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Lab Number:	10LB048
Project Number:	10RT02887
File Number:	MC15465
Date:	July 22, 2010
Models:	Tag Model T33-110 (FCC ID: URG T33110)

Electromagnetic Compatibility Test Report

For

RadarFind Corp.

Raleigh, NC

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Project Number: 10RT02887 File Number: MC15465
Model Number: Tag Model T33-110
Client Name: RadarFind Corp.

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FCC ID: URG T33110

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
Morrisville, NC 27560**

Applicant Contact: **Mr. Steve Snell**
Title: **Director, Hardware Engineering**
Phone: **(919) 228-2170**
E-mail: **ssnell@radarfind.com**

Test Report Date: **July 15, 2010**

Product Type: **Low-Powered Transmitter**

Product standards: **FCC Part 15, Subpart C, 15.249**

Model Number: **Tag Model T33-110**

Sample Serial Number: **Unserialized production samples**

EUT Category: **Frequency Hopping Spread Spectrum Transmitter**

Testing Start Date: **July 6, 2010**

Date Testing Complete: **July 12, 2010**

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
8-19-2010	Model Number Corrected	J. Marley	M. Nolting

1.0 G E N E R A L - Product Description

1.1 Equipment Description

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

1.2 Equipment Marking Plate

Documented in Original FCC Submission.

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1.3 Device Configuration During Test

1.3.1 Equipment Used During Test:

Use	Product Type	Manufacturer	Model	Comments
EUT	Tag #4	RadarFind Corp.	T33-110	Battery Powered
Note: EUT - Equipment Under Test, AE - Auxiliary/Associated Equipment, or SIM - Simulator (Not Subjected to Test)				

1.3.2 Input/Output Ports:

Port #	Name	Type*	Cable Max. >3m (Y/N)	Cable Shielded (Y/N)	Comments
0	Enclosure	N/E	—	—	None
1	Antenna	N/E	—	—	
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					

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1.3.3 EUT Internal Operating Frequencies:

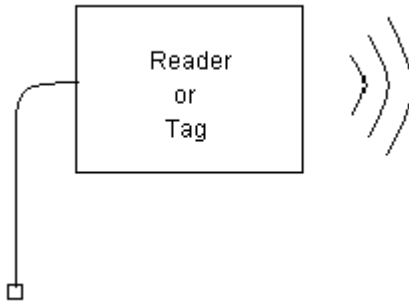
Frequency (MHz)	Description
902-928	Operating Frequency Band.

1.3.4 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

1.4 Block Diagram:

The diagram below illustrates the configuration of the equipment above.



1.5 Description of X and Y Axis Product Orientations



X-Orientation (upright) Y-Orientation (on side)

EUT is measured with Horizontal and Vertical antenna position in each orientation to cover the typical installations and directions of maximum antenna gain. From the original testing the upright orientation was worst case for the reader.

1.6 EUT Configurations

Mode #	Description
1	Equipment Under Test (Tag #4, Model T33-110).

1.7 EUT Operation Modes

Mode #	Description			
1	Readers are set to continuously operate at maximum power level moving between the following six operating frequencies/modes for the purposes of test.			
TX Antenna	Frequency	Baud Rate	Deviation	Length
Vertical	909 MHz	200,000 bit/s	± 297 kHz	400 ms TX
Horizontal	909 MHz	200,000 bit/s	± 297 kHz	400 ms TX
Vertical	905 MHz	200,000 bit/s	± 297 kHz	0.3 ms TX, 3 ms idle (10% duty cycle)
Horizontal	905 MHz	200,000 bit/s	± 297 kHz	0.3 ms TX, 3 ms idle (10% duty cycle)
Vertical	918 MHz	200,000 bit/s	± 297 kHz	400 ms TX
Horizontal	918 MHz	200,000 bit/s	± 297 kHz	400 ms TX

Mode #	Description
2	Tags are set to continuously operate at maximum power level moving between the following six operating frequencies/modes for the purposes of test. • 905 MHz • 909 MHz • 912 MHz • 915 MHz • 918 MHz • 927 MHz.

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	2009

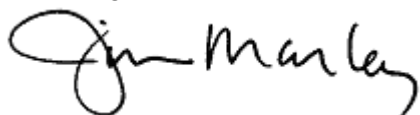
2.4 Results Summary

Requirement – Test	Result (Compliant / Non-Compliant)*
Radiated Power / Radiated Spurious Emissions	Compliant

2.5 Test Scope

These tests are performed in support of a Class III Permissive Change. Other test items from previous certification are considered to remain valid.

Test Engineer:



Jim Marley (919-549-1408)
Staff EMC Engineer
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Reviewer:



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Conformity Assessment Services
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Any information and documentation involving UL Mark services are provided on behalf of Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

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 ± 150
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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 (dBuV/m) = Meter Reading (dBuV) + Antenna Factor (dB/m) - Amp Gain (dB) + Cable Loss (dB)

Conducted Emissions

Conducted Voltage (dBuV) = Meter Reading (dBuV) + Cable/Attenuator Loss (dB) + LISN Voltage Correction Factor (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. 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 various 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) (EIRP Limit, not Point-to-Point operation)

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

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

Frequency (MHz)	Limit (dBµV/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 (dBµV/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 - EUT 10 th harmonic	NA	54.0 (peak limit 74.0)
Supplementary information: None		

Table 1 Radiated Emissions EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	(F) 3 (Tag #T33-110)	2
Supplementary information: None		

