
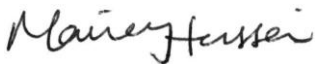




**BUREAU
VERITAS**

Test Report

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

| | |
|---------------------|---|
| Report No | EN2660-1 |
| Client | Fishman Michael Hoffer |
| Address | 6 Riverside Drive Andover, MA 01810 |
| Phone | (978) 988 - 9199 |
| Items tested | OEM Triple Play |
| FCC ID | RMU-OEMTRPP01 |
| IC | 10812A-OEMTRPP01 |
| FRN | 0022326151 |
| Equipment Type | Low Power Communication Device Transmitter |
| Equipment Code | DXX |
| Standards | 47CFR 15.249, RSS 210 issue 8, RSS GEN issue 3 |
| Test Dates | Oct 9, 18, 25 of 2013 |
| Results | As detailed within this report |
| Prepared by |  Tuyen Truong – Test Engineer |
| Authorized by |  Mairaj Hussain – EMC Supervisor |
| Issue Date | 11/25/13 |
| Conditions of Issue | This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' section on page 16 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 2-16-07 (DW)



Product Tested - Configuration Documentation

| EUT Configuration | | | | | | | | | | |
|---|------------------|---------------------|----------------------|-------------------|-----------------|-----------------|---------------|-------------------|-------------------------|---------------------------|
| Work Order: N2660 Company: Fishman Company Address: 6 Riverside Drive Andover, MA 01810 Contact: Michael Hoffer | | | | | | | | | | |
| MN | | | | | SN | | | | | |
| EUT (OEM Unit): OEM-TRP-P01 EUT Description: OEM Triple Play EUT Max Frequency: 16MHz EUT Min Frequency: 12.28MHz EUT TX Frequency: 2404-2480MHz | | | | | Sample 1 | | | | | |
| Support Equipment: | | | | | SN | | | | | |
| Fishman AC to USB power supply | | | | | BX-0501000 | | | | | |
| ACER Latop | | | | | E1-571-6811 | | | | | |
| Godin Guitar | | | | | -- | | | | | |
| EUT Ports: | | | | | | | | | | |
| Port Label | Port Type | No. of ports | No. Populated | Cable Type | Shielded | Ferrites | Length | Max Length | In/Out NEBS Type | Unpopulated Reason |
| USB | USB | 1 | 1 | USB | Yes | None | 2.5m | 2.5m | Indoor | |
| Software / Operating Mode Description: | | | | | | | | | | |
| EUT is transmitting on Low, Mid or High channels. | | | | | | | | | | |

Summary

This test report supports an application for certification of a transmitter operating pursuant to 47 CFR 15.249. The product is OEM Triple Play. It is a transmitter that operates in the range 2404 – 2480 MHz.

We found that the product met the above requirements. The test sample was received in good condition.

Test Methodology

Radiated emission testing was performed according to the procedures specified in ANSI C63.4 (2003) and RSS-GEN. Radiated Emissions were maximized by rotating the device around three orthogonal axes as well as varying the test antenna's height and polarity. The device antenna cannot be maximized separately.

AC Main conducted emission was not done because the EUT is battery powered.

The product was tested with modulation on and peak readings were compared against the average limit presented in section CFR 15.249.

The EUT operating voltage is 3.7VDC.(Fresh battery were used during testing.)

The following bandwidths were used during radiated spurious and line conducted emissions.

| Frequency | RBW | VBW |
|------------|--------|-------|
| 0.15-30MHz | 9kHz | 30kHz |
| 30-1000MHz | 120kHz | 1MHz |
| 1-25GHz | 1MHz | 3MHz |
| >1GHz* | 1MHz | 30Hz |

*Average readings



Compliance Statement

The PC502.1 4G RF Repeater (0dB) has been found to conform to the following parts of 47 CFR and RSS 210 as detailed below:

| RSS-GEN | RSS 210 | Part 15 | Comments |
|---------|---------|-----------|--|
| 5.4 | | 15.15(b) | There are no controls accessible to the user that vary the output power. |
| 5.2 | | 15.19 | The label is shown in the label exhibit. |
| 7.1.3 | | 15.21 | Information to the user is shown in the instruction manual exhibit. |
| | | 15.27 | No special accessories are required for compliance. |
| 7.1.2 | | 15.203 | The antenna for this device is hardwired to the PCB. |
| 7.2.4 | | 15.207 | EUT is Battery powered |
| | A2.9(a) | 15.249(a) | The fundamental and harmonics meet the limits in 15.249(a) |
| | A2.9(b) | 15.249(d) | Spurious emissions meet the limits in 15.209. |
| 4.6.1 | | | 99% emissions bandwidth plot is provided. |



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Test Results

Fundamental Measurements

LIMITS

The field strength from intentional radiators operated within these frequency bands shall comply with the following:

| Fundamental Frequency | Field Strength of Fundamental (millivolts/meter) | Field Strength of Harmonics (microvolts/meter) |
|--------------------------|--|--|
| 902 - 928 MHz | 50 | 500 |
| 2400 - 2483.5 MHz | 50 | 500 |
| 5725 - 5875 MHz | 50 | 500 |
| 24.0 - 24.25 GHz | 250 | 2500 |

[15.249(a)]

