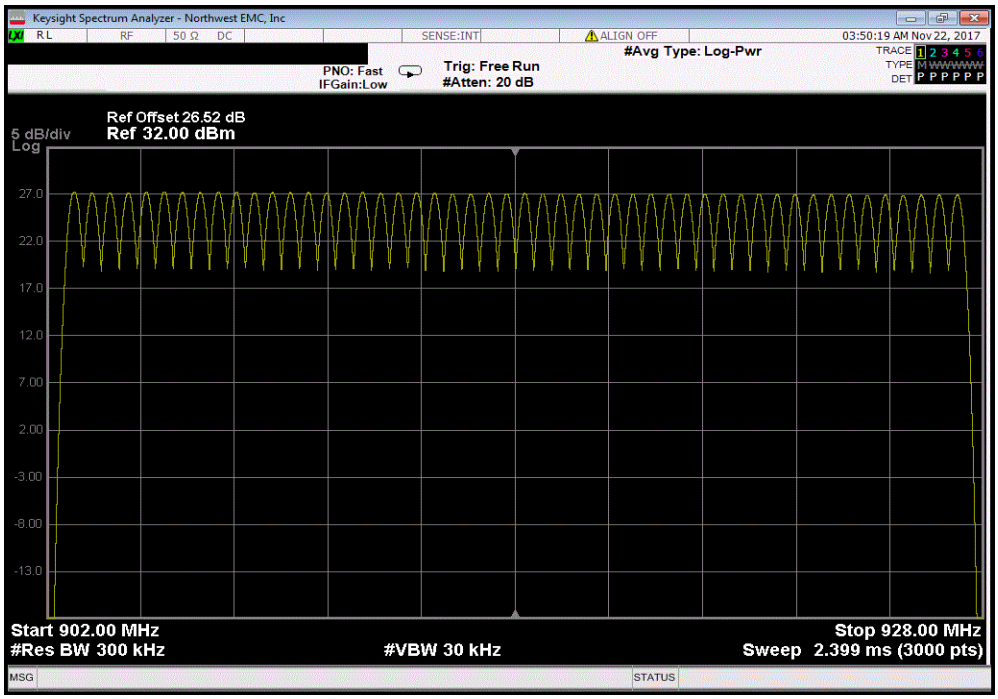
Configuration #	1	Signature

	Number of Channels	Limit (≥)	Results
Hopping Mode			
Dense Reader, PR-ASK			
Mid Channel, 915.25 MHz	50	50	Pass
Very Fast, DSB-ASK			
Mid Channel, 915.25 MHz	50	50	Pass
Very Sensitive, DSB-ASK			
Mid Channel, 915.25 MHz	50	50	Pass

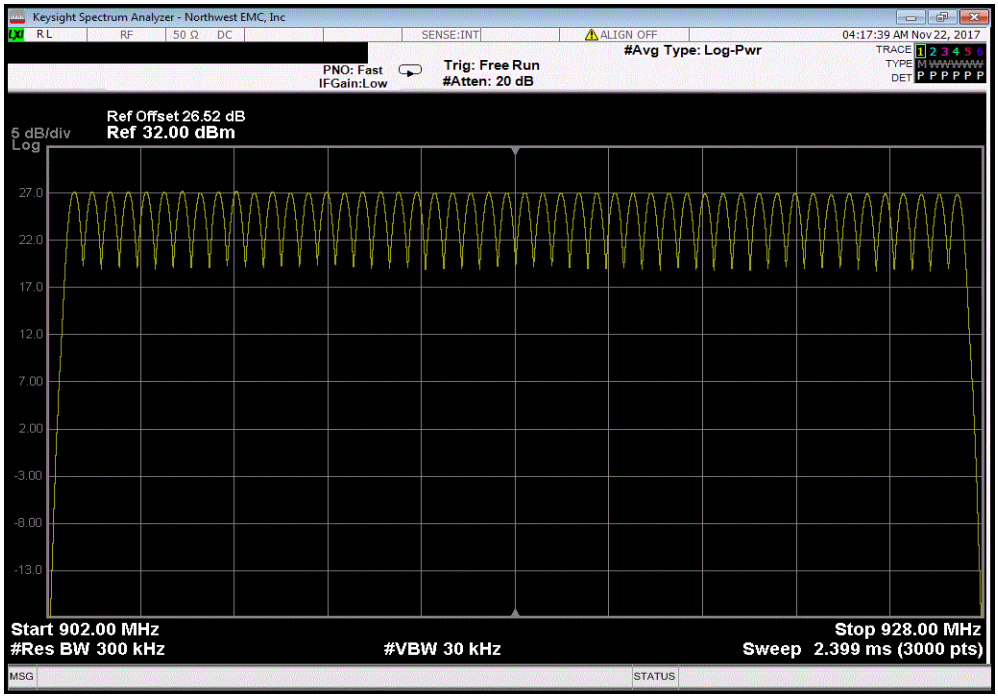
NUMBER OF HOPPING FREQUENCIES

NweTx 2016.09.14.2 XMit 2017.09.21

Hopping Mode, Dense Reader, PR-ASK, Mid Channel, 915.25 MHz						
				Number of Channels	Limit (≥)	Results
				50	50	Pass



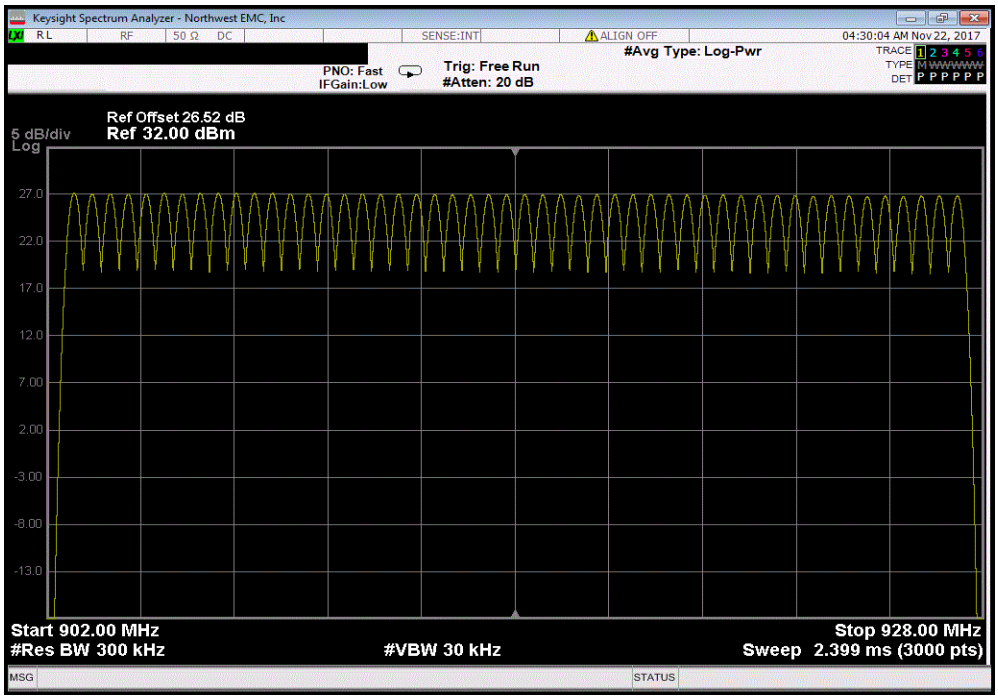
Hopping Mode, Very Fast, DSB-ASK, Mid Channel, 915.25 MHz						
				Number of Channels	Limit (≥)	Results
				50	50	Pass



NUMBER OF HOPPING FREQUENCIES

NweTx 2016.09.14.2 XMit 2017.09.21

Hopping Mode, Very Sensitive, DSB-ASK, Mid Channel, 915.25 MHz						
				Number of Channels	Limit (≥)	Results
				50	50	Pass



DWELL TIME

XMit 2017.09.21

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	19-May-17	19-May-18
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	20-Apr-17	20-Apr-18
Attenuator	Weinschel	54A-6	TYQ	25-Oct-17	25-Oct-18
Attenuator	Fairview Microwave	SA4014-20	TKV	9-Mar-17	9-Mar-18
Block - DC	Fairview Microwave	SD3379	AMU	20-Apr-17	20-Apr-18
Generator - Signal	Agilent	N5183A	TIA	6-Apr-16	6-Apr-18

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The average dwell time per hopping channel was measured at one hopping channel in the middle of the authorized band. The hopping function of the EUT was enabled.

The dwell time limit for frequency hopping systems in the 902-928 MHz band is determined by the 20 dB bandwidth of the hopping channel:

If the 20 dB bandwidth of the hopping channel is less than 250 kHz, the average time of ocupancy 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 average time of ocupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.

DWELL TIME

NweTx 2016.09.14.2 XMit 2017.09.21

EUT:	Indy RS1000			Work Order:	7LAY0128
Serial Number:	110121170091			Date:	21-Nov-17
Customer:	Impinj, Inc.			Temperature:	21.5 °C
Attendees:	Paul Archer			Humidity:	43.1% RH
Project:	None			Barometric Pres.:	1012 mbar
Tested by:	Richard Mellroth	Power:	5 VDC	Job Site:	NC02

TEST SPECIFICATIONS	Test Method
FCC 15.247:2017	ANSI C63.10:2013

COMMENTS

Transmitting at Defaut Power Setting = 27dBm

DEVIATIONS FROM TEST STANDARD

None

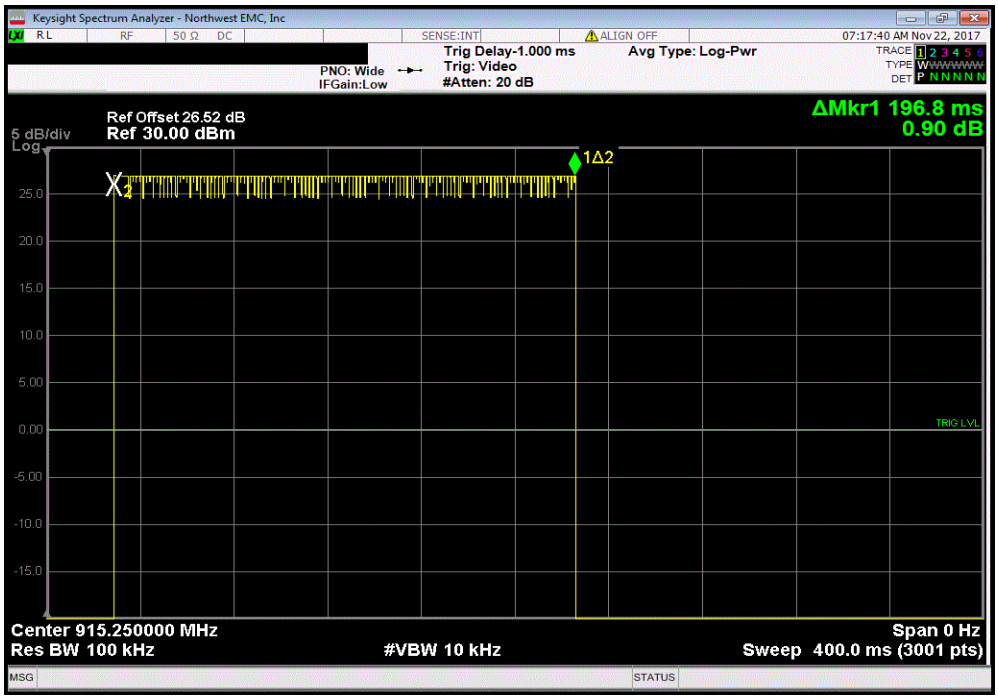
Configuration #	1	Signature

		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Limit (ms)	Results
Hopping Mode						
	Dense Reader, PR-ASK					
	Single Pulse Width	196.8	N/A	N/A	N/A	N/A
	1 Second Sweep	N/A	1	N/A	N/A	N/A
	5 Second Sweep	N/A	1	N/A	N/A	N/A
	10 Second Sweep	N/A	1	N/A	N/A	N/A
	20 Second Sweep	N/A	2	N/A	N/A	N/A
	Dwell Time Calculation	196.8	2	393.6	≤ 400	Pass
	Very Fast, DSB-ASK					
	Single Pulse Width	197.165	N/A	N/A	N/A	N/A
	1 Second Sweep	N/A	1	N/A	N/A	N/A
	2 Second Sweep	N/A	1	N/A	N/A	N/A
	5 Second Sweep	N/A	1	N/A	N/A	N/A
	10 Second Sweep	N/A	1	N/A	N/A	N/A
	Dwell Time Calculation	197.165	1	197.165	≤ 400	Pass
	Very Sensitive, DSB-ASK					
	Single Pulse Width	196.765	N/A	N/A	N/A	N/A
	1 Second Sweep	N/A	1	N/A	N/A	N/A
	5 Second Sweep	N/A	1	N/A	N/A	N/A
	10 Second Sweep	N/A	1	N/A	N/A	N/A
	20 Second Sweep	N/A	2	N/A	N/A	N/A
	Dwell Time Calculation	196.765	2	393.53	≤ 400	Pass

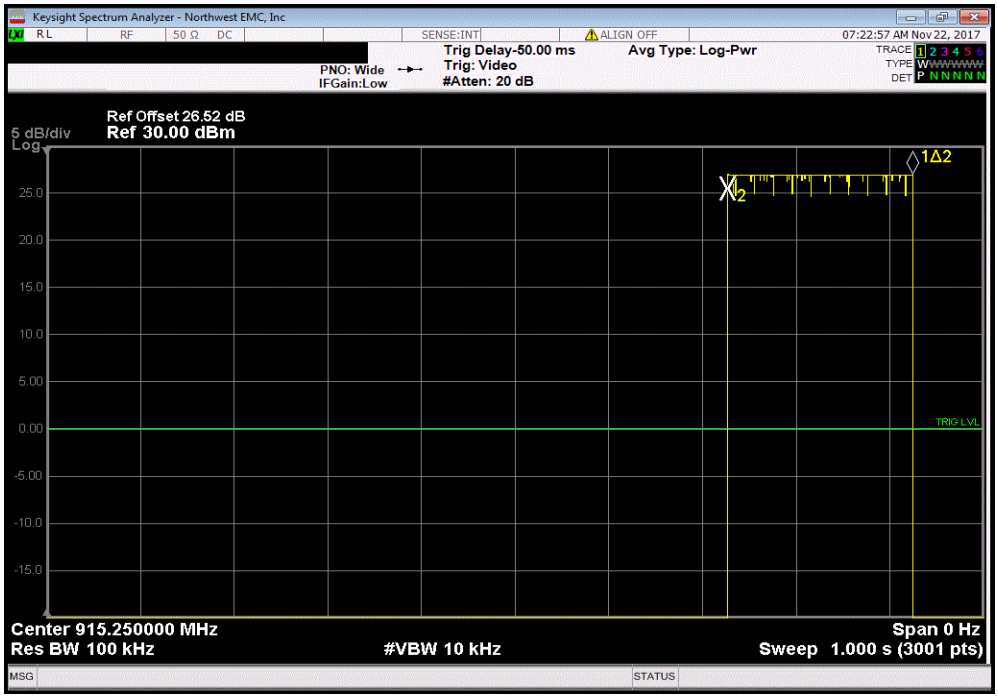
DWELL TIME

NweTx 2016.09.14.2 XMit 2017.09.21

Hopping Mode, Dense Reader, PR-ASK, Mid Channel, 915.25 MHz						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Limit (ms)	Results
		196.8	N/A	N/A	N/A	N/A



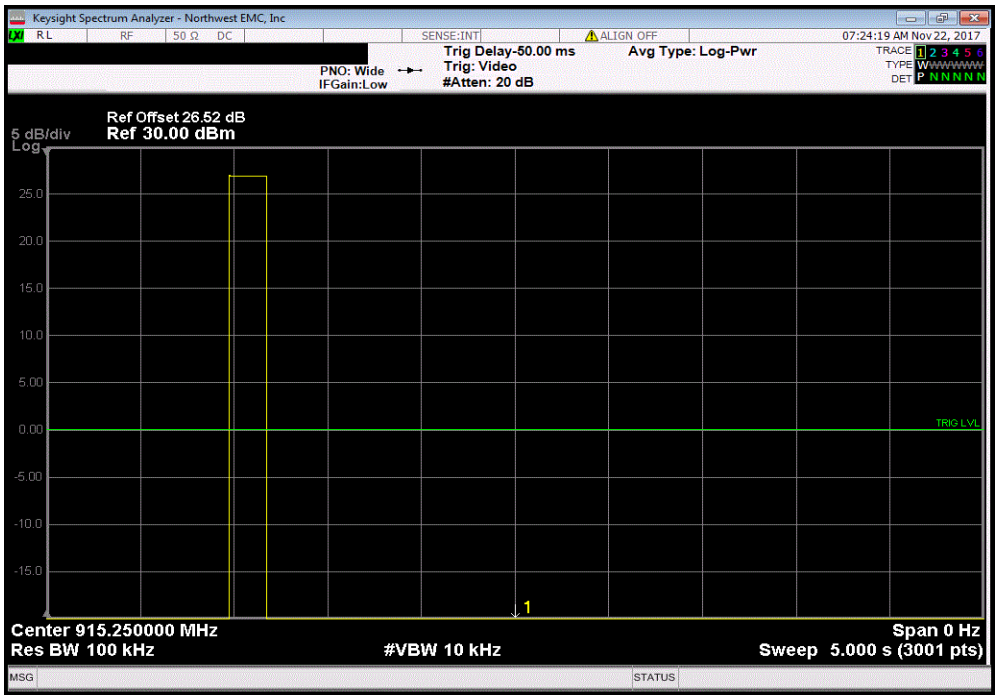
Hopping Mode, Dense Reader, PR-ASK, Mid Channel, 915.25 MHz						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Limit (ms)	Results
		N/A	1	N/A	N/A	N/A



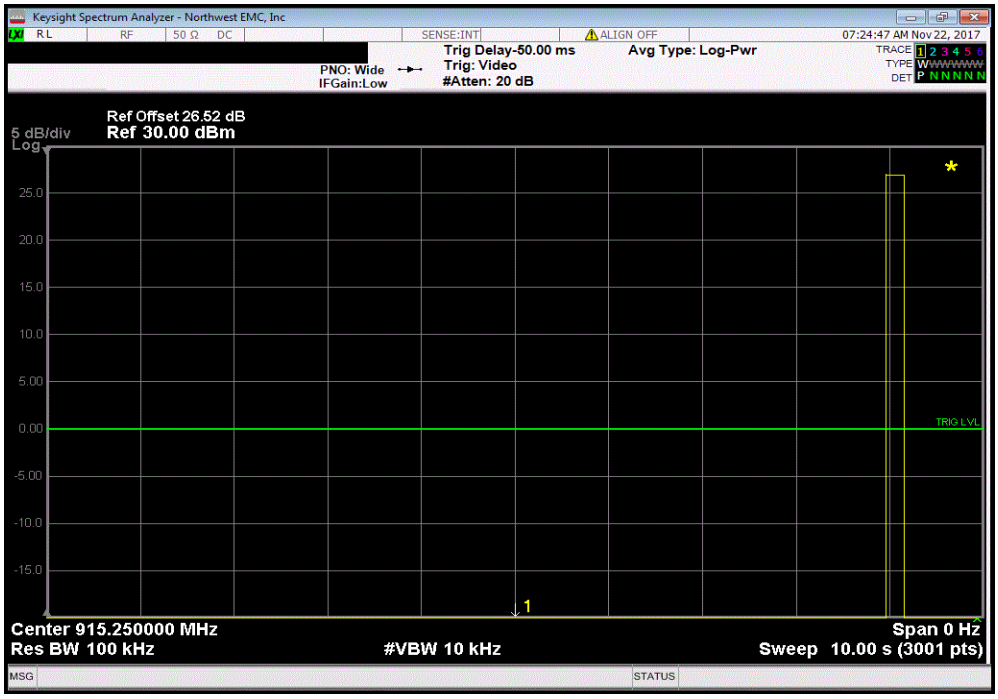
DWELL TIME

NweTx 2016.09.14.2 XMit 2017.09.21

Hopping Mode, Dense Reader, PR-ASK, Mid Channel, 915.25 MHz						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Limit (ms)	Results
		N/A	1	N/A	N/A	N/A



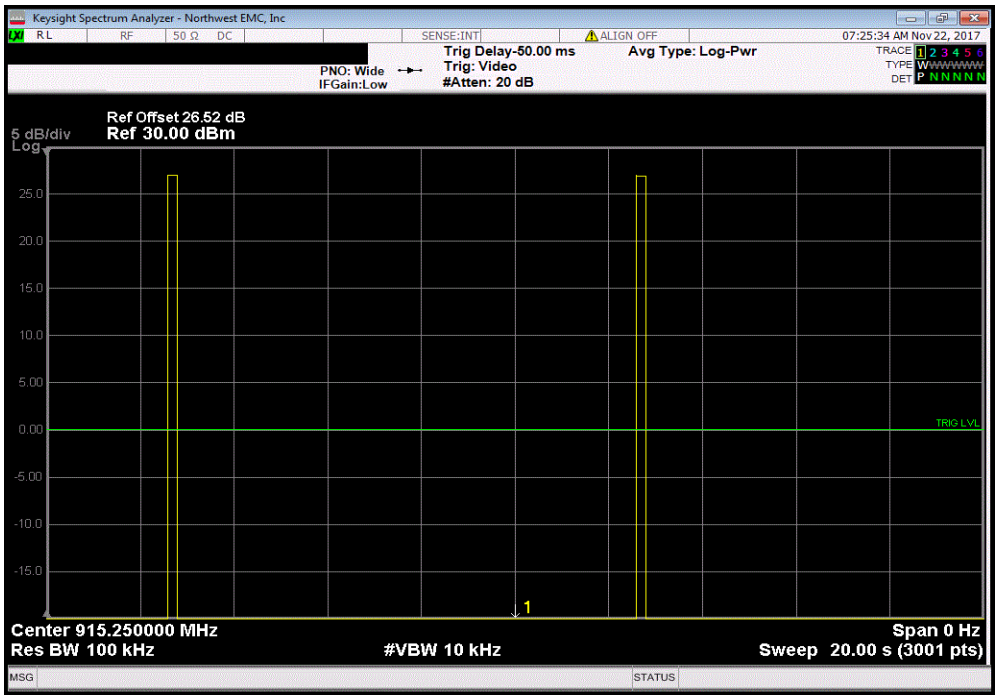
Hopping Mode, Dense Reader, PR-ASK, Mid Channel, 915.25 MHz						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Limit (ms)	Results
		N/A	1	N/A	N/A	N/A



