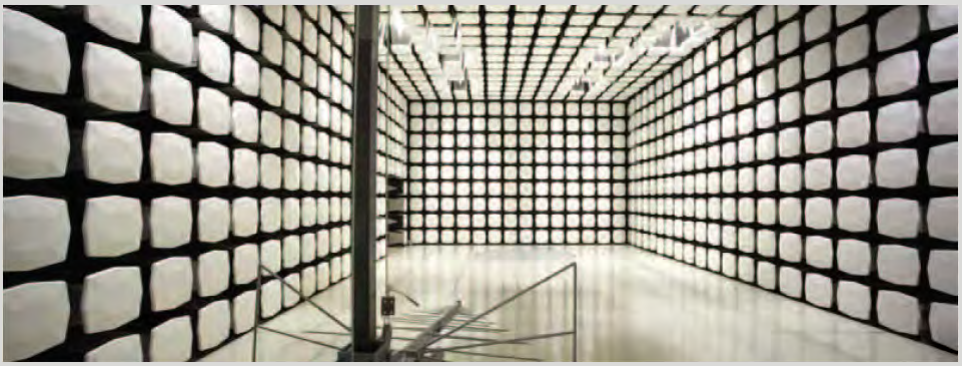
UTC Fire and Security

Learn Mode Freeze Sensor

FCC 15.231:2014

Report #: UTCF0013.1



Report Prepared By Northwest EMC Inc.

NORTHWEST EMC – (888) 364-2378 – www.nwemc.com

California – Minnesota – Oregon – New York – Washington

CERTIFICATE OF TEST

WTD 12.5.23

Last Date of Test: April 30, 2014
UTC Fire and Security
Model: Learn Mode Freeze Sensor

Emissions

Test Description	Specification	Test Method	Pass/Fail
Duty Cycle	FCC 15.231:2014	ANSI C63.10:2009	Pass
Occupied Bandwidth	FCC 15.231:2014	ANSI C63.10:2009	Pass
Field Strength Fundamental	FCC 15.231:2014	ANSI C63.10:2009	Pass
Spurious Radiated Emissions	FCC 15.231:2014	ANSI C63.10:2009	Pass

Deviations From Test Standards

None

Approved By:

Tim O'Shea, Operations Manager

NVLAP Lab Code: 200881-0

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.

NORTHWEST EMC
REV 2012.08.02

REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

REV 2012.05.24

ACCREDITATIONS AND AUTHORIZATIONS

United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Accredited by A2LA to ISO / IEC Guide 65 as a product certifier. This allows Northwest EMC to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

IC - Recognized by Industry Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with IC.

European Union

European Commission – Validated by the European Commission as a Conformity Assessment Body (CAB) under the EMC directive and as a Notified Body under the R&TTE Directive.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

KCC / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Hong Kong

OFTA – Recognized by OFTA as a CAB for the acceptance of test data.

Vietnam

MIC – Recognized by MIC as a CAB for the acceptance of test data.

Russia

GOST – Accredited by Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC to perform EMC and Hygienic testing for Information Technology products to GOST standards.

SCOPE

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

MEASUREMENT UNCERTAINTY

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. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) for each test is listed below. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-1 as applicable), and are available upon request.

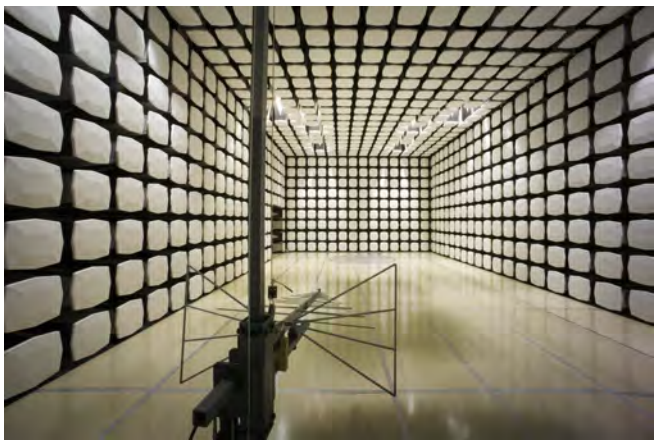
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