MEASUREMENTS / RESULTS

Adjusted Peak Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor
 Average readings were taken with 30Hz VBW

| Radiated Emissions Table | | | | | | | | | | | | | | | |
|---|--------------------------|---------------------|------------------------|---------------------------|-----------------------|-------------------|--------------------------------|-------------------------------|---|------------------------------|--------------------|-------------------------------------|-------------|--------------------|------|
| Date: 09-Oct-13 | | | | Company: Fishman | | | | | Work Order: N2660 | | | | | | |
| Engineer: Tuyen Truong | | | | EUT Desc: OEM Triple Play | | | | | EUT Operating Voltage/Frequency: 3.7Vdc | | | | | | |
| Temp: 25°C | | | | Humidity: 32% | | | | | Pressure: 1023mBar | | | | | | |
| Frequency Range: Fundamental Readings | | | | | | | | | | Measurement Distance: 3 m | | | | | |
| Notes: running with -12dBm output of Transciever chip | | | | | | | | | | EUT Max Freq: 2404 - 2480MHz | | | | | |
| Antenna Polarization (H/ V) | Frequency (MHz) | Peak Reading (dBμV) | Average Reading (dBμV) | Preamp Factor (dB) | Antenna Factor (dB/m) | Cable Factor (dB) | Adjusted Peak Reading (dBμV/m) | Adjusted Avg Reading (dBμV/m) | FCC 15.249 High Frequency - Peak | | | FCC 15.249 High Frequency - Average | | | |
| | | | | | | | | | Limit (dBμV/m) | Margin (dB) | Result (Pass/Fail) | Limit (dBμV/m) | Margin (dB) | Result (Pass/Fail) | |
| Low Channel x-direction | | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| | v | 2404.0 | 58.1 | 24.9 | 0.0 | 28.6 | 3.3 | 90.0 | 56.8 | 113.9 | -23.9 | Pass | 93.9 | -37.1 | Pass |
| | h | 2404.0 | 64.62 | 25.9 | 0.0 | 28.6 | 3.3 | 96.5 | 57.8 | 113.9 | -17.4 | Pass | 93.9 | -36.1 | Pass |
| | | | | | | | | | | | | | | | |
| | y-direction | | | | | | | | | | | | | | |
| | v | 2404.0 | 62.72 | 25.8 | 0.0 | 28.6 | 3.3 | 94.6 | 57.7 | 113.9 | -19.3 | Pass | 93.9 | -36.2 | Pass |
| y-direction | h | 2404.0 | 60.88 | 25.5 | 0.0 | 28.6 | 3.3 | 92.8 | 57.4 | 113.9 | -21.1 | Pass | 93.9 | -36.5 | Pass |
| | | | | | | | | | | | | | | | |
| | z-direction | | | | | | | | | | | | | | |
| | v | 2404.0 | 63.92 | 25.8 | 0.0 | 28.6 | 3.3 | 95.8 | 57.7 | 113.9 | -18.1 | Pass | 93.9 | -36.2 | Pass |
| | h | 2404.0 | 60.94 | 25.5 | 0.0 | 28.6 | 3.3 | 92.8 | 57.4 | 113.9 | -21.1 | Pass | 93.9 | -36.5 | Pass |
| | | | | | | | | | | | | | | | |
| Mid Channel x-direction | v | 2441.0 | 58.76 | 25.1 | 0.0 | 28.8 | 3.4 | 91.0 | 57.3 | 113.9 | -22.9 | Pass | 93.9 | -36.6 | Pass |
| | h | 2441.0 | 64.75 | 26.2 | 0.0 | 28.8 | 3.4 | 97.0 | 58.4 | 113.9 | -16.9 | Pass | 93.9 | -35.5 | Pass |
| | | | | | | | | | | | | | | | |
| | y-direction | | | | | | | | | | | | | | |
| | v | 2441.0 | 61.8 | 25.6 | 0.0 | 28.8 | 3.4 | 94.0 | 57.8 | 113.9 | -19.9 | Pass | 93.9 | -36.1 | Pass |
| | h | 2441.0 | 59.26 | 25.1 | 0.0 | 28.8 | 3.4 | 91.5 | 57.3 | 113.9 | -22.4 | Pass | 93.9 | -36.6 | Pass |
| z-direction | v | 2441.0 | 64.53 | 26.1 | 0.0 | 28.8 | 3.4 | 96.7 | 58.3 | 113.9 | -17.2 | Pass | 93.9 | -35.6 | Pass |
| | h | 2441.0 | 61.03 | 24.7 | 0.0 | 28.8 | 3.4 | 93.2 | 56.9 | 113.9 | -20.7 | Pass | 93.9 | -37.0 | Pass |
| | | | | | | | | | | | | | | | |
| | High Channel x-direction | | | | | | | | | | | | | | |
| | v | 2480.0 | 60.92 | 25.2 | 0.0 | 28.9 | 3.4 | 93.2 | 57.5 | 113.9 | -20.7 | Pass | 93.9 | -36.4 | Pass |
| | h | 2480.0 | 67.37 | 26.4 | 0.0 | 28.9 | 3.4 | 99.7 | 58.7 | 113.9 | -14.2 | Pass | 93.9 | -35.2 | Pass |
| y-direction | v | 2480.0 | 63.57 | 25.5 | 0.0 | 28.9 | 3.4 | 95.9 | 57.8 | 113.9 | -18.0 | Pass | 93.9 | -36.1 | Pass |
| | h | 2480.0 | 61.2 | 25.3 | 0.0 | 28.9 | 3.4 | 93.5 | 57.6 | 113.9 | -20.4 | Pass | 93.9 | -36.3 | Pass |
| | | | | | | | | | | | | | | | |
| | z-direction | | | | | | | | | | | | | | |
| | v | 2480.0 | 66.82 | 25.8 | 0.0 | 28.9 | 3.4 | 99.1 | 58.1 | 113.9 | -14.8 | Pass | 93.9 | -35.8 | Pass |
| | h | 2480.0 | 64.46 | 25.2 | 0.0 | 28.9 | 3.4 | 96.8 | 57.5 | 113.9 | -17.1 | Pass | 93.9 | -36.4 | Pass |
| Table Result: Pass by -14.2 dB Worst Freq: 2480.0 MHz | | | | | | | | | | | | | | | |
| Test Site: EMI Chamber 2 | | | | Cable 1: Asset #1782 | | | | | Cable 2: Asset #1784 | | | | | Cable 3: --- | |
| Analyzer: Gold | | | | Preamp: none | | | | | Antenna: Black Horn | | | | | Preselector: --- | |

