Nemko Test Report:	5L0196RUS1 REV 3
Applicant:	Wyle Labs. 7800 Highway 20 West Huntsville, AL 35806
Equipment Under Test:	Beverage Tracker
In Accordance With:	**FCC Part 15, Subpart C** For Low Power Transmitters Operating Periodically In The Band 40.66 - 40.77 MHz And Above 70 MHz
Tested By:	Nemko Dallas, Inc. 802 N. Kealy Lewisville, TX 75057-3136
Authorized By:	Tom Tidwell, Frontline Manager
Date:	September 21, 2005
Total Number of Pages:	26

NVLAP LAB CODE: 100426-0

TABLE OF CONTENTS

Section 1. Summary of Test Results

Manufacturer: Vital Link

Model No.: NA

Sample No.	Serial No.	Date Received	Modification Status
1	NA	4/17/2005	PRE PRODUCTION

N/A - Not modified from original state

General: **All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C, Paragraph 15.231. All tests were conducted using measurement procedure ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

☒ New Submission ☐ Production Unit

☐ Class II Permissive Change ☒ Pre-Production Unit

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.
See " Summary of Test Data".

NVLAP LAB CODE: 100426-0

Summary Of Test Data

Name of Test	Paragraph No.	Results
Transmission Requirements	15.231(a)	COMPLIES
Radiated Emissions	15.231(b)	COMPLIES
Occupied Bandwidth	15.231(c)	COMPLIES
Frequency Tolerance	15.231(d)	NA
Alternate Field Strength Requirements	15.231(e)	NA
Powerline Conducted Emissions	15.207	NA

Footnotes:

Section 2. Equipment Under Test (E.U.T.)

General Equipment Information

Frequency Range:	418 MHZ FIXED
Operating Frequency(ies) of Sample:	418 MHZ
Type of Emission:	OOK
Supply Power Requirement:	1.5 VOLTS DC Battery
Duty Cycle Correction Factor:	NONE

Description of E.U.T.

The Beverage Tracker is a liquor-monitoring device.

Modifications Incorporated in E.U.T.

The EUT has not been modified from what is described by the brand name and unique type identification stated above.

Test Configuration

The E.U.T. was configured for testing as per typical installation.

The following combinations were investigated to establish worst case configuration:

(1) EUT was place in three orthogonal axis and was found to be worst case on its side.
(2) The EUT was tested with a new battery.

Exercise Mode

The E.U.T. exercise mode used during radiated and conducted testing was designed to exercise the various system components in a manner similar to typical use.

Exercise mode:

(1) Modified to transmit rf carrier continuously

Section 3. Equipment Configuration

Equipment Configuration List:

Item	Description	Model No.	Serial.	Rev.
(A)	Beverage Tracker	NA	NA	-

Inter-connection Cables:

Item	Description	Length (m)
(1)	NO CABLES	

Configuration of the Equipment Under Test (E.U.T)

Continuous Transmit

Section 4. Transmission Requirements

NAME OF TEST: Transmission Requirements	PARA. NO.: 15.231(a)
TESTED BY: Kevin Rose	DATE: May 4, 2005

Minimum Standard:

15.231(a) Continuous transmissions such as voice, video or data transmissions are not permitted.

15.231(a)(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds after being released.

15.231(a)(2) A transmitter activated automatically shall cease transmission within 5 seconds of activation.

15.231(a)(3) Periodic transmissions at regular pre-determined intervals are not permitted. However polling or supervisory transmissions to determine system integrity of transmitters used in security or safety applications are allowed if the periodic rate of transmission does not exceed one transmission of not more than one second duration per hour for each transmitter.

15.231(a)(4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm.

Test Results: Complies

Test Data: Compliance was determined by verification of technical specifications and a functional test on the equipment.

Rationale for Compliance with Transmission Requirements

15.231(a)(1) **15.231(a)(2) :**	☐ Manual activation ☒ Automatic activation	TX deactivation time: <10 nanosec.
15.231(a)(3) :	☐ Regular, predetermined transmissions ☐ Polling or supervisory transmissions	No polling or regular predetermined transmissions.
15.231(a)(4) :	☐ Alarm device operating during the pendancy of alarm condition	
	☒ Non-alarm device	

The device is designed to transmit when the drink canister is tipped. The device transmits a short id transmission and ceases to transmit until the canister is tipped again.