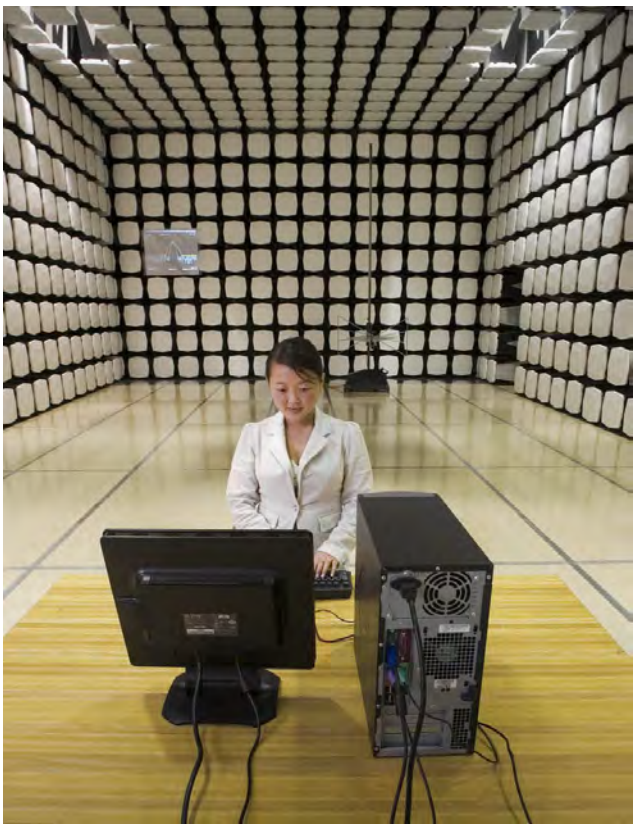
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.12	-0.01
Amplitude Accuracy (dB)	0.49	-0.49
Conducted Power (dB)	0.41	-0.41
Radiated Power via Substitution (dB)	0.69	-0.68
Temperature (degrees C)	0.81	-0.81
Humidity (% RH)	2.89	-2.89
Field Strength (dB)	3.80	-3.80
AC Powerline Conducted Emissions (dB)	2.94	-2.94

FACILITIES

REV 2013.06.28

Oregon	California	New York	Minnesota	Washington
Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	Labs MN01-08 9349 W Broadway Ave. Brooklyn Park, MN 55445 (763) 425-2281	Labs NC01-05,SU02,SU07 19201 120th Ave. NE Bothell, WA 98011 (425) 984-6600
VCCI				
A-0108	A-0029		A-0109	A-0110
Industry Canada				
2834D-1, 2834D-*2*	2834B-1, 2834B-2, 2834B-3		2834E-1	2834F-1
NVLAP				
NVLAP Lab Code: 200630-0	NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200629-0





PRODUCT DESCRIPTION

WTD 12.5.23

Client and Equipment Under Test (EUT) Information

Company Name:	UTC Fire and Security
Address:	1275 Red Fox Road
City, State, Zip:	Arden Hills, MN 55112
Test Requested By:	Paul Price
Model:	Learn Mode Freeze Sensor
First Date of Test:	April 28, 2014
Last Date of Test:	April 30, 2014
Receipt Date of Samples:	April 28, 2014
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):
Learn Mode Freeze Sensor. Low power transmitter operating at 319.5 MHz.

Testing Objective:
To demonstrate compliance to FCC 15.231 specifications.

CONFIGURATIONS

Configuration UTCF0013- 1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Learn Mode Freeze Sensor (Mod)	UTC Fire and Security	60-504-10-319.5	1

Configuration UTCF0013- 2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Learn Mode Freeze Sensor (CW)	UTC Fire and Security	60-504-10-319.5	1

MODIFICATIONS

WTD 12.5.23

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	4/28/2014	Duty Cycle	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	4/28/2014	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	4/29/2014	Field Strength of Fundamental	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	4/30/2014	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

DUTY CYCLE

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Near Field Probe Set	ETS	7405	IPO	NCR	0
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2013	24

TEST DESCRIPTION

For software controlled or pre-programmed devices, the manufacturer shall declare the duty cycle class or classes for the equipment under test. For manually operated or event dependant devices, with or without software controlled functions, the manufacturer shall declare whether the device once triggered, follows a pre-programmed cycle, or whether the transmission is constant until the trigger is released or manually reset. The manufacturer shall also give a description of the application for the device and include a typical usage pattern. The typical usage pattern as declared by the manufacturer shall be used to determine the duty cycle and hence the duty class.

Where an acknowledgement is required, the additional transmitter on-time shall be included and declared by the manufacturer.

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” = N1L1 +N2L2 +….

Where N1 is the number of type 1 pulses, L1 is length of type 1 pulses, N2 is the number of type 2 pulses, L2 is the length of type 2 pulses, etc.

Therefore, Duty Cycle = (N1L1 +N2L2 +…)/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 = 0.9889 mSec
Pulsewidth of Type 2 Pulse = 0.1274 mSec
Pulsewidth of Type 3 Pulse = 0.4975 mSec
Number of Type 1 Pulses = 1
Number of Type 2 Pulses = 58
Number of Type 3 Pulses = 1

Duty Cycle = 20 log [((1)(0.9889) + (58)(0.1274) + (1)(0.4975))/100] = -21.0 dB

The duty cycle correction factor of –21.0 dB was added to the peak readings to mathematically derive the average levels. Peak measurements were made with a resolution bandwidth of 100kHz and a video bandwidth of 300kHz.

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

DUTY CYCLE

EUT:	Learn Mode Freeze Sensor			**Work Order:**	UTCF0013
Serial Number:	1			**Date:**	04/28/14
Customer:	UTC Fire and Security			**Temperature:**	23.3°C
Attendees:	Chris Fuller			**Humidity:**	29%
Project:	None			**Barometric Pres.:**	1006
Tested by:	Trevor Buls	**Power:**	Battery	**Job Site:**	MN05

TEST SPECIFICATIONS	Test Method
FCC 15.231:2014	ANSI C63.10:2009

COMMENTS

Period between bursts is greater than 100 mS. Initial amplitude increase on the 30mS screen capture is due to the system becoming active and is below the spurious limits, so this was excluded from the "on time" of the duty cycle calculation.

