

**Application for Certification of
RS-485 wireless transceiver**

Quest Technical Sales and Marketing, Inc.

Model: HPW-WETHLINK
HVIN: HPW-WETHLINK
FCC ID: 2AHWAQTSHPWETH
IC ID: 21176-QTSHPWETH

REPORT # RV98022A-001

This report was prepared in accordance with the requirements of the FCC Rules and Regulations Part 2, Subpart J, 2.1033, Part 15.247 and other applicable sections of the rules as indicated herein.

Prepared By:

DNB Engineering, Inc.
5969 Robinson Avenue
Riverside, CA 92503

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Paragraph numbers in this report follow the application section numbers found in the FCC Rules and Regulations, Part 2, Subpart J for Certification of electronic equipment.

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1.0 ADMINISTRATIVE DATA

1.1 Certifications and Qualifications

I certify that DNB Engineering, Inc conducted the tests performed in order to obtain the technical data presented in this application. Also, based on the results of the enclosed data, I have concluded that the equipment tested meets or exceeds the requirements of the Rules and Regulations governing this application.

1.2 Measurement Repeatability Information

The test data presented in this report has been acquired using the guidelines set forth in FCC Part 2.1031 through 2.1057, Part 15. The test results presented in this document are valid only for the equipment identified herein under the test conditions described.

Repeatability of these test results will only be achieved with identical measurement conditions. These conditions include: The made test distance, EUT Height, Measurement Site Characteristics, and the same EUT System Components. The system must have the same interconnecting Cables arranged in identical placement to that in the test setup, with the system and/or EUT functioning in the identical mode of operation (i.e. software and so on) as on the date of the test. Any deviation from the test conditions and the environment on the date of the test may result in measurement repeatability difficulties.

All changes made to the EUT during the course of testing as identified in this test report must be incorporated into the EUT or identical models to ensure compliance with the FCC regulations.

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FCC 2.1033 (b) (1), IC RSS-Gen 3.1 Application for Certification

Name of Applicant:	Quest Technical Sales and Marketing, Inc.
Applicant is:	Manufacturer
Name of Manufacturer:	Quest Technical Sales and Marketing, Inc.
Description:	RS-485 wireless transceiver
Model Number:	HPW-WETHLINK
Anticipated Production Quantity:	Multiple Units
15.247 Frequency Bands:	902 – 928 MHz
15.247 Rated Power:	530 mW
Type of Signal:	FHSS
Test Procedure:	ANSI C63.10-2013, C63.4-2014

FCC 2.1033 (b) (2), IC RSS-Gen 3.1 FCC and IC Identifiers

FCC ID: 2AHWAQTSHPWETH

IC ID: 21176-QTSHPWETH

FCC 2.1033 (b) (3), IC RSS-Gen 3.2(a) Installation and Operating Instructions

To be filed as a separate attachment

FCC 2.1033 (b) (4), IC RSS-Gen 3.2(g) Brief Description of Circuit Function

To be filed as a separate attachment.

FCC 2.1033 (b) (5), IC RSS-Gen 3.2(a) Block Diagram

To be filed as a separate attachment.

FCC 2.1033 (b) (6), IC RSS-Gen 3.2(j) Report of Measurements

FCC 15.207 Conducted Emissions (General Provisions)
ANSI C63.10-2013 Section 6.2, C63.4-2014

Equipment List:

Asset	Equipment	Manufacturer	Model #	Serial #	Location	Cal date	Days	Due date
844	QP Adapter	HP	85650A	2811A01240	Riverside	15 Aug 17	730	15 Aug 19
1108	CRT Display	HP	85662A	238AG5252	Riverside	15 Aug 17	730	15 Aug 19
1242	Spectrum Analyzer	HP	8568B	2503A01257	Riverside	15 Aug 17	730	15 Aug 19
2180	LISN	Fisher	FCC-LISN	04077	Riverside	06 Jun 17	730	06 Jun 19
4258	Cable	DNB	RG-58	4258	Riverside	31 Jan 18	365	31 Jan 19
1859	Cable	DNB	RG-214	1859	Riverside	02 Feb 18	365	02 Feb 18

Procedure:

The EUT was placed on a wooden support .8m above the ground plane and connected to an Artificial Mains Network (AMN). The equipment was powered by 115Vac 60Hz. The emissions were measured from 150 kHz to 30 MHz

Analyzer settings:


RBW = 9kHz
VBW = 100kHz
Detector = Peak
Trace = Max Hold

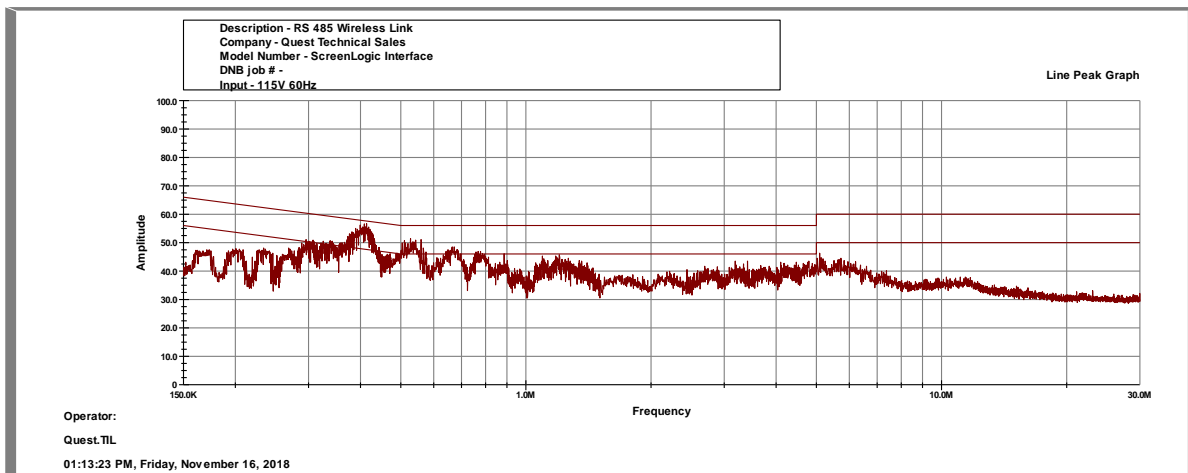
EUT Operating Conditions:

Normal operating condition.


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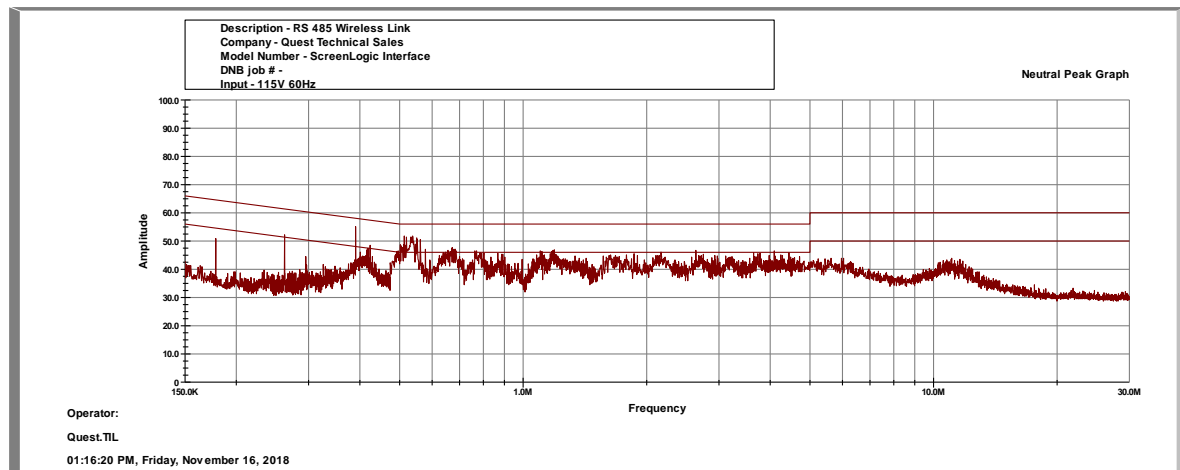
AMN = Artificial mains network
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Conducted Emissions	
DNB Job Number:	98022A	Date:	16 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		FCC 15.207
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Conducted Emissions 150kHz-30MHz	Normal operating condition		



Frequency (MHz)	Peak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	QP (dBμV)	Limit (dBμV)	Margin (dB)	Verdict
0.296	51.1	28.86	50.356	-21.496	45.48	60.356	-14.876	PASS
0.308	50.9	28.46	50.034	-21.574	43.43	60.034	-16.604	PASS
0.325	50.5	28.49	49.566	-21.076	42.68	59.566	-16.886	PASS
0.338	50.7	28.16	49.249	-21.089	43.34	59.249	-15.909	PASS
0.414	56.7	28.81	47.574	-18.764	44.01	57.574	-13.564	PASS
0.425	53.8	28.91	47.343	-18.433	44.37	57.343	-12.973	PASS
0.435	48.9	28	47.149	-19.149	41.69	57.149	-15.459	PASS
0.442	48.3	27.23	47.02	-19.79	38.11	57.02	-18.91	PASS
0.51	50.7	29.85	46	-16.15	38.38	56	-17.62	PASS
0.528	51.4	30.83	46	-15.17	38.37	56	-17.63	PASS
0.543	50.9	37.3	46	-8.7	45.83	56	-10.17	PASS
0.559	51.1	36.1	46	-9.9	47.65	56	-8.35	PASS
0.575	46.7	36.5	46	-9.5	47.4	56	-8.6	PASS
0.665	48.5	29.56	46	-16.44	42.49	56	-13.51	PASS
0.682	47.5	29.5	46	-16.5	43.11	56	-12.89	PASS
0.697	46.1	29.94	46	-16.06	43.7	56	-12.3	PASS
0.768	46.9	27.6	46	-18.4	42.37	56	-13.63	PASS
0.786	46.1	27.83	46	-18.17	41.67	56	-14.33	PASS
0.887	46.1	23.53	46	-22.47	36.68	56	-19.32	PASS

	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Conducted Emissions	
DNB Job Number:	98022A	Date:	16 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		FCC 15.207
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Conducted Emissions 150kHz-30MHz	Normal operating condition		



Frequency (MHz)	Peak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	QP (dBμV)	Limit (dBμV)	Margin (dB)	Verdict
0.262	52.2	27.83	51.361	-23.531	38.24	61.361	-23.121	PASS
0.391	55.1	36.46	48.05	-11.59	51.97	58.05	-6.08	PASS
0.424	48.5	33.38	47.374	-13.994	51.33	57.374	-6.044	PASS
0.502	48.7	26	46	-20	37.83	56	-18.17	PASS
0.513	51.8	25.52	46	-20.48	37.74	56	-18.26	PASS
0.538	51.8	35.6	46	-10.4	47.34	56	-8.66	PASS
0.55	51.1	33.02	46	-12.98	46.77	56	-9.23	PASS
0.562	50.5	33.35	46	-12.65	46.75	56	-9.25	PASS
0.578	47.1	29.36	46	-16.64	45.54	56	-10.46	PASS
0.672	47.7	29.61	46	-16.39	42.34	56	-13.66	PASS
0.684	47.1	29.36	46	-16.64	43.37	56	-12.63	PASS
0.763	46.5	23.86	46	-22.14	36.45	56	-19.55	PASS
1.101	46.5	25.07	46	-20.93	35.38	56	-20.62	PASS
1.191	46.9	29.81	46	-16.19	39.69	56	-16.31	PASS
2.168	46.1	26.95	46	-19.05	39.62	56	-16.38	PASS
2.635	46.7	25.54	46	-20.46	36.63	56	-19.37	PASS
4.091	46.5	23.19	46	-22.81	34.58	56	-21.42	PASS

FCC 15.209, IC RSS-Gen 8.9 Radiated Emissions (general provisions)
ANSI C63.10-2013 Sections 6.5 and 6.6, C63.4-2014

Equipment List:

Asset	Equipment	Manufacturer	Model #	Serial #	Location	Cal date	Days	Due date
1965	QP Adapter	HP	85650A	2043A00277	Riverside	14 Nov 18	730	14 Nov 20
1234	CRT Display	HP	85662A	238AG5252	Riverside	14 Nov 18	730	14 Nov 20
1430	Analyzer	HP	8568B	2732A03600	Riverside	14 Nov 18	730	14 Nov 20
	Pre-selector	HP	85685A	2724A00659	Riverside	14 Nov 18	730	14 Nov 20
2264	Analyzer	Agilent	E4407B	MY45103462	Riverside	16 Aug 17	730	2 Nov 19
1758	Biconical Antenna	AH Systems	2052	524	Riverside	22 Feb 18	730	22 Feb 20
31	Log-periodic Antenna	EMCO	3146	1284	Riverside	14 Feb 18	730	14 Feb 20
11	DRG Antenna	EMCO	3115	2281	Riverside	25 Jul 17	730	25 Jul 19
1875	Cable	DNB	NMN	11875	Riverside	02 Feb 18	365	02 Feb 19
1880	Cable	DNB (Helix)	NMN	11880	Riverside	02 Feb 18	365	02 Feb 19
1884	Cable	DNB (Helix)	NMN	11880	Riverside	02 Feb 18	365	02 Feb 19
1772	Attenuator	Alan	NMN	117018	Riverside	22 Sep 18	365	22 Sep 19
1761	Preamp	Miteq	JS2-0200400	664011	Riverside	28 Feb 18	365	28 Feb 19
1760	Pre-Amp (called ZFL)	Mini-Circuits	ZFL-2000	8350	1760	28 Feb 18	365	28 Feb 19

Test Procedure:

The EUT was measured on an open area test site (OATS)

A measuring distance of 3m was used for measurements.

The EUT shall be placed upon a non-conductive table .8 meters above the ground plane for measurements in the 30MHz to 1GHz range and 1.5 meters for measurements above 1GHz. For measurements above 1GHz RF absorbent material shall be placed on the ground plane as described in ANSI C63.4-2014. The EUT shall be placed in the “worst case” transmitting mode. The EUT shall be rotated 360 degrees to find the azimuth maxima. The receive antenna shall then be raised and lowered between 1 to 4 meters taking into account the antenna beam width above 1GHz. The maximum signal emanating from the EUT shall then be recorded on the data sheets.

Analyzer settings 30MHz to 1GHz:

Quasi Peak RBW = 120kHz
 Analyzer RBW = 1MHz
 Analyzer VBW = 1MHz
 Frequency Span = 1MHz
 Sweep Time = auto

Analyzer setting above 1GHz:

RBW = 1MHz
 VBW = 1MHz
 Span = 1MHz

EUT Operating Conditions:

Normal Operation below 1GHz. Above 1GHz Continuously transmitting at low, mid and high frequency respectively.

Limits:

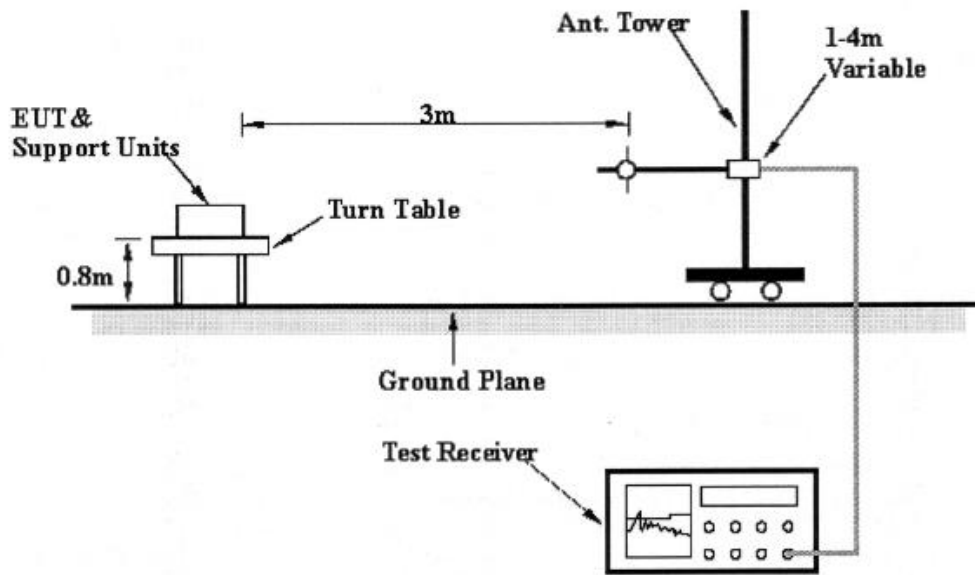
Frequency (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measurement Distance (meters)
.009 – 0.490	2400/f(kHz)	20*(Log10(2400/f(kHz)	300
0.490 – 1.705	24000/f(kHz)	20*(Log10(24000/f(kHz)	30
1.705 – 30.0	30	29.5	30
30 – 88	100	40	3
88 – 216	150	43.5	3
216 – 960	200	46.0	3
Above 960	500	54.0	3


Sample Calculation:

Corrected = Meter Reading + Cable1 Loss + Cable2 Loss + Antenna Factor – Amp Gain

Margin = Corrected – Limit

Test Setup:



	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630		Radiated Emissions (spurious)	
DNB Job Number:	98022A	Date:	19-Nov 2018	
Customer:	Quest Technical Sales and Marketing, Inc.			RSS-210 2.6 FCC 15.209
Model Number:	HPW-WETHLINK	Specification:		
Description:	RS-485 Wireless Transceiver			
Peak Measurements 30MHz – 1000MHz	Normal Operation			

Frequency (MHz)	Meter (dBμV)	Antenna (dB)	Cable (dB)	Distance (dB)	Preamplifier (dB)	Corrected (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Table	Polarity
30.562	36.8	14.3	0.9	0	-22	30	40	-10	PK	360	V
34.561	37.8	13.2	0.9	0	-22	29.9	40	-10.1	PK	72	V
37.077	37.2	12.7	1	0	-22	28.9	40	-11.1	PK	0	V
43.026	37.2	11.5	1.1	0	-22	27.8	40	-12.2	PK	0	V
48.501	44.4	10.7	1.2	0	-22	34.3	40	-5.7	PK	0	V
48.492	42	10.7	1.2	0	-22	31.9	40	-8.1	QP	0	V
52.946	46.1	10.2	1.2	0	-22	35.5	40	-4.5	PK	0	V
52.946	41.4	10.2	1.2	0	-22	30.8	40	-9.2	QP	0	V
62.51	46	9.7	1.2	0	-22	34.9	40	-5.1	PK	0	V
62.51	44.5	9.7	1.2	0	-22	33.4	40	-6.6	QP	0	V
67.628	48.1	9.6	1.3	0	-21.9	37.1	40	-2.9	PK	0	V
67.628	47.2	9.6	1.3	0	-21.9	36.2	40	-3.8	QP	0	V
70.35	46.2	9.6	1.4	0	-21.9	35.3	40	-4.7	PK	0	V
70.35	45	9.6	1.4	0	-21.9	34.1	40	-5.9	QP	0	V
73.71	48	9.4	1.5	0	-21.9	37	40	-3	PK	0	V
73.71	46.2	9.4	1.5	0	-21.9	35.2	40	-4.8	QP	0	V
77.967	47.9	9.3	1.7	0	-21.9	37	40	-3	PK	0	V
77.967	47.3	9.3	1.7	0	-21.9	36.4	40	-3.6	QP	0	V
84.488	45	9.2	1.7	0	-21.9	34	40	-6	PK	0	V
94.171	40.9	9.5	1.6	0	-21.9	30.1	43.5	-13.4	PK	0	V
110.878	40.6	10.5	1.7	0	-21.9	30.9	43.5	-12.6	PK	0	V
125.014	46.9	11.6	1.9	0	-21.9	38.5	43.5	-5	PK	358	V
125.014	45.8	11.6	1.9	0	-21.9	37.4	43.5	-6.1	QP	360	V
150.024	35.5	12.5	2.1	0	-21.9	28.2	43.5	-15.3	PK	40	V
31.188	27.9	14.1	0.9	0	-22	20.9	40	-19.1	PK	0	H
40.158	32.9	12.1	1	0	-22	24	40	-16	PK	0	H
50.158	35.8	10.5	1.2	0	-22	25.5	40	-14.5	PK	0	H
61.486	37.6	9.7	1.1	0	-22	26.4	40	-13.6	PK	0	H
69.991	43.1	9.6	1.4	0	-21.9	32.2	40	-7.8	PK	0	H
73.008	37.9	9.4	1.5	0	-21.9	26.9	40	-13.1	PK	0	H
78.025	42.4	9.3	1.7	0	-21.9	31.5	40	-8.5	PK	0	H
84.031	37.6	9.2	1.7	0	-21.9	26.6	40	-13.4	PK	0	H
85.587	46.1	9.2	1.7	0	-21.9	35.1	40	-4.9	PK	0	H
85.587	42.3	9.2	1.7	0	-21.9	31.3	40	-8.7	QP	0	H
90.506	36.2	9.4	1.6	0	-21.9	25.3	43.5	-18.2	PK	0	H
96.006	37.7	9.6	1.6	0	-21.9	27	43.5	-16.5	PK	0	H

Frequency (MHz)	Meter (dBμV)	Antenna (dB)	Cable (dB)	Distance (dB)	Preamplifier (dB)	Corrected (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Table	Polarity
108.803	39.3	10.4	1.7	0	-21.9	29.5	43.5	-14	PK	0	H
124.989	46.8	11.6	1.8	0	-21.9	38.3	43.5	-5.2	PK	0	H
124.989	46.2	11.6	1.8	0	-21.9	37.7	43.5	-5.8	QP	0	H
149.995	32.7	12.5	2.1	0	-21.9	25.4	43.5	-18.1	PK	0	H
181.452	32.9	14.2	2.4	0	-21.8	27.7	43.5	-15.8	PK	0	H
194.955	38.6	14.5	2.5	0	-21.8	33.8	43.5	-9.7	PK	0	H
225.009	38.9	10.6	2.8	0	-21.7	30.6	46	-15.4	PK	360	V
249.99	48.3	11.6	2.9	0	-21.7	41.1	46	-4.9	PK	360	V
250.009	47.1	11.6	2.9	0	-21.7	39.9	46	-6.1	QP	360	V
274.999	43.5	12.9	3	0	-21.6	37.8	46	-8.2	PK	360	V
299.997	36.7	13.9	3.2	0	-21.6	32.2	46	-13.8	PK	360	V
324.995	37.2	14	3.4	0	-21.5	33.1	46	-12.9	PK	360	V
350.004	36.1	14.3	3.6	0	-21.4	32.6	46	-13.4	PK	360	V
374.99	38.5	14.6	3.7	0	-21.3	35.5	46	-10.5	PK	360	V
400.022	33.7	15.1	3.9	0	-21.3	31.4	46	-14.6	PK	360	V
425.009	38.6	16.2	4	0	-21.2	37.6	46	-8.4	PK	360	V
449.992	36.4	16.1	4.1	0	-21.1	35.5	46	-10.5	PK	360	V
475.019	36.7	17	4.3	0	-21	37	46	-9	PK	360	V
599.994	33.6	18.5	4.7	0	-20.8	36	46	-10	PK	360	V
850.284	32.7	22.4	6.3	0	-21	40.4	46	-5.6	PK	360	V
225.274	38	10.6	2.8	0	-21.7	29.7	46	-16.3	PK	360	H
249.995	49.4	11.6	2.9	0	-21.7	42.2	46	-3.8	PK	360	H
250.004	48.3	11.6	2.9	0	-21.7	41.1	46	-4.9	QP	360	H
275.022	35.8	12.9	3.1	0	-21.6	30.2	46	-15.8	PK	360	H
300.005	34.6	13.9	3.2	0	-21.6	30.1	46	-15.9	PK	360	H
399.974	38.2	15.1	3.9	0	-21.3	35.9	46	-10.1	PK	360	H
425.003	40.6	16.2	4	0	-21.2	39.6	46	-6.4	PK	360	H
450.003	32.5	16.1	4.2	0	-21.1	31.7	46	-14.3	PK	360	H
799.569	32.6	20.4	5.9	0	-20.9	38	46	-8	PK	360	H

	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630		Radiated Emissions (spurious)	
DNB Job Number:	98022A	Date:	19 Nov 2018	
Customer:	Quest Technical Sales and Marketing, Inc.			RSS-210 2.6 FCC 15.209
Model Number:	HPW-WETHLINK	Specification:		
Description:	RS-485 Wireless Transceiver			
Above 1 GHz		Low Channel 903MHz		

Frequency (MHz)	Meter (dBuV)	Antenna (dB)	Cable (dB)	Pre-Amp (dB)	Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table	Polarity
1806	47.18	27.48	0.8	24	51.46	54	-2.54	A	360	V
1806	68.73	27.48	0.8	24	73.01	74	-0.99	P	360	V
2709	40.01	29.26	1	24	46.27	54	-7.73	A	360	V
2709	66.05	29.26	1	24	72.31	74	-1.69	P	360	V
3612	25.78	31.95	1.2	31.1	27.83	54	-26.17	P	360	V
4515	22.89	32.8	1.4	28.6	28.49	54	-25.51	P	360	V
5418	14.98	34.47	1.6	29.3	21.75	54	-32.25	P	360	V
6321	14.75	34.91	1.7	29.1	22.26	54	-31.74	P	360	V
7224	15.09	36.53	1.8	29.6	23.82	54	-30.18	P	360	V
8127	14.66	37.31	1.9	29.2	24.67	54	-29.33	P	360	V
9030	24.02	37.78	2.1	28.9	35	54	-19	P	360	V
1806	35.37	27.48	0.8	24	39.65	54	-14.35	A	360	H
1806	57.81	27.48	0.8	24	62.09	74	-11.91	P	360	H
2709	10.91	29.26	1	24	17.17	54	-36.83	A	360	H
3612	32.59	31.95	1.2	31.1	34.64	54	-19.36	P	360	H
4515	27.81	32.8	1.4	28.6	33.41	54	-20.59	P	360	H
5418	21.59	34.47	1.6	29.3	28.36	54	-25.64	P	360	H
6321	11.6	34.91	1.7	29.1	19.11	54	-34.89	P	360	H
7224	12.78	36.53	1.8	29.6	21.51	54	-32.49	P	360	H
8127	12.42	37.31	1.9	29.2	22.43	54	-31.57	P	360	H
9030	12.37	37.78	2.1	28.9	23.35	54	-30.65	P	360	H

