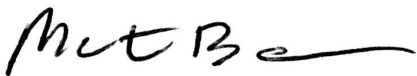





**BUREAU
VERITAS**

Curtis-Straus LLC, a wholly owned subsidiary of BV CPS

Test Report

Report No	EJ1727-1
Client	AirPointe of New Hampshire
Address	35E Industrial Way Suite 101 Rochester, NH 03867
Phone	603-994-2200
Items tested FCC ID FRN	Sushi X5 WUS00024 0018228197
Equipment Type Equipment Code	Part 15 Security/Remote Control Transmitter DSC
FCC Rule Parts	47 CFR 15.231(e)
Test Dates	January 11/25, 2010
Results	As detailed within this report
Prepared by	 Matthew Burman – Test Engineer
Authorized by	 Mairaj Hussain – EMC Supervisor
Issue Date	May 26, 2010
Conditions of Issue	This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' section on page 18 of this report.

Curtis-Straus LLC is accredited by the American Association for Laboratory Accreditation for the specific scope of accreditation under Certificate Number 1627-01. This report may contain data which is not covered by the A2LA accreditation.



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Form Final Report REV 7-20-07 (DW)



Summary

This test report supports an application for certification of a transmitter operating pursuant to 47 CFR 15.231(e). The product is the Sushi X5. The operating frequency range is 300.5-346.5MHz. It is powered by +3VDC coin cell batteries. The manufacturer is setting the power levels for eight different frequency ranges as detailed in the fundamental emission section.

The frequencies between 320.5 and 336.5MHz are not used.

We found that the product met the above requirements with modification (see *Modifications Required for Compliance* section on page 4). Don Proulx from AirPointe was present during the testing. The test sample was received in good condition.

The EUT was tested outside of the plastic enclosure. The plastic material should have no effect on the radiated measurements.

Test Methodology

Testing was performed according to ANSI C63.4-2003. Radiated emissions were maximized by rotating the device around its three orthogonal axes, as well as varying the test antenna's height and polarity.

Frequency range investigated: 30MHz – 3.5GHz

Measurement distance: 30-3500MHz 3m

The receiver portion of this device is subject to the Verification authorization procedure as per 15.101(b). The associated digital circuitry is also subject to the Verification authorization procedure as per 15.101(a). A separate test report has been issued to AirPointe of New Hampshire in order to cover both of these requirements.

Release Control Record

Issue No.	Reason for change	Date Issued
1	Original Release	May 27, 2010



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Product Tested - Configuration Documentation

EUT Configuration										
Work Order: J1727 Company: AirPointe of New Hampshire Company Address: 35E Industrial Way Rochester, NH 03867 Contact: Bob Duggan Person Present: Don Proulx										
MN			PN			SN				
EUT: ID-A200			---			Sample 1				
EUT Description: Sushi X5 - Active RFID Tag FCC ID: WUS00024 EUT Tx Frequency: 300.5-346.5MHz										
Support Equipment:			MN			SN				
none										
EUT Ports:										
Port Label	Port Type	No. of ports	No. Populated	Cable Type	Shielded	Ferrites	Length	Max Length	In/Out NEBS Type	Unpopulated Reason
none	none									
Software / Operating Mode Description:										
EUT transmits at 300.5-346.5MHz										

Modifications Required for Compliance

In order to meet compliance with FCC 15.231(e), the unit needed to implement an EMI filter on the output of the RF chip to eliminate harmonics from surpassing the emission limits. Prior to the filter, the unit was failing spurious emissions:

Radiated Emissions Table																													
Date: 11-Jan-10				Company: AirPointe				Work Order: J1727																					
Engineer: Tuyen Truong				EUT Desc: Sushi				EUT Operating Voltage/Frequency: 3Vdc Battery Powered																					
Temp: 25°C				Humidity: 15%				Pressure: 1009 mBar																					
Frequency Range: 1-4GHz																Measurement Distance: 3 m													
Notes: Any emissions falling within restricted bands must meet FCC class B limits																EUT Max Freq:													
Antenna Polarization (H / V)		Frequency (MHz)	Peak Reading (dBμV)	Duty Cycle Correction Factor (dB)	Average Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB)	Cable Factor (dB)	Adjusted Peak Reading (dBμV/m)	Adjusted Avg Reading (dBμV/m)	FCC 15.231 a - Peak			FCC 15.231 a - Average			FCC Class B High Frequency - Peak			FCC Class B High Frequency - Average									
											Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)							
h		1532.0	63.44	20.0	43.4	0.0	25.9	2.2	91.5	71.5	---	---	---	---	---	---	74.0	17.5	Fail	---	---	---							
h		2452.0	49.0	20.0	29.0	0.0	29.0	2.7	80.7	60.7	87.2	-6.5	Pass	67.2	-6.5	Pass	---	---	---	---	---	---							
h		1840.0	52.3	20.0	32.3	0.0	27.5	2.4	82.2	62.2	87.2	-5.0	Pass	67.2	-5.0	Pass	---	---	---	---	---	---							
h		3969.3	43.6	20.0	23.6	0.0	31.4	3.2	78.2	58.2	87.2	-9.0	Pass	67.2	-9.0	Pass	---	---	---	---	---	---							
h		3980.0	48.5	20.0	28.5	0.0	32.5	3.7	84.7	64.7	---	---	---	---	---	---	74.0	10.7	Fail	54.0	10.7	Fail							
v		1532.0	56.4	20.0	36.4	0.0	25.9	2.2	84.5	64.5	---	---	---	---	---	---	74.0	10.5	Fail	54.0	10.5	Fail							
Table Result:										Fail by 17.5 dB										Worst Freq: 1532.0 MHz									
Test Site: EMI Chamber 2										Cable 1: Asset #1506										Cable 3: ---									
Analyzer: Asset #1328										Preamp: none										Antenna: Black Horn									
																				Preselctor: ---									



Test Results

Fundamental Emission

LIMIT

Fundamental Frequency	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emission (microvolts/meter)
260 - 470 MHz	1,500 to 5,000	150 to 500
[15.231(e)]		

Average Limit[dBμV/m] = $20\log((16.6667(F[\text{in MHz}]) - 2833.3333) @ 3\text{m}$