Table 2 Radiated Emissions Test Equipment

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	30-1000 MHz Range				
AT0021	Biconical Antenna, 30 to 200 MHz	Schaffner, EMC	VBA6106A	12/23/09	12/31/10
AT0022	Log-periodic Antenna, 200 MHz to 1000 MHz	Chase	UPA6109	12/22/09	12/31/10
	1-10 GHz				
AT0032	Horn Antenna 1 to 10 GHz	EMC Test Syst.	3115	9/25/09	9/30/10
	Gain-Loss Chains				
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)	06/03/10	08/31/10
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)	02/17/10	08/31/10
SAC_E_HORN (Horn 3m location)	(1) ATA144: Amplifier (2) ATA207: Cable (3) ATA096: Cable (4) ATA199: Cable	(1) Miteq (2) Micro-Coax (3) Micro-Coax (4) Micro-Coax	(1) AFS42-00101800-25-N-42MF (2) UFB293C-1-3360-50U50U (3) UTiFLEX (4) UFB293C-0-0720-5GU50U)	08/24/09	08/31/10
	Receiver & Software				
SA0123	Spectrum Analyzer / Receiver	HP	8566B	05/27/10	05/31/11
AMP005	Pre-amplifier	HP	8449B Opt H02 (calibrated with ATA091 6dB atten)	05/27/10	05/31/11
SAR003	Spectrum Analyzer / Receiver	Rohde & Schwarz	1088.7490K40	1/18/10	1/31/11

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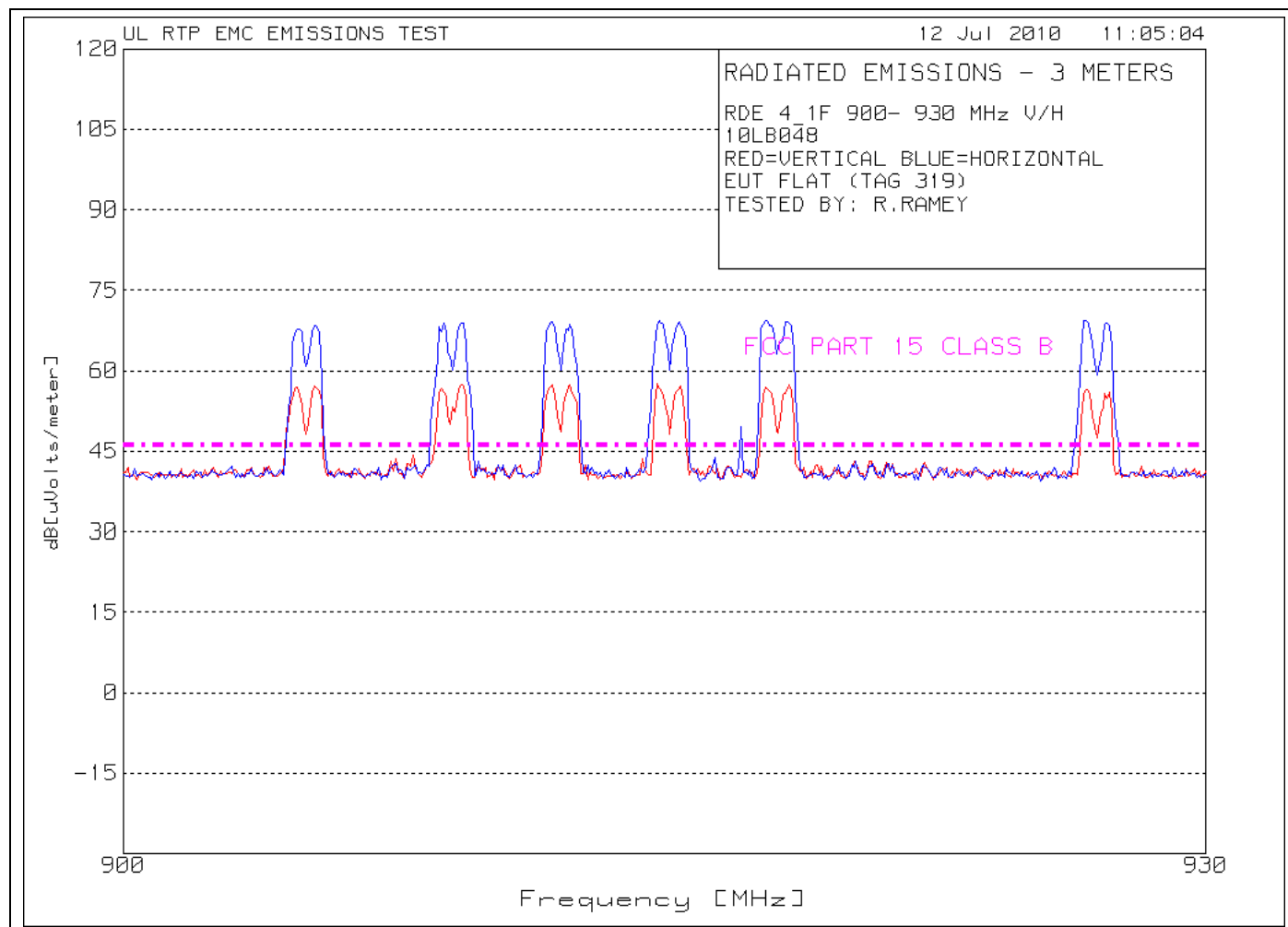
Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
	Additional Equipment used				
HI0034	Environmental meter (T/H/P)	Control Company	99760-00	10/19/09	10/31/10
MG1180	Tape Measure	Lufkin	HI-VIZ	8/8/08	8/31/11

4.1.1 Radiated Spurious Emissions – Tag #4 (Model T33-110)

Figure 1 Test setup photo for Radiated Emissions (Tag #4, X-Y Orientation)



Figure 2 Radiated Emissions Graph 902-930 MHz (Tag #4, X-Orientation)



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Table 3 Radiated Emissions Data Points (Tag #4, X-Orientation)

