Test Report



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

| Report No | Q3573-1 |
|---|--|
| Client | Alarm.com Incorporated |
| Address | 8281 Greensboro Drive Suite 100 Tysons, VA 22102 |
| Phone | (877) 389-4033 |
| Items tested FCC ID IC ID FRN | ADC-IS-300-LP YL6-143IS300 9111A-143IS300 0020041976 |
| Equipment Type Equipment Code Emission Designator | Digital Transmission System DTS 941KF1D |
| FCC/IC Rule Parts | CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 1 |
| Test Dates | January 3 to 4, 2017 |
| Results | As detailed within this report |
| Prepared by | Zachary Johnson Test Engineer |
| Authorized by | Funus Fazilogiu Sr. EMC Engineer |
| Issue Date | 3/23/2017 |
| Conditions of Issue | This Test Report is issued subject to the conditions stated in the ' <i>Conditions of Testing</i> ' section on page 30 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 12-07-15



Summary

This test report supports an application for certification of a transmitter operating pursuant to: CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 1

The product is the ADC-IS-300-LP. It operates in the 912MHz – 924MHz frequency range.

We found that the product met the above requirements without modification. Test sample was received in good condition.

Release Control Record

Issue No. Reason for change 1 Original Release Date Issued March 23, 2017



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Test Methodology

All testing was performed according to the following rules/procedures/documents; FCC Part 15.247, RSS-247 Issue 1, RSS-Gen Issue 4, FCC KDB 558074 D01 DTS Measurement Guidance v03r05 and ANSI C63.10-2013.

Radiated emissions were maximized by rotating the device around 3 orthogonal planes (X, Y and Z) as well as varying the test antenna's height and polarity.

RF measurements were performed at the antenna port. 3 channels were tested as follows:

- 912 MHz: Low Channel (#0)
- 918 MHz: Mid Channel (#19)
- 924 MHz: High Channel (#39)

EUT operating voltage is 3VDC from 2 AA batteries, therefore AC line conducted emissions testing was not required.

| The following bandwidths were | used during radiated spurious em | nissions testing. |
|-------------------------------|----------------------------------|-------------------|
| Frequency | RBW | VBW |

| Frequency | RBW | VBW |
|------------|--------|------|
| 30-1000MHz | 120kHz | 1MHz |
| 1-25GHz | 1MHz | 3MHz |





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Product Tested - Configuration Documentation

| EUT Configuration | | | | | | |
|--|---------------------------------|---------------|---------------|--|--|--|
| Work Order: | Q3573 | | | | | |
| Company: | Alarm.com Incorporated | | | | | |
| Company Address: | 8281 Greensboro Drive Suite 100 | | | | | |
| | Tysons, VA, 22102 | | | | | |
| | | | | | | |
| Contact: | Emily Guthrie | | | | | |
| | | | | | | |
| | MN | PN | SN | | | |
| EUT: | ADC-IS-300-LP | ADC-IS-300-LP | Test Sample 1 | | | |
| EUT Description: | Battery powered image sensor | | | | | |
| EUT Max Frequency: | 924 MHz (transmitter) | | | | | |
| EUT Min Frequency: | 10 MHz (associated circuitry) | | | | | |
| | | | | | | |
| Software Operating Mode D | escription: | | | | | |
| Unit was running FCC Firmware. Continuous max power transmission on 3 channels (912MHz, 918MHz and 924MHz). Modulated. | | | | | | |





Statement of Conformity

ADC-IS-300-LP was found to conform to the following:

| RSS-GEN | RSP-100 | RSS 247 | Part 15 | Comments |
|---------|---------|---------|------------------|---|
| 6.3 | | | 15.15(b) | There are no controls accessible to the user that |
| | | | | varies the output power to operate in violation of the |
| | | | | regulatory requirements. |
| | 3.1 | | 15.19 | The label is shown in the label exhibit. |
| | 4 | | 15.21 | Information to the user is shown in the instruction manual exhibit. |
| | | | 15.27 | No special accessories are required for compliance. |
| 3, 6.1 | | | 15.31 | The EUT was tested in accordance with the measurement standards in this section. |
| 6.13 | | | 15.33 | Frequency range was investigated according to this section, unless noted in specific rule section under which the equipment operates. |
| 8.1 | | | 15.35 | The EUT emissions were measured using the measurement detector and bandwidth specified in this section, unless noted in specific rule section under which the equipment operates. |
| 8.3 | | | 15.203 | The EUT has an SMD Helical antenna with 0dBi gain |
| 8.10 | | | 15.205 15.209 | The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of |
| | | | | 15.209 or RSS-Gen as applicable |
| 8.8 | | | 15.207 | N/A. EUT is battery powered |
| | | | 15.247 | The unit complies with the requirements of 15.247 |
| | | RSS 247 | | The unit complies with the requirements of RSS-247 |
| 6.6 | | | | Occupied Bandwidth measurements were made. |

Modifications Required for Compliance

No modifications were required for compliance.





Test Results

DTS Bandwidth

Limit: The minimum 6 dB bandwidth shall be at least 500 kHz. [15.247(a) (2)]

MEASUREMENTS / RESULTS

| | | 8 | 6dB B | andwidth | | | | | | |
|--|---------------|----------------------------|-----------------------|--------------------------|-------------------------|-------------------------|----------|---------------------|------------|----------------------------|
| Date: Jan 4 2017 | Company: Al | arm.com Inc. | | | | | | ١ | Nork Orde | er: Q3573 |
| Engineer: YF / ZJ | EUT: AI | DC-IS-300-LP | | | | EUT Op | eratin | g Voltage/ | Frequenc | y: 3VDC Batter |
| Temp: 20.9°C | Humidity: 33 | 1% | Pr | essure: 987mbar | | | | | | |
| Frequency Range: | 912MHz-924MHz | Меа | suremen | t Type: Conducte | d | | | | | |
| | | Measu | rement N | Method: FCC KDB | 558074 D01 [| DTS Meas | Guida | nce v03r05 | Section 8. | 2 |
| Notes: | | | | | | | | | | |
| | | | | | | | | (| 6dB Band | width |
| Frequency | | | Reading | I | | | | Limit | Margin | Result |
| (MHz) | | | (kHz) | | | | | (kHz) | (kHz) | (Pass/Fail) |
| 912 | | | 700.1 | | | | | ≥500 | 200 | Pass |
| 918 | | | 694.4 | | | | | ≥500 | 194 | Pass |
| 924 | | | 693.2 | | | | | ≥500 | 193 | Pass |
| Test Site: EMC-4 | Cable: UF | L to SMA dongle | (client su | pplied) Attenuate | or A2121 | | | | | |
| Analyzer: 1170725 | | | | | | | | | Copyright | Curtis-Straus LLC 2 |
| v. 1/21/2017 Spectrum Analyzers / F Rental MXE EMI F | | Range 20Hz-26.5GHz | MN N9038A | Mfr Agilent | SN MY51210151 | Asset 1170725 | Cat | Calibrat 12/22 | | Calibrated o 12/22/2016 |
| Preamps /Couplers / API - 30dB 20 | | Range 9KHz-40GHz | MN 89-30-11 | Mfr API Weinschel | SN 703 | Asset 2121 | Cat I | Calibrati 2/10/2 | | Calibrated o 2/10/2016 |
| Meteorolog Weather Clock (| | | MN BA928 | Mfr Oregon Scientific | SN C3166-1 | Asset 831 | Cat | Calibrati 4/28/2 | | Calibrated o 4/28/2016 |

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





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6dB Bandwidth at low channel



6dB Bandwidth at center channel





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6dB Bandwidth at high channel





Peak Output Power

LIMIT Conducted Output Power 1 Watt [15.247(b) (3)]

MEASUREMENTS / RESULTS

| Date: Jan 4 201 | 7 | Company: Alarm.com | n Inc. | | | Work Ord | er: Q3573 |
|--------------------|----------------------|----------------------|-----------------------|----------------------|-------------------|--------------------|---------------------|
| ngineer: YF / ZJ | | EUT: ADC-IS-30 | 10-LP | | EUT Operating | Voltage/Frequen | cy: 3VDC Batte |
| Temp: 20.9°C | | Humidity: 33% | | Pressure: 987mbar | | | |
| Frequency Range: | 912MHz-924MHz | | Measurer | nent Type: Conducted | | | |
| | | | Measureme | nt Method: FCC KDB 5 | 58074 D01 DTS Mea | as Guidance v03r05 | Section 9.1.2 |
| Notes: | 1 | | | 1 | | | |
| | | | | | | | |
| Frequency | Peak Reading | Cable Loss | Attenuator Loss | Peak Output Power | Limit | Margin | Result |
| (MHz) | (dBm) | (dB) | (dB) | (dBm) | (dBm) | (dB) | (Pass/Fai |
| 912 | -21.78 | 1.0 | 29.4 | 8.62 | 30.0 | -21.38 | Pass |
| 918 | -21.87 | 1.0 | 29.4 | 8.53 | 30.0 | -21.47 | Pass |
| 924 | -22.19 | 1.0 | 29.4 | 8.21 | 30.0 | -21.79 | Pass |
| est Site: EMC-4 | | Cable: UFL to SM | A dongle (client supp | lied) At | tenuator: A2121 | | |
| nalyzer: 1170725 | | | | | | Copyrigh | t Curtis-Straus LLC |
| eak Output Power (| dBm)= Peak Reading (| dBm) + Cable Loss (d | B) + Attenuator Loss | (dB) | | | |
| · · · · · · | | | , | | | | |
| ev. 1/21/2017 | | | | | | | |
| | | | | | | | |

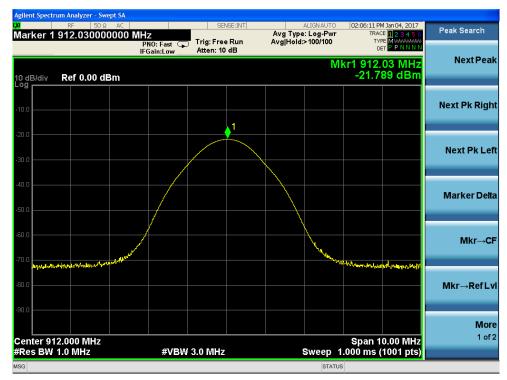
| Spectrum Analyzers / Receivers / Preselectors | Range | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated on 12/22/2016 |
|--|--------------|--------------------|--------------------------|----------------------|---------------------|----------|------------------------------|--------------------------|
| Rental MXE EMI Receiver(1170725) | 20Hz-26.5GHz | N9038A | Agilent | MY51210151 | 1170725 | I | 12/22/2017 | |
| Preamps /Couplers Attenuators / Filters | Range | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated on 2/10/2016 |
| API - 30dB 20W Attenuator | 9KHz-40GHz | 89-30-11 | API Weinschel | 703 | 2121 | I | 2/10/2017 | |
| Meteorological Meters Weather Clock (Pressure Only) | | MN BA928 | Mfr Oregon Scientific | SN C3166-1 | Asset 831 | Cat I | Calibration Due 4/28/2018 | Calibrated on 4/28/2016 |