DWELL TIME

NweTx 2016.09.14.2 XMit 2017.09.21

Hopping Mode, Dense Reader, PR-ASK, Mid Channel, 915.25 MHz						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Limit (ms)	Results
		N/A	2	N/A	N/A	N/A



Hopping Mode, Dense Reader, PR-ASK, Mid Channel, 915.25 MHz						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Limit (ms)	Results
		196.8	2	393.6	≤ 400	Pass

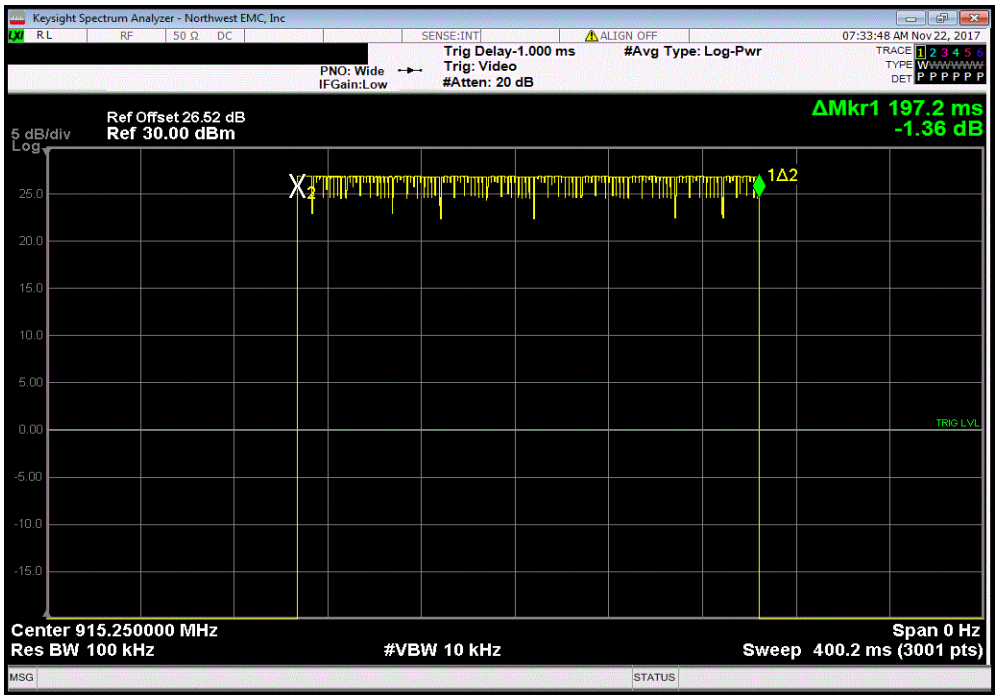
Calculation Only

No Screen Capture Required

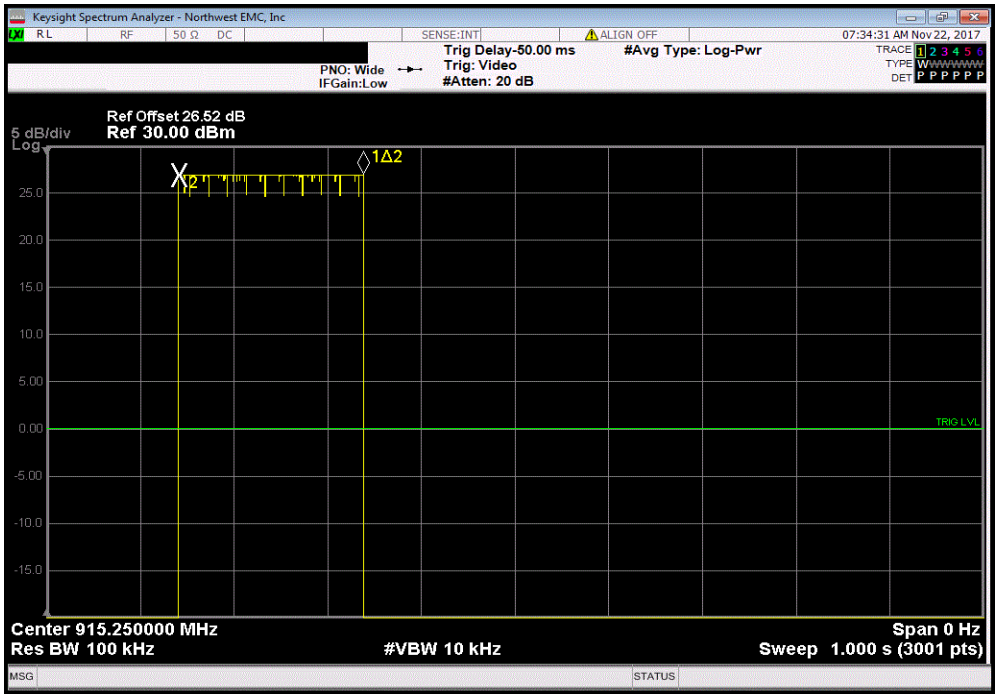
DWELL TIME

NweTx 2016.09.14.2 XMit 2017.09.21

Hopping Mode, Very Fast, DSB-ASK, Mid Channel, 915.25 MHz						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Limit (ms)	Results
		197.165	N/A	N/A	N/A	N/A



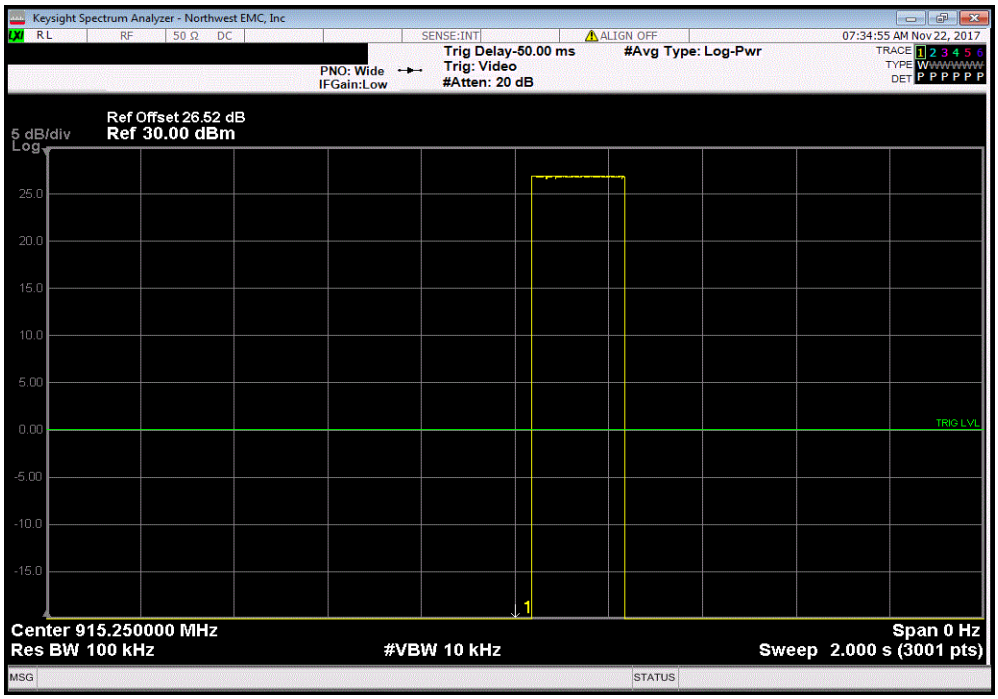
Hopping Mode, Very Fast, DSB-ASK, Mid Channel, 915.25 MHz						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Limit (ms)	Results
		N/A	1	N/A	N/A	N/A



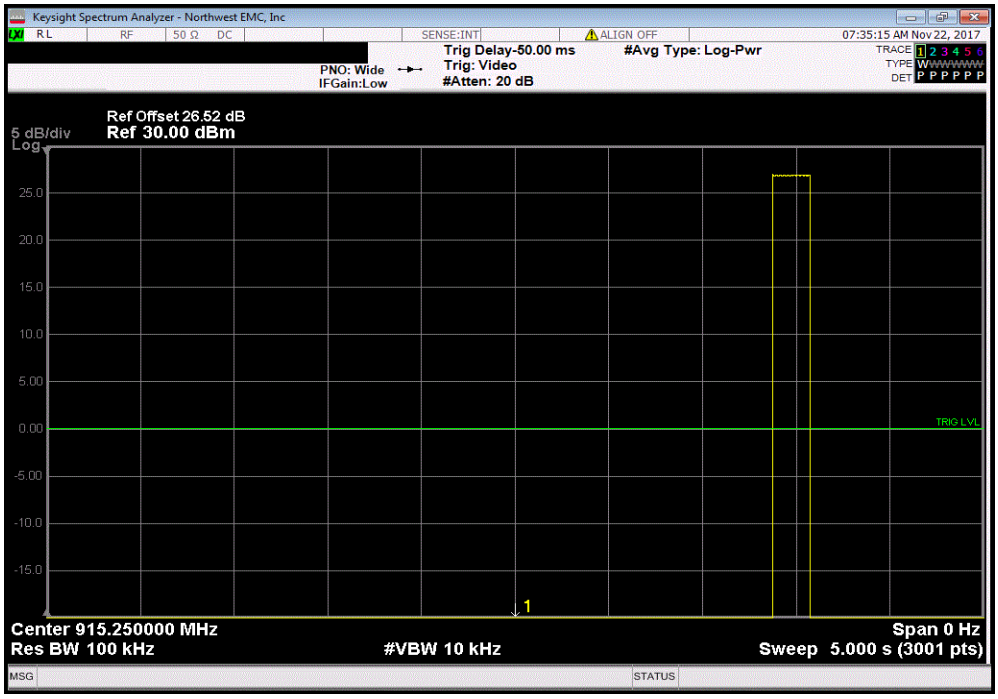
DWELL TIME

NweTx 2016.09.14.2 XMit 2017.09.21

Hopping Mode, Very Fast, DSB-ASK, Mid Channel, 915.25 MHz						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Limit (ms)	Results
		N/A	1	N/A	N/A	N/A



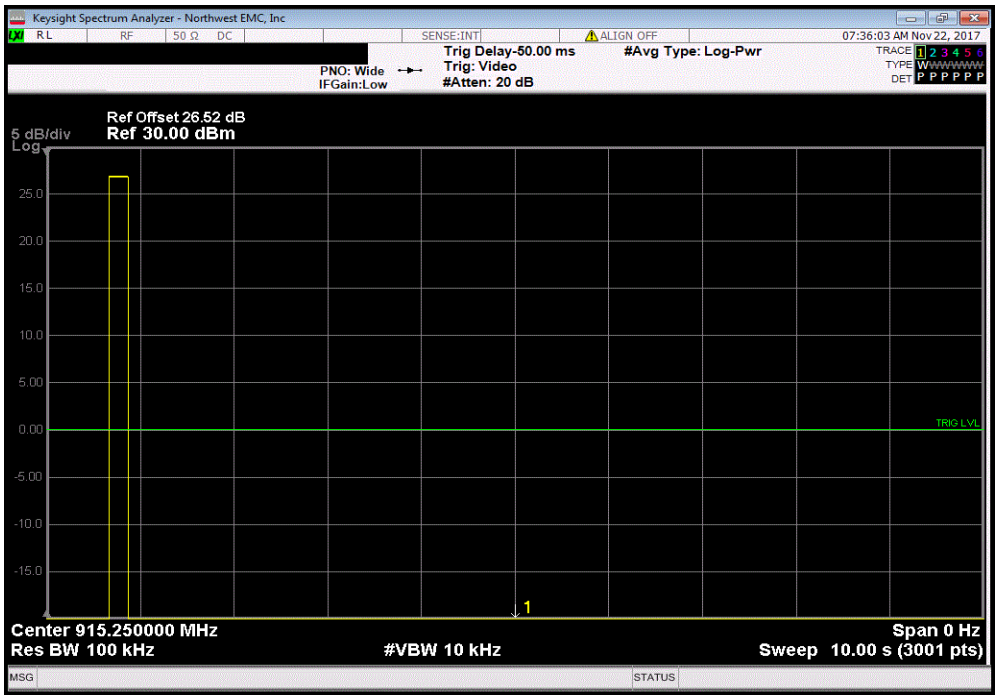
Hopping Mode, Very Fast, DSB-ASK, Mid Channel, 915.25 MHz						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Limit (ms)	Results
		N/A	1	N/A	N/A	N/A



DWELL TIME

NweTx 2016.09.14.2 XMit 2017.09.21

Hopping Mode, Very Fast, DSB-ASK, Mid Channel, 915.25 MHz						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Limit (ms)	Results
		N/A	1	N/A	N/A	N/A



Hopping Mode, Very Fast, DSB-ASK, Mid Channel, 915.25 MHz						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Limit (ms)	Results
		197.165	1	197.165	≤ 400	Pass

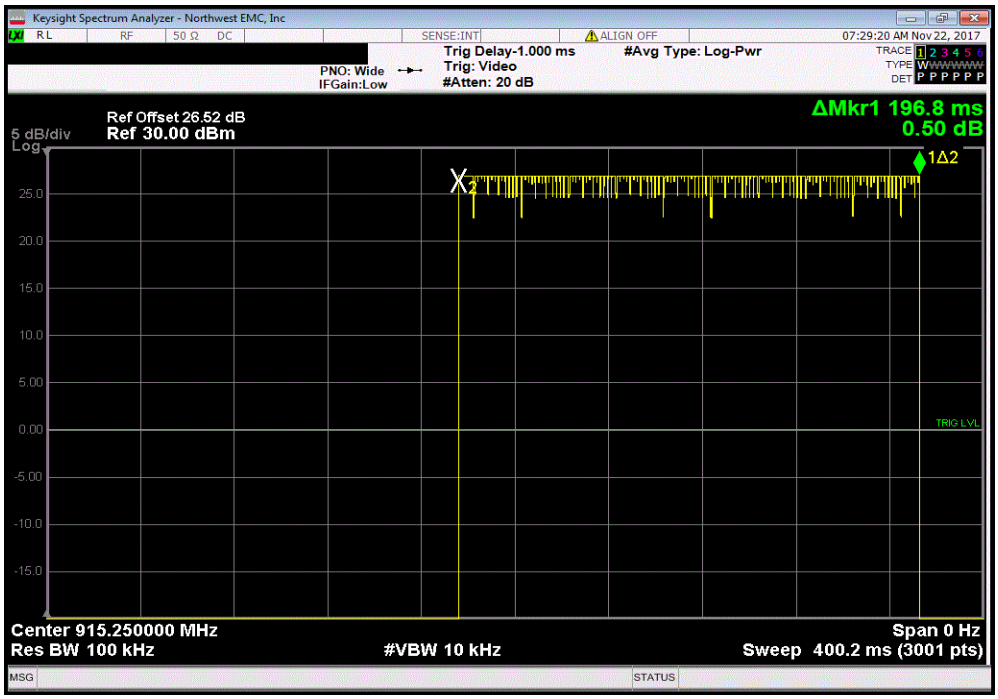
Calculation Only

No Screen Capture Required

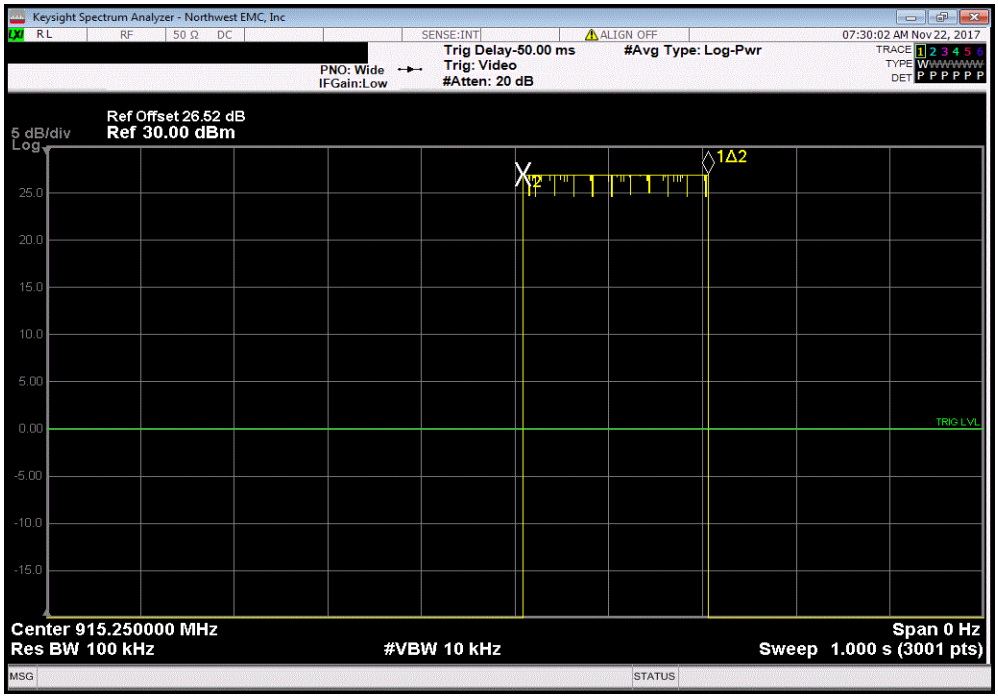
DWELL TIME

NweTx 2016.09.14.2 XMit 2017.09.21

Hopping Mode, Very Sensitive, DSB-ASK, Mid Channel, 915.25 MHz						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Limit (ms)	Results
		196.765	N/A	N/A	N/A	N/A



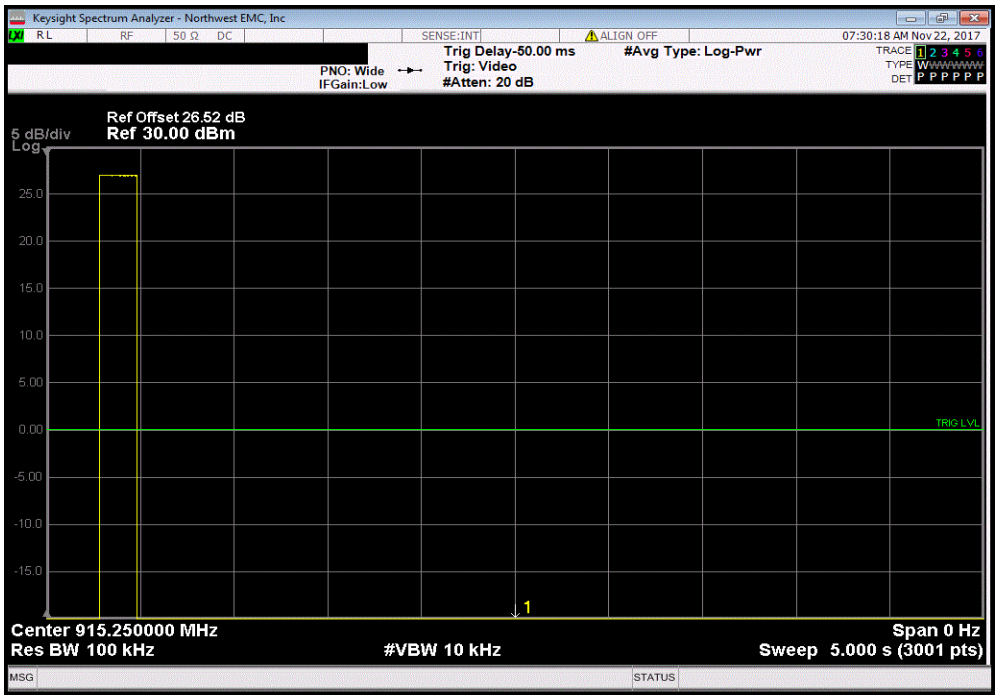
Hopping Mode, Very Sensitive, DSB-ASK, Mid Channel, 915.25 MHz						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Limit (ms)	Results
		N/A	1	N/A	N/A	N/A