Example Calculation: $20\log((16.6667(302.5) - 2833.3333) = 66.8\text{dB}\mu\text{V/m} @ 3\text{m}$

MEASUREMENT

Fundamental Field Strength													
Date: 25-Jan-10			Company: AirPointe			Work Order: J1727							
Engineer: Matthew Burman			EUT Desc: Sushi			EUT Operating Voltage/Frequency: 120Vac 60Hz							
Temp: 18.3°C			Humidity: 24%			Pressure: 1001mBar							
Frequency Range: 300-346MHz						Measurement Distance: 3 m							
Notes: Fundamental Field Strength						peak limit = average limit +20dB							
RBW = 120kHz						duty cycle correction factor = 20° log(0.5^4/100)							
VBW = 300kHz						FCC 15.231.e							
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Duty Cycle Correction Factor (dB)	Cable Factor (dB)	Adjusted Reading (dBμV/m)				Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
Set power to +7.9dBm	300.5	68.1	0.0	13.9	0.0	3.3	85.3	---	---	---	86.7	-1.4	Pass
h pk	300.5	68.1	0.0	13.9	20.0	3.3	65.3	---	---	---	66.7	-1.4	Pass
h avg	300.5	68.1	0.0	13.9	20.0	3.3	65.3	---	---	---	66.7	-1.4	Pass
Set power to +7.5dBm	302.5	69.3	0.0	14.0	0.0	3.3	86.6	---	---	---	86.9	-0.3	Pass
h pk	302.5	69.3	0.0	14.0	20.0	3.3	66.6	---	---	---	66.9	-0.3	Pass
h avg	302.5	69.3	0.0	14.0	20.0	3.3	66.6	---	---	---	66.9	-0.3	Pass
Set power to +6.9dBm	303.5	69.1	0.0	14.0	0.0	3.3	86.4	---	---	---	86.9	-0.5	Pass
h pk	303.5	69.1	0.0	14.0	20.0	3.3	66.4	---	---	---	66.9	-0.5	Pass
h avg	303.5	69.1	0.0	14.0	20.0	3.3	66.4	---	---	---	66.9	-0.5	Pass
Set power to +3.9dBm	305.5	68.6	0.0	14.0	0.0	3.3	85.9	---	---	---	87.1	-1.1	Pass
h pk	305.5	68.6	0.0	14.0	20.0	3.3	65.9	---	---	---	67.1	-1.1	Pass
h avg	305.5	68.6	0.0	14.0	20.0	3.3	65.9	---	---	---	67.1	-1.1	Pass
Set power to +2.2dBm	307.5	69.3	0.0	14.1	0.0	3.4	86.8	---	---	---	87.2	-0.4	Pass
h pk	307.5	69.3	0.0	14.1	20.0	3.4	66.8	---	---	---	67.2	-0.4	Pass
h avg	307.5	69.3	0.0	14.1	20.0	3.4	66.8	---	---	---	67.2	-0.4	Pass
Set power to +0.6dBm	308.5	68.3	0.0	14.1	0.0	3.4	85.8	---	---	---	87.3	-1.5	Pass
h pk	308.5	68.3	0.0	14.1	20.0	3.4	65.8	---	---	---	67.3	-1.5	Pass
h avg	308.5	68.3	0.0	14.1	20.0	3.4	65.8	---	---	---	67.3	-1.5	Pass
Set power to +1.7dBm	310.5	69.7	0.0	14.2	0.0	3.4	87.3	---	---	---	87.4	-0.1	Pass
h pk	310.5	69.7	0.0	14.2	20.0	3.4	67.3	---	---	---	67.4	-0.1	Pass
h avg	310.5	69.7	0.0	14.2	20.0	3.4	67.3	---	---	---	67.4	-0.1	Pass
Set power to +3.1dBm	312.5	69.6	0.0	14.2	0.0	3.4	87.2	---	---	---	87.5	-0.3	Pass
h pk	312.5	69.6	0.0	14.2	20.0	3.4	67.2	---	---	---	67.5	-0.3	Pass
h avg	312.5	69.6	0.0	14.2	20.0	3.4	67.2	---	---	---	67.5	-0.3	Pass
Set power to +7.5dBm	315.5	68.8	0.0	14.3	0.0	3.5	86.6	---	---	---	87.7	-1.1	Pass
h pk	315.5	68.8	0.0	14.3	20.0	3.5	66.6	---	---	---	67.7	-1.1	Pass
h avg	315.5	68.8	0.0	14.3	20.0	3.5	66.6	---	---	---	67.7	-1.1	Pass
Set power to +10dBm	320.5	66.5	0.0	14.4	0.0	3.5	84.4	---	---	---	88.0	-3.6	Pass
h pk	320.5	66.5	0.0	14.4	20.0	3.5	64.4	---	---	---	68.0	-3.6	Pass
h avg	320.5	66.5	0.0	14.4	20.0	3.5	64.4	---	---	---	68.0	-3.6	Pass
Set power to +10dBm	336.5	56.4	0.0	14.8	0.0	3.5	74.7	---	---	---	88.9	-14.1	Pass
h pk	336.5	56.4	0.0	14.8	20.0	3.5	54.7	---	---	---	68.9	-14.1	Pass
h avg	336.5	56.4	0.0	14.8	20.0	3.5	54.7	---	---	---	68.9	-14.1	Pass
Set power to +10dBm	340.5	57.8	0.0	14.9	0.0	3.5	76.2	---	---	---	89.1	-12.9	Pass
h pk	340.5	57.8	0.0	14.9	20.0	3.5	56.2	---	---	---	69.1	-12.9	Pass
h avg	340.5	57.8	0.0	14.9	20.0	3.5	56.2	---	---	---	69.1	-12.9	Pass
Set power to +10dBm	346.5	54.2	0.0	15.2	0.0	3.6	73.0	---	---	---	89.4	-16.4	Pass
h pk	346.5	54.2	0.0	15.2	20.0	3.6	53.0	---	---	---	69.4	-16.4	Pass
h avg	346.5	54.2	0.0	15.2	20.0	3.6	53.0	---	---	---	69.4	-16.4	Pass
Test Site: 1DCC-OATS-3M-I			Cable 1: EMIR-16			Cable 2: ---			Cable 3: ---				
Analyzer: Rental SA#5			Preamp: Red-White			Antenna: Grn-Red			Preselctor: ---				