Rev:10/6/2013

Spectrum Analyzers / Receivers / Preselectors

Gold

| Range | MN | Mfr | SN | Asset | Cat | Calibration Due |
|----------------|--------|---------|------------|-------|-----|-----------------|
| 100Hz-26.5 GHz | E4407B | Agilent | MY45113816 | 1284 | I | 3/18/2014 |

Radiated Emissions Sites

EMI Chamber 2

| FCC Code | IC Code | VCCI Code | Range | Cat | Calibration Due |
|----------|---------|-----------|------------|-----|-----------------|
| 719150 | 2762A-7 | A-0015 | 30-1000MHz | II | 2/15/2014 |

Antennas

Black Horn

| Range | MN | Mfr | SN | Asset | Cat | Calibration Due |
|---------|------|------|-----------|-------|-----|-----------------|
| 1-18GHz | 3115 | EMCO | 9703-5148 | 56 | I | 8/5/2015 |

Cables

Asset #1782

Asset #1784

| Range | Mfr | Cat | Calibration Due |
|--------------|------------|-----|-----------------|
| 9kHz - 18GHz | Florida RF | II | 3/6/2014 |
| 9kHz - 18GHz | Florida RF | II | 3/14/2014 |

Meteorological Meters

Weather Clock (Pressure Only)

CHAMBER2 Thermohygrometer

| MN | Mfr | SN | Asset | Cat | Calibration Due |
|-----------|-------------------|----------|-------|-----|-----------------|
| BA928 | Oregon Scientific | C3166-1 | 831 | I | 3/20/2014 |
| 35519-044 | Control Company | 72457639 | 1347 | II | Retired |

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



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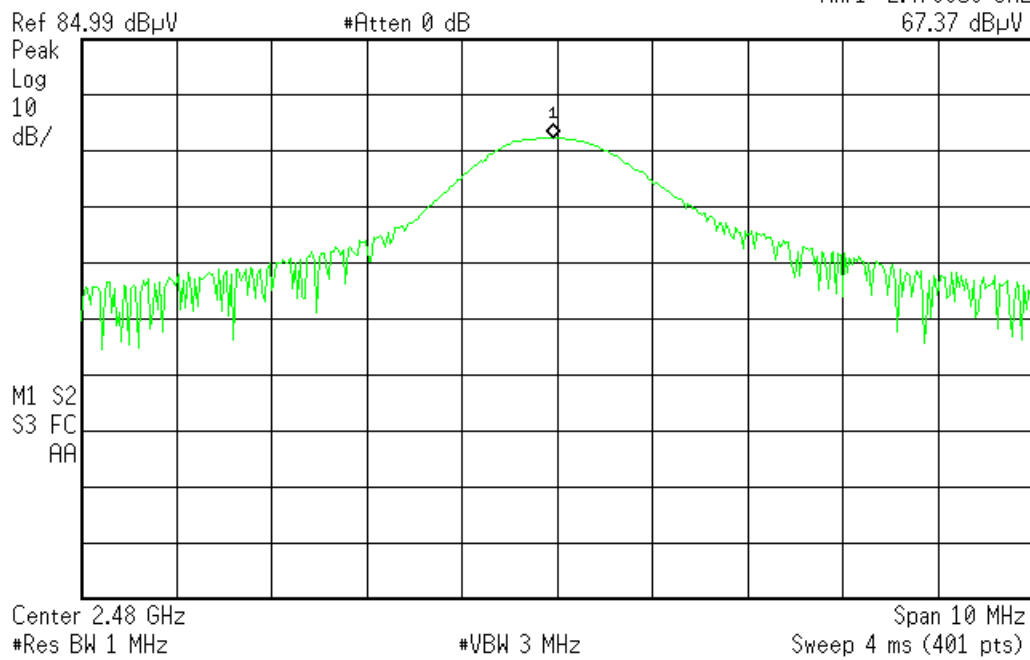
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Sample Plot