RDE 4 1F 900- 930 MHz V/H
 10LB048
 RED=VERTICAL BLUE=HORIZONTAL
 EUT FLAT (TAG T33-110)
 TESTED BY: R.RAMEY

Test Freq. [MHz]	Meter Reading [dBuV]	Det. Type	Cbl/Amp Factor [dB]	Ant. Factor [dB]	Field Strength [dBuV/m]	15.249 Limit [dBuV/m]	Margin [dB]	Azim [deg]	Height [cm]	Pol. [V/H]

Vertical 900 - 930MHz										
904.737	19.48	qp	12	23.1	54.58	94	-39.42	327	106	Vert
904.737	24.99	pk	12	23.1	60.09	94	-33.91	327	106	Vert
908.6819	25.57	pk	12	23	60.57	94	-33.43	327	106	Vert
908.6819	19.48	qp	12	23	54.48	94	-39.52	327	106	Vert
911.737	19.72	qp	12	23	54.72	94	-39.28	327	106	Vert
911.737	25.92	pk	12	23	60.92	94	-33.08	327	106	Vert
915.1924	25.97	pk	12	22.9	60.87	94	-33.13	327	106	Vert
915.1924	18.19	qp	12	22.9	53.09	94	-40.91	327	106	Vert
918.2831	19.44	qp	12	22.8	54.24	94	-39.76	327	106	Vert
918.2831	25.85	pk	12	22.8	60.65	94	-33.35	327	106	Vert
927.1678	24.82	pk	12.1	23	59.92	94	-34.08	327	106	Vert
927.1678	18.57	qp	12.1	23	53.67	94	-40.33	327	106	Vert
Horizontal 900 - 930MHz										
905.2881	29.84	qp	12	23.1	64.94	94	-29.06	31	100	Horz
905.2881	34.51	pk	12	23.1	69.61	94	-24.39	31	100	Horz
909.3231	35.12	pk	12	23	70.12	94	-23.88	31	100	Horz
909.3231	29.64	qp	12	23	64.64	94	-29.36	31	100	Horz
911.742	30.63	qp	12	23	65.63	94	-28.37	31	100	Horz
911.742	35.27	pk	12	23	70.27	94	-23.73	31	100	Horz
914.7219	35.4	pk	12	22.9	70.3	94	-23.7	31	100	Horz
914.7219	30.97	qp	12	22.9	65.87	94	-28.13	31	100	Horz
917.6718	30.72	qp	12	22.8	65.52	94	-28.48	31	100	Horz
917.6718	35.58	pk	12	22.8	70.38	94	-23.62	31	100	Horz
926.5716	35.61	pk	12.1	23	70.71	94	-23.29	31	100	Horz
926.5716	31.05	qp	12.1	23	66.15	94	-27.85	31	100	Horz

pk - Peak detector
 qp - Quasi-Peak detector

Figure 3 Radiated Emissions Graph 30-1000 MHz (Tag #4, X-Orientation)

