



element

Entrust Corporation

MX LC Upgrade Phase 4.0

FCC 15.225:2022

13.56 MHz Radio

Report: DTCD0105.0, Issue Date: August 8, 2023



This report must not be used to claim product certification, approval, or endorsement by A2LA or any agency of the U.S. Government. This Report shall not be reproduced, except in full without written approval of the laboratory.

CERTIFICATE OF TEST

Last Date of Test: December 1, 2022
Entrust Corporation
EUT: MX LC Upgrade Phase 4.0

Radio Equipment Testing

Standards

| Specification | Method |
|-----------------|------------------|
| FCC 15.225:2022 | ANSI C63.10:2013 |

Results

| Test Description | Result | Specification Section(s) | Method Section(s) | Comments |
|--|--------|--|-------------------|--|
| Powerline Conducted Emissions | Pass | 15.207 | 6.2 | |
| Field Strength of Fundamental | Pass | 15.225(a)-(c) | 6.4 | |
| Field Strength of Spurious Emissions (Less Than 30 MHz) | Pass | 15.225(d), 15.209 | 6.4 | |
| Field Strength of Spurious Emissions (Greater Than 30 MHz) | Pass | 15.225(d), 15.209 | 6.5 | |
| Frequency Stability | N/A | 15.225(e), 15.31(e), 15.215(c), 2.1055 | 6.8 | Not included for a C2PC related to testing a limited module in a new host. |
| Emissions Bandwidth (20 dB) | N/A | 15.215(c) | 6.9.2 | Not included for a C2PC related to testing a limited module in a new host. |

Deviations From Test Standards

None

Approved By:



Eric Brandon, Department Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. As indicated in the Statement of Work sent with the quotation, Element's standard process is to always use the latest published version of the test methods even when earlier versions are cited in the test specification. Issuance of a purchase order was de facto acceptance of this approach. Otherwise, the client would have advised Element in writing of the specific version of the test methods they wanted applied to the subject testing.

REVISION HISTORY



| Revision Number | Description | Date (yyyy-mm-dd) | Page Number |
|-----------------|-------------|----------------------|-------------|
| 00 | None | | |

ACCREDITATIONS AND AUTHORIZATIONS



United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Each laboratory is accredited by A2LA to ISO / IEC 17025, and as a product certifier to ISO / IEC 17065 which allows Element to certify transmitters to FCC and IC specifications.

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB) and as a CAB for the acceptance of test data.

European Union

European Commission – Recognized as an EU Notified Body validated for the EMCD and RED Directives.

United Kingdom

BEIS – Recognized by the UK as an Approved Body under the UK Radio Equipment and UK EMC Regulations.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

MSIT / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Israel

MOC – Recognized by MOC as a CAB for the acceptance of test data.

Hong Kong

OFCA – Recognized by OFCA as a CAB for the acceptance of test data.

Vietnam

MIC – Recognized by MIC as a CAB for the acceptance of test data.

SCOPE

For details on the Scopes of our Accreditations, please visit:

[California](#)

[Minnesota](#)

[Oregon](#)

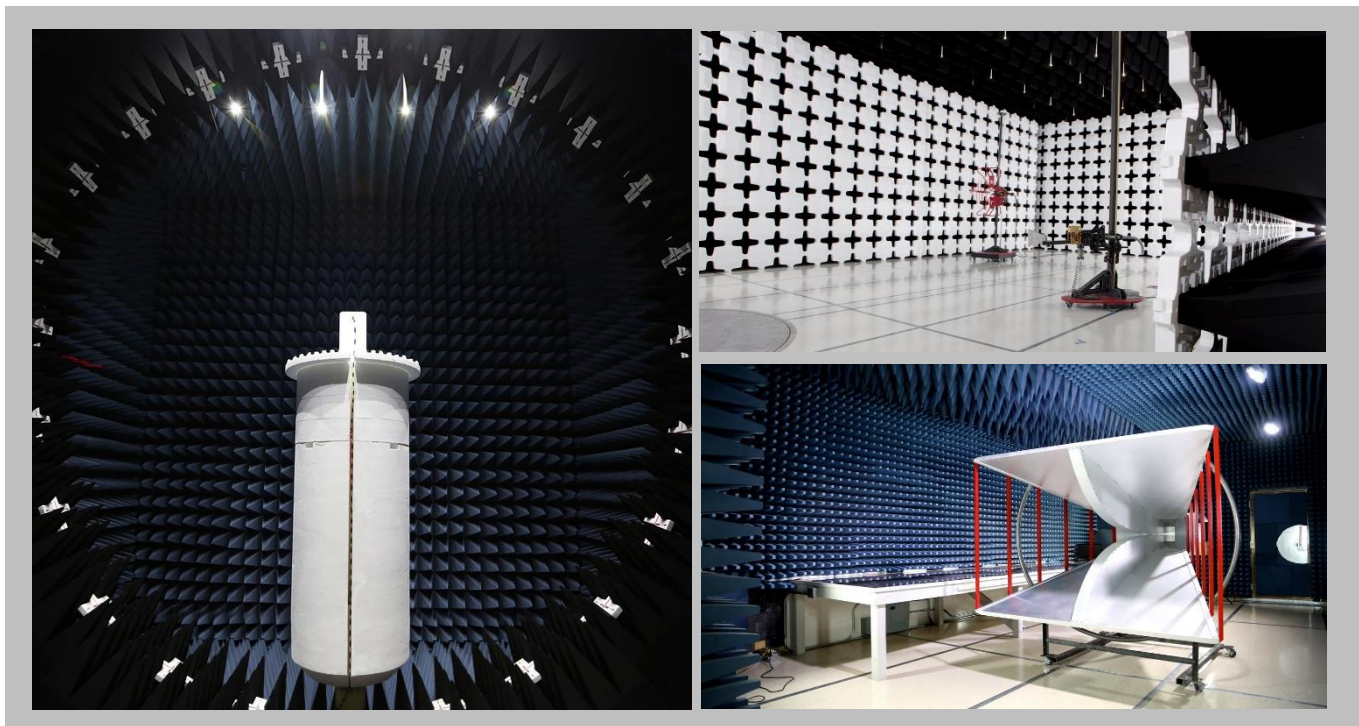
[Texas](#)

[Washington](#)

FACILITIES



| | | | | |
|---|---|---|--|---|
| California Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918 | Minnesota Labs MN01-11 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136 | Oregon Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066 | Texas Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255 | Washington Labs NC01-05 19201 120 th Ave NE Bothell, WA 98011 (425)984-6600 |
| A2LA | | | | |
| Lab Code: 3310.04 | Lab Code: 3310.05 | Lab Code: 3310.02 | Lab Code: 3310.03 | Lab Code: 3310.06 |
| Innovation, Science and Economic Development Canada | | | | |
| 2834B-1, 2834B-3 | 2834E-1, 2834E-3 | 2834D-1 | 2834G-1 | 2834F-1 |
| BSMI | | | | |
| SL2-IN-E-1154R | SL2-IN-E-1152R | SL2-IN-E-1017 | SL2-IN-E-1158R | SL2-IN-E-1153R |
| VCCI | | | | |
| A-0029 | A-0109 | A-0108 | A-0201 | A-0110 |
| Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA | | | | |
| US0158 | US0175 | US0017 | US0191 | US0157 |



MEASUREMENT UNCERTAINTY



Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found in the table below. A lab specific value may also be found in the applicable test description section. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

| Test | + MU | - MU |
|---------------------------------------|-------------|-------------|
| Frequency Accuracy | 0.0007% | -0.0007% |
| Amplitude Accuracy (dB) | 1.2 dB | -1.2 dB |
| Conducted Power (dB) | 1.2 dB | -1.2 dB |
| Radiated Power via Substitution (dB) | 0.7 dB | -0.7 dB |
| Temperature (degrees C) | 0.7°C | -0.7°C |
| Humidity (% RH) | 2.5% RH | -2.5% RH |
| Voltage (AC) | 1.0% | -1.0% |
| Voltage (DC) | 0.7% | -0.7% |
| Field Strength (dB) | 5.2 dB | -5.2 dB |
| AC Powerline Conducted Emissions (dB) | 3.2 dB | -3.2 dB |

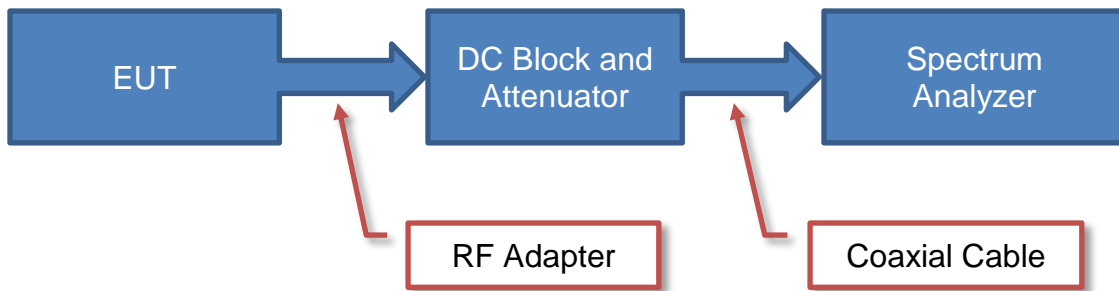
TEST SETUP BLOCK DIAGRAMS

Measurement Bandwidths

| Frequency Range (MHz) | Peak Data (kHz) | Quasi-Peak Data (kHz) | Average Data (kHz) |
|-----------------------|-----------------|-----------------------|--------------------|
| 0.01 - 0.15 | 1.0 | 0.2 | 0.2 |
| 0.15 - 30.0 | 10.0 | 9.0 | 9.0 |
| 30.0 - 1000 | 100.0 | 120.0 | 120.0 |
| Above 1000 | 1000.0 | N/A | 1000.0 |

Unless otherwise stated, measurements were made using the bandwidths and detectors specified. No video filter was used.

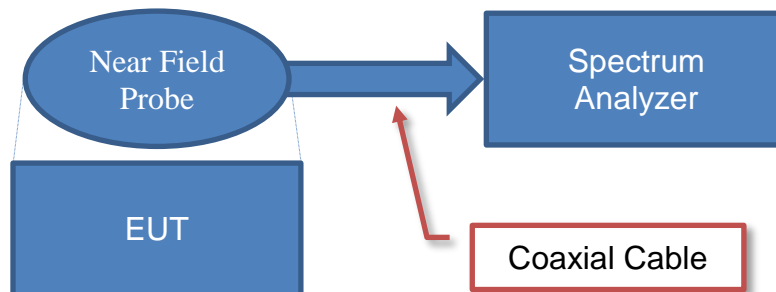
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

$$\begin{array}{r}
 \text{Measured Value} \\
 71.2
 \end{array}
 =
 \begin{array}{r}
 \text{Measured Level} \\
 42.6
 \end{array}
 +
 \begin{array}{r}
 \text{Reference Level Offset} \\
 28.6
 \end{array}$$