Agilent 15:00:16 Oct 9, 2013

R T

Mkr1 2.479950 GHz
67.37 dBμV



Radiated Spurious Emissions

LIMITS

15.249 (d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

MEASUREMENTS / RESULTS

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

| Radiated Emissions Table | | | | | | | | | | | | |
|-------------------------------|--------------------|-------------------|---------------------------|--------------------------|----------------------|------------------------------|---------------------------|--|---|-------------------|-----------------------|-----------------------|
| Date: 14-Oct-13 | | | Company: Fishman | | | | | | Work Order: N2660 | | | |
| Engineer: Arik Zwirner | | | EUT Desc: OEM Triple Play | | | | | | EUT Operating Voltage/Frequency: 3.7Vdc | | | |
| Temp: 25°C | | | Humidity: 33% | | | Pressure: 1001mBar | | | | | | |
| Frequency Range: 30-1000MHz | | | | | | | Measurement Distance: 3 m | | | | | |
| Notes: EUT at 80cm height | | | | | | | EUT Max Freq: 16MHz | | | | | |
| Antenna Polarization (H/V) | Frequency (MHz) | Reading (dBμV) | Preamp Factor (dB) | Antenna Factor (dB/m) | Cable Factor (dB) | Adjusted Reading (dBμV/m) | | | | FCC 15.209 | | |
| | | | | | | | | | | Limit (dBμV/m) | Margin (dB) | Result (Pass/Fail) |
| V | 59.6 | 27.7 | 25.4 | 7.1 | 0.5 | 9.9 | | | | 40.0 | -30.1 | Pass |
| V | 87.6 | 26.1 | 25.1 | 7.5 | 0.6 | 9.1 | | | | 40.0 | -30.9 | Pass |
| V | 148.4 | 29.3 | 25.1 | 12.4 | 0.8 | 17.4 | | | | 43.5 | -26.1 | Pass |
| V | 157.4 | 28.6 | 25.0 | 12.2 | 0.9 | 16.7 | | | | 43.5 | -26.8 | Pass |
| H | 180.0 | 28.8 | 25.1 | 10.9 | 0.8 | 15.4 | | | | 43.5 | -28.1 | Pass |
| V | 180.6 | 26.8 | 25.1 | 10.9 | 0.8 | 13.4 | | | | 43.5 | -30.1 | Pass |
| V | 270.0 | 31.5 | 25.1 | 13.2 | 1.2 | 20.8 | | | | 46.0 | -25.2 | Pass |
| H | 362.0 | 36.1 | 25.1 | 14.9 | 1.3 | 27.2 | | | | 46.0 | -18.8 | Pass |
| H | 632.2 | 29.4 | 25.1 | 19.6 | 1.7 | 25.6 | | | | 46.0 | -20.4 | Pass |
| Table Result: Pass | | | | | | | by | | -18.8 dB | | Worst Freq: 362.0 MHz | |
| Test Site: EMI Chamber 2 | | | Cable 1: Asset #1782 | | | | | | | | | |
| Analyzer: Rental SA#2 | | | Preamp: Red | | | | | | | | | |
| | | | Cable 2: Asset #1784 | | | | | | | | | |
| | | | Antenna: Red-Black | | | | | | | | | |

Rev.10/6/2013

| | | | | | | | | |
|--|--|-----------------|----------------|-------------------|--------------|--------------|------------|------------------------|
| Spectrum Analyzers / Receivers / Preselectors | | Range | MN | Mfr | SN | Asset | Cat | Calibration Due |
| Rental SA #2 | | 9kHz-26.5 GHz | E7405A | Agilent | MY45104194 | rental | I | 12/8/2013 |
| Radiated Emissions Sites | | FCC Code | IC Code | VCCI Code | Range | | Cat | Calibration Due |
| EMI Chamber 2 | | 719150 | 2762A-7 | A-0015 | 30-1000MHz | | II | 2/15/2014 |
| Preamps / Couplers / Attenuators / Filters | | Range | MN | Mfr | SN | Asset | Cat | Calibration Due |
| Red | | 0.009-2000MHz | ZFL-1000-LN | CS | N/A | 798 | II | 2/2/2014 |
| Antennas | | Range | MN | Mfr | SN | Asset | Cat | Calibration Due |
| Red-Black Bilog | | 30-2000MHz | JB1 | Sunol | A091604-2 | 1106 | I | 1/28/2015 |
| Cables | | Range | | Mfr | | | Cat | Calibration Due |
| Asset #1782 | | 9kHz - 18GHz | | Florida RF | | | II | 3/6/2014 |
| Asset #1784 | | 9kHz - 18GHz | | Florida RF | | | II | 3/14/2014 |
| Meteorological Meters | | | MN | Mfr | SN | Asset | Cat | Calibration Due |
| Weather Clock (Pressure Only) | | | BA928 | Oregon Scientific | C3166-1 | 831 | I | 3/20/2014 |
| CHAMBER2 Thermohygrometer | | | 35519-044 | Control Company | 72457639 | 1347 | II | Retired |