DEVIATIONS FROM TEST STANDARD

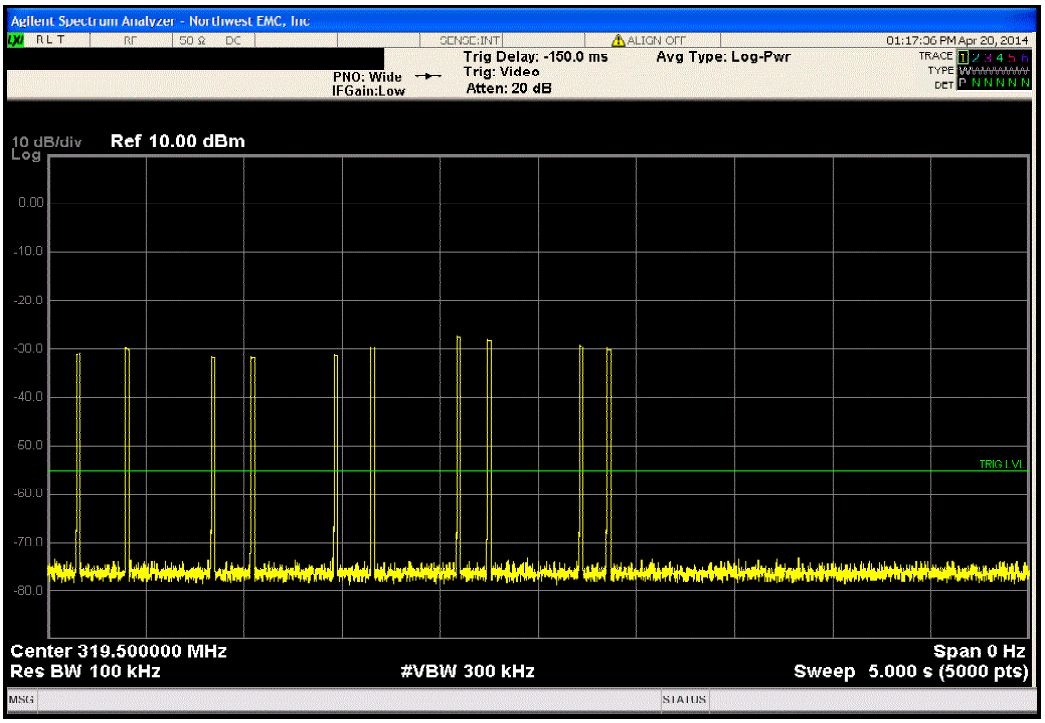
None

Configuration #	1	Signature	Trevor Buls

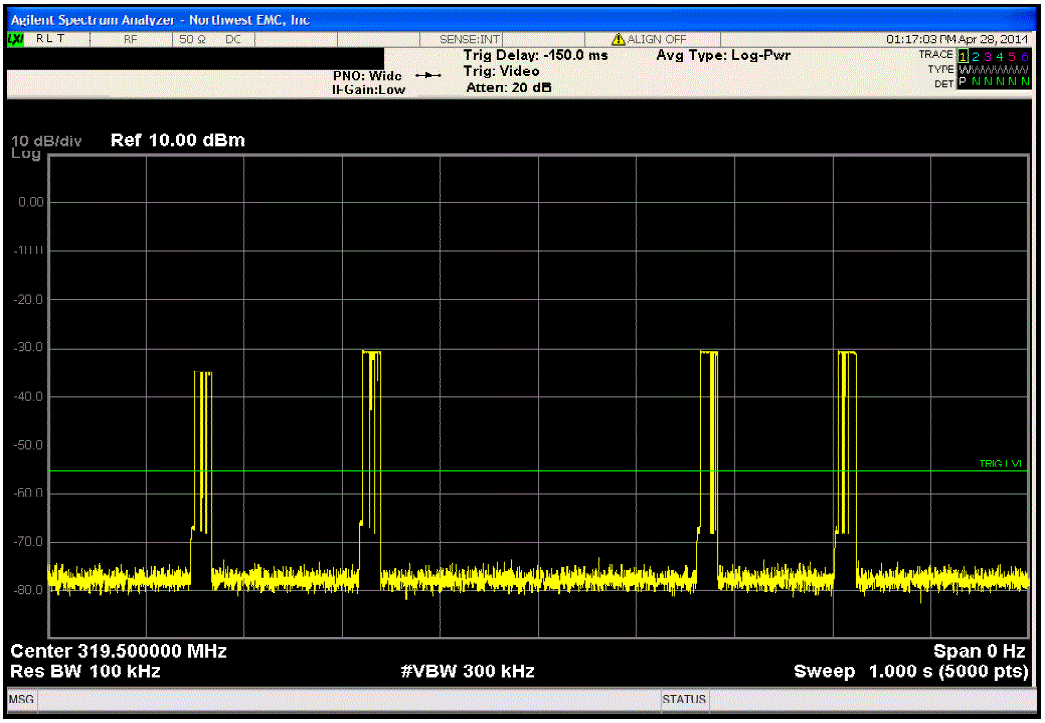
	Pulse Width Type 1 (mS)	Pulse Width Type 2 (mS)	Pulse Width Type 3 (mS)	Limit	Result
5 Second Interval	N/A	N/A	N/A	N/A	N/A
1 Second Interval	N/A	N/A	N/A	N/A	N/A
30 mS Interval	0.9889	0.1274	0.4975	N/A	N/A