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

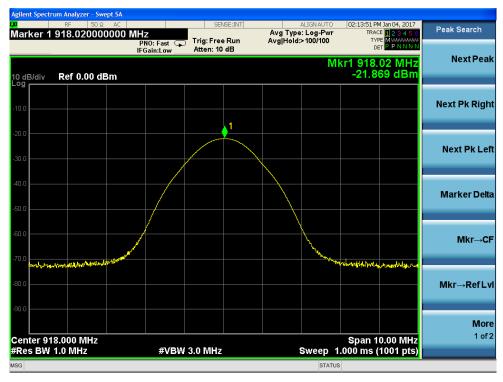




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Peak Output Power at low channel

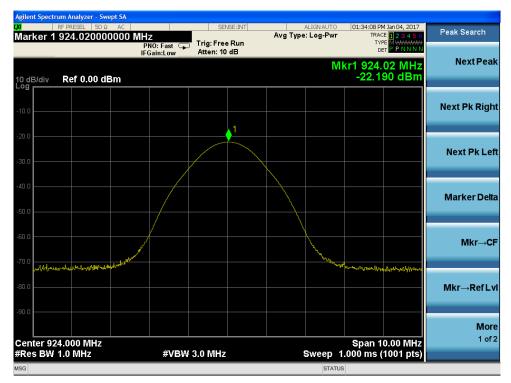


Peak Output Power at center channel





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Peak Output Power at high channel





MEASUREMENTS / RESULTS

| | C | onducted Bande | edge | | | |
|----------------------|------------------|----------------------------|-------------------|----------------|--------------|---------------------|
| Date: Jan 4 2017 | Company: Alarm | | | ١ | Nork Order: | Q3573 |
| Engineer: YF / ZJ | EUT: ADC-IS-30 | 0-LP | EUT Ope | rating Voltage | Frequency: | 3VDC Battery |
| Temp: 20.9°C | Humidity: 33% | Pressure: 987mbar | | | | |
| Frequency Range: 912 | MHz-924MHz Meas | surement Type: Conducted | | | | |
| Notes: | | | | | | |
| | | Bandedge | | Delta | Limit | |
| | | (dBm) | | (dB) | (dB) | (Pass/Fail) |
| Low Bandedge | | -81.86 | | 56.7 | ≥ 20 | Pass |
| High Bandedge | | -82.89 | | 57.39 | ≥ 20 | Pass |
| Test Site: EMC-4 | Cable: UFL to SM | A dongle (client supplied) | Attenuator: A2121 | | | |
| Analyzer: 1170725 | | | | | Copyright Cu | tis-Straus LLC 2000 |

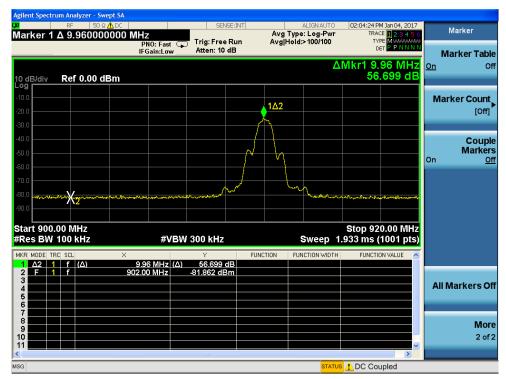
| Rev. 1/21/2017 | | | | | | | | |
|--|----------------------------|-----------------------|--------------------------|-------------------------|----------------------|----------|-------------------------------|-----------------------------|
| Spectrum Analyzers / Receivers /Preselectors Rental MXE EMI Receiver(1170725) | Range 20Hz-26.5GHz | MN N9038A | Mfr Agilent | SN MY51210151 | Asset 1170725 | Cat I | Calibration Due 12/22/2017 | Calibrated on 12/22/2016 |
| Preamps /Couplers Attenuators / Filters API - 30dB 20W Attenuator | Range 9KHz-40GHz | MN 89-30-11 | Mfr API Weinschel | SN 703 | Asset 2121 | Cat | Calibration Due 2/10/2017 | Calibrated on 2/10/2016 |
| Meteorological Meters Weather Clock (Pressure Only) | | MN BA928 | Mfr Oregon Scientific | SN C3166-1 | Asset 831 | Cat | Calibration Due 4/28/2018 | Calibrated on 4/28/2016 |

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

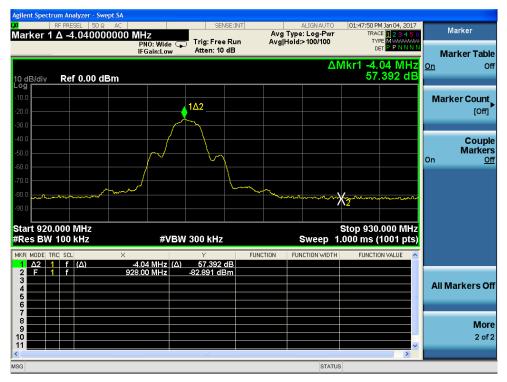




March 23, 2017



902MHz Low Band Edge with Transmission at 912MHz



928MHz High Band Edge with Transmission at 924MHz





Duty Cycle Correction Factor

MEASUREMENTS / CALCULATIONS

DDCF = 20log(Ton / Ton+off)

| ON TIME | 28.4 ms | |
|---------------|-------------|--|
| ON + OFF TIME | 54 ms | |
| DCCF | 52.59259 % | |
| DCCF | -5.58151 dB | |

Rev. 1/21/2017

| • | m Analyzers / Receivers /Preselectors ental MXE EMI Receiver(1170725) | Range 20Hz-26.5GHz | MN N9038A | Mfr Agilent | SN MY51210151 | Asset 1170725 | Cat I | Calibration Due 12/22/2017 | Calibrated on 12/22/2016 |
|------|--|----------------------------|-----------------------|--------------------------|-------------------------|----------------------|----------|-------------------------------|----------------------------|
| Prea | mps / Couplers Attenuators / Filters API - 30dB 20W Attenuator | Range 9KHz-40GHz | MN 89-30-11 | Mfr API Weinschel | SN 703 | Asset 2121 | Cat I | Calibration Due 2/10/2017 | Calibrated on 2/10/2016 |
| | Meteorological Meters Weather Clock (Pressure Only) | | MN BA928 | Mfr Oregon Scientific | SN C3166-1 | Asset 831 | Cat | Calibration Due 4/28/2018 | Calibrated on 4/28/2016 |

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

PLOTS

| RF 50 Ω AC | | SENSE:INT | ALIGNAUTO | 02:41:35 PM Jan 04, 2017 | Masless |
|---|---|------------------------------------|------------------------------------|---|---------------|
| | PNO: Fast 🔸 | . Trig: Free Run | Avg Type: Log-Pwr | TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P P N N N N | Marker |
| | IFGain:Low | Atten: 10 dB | | | Select Marker |
| B/div Ref 0.00 dBm | | | | Mkr3 37.40 ms -21.89 dBm | 3 |
| | | | | | Norma |
| ×3 ⁻ | | | | | |
| | | | | | Delt |
| 100, Auge Alla Lander Ald | 1 <u>02</u> | Lysenser in | المراب المتعاقدين المواوير المراوي | Manggalation | |
| | | | | | Fixed |
| ter 912.000000 MHz BW 1.0 MHz | #VBW | 3.0 MHz | Sweep 2 | Span 0 Hz 00.0 ms (1001 pts) | Of |
| | × | | FUNCTION FUNCTION WIDTH | FUNCTION VALUE | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | -28.40 ms (∆) 54.00 ms (∆) 37.40 ms | -52.42 dB 0.00 dB -21.89 dBm | | | Properties |
| | | | | | Fropences |
| | | | | | Mor |
| | | | | ~ | 1 of |
| | | | | > | |

Duty Cycle





March 23, 2017

Radiated Spurious Emissions

LIMITS

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a). [15.247(d)]

