FCC CFR47 PART 15/ INDUSTRY CANADA RSS-210

Class 2 Permissive Change Test Report

2.4 GHz Transceiver

Model Number: ZE10F

FCC ID: YRIPLF01
IC: 9041A - PLF01

Report Number: 10PRO025

Issue Date: 5 December 2010

Prepared for

Peel Technologies Inc.
4655 Old Ironsides Dr #200
Santa Clara, CA 95054

Prepared by

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EMISSIONS TEST REPORT FOR A LOW POWER TRANSMITTER

I. GENERAL INFORMATION

Requirement:	FCC, IC
Test Requirements:	FCC Part 15, RSS-210, RSS-Gen
Applicant:	Peel Technologies Inc. 4655 Old Ironsides Dr #200 Santa Clara, CA 95054
FCC ID:	YRIPLF01
IC:	9041A - PLF01
Model No.:	ZE10F

II. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

The Peel Node product contains a 2.4 GHz radio and is used as part of a system to control and program entertainment devices remotely via internet and cell phone.

The original version of this product was FCC certified 7 September 2010. The data in this test report is for a new style integrated antenna.

III. TEST DATES AND TEST LOCATION

Testing was performed 17 November 2010. All tests were performed at

Bay Area Compliance Laboratory
1274 Anvilwood Ave.
Sunnyvale, CA 94089

T.N. Cokenias 5 December 2010
EMC Consultant/Agent for Peel Technologies

15.203 Antenna connector requirement

The EUT uses a new custom made permanently attached internal antenna

Antenna description	Mfr.	Model No.	Gain
Built-in flat strip antenna	Peel	n/a	2 dBi maximum

TEST PROCEDURES

All tests were performed in accordance with the applicable procedures called out in the following documents, unless otherwise noted:

FCC 47CFR15

RSS-210 Issue 7: Low power license exempt radio frequency devices (July 2007)
RSS-212: Test Facilities and Test Methods for Radio Equipment

ANSI C63.4 – 2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

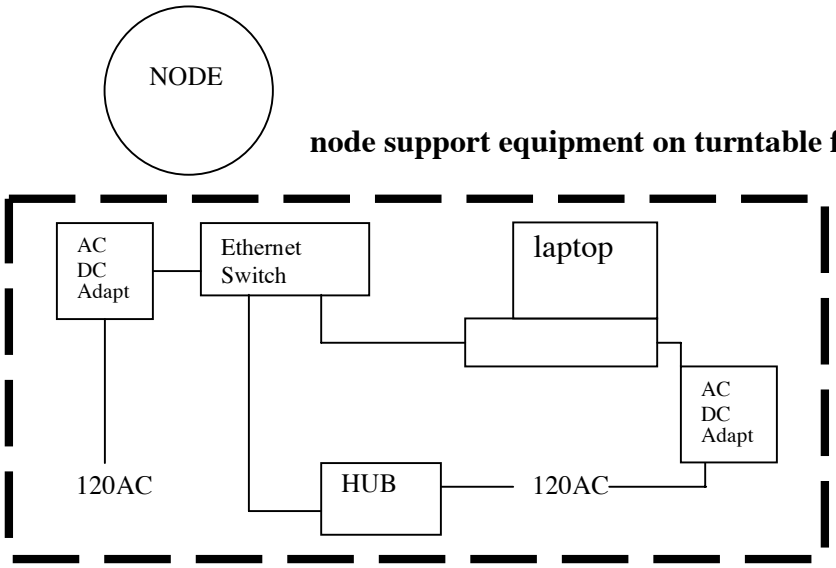
For each radio, tests were performed at three frequencies:

Channel 11 (LOW) – 2405.8 MHz
Channel 20 (MID) – 2450.8 MHz
Channel 26 (HIGH) – 2480.9 MHz

Test Equipment

Manufacturer	Description	Model	Serial Number	Calibration Date
Agilent	Spectrum Analyzer	E4440A	US45303156	2010-08-09
Sunol Science Corp	System Controller	SC99V	122303-1 N/R	NCR
EMCO	Horn antenna	3115	9511-4627	2010-08-09
Mini-Circuits	Pre Amplifier	ZVA-183-S	570400946	2010-05-10

Test Set-up Diagram



Support Equipment

Equipment	Mfr	Model	Asset No.
Laptop PC	HP	Pavillion	X11-45371
AC/DC adapter	HP	DC359A	Q031514
Ethernet switch	Netgear	FS105	1D5178937048A
Ethernet Switch AC/DC	Netgear	DSA-9R-05-AUS	