	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630		Radiated Emissions (spurious)	
DNB Job Number:	98022	Date:	19 Nov 2018	
Customer:	Quest Technical Sales and Marketing, Inc.			RSS-210 2.6 FCC 15.209
Model Number:	HPW-WETHLINK	Specification:		
Description:	RS-485 Wireless Transceiver			
Above 1 GHz		Mid Channel 915MHz		

Frequency (MHz)	Meter (dBuV)	Antenna (dB)	Cable (dB)	Pre-Amp (dB)	Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table	Polarity
1830	46.99	27.48	0.8	24	51.27	54	-2.73	A	360	V
1830	67.23	27.48	0.8	24	71.51	74	-2.49	P	360	V
2745	39.87	29.26	1	24	46.13	54	-7.87	A	360	V
2745	61.89	29.26	1	24	68.15	74	-5.85	P	360	V
3660	26.43	31.95	1.2	31.1	28.48	54	-25.52	P	360	V
4575	24.22	32.8	1.4	28.6	29.82	54	-24.18	P	360	V
5490	17.97	34.47	1.6	29.3	24.74	54	-29.26	P	360	V
6405	15.54	34.91	1.7	29.1	23.05	54	-30.95	P	360	V
7320	15.71	36.53	1.8	29.6	24.44	54	-29.56	P	360	V
8235	15.39	37.31	1.9	29.2	25.4	54	-28.6	P	360	V
9150	21.56	37.78	2.1	28.9	32.54	54	-21.46	P	360	V
1830	37.44	27.48	0.8	24	41.72	54	-12.28	A	360	H
1830	56.13	27.48	0.8	24	60.41	74	-13.59	P	360	H
2745	34.69	29.26	1	24	40.95	54	-13.05	A	360	H
2745	53.87	29.26	1	24	60.13	74	-13.87	P	360	H
3660	30.12	31.95	1.2	31.1	32.17	54	-21.83	P	360	H
4575	24.36	32.8	1.4	28.6	29.96	54	-24.04	P	360	H
5490	20.11	34.47	1.6	29.3	26.88	54	-27.12	P	360	H
6405	14.37	34.91	1.7	29.1	21.88	54	-32.12	P	360	H
7320	15.46	36.53	1.8	29.6	24.19	54	-29.81	P	360	H
8235	14.28	37.31	1.9	29.2	24.29	54	-29.71	P	360	H
9150	13.25	37.78	2.1	28.9	24.23	54	-29.77	P	360	H

	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630		Radiated Emissions (spurious)	
DNB Job Number:	98022	Date:	19 Nov 2018	
Customer:	Quest Technical Sales and Marketing, Inc.			RSS-210 2.6 FCC 15.209
Model Number:	HPW-WETHLINK	Specification:		
Description:	RS-485 Wireless Transceiver			
Above 1 GHz		High Channel 927.5MHz		

Frequency (MHz)	Meter (dBuV)	Antenna (dB)	Cable (dB)	Pre-Amp (dB)	Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table	Polarity
1855	47.01	27.48	0.8	24	51.29	54	-2.71	A	360	V
1855	68.21	27.48	0.8	24	72.49	74	-1.51	P	360	V
2782.5	38.94	29.26	1	24	45.2	54	-8.8	A	360	V
2782.5	59.36	29.26	1	24	65.62	74	-8.38	P	360	V
3710	25.43	31.95	1.2	31.1	27.48	54	-26.52	P	360	V
4637.5	22.65	32.8	1.4	28.6	28.25	54	-25.75	P	360	V
5565	18.62	34.47	1.6	29.3	25.39	54	-28.61	P	360	V
6482.5	14.57	34.91	1.7	29.1	22.08	54	-31.92	P	360	V
7420	15.44	36.53	1.8	29.6	24.17	54	-29.83	P	360	V
8347.5	15.08	37.31	1.9	29.2	25.09	54	-28.91	P	360	V
9275	18.78	37.78	2.1	28.9	29.76	54	-24.24	P	360	V
1855	38	27.48	0.8	24	42.28	54	-11.72	A	360	H
1855	59.74	27.48	0.8	24	64.02	74	-9.98	P	360	H
2782.5	34.87	29.26	1	24	41.13	54	-12.87	A	360	H
2782.5	57.68	29.26	1	24	63.94	74	-10.06	P	360	H
3710	29.33	31.95	1.2	31.1	31.38	54	-22.62	P	360	H
4637.5	22.76	32.8	1.4	28.6	28.36	54	-25.64	P	360	H
5565	19.41	34.47	1.6	29.3	26.18	54	-27.82	P	360	H
6482.5	16.59	34.91	1.7	29.1	24.1	54	-29.9	P	360	H
7420	15.33	36.53	1.8	29.6	24.06	54	-29.94	P	360	H
8347.5	15.82	37.31	1.9	29.2	25.83	54	-28.17	P	360	H
9275	13.24	37.78	2.1	28.9	24.22	54	-29.78	P	360	H

FCC 15.247, RSS-247 5.1 Occupied Bandwidth
ANSI C63.10-2013 Section 6.9

Equipment List:

Asset	Equipment	Manufacturer	Model #	Serial #	Location	Cal date	Days	Due date
2264	Analyzer	Agilent	E4407B	MY45103462	Riverside	16 Aug 17	730	2 Nov 19

Test Procedure:

Use the occupied bandwidth measurement function on the spectrum analyzer to record the 20dB and 99% bandwidths of the emission.

Use the following spectrum analyzer settings:

RBW = 10kHz
VBW = 30KHz
Span = 3-4 x Occupied Bandwidth
Sweep = auto
Detector = Peak
Trace = Max hold

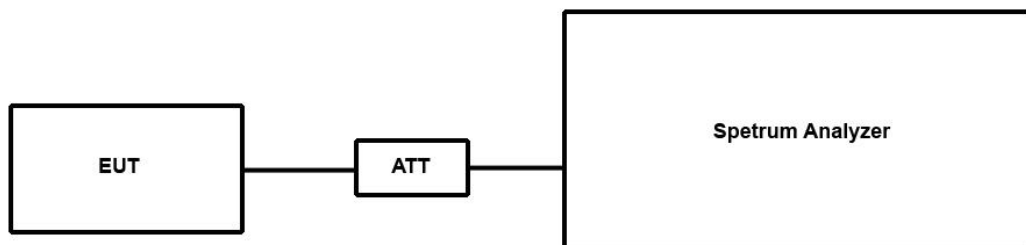
Requirement:

If the 20dB bandwidth of the hopping channel is less than 250kHz, 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 20dB 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.

EUT Operating Conditions:

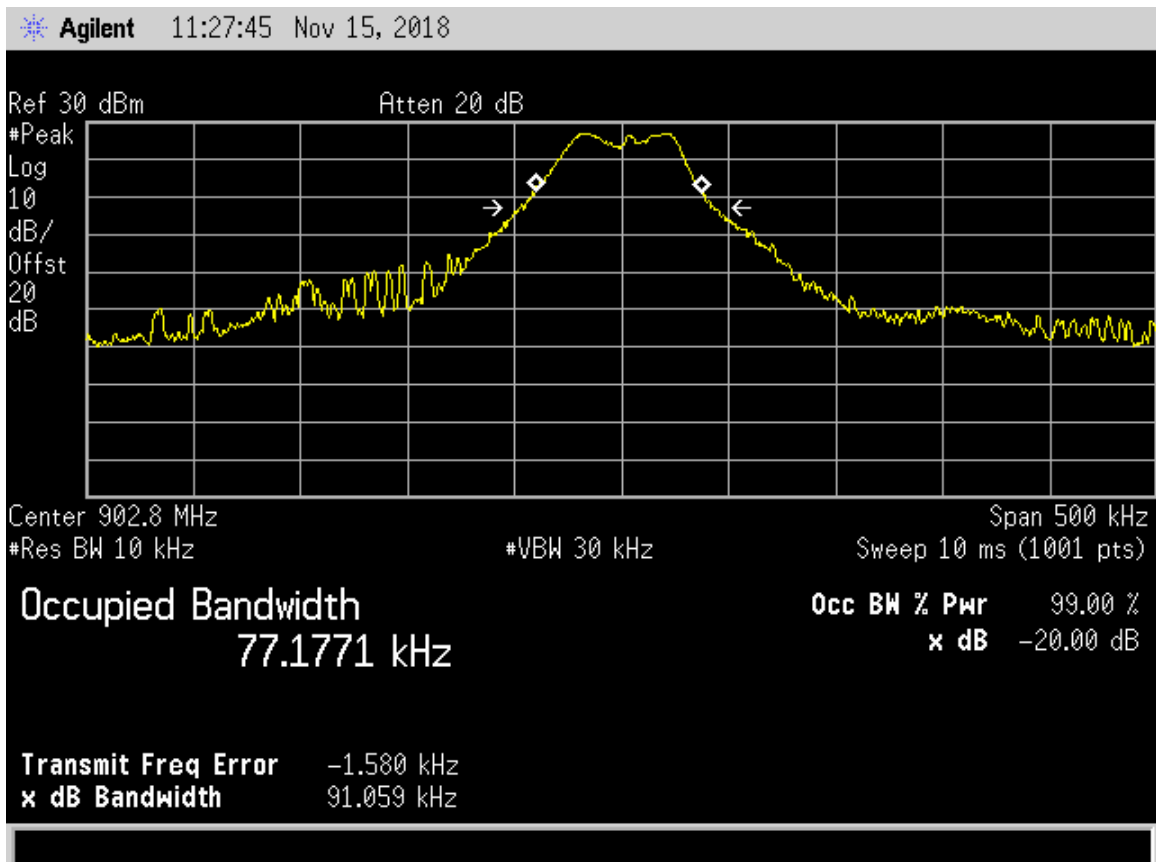
continuously transmitting at the low, mid, and upper channels respectively.

Test Setup:



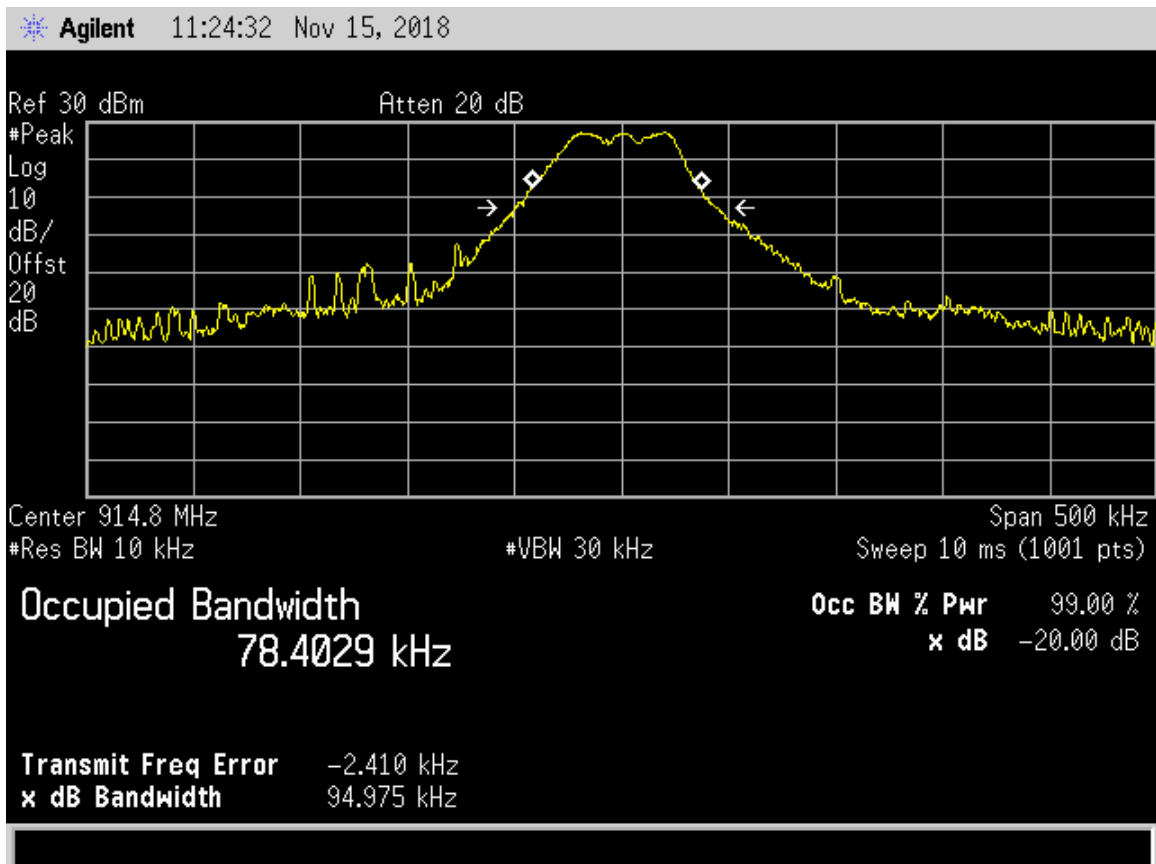
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Occupied Bandwidth (conducted)	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Occupied BW		Narrow Band Low 903MHz	

Channel	Mode	Frequency (MHz)	20dB BW (kHz)	Maximum (kHz)	Result
Low	Transmit	903	91.059	500kHz	Pass



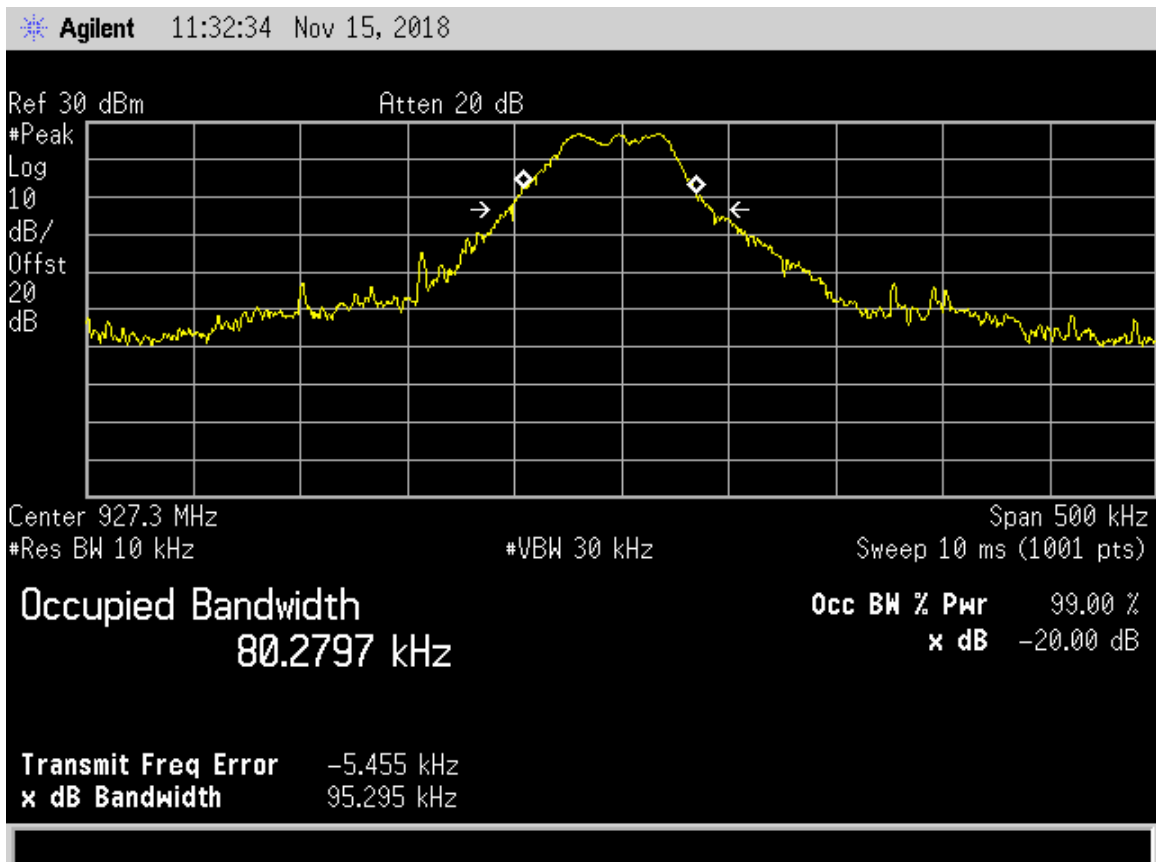
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630		Occupied Bandwidth (conducted)	
DNB Job Number:	98022A	Date:	19 Nov 2018	
Customer:	Quest Technical Sales and Marketing, Inc.			RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:		
Description:	RS-485 Wireless Transceiver			
Occupied BW		Narrow Band Mid 915MHz		

Channel	Mode	Frequency (MHz)	20dB BW (kHz)	Maximum (kHz)	Result
Mid	Transmit	915	94.975	500	Pass



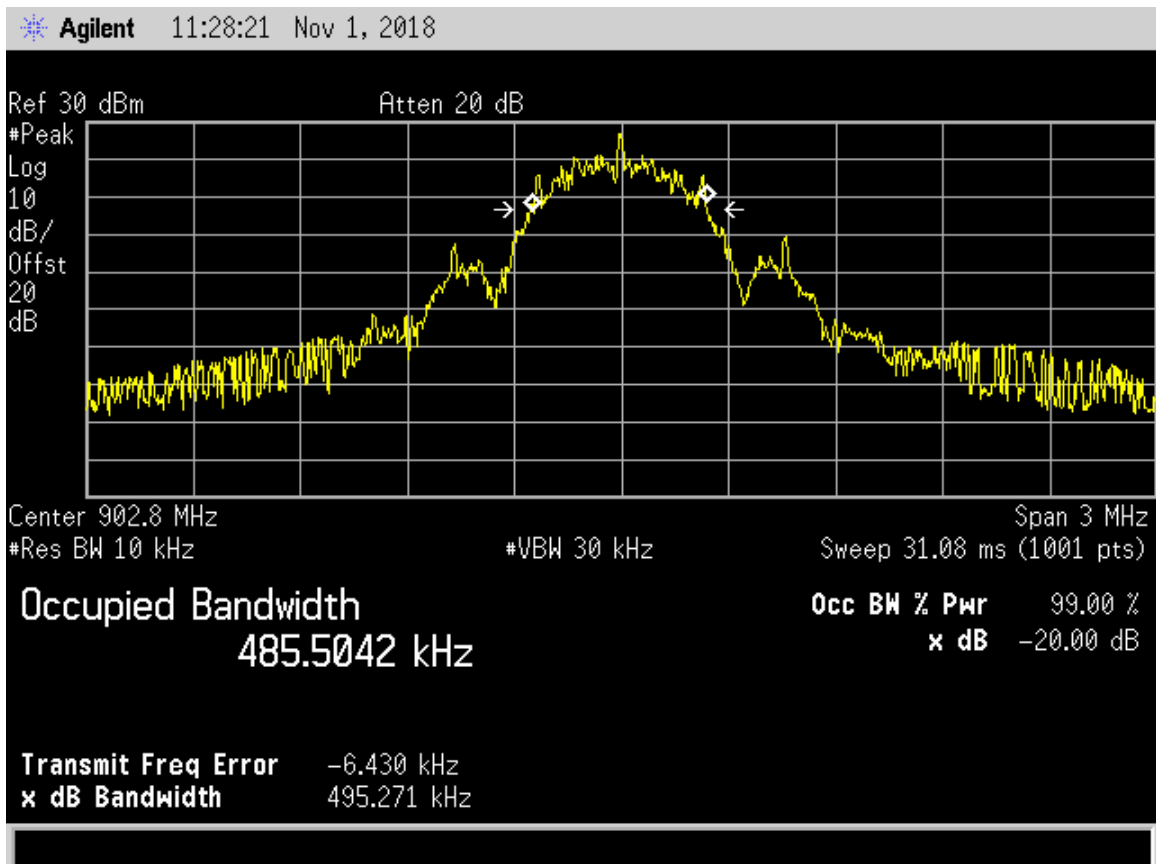
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Occupied Bandwidth (conducted)	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Occupied BW		Narrow Band High 927.5MHz	


Channel	Mode	Frequency (MHz)	20dB BW (kHz)	Maximum (kHz)	Result
Mid	Transmit	927.5	80.279	500	Pass



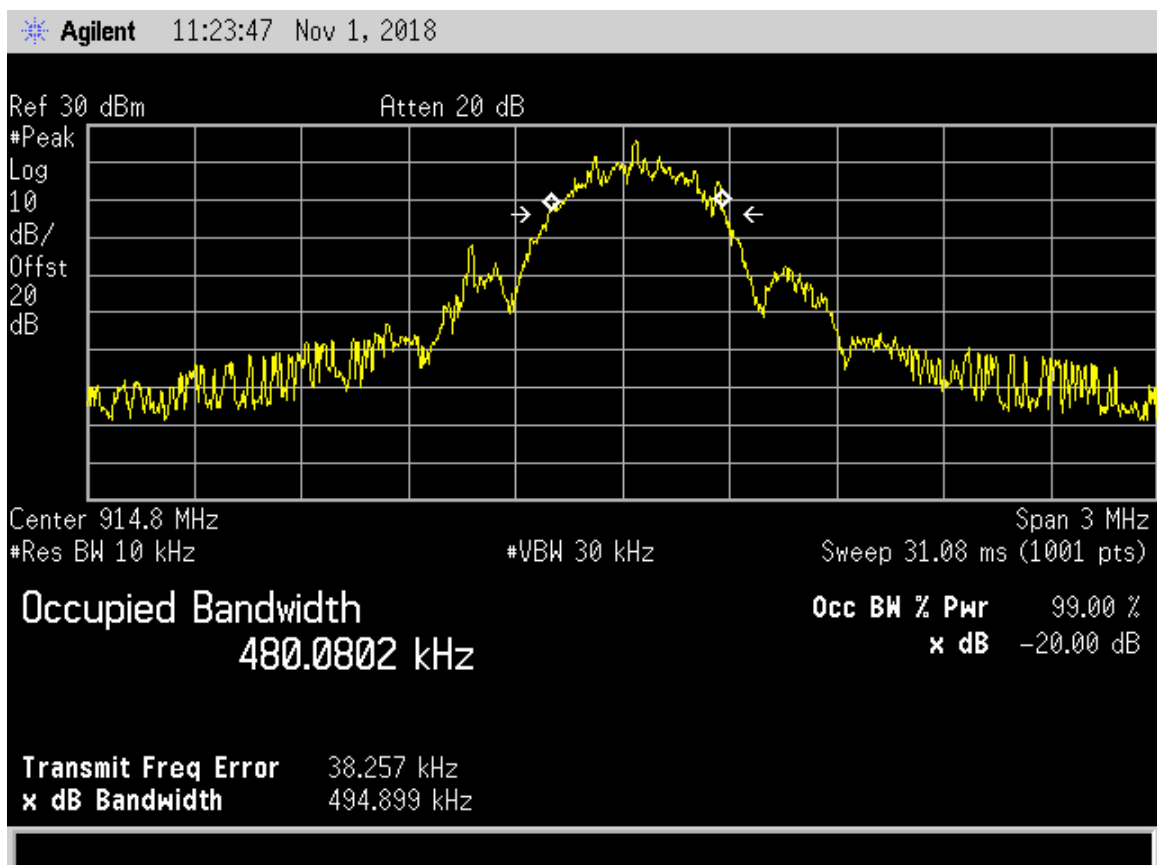
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630		Occupied Bandwidth (conducted)	
DNB Job Number:	98022A	Date:	19 Nov 2018	
Customer:	Quest Technical Sales and Marketing, Inc.			RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:		
Description:	RS-485 Wireless Transceiver			
Occupied BW		Wide Band Low 903MHz		

Channel	Mode	Frequency (MHz)	20dB BW (kHz)	Maximum (kHz)	Result
Low	Transmit	903	495.271	500kHz	Pass



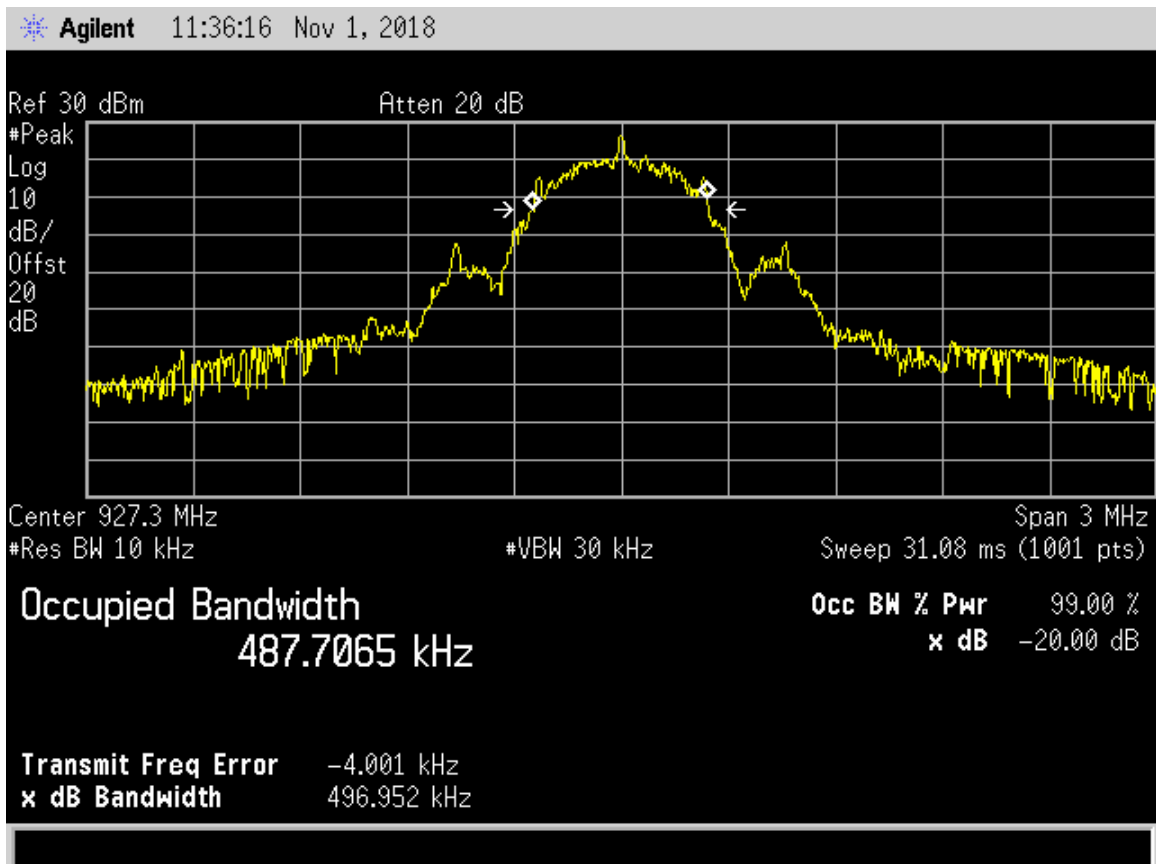
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Occupied Bandwidth (conducted)	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Occupied BW		Wide Band Mid 915MHz	

Channel	Mode	Frequency (MHz)	20dB BW (kHz)	Maximum (kHz)	Result
Mid	Transmit	915	494.899	500	Pass



	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Occupied Bandwidth (conducted)	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Occupied BW		Wide Band High 927.5MHz	

Channel	Mode	Frequency (MHz)	20dB BW (kHz)	Maximum (kHz)	Result
Mid	Transmit	927.5	496.952	500	Pass



FCC 15.24, RSS-247 5.1 Output Power (Conducted)

ANSI C63.10-2013 Section 11.9

Equipment List:

Asset #	Equipment	Manufacturer	Model #	Serial #	Location	Cal date	Interval	Due date
2264	Analyzer	Agilent	E4407B	MY45103462	Riverside	16 Aug 17	730	2 Nov 19

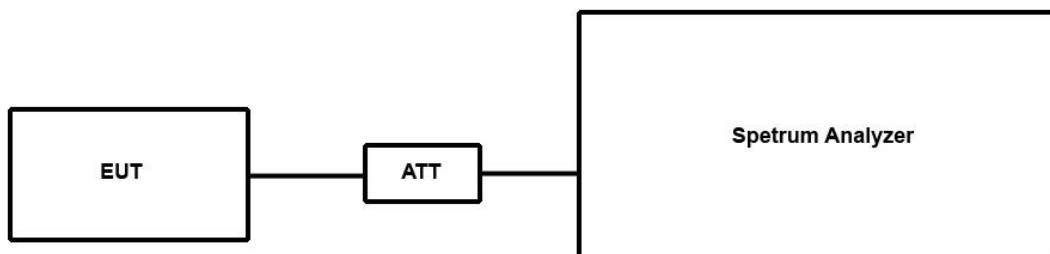
Test Procedure:


Connect the spectrum analyzer directly to antenna terminals. Use peak detector on max hold. Allow trace to stabilize. Use marker to peak function to set the marker on the peak emission. Record analyzer plot.