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



Radiated Emissions Table

| Date: 18-Oct-13 | | Company: Fishman | | | | Work Order: N2660 | | | | | | | | | |
|------------------------------------|--------------------|---------------------------|---------------------------|-----------------------|--------------------------|---|-----------------------------------|----------------------------------|----------------------------------|----------------|-----------------------|-------------------------------------|----------------|-----------------------|--|
| Engineer: Chris Bramley | | EUT Desc: OEM Triple Play | | | | EUT Operating Voltage/Frequency: 3.7Vdc | | | | | | | | | |
| Temp: 25.5°C | | Humidity: 33% | | | | Pressure: 1001mBar | | | | | | | | | |
| Frequency Range: 1-6GHz | | | | | | Measurement Distance: 3 m | | | | | | | | | |
| Notes: Tx on High Channel(2480MHz) | | | | | | EUT Max Freq: 16MHz | | | | | | | | | |
| Antenna Polarization (H / V) | Frequency (MHz) | Peak Reading (dBμV) | Average Reading (dBμV) | Preamp Factor (dB) | Antenna Factor (dB/m) | Cable Factor (dB) | Adjusted Peak Reading (dBμV/m) | Adjusted Avg Reading (dBμV/m) | FCC 15.209 High Frequency - Peak | | | FCC 15.209 High Frequency - Average | | | |
| | | | | | | | | | Limit (dBμV/m) | Margin (dB) | Result (Pass/Fail) | Limit (dBμV/m) | Margin (dB) | Result (Pass/Fail) | |
| v | 1500.0 | 32.88 | 19.5 | 21.4 | 26.0 | 2.9 | 40.4 | 27.0 | 74.0 | -33.6 | Pass | 54.0 | -27.0 | Pass | |
| v | 2836.5 | 35.39 | 21.4 | 22.6 | 29.4 | 3.6 | 45.8 | 31.8 | 74.0 | -28.2 | Pass | 54.0 | -22.2 | Pass | |
| v | 3000.0 | 34.12 | 19.9 | 22.3 | 30.5 | 3.6 | 45.9 | 31.7 | 74.0 | -28.1 | Pass | 54.0 | -22.3 | Pass | |
| v | 4000.0 | 32.64 | 18.3 | 21.4 | 32.6 | 4.2 | 48.0 | 33.7 | 74.0 | -26.0 | Pass | 54.0 | -20.3 | Pass | |
| h | 4960.0 | 38.63 | 20.6 | 20.7 | 33.4 | 5.1 | 56.4 | 38.4 | 74.0 | -17.6 | Pass | 54.0 | -15.6 | Pass | |
| v | 5500.0 | 31.3 | 17.5 | 20.5 | 34.7 | 5.8 | 51.3 | 37.5 | 74.0 | -22.7 | Pass | 54.0 | -16.5 | Pass | |
| Table Result: | | Pass | | by | | -15.6 dB | | | | Worst Freq: | | 4960.0 MHz | | | |
| Test Site: EMI Chamber 1 | | | | Cable 1: Asset #1781 | | | | Cable 2: Asset #1785 | | | | | | | |
| Analyzer: Gold | | | | Preamp: Asset #1517 | | | | Antenna: Black Horn | | | | | | | |

Rev.10/6/2013

Spectrum Analyzers / Receivers / Preselectors

Gold

Range
100Hz-26.5 GHzMN
E4407BMfr
AgilentSN
MY45113816Asset
1284Cat
ICalibration Due
3/18/2014**Radiated Emissions Sites**

EMI Chamber 1

FCC Code
719150IC Code
2762A-6VCCI Code
A-0015Range
30-1000MHzCat
IICalibration Due
2/16/2014**Preamps / Couplers Attenuators / Filters**

1517 HF Preamp

Range
1-20GHzMN
CSMfr
CSSN
N/AAsset
1517Cat
IICalibration Due
9/11/2014**Antennas**

Black Horn

Range
1-18GHzMN
3115Mfr
EMCOSN
9703-5148Asset
56Cat
ICalibration Due
8/5/2015**Cables**

Asset #1781

Range
9kHz - 18GHzMfr
Florida RFCat
IICalibration Due
3/6/2014

Asset #1785

Range
9kHz - 18GHzMfr
Florida RFCat
IICalibration Due
3/14/2014**Meteorological Meters**

Weather Clock (Pressure Only)

MN

BA928

Mfr

Oregon Scientific

SN

C3166-1

Asset

831

Cat

I

Calibration Due

3/20/2014

CHAMBER1 Thermohygrometer

35519-044

Control Company

72457642

1345

II

Retired

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



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Band Edge

Radiated Emissions Table

| Date: 18-Oct-13 | | | | Company: Fishman | | | | Work Order: N2660 | | | | | | |
|---|--------------------|------------------------|---------------------------|---------------------------|--------------------------|----------------------|-----------------------------------|---|----------------------------------|----------------|-----------------------|-------------------------------------|----------------|-----------------------|
| Engineer: Chris Bramley | | | | EUT Desc: OEM Triple Play | | | | EUT Operating Voltage/Frequency: 3.7Vdc | | | | | | |
| Temp: 25.5°C | | | | Humidity: 33% | | | | Pressure: 1001mBar | | | | | | |
| Frequency Range: Band Edge | | | | | | | | Measurement Distance: 3 m | | | | | | |
| Notes: Duty cycle: 5400microseconds On time in 100ms window or 25.35dB Duty cycle correction factor applied to peak readings | | | | | | | | EUT Tx Freq: 2404-2480MHz | | | | | | |
| Antenna Polarization (H/ V) | Frequency (MHz) | Peak Reading (dBµV) | Average Reading (dBµV) | Preamp Factor (dB) | Antenna Factor (dB/m) | Cable Factor (dB) | Adjusted Peak Reading (dBµV/m) | Adjusted Avg Reading (dBµV/m) | FCC 15.209 High Frequency - Peak | | | FCC 15.209 High Frequency - Average | | |
| | | | | | | | | | Limit (dBµV/m) | Margin (dB) | Result (Pass/Fail) | Limit (dBµV/m) | Margin (dB) | Result (Pass/Fail) |
| h | 2400.0 | 34.37 | 22.2 | 22.3 | 28.6 | 3.3 | 44.0 | 31.8 | 74.0 | -30.0 | Pass | 54.0 | -22.2 | Pass |
| v | 2400.0 | 28.23 | 21.0 | 22.3 | 28.6 | 3.3 | 37.8 | 30.6 | 74.0 | -36.2 | Pass | 54.0 | -23.4 | Pass |
| | | | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| h | 2483.5 | 41.74 | 23.2 | 22.7 | 28.9 | 3.3 | 51.2 | 32.7 | 74.0 | -22.8 | Pass | 54.0 | -21.3 | Pass |
| v | 2483.5 | 34.96 | 23.2 | 22.7 | 28.9 | 3.3 | 44.5 | 32.7 | 74.0 | -29.5 | Pass | 54.0 | -21.3 | Pass |
| Table Result: | | | | Pass by -21.3 dB | | | | Worst Freq: 2483.5 MHz | | | | | | |
| Test Site: EMI Chamber 1 | | | | Cable 1: Asset #1781 | | | | Cable 2: Asset #1785 | | | | | | |
| Analyzer: Gold | | | | Preamp: Asset #1517 | | | | Antenna: Black Horn | | | | | | |

