

**Supplementary Test Measurements
to Demonstrate IPJ-REV
Section 15.247 (a) 1. Compliance to
"Each frequency must be used equally on the average by each
transmitter".**

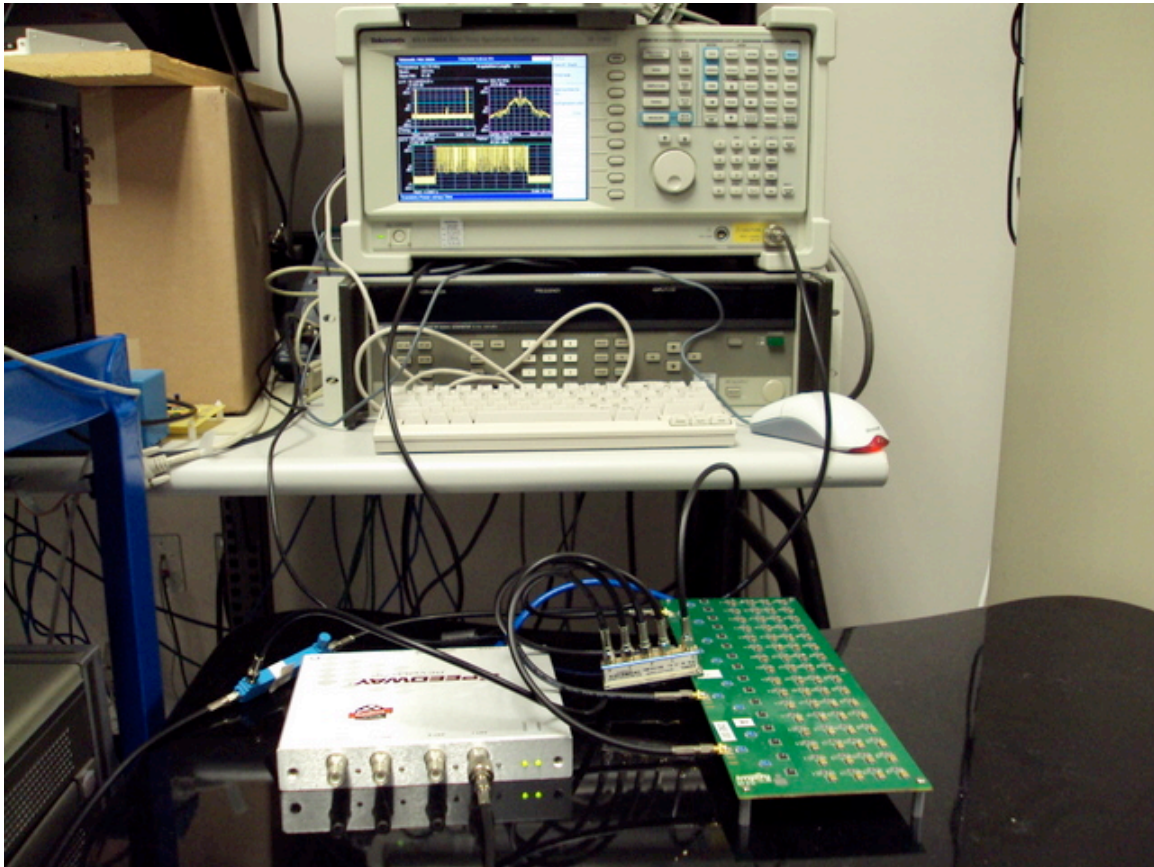
July 2009

Tests Description

The same test measurement sequence is run three times:

1. Reader configured with all 50 channels as high power channels; this is the default reader configuration if the low power channel feature is not enabled.
2. Reader configured with 48 high power channels and 2 low power channels; this is the minimum number of low power channels a user could specify when using the reader.
3. Reader configured with 34 high power channels and 16 low power channels; this is the maximum number of low power channels a user could specify when using the reader.

Test equipment used is a Tektronix RSA3303A with the reader connected via RF cable as shown on photo.



