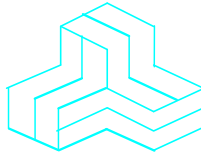


ENGINEERING TEST REPORT



Multilane POS Terminal

Model: L5300

FCC ID: NVA00010

Applicant:

Equinox Payments LLC

8901 East Raintree Drive, Suite 400
Scottsdale, AZ 85260
USA

In Accordance With

Federal Communications Commission (FCC)

Part 15, Subpart C

Unlicensed Low Power Transmitter Operating in the Band 13.110-14.010 MHz

UltraTech's File No.: MIS-107F15C225

This Test report is Issued under the Authority of
Tri M. Luu
Vice President of Engineering
UltraTech Group of Labs

Date: September 3, 2014

Report Prepared by: Dan Huynh

Tested by: Wei Wu

Issued Date: September 3, 2014

Test Dates: July 8, 30 & September 3, 2014

- The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.
- This report must not be used by the client to claim product endorsement by NVLAP or any agency of the US Government.

UltraTech

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91038



1309



46390-2049



NVLAP LAB
CODE 200093-0



SL2-IN-E-
1119R



CA2049



TL363_B



TPTDP
DA1300

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EXHIBIT 1. INTRODUCTION

1.1. SCOPE

| | |
|--------------------------------------|--|
| Reference: | FCC Part 15, Subpart C, Section 15.225 - Operation within the band 13.110 - 14.010 MHz. |
| Title: | Code of Federal Regulations (CFR), Title 47 Telecommunication, Part 15, Subpart C - Intentional Radiators |
| Purpose of Test: | Equipment Certification for Devices in Section 15.225 - Operation within the Band 13.110 - 14.010 MHz. |
| Test Procedures: | American National Standards Institute ANSI C63.4 - American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 KHz to 40 GHz |
| Environmental Classification: | Commercial, industrial or business environment |

1.2. RELATED SUBMITTAL(S)/GRANT(S)

None.

1.3. NORMATIVE REFERENCES

| Publication | Year | Title |
|----------------------------|------------------------------|---|
| 47 CFR Parts 0-19 | 2014 | Code of Federal Regulations (CFR), Title 47 – Telecommunication |
| ANSI C63.4 | 2014 | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 KHz to 40 GHz |
| ANSI C63.10 | 2009 | American National Standard for Testing Unlicensed Wireless Devices |
| CISPR 22 & EN 55022 | 2008-09, Edition 6.0 2006 | Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement |
| CISPR 16-1-1 +A1 +A2 | 2006 2006 2007 | Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-1: Measuring Apparatus |
| CISPR 16-1-2 +A1 +A2 | 2003 2004 2006 | Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-2: Conducted disturbances |

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September 3, 2014

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EXHIBIT 2. PERFORMANCE ASSESSMENT

2.1. CLIENT INFORMATION

| APPLICANT | |
|------------------------|---|
| Name: | Equinox Payments LLC |
| Address: | 8901 East Raintree Drive, Suite 400 Scottsdale, AZ 85260 USA |
| Contact Person: | Clint Woodworth Phone #: 480-551-7803 Fax #: N/A Email Address: cwoodworth@equinoxpayments.com |

| MANUFACTURER | |
|------------------------|--|
| Name: | Technocom Systems Sdn. Bhd. |
| Address: | PLO 121 Jalan Firma 1/3 Tebrau Industrial Estate 1 Johor Bahru 81100 Malaysia |
| Contact Person: | Thomas Lee Phone #: +6-017-724-1250 Fax #: N/A Email Address: Thomas.Lee@venture.com.sg |

2.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

| | |
|---------------------------------------|---|
| Brand Name: | Equinox Payments LLC |
| Product Name: | Multilane POS Terminal |
| Model Name or Number: | L5300 |
| Serial Number: | Test sample |
| Type of Equipment: | Low Power Communication Device Transmitter |
| Input Power Supply Type: | 12 VDC / PoE from AC/DC adapter |
| Primary User Functions of EUT: | Point of Sale credit/debit financial transactions |

2.3. EUT'S TECHNICAL SPECIFICATIONS

| Transmitter | |
|---------------------------------|---|
| Equipment Type: | Mobile |
| Intended Operating Environment: | Commercial, light industry & heavy industry |
| Power Supply Requirement: | 12V/2.5A / PoE |
| Field Strength: | 55.02 dB μ V/m at 10 m |
| Operating Frequency Range: | 13.56 MHz |
| RF Output Impedance: | 50 Ω |
| 20 dB Bandwidth: | 41.6 kHz |
| Modulation Type: | ASK |
| Oscillator Frequencies: | 27.12 MHz |
| Antenna Connector Type: | Integral |

2.4. LIST OF EUT'S PORTS

| Port Number | EUT's Port Description | Number of Identical Ports | Connector Type | Cable Type (Shielded/Non-shielded) |
|-------------|------------------------|---------------------------|----------------------------|------------------------------------|
| 1 | RS232 | 1 | RJ45 | 1.8m, Non-shielded |
| 2 | Ethernet | 2 | RJ45 | 2.0m, Non-shielded |
| 3 | PUSB | 1 | PUSB Remote Side Connector | 3m, Shielded |
| 4 | Tailgate | 1 | RJ11 | 3.6m, Non-shielded |
| 5 | USB Host | 1 | USB Type A | 1.8m, Shielded |
| 6 | Power Port | 1 | Power Jack | Non-shielded |
| 7 | Touch Screen Stylus | 1 | 4-pin Custom | 0.75m, Shielded |
| 8 | Audio Out | 1 | 2.5mm Jack | 1m, Non-shielded |

2.5. ANCILLARY EQUIPMENT

The EUT was tested while connected to the following representative configuration of ancillary equipment necessary to exercise the ports during tests:

| Ancillary Equipment # 1 | |
|--------------------------|-----------------------------|
| Description: | ITE Power Supply AC Adapter |
| Brand name: | Equinox |
| Model Name or Number: | NU40-E120250-13 |
| Connected to EUT's Port: | DC Port |