Use the following analyzer settings:

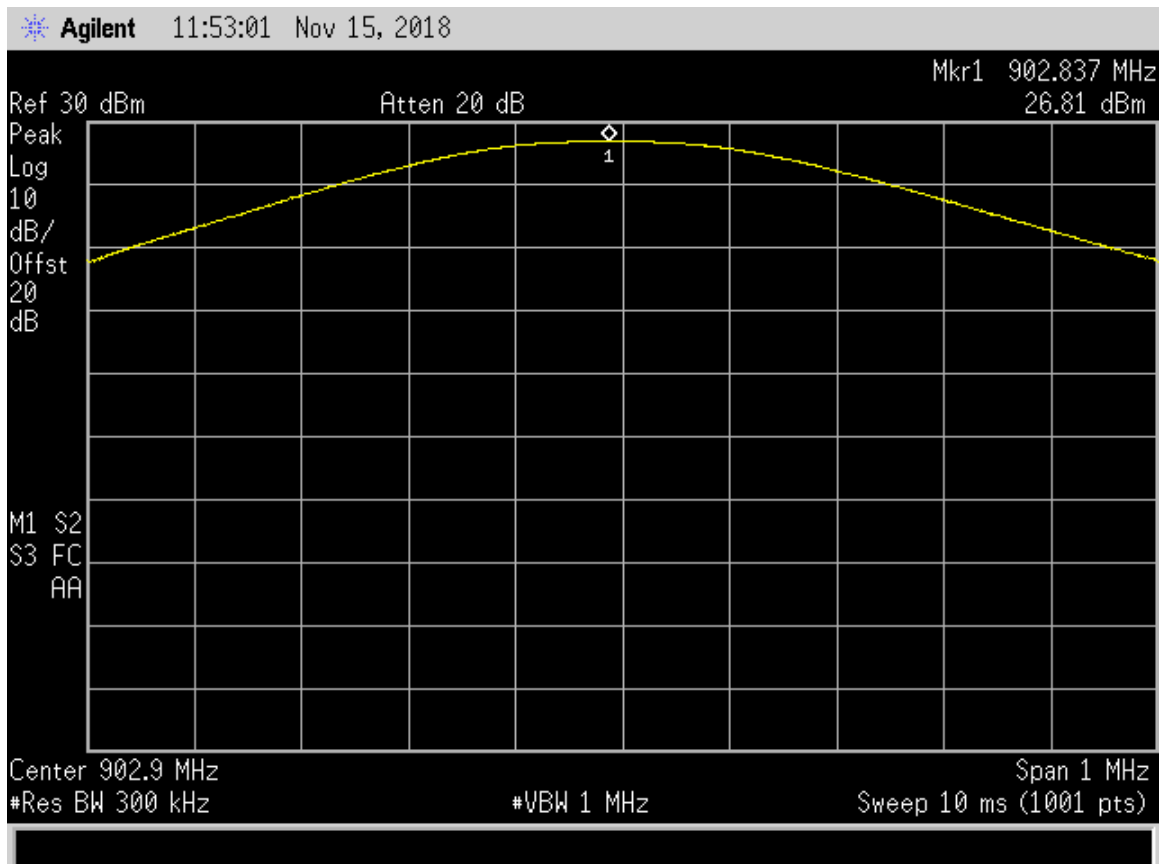
Span = approximately five times 20dB bandwidth
RBW = > 20dB bandwidth
VBW = > the RBW
Sweep = auto
Trace = max hold


Test Setup:



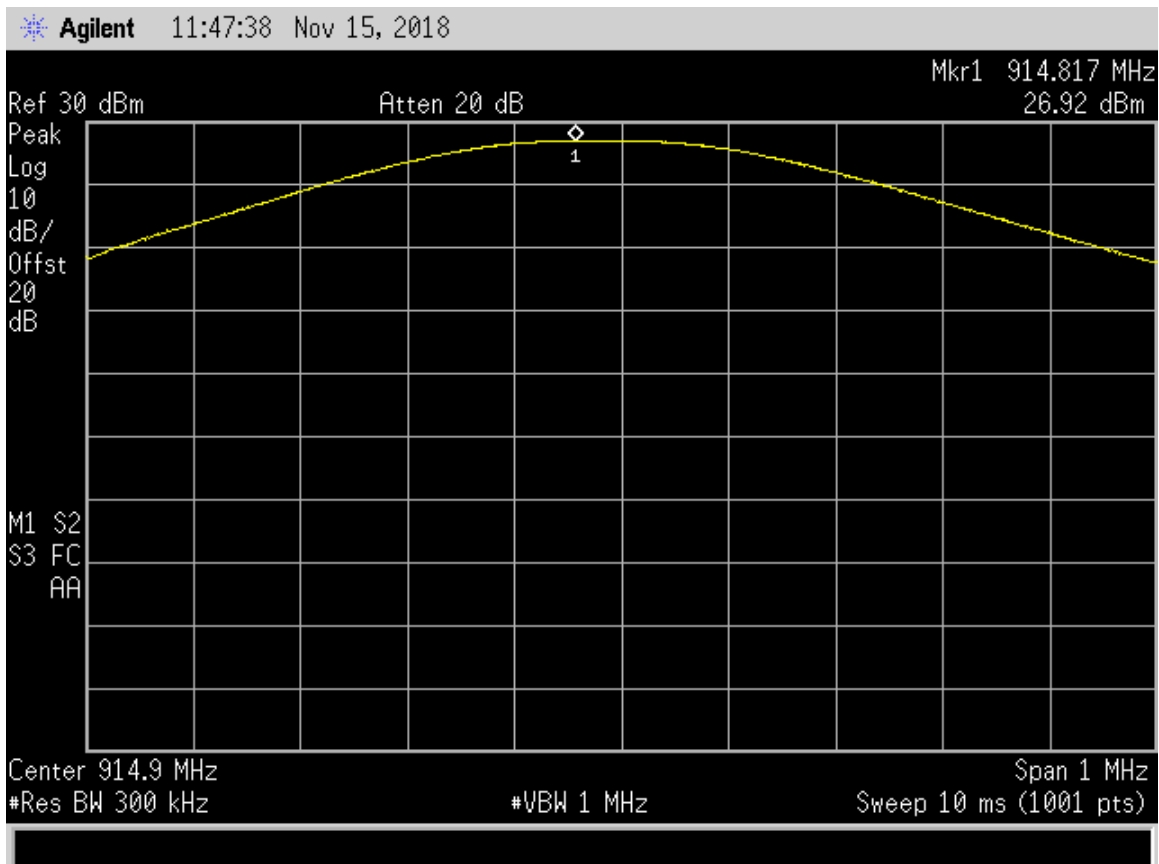
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Peak Power (Conducted)	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Peak Output Power		Narrow Band 903MHz	

Channel	Mode	Frequency (MHz)	Analyzer (dBm)	Limit (dBm)	Margin (dB)	Pass/Fail
Low	Transmit	903	26.81	30	-3.19	Pass



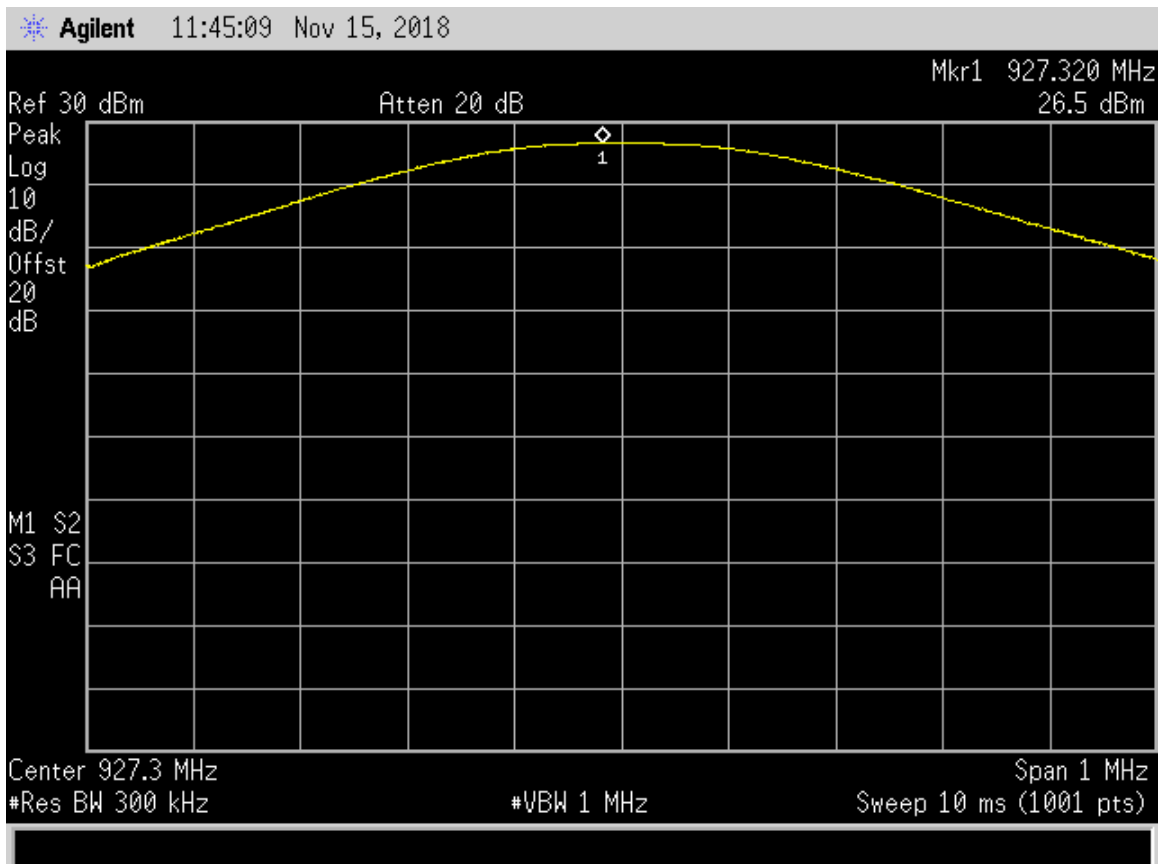
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Peak Power (Conducted)	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Peak Output Power		Narrow Bank Mid 915MHz	

Channel	Mode	Frequency (MHz)	Analyzer (dBm)	Limit (dBm)	Margin (dB)	Pass/Fail
Mid	Transmit	915	26.92	30	-3.08	Pass



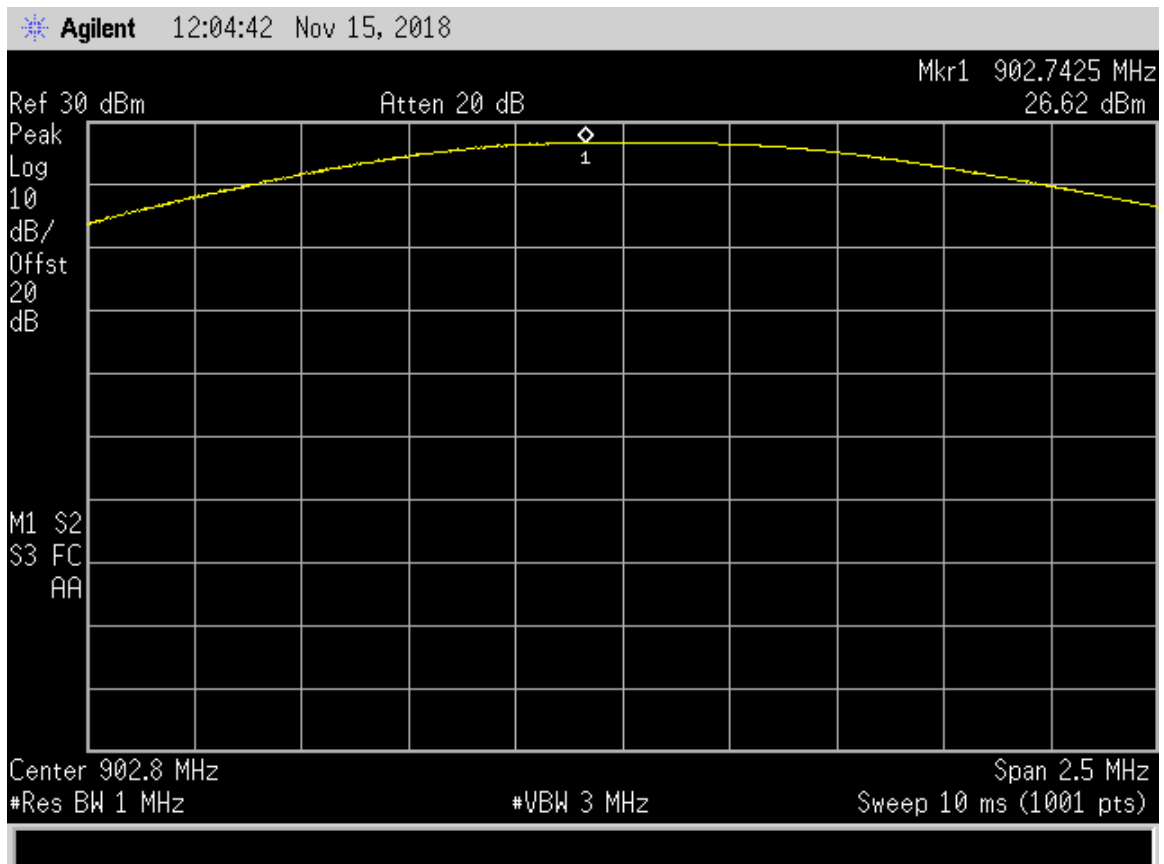
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Peak Power (Conducted)	
DNB Job Number:	68056	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Peak Output Power		High Channel 927.5MHz	


Channel	Mode	Frequency (MHz)	Analyzer (dBm)	Limit (dBm)	Margin (dB)	Pass/Fail
High	Transmit	927.5	26.5	30	-3.5	Pass



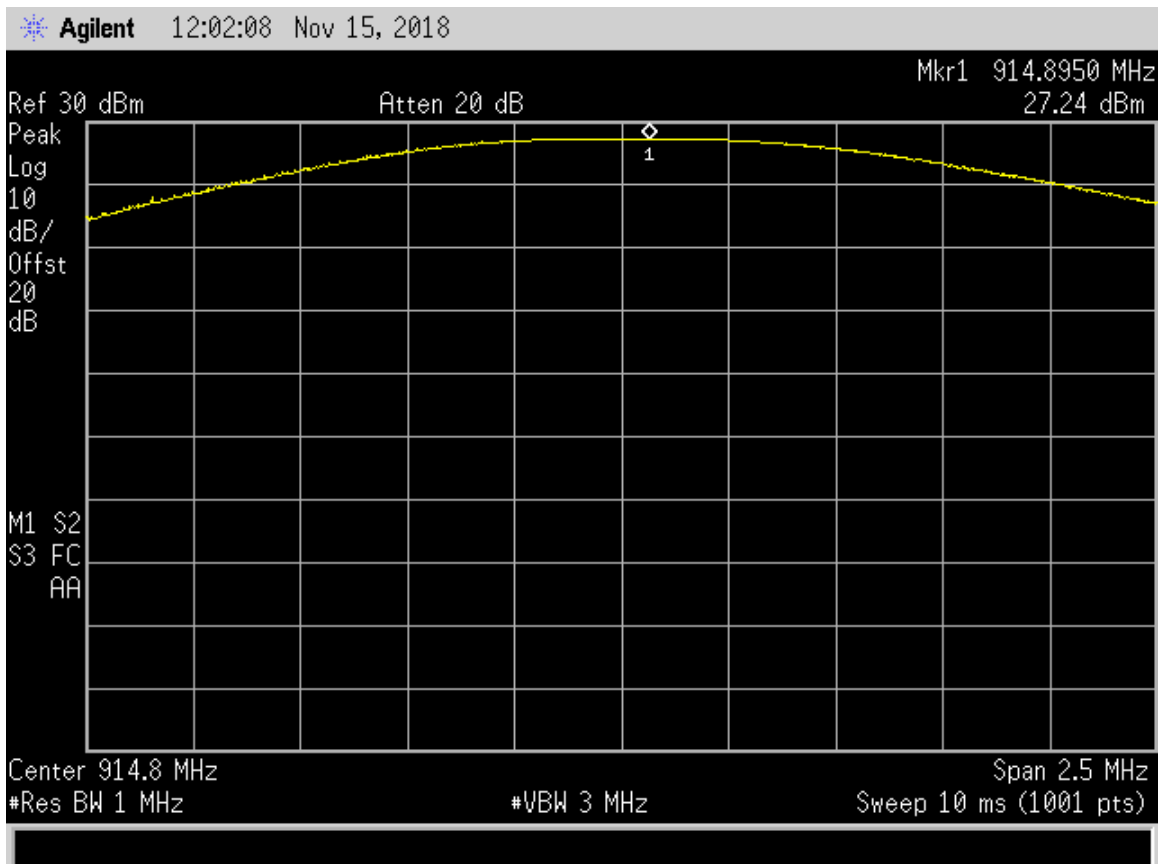
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Peak Power (Conducted)	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Peak Output Power		Wide Band 903MHz	


Channel	Mode	Frequency (MHz)	Analyzer (dBm)	Limit (dBm)	Margin (dB)	Pass/Fail
Low	Transmit	903	26.62	30	-3.38	Pass



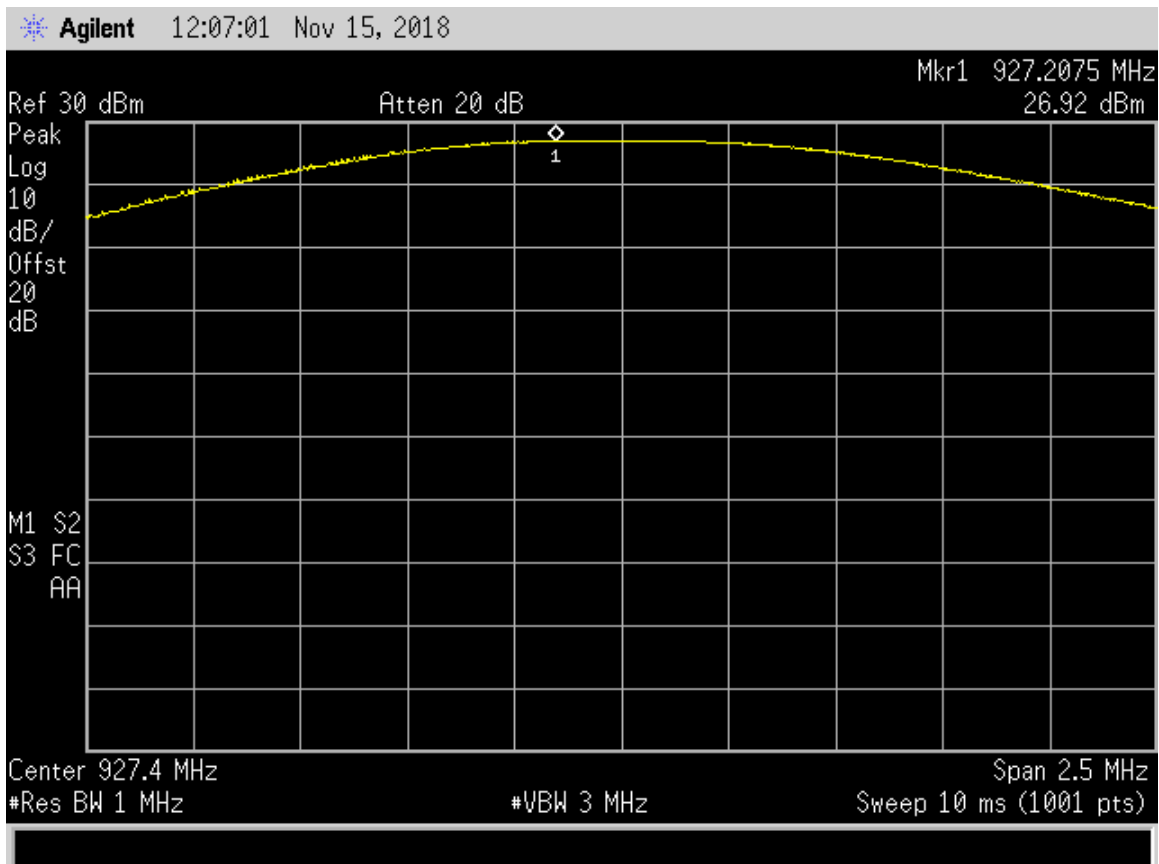
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Peak Power (Conducted)	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Peak Output Power		Wide Bank Mid 915MHz	

Channel	Mode	Frequency (MHz)	Analyzer (dBm)	Limit (dBm)	Margin (dB)	Pass/Fail
Mid	Transmit	915	27.24	30	-2.76	Pass



	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Peak Power (Conducted)	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Peak Output Power		Wide Band High 927.5MHz	

Channel	Mode	Frequency (MHz)	Analyzer (dBm)	Limit (dBm)	Margin (dB)	Pass/Fail
High	Transmit	927.5	26.5	30	-3.5	Pass



FCC 15.247, RSS-247 5.1 Antenna Port Conducted Emissions
ANSI C63.10-2013 Section 11.11

Equipment List:

Asset #	Equipment	Manufacturer	Model #	Serial #	Location	Cal date	Interval	Due date
2264	Analyzer	Agilent	E4407B	MY45103462	Riverside	16 Aug 17	730	2 Nov 19
1196	Attenuator	Pasternack	PE7010-20	1196	Riverside	21 Sep 18	365	21 Sep 19

Test Procedure:

Testing shall be done on a lab bench in a shielded room, or in another suitable location. The unlicensed wireless device active antenna port shall be connected to the spectrum analyzer, after applying appropriate precautions to protect the instrumentation

Use the following spectrum analyzer settings:

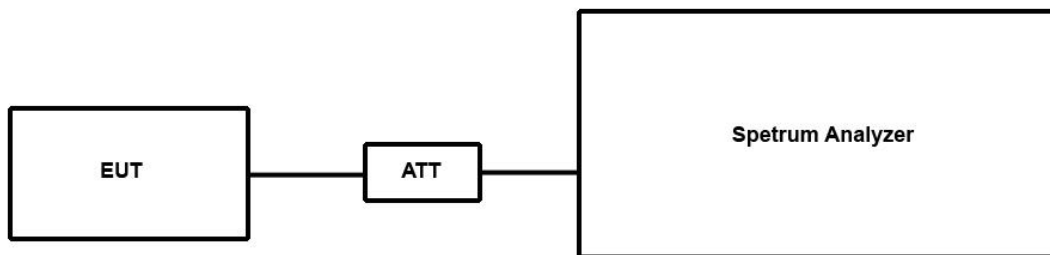
Span = Wide enough to capture the peak level of the in-band emission and all spurious emissions.
RBW = 100kHz
VBW = 100kHz
Sweep = auto
Detector = peak
Trace = max. hold


Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded.