The reader is started to perform RFID tag inventory and a PC program controls the RSA3303A via GPIB in order to automate the exact measurements of 20 captures per channel. The measurements taken are:

- dwell times on the channel

- period(s) of the dwell as defined by interval between two successive power ramp on the channel being monitored

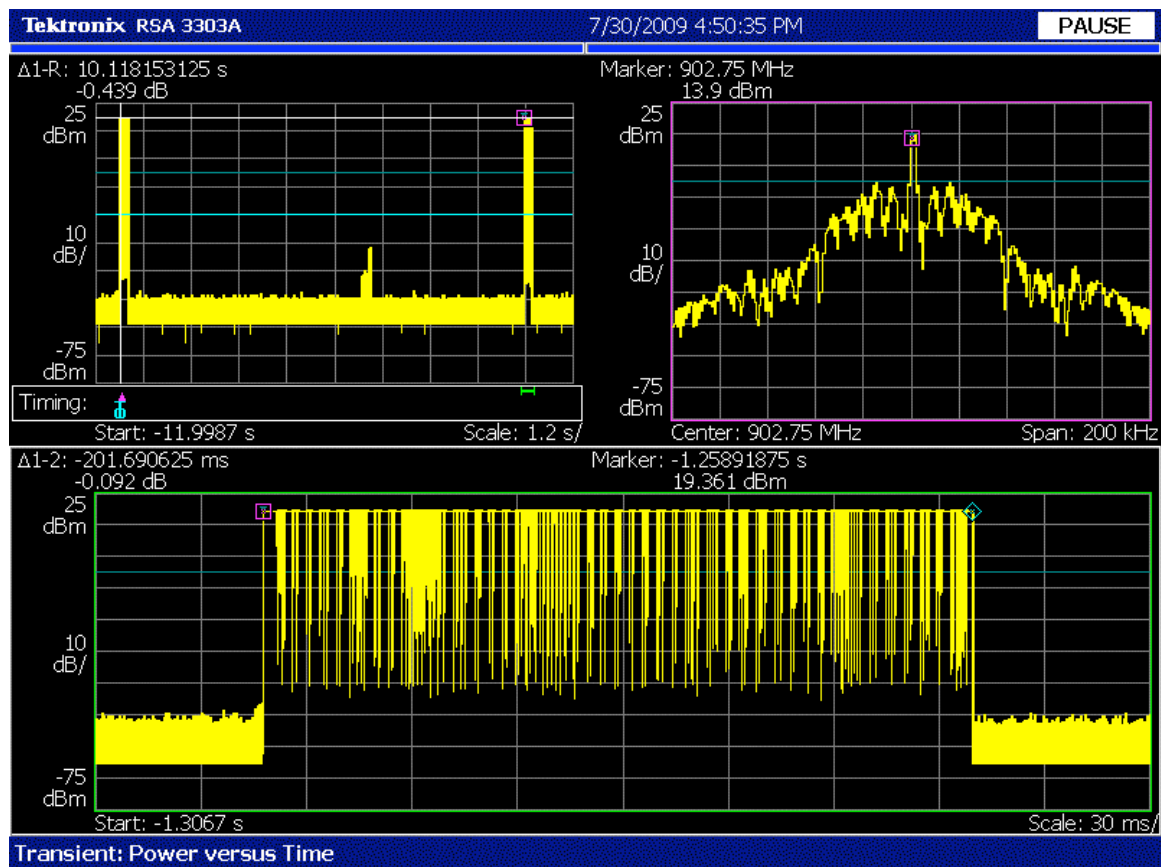
Out of all captures for a given channel N, the average period time ($T_{\text{Period(channel N)}}$) and dwell time ($T_{\text{dwell(channel N)}}$) are computed.