Section 5. Radiated Emissions

NAME OF TEST: Radiated Emissions	PARA. NO.: 15.231(b)
TESTED BY: Kevin Rose	DATE: May 4, 2005

Minimum Standard:

Permissible Field Strength Limits (Momentarily Operated Devices

Fundamental Frequency (MHz)	Field Strength of Fundamental Microvolts/Meter at 3 meters; (watts)	Field Strength of Unwanted Emissions Microvolts/Meter at 3 meters; (watts)
40.66 - 40.70	2,250	225
70-130	1, 250	125
130-174	1,250 to 3,750*	125 to 375
174-260 (note 1)	3,750	375
260-470 (note 1)	3,750 to 12,500*	375 to 1,250
Above 470	12,500	1,250

Notes:

# Use quasi-peak or averaging meter.	*For 130 - 174 MHz: FS (microvolts/m) = (56.82 x F) - 6136*
** Linear interpolation with frequency F in MHz*	*For 260 - 470 MHz: FS (microvolts/m) = (41.67 x F) - 7083*

Any emissions that fall within the restricted bands of 15.205 shall not exceed the following limits:

Frequency (MHz)	Field Strength (µV/m @ 3m)	Field Strength (dB @ 3m)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

Test Results: Complies The worst-case emission level is 55.4 dBµV/m @ 3m at 836 MHz. This is 4.9 dB below the specification limit.

Test Data: See attached table.

Above 1 GHz a spectrum analyzer and low noise amplifier are used to measure emission levels. The spectrum analyzer resolution bandwidth was set to 1 MHz and video bandwidth was 3 MHz.

In the case of handheld equipment, the E.U.T. is rotated in three planes to obtain worst-case results.

Test Data - Radiated Emissions

NEMKO Dallas, Inc.

Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Radiated Emissions Data

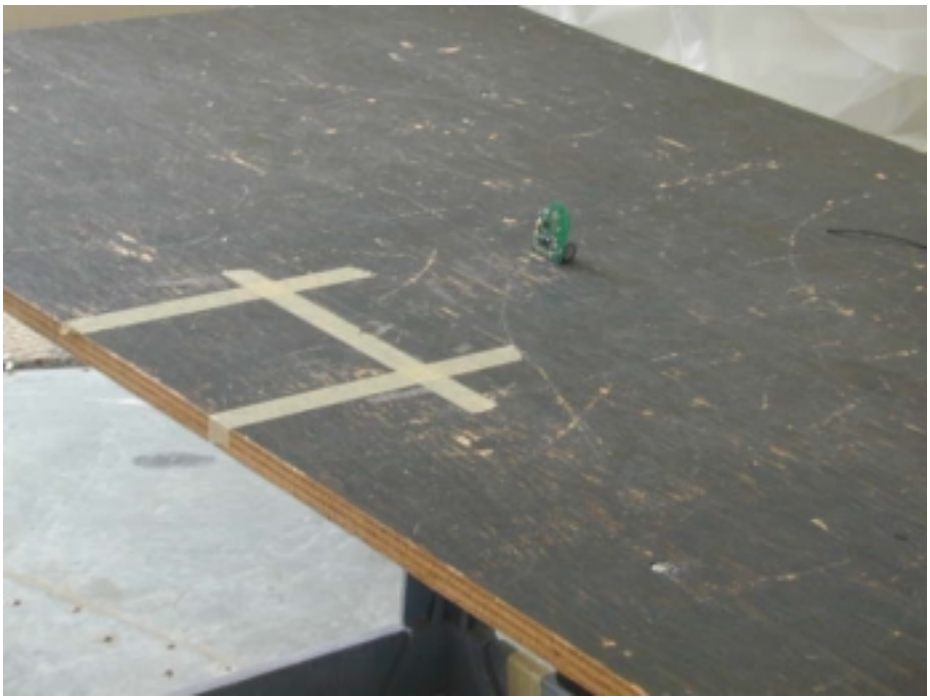
Complete	X			Job # :	5L0196R
Preliminary				Page	1
Client Name :	WYLE LABS				
EUT Name :	BEVERAGE TRACKER				
EUT Model # :	NA				
EUT Part # :	NA				
EUT Serial # :	NA				
EUT Config. :	CONTINUOUS TRANSMIT				
Specification :	CISPR 22: 1993 +A1&A2, Class A			Reference :	
Rod. Ant. #:		Temp. (deg. C) :	25	Date :	APRIL 29 2005
Bicon Ant.#:	1306	Humidity (%) :	63	Time :	14:00
Log Ant.#:	1311	EUT Voltage :	1.5DC	Staff :	Kevin Rose
Bilog Ant.#:		EUT Frequency :		Photo ID:	
Dipole Ant.#:		Phase:		Peak Bandwidth:	1 MHz
Cable#:	1522	Location:	D OATS	Video Bandwidth	3 MHz
Preamp#:	762	Distance:	3		
Limiter#:	na				
Atten #:	na				
Detector#:	1283	Other Equipment	1304 1016		