Requirement:

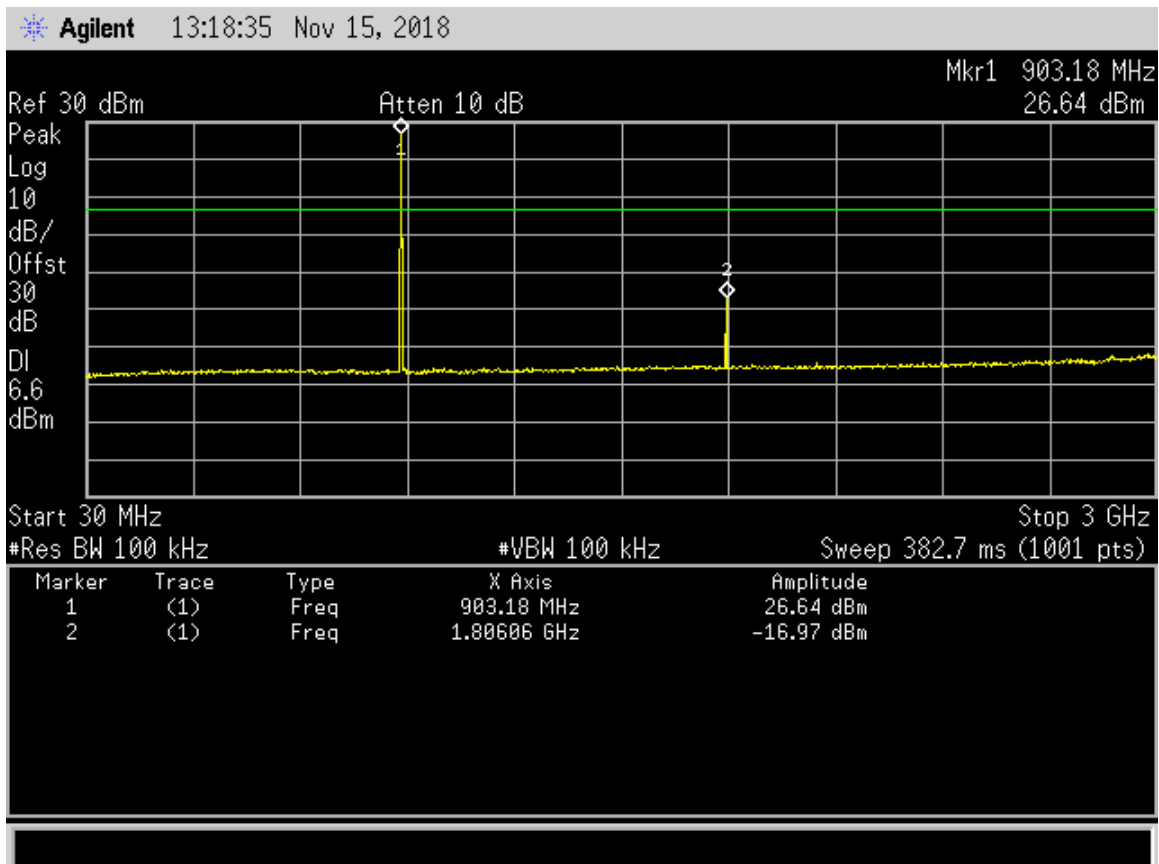
The maximum out-of-band emissions shall not exceed 20dBc


Test Setup:



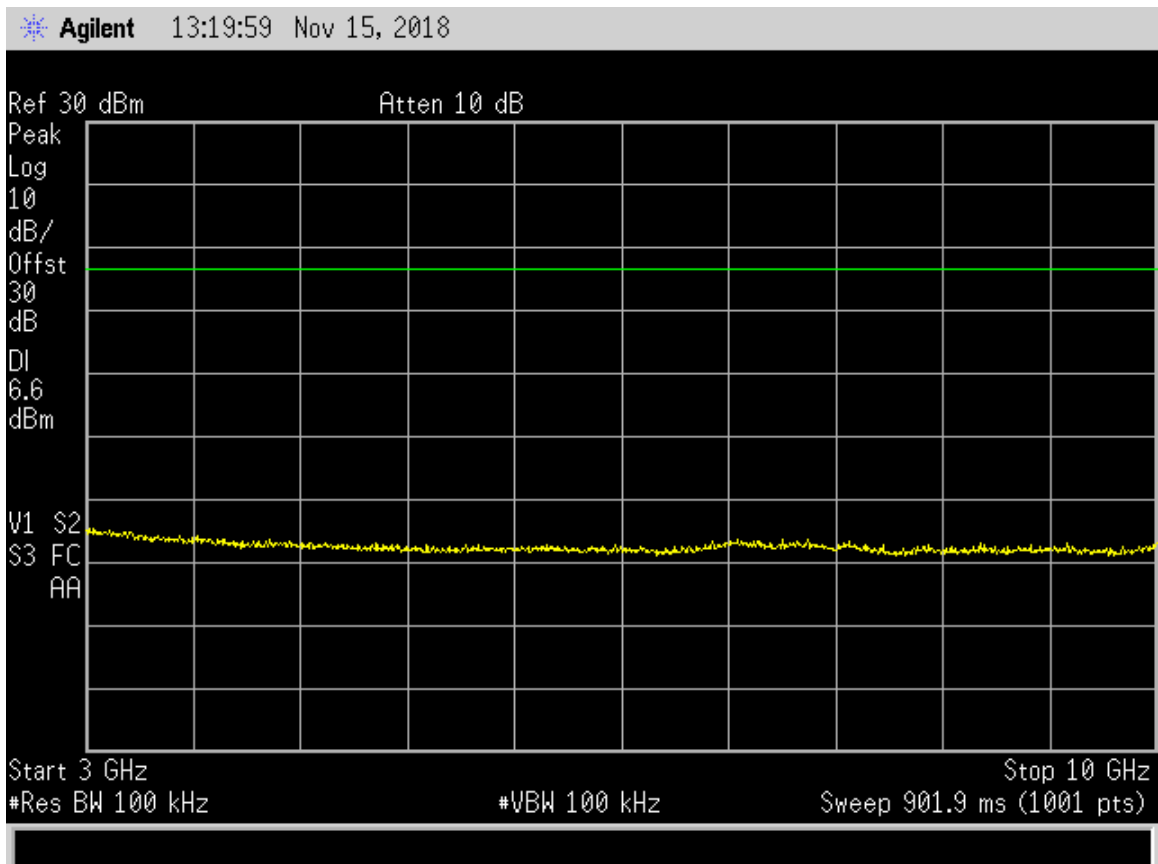
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Antenna Port Conducted Emissions	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Conducted Emissions		Narrow Band Low 903MHz	


Channel	Mode	Frequency (MHz)	Sweep (MHz)	Result
Low	Transmit	903	30 - 3000	Pass



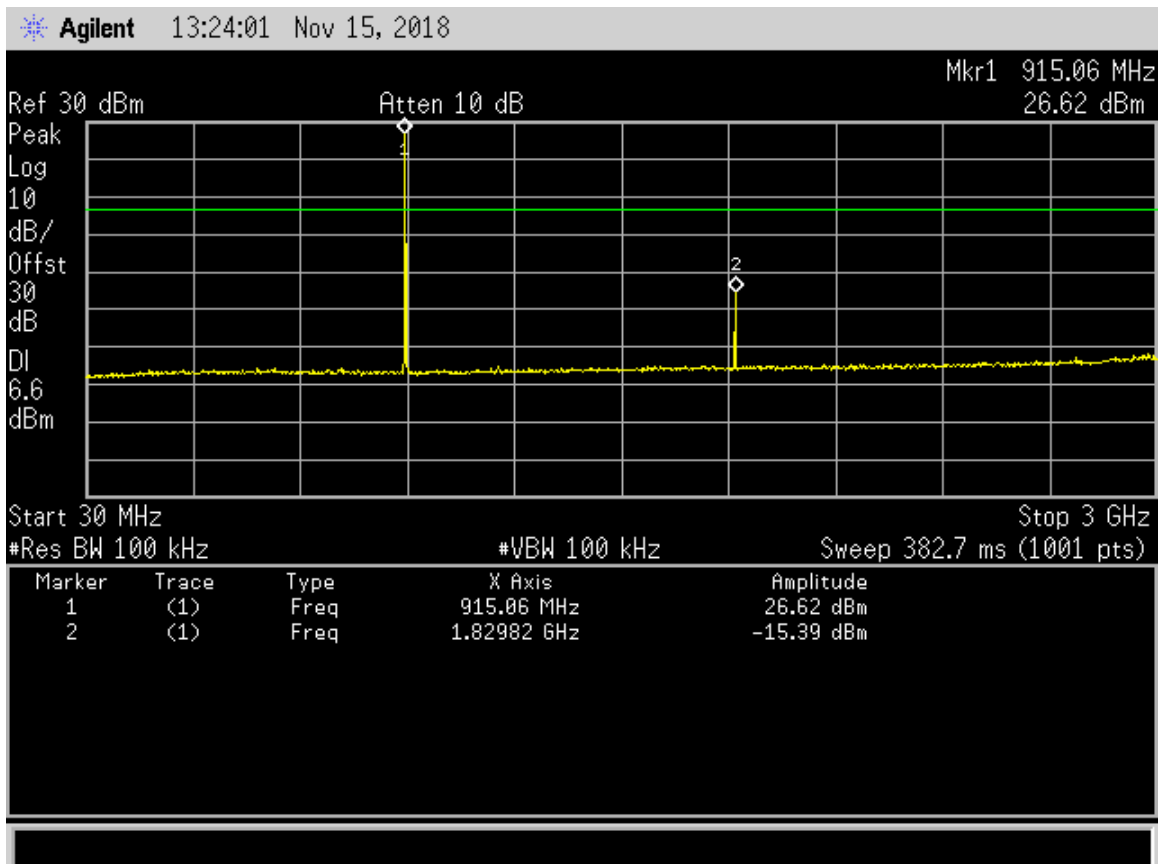
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Antenna Port Conducted Emissions	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Conducted Emissions		Narrow Band Low 903MHz	


Channel	Mode	Frequency (MHz)	Sweep (MHz)	Result
Low	Transmit	903	3000 - 10000	Pass



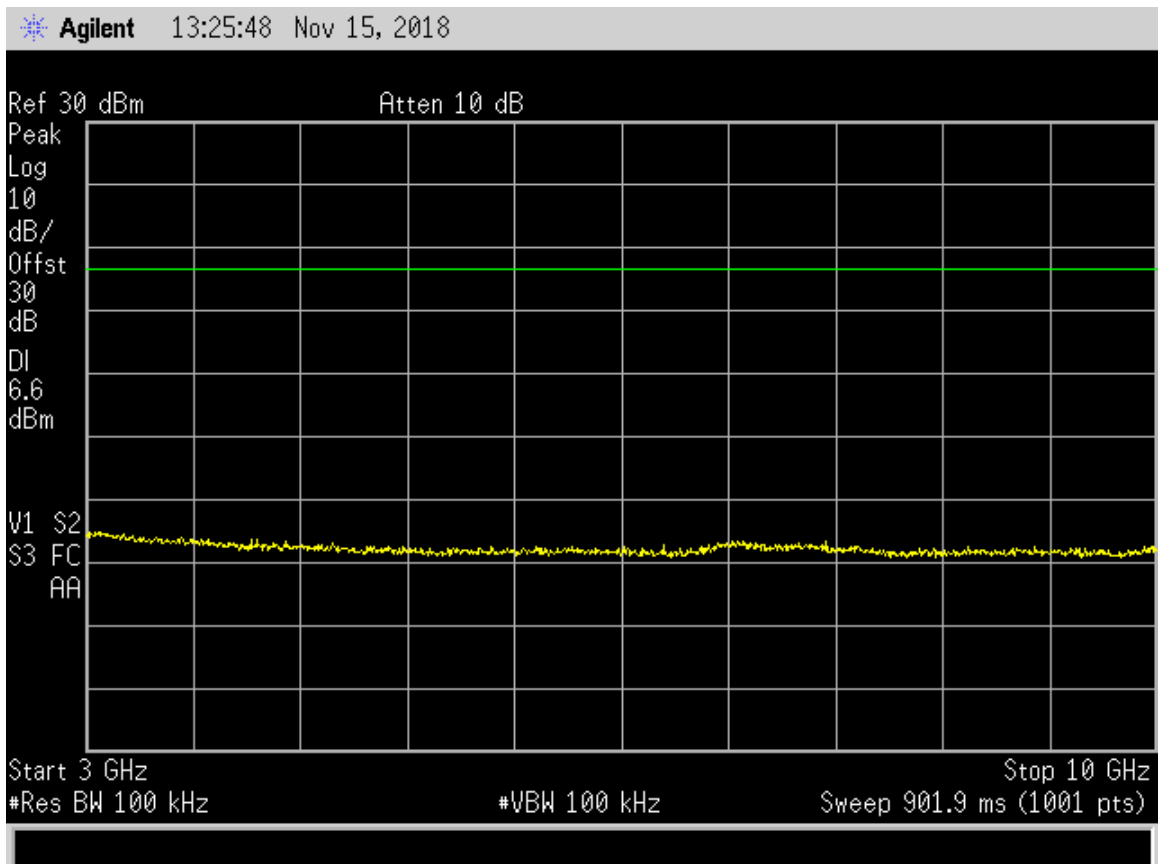
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DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Conducted Emissions		Narrow Band Mid 915MHz	


Channel	Mode	Frequency (MHz)	Sweep (MHz)	Result
Mid	Transmit	915	30 - 3000	Pass



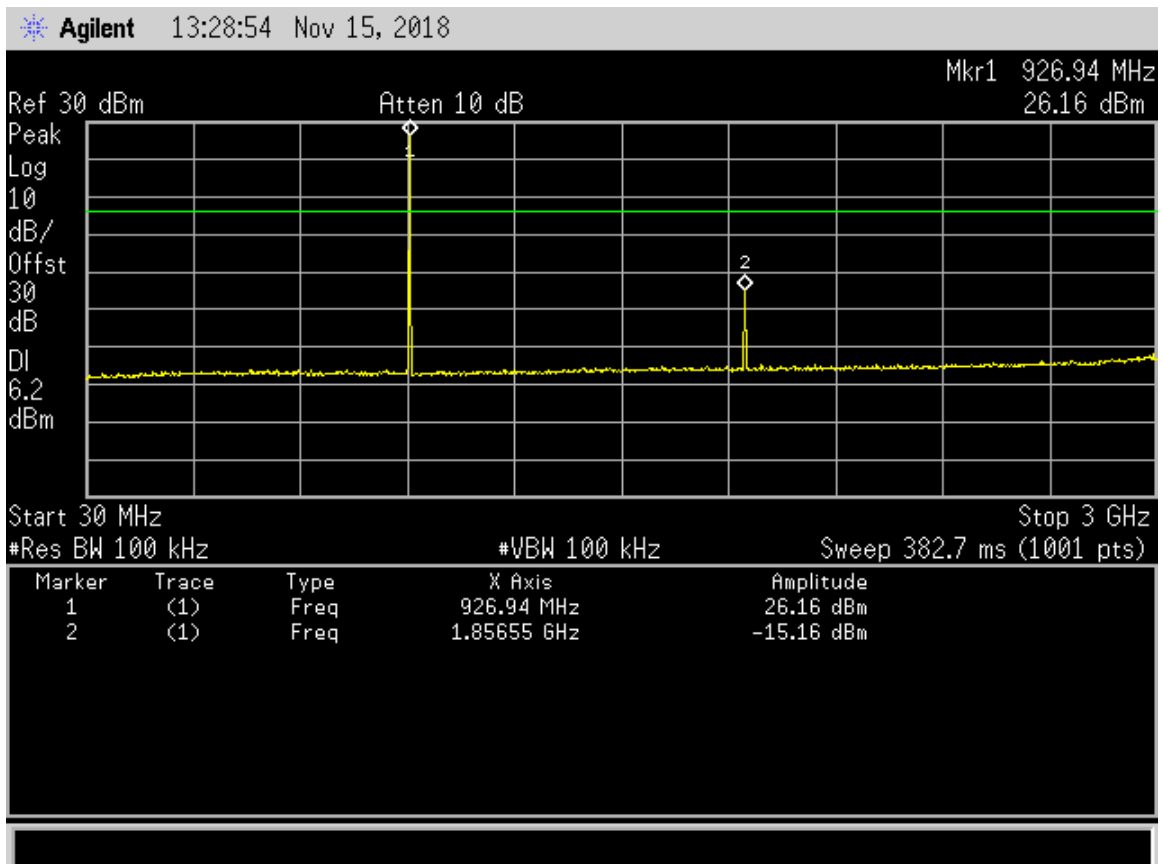
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Antenna Port Conducted Emissions	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Conducted Emissions		Narrow Band Mid 915MHz	


Channel	Mode	Frequency (MHz)	Sweep (MHz)	Result
Mid	Transmit	915	3000 - 10000	Pass



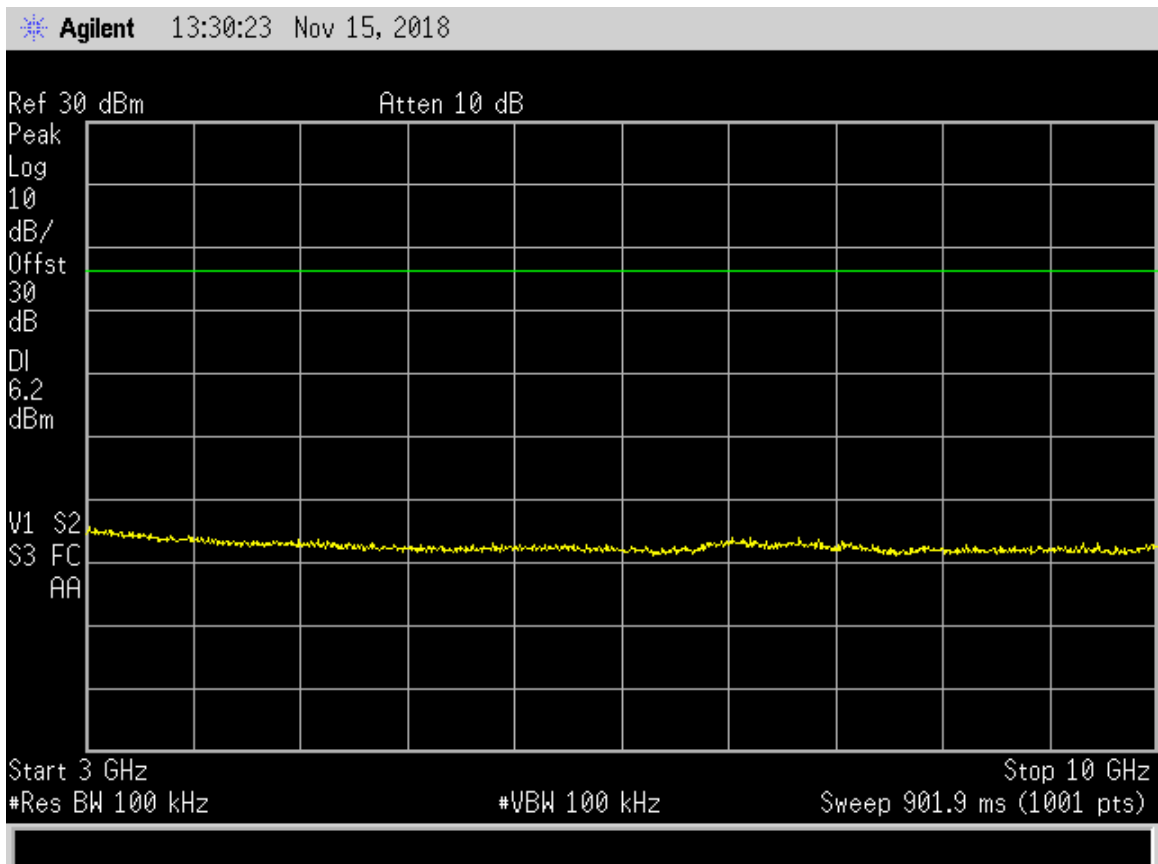
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Antenna Port Conducted Emissions	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Conducted Emissions		Narrow Band High 927.5MHz	


Channel	Mode	Frequency (MHz)	Sweep (MHz)	Result
High	Transmit	927.5	30 - 3000	Pass



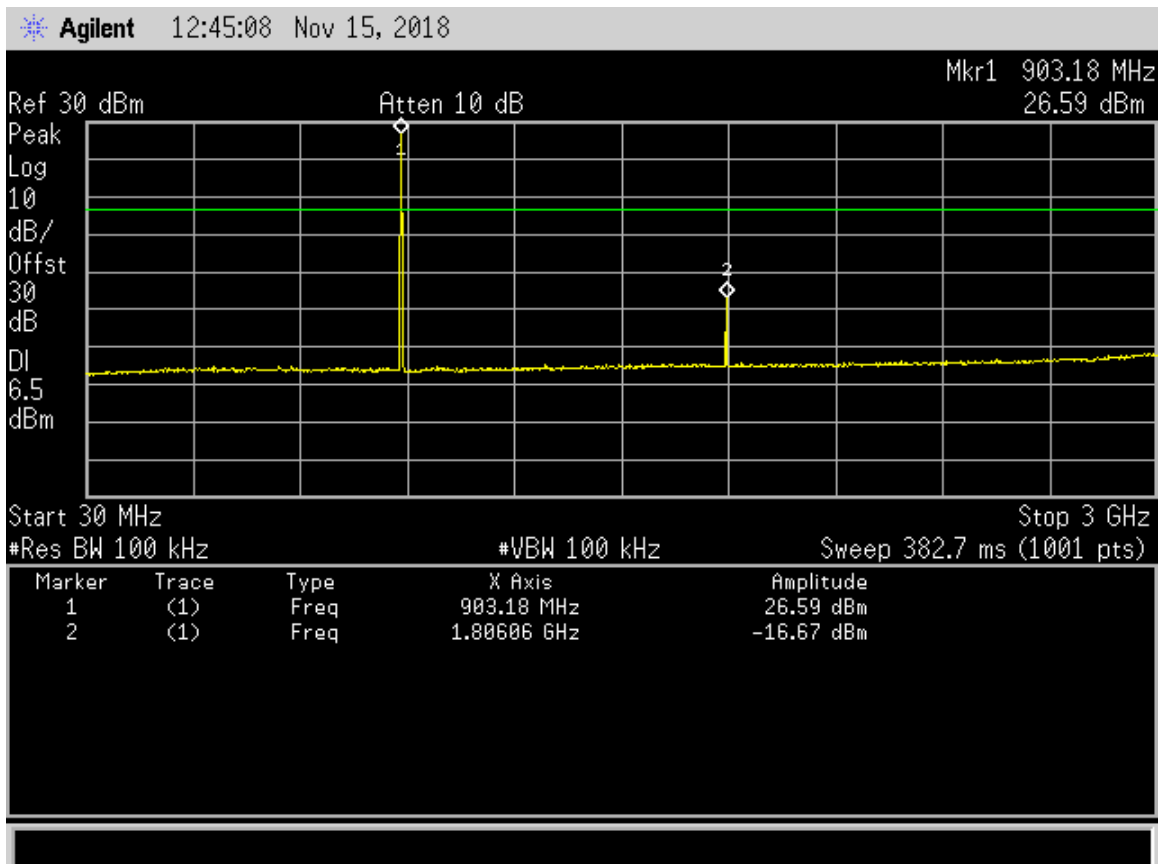
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Antenna Port Conducted Emissions	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Conducted Emissions		Narrow Band High 927.5MHz	


Channel	Mode	Frequency (MHz)	Sweep (MHz)	Result
High	Transmit	927.5	3000 - 10000	Pass



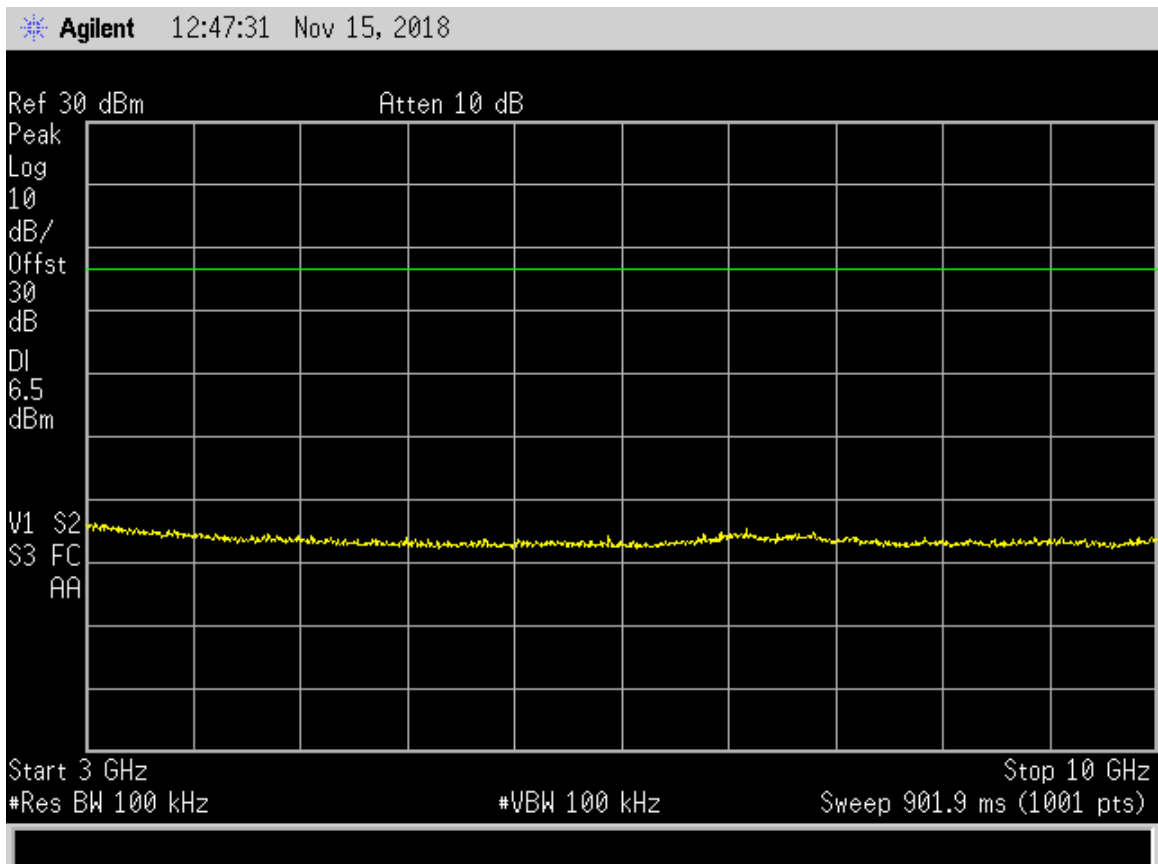
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Antenna Port Conducted Emissions	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Conducted Emissions		Wide Band Low 903MHz	