Radiated Emissions Table

| Date: 18-Oct-13 | | Company: Fishman | | Work Order: N2660 | | | | | | | | | | |
|------------------------------------|--------------------|---------------------------|---------------------------|---|--------------------------|----------------------|-----------------------------------|----------------------------------|----------------------------------|----------------|-----------------------|-------------------------------------|----------------|-----------------------|
| Engineer: Chris Bramley | | EUT Desc: OEM Triple Play | | EUT Operating Voltage/Frequency: 3.7Vdc | | | | | | | | | | |
| Temp: 25.5°C | | Humidity: 33% | | Pressure: 1001mBar | | | | | | | | | | |
| Frequency Range: 6-18GHz | | | | Measurement Distance: 1 m | | | | | | | | | | |
| Notes: Tx on High Channel(2480MHz) | | | | EUT Max Freq: 16MHz | | | | | | | | | | |
| Antenna Polarization (H / V) | Frequency (MHz) | Peak Reading (dBμV) | Average Reading (dBμV) | Preamp Factor (dB) | Antenna Factor (dB/m) | Cable Factor (dB) | Adjusted Peak Reading (dBμV/m) | Adjusted Avg Reading (dBμV/m) | FCC 15.209 High Frequency - Peak | | | FCC 15.209 High Frequency - Average | | |
| | | | | | | | | | Limit (dBμV/m) | Margin (dB) | Result (Pass/Fail) | Limit (dBμV/m) | Margin (dB) | Result (Pass/Fail) |
| v | 7440.0 | 36.77 | 20.9 | 20.4 | 38.1 | 6.4 | 60.9 | 45.0 | 83.5 | -22.6 | Pass | 63.5 | -18.5 | Pass |
| v | 9920.0 | 34.12 | 20.2 | 19.5 | 39.3 | 7.2 | 61.1 | 47.2 | 83.5 | -22.4 | Pass | 63.5 | -16.3 | Pass |
| v | 11760.0 | 34.76 | 19.7 | 19.7 | 39.3 | 8.2 | 62.6 | 47.5 | 83.5 | -20.9 | Pass | 63.5 | -16.0 | Pass |
| v | 12400.0 | 34.44 | 20.1 | 19.5 | 39.2 | 8.4 | 62.5 | 48.2 | 83.5 | -21.0 | Pass | 63.5 | -15.3 | Pass |
| v | 14880.0 | 35.38 | 21.5 | 19.3 | 40.7 | 8.4 | 65.2 | 51.3 | 83.5 | -18.3 | Pass | 63.5 | -12.2 | Pass |
| v | 17360.0 | 35.36 | 20.5 | 19.1 | 43.9 | 8.4 | 68.6 | 53.7 | 83.5 | -14.9 | Pass | 63.5 | -9.8 | Pass |
| Table Result: | | | | Pass by -9.8 dB | | | | Worst Freq: 17360.0 MHz | | | | | | |
| Test Site: EMI Chamber 1 | | | | Cable 1: Asset #1781 | | | | Cable 2: Asset #1785 | | | | | | |
| Analyzer: Gold | | | | Preamp: Asset #1517 | | | | Antenna: Black Horn | | | | | | |

Rev.10/6/2013

Spectrum Analyzers / Receivers / Preselectors

Gold

| Range | MN | Mfr | SN | Asset | Cat | Calibration Due |
|----------------|--------|---------|------------|-------|-----|-----------------|
| 100Hz-26.5 GHz | E4407B | Agilent | MY45113816 | 1284 | I | 3/18/2014 |

Radiated Emissions Sites

EMI Chamber 1

| FCC Code | IC Code | VCCI Code | Range | Cat | Calibration Due |
|----------|---------|-----------|------------|-----|-----------------|
| 719150 | 2762A-6 | A-0015 | 30-1000MHz | II | 2/16/2014 |

Preamps / Couplers Attenuators / Filters

1517 HF Preamp

| Range | MN | Mfr | SN | Asset | Cat | Calibration Due |
|---------|----|-----|-----|-------|-----|-----------------|
| 1-20GHz | CS | CS | N/A | 1517 | II | 9/11/2014 |

Antennas

Black Horn

| Range | MN | Mfr | SN | Asset | Cat | Calibration Due |
|---------|------|------|-----------|-------|-----|-----------------|
| 1-18GHz | 3115 | EMCO | 9703-5148 | 56 | I | 8/5/2015 |

Cables

Asset #1781

Asset #1785

| Range | Mfr | Cat | Calibration Due |
|--------------|------------|-----|-----------------|
| 9kHz - 18GHz | Florida RF | II | 3/6/2014 |
| 9kHz - 18GHz | Florida RF | II | 3/14/2014 |

Meteorological Meters

Weather Clock (Pressure Only)

