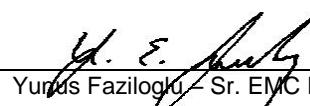




BUREAU
VERITAS

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

Test Report

| | |
|---------------------|---|
| Report No | ES1024-3 |
| Client | ASSA ABLOY Inc. |
| Address | 110 Sargent Drive New Haven, CT 06511 |
| Phone | 203-498-5686 |
| Items tested | Aperio V3 iN100 |
| FCC ID | U4A-SCYMCA1 |
| IC | 6982A-SCYMCA1 |
| FRN | 0016550824 |
| Equipment Type | Part 15 Low Power Communication Device Transmitter |
| Equipment Code | DXX |
| Emission Designator | 2K03F1D |
| FCC Rule Parts | CFR Title 47 FCC Part 15.209, ISED Canada RSS-210 Issue 9 |
| Test Dates | 1/7/2019 to 1/10/2019 |
| Results | As detailed within this report |
| Prepared by |  Arik Zwirner – Sr. EMC Engineer |
| Authorized by |  Yurdis Faziloglu – Sr. EMC Engineer |
| Issue Date | 2/25/2019 |
| Conditions of Issue | This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' section on page 14 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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| Conditions Of Testing | 14 |

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



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Summary and Test Methodology

This test report supports an application for Class 2 Permissive Change for a transmitter operating pursuant to:

CFR Title 47 FCC Part 15.209, ISED Canada RSS-210 Issue 9

EUT is the Aperio V3 iN100. Its operating frequency is 125kHz.

All testing was performed according to the following rules/procedures/documents;
CFR Title 47 FCC Part 15.209, ISED Canada RSS-210 Issue 9, ISED Canada RSS-Gen Issue 5 and ANSI C63.10-2013.

Radiated Emissions were maximized by rotating the device around its installation axes as well as varying the test antenna's height and polarity. EUT antenna is internal and cannot be maximized separately.

The EUT operating voltage is 9VDC from battery. Fresh batteries were used during testing. The environmental conditions during each test are detailed in the results tables for each section. Following bandwidths were used during radiated spurious and line conducted emissions testing.

| Frequency | RBW | VBW |
|------------------|------------|------------|
| 9kHz-150kHz | 200Hz | 1kHz |
| 0.15-30MHz | 9kHz | 30kHz |
| 30-1000MHz | 120kHz | 1MHz |

EUT was tested for fundamental level, radiated spurious emissions and AC line conducted emissions and met the corresponding requirements. Test sample was received in good condition.

Release Control Record

Issue No. Reason for change
1 Original Release

Date Issued
February 25, 2019



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Product Tested - Configuration Documentation

| EUT Configuration | | | | | | | | | | |
|--|----------------------------|-----------------|--------------------|-------------------|-----------------|-----------------|-------------------|---------------|-------------------|--|
| Work Order: | S1024 | | | | | | | | | |
| Company: | Assa Abloy | | | | | | | | | |
| Company Address: | 110 Sargent Drive | | | | | | | | | |
| New Haven, CT 06511 | Berlin, CT, 06037 | | | | | | | | | |
| Contact: | Steve Morse | | | | | | | | | |
| | | MN | | PN | | | SN | | | |
| EUT: | iN100 (with New BT Module) | | | iN100 | | | 1 | | | |
| EUT Description: | Aperio V3 | | | | | | | | | |
| EUT Max Frequency: | 2475 MHz | | | | | | | | | |
| EUT Min Frequency: | 0.032 MHz | | | | | | | | | |
| Support Equipment | | MN | | | | | SN | | | |
| AC/DC Brick | | SYS1308-2424-W2 | | | | | SW-241PR | | | |
| Laptop computer | | dell | | | | | | | | |
| Sargent 12V Supply | | 3521 | | | | | Sample 1 | | | |
| Sargent 24V Supply | | 3520 | | | | | Sample 1 | | | |
| Port Label | Port Type | # ports | # populated | cable type | shielded | ferrites | length (m) | in/out | under test | comment |
| DC Power input | Power DC | 1 | 1 | Power DC | No | No | 10 | in | yes | *not used for emissions. emissions done with battery power |
| USB setup port | USB | 1 | 1 | USB | Yes | No | 1 | in | yes | *used to setup the radio power and channels |
| Software Operating Mode Description: | | | | | | | | | | |
| Commands are given to the EUT over USB, setting up the radio parameters. Then the laptop and usb are disconnected and the EUT continues operating in that mode until battery power is removed. | | | | | | | | | | |

Clock Frequencies

frequencies (MHz) | 2475, 48, 32, 27.12, 18, 16, 13.56, 8, 0.125, 0.1, 0.032768, 0.03216, 0.032

Modifications Required for Compliance

None.



