Veris Industries, Inc.

Temperature/rH Transmitter

EMC Test Report

June 29, 2005

Report No. VERI0111

Report Prepared By

NORTHWEST EMC

www.nwemc.com
1-888-EMI-CERT

NORTHWEST EMC

22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test

Issue Date: June 29, 2005
Veris Industries, Inc.
Model: Temperature/rH Transmitter

Emissions			
Specification	**Test Method**	**Pass**	**Fail**
FCC 15.107 AC Powerline Conducted Emissions:2005-04	ANSI C63.4:2003	☒	☐
FCC 15.109(a):2005-04 Receiver Verification	ANSI C63.4:2003	☒	☐
FCC 15.231(c) Occupied Bandwidth:2005-04	ANSI C63.4:2003	☒	☐
FCC 15.231(e) Field Strength of Fundamental:2005	ANSI C63.4:2003	☒	☐
FCC 15.231(e) Field Strength of Spurious Emissions:2005	ANSI C63.4:2003	☒	☐

Modifications made to the product
See the Modifications section of this report

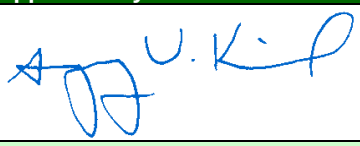
Test Facility

The measurement facility used to collect the data is located at:

Northwest EMC, Inc.
22975 NW Evergreen Parkway, Suite 400; Hillsboro, OR 97124
Phone: (503) 844-4066
Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada.

Approved By:



Greg Kiemel, Director of Engineering

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.

Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested, the specific description is noted in each of the individual sections of the test report supporting this certificate of test.

Revision Number	Description	Date	Page Number
00	None		

FCC: Accredited by NVLAP for performance of FCC radio, digital, and ISM device testing. Our Open Area Test Sites, certification chambers, and conducted measurement facilities have been fully described in reports filed with the FCC and accepted by the FCC in letters maintained in our files. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by the FCC as a Telecommunications Certification Body (TCB). This allows Northwest EMC to certify transmitters to FCC specifications in accordance with 47 CFR 2.960 and 2.962.

NVLAP: Northwest EMC, Inc. is recognized under the United States Department of Commerce, National Institute of Standards and Technology, and National Voluntary Laboratory Accreditation Program for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 89/336/EEC, ANSI C63.4, MIL-STD 461E, DO-160D and SAE J1113. Additionally, Northwest EMC is accredited by NVLAP to perform radio testing in accordance with the European Union R&TTE Directive 1999/5/EEC, the requirements of FCC, and the RSS radio standards for Industry Canada.

200629-0
200630-0
200676-0

Industry Canada: Accredited by NVLAP for performance of Industry Canada RSS and ICES testing. Our Open Area Test Sites and certification chambers comply with RSS 212, Issue 1 (Provisional) and have been filed with Industry Canada and accepted. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by NIST and recognized by Industry Canada as a Certification Body (CB) per the APEC Mutual Recognition Arrangement (MRA). This allows Northwest EMC to certify transmitters to Industry Canada technical requirements.

CAB: Designated by NIST and validated by the European Commission as a Conformity Assessment Body (CAB) to conduct tests and approve products to the EMC directive and transmitters to the R&TTE directive, as described in the U.S. - EU Mutual Recognition Agreement.

TÜV Product Service: Included in TUV Product Service Group's Listing of Recognized Laboratories. It qualifies in connection with the TUV Certification after Recognition of Agent's Testing Program for the product categories and/or standards shown in TUV's current Listing of CARAT Laboratories, available from TUV. A certificate was issued to represent that this laboratory continues to meet TUV's CARAT Program requirements. Certificate No. USA0401C.

TÜV Rheinland: Authorized to carryout EMC tests by order and under supervision of TÜV Rheinland. This authorization is based on "Conditions for EMC-Subcontractors" of November 1992.

NEMKO: Assessed and accredited by NEMKO (Norwegian testing and certification body) for European emissions and immunity testing. As a result of NEMKO's laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification (Authorization No. ELA 119).

Technology International: Assessed in accordance with ISO Guide 25 defining the general international requirements for the competence of calibration and testing laboratories and with ITI assessment criteria LACO196. Based upon that assessment, Interference Technology International, Ltd., has granted approval for specifications implementing the EU Directive on EMC (89/336/EEC and amendments). The scope of the approval was provided on a Schedule of Assessment supplied with the certificate and is available upon request.

Australia/New Zealand: The National Association of Testing Authorities (NATA), Australia has been appointed by the ACA as an accreditation body to accredit test laboratories and competent bodies for EMC standards. Accredited test reports or assessments by competent bodies must carry the NATA logo. Test reports made by an overseas laboratory that has been accredited for the relevant standards by an overseas accreditation body that has a Mutual Recognition Agreement (MRA) with NATA are also accepted as technical grounds for product conformity. The report should be endorsed with the respective logo of the accreditation body (NVLAP).

VCCI: Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. *(Registration Numbers. - Hillsboro: C-1071 and R-1025, Irvine: C-2094 and R-1943, Newberg: C-1877 and R-1760, Sultan: R-871, C-1784 and R-1761).*

BSMI: Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement. License No.SL2-IN-E-1017.

GOST: Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification

SCOPE

For details on the Scopes of our Accreditations, please visit:
http://www.nwemc.com/scope.asp

What is measurement uncertainty?

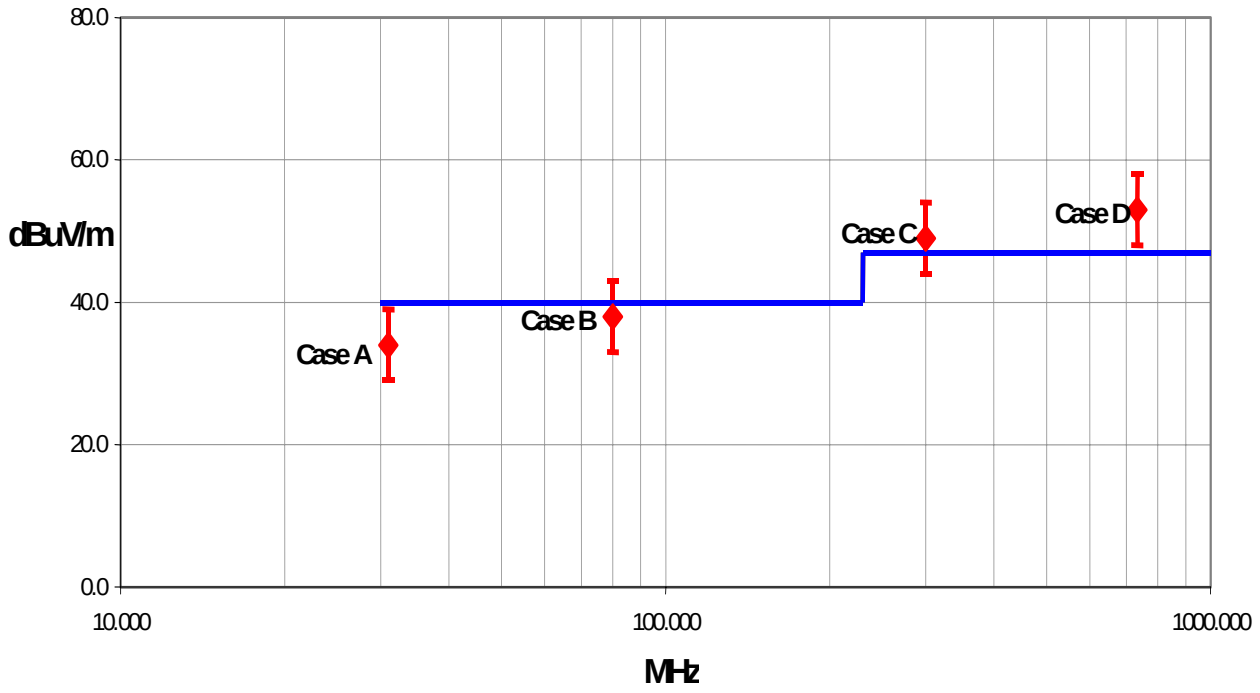
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. The following statement of measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" value. In the case of transient tests (ESD, EFT, Surge, Voltage Dips and Interruptions), the test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements.

The following documents were the basis for determining the uncertainty levels of our measurements:

- "ISO Guide to the Expression of Uncertainty in Measurements", October 1993
- "NIS81: The Treatment of Uncertainty in EMC Measurements", May 1994
- "IEC CISPR 16-3 A1 f1 Ed.1: Radio-interference measurements and statistical techniques", December 2000

How might measurement uncertainty be applied to test results?

If the diamond marks the measured value for the test and the vertical bars bracket the range of + and – measurement uncertainty, then test results can be interpreted from the diagram below.



Test Result Scenarios:
Case A: Product complies.
Case B: Product conditionally complies. It is not possible to say with 95% confidence that the product complies.
Case C: Product conditionally does not comply. It is not possible to say with 95% confidence that the product does not comply.
Case D: Product does not comply.

Radiated Emissions ≤ 1 GHz		Value (dB)					
	Probability Distribution	Biconical Antenna		Log Periodic Antenna		Dipole Antenna	
Test Distance		3m	10m	3m	10m	3m	10m
Combined standard uncertainty $u_c(y)$	normal	+ 1.86 - 1.88	+ 1.82 - 1.87	+ 2.23 - 1.41	+ 1.29 - 1.26	+ 1.31 - 1.27	+ 1.25 - 1.25
Expanded uncertainty ***U*** (level of confidence ≈ 95%)	normal (k=2)	+ 3.72 - 3.77	+ 3.64 - 3.73	+ 4.46 -2.81	+ 2.59 - 2.52	+ 2.61 - 2.55	+ 2.49 - 2.49

Radiated Emissions > 1 GHz	Value (dB)		
	Probability Distribution	Without High Pass Filter	With High Pass Filter
Combined standard uncertainty $u_c(y)$	normal	+ 1.29 - 1.25	+ 1.38 - 1.35
Expanded uncertainty ***U*** (level of confidence ≈ 95%)	normal (k=2)	+ 2.57 - 2.51	+ 2.76 - -2.70

Conducted Emissions		
	Probability Distribution	Value (+/- dB)
Combined standard uncertainty ***uc(y)***	normal	1.48
Expanded uncertainty ***U*** (level of confidence ≈ 95 %)	normal (k = 2)	2.97

Radiated Immunity		
	Probability Distribution	Value (+/- dB)
Combined standard uncertainty ***uc(y)***	normal	1.05
Expanded uncertainty ***U*** (level of confidence ≈ 95 %)	normal (k = 2)	2.11

Conducted Immunity		
	Probability Distribution	Value (+/- dB)
Combined standard uncertainty ***uc(y)***	normal	1.05
Expanded uncertainty ***U*** (level of confidence ≈ 95 %)	normal (k = 2)	2.10

Legend

$u_c(y)$ = square root of the sum of squares of the individual standard uncertainties

U = combined standard uncertainty multiplied by the coverage factor: **k**. This defines an interval about the measured result that will encompass the true value with a confidence level of approximately 95%. If a higher level of confidence is required, then k=3 (CL of 99.7%) can be used. Please note that with a coverage factor of one, uc(y) yields a confidence level of only 68%.

California

Orange County Facility

Labs OC01 – OC13

41 Tesla Ave.
Irvine, CA 92618
(888) 364-2378
FAX (503) 844-3826

Oregon

Evergreen Facility

Labs EV01 – EV10

22975 NW Evergreen Pkwy.
Suite 400
Hillsboro, OR 97124
(503) 844-4066
FAX (503) 844-3826

Oregon

Trails End Facility

Labs TE01 – TE03

30475 NE Trails End Lane
Newberg, OR 97132
(503) 844-4066
FAX (503) 537-0735

Washington

Sultan Facility

Labs SU01 – SU07

14128 339th Ave. SE
Sultan, WA 98294
(888) 364-2378
FAX (360) 793-2536

Party Requesting the Test	
Company Name:	Veris Industries, Inc.
Address:	16640 SW 72nd Avenue
City, State, Zip:	Portland, OR 97224
Test Requested By:	Dave Bruno
Model:	Temperaturer/rH Transmitter, Serial RF Processor
First Date of Test:	06-23-2005
Last Date of Test:	06-27-2005
Receipt Date of Samples:	06-23-2005
Equipment Design Stage:	Prototype
Equipment Condition:	No visual damage.

Information Provided by the Party Requesting the Test

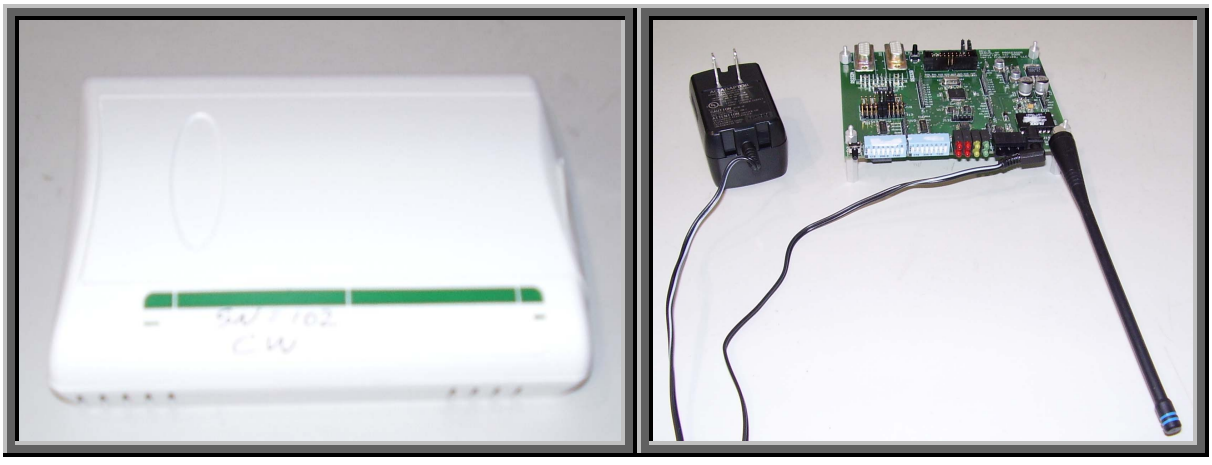
Clocks/Oscillators:	Temperature/rH Transmitter CPU = 32768Hz with PLL to 1MHz (during transmission), Transmitter is Linx 418MHz. Serial/RF Processor = 19.6608MHz
I/O Ports:	Serial (Only on Serial/RF Processor)

Functional Description of the EUT (Equipment Under Test):
Temperature/rH Transmitter measures and transmits 24bytes of serial-number/Termperature/rH data at a random interval, which averages 1minute. Data is variable. Packet contains equal number of 1's and 0's. OOK at 418MHz

Client Justification for EUT Selection:
Engineering sample with typical load configuration.

Client Justification for Test Selection:
These tests satisfy the FCC requirements for the US market.

EUT Photo



Equipment modifications					
Item	Test	Date	Modification	Note	Disposition of EUT
1	Field Strength of Fundamental Emission	06/23/2005	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.	EUT remained at Northwest EMC.
2	Field Strength of Spurious Emissions	06/23/2005	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.	EUT remained at Northwest EMC.
3	AC Powerline Conducted Emissions	06/24/2005	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
4	Occupied Bandwidth	06/27/2005	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
5	Receiver Verification Radiated Emissions	06/27/2005	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.

Occupied Bandwidth

Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Operating Modes Investigated:
Receive

Data Rates Investigated:
Typical

Power Input Settings Investigated:
120 VAC, 60 Hz.

Software\Firmware Applied During Test			
Exercise software	N/A	**Version**	N/A

EUT and Peripherals			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
EUT-Temperature/rH Transmitter	Veris Industries	Temperature/rH Transmitter	102

Measurement Equipment					
Description	**Manufacturer**	**Model**	**Identifier**	**Last Cal**	**Interval**
Spectrum Analyzer	Tektronix	2784	AAO	01/02/2005	12 mo
Near Field Probe	EMCO	7405	IPD	NCR	NA

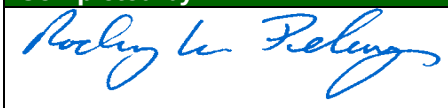
Test Description

Requirement: Per 47 CFR 15.231(c), the 20 dB bandwidth of the transmit frequency shall be no wider than 0.25% of the center frequency.

Configuration: The occupied bandwidth was measured with the EUT configured for continuous modulated operation at its single transmit frequency. The spectrum analyzer's resolution bandwidth was >= 1% of the 20dB bandwidth and the video bandwidth was greater than or equal to the resolution bandwidth.

The 20 dB bandwidth of the transmit frequency is less than 0.25% of the center frequency.

Completed by:



NORTHWEST
EMC

OCCUPIED BANDWIDTH

Rev BETA
01/30/01

EUT:	Temperature / rH Transmitter			Work Order:	VERI0111
Serial Number:	103			Date:	06/27/05
Customer:	Veris Industries, Inc.			Temperature:	23° C
Attendees:	None	Tested by:	Rod Peloquin	Humidity:	38% RH
Customer Ref. No.:		Power:	Internal Battery	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.231 (c)	Year:	2005	Method:	DA 00-705, ANSI C63.4	Year:	2004

SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES

Modulated carrier

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

The maximum 20dB bandwidth is no wider than 0.25% of the center frequency.