CHAMBER1 Thermohygrometer

| MN | Mfr | SN | Asset | Cat | Calibration Due |
|-----------|-------------------|----------|-------|-----|-----------------|
| BA928 | Oregon Scientific | C3166-1 | 831 | I | 3/20/2014 |
| 35519-044 | Control Company | 72457642 | 1345 | II | Retired |

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



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Radiated Emissions Table

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------------|--------------------|------------------------|---------------------------|---------------------------|--------------------------|----------------------|-----------------------------------|---|----------------------------------|----------------|-----------------------|-------------------------------------|----------------|-----------------------|--|--------------------------|--|--|--|-------------|--|--|--|-----|--|--|--|-----|--|--|--|
| Date: 18-Oct-13 | | | | Company: Fishman | | | | Work Order: N2660 | | | | | | | | | | | | | | | | | | | | | | | |
| Engineer: Chris Bramley | | | | EUT Desc: OEM Triple Play | | | | EUT Operating Voltage/Frequency: 3.7Vdc | | | | | | | | | | | | | | | | | | | | | | | |
| Temp: 25.5°C | | | | Humidity: 33% | | | | Pressure: 1001mBar | | | | | | | | | | | | | | | | | | | | | | | |
| Frequency Range: 18-25GHz | | | | | | | | Measurement Distance: 0.1 m | | | | | | | | | | | | | | | | | | | | | | | |
| Notes: Tx on High Channel(2480MHz) | | | | | | | | EUT Max Freq: 16MHz | | | | | | | | | | | | | | | | | | | | | | | |
| Antenna Polarization (H/V) | Frequency (MHz) | Peak Reading (dBμV) | Average Reading (dBμV) | Preamp Factor (dB) | Antenna Factor (dB/m) | Cable Factor (dB) | Adjusted Peak Reading (dBμV/m) | Adjusted Avg Reading (dBμV/m) | FCC 15.209 High Frequency - Peak | | | FCC 15.209 High Frequency - Average | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | Limit (dBμV/m) | Margin (dB) | Result (Pass/Fail) | Limit (dBμV/m) | Margin (dB) | Result (Pass/Fail) | | | | | | | | | | | | | | | | | |
| No Emissions found | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Table Result: | | | | --- | | | | by | | | | --- | | | | dB | | | | Worst Freq: | | | | --- | | | | MHz | | | |
| Test Site: EMI Chamber 1 | | | | | | | | Cable 1: EMIR-HIGH-21 | | | | | | | | | | | | | | | | | | | | | | | |
| Analyzer: Gold | | | | | | | | Preamp: 18-26.5GHz | | | | | | | | Antenna: 18-26.5GHz Horn | | | | | | | | | | | | | | | |

Rev.10/6/2013

| | | | | | | | | |
|--|--|-----------------|-----------------------|-------------------|--------------|--------------|------------|------------------------|
| Spectrum Analyzers / Receivers / Preselectors | | Range | MN | Mfr | SN | Asset | Cat | Calibration Due |
| Gold | | 100Hz-26.5 GHz | E4407B | Agilent | MY45113816 | 1284 | I | 3/18/2014 |
| Radiated Emissions Sites | | FCC Code | IC Code | VCCI Code | Range | | Cat | Calibration Due |
| EMI Chamber 1 | | 719150 | 2762A-6 | A-0015 | 30-1000MHz | | II | 2/16/2014 |
| Preamps/Couplers Attenuators / Filters | | Range | MN | Mfr | SN | Asset | Cat | Calibration Due |
| HF (Yellow) | | 18-26.5GHz | AFS4-18002650-60-8P-4 | CS | 467559 | 1266 | I | 10/13/2013 |
| Antennas | | Range | MN | Mfr | SN | Asset | Cat | Calibration Due |
| HF (White) Horn | | 18-26.5GHz | 801-WLM | Waveline | 758 | 758 | I | Verify before Use |
| Cables | | Range | | Mfr | | | Cat | Calibration Due |
| REM-High-21 | | 9kHz - 26.5GHz | | C-S | | | II | 2/2/2014 |
| Meteorological Meters | | | MN | Mfr | SN | Asset | Cat | Calibration Due |
| Weather Clock (Pressure Only) | | | BA928 | Oregon Scientific | C3166-1 | 831 | I | 3/20/2014 |
| CHAMBER1 Thermohygrometer | | | 35519-044 | Control Company | 72457642 | 1345 | II | Retired |