MEASUREMENTS / RESULTS

| Date: | 03-Jan-17 | | Company: | Alarm.com | Inc. | | | | | | v | Vork Orde | r: Q3573 |
|--|--|---|---|--|---|---|---|---|---|---|---|--|--|
| Engineer: | Zac Johnson | | EUT Desc: | ADC-IS-30 | 0-LP | | | | EUT Ope | rating | Voltage/ | Frequency | y: 3.0V DC |
| Temp: | 22.4°C | | Humidity: | 30% | | Pressu | ure: 1013mBar | | | | | | Battery |
| | Freque | ency Range: | 902-928MH | lz | | | | | Measurer | nent I | Distance : | 3m | |
| Notes: | All 3 orientatio | | 0 | | | | | | | EUT M | lax Freq: | 924MHz | |
| | Worst Case C | nentation z, | bandedge i | readings | | | | | | | | FCC Class | s B |
| Antenna Polarization | Frequency | Reading | Preamp Factor (dB) | Antenna Factor (dB/m) | Cable Factor (dB) | Adjusted Reading | Limit | Margin (dB) | Result (Pass/Fai | | Limit dBµV/m) | Margin (dB) | Result (Pass/Fai |
| (H / V) H | (MHz) 902.0 | (dBµV) 13.1 | (dB) 0.0 | (dB/III) 22.6 | (ub) 2.2 | (dBµV/m) 37.9 | (dBµV/m) | (UB) | (Pass/Fai | I) (| авµv/m) 46.0 | -8.1 | Pass |
| V | 902.0 | 11.6 | 0.0 | 22.6 | 2.2 | 36.4 | | | | | 46.0 | -9.6 | Pass |
| H | 928.0 | 14.8 | 0.0 | 22.4 | 2.0 | 39.2 | | | | | 46.0 | -6.8 | Pass |
| V | 928.0 | 12.2 | 0.0 | 22.4 | 2.0 | 36.6 | | | | | 46.0 | -9.4 | Pass |
| Tabl | e Result: | Pass | by | -6.8 | dB | | | | | Wors | st Freq: | 928. | 0 MHz |
| Analyzer: Ssoft Radiate | EMI Chamber Rental SA#3 ed Emissions C ing = Reading | Calculator | Preamp: v 1.017.180 | | | Factor | | Cable 2: Antenna: | | | P | Cable 3 Preselecto Copyright Cu | r: |
| Analyzer: Ssoft Radiate djusted Read | Rental SA#3 ed Emissions C ing = Reading · | Calculator - Preamp Fac | Preamp: v 1.017.180 ctor + Anter | none | | | | Antenna: | | e | | Preselecto Copyright Cu | r: urtis-Straus LLC |
| Analyzer: Ssoft Radiate djusted Read ev. 12/29/2016 Spectrum | Rental SA#3 ed Emissions C | Calculator - Preamp Fac | Preamp: v 1.017.180 ctor + Anter selectors | none | + Cable | Factor MN N9038A | Mfr Agilent | | Red-White Asset | | P Calibrati 12/22/ | Preselecto Copyright Cu on Due | |
| Analyzer: Ssoft Radiate djusted Read ev. 12/29/2016 Spectrum | Rental SA#3 ed Emissions C ing = Reading - Analyzers / Re | Calculator - Preamp Fac acceivers /Pres acceiver(117072 assions Sites | Preamp: v 1.017.180 ctor + Anter selectors | none na Factor - Ran | + Cable ge 3.5GHz Code | MN | | Antenna: SN | Red-White Asset | e Cat | Calibrati | Preselecto Copyright Cu on Due 2017 on Due | r: urtis-Straus LLC Calibrated |
| Analyzer: Ssoft Radiate djusted Read w. 12/29/2016 Spectrum Rei | Rental SA#3 ed Emissions C ing = Reading Analyzers / Re ntal MXE EMI Re Radiated Emis | Calculator - Preamp Fac - Preamp Fac - Ceivers / Press - Ceiver (117072 - Stors Sites - Nber 2 - ttenuators / F | Preamp: v 1.017.180 ctor + Anter selectors 5) | none na Factor - Ran 20Hz-26 FCC (719 Ran | • Cable ge 3.5GHz Code 150 ge | MN N9038A IC Code | Agilent VCCI Code | Antenna: SN MY51210151 Range | Red-White Asset | e Cat I Cat | Calibrati 12/22/ Calibrati | on Due 2017 on Due 2017 on Due 2017 on Due | r: rtis-Straus LLC Calibrated 12/22/2016 Calibrated 3/22/2015 Calibrated |
| Analyzer: Ssoft Radiate Ijusted Read v. 12/29/2016 Spectrum Rei | Rental SA#3 ad Emissions C ing = Reading Analyzers / Re tal MXE EMI Re Radiated Emis EMI Chan ups /Couplers Ai | alculator - Preamp Far acceivers /Press acceiver(117072 assions Sites mber 2 ttenuators / F | Preamp: v 1.017.180 ctor + Anter selectors 5) | none na Factor - Ran 20Hz-26 FCC (719 Ran | + Cable ge 5.5GHz Code 150 ge 000MHz ge | MN N9038A IC Code 2762A-7 MN | Agilent VCCI Code A-0015 Mfr | SN MY51210151 Range 30-1000MHz SN | Asset 1170725 | Cat I Cat I Cat | Calibrati 12/22/ Calibrati 3/22/2 Calibrati | reselecto Copyright CL on Due 2017 on Due 2017 on Due 2017 on Due 2017 on Due | r: urtis-Straus LLC Calibrated 12/22/2016 Calibrated |
| Analyzer: soft Radiate justed Read 2. 12/29/2016 Spectrum Rer Pream | Rental SA#3 ed Emissions C ing = Reading Analyzers / Re tal MXE EMI Re Radiated Emis EMI Chan Ips /Couplers Al Red Antenr | alculator - Preamp Far accivers /Press acciver(117072 asions Sites mber 2 ttenuators / F a Bilog cal Meters Pressure Only) | Preamp: v 1.017.180 ctor + Anter selectors 5) | none Ran 20Hz-26 FCC C 719 Ran 0.009-20 Ran | + Cable ge 5.5GHz Code 150 ge 000MHz ge | MN N9038A IC Code 2762A-7 MN ZFL-1000-LN MN | Agilent VCCI Code A-0015 Mfr CS Mfr | SN MY51210151 Range 30-1000MHz SN N/A SN | Asset 1170725 Asset 798 Asset | Cat I Cat II Cat II Cat | Calibrati 12/22/ Calibrati 3/22/2 Calibrati 1/29/2 Calibrati | on Due 2017 on Due 2017 on Due 2017 on Due 2017 on Due 2017 on Due 2017 | r: ortis-Straus LLC Calibrated 12/22/2016 Calibrated 3/22/2015 Calibrated 1/29/2016 Calibrated |
| Analyzer: Ssoft Radiate djusted Read sv. 12/29/2016 Spectrum Rer Pream | Rental SA#3 ad Emissions C ing = Reading · Analyzers / Re tal MXE EMI Re Radiated Emis EMI Chan ps /Couplers Al Red Antenr Red-White Meteorologic Veather Clock (P | alculator - Preamp Fac - Preamp Fac - Preamp Fac - Presevers / Press - States - State | Preamp: v 1.017.180 ctor + Anter selectors 5) | none Ran 20Hz-26 FCC C 719 Ran 0.009-20 Ran | + Cable ge 5.5GHz Code 150 ge 000MHz ge 00MHz ge | MN N9038A IC Code 2762A-7 MN ZFL-1000-LN JB1 MN BA928 | Agilent VCCI Code A-0015 Mfr CS Mfr Sunol Mfr Oregon Scientific | Antenna: SN MY51210151 Range 30-1000MHz SN N/A SN A091604-1 SN | Asset 1170725 Asset 798 Asset 1105 Asset 831 | Cat I Cat I Cat I Cat I Cat I Cat | Calibrati 12/22/ Calibrati 3/22/2 Calibrati 1/29/2 Calibrati 8/12/2 Calibrati 4/28/2 | reselecto Copyright Cu on Due 2017 on Due 2017 on Due 2017 on Due 2017 on Due 2017 on Due 2017 on Due 2018 017 on Due | Calibrated 12/22/2011 Calibrated 3/22/2015 Calibrated 1/29/2016 Calibrated 8/12/2016 Calibrated 4/28/2016 |