Near Field Test Fixture Measurements

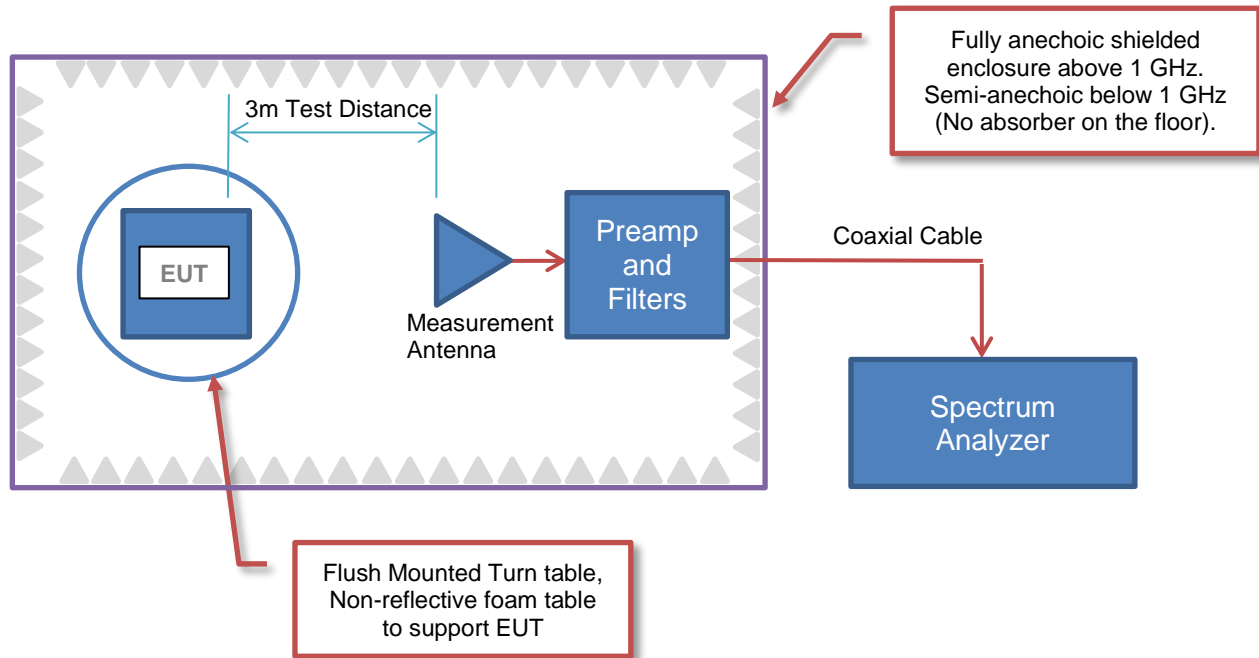


Sample Calculation (logarithmic units)

$$\begin{array}{r}
 \text{Measured Value} \\
 71.2
 \end{array}
 =
 \begin{array}{r}
 \text{Measured Level} \\
 42.6
 \end{array}
 +
 \begin{array}{r}
 \text{Reference Level Offset} \\
 28.6
 \end{array}$$

TEST SETUP BLOCK DIAGRAMS

Emissions Measurements



Sample Calculation (logarithmic units)

Radiated Emissions:

| Measured Level (Amplitude) | Factor | | | Distance Adjustment Factor | External Attenuation | Field Strength |
|----------------------------|----------------|--------------|----------------|----------------------------|----------------------|----------------|
| | Antenna Factor | Cable Factor | Amplifier Gain | | | |
| 42.6 | 28.6 | 3.1 | 40.8 | 0.0 | 0.0 | 33.5 |

42.6 + 28.6 + 3.1 - 40.8 + 0.0 + 0.0 = 33.5

Conducted Emissions:

| Measured Level (Amplitude) | Factor | | External Attenuation | Adjusted Level |
|----------------------------|-------------------|--------------|----------------------|----------------|
| | Transducer Factor | Cable Factor | | |
| 26.7 | 0.3 | 0.1 | 20.0 | 47.1 |

26.7 + 0.3 + 0.1 + 20.0 = 47.1

Radiated Power (ERP/EIRP) – Substitution Method:

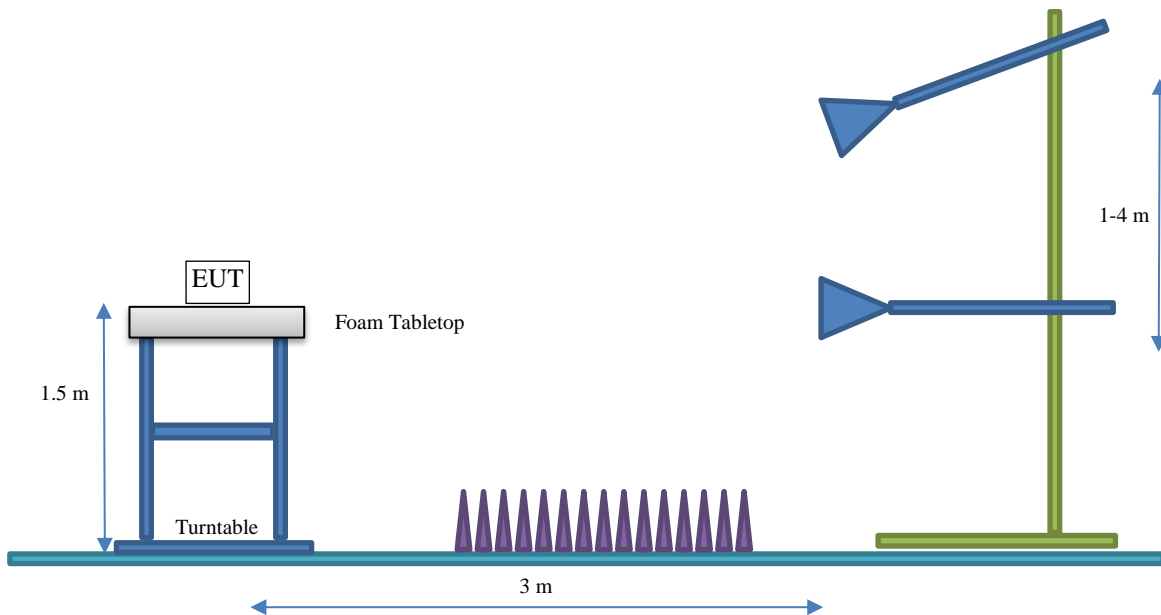
| Measured Level into Substitution Antenna (Amplitude dBm) | Substitution Antenna Factor (dBi) | EIRP to ERP (if applicable) | Measured power (dBm ERP/EIRP) |
|--|-----------------------------------|-----------------------------|-------------------------------|
| 10.0 | 6.0 | 2.15 | 13.9/16.0 |

10.0 + 6.0 - 2.15 = 13.9/16.0

TEST SETUP BLOCK DIAGRAMS

Bore Sighting (>1GHz)

The diameter of the illumination area is the dimension of the line tangent to the EUT formed by 3 dB beamwidth of the measurement antenna at the measurement distance. At a 3 meter test distance, the diameter of the illumination area was 3.8 meters at 1 GHz and greater than 2.1 meters up to 6 GHz. Above 1 GHz, when required by the measurement standard, the antenna is pointed for both azimuth and elevation to maintain the receive antenna within the cone of radiation from the EUT. The specified measurement detectors were used for comparison of the emissions to the peak and average specification limits.



PRODUCT DESCRIPTION



Client and Equipment under Test (EUT) Information

| | |
|---------------------------------|-------------------------|
| Company Name: | Entrust Corporation |
| Address: | 1187 Park Place |
| City, State, Zip: | Shakopee, MN 55379 |
| Test Requested By: | Mike Greschner |
| EUT: | MX LC Upgrade Phase 4.0 |
| First Date of Test: | November 14, 2022 |
| Last Date of Test: | December 1, 2022 |
| Receipt Date of Samples: | November 14, 2022 |
| Equipment Design Stage: | Prototype |
| Equipment Condition: | No Damage |
| Purchase Authorization: | Verified |

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

Large device containing a 13.56 MHz radio.

Testing Objective:

To demonstrate compliance to FCC Part 15.225 specifications.

POWER SETTINGS AND ANTENNAS



The power settings, antenna gain value(s) and cable loss (if applicable) used for the testing contained in this report were provided by the customer and will affect the validity of the results. Element assumes no responsibility for the accuracy of this information. The power settings below reflect the maximum power that the EUT is allowed to transmit at during normal operation.

ANTENNA GAIN (dBi)

| Type | Provided by: | Frequency Range (MHz) | Gain (dBi) |
|--|---------------------|-----------------------|------------|
| PCB Loop An. (4 turns) 46 mm Diameter | Entrust Corporation | 13.56 (1.063 W) | - |

No adjustable power settings were provided. The EUT was tested using power settings pre-defined by the manufacturer.

| Radio | Modulation | Protocol | Data Rate | Frequency |
|--------------|------------|-----------|------------|-----------|
| Passive RFID | ASK | ISO 15693 | 26.48 kbps | 13.56 MHz |

CONFIGURATIONS



Configuration DTCD0105- 1

| EUT | | | |
|-------------------------|---------------------|--------------------------|----------------------|
| Description | Manufacturer | Model/Part Number | Serial Number |
| MX LC Upgrade Phase 4.0 | Entrust Corporation | MX LC | 1 |

| Cables | | | | | |
|-------------------------|---------------|-------------------|----------------|-------------------------|---------------------|
| Cable Type | Shield | Length (m) | Ferrite | Connection 1 | Connection 2 |
| Controller Supply Cable | No | 2.0 m | No | MX LC Upgrade Phase 4.0 | AC Mains |
| Cure Lamp Supply Cable | No | 2.0 m | No | MX LC Upgrade Phase 4.0 | AC Mains |

MODIFICATIONS



Equipment Modifications

| Item | Date | Test | Modification | Note | Disposition of EUT |
|------|------------|--|--------------------------------------|---|---|
| 1 | 2022-11-14 | Powerline Conducted Emissions | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 2 | 2022-11-30 | Field Strength of Fundamental | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 3 | 2022-11-30 | Field Strength of Spurious Emissions (Less Than 30 MHz) | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Element following the test. |
| 4 | 2022-12-01 | Field Strength of Spurious Emissions (Greater Than 30 MHz) | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | Scheduled testing was completed. |

POWERLINE CONDUCTED EMISSIONS



TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Per the standard, an insulating material was also added to ground plane between the EUT's power and remote I/O cables. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50ohm measuring port is terminated by a 50ohm EMI meter or a 50ohm resistive load. All 50ohm measuring ports of the LISN are terminated by 50ohm. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

TEST EQUIPMENT

| Description | Manufacturer | Model | ID | Last Cal. | Cal. Due |
|----------------------------------|-------------------|------------------|------|------------|------------|
| Receiver | Gauss Instruments | TDEMI 30M | ARS | 2022-04-20 | 2023-04-20 |
| LISN | Solar Electronics | 9252-50-R-24-BNC | LIY | 2022-04-04 | 2023-04-04 |
| LISN | Solar Electronics | 9252-50-R-24-BNC | LIQ | 2022-04-04 | 2023-04-04 |
| Cable - Conducted Cable Assembly | Northwest EMC | MNC, HGN, TYK | MNCA | 2022-03-07 | 2023-03-07 |

MEASUREMENT UNCERTAINTY

| Description | | |
|--------------|--------|---------|
| Expanded k=2 | 3.2 dB | -3.2 dB |

CONFIGURATIONS INVESTIGATED

DTCD0105-1

MODES INVESTIGATED

All Parallel Exerciser (APE) mode, RFID active.

POWERLINE CONDUCTED EMISSIONS



| | | | |
|-------------------|-------------------------|-----------------------|------------|
| EUT: | MX LC Upgrade Phase 4.0 | Work Order: | DTCD0105 |
| Serial Number: | 1 | Date: | 2022-11-14 |
| Customer: | Entrust Corporation | Temperature: | 20.5°C |
| Attendees: | Craig Jacobsen | Relative Humidity: | 25.4% |
| Customer Project: | None | Bar. Pressure (PMSL): | 1025 mb |
| Tested By: | Dan Haas | Job Site: | MN03 |
| Power: | 208VAC/60Hz | Configuration: | DTCD0105-1 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2022 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|---|-------|-----------|-----------------------------|---|
| Run #: | 1 | Line: | High Line | Add. Ext. Attenuation (dB): | 0 |
|--------|---|-------|-----------|-----------------------------|---|

COMMENTS

Controller AC power cable.