Test control software: ZELFY/Peel guiHubNodeTest-FCC

TEST RESULTS

Radiated Test Set-up, 30-25 GHz

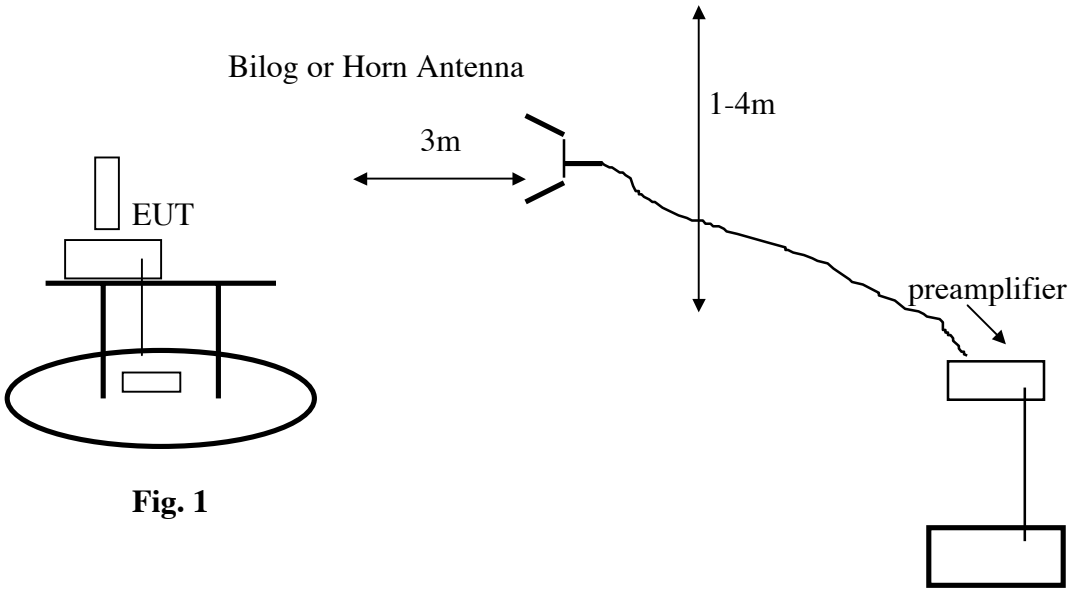


Fig. 1

Test Procedures

Radiated emissions generated by the transmitter portion of the EUT were measured.

1. The EUT was placed on a wooden table resting on a turntable on the test site. The search antenna was placed 3m from the EUT. The EUT antenna was mounted in the with the EUT TX antenna pointed directly to the search antenna.

2. The turntable was slowly rotated to locate the direction of maximum emission at each emission falling in the restricted bands of 15.205.

3. Emissions were investigated to the 10^{th} harmonic of the fundamental.

4. Once maximum direction was determined, the search antenna was raised and lowered in both vertical and horizontal polarizations. The maximum readings so obtained are recorded in the data listed below.

Test Results: Worst-case results are presented. Refer to data sheets below. Restricted band emissions meet 54 dBuV/m. Other undesired emissions from the transmitter meet the -20 dBc requirement in 15.247(d).

15.205 Restricted Frequency Bands

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.495 - 0.505 (1)	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	
13.36 - 13.41	322 - 335.4		

15.209 General Field Strength Limits

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

Industry Canada RSS-210 Restricted Bands and General Field Strength Limits

Table 1: Restricted Frequency Bands (Note)

MHz
0.090-0.110
2.1735-2.1905
3.020-3.026
4.125-4.128
4.17725-4.17775
4.20725-4.20775
5.677-5.683
6.215-6.218
6.26775-6.26825
6.31175-6.31225
8.291-8.294
8.362-8.366
8.37625-8.38675
8.41425-8.41475
12.29-12.293
12.51975-12.52025
12.57675-12.57725
13.36-13.41
16.42-16.423
16.69475-16.69525
16.80425-16.80475
25.5-25.67
37.5-38.25

MHz
73-74.6
74.8-75.2
108-138
156.52475-156.52525
156.7-156.9
240-285
322-335.4
399.9-410
608-614
960-1427
1435-1626.5
1645.5-1646.5
1660-1710
1718.8-1722.2
2200-2300
2310-2390
2655-2900
3260-3267
3332-3339
3345.8-3358
3500-4400
4500-5150
5350-5460

MHz
7250-7750
8025-8500

GHz
9.0-9.2
9.3-9.5
10.6-12.7
13.25-13.4
14.47-14.5
15.35-16.2
17.7-21.4
22.01-23.12
23.6-24.0
31.2-31.8
36.43-36.5
Above 38.6

Note: Certain frequency bands listed in Table 1 and above 38.6 GHz are designated for low-power licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in this Standard as well as in RSS-310.

Table 2: General Field Strength Limits for Transmitters and Receivers at Frequencies Above 30 MHz (Note)

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

Note: Transmitting devices are not permitted in Table 1 bands or in TV bands (54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz, and 614-806 MHz). Prohibition of operation in TV bands does not apply to momentary devices, or to medical telemetry devices in the band 174-216 MHz, and to perimeter protection systems in the bands 54-72 and 76-88 MHz. The perimeter protection devices are to meet Table 3 field strengths limits.