Meas. Freq. (MHz)	Ant. Pol. (H/V)	Atten. (dB)	Meter Reading (dBuV)	Antenna Factor (dB)	Path Loss (dB)	RF Gain (dB)	Corrected Reading (dBuV/m)	Spec. limit (dBuV/m)	CR/SL Diff. (dB)	Pass Fail Unc.	QP readings Comment
418.02	V	0	76	15	7.4	27.4	71.0	80.3	-9.3	Pass	
418.02	H	0	67.7	15	7.4	27.4	62.7	80.3	-17.6	Pass	
836	V	0	50.4	22	10.5	27.5	55.4	60.3	-4.9	Pass	
836	H	0	46.5	22	10.5	27.5	51.5	60.3	-8.8	Pass	
1254	V	0	38	24.5	12.3	32.2	42.6	60.3	-17.7	Pass	
1254	H	0	41.2	24.5	12.3	32.2	45.8	60.3	-14.5	Pass	
1672	V	0	39.8	24.5	12.3	31.8	44.8	60.3	-15.5	Pass	
1672	H	0	38.7	24.5	12.3	31.8	43.7	60.3	-16.6	Pass	
2090	V	0	39	24.5	12.3	32.6	43.2	60.3	-17.1	Pass	
2090	H	0	36.6	24.5	12.3	32.6	40.8	60.3	-19.5	Pass	
											SCAN COMPLETE
											30MHZ TO 5GHZ

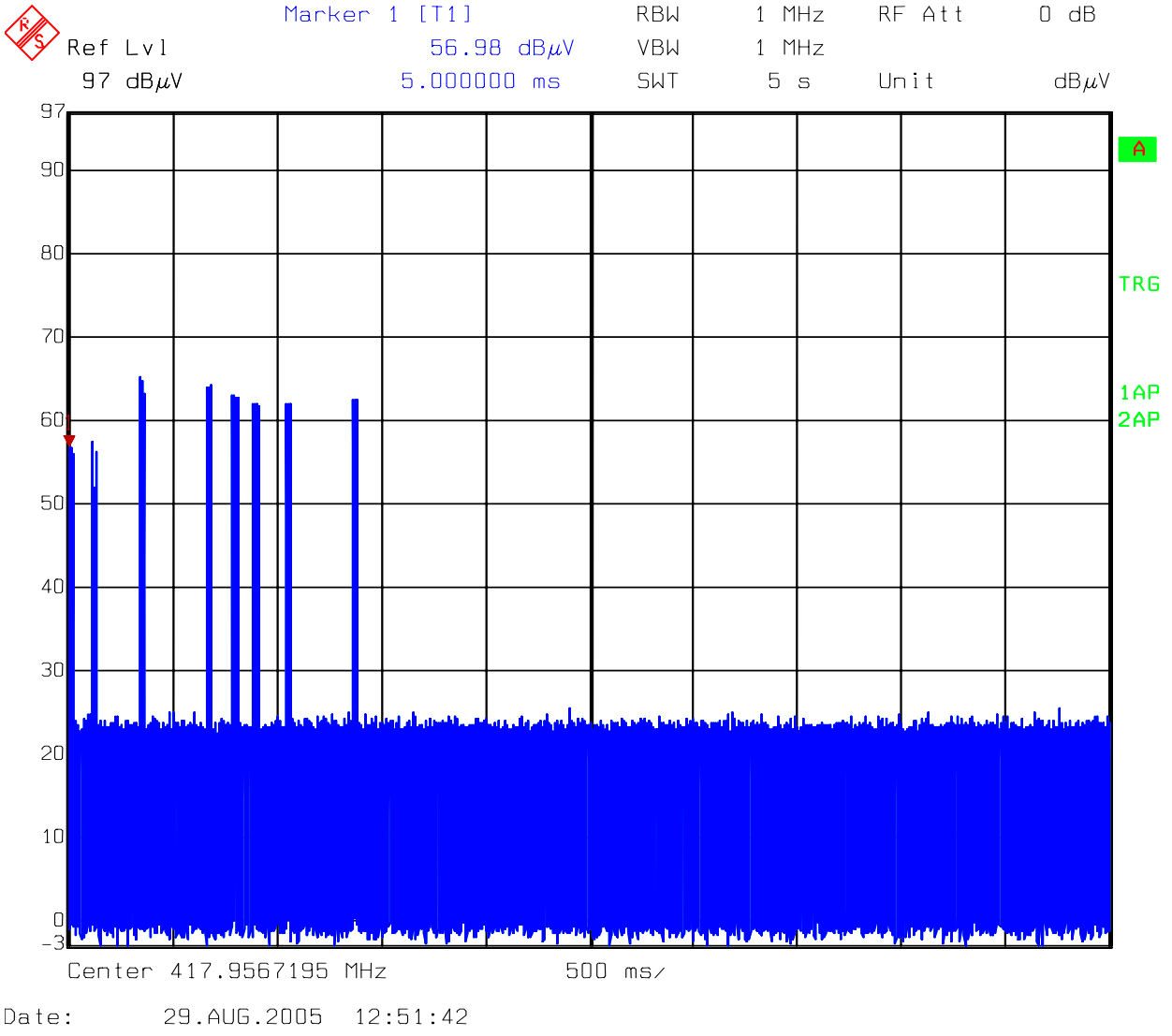
..\EMCShare\AUTOMATE\DATASHTS\RADEMEV Rev C.xls Document Control #EMC DS EM RAD HFE