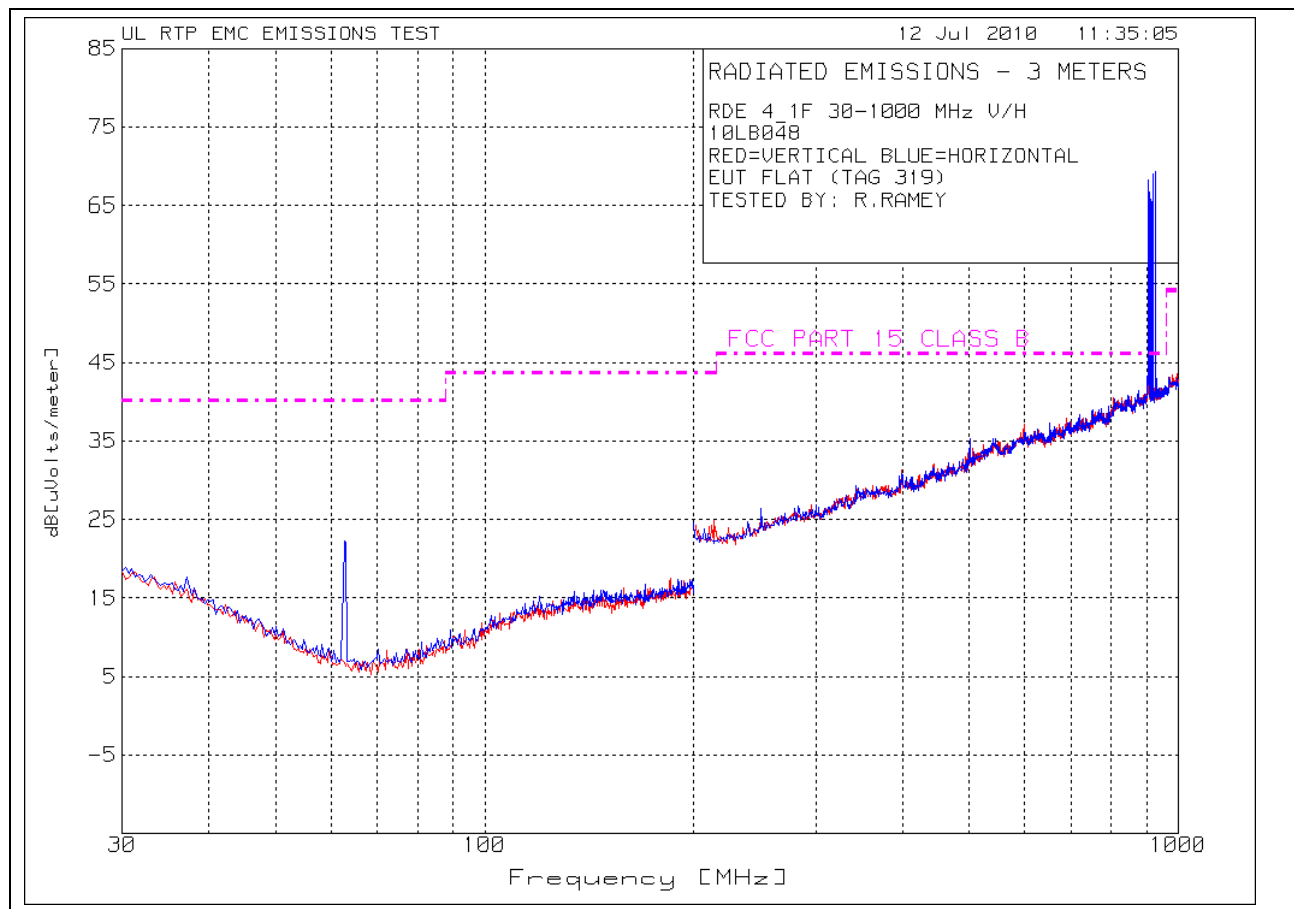


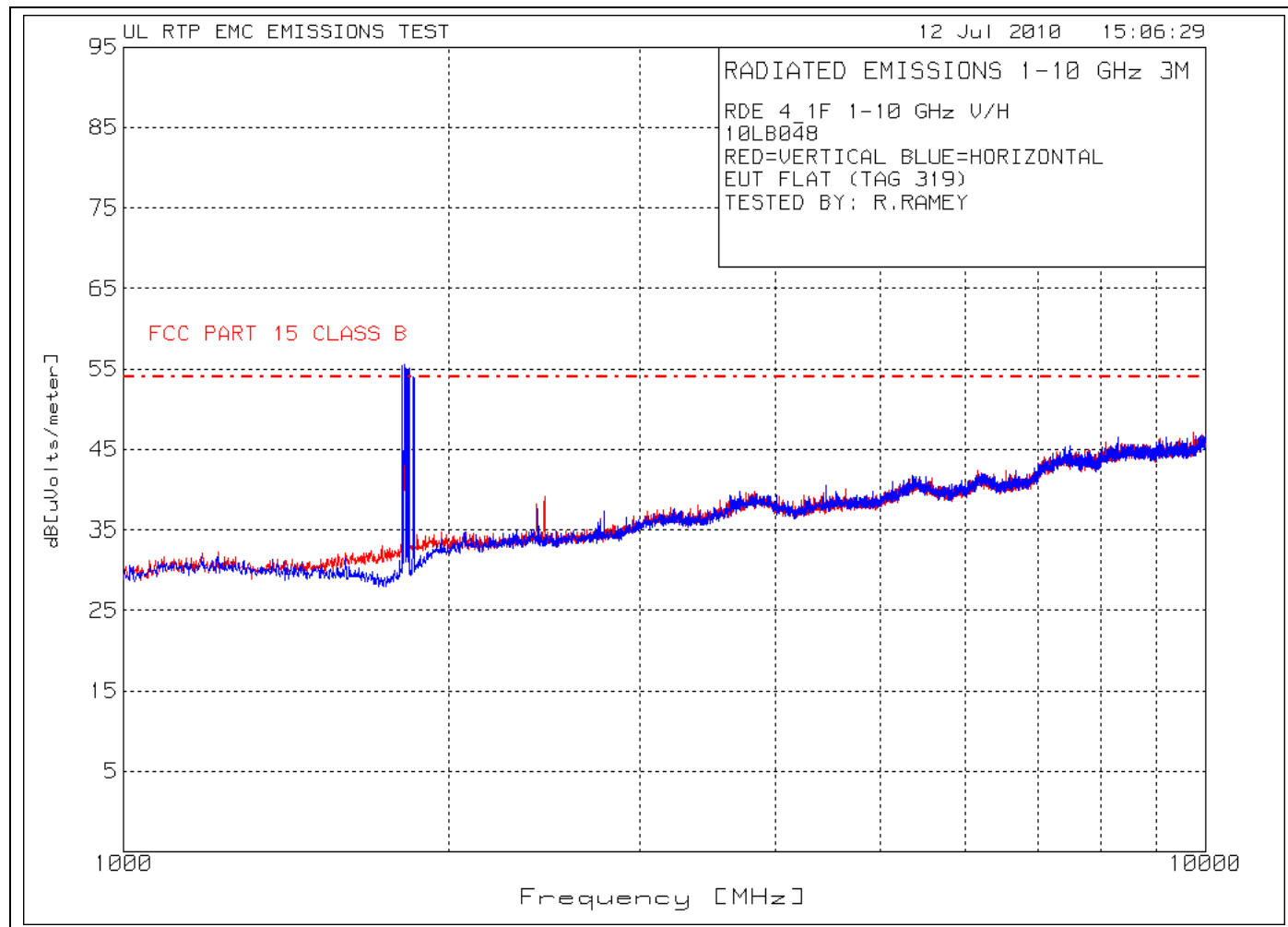
Table 4 Radiated Emissions Data Points (Tag #4, X-Orientation)

RDE 4_1F 30-1000 MHz V/H
10LB048
RED=VERTICAL BLUE=HORIZONTAL
EUT FLAT (TAG T33-110)
TESTED BY: R.RAMEY

Marker Number	Test Freq. [MHz]	Meter Reading [dBuV]	Det. Type	Cbl/Amp Factor [dB]	Ant. Factor [dB]	Field Strength [dBuV/m]	FCC-B Limit [dBuV/m]	Margin [dB]	Height [cm]	Pol. [V/H]
Horizontal 30 - 200MHz										
1	37.1543	28.82	pk	-26.6	15.4	17.62	40	-22.38	100	Horz
2	62.7054	42.63	pk	-26.7	6.4	22.33	40	-17.67	399	Horz
3	70.2004	28.85	pk	-26.6	6.2	8.45	40	-31.55	100	Horz
4	134.5892	27.83	pk	-26.3	14.3	15.83	43.5	-27.67	100	Horz
Horizontal 200 - 1000MHz										
5	250.4505	5.86	pk	8.8	11.7	26.36	46	-19.64	100	Horz
6	399.3994	5.34	pk	10	15.5	30.84	46	-15.16	399	Horz

pk - Peak detector

Figure 4 Radiated Emissions Graph 1-10 GHz (Tag #4, X-Orientation)