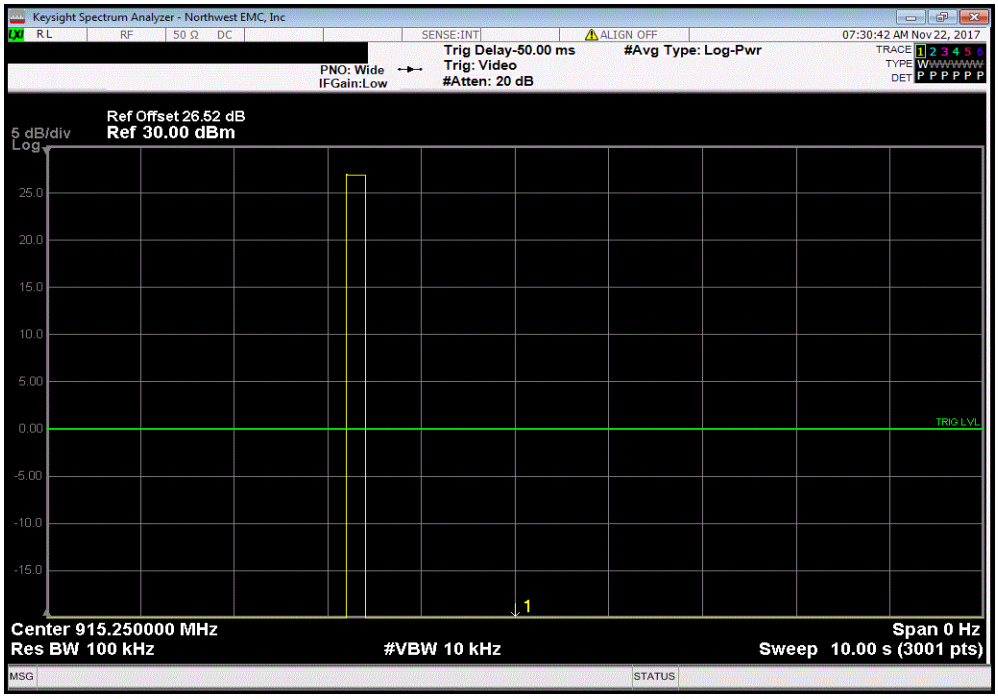
DWELL TIME

NweTx 2016.09.14.2 XMit 2017.09.21

Hopping Mode, Very Sensitive, DSB-ASK, Mid Channel, 915.25 MHz						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Limit (ms)	Results
		N/A	1	N/A	N/A	N/A



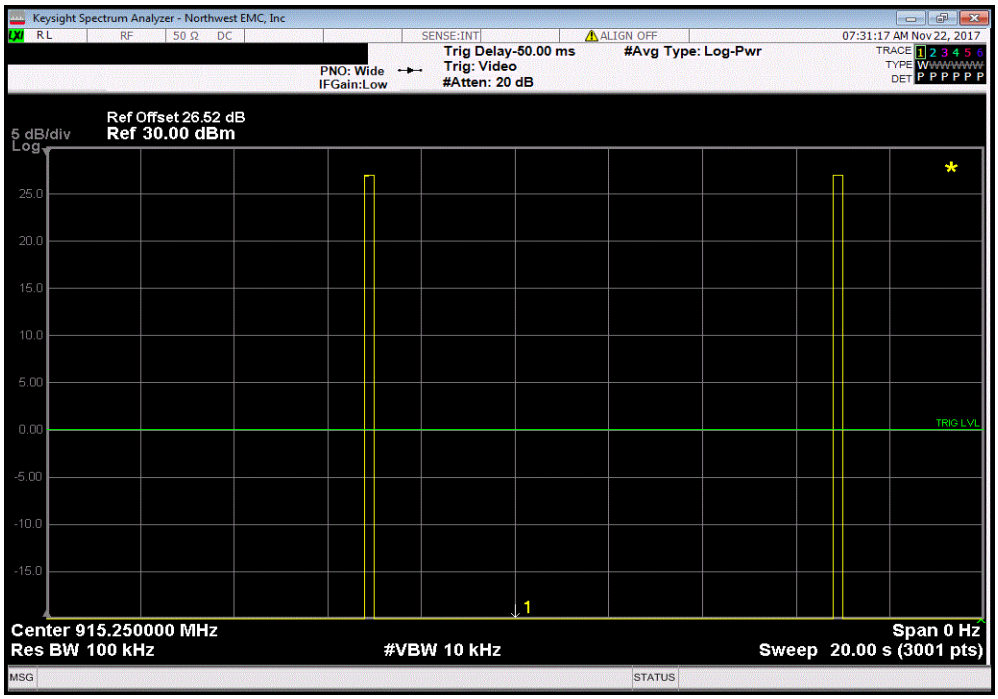
Hopping Mode, Very Sensitive, DSB-ASK, Mid Channel, 915.25 MHz						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Limit (ms)	Results
		N/A	1	N/A	N/A	N/A



DWELL TIME

NweTx 2016.09.14.2 XMit 2017.09.21

Hopping Mode, Very Sensitive, DSB-ASK, Mid Channel, 915.25 MHz						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Limit (ms)	Results
		N/A	2	N/A	N/A	N/A



Hopping Mode, Very Sensitive, DSB-ASK, Mid Channel, 915.25 MHz						
		Pulse Width (ms)	Number of Pulses	Total On Time (ms)	Limit (ms)	Results
		196.765	2	393.53	≤ 400	Pass

Calculation Only

No Screen Capture Required

OUTPUT POWER

XMit 2017.09.21

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	19-May-17	19-May-18
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	20-Apr-17	20-Apr-18
Attenuator	Weinschel	54A-6	TYQ	25-Oct-17	25-Oct-18
Attenuator	Fairview Microwave	SA4014-20	TKV	9-Mar-17	9-Mar-18
Block - DC	Fairview Microwave	SD3379	AMU	20-Apr-17	20-Apr-18
Generator - Signal	Agilent	N5183A	TIA	6-Apr-16	6-Apr-18

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The peak output power was measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting in a no hop mode at the data rate(s) listed in the datasheet.

The method found in ANSI C63.10:2013 Section 7.8.5 was used for a FHSS radio.

De Facto EIRP Limit: The EUT meets the de facto EIRP limit of +36 dBm.

OUTPUT POWER

NweTx 2016.09.14.2 XMit 2017.09.21

EUT:	Indy RS1000			Work Order:	7LAY0128
Serial Number:	110121170091			Date:	21-Nov-17
Customer:	Impinj, Inc.			Temperature:	21.5 °C
Attendees:	Paul Archer			Humidity:	41.5% RH
Project:	None			Barometric Pres.:	1013 mbar
Tested by:	Richard Mellroth	Power:	5 VDC	Job Site:	NC02

TEST SPECIFICATIONS	Test Method
FCC 15.247:2017	ANSI C63.10:2013

COMMENTS

Transmitting at Defaut Power Setting = 27dBm

DEVIATIONS FROM TEST STANDARD

None

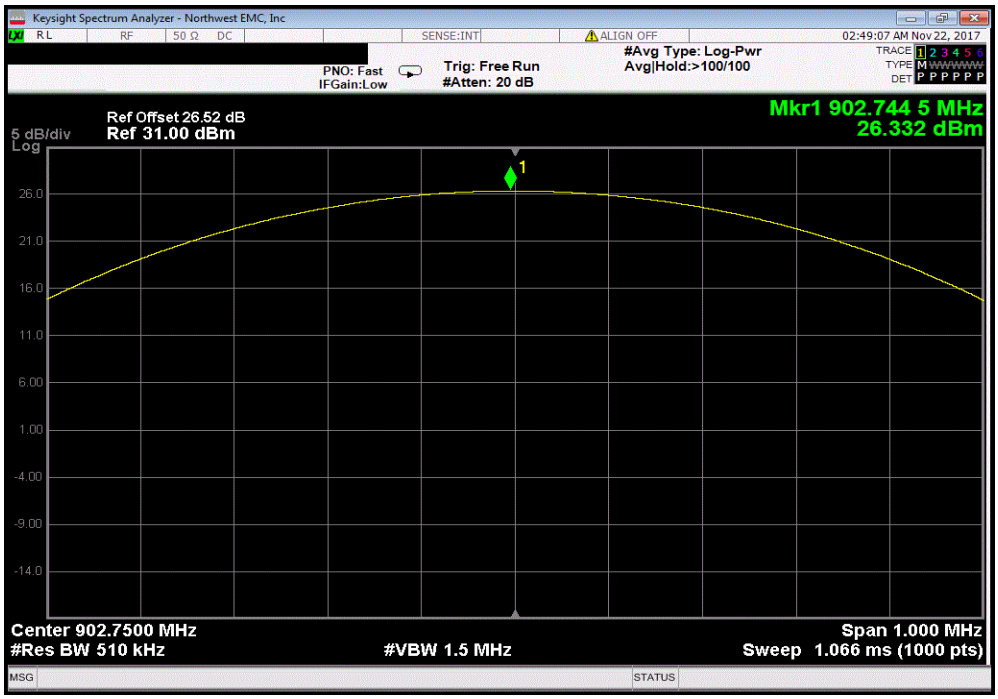
Configuration #	1	Signature

		Value	Limit (≤)	Result
Non-Hopping Mode				
	Dense Reader, PR-ASK			
	Low Channel 1, 902.75 MHz	26.332 dBm	30 dBm	Pass
	Mid Channel 26, 915.25 MHz	26.197 dBm	30 dBm	Pass
	High Channel 50, 927.25 MHz	25.914 dBm	30 dBm	Pass
	Very Fast, DSB-ASK			
	Low Channel 1, 902.75 MHz	26.358 dBm	30 dBm	Pass
	Mid Channel 26, 915.25 MHz	26.62 dBm	30 dBm	Pass
	High Channel 50, 927.25 MHz	27.13 dBm	30 dBm	Pass
	Very Sensitive, DSB-ASK			
	Low Channel 1, 902.75 MHz	26.517 dBm	30 dBm	Pass
	Mid Channel 26, 915.25 MHz	26.643 dBm	30 dBm	Pass
	High Channel 50, 927.25 MHz	26.692 dBm	30 dBm	Pass

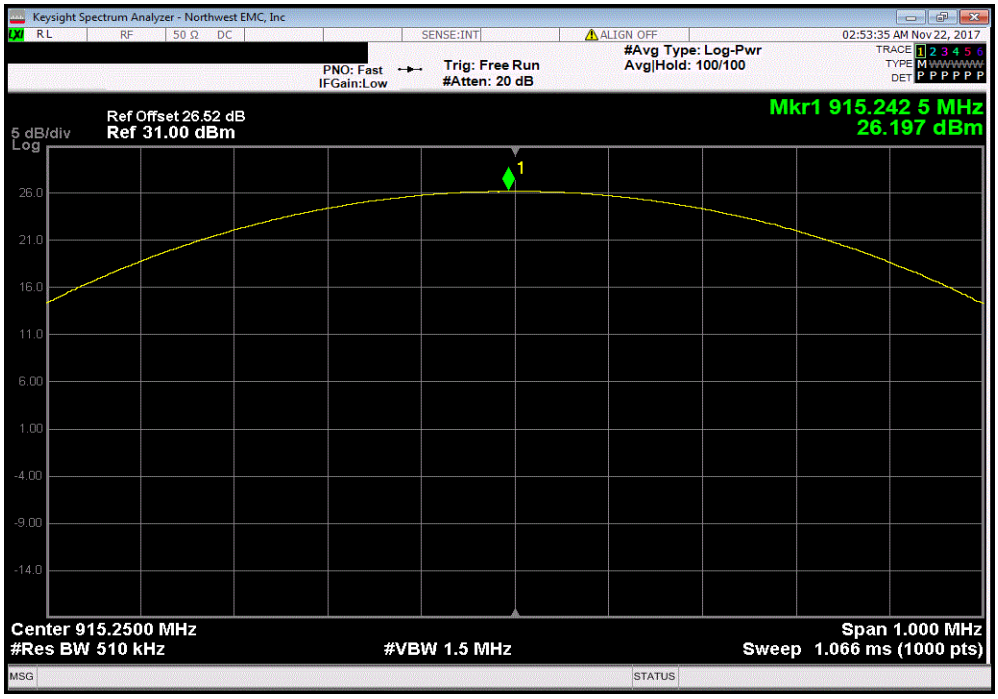
OUTPUT POWER

NweTx 2016.09.14.2 XMit 2017.09.21

Non-Hopping Mode, Dense Reader, PR-ASK, Low Channel 1, 902.75 MHz						
				Value	Limit (≤)	Result
				26.332 dBm	30 dBm	Pass



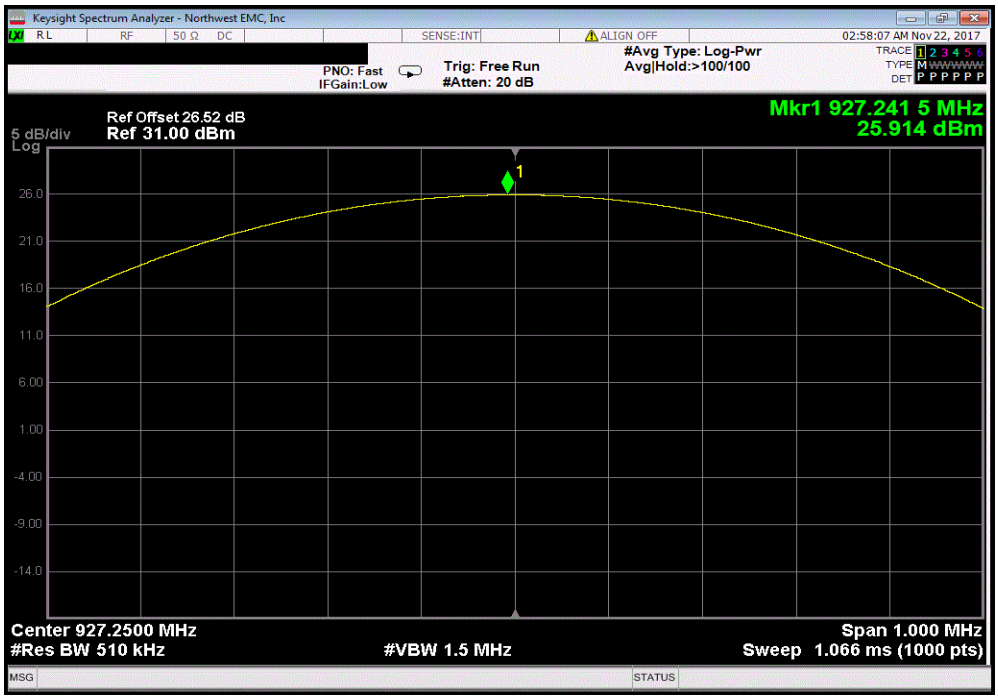
Non-Hopping Mode, Dense Reader, PR-ASK, Mid Channel 26, 915.25 MHz						
				Value	Limit (≤)	Result
				26.197 dBm	30 dBm	Pass



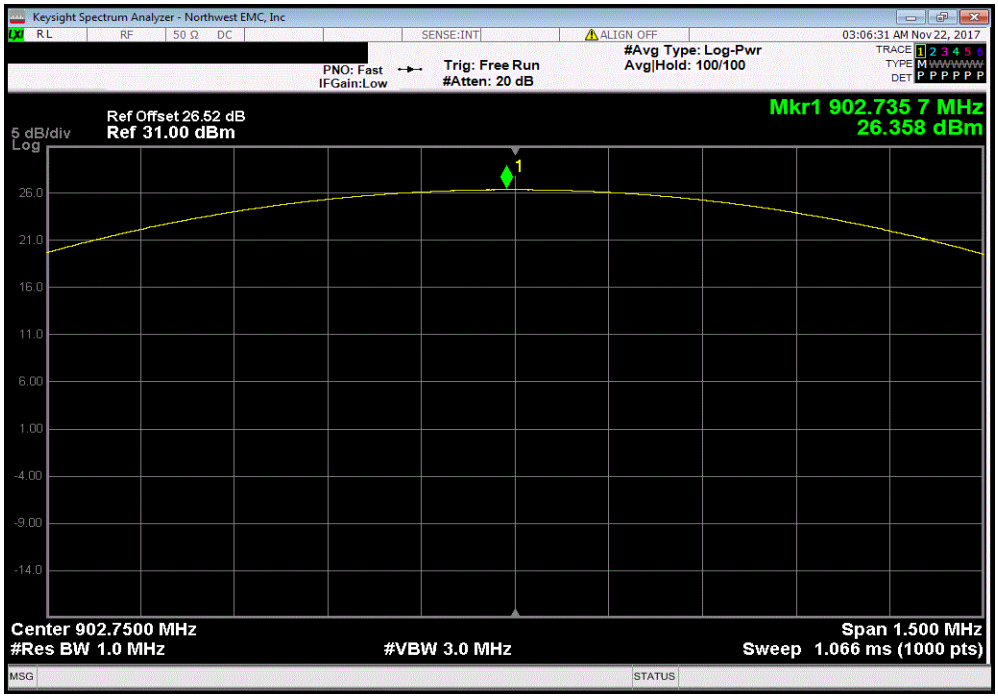
OUTPUT POWER

NweTx 2016.09.14.2 XMit 2017.09.21

Non-Hopping Mode, Dense Reader, PR-ASK, High Channel 50, 927.25 MHz						
				Value	Limit (≤)	Result
				25.914 dBm	30 dBm	Pass



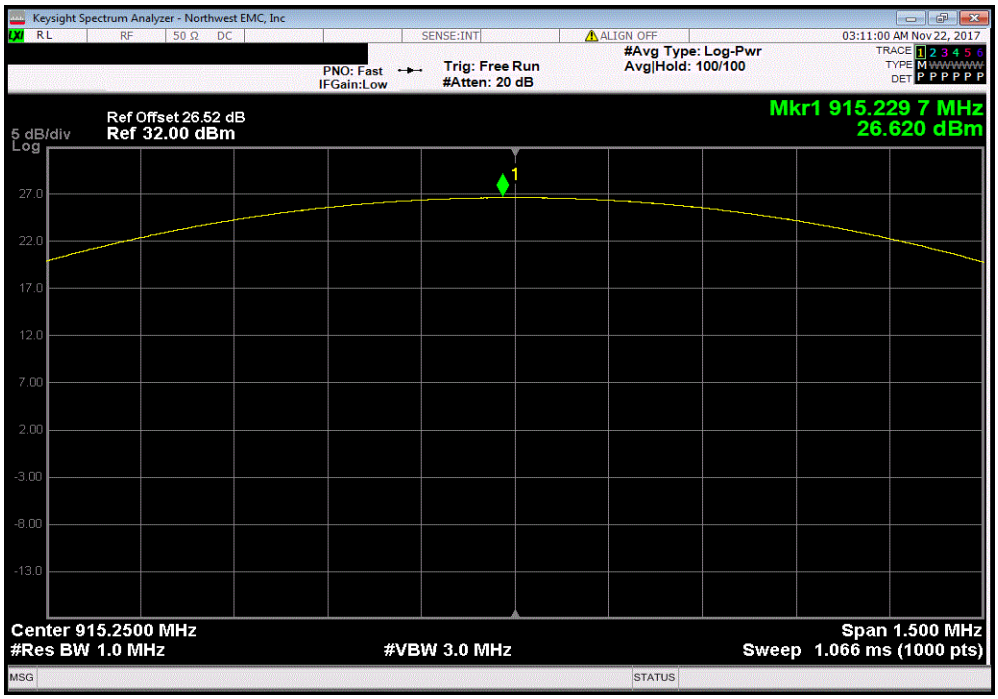
Non-Hopping Mode, Very Fast, DSB-ASK, Low Channel 1, 902.75 MHz						
				Value	Limit (≤)	Result
				26.358 dBm	30 dBm	Pass



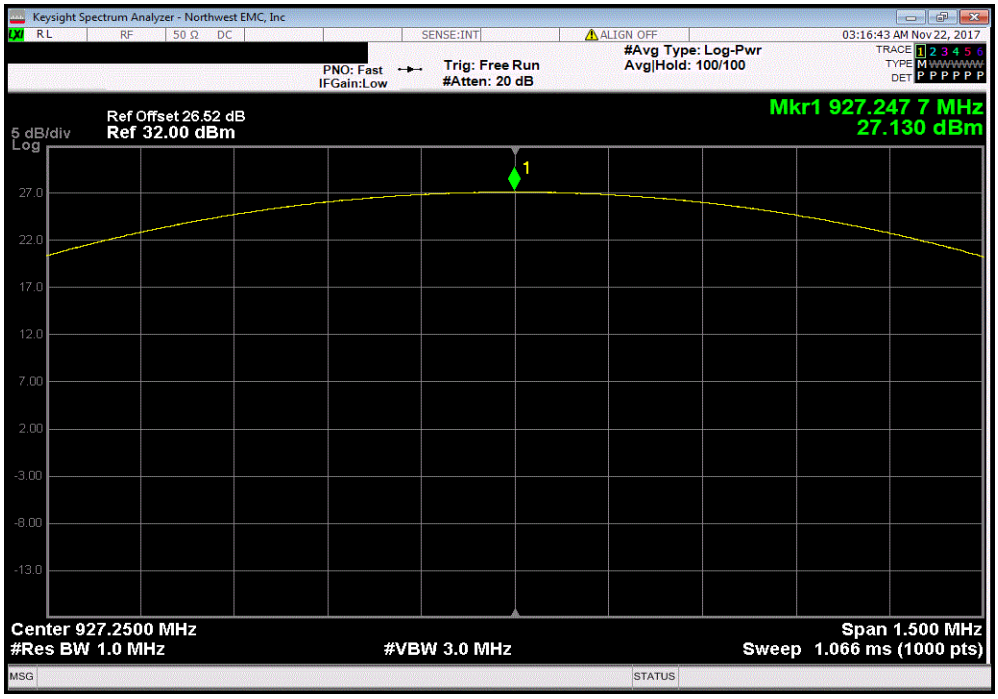
OUTPUT POWER

NweTx 2016.09.14.2 XMit 2017.09.21

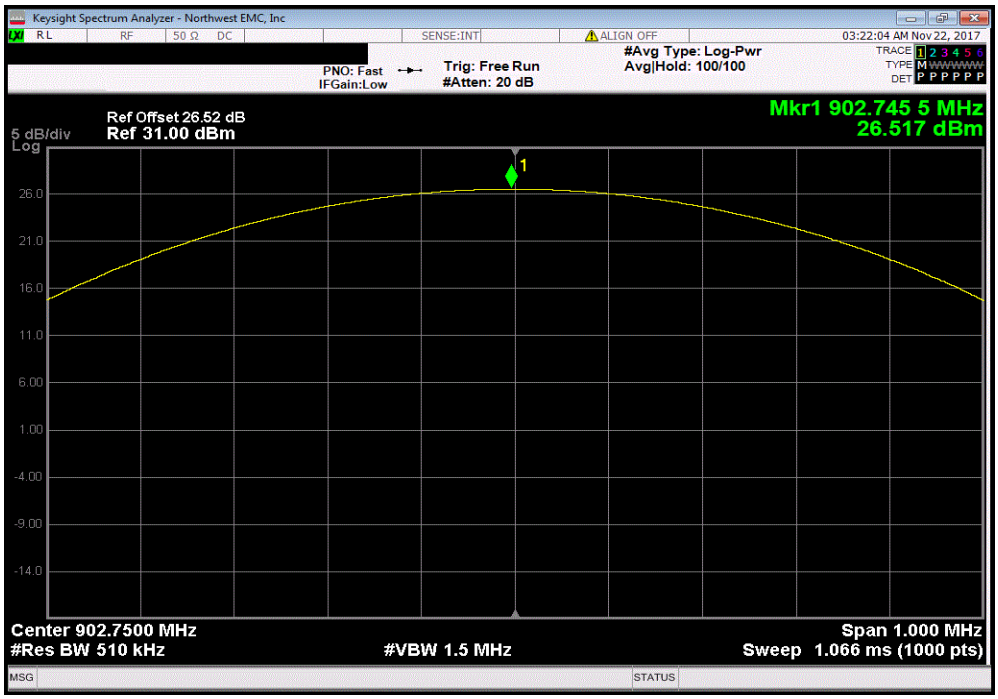
Non-Hopping Mode, Very Fast, DSB-ASK, Mid Channel 26, 915.25 MHz						
				Value	Limit (≤)	Result
				26.62 dBm	30 dBm	Pass