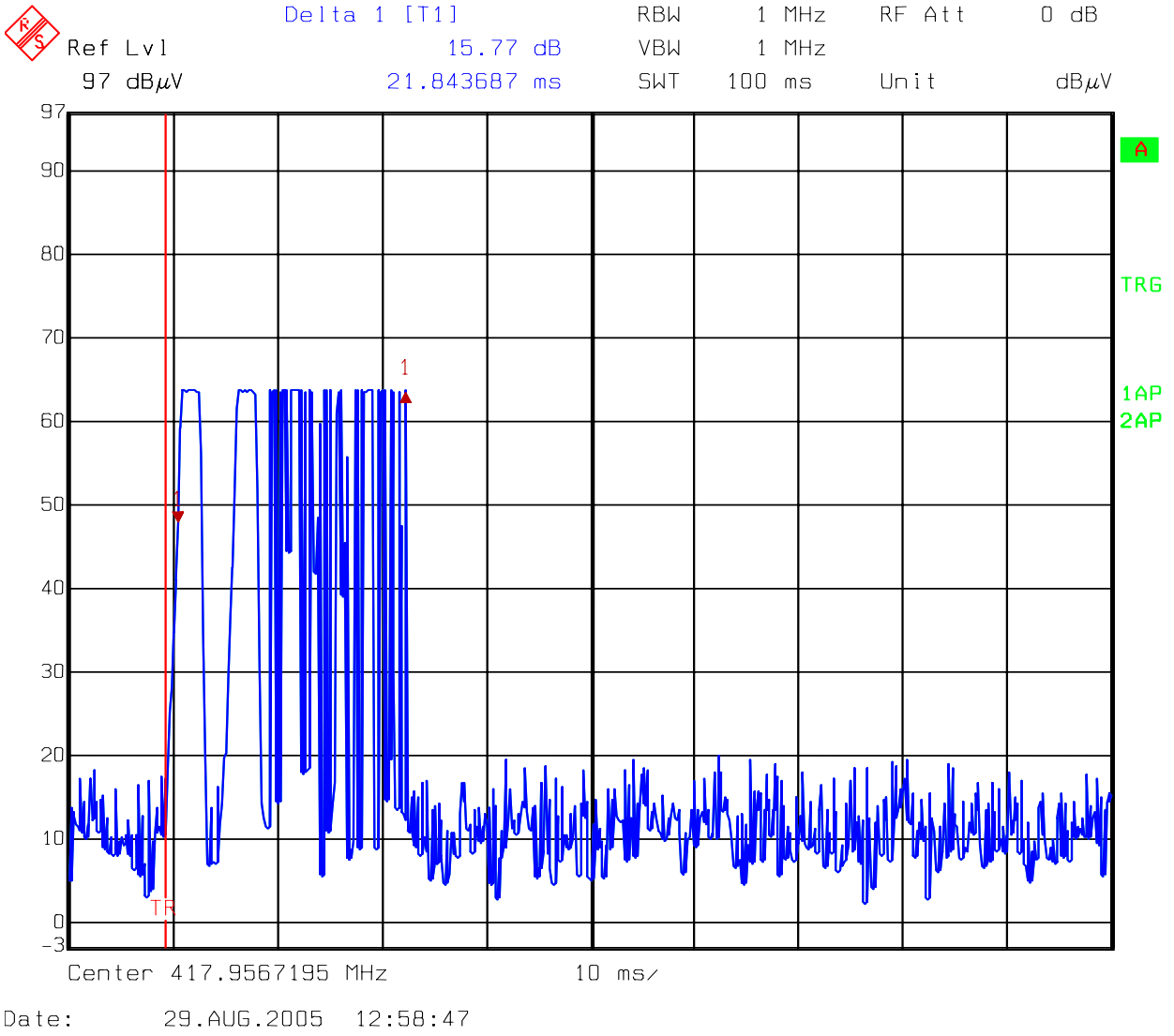
Radiated Photographs (Worst Case Configuration)

FRONT VIEW



REAR VIEW


Marker 1 [T1]
RBW 1 MHz
RF Att 0 dB
Ref Lvl
56.98 dBµV
VBW 1 MHz
97 dBµV
5.000000 ms
SWT 5 s
Unit dBµV
97
90
80
70
60
50
40
30
20
10
0
-3
A
TRG
1AP
2AP
Center 417.9567195 MHz
500 ms/
Date: 29.AUG.2005 12:51:42


Delta 1 [T1]
RBW 1 MHz
RF Att 0 dB
Ref Lvl
15.77 dB
VBW 1 MHz
97 dBµV
21.843687 ms
SWT 100 ms
Unit dBµV
97
90
80
70
60
50
40
30
20
10
0
-3
A
TRG
1AP
2AP
1
T
TR
Center 417.9567195 MHz
10 ms/
Date: 29.AUG.2005 12:58:47

Section 6. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 15.231(c)
TESTED BY: Kevin Rose	DATE: May 4, 2005

Minimum Standard: 15.231(c) The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Test Results: Complies. See attached graph.