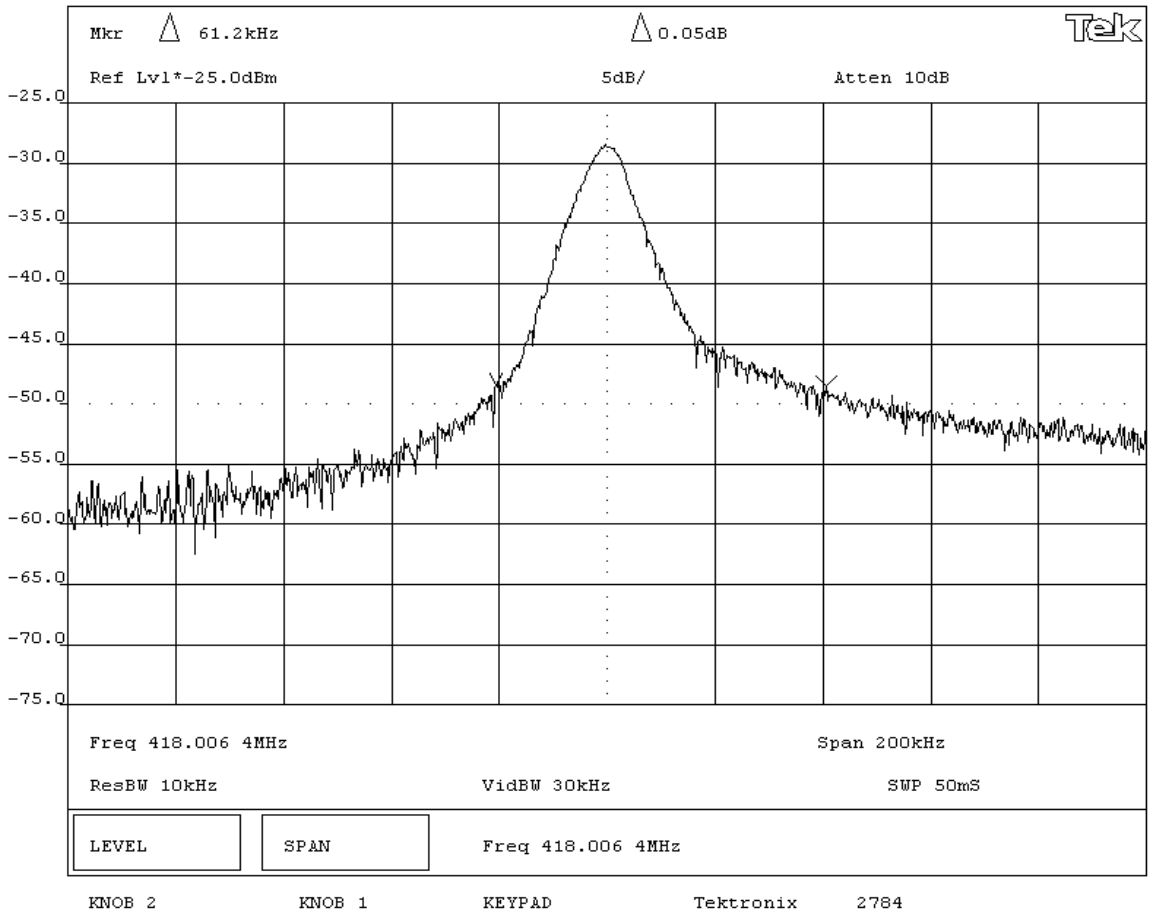
RESULTS	BANDWIDTH
Pass	61.2 kHz

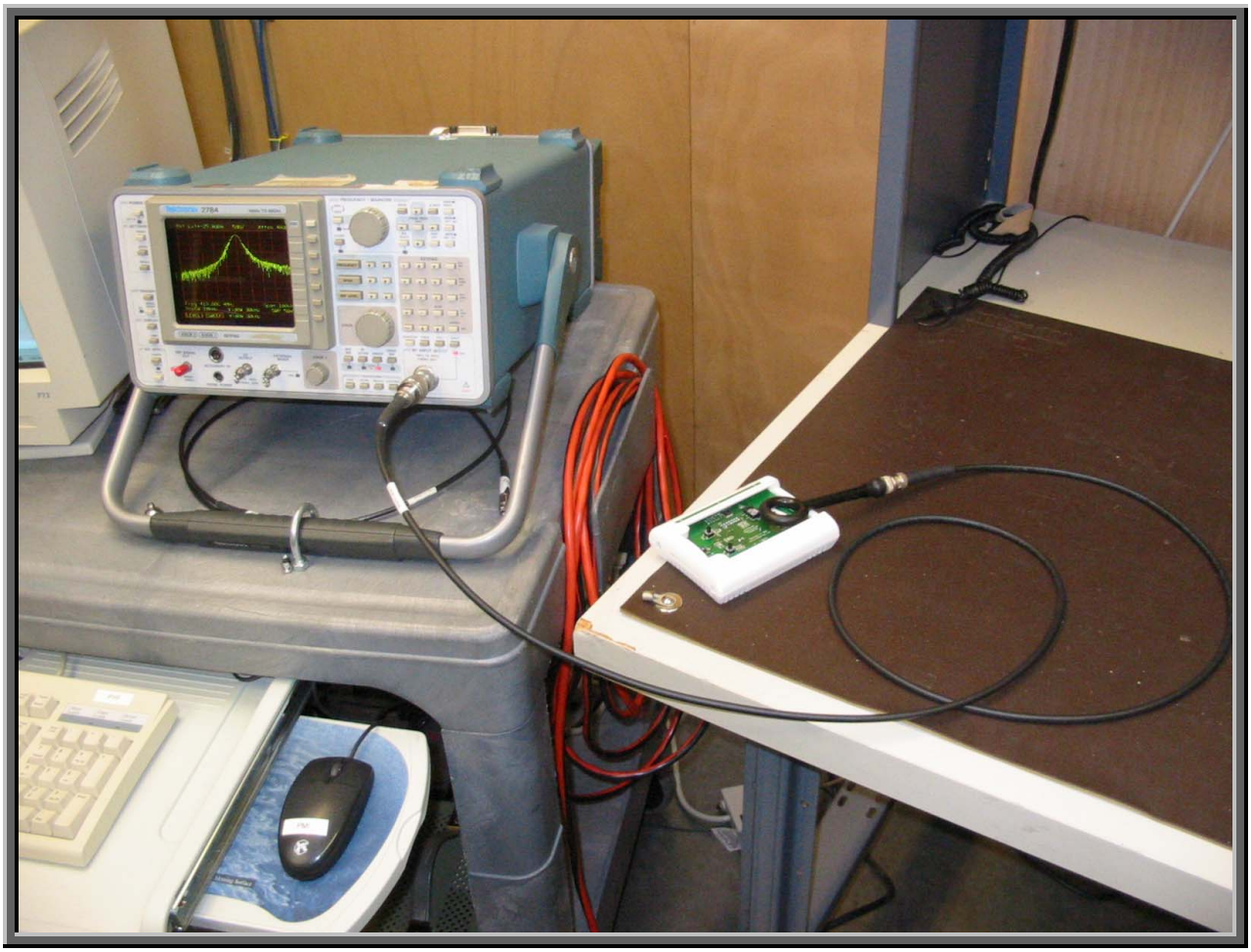
SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

Occupied Bandwidth





Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:
418MHz

Operating Modes Investigated:
Unmodulated CW

Data Rates Investigated:
Typical

Power Input Settings Investigated:
Battery

Software\Firmware Applied During Test			
Exercise software	N/A	**Version**	N/A
Description			
N/A			

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT-Temperature/rH Transmitter	Veris Industries	Temperature/rH Transmitter	102

Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Antenna, Biconilog	EMCO	3141	AXE	12/03/2003	24 mo
Pre-Amplifier	Amplifier Research	LN1000A	APS	03/01/2005	13 mo
Attenuator	Coaxicom	66702 5910-20	RBJ	02/25/2005	13 mo
Spectrum Analyzer	Hewlett-Packard	8566B	AAL	12/02/2004	13 mo
Spectrum Analyzer Display	Hewlett Packard	85662A	AALD	12/02/2004	13 mo

Test Description

Requirement: The field strength of the fundamental (transmit) frequency shall meet the limits as defined in 47 CFR 15.231(e). Field strength limits are specified at a distance of 3 meters. If average emission measurements are employed, the provisions in 15.35 for averaging pulsed emissions and for limiting peak emissions apply.

Configuration: The antennas to be used with the EUT were tested. The EUT was configured for continuous modulated operation at its single transmit frequency. The field strength of the transmit frequency was maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT in 3 orthogonal planes (per ANSI C63.4:2003).

To derive average emission measurements, a duty cycle correction factor per 15.35(c) was utilized:

Duty Cycle = On time/100 milliseconds (or the period, whichever is less)

Where "On time" = $N_1L_1 + N_2L_2 + \ldots$

Where N_1 is the number of type 1 pulses, L_1 is length of type 1 pulses, N_2 is the number of type 2 pulses, L_2 is the length of type 2 pulses, etc.

Therefore, Duty Cycle = $(N_1L_1 + N_2L_2 + \ldots)$/100mS or T, whichever is less. Where T is the period of the pulse train.

The measured values for the EUT's pulse train are as follows:

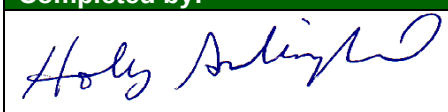
Period = 100 mSec
Pulsewidth of Type 1 Pulse = 0.150 mSec
Pulsewidth of Type 2 Pulse = 0.225 mSec
Pulsewidth of Type 3 Pulse = 0.600mSec
Pulsewidth of Type 4 Pulse = 0.975mSec
Pulsewidth of Type 5 Pulse = 1.8mSec
Number of Type 1 Pulses = 33
Number of Type 2 Pulses = 34
Number of Type 3 Pulses = 4
Number of Type 4 Pulses = 1
Number of Type 5 Pulses = 1

Duty Cycle = 20 log [((33)(0.150)+(34)(0.225)+(4)(0.6)+(1)(0.975)+(1)(1.8))/100] = -15.0 dB

The duty cycle correction factor of –15.0 dB was added to the peak readings to mathematically derive the average levels. Peak measurements were made with a resolution bandwidth of 120kHz and a video bandwidth of 300kHz.

The field strength of the fundamental (transmit) frequency meets the limits as defined in 47 CFR 15.231(e). It also meets the provisions in 15.35 for averaging pulsed emissions and for limiting peak emissions.

Completed by:



NORTHWEST EMC

Field Strength of Fundamental

ACQ 2005.6.24
EMI 2005.5.05

EUT:	Temperature / rH Transmitter	Work Order:	VERI0111
Serial Number:	102	Date:	06/22/05
Customer:	Veris Industries, Inc.	Temperature:	25
Attendees:	None	Humidity:	42%
Cust. Ref. No.:		Barometric Pressure	29.96
Tested by:	Holly Ashkannejhad	Power: Battery	Job Site: EV01

TEST SPECIFICATIONS

Specification:	FCC 15.231(e):2005	Method:	ANSI C63.4:2003

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

COMMENTS

EUT OPERATING MODES

Transmitting unmodulated CW signal at 418MHz

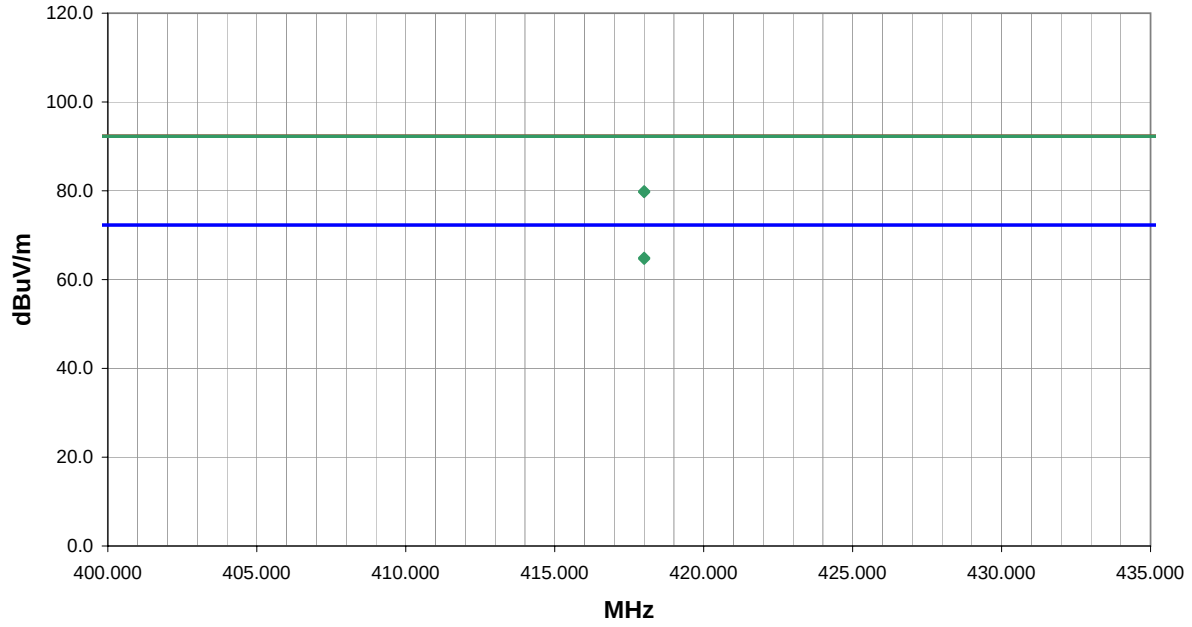
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS	Run #
Pass	1

Other

Tested By: Holly Ashkannejhad



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
418.000	65.0	-5.1	252.0	1.0	15.0	20.0	H-Bilog	AV	0.0	64.9	72.3	-7.4
418.000	64.8	-5.1	360.0	1.3	15.0	20.0	V-Bilog	AV	0.0	64.7	72.3	-7.6
418.000	65.0	-5.1	252.0	1.0	0.0	20.0	H-Bilog	PK	0.0	79.9	92.3	-12.4
418.000	64.8	-5.1	360.0	1.3	0.0	20.0	V-Bilog	PK	0.0	79.7	92.3	-12.6

NORTHWEST Field Strength

EMC

DWELL TIME

Rev BETA
01/30/01

EUT:	Temperature / rH Transmitter			Work Order:	VERI0111
Serial Number:	103			Date:	06/27/05
Customer:	Veris Industries, Inc.			Temperature:	23° C
Attendees:	N/A	Tested by:	Rod Peloquin	Humidity:	38% RH
Customer Ref. No.:	N/A	Power:	Internal Battery	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.231(e)	Year:	2005	Method:	ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

Basic Formula (15.35)): Duty cycle = $(N_1L_1+N_2L_2+...+N_{N-1}L_{N-1})$/100ms or T, whichever is less. Where N_1 is the number of pulses, L_1 is the length of type 1 pulses, etc. Where T is the period of the pulse train.

COMMENTS

EUT OPERATING MODES

Modulated

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

RESULTS — DWELL TIME DURING A SINGLE TRANSMISSION

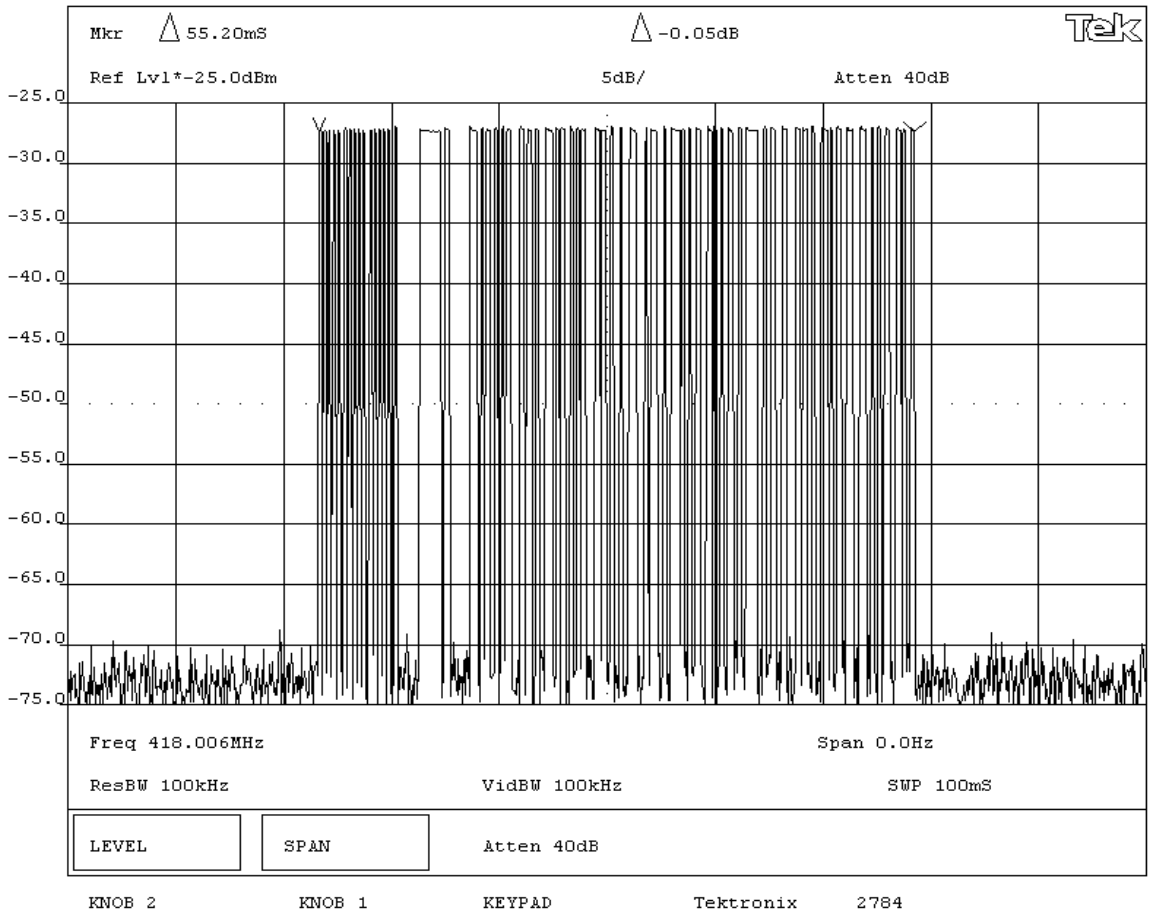
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

Duration of Transmission



NORTHWEST Field Strength

EMC

DWELL TIME

Rev BETA
01/30/01

EUT:	Temperature / rH Transmitter			Work Order:	VERI0111
Serial Number:	103			Date:	06/27/05
Customer:	Veris Industries, Inc.			Temperature:	23° C
Attendees:	N/A	Tested by:	Rod Peloquin	Humidity:	38% RH
Customer Ref. No.:	N/A	Power:	Internal Battery	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.231(e)	Year:	2005	Method:	ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

Basic Formula (15.35)): Duty cycle = $(N_1L_1+N_2L_2+\ldots+N_{N-1}L_{N-1})/100$ or T, whichever is less. Where N_1 is the number of pulses, L_1 is the length of type 1 pulses, etc. Where T is the period of the pulse train.

