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Report Number: R11CA36290-FCC

Project Number: 11CA36290

File Number: MC15465

Date: July 13, 2011

Models: Tag Model T25-122
(FCC ID: URGT25122)

Electromagnetic Compatibility Test Report

For

Radarfind Inc.

Raleigh, NC

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Test Report Details

Tests Performed By:

Underwriters Laboratories Inc.
12 Laboratory Dr.
Research Triangle Park, NC 27709

Tests Performed For:

RadarFind Corporation
A TeleTracking Technologies Company
2100 Gateway Centre Blvd., Suite 150
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Applicant Contact:

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Test Report Date:

July 13, 2011

Product Type:

Low-Powered Transmitter

Product standards

FCC Part 15 Subpart C, 15.249

Model Number:

Tag Model T25-122

Sample Serial Number:

S/N 28286

EUT Category:

902-928 MHz Transmitter

Testing Start Date:

June 30, 2011

Date Testing Complete:

July 1, 2011

Overall Results:

Compliant

Underwriters Laboratories Inc. reports apply only to the specific samples tested under stated test conditions. All samples tested were in good operating condition throughout the entire test program. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. Underwriters Laboratories Inc. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from Underwriters Laboratories Inc. issued reports. This report shall not be used to claim, constitute or imply product certification, approval, or endorsement by NVLAP, NIST, A2LA, or any agency of the US government.

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Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
None	-	-	-

1.0 G E N E R A L - Product Description

1.1 Equipment Description

This equipment functions as part of a device tracking system consisting of readers and tags. It operates in the 902-928 MHz ISM band under FCC Part 15.249.

1.2 Device Configuration During Test

1.2.1 Equipment Used During Test:

Use	Product Type	Manufacturer	Model	Comments
EUT	RF Transceiver Tag	RadarFind Inc.	T25-122	S/N 28286

Note: **EUT** - Equipment Under Test, **AE** - Auxiliary/Associated Equipment, or **SIM** - Simulator (Not Subjected to Test)

1.2.2 Input/Output Ports:

Port #	Name	Type*	Cable Max. >3m (Y/N)	Cable Shielded (Y/N)	Comments
0	Enclosure	N/E	—	—	None
1	Battery	DC	N	N	
2	Antenna	N/E	—	—	Antenna is internal to enclosure and not removal

Note:
AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
I/O = Signal Input or Output Port (Not Involved in Process Control)
TP = Telecommunication Ports

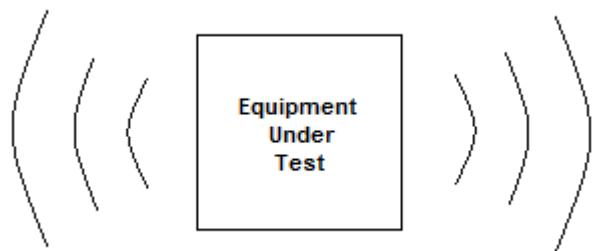
1.2.3 EUT Internal Operating Frequencies:

Frequency (MHz)	Description
902-928	Operating Frequency Band.

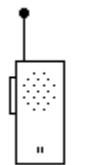
1.2.4 Power Interface:

Mode # /Rated	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
1	3V	-	-	DC	-	A fresh battery was installed prior to test

1.3 Block Diagram:



1.4 Description of Product Orientations



Upright



Side



Flat

EUT is measured positioned in each of three orientations. Upright (X) orientation was worst-case for this device.

1.5 EUT Configurations

Mode #	Description
1	Equipment Under Test is transmitting. Product orientation is as noted in each test section.

1.6 EUT Operation Modes

Mode #	Description
1	Reader/Tags are set to continuously operate at maximum power level moving between the following six operating frequencies/modes for the purposes of test.

TX Antennas	Frequency	Baud Rate	Deviation	Length of Transmission
Internal	905 MHz (Low)	200,000 bit/s	± 297 kHz	10 ms Tx, 30 ms idle (25% duty cycle)
	909 MHz			
	912 MHz			
	915 MHz (Mid)			
	918 MHz			
	926.9 MHz (High)			

2.0 Summary

The tests listed in the Summary of Testing section of this report have been performed and the results recorded by Underwriters Laboratories Inc. in accordance with the procedures stated in each test requirement and specification. The applicant determined the list of tests performed were applicable to the Equipment Under Test. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

2.1 Deviations from standard test methods

None

2.2 Device Modifications Necessary for Compliance

None

2.3 Reference Standards

Standard Number	Standard Name	Standard Date
FCC Part 15, Subpart C, 15.249	Code of Federal Regulations, Part 15, Radio Frequency Devices	2010

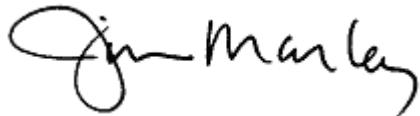
2.4 Results Summary

Requirement – Test	Result (Compliant / Non-Compliant)*
Radiated Power / Radiated Spurious Emissions	Compliant
AC Conducted Emissions	N/A
Occupied Bandwidth (-20dBc and 99% power)	Compliant
Duty Cycle Measurement	N/A
Maximum Permissible Exposure	Compliant

2.5 Test Scope

These tests are performed in support of a new FCC Certification.

Test Engineer:



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Reviewer:



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3.0 Calibration of Equipment Used for Measurement

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is one year or the manufacturers' recommendation, whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST); therefore, all test data recorded in this report is traceable to NIST.

4.0 EMISSIONS TEST RESULTS

The emissions tests were performed according to following regulations:

----- United States -----

Code of Federal Regulations Title 47	Part 15, Subpart C, Radio Frequency Devices
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Unless specified otherwise in the individual Methods, the tests shall be conducted under the following ambient conditions. Confirmation of these conditions shall be verified at the time the test is conducted.

Ambient Temperature, °C	22.5° ± 2.5°	Relative Humidity, %	45% ± 15%	Barometric Pressure, mBar	950 mB ±150 mB
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Sample Calculations

Radiated Field Strength and Conducted Emissions data contained within this report are calculated as follows:

Radiated Field Strength

Field Strength (dB μ V/m) = Meter Reading (dB μ V) + Antenna Factor (dB/m) - Amp Gain (dB) + Cable Loss (dB)

4.1 Test Conditions and Results – RADIATED POWER / RADIATED SPURIOUS EMISSIONS

Test Description	Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4:2003. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at a minimum of two heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable, and with EUT oriented in each of three orthogonal axes as noted.		
Basic Standard	FCC Part 15, Subpart C, 15.249 (Restricted Bands, FCC Part 15.209 General Limits Apply)		
UL LPG	80-EM-S0029		
		Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range		30 MHz – 9.30 GHz	(3 meter measurement distance)

Limits – FCC Part 15.249(a) (Field Strength Limit, not Point-to-Point operation)

Frequency (MHz)	Limit (dB μ V/m)		
	Fundamental		Harmonics
	Peak or Quasi-Peak	Peak	Average
902 – 928	94.0	74.0	54.0

Limits – FCC Part 15.249(d) Spurious Other than Harmonics

Frequency (MHz)	Limit (dB μ V/m)
30 – 10 th harmonic	50 dB below fundamental (or 15.209 limit, whichever is higher)

Limits – FCC Part 15.209 (General Limits)

Frequency (MHz)	Limit (dB μ V/m)	
	Quasi-Peak	Average
30 - 88	40.0	NA
88 - 216	43.5	NA
216 - 960	46.0	NA
960 - 1000	54.0	NA
1000 - 10 th harmonic	NA	54.0 (peak limit 74.0 per FCC Part 15.35)

Supplementary information: None

Table 1 Radiated Emissions EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1 (X-Orientation)	1
1	1 (Y-Orientation)	1
1	1 (Z-Orientation)	1

Supplementary information:

1. Receiver emissions are subject to verification per 15.101(b) and not presented in this report.
2. By special test software the device is set to sequentially transmit on each of the six operating frequencies.

Table 2 Radiated Emissions Test Equipment

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
30-1000 MHz Range					
AT0025	Biconical Antenna, 30 to 300 MHz	Schaffner, EMC	VBA6106A	2011-05-16	2012-05-31
AT0022	Log-periodic Antenna, 200 MHz to 1000 MHz	Chase	UPA6109	2011-01-13	2012-01-31
1-10 GHz					
AT0026	Horn Antenna 1 to 18 GHz	EMC Test Systems	3115	2011-02-03	2012-02-29
Cables, Attenuators, and Pre-Amplifiers					
SAC_C (Biconical 3m location)	(1) ATA084: Attenuator (2) ATA124: Amplifier (3) ATA167: Cable (4) ATA132: Cable (5) ATA229: DC Bias Tee (6) ATA199: Cable	(1) Pasternack (2) Miteq (3) Eupen (4) UL (5) Miteq (6) Micro-Coax	(1) PE7002-6 (2) AM-3A-000110-N (3) CMS/RG 214 (4) UFA210A-0-6000-50U-50U (5) BT2000-C (6) UFB293C-0-0720-5GU50U)	2010-08-16	2011-08-31
SAC_D (Log-Periodic 3m location)	(1) ATA085: Attenuator (2) ATA125: Amplifier (3) ATA225: Cable (4) ATA189: Cable (5) ATA115: DC Bias Tee (6) ATA198: Cable	(1) Pasternack (2) Miteq (3) EUPEN (4) EUPE (5) Miteq (6) Micro-Coax	(1) PE7002-6 (2) AM-3A-000110-N (3) CMS/RG 214 (4) CMS/RG 214 (5) AM-1523-7687 (6) UFB293C-0-0720-5GU50U	2010-08-16	2011-08-31
SAC_E_HORN (SA in control room; Class A)	(1) ATA144: Amplifier (2) CBL002: Cable (3) ATA199: Cable	(1) Miteq (2) MegaPhase (3) Micro-Coax	(1) AFS42-00101800-25-N-42MF (2) EM18-NKNK-600 (3) UFB293C-0-0720-5GU50U	2011-03-25	2012-03-31
Receiver & Software					
SAR003	Spectrum Analyzer / Receiver	Rohde & Schwarz	ESIB 40	2011-03-11	2012-03-31

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Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
	Additional Equipment used				
HI0034	Environmental meter (T/H/P)	Control Company	99760-00	2011-01-17	2012-01-31