Channel	Mode	Frequency (MHz)	Sweep (MHz)	Result
Low	Transmit	903	30 - 3000	Pass



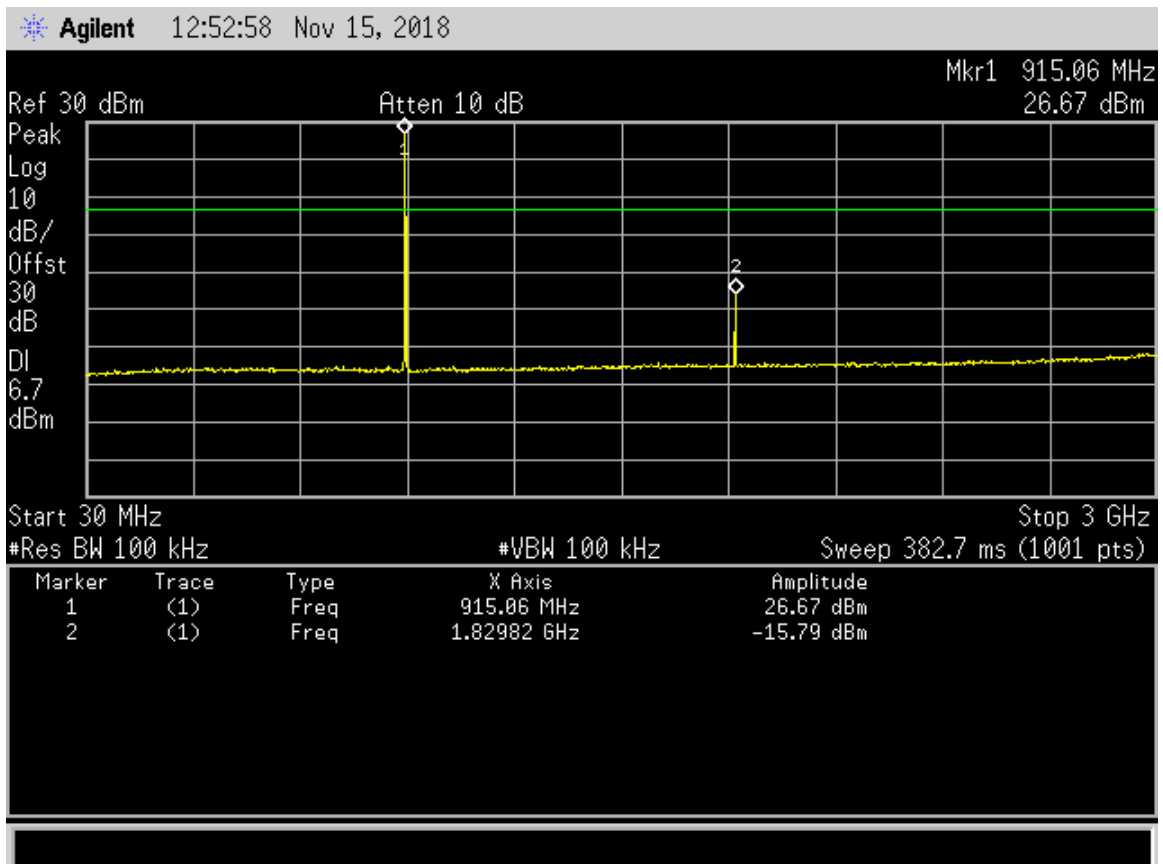
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Antenna Port Conducted Emissions	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Conducted Emissions		Wide Band Low 903MHz	


Channel	Mode	Frequency (MHz)	Sweep (MHz)	Result
Low	Transmit	903	3000 - 10000	Pass



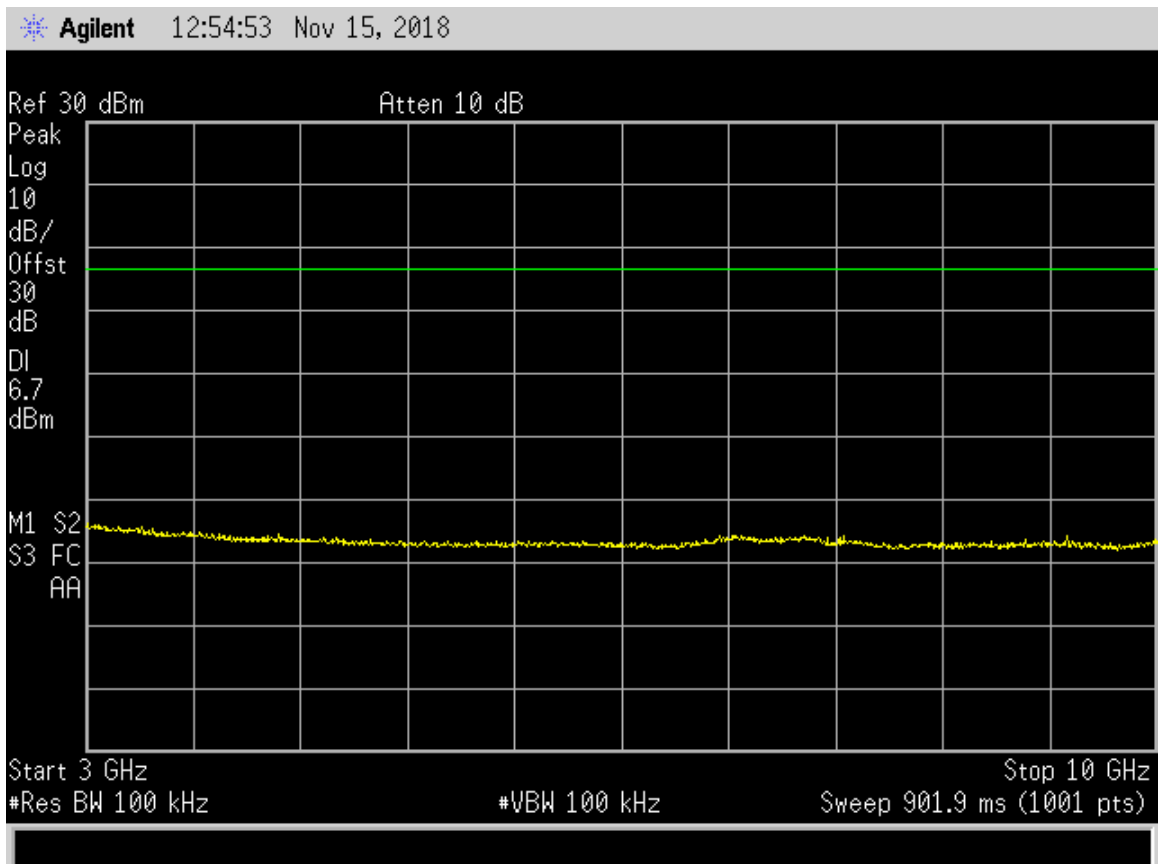
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Antenna Port Conducted Emissions	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Conducted Emissions		Wide Band Mid 915MHz	


Channel	Mode	Frequency (MHz)	Sweep (MHz)	Result
Mid	Transmit	915	30 - 3000	Pass



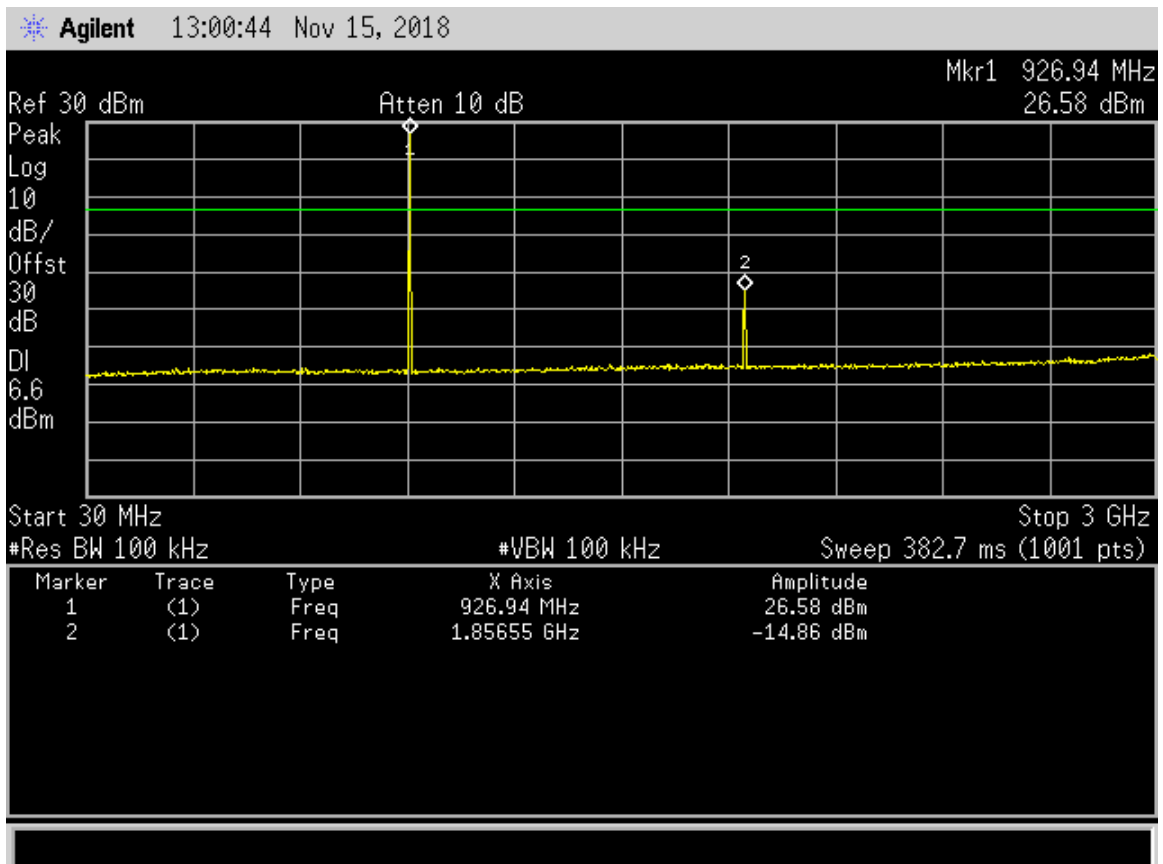
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Antenna Port Conducted Emissions	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Conducted Emissions		Wide Band Mid 915MHz	


Channel	Mode	Frequency (MHz)	Sweep (MHz)	Result
Mid	Transmit	915	3000 - 10000	Pass



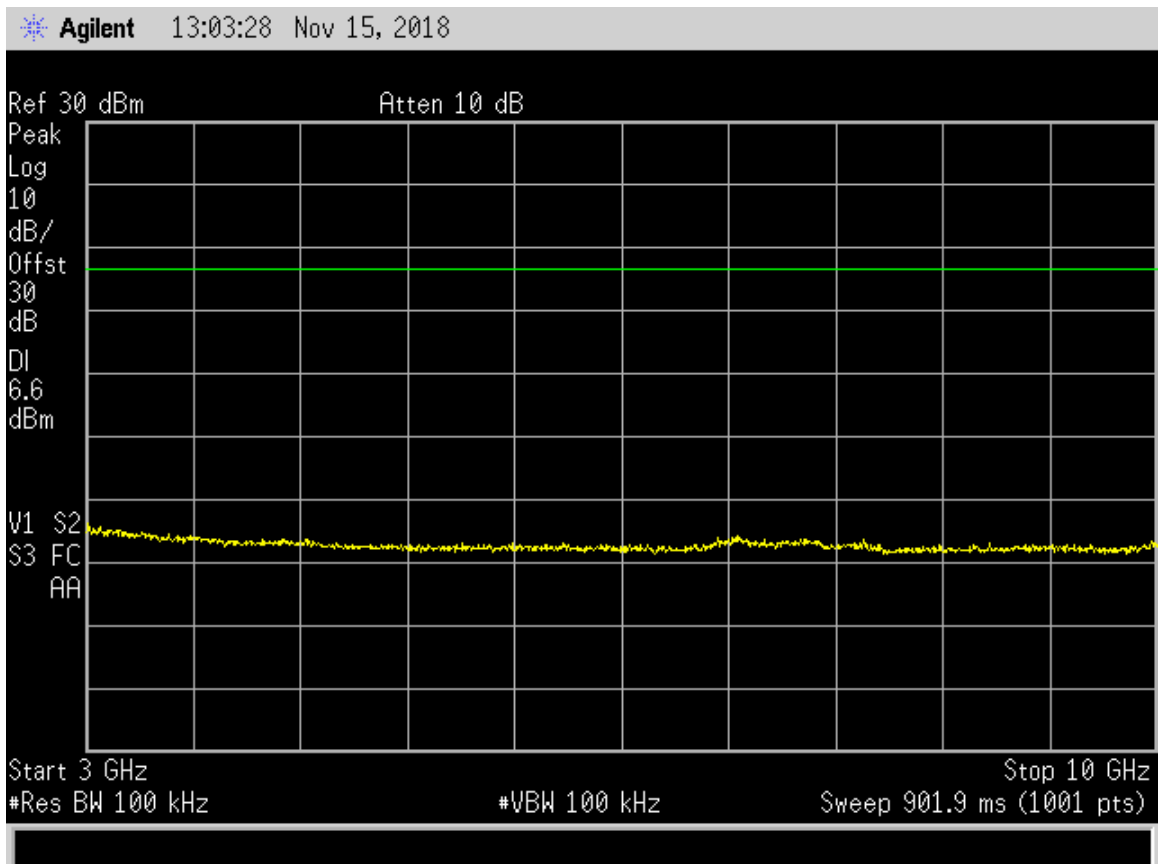
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Antenna Port Conducted Emissions	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Conducted Emissions		Wide Band High 927.5MHz	

Channel	Mode	Frequency (MHz)	Sweep (MHz)	Result
High	Transmit	927.5	30 - 3000	Pass



	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Antenna Port Conducted Emissions	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Conducted Emissions		Wide Band High 927.5MHz	

Channel	Mode	Frequency (MHz)	Sweep (MHz)	Result
High	Transmit	927.5	3000 - 10000	Pass



FCC 15.247, RSS-247 5.1 Band Edge Measurements
ANSI C63.10-2013 Section 6.10

Equipment List:

Asset #	Equipment	Manufacturer	Model #	Serial #	Location	Cal date	Interval	Due date
2264	Analyzer	Agilent	E4407B	MY45103462	Riverside	16 Aug 17	730	2 Nov 19
1196	Attenuator	Pasternack	PE7010-20	1196	Riverside	21 Sep 18	365	21 Sep 19

Procedure:

Connect the antenna port of the EUT to the spectrum analyzer input using adequate attenuation to protect the measurement instrument.

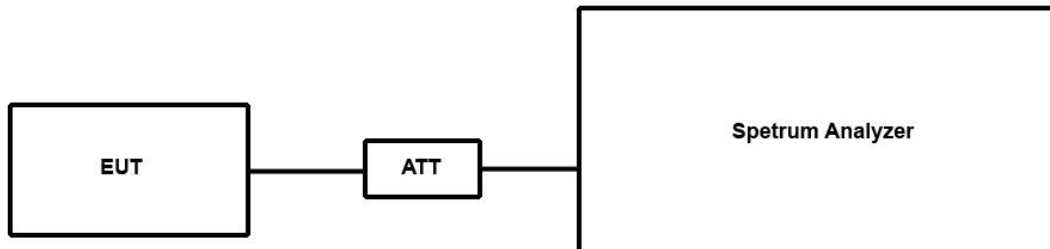
Use the following spectrum analyzer settings:

Span = 50MHz
RBW = 100kHz
VBW = 300kHz
Sweep = auto
Detector = peak
Trace = max hold

Place a marker at the end of the restricted band closest to the transmit frequency to show compliance.

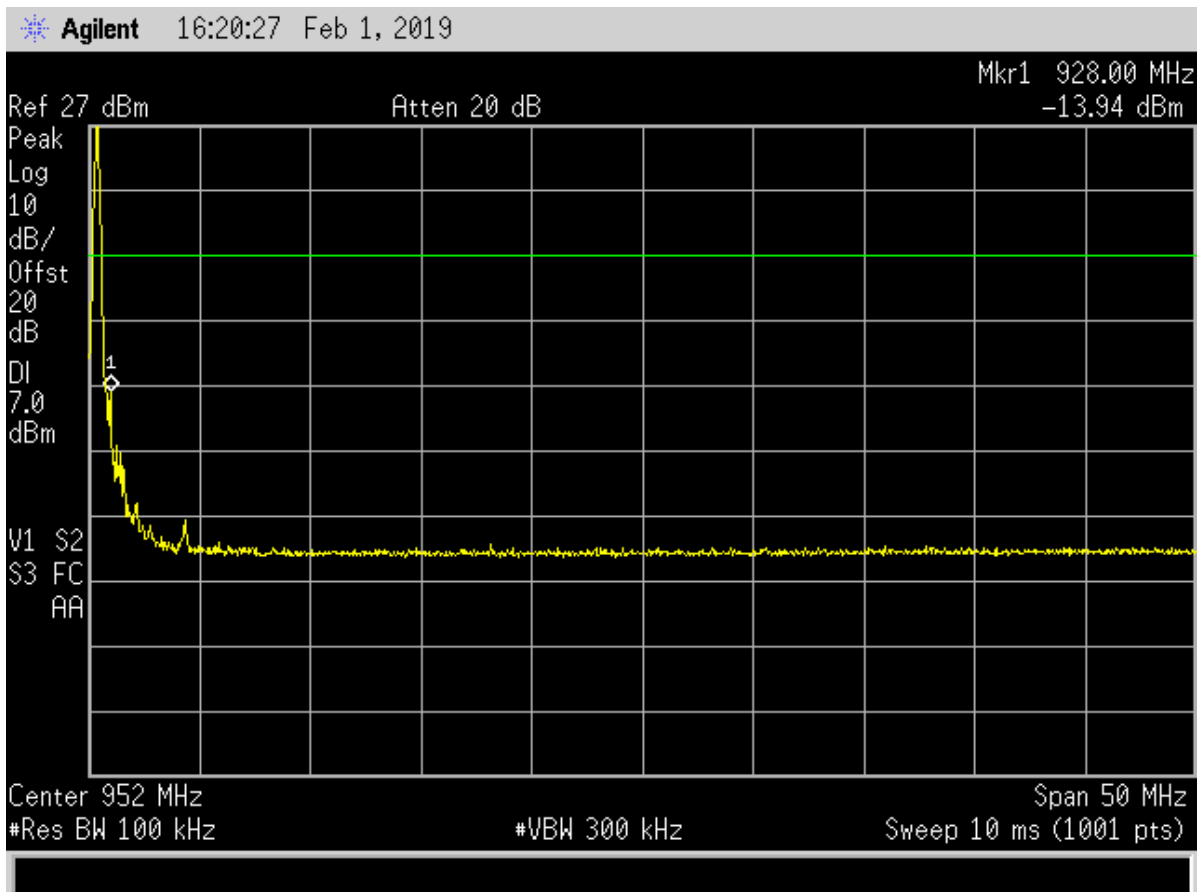
Requirement: The maximum out-of-band emissions shall not exceed 20dBc


Test Setup:



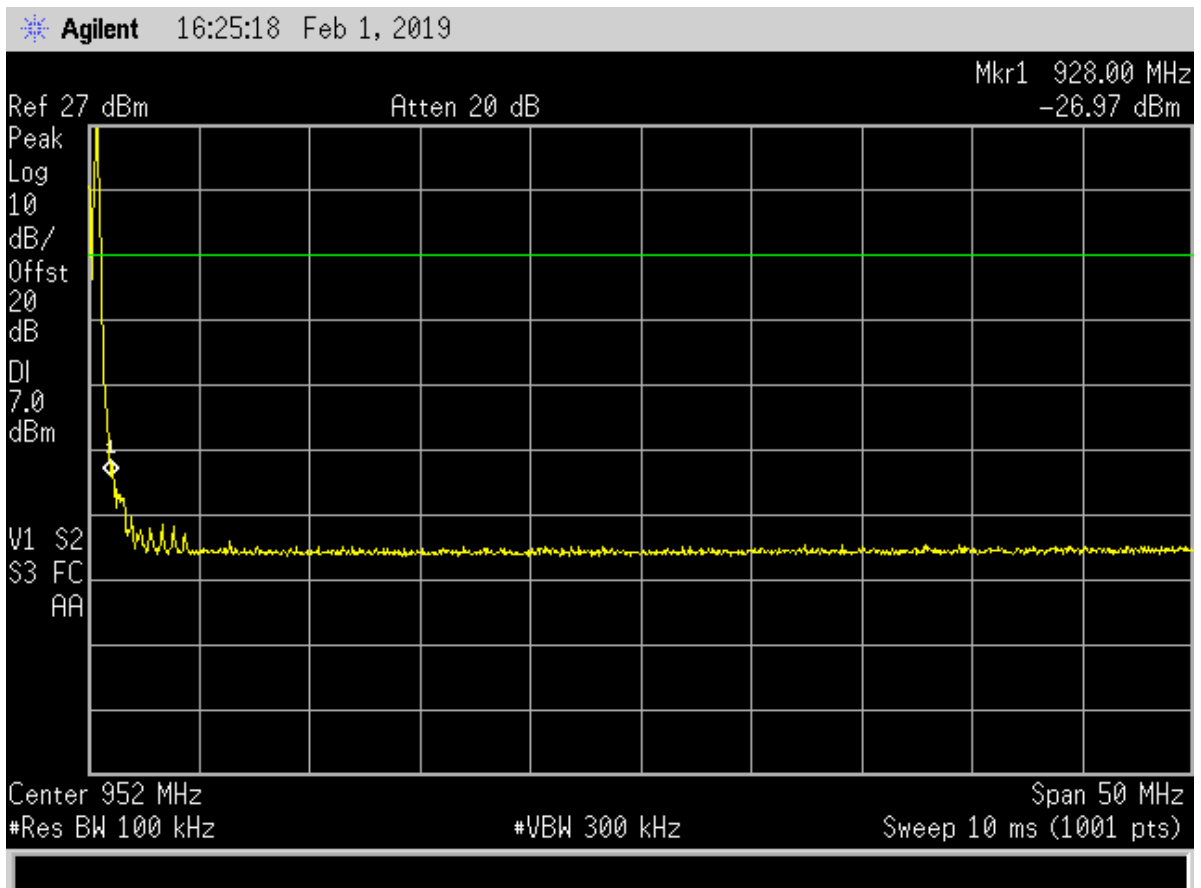
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630		Band Edge (Conducted)	
DNB Job Number:	98022A	Date:	01 Feb 2019	
Customer:	Quest Technical Sales and Marketing, Inc.			RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:		
Description:	RS-485 Wireless Transceiver			
Band Edge	Narrow Band High 927.5MHz			


Channel	Mode	Start Frequency (MHz)	Stop Frequency (MHz)	Span (MHz)	Result
High	Transmit hop stopped	927.5	977.5	50	Pass



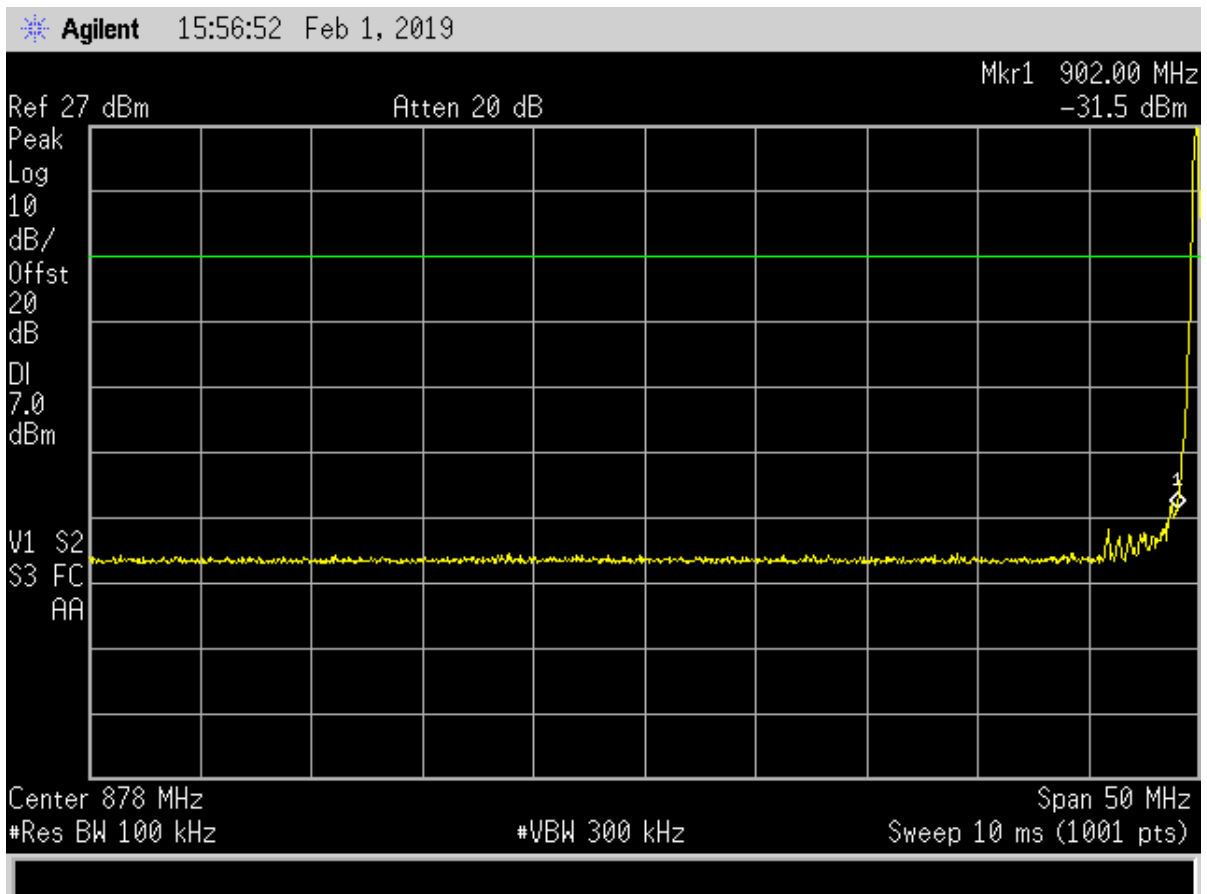
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Band Edge (Conducted)	
DNB Job Number:	98022A	Date:	01 Feb 2019
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Band Edge	Narrow Band High 927.5MHz		