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Radiated Spurious Emissions**LIMITS**

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
|-----------------|-----------------------------------|-------------------------------|
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30.0 | 30 | 30 |
| 30-88 | 100** | 3 |
| 88-216 | 150** | 3 |
| 216-960 | 200** | 3 |
| Above 960 | 500 | 3 |

[15.209(a)]



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MEASUREMENTS / RESULTS

| Radiated Emissions Table | | | | | | | FCC 15.209 | | | | | | | | | |
|---|-----------------|----------------------|--------------------|-----------------------|-------------------|---------------------------------|--|-----|-----|--|--|--|--|--|--|--|
| Date: 08-Jan-19 | | Company: Assa Abloy | | Work Order: S1024 | | | EUT Operating Voltage/Frequency: Battery | | | | | | | | | |
| Engineer: AKZ | | | | | | | | | | | | | | | | |
| Temp: 24°C | | Humidity: 21% | | Pressure: 1001mbar | | | Measurement Distance: 3 m | | | | | | | | | |
| Frequency Range: 9kHz-1MHz | | | | | | | Measurement Distance: 3 m | | | | | | | | | |
| Notes: Antenna orientations: 0, 90, and horizontal (parallel to ground plane) EUT transmitting at 125kHz | | | | | | | | | | | | | | | | |
| Antenna Polarization (0° - 90°) | Frequency (MHz) | Reading (dB μ V) | Preamp Factor (dB) | Antenna Factor (dB/m) | Cable Factor (dB) | Adjusted Reading (dB μ V/m) | — | — | — | | | | | | | |
| 0 | 0.125 | 23.9 | 0.0 | 49.7 | 0.0 | 73.6 | --- | --- | --- | | | | | | | |
| 90 | 0.125 | 21.9 | 0.0 | 49.7 | 0.0 | 71.6 | --- | --- | --- | | | | | | | |
| horizontal | 0.125 | 22.6 | 0.0 | 49.7 | 0.0 | 72.3 | --- | --- | --- | | | | | | | |
| Table Result: Pass by -32.1 dB | | | | | | | Worst Freq: 0.125 MHz | | | | | | | | | |
| Test Site: EMI Chamber 1 | | Cable 1: Asset #2480 | | Cable 2: Asset #2456 | | Cable 3: --- | | | | | | | | | | |
| Analyzer: Asset #2093 | | Preamp: None | | Antenna: Lg Loop | | Preselector: --- | | | | | | | | | | |
| CSsoft Radiated Emissions Calculator v 1.017.211 | | | | | | | Copyright Curtis-Straus LLC 2000 | | | | | | | | | |
| Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor | | | | | | | | | | | | | | | | |

| Radiated Emissions Table | | | | | | | FCC 15.209 | | | | | | | | | |
|---|-----------------|----------------------|--------------------|-----------------------|-------------------|---------------------------------|--|-----|-----|--|--|--|--|--|--|--|
| Date: 08-Jan-19 | | Company: Assa Abloy | | Work Order: S1024 | | | EUT Operating Voltage/Frequency: Battery | | | | | | | | | |
| Engineer: AKZ | | | | | | | | | | | | | | | | |
| Temp: 24°C | | Humidity: 21% | | Pressure: 1001mbar | | | Measurement Distance: 3 m | | | | | | | | | |
| Frequency Range: 1-30MHz | | | | | | | Measurement Distance: 3 m | | | | | | | | | |
| Notes: Antenna orientations: 0, 90, and horizontal (parallel to ground plane) 125kHz radio | | | | | | | | | | | | | | | | |
| Antenna Polarization (0° - 90°) | Frequency (MHz) | Reading (dB μ V) | Preamp Factor (dB) | Antenna Factor (dB/m) | Cable Factor (dB) | Adjusted Reading (dB μ V/m) | — | — | — | | | | | | | |
| NO EMISSIONS FOUND IN THIS RANGE. | --- | --- | --- | --- | --- | --- | --- | --- | --- | | | | | | | |
| NO EMISSIONS FOUND IN THIS RANGE. | --- | --- | --- | --- | --- | --- | --- | --- | --- | | | | | | | |
| NO EMISSIONS FOUND IN THIS RANGE. | --- | --- | --- | --- | --- | --- | --- | --- | --- | | | | | | | |
| Test Site: EMI Chamber 1 | | | | | | | Cable 1: Asset #2480 | | | | | | | | | |
| Analyzer: Asset #2093 | | | | | | | Cable 2: Asset #2456 | | | | | | | | | |
| CSsoft Radiated Emissions Calculator v 1.017.211 | | | | | | | Cable 3: Asset #2464 | | | | | | | | | |
| Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor | | | | | | | Preselector: --- | | | | | | | | | |
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| | |
|---|------------------------------------|
| Curtis Straus - a Bureau Veritas Company | Work Order - S1024 |
| Radiated Emissions Electric Field 3m Distance | EUT Power Input - Battery |
| Top Peaks Horizontal 30-1000MHz | Test Site - CH-1 |
| Operator: AKZ | Conditions - 23°C; 21%RH; 1023mBar |
| Notes: | |
| 125kHz | |

