

Magtek Incorporated

TEST REPORT FOR

Flexible/Modular Hybrid Secure Card Reader Model: DynaFlex Pro*

*(See Appendix A for Manufacturer's Declaration)

Tested to The Following Standards:

FCC Part 15 Subpart C Section(s)

15.207 & 15.225
(13.110-14.010 MHz)

Report No.: 103582-16

Date of issue: April 10, 2020



Test Certificate # 803.01

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Magtek Incorporated
1710 Apollo Court
Seal Beach, CA 90740

REPORT PREPARED BY:

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5046 Sierra Pines Drive
Mariposa, CA 95338

REPRESENTATIVE: Kevin Gin
Customer Reference Number: 30009494

Project Number: 103582

DATE OF EQUIPMENT RECEIPT:

January 16, 2020

DATE(S) OF TESTING:

January 16 – February 4, 2020

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the equipment provided by the client, tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.



Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information



Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
110 Olinda Place
Brea, CA 92823

Software Versions

| CKC Laboratories Proprietary Software | Version |
|---------------------------------------|---------|
| EMITest Emissions | 5.03.12 |

Site Registration & Accreditation Information

| Location | *NIST CB # | FCC | Japan |
|--------------------------|------------|--------|--------|
| Canyon Park, Bothell, WA | US0081 | US1022 | A-0136 |
| Brea, CA | US0060 | US1025 | A-0136 |
| Fremont, CA | US0082 | US1023 | A-0136 |
| Mariposa, CA | US0103 | US1024 | A-0136 |

*CKC's list of NIST designated countries can be found at: <https://standards.gov/cabs/designations.html>

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C - 15.225

| Test Procedure | Description | Modifications | Results |
|----------------|--------------------------------------|---------------|---------|
| 15.215(c) | Occupied Bandwidth | Mod. #1 | Pass |
| 15.225(a)-(c) | Field Strength of Fundamental | Mod. #1 | Pass |
| 15.225(e) | Frequency Stability | Mod. #1 | Pass |
| 15.225(d) | Field Strength of Spurious Emissions | Mod. #1 | Pass |
| 15.207 | AC Conducted Emissions | Mod. #1 | Pass |

NA = Not Applicable

ISO/IEC 17025 Decision Rule

The declaration of pass or fail herein is based upon assessment to the specification(s) listed above, including where applicable, assessment of measurement uncertainties. For performance related tests, equipment was monitored for specified criteria identified in that section of testing.

Modifications During Testing

This list is a summary of the modifications made to the equipment during testing.

Summary of Conditions

Modification #1 - Installing two 7mm ferrites (manufacturer: Wellcn, model: 8541634656) on both ends of the USB cable.

Modifications listed above must be incorporated into all production units.

Conditions During Testing

This list is a summary of the conditions noted to the equipment during testing.

Summary of Conditions

None

EQUIPMENT UNDER TEST (EUT)

During testing, numerous configurations may have been utilized. The configurations listed below support compliance to the standard(s) listed in the Summary of Results section.

Configuration 1

Equipment Tested:

| Device | Manufacturer | Model # | S/N |
|--|---------------------|--------------|-----|
| Flexible/Modular Hybrid Secure Card Reader | Magtek Incorporated | DynaFlex Pro | AP4 |

Support Equipment:

| Device | Manufacturer | Model # | S/N |
|----------------------|--------------|-------------|---------|
| Laptop | Dell | latitude | Tag1283 |
| Laptop power adapter | Dell | DA130PE1-00 | NA |

General Product Information:

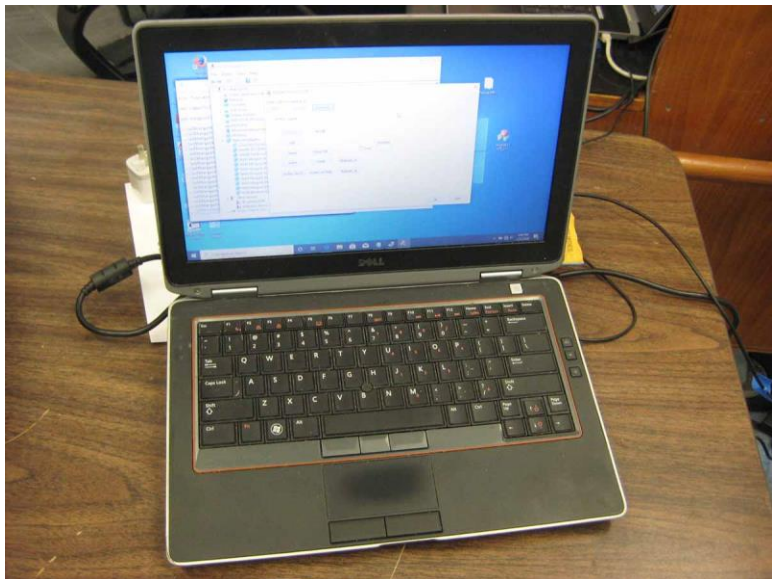
| Product Information | Manufacturer-Provided Details |
|------------------------------------|-------------------------------|
| Equipment Type: | Stand-Alone Equipment |
| Modulation Type(s): | OOK |
| Maximum Duty Cycle: | 98% |
| Antenna Type(s) and Gain: | 2.4 inch x 3.7 in loop, NA |
| Antenna Connection Type: | Integral |
| Nominal Input Voltage: | 5Vdc USB/ 3.7Vdc battery |
| Firmware / Software used for Test: | Apollo_Main_K81 |

EUT and Accessory Photo(s)



EUT

Support Equipment Photo(s)



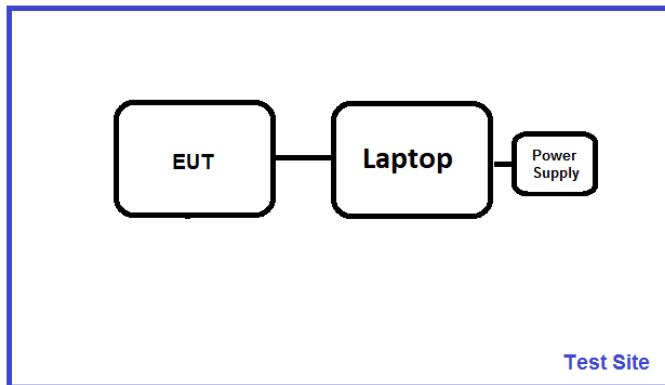
Laptop



Laptop power adapter

Block Diagram of Test Setup(s)

Test Setup Block Diagram



FCC Part 15 Subpart C

15.215(c) Occupied Bandwidth (20dB BW)