Radiated Spurious Emissions Graph – 900-930 MHz, X-Orientation

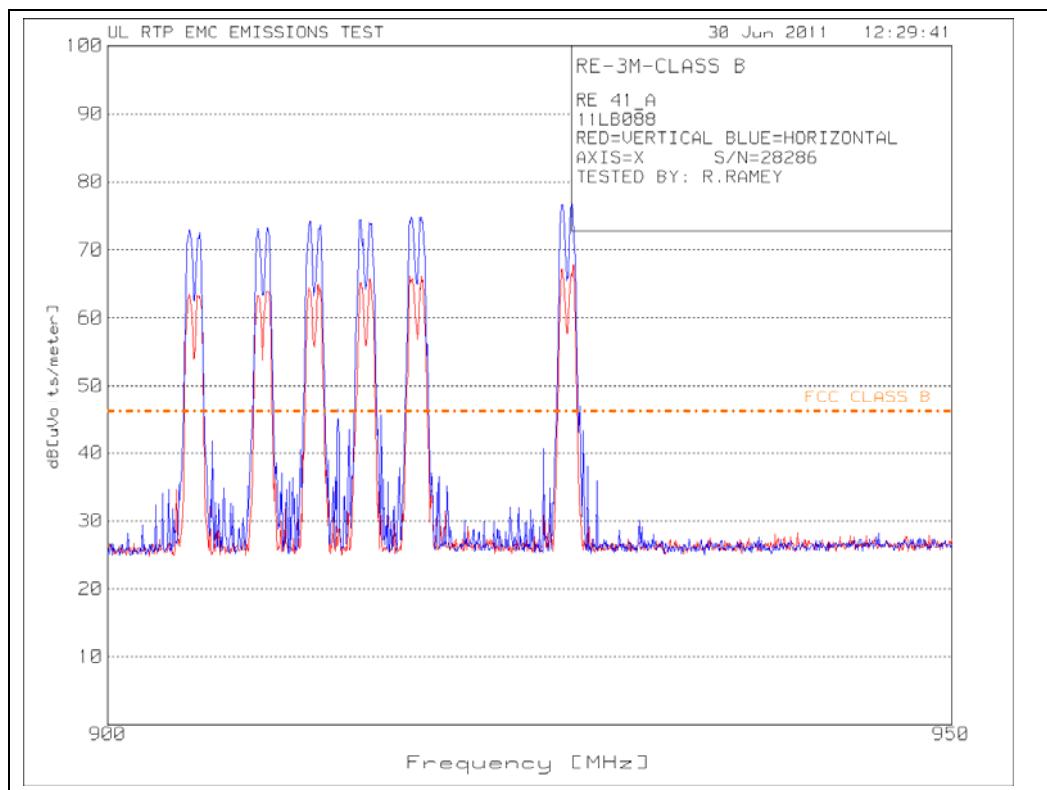


Table 3 Radiated Emissions Data Points – 900-930 MHz, X-Orientation

Measured Frequency [MHz]	Meter Reading [dBuV]	Detector Type	Antenna Factor [dB]	Cable/Amp Factor [dB]	Field Strength [dBuV/m]	15.209 Limit [dBuV/m]	Margin [dB]	Turntable Angle [deg]	Antenna Height [cm]	Antenna Polarity [V/H]
Frequency 1:										
904.7047	71.71	PK	22.4	-21.2	72.91	94	-21.09	rot	1-4m	Horz
905.3053	71.36	PK	22.4	-21.2	72.56	94	-21.44	rot	1-4m	Horz
Frequency 2:										
908.7087	71.88	PK	22.3	-21.1	73.08	94	-20.92	rot	1-4m	Horz
909.2593	72.28	PK	22.2	-21.1	73.38	94	-20.62	rot	1-4m	Horz
Frequency 3:										
911.7618	73.05	PK	22.2	-21.1	74.15	94	-19.85	rot	1-4m	Horz
912.3624	72.53	PK	22.2	-21.1	73.63	94	-20.37	rot	1-4m	Horz
Frequency 4:										
914.7147	73.31	PK	22.3	-21.1	74.51	94	-19.49	rot	1-4m	Horz
915.2152	72.88	PK	22.3	-21.1	74.08	94	-19.92	rot	1-4m	Horz
Frequency 5:										
917.6677	73.45	PK	22.5	-21.1	74.85	94	-19.15	rot	1-4m	Horz
918.2683	73.47	PK	22.5	-21.1	74.87	94	-19.13	rot	1-4m	Horz
Frequency 6:										
926.6266	75.19	PK	22.4	-21	76.59	94	-17.41	rot	1-4m	Horz
927.1772	75.34	PK	22.4	-21	76.74	94	-17.26	rot	1-4m	Horz

LIMIT 1: 15.249 Limit

PK - Peak Detector

Figure 1 Radiated Emissions Graph - 30-1000 MHz – X-Orientation

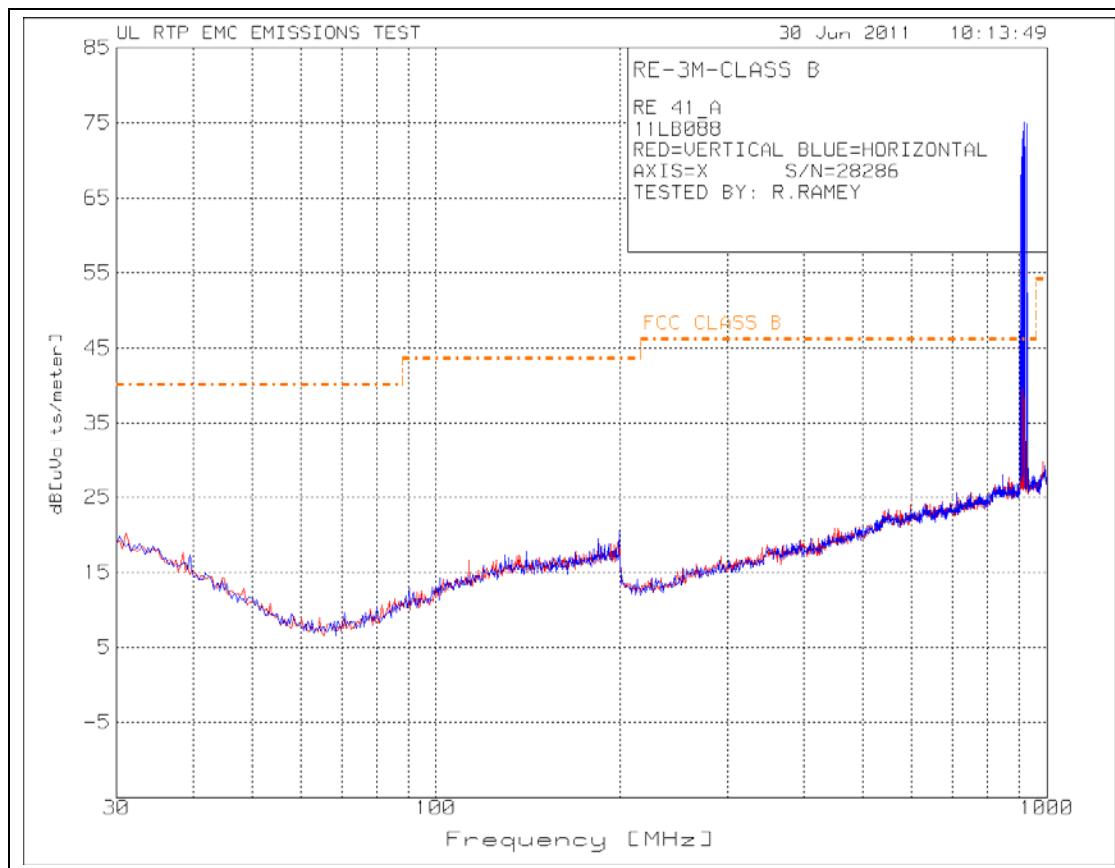


Table 4 Radiated Emissions Data Points – X-Orientation

Marker Test Number	Freq. [MHz]	Meter Reading [dBuV]	Det. Type	Cbl/Amp Factor	Ant. Factor	Field Strength [dBuV/m]	15.209 Margin [dB]	Height [cm]	Pol. [V/H]
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No significant spurious emissions observed in this range.