COMMENTS

EUT OPERATING MODES

Modulated

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

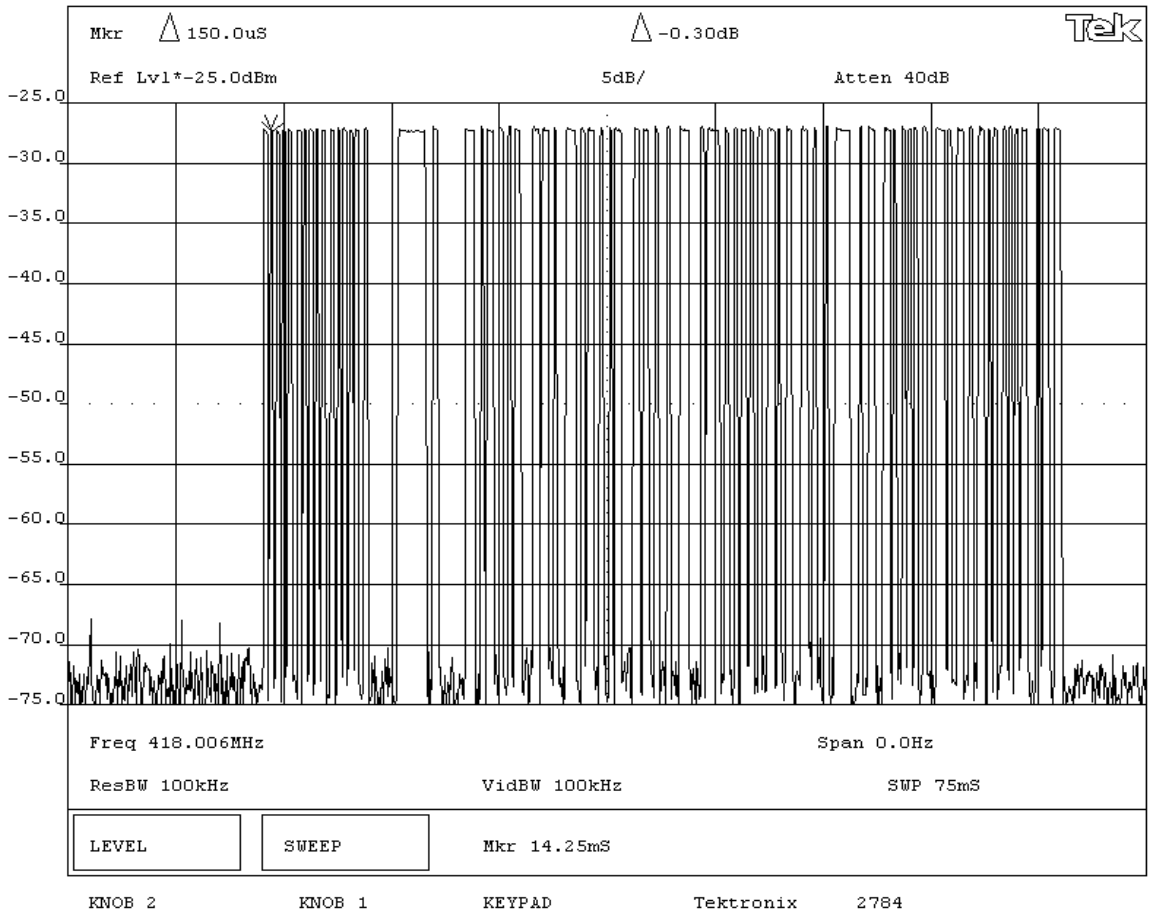
RESULTS	DWELL TIME DURING A SINGLE TRANSMISSION
Pass	Pulse 1 = 150us

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

Pulse 1



NORTHWEST Field Strength

EMC

DWELL TIME

Rev BETA
01/30/01

EUT:	Temperature / rH Transmitter			Work Order:	VERI0111
Serial Number:	103			Date:	06/27/05
Customer:	Veris Industries, Inc.			Temperature:	23° C
Attendees:	N/A	Tested by:	Rod Peloquin	Humidity:	38% RH
Customer Ref. No.:	N/A	Power:	Internal Battery	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.231(e)	Year:	2005	Method:	ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

Basic Formula (15.35)): Duty cycle = $(N_1L_1+N_2L_2+\ldots+N_{N-1}L_{N-1})/100$ or T, whichever is less. Where N_1 is the number of pulses, L_1 is the length of type 1 pulses, etc. Where T is the period of the pulse train.

COMMENTS

EUT OPERATING MODES

Modulated

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

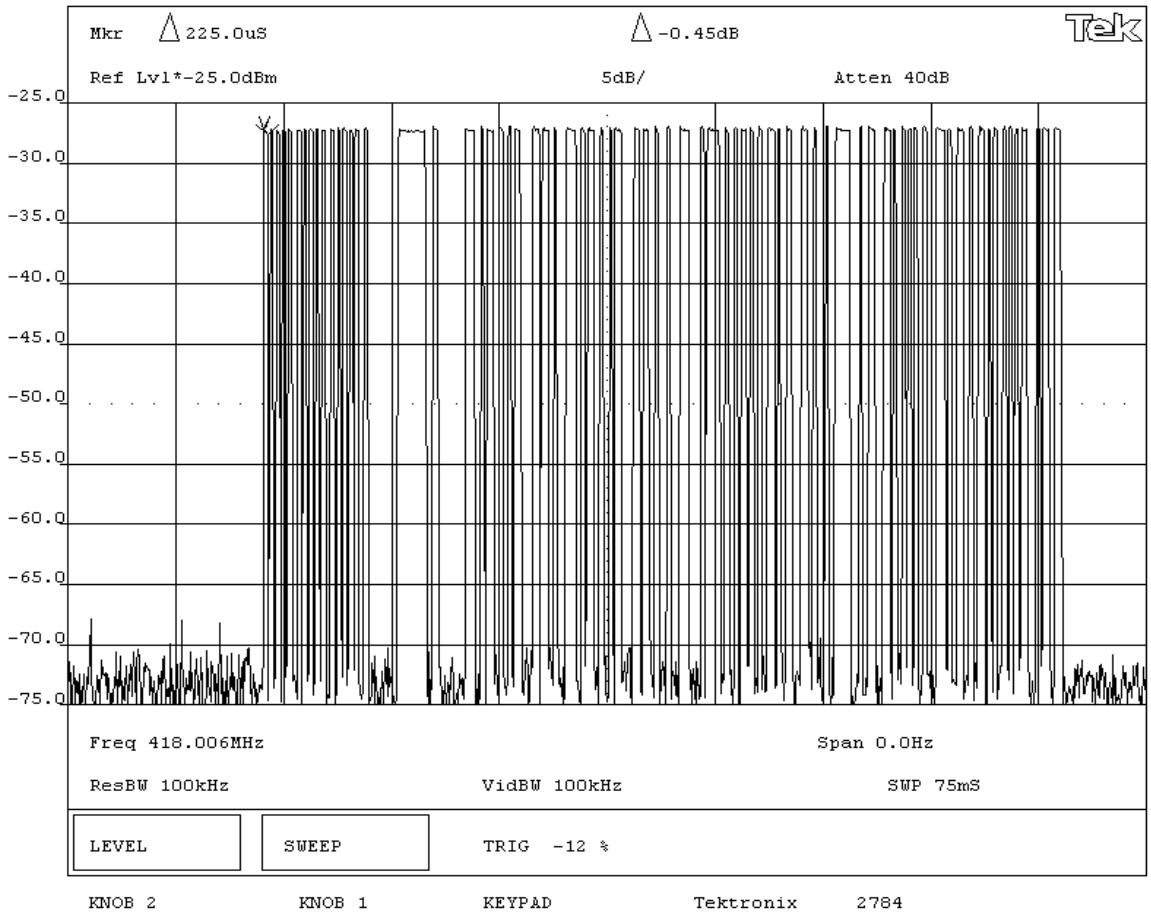
RESULTS	DWELL TIME DURING A SINGLE TRANSMISSION
Pass	Pulse 2 = 225us

SIGNATURE

Tested By: Rodney La Peloquin

DESCRIPTION OF TEST

Pulse 2



NORTHWEST Field Strength

EMC

DWELL TIME

Rev BETA
01/30/01

EUT:	Temperature / rH Transmitter			Work Order:	VERI0111
Serial Number:	103			Date:	06/27/05
Customer:	Veris Industries, Inc.			Temperature:	23° C
Attendees:	N/A	Tested by:	Rod Peloquin	Humidity:	38% RH
Customer Ref. No.:	N/A	Power:	Internal Battery	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.231(e)	Year:	2005	Method:	ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

Basic Formula (15.35)): Duty cycle = $(N_1L_1+N_2L_2+...+N_{N-1}L_{N-1})$/100ms or T, whichever is less. Where N_1 is the number of pulses, L_1 is the length of type 1 pulses, etc. Where T is the period of the pulse train.

COMMENTS

EUT OPERATING MODES

Modulated

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

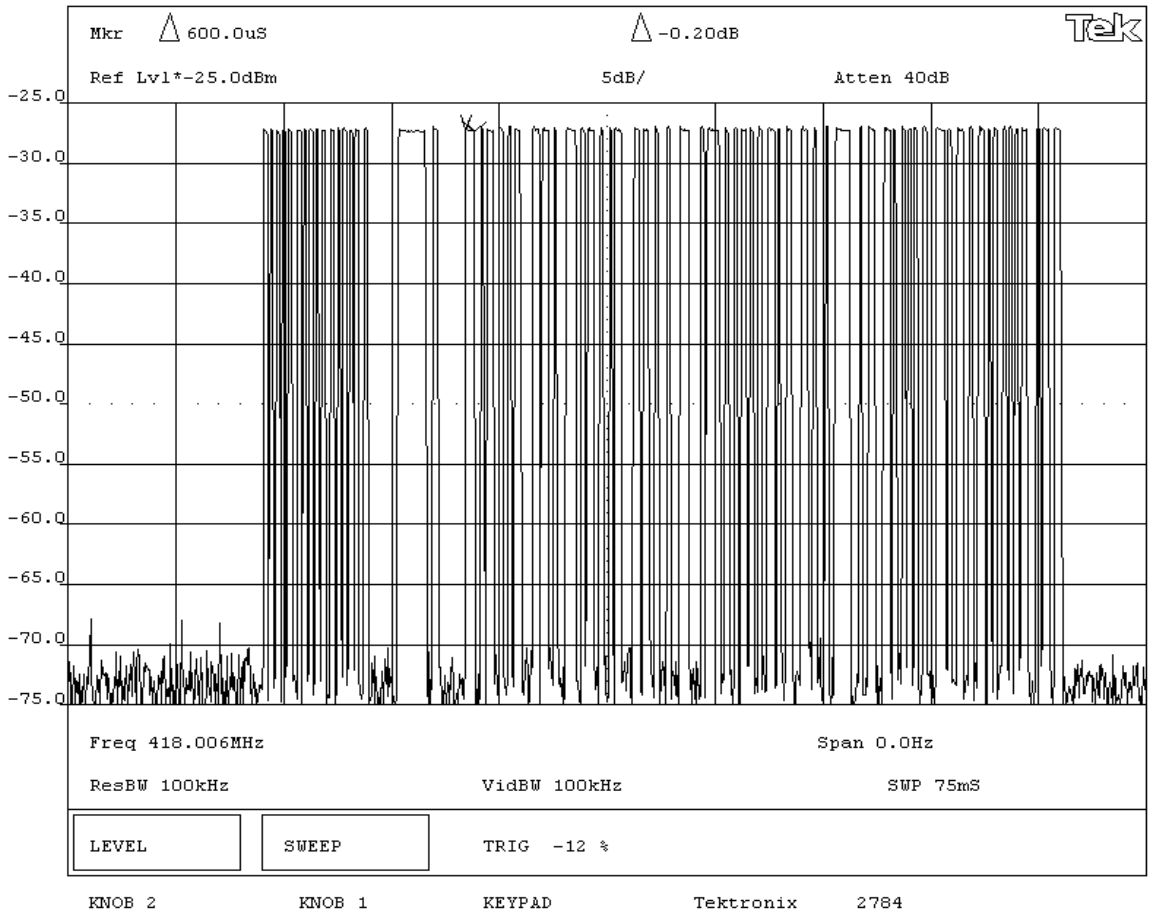
RESULTS	DWELL TIME DURING A SINGLE TRANSMISSION
Pass	Pulse 3 = 600us

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

Pulse 3



NORTHWEST Field Strength

EMC

DWELL TIME

Rev BETA
01/30/01

EUT:	Temperature / rH Transmitter			Work Order:	VERI0111
Serial Number:	103			Date:	06/27/05
Customer:	Veris Industries, Inc.			Temperature:	23° C
Attendees:	N/A	Tested by:	Rod Peloquin	Humidity:	38% RH
Customer Ref. No.:	N/A	Power:	Internal Battery	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.231(e)	Year:	2005	Method:	ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

Basic Formula (15.35)): Duty cycle = $(N_1L_1+N_2L_2+\ldots+N_{N-1}L_{N-1})/100$ or T, whichever is less. Where N_1 is the number of pulses, L_1 is the length of type 1 pulses, etc. Where T is the period of the pulse train.

COMMENTS

EUT OPERATING MODES

Modulated

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

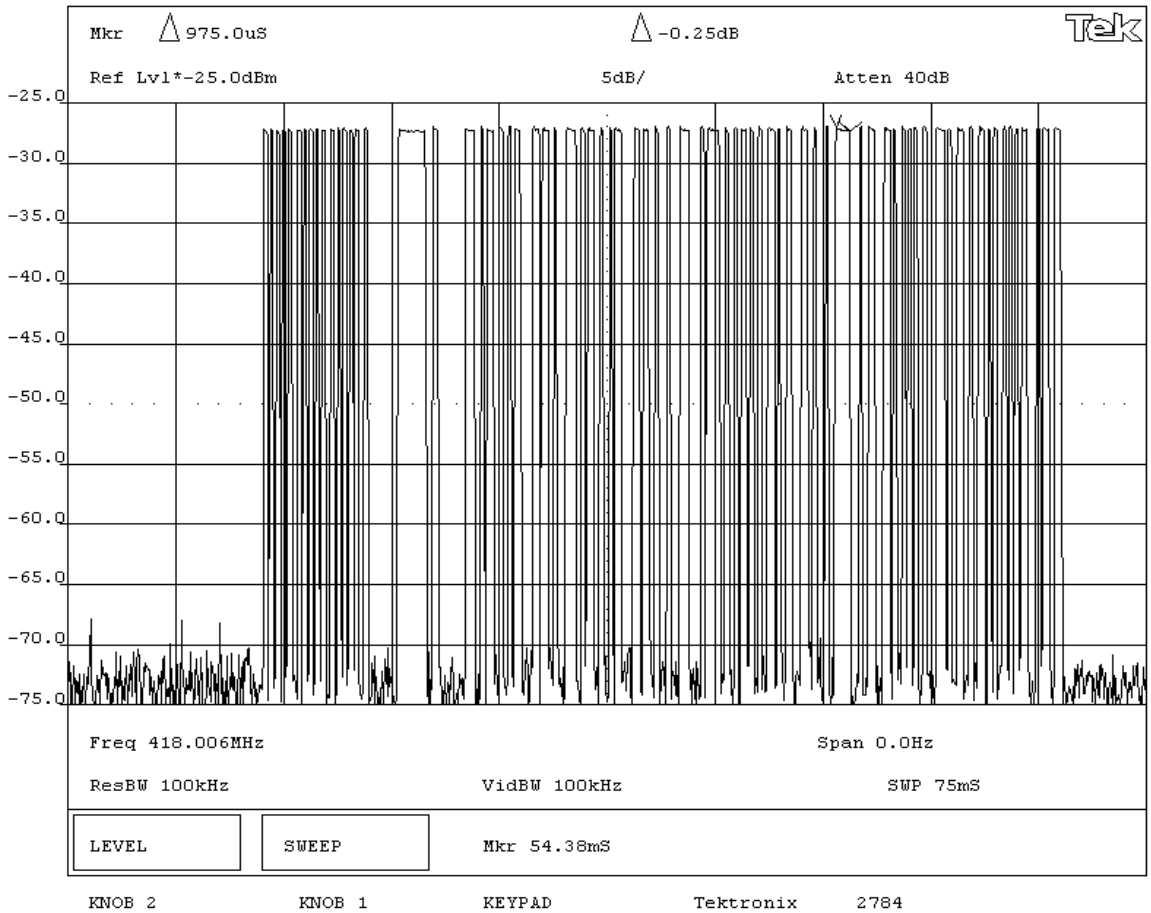
RESULTS	DWELL TIME DURING A SINGLE TRANSMISSION
Pass	Pulse 4 = 975us

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

Pulse 4



NORTHWEST Field Strength

EMC

DWELL TIME

Rev BETA
01/30/01

EUT:	Temperature / rH Transmitter			Work Order:	VERI0111
Serial Number:	103			Date:	06/27/05
Customer:	Veris Industries, Inc.			Temperature:	23° C
Attendees:	N/A	Tested by:	Rod Peloquin	Humidity:	38% RH
Customer Ref. No.:	N/A	Power:	Internal Battery	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.231(e)	Year:	2005	Method:	ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

Basic Formula (15.35)): Duty cycle = $(N_1L_1+N_2L_2+\ldots+N_{N-1}L_{N-1})/100$ or T, whichever is less. Where N_1 is the number of pulses, L_1 is the length of type 1 pulses, etc. Where T is the period of the pulse train.