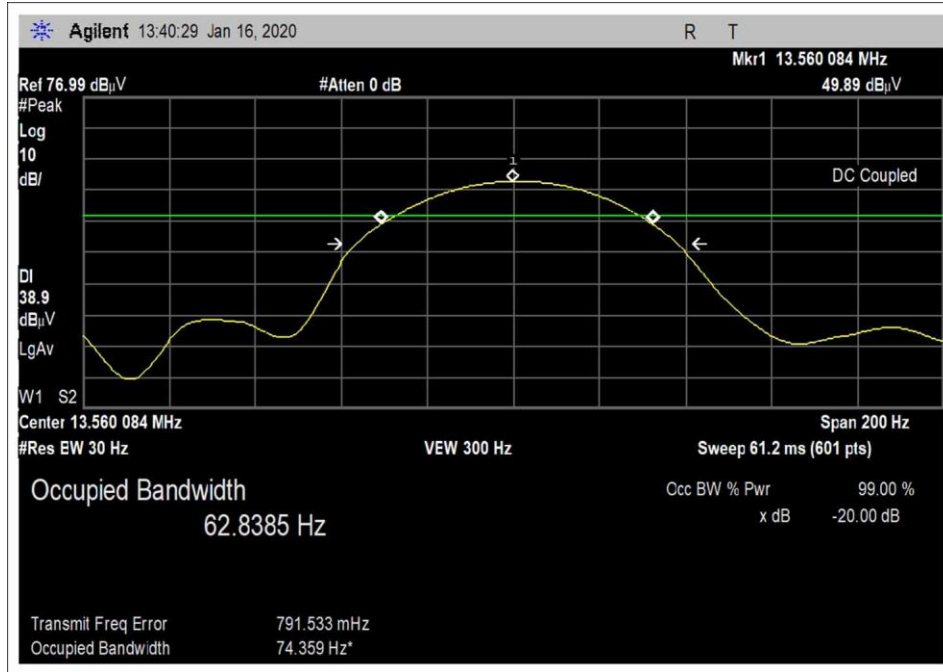
| Test Setup/Conditions | | | |
|-----------------------|---|----------------|-----------|
| Test Location: | Brea Lab A | Test Engineer: | E. Wong |
| Test Method: | ANSI C63.10 (2013) | Test Date(s): | 1/16/2020 |
| Configuration: | 1 | | |
| Test Setup: | <p>The EUT is placed on Styrofoam platform, connected to a support laptop via USB cable which also charges the EUT.</p> <p>Device (AP4) has a single modular approved BLE module FCCID: QQQBGM13P, IC:5123A-BGM13P installed.</p> <p>The 13.56MHz NFC radio under evaluation is placed in constant transmit mode. Operating at rated input power.</p> <p>Note: RBW / measured BW not at 1-5 % ratio due to CW nature of the emission.</p> <p>Modification #1 was in place during testing.</p> | | |

| Environmental Conditions | | | |
|--------------------------|----|------------------------|----|
| Temperature (°C) | 20 | Relative Humidity (%): | 51 |

| Test Equipment | | | | | |
|----------------|-------------------|--------------|--------|-----------|-----------|
| Asset# | Description | Manufacturer | Model | Cal Date | Cal Due |
| 02869 | Spectrum Analyzer | Agilent | E4440A | 7/25/2019 | 7/25/2020 |
| P05198 | Cable | Belden | 8268 | 12/4/2018 | 12/4/2020 |
| 00314 | Loop Antenna | EMCO | 6502 | 5/13/2018 | 5/13/2020 |

| Test Data Summary | | | | | |
|-------------------|--------------|------------|----------------|-------------|---------|
| Frequency (MHz) | Antenna Port | Modulation | Measured (kHz) | Limit (kHz) | Results |
| 13.56 | 1 | OOK | 0.074 | None | NA |
| | | | | | |

Plot(s)



-20dB 99%BW

Test Setup Photo(s)



15.225(a)-(c) Field Strength of Fundamental

Test Data Summary - Voltage Variations

| Frequency (MHz) | Modulation / Ant Port | V _{Minimum} (dBuV/m@ 30m) | V _{Nominal} (dBuV/m@ 30m) | V _{Maximum} (dBuV/m@ 30m) | Max Deviation from V _{Nominal} (dB) | Limit (dBuV/m @ 30m) | Result |
|-----------------|-----------------------|------------------------------------|------------------------------------|------------------------------------|--|----------------------|--------|
| 13.56 | OOK | 41.8 | 41.8 | 41.8 | 0 | ≤84 | Pass |

Test performed using operational mode with the highest output power, representing worst case.

Parameter Definitions:

Measurements performed at input voltage V_{Nominal} ± 15%.

| Parameter | Value |
|------------------------|----------|
| V _{Nominal} : | 5VDC |
| V _{Minimum} : | 4.25 VDC |
| V _{Maximum} : | 5.75 VDC |

Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA • 714 993 6112
 Customer: **Magtek Incorporated**
 Specification: **15.225 Carrier and Spurious Emissions (13.110-14.010 MHz Transmitter)**
 Work Order #: **103582** Date: 1/16/2020
 Test Type: **Radiated Scan** Time: 11:39:38
 Tested By: E. Wong Sequence#: 1
 Software: EMITest 5.03.12

Equipment Tested:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 1 | | | |

Support Equipment:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 1 | | | |

Test Conditions / Notes:

The EUT is placed on Styrofoam platform, connected to a support laptop via USB cable which also charges the EUT.