LIMIT 1: FCC PART 15 CLASS B
PK - Peak detector

Figure 2 Radiated Emissions Graph - 1-9.3 GHz X-Orientation

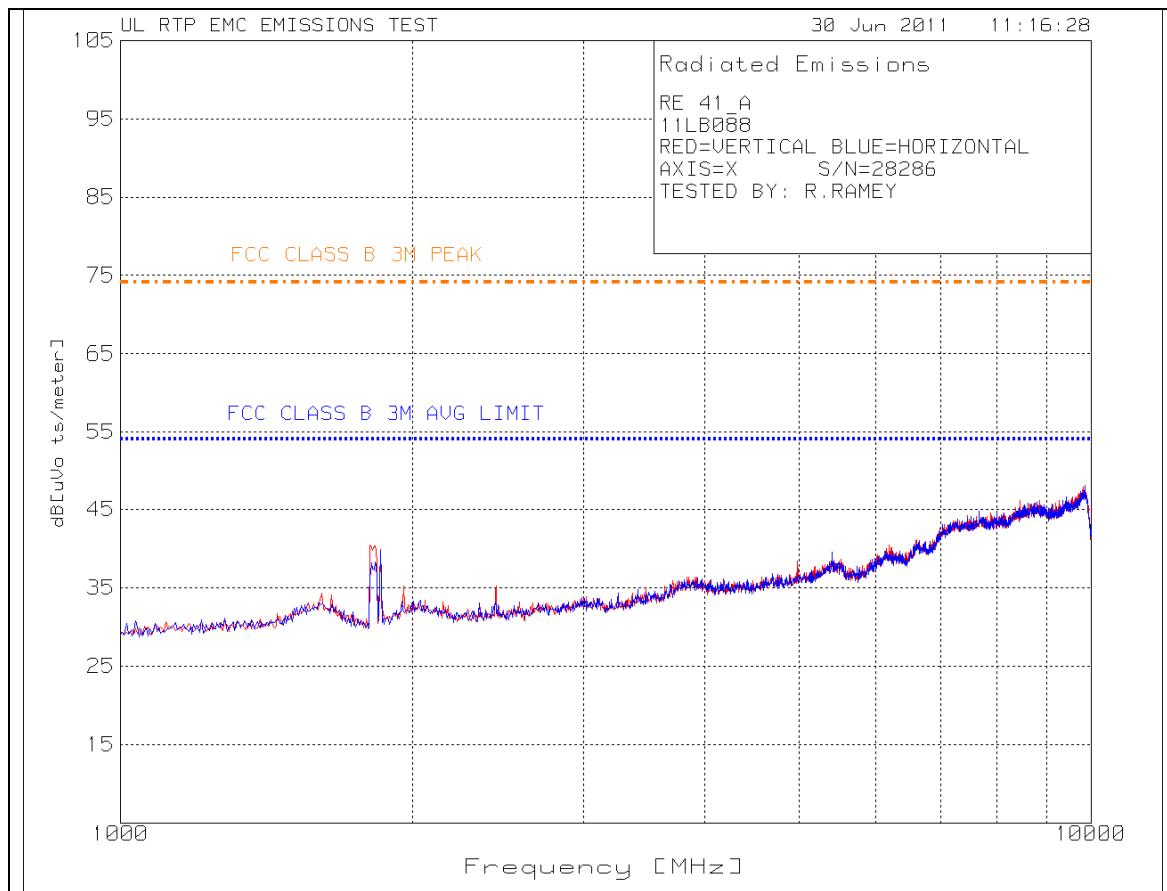


Table 5 Radiated Emissions Data Points (Tag #1, X-Orientation)

Measured Frequency [MHz]	Meter Reading [dBuV]	Detector Type	Antenna Factor [dB]	Cable/Amp Factor [dB]	Field Strength [dBuV/m]	15.209 Limit [dBuV/m]	Margin [dB]	Turntable Angle [deg]	Antenna Height [cm]	Antenna Polarity [V/H]
1828.414	46.55	PK	26	-33.6	38.95	54	-15.05	rot	1-4m	Vert
1850.925	47.71	PK	26.2	-33.7	40.21	54	-13.79	rot	1-4m	Vert
1958.979	44.22	PK	27.3	-33.7	37.82	54	-16.18	rot	1-4m	Vert
2463.232	43.42	PK	27.7	-33.8	37.32	54	-16.68	rot	1-4m	Vert <ambient
1805.903	47.08	PK	25.9	-33.6	39.38	54	-14.62	rot	1-4m	Horz
1832.916	48.24	PK	26	-33.6	40.64	54	-13.36	rot	1-4m	Horz
1850.925	48.40	PK	26.2	-33.7	40.90	54	-13.1	rot	1-4m	Horz

LIMIT 1: FCC PART 15 CLASS B / 15.209 AVG LIMIT

No significant harmonic beyond 2nd harmonic was observed.

Radiated Spurious Emissions Graph – 900-930 MHz, Y-Orientation

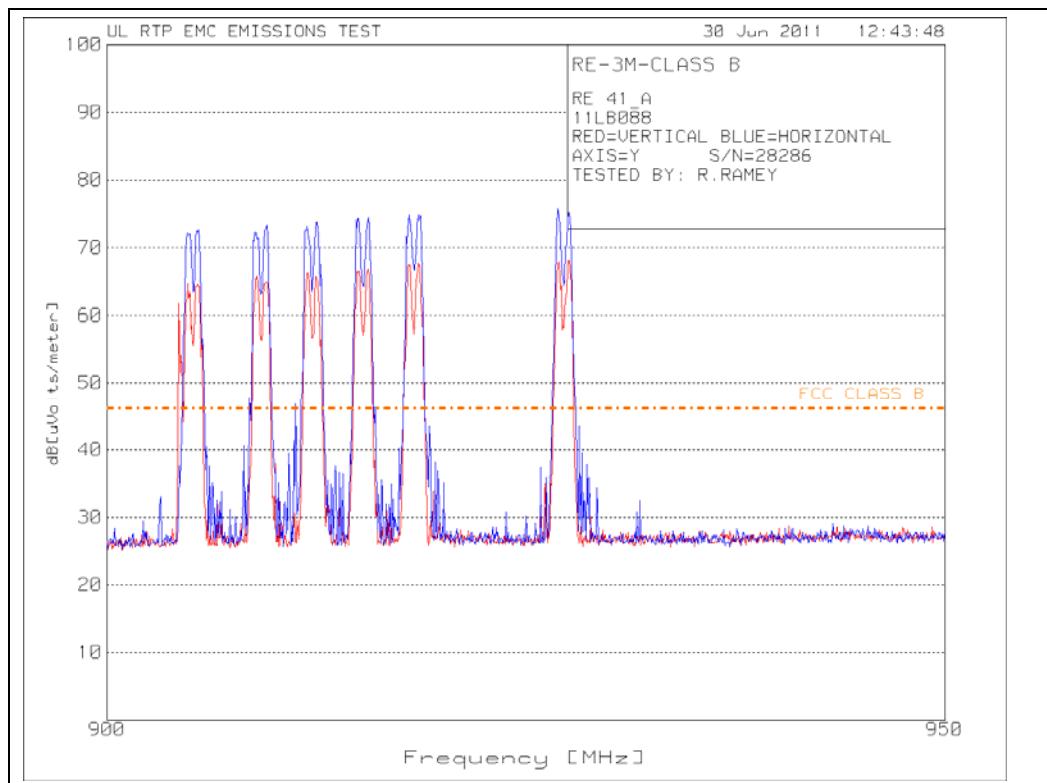


Table 6 Radiated Emissions Data Points – 900-930 MHz, Y-Orientation

Measured Frequency [MHz]	Meter Reading [dBuV]	Detector Type	Antenna Factor [dB]	Cable/Amp Factor [dB]	Field Strength [dBuV/m]	15.209 Limit [dBuV/m]	Margin [dB]	Turntable Angle [deg]	Antenna Height [cm]	Antenna Polarity [V/H]
Frequency 1:										
904.7047	71.03	PK	22.4	-21.2	72.23	94	-21.77	rot	1-4m	Horz
905.3053	71.45	PK	22.4	-21.2	72.65	94	-21.35	rot	1-4m	Horz
Frequency 2:										
908.6587	71.17	PK	22.3	-21.1	72.37	94	-21.63	rot	1-4m	Horz
909.3093	72.2	PK	22.2	-21.1	73.3	94	-20.7	rot	1-4m	Horz
Frequency 3:										
911.6617	71.98	PK	22.2	-21.1	73.08	94	-20.92	rot	1-4m	Horz
912.2372	72.68	PK	22.2	-21.1	73.78	94	-20.22	rot	1-4m	Horz
Frequency 4:										
914.6647	73.19	PK	22.3	-21.1	74.39	94	-19.61	rot	1-4m	Horz
915.3153	73.25	PK	22.3	-21.1	74.45	94	-19.55	rot	1-4m	Horz
Frequency 5:										
917.7177	73.43	PK	22.5	-21.1	74.83	94	-19.17	rot	1-4m	Horz
918.4184	73.28	PK	22.5	-21.1	74.68	94	-19.32	rot	1-4m	Horz
Frequency 6:										
926.5265	74.33	PK	22.4	-21	75.73	94	-18.27	rot	1-4m	Horz
927.2272	73.78	PK	22.4	-21	75.18	94	-18.82	rot	1-4m	Horz

LIMIT 1: FCC PART 15.249 LIMIT

PK - Peak detector

Figure 3 Radiated Emissions Graph - 30-1000 MHz – Y-Orientation

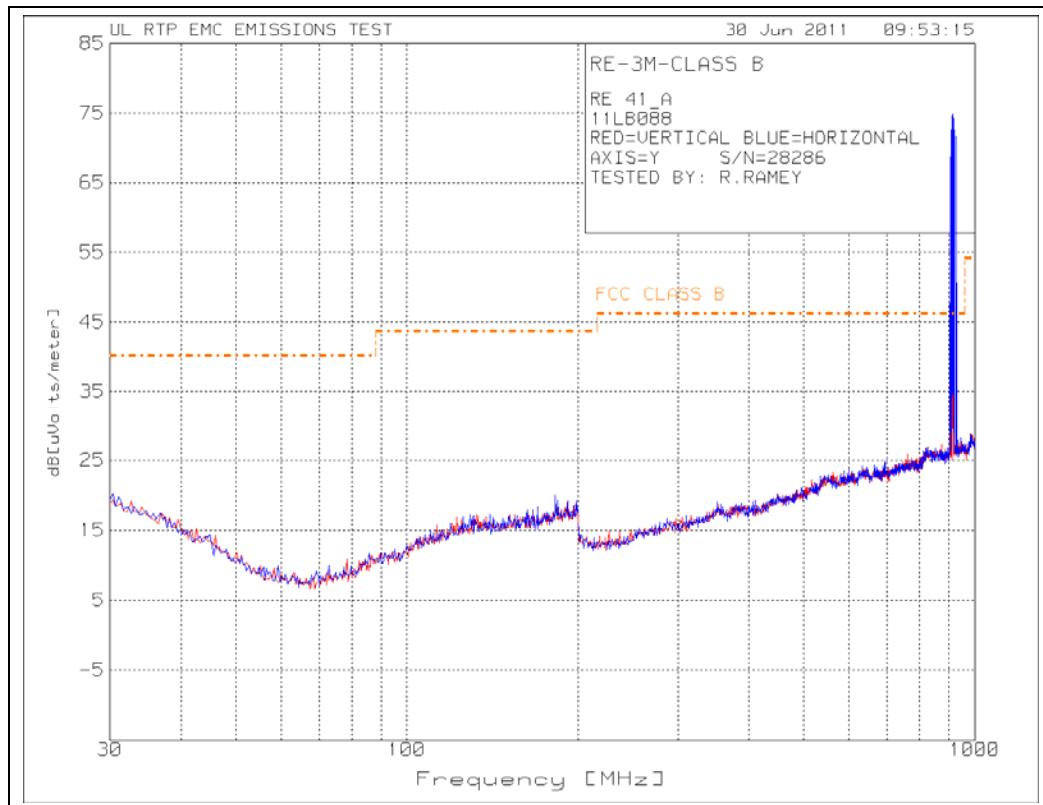


Table 7 Radiated Emissions Data Points – Y-Orientation

Marker Test Number	Freq. [MHz]	Meter Reading [dBuV]	Det. Type	Cbl/Amp Factor	Ant. Factor	Field Strength [dBuV/m]	15.209 Margin [dB]	Height [cm]	Pol. [V/H]
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No significant spurious emissions observed in this range.