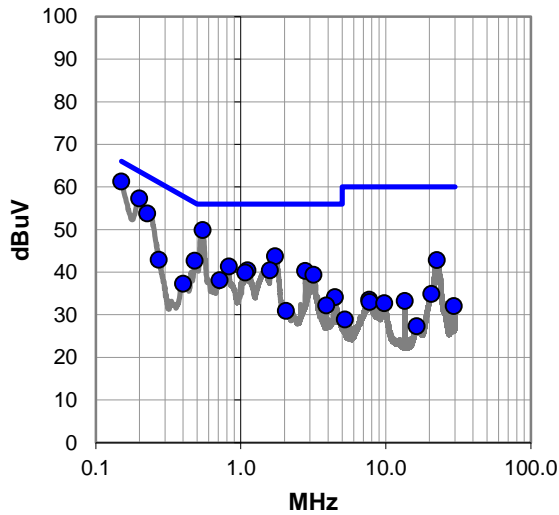
EUT OPERATING MODES

All Parallel Exerciser (APE) mode, RFID active.

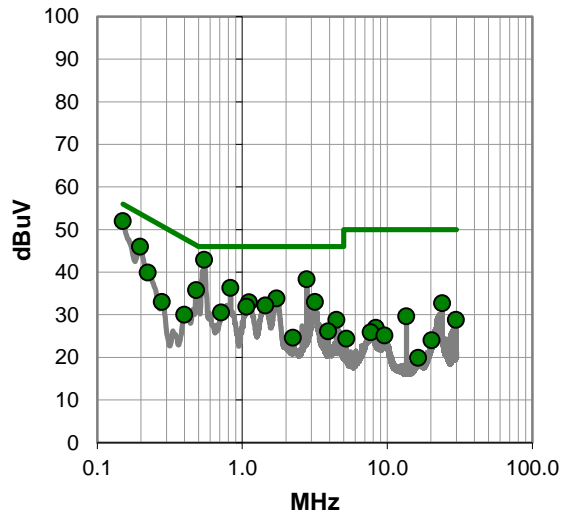
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS



RESULTS - Run #1

Quasi Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 0.150 | 40.6 | 20.7 | 61.3 | 66.0 | -4.7 |
| 0.547 | 29.6 | 20.3 | 49.9 | 56.0 | -6.1 |
| 0.199 | 36.8 | 20.5 | 57.3 | 63.7 | -6.4 |
| 0.226 | 33.4 | 20.4 | 53.8 | 62.6 | -8.8 |
| 1.723 | 23.4 | 20.3 | 43.7 | 56.0 | -12.3 |
| 0.480 | 22.4 | 20.3 | 42.7 | 56.3 | -13.6 |
| 0.831 | 21.1 | 20.2 | 41.3 | 56.0 | -14.7 |
| 1.114 | 20.2 | 20.2 | 40.4 | 56.0 | -15.6 |
| 1.590 | 20.1 | 20.3 | 40.4 | 56.0 | -15.6 |
| 2.787 | 19.9 | 20.4 | 40.3 | 56.0 | -15.7 |
| 1.072 | 19.7 | 20.2 | 39.9 | 56.0 | -16.1 |
| 3.182 | 18.9 | 20.5 | 39.4 | 56.0 | -16.6 |
| 22.506 | 20.9 | 21.9 | 42.8 | 60.0 | -17.2 |
| 0.715 | 17.8 | 20.3 | 38.1 | 56.0 | -17.9 |
| 0.272 | 22.6 | 20.3 | 42.9 | 61.1 | -18.2 |
| 0.400 | 17.0 | 20.3 | 37.3 | 57.8 | -20.5 |
| 4.460 | 13.6 | 20.5 | 34.1 | 56.0 | -21.9 |
| 3.900 | 11.7 | 20.5 | 32.2 | 56.0 | -23.8 |
| 2.051 | 10.6 | 20.3 | 30.9 | 56.0 | -25.1 |
| 20.646 | 13.1 | 21.8 | 34.9 | 60.0 | -25.1 |
| 7.691 | 12.7 | 20.8 | 33.5 | 60.0 | -26.5 |
| 13.559 | 11.8 | 21.4 | 33.2 | 60.0 | -26.8 |
| 7.729 | 12.2 | 20.8 | 33.0 | 60.0 | -27.0 |
| 9.749 | 11.6 | 21.1 | 32.7 | 60.0 | -27.3 |
| 29.478 | 9.5 | 22.5 | 32.0 | 60.0 | -28.0 |

Average Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 0.547 | 22.6 | 20.3 | 42.9 | 46.0 | -3.1 |
| 0.150 | 31.3 | 20.7 | 52.0 | 56.0 | -4.0 |
| 2.787 | 17.9 | 20.4 | 38.3 | 46.0 | -7.7 |
| 0.197 | 25.5 | 20.5 | 46.0 | 53.7 | -7.7 |
| 0.831 | 16.1 | 20.2 | 36.3 | 46.0 | -9.7 |
| 0.481 | 15.5 | 20.3 | 35.8 | 46.3 | -10.5 |
| 1.722 | 13.5 | 20.3 | 33.8 | 46.0 | -12.2 |
| 0.223 | 19.5 | 20.4 | 39.9 | 52.7 | -12.8 |
| 3.182 | 12.5 | 20.5 | 33.0 | 46.0 | -13.0 |
| 1.114 | 12.7 | 20.2 | 32.9 | 46.0 | -13.1 |
| 1.441 | 11.9 | 20.3 | 32.2 | 46.0 | -13.8 |
| 1.069 | 11.7 | 20.2 | 31.9 | 46.0 | -14.1 |
| 0.715 | 10.2 | 20.3 | 30.5 | 46.0 | -15.5 |
| 4.460 | 8.3 | 20.5 | 28.8 | 46.0 | -17.2 |
| 23.986 | 10.7 | 22.0 | 32.7 | 50.0 | -17.3 |
| 0.278 | 12.7 | 20.3 | 33.0 | 50.9 | -17.9 |
| 0.397 | 9.7 | 20.3 | 30.0 | 47.9 | -17.9 |
| 3.903 | 5.6 | 20.5 | 26.1 | 46.0 | -19.9 |
| 13.559 | 8.2 | 21.4 | 29.6 | 50.0 | -20.4 |
| 29.798 | 6.3 | 22.5 | 28.8 | 50.0 | -21.2 |
| 2.231 | 4.3 | 20.3 | 24.6 | 46.0 | -21.4 |
| 8.366 | 6.0 | 20.9 | 26.9 | 50.0 | -23.1 |
| 7.691 | 5.1 | 20.8 | 25.9 | 50.0 | -24.1 |
| 9.584 | 4.1 | 21.0 | 25.1 | 50.0 | -24.9 |
| 5.214 | 3.8 | 20.6 | 24.4 | 50.0 | -25.6 |

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS



| | | | |
|-------------------|-------------------------|-----------------------|------------|
| EUT: | MX LC Upgrade Phase 4.0 | Work Order: | DTCD0105 |
| Serial Number: | 1 | Date: | 2022-11-14 |
| Customer: | Entrust Corporation | Temperature: | 20.5°C |
| Attendees: | Craig Jacobsen | Relative Humidity: | 25.4% |
| Customer Project: | None | Bar. Pressure (PMSL): | 1025 mb |
| Tested By: | Dan Haas | Job Site: | MN03 |
| Power: | 208VAC/60Hz | Configuration: | DTCD0105-1 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2022 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|---|-------|---------|-----------------------------|---|
| Run #: | 2 | Line: | Neutral | Add. Ext. Attenuation (dB): | 0 |
|--------|---|-------|---------|-----------------------------|---|

COMMENTS

Controller AC power cable.

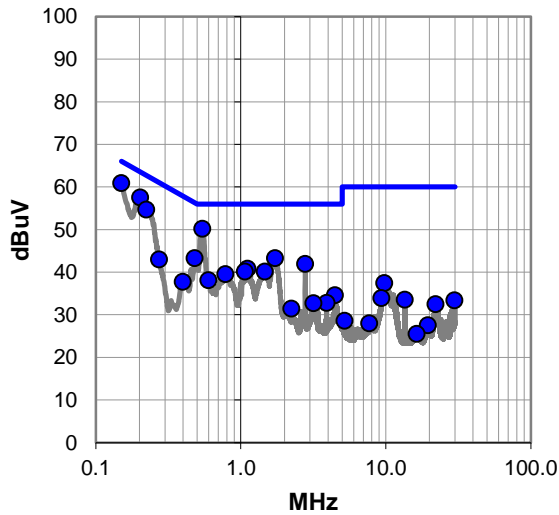
EUT OPERATING MODES

All Parallel Exerciser (APE) mode, RFID active.

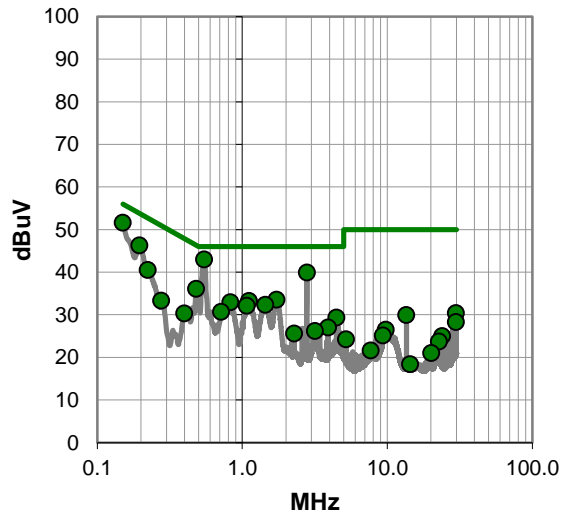
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS



RESULTS - Run #2

Quasi Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 0.150 | 40.2 | 20.7 | 60.9 | 66.0 | -5.1 |
| 0.542 | 29.9 | 20.3 | 50.2 | 56.0 | -5.8 |
| 0.202 | 37.0 | 20.5 | 57.5 | 63.5 | -6.0 |
| 0.223 | 34.3 | 20.4 | 54.7 | 62.7 | -8.0 |
| 1.722 | 23.0 | 20.3 | 43.3 | 56.0 | -12.7 |
| 0.481 | 23.0 | 20.3 | 43.3 | 56.3 | -13.0 |
| 2.787 | 21.5 | 20.4 | 41.9 | 56.0 | -14.1 |
| 1.114 | 20.6 | 20.2 | 40.8 | 56.0 | -15.2 |
| 1.070 | 19.9 | 20.2 | 40.1 | 56.0 | -15.9 |
| 1.462 | 19.8 | 20.3 | 40.1 | 56.0 | -15.9 |
| 0.785 | 19.3 | 20.2 | 39.5 | 56.0 | -16.5 |
| 0.597 | 17.8 | 20.3 | 38.1 | 56.0 | -17.9 |
| 0.274 | 22.7 | 20.3 | 43.0 | 61.0 | -18.0 |
| 0.399 | 17.4 | 20.3 | 37.7 | 57.9 | -20.2 |
| 4.460 | 14.1 | 20.5 | 34.6 | 56.0 | -21.4 |
| 9.755 | 16.3 | 21.1 | 37.4 | 60.0 | -22.6 |
| 3.903 | 12.3 | 20.5 | 32.8 | 56.0 | -23.2 |
| 3.179 | 12.2 | 20.5 | 32.7 | 56.0 | -23.3 |
| 2.231 | 11.1 | 20.3 | 31.4 | 56.0 | -24.6 |
| 9.325 | 12.9 | 21.0 | 33.9 | 60.0 | -26.1 |
| 13.559 | 12.1 | 21.4 | 33.5 | 60.0 | -26.5 |
| 29.778 | 10.9 | 22.5 | 33.4 | 60.0 | -26.6 |
| 22.094 | 10.6 | 21.9 | 32.5 | 60.0 | -27.5 |
| 5.211 | 8.0 | 20.6 | 28.6 | 60.0 | -31.4 |
| 7.689 | 7.2 | 20.8 | 28.0 | 60.0 | -32.0 |