RSA3303A is configured as follows:

- SPAN: 200 kHz
- Acquisition length: 12s

For instance, in the following example capture taken with 50 full power channels:

- dwell times measured at 201.69062 ms (shown by markers) and 199.64375 ms (not shown)
- period measured at 10.11815 s (shown by markers)

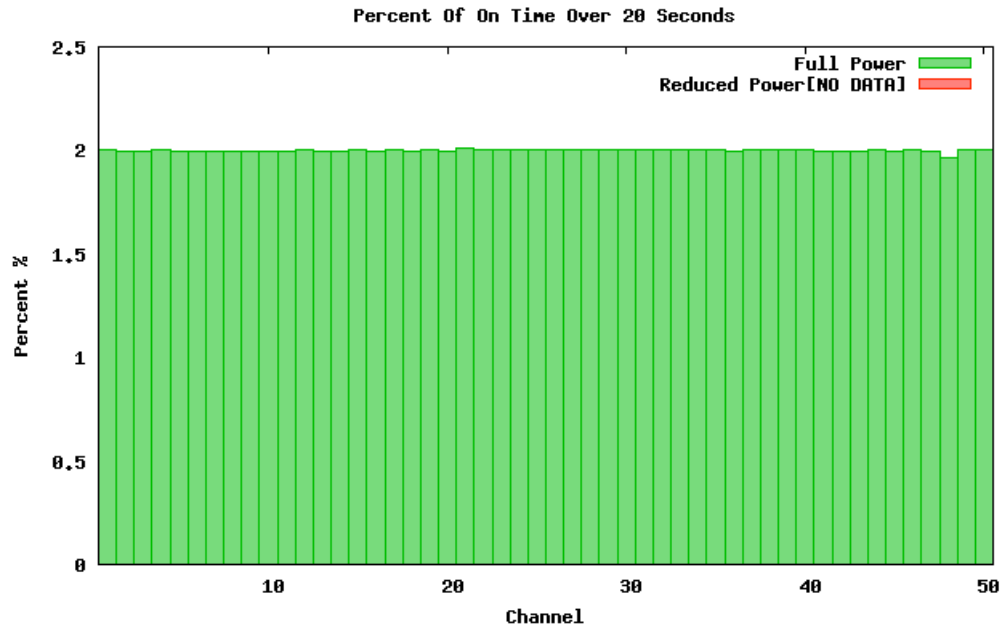


Results are then normalized into average occupancy within 20s for each channel using:

$$\text{Occupancy(channel N)} = (20\text{s} / T_{\text{Period(channel N)}}) \times T_{\text{dwell(channel N)}}$$

Average percentage of ON time for any given channel within 20s is then computed to demonstrate in each configuration compliance to Section 15.247 (a) 1. "Each frequency must be used equally on the average by each transmitter".

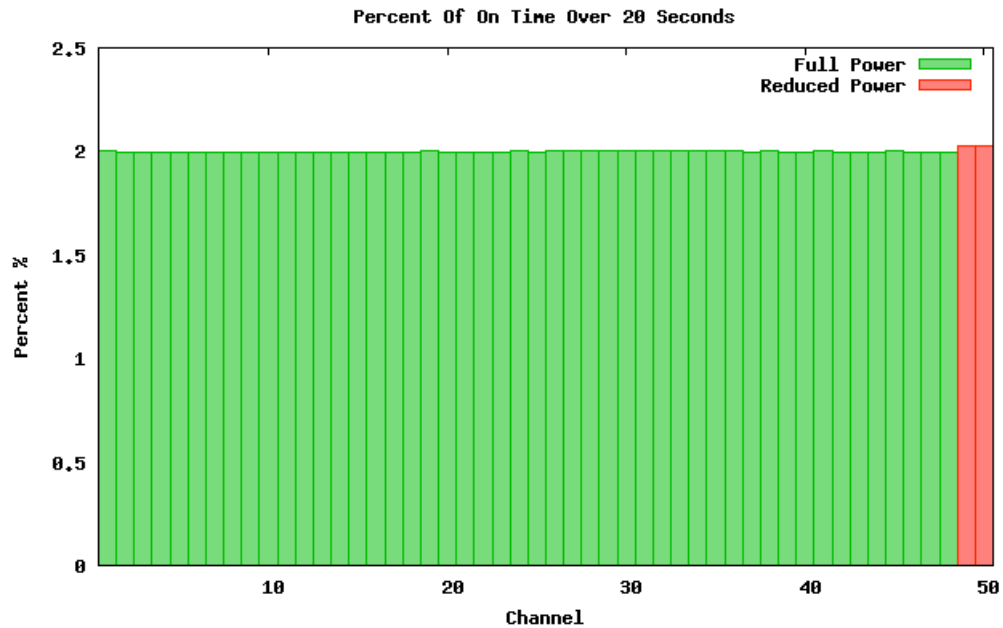
Results when reader is configured with 50 high power channels