DUTY CYCLE

5 Second Interval						
		Pulse Width Type 1 (mS)	Pulse Width Type 2 (mS)	Pulse Width Type 3 (mS)	Limit	Result
		N/A	N/A	N/A	N/A	N/A

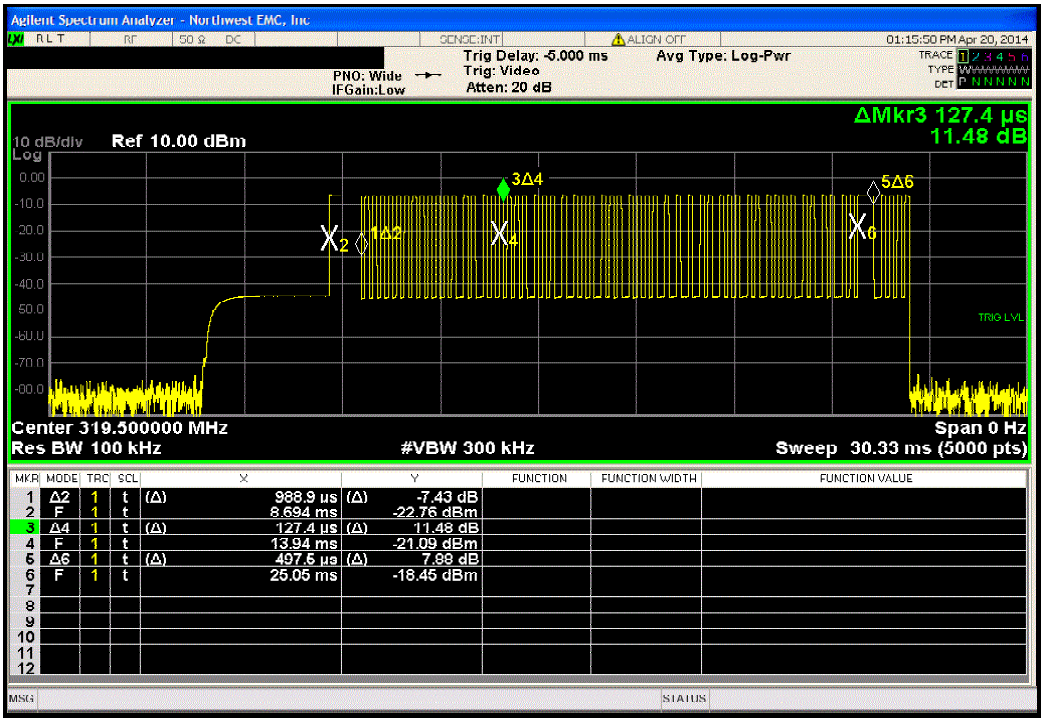


1 Second Interval						
		Pulse Width Type 1 (mS)	Pulse Width Type 2 (mS)	Pulse Width Type 3 (mS)	Limit	Result
		N/A	N/A	N/A	N/A	N/A



DUTY CYCLE

30 mS Interval						
		Pulse Width Type 1 (mS)	Pulse Width Type 2 (mS)	Pulse Width Type 3 (mS)	Limit	Result
		0.9889	0.1274	0.4975	N/A	N/A



OCCUPIED BANDWIDTH

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Near Field Probe Set	ETS	7405	IPO	NCR	0
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2013	24

TEST DESCRIPTION

The occupied bandwidth is required to be no wider that 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz.

The measurement was made using near field probe near the integral antenna of the EUT to the input of the spectrum analyzer. The EUT was transmitting at its maximum data rate.

OCCUPIED BANDWIDTH

EUT:	Learn Mode Freeze Sensor			**Work Order:**	UTCF0013
Serial Number:	1			**Date:**	04/28/14
Customer:	UTC Fire and Security			**Temperature:**	23.3°C
Attendees:	Chris Fuller			**Humidity:**	29%
Project:	None			**Barometric Pres.:**	1006
Tested by:	Trevor Buls	**Power:**	Battery	**Job Site:**	MN05

TEST SPECIFICATIONS	Test Method
FCC 15.231:2014	ANSI C63.10:2009

COMMENTS

Limit is based on center frequency: 319.5 MHz * 0.25% = 0.79875 MHz.