Test Data: See attached graph.

Monday, May 09, 2005

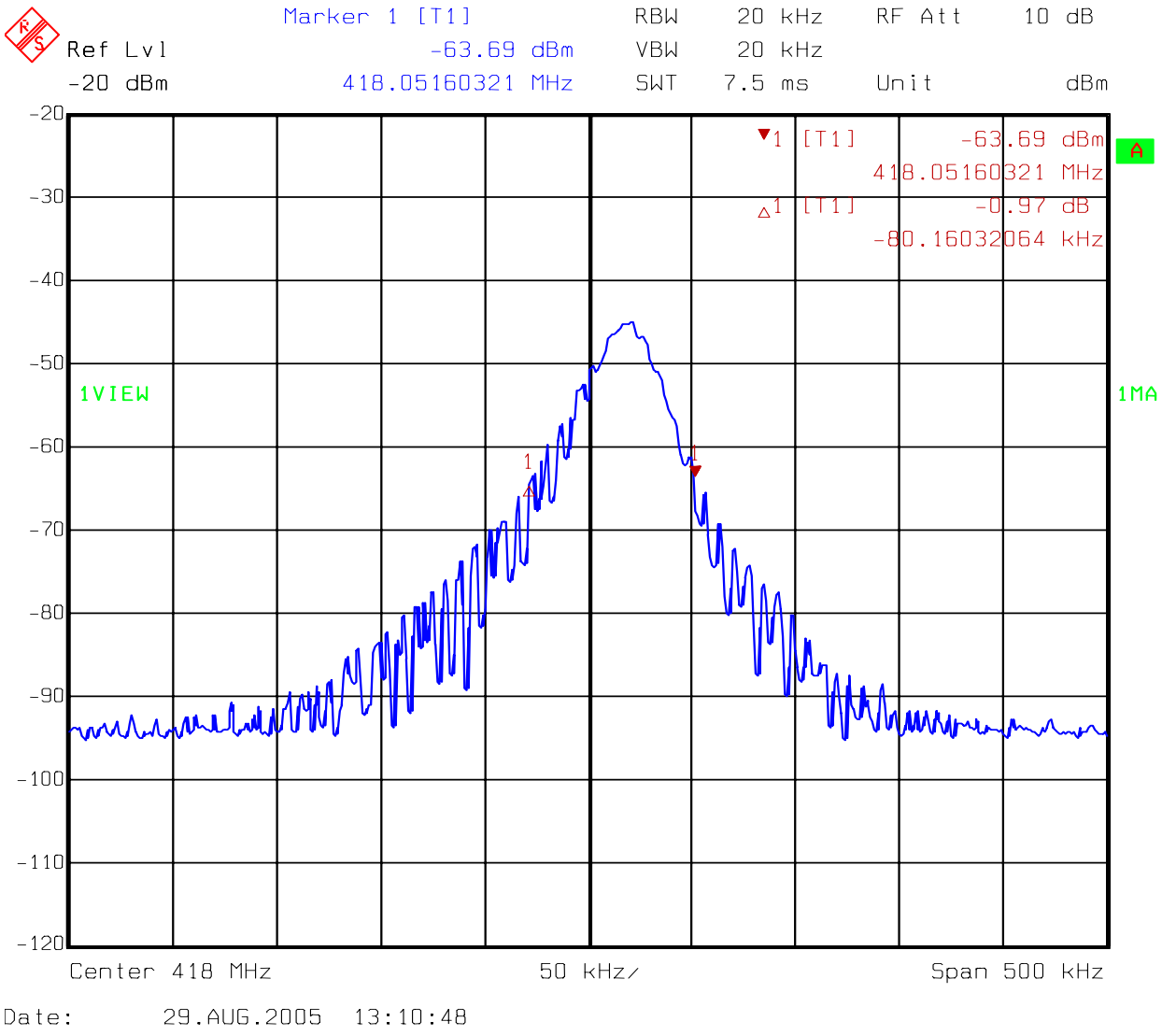
MEMO on Pour Top Transmission

To Whom It May Concern:

There is no modulation with a pour spout transmit signal. The electronics use OOK (on/off keying). When the device transmits the transmitter is turned on/off at a timing controlled rate to signify data characters.