COMMENTS

EUT OPERATING MODES

Modulated

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

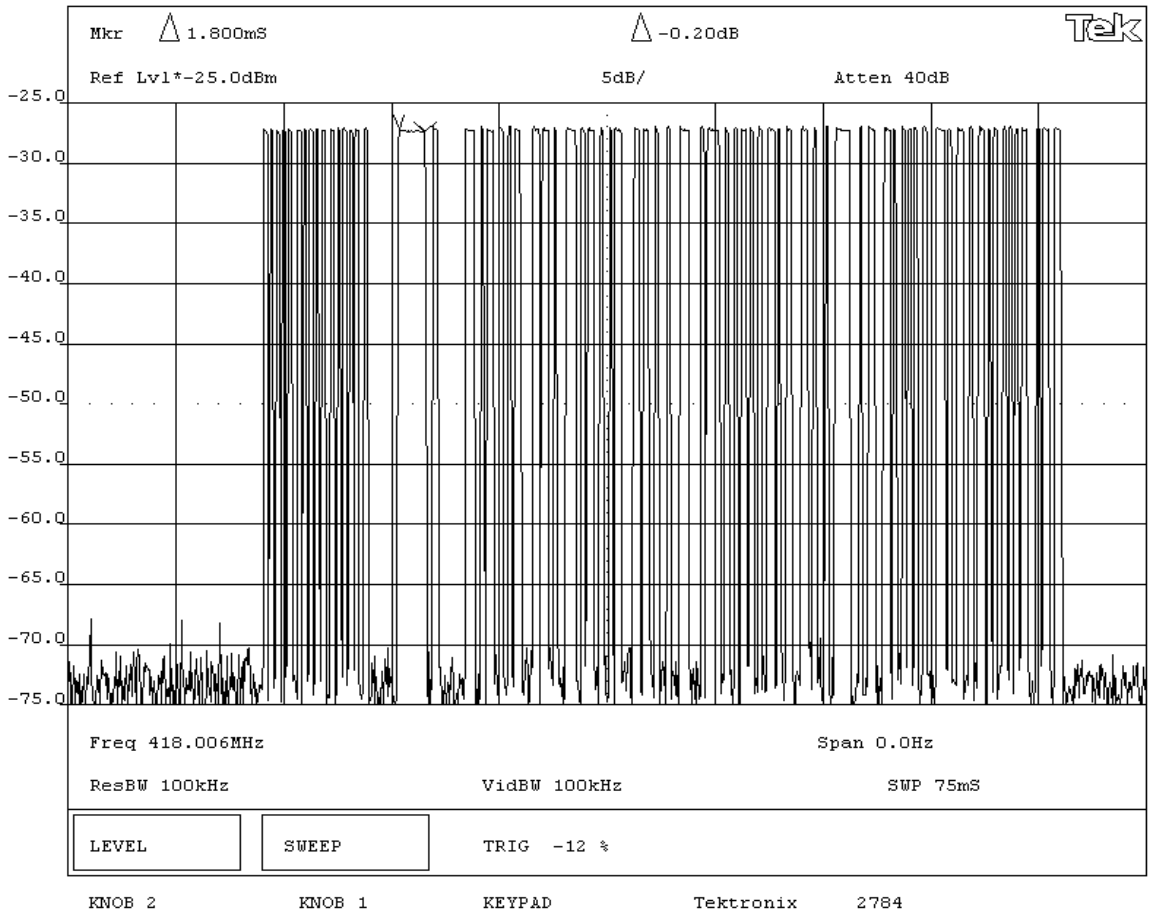
RESULTS	DWELL TIME DURING A SINGLE TRANSMISSION
Pass	Pulse 5 = 1.8ms

SIGNATURE

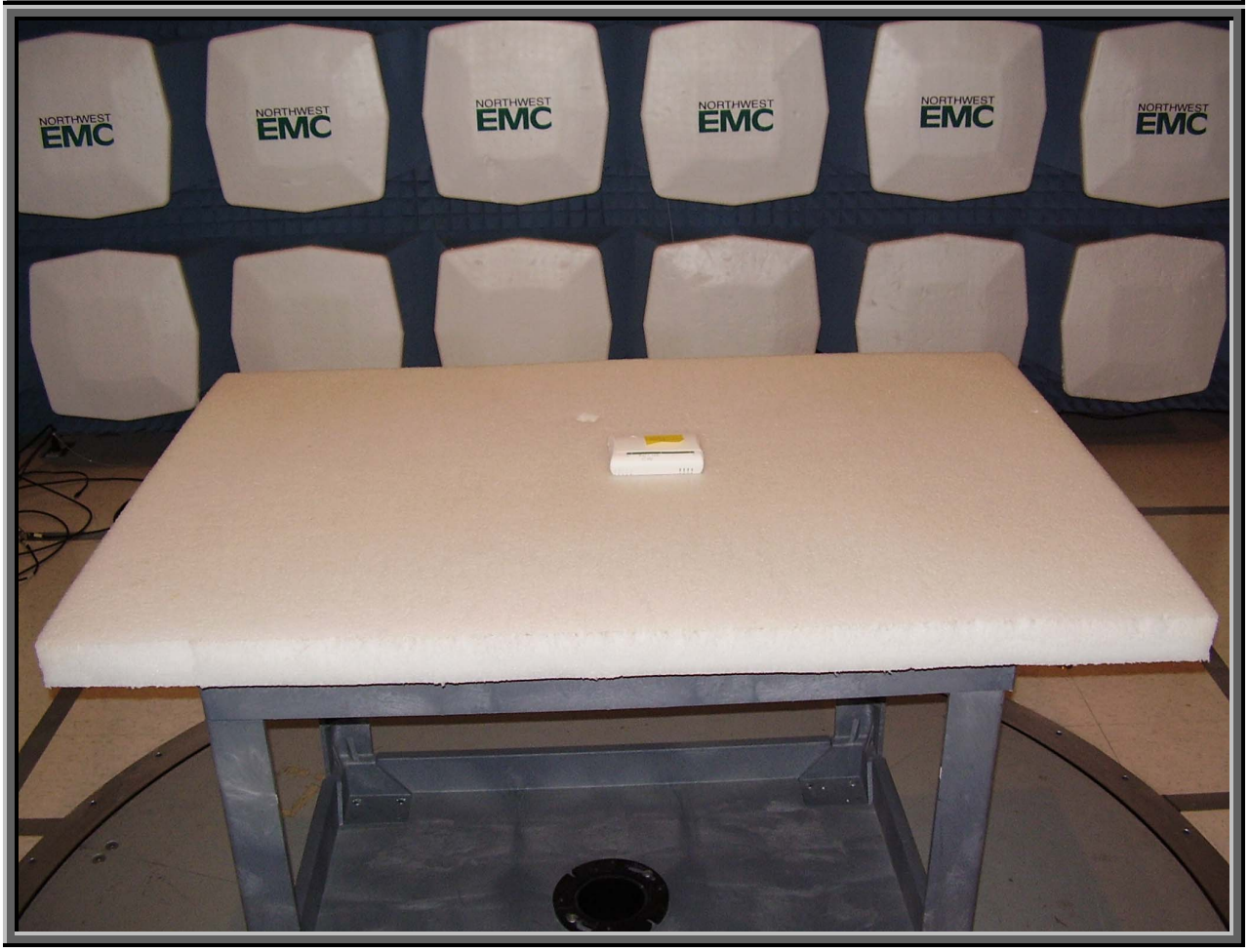
Tested By: _____

DESCRIPTION OF TEST

Pulse 5




NORTHWEST
EMC


NORTHWEST
EMC


NORTHWEST
EMC
NORTHWEST
EMC
NORTHWEST
EMC
NORTHWEST
EMC

Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:
418MHz

Operating Modes Investigated:
Unmodulated CW

Data Rates Investigated:
Typical

Power Input Settings Investigated:
Battery

Software\Firmware Applied During Test			
Exercise software	N/A	**Version**	N/A

EUT and Peripherals			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
EUT-Temperature/rH Transmitter	Veris Industries	Temperature/rH Transmitter	102

Measurement Equipment					
Description	**Manufacturer**	**Model**	**Identifier**	**Last Cal**	**Interval**
Antenna, Horn	EMCO	3115	AHC	09/07/2004	12 mo
Pre-Amplifier	Miteq	AMF-4D-005180-24-10P	APJ	05/05/2005	3 mo
Antenna, Biconilog	EMCO	3141	AXE	12/03/2003	24 mo
Pre-Amplifier	Amplifier Research	LN1000A	APS	03/01/2005	13 mo
Attenuator	Coaxicom	66702 5910-20	RBJ	02/25/2005	13 mo
Spectrum Analyzer	Hewlett-Packard	8566B	AAL	12/02/2004	13 mo
Spectrum Analyzer Display	Hewlett Packard	85662A	AALD	12/02/2004	13 mo

Test Description

Requirement: The field strength of the spurious emissions shall meet the limits as defined in 47 CFR 15.231(e). If average emission measurements are employed, the provisions in 15.35 for averaging pulsed emissions and for limiting peak emissions apply. Further, compliance with the provisions of 15.205 shall be demonstrated using the measurement instrumentation specified in that section.

Configuration: The single, integral antenna to be used with the EUT was tested. The EUT was configured for un-modulated, CW operation at its single transmit frequency. The field strength of the transmit frequency was maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT in 3 orthogonal planes (per ANSI C63.4:2003).

A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

To derive average emission measurements, a duty cycle correction factor per 15.35(c) was utilized:

Duty Cycle = On time/100 milliseconds (or the period, whichever is less)

Where "On time" = $N_1L_1 + N_2L_2 + \ldots$

Where N_1 is the number of type 1 pulses, L_1 is length of type 1 pulses, N_2 is the number of type 2 pulses, L_2 is the length of type 2 pulses, etc.

Therefore, Duty Cycle = $(N_1L_1 + N_2L_2 + \ldots)$/100mS or T, whichever is less. Where T is the period of the pulse train.

The measured values for the EUT's pulse train are as follows:

Period = 100 mSec
Pulsewidth of Type 1 Pulse = 0.150 mSec
Pulsewidth of Type 2 Pulse = 0.225 mSec
Pulsewidth of Type 3 Pulse = 0.600mSec
Pulsewidth of Type 4 Pulse = 0.975mSec
Pulsewidth of Type 5 Pulse = 1.8mSec
Number of Type 1 Pulses = 33
Number of Type 2 Pulses = 34
Number of Type 3 Pulses = 4
Number of Type 4 Pulses = 1
Number of Type 5 Pulses = 1

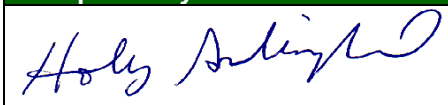
Duty Cycle = 20 log [((33)(0.150)+(34)(0.225)+(4)(0.6)+(1)(0.975)+(1)(1.8))/100] = -15.0 dB

The duty cycle correction factor of –15.0 dB was added to the peak readings to mathematically derive the average levels. Peak measurements were made with a resolution bandwidth of 120kHz and a video bandwidth of 300kHz for measurements at or below 1GHz. Above 1GHz, a resolution bandwidth of 1MHz and a video bandwidth of 1MHz was used.

The field strength of the spurious emissions meet the limits as defined in 47 CFR 15.231(e). The spurious emissions also meet the provisions in 15.35 for averaging pulsed emissions and for limiting peak emissions. Further, spurious emissions meet the provisions of 15.205 using the measurement instrumentation specified in that section.

Bandwidths Used for Measurements			
Frequency Range (MHz)	**Peak Data (kHz)**	**Quasi-Peak Data (kHz)**	**Average Data (kHz)**
0.01 – 0.15	1.0	0.2	0.2
0.15 – 30.0	10.0	9.0	9.0
30.0 – 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0
Measurements were made using the bandwidths and detectors specified. No video filter was used.			

Completed by:



NORTHWEST EMC

Field Strength of Spurious Emissions

ACQ 2005.6.24
EMI 2005.5.05

EUT:	Temperature / rH Transmitter	Work Order:	VERI0111
Serial Number:	102	Date:	06/22/05
Customer:	Veris Industries, Inc.	Temperature:	25
Attendees:	None	Humidity:	42%
Cust. Ref. No.:		Barometric Pressure	29.96
Tested by:	Holly Ashkannejhad	Power: Battery	Job Site: EV01

TEST SPECIFICATIONS

Specification:	FCC 15.231(e):2005	Method:	ANSI C63.4:2003

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

COMMENTS

EUT OPERATING MODES

Transmitting unmodulated CW signal at 418MHz

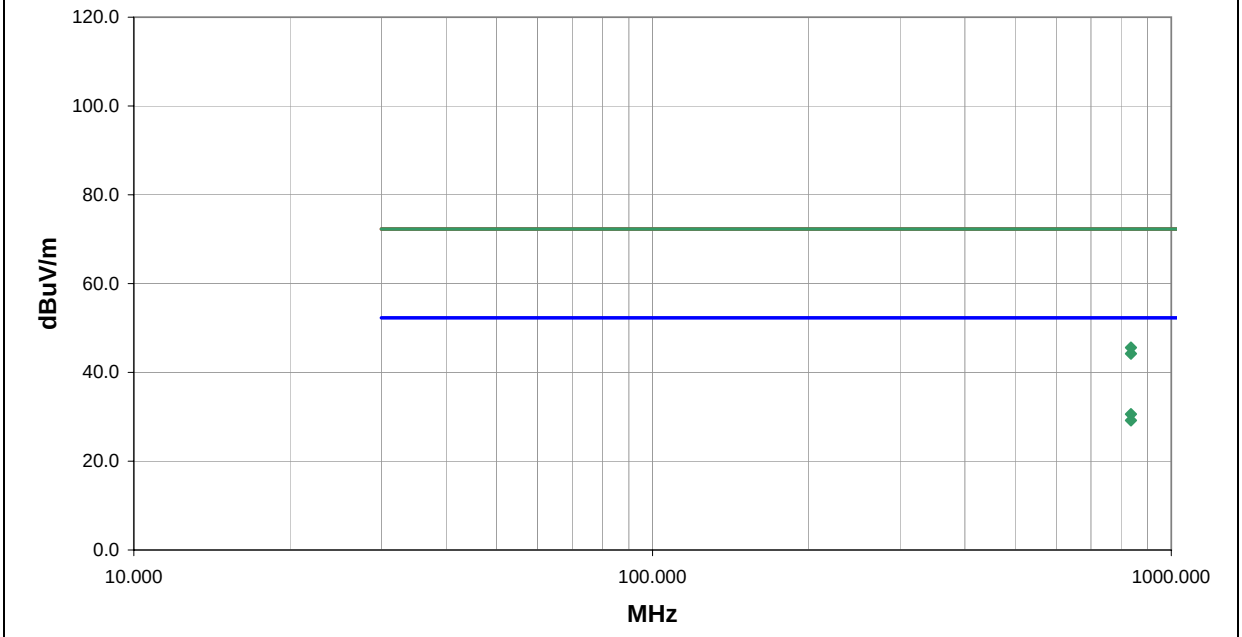
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS	Run #
Pass	2

Other

Tested By: Holly Ashkannejhad



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
836.010	45.4	0.2	21.0	1.1	15.0	0.0	H-Bilog	AV	0.0	30.6	52.3	-21.7
836.010	44.0	0.2	189.0	1.3	15.0	0.0	V-Bilog	AV	0.0	29.2	52.3	-23.1
836.010	45.4	0.2	21.0	1.1	0.0	0.0	H-Bilog	PK	0.0	45.6	72.3	-26.7
836.010	44.0	0.2	189.0	1.3	0.0	0.0	V-Bilog	PK	0.0	44.2	72.3	-28.1