LIMIT 1: FCC PART 15 CLASS B
PK - Peak detector

Figure 4 Radiated Emissions Graph - 1-9.3 GHz Y-Orientation

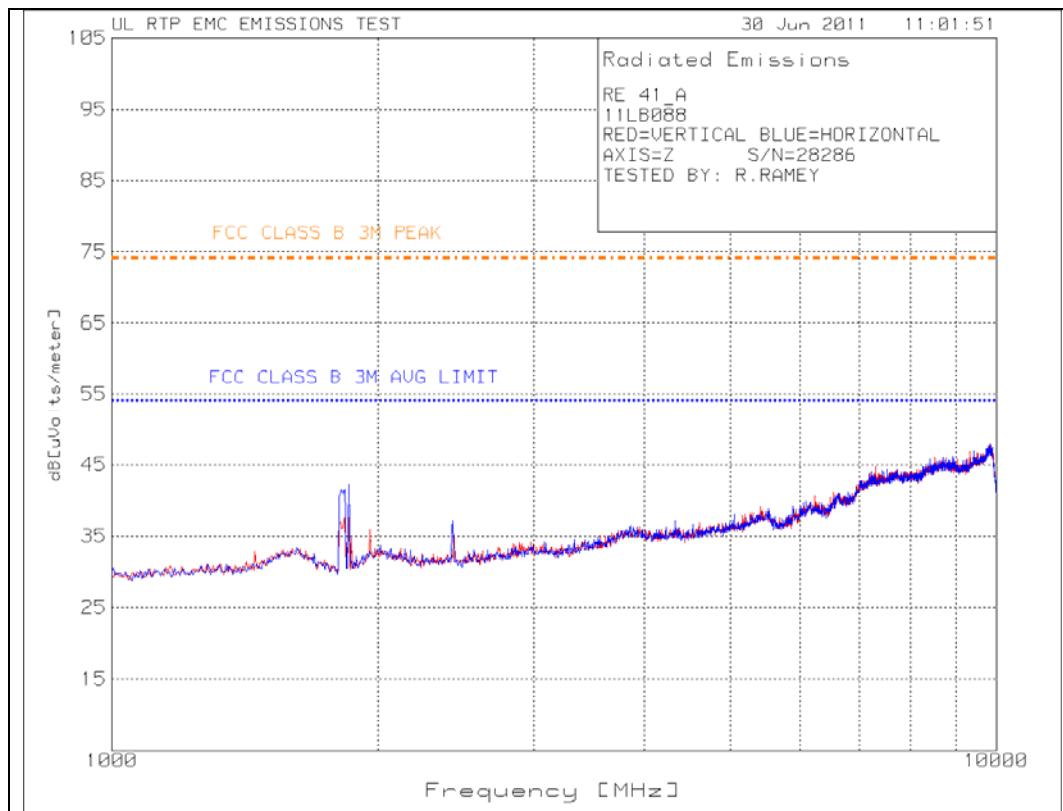


Table 8 Radiated Emissions Data Points (Tag #1, Y-Orientation)

Measured Frequency [MHz]	Meter Reading [dBuV]	Detector Type	Antenna Factor	Cable/Amp Factor	Field Strength [dBuV/m]	15.209 Limit [dBuV/m]	Margin [dB]	Turntable Angle [deg]	Antenna Height [cm]	Antenna Polarity [V/H]
1805.903	48.24	PK	25.9	-33.6	40.54	54	-13.46	rot	1-4m	Horz
1832.916	49.24	PK	26	-33.6	41.64	54	-12.36	rot	1-4m	Horz
1850.925	49.8	PK	26.2	-33.7	42.3	54	-11.7	rot	1-4m	Horz
2427.214	43.31	PK	27.5	-33.7	37.11	54	-16.89	rot	1-4m	Horz
<ambient										

LIMIT 1: FCC PART 15.209 AVERAGE

PK - Peak Detector

No significant harmonic beyond 2nd harmonic was observed.

Radiated Spurious Emissions Graph – 900-930 MHz, Z-Orientation

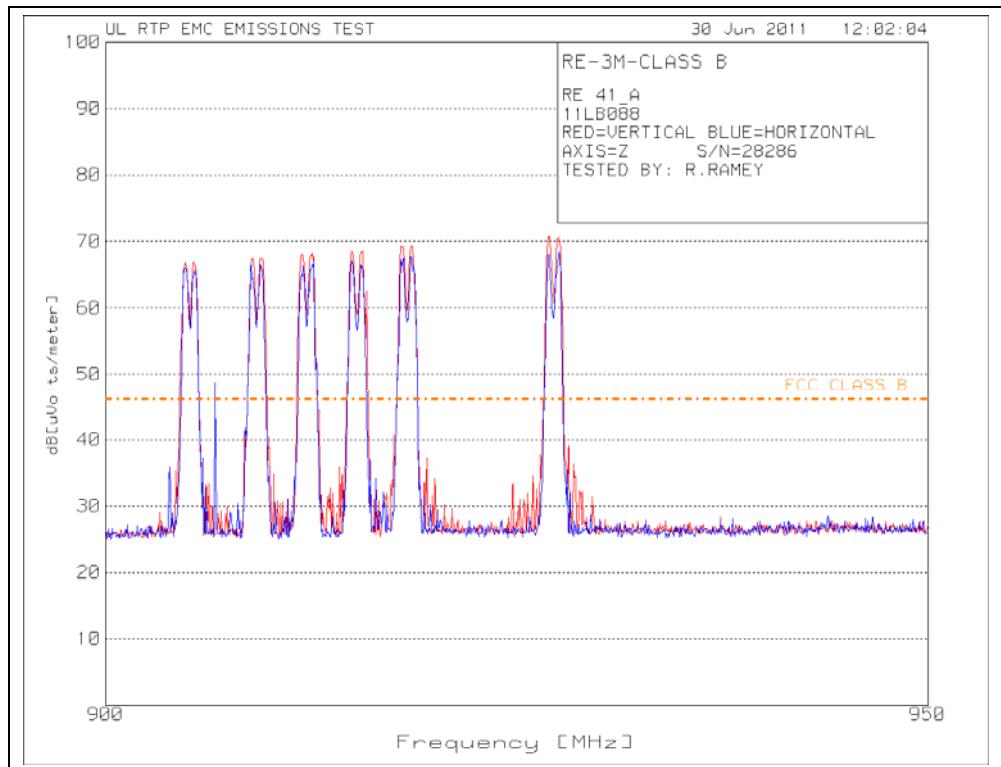


Table 9 Radiated Emissions Data Points – 900-930 MHz, Z-Orientation

Measured Frequency [MHz]	Meter Reading [dBuV]	Detector Type	Antenna Factor [dB]	Cable/Amp Factor [dB]	Field Strength [dBuV/m]	15.209 Limit [dBuV/m]	Margin [dB]	Turntable Angle [deg]	Antenna Height [cm]	Antenna Polarity [V/H]
Frequency 1:										
904.7548	65.55	PK	22.4	-21.2	66.75	94	-27.25	rot	1-4m	Vert
905.2052	65.67	PK	22.4	-21.2	66.87	94	-27.13	rot	1-4m	Vert
Frequency 2:										
908.7588	66.39	PK	22.2	-21.1	67.49	94	-26.51	rot	1-4m	Vert
909.2092	66.4	PK	22.2	-21.1	67.5	94	-26.5	rot	1-4m	Vert
Frequency 3:										
911.7117	67.02	PK	22.2	-21.1	68.12	94	-25.88	rot	1-4m	Vert
912.3123	67.09	PK	22.2	-21.1	68.19	94	-25.81	rot	1-4m	Vert
Frequency 4:										
914.6647	67.33	PK	22.3	-21.1	68.53	94	-25.47	rot	1-4m	Vert
915.3654	67.39	PK	22.3	-21.1	68.59	94	-25.41	rot	1-4m	Vert
Frequency 5:										
917.6677	68.01	PK	22.5	-21.1	69.41	94	-24.59	rot	1-4m	Vert
918.2933	67.91	PK	22.5	-21.1	69.31	94	-24.69	rot	1-4m	Vert
Frequency 6:										
926.6016	69.31	PK	22.4	-21	70.71	94	-23.29	rot	1-4m	Vert
927.1772	69.27	PK	22.4	-21	70.67	94	-23.33	rot	1-4m	Vert