Average Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 0.547 | 22.7 | 20.3 | 43.0 | 46.0 | -3.0 |
| 0.150 | 30.9 | 20.7 | 51.6 | 56.0 | -4.4 |
| 2.790 | 19.5 | 20.4 | 39.9 | 46.0 | -6.1 |
| 0.196 | 25.8 | 20.5 | 46.3 | 53.8 | -7.5 |
| 0.481 | 15.8 | 20.3 | 36.1 | 46.3 | -10.2 |
| 0.223 | 20.1 | 20.4 | 40.5 | 52.7 | -12.2 |
| 1.720 | 13.2 | 20.3 | 33.5 | 46.0 | -12.5 |
| 1.114 | 13.0 | 20.2 | 33.2 | 46.0 | -12.8 |
| 0.829 | 12.7 | 20.2 | 32.9 | 46.0 | -13.1 |
| 1.441 | 12.0 | 20.3 | 32.3 | 46.0 | -13.7 |
| 1.072 | 11.9 | 20.2 | 32.1 | 46.0 | -13.9 |
| 0.715 | 10.4 | 20.3 | 30.7 | 46.0 | -15.3 |
| 4.460 | 8.8 | 20.5 | 29.3 | 46.0 | -16.7 |
| 0.399 | 10.0 | 20.3 | 30.3 | 47.9 | -17.6 |
| 0.277 | 13.0 | 20.3 | 33.3 | 50.9 | -17.6 |
| 3.902 | 6.5 | 20.5 | 27.0 | 46.0 | -19.0 |
| 29.783 | 7.9 | 22.5 | 30.4 | 50.0 | -19.6 |
| 3.182 | 5.7 | 20.5 | 26.2 | 46.0 | -19.8 |
| 13.559 | 8.5 | 21.4 | 29.9 | 50.0 | -20.1 |
| 2.282 | 5.3 | 20.3 | 25.6 | 46.0 | -20.4 |
| 29.790 | 5.8 | 22.5 | 28.3 | 50.0 | -21.7 |
| 9.755 | 5.4 | 21.1 | 26.5 | 50.0 | -23.5 |
| 9.322 | 4.1 | 21.0 | 25.1 | 50.0 | -24.9 |
| 23.986 | 3.0 | 22.0 | 25.0 | 50.0 | -25.0 |
| 5.211 | 3.6 | 20.6 | 24.2 | 50.0 | -25.8 |

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS



| | | | |
|-------------------|-------------------------|-----------------------|------------|
| EUT: | MX LC Upgrade Phase 4.0 | Work Order: | DTCD0105 |
| Serial Number: | 1 | Date: | 2022-11-14 |
| Customer: | Entrust Corporation | Temperature: | 20.5°C |
| Attendees: | Craig Jacobsen | Relative Humidity: | 25.4% |
| Customer Project: | None | Bar. Pressure (PMSL): | 1025 mb |
| Tested By: | Dan Haas | Job Site: | MN03 |
| Power: | 208VAC/60Hz | Configuration: | DTCD0105-1 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2022 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|---|-------|-----------|-----------------------------|---|
| Run #: | 3 | Line: | High Line | Add. Ext. Attenuation (dB): | 0 |
|--------|---|-------|-----------|-----------------------------|---|

COMMENTS

Cure Lamp AC power cable.

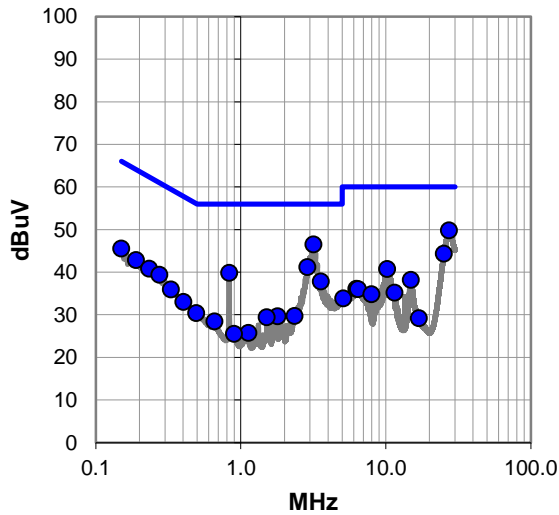
EUT OPERATING MODES

All Parallel Exerciser (APE) mode, RFID active.

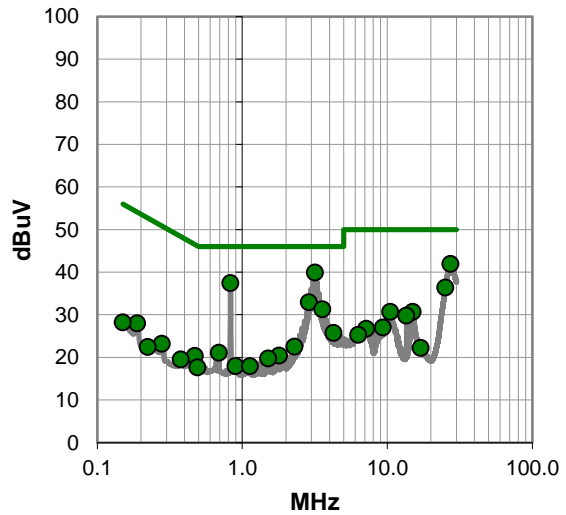
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS



RESULTS - Run #3

Quasi Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 3.179 | 26.1 | 20.4 | 46.5 | 56.0 | -9.5 |
| 27.355 | 27.3 | 22.5 | 49.8 | 60.0 | -10.2 |
| 2.880 | 20.9 | 20.3 | 41.2 | 56.0 | -14.8 |
| 25.124 | 22.1 | 22.2 | 44.3 | 60.0 | -15.7 |
| 0.832 | 19.7 | 20.1 | 39.8 | 56.0 | -16.2 |
| 3.577 | 17.4 | 20.4 | 37.8 | 56.0 | -18.2 |
| 10.252 | 20.0 | 20.7 | 40.7 | 60.0 | -19.3 |
| 0.150 | 25.1 | 20.4 | 45.5 | 66.0 | -20.5 |
| 0.190 | 22.5 | 20.3 | 42.8 | 64.1 | -21.3 |
| 0.234 | 20.6 | 20.2 | 40.8 | 62.3 | -21.5 |
| 0.275 | 19.2 | 20.2 | 39.4 | 61.0 | -21.6 |
| 14.892 | 17.1 | 21.1 | 38.2 | 60.0 | -21.8 |
| 0.330 | 15.7 | 20.2 | 35.9 | 59.5 | -23.6 |
| 6.262 | 15.6 | 20.5 | 36.1 | 60.0 | -23.9 |
| 6.430 | 15.5 | 20.5 | 36.0 | 60.0 | -24.0 |
| 0.402 | 12.9 | 20.1 | 33.0 | 57.8 | -24.8 |
| 11.499 | 14.3 | 20.9 | 35.2 | 60.0 | -24.8 |
| 7.954 | 14.2 | 20.6 | 34.8 | 60.0 | -25.2 |
| 0.493 | 10.3 | 20.1 | 30.4 | 56.1 | -25.7 |
| 5.091 | 13.4 | 20.4 | 33.8 | 60.0 | -26.2 |
| 2.356 | 9.4 | 20.3 | 29.7 | 56.0 | -26.3 |
| 1.792 | 9.4 | 20.2 | 29.6 | 56.0 | -26.4 |
| 1.509 | 9.2 | 20.2 | 29.4 | 56.0 | -26.6 |
| 0.660 | 8.3 | 20.1 | 28.4 | 56.0 | -27.6 |
| 1.131 | 5.6 | 20.1 | 25.7 | 56.0 | -30.3 |

Average Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 3.180 | 19.5 | 20.4 | 39.9 | 46.0 | -6.1 |
| 27.248 | 19.5 | 22.4 | 41.9 | 50.0 | -8.1 |
| 0.831 | 17.3 | 20.1 | 37.4 | 46.0 | -8.6 |
| 2.880 | 12.6 | 20.3 | 32.9 | 46.0 | -13.1 |
| 25.150 | 14.2 | 22.2 | 36.4 | 50.0 | -13.6 |
| 3.577 | 10.9 | 20.4 | 31.3 | 46.0 | -14.7 |
| 10.472 | 10.0 | 20.7 | 30.7 | 50.0 | -19.3 |
| 14.956 | 9.6 | 21.1 | 30.7 | 50.0 | -19.3 |
| 13.559 | 8.8 | 21.0 | 29.8 | 50.0 | -20.2 |
| 4.273 | 5.3 | 20.4 | 25.7 | 46.0 | -20.3 |
| 9.320 | 6.3 | 20.7 | 27.0 | 50.0 | -23.0 |
| 7.150 | 6.1 | 20.6 | 26.7 | 50.0 | -23.3 |
| 2.286 | 2.2 | 20.3 | 22.5 | 46.0 | -23.5 |
| 6.314 | 4.8 | 20.5 | 25.3 | 50.0 | -24.7 |
| 0.690 | 1.0 | 20.1 | 21.1 | 46.0 | -24.9 |
| 1.793 | 0.2 | 20.2 | 20.4 | 46.0 | -25.6 |
| 0.188 | 7.7 | 20.3 | 28.0 | 54.1 | -26.1 |
| 0.472 | 0.2 | 20.1 | 20.3 | 46.5 | -26.2 |
| 1.511 | -0.5 | 20.2 | 19.7 | 46.0 | -26.3 |
| 0.278 | 3.0 | 20.2 | 23.2 | 50.9 | -27.7 |
| 0.150 | 7.8 | 20.4 | 28.2 | 56.0 | -27.8 |
| 17.022 | 0.8 | 21.4 | 22.2 | 50.0 | -27.8 |
| 0.898 | -2.2 | 20.1 | 17.9 | 46.0 | -28.1 |
| 1.131 | -2.2 | 20.1 | 17.9 | 46.0 | -28.1 |
| 0.490 | -2.5 | 20.1 | 17.6 | 46.2 | -28.6 |

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS



| | | | |
|-------------------|-------------------------|-----------------------|------------|
| EUT: | MX LC Upgrade Phase 4.0 | Work Order: | DTCD0105 |
| Serial Number: | 1 | Date: | 2022-11-14 |
| Customer: | Entrust Corporation | Temperature: | 20.5°C |
| Attendees: | Craig Jacobsen | Relative Humidity: | 25.4% |
| Customer Project: | None | Bar. Pressure (PMSL): | 1025 mb |
| Tested By: | Dan Haas | Job Site: | MN03 |
| Power: | 208VAC/60Hz | Configuration: | DTCD0105-1 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.207:2022 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|---|-------|---------|-----------------------------|---|
| Run #: | 4 | Line: | Neutral | Add. Ext. Attenuation (dB): | 0 |
|--------|---|-------|---------|-----------------------------|---|

COMMENTS

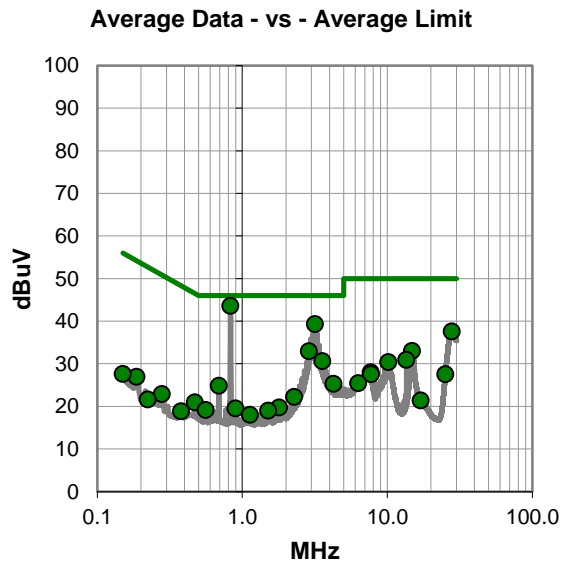
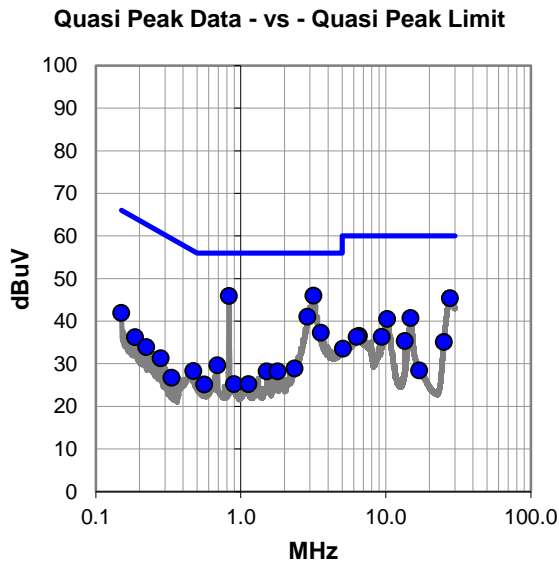
Cure Lamp AC power cable.