DEVIATIONS FROM TEST STANDARD

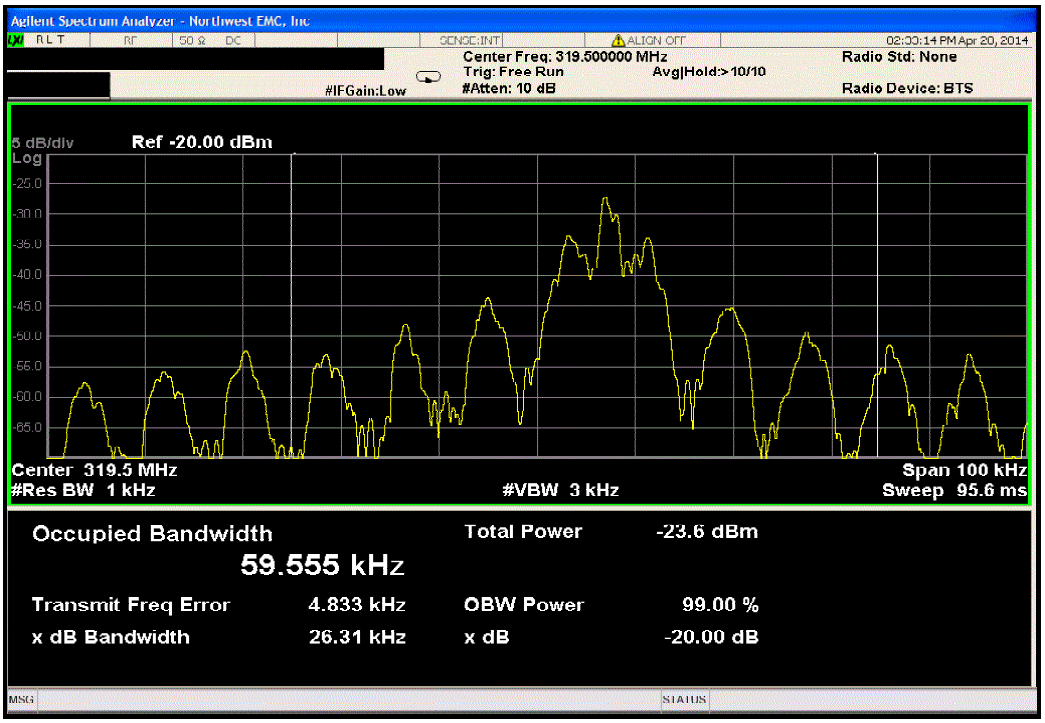
None

Configuration #	1	Signature	Trevor Buls

	Value (kHz)	Limit (kHz)	Result
319.5 MHz	26.31	798.75	Pass

OCCUPIED BANDWIDTH

319.5 MHz						
				Value (kHz)	Limit (kHz)	Result
				26.31	798.75	Pass



FIELD STRENGTH OF FUNDAMENTAL

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Transmitting at 319.5 MHz, CW

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

UTCF0013 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency	319 MHz	Stop Frequency	320 MHz

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Antenna, Bilog	Teseq	CBL 6141B	AYD	12/17/2013	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	3/14/2014	12 mo
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2013	24 mo

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

TEST DESCRIPTION

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 C63.10:2009).

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” = N1L1 +N2L2 +….

Where N1 is the number of type 1 pulses, L1 is length of type 1 pulses, N2 is the number of type 2 pulses, L2 is the length of type 2 pulses, etc.

Therefore, Duty Cycle = (N1L1 +N2L2 +…)/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 = 0.9889 mSec
Pulsewidth of Type 2 Pulse = 0.1274 mSec
Pulsewidth of Type 3 Pulse = 0.4975 mSec
Number of Type 1 Pulses = 1
Number of Type 2 Pulses = 58
Number of Type 3 Pulses = 1

Duty Cycle = 20 log [((1)(0.9889) + (58)(0.1274) + (1)(0.4975))/100] = -21.0 dB

The duty cycle correction factor of –21.0 dB was added to the peak readings to mathematically derive the average levels. Peak measurements were made with a resolution bandwidth of 100kHz and a video bandwidth of 300kHz.

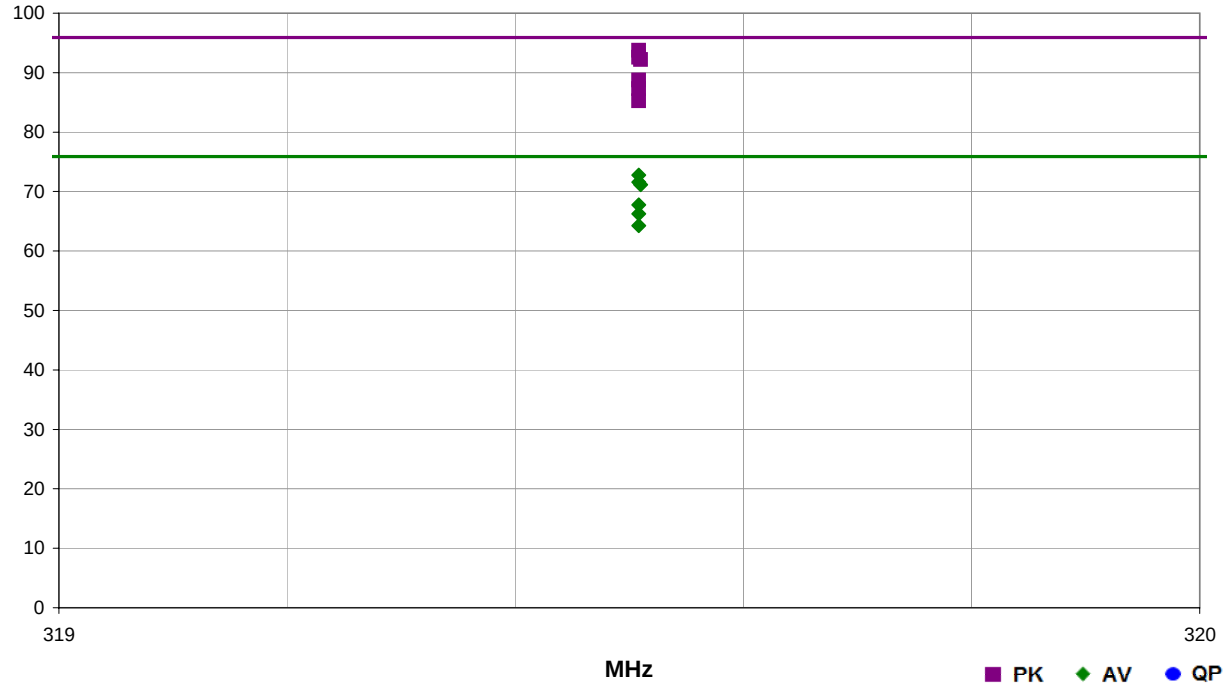
The field strength of the fundamental (transmit) frequency meets the limits as defined in 47 CFR 15.231(b). It also meets the provisions in 15.35 for averaging pulsed emissions and for limiting peak emissions.