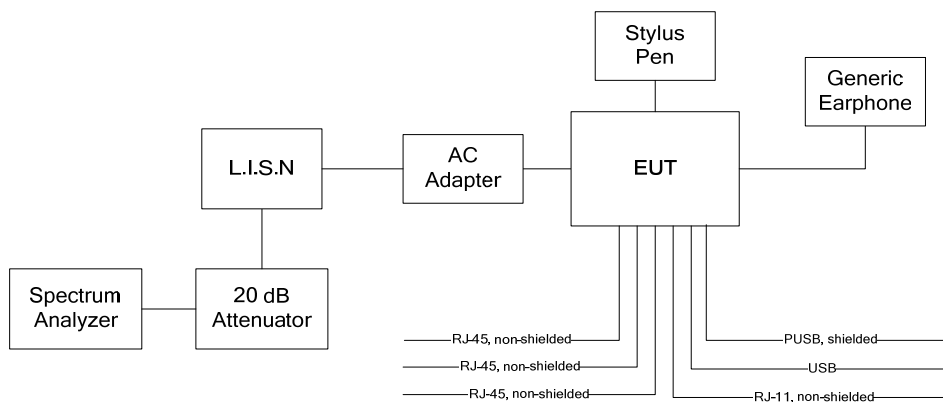
| Ancillary Equipment # 2 | |
|--------------------------|-----------------------------|
| Description: | ITE Power Supply AC Adapter |
| Brand name: | Hypercom |
| Model Name or Number: | NU40-8120250-I3 |
| Connected to EUT's Port: | PUSB and USB Ports |

| Ancillary Equipment # 3 | |
|--------------------------|--------------------------|
| Description: | Stylus Pen |
| Brand name: | Equinox |
| Model Name or Number: | P/N 040367-001E |
| Connected to EUT's Port: | Touch Screen Stylus Port |

| Ancillary Equipment # 4 | |
|--------------------------|----------------|
| Description: | Earphone |
| Brand name: | Generic |
| Model Name or Number: | N/A |
| Connected to EUT's Port: | Audio Out Port |

2.6. TEST SETUP

Power Line Conducted Emission (Power Port)



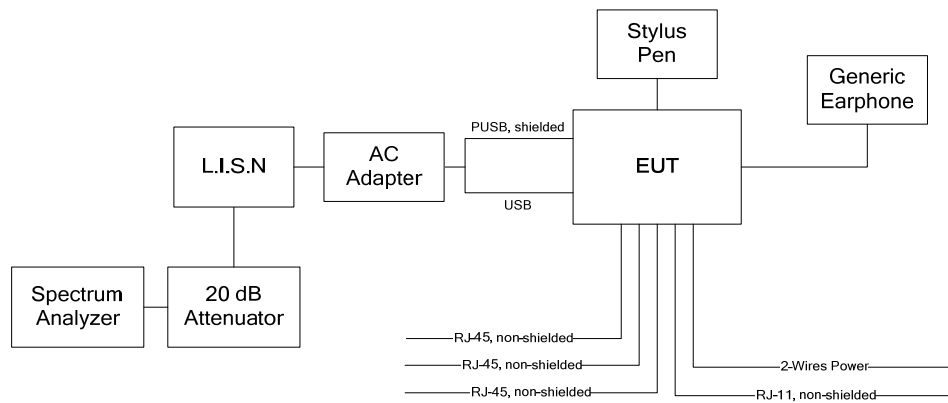
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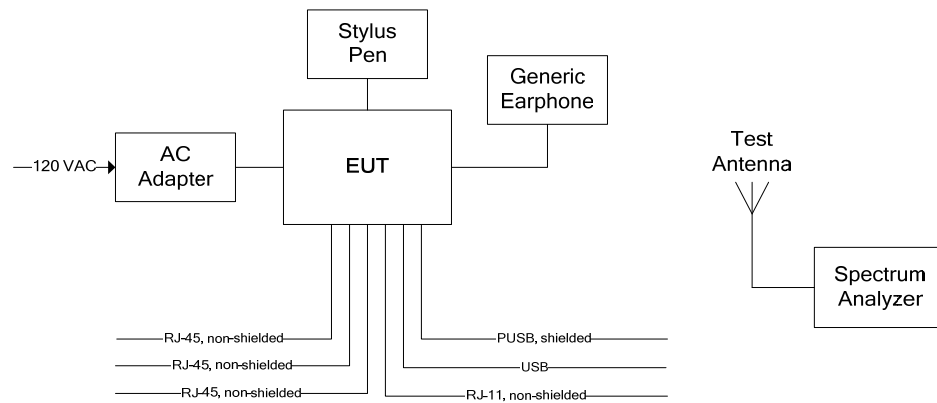
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Power Line Conducted Emission (Power over Ethernet and USB)



Radiated Emission



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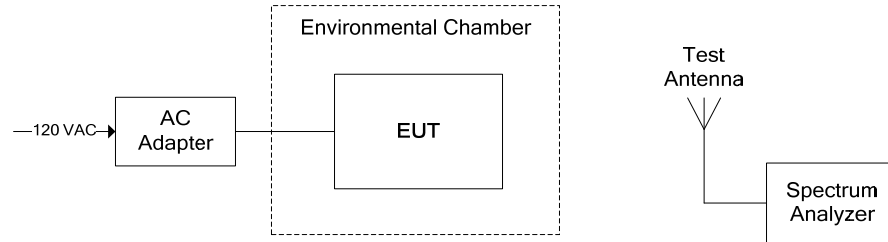
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Frequency Stability



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EXHIBIT 3. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

3.1. CLIMATE TEST CONDITIONS

The climate conditions of the test environment are as follows:

| | |
|---------------------|------------------------------|
| Temperature: | 21 to 23 °C |
| Humidity: | 45 to 58% |
| Pressure: | 102 kPa |
| Power Input Source: | 12 VDC / PoE from AC adapter |

3.2. OPEPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TESTS

| | |
|----------------------------------|--|
| Operating Modes: | The EUT was configured for continuous transmission for the duration of testing. |
| Special Test Software: | N/A |
| Special Hardware Used: | N/A |
| Transmitter Test Antenna: | The EUT was tested with the antenna fitted in a manner typical of normal intended use as integral antenna equipment. |

| | |
|--|----------------------|
| Transmitter Test Signals: | |
| Frequency: | 13.56 MHz |
| Transmitter Wanted Output Test Signals: | |
| ▪ RF Power Output (measured maximum output power): | 55.02 dBμV/m at 10 m |
| ▪ Normal Test Modulation: | ASK |
| ▪ Modulating signal source: | Internal |

EXHIBIT 4. SUMMARY OF TEST RESULTS

4.1. LOCATION OF TESTS

All of the measurements described in this report were performed at Ultratech Group of Labs located in the city of Oakville, Province of Ontario, Canada.