Channel	Mode	Start Frequency (MHz)	Stop Frequency (MHz)	Span (MHz)	Result
High	Transmit hopping	927.5	977.5	50	Pass



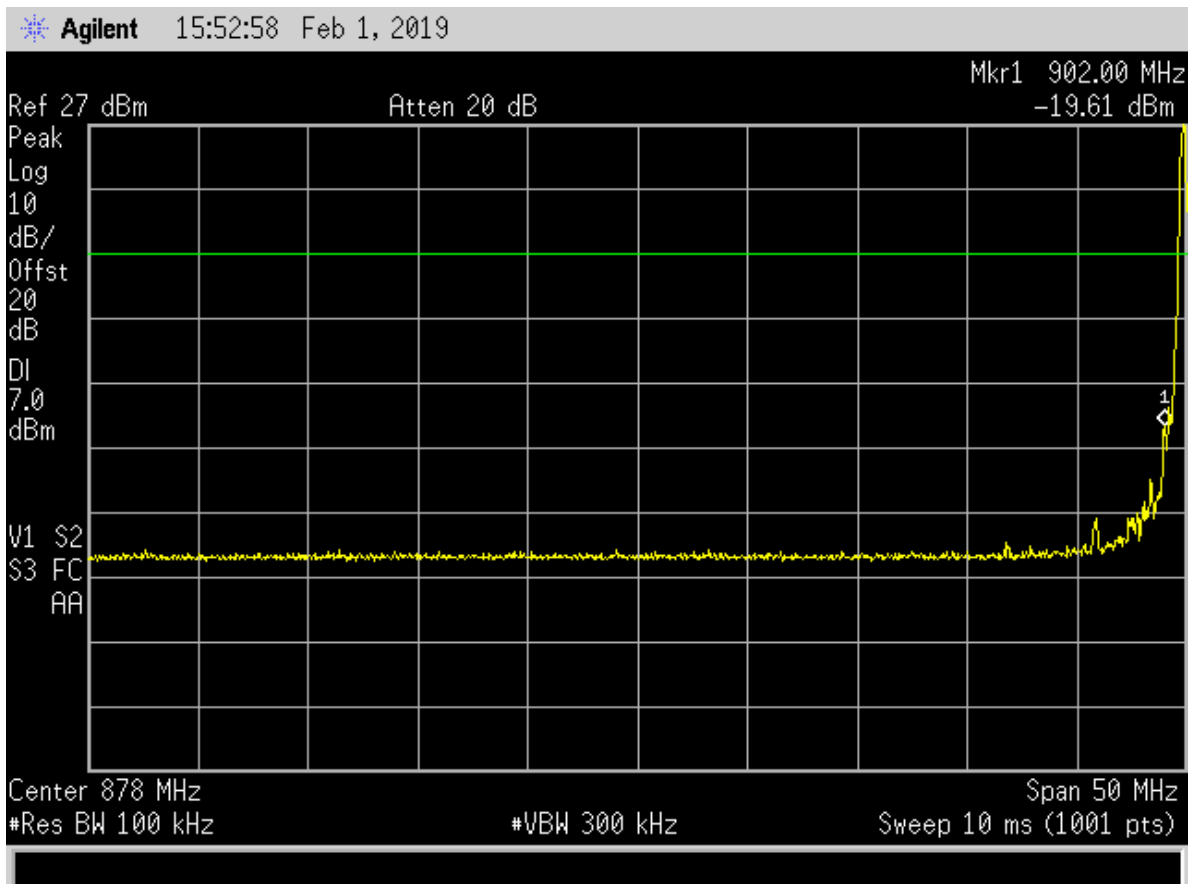
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Band Edge (Conducted)	
DNB Job Number:	98022A	Date:	01 Feb 2019
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Band Edge	Narrow Band Low 903MHz		

Channel	Mode	Start Frequency (MHz)	Stop Frequency (MHz)	Span (MHz)	Result
Low	Transmit hop stopped	853	903	50	Pass



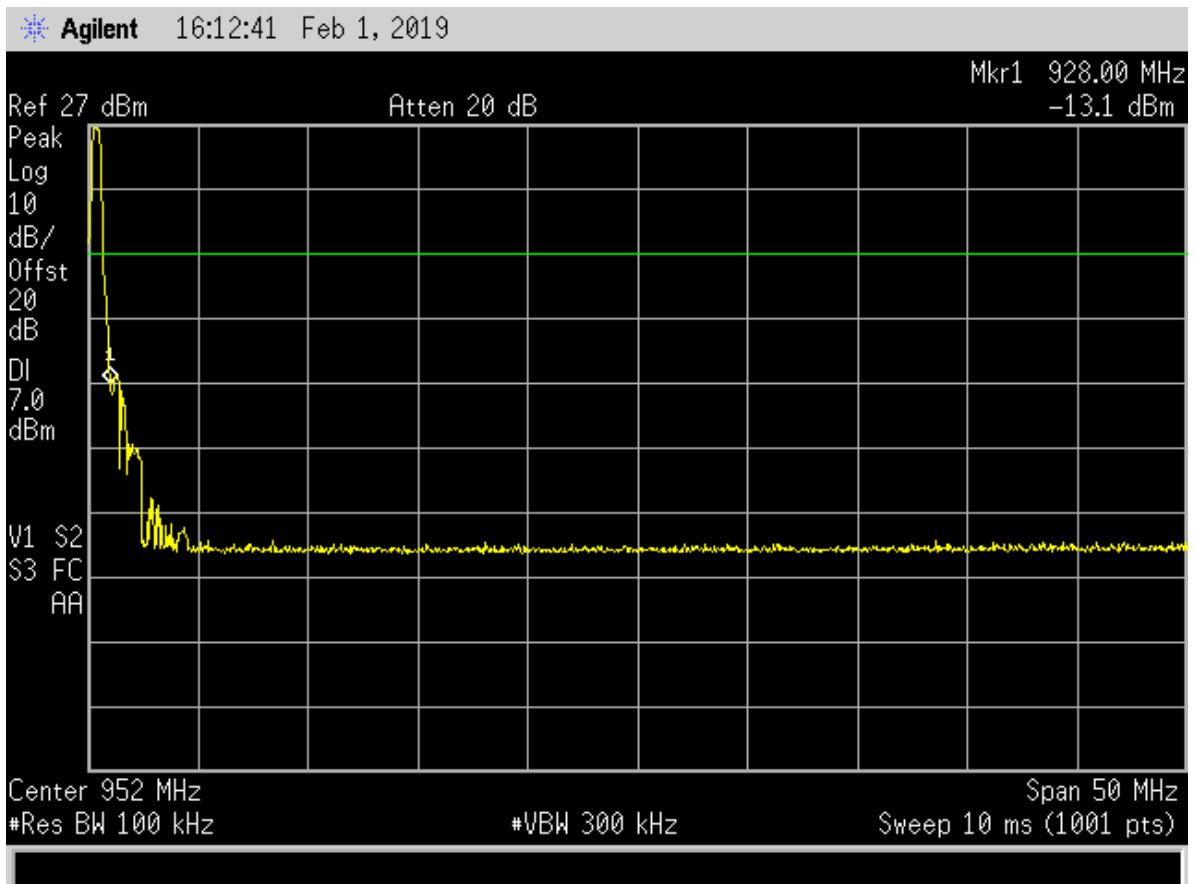
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Band Edge (Conducted)	
DNB Job Number:	98022A	Date:	01 Feb 2019
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Band Edge	Narrow Band Low 903MHz		


Channel	Mode	Start Frequency (MHz)	Stop Frequency (MHz)	Span (MHz)	Result
Low	Transmit hopping	853	903	50	Pass



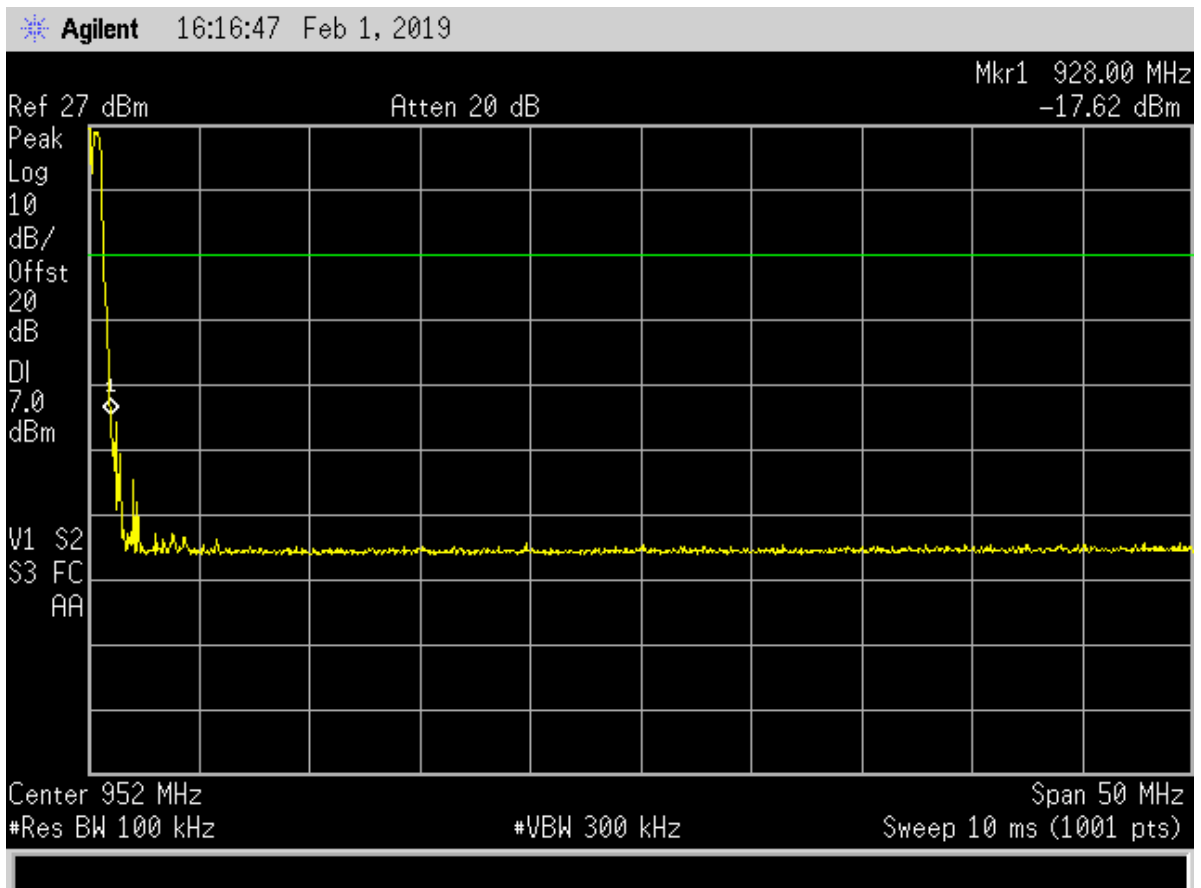
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630		Band Edge (Conducted)	
DNB Job Number:	98022A	Date:	01 Feb 2019	
Customer:	Quest Technical Sales and Marketing, Inc.			RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:		
Description:	RS-485 Wireless Transceiver			
Band Edge	Wide Band High 927.5MHz			


Channel	Mode	Start Frequency (MHz)	Stop Frequency (MHz)	Span (MHz)	Result
High	Transmit hop stopped	927.5	977.5	50	Pass



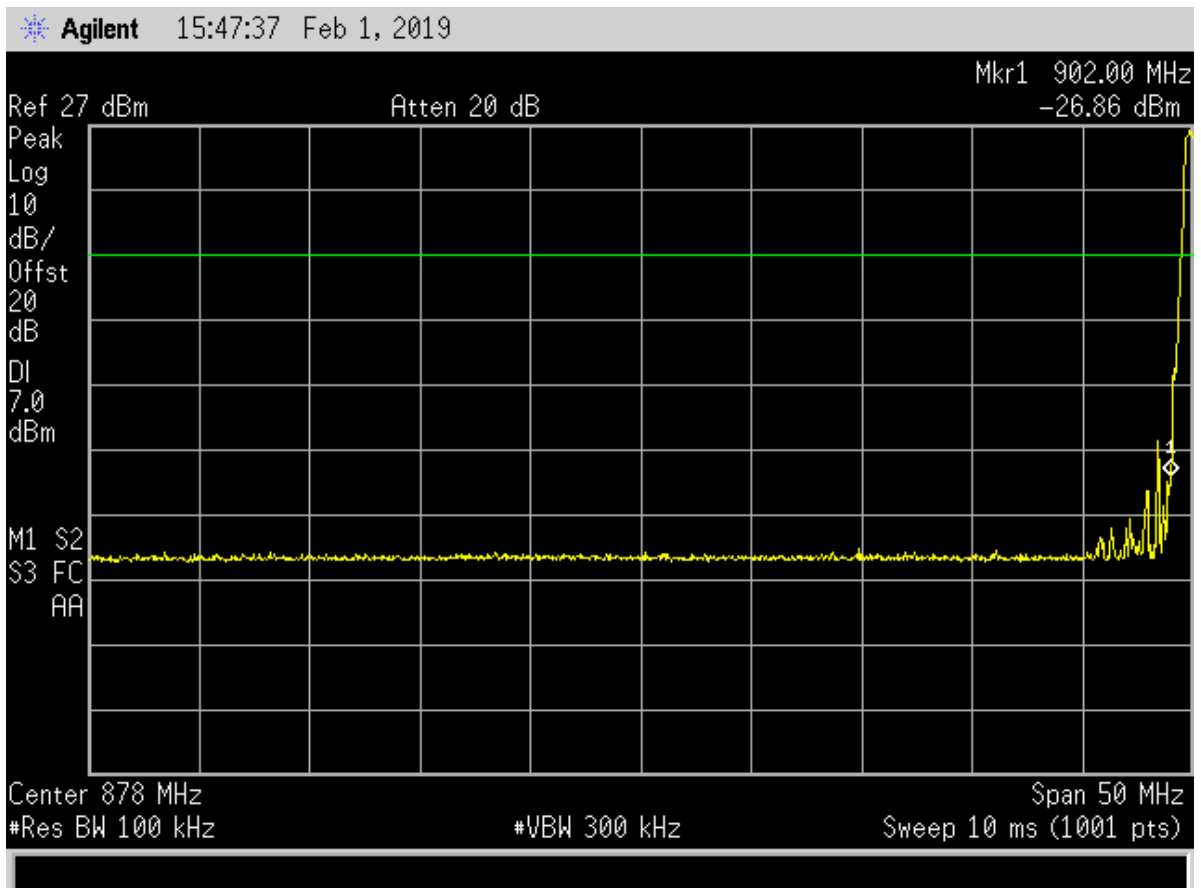
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Band Edge (Conducted)	
DNB Job Number:	98022A	Date:	01 Feb 2019
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Band Edge	Wide Band High 927.5MHz		

Channel	Mode	Start Frequency (MHz)	Stop Frequency (MHz)	Span (MHz)	Result
High	Transmit hopping	927.5	977.5	50	Pass



	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Band Edge (Conducted)	
DNB Job Number:	98022A	Date:	01 Feb 2019
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Band Edge	Wide Band Low 903MHz		

Channel	Mode	Start Frequency (MHz)	Stop Frequency (MHz)	Span (MHz)	Result
Low	Transmit hopping	853	903	50	Pass



FCC 15.247, RSS-247 5.1 Hopping Channels
ANSI C63.10-2013 Section 7.8

Equipment List:

Asset #	Equipment	Manufacturer	Model #	Serial #	Location	Cal date	Interval	Due date
2264	Analyzer	Agilent	E4407B	MY45103462	Riverside	16 Aug 17	730	2 Nov 19
1196	Attenuator	Pasternack	PE7010-20	1196	Riverside	21 Sep 18	365	21 Sep 19

Procedure:

Connect the antenna port to be measured to the spectrum analyzer input. Configure the spectrum analyzer as described below.

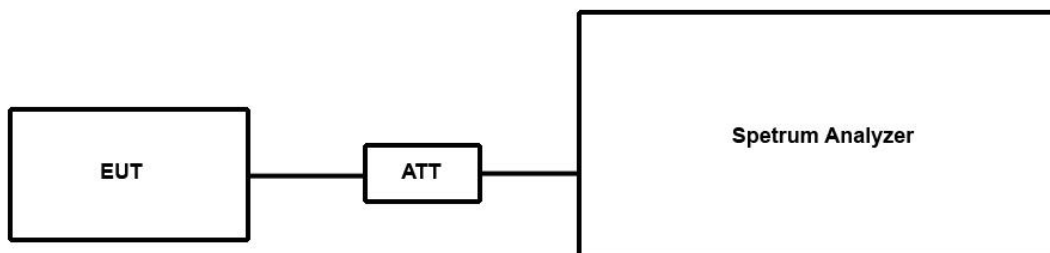
Span = Wide enough to view all channels
RBW = 100kHz
VBW = 100kHz
Sweep Time = auto
Trace = max hold

Allow trace to stabilize. Record analyzer plot.

Requirement:

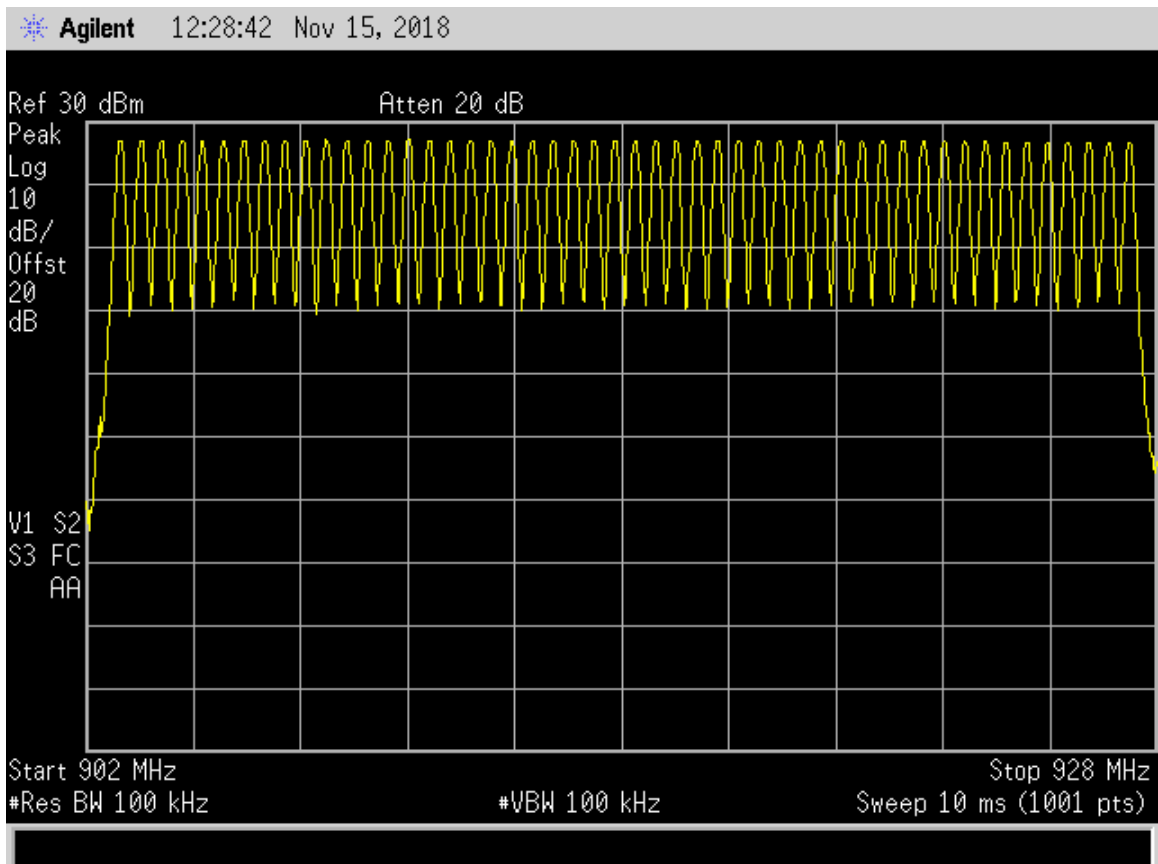
If the 20dB bandwidth of the hopping channel is less than 250kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period. If the 20dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies (50 required for systems with output above .25W) 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 Setup:



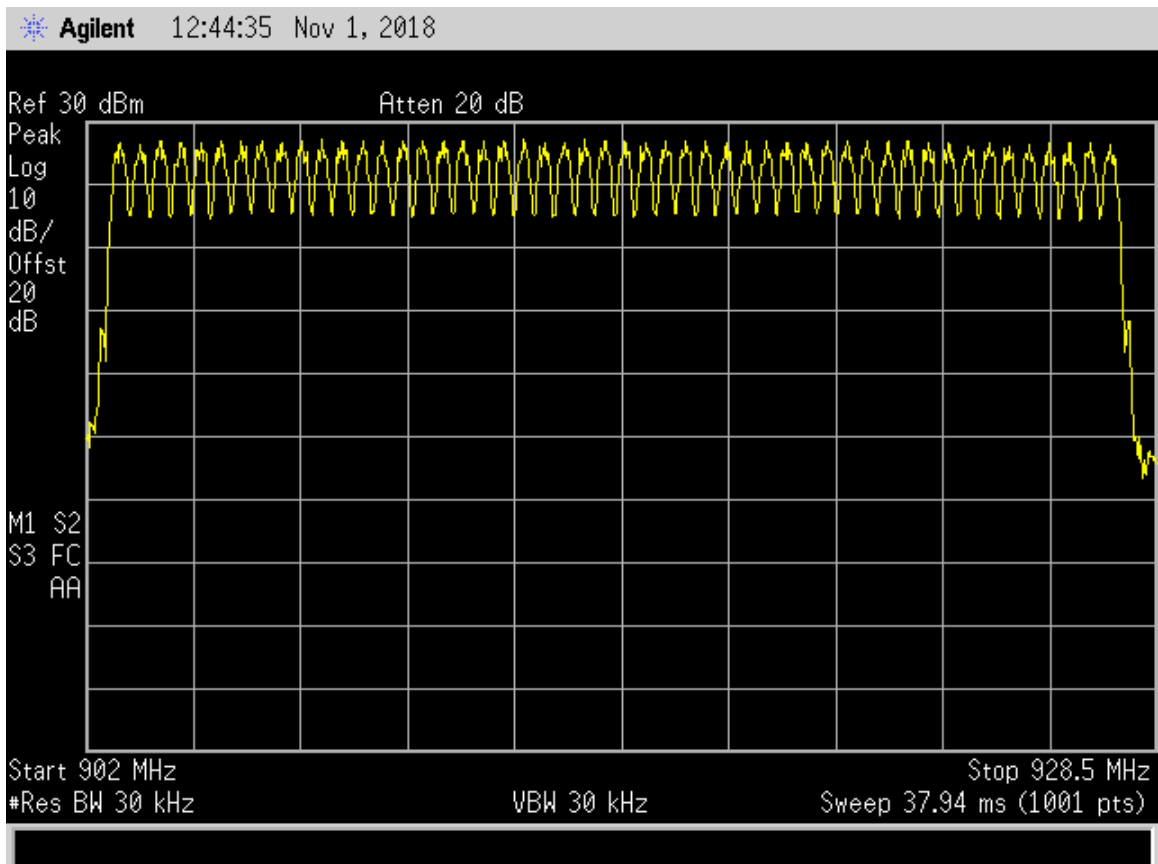
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Hopping Channels	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Hopping Channels		Narrow Band 902-928MHz	

Channel	Mode	Channels Required	Channels Used	Result
All	Transmit	50	50	Pass



	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Hopping Channels	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Hopping Channels		Wide Band 902-928MHz	

Channel	Mode	Channels Required	Channels Used	Result
All	Transmit	50	50	Pass



FCC 15.247, RSS-247 5.1 Channel Separation
ANSI C63.10-2013 Section 7.8

Equipment List:

Asset #	Equipment	Manufacturer	Model #	Serial #	Location	Cal date	Interval	Due date
2264	Analyzer	Agilent	E4407B	MY45103462	Riverside	16 Aug 17	730	2 Nov 19
1196	Attenuator	Pasternack	PE7010-20	1196	Riverside	21 Sep 18	365	21 Sep 19

Procedure:

Connect the antenna port to be measured to the spectrum analyzer input. Configure the spectrum analyzer as described below.

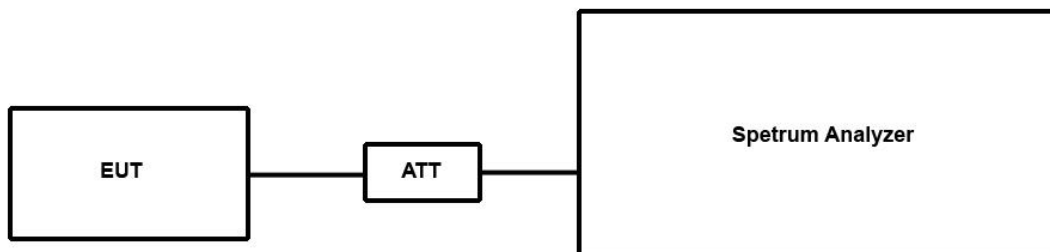
Span = Wide enough to view at least 2 consecutive channels
RBW = 100kHz
VBW = 100kHz
Sweep Time = auto
Trace = max hold


Allow trace to stabilize. Use delta marker function to determine channel spacing. Record Analyzer plot.