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





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| Date: | 03-Jan-17 | | Company: | Alarm.com | Inc. | | | | | | v | Vork Orde | r: Q3573 |
|---|--|--|---|---|--|---|--|--|--|---|---|--|---|
| Engineer: | Zac Johnson | | EUT Desc: | ADC-IS-30 | 0-LP | | | | EUT Ope | rating | Voltage/ | Frequency | : 3.0V DC |
| Temp: | 22.4°C | | Humidity: | 30% | | Pressu | ire: 1013mBar | | | | | | Battery |
| | Freque | ncy Range: | 30-1000MH | Ηz | | | | | Measurer | nent I | Distance: | 3m | |
| Notes: | All 3 orientatio | | | | | | | | | | lax Freq: | - | |
| | Worst Case O | | ore inteerig | | | | | | - | | | 02 | |
| | | | | | | | | | | 1 | | FCC Class | s B |
| Antenna | | | Preamp | Antenna | Cable | Adjusted | 1 | | | | | | |
| Polarization | Frequency | Reading | Factor | Factor | Factor | Reading | Limit | Margin | Result | | Limit | Margin | Result |
| (H / V) | (MHz) | (dBµV) | (dB) | (dB/m) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | (Pass/Fai | l) (| dBµV/m) | (dB) | (Pass/Fai |
| V | 51.3 | 36.8 | 25.3 | 7.6 | 0.4 | 19.5 | | | | | 40.0 | -20.5 | Pass |
| V | 58.1 | 38.9 | 25.3 | 7.4 | 0.5 | 21.5 | | | | | 40.0 | -18.5 | Pass |
| н | 60.1 | 29.8 | 25.3 | 7.6 | 0.5 | 12.6 | | | | | 40.0 | -27.4 | Pass |
| Н | 131.9 | 31.2 | 25.3 | 14.1 | 0.8 | 20.8 | | | | | 43.5 | -22.7 | Pass |
| Н | 184.2 | 35.9 | 25.2 | 11.3 | 1.0 | 23.0 | | | | | 43.5 | -20.5 | Pass |
| V | 227.9 | 33.2 | 25.2 | 11.1 | 1.0 | 20.1 | | | | | 46.0 | -25.9 | Pass |
| Н | 466.5 | 35.8 | 25.5 | 17.3 | 1.4 | 29.0 | | | | | 46.0 | -17.0 | Pass |
| V | 466.5 | 32.6 | 25.5 | 17.3 | 1.4 | 25.8 | | | | | 46.0 | -20.2 | Pass |
| Table | - D/4- | - | | | | | | | | | | 400 | - MU- |
| Table | e Result: | Pass | by | -17.0 | dB | | | | | wors | st Freq: | 400. | 5 MHz |
| | EMI Chamber | | - | -17.0 Asset #20 | | | | Cable 2: | | | st Freq: | Cable S | - |
| Test Site: | | | - | Asset #20 | | | | Cable 2: Antenna: | Asset #20 |)53 | , | | 3: |
| Test Site: Analyzer: | EMI Chamber | 2 | Cable 1: | Asset #20 Red | | | | | Asset #20 |)53 | , | Cable 3 Preselector | 3: |
| Test Site: Analyzer: Ssoft Radiate | EMI Chamber Rental SA#3 | 2 alculator | Cable 1: Preamp: v 1.017.180 | Asset #20 Red | 52 | Factor | | | Asset #20 |)53 | , | Cable 3 Preselector | 3: r: |
| Test Site: Analyzer: Ssoft Radiate | EMI Chamber Rental SA#3 d Emissions C | 2 alculator | Cable 1: Preamp: v 1.017.180 | Asset #20 Red | 52 | Factor | | | Asset #20 |)53 | , | Cable 3 Preselector | 3: r: |
| Test Site: Analyzer: Ssoft Radiate djusted Readi | EMI Chamber Rental SA#3 d Emissions C ing = Reading - | 2 alculator - Preamp Fac | Cable 1: Preamp: v 1.017.180 ctor + Anter | Asset #20 Red nna Factor | 52 + Cable | | | Antenna: | Asset #20 Red-Whit | 053 e | F | Cable 3 Preselector Copyright Cu | 3: r: ırtis-Straus LLC |
| Test Site: Analyzer: Ssoft Radiate djusted Readi ev. 12/29/2016 Spectrum | EMI Chamber Rental SA#3 d Emissions C ing = Reading - Analyzers / Re | 2 alculator - Preamp Fac ceivers /Pres | Cable 1: Preamp: v 1.017.180 ctor + Anter | Asset #20 Red nna Factor Rar | 52 + Cable | MN | Mfr | Antenna: SN | Asset #20 Red-Whit | 053 e Cat | , Calibrati | Cable 3 Preselector Copyright Cu | 3: r: ırtis-Straus LLC : Calibrated c |
| Test Site: Analyzer: Ssoft Radiate djusted Readi ev. 12/29/2016 Spectrum | EMI Chamber Rental SA#3 d Emissions C ing = Reading - | 2 alculator - Preamp Fac ceivers /Pres | Cable 1: Preamp: v 1.017.180 ctor + Anter | Asset #20 Red nna Factor | 52 + Cable | | Mfr Agilent | Antenna: | Asset #20 Red-Whit | 053 e | F | Cable 3 Preselector Copyright Cu | 3: r: |
| Test Site: Analyzer: Ssoft Radiate djusted Readi av. 12/29/2016 Spectrum Ren | EMI Chamber Rental SA#3 d Emissions C ing = Reading - Analyzers / Re | 2 alculator • Preamp Fac ceivers /Pres ceiver(117072 | Cable 1: Preamp: v 1.017.180 ctor + Anter | Asset #20 Red nna Factor Rar | 52 + Cable ge 5.5GHz | MN | | Antenna: SN MY51210151 | Asset #20 Red-Whit | 053 e Cat | , Calibrati | Cable 3 Preselector Copyright Cu ion Due (2017 | 3: r: rtis-Straus LLC :: Calibrated c 12/22/2016 |
| Test Site: Analyzer: Ssoft Radiate djusted Readi ev. 12/29/2016 Spectrum Ren | EMI Chamber Rental SA#3 d Emissions C ing = Reading - Analyzers / Re tal MXE EMI Re | 2 alculator - Preamp Fac ceivers /Press ceiver(117072 ssions Sites | Cable 1: Preamp: v 1.017.180 ctor + Anter | Asset #20 Red Inna Factor Rar 20Hz-26 | 52 + Cable oge 5.5GHz Code | MN N9038A | Agilent | Antenna: SN | Asset #20 Red-Whit | 053 e Cat | Calibrati 12/22/ | Cable Copyright Cu Copyright Cu Con Due 2017 | 3: r: rtis-Straus LLC :: Calibrated c 12/22/2016 |
| Test Site: Analyzer: Ssoft Radiate djusted Readi av. 12/29/2016 Spectrum Ren | EMI Chamber Rental SA#3 d Emissions C ing = Reading Analyzers / Re tal MXE EMI Re Radiated Emis EMI Chan | 2 calculator Preamp Fac ceivers /Pres ceiver(117072 sions Sites nber 2 | Cable 1: Preamp: v 1.017.180 ctor + Anter selectors 5) | Asset #20 Red nna Factor Rar 20Hz-26 FCC (719 | 52 + Cable oge 5.5GHz Code 150 | MN N9038A IC Code 2762A-7 | Agilent VCCI Code A-0015 | SN MY51210151 Range 30-1000MHz | Asset #20 Red-White Asset 1170725 | D53 e Cat I Cat | Calibrati 12/22/ Calibrati 3/22/2 | Cable 3 Preselecto Copyright Cu ion Due (2017 | Calibrated of 12/22/2016 Calibrated of 3/22/2015 |
| Test Site: Analyzer: Ssoft Radiate djusted Readi syectrum Ren | EMI Chamber Rental SA#3 d Emissions C ing = Reading - Analyzers / Re tal MXE EMI Re Radiated Emis EMI Chan ps /Couplers Al | 2 ceivers /Press ceivers /Press ceiver(117072 sions Sites nber 2 ttenuators / F | Cable 1: Preamp: v 1.017.180 ctor + Anter selectors 5) | Asset #20 Red Ina Factor 20Hz-26 FCC 0 719 Rar | 52 + Cable nge 5.5GHz Code 150 nge | MN N9038A IC Code 2762A-7 MN | Agilent VCCI Code A-0015 Mfr | SN MY51210151 Range 30-1000MHz SN | Asset #20 Red-Whit Asset 1170725 | D53 e Cat I Cat II Cat | Calibrati 12/22/ Calibrati 3/22/2 Calibrati | Cable 3 Preselector Copyright Cu ion Due 2017 ion Due 2017 | Calibrated c 12/22/2016 Calibrated c 3/22/2015 Calibrated c |
| Test Site: Analyzer: Ssoft Radiate djusted Readi syectrum Ren | EMI Chamber Rental SA#3 d Emissions C ing = Reading - Analyzers / Re tal MXE EMI Re Radiated Emis EMI Chan ps /Couplers Al Red | 2 ceivers /Pres ceivers /Pres ceiver(117072 sions Sites nber 2 ttenuators / F | Cable 1: Preamp: v 1.017.180 ctor + Anter selectors 5) | Asset #20 Red Rat 20Hz-2(FCC (719 Rat 0.009-2(| 52 + Cable nge 5.5GHz Code 150 nge | MN N9038A IC Code 2762A-7 MN ZFL-1000-LN | Agilent VCCI Code A-0015 Mfr CS | Antenna: SN MY51210151 Range 30-1000MHz SN N/A | Asset #20 Red-Whit Asset 1170725 Asset 798 | D53 e Cat I Cat II Cat II | Calibrati 12/22/ Calibrati 3/22/2 Calibrati 1/29/2 | Cable 3 Preselector Copyright Cu ion Due 2017 ion Due 2017 | Calibrated of 12/22/2016 Calibrated of 3/22/2015 Calibrated of 1/29/2016 |
| Test Site: Analyzer: Ssoft Radiate djusted Readi syectrum Ren | EMI Chamber Rental SA#3 d Emissions C ing = Reading - Analyzers / Re tal MXE EMI Re Radiated Emis EMI Chan ps /Couplers Al | 2 ceivers /Pres ceivers /Pres ceiver(117072 sions Sites nber 2 ttenuators / F | Cable 1: Preamp: v 1.017.180 ctor + Anter selectors 5) | Asset #20 Red Ina Factor 20Hz-26 FCC 0 719 Rar | 52 + Cable nge 5.5GHz Code 150 nge | MN N9038A IC Code 2762A-7 MN | Agilent VCCI Code A-0015 Mfr | SN MY51210151 Range 30-1000MHz SN | Asset #20 Red-Whit Asset 1170725 | D53 e Cat I Cat II Cat | Calibrati 12/22/ Calibrati 3/22/2 Calibrati | Cable 3 Preselector Copyright Cu ion Due 2017 ion Due 2017 | Calibrated of 12/22/2016 Calibrated of 3/22/2015 Calibrated of |