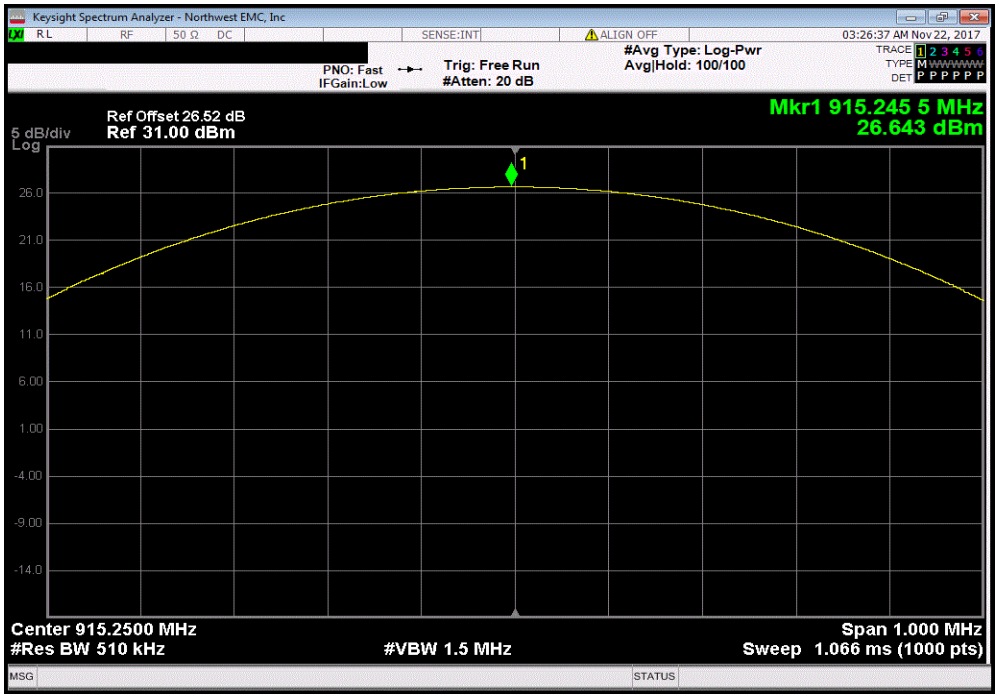
Non-Hopping Mode, Very Fast, DSB-ASK, High Channel 50, 927.25 MHz						
				Value	Limit (≤)	Result
				27.13 dBm	30 dBm	Pass



Non-Hopping Mode, Very Sensitive, DSB-ASK, Low Channel 1, 902.75 MHz						
				Value	Limit (≤)	Result
				26.517 dBm	30 dBm	Pass



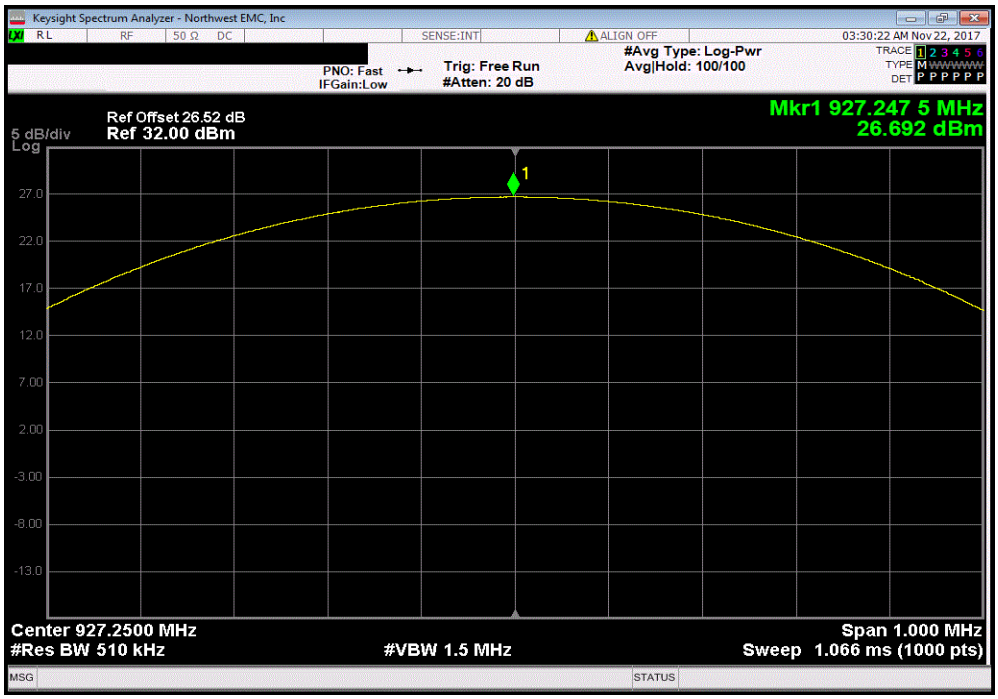
Non-Hopping Mode, Very Sensitive, DSB-ASK, Mid Channel 26, 915.25 MHz						
				Value	Limit (≤)	Result
				26.643 dBm	30 dBm	Pass



OUTPUT POWER

NweTx 2016.09.14.2 XMit 2017.09.21

Non-Hopping Mode, Very Sensitive, DSB-ASK, High Channel 50, 927.25 MHz						
				Value	Limit (≤)	Result
				26.692 dBm	30 dBm	Pass



BAND EDGE COMPLIANCE - HOPPING MODE

XMit 2017.09.21

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	19-May-17	19-May-18
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	20-Apr-17	20-Apr-18
Attenuator	Weinschel	54A-6	TYQ	25-Oct-17	25-Oct-18
Attenuator	Fairview Microwave	SA4014-20	TKV	9-Mar-17	9-Mar-18
Block - DC	Fairview Microwave	SD3379	AMU	20-Apr-17	20-Apr-18
Generator - Signal	Agilent	N5183A	TIA	6-Apr-16	6-Apr-18

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The spurious RF conducted emissions at the edges of the authorized band were measured with the EUT set to its normal pseudo-random hopping sequence. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge.

BAND EDGE COMPLIANCE - HOPPING MODE

NweTx 2016.09.14.2 XMit 2017.09.21

EUT:	Indy RS1000			**Work Order:**	7LAY0128
Serial Number:	110121170091			**Date:**	21-Nov-17
Customer:	Impinj, Inc.			**Temperature:**	21.7 °C
Attendees:	Paul Archer			**Humidity:**	41.2% RH
Project:	None			**Barometric Pres.:**	1013 mbar
Tested by:	Richard Mellroth	**Power:**	5 VDC	**Job Site:**	NC02

TEST SPECIFICATIONS	Test Method
FCC 15.247:2017	ANSI C63.10:2013

COMMENTS

Transmitting at Defaut Power Setting = 27dBm

DEVIATIONS FROM TEST STANDARD

None

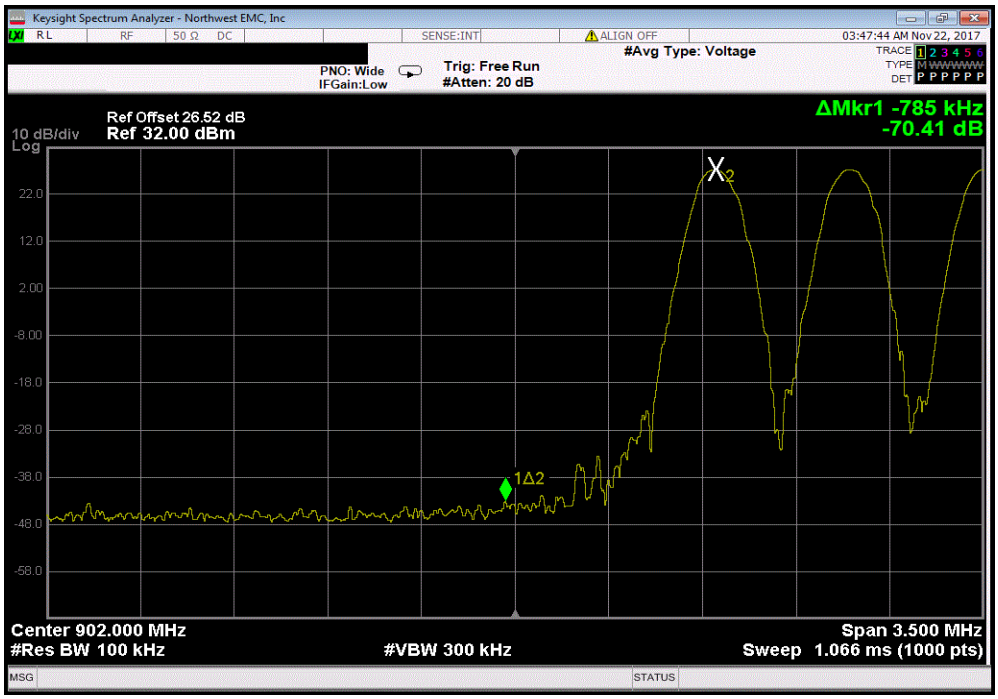
Configuration #	1	Signature

		Value (dBc)	Limit ≤ (dBc)	Result
Hopping Mode				
	Dense Reader, PR-ASK			
	Low Channel, 902.75 MHz	-70.41	-20	Pass
	High Channel, 927.25 MHz	-66.59	-20	Pass
	Very Fast, DSB-ASK			
	Low Channel, 902.75 MHz	-64.26	-20	Pass
	High Channel, 927.25 MHz	-63.39	-20	Pass
	Very Sensitive, DSB-ASK			
	Low Channel, 902.75 MHz	-67.06	-20	Pass
	High Channel, 927.25 MHz	-66.91	-20	Pass

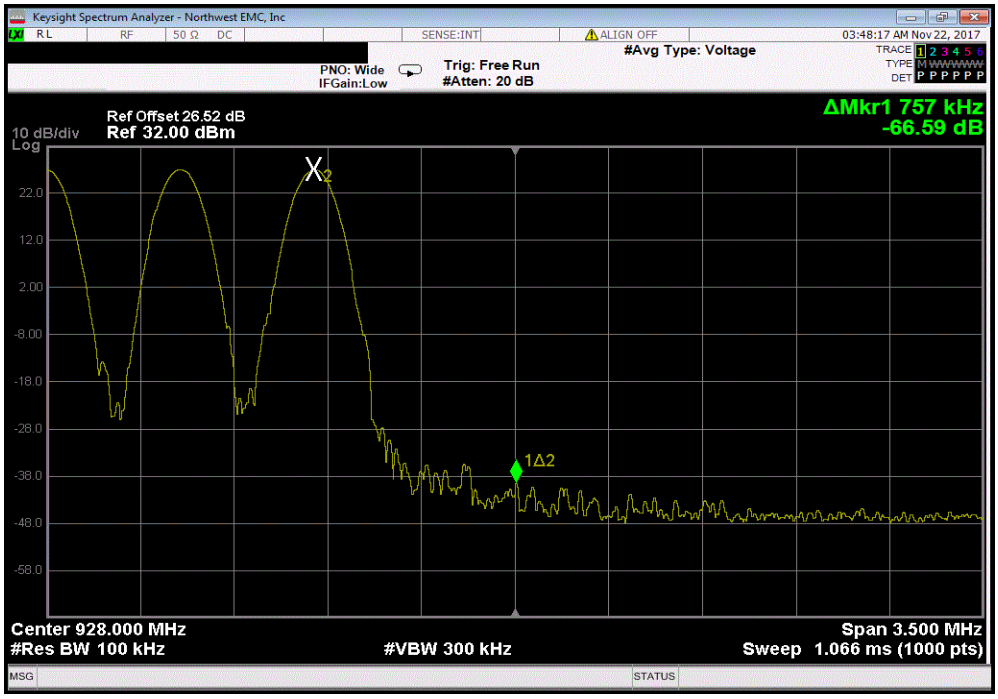
BAND EDGE COMPLIANCE - HOPPING MODE

NweTx 2016.09.14.2 XMit 2017.09.21

Hopping Mode, Dense Reader, PR-ASK, Low Channel, 902.75 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-70.41	-20	Pass



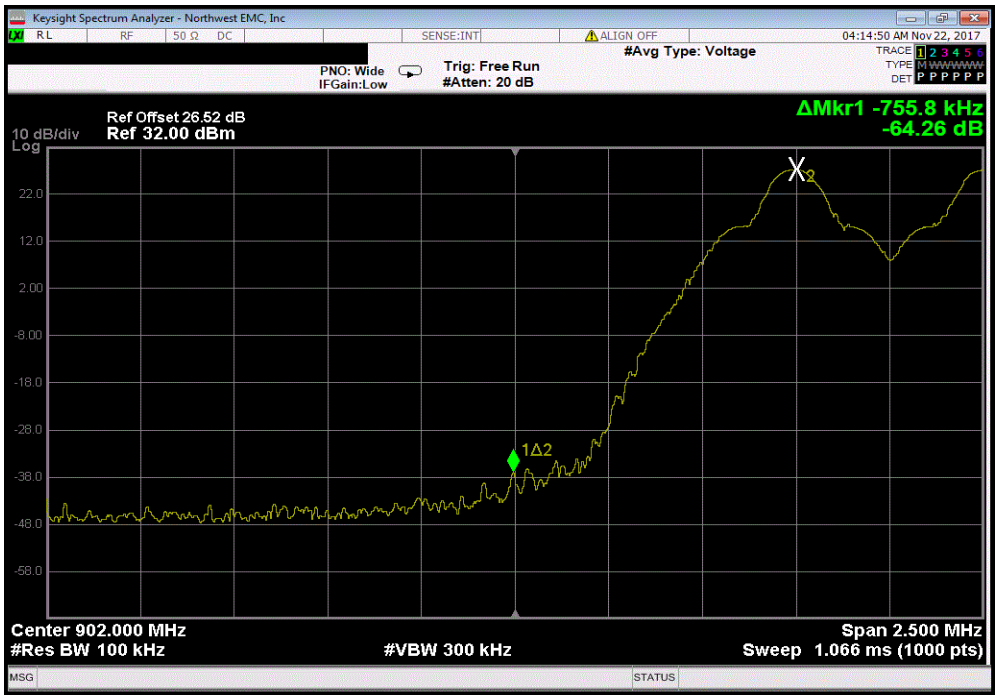
Hopping Mode, Dense Reader, PR-ASK, High Channel, 927.25 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-66.59	-20	Pass



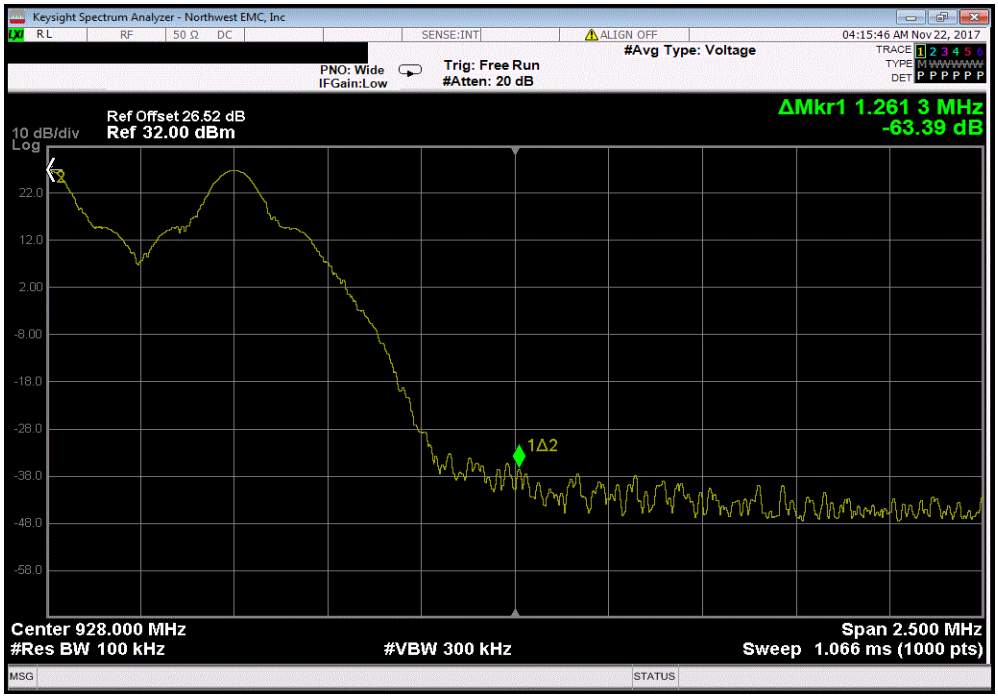
BAND EDGE COMPLIANCE - HOPPING MODE

NweTx 2016.09.14.2 XMit 2017.09.21

Hopping Mode, Very Fast, DSB-ASK, Low Channel, 902.75 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-64.26	-20	Pass



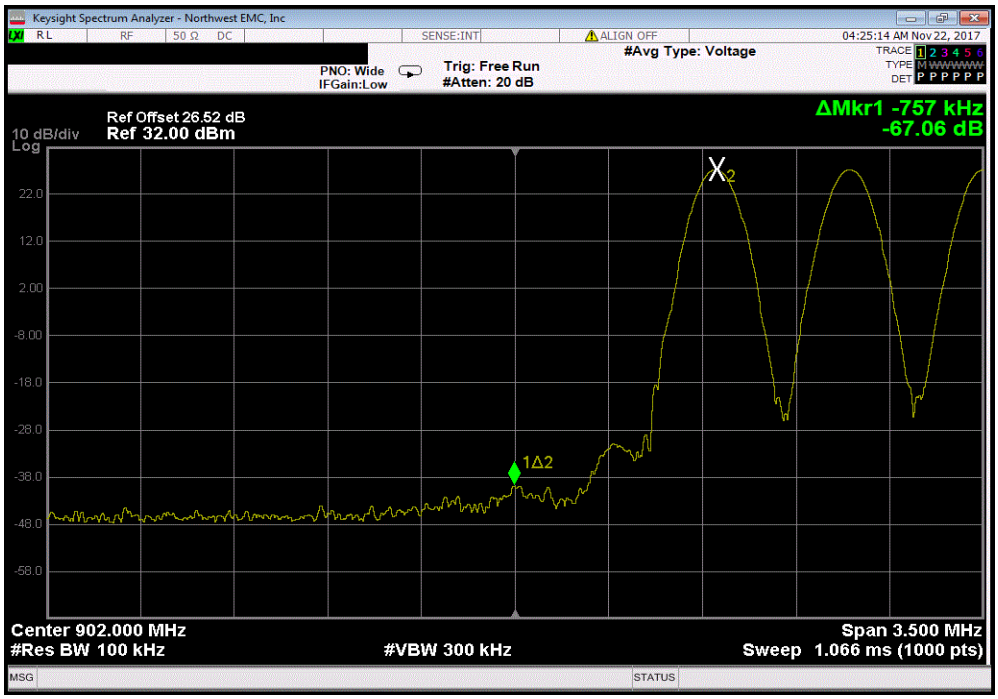
Hopping Mode, Very Fast, DSB-ASK, High Channel, 927.25 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-63.39	-20	Pass



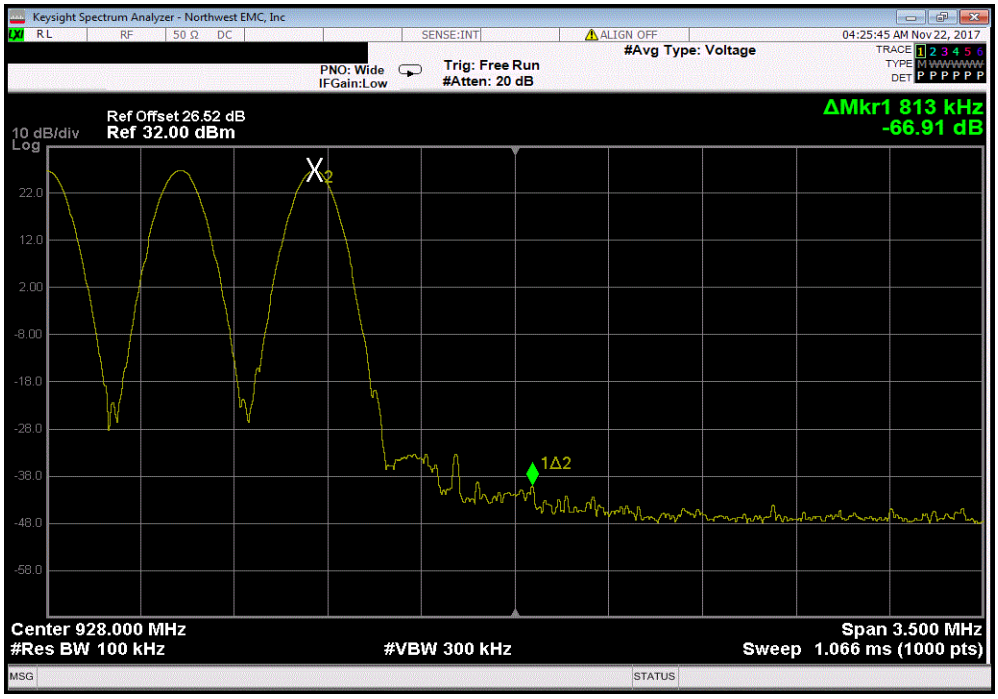
BAND EDGE COMPLIANCE - HOPPING MODE

NweTx 2016.09.14.2 XMit 2017.09.21

Hopping Mode, Very Sensitive, DSB-ASK, Low Channel, 902.75 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-67.06	-20	Pass



Hopping Mode, Very Sensitive, DSB-ASK, High Channel, 927.25 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-66.91	-20	Pass



BAND EDGE COMPLIANCE

XMit 2017.09.21

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	19-May-17	19-May-18
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	20-Apr-17	20-Apr-18
Attenuator	Weinschel	54A-6	TYQ	25-Oct-17	25-Oct-18
Attenuator	Fairview Microwave	SA4014-20	TKV	9-Mar-17	9-Mar-18
Block - DC	Fairview Microwave	SD3379	AMU	20-Apr-17	20-Apr-18
Generator - Signal	Agilent	N5183A	TIA	6-Apr-16	6-Apr-18

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The spurious RF conducted emissions at the edges of the authorized band were measured with the EUT set to low and high transmit frequencies. The EUT was transmitting at the data rate(s) listed in the datasheet in a no hop mode. The channels closest to the band edges were selected.