NORTHWEST EMC

Field Strength of Spurious Emissions

ACQ 2005.6.24
EMI 2005.5.05

EUT:	Temperature / rH Transmitter	Work Order:	VERI0111
Serial Number:	102	Date:	06/23/05
Customer:	Veris Industries, Inc.	Temperature:	25
Attendees:	None	Humidity:	42%
Cust. Ref. No.:		Barometric Pressure	29.96
Tested by:	Holly Ashkannejhad	Power: Battery	Job Site: EV01

TEST SPECIFICATIONS

Specification:	FCC 15.231(e):2005	Method:	ANSI C63.4:2003

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

COMMENTS

EUT OPERATING MODES

Transmitting unmodulated CW signal at 418MHz

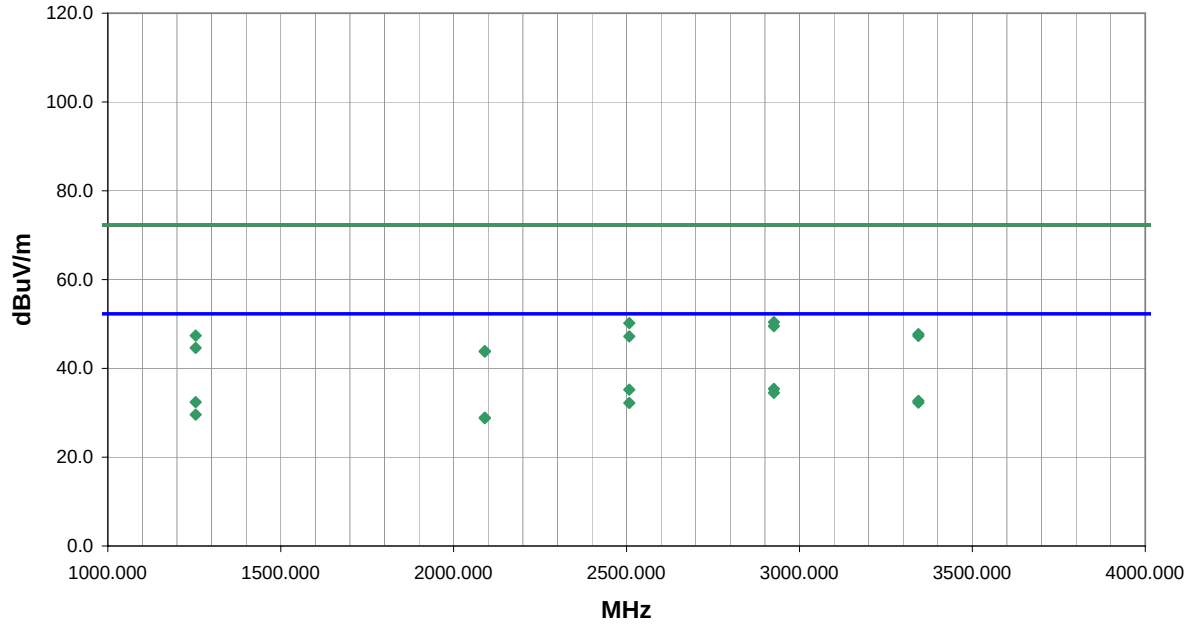
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS	Run #
Pass	4

Other

Tested By: Holly Ashkannejhad



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
2926.040	50.7	-0.3	302.0	1.6	15.0	0.0	H-Horn	AV	0.0	35.4	52.3	-16.9
2508.021	52.4	-2.2	304.0	1.2	15.0	0.0	V-Horn	AV	0.0	35.2	52.3	-17.1
2926.040	49.8	-0.3	2.0	1.2	15.0	0.0	V-Horn	AV	0.0	34.5	52.3	-17.8
3344.042	46.5	1.2	177.0	1.5	15.0	0.0	H-Horn	AV	0.0	32.7	52.3	-19.6
1254.031	55.2	-7.8	284.0	2.1	15.0	0.0	H-Horn	AV	0.0	32.4	52.3	-19.9
3344.042	46.1	1.2	31.0	1.2	15.0	0.0	V-Horn	AV	0.0	32.3	52.3	-20.0
2508.021	49.4	-2.2	285.0	1.1	15.0	0.0	H-Horn	AV	0.0	32.2	52.3	-20.1
2926.040	50.7	-0.3	302.0	1.6	0.0	0.0	H-Horn	PK	0.0	50.4	72.3	-21.9
2508.021	52.4	-2.2	304.0	1.2	0.0	0.0	V-Horn	PK	0.0	50.2	72.3	-22.1
1254.031	52.4	-7.8	189.0	1.4	15.0	0.0	V-Horn	AV	0.0	29.6	52.3	-22.7
2926.040	49.8	-0.3	2.0	1.2	0.0	0.0	V-Horn	PK	0.0	49.5	72.3	-22.8
2090.039	47.3	-3.4	160.0	1.2	15.0	0.0	H-Horn	AV	0.0	28.9	52.3	-23.4
2090.039	47.2	-3.4	237.0	1.1	15.0	0.0	V-Horn	AV	0.0	28.8	52.3	-23.5
3344.042	46.5	1.2	177.0	1.5	0.0	0.0	H-Horn	PK	0.0	47.7	72.3	-24.6
1254.031	55.2	-7.8	284.0	2.1	0.0	0.0	H-Horn	PK	0.0	47.4	72.3	-24.9
3344.042	46.1	1.2	31.0	1.2	0.0	0.0	V-Horn	PK	0.0	47.3	72.3	-25.0
2508.021	49.4	-2.2	285.0	1.1	0.0	0.0	H-Horn	PK	0.0	47.2	72.3	-25.1
1254.031	52.4	-7.8	189.0	1.4	0.0	0.0	V-Horn	PK	0.0	44.6	72.3	-27.7
2090.039	47.3	-3.4	160.0	1.2	0.0	0.0	H-Horn	PK	0.0	43.9	72.3	-28.4
2090.039	47.2	-3.4	237.0	1.1	0.0	0.0	V-Horn	PK	0.0	43.8	72.3	-28.5

NORTHWEST EMC

Field Strength of Spurious Emissions

ACQ 2005.6.24
EMI 2005.5.05

EUT:	Temperature / rH Transmitter	Work Order:	VERI0111
Serial Number:	102	Date:	06/23/05
Customer:	Veris Industries, Inc.	Temperature:	25
Attendees:	None	Humidity:	42%
Cust. Ref. No.:		Barometric Pressure	29.96
Tested by:	Holly Ashkannejhad	Power: Battery	Job Site: EV01

TEST SPECIFICATIONS

Specification:	FCC 15.209(a):2005-04	Method:	ANSI C63.4:2003

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

COMMENTS

EUT OPERATING MODES

Transmitting unmodulated CW signal at 418MHz

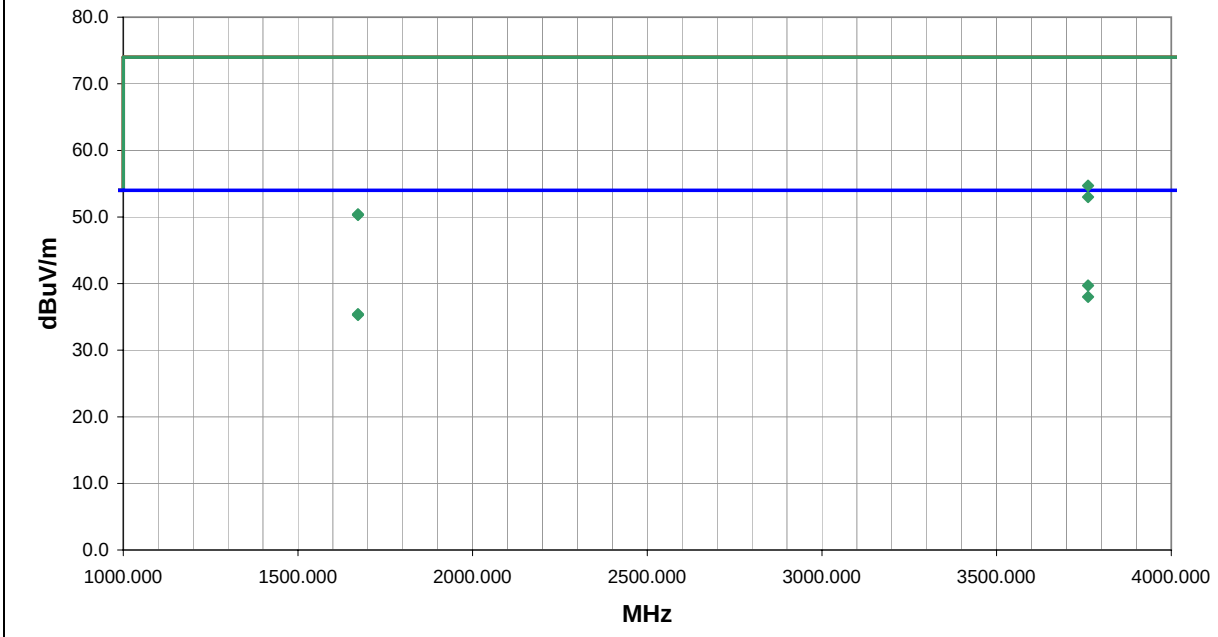
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS	Run #
Pass	5

Other

Tested By:



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
3762.051	51.8	2.9	161.0	1.2	15.0	0.0	H-Horn	AV	0.0	39.7	54.0	-14.3
3762.051	50.1	2.9	15.0	1.6	15.0	0.0	V-Horn	AV	0.0	38.0	54.0	-16.0
4180.052	47.9	4.2	60.0	1.8	15.0	0.0	H-Horn	AV	0.0	37.1	54.0	-16.9
1672.048	56.1	-5.7	78.0	1.2	15.0	0.0	H-Horn	AV	0.0	35.4	54.0	-18.6
1672.048	56.0	-5.7	194.0	1.1	15.0	0.0	V-Horn	AV	0.0	35.3	54.0	-18.7
4180.052	45.9	4.2	161.0	1.5	15.0	0.0	V-Horn	AV	0.0	35.1	54.0	-18.9
3762.051	51.8	2.9	161.0	1.2	0.0	0.0	H-Horn	PK	0.0	54.7	74.0	-19.3
3762.051	50.1	2.9	15.0	1.6	0.0	0.0	V-Horn	PK	0.0	53.0	74.0	-21.0
4180.052	47.9	4.2	60.0	1.8	0.0	0.0	H-Horn	PK	0.0	52.1	74.0	-21.9
1672.048	56.1	-5.7	78.0	1.2	0.0	0.0	H-Horn	PK	0.0	50.4	74.0	-23.6
1672.048	56.0	-5.7	194.0	1.1	0.0	0.0	V-Horn	PK	0.0	50.3	74.0	-23.7
4180.052	45.9	4.2	161.0	1.5	0.0	0.0	V-Horn	PK	0.0	50.1	74.0	-23.9

NORTHWEST Field Strength

EMC

DWELL TIME

Rev BETA
01/30/01

EUT:	Temperature / rH Transmitter			Work Order:	VERI0111
Serial Number:	103			Date:	06/27/05
Customer:	Veris Industries, Inc.			Temperature:	23° C
Attendees:	N/A	Tested by:	Rod Peloquin	Humidity:	38% RH
Customer Ref. No.:	N/A	Power:	Internal Battery	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.231(e)	Year:	2005	Method:	ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

Basic Formula (15.35)): Duty cycle = $(N_1L_1+N_2L_2+...+N_{N-1}L_{N-1})$/100ms or T, whichever is less. Where N_1 is the number of pulses, L_1 is the length of type 1 pulses, etc. Where T is the period of the pulse train.

COMMENTS

EUT OPERATING MODES

Modulated

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

RESULTS — DWELL TIME DURING A SINGLE TRANSMISSION

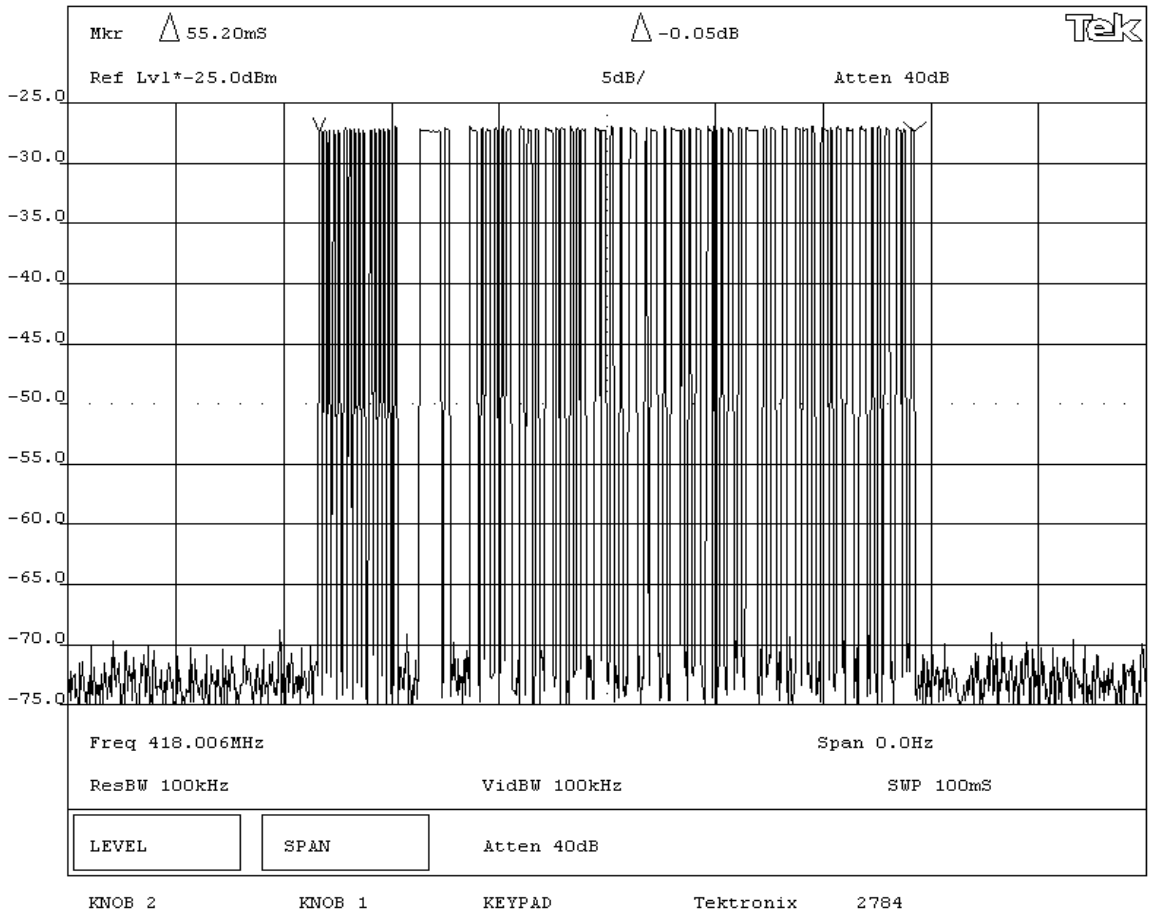
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

Duration of Transmission



NORTHWEST Field Strength

EMC

DWELL TIME

Rev BETA
01/30/01

EUT:	Temperature / rH Transmitter			Work Order:	VERI0111
Serial Number:	103			Date:	06/27/05
Customer:	Veris Industries, Inc.			Temperature:	23° C
Attendees:	N/A	Tested by:	Rod Peloquin	Humidity:	38% RH
Customer Ref. No.:	N/A	Power:	Internal Battery	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.231(e)	Year:	2005	Method:	ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

Basic Formula (15.35)): Duty cycle = $(N_1L_1+N_2L_2+\ldots+N_{N-1}L_{N-1})/100$ or T, whichever is less. Where N_1 is the number of pulses, L_1 is the length of type 1 pulses, etc. Where T is the period of the pulse train.