Requirement:

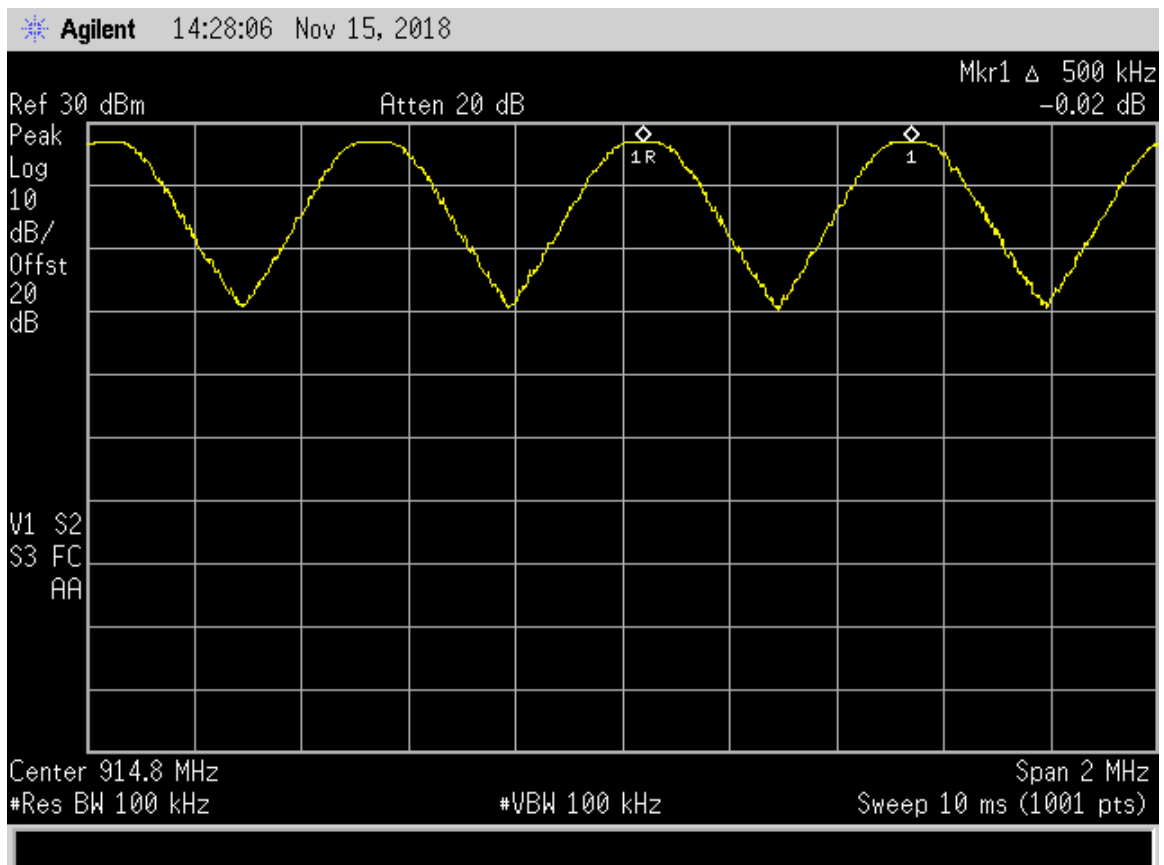
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.


Test Setup:



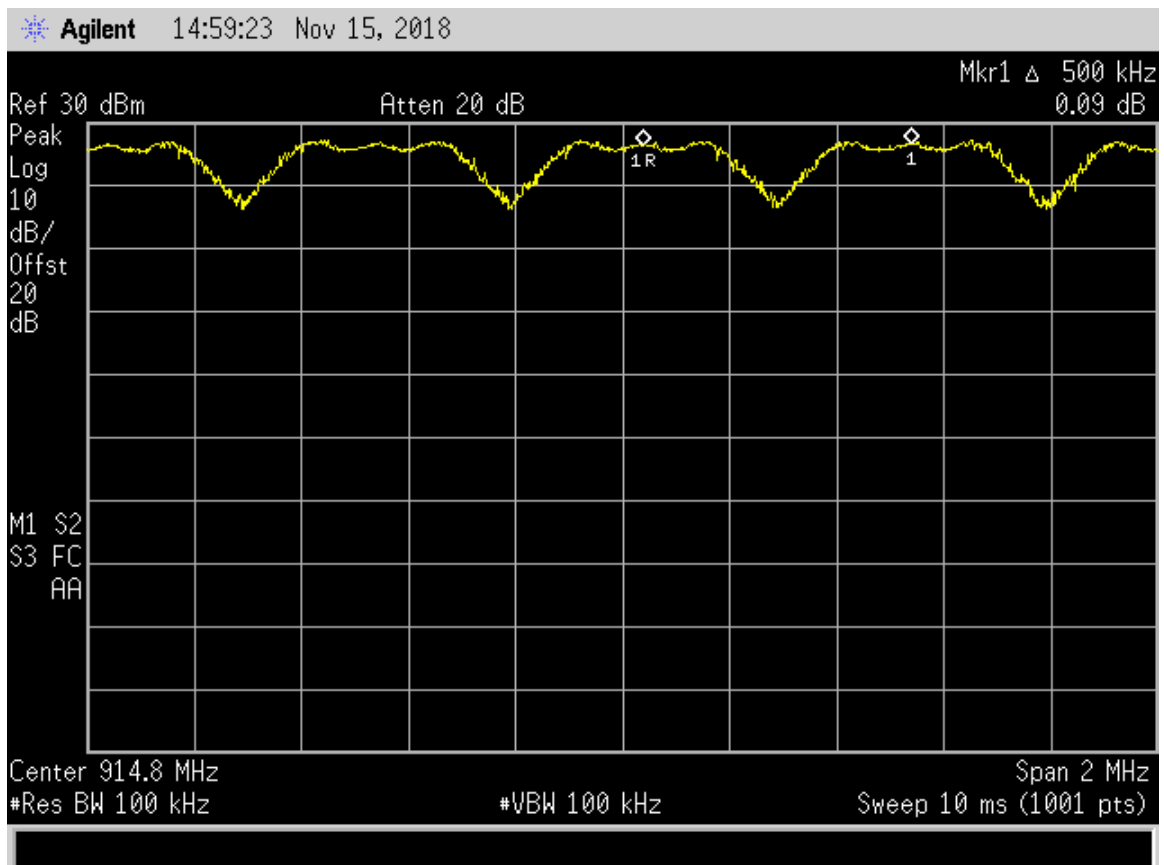
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Channel Spacing	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Channel Spacing		Narrow Band 915MHz	

Channel	Mode	Spacing Required (kHz)	Spacing Measured (kHz)	Result
All	Transmit	91	500	Pass



	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Channel Spacing	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:		Specification:	
Description:	RS-485 Wireless Transceiver		
Channel Spacing		Wind Band 915MHz	

Channel	Mode	Spacing Required (kHz)	Spacing Measured (kHz)	Result
All	Transmit	495kHz	500	Pass



FCC 15.247, RSS-247 5.1 Dwell Time
ANSI C63.10-2013 Section 7.8

Equipment List:

Asset #	Equipment	Manufacturer	Model #	Serial #	Location	Cal date	Interval	Due date
2264	Analyzer	Agilent	E4407B	MY45103462	Riverside	16 Aug 17	730	2 Nov 19
1196	Attenuator	Pasternack	PE7010-20	1196	Riverside	21 Sep 18	365	21 Sep 19

Procedure:

Connect the antenna port to be measured to the spectrum analyzer input. Configure the spectrum analyzer as described below.

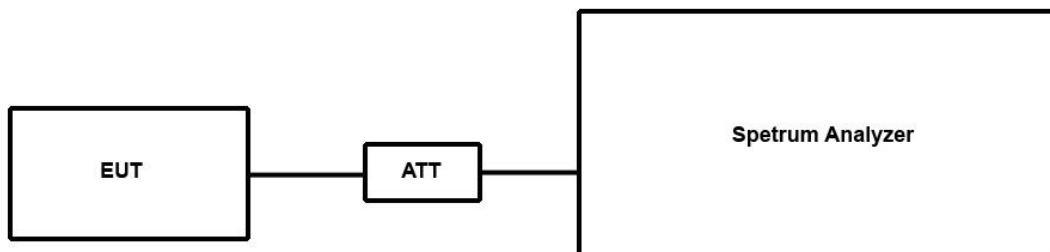
Span = Wide enough to view at least 2 consecutive channels
RBW = 100kHz
VBW = 100kHz
Sweep Time = auto
Trace = max hold


Allow trace to stabilize. Use delta marker function to determine channel spacing. Record Analyzer plot.

Requirement:

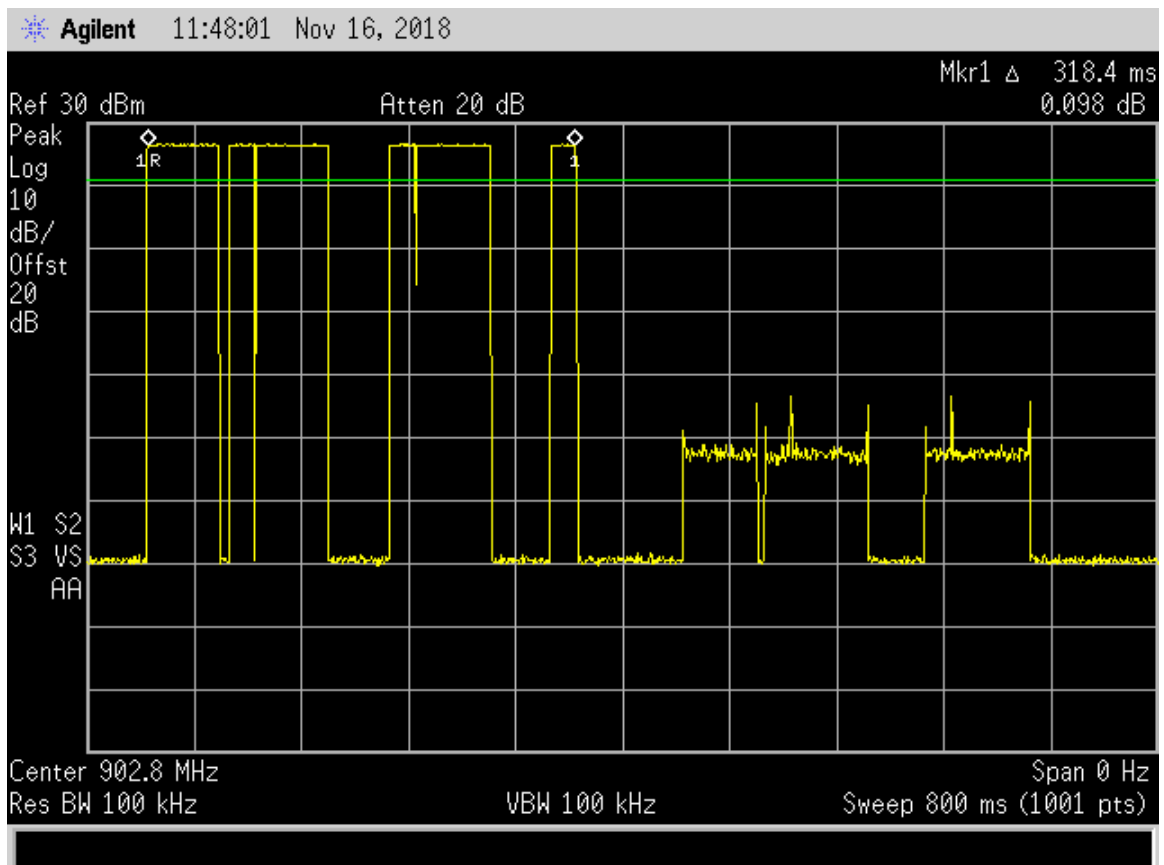
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.


Test Setup:



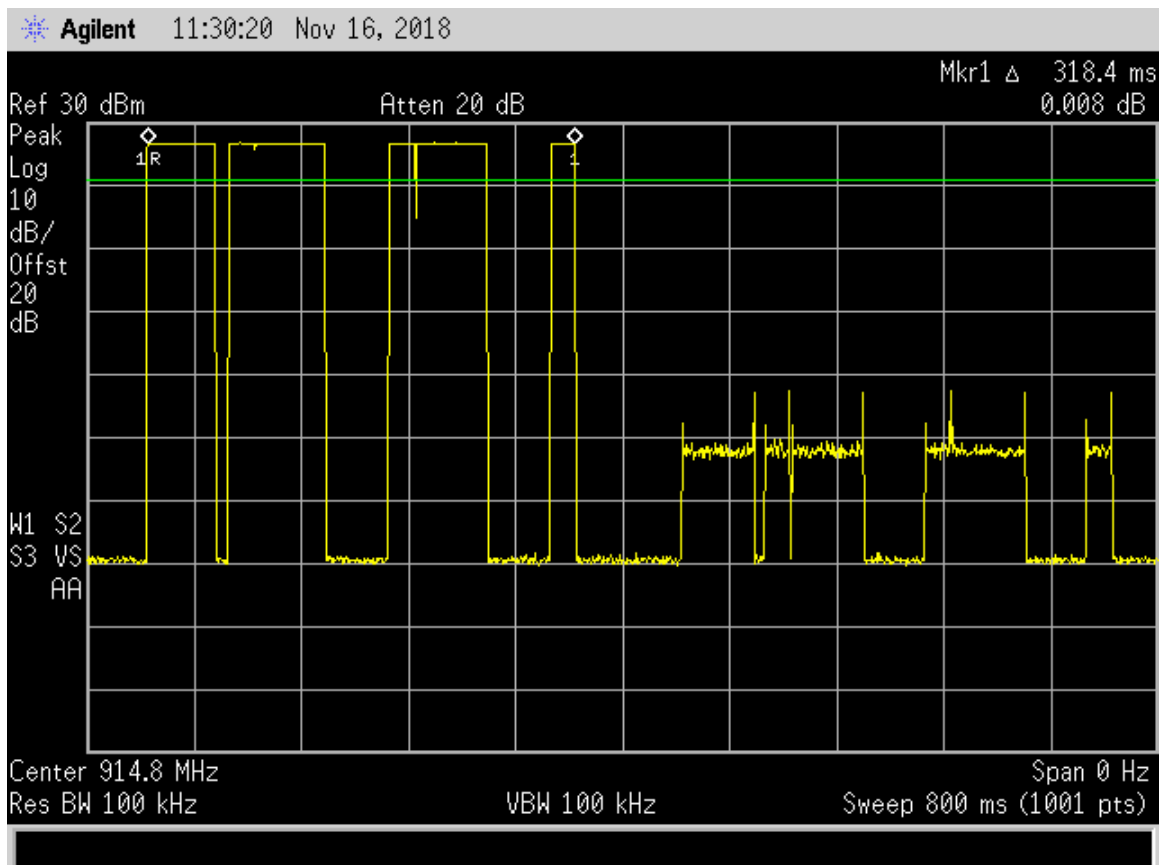
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Dwell Time	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Dwell Time		Narrow Band Low 903MHz	

Channel	Mode	Frequency (MHz)	Max Dwell Time (mS)	Dwell Time (mS)	Result
Low	Transmit	903	400	318.4	Pass



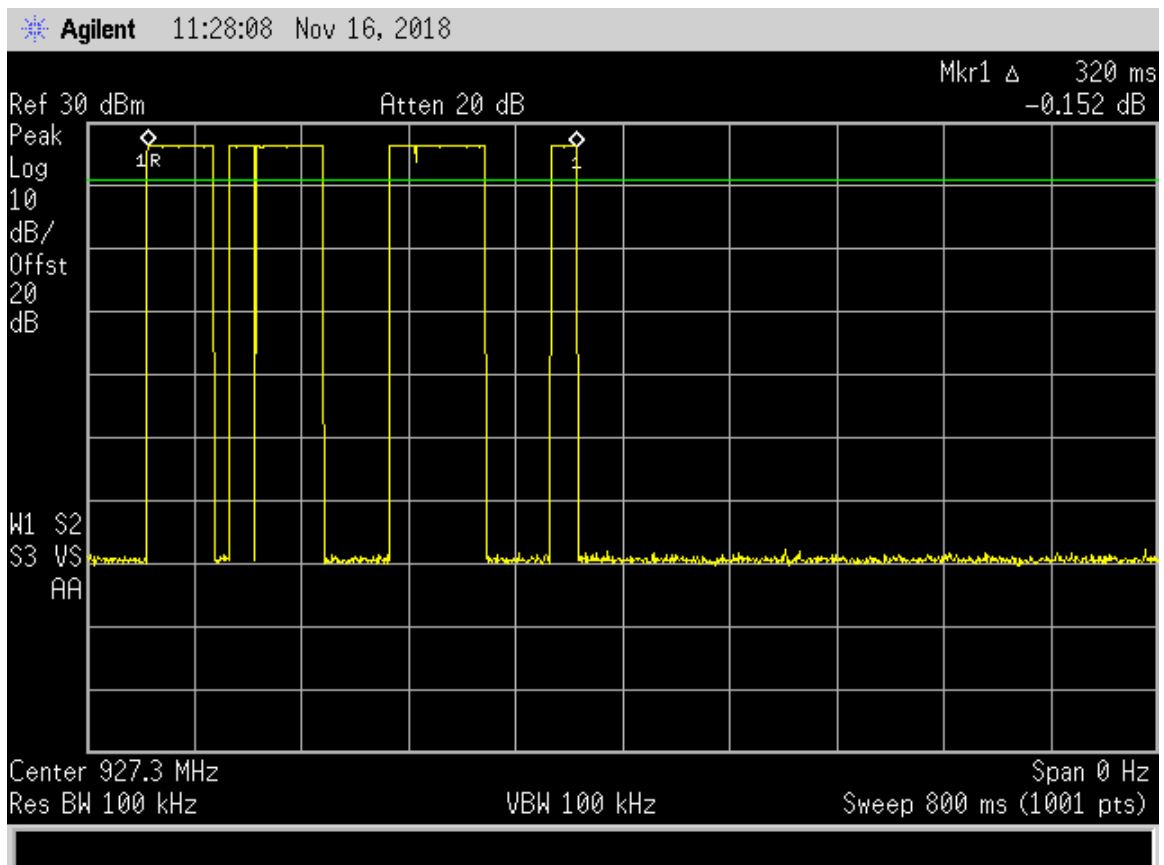
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630		Dwell Time	
DNB Job Number:	98022A	Date:	19 Nov 2018	
Customer:	Quest Technical Sales and Marketing, Inc.			RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:		
Description:	RS-485 Wireless Transceiver			
Dwell Time		Narrow Band Mid 915 MHz		


Channel	Mode	Frequency (MHz)	Max Dwell Time (mS)	Dwell Time (mS)	Result
Mid	Transmit	915	400	318.4	Pass



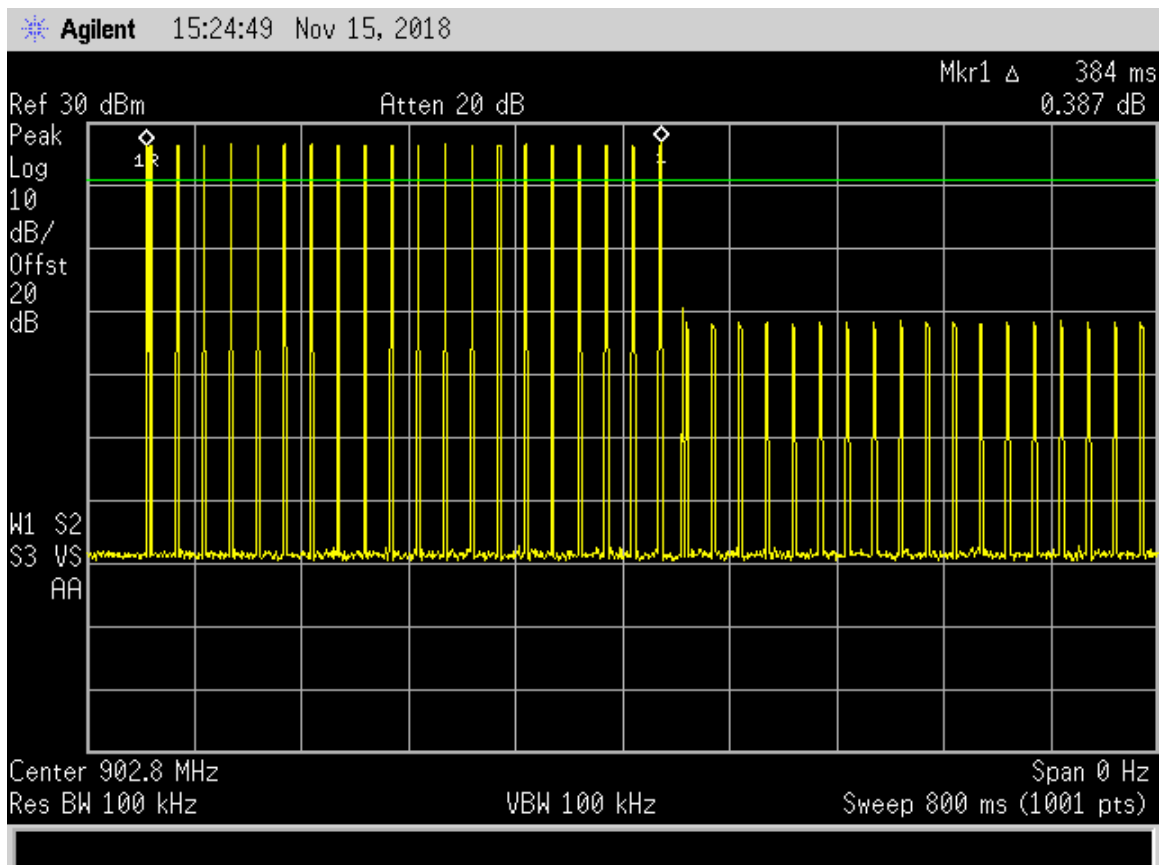
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Dwell Time	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Dwell Time	Narrow Band High 927.5 MHz		


Channel	Mode	Frequency (MHz)	Max Dwell Time (mS)	Dwell Time (mS)	Result
High	Transmit	927.5	400	320	Pass



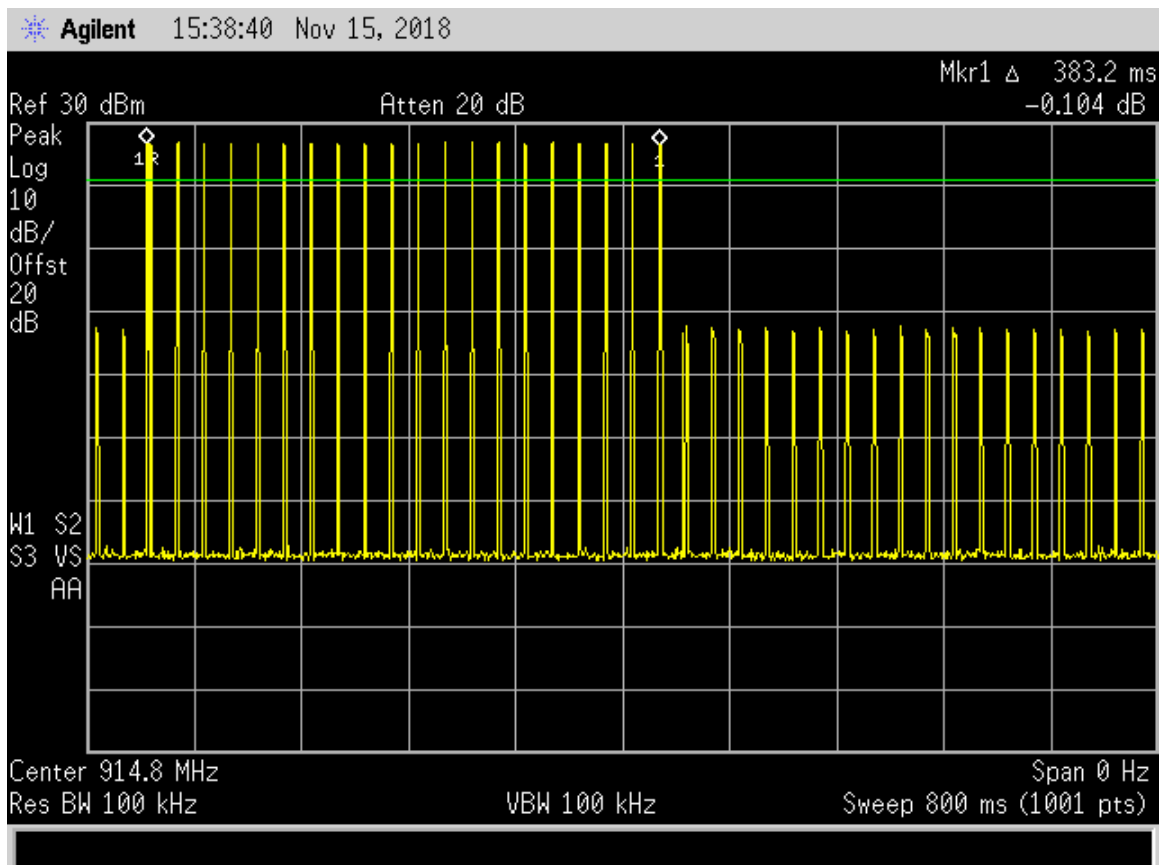
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Dwell Time	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Dwell Time		Wide Band Low 903MHz	


Channel	Mode	Frequency (MHz)	Max Dwell Time (mS)	Dwell Time (mS)	Result
Low	Transmit	903	400	384	Pass