Device (AP4) has a single modular approved BLE module FCCID: QOQBGM13P IC:5123A-BGM13P installed.

The 13.56MHz NFC radio under evaluation is placed in constant transmit mode.
Operating at rated input power.

Frequency range of measurement = 9 kHz- 1 GHz.
9 kHz -150 kHz;RBW=200 Hz,VBW=200 Hz;150 kHz-30 MHz;RBW=9 kHz,VBW=9 kHz;30 MHz-1000 MHz;RBW=120 kHz,VBW=120 kHz,

Test environment conditions:
 Temperature: 20°C
 Relative Humidity: 51 %
 Pressure: 99.3kPa

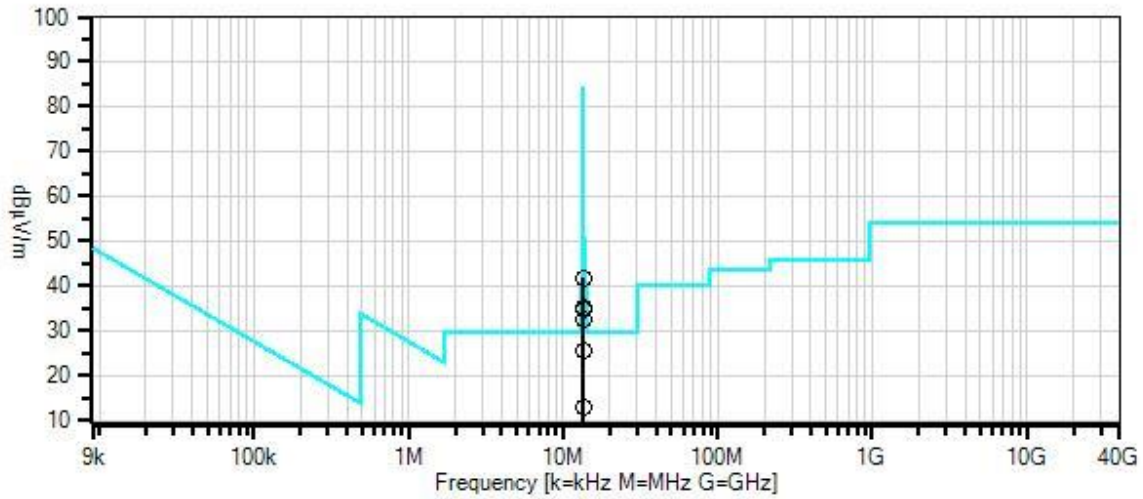
Site A

ANSI C63.10-2013

Emission profile of the EUT rotated along three orthogonal axes was investigated.
Recorded data represent worse case emission.

Modification #1 was in place during testing.

Magtek Incorporated W/O#: 103582 Sequence#: 1 Date: 1/16/2020
 15.225 Carrier and Spurious Emissions (13.110-14.010 MHz Transmitter) Test Distance: 3 Meters Vert



- Readings
 - Peak Readings
 - × QP Readings
 - * Average Readings
 - ▼ Ambient
- Software Version: 5.03.12
- 1 - 15.225 Carrier and Spurious Emissions (13.110-14.010 MHz Transmitter)

Test Equipment:

| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|----|----------|-----------------------------------|--------|------------------|--------------|
| T1 | AN02869 | Spectrum Analyzer | E4440A | 7/25/2019 | 7/25/2020 |
| T2 | ANP05198 | Cable-Amplitude +15C to +45C (dB) | 8268 | 12/4/2018 | 12/4/2020 |
| T3 | AN00314 | Loop Antenna | 6502 | 5/13/2018 | 5/13/2020 |