EUT OPERATING MODES

All Parallel Exerciser (APE) mode, RFID active.

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS



RESULTS - Run #4

Quasi Peak Data - vs - Quasi Peak Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 3.179 | 25.6 | 20.4 | 46.0 | 56.0 | -10.0 |
| 0.829 | 25.8 | 20.1 | 45.9 | 56.0 | -10.1 |
| 27.769 | 22.9 | 22.5 | 45.4 | 60.0 | -14.6 |
| 2.878 | 20.7 | 20.3 | 41.0 | 56.0 | -15.0 |
| 3.575 | 16.9 | 20.4 | 37.3 | 56.0 | -18.7 |
| 14.815 | 19.6 | 21.1 | 40.7 | 60.0 | -19.3 |
| 10.210 | 19.8 | 20.7 | 40.5 | 60.0 | -19.5 |
| 6.542 | 16.0 | 20.5 | 36.5 | 60.0 | -23.5 |
| 6.310 | 15.8 | 20.5 | 36.3 | 60.0 | -23.7 |
| 9.363 | 15.6 | 20.7 | 36.3 | 60.0 | -23.7 |
| 0.150 | 21.5 | 20.4 | 41.9 | 66.0 | -24.1 |
| 13.559 | 14.3 | 21.0 | 35.3 | 60.0 | -24.7 |
| 25.134 | 12.9 | 22.2 | 35.1 | 60.0 | -24.9 |
| 0.690 | 9.5 | 20.1 | 29.6 | 56.0 | -26.4 |
| 5.068 | 13.1 | 20.4 | 33.5 | 60.0 | -26.5 |
| 2.355 | 8.6 | 20.3 | 28.9 | 56.0 | -27.1 |
| 1.509 | 8.0 | 20.2 | 28.2 | 56.0 | -27.8 |
| 1.793 | 8.0 | 20.2 | 28.2 | 56.0 | -27.8 |
| 0.187 | 15.9 | 20.3 | 36.2 | 64.2 | -28.0 |
| 0.472 | 8.2 | 20.1 | 28.3 | 56.5 | -28.2 |
| 0.223 | 13.7 | 20.2 | 33.9 | 62.7 | -28.8 |
| 0.280 | 11.1 | 20.2 | 31.3 | 60.8 | -29.5 |
| 0.899 | 5.1 | 20.1 | 25.2 | 56.0 | -30.8 |
| 1.131 | 5.1 | 20.1 | 25.2 | 56.0 | -30.8 |
| 0.559 | 5.0 | 20.1 | 25.1 | 56.0 | -30.9 |

Average Data - vs - Average Limit

| Freq (MHz) | Amp. (dBuV) | Factor (dB) | Adjusted (dBuV) | Spec. Limit (dBuV) | Margin (dB) |
|------------|-------------|-------------|-----------------|--------------------|-------------|
| 0.829 | 23.5 | 20.1 | 43.6 | 46.0 | -2.4 |
| 3.179 | 18.9 | 20.4 | 39.3 | 46.0 | -6.7 |
| 27.929 | 15.1 | 22.5 | 37.6 | 50.0 | -12.4 |
| 2.880 | 12.6 | 20.3 | 32.9 | 46.0 | -13.1 |
| 3.577 | 10.2 | 20.4 | 30.6 | 46.0 | -15.4 |
| 14.859 | 11.9 | 21.1 | 33.0 | 50.0 | -17.0 |
| 13.559 | 9.9 | 21.0 | 30.9 | 50.0 | -19.1 |
| 10.193 | 9.7 | 20.7 | 30.4 | 50.0 | -19.6 |
| 4.273 | 4.9 | 20.4 | 25.3 | 46.0 | -20.7 |
| 0.690 | 4.7 | 20.1 | 24.8 | 46.0 | -21.2 |
| 7.689 | 7.4 | 20.6 | 28.0 | 50.0 | -22.0 |
| 7.727 | 6.9 | 20.6 | 27.5 | 50.0 | -22.5 |
| 25.138 | 5.3 | 22.2 | 27.5 | 50.0 | -22.5 |
| 2.285 | 1.9 | 20.3 | 22.2 | 46.0 | -23.8 |
| 6.293 | 4.9 | 20.5 | 25.4 | 50.0 | -24.6 |
| 0.472 | 0.8 | 20.1 | 20.9 | 46.5 | -25.6 |
| 1.793 | -0.5 | 20.2 | 19.7 | 46.0 | -26.3 |
| 0.899 | -0.6 | 20.1 | 19.5 | 46.0 | -26.5 |
| 0.559 | -1.0 | 20.1 | 19.1 | 46.0 | -26.9 |
| 1.509 | -1.2 | 20.2 | 19.0 | 46.0 | -27.0 |
| 0.187 | 6.6 | 20.3 | 26.9 | 54.2 | -27.3 |
| 0.278 | 2.7 | 20.2 | 22.9 | 50.9 | -28.0 |
| 1.131 | -2.1 | 20.1 | 18.0 | 46.0 | -28.0 |
| 0.150 | 7.2 | 20.4 | 27.6 | 56.0 | -28.4 |
| 17.028 | 0.0 | 21.4 | 21.4 | 50.0 | -28.6 |

CONCLUSION

Pass

Tested By

FIELD STRENGTH OF FUNDAMENTAL



TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was continuously transmitting while set to the channel specified.

The fundamental carrier of the EUT was maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A calibrated active loop antenna was used for this test in order to provide sufficient measurement sensitivity. The reference point of the loop antenna was maintained at 1m above the ground plane during the testing.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

As outlined in 15.209(e), 15.31(f)(2), and RSS-GEN, 6.5, measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of 40dB/decade for comparison to the limit.

TEST EQUIPMENT

| Description | Manufacturer | Model | ID | Last Cal. | Cal. Due |
|----------------|-----------------|--------------------|-----|------------|------------|
| Antenna - Loop | ETS Lindgren | 6502 | AOB | 2021-06-01 | 2023-06-01 |
| Receiver | Rohde & Schwarz | ESR26 | ARP | 2022-04-20 | 2023-04-20 |
| Cable | ESM Cable Corp. | Antenna Loop Cable | MNE | 2022-01-30 | 2023-01-30 |

MEASUREMENT UNCERTAINTY

| Description | | |
|--------------|--------|---------|
| Expanded k=2 | 1.8 dB | -1.8 dB |

FREQUENCY RANGE INVESTIGATED

12.5 - 15 MHz

POWER INVESTIGATED

220VAC/60Hz

CONFIGURATIONS INVESTIGATED

DTCD0105-1

MODES INVESTIGATED

RFID Transmitting 13.56 MHz

FIELD STRENGTH OF FUNDAMENTAL



| | | | |
|-------------------|-------------------------|-----------------------|------------|
| EUT: | MX LC Upgrade Phase 4.0 | Work Order: | DTCD0105 |
| Serial Number: | 1 | Date: | 2022-11-30 |
| Customer: | Entrust Corporation | Temperature: | 21.4°C |
| Attendees: | Craig Jacobsen | Relative Humidity: | 22.8% |
| Customer Project: | None | Bar. Pressure (PMSL): | 1015 mb |
| Tested By: | Chris Patterson | Job Site: | MN04 |
| Power: | 220VAC/60Hz | Configuration: | DTCD0105-1 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.225:2022 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|---|--------------------|----|---------------------|------|
| Run #: | 2 | Test Distance (m): | 10 | Ant. Height(s) (m): | 1(m) |
|--------|---|--------------------|----|---------------------|------|

COMMENTS

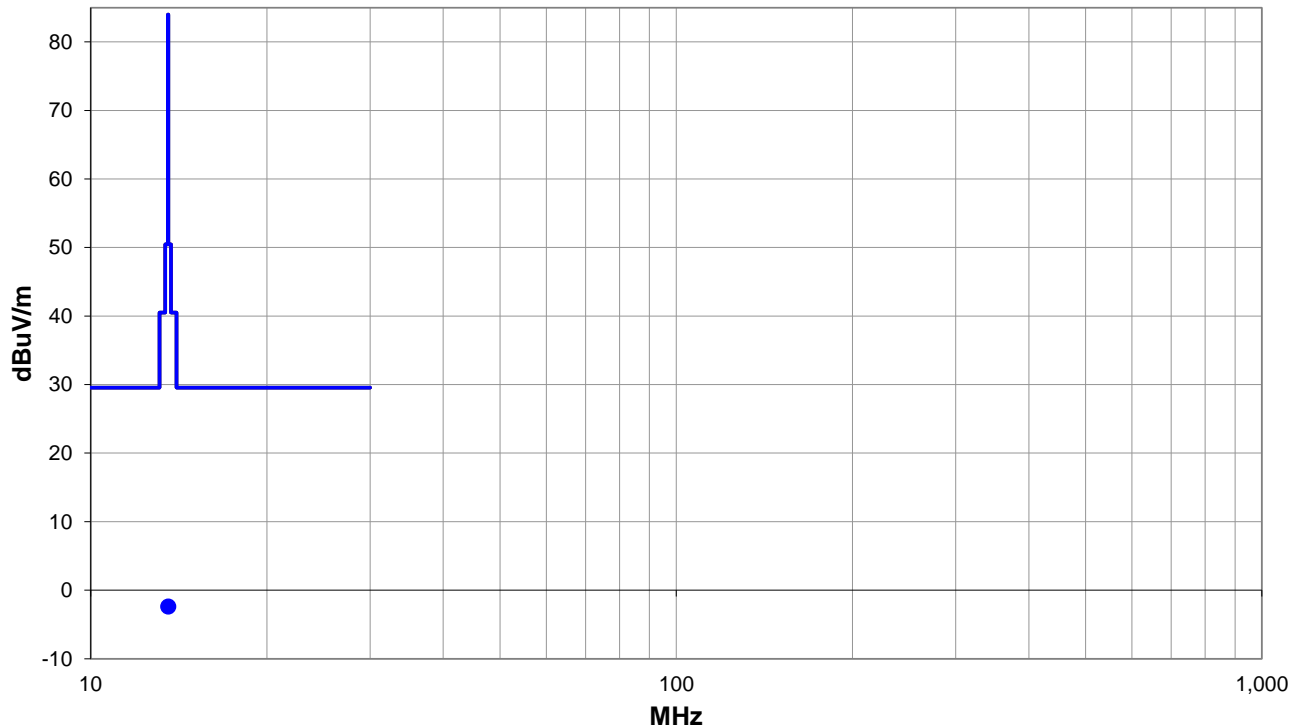
None

EUT OPERATING MODES

RFID Transmitting 13.56 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 2

■ PK ◆ AV ● QP

FIELD STRENGTH OF FUNDAMENTAL



RESULTS - Run #2

| Freq (MHz) | Amplitude (dBuV) | Factor (dB/m) | Antenna Height (meters) | Azimuth (degrees) | Test Distance (meters) | External Attenuation (dB) | Polarity/ Transducer Type | Detector | Distance Adjustment (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) |
|------------|------------------|---------------|-------------------------|-------------------|------------------------|---------------------------|---------------------------|----------|--------------------------|-------------------|----------------------|------------------------|
| 13.562 | 5.8 | 10.9 | 1.0 | 89.0 | 10.0 | 0.0 | Para to GND | QP | -19.1 | -2.4 | 84.0 | -86.4 |