The spectrum was scanned below the lower band edge and above the higher band edge.

BAND EDGE COMPLIANCE

NweTx 2016.09.14.2 XMit 2017.09.21

EUT:	Indy RS1000			**Work Order:**	7LAY0128
Serial Number:	110121170091			**Date:**	21-Nov-17
Customer:	Impinj, Inc.			**Temperature:**	21.5 °C
Attendees:	Paul Archer			**Humidity:**	41.4% RH
Project:	None			**Barometric Pres.:**	1013 mbar
Tested by:	Richard Mellroth	**Power:**	5 VDC	**Job Site:**	NC02

TEST SPECIFICATIONS	Test Method
FCC 15.247:2017	ANSI C63.10:2013

COMMENTS

Transmitting at Defaut Power Setting = 27dBm

DEVIATIONS FROM TEST STANDARD

None

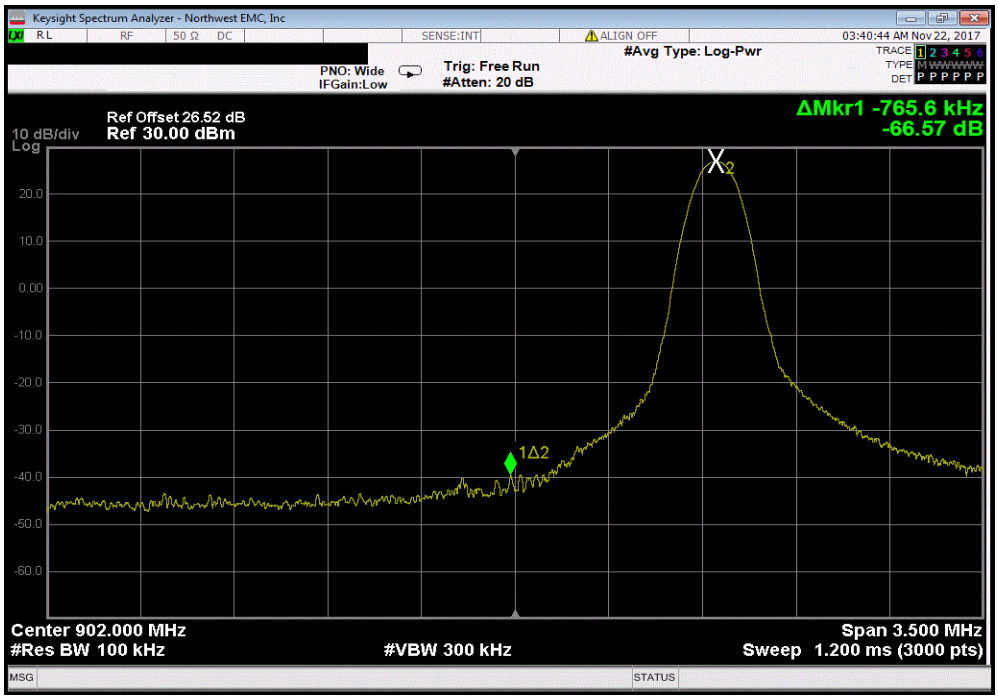
Configuration #	1	Signature

		Value (dBc)	Limit ≤ (dBc)	Result
Non-Hopping Mode				
	Dense Reader, PR-ASK			
	Low Channel 1, 902.75 MHz	-66.57	-20	Pass
	High Channel 50, 927.25 MHz	-62.93	-20	Pass
	Very Fast, DSB-ASK			
	Low Channel 1, 902.75 MHz	-67.47	-20	Pass
	High Channel 50, 927.25 MHz	-63.19	-20	Pass
	Very Sensitive, DSB-ASK			
	Low Channel 1, 902.75 MHz	-67.07	-20	Pass
	High Channel 50, 927.25 MHz	-64.02	-20	Pass

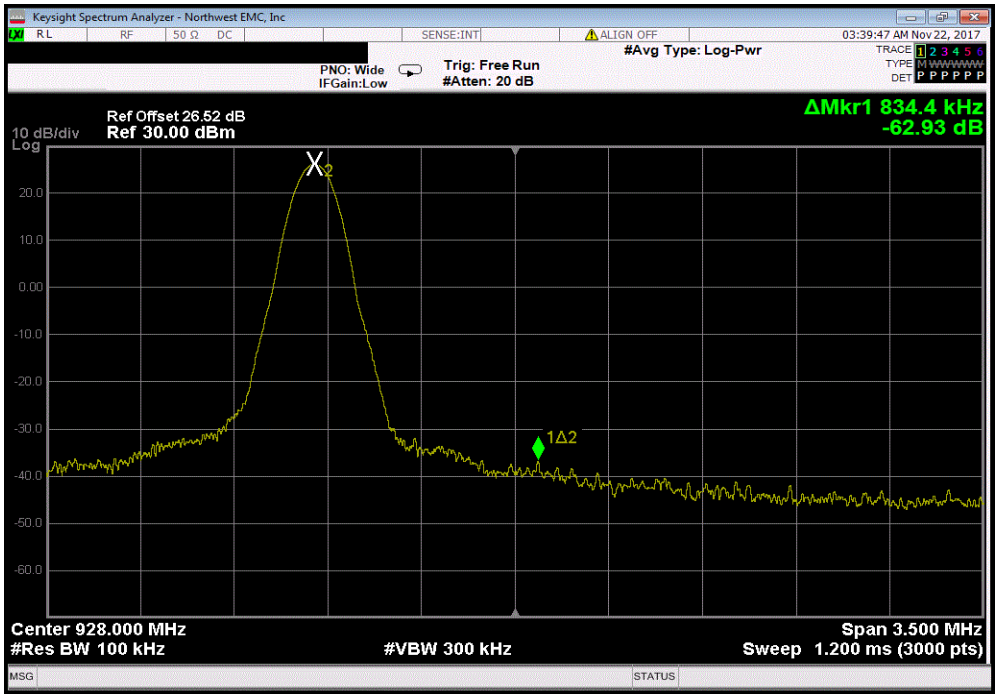
BAND EDGE COMPLIANCE

NweTx 2016.09.14.2 XMit 2017.09.21

Non-Hopping Mode, Dense Reader, PR-ASK, Low Channel 1, 902.75 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-66.57	-20	Pass



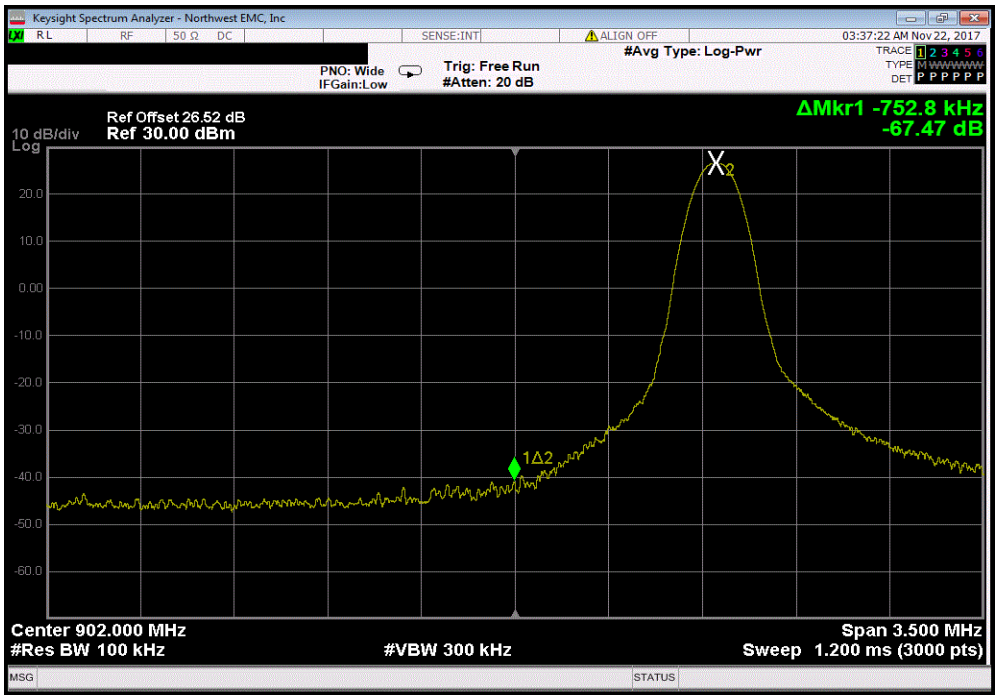
Non-Hopping Mode, Dense Reader, PR-ASK, High Channel 50, 927.25 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-62.93	-20	Pass



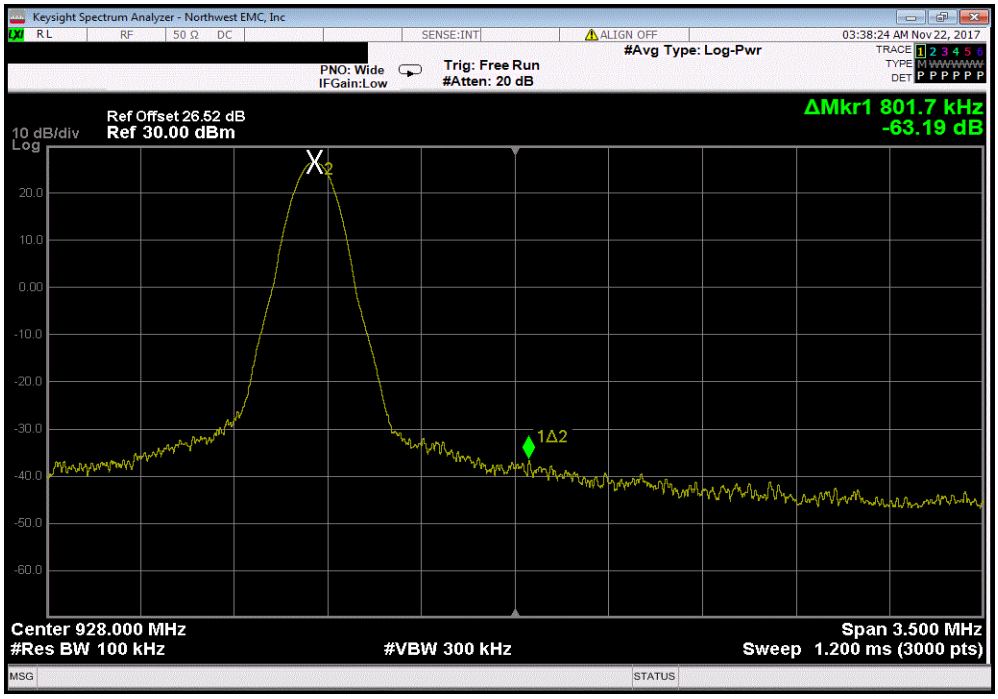
BAND EDGE COMPLIANCE

NweTx 2016.09.14.2 XMit 2017.09.21

Non-Hopping Mode, Very Fast, DSB-ASK, Low Channel 1, 902.75 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-67.47	-20	Pass



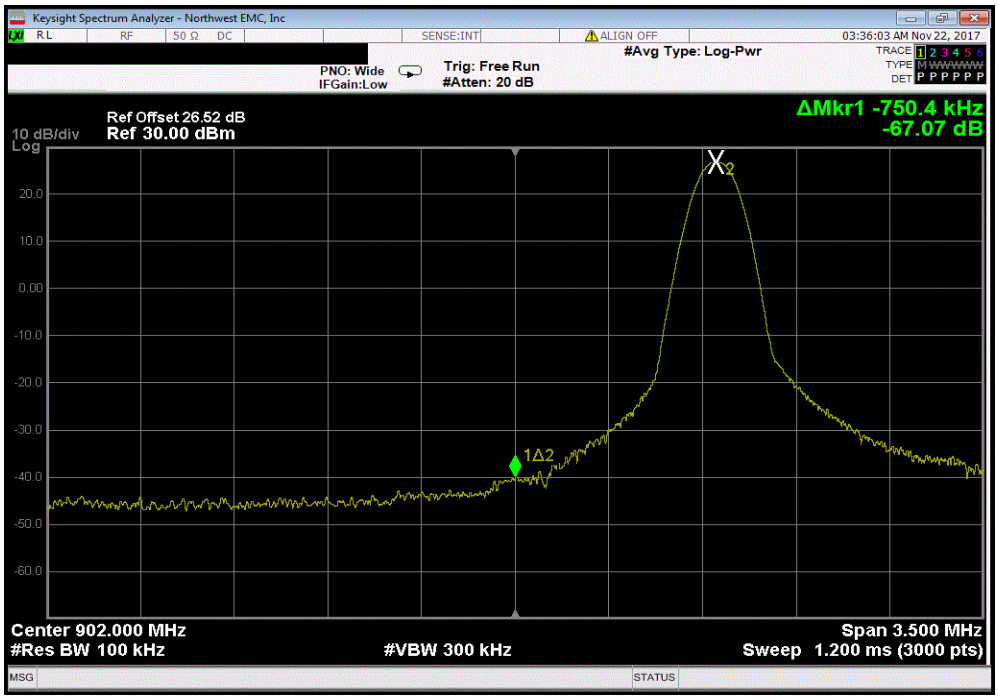
Non-Hopping Mode, Very Fast, DSB-ASK, High Channel 50, 927.25 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-63.19	-20	Pass



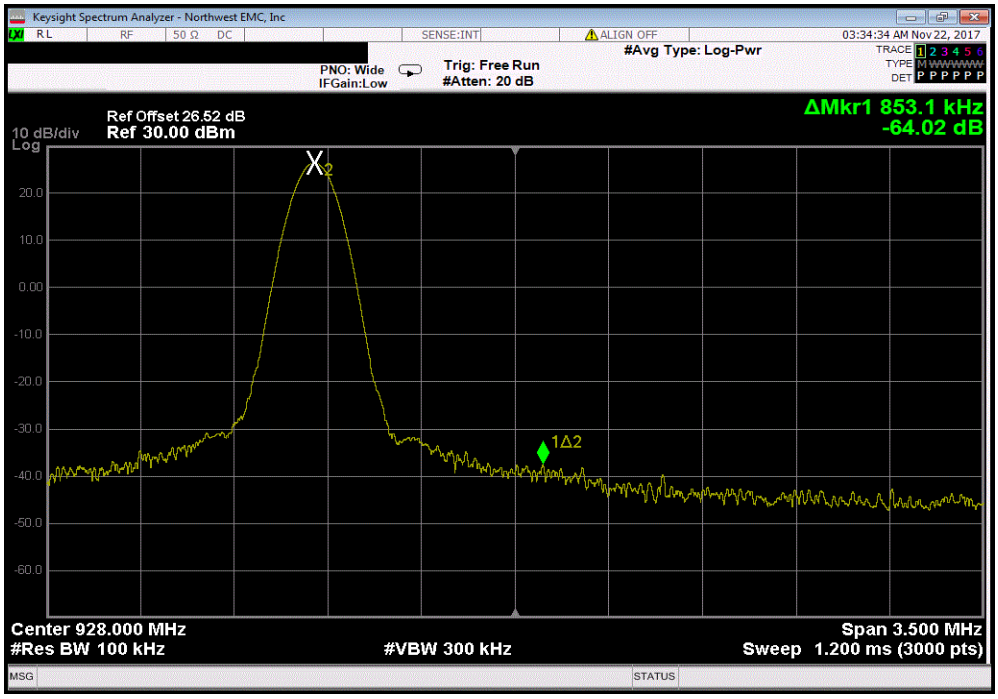
BAND EDGE COMPLIANCE

NweTx 2016.09.14.2 XMit 2017.09.21

Non-Hopping Mode, Very Sensitive, DSB-ASK, Low Channel 1, 902.75 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-67.07	-20	Pass



Non-Hopping Mode, Very Sensitive, DSB-ASK, High Channel 50, 927.25 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-64.02	-20	Pass



OCCUPIED BANDWIDTH

XMit 2017.09.21

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	19-May-17	19-May-18
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	20-Apr-17	20-Apr-18
Attenuator	Weinschel	54A-6	TYQ	25-Oct-17	25-Oct-18
Attenuator	Fairview Microwave	SA4014-20	TKV	9-Mar-17	9-Mar-18
Block - DC	Fairview Microwave	SD3379	AMU	20-Apr-17	20-Apr-18
Generator - Signal	Agilent	N5183A	TIA	6-Apr-16	6-Apr-18

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The 20 dB occupied bandwidth was measured with the EUT set to low, medium and high transmit frequencies in the band. The EUT was transmitting at the data rate(s) listed in the datasheet in a no-hop mode.