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq MHz | Rdng dB μ V | T1 dB | T2 dB | T3 dB | Dist Table | Corr dB μ V/m | Spec dB μ V/m | Margin dB | Polar Ant |
|---|-------------|--------------------|----------|----------|----------|---------------|----------------------|----------------------|--------------|--------------|
| 1 | 13.560M | 72.7 | +0.0 | +0.6 | +8.5 | -40.0 | 41.8 | 84.0 | -42.2 | Paral |
| | | | | | | | | Y_max | | |
| 2 | 13.560M | 72.4 | +0.0 | +0.6 | +8.5 | -40.0 | 41.5 | 84.0 | -42.5 | Paral |
| | | | | | | | | Z | | |
| 3 | 13.560M | 66.1 | +0.0 | +0.6 | +8.5 | -40.0 | 35.2 | 84.0 | -48.8 | Perpe |
| | | | | | | | | Z | | |
| 4 | 13.560M | 65.7 | +0.0 | +0.6 | +8.5 | -40.0 | 34.8 | 84.0 | -49.2 | Perpe |
| | | | | | | | | Y | | |
| 5 | 13.560M | 65.5 | +0.0 | +0.6 | +8.5 | -40.0 | 34.6 | 84.0 | -49.4 | Groun |
| | | | | | | | | Z | | |
| 6 | 13.560M | 63.6 | +0.0 | +0.6 | +8.5 | -40.0 | 32.7 | 84.0 | -51.3 | Groun |
| | | | | | | | | Y | | |
| 7 | 13.560M | 63.5 | +0.0 | +0.6 | +8.5 | -40.0 | 32.6 | 84.0 | -51.4 | Groun |
| | | | | | | | | X | | |
| 8 | 13.560M | 56.5 | +0.0 | +0.6 | +8.5 | -40.0 | 25.6 | 84.0 | -58.4 | Paral |
| | | | | | | | | X | | |
| 9 | 13.560M | 43.9 | +0.0 | +0.6 | +8.5 | -40.0 | 13.0 | 84.0 | -71.0 | Perpe |
| | | | | | | | | X | | |

Test Setup Photo(s)



15.225(e) Frequency Stability

| Test Setup/Conditions | | | |
|-----------------------|--|----------------|------------|
| Test Location: | Brea Lab A | Test Engineer: | Don Nguyen |
| Test Method: | ANSI C63.10 (2013) | Test Date(s): | 1/23/2020 |
| Configuration: | 1 | | |
| Test Setup: | <p>The EUT is placed in temperature chamber next to near field probe. An external DC power supply is used to vary USB voltage.</p> <p>The EUT is set to transmit constantly at 13.56MHz.</p> <p>Modification #1 was in place during testing.</p> | | |

| Environmental Conditions | | | |
|--------------------------|------|------------------------|----|
| Temperature (°C) | 22.2 | Relative Humidity (%): | 40 |

| Test Equipment | | | | | |
|----------------|---------------------|------------------|----------------|------------|------------|
| Asset# | Description | Manufacturer | Model | Cal Date | Cal Due |
| 02869 | Spectrum Analyzer | Agilent | E4440A | 7/25/2019 | 7/25/2020 |
| 01878 | Temperature Chamber | Thermotron Corp. | S 1.2 Mini-Max | 3/26/2019 | 3/26/2021 |
| P05947 | Thermometer | Fluke | 51 | 5/11/2018 | 5/11/2020 |
| P07338 | Cable | Pomona | 2249-Y-240 | 12/24/2019 | 12/24/2021 |