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Rev: 25-Jan-2010

Spectrum Analyzers / Receivers / Preselectors

	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Rental SA #5	9kHz-26.5 GHz	E4407B	Agilent	MY44220066	1491	I	2-Feb-2010

Radiated Emissions Sites

	FCC Code	IC Code	VCCI Code	Cat	Calibration Due
1DCC-OATS-3M-I	719150	2762A-8	R-3109	II	7-Jul-2011

Preamps / Couplers Attenuators / Filters

	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Red-White	0.009-2000MHz	ZFL-1000-LN	CS	N/A	1258	II	6-Nov-2010
Red-Blue	1-20GHz	PE2-38-218-4R5-17-15-SFF	CS	NA	1257	II	8-May-2010

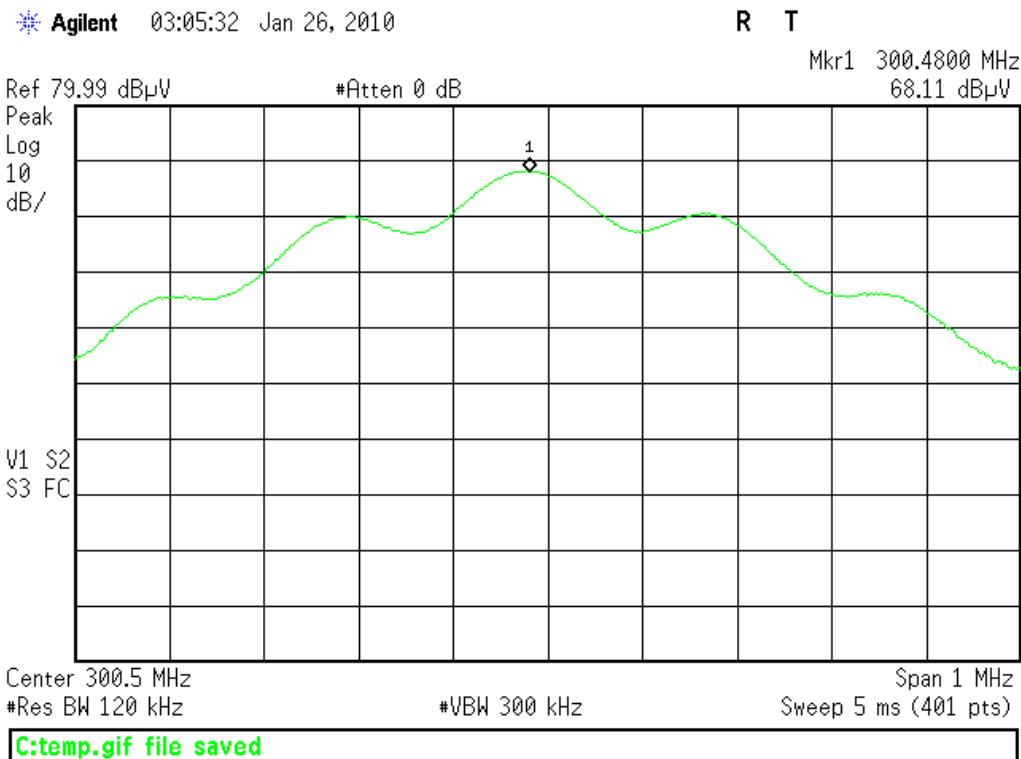
Antennas

	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Green-Red Bilog	30-2000MHz	CBL6112B	Chase	2435	990	I	22-Apr-2010
Yellow Horn	1-18GHz	3115	EMCO	9608-4898	37	I	27-May-2011

Meteorological Meters

	MN	Mfr	SN	Asset	Cat	Calibration Due
Temp./Humidity/Atm. Pressure Gauge	7400 Perception II	Davis	N/A	965	I	6-Apr-2011
1DCC-OATS-3M-I Thermohygrometer	35519-044	Control Company	72457635	1334	II	18-Aug-2011

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Sample Analyzer Screen Plot

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Bandwidth**LIMIT**

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

MEASUREMENTS / RESULTS

Engineer: Matthew Burman

Date: January 11, 2010

Site: 3m Indoor OATS

Frequency	20dB BW	Limit	Results
(MHz)	(MHz)	(MHz)	(Pass/Fail)
300.5	0.595	0.75125	Pass
320.5	0.595	0.80125	Pass
336.5	0.62	0.84125	Pass
340.5	0.85	0.85125	Pass
346.5	0.866	0.86625	Pass

Rev: 25-Jan-2010

Spectrum Analyzers / Receivers /Preselectors

Rental SA #5

Range
9kHz-26.5 GHz**MN**
E4407B**Mfr**
Agilent**SN**
MY44220066**Asset**
1491**Cat**
I**Calibration Due**
2-Feb-2010**Radiated Emissions Sites**

1DCC-OATS-3M-I

FCC Code
719150**IC Code**
2762A-8**VCCI Code**
R-3109**Cat**
II**Calibration Due**
7-Jul-2011**Preamps /Couplers Attenuators / Filters**Red-White
Red-Blue**Range**
0.009-2000MHz
1-20GHz**MN**
ZFL-1000-LN
PE2-38-218-4R5-17-15-SFF**Mfr**
CS
CS**SN**
N/A
NA**Asset**
1258
1257**Cat**
II
II**Calibration Due**
6-Nov-2010
8-May-2010**Antennas**Green-Red Bilog
Yellow Horn**Range**
30-2000MHz
1-18GHz**MN**
CBL6112B
3115**Mfr**
Chase
EMCO**SN**
2435
9608-4898**Asset**
990
37**Cat**
I
I**Calibration Due**
22-Apr-2010
27-May-2011**Meteorological Meters**Temp./Humidity/Atm. Pressure Gauge
1DCC-OATS-3M-I Thermohygrometer**MN**
7400 Perception II
35519-044**Mfr**
Davis
Control Company**SN**
N/A
72457635**Asset**
965
1334**Cat**
I
II**Calibration Due**
6-Apr-2011
18-Aug-2011