COMMENTS

EUT OPERATING MODES

Modulated

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

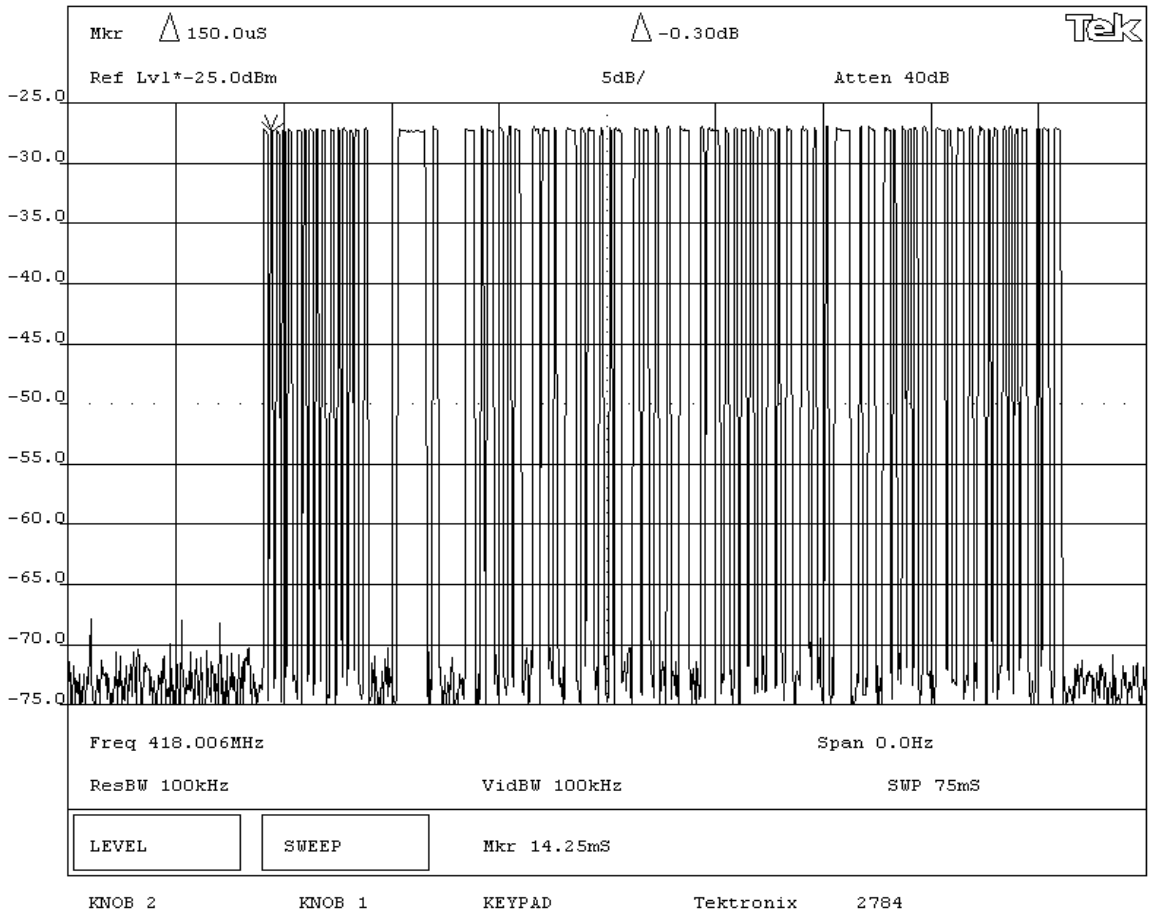
RESULTS	DWELL TIME DURING A SINGLE TRANSMISSION
Pass	Pulse 1 = 150us

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

Pulse 1



NORTHWEST Field Strength

EMC

DWELL TIME

Rev BETA
01/30/01

EUT:	Temperature / rH Transmitter			Work Order:	VERI0111
Serial Number:	103			Date:	06/27/05
Customer:	Veris Industries, Inc.			Temperature:	23° C
Attendees:	N/A	Tested by:	Rod Peloquin	Humidity:	38% RH
Customer Ref. No.:	N/A	Power:	Internal Battery	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.231(e)	Year:	2005	Method:	ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

Basic Formula (15.35)): Duty cycle = $(N_1L_1+N_2L_2+\ldots+N_{N-1}L_{N-1})/100$ or T, whichever is less. Where N_1 is the number of pulses, L_1 is the length of type 1 pulses, etc. Where T is the period of the pulse train.

COMMENTS

EUT OPERATING MODES

Modulated

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

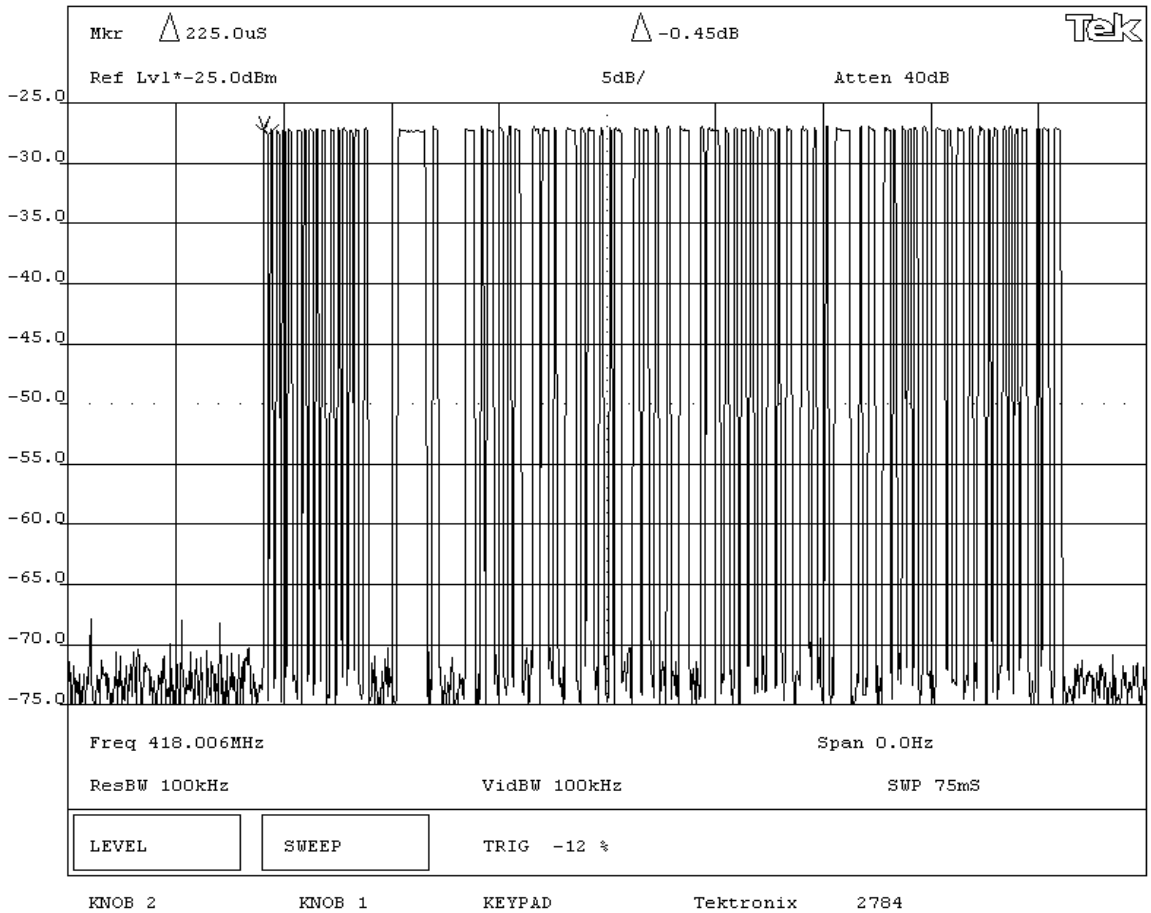
RESULTS	DWELL TIME DURING A SINGLE TRANSMISSION
Pass	Pulse 2 = 225us

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

Pulse 2



NORTHWEST Field Strength

EMC

DWELL TIME

Rev BETA
01/30/01

EUT:	Temperature / rH Transmitter			Work Order:	VERI0111
Serial Number:	103			Date:	06/27/05
Customer:	Veris Industries, Inc.			Temperature:	23° C
Attendees:	N/A	Tested by:	Rod Peloquin	Humidity:	38% RH
Customer Ref. No.:	N/A	Power:	Internal Battery	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.231(e)	Year:	2005	Method:	ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

Basic Formula (15.35)): Duty cycle = $(N_1L_1+N_2L_2+...+N_{N-1}L_{N-1})$/100ms or T, whichever is less. Where N_1 is the number of pulses, L_1 is the length of type 1 pulses, etc. Where T is the period of the pulse train.

COMMENTS

EUT OPERATING MODES

Modulated

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

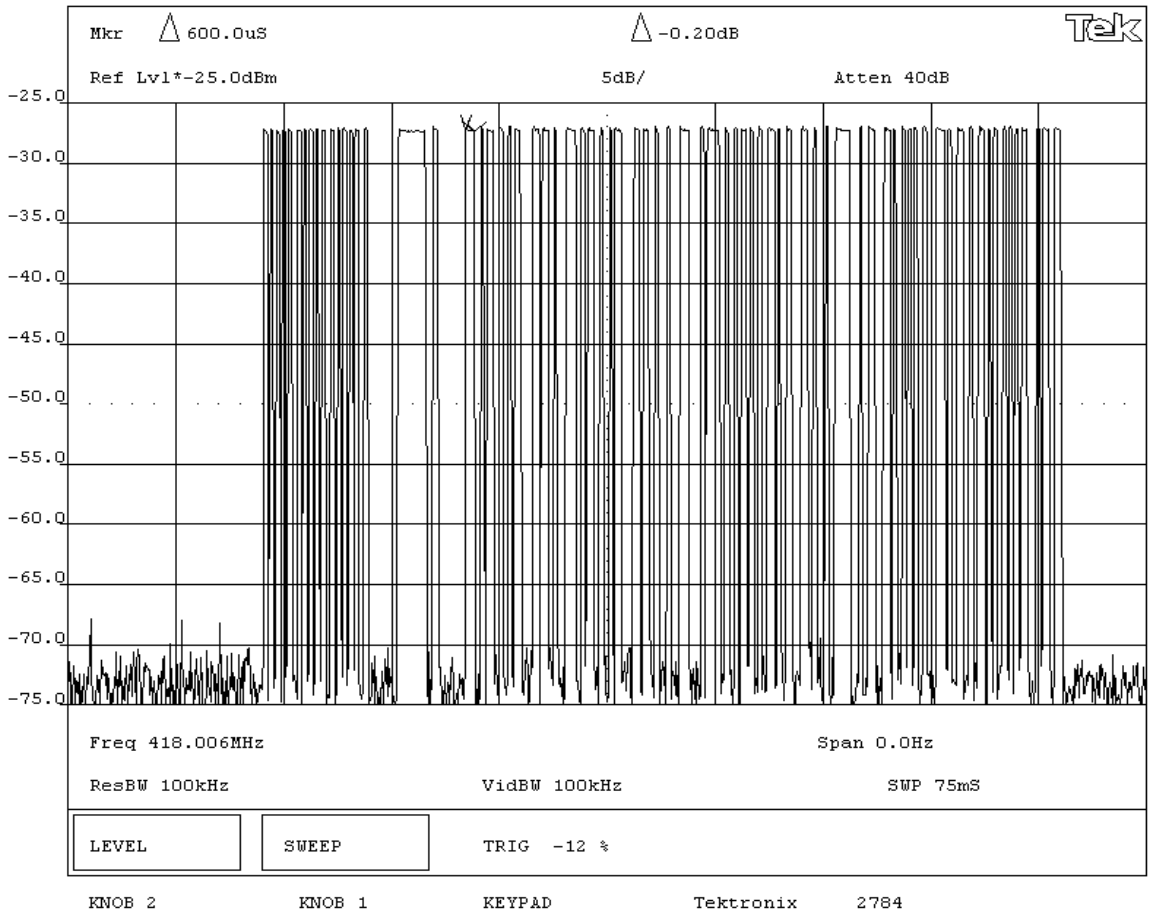
RESULTS	DWELL TIME DURING A SINGLE TRANSMISSION
Pass	Pulse 3 = 600us

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

Pulse 3



NORTHWEST Field Strength

EMC

DWELL TIME

Rev BETA
01/30/01

EUT:	Temperature / rH Transmitter			Work Order:	VERI0111
Serial Number:	103			Date:	06/27/05
Customer:	Veris Industries, Inc.			Temperature:	23° C
Attendees:	N/A	Tested by:	Rod Peloquin	Humidity:	38% RH
Customer Ref. No.:	N/A	Power:	Internal Battery	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.231(e)	Year:	2005	Method:	ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

Basic Formula (15.35)): Duty cycle = $(N_1L_1+N_2L_2+\ldots+N_{N-1}L_{N-1})/100$ or T, whichever is less. Where N_1 is the number of pulses, L_1 is the length of type 1 pulses, etc. Where T is the period of the pulse train.

COMMENTS

EUT OPERATING MODES

Modulated

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

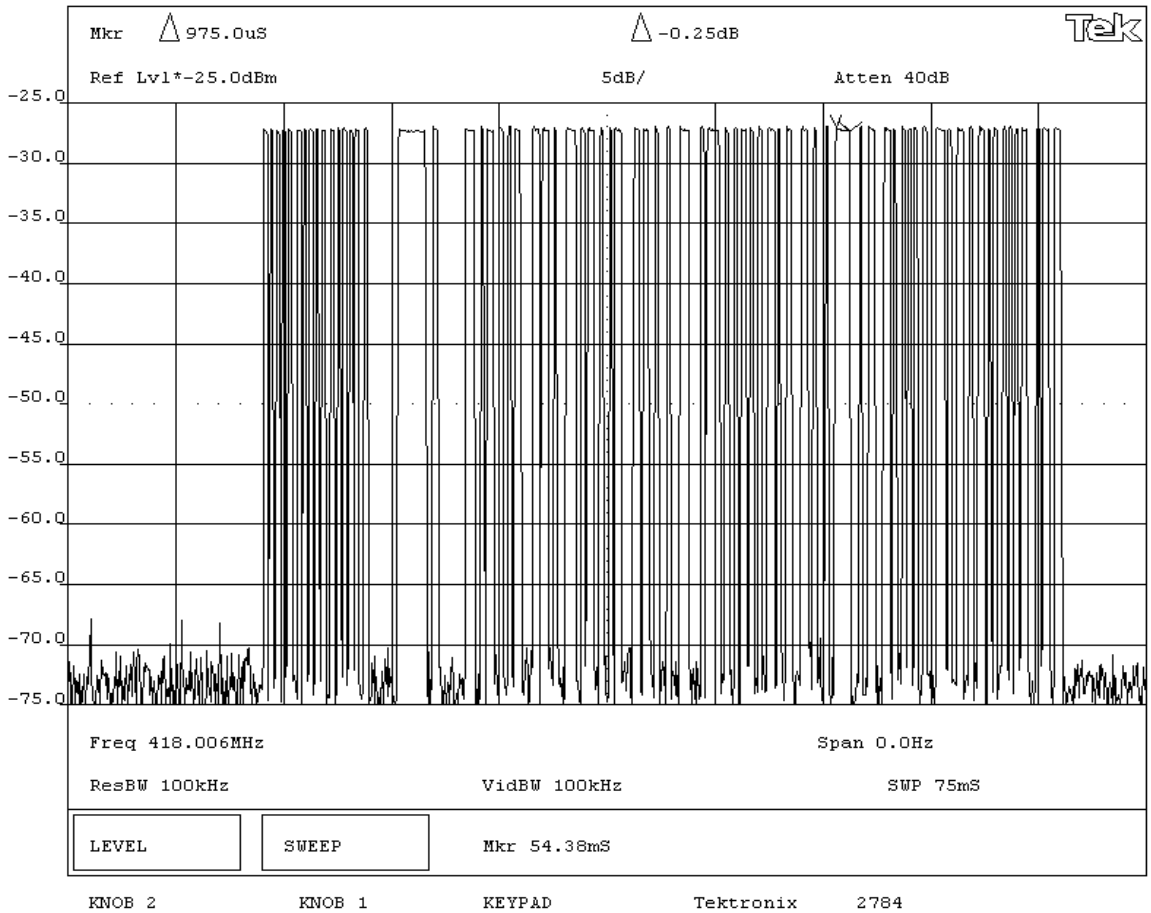
RESULTS	DWELL TIME DURING A SINGLE TRANSMISSION
Pass	Pulse 4 = 975us

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

Pulse 4



NORTHWEST Field Strength

EMC

DWELL TIME

Rev BETA
01/30/01

EUT:	Temperature / rH Transmitter			Work Order:	VERI0111
Serial Number:	103			Date:	06/27/05
Customer:	Veris Industries, Inc.			Temperature:	23° C
Attendees:	N/A	Tested by:	Rod Peloquin	Humidity:	38% RH
Customer Ref. No.:	N/A	Power:	Internal Battery	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.231(e)	Year:	2005	Method:	ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

Basic Formula (15.35)): Duty cycle = $(N_1L_1+N_2L_2+\ldots+N_{N-1}L_{N-1})/100$ or T, whichever is less. Where N_1 is the number of pulses, L_1 is the length of type 1 pulses, etc. Where T is the period of the pulse train.