Channel	Power	Over 20 s	
		Average occupancy (ms)	Percentage of total ON Time (%)
1	Full	394.434	2.001
2	Full	394.054	1.999
3	Full	393.967	1.999
4	Full	395.192	2.005
5	Full	393.945	1.999
6	Full	393.934	1.998
7	Full	393.795	1.998
8	Full	393.822	1.998
9	Full	393.788	1.998
10	Full	393.847	1.998
11	Full	393.938	1.998
12	Full	394.230	2.000
13	Full	393.885	1.998
14	Full	393.945	1.999
15	Full	394.179	2.000
16	Full	393.782	1.998
17	Full	394.118	1.999
18	Full	394.079	1.999
19	Full	394.324	2.001
20	Full	393.837	1.998
21	Full	395.862	2.008
22	Full	394.473	2.001
23	Full	394.789	2.003
24	Full	394.903	2.003

		Over 20 s	
Channel	Power	Average occupancy (ms)	Percentage of total ON Time (%)
25	Full	395.114	2.005
26	Full	395.013	2.004
27	Full	395.073	2.004
28	Full	394.086	1.999
29	Full	394.983	2.004
30	Full	395.200	2.005
31	Full	395.070	2.004
32	Full	395.185	2.005
33	Full	395.316	2.006
34	Full	394.843	2.003
35	Full	394.561	2.002
36	Full	393.763	1.998
37	Full	394.643	2.002
38	Full	394.729	2.002
39	Full	394.513	2.001
40	Full	394.166	2.000
41	Full	394.027	1.999
42	Full	393.997	1.999
43	Full	394.031	1.999
44	Full	394.206	2.000
45	Full	393.719	1.997
46	Full	394.361	2.001
47	Full	394.008	1.999
48	Full	386.491	1.961
49	Full	394.912	2.003
50	Full	394.386	2.001

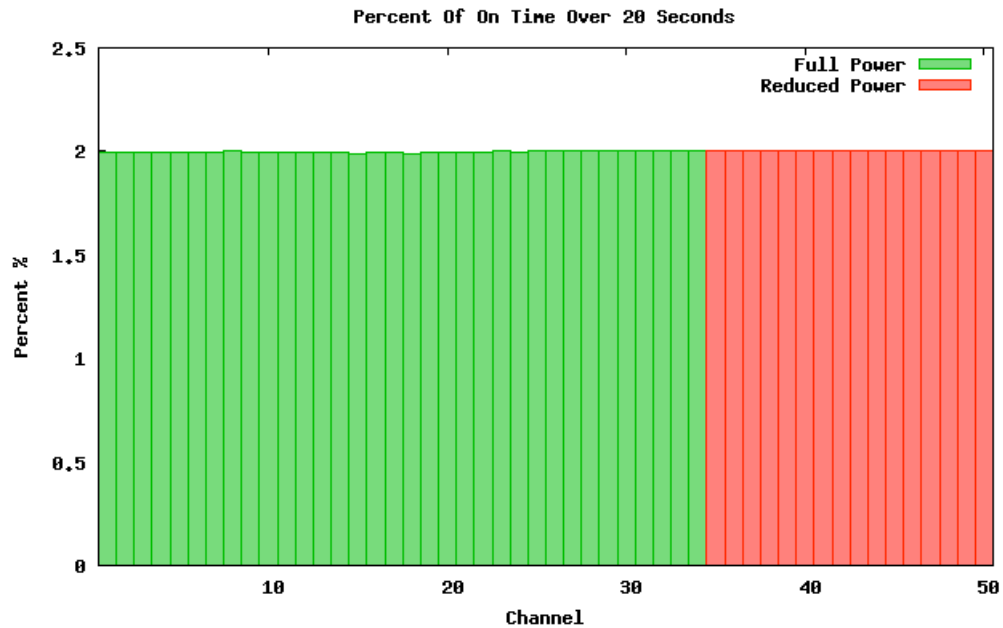
Results when reader is configured with 48 high power channels and 2 low power channels