FIELD STRENGTH OF FUNDAMENTAL

Work Order:	UTCF0013	**Date:**	04/29/14	Trevor Buls	
Project:	None	**Temperature:**	23.2 °C		
Job Site:	MN05	**Humidity:**	28.3% RH		
Serial Number:	1	**Barometric Pres.:**	1008.7 mbar	**Tested by:**	Trevor Buls
EUT:	Learn Mode Freeze Sensor				
Configuration:	2				
Customer:	UTC Fire and Security				
Attendees:	Chris Fuller				
EUT Power:	Battery				
Operating Mode:	Transmitting at 319.5 MHz, CW				
Deviations:	None				
Comments:	None				

Test Specifications	**Test Method**
FCC 15.231:2014	ANSI C63.10:2009

Run #	0	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
319.508	74.5	19.3	1.0	226.0		0.0	Horz	PK	0.0	93.8	95.9	-2.1	EUT on Side
319.508	74.5	19.3	1.0	226.0	-21.0	0.0	Horz	AV	0.0	72.8	75.9	-3.1	EUT on Side
319.508	73.3	19.3	1.0	92.0		0.0	Horz	PK	0.0	92.6	95.9	-3.3	EUT Horizontal
319.510	72.9	19.3	1.6	122.0		0.0	Vert	PK	0.0	92.2	95.9	-3.7	EUT Vertical
319.508	73.3	19.3	1.0	92.0	-21.0	0.0	Horz	AV	0.0	71.6	75.9	-4.3	EUT Horizontal
319.510	72.9	19.3	1.6	122.0	-21.0	0.0	Vert	AV	0.0	71.2	75.9	-4.7	EUT Vertical
319.508	69.5	19.3	2.0	335.0		0.0	Vert	PK	0.0	88.8	95.9	-7.1	EUT Horizontal
319.508	69.5	19.3	2.0	335.0	-21.0	0.0	Vert	AV	0.0	67.8	75.9	-8.1	EUT Horizontal
319.508	68.0	19.3	1.8	201.0		0.0	Horz	PK	0.0	87.3	95.9	-8.6	EUT Vertical
319.508	68.0	19.3	1.8	201.0	-21.0	0.0	Horz	AV	0.0	66.3	75.9	-9.6	EUT Vertical
319.508	66.0	19.3	2.0	161.0		0.0	Vert	PK	0.0	85.3	95.9	-10.6	EUT on Side
319.508	66.0	19.3	2.0	161.0	-21.0	0.0	Vert	AV	0.0	64.3	75.9	-11.6	EUT on Side

SPURIOUS RADIATED EMISSIONS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Transmitting at 319.5 MHz, CW

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

UTCF0013 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	4 GHz

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	3/14/2014	12 mo
MN05 Cables	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	3/14/2014	12 mo
Antenna, Horn (DRG)	ETS Lindgren	3115	AIP	6/29/2011	36 mo
Attenuator, 10db, 'SMA'	S.M. Electronics	SA18H-10	REN	5/20/2013	12 mo
Pre-Amplifier	Miteq	AM-1616-1000	PAD	3/14/2014	12 mo
Antenna, Bilog	Teseq	CBL 6141B	AYD	12/17/2013	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	3/14/2014	12 mo
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2013	24 mo

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

TEST DESCRIPTION

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 C63.10:2009).

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” = N1L1 +N2L2 +….

Where N1 is the number of type 1 pulses, L1 is length of type 1 pulses, N2 is the number of type 2 pulses, L2 is the length of type 2 pulses, etc.

Therefore, Duty Cycle = (N1L1 +N2L2 +…)/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 = 0.9889 mSec
Pulsewidth of Type 2 Pulse = 0.1274 mSec
Pulsewidth of Type 3 Pulse = 0.4975 mSec
Number of Type 1 Pulses = 1
Number of Type 2 Pulses = 58
Number of Type 3 Pulses = 1

Duty Cycle = 20 log [((1)(0.9889) + (58)(0.1274) + (1)(0.4975))/100] = -21.0 dB

The duty cycle correction factor of –21.0 dB was added to the peak readings to mathematically derive the average levels. Peak measurements were made with a resolution bandwidth of 100kHz and a video bandwidth of 300kHz for measurements at or below 1GHz. Above 1GHz, a resolution bandwidth of 1MHz and a video bandwidth of 3MHz was used.