OCCUPIED BANDWIDTH

NweTx 2016.09.14.2 XMit 2017.09.21

EUT:	Indy RS1000			**Work Order:**	7LAY0128
Serial Number:	110121170091			**Date:**	21-Nov-17
Customer:	Impinj, Inc.			**Temperature:**	21.6 °C
Attendees:	Paul Archer			**Humidity:**	41.1% RH
Project:	None			**Barometric Pres.:**	1013 mbar
Tested by:	Richard Mellroth	**Power:**	5 VDC	**Job Site:**	NC02

TEST SPECIFICATIONS	Test Method
FCC 15.247:2017	ANSI C63.10:2013

COMMENTS

Transmitting at Defaut Power Setting = 27dBm

DEVIATIONS FROM TEST STANDARD

None

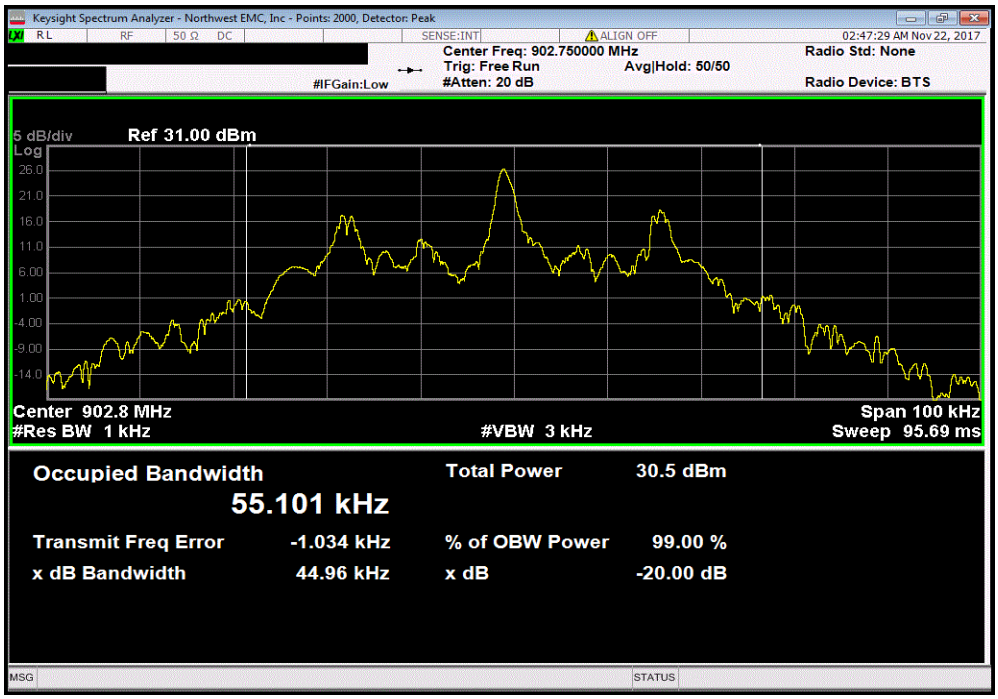
Configuration #	1	*Signature*

		Value	Limit (≤)	Result
Non-Hopping Mode				
	Dense Reader, PR-ASK			
	Low Channel 1, 902.75 MHz	44.958 kHz	500 kHz	Pass
	Mid Channel 26, 915.25 MHz	44.065 kHz	500 kHz	Pass
	High Channel 50, 927.25 MHz	44.091 kHz	500 kHz	Pass
	Very Fast, DSB-ASK			
	Low Channel 1, 902.75 MHz	384.769 kHz	500 kHz	Pass
	Mid Channel 26, 915.25 MHz	381.319 kHz	500 kHz	Pass
	High Channel 50, 927.25 MHz	384.339 kHz	500 kHz	Pass
	Very Sensitive, DSB-ASK			
	Low Channel 1, 902.75 MHz	82.655 kHz	500 kHz	Pass
	Mid Channel 26, 915.25 MHz	82.276 kHz	500 kHz	Pass
	High Channel 50, 927.25 MHz	82.5 kHz	500 kHz	Pass

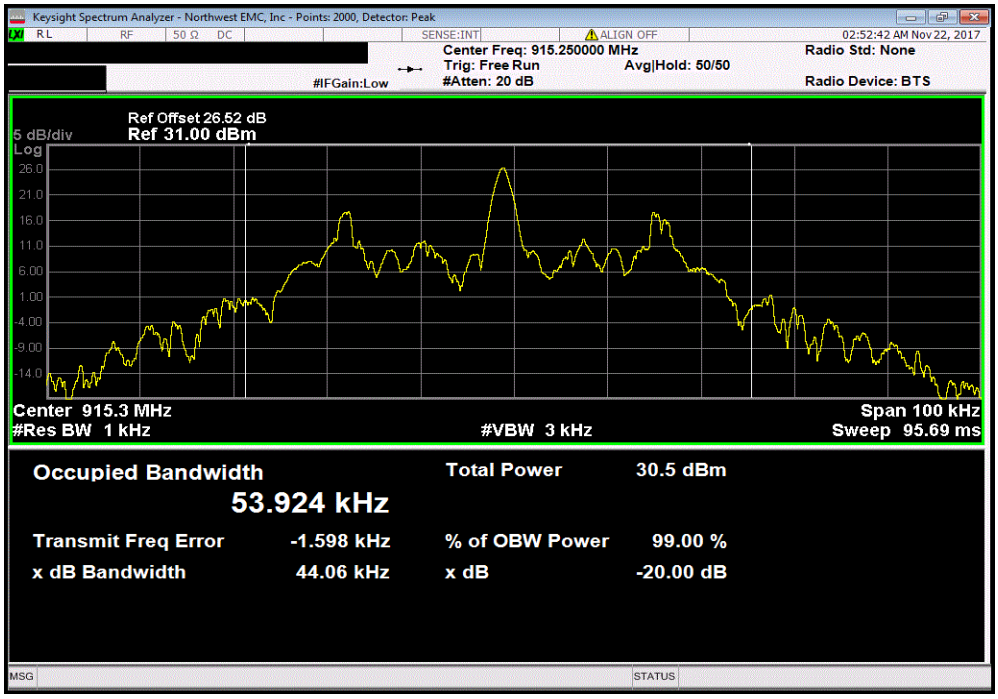
OCCUPIED BANDWIDTH

NweTx 2016.09.14.2 XMit 2017.09.21

Non-Hopping Mode, Dense Reader, PR-ASK, Low Channel 1, 902.75 MHz						
				Value	Limit (≤)	Result
				44.958 kHz	500 kHz	Pass



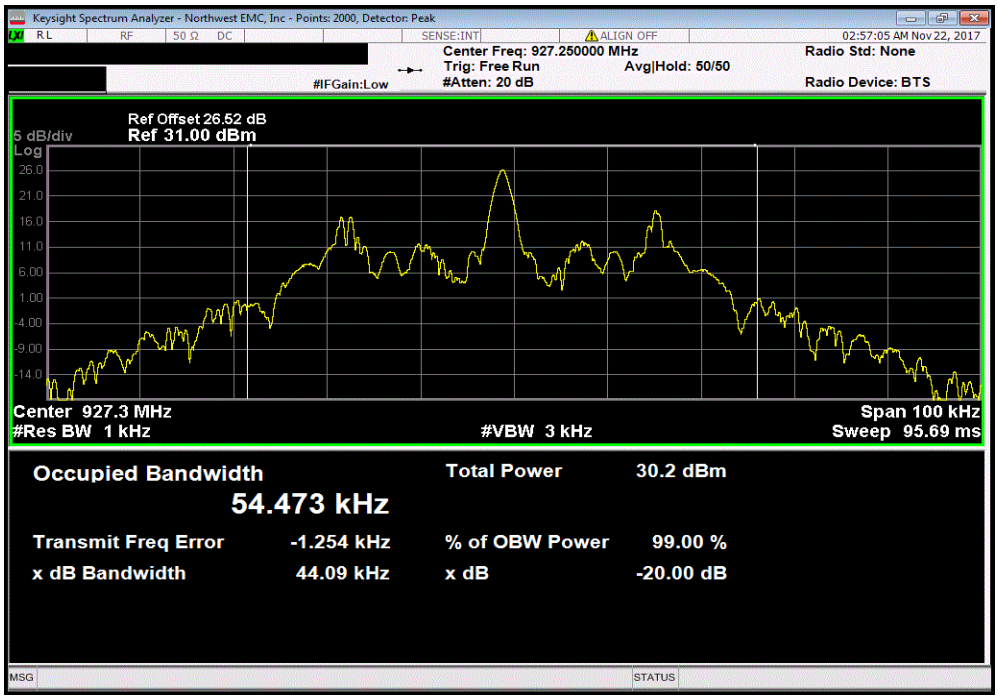
Non-Hopping Mode, Dense Reader, PR-ASK, Mid Channel 26, 915.25 MHz						
				Value	Limit (≤)	Result
				44.065 kHz	500 kHz	Pass



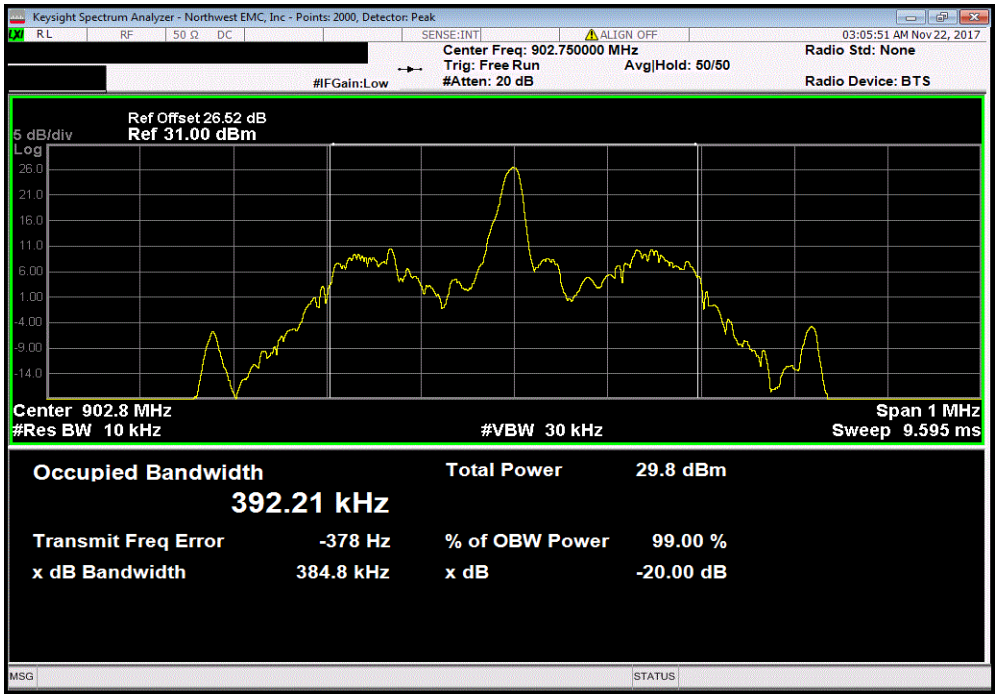
OCCUPIED BANDWIDTH

NweTx 2016.09.14.2 XMit 2017.09.21

Non-Hopping Mode, Dense Reader, PR-ASK, High Channel 50, 927.25 MHz						
				Value	Limit (≤)	Result
				44.091 kHz	500 kHz	Pass



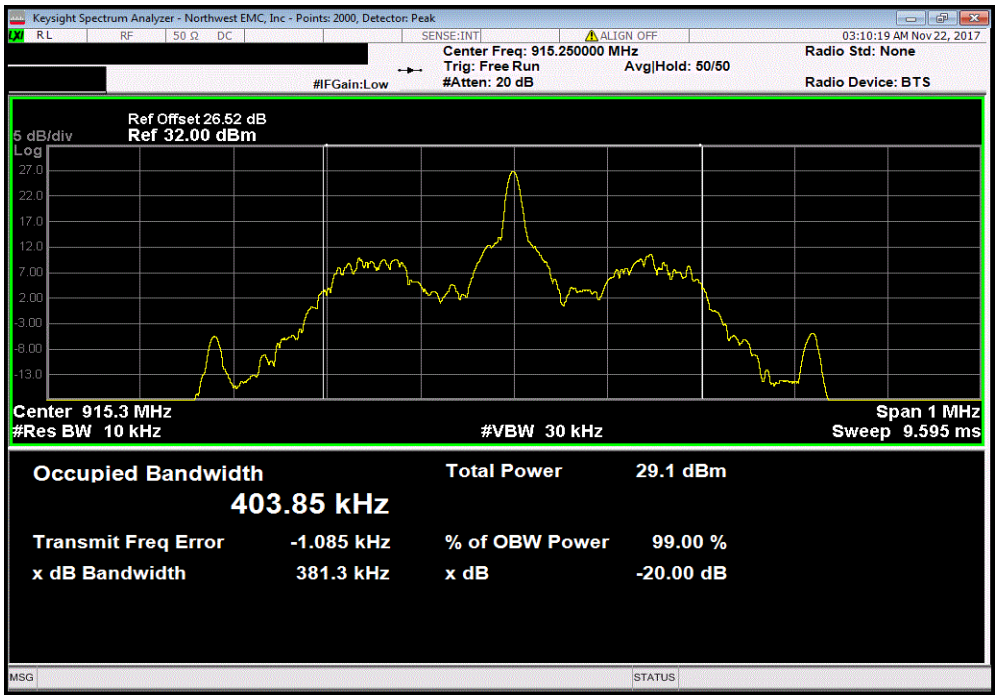
Non-Hopping Mode, Very Fast, DSB-ASK, Low Channel 1, 902.75 MHz						
				Value	Limit (≤)	Result
				384.769 kHz	500 kHz	Pass



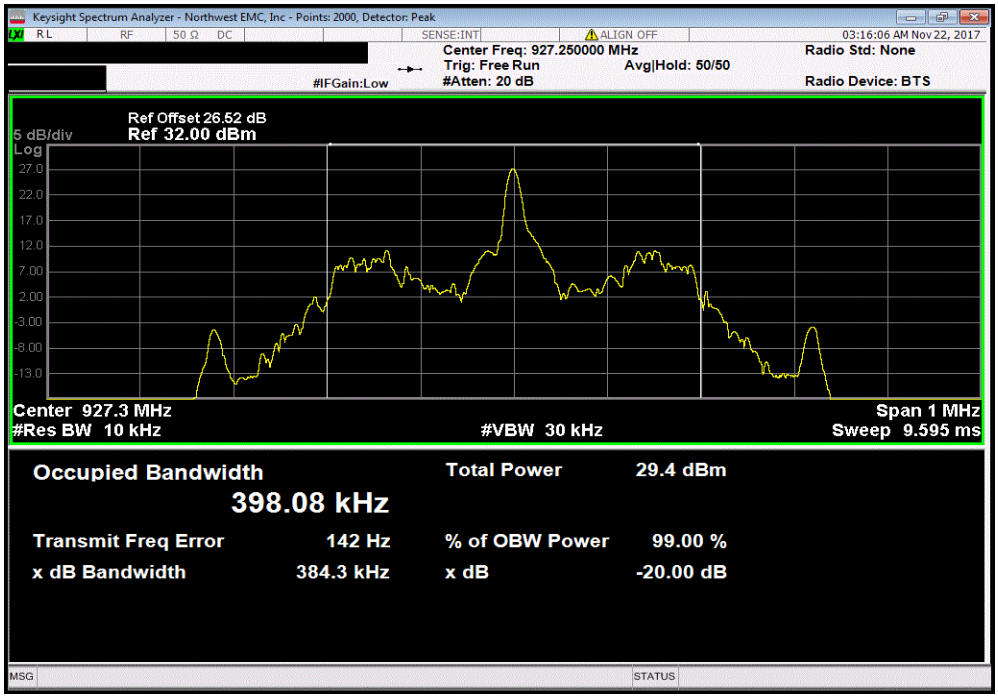
OCCUPIED BANDWIDTH

NweTx 2016.09.14.2 XMit 2017.09.21

Non-Hopping Mode, Very Fast, DSB-ASK, Mid Channel 26, 915.25 MHz						
				Value	Limit (≤)	Result
				381.319 kHz	500 kHz	Pass



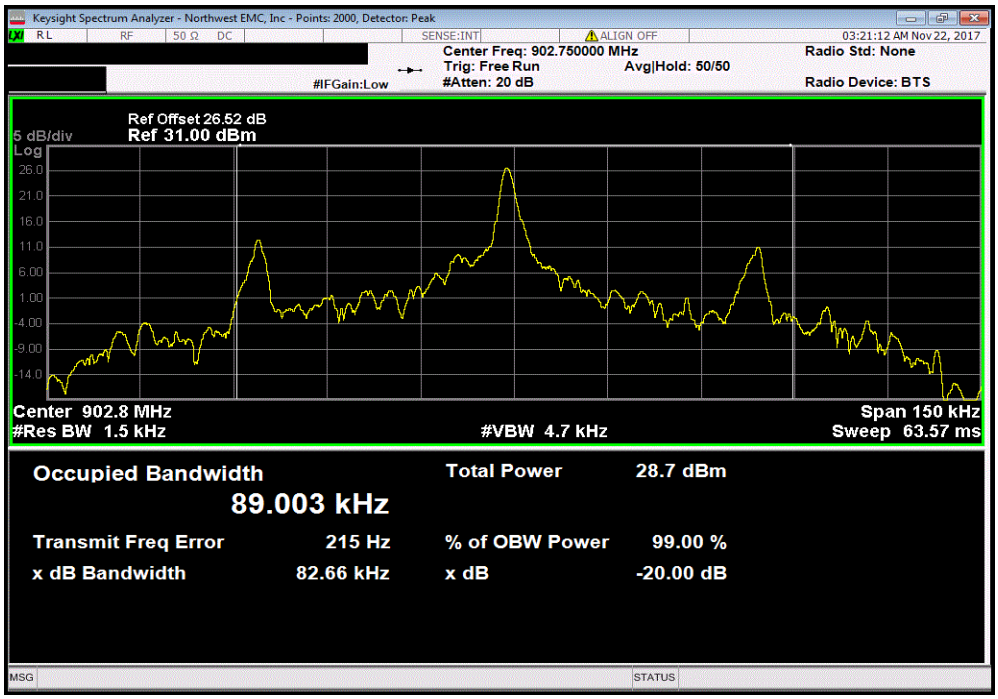
Non-Hopping Mode, Very Fast, DSB-ASK, High Channel 50, 927.25 MHz						
				Value	Limit (≤)	Result
				384.339 kHz	500 kHz	Pass



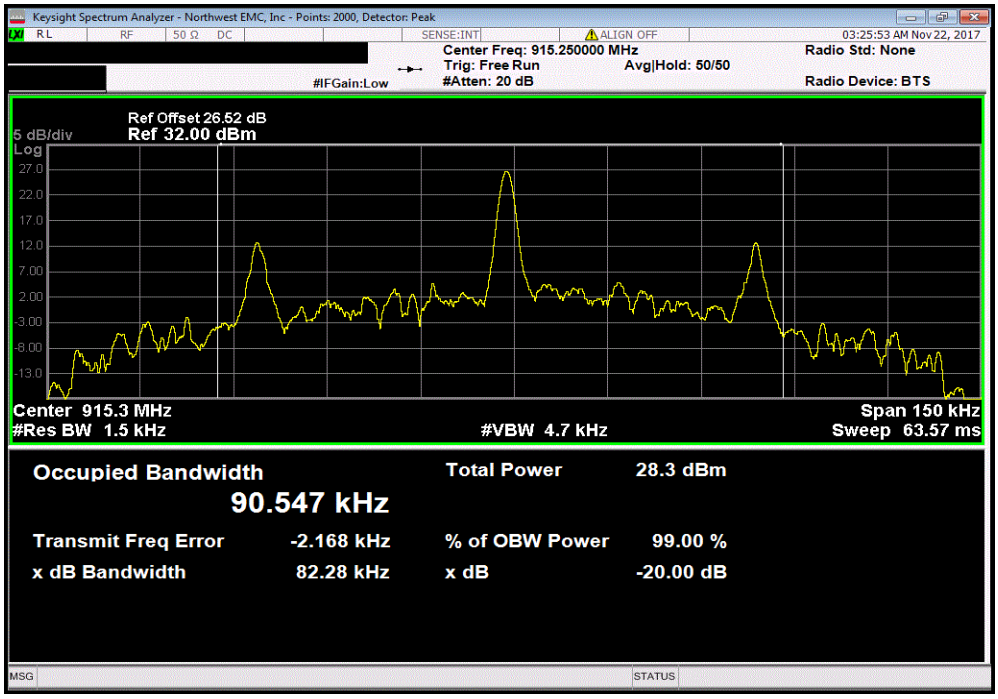
OCCUPIED BANDWIDTH

NweTx 2016.09.14.2 XMit 2017.09.21

Non-Hopping Mode, Very Sensitive, DSB-ASK, Low Channel 1, 902.75 MHz						
				Value	Limit (≤)	Result
				82.655 kHz	500 kHz	Pass



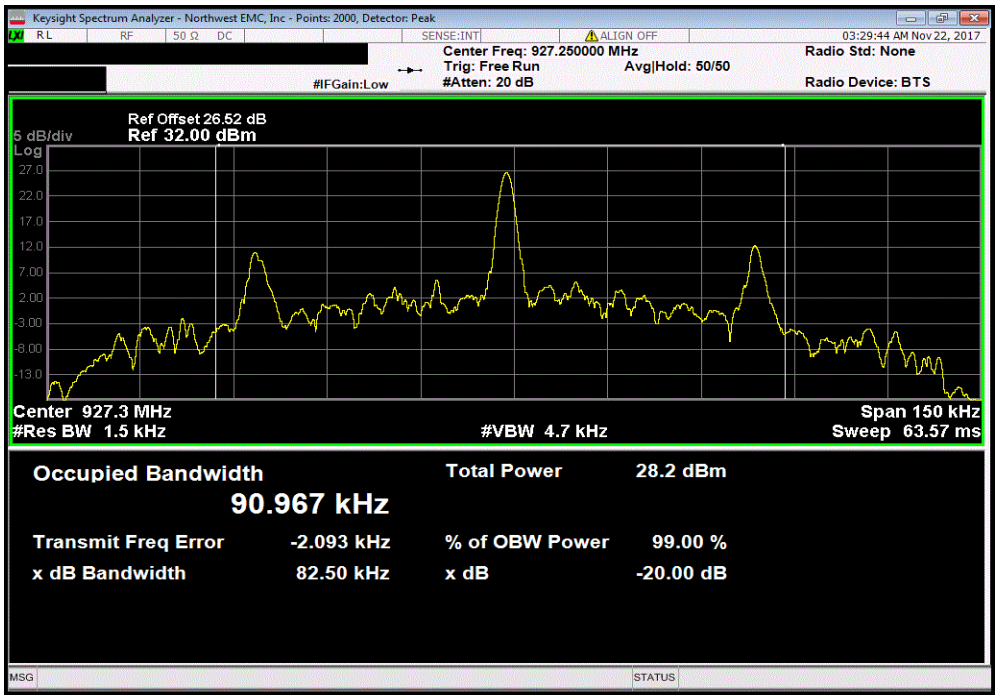
Non-Hopping Mode, Very Sensitive, DSB-ASK, Mid Channel 26, 915.25 MHz						
				Value	Limit (≤)	Result
				82.276 kHz	500 kHz	Pass



OCCUPIED BANDWIDTH

NweTx 2016.09.14.2 XMit 2017.09.21

Non-Hopping Mode, Very Sensitive, DSB-ASK, High Channel 50, 927.25 MHz						
				Value	Limit (≤)	Result
				82.5 kHz	500 kHz	Pass