Data Taken at 11:12:49 AM, Monday, January 07, 2019

| Frequency (MHz) | Peak Reading (dB μ V) | Correction Factor (dB/m) | Adjusted Peak Amplitude (dB μ V/m) | Lim1: FCC_pt15_1_09_Class_B (dB μ V/m) | Lim1 Margin (dB) | Lim1 Test Results (Pass/Fail) | Worst Margin Lim1 (dB) | Lim2: CISPR_Class_B (dB μ V/m) | Lim2 Margin (dB) | Lim2 Test Results (Pass/Fail) | Worst Margin Lim2 (dB) | Antenna Height (cm) | EUT Azimuth (degrees) |
|-----------------|---------------------------|--------------------------|--|--|------------------|-------------------------------|------------------------|------------------------------------|------------------|-------------------------------|------------------------|---------------------|-----------------------|
| 30.606 | 31.9 | -7.9 | 24 | 40 | -16 | PASS | | 40.5 | -16.5 | PASS | -16.5 | 150 | 270 |
| 125.133 | 32.4 | -14.1 | 18.3 | 43.5 | -25.2 | PASS | | 40.5 | -22.2 | PASS | | 100 | 180 |
| 932.706 | 32.7 | -2 | 30.8 | 46 | -15.2 | PASS | -15.2 | 47.5 | -16.7 | PASS | | 150 | 0 |

| | |
|---|------------------------------------|
| Curtis Straus - a Bureau Veritas Company | Work Order - S1024 |
| Radiated Emissions Electric Field 3m Distance | EUT Power Input - Battery |
| Top Peaks Vertical 30-1000MHz | Test Site - CH-1 |
| Operator: AKZ | Conditions - 23°C; 21%RH; 1023mBar |
| Notes: | |
| 125kHz | |

Data Taken at 11:12:48 AM, Monday, January 07, 2019

| Frequency (MHz) | Peak Reading (dB μ V) | Correction Factor (dB/m) | Adjusted Peak Amplitude (dB μ V/m) | Lim1: FCC_pt15_1_09_Class_B (dB μ V/m) | Lim1 Margin (dB) | Lim1 Test Results (Pass/Fail) | Worst Margin Lim1 (dB) | Lim2: CISPR_Class_B (dB μ V/m) | Lim2 Margin (dB) | Lim2 Test Results (Pass/Fail) | Worst Margin Lim2 (dB) | Antenna Height (cm) | Turntable Azimuth (degrees) |
|-----------------|---------------------------|--------------------------|--|--|------------------|-------------------------------|------------------------|------------------------------------|------------------|-------------------------------|------------------------|---------------------|-----------------------------|
| 30.024 | 32.1 | -7.4 | 24.7 | 40 | -15.3 | PASS | -15.3 | 40.5 | -15.8 | PASS | -15.8 | 200 | 270 |
| 143.49 | 37.9 | -15.4 | 22.5 | 43.5 | -21 | PASS | | 40.5 | -18 | PASS | | 100 | 180 |
| 146.667 | 38 | -15.6 | 22.4 | 43.5 | -21.1 | PASS | | 40.5 | -18.1 | PASS | | 100 | 180 |
| 162.26 | 38.5 | -15.9 | 22.6 | 43.5 | -20.9 | PASS | | 40.5 | -17.9 | PASS | | 100 | 225 |
| 165.339 | 40.5 | -16.1 | 24.4 | 43.5 | -19.2 | PASS | | 40.5 | -16.1 | PASS | | 100 | 225 |
| 944.759 | 31.9 | -1.9 | 30.1 | 46 | -16 | PASS | | 47.5 | -17.4 | PASS | | 200 | 315 |