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Table 5 Radiated Emissions Data Points (Tag #4, X-Orientation)

RDE 4_1F 1-10 GHz V/H
 10LB048
 RED=VERTICAL BLUE=HORIZONTAL
 EUT FLAT (TAG T33-110)
 TESTED BY: R.RAMEY

Marker Number	Test Freq. [MHz]	Meter Reading [dBuV]	Det. Type	Cbl/Amp Factor [dB]	Ant. Factor [dB]	Field Strength [dBuV/m]	15.209 Limit [dBuV/m]	Margin [dB]	Height [cm]	Pol. [V/H]
Vertical 1000 - 3000MHz										
7	1808.809	55.58	pk	-34.7	26.9	47.78	54	-6.22	150	Vert
8	1818.819	55.79	pk	-34.7	26.9	47.99	54	-6.01	150	Vert
9	1822.823	55.45	pk	-34.7	27	47.75	54	-6.25	150	Vert
10	1828.829	55.81	pk	-34.7	27	48.11	54	-5.89	150	Vert
11	1834.835	55.48	pk	-34.7	27	47.78	54	-6.22	150	Vert
12	1854.855	55.17	pk	-34.6	27.1	47.67	54	-6.33	150	Vert

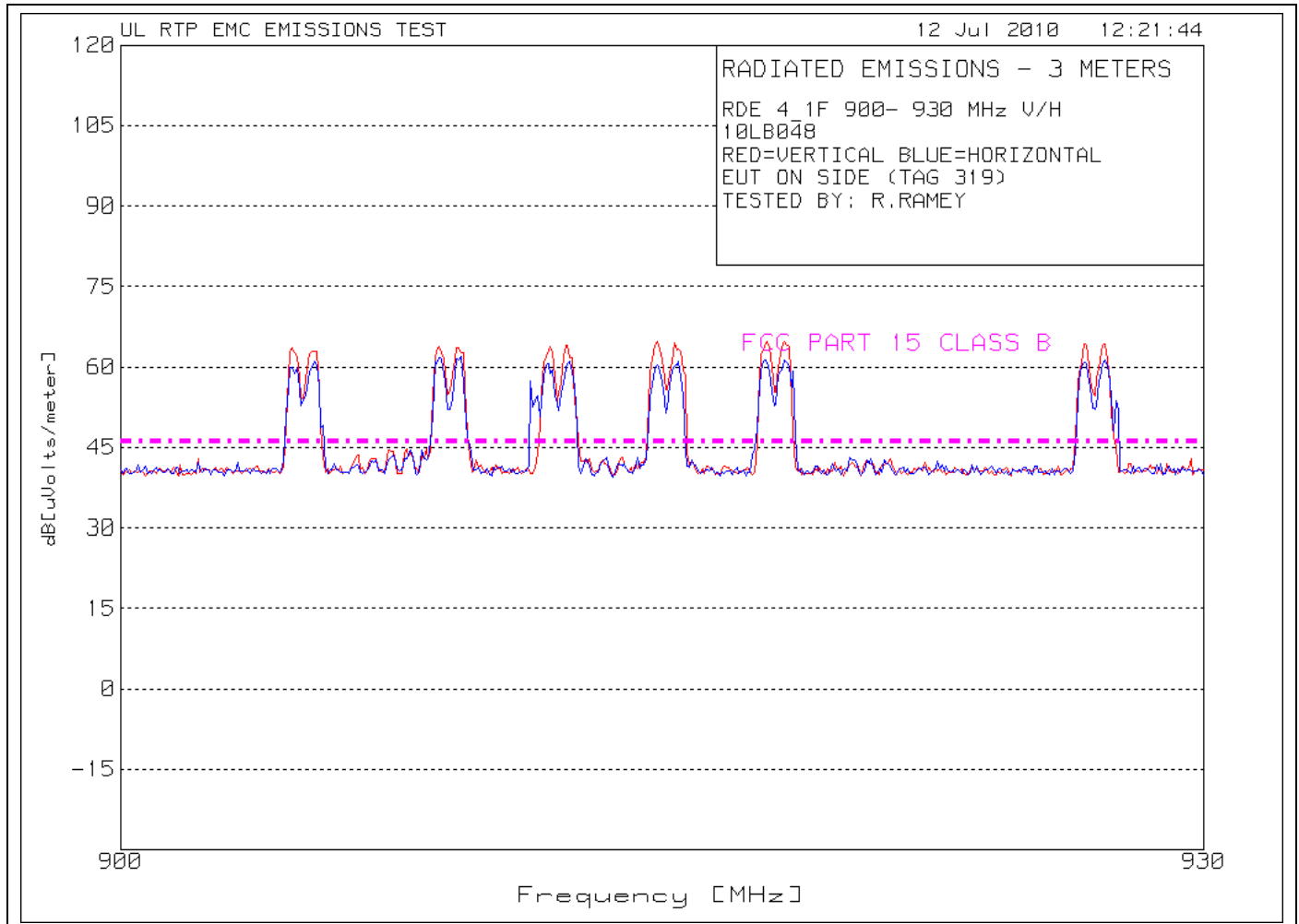
Horizontal 1000 - 3000MHz										
1	1808.809	63.16	pk	-34.7	26.9	55.36	54	1.36	149	Horz
2	1818.819	63.01	pk	-34.7	26.9	55.21	54	1.21	149	Horz
3	1822.823	62.75	pk	-34.7	27	55.05	54	1.05	149	Horz
4	1830.831	62.57	pk	-34.7	27	54.87	54	.87	149	Horz
5	1836.837	62.75	pk	-34.7	27	55.05	54	1.05	149	Horz
6	1854.855	61.41	pk	-34.6	27.1	53.91	54	-.09	149	Horz