CONCLUSION

Pass

Tested By

FIELD STRENGTH OF FUNDAMENTAL



| | | | |
|-------------------|-------------------------|-----------------------|------------|
| EUT: | MX LC Upgrade Phase 4.0 | Work Order: | DTCD0105 |
| Serial Number: | 1 | Date: | 2022-11-30 |
| Customer: | Entrust Corporation | Temperature: | 21.4°C |
| Attendees: | Craig Jacobsen | Relative Humidity: | 22.8% |
| Customer Project: | None | Bar. Pressure (PMSL): | 1015 mb |
| Tested By: | Chris Patterson | Job Site: | MN04 |
| Power: | 220VAC/60Hz | Configuration: | DTCD0105-1 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.225:2022 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|---|--------------------|---|---------------------|------|
| Run #: | 1 | Test Distance (m): | 3 | Ant. Height(s) (m): | 1(m) |
|--------|---|--------------------|---|---------------------|------|

COMMENTS

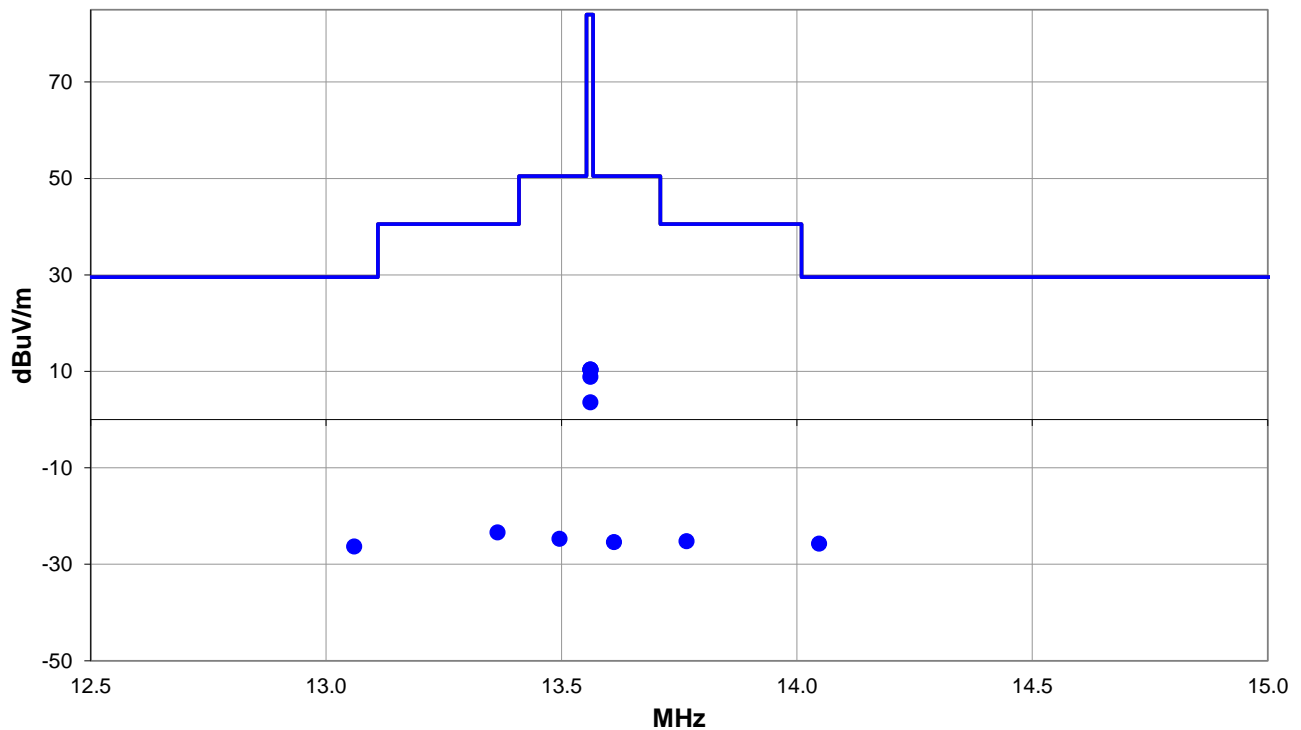
None

EUT OPERATING MODES

RFID Transmitting 13.56 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 1

PK AV QP

FIELD STRENGTH OF FUNDAMENTAL



RESULTS - Run #1

| Freq (MHz) | Amplitude (dBuV) | Factor (dB/m) | Antenna Height (meters) | Azimuth (degrees) | Test Distance (meters) | External Attenuation (dB) | Polarity/ Transducer Type | Detector | Distance Adjustment (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) |
|------------|------------------|---------------|-------------------------|-------------------|------------------------|---------------------------|---------------------------|----------|--------------------------|-------------------|----------------------|------------------------|
| 14.047 | 3.4 | 10.9 | 1.0 | 44.0 | 3.0 | 0.0 | Para to GND | QP | -40.0 | -25.7 | 29.5 | -55.2 |
| 13.060 | 2.7 | 11.0 | 1.0 | 0.0 | 3.0 | 0.0 | Para to GND | QP | -40.0 | -26.3 | 29.5 | -55.8 |
| 13.364 | 5.6 | 11.0 | 1.0 | 2.0 | 3.0 | 0.0 | Para to GND | QP | -40.0 | -23.4 | 40.5 | -63.9 |
| 13.766 | 3.9 | 10.9 | 1.0 | 307.0 | 3.0 | 0.0 | Para to GND | QP | -40.0 | -25.2 | 40.5 | -65.7 |
| 13.562 | 39.5 | 10.9 | 1.0 | 15.0 | 3.0 | 0.0 | Para to GND | QP | -40.0 | 10.4 | 84.0 | -73.6 |
| 13.561 | 39.5 | 10.9 | 1.0 | 18.0 | 3.0 | 0.0 | Para to GND | QP | -40.0 | 10.4 | 84.0 | -73.6 |
| 13.562 | 39.4 | 10.9 | 1.0 | 16.0 | 3.0 | 0.0 | Para to GND | QP | -40.0 | 10.3 | 84.0 | -73.7 |
| 13.562 | 38.0 | 10.9 | 1.0 | 354.0 | 3.0 | 0.0 | Para to EUT | QP | -40.0 | 8.9 | 84.0 | -75.1 |
| 13.496 | 4.3 | 11.0 | 1.0 | 63.0 | 3.0 | 0.0 | Para to GND | QP | -40.0 | -24.7 | 50.5 | -75.2 |
| 13.611 | 3.7 | 10.9 | 1.0 | 294.0 | 3.0 | 0.0 | Para to GND | QP | -40.0 | -25.4 | 50.5 | -75.9 |
| 13.562 | 32.7 | 10.9 | 1.0 | 74.0 | 3.0 | 0.0 | Perp to EUT | QP | -40.0 | 3.6 | 84.0 | -80.4 |

CONCLUSION

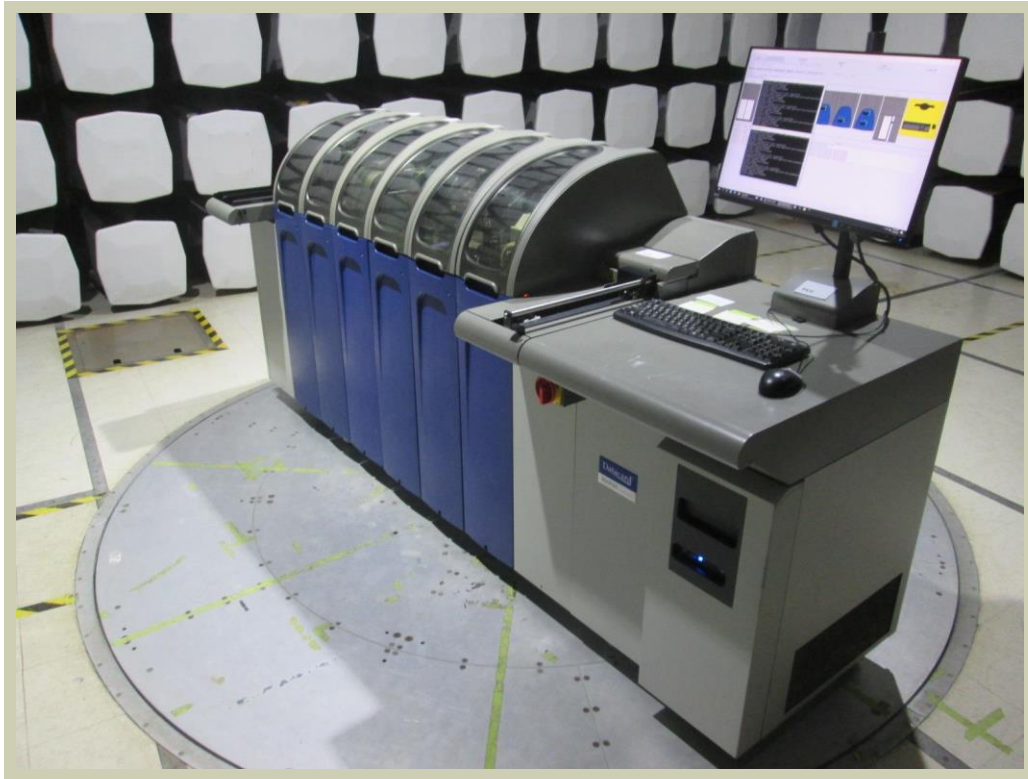
Pass

Tested By

FIELD STRENGTH OF FUNDAMENTAL



FIELD STRENGTH OF FUNDAMENTAL



FIELD STRENGTH OF SPURIOUS EMISIONS (LESS THAN 30MHz)



TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was continuously transmitting while set to the channel specified.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These "pre-scans" are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). An active loop antenna was used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

As outlined in 15.209(e), 15.31(f)(2), and RSS-GEN, 6.5, measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of 40dB/decade for comparison to the limit.

TEST EQUIPMENT

| Description | Manufacturer | Model | ID | Last Cal. | Cal. Due |
|----------------|-----------------|--------------------|-----|------------|------------|
| Antenna - Loop | ETS Lindgren | 6502 | AOB | 2021-06-01 | 2023-06-01 |
| Cable | ESM Cable Corp. | Antenna Loop Cable | MNE | 2022-01-30 | 2023-01-30 |
| Receiver | Rohde & Schwarz | ESR26 | ARP | 2022-04-20 | 2023-04-20 |

MEASUREMENT UNCERTAINTY

| Description | | |
|--------------|--------|---------|
| Expanded k=2 | 1.8 dB | -1.8 dB |

FREQUENCY RANGE INVESTIGATED

490 kHz TO 30 MHz

POWER INVESTIGATED

220VAC/60Hz

CONFIGURATIONS INVESTIGATED

DTCD0105-1

MODES INVESTIGATED

RFID Transmitting 13.56 MHz

FIELD STRENGTH OF SPURIOUS EMISIONS (LESS THAN 30MHz)



| | | | |
|-------------------|-------------------------|-----------------------|------------|
| EUT: | MX LC Upgrade Phase 4.0 | Work Order: | DTCD0105 |
| Serial Number: | 1 | Date: | 2022-11-30 |
| Customer: | Entrust Corporation | Temperature: | 21.4°C |
| Attendees: | Craig Jacobsen | Relative Humidity: | 22.8% |
| Customer Project: | None | Bar. Pressure (PMSL): | 1015 mb |
| Tested By: | Chris Patterson | Job Site: | MN04 |
| Power: | 220VAC/60Hz | Configuration: | DTCD0105-1 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.225:2022 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|---|--------------------|----|---------------------|------|
| Run #: | 3 | Test Distance (m): | 10 | Ant. Height(s) (m): | 1(m) |
|--------|---|--------------------|----|---------------------|------|