LIMIT 1: FCC PART 15 CLASS B

PK – Peak detector

Figure 5 Radiated Emissions Graph - 30-1000 MHz – Z-Orientation

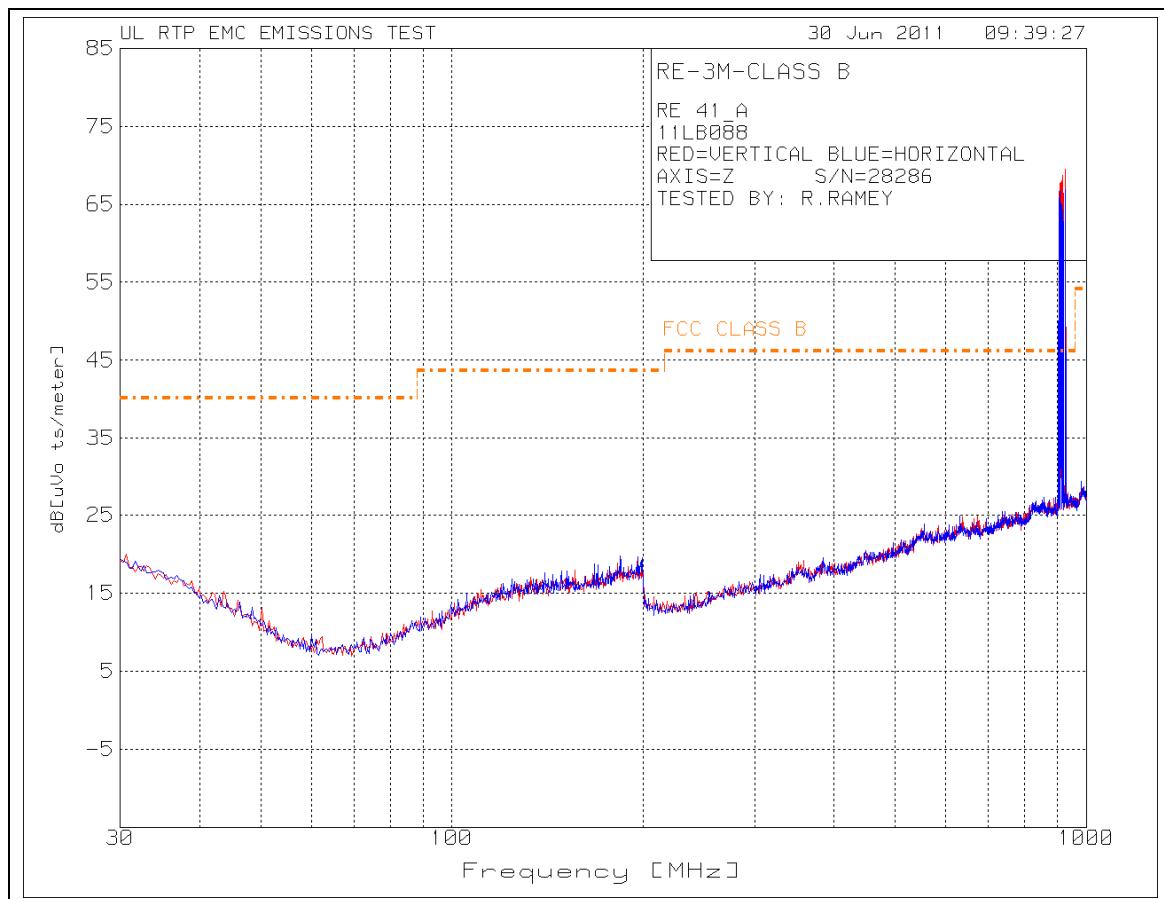


Table 10 Radiated Emissions Data Points – Z-Orientation

Marker Test Number	Freq. [MHz]	Meter Reading [dBuV]	Det. Type	Cbl/Amp Factor	Ant. Factor	Field Strength [dBuV/m]	15.209 [dBuV/m]	Margin [dB]	Height [cm]	Pol. [V/H]
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No significant spurious emissions observed in this range.

LIMIT 1: FCC PART 15 CLASS B
PK - Peak detector

Figure 6 Radiated Emissions Graph - 1-9.3 GHz Z-Orientation

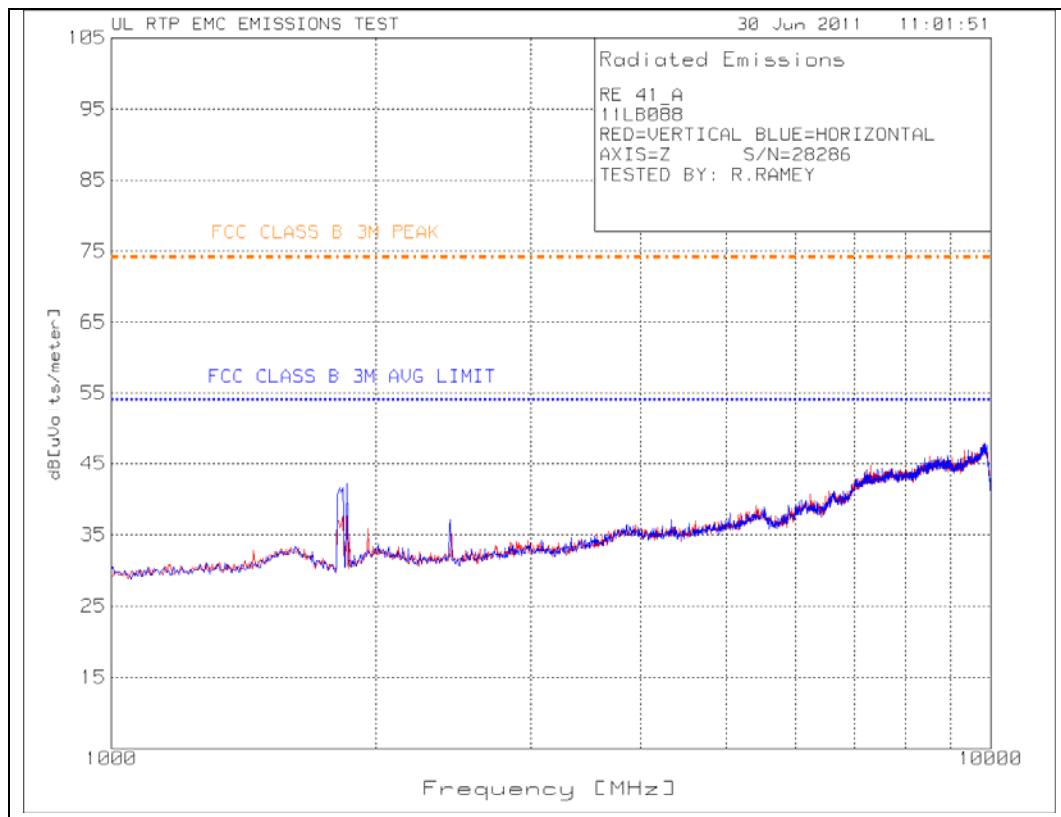


Table 11 Radiated Emissions Data Points (Tag #1, Z-Orientation)

Measured Frequency [MHz]	Meter Reading [dBuV]	Detector Type	Antenna Factor [dB]	Cable/Amp Factor [dB]	Field Strength [dBuV/m]	15.209 Limit [dBuV/m]	Margin [dB]	Turntable Angle [deg]	Antenna Height [cm]	Antenna Polarity [V/H]
1805.903	48.24	PK	25.9	-33.6	40.54	54	-13.46	rot	1-4m	Horz
1832.916	49.24	PK	26	-33.6	41.64	54	-12.36	rot	1-4m	Horz
1850.925	49.8	PK	26.2	-33.7	42.3	54	-11.7	rot	1-4m	Horz
2427.214	43.31	PK	27.5	-33.7	37.11	54	-16.89	rot	1-4m	Horz <ambient

LIMIT 1: FCC PART 15 CLASS B
 PK - Peak detector

No significant harmonic beyond 2nd harmonic was observed.

4.2 Test Conditions and Results – MAINS TERMINAL – CONDUCTED EMISSIONS

Test Description	Measurements were made on a ground plane. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.	
Basic Standard	FCC Part 15, Subpart B/ 15.207	
UL LPG	80-EM-S0026	
	Frequency range on each side of line	Measurement Point
Fully configured sample scanned over the following frequency range	150kHz to 30MHz	Mains
Limits – 15.107 / 15.207		
Frequency (MHz)	Limit (dB μ V)	
	Quasi-Peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.5 - 5	56	46
5 - 30	60	50
Supplementary information: None		

Note: This test is not applicable. Device is battery powered.

4.3 Test Conditions and Results – OCCUPIED BANDWIDTH / BAND EDGE

Test Description	<p>Measurements were performed as a radiated measurement, as no antenna port was accessible. A log-periodic antenna was used identical to the radiated field strength/radiated spurious measurements.</p> <p>FCC: The resolution bandwidth is set to 10 kHz. The video bandwidth is set to 100 kHz. Span is set sufficiently large to capture the emission and all skirts. The peak emission is marked. The left and right -20dBc points are marked. The difference between these points is recorded as the 20dB bandwidth.</p> <p>Canada: The span is set sufficiently large to capture the emission and all skirts. The resolution bandwidth is reset to 1% to 3% of the span. Video Bandwidth is set to 3 to 10 times Resolution Bandwidth. The spectrum analyzer 99% Occupied Bandwidth function is enabled.</p>	
Basic Standard	<p>FCC Part 15, Subpart C, 15.249 ANSI C63.4:2003</p>	
UL LPG	<p>80-EM-S0029</p>	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	902-928 MHz	Antenna Port Conducted or via Radiated Antenna

Limits – FCC Part 15.249(a)

Frequency (MHz)	Limit
902 – 928	Occupied BW must remain within band (902-928 MHz)