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

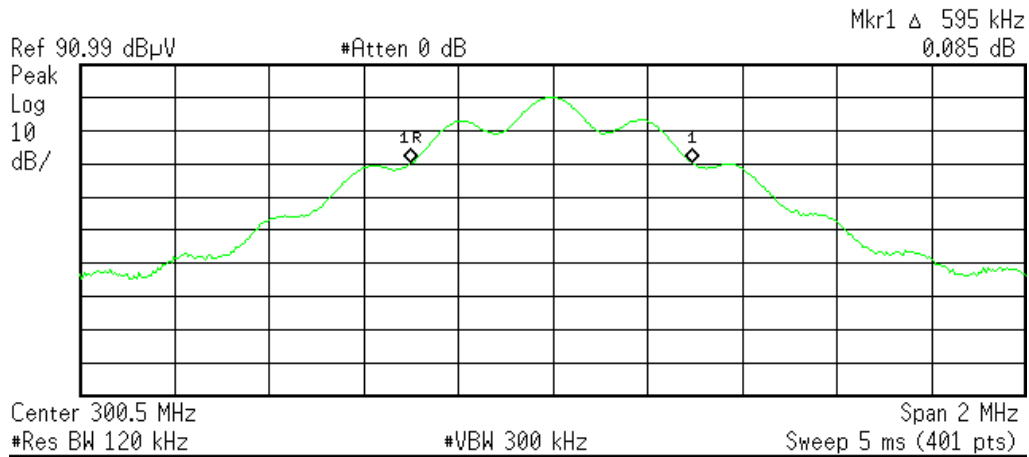
Sample Analyzer Plot

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Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Freq	300.200 MHz	61.14 dBμV
1Δ	(1)	Freq	595 kHz	0.085 dB

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Restricted Bands of Operations

Restricted bands of operation												
Date: 11-Jan-10			Company: AirPointe						Work Order: J1727			
Engineer: Matthew Burman			EUT Desc: Sushi						EUT Operating Voltage/Frequency: Battery Power (3V)			
Temp: 14.6°C			Humidity: 25%						Pressure: 1009mBar			
Frequency Range: 322-335.4								Measurement Distance: 3 m				
Notes: Peak Readings Restricted bands of operation												
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBμV/m)	---			FCC Class B		
							Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
h	322.0	23.2	0.0	14.4	2.6	40.2	---	---	---	46.0	-5.8	Pass
h	335.4	22.1	0.0	14.8	2.6	39.5	---	---	---	46.0	-6.5	Pass
Table Result: Pass by -5.8 dB Worst Freq: 322.0 MHz												
Test Site: 1DCC-OATS-3M-I			Cable 1: EMIR-17									
Analyzer: Gold			Antenna: Grn-Red									

Rev: 25-Jan-2010

Spectrum Analyzers / Receivers / Preselectors

Rental SA #5

Range
9kHz-26.5 GHzMN
E4407BMfr
AgilentSN
MY44220066Asset
1491Cat
ICalibration Due
2-Feb-2010

Radiated Emissions Sites

1DCC-OATS-3M-I

FCC Code
719150IC Code
2762A-8VCCI Code
R-3109Cat
IICalibration Due
7-Jul-2011

Preamps / Couplers Attenuators / Filters

Red-White

Red-Blue

Range
0.009-2000MHz
1-20GHzMN
ZFL-1000-LN
PE2-38-218-4R5-17-15-SFFMfr
CS
CSSN
N/A
NAAsset
1258
1257Cat
II
IICalibration Due
6-Nov-2010
8-May-2010

Antennas

Green-Red Bilog

Yellow Horn

Range
30-2000MHz
1-18GHzMN
CBL6112B
3115Mfr
Chase
EMCOSN
2435
9608-4898Asset
990
37Cat
I
ICalibration Due
22-Apr-2010
27-May-2011

Meteorological Meters

Temp./Humidity/Atm. Pressure Gauge

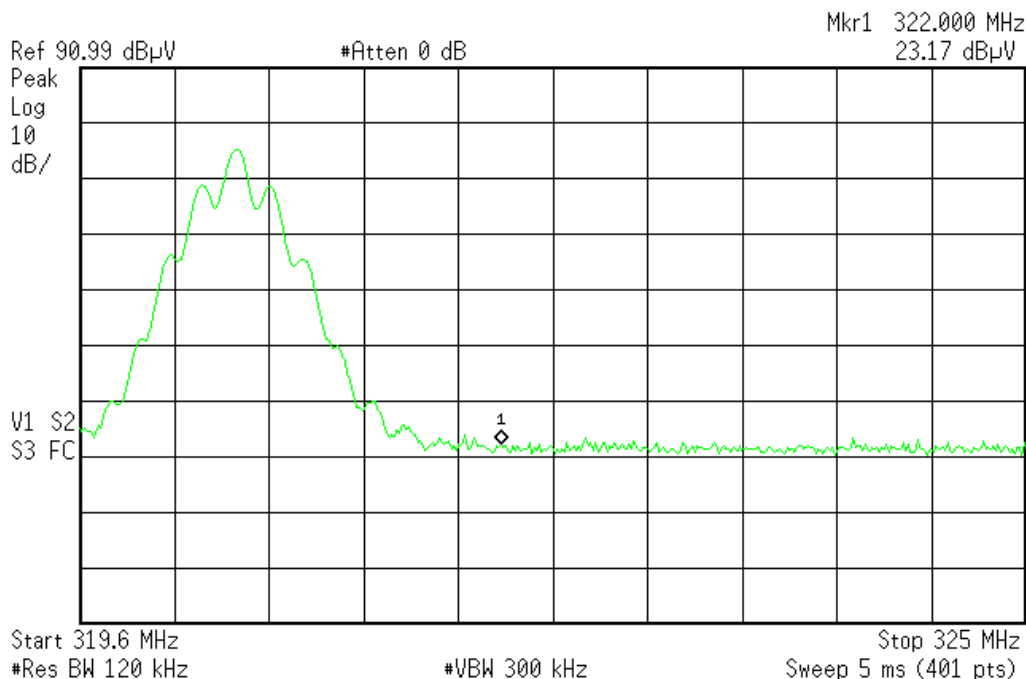
1DCC-OATS-3M-I Thermohygrometer

MN
7400 Perception II
35519-044Mfr
Davis
Control CompanySN
N/A
72457635Asset
965
1334Cat
I
IICalibration Due
6-Apr-2011
18-Aug-2011