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

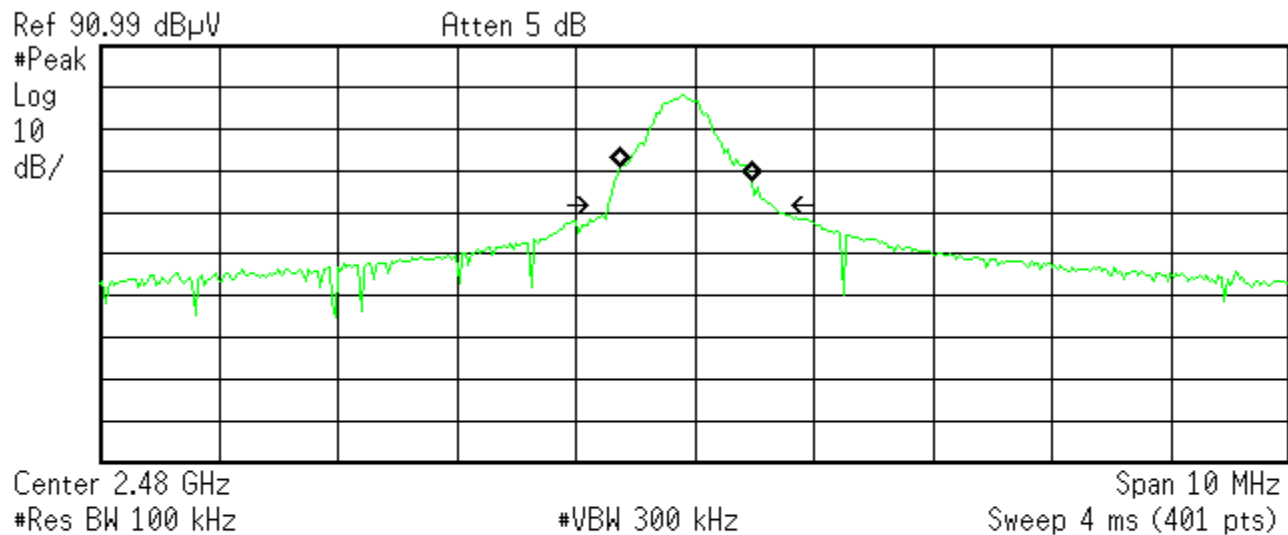
Occupied Bandwidth

REQUIREMENT

When an occupied bandwidth is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.
[RSS-GEN 4.6.1]

* Agilent 17:45:21 Oct 2, 2013

R T



Occupied Bandwidth
1.1005 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -72.876 kHz
x dB Bandwidth 1.362 MHz

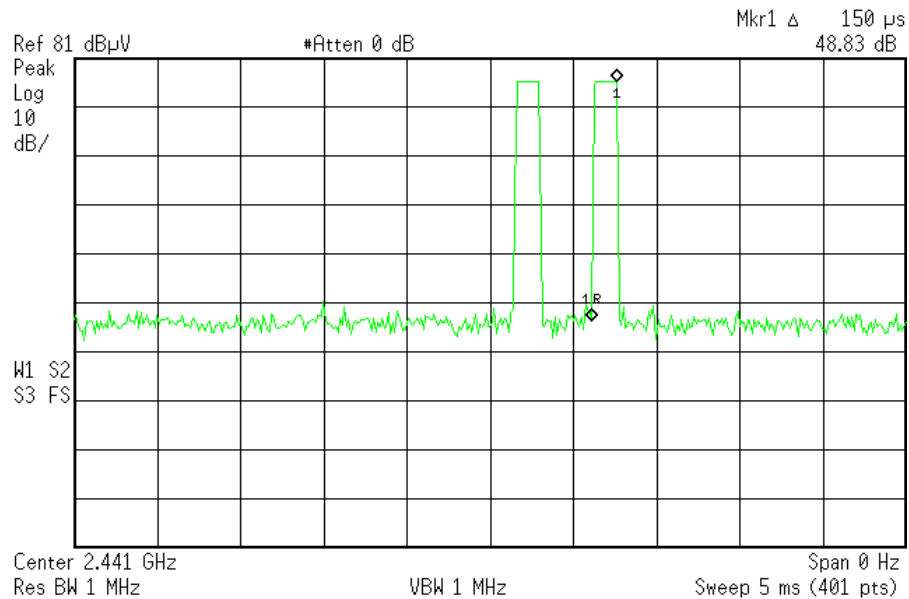
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High Channel

Duty Cycle

Agilent 14:31:54 Sep 30, 2013

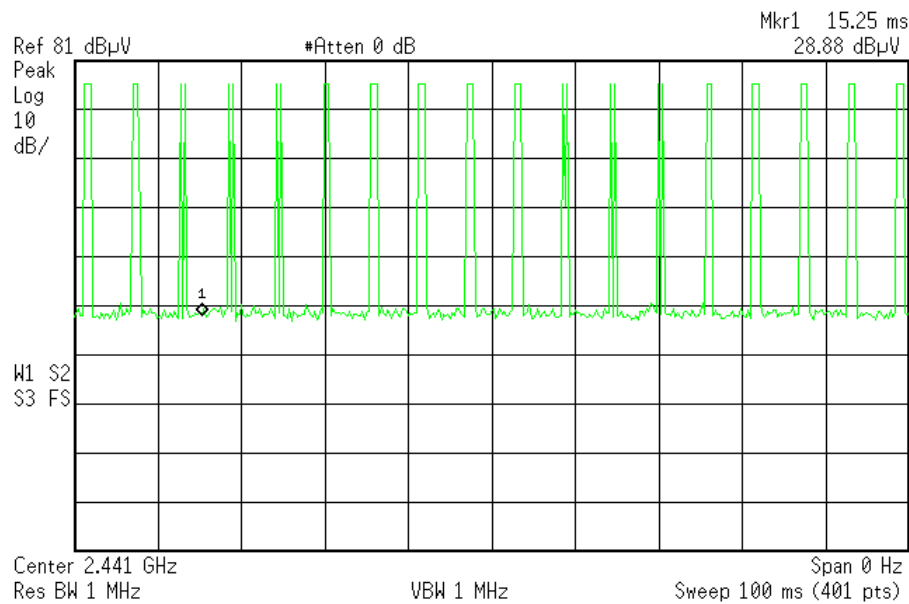
R T



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Agilent 14:34:09 Sep 30, 2013

R T



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$$\text{DCCF} = 20 \cdot \log(0.15 \cdot 2 \cdot 18 / 100) = -25.35 \text{ dB}$$

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 | | |



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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.
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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.



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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.

Rev.160009121(2)_#684340 v13CS