Test Freq. [MHz]	Meter Reading [dBuV]	Det. Type	Cbl/Amp Factor [dB]	Ant. Factor [dB]	Field Strength [dBuV/m]	15.209 Limit [dBuV/m]	Margin [dB]	Azim [deg]	Height [cm]	Pol. [V/H]
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Horizontal 1000 - 3000MHz										
1809.832	35.37	av	-34.7	26.9	27.57	54	-26.43	192	113	Horz
1817.6922	34.59	av	-34.7	26.9	26.79	54	-27.21	195	149	Horz
1824.4162	35.11	av	-34.7	27	27.41	54	-26.59	200	113	Horz
1830.5625	34.67	av	-34.7	27	26.97	54	-27.03	203	113	Horz
1835.6121	34.64	av	-34.7	27	26.94	54	-27.06	222	110	Horz
1853.3991	34.56	av	-34.7	27.1	26.96	54	-27.04	210	112	Horz

pk - Peak detector
 av - Average detector

Figure 5 Radiated Emissions Graph 902-930 MHz (Tag #4, Y-Orientation)



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Table 6 Radiated Emissions Data Points (Tag #4, Y-Orientation)

RDE 4 1F 900- 930 MHz V/H
 10LB048
 RED=VERTICAL BLUE=HORIZONTAL
 EUT ON SIDE (TAG T33-110)
 TESTED BY: R.RAMEY

Test Freq. [MHz]	Meter Reading [dBuV]	Det. Type	Cbl/Amp Factor [dB]	Ant. Factor [dB]	Field Strength [dBuV/m]	15.249 Limit [dBuV/m]	Margin [dB]	Azim [deg]	Height [cm]	Pol. [V/H]

Vertical 900 - 930MHz										
904.742	26.43	qp	12	23.1	61.53	94	-32.47	254	129	Vert
904.742	31.31	pk	12	23.1	66.41	94	-27.59	254	129	Vert
909.3181	31.74	pk	12	23	66.74	94	-27.26	254	129	Vert
909.3181	26.22	qp	12	23	61.22	94	-32.78	254	129	Vert
911.6518	25.43	qp	12	23	60.43	94	-33.57	254	129	Vert
911.6518	25.34	qp	12	23	60.34	94	-33.66	254	129	Vert
915.2275	26.99	qp	12	22.9	61.89	94	-32.11	254	129	Vert
915.2275	31.82	pk	12	22.9	66.72	94	-27.28	254	129	Vert
918.268	32.22	pk	12	22.8	67.02	94	-26.98	254	129	Vert
918.268	27.5	qp	12	22.8	62.3	94	-31.7	254	129	Vert
926.6318	27.72	qp	12.1	23	62.82	94	-31.18	254	129	Vert
926.6318	32.77	pk	12.1	23	67.87	94	-26.13	254	129	Vert
Horizontal 900 - 930MHz										
905.2981	25.89	pk	12	23.1	60.99	94	-33.01	208	206	Horz
905.2981	19.63	qp	12	23.1	54.73	94	-39.27	208	206	Horz
909.228	20.53	qp	12	23	55.53	94	-38.47	208	206	Horz
909.228	26.25	pk	12	23	61.25	94	-32.75	208	206	Horz
911.6919	26.56	pk	12	23	61.56	94	-32.44	208	206	Horz
911.6919	20.84	qp	12	23	55.84	94	-38.16	208	206	Horz
915.2776	21.31	qp	12	22.9	56.21	94	-67.79	208	206	Horz
915.2776	26.99	pk	12	22.9	61.89	94	-32.11	208	206	Horz
918.263	27.65	pk	12	22.8	62.45	94	-31.55	208	206	Horz
918.263	27.51	pk	12	22.8	62.31	94	-31.69	208	206	Horz
927.1528	27.68	pk	12.1	23	62.78	94	-31.22	208	206	Horz
927.1528	22.2	qp	12.1	23	57.3	94	-36.70	208	206	Horz

pk - Peak detector
 qp - Quasi-Peak detector

Figure 6 Radiated Emissions Graph 30-1000 MHz (Tag #4, Y-Orientation)