Bay Area Compliance Labs Corp.
1274 Anvilwood Ave., Sunnyvale, CA 94089
Tel: (408) 732 9162/Fax: (408) 732 9164

FCC15.247 Radiated Above 1GHz Test DATA

Customer Name	Peel Technologies	**Test Date**	2010-11-17
Project Number	T1011174	**Time**	1:00pm - 5:00pm
EUT Name	2.4Ghz Zigbee Consumer Device	**Temperature (°C)**	25
EUT Model No.	/	**Humidity (%)**	53
EUT Serial No.	/	**ATM Pressure**	102 kPa
EUT Configuration	See Notes	**Location**	Chamber 3

Standard/Specification: FCC 15.247

NOTES: Above 1GHz Test data only, Measured at 3 meters, 1~18 GHz

Device: New Node

Low Channel: 2405 MHz

Frequency (MHz)	S.A. Reading (dBuV)	Table Azimuth (Degree)	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBuV/m)	FCC & IC		
			Height (cm)	Polarity (H/V)	Factor (dB)				Limit (dBuV/m)	Margin (dB)	Comment
4810	43.4	187	100	V	32.9	4.56	27.5	53.36	74	-20.64	Peak
4810	43.3	155	165	H	32.9	4.56	27.5	53.26	74	-20.74	Peak
4810	33.73	187	100	V	32.9	4.56	27.5	43.69	54	-10.31	Ave
4810	34.35	155	165	H	32.9	4.56	27.5	44.31	54	-9.69	Ave

Middle Channel: 2450 MHz

Frequency (MHz)	S.A. Reading (dBuV)	Table Azimuth (Degree)	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBuV/m)	FCC & IC		
			Height (cm)	Polarity (H/V)	Factor (dB)				Limit (dBuV/m)	Margin (dB)	Comment
4900	43.01	111	100	V	33.1	4.52	27.4	53.23	74	-20.77	Peak
4900	41.99	208	174	H	33.1	4.52	27.4	52.21	74	-21.79	Peak
4900	32.22	111	100	V	33.1	4.52	27.4	42.44	54	-11.56	Ave
4900	33.84	208	172	H	33.1	4.52	27.4	44.06	54	-9.94	Ave
7350	48.26	175	202	V	36.1	5.57	26.9	63.03	74	-10.97	Peak
7350	46.37	155	161	H	36.1	5.57	26.9	61.14	74	-12.86	Peak
7350	38.24	175	202	V	36.1	5.57	26.9	53.01	54	-0.99	Ave
7350	35.46	155	161	H	36.1	5.57	26.9	50.23	54	-3.77	Ave

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High Channel: 2480 MHz

Frequency (MHz)	S.A. Reading (dBuV)	Table Azimuth (Degree)	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBuV/m)	FCC & IC		
			Height (cm)	Polarity (H/V)	Factor (dB)				Limit (dBuV/m)	Margin (dB)	Comment
4960	41.62	137	149	V	33.2	4.52	27.4	51.94	74	-22.06	Peak
4960	42.28	220	166	H	33.2	4.52	27.4	52.6	74	-21.4	Peak
4960	30.11	137	149	V	33.2	4.52	27.4	40.43	54	-13.57	Ave
4960	33.84	220	166	H	33.2	4.52	27.4	44.16	54	-9.84	Ave
7440	45.35	202	100	V	36.2	5.57	26.8	60.32	74	-13.68	Peak
7440	45.47	342	149	H	36.2	5.57	26.8	60.44	74	-13.56	Peak
7440	33.95	202	100	V	36.2	5.57	26.8	48.92	54	-5.08	Ave
7440	35.08	342	149	H	36.2	5.57	26.8	50.05	54	-3.95	Ave

Band Edge:

Lowest Channel: 2405 MHz

Frequency (MHz)	S.A. Reading (dBuV)	Table Azimuth (Degree)	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBuV/m)	FCC & IC		
			Height (cm)	Polarity (H/V)	Factor (dB)				Limit (dBuV/m)	Margin (dB)	Comment
2372.5	45.53	261	100	V	28.4	3.12	27.8	49.25	74	-24.75	Peak
2372.5	45.64	100	164	H	28.4	3.12	27.8	40.77	74	-33.23	Peak
2372.5	37.05	261	100	V	28.4	3.12	27.8	41.37	54	-12.63	Ave
2372.5	37.65	100	164	H	28.4	3.12	27.8	41.37	54	-12.63	Ave

Highest Channel: 2480 MHz

Frequency (MHz)	S.A. Reading (dBuV)	Table Azimuth (Degree)	Test Antenna			Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBuV/m)	FCC & IC		
			Height (cm)	Polarity (H/V)	Factor (dB)				Limit (dBuV/m)	Margin (dB)	Comment
2483.5	58.58	261	100	V	28.5	3.25	27.8	62.53	74	-11.47	Peak
2483.5	57.5	40	153	H	28.5	3.25	27.8	61.45	74	-12.55	Peak
2483.5	49.62	261	100	V	28.5	3.25	27.8	53.57	54	-0.43	Ave
2483.5	48.16	40	153	H	28.5	3.25	27.8	52.11	54	-1.89	Ave

END OF REPORT

Report Revision History

Revision No.	Revision Description	Pages Revised	Revised by	Date
-	Original Issue		T. Cokenias	12/05/10