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

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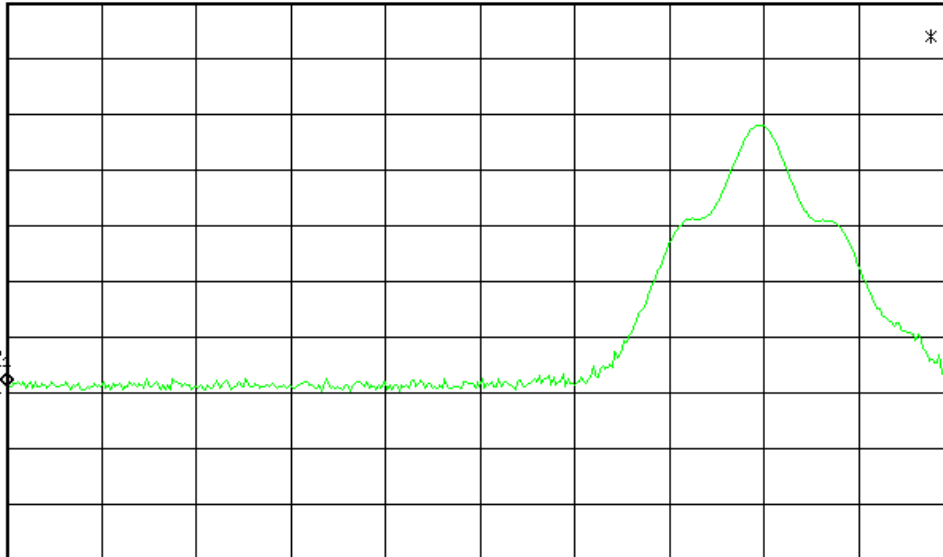
Mkr1 335.400 MHz
22.08 dBμV

Ref 90.99 dBμV

#Atten 0 dB

Peak
Log
10
dB/

V1 S2
S3 FC



Start 335.4 MHz

#Res BW 120 kHz

#VBW 300 kHz

Stop 337 MHz

Sweep 5 ms (401 pts)

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Harmonics and Spurious Emissions

LIMIT

Fundamental Frequency	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emission (microvolts/meter)
260 - 470 MHz	1,500 to 5,000	150 to 500

[15.231(e)]

Average Limit[dBμV/m] = $20\log((16.6667(F[\text{in MHz}]) - 2833.3333) - 20 @ 3\text{m}$

Example Calculation: $20\log((16.6667(302.5) - 2833.3333) - 20 = 46.8\text{dB}\mu\text{V/m} @ 3\text{m}$

MEASUREMENTS

Radiated Emissions Table																
Date: 26-May-10			Company: AirPointe			Work Order: J1727										
Engineer: Matthew Burman			EUT Desc: Sushi			EUT Operating Voltage/Frequency: 3Vdc Battery Powered										
Temp: 25.3 °C			Humidity: 35%			Pressure: 1015mBar										
Frequency Range: 30-1000MHz								Measurement Distance: 3 m								
Notes: Duty Cycle Correction Factor of 20dB								EUT Max Freq: 306.5MHz								
Peak Readings								RBW = 120kHz VBW = 300kHz								
Antenna Polarization		Frequency	Reading	Preamp Factor	Antenna Factor	Cable Factor	Duty Cycle Correction Factor	Adjusted Reading	FCC 15.231 (e)			FCC Class B				
(H / V)		(MHz)	(dBμV)	(dB)	(dB/m)	(dB)		(dBμV/m)	Limit	Margin	Result	Limit	Margin	Result		
									(dBμV/m)	(dB)	(Pass/Fail)	(dBμV/m)	(dB)	(Pass/Fail)		
v pk		613.0	48.0	24.4	19.5	1.6	0.0	44.7	67.1	-41.9	Pass	46.0	-1.3	Pass		
v pk		919.5	25.0	24.8	23.1	1.9	0.0	25.2								
Table Result: Pass								by -1.3 dB			Worst Freq: 613.0 MHz					
Test Site: EMI Chamber 1			Cable 1: Asset #1507			Cable 2: Asset #1505			Cable 3: ...							
Analyzer: Gold			Preamp: Black			Antenna: Red-Brown			Preselector: ...							

Radiated Emissions Table													
Date: 26-May-10			Company: AirPointe			Work Order: J1727							
Engineer: Matthew Burman			EUT Desc: Sushi			EUT Operating Voltage/Frequency: 3Vdc Battery Powered							
Temp: 25.3°C			Humidity: 35%			Pressure: 1015mBar							
Frequency Range: 1-4GHz								Measurement Distance: 3 m					
Notes: Duty Cycle Correction Factor of 20dB Peak Readings RBW = 1MHz VBW = 3MHz								All emissions are noise floor EUT Max Freq: 306.5MHz					
Antenna Polarization	Frequency	Reading	Preamp Factor	Antenna Factor	Cable Factor	Duty Cycle Correction Factor	Adjusted Reading (dB(Vin))	FCC 15.231 (e)			FCC Class B		
								Limit (dB(Vin))	Margin (dB)	Result (Pass/Fail)	Limit (dB(Vin))	Margin (dB)	Result (Pass/Fail)
h pk	1226.0	31.4	22.3	26.0	2.2	0.0	37.3	---	---	---	74.0	-36.7	Pass
h avg	1226.0	31.4	22.3	26.0	2.2	20.0	17.3	---	---	---	54.0	-36.7	Pass
h pk	1532.5	33.0	21.2	25.9	2.4	0.0	40.1	---	---	---	74.0	-33.9	Pass
h avg	1532.5	33.0	21.2	25.9	2.4	20.0	20.1	---	---	---	54.0	-33.9	Pass
h pk	1839.0	32.4	21.2	27.5	2.7	0.0	41.4	87.1	-45.7	Pass	---	---	---
h avg	1839.0	32.4	21.2	27.5	2.7	20.0	21.4	67.1	-45.7	Pass	---	---	---
h pk	2145.5	32.8	22.5	27.7	2.8	0.0	40.8	87.1	-46.3	Pass	---	---	---
h avg	2145.5	32.8	22.5	27.7	2.8	20.0	20.8	67.1	-46.3	Pass	---	---	---
h pk	2452.0	31.8	22.6	29.0	3.0	0.0	41.2	87.1	-45.9	Pass	---	---	---
h avg	2452.0	31.8	22.6	29.0	3.0	20.0	21.2	67.1	-45.9	Pass	---	---	---
h pk	2758.5	34.3	22.7	29.2	3.2	0.0	44.0	---	---	---	74.0	-30.0	Pass
h avg	2758.5	34.3	22.7	29.2	3.2	20.0	24.0	---	---	---	54.0	-30.0	Pass
h pk	3065.0	31.8	22.2	30.9	3.6	0.0	44.1	87.1	-43.0	Pass	---	---	---
h avg	3065.0	31.8	22.2	30.9	3.6	20.0	24.1	67.1	-43.0	Pass	---	---	---
Table Result: Pass by -10.0 dB												Worst Freq: 2758.5 MHz	
Test Site: EMI Chamber 1			Cable 1: Asset #1507			Cable 2: Asset #1505			Cable 3: ---				
Analyzer: Gold			Preamp: Asset #1517			Antenna: Black Horn			Preselector: ---				