COMMENTS

EUT OPERATING MODES

Modulated

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

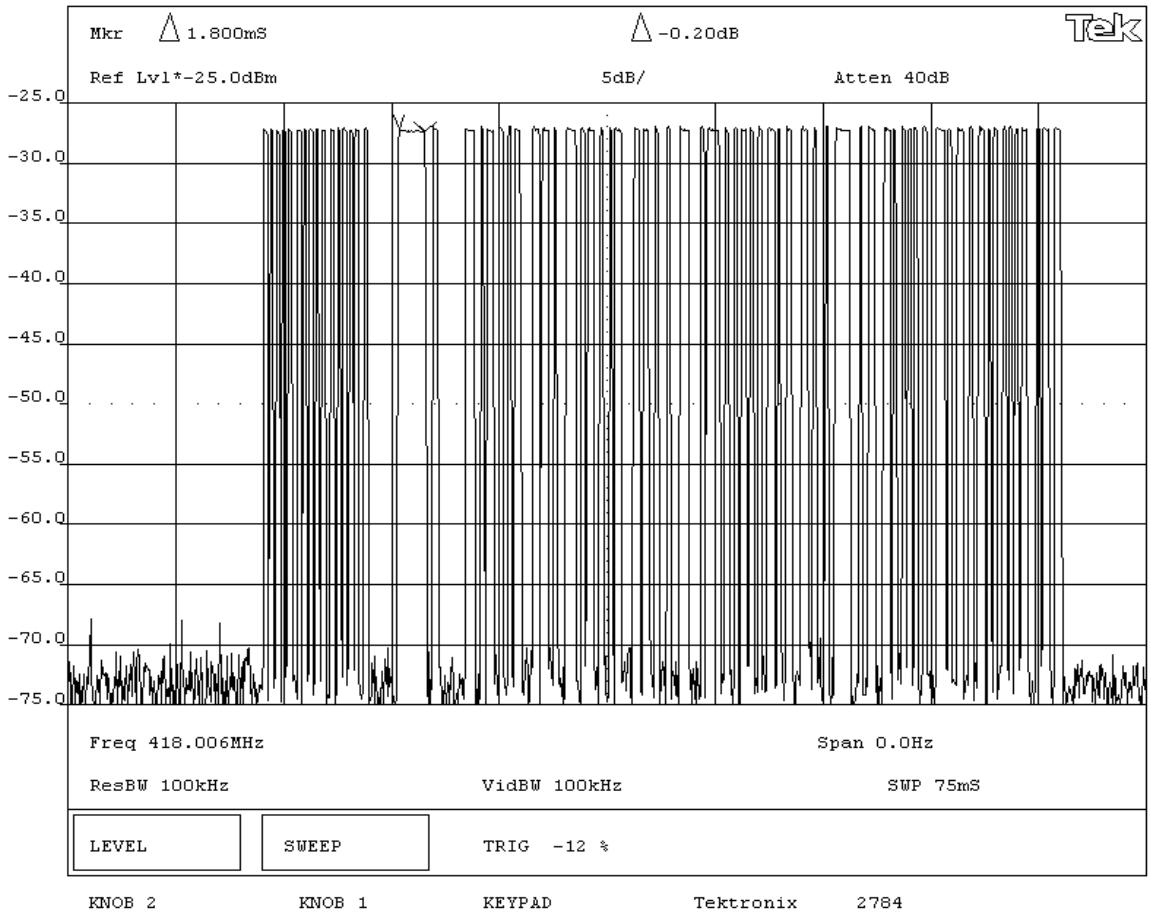
RESULTS	DWELL TIME DURING A SINGLE TRANSMISSION
Pass	Pulse 5 = 1.8ms

SIGNATURE

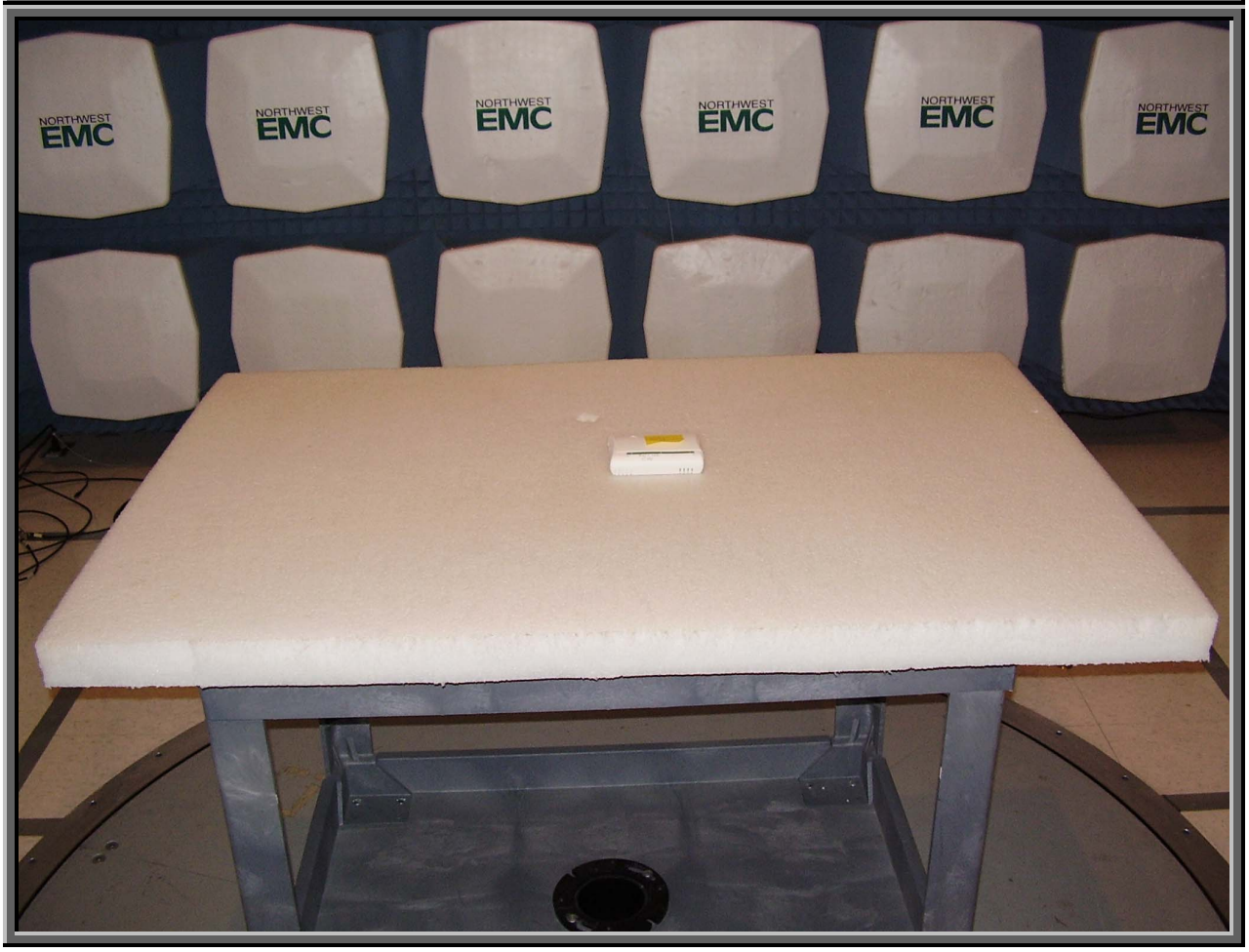
Tested By: _____

DESCRIPTION OF TEST

Pulse 5




NORTHWEST
EMC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Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Operating Modes Investigated:
Receive

Data Rates Investigated:
Typical

Power Input Settings Investigated:
120 VAC, 60 Hz.

Software\Firmware Applied During Test			
Exercise software	N/A	**Version**	N/A
Description			
N/A			

EUT and Peripherals			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
EUT-Temperature/rH Transmitter	Veris Industries	Temperature/rH Transmitter	0x22222222
AC Adaptor	Tamura Group	318AS09035	Unknown

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Leads	No	2.0	No	EUT-Temperature/rH Transmitter	AC Adaptor

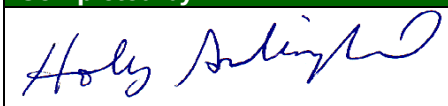
Measurement Equipment					
Description	**Manufacturer**	**Model**	**Identifier**	**Last Cal**	**Interval**
LISN	Solar	9252-50-R-24-BNC	LIN	12/29/2004	13 mo
High Pass Filter	TTE	H97-100k-50-720B	HFC	12/29/2004	13 mo
Quasi-Peak Adapter	Hewlett-Packard	85650A	AQF	12/02/2004	13 mo
Spectrum Analyzer	Hewlett-Packard	8566B	AAL	12/02/2004	13 mo
Spectrum Analyzer Display	Hewlett Packard	85662A	AALD	12/02/2004	13 mo

Test Description

Requirement: Per 47 15.107, if the EUT is connected to the AC power line directly or indirectly, obtaining its power from another device that is connected to the AC power line, then it should be tested to demonstrate compliance with the conducted limits of 15.107.

Configuration: The EUT will be powered directly from the AC power line. The AC power line conducted emissions were measured with the EUT receiving at its single channel in the operational band. The spectrum was scanned from 150 kHz to 30 MHz. The test setup and procedures were in accordance with ANSI C63.4-2003.

Completed by:



NORTHWEST EMC

CONDUCTED EMISSIONS DATA SHEET

ACQ 2005.6.24
EMI 2005.5.05

EUT:	Temperature/rH Transmitter	Work Order:	VERI0111
Serial Number:		Date:	06/24/05
Customer:	Veris Industries, Inc.	Temperature:	26
Attendees:	None	Humidity:	38%
Cust. Ref. No.:		Barometric Pressure	29.96
Tested by:	Holly Ashkannejhad	Power: 120VAC, 60Hz	Job Site: EV01

TEST SPECIFICATIONS

Specification:	FCC 15.107 AC Powerline Conducted Emissions:2005-04	Method:	ANSI C63.4:2003

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

COMMENTS

EUT OPERATING MODES

Receive mode

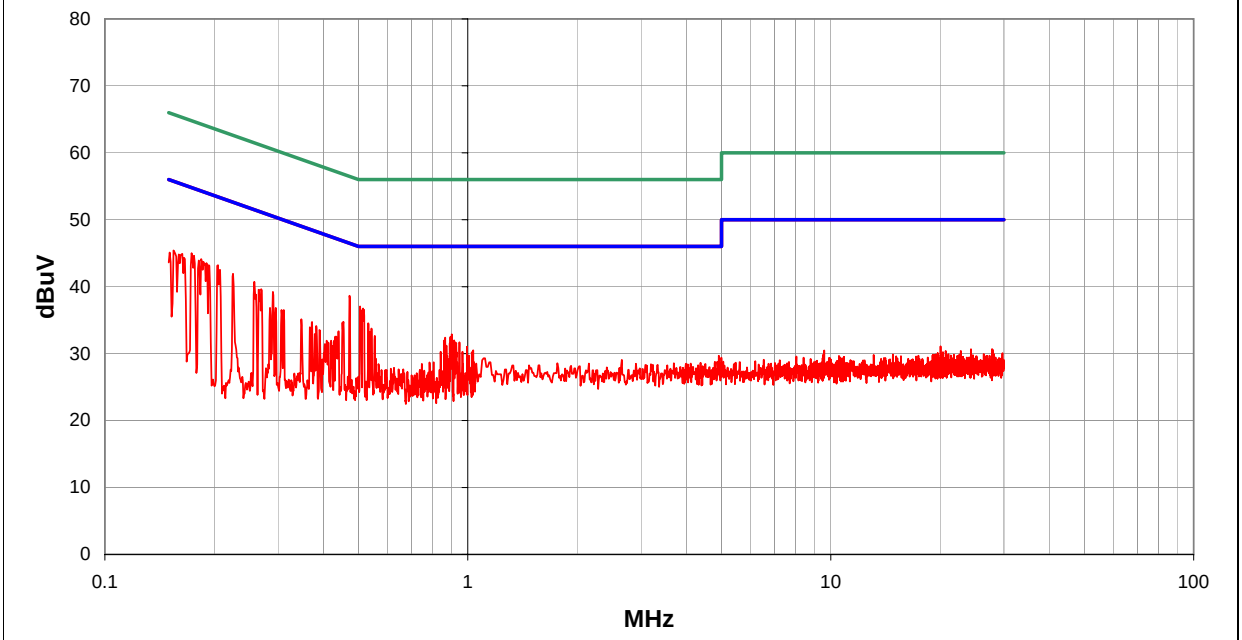
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS	Line	Run #
Pass	L1	1

Other

Tested By: Holly Ashkannejhad



Freq (MHz)	Amplitude (dBuV)			Transducer (dB)	Cable (dB)	External Attenuation (dB)		Detector (blank equal peaks [PK] from scan)		Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.472	18.4			0.0	0.2	20.0				38.6	46.5	-7.8
0.505	16.8			0.0	0.2	20.0				37.0	46.0	-9.0
0.514	16.5			0.0	0.2	20.0				36.7	46.0	-9.3
0.507	16.2			0.0	0.2	20.0				36.4	46.0	-9.6
0.173	24.8			0.0	0.2	20.0				45.0	54.8	-9.8
0.184	23.9			0.0	0.2	20.0				44.1	54.3	-10.2
0.205	23.0			0.0	0.2	20.0				43.2	53.4	-10.2
0.155	25.2			0.0	0.2	20.0				45.4	55.8	-10.3
0.164	24.7			0.0	0.2	20.0				44.9	55.3	-10.4
0.191	23.3			0.0	0.2	20.0				43.5	54.0	-10.5
0.182	23.7			0.0	0.2	20.0				43.9	54.4	-10.5
0.193	23.0			0.0	0.2	20.0				43.2	53.9	-10.7
0.226	21.7			0.0	0.2	20.0				41.9	52.6	-10.7
0.258	20.5			0.0	0.2	20.0				40.7	51.5	-10.8
0.208	22.3			0.0	0.2	20.0				42.5	53.3	-10.8
0.151	24.9			0.0	0.2	20.0				45.1	56.0	-10.8
0.165	24.1			0.0	0.2	20.0				44.3	55.2	-10.9
0.290	19.0			0.0	0.2	20.0				39.2	50.5	-11.3
0.532	14.3			0.0	0.3	20.0				34.6	46.0	-11.4

NORTHWEST EMC

CONDUCTED EMISSIONS DATA SHEET

ACQ 2005.6.24
EMI 2005.5.05

EUT:	Temperature/rH Transmitter	Work Order:	VERI0111
Serial Number:		Date:	06/24/05
Customer:	Veris Industries, Inc.	Temperature:	26
Attendees:	None	Humidity:	38%
Cust. Ref. No.:		Barometric Pressure	29.96
Tested by:	Holly Ashkannejhad	Power: 120VAC, 60Hz	Job Site: EV01

TEST SPECIFICATIONS

Specification:	FCC 15.107 AC Powerline Conducted Emissions:2005-04	Method:	ANSI C63.4:2003

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

COMMENTS

EUT OPERATING MODES

Receive mode

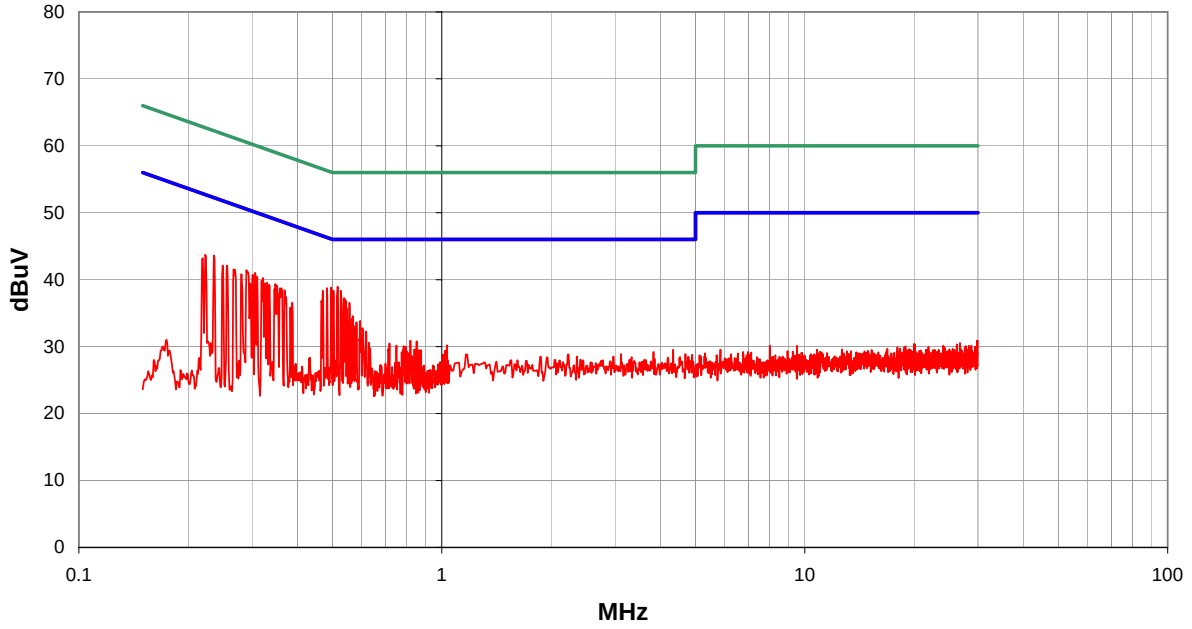
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS	Line	Run #
Pass	N	2

Other

Tested By: Holly Ashkannejhad



Freq (MHz)	Amplitude (dBuV)			Transducer (dB)	Cable (dB)	External Attenuation (dB)		Detector (blank equal peaks [PK] from scan)		Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.516	18.7			0.0	0.2	20.0				38.9	46.0	-7.1
0.496	18.6			0.0	0.2	20.0				38.8	46.1	-7.2
0.483	18.5			0.0	0.2	20.0				38.7	46.3	-7.5
0.527	18.1			0.0	0.2	20.0				38.3	46.0	-7.7
0.503	18.1			0.0	0.2	20.0				38.3	46.0	-7.7
0.470	18.1			0.0	0.2	20.0				38.3	46.5	-8.2
0.236	23.4			0.0	0.2	20.0				43.6	52.3	-8.6
0.539	17.0			0.0	0.3	20.0				37.3	46.0	-8.7
0.223	23.5			0.0	0.2	20.0				43.7	52.7	-9.0
0.306	20.8			0.0	0.2	20.0				41.0	50.1	-9.1
0.290	21.2			0.0	0.2	20.0				41.4	50.5	-9.1
0.544	16.6			0.0	0.3	20.0				36.9	46.0	-9.1
0.322	20.0			0.0	0.2	20.0				40.2	49.7	-9.4
0.256	21.9			0.0	0.2	20.0				42.1	51.6	-9.4
0.557	16.3			0.0	0.3	20.0				36.6	46.0	-9.4
0.301	20.5			0.0	0.2	20.0				40.7	50.2	-9.5
0.310	20.2			0.0	0.2	20.0				40.4	50.0	-9.5
0.219	23.0			0.0	0.2	20.0				43.2	52.8	-9.6
0.269	21.3			0.0	0.2	20.0				41.5	51.2	-9.6


NORTHWEST
EMC

Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. All of the EUT parameters listed below were investigated. This includes, but may not be limited to, CPU speeds, video resolution settings, operational modes, and input voltages.