Channel	Power	Over 20 s	
		Average occupancy (ms)	Percentage of total ON Time (%)
1	Full	391.390	2.003
2	Full	390.323	1.997
3	Full	390.286	1.997
4	Full	390.402	1.998
5	Full	389.901	1.995
6	Full	390.243	1.997
7	Full	390.578	1.999
8	Full	390.661	1.999
9	Full	390.648	1.999
10	Full	390.261	1.997
11	Full	389.848	1.995
12	Full	389.841	1.995
13	Full	389.827	1.995
14	Full	389.737	1.994
15	Full	390.156	1.997
16	Full	390.471	1.998
17	Full	390.480	1.998
18	Full	390.587	1.999
19	Full	391.849	2.005
20	Full	390.215	1.997
21	Full	390.480	1.998
22	Full	390.442	1.998

		Over 20 s	
Channel	Power	Average occupancy (ms)	Percentage of total ON Time (%)
23	Full	390.498	1.998
24	Full	390.831	2.000
25	Full	390.638	1.999
26	Full	391.122	2.002
27	Full	391.538	2.004
28	Full	391.310	2.002
29	Full	391.559	2.004
30	Full	390.800	2.000
31	Full	391.665	2.004
32	Full	391.625	2.004
33	Full	391.677	2.004
34	Full	390.943	2.001
35	Full	391.158	2.002
36	Full	390.849	2.000
37	Full	390.616	1.999
38	Full	390.807	2.000
39	Full	390.425	1.998
40	Full	390.426	1.998
41	Full	390.892	2.000
42	Full	390.565	1.999
43	Full	390.559	1.999
44	Full	390.639	1.999
45	Full	390.840	2.000
46	Full	389.997	1.996
47	Full	390.397	1.998
48	Full	389.267	1.992
49	Reduced	395.529	2.024
50	Reduced	396.098	2.027

Results when reader is configured with 34 high power channels and 16 low power channels



Channel	Power	Over 20 s	
		Average occupancy (ms)	Percentage of total ON Time (%)
1	Full	392.071	1.995
2	Full	392.137	1.995
3	Full	392.063	1.995
4	Full	392.252	1.996
5	Full	392.232	1.996
6	Full	392.212	1.996
7	Full	392.426	1.997
8	Full	393.214	2.001
9	Full	392.096	1.995
10	Full	392.503	1.997
11	Full	391.808	1.994
12	Full	392.077	1.995
13	Full	392.222	1.996
14	Full	392.728	1.998
15	Full	391.089	1.990
16	Full	392.639	1.998
17	Full	391.570	1.992
18	Full	390.756	1.988
19	Full	392.843	1.999
20	Full	392.365	1.996
21	Full	392.399	1.997
22	Full	392.663	1.998
23	Full	393.125	2.000

		Over 20 s	
Channel	Power	Average occupancy (ms)	Percentage of total ON Time (%)
24	Full	392.735	1.998
25	Full	393.499	2.002
26	Full	393.723	2.003
27	Full	393.741	2.003
28	Full	393.309	2.001
29	Full	393.811	2.004
30	Full	393.828	2.004
31	Full	393.248	2.001
32	Full	393.274	2.001
33	Full	393.759	2.003
34	Full	393.687	2.003
35	Reduced	393.984	2.005
36	Reduced	394.159	2.006
37	Reduced	394.085	2.005
38	Reduced	394.107	2.005
39	Reduced	394.050	2.005
40	Reduced	394.021	2.005
41	Reduced	394.031	2.005
42	Reduced	394.101	2.005
43	Reduced	394.040	2.005
44	Reduced	393.995	2.005
45	Reduced	394.041	2.005
46	Reduced	394.122	2.005
47	Reduced	393.766	2.003
48	Reduced	393.825	2.004
49	Reduced	393.696	2.003
50	Reduced	394.026	2.005