- AC Power Line Conducted Emissions were performed in UltraTech's shielded room, 24'(L) by 16'(W) by 8'(H).
- Radiated Emissions were performed at the Ultratech's 3-10 TDK Semi-Anechoic Chamber situated in the Town of Oakville, province of Ontario. This test site been calibrated in accordance with ANSI C63.4, and found to be in compliance with the requirements of Sec. 2.948 of the FCC Rules. The descriptions and site measurement data of the Oakville 3-10 TDK Semi-Anechoic Chamber has been filed with FCC office (FCC File No.: 91038) and Industry Canada office (Industry Canada File No.: 2049A-3). Expiry Date: 2017-04-02.

4.2. APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

| FCC Regulations | Test Requirements | Compliance (Yes/No) |
|-----------------|---|---------------------|
| 15.203 & 15.204 | The transmitter shall use a transmitting antenna that is an integral part of the device | Yes |
| 15.215(c) | Emission Bandwidth | Yes |
| 15.225(a) – (d) | Field Strength of Emissions Inside and Outside the Permitted Band 13.110 - 14.010 MHz | Yes |
| 15.225(e) | Frequency Stability | Yes |
| 15.107 & 15.207 | Class B - Power Line Conducted Emissions | Yes |

4.3. MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

- 1) DC input power cable looped twice around Steward Ferrite Part number 28A2025-OAO.



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EXHIBIT 5. TEST DATA

5.1. EMISSION BANDWIDTH [§15.215(c)]

5.1.1. Limits

The 20 dB bandwidth of the emission shall be contained within the band 13.110–14.010 MHz.

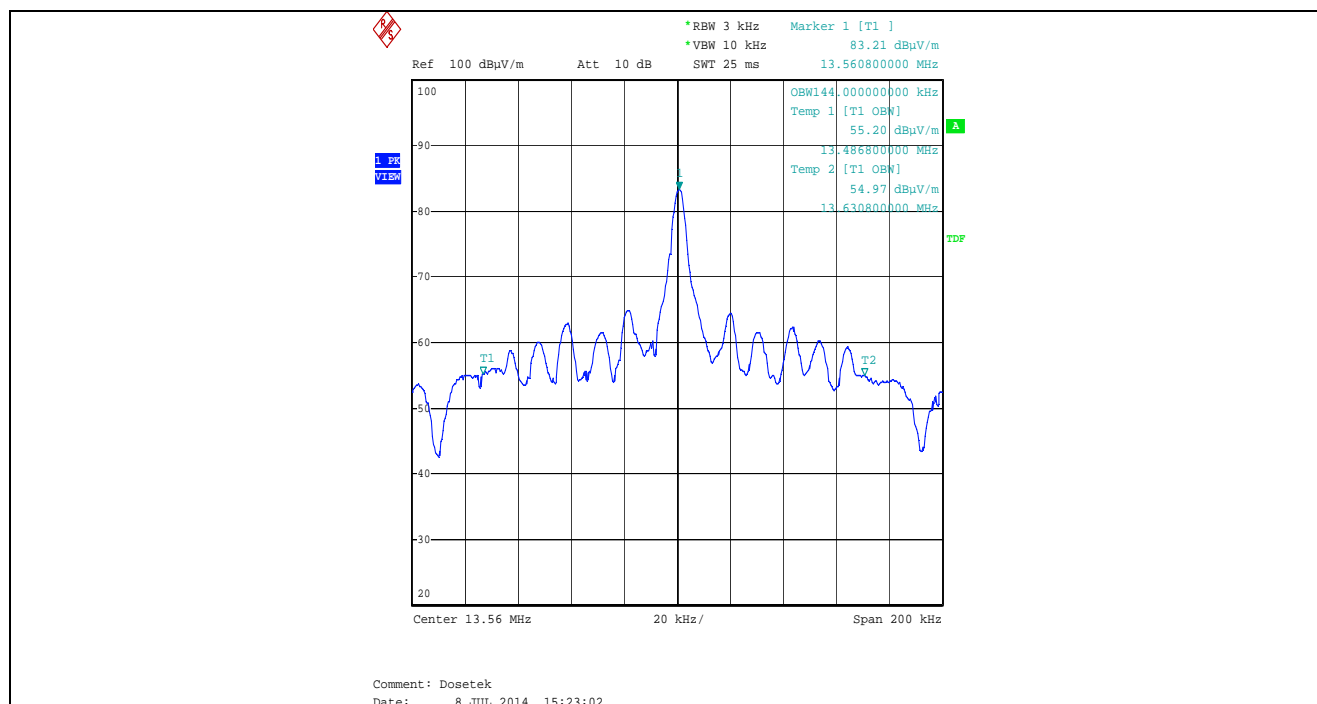
5.1.2. Method of Measurements

Refer to Ultratech Test Procedures, File # ULTR P001 and ANSI C63.4 for measurement methods