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Rev: 24-May-2010

Spectrum Analyzers / Receivers / Preselectors

	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Gold	100Hz-26.5 GHz	E4407B	Agilent	MY45113816	1284	I	9-Apr-2011

Radiated Emissions Sites

	FCC Code	IC Code	VCCI Code	Cat	Calibration Due
EMI Chamber 1	719150	2762A-6	R-3032, G-106	I	15-Feb-2011

Preamps / Couplers Attenuators / Filters

	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Black	0.009-2000MHz	ZFL-1000-LN	CS	N/A	799	II	22-Jan-2011
1517 HF Preamp	1-18GHz	CS	CS	N/A	1517	II	29-May-2010

Antennas

	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Red-Brown Bilog	30-2000MHz	JB1	Sunol	A0032406	1218	I	11-Aug-2010
Black Horn	1-18GHz	3115	EMCO	9703-5148	56	I	6-Jul-2011

Meteorological Meters

	MN	Mfr	SN	Asset	Cat	Calibration Due
Temp./Humidity/Atm. Pressure Gauge	7400 Perception II	Davis	N/A	965	I	6-Apr-2011
CHAMBER1 Thermohygrometer	35519-044	Control Company	72457642	1345	II	18-Aug-2011

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Note: 15.231(b)(3) states “*Spurious emissions shall be attenuated to the average...limits shown in this table [15.231(e)] or to the general limits shown in Section 15.209, whichever limit permits a higher field strength.*” Since the emissions above 1GHz meet the 15.209 limits, those limits are displayed in the data table to show worst case.



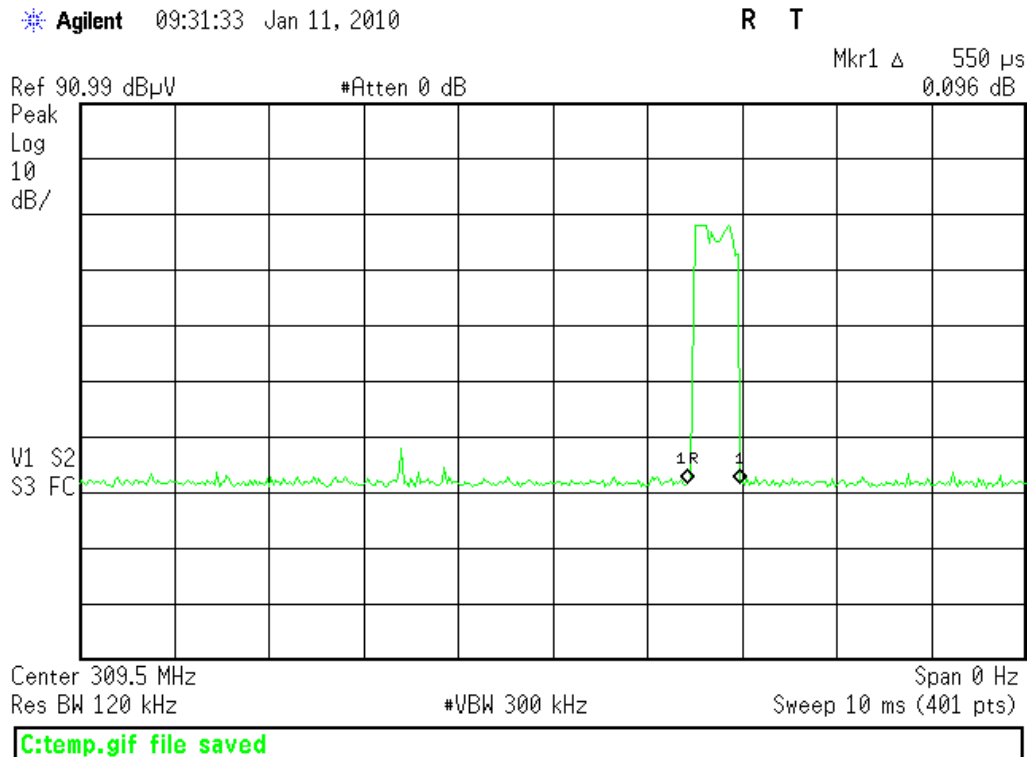
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Timing Requirements / Duty Cycle Correction Factor

“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.” [15.231(e)]