SPURIOUS CONDUCTED EMISSIONS

XMit 2017.09.21

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	19-May-17	19-May-18
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	20-Apr-17	20-Apr-18
Attenuator	Weinschel	54A-6	TYQ	25-Oct-17	25-Oct-18
Attenuator	Fairview Microwave	SA4014-20	TKV	9-Mar-17	9-Mar-18
Block - DC	Fairview Microwave	SD3379	AMU	20-Apr-17	20-Apr-18
Generator - Signal	Agilent	N5183A	TIA	6-Apr-16	6-Apr-18

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting at the data rate(s) listed in the datasheet in a no-hop mode. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

SPURIOUS CONDUCTED EMISSIONS

NweTx 2016.09.14.2 XMit 2017.09.21

EUT:	**Indy RS1000**			**Work Order:**	**7LAY0128**
Serial Number:	**110121170091**			**Date:**	**21-Nov-17**
Customer:	**Impinj, Inc.**			**Temperature:**	**21.6 °C**
Attendees:	**Paul Archer**			**Humidity:**	**42% RH**
Project:	**None**			**Barometric Pres.:**	**1013 mbar**
Tested by:	**Richard Mellroth**	**Power:**	**5 VDC**	**Job Site:**	**NC02**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2017	ANSI C63.10:2013

COMMENTS

Transmitting at Defaut Power Setting = 27dBm

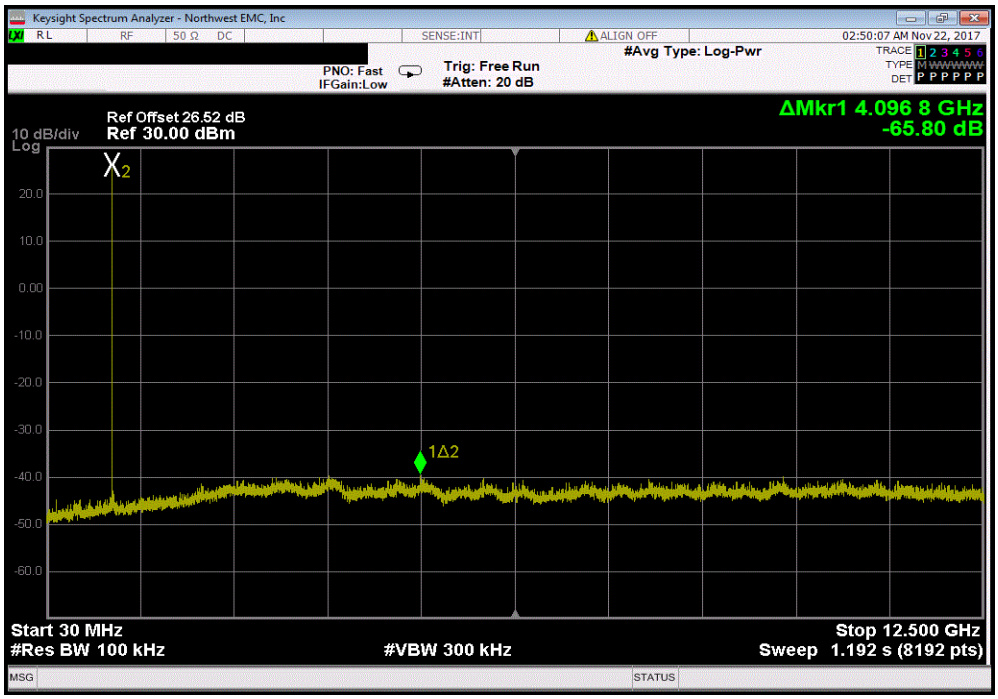
DEVIATIONS FROM TEST STANDARD

None

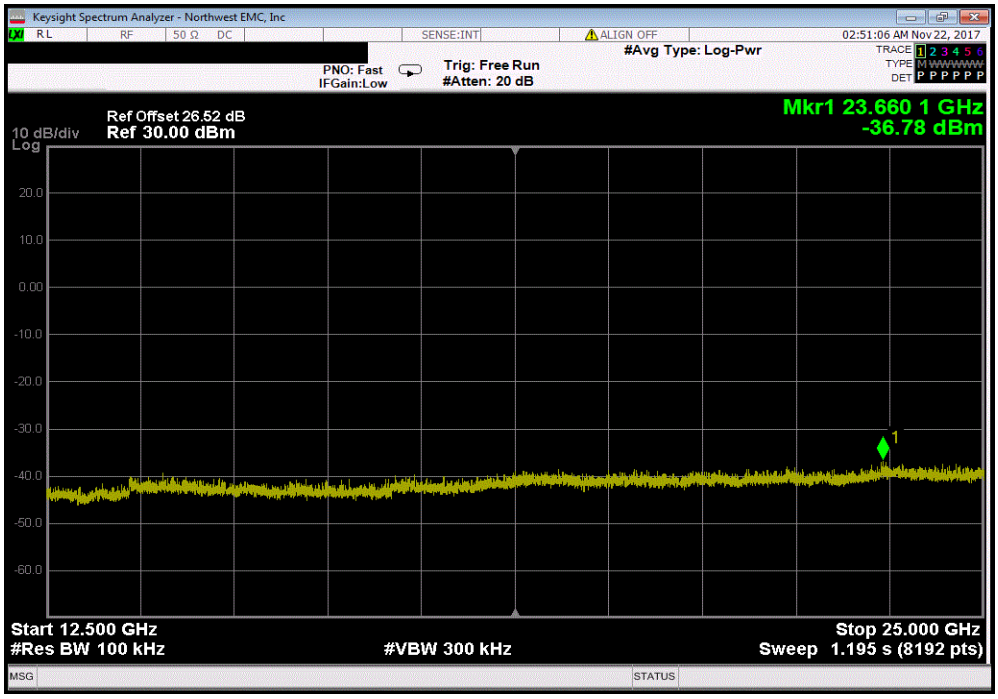
Configuration #	**1**	*Signature*

		Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result
Non-Hopping Mode					
	Dense Reader, PR-ASK				
	Low Channel 1, 902.75 MHz	30 MHz - 12.5 GHz	-65.8	-20	Pass
	Low Channel 1, 902.75 MHz	12.5 GHz - 25 GHz	-62.96	-20	Pass
	Mid Channel 26, 915.25 MHz	30 MHz - 12.5 GHz	-65.42	-20	Pass
	Mid Channel 26, 915.25 MHz	12.5 GHz - 25 GHz	-63	-20	Pass
	High Channel 50, 927.25 MHz	30 MHz - 12.5 GHz	-64.89	-20	Pass
	High Channel 50, 927.25 MHz	12.5 GHz - 25 GHz	-62.55	-20	Pass
	Very Fast, DSB-ASK				
	Low Channel 1, 902.75 MHz	30 MHz - 12.5 GHz	-65.17	-20	Pass
	Low Channel 1, 902.75 MHz	12.5 GHz - 25 GHz	-63.01	-20	Pass
	Mid Channel 26, 915.25 MHz	30 MHz - 12.5 GHz	-66.4	-20	Pass
	Mid Channel 26, 915.25 MHz	12.5 GHz - 25 GHz	-63.54	-20	Pass
	High Channel 50, 927.25 MHz	30 MHz - 12.5 GHz	-66.42	-20	Pass
	High Channel 50, 927.25 MHz	12.5 GHz - 25 GHz	-62.82	-20	Pass
	Very Sensitive, DSB-ASK				
	Low Channel 1, 902.75 MHz	30 MHz - 12.5 GHz	-65.79	-20	Pass
	Low Channel 1, 902.75 MHz	12.5 GHz - 25 GHz	-62.33	-20	Pass
	Mid Channel 26, 915.25 MHz	30 MHz - 12.5 GHz	-65.91	-20	Pass
	Mid Channel 26, 915.25 MHz	12.5 GHz - 25 GHz	-62.99	-20	Pass
	High Channel 50, 927.25 MHz	30 MHz - 12.5 GHz	-65.34	-20	Pass
	High Channel 50, 927.25 MHz	12.5 GHz - 25 GHz	-63.25	-20	Pass

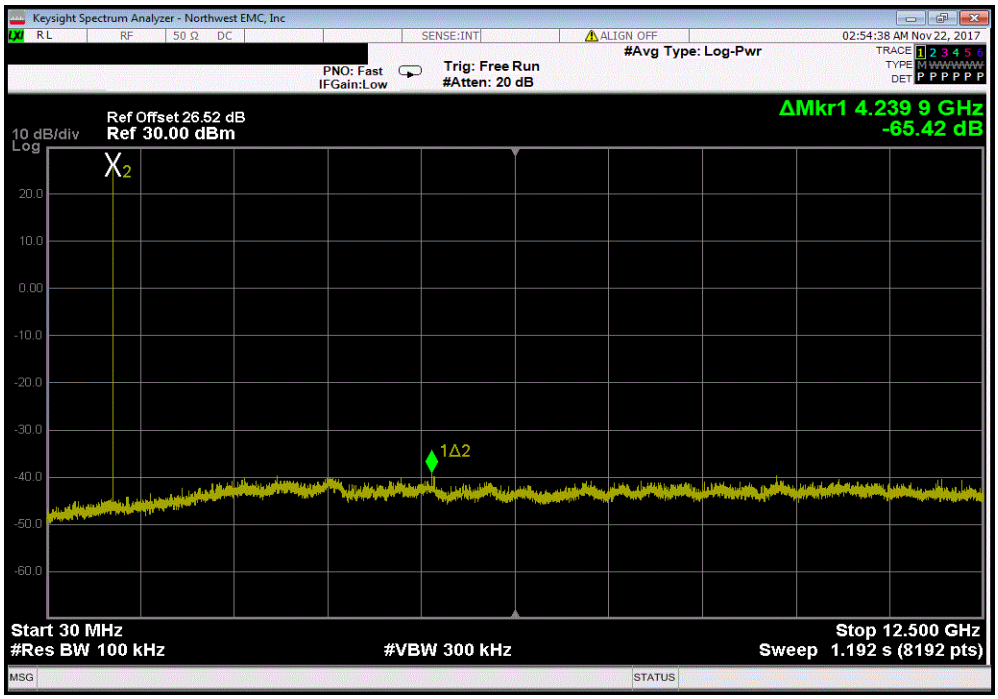
Non-Hopping Mode, Dense Reader, PR-ASK, Low Channel 1, 902.75 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-65.8	-20	Pass



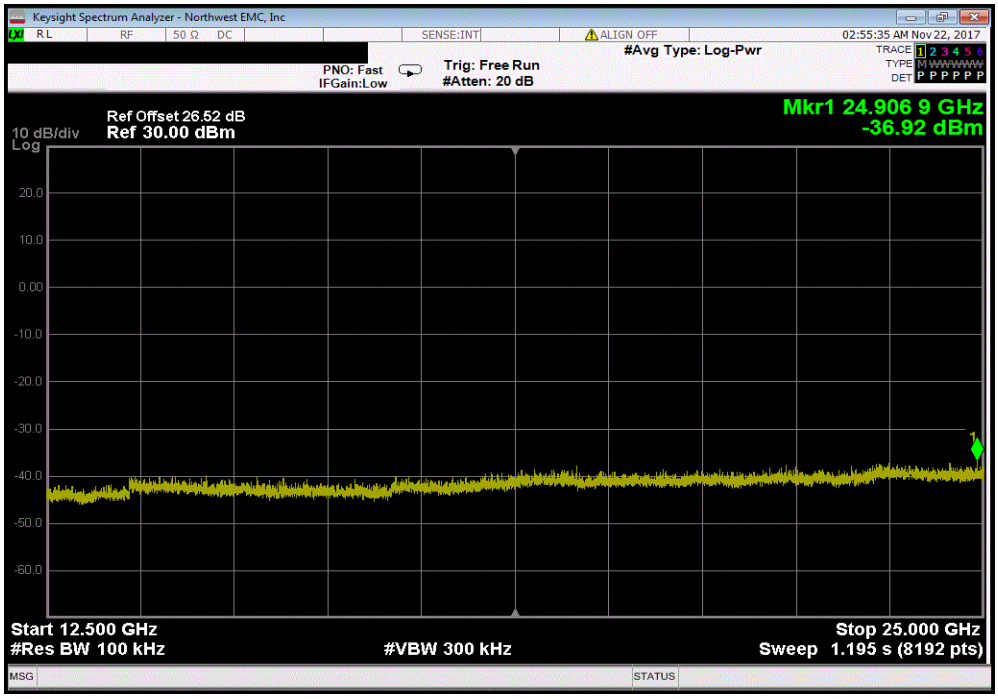
Non-Hopping Mode, Dense Reader, PR-ASK, Low Channel 1, 902.75 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-62.96	-20	Pass



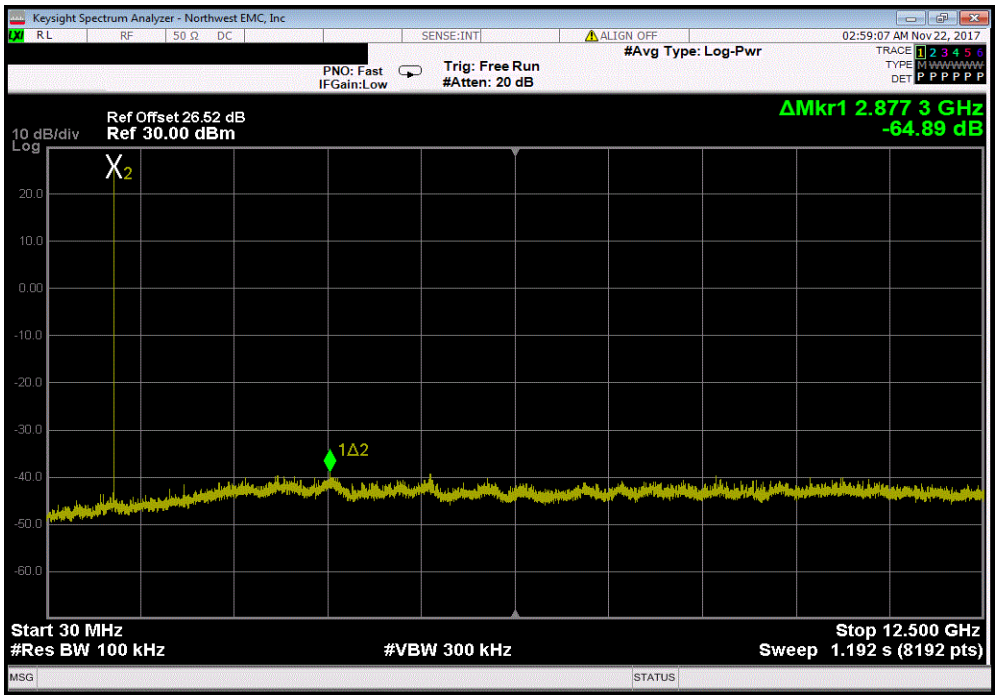
Non-Hopping Mode, Dense Reader, PR-ASK, Mid Channel 26, 915.25 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-65.42	-20	Pass



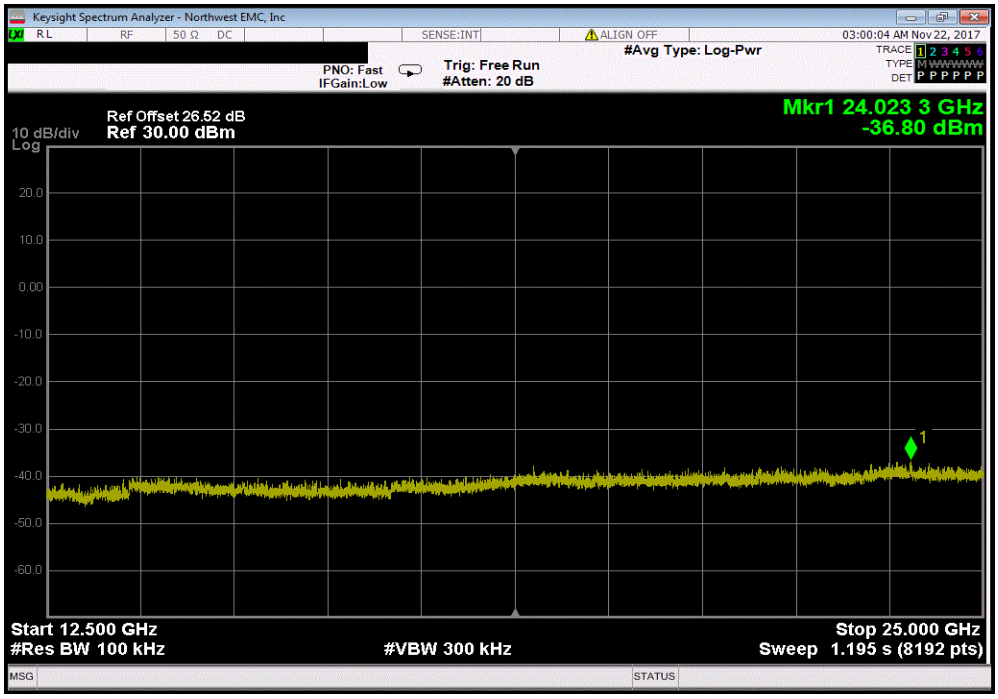
Non-Hopping Mode, Dense Reader, PR-ASK, Mid Channel 26, 915.25 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-63	-20	Pass



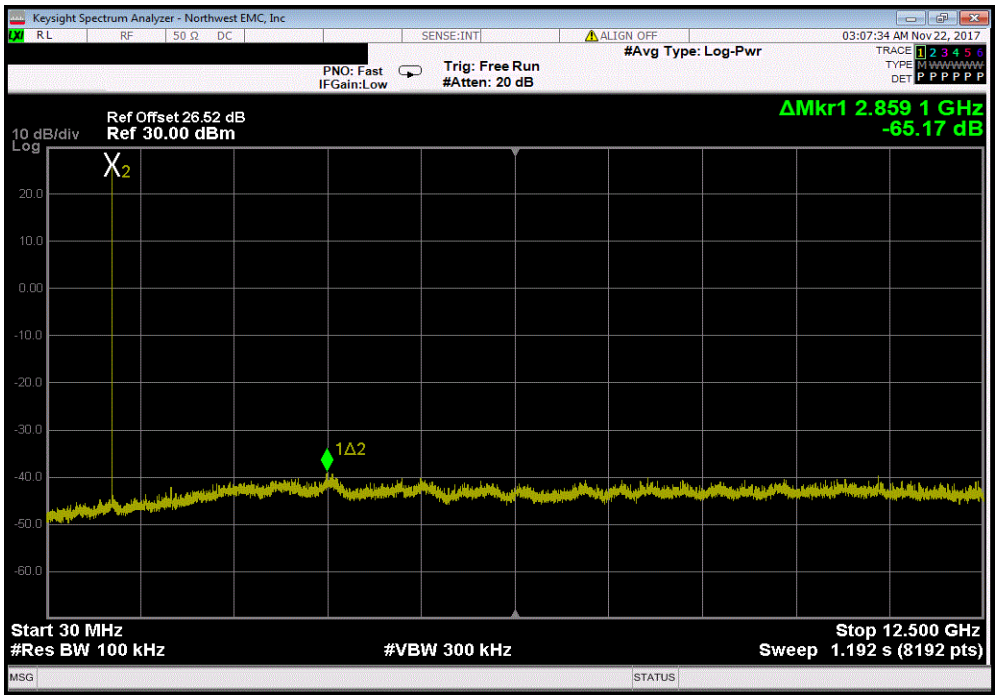
Non-Hopping Mode, Dense Reader, PR-ASK, High Channel 50, 927.25 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-64.89	-20	Pass



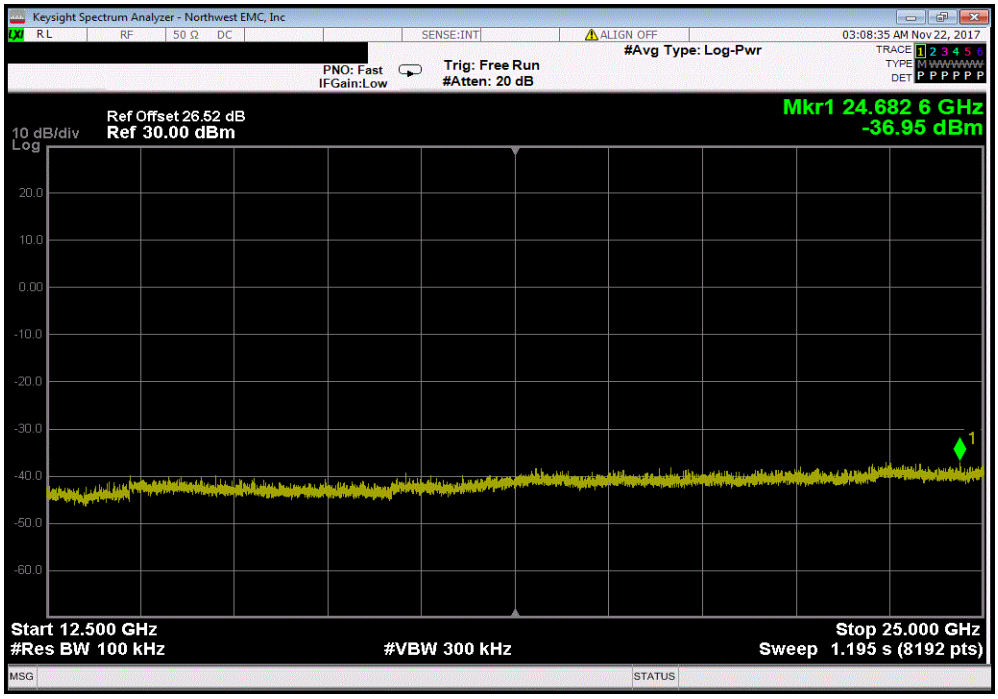
Non-Hopping Mode, Dense Reader, PR-ASK, High Channel 50, 927.25 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-62.55	-20	Pass