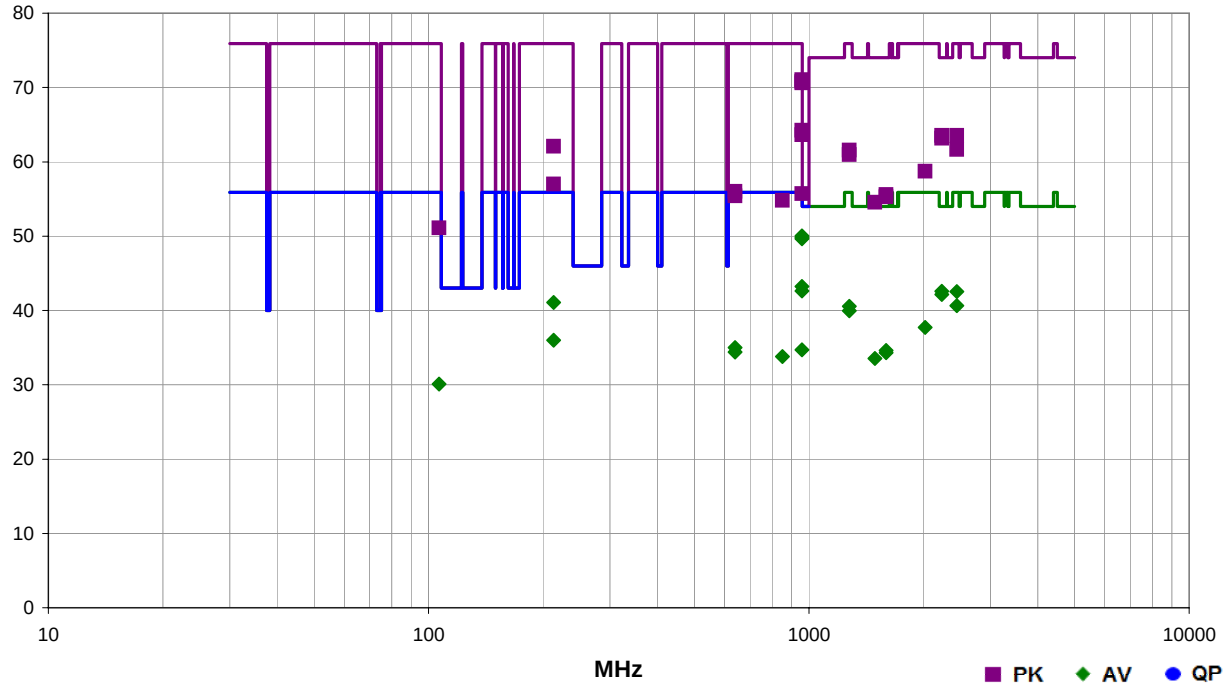
The field strength of the spurious emissions meet the limits as defined in 47 CFR 15.231(b). The spurious emissions also meet the provisions in 15.35 for averaging pulsed emissions and for limiting peak emissions. Further, spurious emissions meet the provisions of 15.205 using using the measurement instrumentation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

SPURIOUS RADIATED EMISSIONS

Work Order:	UTCF0013	**Date:**	04/30/14	Trevor Buls	
Project:	None	**Temperature:**	23.4 °C		
Job Site:	MN05	**Humidity:**	27.4% RH		
Serial Number:	1	**Barometric Pres.:**	1009.7 mbar	**Tested by:**	Trevor Buls
EUT:	Learn Mode Freeze Sensor				
Configuration:	2				
Customer:	UTC Fire and Security				
Attendees:	None				
EUT Power:	Battery				
Operating Mode:	Transmitting at 319.5 MHz, CW				
Deviations:	None				
Comments:	None				

Test Specifications	**Test Method**
FCC 15.231:2014	ANSI C63.10:2009

Run #	2	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
958.524	50.2	10.8	1.0	71.0		10.0	Horz	PK	0.0	71.0	75.9	-4.9	EUT on Side
958.522	50.0	10.8	1.0	78.0		10.0	Horz	PK	0.0	70.8	75.9	-5.1	EUT Horizontal
958.526	49.8	10.8	1.1	214.0		10.0	Vert	PK	0.0	70.6	75.9	-5.3	EUT Vertical
958.524	50.2	10.8	1.0	71.0	-21.0	10.0	Horz	AV	0.0	50.0	55.9	-5.9	EUT on Side
958.522	50.0	10.8	1.0	78.0	-21.0	10.0	Horz	AV	0.0	49.8	55.9	-6.1	EUT Horizontal
958.526	49.8	10.8	1.1	214.0	-21.0	10.0	Vert	AV	0.0	49.6	55.9	-6.3	EUT Vertical
2236.575	65.6	-2.0	1.2	25.0		0.0	Vert	PK	0.0	63.6	74.0	-10.4	EUT on Side
2236.535	65.2	-2.0	1.0	276.0		0.0	Horz	PK	0.0	63.2	74.0	-10.8	EUT on Side
2236.575	65.6	-2.0	1.2	25.0	-21.0	0.0	Vert	AV	0.0	42.6	54.0	-11.4	EUT on Side
958.521	43.4	10.8	1.5	345.0		10.0	Vert	PK	0.0	64.2	75.9	-11.7	EUT on Side
2236.535	65.2	-2.0	1.0	276.0	-21.0	0.0	Horz	AV	0.0	42.2	54.0	-11.8	EUT on Side
958.529	42.8	10.8	1.6	159.0		10.0	Vert	PK	0.0	63.6	75.9	-12.3	EUT Horizontal
2449.535	66.7	-3.2	1.2	189.0		0.0	Horz	PK	0.0	63.5	75.9	-12.4	EUT Vertical
958.521	43.4	10.8	1.5	345.0	-21.0	10.0	Vert	AV	0.0	43.2	55.9	-12.7	EUT on Side
958.529	42.8	10.8	1.6	159.0	-21.0	10.0	Vert	AV	0.0	42.6	55.9	-13.3	EUT Horizontal