COMMENTS

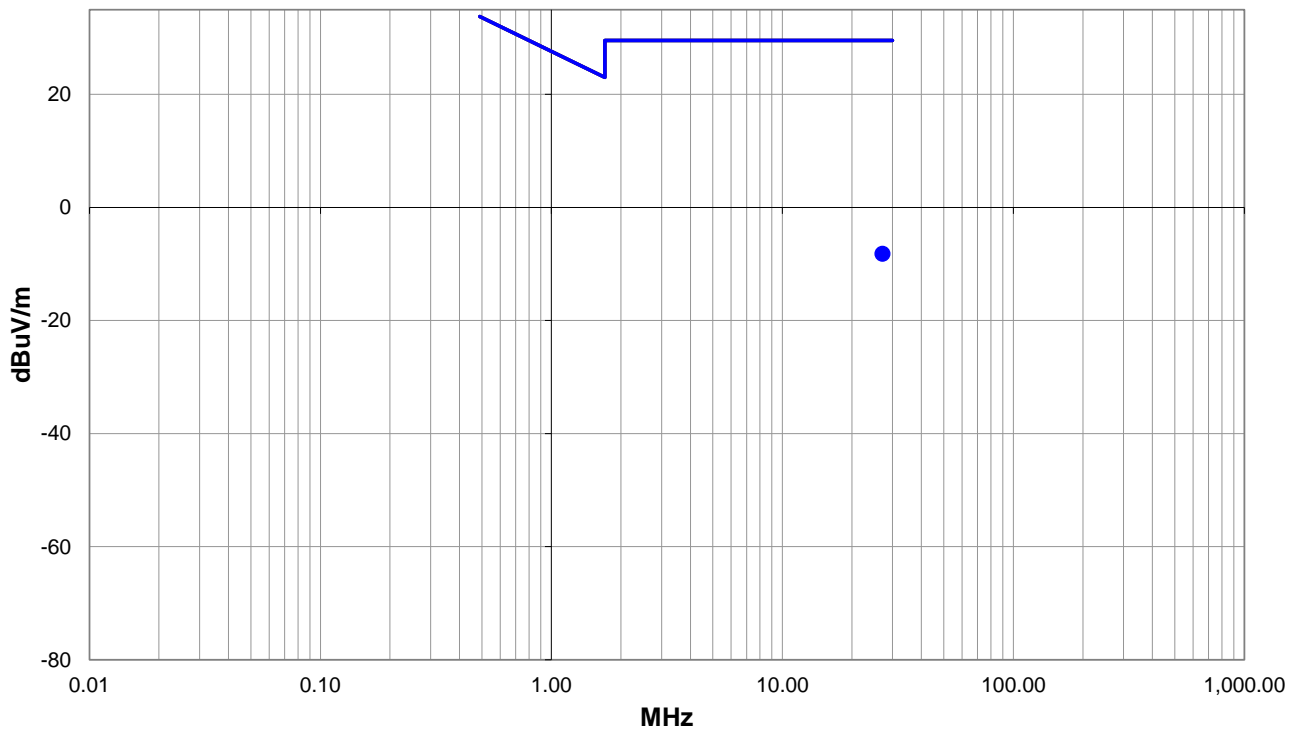
None

EUT OPERATING MODES

RFID Transmitting 13.56 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 3

■ PK ◆ AV ● QP

FIELD STRENGTH OF SPURIOUS EMISIONS (LESS THAN 30MHz)



RESULTS - Run #3

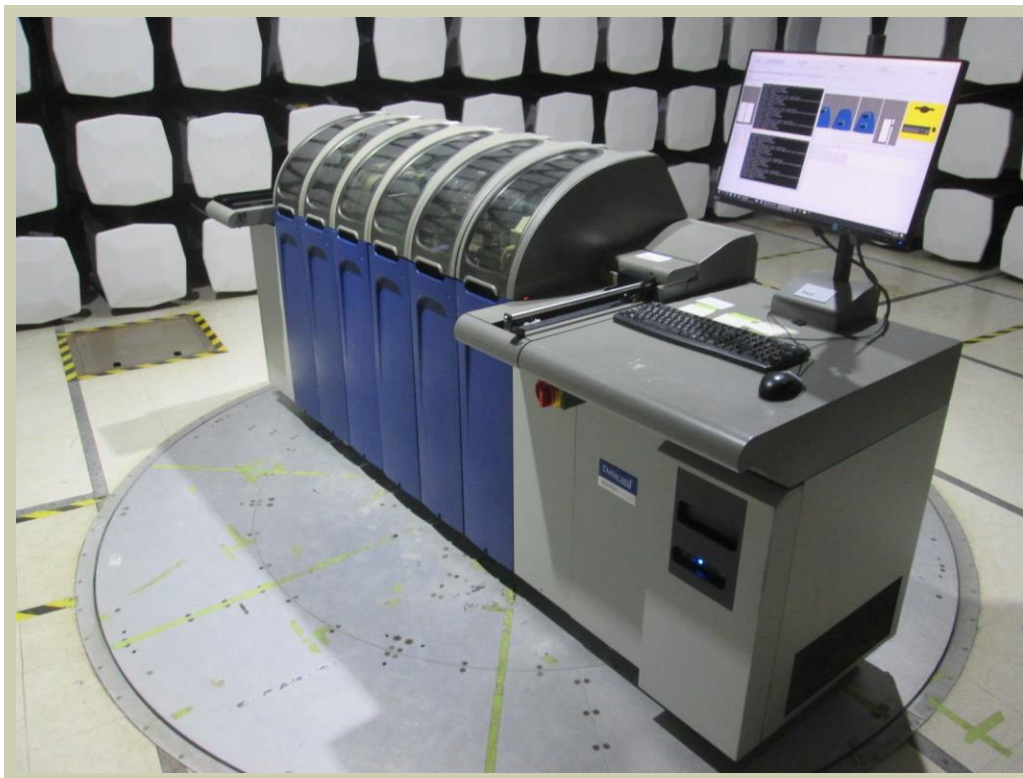
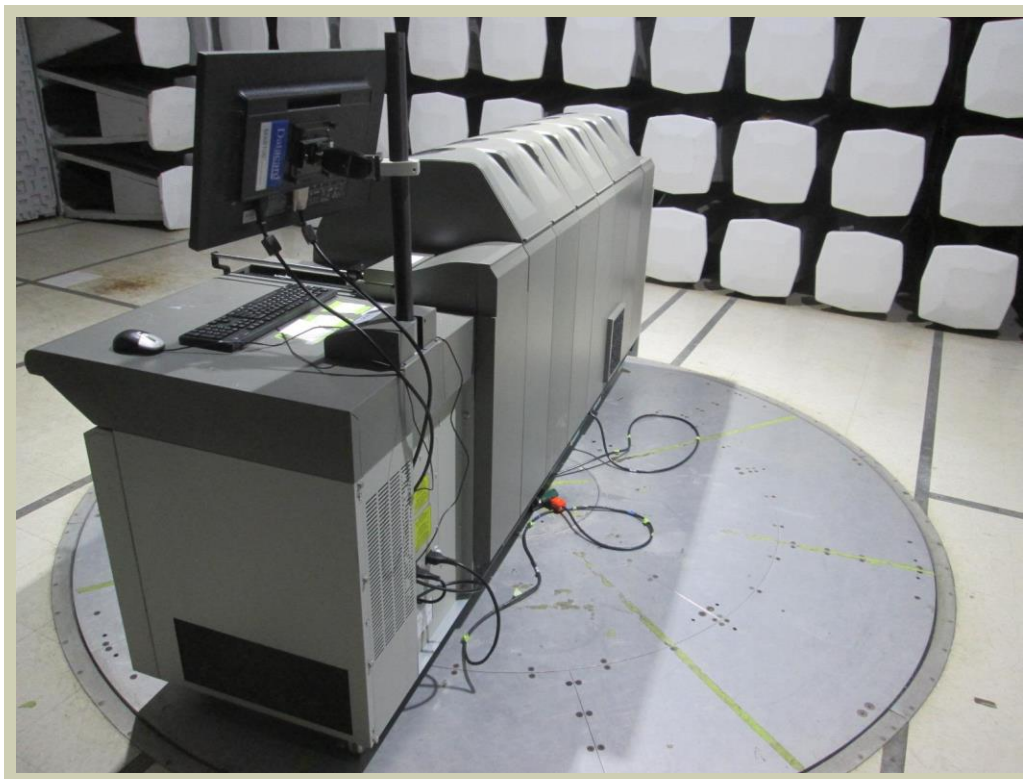
| Freq (MHz) | Amplitude (dBuV) | Factor (dB/m) | Antenna Height (meters) | Azimuth (degrees) | Test Distance (meters) | External Attenuation (dB) | Polarity/ Transducer Type | Detector | Distance Adjustment (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) |
|------------|------------------|---------------|-------------------------|-------------------|------------------------|---------------------------|---------------------------|----------|--------------------------|-------------------|----------------------|------------------------|
| 27.126 | 1.2 | 9.7 | 1.0 | 112.0 | 10.0 | 0.0 | Para to GND | QP | -19.1 | -8.2 | 29.5 | -37.7 |

CONCLUSION

Pass

Tested By

FIELD STRENGTH OF SPURIOUS EMISIONS (LESS THAN 30MHz)



FIELD STRENGTH OF SPURIOUS EMISIONS (GREATER THAN 30MHz)



TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting while set at the operating channel.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These “pre-scans” are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

- QP = Quasi-Peak Detector
- PK = Peak Detector
- AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

TEST EQUIPMENT

| Description | Manufacturer | Model | ID | Last Cal. | Cal. Due |
|---------------------------|--------------------|-------------------|-----|------------|------------|
| Antenna - Biconilog | ETS Lindgren | 3142D | AXN | 2021-12-08 | 2023-12-08 |
| Cable | ESM Cable Corp. | MN04 Bilog Cables | MND | 2022-01-30 | 2023-01-30 |
| Amplifier - Pre-Amplifier | Miteq | AM-1551 | PAC | 2022-06-13 | 2023-06-13 |
| Receiver | Rohde & Schwarz | ESR26 | ARP | 2022-04-20 | 2023-04-20 |
| Filter - Low Pass | Micro-Tronics | LPM50004 | HGW | 2022-09-11 | 2023-09-11 |
| Attenuator | Fairview Microwave | SA6021-10 | UAT | 2022-08-13 | 2023-08-13 |

MEASUREMENT UNCERTAINTY

| Description | | |
|--------------|--------|---------|
| Expanded k=2 | 4.6 dB | -4.6 dB |

FREQUENCY RANGE INVESTIGATED

30 MHz TO 1000 MHz

POWER INVESTIGATED

220VAC/60Hz

CONFIGURATIONS INVESTIGATED

DTCD0105-1

MODES INVESTIGATED

RFID Transmitting 13.56 MHz

FIELD STRENGTH OF SPURIOUS EMISIONS (GREATER THAN 30MHz)



| | | | |
|-------------------|-------------------------|-----------------------|------------|
| EUT: | MX LC Upgrade Phase 4.0 | Work Order: | DTCD0105 |
| Serial Number: | 1 | Date: | 2022-12-01 |
| Customer: | Entrust Corporation | Temperature: | 21.9°C |
| Attendees: | Jeff Aymond | Relative Humidity: | 20.4% |
| Customer Project: | None | Bar. Pressure (PMSL): | 1023 mb |
| Tested By: | Chris Patterson | Job Site: | MN04 |
| Power: | 220VAC/60Hz | Configuration: | DTCD0105-1 |

TEST SPECIFICATIONS

| | |
|-----------------|------------------|
| Specification: | Method: |
| FCC 15.225:2022 | ANSI C63.10:2013 |

TEST PARAMETERS

| | | | | | |
|--------|---|--------------------|---|---------------------|-----------|
| Run #: | 9 | Test Distance (m): | 3 | Ant. Height(s) (m): | 1 to 4(m) |
|--------|---|--------------------|---|---------------------|-----------|