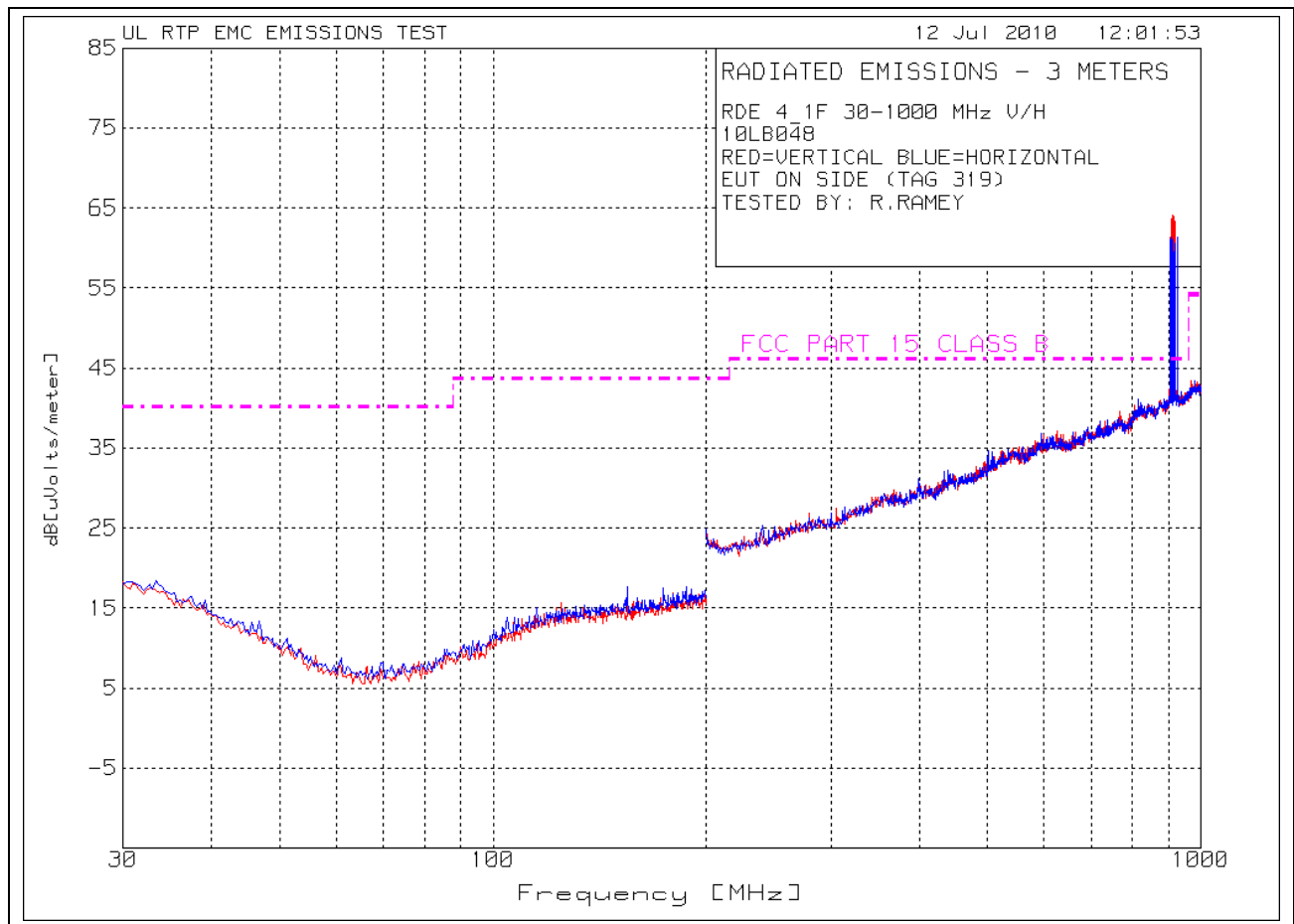


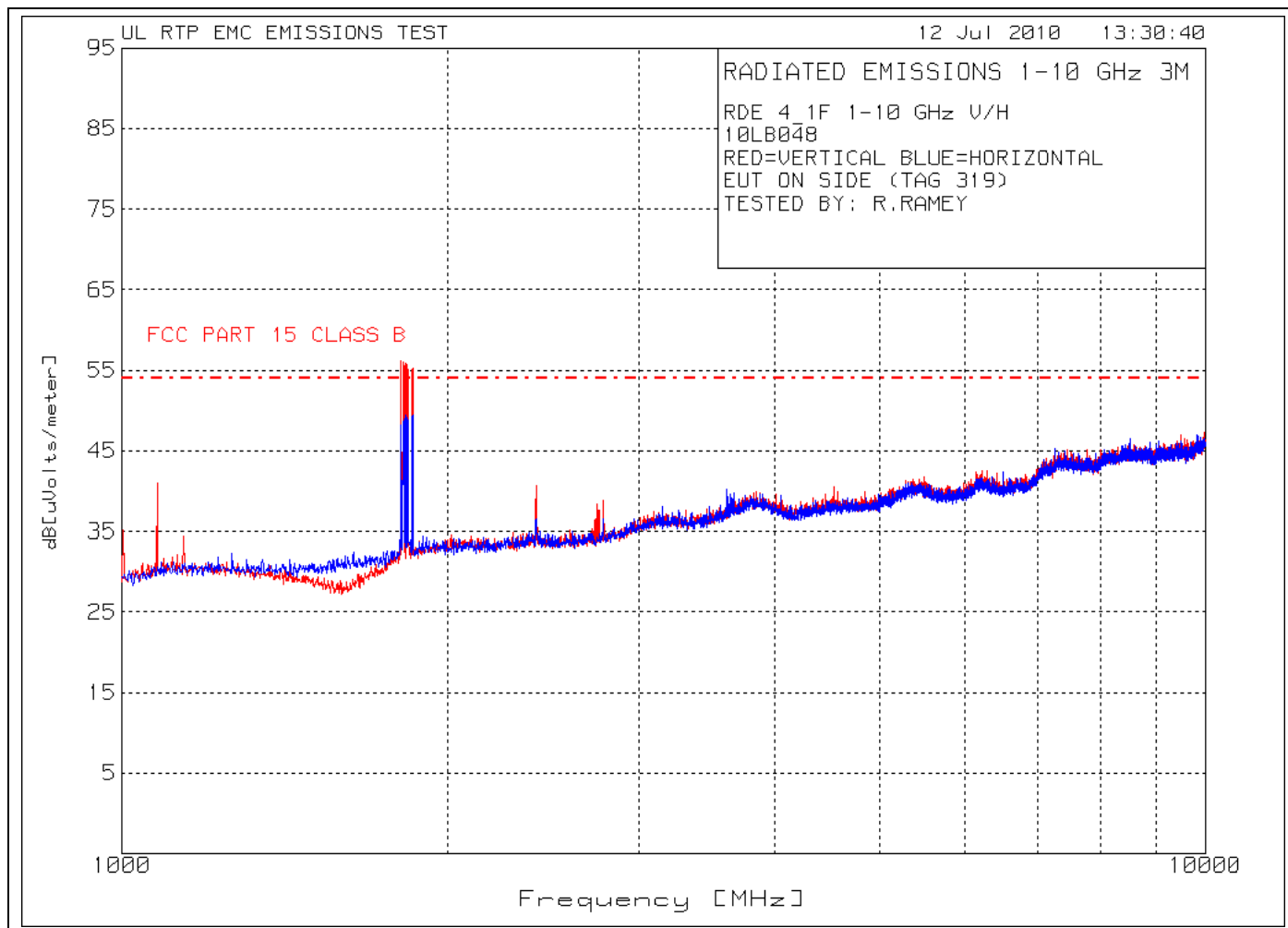
Table 7 Radiated Emissions Data Points (Tag #4, Y-Orientation)