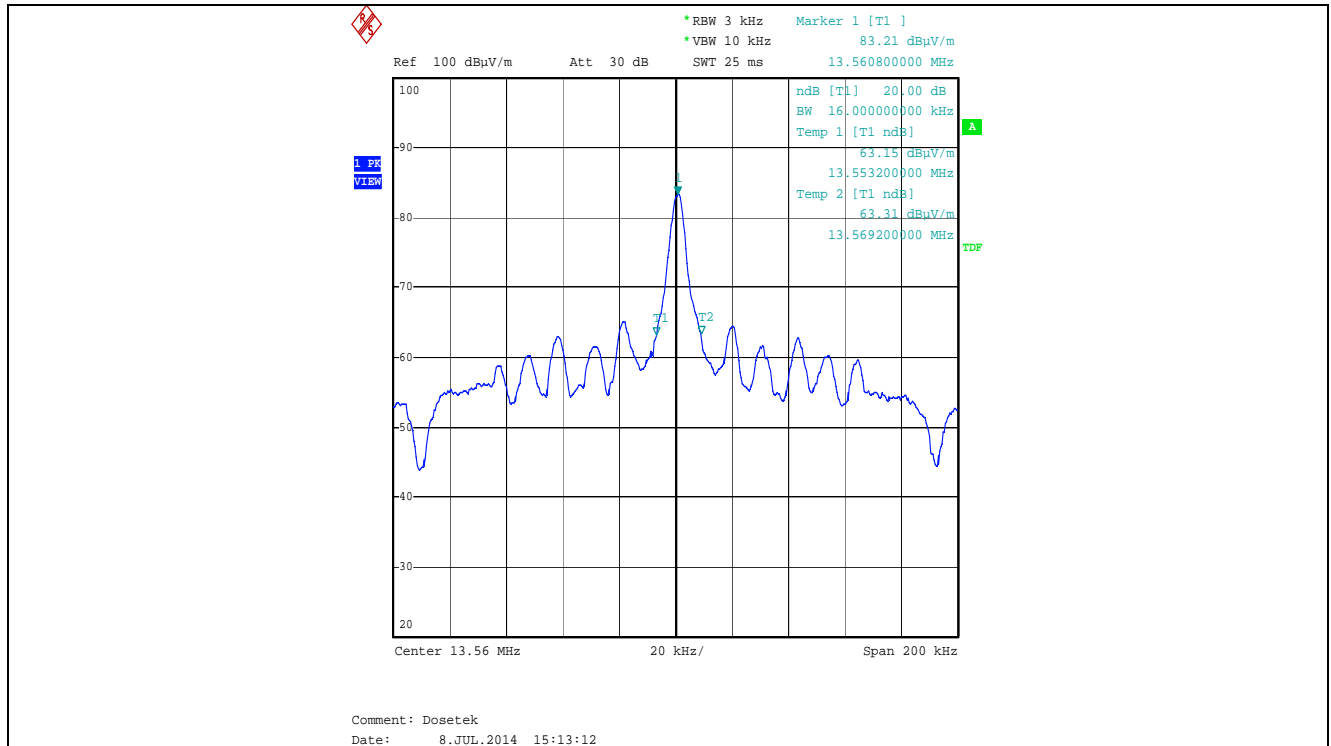
5.1.3. Test Data

| Test Frequency (MHz) | Occupied Bandwidth (kHz) | |
|----------------------|--------------------------|---------|
| | 20 dB BW | 99 % BW |
| 13.56 | 41.6 | 144.0 |

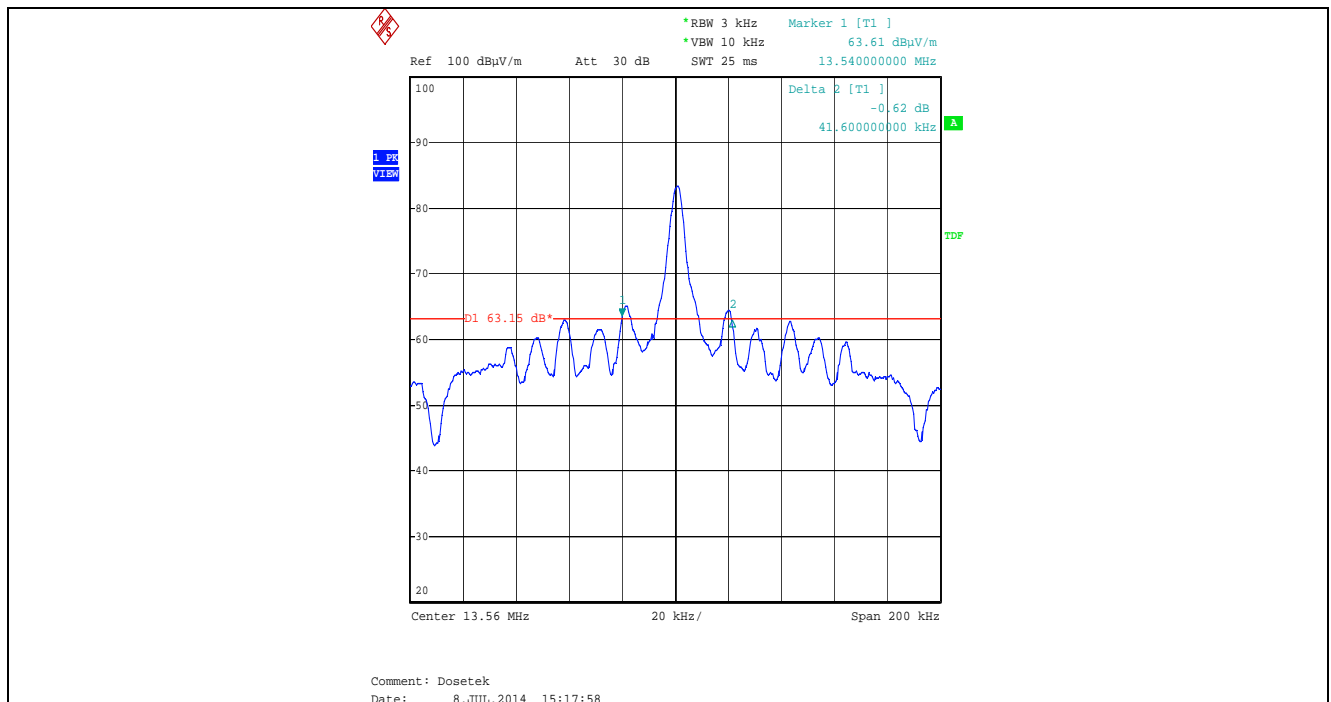
Plot 5.1.3.1. 99% Occupied Bandwidth, 13.56 MHz



Plot 5.1.3.2. 20 dB Emission Bandwidth, 13.56 MHz,



Plot 5.1.3.3. 20 dB Emission Bandwidth, 13.56 MHz



5.2. FIELD STRENGTH OF EMISSIONS WITHIN & OUTSIDE THE PERMITTED BAND 13.110-14.010 MHz [47 CFR 15.225 (a) to (d)]

5.2.1. Limits

- (a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- (b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- (c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- (d) The field strength of any emissions appearing outside of the 13.110 – 14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