Sincerely,

Seth Temko
Vice President Operations
CAPTON, Inc.
(formerly Beverage Wireless)
847-483-9542


Marker 1 [T1]
Ref Lvl
-20 dBm
-63.69 dBm
418.05160321 MHz
RBW 20 kHz
VBW 20 kHz
SWT 7.5 ms
RF Att 10 dB
Unit dBm
1 [T1] -63.69 dBm
418.05160321 MHz
Δ1 [T1] -0.97 dB
-80.16032064 kHz
A
1VIEW
1MA
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
Center 418 MHz
50 kHz/
Span 500 kHz
Date: 29.AUG.2005 13:10:48

Section 7. Frequency Tolerance
Devices in the Frequency Band 40.66 - 40.77 MHz

NAME OF TEST: Frequency Tolerance	PARA. NO.: 15.231(d)
TESTED BY: Kevin Rose	DATE: May 4, 2005

Minimum Standard: 15.231(d) For devices operating within the frequency band 40.66 - 40.70 MHz, the bandwidth of the emission shall be confined within the band edges and the frequency tolerance of the carrier shall be ±0.01%. This frequency tolerance shall be maintained for a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary power supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery-operated equipment, the equipment tests shall be performed using a new battery.

Test Results: Complies. See attached graph and data.

Test Data: N/A THE EUT OPERATES AT 418 MHz

Section 8. Periodic Alternate Field Strength Requirements

NAME OF TEST: Periodic Alternate Field Strength Requirements PARA. NO.: 15.231(e)

TESTED BY: DATE:

Minimum Standard: 15.231(e) Intentional radiators may operate at a periodic rate exceeding that specified in paragraph (a) of this section and may be employed for any type of operation, including operation prohibited in paragraph (a) of this section, provided the intentional radiator complies with the provisions of paragraphs (b) through (d) of this section, except the field strength table in paragraph (b) of this section is replaced by the following.

Fundamental Frequency (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66 - 40.70	1,000	100
70 - 130	500	50
130 - 174	500 to 1,500	50 to 150
174 - 260	1,500	150
260-470	1,500 to 5,000	150 to 500
Above 470	5,000	500

In addition, devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

Test Results: NA

Test Data: NA.

Section 9. Powerline Conducted Emissions

NAME OF TEST: Powerline Conducted Emissions	PARA. NO.: 15.207
TESTED BY:	DATE:

Minimum Standard:

Frequency(MHz)	**Maximum Powerline Conducted RF Voltage**	
	µV	**dBµV**
0.45 - 30.0	250	48

Test Results: NA THE EUT IS BATTERY POWERED..

Test Data: See attached graphs and table.

Method Of Measurement: (Procedure ANSI C63.4-2003)

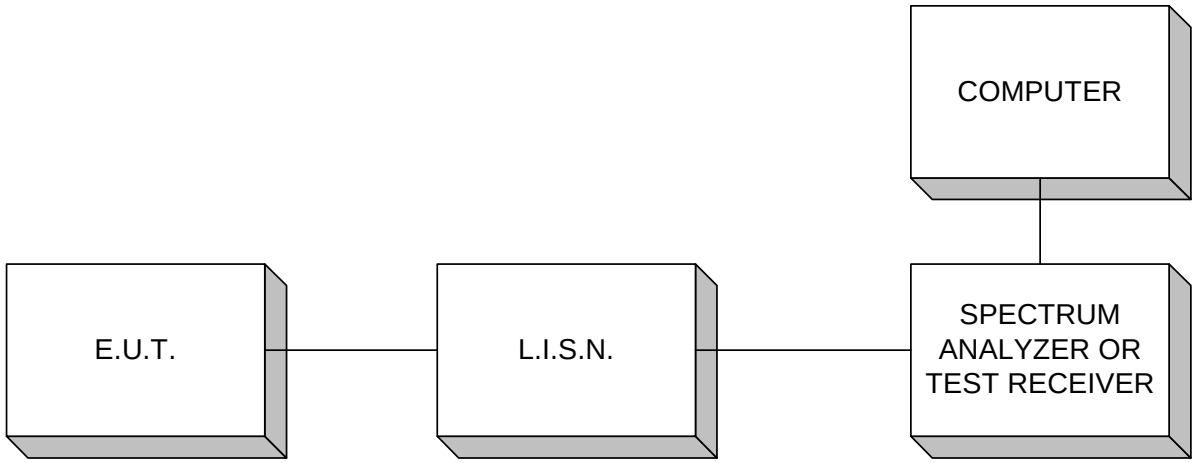
Measurements were made using a spectrum analyzer with 10 kHz RBW, Peak detector. Any emissions that are close to the limit are measured using a test receiver with 10 kHz bandwidth, CISPR Quasi-Peak detector.