Operating Modes Investigated:
Receive mode
Operating Mode used for Final Test:
Receive mode

Power Input Settings Investigated:
120 VAC, 60 Hz
Input Power Setting used for Final Test:
120 VAC, 60 Hz

Frequency Range Investigated			
Start Frequency	30 MHz	**Stop Frequency**	1 GHz

Software\Firmware Applied During Test			
Operating system	Unknown	**Version**	Unknown
Exercise software	Unknown	**Version**	Unknown
Description			
Unknown			

EUT and Peripherals in Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
EUT-Temperature/rH Transmitter	Veris Industries	Temperature/rH Transmitter	0x22222222
AC Adaptor	Tamura Group	318AS09035	Unknown

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Leads	No	2.0	No	EUT-Temperature/rH Transmitter	AC Adapter
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Measurement Equipment					
Description	**Manufacturer**	**Model**	**Identifier**	**Last Cal**	**Interval**
Antenna, Biconilog	EMCO	3141	AXE	12/03/2003	24 mo
Pre-Amplifier	Amplifier Research	LN1000A	APS	03/01/2005	13 mo
Quasi-Peak Adapter	Hewlett-Packard	85650A	AQF	12/02/2004	13 mo
Spectrum Analyzer	Hewlett-Packard	8566B	AAL	12/02/2004	13 mo
Spectrum Analyzer Display	Hewlett Packard	85662A	AALD	12/02/2004	13 mo

Test Description

The final radiated emissions test was performed using the parameters described above as worst case. That final test was conducted at a facility that meets the ANSI C63.4 NSA requirements. The frequency range noted in the data sheets was scanned/tested at that facility. Emissions were maximized as specified, by maximizing table azimuth, antenna height, and cable manipulation.

Using the mode of operation and configuration noted within this report, a final radiated emissions test was performed. The frequency range investigated (scanned), is also noted in this report. Radiated emissions measurements were made at the EUT azimuth and antenna height such that the maximum radiated emissions level will be detected. This requires the use of a turntable and an antenna positioner. The preferred method of a continuous azimuth search is utilized for frequency scans of the EUT field strength with both polarities of the measuring antenna. A calibrated, linearly polarized antenna was positioned at the specified distance from the periphery of the EUT.

> *Note: The specified distance is the horizontal separation between the closest periphery of the EUT and the center of the axis of the elements of the receiving antenna. However, if the receiving antenna is a log-periodic array, the specified distance shall be the distance between the closest periphery of the EUT and the front-to-back center of the array of elements.*

Tests were made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement was varied in height above the conducting ground plane to obtain the maximum signal strength. Though specified in the report, the measurement distance shall be 1 meter, 3 meters, 5 meters, 10 meters, or 30 meters. At any measurement distance, the antenna height was varied from 1 meter to 4 meters. These height scans apply for both horizontal and vertical polarization, except that for vertical polarization the minimum height of the center of the antenna shall be increased so that the lowest point of the bottom of the antenna clears the ground surface by at least 25 cm.

Measurement Bandwidths

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 – 0.15	1.0	0.2	0.2
0.15 – 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

Completed by:

Holly Arbaugh

NORTHWEST EMC

RADIATED EMISSIONS DATA SHEET

ACQ 2005.6.24
EMI 2005.5.05

EUT:	Temperature/rH Transmitter			Work Order:	VERI0111
Serial Number:				Date:	06/27/05
Customer:	Veris Industries, Inc.			Temperature:	23
Attendees:	None			Humidity:	55%
Cust. Ref. No.:				Barometric Pressure	29.92
Tested by:	Holly Ashkannejhad	Power:	120VAC, 60Hz	Job Site:	EV01

TEST SPECIFICATIONS

Specification:	FCC 15.109(a) Class B:2005-04	Method:	ANSI C63.4:2003

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

COMMENTS

EUT OPERATING MODES

Receive mode

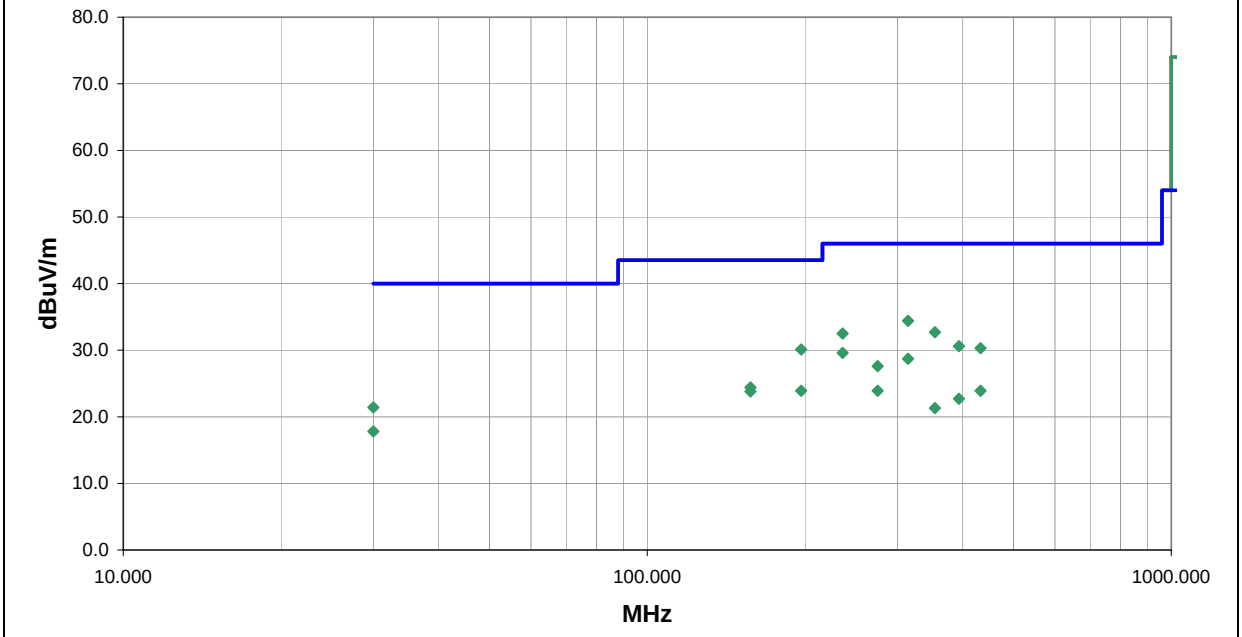
DEVIATIONS FROM TEST STANDARD

No deviations.

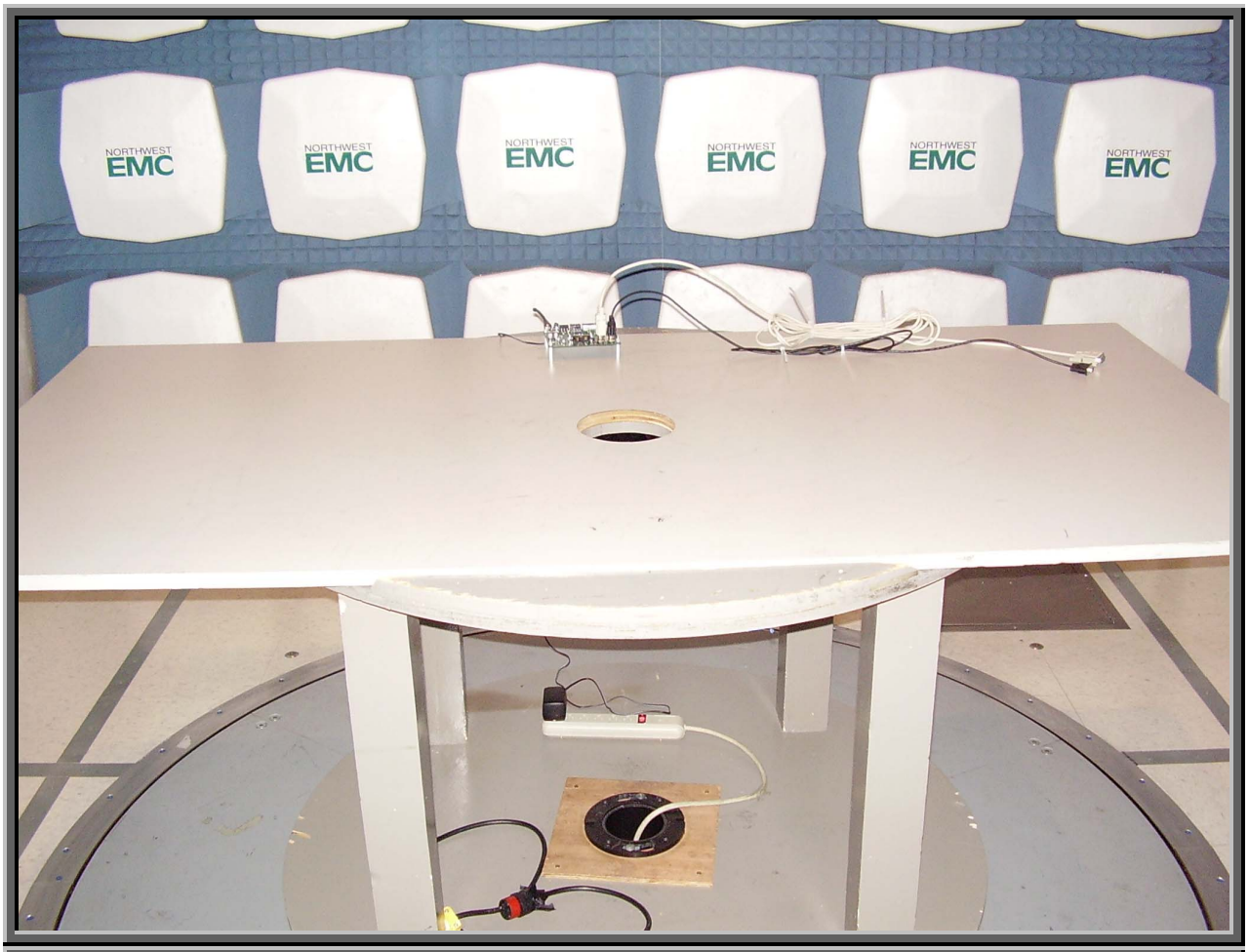
RESULTS	Run #
Pass	1

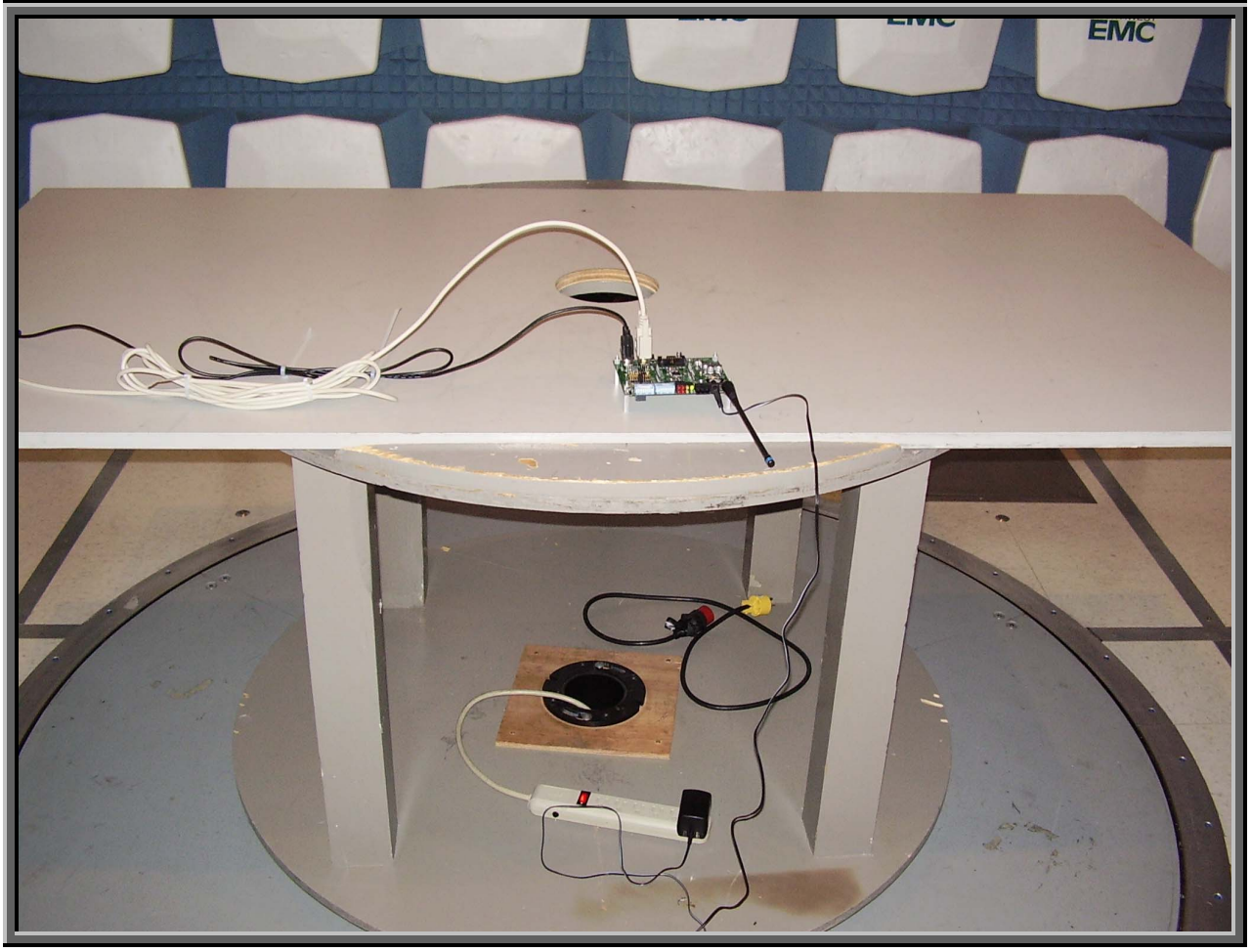
Other

Tested By:



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
314.628	42.2	-7.8	296.0	1.2	3.0	0.0	H-Bilog	QP	0.0	34.4	46.0	-11.6
353.962	39.1	-6.4	282.0	1.0	3.0	0.0	H-Bilog	QP	0.0	32.7	46.0	-13.3
196.651	41.5	-11.4	317.0	1.4	3.0	0.0	H-Bilog	QP	0.0	30.1	43.5	-13.4
235.985	42.7	-10.2	310.0	1.3	3.0	0.0	H-Bilog	QP	0.0	32.5	46.0	-13.5
393.269	35.9	-5.3	280.0	1.0	3.0	0.0	H-Bilog	QP	0.0	30.6	46.0	-15.4
432.612	35.2	-4.9	238.0	1.0	3.0	0.0	H-Bilog	QP	0.0	30.3	46.0	-15.7
235.987	39.8	-10.2	291.0	1.2	3.0	0.0	V-Bilog	QP	0.0	29.6	46.0	-16.4
314.640	36.5	-7.8	237.0	1.5	3.0	0.0	V-Bilog	QP	0.0	28.7	46.0	-17.3
275.306	36.7	-9.1	300.0	1.0	3.0	0.0	H-Bilog	QP	0.0	27.6	46.0	-18.4
30.000	25.9	-4.5	253.0	1.0	3.0	0.0	V-Bilog	QP	0.0	21.4	40.0	-18.6
157.336	37.9	-13.5	262.0	1.0	3.0	0.0	V-Bilog	QP	0.0	24.4	43.5	-19.1
196.642	35.3	-11.4	263.0	1.0	3.0	0.0	V-Bilog	QP	0.0	23.9	43.5	-19.6
157.335	37.3	-13.5	305.0	2.3	3.0	0.0	H-Bilog	QP	0.0	23.8	43.5	-19.7
275.291	33.0	-9.1	270.0	1.5	3.0	0.0	V-Bilog	QP	0.0	23.9	46.0	-22.1
432.618	28.8	-4.9	341.0	1.4	3.0	0.0	V-Bilog	QP	0.0	23.9	46.0	-22.1
30.000	22.3	-4.5	268.0	2.7	3.0	0.0	H-Bilog	QP	0.0	17.8	40.0	-22.2
393.292	28.0	-5.3	25.0	1.6	3.0	0.0	V-Bilog	QP	0.0	22.7	46.0	-23.3
353.962	27.7	-6.4	179.0	1.8	3.0	0.0	V-Bilog	QP	0.0	21.3	46.0	-24.7


NORTHWEST
EMC


EMC