| Test Site: Analyzer: Ssoft Radiate djusted Readi syectrum Ren | EMI Chamber Rental SA#3 d Emissions C ing = Reading - Analyzers / Re tal MXE EMI Re Radiated Emis EMI Chan ps /Couplers Al Red | 2 alculator • Preamp Fac ceivers /Press ceiver(117072 ssions Sites nber 2 ttenuators / F | Cable 1: Preamp: v 1.017.180 ctor + Anter selectors 5) | Asset #20 Red Rat 20Hz-2(FCC (719 Rat 0.009-2(| 52 + Cable nge 3.5GHz Code 150 nge 000MHz 000MHz | MN N9038A IC Code 2762A-7 MN ZFL-1000-LN | Agilent VCCI Code A-0015 Mfr CS | Antenna: SN MY51210151 Range 30-1000MHz SN N/A | Asset #20 Red-Whit Asset 1170725 Asset 798 | D53 e Cat I Cat II Cat II | Calibrati 12/22/ Calibrati 3/22/2 Calibrati 1/29/2 | Cable 3 Preselecto Copyright Cu ion Due 2017 ion Due 2017 ion Due 2017 ion Due | Calibrated of 12/22/2016 Calibrated of 3/22/2015 Calibrated of 1/29/2016 1/6/2016 |
| Test Site: Analyzer: Ssoft Radiate djusted Readi syectrum Ren | EMI Chamber Rental SA#3 d Emissions C ing = Reading - Analyzers / Re tal MXE EMI Re Radiated Emis EMI Chan ps /Couplers At Red 2130 B | 2 ceivers /Pres ceivers /Pres ceiver(117072 sions Sites nber 2 ttenuators / F RF | Cable 1: Preamp: v 1.017.180 ctor + Anter selectors 5) | Asset #20 Red Inna Factor 20Hz-20 FCC (719 Rar 0.009-20 0.009-18 | 52 + Cable ge 3.5GHz Code 150 ge 000MHz 000MHz 19ge | MN N9038A IC Code 2762A-7 MN ZFL-1000-LN BRM18770 | Agilent VCCI Code A-0015 Mfr CS Micro-Tronics | SN MY51210151 Range 30-1000MHz SN N/A 1 | Asset #20 Red-Whit 1170725 Asset 798 2130 | Cat Cat Cat I Cat II Cat II | Calibrati 12/22/ Calibrati 3/22/2 Calibrati 1/29/2 1/6/2 | Cable 2 Preselector Copyright Cu 2017 ion Due 2017 ion Due 2017 ion Due 2017 ion Due | Calibrated of 12/22/2016 Calibrated of 3/22/2015 Calibrated of 1/29/2016 1/6/2016 Calibrated of |
| Test Site: Analyzer: Ssoft Radiate djusted Readi syectrum Ren | EMI Chamber Rental SA#3 d Emissions C ing = Reading Analyzers / Re tal MXE EMI Re Radiated Emis EMI Chan ps /Couplers Ai Red 2130 B Antenr Red-White | 2 alculator • Preamp Fac ceivers / Press ceiver(117072 ssions Sites nber 2 ttenuators / F RF nas e Bilog | Cable 1: Preamp: v 1.017.180 ctor + Anter selectors 5) | Asset #20 Red na Factor 20Hz-20 FCC (719 Rar 0.009-20 0.009-18 Rar | 52 + Cable ge 3.5GHz Code 150 ge 000MHz 000MHz 19ge | MN N9038A IC Code 2762A-7 MN ZFL-1000-LN BRM18770 MN JB1 | Agilent VCCI Code A-0015 Mfr CS Micro-Tronics Mfr Sunol | SN MY51210151 Range 30-1000MHz SN N/A 1 SN A091604-1 | Asset #20 Red-Whit 1170725 Asset 2130 Asset 1105 | Cat I Cat I Cat II Cat I Cat I | Calibrati 12/22/ Calibrati 3/22/2 Calibrati 1/29/2 1/6/2 Calibrati 8/12/2 | Cable 3 Preselector Copyright Cu ion Due 2017 ion Due 2017 ion Due 2017 ion Due 2017 | 3: r: rtts-Straus LLC Calibrated of 12/22/2016 Calibrated of 3/22/2015 Calibrated of 1/6/2016 Calibrated of 8/12/2015 |
| Test Site: Analyzer: Ssoft Radiate djusted Readi spectrum Ren Pream | EMI Chamber Rental SA#3 d Emissions C ing = Reading - Analyzers / Re tal MXE EMI Re Radiated Emis EMI Chan ps /Couplers Al Red 2130 B Antenr Red-White Meteorologic | 2 ceivers /Press ceivers /Press ceiver(117072 ssions Sites nber 2 ttenuators / F RF nas e Bilog al Meters | Cable 1: Preamp: v 1.017.180 ctor + Anter selectors 5) | Asset #20 Red na Factor 20Hz-20 FCC (719 Rar 0.009-20 0.009-18 Rar | 52 + Cable ge 3.5GHz Code 150 ge 000MHz 000MHz 19ge | MN N9038A IC Code 2762A-7 MN ZFL-1000-LN BRM18770 MN JB1 MN | Agilent VCCI Code A-0015 Mfr CS Micro-Tronics Mfr Sunol Mfr | SN MY51210151 Range 30-1000MHz SN N/A 1 SN A091604-1 SN | Asset #20 Red-Whit 1170725 Asset 798 2130 Asset 1105 Asset | Cat Cat Cat Cat Cat Cat Cat Cat Cat | Calibrati 12/22/ Calibrati 3/22/2 Calibrati 1/29/2 1/6/2 Calibrati 8/12/2 Calibrati | Cable 3 Preselector Copyright Cu 2017 ion Due 2017 ion Due 2017 ion Due 2017 ion Due 2017 ion Due 2017 | Calibrated of 12/22/2016 Calibrated of 3/22/2016 Calibrated of 3/22/2015 Calibrated of 1/29/2016 1/6/2016 Calibrated of 8/12/2015 Calibrated of 8/12/2015 |
| Test Site: Analyzer: Ssoft Radiate ijusted Readi vv. 12/29/2016 Spectrum Ren Pream | EMI Chamber Rental SA#3 d Emissions C ing = Reading Analyzers / Re tal MXE EMI Re Radiated Emis EMI Chan ps /Couplers Ai Red 2130 B Antenr Red-White | 2 alculator Preamp Fac ceivers / Pres ceiver (117072 sions Sites aber 2 ttenuators / F RF as e Bilog al Meters ressure Only) | Cable 1: Preamp: v 1.017.180 ctor + Anter selectors 5) | Asset #20 Red na Factor 20Hz-20 FCC (719 Rar 0.009-20 0.009-18 Rar | 52 + Cable ge 3.5GHz Code 150 ge 000MHz 000MHz 19ge | MN N9038A IC Code 2762A-7 MN ZFL-1000-LN BRM18770 MN JB1 | Agilent VCCI Code A-0015 Mfr CS Micro-Tronics Mfr Sunol | SN MY51210151 Range 30-1000MHz SN N/A 1 SN A091604-1 | Asset #20 Red-Whit 1170725 Asset 2130 Asset 1105 | Cat I Cat I Cat II Cat I Cat I | Calibrati 12/22/ Calibrati 3/22/2 Calibrati 1/29/2 1/6/2 Calibrati 8/12/2 | Cable 2 Preselector Copyright Cu 2017 ion Due 2017 ion Due 2017 ion Due 2017 ion Due 2017 ion Due 2017 | Calibrated of 12/22/2016 Calibrated of 3/22/2016 Calibrated of 3/22/2015 Calibrated of 1/29/2016 1/6/2016 Calibrated of 8/12/2015 Calibrated of 8/12/2015 |
| Test Site: Analyzer: Ssoft Radiate djusted Readi ev. 12/29/2016 Spectrum Ren Pream | EMI Chamber Rental SA#3 d Emissions C ing = Reading - Analyzers / Re tal MXE EMI Re Radiated Emis EMI Chan ps /Couplers At Red 2130 B Antenr Red-White Meteorologic /eather Clock (P TH A#2 | 2 alculator Preamp Face ceivers /Press ceiver(117072 ssions Sites nber 2 ttenuators / F RF nas al Meters ressure Only) 081 | Cable 1: Preamp: v 1.017.180 ctor + Anter selectors 5) | Asset #20 Red nna Factor 20Hz-20 FCC (719 Rar 0.009-20 0.009-18 Rar 30-200 | 52 + Cable nge 3.5GHz Code 150 nge 000MHz 000MHz 000MHz 000Hz | MN N9038A IC Code 2762A-7 MN ZFL-1000-LN BRM18770 MN JB1 MN BA928 | Agilent VCCI Code A-0015 CS Micro-Tronics Mfr Sunol Mfr Oregon Scientific HDE | SN MY51210151 Range 30-1000MHz SN N/A 1 SN A091604-1 SN | Asset #20 Red-Whit 1170725 Asset 2130 Asset 1105 Asset 831 | D53 e Cat I Cat II I Cat I Cat I I Cat I I I | Calibrati 12/22/ Calibrati 3/22/2 Calibrati 1/29/2 1/6/2 Calibrati 8/12/2 Calibrati 4/28/2 4/5/2 | Cable 3 Preselectol Copyright Cu 2017 Ion Due 2017 Ion Due 2017 Ion Due 2017 Ion Due 2017 Ion Due 2017 Ion Due 2017 | Calibrated of 12/22/2016 Calibrated of 3/22/2015 Calibrated of 1/29/2016 1/6/2016 Calibrated of 8/12/2015 Calibrated of 8/12/2015 |
| Test Site: Analyzer: Ssoft Radiate djusted Readi ev. 12/29/2016 Spectrum Ren Pream | EMI Chamber Rental SA#3 d Emissions C ing = Reading - Analyzers / Re ttal MXE EMI Re Radiated Emis EMI Chan ps /Couplers Al Red 2130 B Antenr Red-White Meteorologic Jeather Clock (P | 2 valculator Preamp Fac ceivers /Pres ceiver(117072 sions Sites nber 2 ttenuators / F RF nas p Bilog val Meters ressure Only) 081 25 | Cable 1: Preamp: v 1.017.180 ctor + Anter selectors 5) | Asset #20 Red na Factor 20Hz-20 FCC (719 Rar 0.009-20 0.009-18 Rar | 52 + Cable ge 5.5GHz Code 150 000MHz 000MHz 000HHz 000Hz 000Hz | MN N9038A IC Code 2762A-7 MN ZFL-1000-LN BRM18770 MN JB1 MN BA928 | Agilent VCCI Code A-0015 Mfr CS Micro-Tronics Mfr Sunol Mfr Oregon Scientific | SN MY51210151 Range 30-1000MHz SN N/A 1 SN A091604-1 SN | Asset #20 Red-Whit 1170725 Asset 2130 Asset 1105 Asset 831 | Cat Cat Cat Cat I Cat I Cat Cat I | Calibrati 12/22/ Calibrati 3/22/2 Calibrati 1/29/3 1/6/2 Calibrati 8/12/2 Calibrati 4/28/3 | Cable 2 Preselector Copyright Cu 2017 ion Due 2017 ion Du | Calibrated of 12/22/2016 Calibrated of 3/22/2015 Calibrated of 1/29/2016 1/6/2016 Calibrated of 8/12/2015 Calibrated of 8/12/2015 |