47 CFR 15.209(a) – Radiated Emission Limits; general requirements

| Frequency (MHz) | Field Strength Limits (microvolts/m) | Distance (Meters) |
|-----------------|--------------------------------------|-------------------|
| 0.009 - 0.490 | 2,400 / F (KHz) | 300 |
| 0.490 - 1.705 | 24,000 / 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 |

5.2.2. Method of Measurements

Refer to Ultratech Test Procedures, File # ULTR P001 and ANSI C63.4 for measurement methods

5.2.3. Test Data

Remarks:

- Radiated spurious emissions measurements were performed at a measuring distance of 10 m (for frequencies below 30 MHz) and 3 m (for frequencies at or above 30 MHz), from 10 kHz – 10th harmonic of the fundamental or the range applicable to the digital device, whichever is the higher frequency range and all spurious emissions that are in excess of 20 dB below the specified limit shall be recorded.
- For frequencies below 30 MHz, the results measured at 10 m distance shall be extrapolated to the specified distance using an extrapolation factor of 40 dB/decade for determining compliance.

5.2.3.1. Field Strength of Emissions Within the Permitted Band at 10 m

| Frequency (MHz) | Measured Field Strength @ 10 m (dBµV/m) | Detector Used (Peak/QP) | Antenna Plane (H/V) | Field Strength Extrapolated Value (dBµV/m) | § 15.225 Field Strength Limits (dBµV/m) | Margin (dB) |
|-----------------|---|-------------------------|---------------------|--|---|-------------|
| 13.56 | 55.02 | Peak | V | 35.9 | 84.0 | -48.1 |
| 13.56 | 49.27 | Peak | H | 30.2 | 84.0 | -53.8 |

5.2.3.2. Field Strength of Emissions Outside the Permitted Band Below 30 MHz at 10 m

| Frequency (MHz) | Measured Field Strength @ 10 m (dBµV/m) | Detector Used (Peak/QP) | Antenna Plane (H/V) | Field Strength Extrapolated Value (dBµV/m) | § 15.209 Field Strength Limits (dBµV/m) | Margin (dB) |
|---|---|-------------------------|---------------------|--|---|-------------|
| All spurious emissions are more than 20 dB below the specified limit. | | | | | | |

5.2.3.3. Field Strength of Emissions Outside the Permitted Band at or Above 30 MHz at 3 m

| Frequency (MHz) | Measured Field Strength @ 3 m (dBµV/m) | Detector Used (Peak/QP) | Antenna Plane (H/V) | § 15.209 Field Strength Limits (dBµV/m) | Margin (dB) |
|-----------------|--|-------------------------|---------------------|---|-------------|
| 40.68 | 34.64 | Peak | V | 40.0 | -5.4 |
| 81.36 | 29.21 | Peak | V | 40.0 | -10.8 |
| 94.92 | 34.79 | Peak | V | 43.5 | -8.7 |
| 108.48 | 36.86 | Peak | V | 43.5 | -6.6 |
| 108.48 | 27.93 | Peak | H | 43.5 | -15.6 |
| 122.04 | 36.03 | Peak | V | 43.5 | -7.5 |
| 122.04 | 28.05 | Peak | H | 43.5 | -15.5 |
| 135.60 | 36.71 | Peak | V | 43.5 | -6.8 |
| 135.60 | 30.07 | Peak | H | 43.5 | -13.4 |

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5.3. FREQUENCY STABILITY [47 CFR 15.225(e)]

5.3.1. Limits

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

5.3.2. Method of Measurements

ANSI C63.4.

5.3.3. Test Data

| | |
|------------------------------------|-------------------------------|
| Frequency Band: | 13.56 MHz |
| Center Frequency: | 13.56 MHz |
| Frequency Tolerance Limit: | $\pm 0.01\%$ (± 1356 Hz) |
| Max. Frequency Tolerance Measured: | -60 Hz |
| Input Voltage Rating: | 120 VAC |

| Ambient Temperature (°C) | Frequency Drift (Hz) | | |
|--------------------------|------------------------|------------------------|------------------------|
| | Supply Voltage 120 VAC | Supply Voltage 138 VAC | Supply Voltage 102 VAC |
| -20 | -20 | N/A | N/A |
| -10 | +20 | N/A | N/A |
| 0 | +40 | N/A | N/A |
| 10 | +20 | N/A | N/A |
| 20 | 0 | +20 | -20 |
| 30 | 0 | N/A | N/A |
| 40 | -60 | N/A | N/A |
| 50 | -60 | N/A | N/A |

5.4. POWER LINE CONDUCTED EMISSIONS [47 CFR 15.107(a) & 15.207]

5.4.1. Limits

The equipment shall meet the limits of the following table:

| Frequency of emission (MHz) | Class B Conducted Limits (dB μ V) | |
|--------------------------------|---------------------------------------|-----------|
| | Quasi-peak | Average |
| 0.15–0.5 | 66 to 56* | 56 to 46* |
| 0.5–5 | 56 | 46 |
| 5–30 | 60 | 50 |