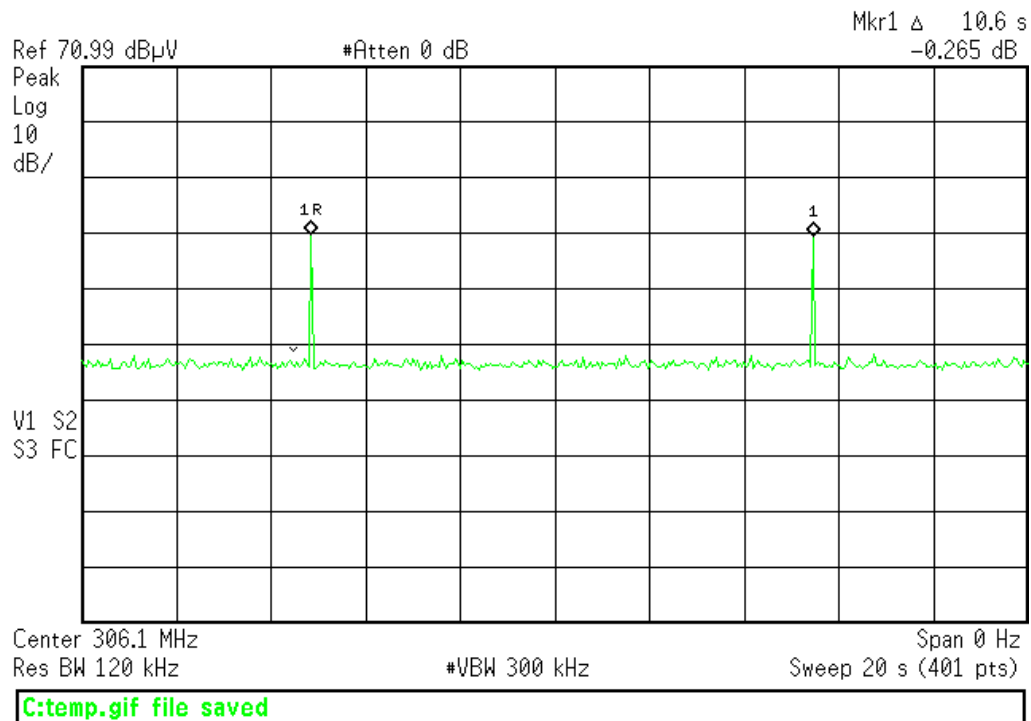
Duration of single pulse



Silent period = $30 \times 550 \text{ microseconds} = 16500 \text{ microseconds} = 0.0165 \text{ seconds}$
The silent period shall be minimum 10 seconds.

Agilent 14:05:46 May 20, 2010

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The worst case duty cycle is represented by the two analyzer plots immediately above.

$$\text{DCCF} = 20 \cdot \log(550 \mu\text{s} / 0.1 \text{ s})$$

$$\text{DCCF} = 20 \cdot \log(0.0055)$$

$$\text{DCCF} = -45.2 \text{ dB}$$

A 20dB Duty Cycle Correction Factor was used in this report.



Line Conducted Emissions**LIMITS**

Frequency of emission (MHz)	Quasi-peak limit (dB μ V)	Average limit (dB μ V)
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.
[47 CFR 15.207(a)]

No Line Conducted Emissions were performed since EUT is battery powered

Measurement Uncertainty

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Expanded Uncertainty k=2	Maximum allowable uncertainty
Radiated Emissions (30-1000MHz)		
NIST	5.6dB	N/A
CISPR	4.6dB	5.2dB (Ucisprr)
Radiated Emissions (1-26.5GHz)	4.6dB	N/A
Radiated Emissions (above 26.5GHz)	4.9dB	N/A
Magnetic Radiated Emissions	5.6dB	N/A
Conducted Emissions		
NIST	3.9dB	N/A
CISPR	3.6dB	3.6dB (Ucisprr)
Telco Conducted Emissions (Current)	2.9dB	N/A
Telco Conducted Emissions (Voltage)	4.4dB	N/A
Electrostatic Discharge	11.5%	N/A
Radiated RF Immunity (Uniform Field)	1.6dB	N/A
Electrical Fast Transients	23.1%	N/A
Surge	23.1%	N/A
Conducted RF Immunity	3dB	N/A
Magnetic Immunity	12.8%	N/A
Dips and Interrupts	2.3V	N/A
Harmonics	3.5%	N/A
Flicker	3.5%	N/A
Radio frequency (@ 2.4GHz)	3.23×10^{-8}	1×10^{-7}
RF power, conducted	0.40dB	0.75dB
Maximum frequency deviation:		
• Within 300Hz and 6kHz of audio frequency / Within 6kHz and 25kHz of audio frequency	3.4% 0.3dB	5% 3dB
Adjacent channel power	1.9dB	3dB
Conducted spurious emission of transmitter, valid up to 12.75GHz	2.39dB	3dB
Conducted emission of receivers	1.3dB	3dB
Radiated emission of transmitter, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of transmitter, valid up to 80GHz	3.3dB	6dB
Radiated emission of receiver, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of receiver, valid up to 80GHz	3.3dB	6dB
Humidity	2.37%	5%
Temperature	0.7°C	1.0°C
Time	4.1%	10%
RF Power Density, Conducted	0.4dB	3dB
DC and low frequency voltages	1.3%	3%
Voltage (AC, <10kHz)	1.3%	2%
Voltage (DC)	0.62%	1%
The above reflects a 95% confidence level		



Product Documentation

The following documentation has been provided by the client for inclusion in this report.



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Conditions Of Testing

[Bureau Veritas Consumer Products Services, Inc., a Massachusetts corporation], and/or its affiliates (collectively, the "Company") will conduct, at the request of the Submitter ("Client"), the tests specified on the submitted Test Request Form or equivalent in accordance with, and subject to, the following terms and conditions (collectively, "Conditions"):