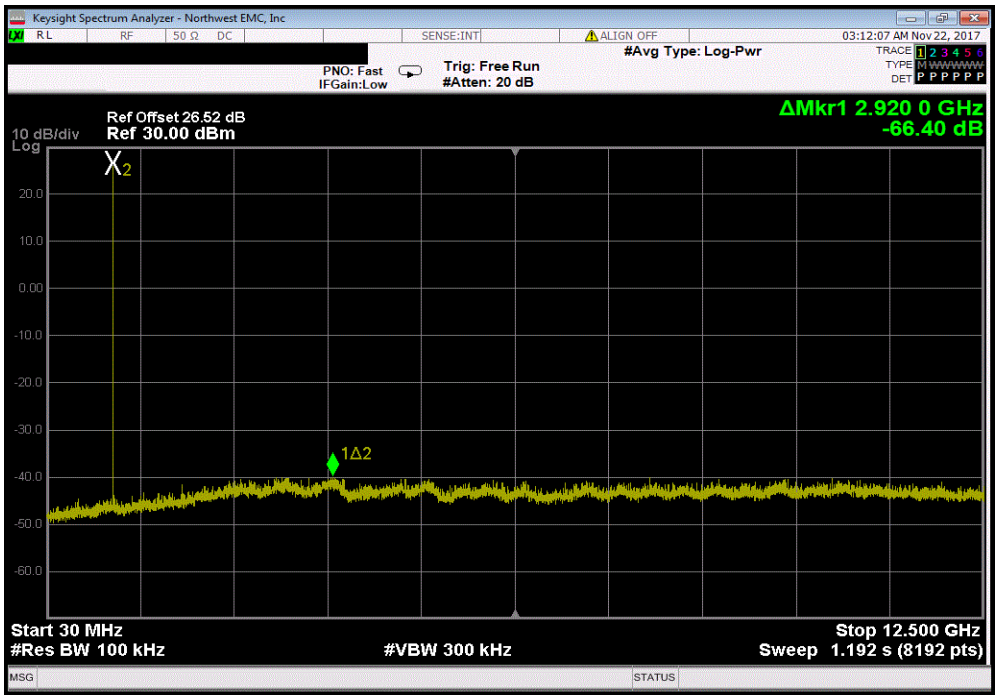
Non-Hopping Mode, Very Fast, DSB-ASK, Low Channel 1, 902.75 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-65.17	-20	Pass



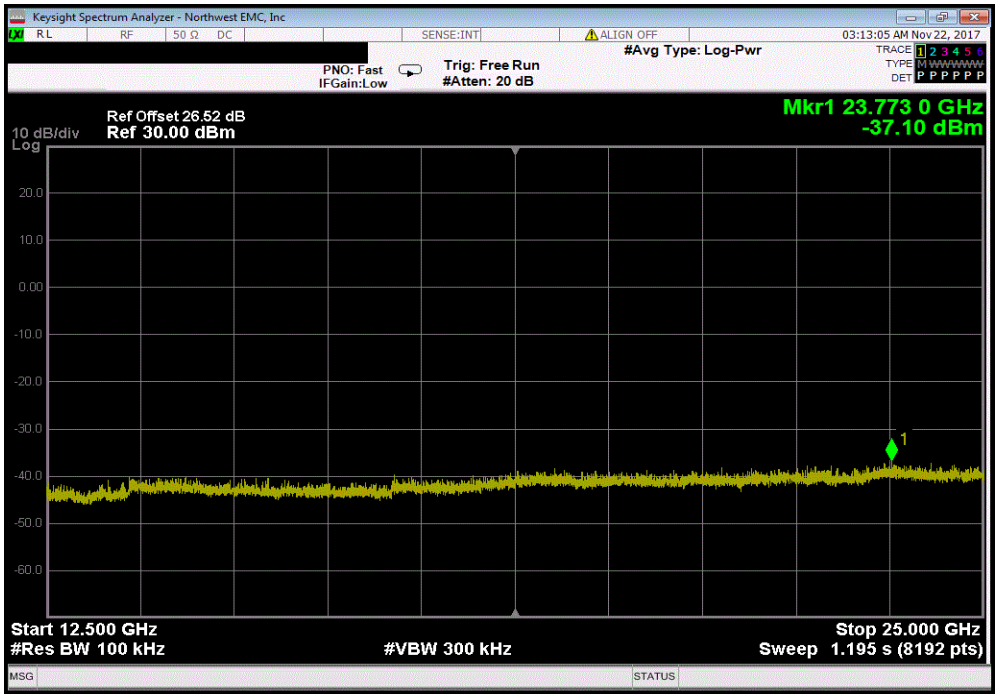
Non-Hopping Mode, Very Fast, DSB-ASK, Low Channel 1, 902.75 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-63.01	-20	Pass



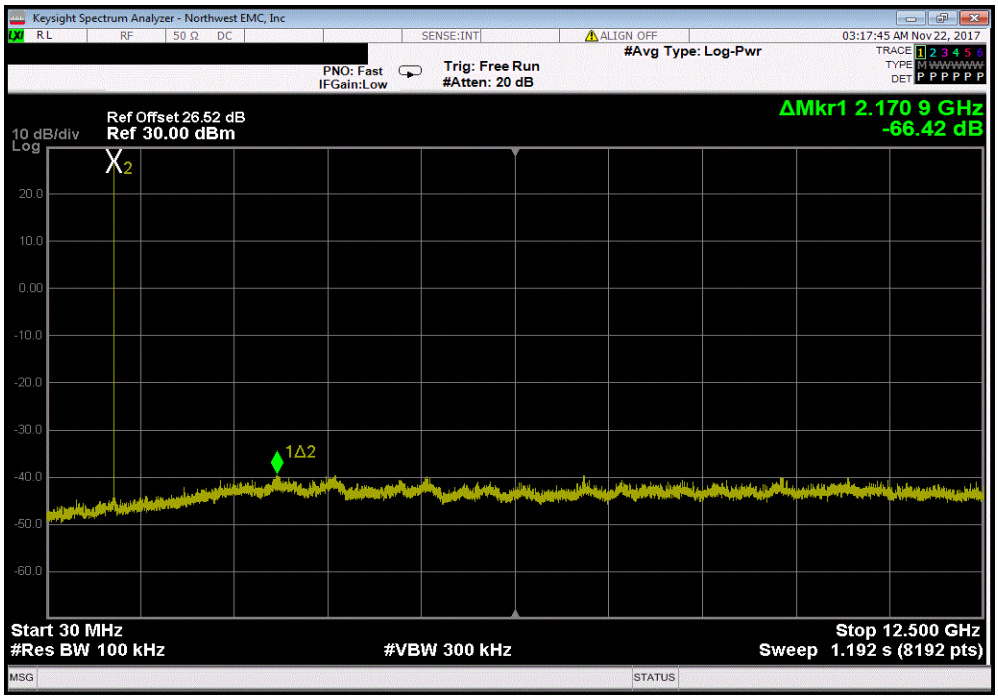
Non-Hopping Mode, Very Fast, DSB-ASK, Mid Channel 26, 915.25 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-66.4	-20	Pass



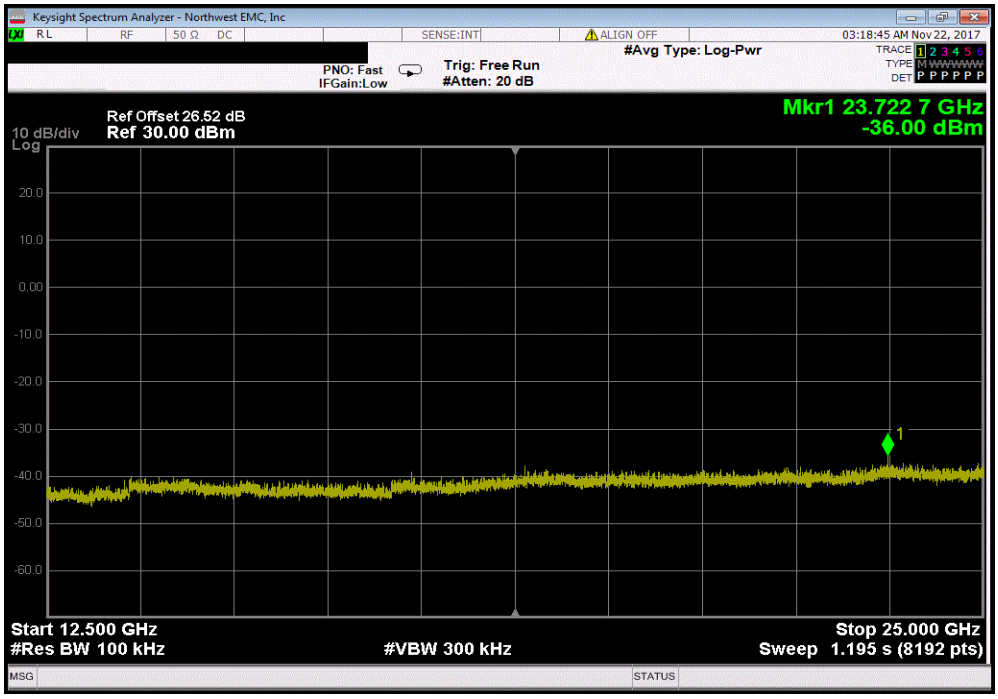
Non-Hopping Mode, Very Fast, DSB-ASK, Mid Channel 26, 915.25 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-63.54	-20	Pass



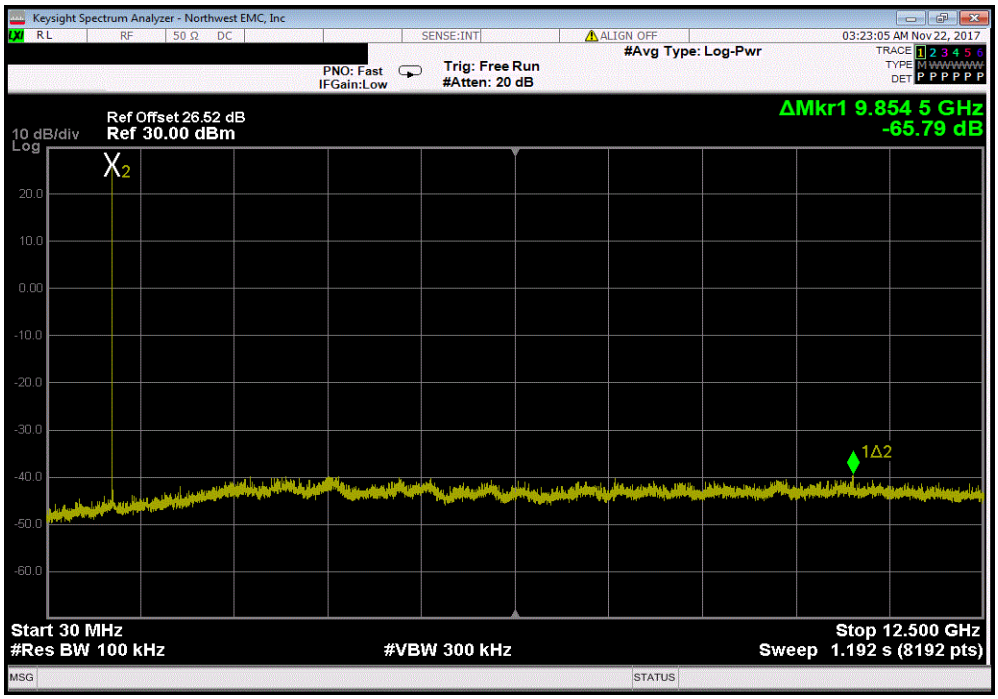
Non-Hopping Mode, Very Fast, DSB-ASK, High Channel 50, 927.25 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-66.42	-20	Pass



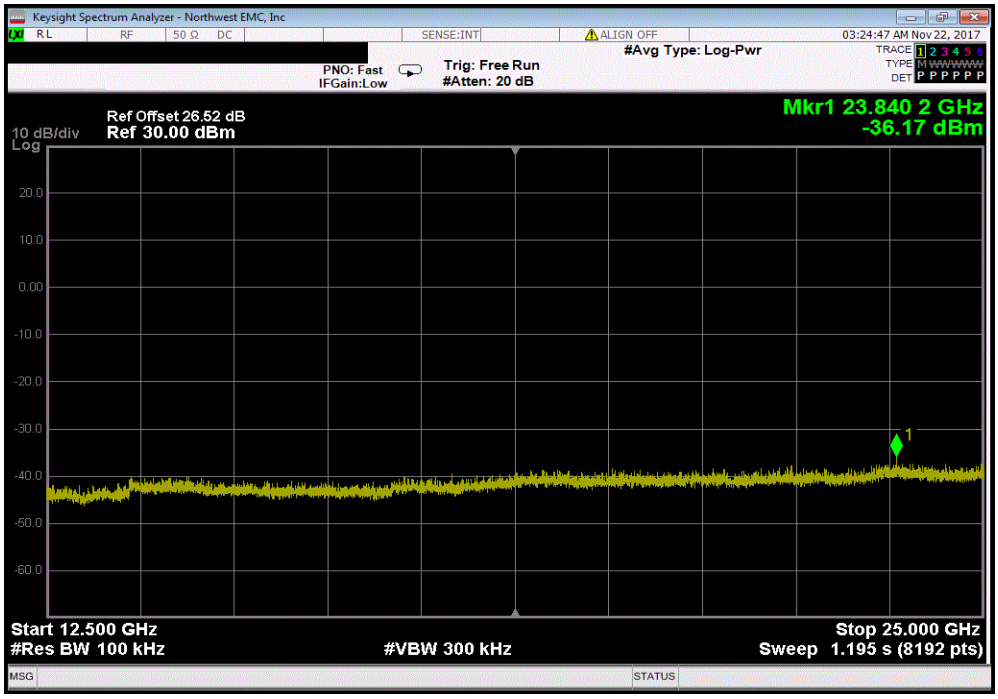
Non-Hopping Mode, Very Fast, DSB-ASK, High Channel 50, 927.25 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-62.82	-20	Pass



Non-Hopping Mode, Very Sensitive, DSB-ASK, Low Channel 1, 902.75 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-65.79	-20	Pass



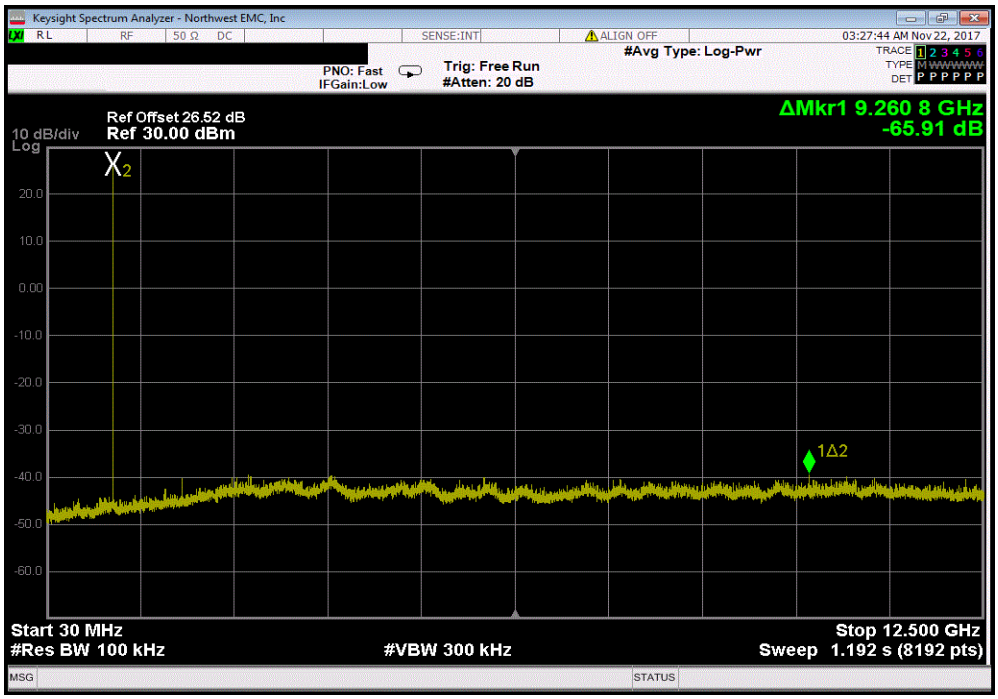
Non-Hopping Mode, Very Sensitive, DSB-ASK, Low Channel 1, 902.75 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-62.33	-20	Pass



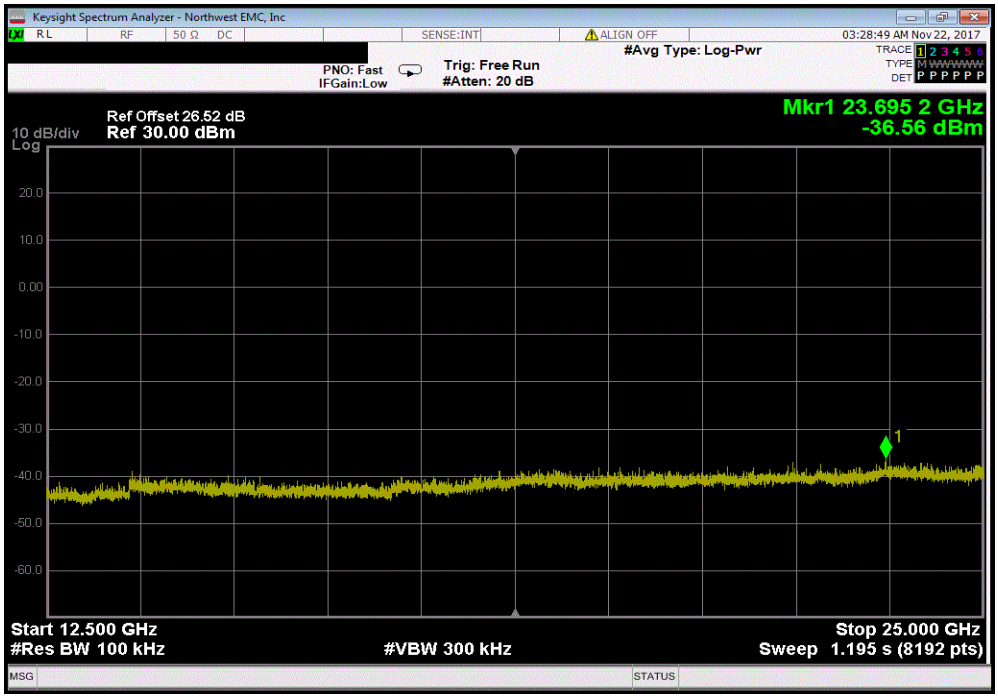
SPURIOUS CONDUCTED EMISSIONS

NweTx 2016.09.14.2 XMit 2017.09.21

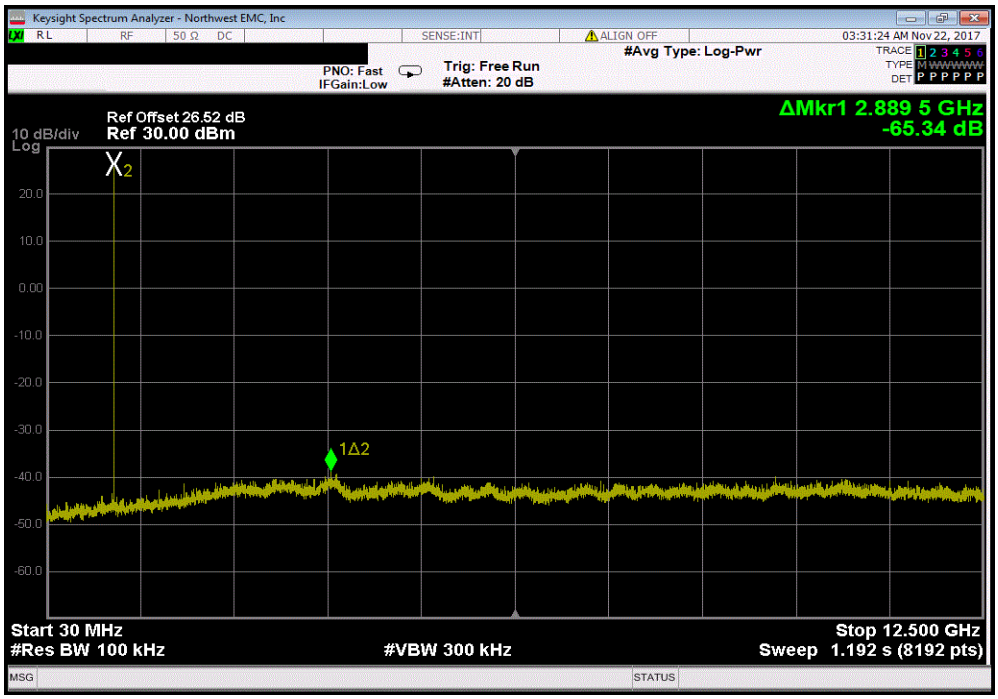
Non-Hopping Mode, Very Sensitive, DSB-ASK, Mid Channel 26, 915.25 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-65.91	-20	Pass



Non-Hopping Mode, Very Sensitive, DSB-ASK, Mid Channel 26, 915.25 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-62.99	-20	Pass



Non-Hopping Mode, Very Sensitive, DSB-ASK, High Channel 50, 927.25 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz		-65.34	-20	Pass



Non-Hopping Mode, Very Sensitive, DSB-ASK, High Channel 50, 927.25 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-63.25	-20	Pass