Broadband emissions are identified by switching the receiver detector function from Quasi-Peak to Average. If the amplitude of the emission drops by 6 dB or more then the emission is classified as broadband and the Quasi-Peak level is reduced by a factor of 13 dB.

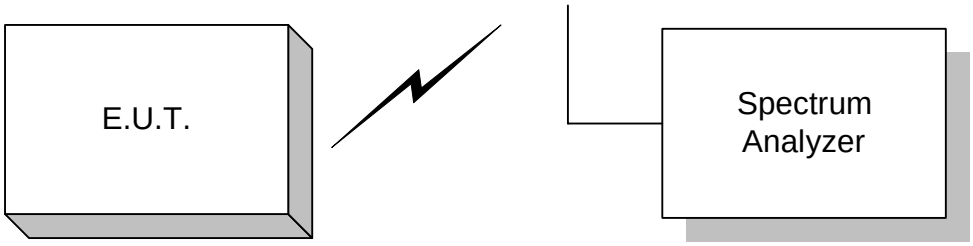
All emissions within 10 dB of limit have been recorded.

Section 10. Block Diagrams

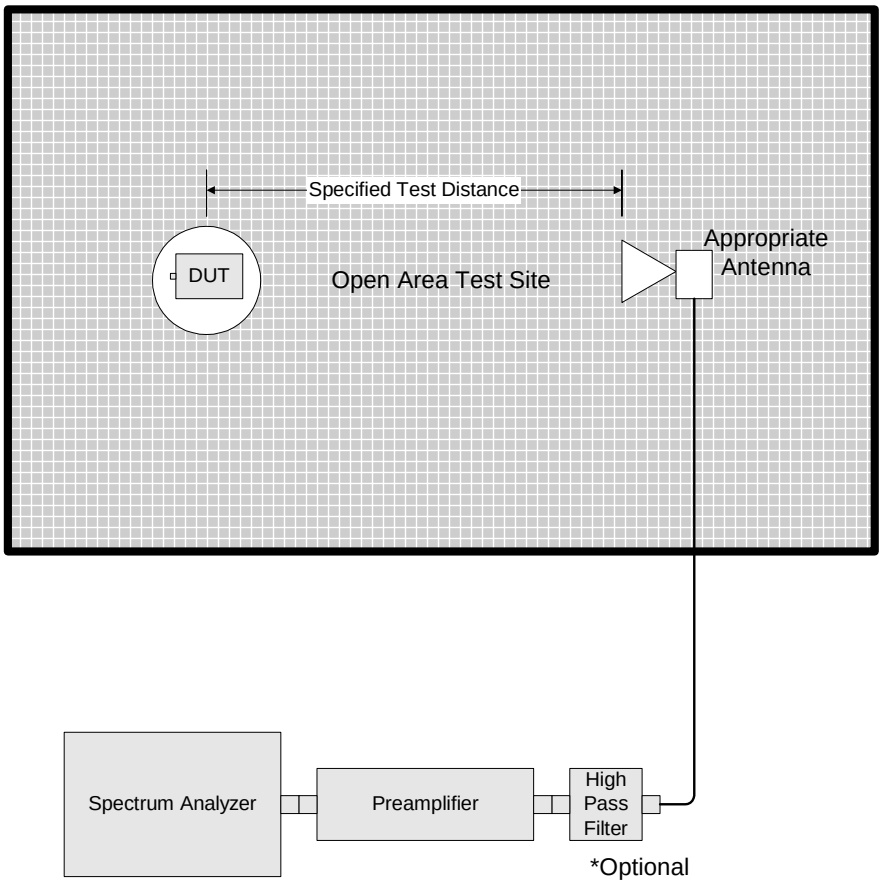
Conducted Emissions



Occupied Bandwidth, Duty Cycle

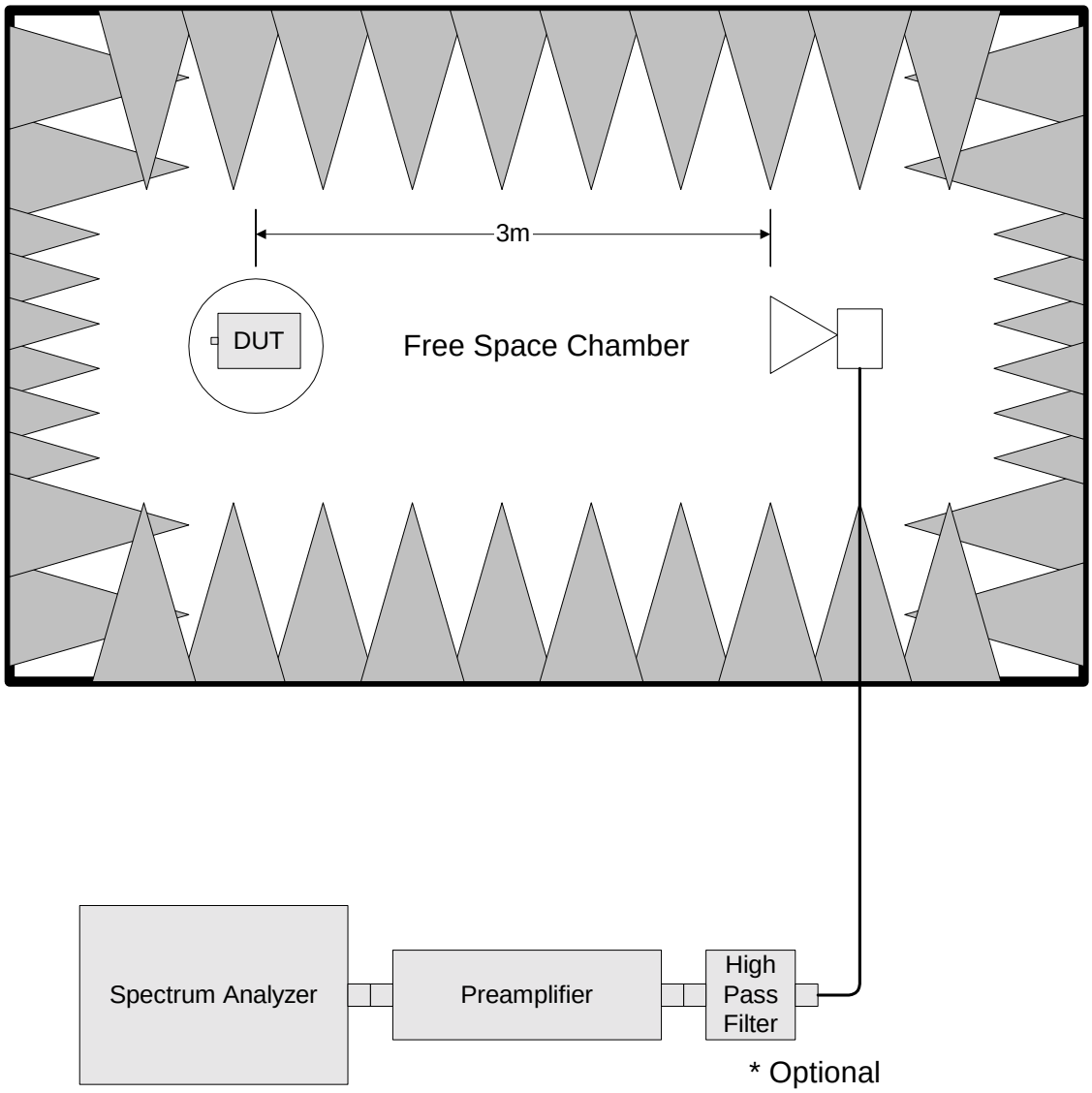


Outdoor Test Site For Radiated Emissions



Radiated Emissions 30 MHz - 1 GHz

The spectrum was searched up to the 10th harmonic of the fundamental frequency of operation.



Radiated Emissions above 1 GHz

Section 11. Test Equipment List

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
1306	Antenna biconical	ICC BCON 30300	212	09/09/03	09/08/04
1311	ANTENNA, LOG PERIODIC	EMCO 3146	1753	06/04/04	06/04/05
1304	HORN ANTENNA	ELECTRO METRICS RGA-60	6151	09/22/03	09/22/05
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	11/12/04	11/12/05
762	27dB GAIN PREAMP	ICC 27dB LNA	946	04/06/04	04/06/06