RDE 4 1F 30-1000 MHz V/H
10LB048
RED=VERTICAL BLUE=HORIZONTAL
EUT ON SIDE (TAG T33-110)
TESTED BY: R.RAMEY

Marker Number	Test Freq. [MHz]	Meter Reading [dBuV]	Det. Type	Cbl/Amp Factor [dB]	Ant. Factor [dB]	Field Strength [dBuV/m]	FCC-B Limit [dBuV/m]	Margin [dB]	Height [cm]	Pol. [V/H]
Horizontal 30 - 200MHz										
1	33.4068	28.29	pk	-26.7	16.8	18.39	40	-21.61	100	Horz
2	46.6934	28.3	pk	-26.6	11.7	13.4	40	-26.6	250	Horz
3	104.6092	28.76	pk	-26.5	11.5	13.76	43.5	-29.74	100	Horz
4	154.6894	28.69	pk	-26.2	15.1	17.59	43.5	-25.91	400	Horz
Horizontal 200 - 1000MHz										
5	279.2793	4.39	pk	9.0	12.9	26.29	46	-19.71	299	Horz
6	506.7067	6.47	pk	10.2	17.8	34.47	46	-11.53	299	Horz

pk - Peak detector

Figure 7 Radiated Emissions Graph 1-10 GHz (Tag #4, Y-Orientation)



Project Number: 10RT02887 File Number: MC15465
 Model Number: Tag Model T33-110
 Client Name: RadarFind Corp.

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FCC ID: URGTT33110

Table 8 Radiated Emissions Data Points (Tag #4, Y-Orientation)

RDE 4_1F 1-10 GHz V/H
 10LB048
 RED=VERTICAL BLUE=HORIZONTAL
 EUT ON SIDE (TAG T33-110)
 TESTED BY: R.RAMEY

Marker Test Number	Freq. [MHz]	Meter Reading [dBuV]	Det. Type	Cbl/Amp Factor [dB]	Ant. Factor [dB]	Field Strength [dBuV/m]	15.209 Limit [dBuV/m]	Margin [dB]	Height [cm]	Pol. [V/H]
Vertical 1000 - 3000MHz										
1	1810.811	64.03	pk	-34.7	26.9	56.23	54	2.23	150	Vert
2	1818.819	63.88	pk	-34.7	26.9	56.08	54	2.08	150	Vert
3	1824.825	63.27	pk	-34.7	27	55.57	54	1.57	150	Vert
4	1830.831	63.4	pk	-34.7	27	55.7	54	1.7	150	Vert
5	1835.836	62.81	pk	-34.7	27	55.11	54	1.11	150	Vert
6	1854.855	62.7	pk	-34.6	27.1	55.2	54	1.2	150	Vert
Horizontal 1000 - 3000MHz										
7	1810.811	56	pk	-34.7	26.9	48.2	54	-5.8	100	Horz
8	1818.819	56.23	pk	-34.7	26.9	48.43	54	-5.57	100	Horz
9	1824.825	56.59	pk	-34.7	27	48.89	54	-5.11	100	Horz
10	1830.831	56.87	pk	-34.7	27	49.17	54	-4.83	100	Horz
11	1836.837	56.59	pk	-34.7	27	48.89	54	-5.11	100	Horz
12	1854.855	56.98	pk	-34.6	27.1	49.48	54	-4.52	100	Horz

Test Freq. [MHz]	Meter Reading [dBuV]	Det. Type	Cbl/Amp Factor [dB]	Ant. Factor [dB]	Field Strength [dBuV/m]	15.209 Limit [dBuV/m]	Margin [dB]	Azim [deg]	Height [cm]	Pol. [V/H]
Vertical 1000 - 3000MHz										
1810.4177	35.4	av	-34.7	26.9	27.6	54	-26.4	270	153	Vert
1818.3896	36.23	av	-34.7	26.9	28.43	54	-25.57	180	111	Vert
1824.5159	36.63	av	-34.7	27	28.93	54	-25.07	176	117	Vert
1829.7138	36.61	av	-34.7	27	28.91	54	-25.09	191	115	Vert
1836.2704	35.97	av	-34.7	27	28.27	54	-25.73	195	113	Vert
1854.2187	36.72	av	-34.7	27.1	29.12	54	-24.88	191	112	Vert

pk - Peak detector
 av - Average detector

Appendix A

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/ts/htdocs/210/214/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 #: 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) C-2427, R-722
- Test Station 4 (Location E) C-743, T-236

- Test Station 1 (Location D) C-742, T-235
- Test Station 6 (Location C) C-744, T-237



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 (2-3). 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), IEC 61000-4-2, -4-3, -4-4, -4-5, and -4-6.