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2449.535	66.7	-3.2	1.2	189.0	-21.0	0.0	Horz	AV	0.0	42.5	55.9	-13.4	EUT Vertical
213.004	57.0	-4.9	1.3	79.0		10.0	Horz	PK	0.0	62.1	75.9	-13.8	EUT on Side
2449.510	64.8	-3.2	1.2	57.0		0.0	Vert	PK	0.0	61.6	75.9	-14.3	EUT on Side
1278.030	67.4	-5.8	1.0	291.0		0.0	Horz	PK	0.0	61.6	75.9	-14.3	EUT on Side
213.004	57.0	-4.9	1.3	79.0	-21.0	10.0	Horz	AV	0.0	41.1	55.9	-14.8	EUT on Side
1277.960	66.8	-5.8	1.1	92.0		0.0	Vert	PK	0.0	61.0	75.9	-14.9	EUT Vertical
2449.510	64.8	-3.2	1.2	57.0	-21.0	0.0	Vert	AV	0.0	40.6	55.9	-15.3	EUT on Side
1278.030	67.4	-5.8	1.0	291.0	-21.0	0.0	Horz	AV	0.0	40.6	55.9	-15.3	EUT on Side
1277.960	66.8	-5.8	1.1	92.0	-21.0	0.0	Vert	AV	0.0	40.0	55.9	-15.9	EUT Vertical
2023.595	60.8	-2.1	1.2	223.0		0.0	Horz	PK	0.0	58.7	75.9	-17.2	EUT on Side
2023.595	60.8	-2.1	1.2	223.0	-21.0	0.0	Horz	AV	0.0	37.7	55.9	-18.2	EUT on Side
1597.535	60.9	-5.3	1.2	179.0		0.0	Vert	PK	0.0	55.6	74.0	-18.4	EUT on Side
1597.515	60.6	-5.3	1.2	194.0		0.0	Horz	PK	0.0	55.3	74.0	-18.7	EUT Vertical
213.003	51.9	-4.9	2.5	4.0		10.0	Vert	PK	0.0	57.0	75.9	-18.9	EUT Vertical
1597.535	60.9	-5.3	1.2	179.0	-21.0	0.0	Vert	AV	0.0	34.6	54.0	-19.4	EUT on Side
1491.175	59.6	-5.1	1.0	20.0		0.0	Vert	PK	0.0	54.5	74.0	-19.5	EUT Vertical
1597.515	60.6	-5.3	1.2	194.0	-21.0	0.0	Horz	AV	0.0	34.3	54.0	-19.7	EUT Vertical
639.018	40.6	5.4	1.3	242.0		10.0	Horz	PK	0.0	56.0	75.9	-19.9	EUT on Side
213.003	51.9	-4.9	2.5	4.0	-21.0	10.0	Vert	AV	0.0	36.0	55.9	-19.9	EUT Vertical
958.521	34.9	10.8	1.0	297.0		10.0	Horz	PK	0.0	55.7	75.9	-20.2	EUT Vertical
1491.175	59.6	-5.1	1.0	20.0	-21.0	0.0	Vert	AV	0.0	33.5	54.0	-20.5	EUT Vertical
639.015	40.0	5.4	1.0	207.0		10.0	Vert	PK	0.0	55.4	75.9	-20.5	EUT Vertical
639.018	40.6	5.4	1.3	242.0	-21.0	10.0	Horz	AV	0.0	35.0	55.9	-20.9	EUT on Side
852.020	35.9	8.9	1.0	255.0		10.0	Horz	PK	0.0	54.8	75.9	-21.1	EUT on Side
958.521	34.9	10.8	1.0	297.0	-21.0	10.0	Horz	AV	0.0	34.7	55.9	-21.2	EUT Vertical
639.015	40.0	5.4	1.0	207.0	-21.0	10.0	Vert	AV	0.0	34.4	55.9	-21.5	EUT Vertical
852.020	35.9	8.9	1.0	255.0	-21.0	10.0	Horz	AV	0.0	33.8	55.9	-22.1	EUT on Side
106.502	47.6	-6.5	2.5	218.0		10.0	Horz	PK	0.0	51.1	75.9	-24.8	EUT on Side
106.502	47.6	-6.5	2.5	218.0	-21.0	10.0	Horz	AV	0.0	30.1	55.9	-25.8	EUT on Side