COMMENTS

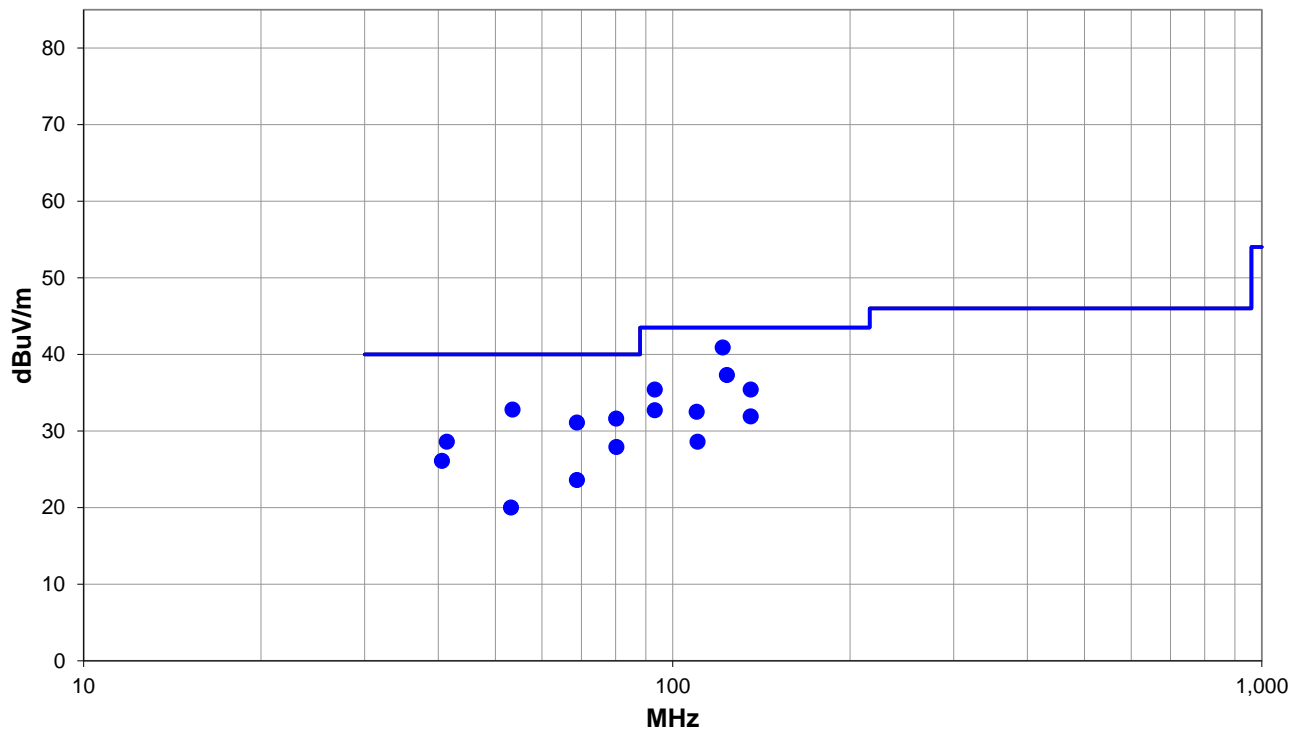
None

EUT OPERATING MODES

RFID Transmitting 13.56 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 9

■ PK ◆ AV ● QP

FIELD STRENGTH OF SPURIOUS EMISIONS (GREATER THAN 30MHz)



RESULTS - Run #9

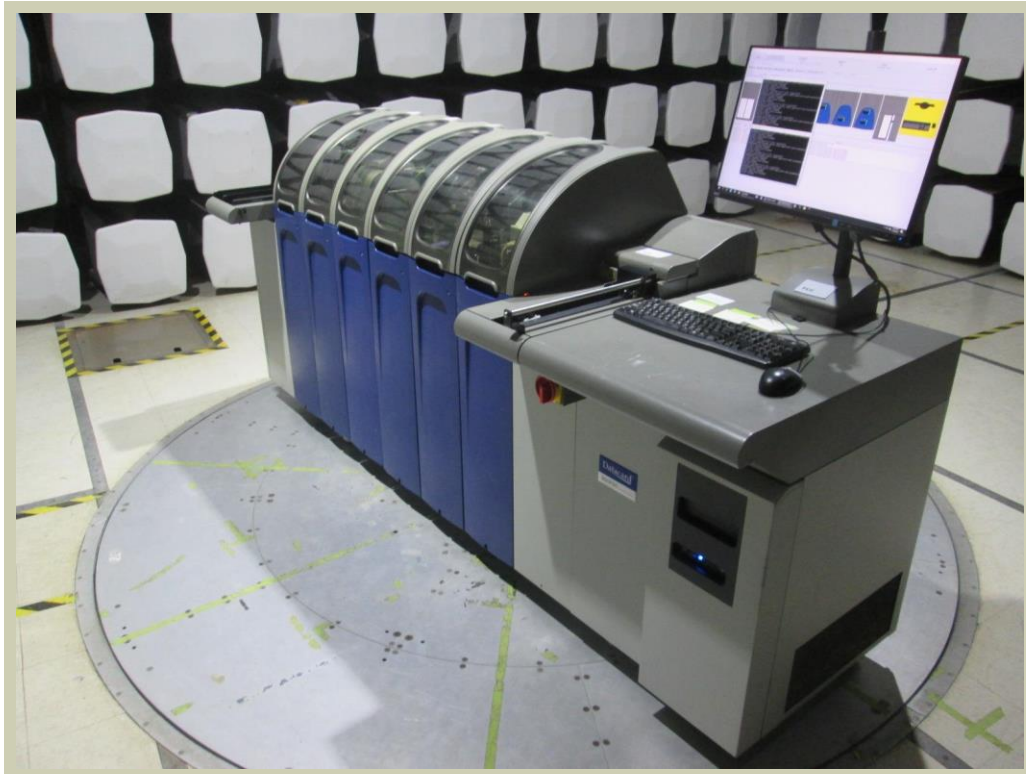
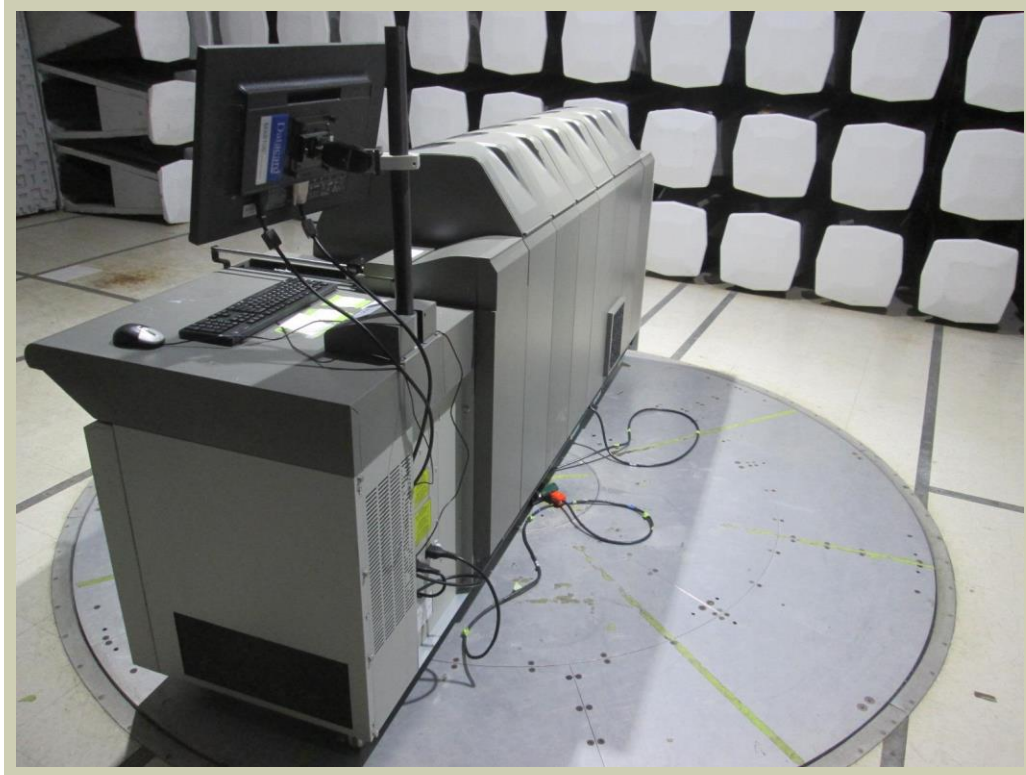
| Freq (MHz) | Amplitude (dBuV) | Factor (dB/m) | Antenna Height (meters) | Azimuth (degrees) | Test Distance (meters) | External Attenuation (dB) | Polarity/Transducer Type | Detector | Distance Adjustment (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) |
|------------|------------------|---------------|-------------------------|-------------------|------------------------|---------------------------|--------------------------|----------|--------------------------|-------------------|----------------------|------------------------|
| 121.605 | 61.8 | -30.9 | 1.54 | 116.0 | 3.0 | 10.0 | Horz | QP | 0.0 | 40.9 | 43.5 | -2.6 |
| 123.516 | 58.4 | -31.1 | 1.0 | 358.0 | 3.0 | 10.0 | Vert | QP | 0.0 | 37.3 | 43.5 | -6.2 |
| 53.458 | 54.2 | -31.4 | 1.09 | 34.0 | 3.0 | 10.0 | Vert | QP | 0.0 | 32.8 | 40.0 | -7.2 |
| 93.231 | 56.3 | -30.9 | 1.0 | 0.0 | 3.0 | 10.0 | Vert | QP | 0.0 | 35.4 | 43.5 | -8.1 |
| 135.609 | 56.6 | -31.2 | 2.09 | 129.0 | 3.0 | 10.0 | Horz | QP | 0.0 | 35.4 | 43.5 | -8.1 |
| 80.183 | 54.1 | -32.5 | 1.0 | 120.0 | 3.0 | 10.0 | Vert | QP | 0.0 | 31.6 | 40.0 | -8.4 |
| 68.732 | 52.8 | -31.7 | 1.19 | 113.0 | 3.0 | 10.0 | Vert | QP | 0.0 | 31.1 | 40.0 | -8.9 |
| 93.243 | 53.6 | -30.9 | 2.19 | 114.0 | 3.0 | 10.0 | Horz | QP | 0.0 | 32.7 | 43.5 | -10.8 |
| 109.816 | 52.7 | -30.2 | 1.0 | 146.0 | 3.0 | 10.0 | Vert | QP | 0.0 | 32.5 | 43.5 | -11.0 |
| 41.333 | 46.6 | -28.0 | 1.0 | 145.0 | 3.0 | 10.0 | Vert | QP | 0.0 | 28.6 | 40.0 | -11.4 |
| 135.628 | 53.1 | -31.2 | 1.0 | 0.0 | 3.0 | 10.0 | Vert | QP | 0.0 | 31.9 | 43.5 | -11.6 |
| 80.203 | 50.4 | -32.5 | 2.39 | 313.0 | 3.0 | 10.0 | Horz | QP | 0.0 | 27.9 | 40.0 | -12.1 |
| 40.567 | 43.7 | -27.6 | 3.79 | 94.0 | 3.0 | 10.0 | Horz | QP | 0.0 | 26.1 | 40.0 | -13.9 |
| 110.149 | 48.8 | -30.2 | 2.83 | 146.0 | 3.0 | 10.0 | Horz | QP | 0.0 | 28.6 | 43.5 | -14.9 |
| 68.749 | 45.3 | -31.7 | 2.28 | 284.0 | 3.0 | 10.0 | Horz | QP | 0.0 | 23.6 | 40.0 | -16.4 |
| 53.149 | 41.4 | -31.4 | 3.78 | 186.0 | 3.0 | 10.0 | Horz | QP | 0.0 | 20.0 | 40.0 | -20.0 |

CONCLUSION

Pass

Tested By

FIELD STRENGTH OF SPURIOUS EMISIONS (GREATER THAN 30MHz)



End of Test Report