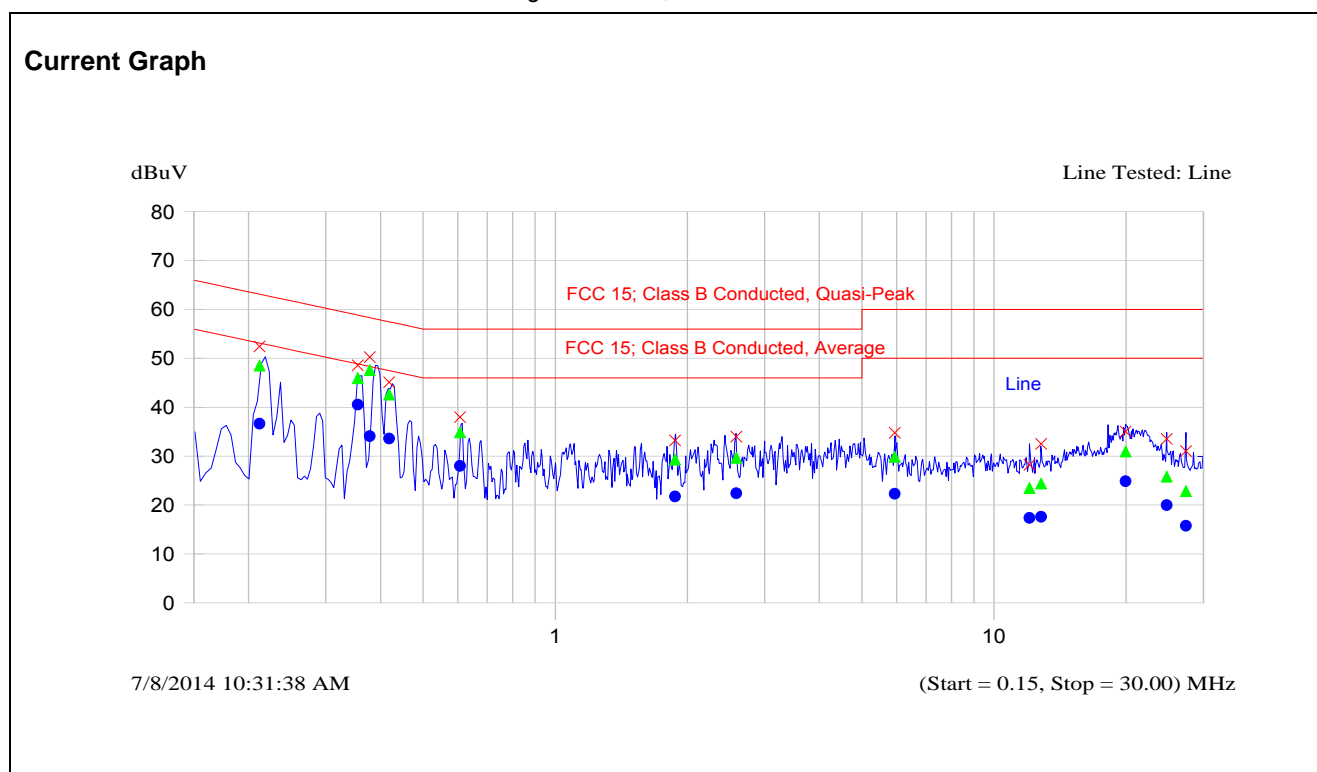
* Decreases linearly with logarithm of the frequency

5.4.2. Method of Measurements

Refer to Ultratech Test Procedures, File # ULTR P001 and ANSI C63.4 for measurement methods

5.4.3. Test Data

Plot 5.4.3.1. Power Line Conducted Emissions
Test Configuration 1: Power Port via Equinox ITE Power Supply AC Adapter
Voltage: 120 VAC, Line Tested: Line



Current List

| Frequency MHz | Peak dBuV | QP dBuV | Delta QP-QP Limit dB | Avg dBuV | Delta Avg-Avg Limit dB | Trace Name |
|------------------|--------------|------------|-------------------------|-------------|---------------------------|------------|
| 0.212 | 52.4 | 48.5 | -15.7 | 36.6 | -17.6 | Line |
| 0.355 | 48.6 | 45.9 | -14.1 | 40.5 | -9.6 | Line |
| 0.378 | 50.2 | 47.6 | -11.8 | 34.1 | -15.3 | Line |
| 0.418 | 45.1 | 42.6 | -15.7 | 33.6 | -14.7 | Line |
| 0.607 | 38.0 | 34.9 | -21.1 | 28.0 | -18.0 | Line |
| 1.875 | 33.2 | 29.3 | -26.7 | 21.8 | -24.2 | Line |
| 2.586 | 34.0 | 29.7 | -26.3 | 22.4 | -23.6 | Line |
| 5.945 | 34.8 | 29.9 | -30.1 | 22.3 | -27.7 | Line |
| 12.044 | 28.2 | 23.5 | -36.5 | 17.4 | -32.6 | Line |
| 12.797 | 32.5 | 24.4 | -35.6 | 17.6 | -32.4 | Line |
| 19.951 | 35.0 | 31.0 | -29.0 | 24.9 | -25.1 | Line |
| 24.749 | 33.5 | 25.8 | -34.2 | 20.0 | -30.0 | Line |
| 27.393 | 31.0 | 22.9 | -37.1 | 15.8 | -34.2 | Line |

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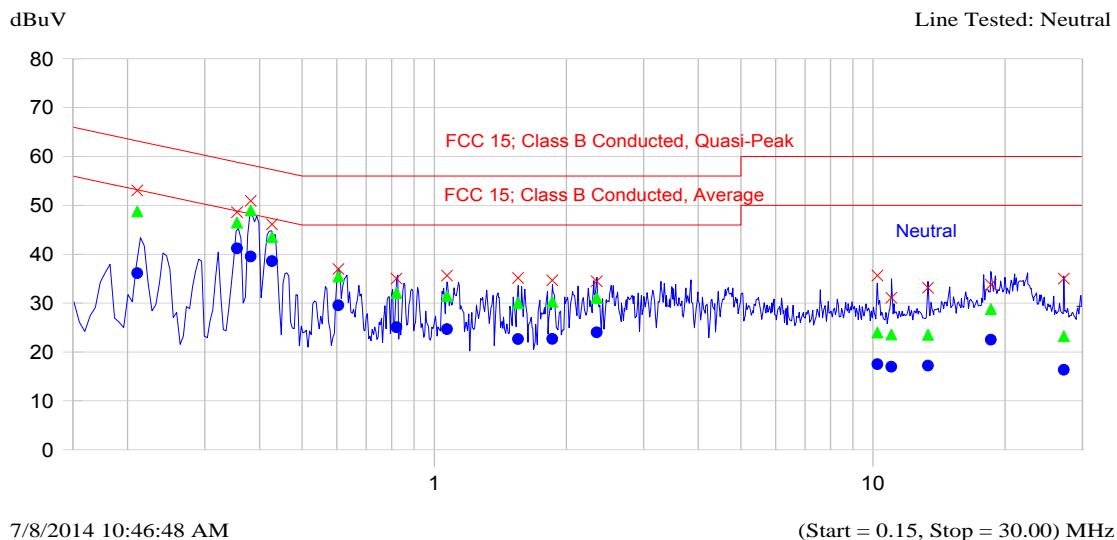
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Plot 5.4.3.2. Power Line Conducted Emissions
Test Configuration 1: Power Port via Equinox ITE Power Supply AC Adapter
Voltage: 120 VAC, Line Tested: Neutral