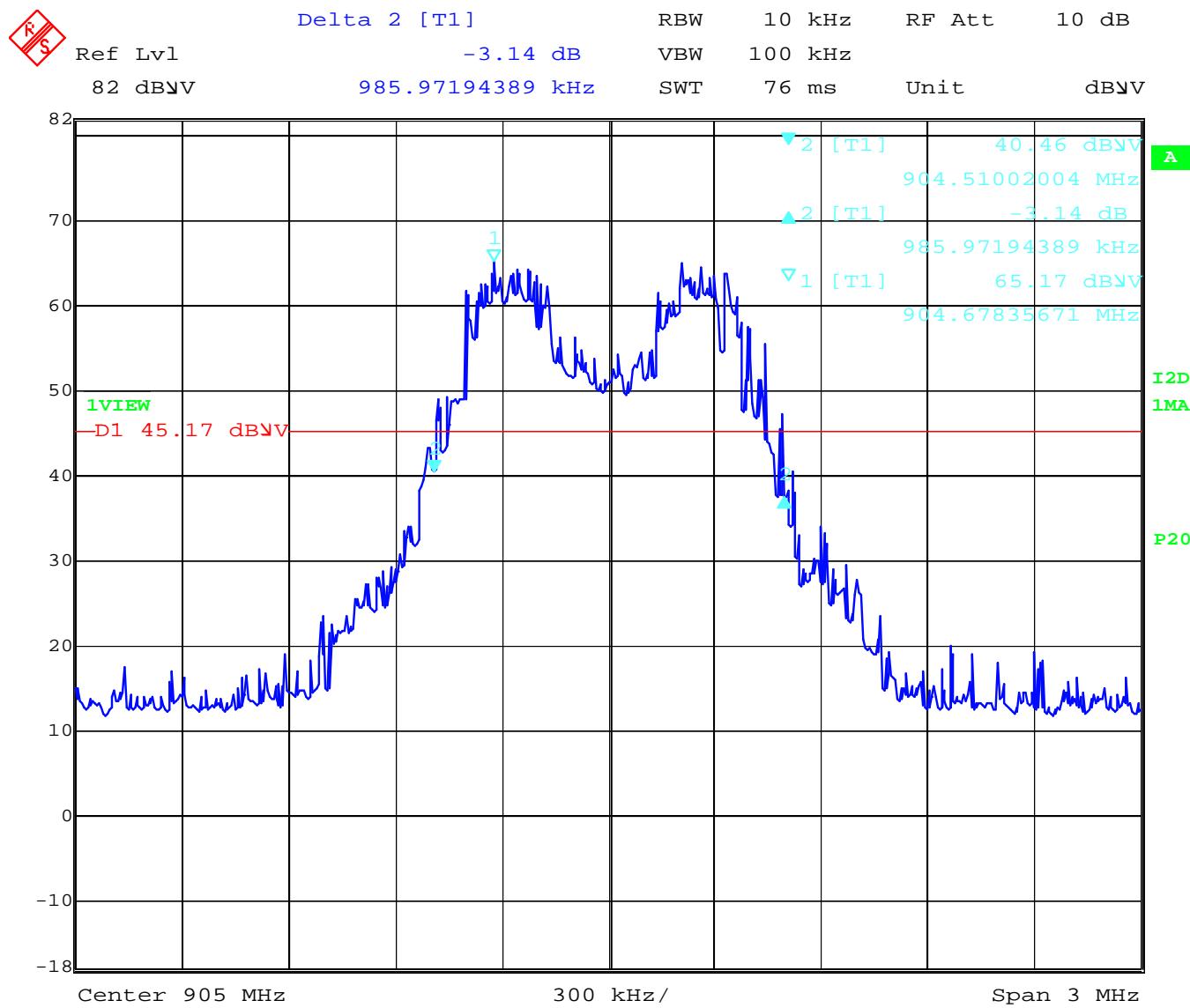
Table 12 Radiated Emissions EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1 (Low Channel, 905 MHz)	1
1	1 (Mid Channel 915 MHz)	1
1	1 (High Channel, 926.9 MHz)	1
Supplementary information: None		

Table 13 Radiated Emissions Test Equipment

See Radiated Spurious Emissions Equipment on Page on page 12.

Occupied Bandwidth (-20dBc) – Low Channel, 905 MHz

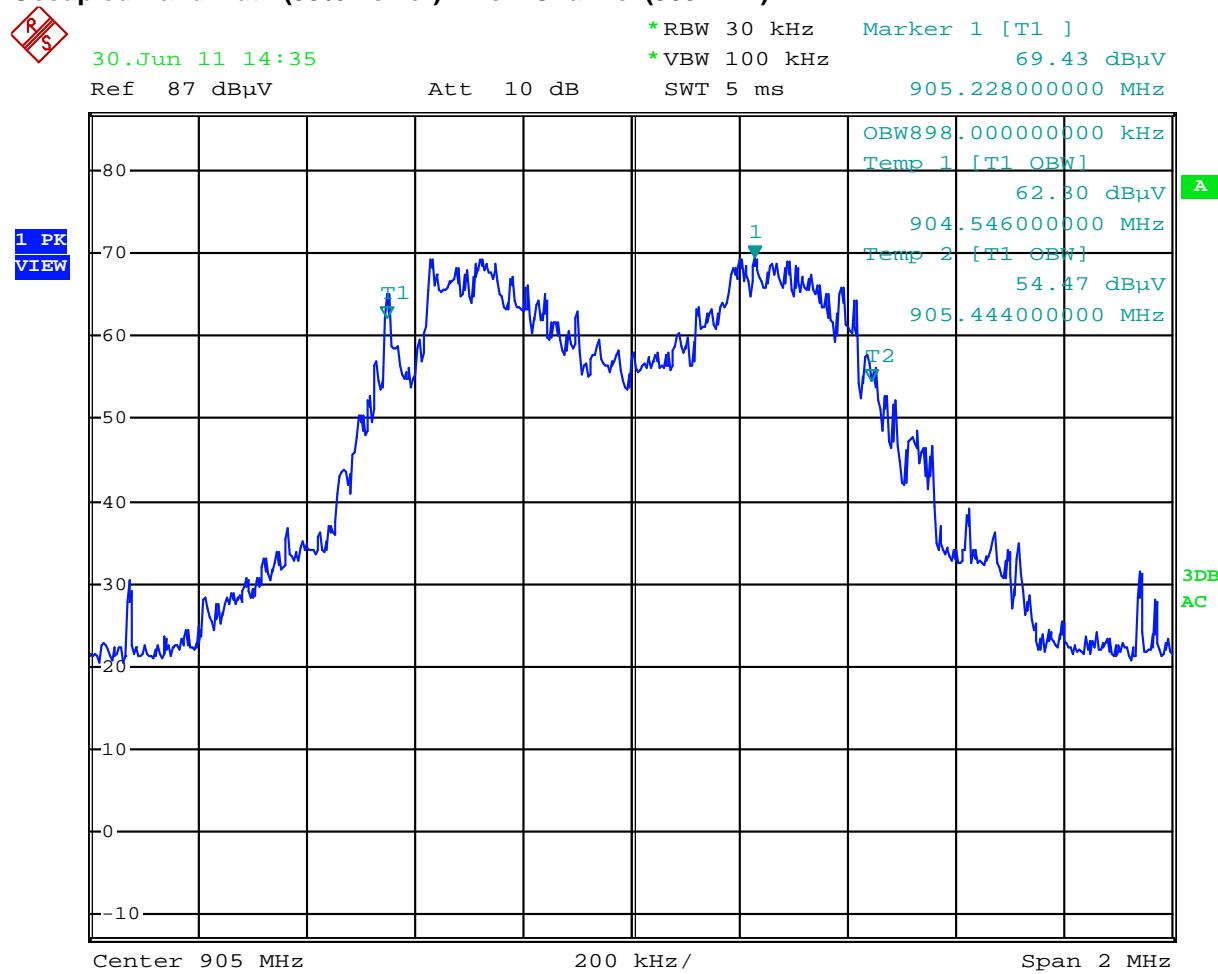


Date: 30.JUN.2011 13:09:29

20 dBc OBW = 985.97 kHz

Note: Lower -20dBc point is shown to be 904.51 MHz (greater than 902 MHz).

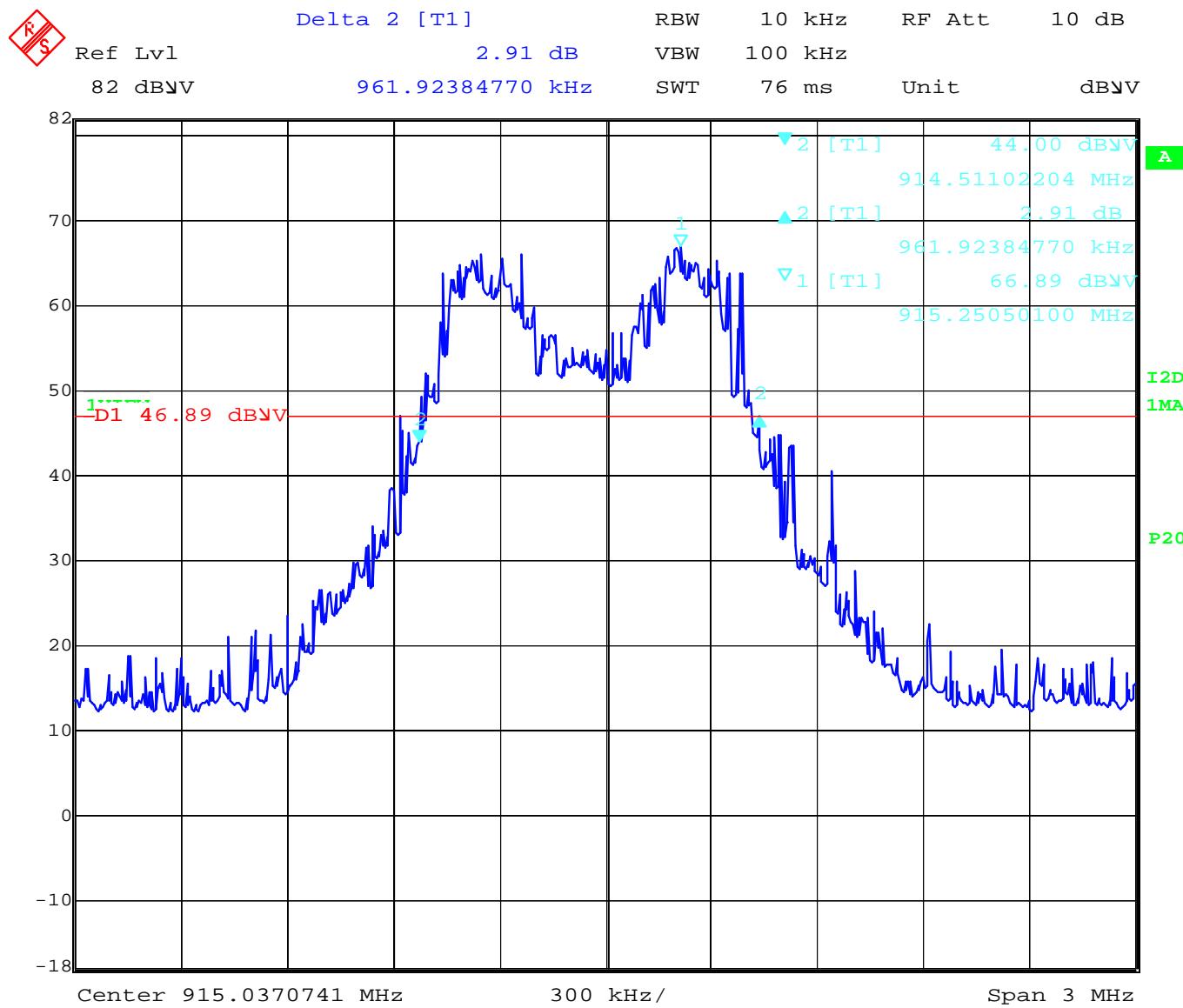
Occupied Bandwidth (99% Power) – Low Channel (905 MHz)