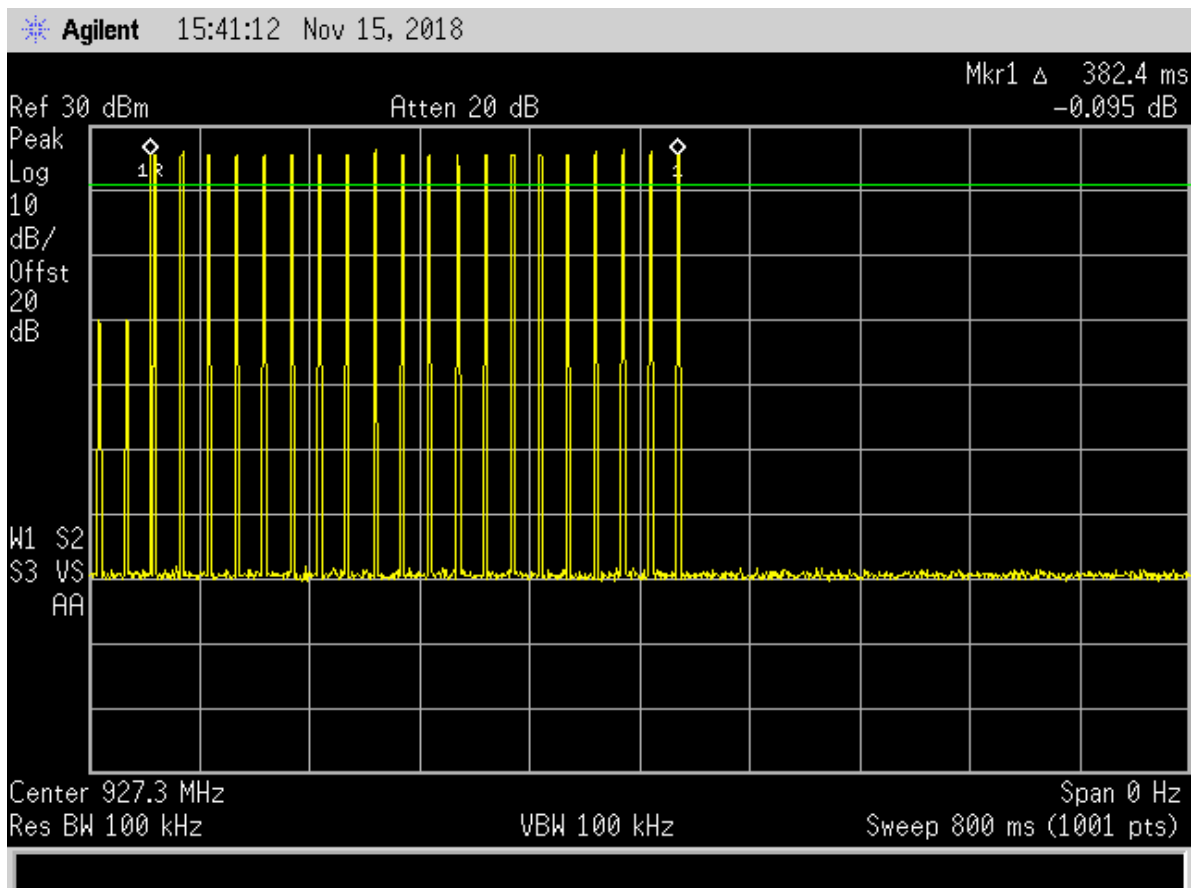
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Dwell Time	
Dwell Time	Wide Band Mid 915 MHz	Date:	19 Nov 2018
Dwell Time	Customer:	Quest Technical Sales and Marketing, Inc.	RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		

Channel	Mode	Frequency (MHz)	Max Dwell Time (mS)	Dwell Time (mS)	Result
Mid	Transmit	915	400	383.2	Pass



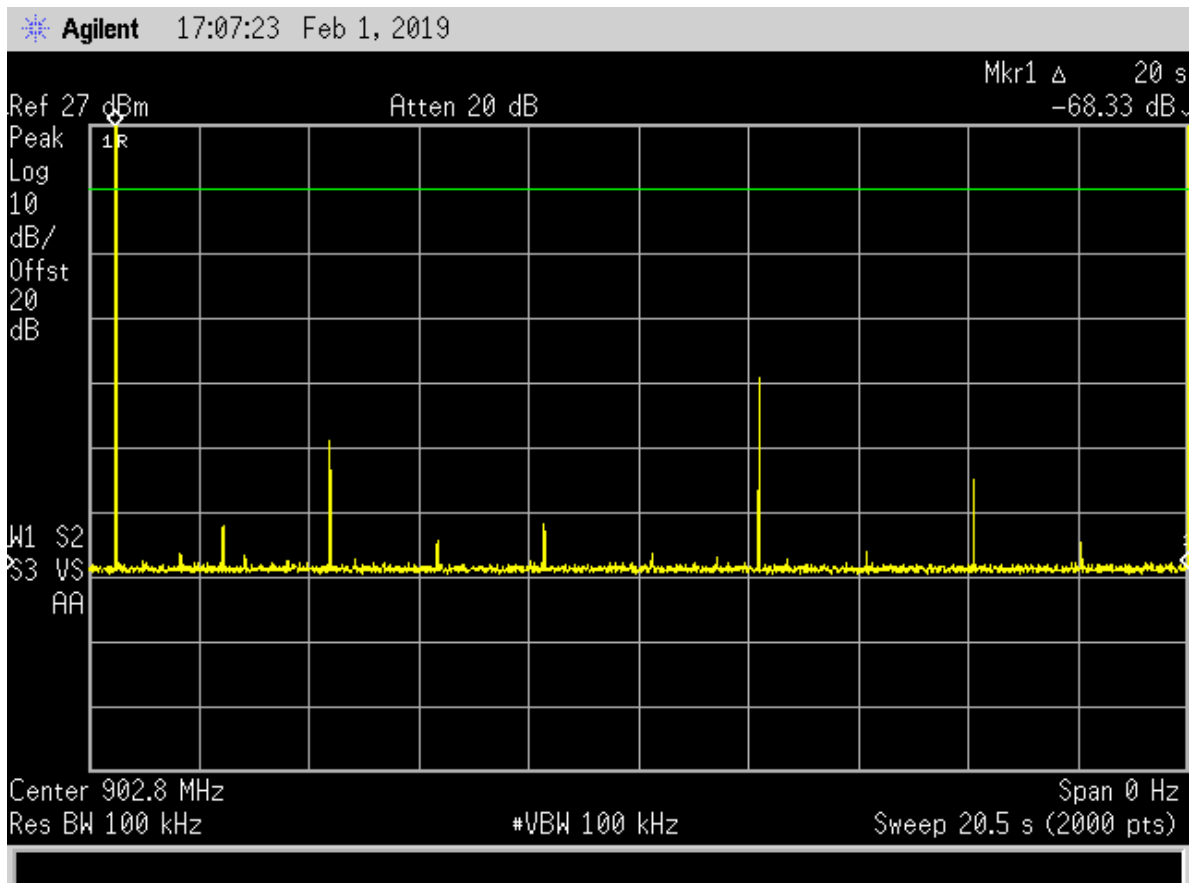
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Dwell Time	
DNB Job Number:	98022A	Date:	19 Nov 2018
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Dwell Time	Wide Band High 927.5 MHz		


Channel	Mode	Frequency (MHz)	Max Dwell Time (mS)	Dwell Time (mS)	Result
High	Transmit	927.5	400	382.4	Pass



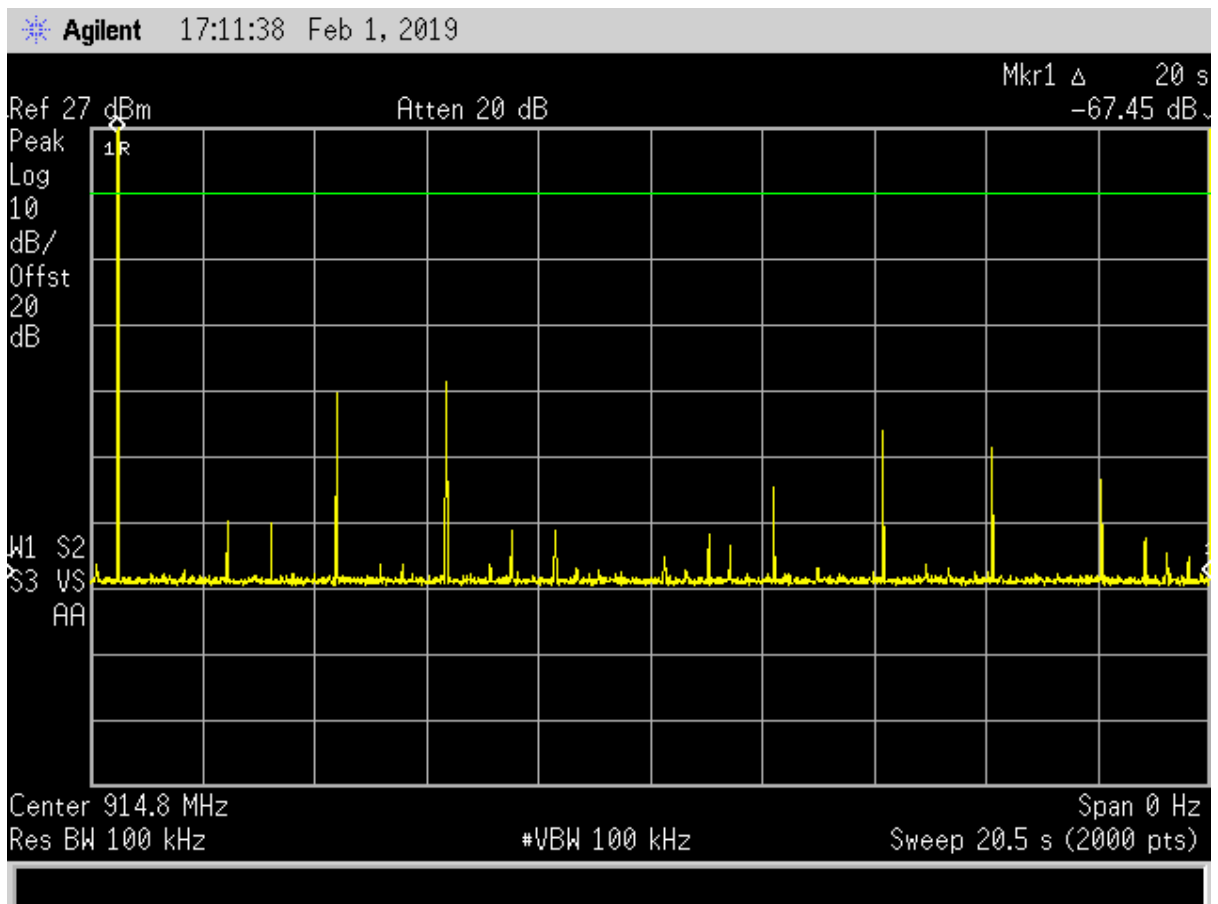
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Dwell Time	
DNB Job Number:	98022A	Date:	01 Feb 2019
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Dwell Time	Narrow Band High 927.5 MHz		


Channel	Mode	Frequency (MHz)	Time required between transmissions (seconds)	Time measured (seconds)	Result
Low	Transmit hopping	927.5	20	20	Pass



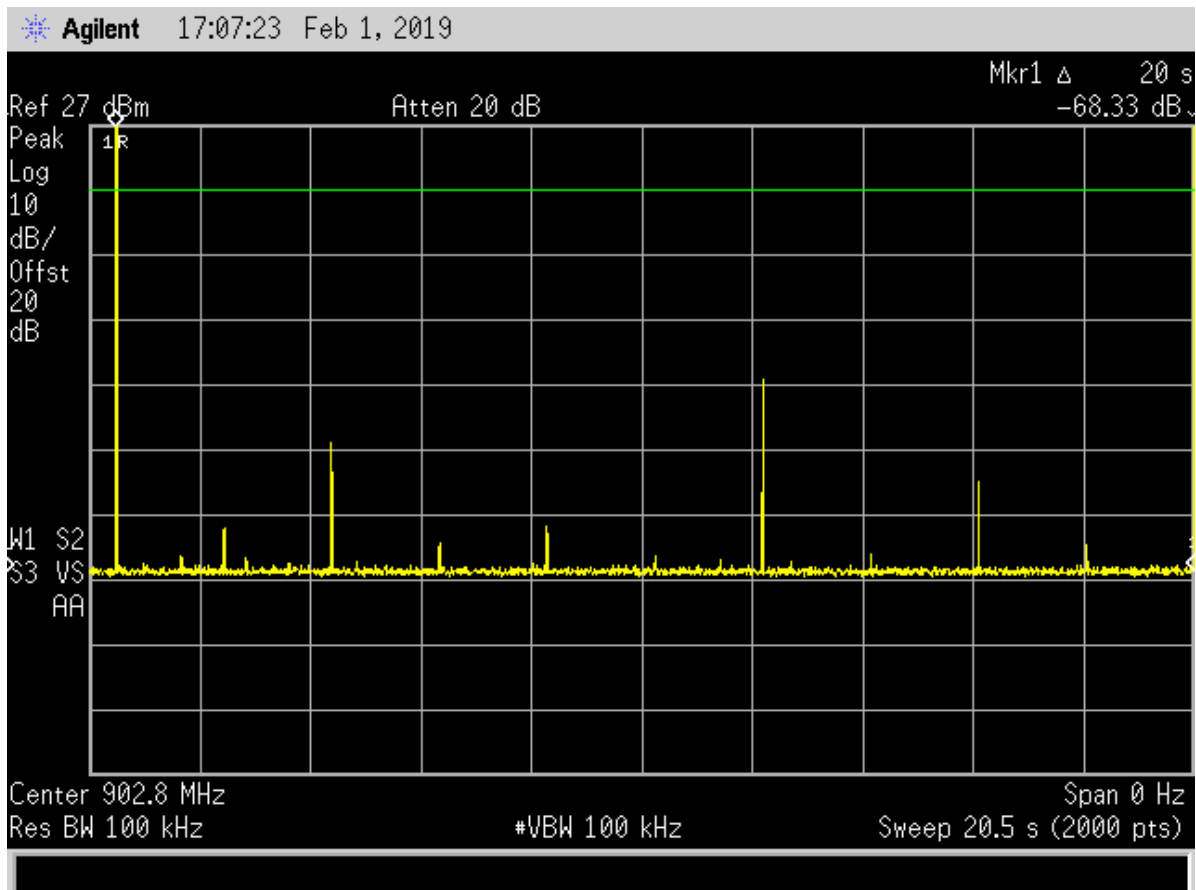
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Dwell Time	
DNB Job Number:	98022A	Date:	01 Feb 2019
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Dwell Time	Narrow Band Mid 915MHz		

Channel	Mode	Frequency (MHz)	Time required between transmissions (seconds)	Time measured (seconds)	Result
Mid	Transmit hopping	915	20	20	Pass



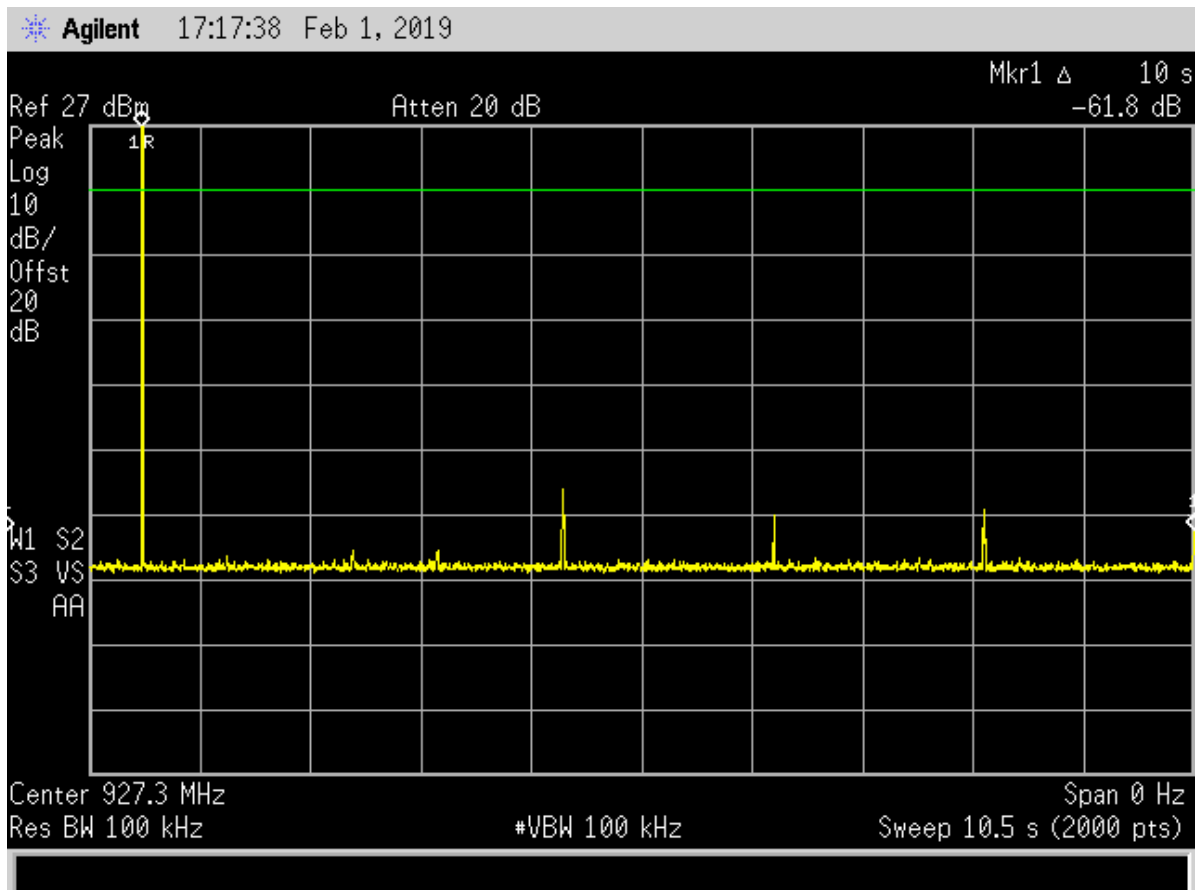
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Dwell Time	
DNB Job Number:	98022A	Date:	01 Feb 2019
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Dwell Time	Narrow Band Low 903MHz		


Channel	Mode	Frequency (MHz)	Time required between transmissions (seconds)	Time measured (seconds)	Result
Low	Transmit hopping	903	20	20	Pass



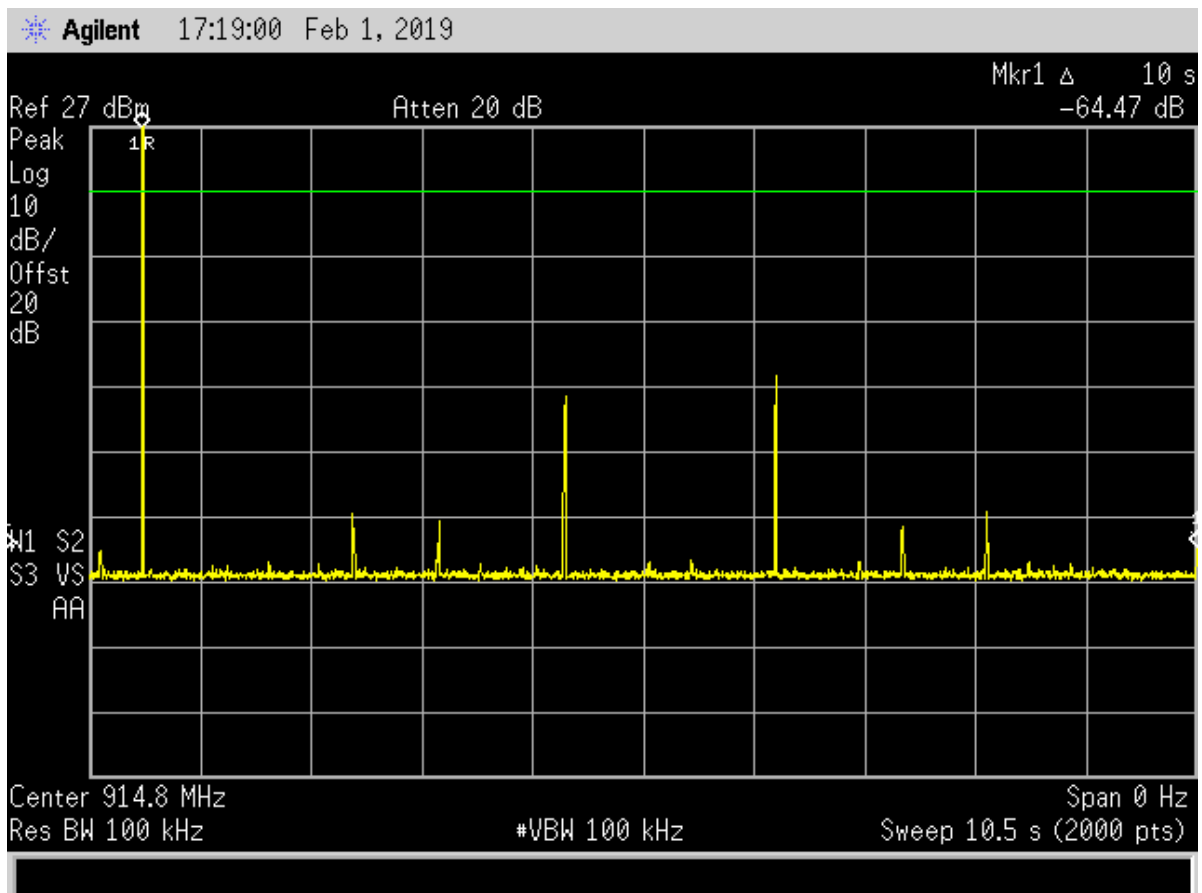
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Dwell Time	
DNB Job Number:	98022A	Date:	01 Feb 2019
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Dwell Time	Wide Band High 903MHz		


Channel	Mode	Frequency (MHz)	Time required between transmissions (seconds)	Time measured (seconds)	Result
High	Transmit hopping	927.5	10	10	Pass



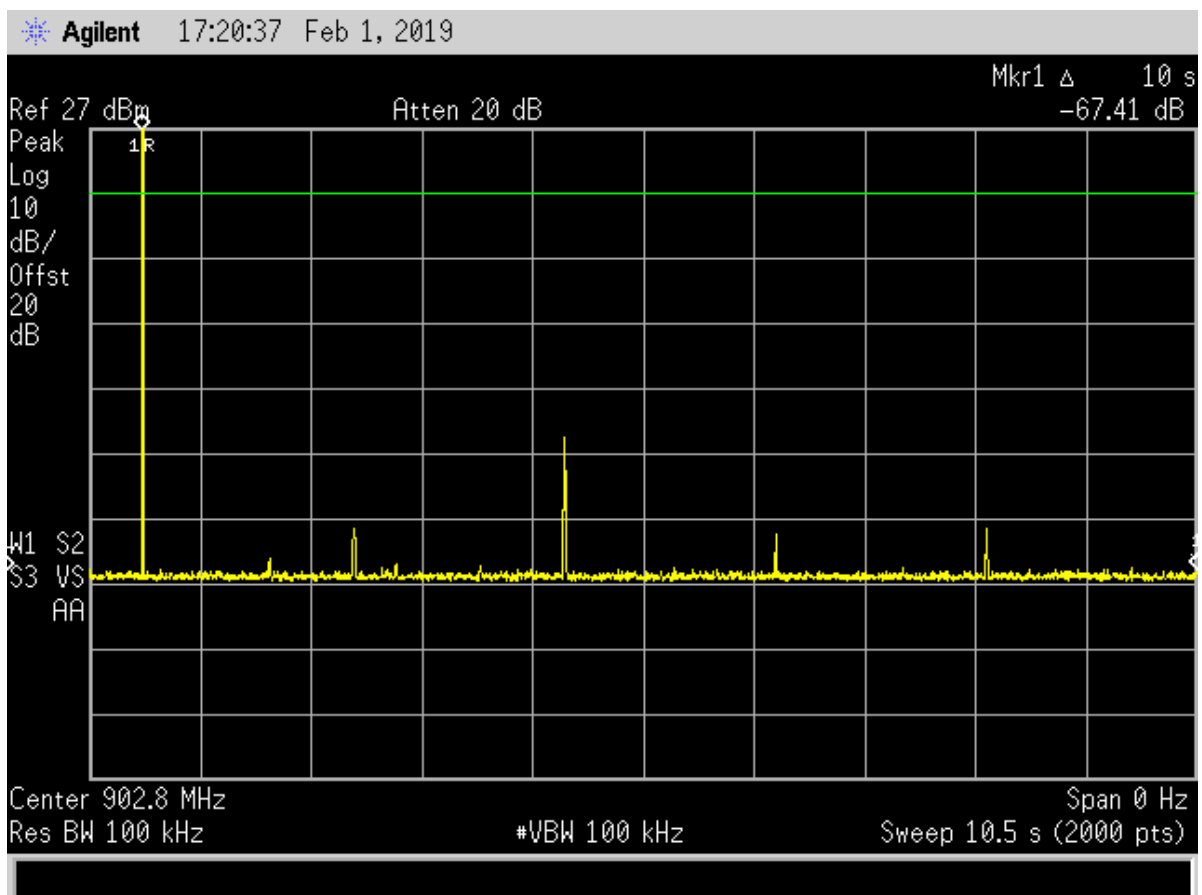
	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Dwell Time	
DNB Job Number:	98022A	Date:	01 Feb 2019
Customer:	Quest Technical Sales and Marketing, Inc.		RSS-247 5.1 FCC 15.247
Model Number:	HPW-WETHLINK	Specification:	
Description:	RS-485 Wireless Transceiver		
Dwell Time	Wide Band Mid 915MHz		

Channel	Mode	Frequency (MHz)	Time required between transmissions (seconds)	Time measured (seconds)	Result
Mid	Transmit hopping	915	10	10	Pass



	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Dwell Time	
Dwell Time	Wide Band Low 903MHz	Dwell Time:	98022A
Customer:	Quest Technical Sales and Marketing, Inc.	Date:	01 Feb 2019
Model Number:	HPW-WETHLINK	Specification:	RSS-247 5.1 FCC 15.247
Description:	RS-485 Wireless Transceiver		

Channel	Mode	Frequency (MHz)	Time required between transmissions (seconds)	Time measured (seconds)	Result
Low	Transmit hopping	903	10	10	Pass



FCC 2.1033 (b) (7) Equipment Photographs

To be filed as a separate attachment.

End of Report