Current Graph



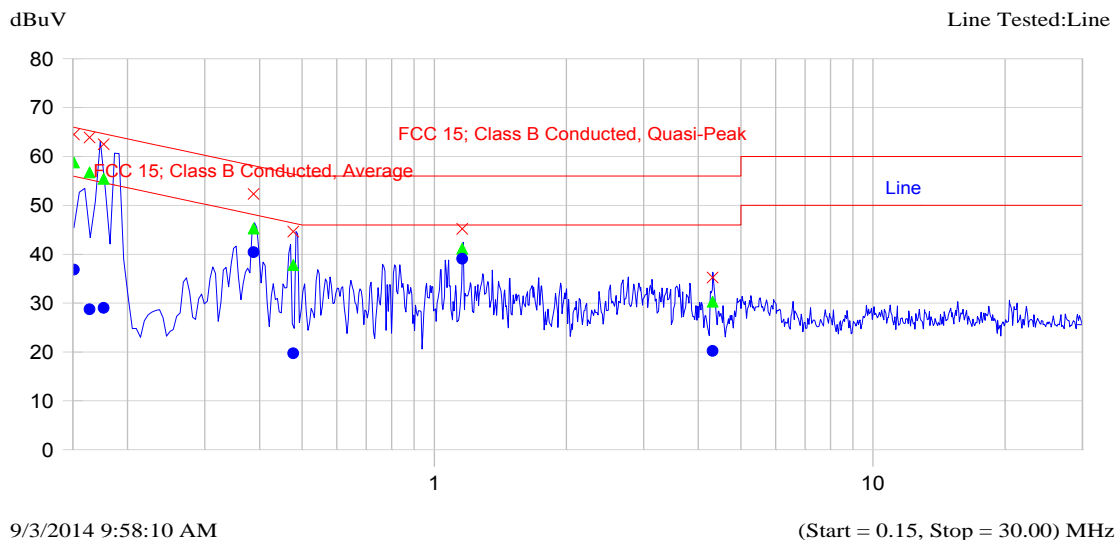
Current List

| Frequency MHz | Peak dBuV | QP dBuV | Delta QP-QP Limit dB | Avg dBuV | Delta Avg-Avg Limit dB | Trace Name |
|---------------|-----------|---------|----------------------|----------|------------------------|------------|
| 0.210 | 53.0 | 48.8 | -15.5 | 36.1 | -18.1 | Neutral |
| 0.355 | 48.6 | 46.4 | -13.6 | 41.2 | -8.8 | Neutral |
| 0.381 | 50.9 | 49.0 | -10.3 | 39.5 | -9.8 | Neutral |
| 0.427 | 46.1 | 43.5 | -14.5 | 38.6 | -9.5 | Neutral |
| 0.605 | 37.0 | 35.4 | -20.6 | 29.6 | -16.4 | Neutral |
| 0.820 | 35.0 | 32.0 | -24.0 | 25.1 | -20.9 | Neutral |
| 1.069 | 35.6 | 31.4 | -24.6 | 24.7 | -21.3 | Neutral |
| 1.552 | 35.1 | 30.0 | -26.0 | 22.6 | -23.4 | Neutral |
| 1.857 | 34.6 | 30.3 | -25.7 | 22.7 | -23.3 | Neutral |
| 2.346 | 34.5 | 31.1 | -24.9 | 24.0 | -22.0 | Neutral |
| 10.231 | 35.6 | 24.0 | -36.0 | 17.5 | -32.5 | Neutral |
| 11.004 | 31.1 | 23.6 | -36.4 | 17.0 | -33.0 | Neutral |
| 13.340 | 33.1 | 23.5 | -36.5 | 17.2 | -32.8 | Neutral |
| 18.570 | 33.8 | 28.8 | -31.2 | 22.5 | -27.5 | Neutral |
| 27.230 | 35.0 | 23.2 | -36.8 | 16.4 | -33.6 | Neutral |

Plot 5.4.3.3. Power Line Conducted Emissions

Test Configuration 2: Power over Ethernet (PoE) + USB via Hypercom ITE Power Supply and Cable Adapter
Voltage: 120 VAC, Line Tested: Line