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Rev. 1/5/2019

| Spectrum Analyzers / Receivers /Preselectors | | Range | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated on |
|---|-------------|-------------------|----------------|------------------|--------------|--------------|------------------------|------------------------|----------------------|
| 2093 MXE EMI Receiver | | 20Hz-26.5GHz | N9038A | Agilent | MY51210181 | 2093 | I | 11/21/2019 | 11/21/2018 |
| Radiated Emissions Sites | | FCC Code | IC Code | VCCI Code | Range | Asset | Cat | Calibration Due | Calibrated on |
| EMI Chamber 1 | 719150 | 2762A-6 | A-0015 | A-0015 | 30-1000MHz | 1685 | I | 12/7/2020 | 12/7/2018 |
| EMI Chamber 1 | 719150 | 2762A-6 | A-0015 | A-0015 | 1-18GHz | 1685 | I | 12/7/2020 | 12/7/2018 |
| Preamps/Couplers Attenuators / Filters | | Range | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated on |
| 2311 PA | 1-1000MHz | PAM-103 | COM-POWER | 441174 | 2311 | II | | 10/29/2019 | 10/29/2018 |
| Antennas | | Range | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated on |
| Small Loop | 10KHz-30MHz | PLA-130/A | ARA | 1024 | 755 | I | | 7/23/2020 | 7/23/2018 |
| Large Loop | 20Hz-5MHz | 6511 | EMCO | 9704-1154 | 67 | I | | 7/20/2020 | 7/20/2018 |
| Meteorological Meters/Chambers | | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated on | |
| Weather Clock (Pressure Only) | BA928 | Oregon Scientific | C3166-1 | 831 | I | | 5/15/2020 | 5/15/2018 | |
| TH A#2082 | HTC-1 | HDE | | 2082 | II | | 3/23/2019 | 3/23/2018 | |
| Cables | | Range | | Mfr | | Cat | Calibration Due | Calibrated on | |
| Asset #2456 | 9KHz-18GHz | | MegaPhase | | | II | 10/31/2019 | 10/31/2018 | |
| Asset #2464 | 9KHz-18GHz | | MegaPhase | | | II | 10/31/2019 | 10/31/2018 | |
| Asset #2480 | 9KHz-18GHz | | MegaPhase | | | II | 10/29/2019 | 10/29/2018 | |

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

Rev. 1/5/2019

| Spectrum Analyzers / Receivers /Preselectors | | Range | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated on |
|--|------------|-------------------|----------------|------------------|--------------|--------------|------------------------|------------------------|----------------------|
| 2093 MXE EMI Receiver | | 20Hz-26.5GHz | N9038A | Agilent | MY51210181 | 2093 | I | 11/21/2019 | 11/21/2018 |
| Radiated Emissions Sites | | FCC Code | IC Code | VCCI Code | Range | Asset | Cat | Calibration Due | Calibrated on |
| EMI Chamber 1 | 719150 | 2762A-6 | A-0015 | A-0015 | 30-1000MHz | 1685 | I | 12/7/2020 | 12/7/2018 |
| EMI Chamber 1 | 719150 | 2762A-6 | A-0015 | A-0015 | 1-18GHz | 1685 | I | 12/7/2020 | 12/7/2018 |
| Meteorological Meters/Chambers | | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated on | |
| Weather Clock (Pressure Only) | BA928 | Oregon Scientific | C3166-1 | 831 | I | | 5/15/2020 | 5/15/2018 | |
| TH A#2082 | HTC-1 | HDE | | 2082 | II | | 3/23/2019 | 3/23/2018 | |
| Cables | | Range | | Mfr | | Cat | Calibration Due | Calibrated on | |
| Asset #2456 | 9KHz-18GHz | | MegaPhase | | | II | 10/31/2019 | 10/31/2018 | |
| Asset #2464 | 9KHz-18GHz | | MegaPhase | | | II | 10/31/2019 | 10/31/2018 | |
| Asset #2480 | 9KHz-18GHz | | MegaPhase | | | II | 10/29/2019 | 10/29/2018 | |
| 2489(6dB) | 9KHz-18GHz | | | | | II | 11/27/2019 | 11/27/2018 | |