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

| Date: | 03-Jan-17 | | | Company: | Alarm.com | n Inc. | | | | | | ١ | Vork Order: | Q3573 | |
|-----------------------|---|-------------------|-------------------|----------------|------------------|----------------|--------------------------|-------------------------|-------------------|----------------------|--------------------------|-------------------|----------------|-----------------------|--|
| Engineer: | Zac Johnson | | | EUT Desc: | ADC-IS-30 | 0-LP | | | | | EUT Opera | ting Voltage/ | Frequency: | 3.0V DC | |
| Temp: | 22.4°C | | | Humidity: | 30% | | | Pressure: | 1013mBar | | | | | Battery | |
| | | Freque | ncy Range: | 1-6GHz | | | | | | | Measurement Distance: 3m | | | | |
| Notes: | All 3 orientation | ons of EUT v | vere investiga | ited | | | | | | | EU | T Max Freq: | 924MHz | | |
| Antenna | | Peak | Average | Preamp | Antenna | Cable | Adjusted | Adjusted | FCC Clas | s B High Fro Peak | equency - | FCC Class | B High Frequ | uency - Averaç | |
| Polarization (H/V) | Frequency (MHz) | Reading (dBµV) | Reading (dBµV) | Factor (dB) | Factor (dB/m) | Factor (dB) | Peak Reading (dBµV/m) | Avg Reading (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Result (Pass/Fail) | Limit (dBµV/m) | Margin (dB) | Result (Pass/Fail) | |
| H - Z | 1670.0 | 50.9 | 50.9 | 37.3 | 29.7 | 4.1 | 47.4 | 47.4 | 74.0 | -26.6 | Pass | 54.0 | -6.6 | Pass | |
| H - Z | 1865.0 | 50.3 | 50.3 | 37.4 | 30.9 | 4.2 | 48.0 | 48.0 | 74.0 | -26.0 | Pass | 54.0 | -6.0 | Pass | |
| V - Z | 2062.0 | 49.7 | 49.7 | 37.3 | 31.9 | 4.6 | 48.9 | 48.9 | 74.0 | -25.1 | Pass | 54.0 | -5.1 | Pass | |
| V - Z | 2415.0 | 49.0 | 49.0 | 37.5 | 32.3 | 5.0 | 48.8 | 48.8 | 74.0 | -25.2 | Pass | 54.0 | -5.2 | Pass | |
| V - Z | 2454.0 | 48.5 | 48.5 | 37.5 | 32.4 | 5.1 | 48.5 | 48.5 | 74.0 | -25.5 | Pass | 54.0 | -5.5 | Pass | |
| H - Z | 3648.0 | 52.7 | 47.1 | 37.9 | 33.3 | 5.9 | 54.0 | 48.4 | 74.0 | -20.0 | Pass | 54.0 | -5.6 | Pass | |
| V - Z | 3648.0 | 52.9 | 47.3 | 37.9 | 33.3 | 5.9 | 54.2 | 48.6 | 74.0 | -19.8 | Pass | 54.0 | -5.4 | Pass | |
| H - Y | 3648.0 | 52.0 | 46.4 | 37.9 | 33.3 | 5.9 | 53.3 | 47.7 | 74.0 | -20.7 | Pass | 54.0 | -6.3 | Pass | |
| V - Y | 3648.0 | 53.5 | 47.9 | 37.9 | 33.3 | 5.9 | 54.8 | 49.2 | 74.0 | -19.2 | Pass | 54.0 | -4.8 | Pass | |
| H - Z | 5780.0 | 44.4 | 44.4 | 36.4 | 35.2 | 8.1 | 51.3 | 51.3 | 74.0 | -22.7 | Pass | 54.0 | -2.7 | Pass | |
| Table | e Result: | | Pass | by | -2.7 | dB | | | | | W | orst Freq: | 5780.0 | MHz | |
| Test Site: | EMI Chamber | 2 | | Cable 1: | Asset #20 | 52 | | | | Cable 2: | Asset #205 | 3 | Cable 3: | EMIR-HIGH-07 | |
| | Analyzer: Rental SA#3 Preamp: Asset #2111 Antenna: Blue Horn Preselector: | | | | | | | | | | | | | | |