Current Graph



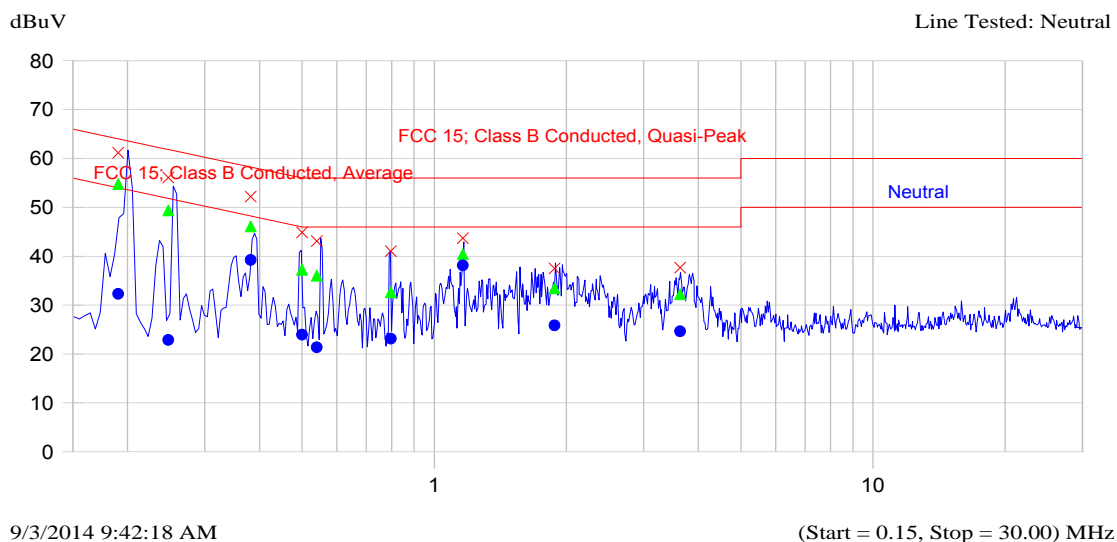
Current List

| Frequency MHz | Peak dBuV | QP dBuV | Delta QP-QP dB | QP-QP Limit dB | Avg dBuV | Delta Avg-Avg dB | Avg-Avg Limit dB | Trace Name |
|------------------|--------------|------------|----------------------|-------------------|-------------|------------------------|---------------------|------------|
| 0.151 | 64.5 | 58.8 | -7.2 | | 36.9 | -19.1 | | Line |
| 0.164 | 63.9 | 56.7 | -8.8 | | 28.7 | -26.9 | | Line |
| 0.176 | 62.5 | 55.5 | -9.8 | | 29.0 | -26.2 | | Line |
| 0.388 | 52.3 | 45.3 | -13.9 | | 40.4 | -8.7 | | Line |
| 0.477 | 44.6 | 37.8 | -18.8 | | 19.7 | -26.9 | | Line |
| 1.158 | 45.2 | 41.2 | -14.8 | | 39.1 | -6.9 | | Line |
| 4.311 | 35.2 | 30.3 | -25.7 | | 20.2 | -25.8 | | Line |

Plot 5.4.3.4. Power Line Conducted Emissions

Test Configuration 2: Power over Ethernet (PoE) + USB via Hypercom ITE Power Supply and Cable Adapter
Voltage: 120 VAC, Line Tested: Neutral

Current Graph



Current List

| Frequency MHz | Peak dBuV | QP dBuV | Delta QP-QP Limit dB | Avg dBuV | Delta Avg-Avg Limit dB | Trace Name |
|------------------|--------------|------------|-------------------------|-------------|---------------------------|------------|
| 0.190 | 61.2 | 54.8 | -10.0 | 32.3 | -22.5 | Neutral |
| 0.248 | 56.1 | 49.4 | -13.8 | 22.9 | -30.3 | Neutral |
| 0.382 | 52.2 | 46.1 | -13.2 | 39.2 | -10.1 | Neutral |
| 0.500 | 44.9 | 37.2 | -18.8 | 23.9 | -22.1 | Neutral |
| 0.540 | 43.1 | 36.0 | -20.0 | 21.4 | -24.6 | Neutral |
| 0.796 | 41.0 | 32.6 | -23.4 | 23.1 | -22.9 | Neutral |
| 1.163 | 43.7 | 40.4 | -15.6 | 38.1 | -7.9 | Neutral |
| 1.879 | 37.5 | 33.5 | -22.5 | 25.9 | -20.1 | Neutral |
| 3.634 | 37.7 | 32.3 | -23.7 | 24.6 | -21.4 | Neutral |

EXHIBIT 6. TEST EQUIPMENT LIST

| Test Instruments | Manufacturer | Model No. | Serial No. | Frequency Range | Cal. Due Date |
|-----------------------|-----------------|-----------|------------------|-----------------|---------------|
| Spectrum Analyzer | Rohde & Schwarz | FSP7 | 100646 | 9 kHz – 7 GHz | 25 Sep 2014 |
| Loop Antenna | EMCO | 6502 | 9104-2611 | 10 kHz – 30 MHz | 27 Aug 2015 |
| EMC Analyzer | Agilent | E7401A | US40240432 | 9 kHz - 1.5 GHz | 14 Mar 2015 |
| Spectrum Analyzer | Rohde & Schwarz | ESU40 | 100037 | 20 Hz – 40 GHz | 05 Apr 2015 |
| Biconi-Log Antenna | EMCO | 3142C | 00026873 | 26 – 3000 MHz | 14 Apr 2015 |
| Transient Limiter | Pasternack | PE7010-20 | N/A | DC - 2 GHz | 02 Jan 2015 |
| LISN | Schwarzbeck | NSLK 8127 | 8127276 | 10 kHz – 30 MHz | 25 Mar 2015 |
| LISN | EMCO | 3825/2R | 1165 | 10 kHz – 30 MHz | 05 Nov 2014 |
| Spectrum Analyzer | Rohde & Schwarz | FSEK | 834157/005 | 9 kHz – 40 GHz | 03 Jan 2015 |
| Environmental Chamber | Envirotronics | SSH32C | 11994847-S-11059 | -60 to 177 °C | 16 Apr 2015 |
| Antenna | EMCO | 6502 | 2611 | 10 kHz – 30 MHz | 27 Aug 2015 |

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File #: MIS-107F15C225
September 3, 2014

All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

EXHIBIT 7. MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of CISPR 16-4-2 @ IEC:2003 and JCGM 100:2008 (GUM 1995) – Guide to the Expression of Uncertainty in Measurement.

7.1. LINE CONDUCTED EMISSION MEASUREMENT UNCERTAINTY

| | Line Conducted Emission Measurement Uncertainty (9 kHz – 30 MHz): | Measured | Limit |
|-------|---|------------|-----------|
| u_c | Combined standard uncertainty: $u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$ | ± 1.44 | ± 1.8 |
| U | Expanded uncertainty U: $U = 2u_c(y)$ | ± 2.89 | ± 3.6 |

7.2. RADIATED EMISSION MEASUREMENT UNCERTAINTY

| | Radiated Emission Measurement Uncertainty @ 3m, Horizontal (30-1000 MHz): | Measured (dB) | Limit (dB) |
|-------|--|------------------|---------------|
| u_c | Combined standard uncertainty: $u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$ | ± 2.39 | ± 2.6 |
| U | Expanded uncertainty U: $U = 2u_c(y)$ | ± 4.79 | ± 5.2 |

| | Radiated Emission Measurement Uncertainty @ 3m, Vertical (30-1000 MHz): | Measured (dB) | Limit (dB) |
|-------|--|------------------|---------------|
| u_c | Combined standard uncertainty: $u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$ | ± 2.39 | ± 2.6 |
| U | Expanded uncertainty U: $U = 2u_c(y)$ | ± 4.78 | ± 5.2 |

| | Radiated Emission Measurement Uncertainty @ 3 m, Horizontal & Vertical (1 – 18 GHz): | Measured (dB) | Limit (dB) |
|-------|---|------------------|------------------------|
| u_c | Combined standard uncertainty: $u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$ | ± 1.87 | Under consideration |
| U | Expanded uncertainty U: $U = 2u_c(y)$ | ± 3.75 | Under consideration |

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