1522	Cable Assy, LAB 5 - D OATS	KTL Site D OATS	N/A	04/05/05	04/05/06
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	07/30/04	07/31/06

ANNEX A - RESTRICTED BANDS

Annex A Restricted Bands of Operation

(a) Except as shown in paragraph (d) of this section , only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42-16.423	399.9-410	4.5-5.15
0.49 - 0.51	16.69475-16.69525	608-614	5.35-5.46
2.1735 - 2.1905	16.80425-16.80475	960-1240	7.25-7.75
3.020 - 3.026	25.5-25.67	1300-1427	8.025-8.5
4.125 - 4.128	37.5-38.25	1435-1626.6	9.0-9.2
4.17725 - 4.17775	73-74.6	1645.5-1646.5	9.3-9.5
4.20725 - 4.20775	74.8-75.2	1660-1710	10.6-12.7
6.215 - 6.218	108-121.94	1718.8-1722.2	13.25-13.4
6.31175 - 6.31225	123-138	2220-2300	14.47-14.5
8.291 - 8.294	149.9-150.05	2310-2390	15.35-16.2
8.362 - 8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625 - 8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425 - 8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29 - 12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975 - 12.52025	240-285	3345.8-3358	36.43-36.5
12.57675 - 12.57725	322-335.4	3600-4400	Above 38.6
13.36 - 13.41			