Test Report for Alarm.com Incorporated. • Report No. EQ3573-1

| Date: | 03-Jan-17 | | | Company: | Alarm.com | n Inc. | | | | | | v | Vork Order | : Q3573 |
|---|--|--|---|----------------------------------|--|---|---|--|--|--|---|--|---|---|
| Engineer: | Zac Johnson | | | EUT Desc: | ADC-IS-30 | 0-LP | | | | EUT C | Operati | ing Voltage/ | Frequency | : 3.0V DC |
| Temp: | 22.4°C | | | Humidity: | 30% | | | Pressure: 101 | 3mBar | | | | | Battery |
| | | Freque | ency Range: | 6-10GHz | | | | | | Measu | iremer | nt Distance: | 1m | |
| Notes: | All 3 orientatio | ons of EUT v | were investiga | ated | | | | | | | EUT | Max Freq: | 924MHz | |
| | Worst Case C | Drientation Z | , All readings | are noise f | loor | | | | | | | - | | |
| Antenna | | Peak | Average | Preamp | Antenna | Cable | Adjusted | Adjusted | FCC Class B Hig Pea | | су - | | B High Fre | quency - Avera |
| olarization | Frequency | Reading | Reading | Factor | Factor | Factor | Peak Reading | 5 5 | Limit Mar | | sult | Limit | Margin | Result |
| (H / V) | (MHz) | (dBµV) | (dBµV) | (dB) | (dB/m) | (dB) | (dBµV/m) | | dBμV/m) (dE | | s/Fail) | (dBµV/m) | (dB) | (Pass/Fail) |
| V H | 6550.0 | 45.9 | 45.9 46.4 | 36.5 37.1 | 35.8 35.9 | 8.7 9.5 | 53.9 54.7 | 53.9 54.7 | 83.5 -29 83.5 -28 | | ISS | 63.5 63.5 | -9.6 -8.8 | Pass |
| н V | 7280.0 7656.0 | 46.4 45.5 | 46.4 | 37.1 | 35.9 | 9.5 9.5 | 54.7 54.4 | 54.7 54.4 | 83.5 -28 83.5 -29 | | ISS | 63.5 | -8.8 -9.1 | Pass Pass |
| н | 8532.0 | 45.5 | 45.5 | 35.8 | 36.1 | 9.5 | 54.4 | 54.4 54.7 | 83.5 -29 | | ISS | 63.5 | -9.1 | Pass |
| н V | 9292.0 | 44.7 | 44.7 | 35.8 | 36.1 | 9.7 | 54.7 | 54.7 56.1 | 83.5 -26 | | ISS | 63.5 | -0.0 | Pass |
| н | 9292.0 | 45.1 | 45.1 | 35.9 | 36.9 | 10.1 | 56.6 | 56.6 | 83.5 -26 | | ISS | 63.5 | -7.4 | Pass |
| V | 9892.0 | 43.5 | 45.5 | 36.1 | 37.7 | 10.1 | 56.9 | 56.9 | 83.5 -26 | | ISS | 63.5 | -6.6 | Pass |
| н | 9928.0 | 45.4 | 45.4 | 36.0 | 37.8 | 10.0 | 57.9 | 57.9 | 83.5 -25 | | ISS | 63.5 | -5.6 | Pass |
| Tabl | e Result: | | Pass | by | -5.6 | | | I | | | | orst Freq: | 9928.0 | |
| Test Site: | EMI Chombor | 0 | | Cable 1 | Asset #20 | 50 | | | Cal | le 2: Asset | 10050 | - | | EMIR-HIGH-07 |
| | | | | | | | | | | | | | | |
| | | 2 | | | | | | | | | | | | |
| Analyzer: soft Radiate | Rental SA#3 d Emissions C ing = Reading | Calculator | v 1.017.180 actor + Anten | Preamp: | Asset #21 | 11 | | | | nna: Blue I | | | Preselector | |
| Analyzer: soft Radiate justed Read v. 12/29/20 Spectru | Rental SA#3 d Emissions C ing = Reading 16 IM Analyzers | Calculator - Preamp Fa s / Receive | actor + Anten ers /Preseleo | Preamp: | Asset #21 Cable Fac | 11 stor | MN | Mfr | Ante | nna: Blue F | Horn | F | Preselector Copyri | : ght Curtis-Straus LLC Calibrated |
| Analyzer: isoft Radiate justed Read w. 12/29/20 Spectru | Rental SA#3 d Emissions C ing = Reading 16 IM Analyzers Rental MXE EM | Calculator - Preamp Fa s / Receive MI Receiver | actor + Anten ers /Presele r(1170725) | Preamp: | Asset #21 Cable Fac Rang 20Hz-26. | 11 ator ge 5GHz | N9038A | Agilent | Ante | nna: Blue F | Horn Cat | E Calibrati 12/22 | Preselector Copyri ion Due /2017 | calibrated |
| Analyzer: soft Radiate usted Read v. 12/29/20 Spectru | Rental SA#3 d Emissions C ing = Reading 16 Im Analyzers Rental MXE EN Radiated | Calculator - Preamp Fa s / Receive | actor + Anten ers/Preseler r(1170725) sSites | Preamp: | Asset #21 Cable Fac | 11 ator ge 5GHz ode | | | Ante | nna: Blue F | Horn | F Calibrati | Preselector Copyri ion Due /2017 ion Due | Calibrated 12/22/2016 |
| Analyzer: soft Radiate usted Read v. 12/29/20 Spectru F | Rental SA#3 d Emissions C ing = Reading 16 Im Analyzers Rental MXE EN Radiated | Calculator - Preamp Fa s / Receiver MI Receiver Emissions Chamber 2 | actor + Anten ers /Preseler (1170725) e Sites | Preamp: ana Factor + ctors | Asset #21 Cable Fac Rang 20Hz-26. | 11 stor ge 5GHz ode 50 | N9038A | Agilent VCCI Code | Ante SN MY5121015 Range | nna: Blue F | Horn Cat | Calibrati 12/22 Calibrati | ion Due /2017 ion Due 2017 | Calibrated 12/22/2016 Calibrated 4/29/2015 |
| Analyzer: soft Radiate usted Read v. 12/29/20 Spectru F | Rental SA#3 d Emissions C ing = Reading 16 im Analyzers Rental MXE EN Radiated EMI amps /Couple | Calculator - Preamp Fa s / Receiver MI Receiver Emissions Chamber 2 | actor + Anten ers /Presele (1170725) s Sites 2 ators / Filter | Preamp: ana Factor + ctors | Asset #21 Cable Fac Rang 20Hz-26. FCC Ca 7191 | 11 stor 5GHz ode 50 ge | N9038A IC Code 2762A-7 | Agilent VCCI Code A-0015 | SN MY5121015 Range 1-18GHz SN | nna: Blue H Asset 1 1170725 | Cat I Cat | Calibrati 12/22/ Calibrati 4/29/: | ion Due /2017 ion Due 2017 ion Due | : ght Curtis-Straus LLC Calibrated |
| Analyzer: soft Radiate usted Read v. 12/29/20 Spectru F | Rental SA#3 d Emissions C ing = Reading 16 im Analyzers Radiated EMI amps /Couple A#211 | Calculator - Preamp Fa s / Receive MI Receiver Emissions Chamber 2 ers Attenua | actor + Anten ers /Presele (1170725) s Sites 2 ators / Filter | Preamp: ana Factor + ctors | Asset #21 Cable Fac 20Hz-26. FCC C 7191 Rang | 11 stor 5GHz ode 50 ge GHz | N9038A IC Code 2762A-7 MN | Agilent VCCI Code A-0015 Mfr | SN MY5121015 Range 1-18GHz SN | Asset 1 1170725 | Cat I Cat I Cat | Calibrati 12/22/ Calibrati 4/29/: Calibrati | ion Due /2017 ion Due 2017 ion Due 2017 ion Due 2017 | Calibrated 12/22/2016 Calibrated 4/29/2015 Calibrated |
| Analyzer: soft Radiate usted Read v. 12/29/20 Spectru F | Rental SA#3 d Emissions C ing = Reading 16 m Analyzers Rental MXE EN Radiated EMI amps /Couple A#211 21 | Calculator - Preamp Fa s / Receive MI Receiver Emissions Chamber 2 ers Attenua 1 HF Pream | actor + Anten ers /Presele (1170725) s Sites 2 ators / Filter | Preamp: ana Factor + ctors | Asset #21 - Cable Fac - Rang 20Hz-26. FCC C 7191: Rang 0.5-180 0.009-180 | 11 ator 5GHz ode 50 ge GHz 00MHz | N9038A IC Code 2762A-7 MN PAM-118A | Agilent VCCI Code A-0015 Mfr COM-POWEF | SN MY5121015 Range 1-18GHz SN 551063 | Asset 1 1170725 Asset 2111 | Cat I Cat I Cat I | Calibrati 12/22 Calibrati 4/29/2 Calibrati 11/5/2 | Preselector Copyri ion Due /2017 ion Due 2017 ion Due 2017 2017 | Calibrated 12/22/2016 Calibrated 4/29/2015 Calibrated 11/5/2016 |
| Analyzer: soft Radiate usted Read /. 12/29/20 Spectru F | Rental SA#3 d Emissions C ing = Reading 16 am Analyzers Rental MXE EN Radiated EMI amps /Couple A#211 21 | Alculator - Preamp Fa / Receiver MI Receiver Emissions Chamber 2 ers Attenua 1 HF Pream 130 BRF | actor + Anten ers /Presele (1170725) s Sites 2 ators / Filter | Preamp: ana Factor + ctors | Asset #21 Cable Fac Rang 20Hz-26. FCC C 7191: Rang 0.5-180 | 11 stor 5GHz ode 50 ge GHz 00MHz ge | N9038A IC Code 2762A-7 MN PAM-118A BRM18770 | Agilent VCCI Code A-0015 Mfr COM-POWEF Micro-Tronics | SN MY5121015 Range 1-18GHz SN 551063 1 | Asset 1 1170725 Asset 2111 2130 | Cat I Cat I Cat II II | Calibrati 12/22/ Calibrati 4/29/: Calibrati 11/5/: 1/6/2 | ion Due /2017 ion Due 2017 ion Due 2017 2017 2017 ion Due | Calibrated 12/22/2011 Calibrated 4/29/2015 Calibrated 11/5/2016 1/6/2016 |
| Analyzer: soft Radiate usted Read /. 12/29/20 Spectru F | Rental SA#3 d Emissions C ing = Reading 16 m Analyzers Rental MXE EM Radiated EMI amps /Couple A#211 21 An BI | Alculator - Preamp Fa s / Receiver MI Receiver Emissions Chamber 2 ers Attenua 1 HF Pream 130 BRF ntennas | actor + Anter ers /Preselec (1170725) 3 Sites 2 ators / Filter mp | Preamp: ana Factor + ctors | Asset #21 - Cable Fac - Rang 20Hz-26. FCC C 7191: Rang 0.5-180 0.009-180 Rang | 11 stor 5GHz ode 50 ge GHz 00MHz ge | N9038A IC Code 2762A-7 MN PAM-118A BRM18770 MN | Agilent VCCI Code A-0015 Mfr COM-POWEF Micro-Tronics Mfr | SN MY5121015 Range 1-18GHz SN 551063 1 SN | Asset 1 1170725 Asset 2111 2130 Asset | Cat Cat Cat Cat | Calibrati 12/22/ Calibrati 4/29/ Calibrati 11/5/2 1/6/2 Calibrati | Copyri copyri copyri con Due 2017 con Due 2017 2017 con Due 2017 2017 2017 | Calibrated 12/22/2010 Calibrated 4/29/2015 Calibrated 11/5/2016 1/6/2016 Calibrated |
| Analyzer: soft Radiate usted Read 4. 12/29/20 Spectru F | Rental SA#3 d Emissions C ing = Reading 16 m Analyzers Rental MXE EN Radiated EMI amps /Couple A#211 21 Air BI Meteoro Weather Clo | Alculator - Preamp Fa s / Receive MI Receiver Emissions Chamber 2 ers Attenue 1 HF Pream 1 30 BRF Intennas ue Horn logical Me | actor + Anten ers /Presele ((1170725) 2 Sites 2 ators / Filte mp | Preamp: ana Factor + ctors | Asset #21 - Cable Fac - Rang 20Hz-26. FCC C 7191: Rang 0.5-180 0.009-180 Rang | 11 stor 5GHz ode 50 ge GHz 00MHz ge | N9038A IC Code 2762A-7 MN PAM-118A BRM18770 MN 3117 | Agilent VCCI Code A-0015 Mfr COM-POWEF Micro-Tronics Mfr ETS | SN MY5121015 Range 1-18GHz SN 551063 1 SN 157647 SN | Asset 1 1170725 Asset 2111 2130 Asset 1861 | Cat I Cat I Cat II I Cat I | Calibrati 12/22: Calibrati 4/29/ Calibrati 11/5/2 Calibrati 2/8/2 | Copyri | Calibrated 12/22/201 Calibrated 4/29/2015 Calibrated 4/29/2016 Calibrated 11/5/2016 Calibrated 2/8/2015 |
| Analyzer: soft Radiate usted Read v. 12/29/20 Spectru F | Rental SA#3 d Emissions C ing = Reading 16 im Analyzers Radiated EMI amps /Couple A#211 21 A BI Meteoro Weather Clo Th | Alculator - Preamp Fa s / Receive MI Receiver Emissions Chamber 2 ers Attenue 1 HF Pream 130 BRF Intennas ue Horn logical Me ck (Pressu 1 A#2081 | actor + Anten ers /Presele ((1170725) 2 Sites 2 ators / Filte mp | Preamp: ana Factor + ctors | Asset #21 - Cable Fac - Cable Fac 20Hz-26. FCC C 7191: Rang 0.5-180 0.009-180 Rang 1-18G | 11 stor ge 5GHz ode 50 ge GHz 00MHz ge shz | N9038A IC Code 2762A-7 MN PAM-118A BRM18770 MN 3117 MN BA928 | Agilent VCCI Code A-0015 Mfr COM-POWEF Micro-Tronics Mfr ETS Mfr Oregon Scientif HDE | SN MY5121015 Range 1-18GHz SN 551063 1 SN 157647 SN | Asset 1 1170725 Asset 2111 2130 Asset 1861 Asset 831 | Cat Cat Cat Cat Cat | Calibrati 12/22/ Calibrati 4/29// Calibrati 11/5/2 Calibrati 2/8/2 Calibrati 4/28/ 4/5/2 | Copys | Calibrated 12/22/201 Calibrated 4/29/2018 Calibrated 11/5/2016 Calibrated 2/8/2015 Calibrated 4/28/2016 4/5/2016 |
| Analyzer: soft Radiate usted Read /. 12/29/20 Spectru F | Rental SA#3 d Emissions C ing = Reading 16 m Analyzers Rental MXE EN Radiated EMI amps /Couple A#211 21 An BI Meteoro Weather Clo Th | Alculator - Preamp Fa - Preamp Fa - Receiver MI Receiver Emissions Chamber 2 ers Attenua 1 HF Pream 130 BRF ntennas ue Horn logical Me ck (Pressu I A#2081 Cables | actor + Anten ers /Presele ((1170725) 2 Sites 2 ators / Filte mp | Preamp: ana Factor + ctors | Asset #21 - Cable Fac 20Hz-26. FCC C 7191: Rang 0.5-180 0.09-180 Rang Rang | 11 ge 5GHz ode 50 ge GHz 00MHz ge shz | N9038A IC Code 2762A-7 MN PAM-118A BRM18770 MN 3117 MN BA928 | Agilent VCCI Code A-0015 Mfr COM-POWEF Micro-Tronics Mfr ETS Mfr Oregon Scientif HDE Mfr | SN MY5121015 Range 1-18GHz SN 551063 1 SN 157647 SN | Asset 1 1170725 Asset 2111 2130 Asset 1861 Asset 831 | Cat I Cat I Cat I I Cat I I Cat I I Cat Cat Cat Cat Cat Cat Cat Cat Cat Cat | Calibrati 12/22 Calibrati 4/29/3 Calibrati 11/5/7 Calibrati 2/8/2 Calibrati 4/28/7 4/5/2 Calibrati | copy ion Due //2017 ion Due 2017 ion Due 2018 2017 ion Due 2018 2017 ion Due | Calibrated 12/22/2011 Calibrated 4/29/2015 Calibrated 11/5/2016 Calibrated 2/8/2015 Calibrated 4/28/2016 Calibrated 4/5/2016 Calibrated |
| Analyzer: soft Radiate usted Read v. 12/29/20 Spectru F | Rental SA#3 d Emissions C ing = Reading 16 m Analyzers Rental MXE EN Radiated EMI mps /Couple A#211 2: Au BI Meteoro Weather Clo Th Case | Alculator - Preamp Fa - Pream | actor + Anten ers /Presele ((1170725) 2 Sites 2 ators / Filte mp | Preamp: ana Factor + ctors | Asset #21 - Cable Fac 20Hz-26. FCC C 7191: Rang 0.5-180 0.009-180 Rang 9kHz - 1 | 11 stor 5GHz ode 50 ge GHz 00MHz ge shz ge 8GHz | N9038A IC Code 2762A-7 MN PAM-118A BRM18770 MN 3117 MN BA928 | Agilent VCCI Code A-0015 Mfr COM-POWEF Micro-Tronics Mfr Coregon Scientif HDE Mfr Florida RF | SN MY5121015 Range 1-18GHz SN 551063 1 SN 157647 SN | Asset 1 1170725 Asset 2111 2130 Asset 1861 Asset 831 | Cat I Cat I I Cat I I Cat I I Cat I I Cat I I Cat I I I Cat I I I Cat I I I Cat I I I I Cat I I I I Cat I I I Cat I I I I Cat I I I Cat I I Cat I Cat I I Cat Cat I Cat I Cat I C C C C C C C C C C C C C C C C C C | Calibrati 12/22 Calibrati 4/29// Calibrati 11/5// 1/6/2 Calibrati 4/28/3 4/5/2 Calibrati 4/2/2/ Calibrati 3/2/2 | Copyril Copyri Copyril Copyril Copyril Copyril Copyril Co | Calibrated 12/22/2011 Calibrated 4/29/2015 Calibrated 11/5/2016 1/6/2016 Calibrated 2/8/2015 Calibrated 4/28/2016 4/5/2016 Calibrated 3/2/2016 |
| Analyzer: soft Radiate justed Read w. 12/29/20 Spectru F | Rental SA#3 d Emissions C ing = Reading fa Radiated EMI mps /Couple A#211 21 Autor Bi Meteoro Weather Clo The Case Ass | Alculator - Preamp Fa - Preamp Fa - Receiver MI Receiver Emissions Chamber 2 ers Attenua 1 HF Pream 130 BRF ntennas ue Horn logical Me ck (Pressu I A#2081 Cables | actor + Anten ers /Presele ((1170725) 2 Sites 2 ators / Filte mp | Preamp: ana Factor + ctors | Asset #21 - Cable Fac 20Hz-26. FCC C 7191: Rang 0.5-180 0.09-180 Rang Rang | 11 Je 5GHz 5GHz 006 50 Je 6GHz 000MHz Je 8GHz 8GHz | N9038A IC Code 2762A-7 MN PAM-118A BRM18770 MN 3117 MN BA928 | Agilent VCCI Code A-0015 Mfr COM-POWEF Micro-Tronics Mfr ETS Mfr Oregon Scientif HDE Mfr | SN MY5121015 Range 1-18GHz SN 551063 1 SN 157647 SN | Asset 1 1170725 Asset 2111 2130 Asset 1861 Asset 831 | Cat I Cat I Cat I I Cat I I Cat I I Cat Cat Cat Cat Cat Cat Cat Cat Cat Cat | Calibrati 12/22 Calibrati 4/29/3 Calibrati 11/5/7 Calibrati 2/8/2 Calibrati 4/28/7 4/5/2 Calibrati | reselector Copysi ion Due 2017 ion Due 2017 ion Due 2017 ion Due 2018 ion Due 2018 ion Due 2018 ion Due 2017 ion Due 2017 ion Due 2017 ion Due 2017 ion Due 2017 ion Due 2017 ion Due 2017 ion Due 2017 ion Due | Calibrated 12/22/201 Calibrated 4/29/201: Calibrated 11/5/2010 1/6/2016 Calibrated 2/8/2015 Calibrated 4/28/2016 Calibrated 4/28/2016 Calibrated 4/5/2016 Calibrated |

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





Conducted Spurious Emissions

LIMITS

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth that contains the highest level of desired power...