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



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AC 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)]



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MEASUREMENTS / RESULTS

| | |
|--|--------------------------------------|
| Curtis Straus - a Bureau Veritas Company | Work Order # - S1024 |
| Conducted Emissions per CISPR 16-2-1 | EUT Power Input - 120VAC/ 60Hz |
| Peak Detector Data | Test Site - CEMI-3 |
| Notes: | Conditions: -19.4°C; 35%RH; 1003mBar |
| EUT Line tested: 120VAC/60Hz; Neutral (line 0) | Test Engineer - Patrick Crozier |
| | Witnessed by - Steve Morse |

Data Taken at 05:03:45 PM, Friday, January 11, 2019

| Frequency (MHz) | Raw Pk Reading (dB μ V) | Correction Factor (dB) | Adjusted Pk Amplitude (dB μ V) | QP Lim: Mains_FCC&CISP R_QP_Class_B (dB μ V) | Margin to the QP Limit (dB) | Pk to QP Limit Results (Pass/Fail) | Worst Margin (QP Limit) (dB) |
|-----------------|-----------------------------|------------------------|------------------------------------|--|-----------------------------|------------------------------------|------------------------------|
| 0.15 | 36 | 20.7 | 56.7 | 66.0 | -9.3 | PASS | |
| 0.167 | 33.8 | 20.8 | 54.6 | 65.1 | -10.5 | PASS | |
| 0.213 | 29.9 | 20.8 | 50.7 | 63.1 | -12.4 | PASS | |
| 0.251 | 32.8 | 20.8 | 53.5 | 61.7 | -8.2 | PASS | -8.2 |
| 0.315 | 26.6 | 20.8 | 47.3 | 59.8 | -12.5 | PASS | |
| 0.51 | 20.1 | 20.8 | 40.8 | 56.0 | -15.2 | PASS | |

| | |
|--|--------------------------------------|
| Curtis Straus - a Bureau Veritas Company | Work Order # - S1024 |
| Conducted Emissions per CISPR 16-2-1, CISPR Average Detector | EUT Power Input - 120VAC/ 60Hz |
| Quick Average Detector Data | Test Site - CEMI-3 |
| Notes: | Conditions: -19.4°C; 35%RH; 1003mBar |
| EUT Line tested: 120VAC/60Hz; Neutral (line 0) | Test Engineer - Patrick Crozier |
| | Witnessed by - Steve Morse |

Data Taken at 05:03:45 PM, Friday, January 11, 2019

| Frequency (MHz) | Raw Avg Reading (dB μ V) | Correction Factor (dB) | Adjusted Avg Amplitude (dB μ V) | Av Lim: Mains_FCC&CISP R_Avg_Class_B (dB μ V) | Avg Margin (dB) | Avg Results (Pass/Fail) | Worst Avg Margin (dB) |
|-----------------|------------------------------|------------------------|-------------------------------------|---|-----------------|-------------------------|-----------------------|
| 0.155 | 26.2 | 20.7 | 46.9 | 55.7 | -8.8 | PASS | |
| 0.251 | 22.9 | 20.8 | 43.6 | 51.7 | -8.1 | PASS | -8.1 |
| 0.312 | 20.5 | 20.8 | 41.2 | 49.9 | -8.7 | PASS | |
| 0.337 | 18.5 | 20.8 | 39.2 | 49.3 | -10.1 | PASS | |
| 0.505 | 12.3 | 20.8 | 33.1 | 46.0 | -12.9 | PASS | |
| 0.582 | 12.2 | 20.8 | 32.9 | 46.0 | -13.1 | PASS | |



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| | |
|--|---------------------------------------|
| Curtis Straus - a Bureau Veritas Company | Work Order # - S1024 |
| Conducted Emissions per CISPR 16-2-1 | EUT Power Input - 120VAC/ 60Hz |
| Peak Detector Data | Test Site - CEMI-3 |
| Notes: | Conditions: - 19.4°C; 35%RH; 1003mBar |
| EUT Line tested: 120VAC/60Hz; Phase (line 1) | Test Engineer - Patrick Crozier |
| | Witnessed by - Steve Morse |