Date: 30.JUN.2011 14:35:56

99% OBW = 898 kHz

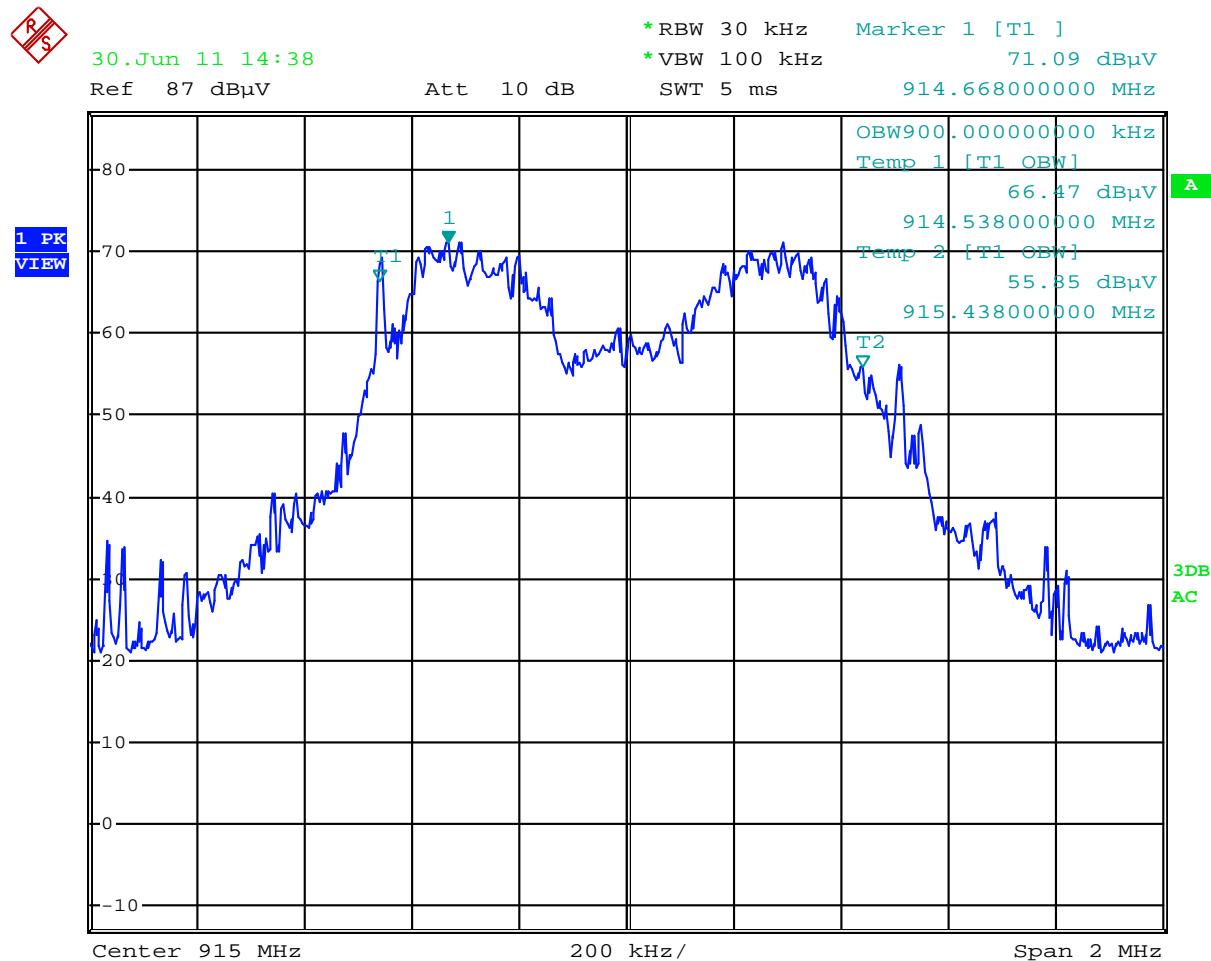
Occupied Bandwidth (-20dBc) – Mid Channel (915 MHz)



Date: 30.JUN.2011 13:05:16

20 dBc OBW = 961.92 kHz

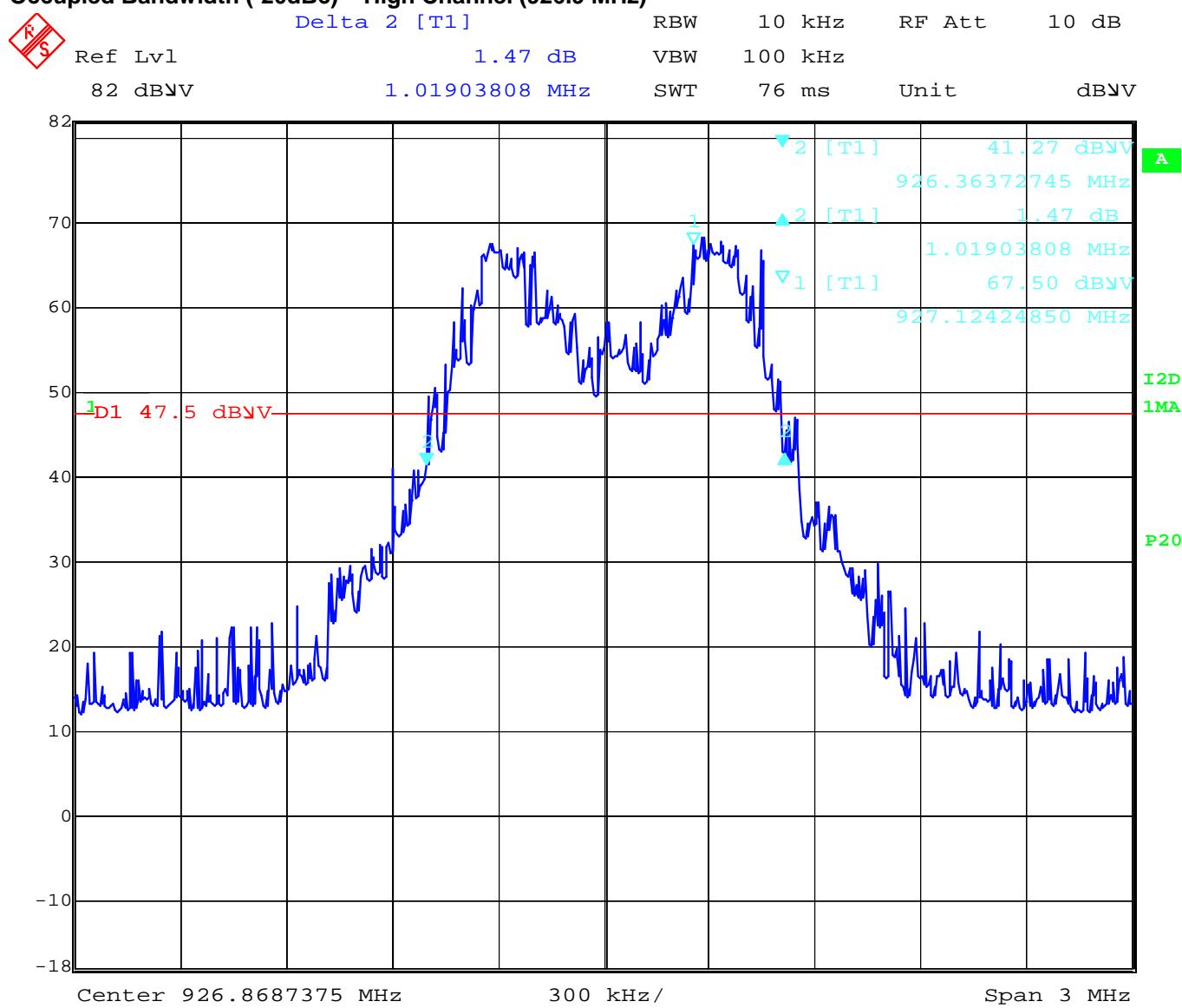
Occupied Bandwidth (99% Power) – Mid Channel (915 MHz)



Date: 30.JUN.2011 14:38:13

99% OBW = 900 kHz

Occupied Bandwidth (-20dBc) – High Channel (926.9 MHz)