[15.247(d)]

MEASUREMENTS / RESULTS

All emissions were more than 20dB below the fundamental

Rev. 1/21/2017

| Spectrum Analyzers / Receivers / Preselectors | Range | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated on 12/22/2016 |
|---|--------------|-----------|-------------------|------------|--------------|-----|-----------------|--------------------------|
| Rental MXE EMI Receiver(1170725) | 20Hz-26.5GHz | N9038A | Agilent | MY51210151 | 1170725 | I | 12/22/2017 | |
| Preamps /Couplers Attenuators / Filters | Range | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated on 2/10/2016 |
| API - 30dB 20W Attenuator | 9KHz-40GHz | 89-30-11 | API Weinschel | 703 | 2121 | I | 2/10/2017 | |
| Meteorological Meters | | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated on |
| Weather Clock (Pressure Only) | | BA928 | Oregon Scientific | C3166-1 | 831 | I | 4/28/2018 | 4/28/2016 |

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







Conducted Spurious 9 KHz - 10GHz with Transmission at 912MHz



Conducted Spurious Reference with Transmission at 912MHz





| arker 1 917.96200 | 2 <u>A</u> DC DOOOO MHz PNO: Fast C IEGain:Low | Trig: Free Run Atten: 10 dB | ALIGNAUTO Avg Type: Log-Pwr Avg Hold: 55/100 | 02:17:44 PM Jan 04, 2017 TRACE 1 2 3 4 5 6 TYPE M WWWWW DET P P N N N N | Marker |
|------------------------------|---|--------------------------------|--|--|---------------------|
|) dB/div Ref 0.00 d | | | | Mkr1 918 MHz -25.236 dBm | Marker Tab On (|
| | | | | | Marker Coun [Off |
| 0.0 0.0 0.0 | | | | | Coup Marke |
| | | 2 3 | and a state of the start of the | | |
| tart 9 kHz Res BW 100 kHz | +1/P | W 300 kHz | Ewoon 0 | Stop 10.000 GHz 55.7 ms (1001 pts) | |
| R MODE TRC SCL | × 918 MHz | Y F -25.236 dBm | Sweep 9 | FUNCTION VALUE | |
| 1 N 1 f | 3.670 GHz 4.590 GHz | -73.160 dBm -76.461 dBm | | | All Markers (|
| 2 N 1 F 3 N 1 F 4 | | | | = | |
| 2 N 1 f | | | | | Ма 2 о |

Conducted Spurious 9 KHz - 10GHz with Transmission at 918MHz



Conducted Spurious Reference with Transmission at 918MHz





| Agilent Spectrum Analyzer - Swept SA RF 50 & ADC Marker 3 4.6200048420 | | SENSE;IM | | ALIGNAUTO | 01:53:48 PM Jan 04, 20 TRACE 1 2 3 4 | | Frace/Detector |
|--|-----------------------------------|--|---|-----------|--|-----------|----------------------|
| Marker 5 4.0200046420 | PNO: Fast IFGain:Low | Trig: Free Run Atten: 10 dB | | | TYPE MWWW DET PPNN | N N | Select Trace |
| 10 dB/div Ref 0.00 dBm | | | | Ν | /kr3 4.620 GF -76.043 dB | | 1 |
| -10.0 -20.0 -30.0 | | | | | | | Clear Write |
| -40.0 | | | | | | • | Frace Average |
| -70.0 -80.0 -90.0 | | | and a star of the | ر | andra ay an | ~~~ | Max Hole |
| Start 9 kHz #Res BW 100 kHz | #VB | W 300 kHz Y | FUNCTION | Sweep 9 | Stop 10.000 GI 55.7 ms (1001 pr FUNCTION VALUE | tz ts) | Min Hol |
| 1 N 1 f 2 N 1 f 3 N 1 f 4 5 6 | 924 MHz 3.700 GHz 4.620 GHz | -25.323 dBm -73.297 dBm -76.043 dBm | | | | | View Blank View |
| 7 8 9 9 10 10 10 10 10 10 10 10 10 10 10 10 10 | | | | | > | | Mor 1 of 3 |
| ISG | | | | STATUS | DC Coupled | | |

Conducted Spurious 9 KHz -10GHz with Transmission at 924MHz



Conducted Spurious Reference with Transmission at 924MHz





Power Spectral Density

LIMIT

...the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission. [15.247(e)]

MEASUREMENTS / RESULTS

| Date: Jan 4 2017 | Company | : Alarm.com Inc. | | | | Work Order: | Q3573 |
|---|-------------------------|----------------------------------|---------------------------------|-------------|---------------|---------------|----------------|
| Engineer: YF / ZJ | EUT | : ADC-IS-300-LP | | EUT Oper | ating Voltage | /Frequency: | 3VDC Batte |
| Temp: 20.9°C | Humidity | : 33% P ı | r essure: 987mbar | | | | |
| Frequency Range: 9 | 12MHz-924MHz | Measurement Ty Measurement Me | pe: Conducted ethod: FCC KDB | | TS Meas Guid | ance v03r05 S | ection 10.2 |
| Notes: | | | | | | | |
| Frequency | Peak Reading | Cable Loss | Attenuator Loss | Peak PSD | Limit | Margin | Result |
| (MHz) | (dBm) | (dB) | (dB) | (dBm) | (dBm) | (dB) | |
| 912 | -31.99 | 1.0 | 29.4 | -1.59 | 8.0 | -9.59 | Pass |
| 918 | -32.15 | 1.0 | 29.4 | -1.75 | 8.0 | -9.75 | Pass |
| 924 | -32.47 | 1.0 | 29.4 | -2.07 | 8.0 | -10.07 | Pass |
| Test Site: EMC-4 | Cable | : UFL to SMA dong | le (client supplied) | Attenuator: | A2121 | | |
| Analyzer: 1170725 D(dBm) = Reading (dBm) |) + Cable Loss (dB) + A | Attenuator Loss (dBn | n) | | | Copyright Cur | tis-Straus LLC |
| D(dBm) = Reading (dBm) |) + Cable Loss (dB) + P | attenuator Loss (dBn | 1) | | | | |

| Spectrum Analyzers / Receivers / Preselectors | Range | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated on 12/22/2016 |
|--|----------------------------|-----------------------|----------------------|------------------|----------------------|----------|---------------------------|--------------------------|
| Rental MXE EMI Receiver(1170725) | 20Hz-26.5GHz | N9038A | Agilent | MY51210151 | 1170725 | I | 12/22/2017 | |
| Preamps /Couplers Attenuators / Filters API - 30dB 20W Attenuator | Range 9KHz-40GHz | MN 89-30-11 | Mfr API Weinschel | SN 703 | Asset 2121 | Cat I | Calibration Due 2/10/2017 | Calibrated on 2/10/2016 |
| Meteorological Meters | | MN | Mfr | SN | Asset | Cat | Calibration Due | Calibrated on |
| Weather Clock (Pressure Only) | | BA928 | Oregon Scientific | C3166-1 | 831 | I | 4/28/2018 | 4/28/2016 |

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





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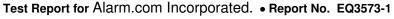
Power Spectral Density with Transmission at 912MHz



Power Spectral Density with Transmission at 918MHz









Power Spectral Density with Transmission at 924MHz





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Occupied Bandwidth

REQUIREMENT

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

MEASUREMENTS / RESULTS

| | | 99% C | ccupi | ied Bandwi | idth | | | | |
|--|--------------|----------------------------|-----------------------|--------------------------|-------------------------|----------------------|----------|-------------------------------|-----------------------------|
| Date: Jan 4 2017 | Company: A | larm.com Inc. | | | | | | Work Ord | er: Q3573 |
| Engineer: YF / ZJ | EUT: A | DC-IS-300-LP | | | | EUT Op | erating | g Voltage/Frequen | cy: 3VDC Batter |
| Temp: 20.9°C | Humidity: 33 | 3% | Pre | essure: 987mbar | | | | | |
| Frequency Range: 912 | 2MHz-924MHz | Mea | suremen | t Type: Conducted | d | | | | |
| | | Measu | rement M | lethod: RSS-Gen | Issue 4 Section | n 6.6 | | | |
| Notes: | | | | | | | | | |
| Frequency | | | | 99% O | | | | | |
| (MHz) | | | | (kH | z) | | | | |
| 912 | | | | 941. | 33 | | | | |
| 918 | | | | 930. | 28 | | | | |
| 924 | | | | 906. | 68 | | | | |
| Test Site: EMC-4 | Cable: U | FL to SMA dongle | (client su | pplied) Attenuate | or A2121 | | | | |
| Analyzer: 1170725 | | | | | | | | Copyright | Curtis-Straus LLC 20 |
| . 1/21/2017 | | | | | | | | | |
| Spectrum Analyzers / Rece Rental MXE EMI Rece | | Range 20Hz-26.5GHz | MN N9038A | Mfr Agilent | SN MY51210151 | Asset 1170725 | Cat I | Calibration Due 12/22/2017 | Calibrated on 12/22/2016 |
| Preamps /Couplers Atte API - 30dB 20W A | | Range 9KHz-40GHz | MN 89-30-11 | Mfr API Weinschel | SN 703 | Asset 2121 | Cat I | Calibration Due 2/10/2017 | Calibrated or 2/10/2016 |
| Meteorological Weather Clock (Pres | | | MN BA928 | Mfr Oregon Scientific | SN C3166-1 | Asset 831 | Cat | Calibration Due 4/28/2018 | Calibrated or 4/28/2016 |

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





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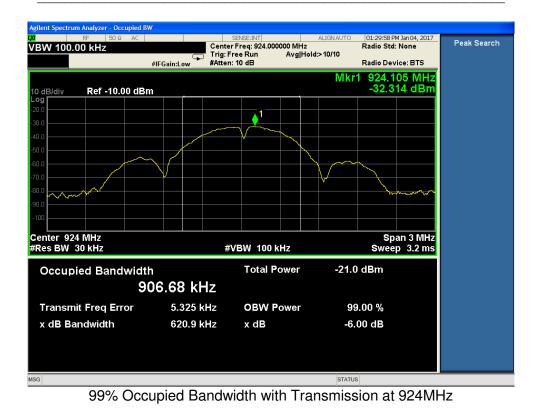
99% Occupied Bandwidth with Transmission at 912MHz



99% Occupied Bandwidth with Transmission at 918MHz











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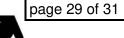
Measurement Uncertainty

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 CISPR | 5.6dB 4.6dB | N/A 5.2dB (Ucispr) |
| 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 (Ucispr) |
| 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 x 10 ⁻⁸ | 1 x 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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ACCREDITED

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

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.

 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.
 These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof

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 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.

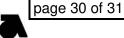
11. The Company shall undertake due care and ordinary skill in the performance of its services to Client, and the Company shall accept responsibility only were such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.

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.

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 litigation arising hereunder.

The complete list of the Approved Subcontractors Curtis-Straus may use to delegate the performance of work can be provided upon request. Rev.160009121(2)_#684340 v14CS





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