Data Taken at 04:43:22 PM, Friday, January 11, 2019

| Frequency (MHz) | Raw Pk Reading (dB μ V) | Correction Factor (dB) | Adjusted Pk Amplitude (dB μ V) | QP Lim: Mains_FCC&CISP R_QP_Class_B (dB μ V) | Margin to the QP Limit (dB) | Pk to QP Limit Results (Pass/Fail) | Worst Margin (QP Limit) (dB) |
|-----------------|-----------------------------|------------------------|------------------------------------|--|-----------------------------|------------------------------------|------------------------------|
| 0.153 | 37 | 20.7 | 57.8 | 65.8 | -8.0 | PASS | -8.0 |
| 0.184 | 31.5 | 20.8 | 52.2 | 64.3 | -12.1 | PASS | |
| 0.25 | 28.5 | 20.7 | 49.3 | 61.8 | -12.5 | PASS | |
| 0.332 | 24.7 | 20.7 | 45.4 | 59.4 | -14.0 | PASS | |
| 0.508 | 19.2 | 20.8 | 40 | 56.0 | -16.0 | PASS | |
| 0.617 | 19 | 20.8 | 39.7 | 56.0 | -16.3 | PASS | |

| | |
|--|---------------------------------------|
| Curtis Straus - a Bureau Veritas Company | Work Order # - S1024 |
| Conducted Emissions per CISPR 16-2-1, CISPR Average Detector | EUT Power Input - 120VAC/ 60Hz |
| Quick Average Detector Data | Test Site - CEMI-3 |
| Notes: | Conditions: - 19.4°C; 35%RH; 1003mBar |
| EUT Line tested: 120VAC/60Hz; Phase (line 1) | Test Engineer - Patrick Crozier |
| | Witnessed by - Steve Morse |

Data Taken at 04:43:22 PM, Friday, January 11, 2019

| Frequency (MHz) | Raw Avg Reading (dB μ V) | Correction Factor (dB) | Adjusted Avg Amplitude (dB μ V) | Av Lim: Mains_FCC&CISP R_Avg_Class_B (dB μ V) | Avg Margin (dB) | Avg Results (Pass/Fail) | Worst Avg Margin (dB) |
|-----------------|------------------------------|------------------------|-------------------------------------|---|-----------------|-------------------------|-----------------------|
| 0.15 | 26.7 | 20.7 | 47.4 | 56.0 | -8.6 | PASS | |
| 0.253 | 23.4 | 20.7 | 44.1 | 51.7 | -7.6 | PASS | -7.6 |
| 0.306 | 21 | 20.7 | 41.8 | 50.1 | -8.3 | PASS | |
| 0.513 | 12.3 | 20.8 | 33 | 46.0 | -13.0 | PASS | |
| 0.546 | 11.9 | 20.8 | 32.7 | 46.0 | -13.3 | PASS | |
| 0.602 | 11.4 | 20.8 | 32.1 | 46.0 | -13.9 | PASS | |



| Rev. 1/5/2019 | | | | | | | | |
|---|-----------------|-----------|-------------------|------------------|--------------|------------|------------------------|----------------------|
| Spectrum Analyzers / Receivers /Preselectors | Range | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated on |
| Rental MXE EMI Receiver(1168255) | 20Hz-8.4GHz | N9038A | Agilent | MY53290009 | 1168255 | I | 8/23/2019 | 8/23/2018 |
| LISNs/Measurement Probes | Range | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated on |
| LISN Asset 2092 | 9KHz-30MHz | NNLK 8121 | Schwarzbeck | NNLK 8121-66 | 2092 | I | 7/31/2019 | 7/31/2018 |
| Conducted Test Sites (Mains / Telco) | FCC Code | | | VCCI Code | | Cat | Calibration Due | Calibrated on |
| CEMI 3 | 719150 | | | A-0015 | | III | NA | N/A |
| Meteorological Meters/Chambers | | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated on |
| Weather Clock (Pressure Only) | | BA928 | Oregon Scientific | C3166-1 | 831 | I | 5/15/2020 | 5/15/2018 |
| TH A#2077 | | HTC-1 | HDE | | 2077 | II | 3/23/2019 | 3/23/2018 |
| Cables | Range | | Mfr | | | Cat | Calibration Due | Calibrated on |
| CEMI-18 | 9kHz - 2GHz | | C-S | | | II | 11/5/2019 | 11/5/2018 |
| Attenuators | Range | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated on |
| 20dB Attenuator-64 | 9kHz-2GHz | | | N/A | | II | 11/15/2019 | 11/15/2018 |

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



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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 (Ucispqr) |
| 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 (Ucispqr) |
| 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 | | |



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 were 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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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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