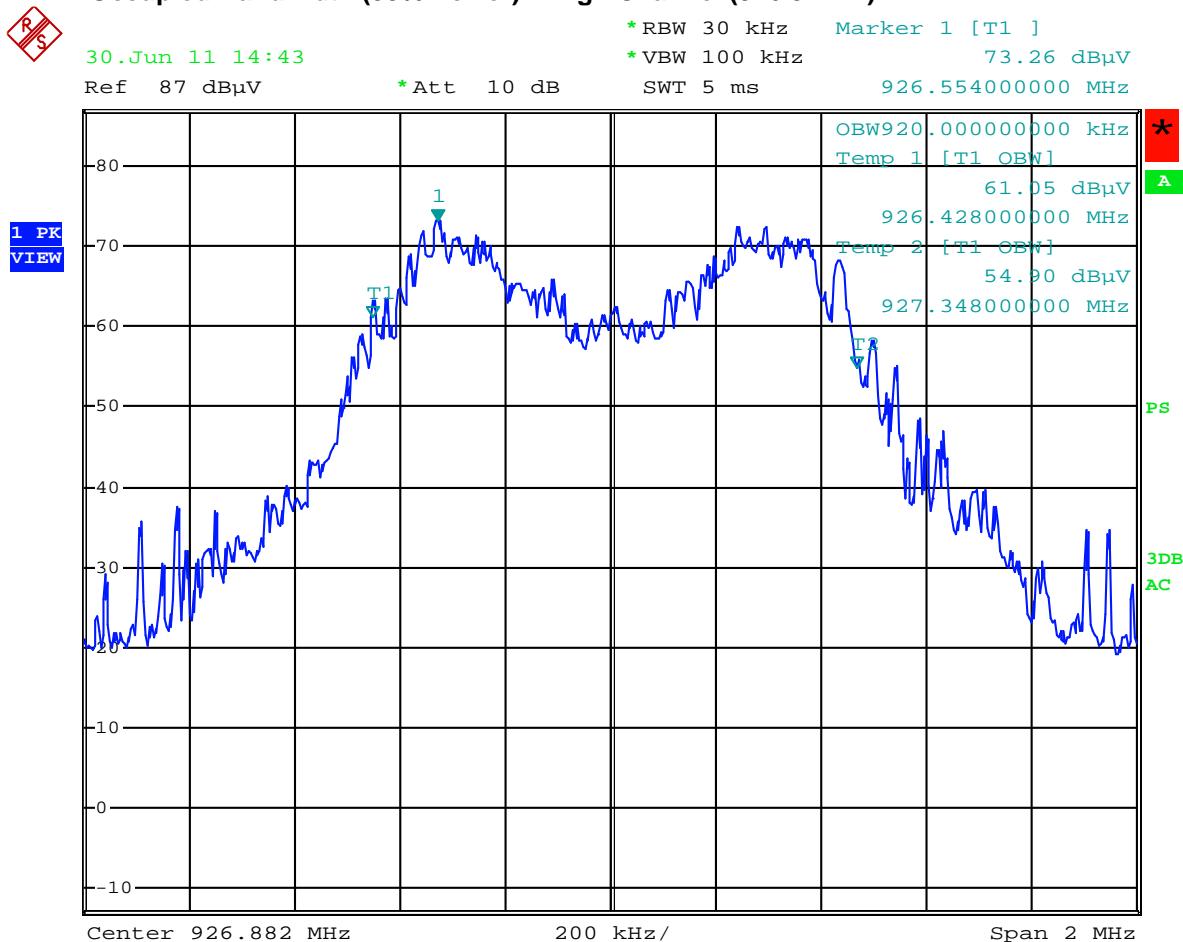


Date: 30.JUN.2011 13:07:34

20 dBc OBW = 1.019 MHz

Note: Upper -20dBc point is shown to be 927.383 MHz (lower than 928 MHz).

Occupied Bandwidth (99% Power) – High Channel (926.9 MHz)



Date: 30.JUN.2011 14:43:44

99% OBW = 920 kHz

4.4 Test Conditions and Results – DUTY CYCLE

Test Description	Duty Cycle Factor is provided by the manufacturer's timing diagram information.	
Basic Standard	FCC Part 15, Subpart C, 15.249; ANSI C63.4:2003	
UL LPG	80-EM-S0029	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	902-928 MHz	Antenna Port Conducted or via Radiated Antenna

Limits – FCC Part 15.249(a)

Frequency (MHz)	Limit
902 – 928	None. Used to determine duty cycle correction factor over one operating cycle, or 100mS, whichever is less.

Table 14 Radiated Emissions EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1
Supplementary information: None		

RESULTS – Duty Cycle measurement was not performed. Duty Cycle may be adjusted by the manufacturer or user depending upon installation performance requirements. As peak measurements are found to comply with average limit, worst-case duty cycle of 100% may be assumed.

4.5 Test Conditions and Results – MAXIMUM PERMISSIBLE EXPOSURE CALCULATION

Test Description	Maximum Permissible Exposure calculation is performed to ensure that this device meets RF exposure limits for its intended environment. This device is required to meet the General Population/Uncontrolled exposure limits.			
Basic Standard	47 CFR Part 1.1307 Industry Canada IC Safety Code 6			
FCC Limits for Occupational/Controlled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² . or S (minutes)
0.3 – 3.0	614	1.63	(100)*	6
3.0 - 30	1824/F	4.89/F	(900/F ²)*	6
30 - 300	61.4	0.163	1.0	6
300 – 1500	-	-	F/300	6
1500 – 100,000	-	-	5.0	6
FCC Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² . or S (minutes)
0.3 - 1.34	614	1.63	(100)*	30
1.34 - 30	824/F	2.19/F	(180/F ²)*	30
30 - 300	27.5	0.073	0.2	30
300 – 1500	-	-	F/1500	30
1500 – 100,000	-	-	1.0	30

Note: General Population / Uncontrolled Exposure Limit apply.

Background: Per the following guidance from OET Bulletin 65 Supplement C required minimum spacings are provided to the professional installer.

<u>Transmitter or Device Type</u> ¹⁸	<u>Output</u> ¹⁹	<u>Applicable Methods to Ensure Compliance</u> ²⁰
Transmitters using indoor antennas that operate at 20 cm or more from nearby persons	>2.5 W at 915 MHz	If the MPE distance is greater than that required for normal operation of the device, operating instructions, warning instructions and/or warning labels may be used to ensure compliance by indicating the minimal separation distance to comply with MPE limits. If the antennas are professionally installed to ensure compliance, warning instructions and warning labels are not necessary.
	=< 2.5 W at 915 MHz or =< 4 W at 2450 MHz	Transmitters operating at 2.5 W EIRP (1.5 W ERP) or less at 915 MHz, or at 4 W EIRP (2.4 W ERP) or less at 2450 MHz, generally are not expected to exceed MPE limits when nearby persons are 20 cm or more from most antennas. Therefore, special instructions and warnings are normally not necessary to ensure compliance.

Table 15 MPE - Calculation

MPE Calculation with highest field strength:

The highest electric field strength observed was 76.74 dB μ V/m at 3m distance. Adjusting this measurement to 20cm distance using 20dB/decade yields:

$$76.74 \text{ dB}\mu\text{V/m} + 20(\log(300/20)) = 76.74 \text{ dB}\mu\text{V} + 23.52 \text{ dB} = 100.26 \text{ dB}\mu\text{V/m at 20 cm, or } 0.10306 \text{ V/m}$$

Calculating Power Density from Electric Field Strength

$$\begin{aligned} S &= (\text{Electric Field Strength})^2 / \text{Impedance of Free Space} = (0.10306 \text{ V/m})^2 / 377 \text{ ohms} \\ &= 0.000028174 \text{ W/m}^2 \end{aligned}$$

Limit at Center of operating band is used to calculate limit. Duty cycle of 100% is assumed. 20cm spacing is assumed.

Uncontrolled/General Exposure - 20 cm spacing

Operating Frequency	915 MHz
Separation Distance	0.2 m

Peak Power Density	0.000028174 W/m ²	- or -	0.00000028174 mW/cm ²
Exposure % (over 6 min timespan)	100%		
Transmit Duty Cycle (Peak-to-Average Ratio)	100%		
Average Power Density	0.000028174 W/m ²	- or -	0.00000028174 mW/cm ²

Limit for **Uncontrolled/General**

Exposure at Operating

Frequency

6.1 W/m²

- or -

0.61 mW/cm²

The product was found to comply with this requirement.

Report Number: R11CA36290-FCC
Model Number: RF Tag Model T25-122
Client Name: RadarFind Corporation

File Number: MC15465

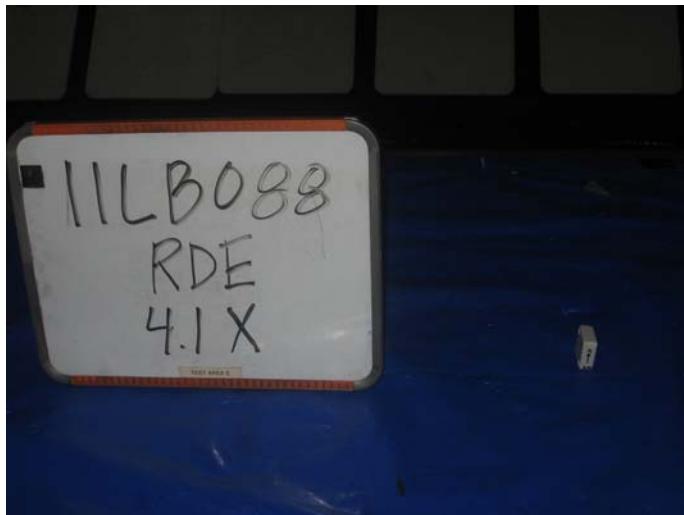
Page 35 of 37

FCC ID: URGT25122

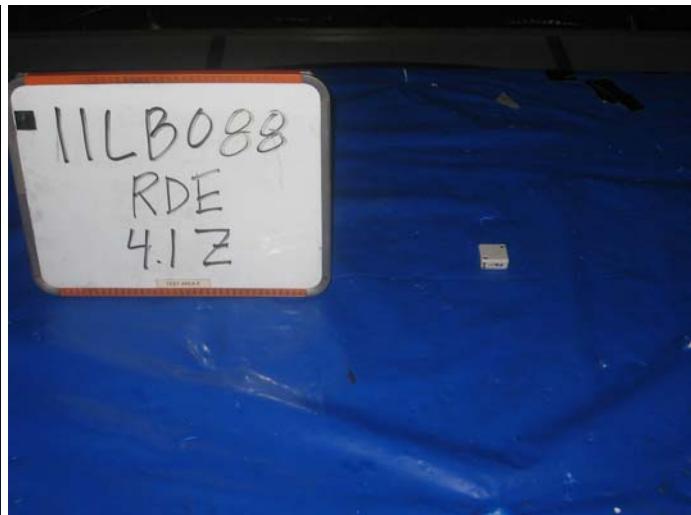
Appendix A

Test Setup Photos

X-Orientation



Z-Orientation



Y-Orientation



Note: Radiated Emissions photos only. AC Conducted or Antenna Port Conducted measurements are not applicable.

Appendix B

Accreditations and Authorizations



NVLAP Lab code: 200246-0

NVLAP: The National Institute of Standards and Technology (NIST) administers the National Voluntary Laboratory Accreditation Program (NVLAP). NVLAP is comprised of laboratory accreditation programs (LAPs) which are established on the basis of requests and demonstrated need. Each LAP includes specific calibration and/or test standards and related methods and protocols assembled to satisfy the unique needs for accreditation in a field of testing or calibration. NVLAP accredits public and private laboratories based on evaluation of their technical qualifications and competence to carry out specific calibrations or tests. Accreditation criteria are established in accordance with the U.S. Code of Federal Regulations (CFR, Title 15, Part 285), NVLAP Procedures and General Requirements, and encompass the requirements of ISO/IEC 17025. For a full scope listing see

<http://ts.nist.gov/Standards/scopes/2002460.htm>



FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland (Ref. No. 91039).



Industry Canada Industrie Canada

Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP 100, Issue 7, Section 3.3. File #: IC 2180C



VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. Registration Nos.:

- Test Station 5 (Location A) R-722, G-246
- Test Station 4 (Location E) C-743, T-1485
- Test Station 1 (Location D) C-742, T-1484



ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).



NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 2004/108/EC, Annex III. Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.

NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).

NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22).