1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless and until such order is accepted by it, as evidenced by the issuance of a written report ("Test Report") by the Company. The Test Report is issued solely by the Company, is intended for the exclusive use of Client and shall not be published, used for advertising purposes, copied or replicated for distribution to any other person or entity or otherwise publicly disclosed without the prior written consent of the Company. By submitting a request for services to the Company, Client consents to the disclosure to accreditation bodies of those records of Client relevant to the accreditation body's assessment of the Company's competence and compliance with relevant accreditation criteria. The Company shall not be liable for any loss or damage whatsoever resulting from the failure of the Company to provide its services within any time period for completion estimated by the Company. If Client anticipates using the Test Report in any legal proceeding, arbitration, dispute resolution forum or other proceeding, it shall so notify the Company prior to submitting the Test Report in such proceeding. The Company has no obligation to provide a fact or expert witness at such proceeding unless the Company agrees in advance to do so for a separate and additional fee.
2. The Test Report will set forth the findings of the Company solely with respect to the test samples identified therein. Unless specifically and expressly indicated in the Test Report, the results set forth in such Test Report are not intended to be indicative or representative of the quality or characteristics of the lot from which a test sample is taken, and Client shall not rely upon the Test Report as being so indicative or representative of the lot or of the tested product in general. The Test Report will reflect the findings of the Company at the time of testing only, and the Company shall have no obligation to update the Test Report after its issuance. The Test Report will set forth the results of the tests performed by the Company based upon the written information provided to the Company. The Test Report will be based solely on the samples and written information submitted to the Company by Client, and the Company shall not be obligated to conduct any independent investigation or inquiry with respect thereto.
3. The Company may, in its sole discretion, destroy samples which have been furnished to the Company for testing and which have not been destroyed in the course of testing. The Company may delegate the performance of all or a portion of the services contemplated hereunder to an affiliate, agent or subcontractor of the Company, and Client consents to such delegation.
4. These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof and of the Test Report, and no modification, variance or extrapolation with respect thereto shall be permitted without the prior written consent of the Company.
5. The names, service marks, trademarks and copyrights of the Company and its affiliates, including the names "BUREAU VERITAS," "BUREAU VERITAS CONSUMER PRODUCTS SERVICES," "BVCPS," "MTL," "ACTS," "MTL-ACTS" and "CURTIS-STRAUS" (collectively, the "Marks") are and shall remain the sole property of the Company or its affiliates and shall not be used by Client except solely to the extent that Client obtains the prior written approval of the Company and then only in the manner prescribed by the Company. Client shall not contest the validity of the Marks or take any action that might impair the value or goodwill associated with the Marks or the image or reputation of the Company or its affiliates.
6. Payment in full shall be due 30 days after the date of invoice. Interest shall be due on overdue amounts from the due date until paid at an interest rate of 1.5% per month or, if less, the maximum rate permitted by law. The Company reserves the right, at any time and from time to time, to revoke any credit extended to Client. Client shall reimburse the Company for any costs it incurs in collecting past due amounts, including court costs and fees and expenses of attorneys and collection agencies. The Test Report may not be used or relied upon by Client if and for so long as Client fails to pay when due any invoice issued by the Company or any affiliate of it to Client or any affiliate or subsidiary of Client together with interest and penalties, if any, accrued thereon.
7. The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.
8. Client understands and agrees that the Company is neither an insurer nor a guarantor, that the Company does not take the place of Client or any designer, manufacturer, agent, buyer, distributor or transportation or shipping company, and that the Company disclaims all liability in such capacities. Client further understands that if it seeks assurance against loss or damage, it should obtain appropriate insurance.
9. Client agrees that the Company, by providing the services, does not take the place of Client nor any third party, nor does the Company release them from any of their obligations, nor does the Company otherwise assume, abridge, abrogate or undertake to discharge any duty of any third party to Client or any duty of Client or any third party to any other third party, and Client will not release any third party from its obligations and duties with respect to the tested goods.
10. Client shall, on a timely basis, (a) provide adequate instructions to the Company in order to enable the Company to perform properly its services, (b) provide, or cause Client's suppliers and contractors to provide, the Company with all documents necessary to enable the Company to perform its services, (c) furnish the Company with all relevant information regarding Client's intended use and purposes of the tested goods, (d) advise the Company of essential dates and deadlines relevant to the tested goods and (e) fully exercise all rights and remedies available to Client against third parties in respect of the tested goods.
11. The Company shall undertake due care and ordinary skill in the performance of its services to Client, and the Company shall accept responsibility only where such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.
12. If Client desires to assert a claim arising from or relating to (i) the performance, purported performance or non-performance of any services by the Company or (ii) the sale, resale, manufacture, distribution or use of any tested goods, it must submit that claim to the Company in a writing that sets forth with particularity the basis for such claim within 60 days from discovery of the potential claim and not more than six months after the date of issuance of the Test Report to Client. Client waives any and all such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.



13. CLIENT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.

14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, IS MADE.

15. (A) IN NO EVENT WHATSOEVER SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE TEST REPORT OR THE SERVICES PROVIDED BY THE COMPANY HEREUNDER, INCLUDING WITHOUT LIMITATION LOSS OF OR DAMAGE TO PROPERTY; LOSS OF INCOME, PROFIT OR USE; OR ANY CLAIMS OR DEMANDS MADE AGAINST CLIENT OR ANY OTHER PERSON BY ANY THIRD PARTY IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE SERVICES PROVIDED BY THE COMPANY HEREUNDER.

(B) NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN, AND IN RECOGNITION OF THE RELATIVE RISKS AND BENEFITS TO CLIENT AND THE COMPANY ASSOCIATED WITH THE TESTING SERVICES CONTEMPLATED HEREBY, THE RISKS HAVE BEEN ALLOCATED SUCH THAT UNDER NO CIRCUMSTANCES WHATSOEVER SHALL THE LIABILITY OF THE COMPANY TO CLIENT OR ANY THIRD PARTY IN RESPECT OF ANY CLAIM FOR LOSS, DAMAGE OR EXPENSE, OF WHATSOEVER NATURE OR MAGNITUDE, AND HOWSOEVER ARISING, EXCEED AN AMOUNT EQUAL TO FIVE (5) TIMES THE AMOUNT OF THE FEES PAID TO THE COMPANY FOR THE SPECIFIC SERVICES WHICH GAVE RISE TO SUCH CLAIM OR U.S.\$10,000, WHICHEVER IS THE LESSER AMOUNT.

16. The Company shall not be liable for any loss or damage resulting from any delay or failure in performance of its obligations hereunder resulting directly or indirectly from any event of force majeure or any event outside the control of the Company. If any such event occurs, the Company may immediately cancel or suspend its performance hereunder without incurring any liability whatsoever to Client.

17. Company's services, including these Conditions, shall be governed by, and construed in accordance with, the local laws of the country where the Company performs the tests or, in the case of tests performed in the United States of America, the laws of Massachusetts without regard to conflicts of laws principles. If any aspect(s) of these Conditions is found to be illegal or unenforceable, the validity, legality and enforceability of all remaining aspects of these Conditions shall not in any way be affected or impaired thereby. Any proceeding related to the subject matter hereof shall be brought, if at all, in the courts of the country where the Company performs the tests or, in the case of tests performed in the United States of America, in the courts of Massachusetts. Client waives the right to interpose any counterclaim or setoffs of any nature in any litigation arising hereunder.

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