Test Data Summary

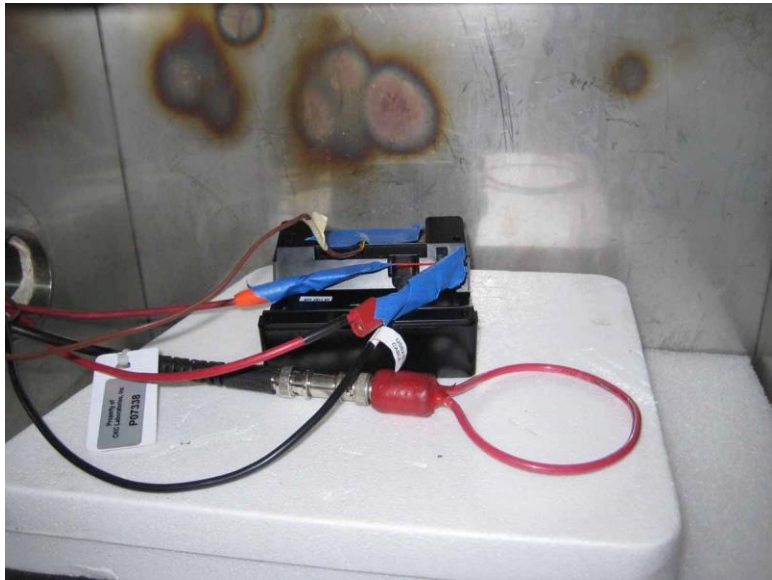
| Temperature (°C) | Voltage | Frequency (MHz) | Deviation (%) | Limit (%) | Results |
|--------------------|----------------------|-----------------|---------------|-----------|---------|
| -20 | V _{Nominal} | 13.560244 | 0.000317 | ±0.01 | Pass |
| -10 | V _{Nominal} | 13.560242 | 0.000302 | ±0.01 | |
| 0 | V _{Nominal} | 13.560235 | 0.000251 | ±0.01 | |
| 10 | V _{Nominal} | 13.560218 | 0.000125 | ±0.01 | |
| 20 | V _{Minimum} | 13.560201 | 0 | ±0.01 | |
| 20 | V _{Nominal} | 13.560201 | 0 | ±0.01 | |
| 20 | V _{Maximum} | 13.560201 | 0 | ±0.01 | |
| 30 | V _{Nominal} | 13.560170 | -0.00023 | ±0.01 | |
| 40 | V _{Nominal} | 13.560136 | -0.00048 | ±0.01 | |
| 50 | V _{Nominal} | 13.560149 | -0.00038 | ±0.01 | |
| Nominal Frequency: | | 13.560201 | | | |

Parameter Definitions:

Measurements performed at input voltage V_{Nominal} ± 15%.

| Parameter | Value |
|------------------------|----------|
| V _{Nominal} : | 5VDC |
| V _{Minimum} : | 4.25 VDC |
| V _{Maximum} : | 5.75 VDC |

Test Setup Photo(s)



15.225(d) Radiated Emissions & Band Edge

Test Setup / Conditions/ Data

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA • 714 993 6112
 Customer: **Magtek Incorporated**
 Specification: **15.225 Carrier and Spurious Emissions (13.110-14.010 MHz Transmitter)**
 Work Order #: **103582** Date: 2/4/2020
 Test Type: **Maximized Emissions** Time: 09:41:57
 Tested By: Don Nguyen Sequence#: 3
 Software: EMITest 5.03.12

Equipment Tested:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 1 | | | |

Support Equipment:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 1 | | | |

Test Conditions / Notes:

The EUT is placed on Styrofoam platform, connected to a support laptop via USB cable which also charges the EUT.

Device (AP4) has a single modular approved BLE module FCCID: QOQBGM13P IC:5123A-BGM13P installed.

The 13.56MHz NFC radio under evaluation is placed in constant transmit mode.
Operating at rated input power.

The manufacturer declares the highest EUT frequency generated or used is 2480MHz.

Frequency range of measurement = 9kHz- 13 GHz.
 9 kHz -150 kHz;RBW=200 Hz,VBW=600 Hz;
 150 kHz-30 MHz;RBW=9 kHz,VBW=27 kHz;
 30 MHz-1000 MHz;RBW=120 kHz,VBW=360 kHz,
 1000-13000MHz;RBW=1MHz,VBW=3MHz,

Test environment conditions:
 Temperature: 18.3°C
 Relative Humidity: 30%
 Pressure: 99.5kPa

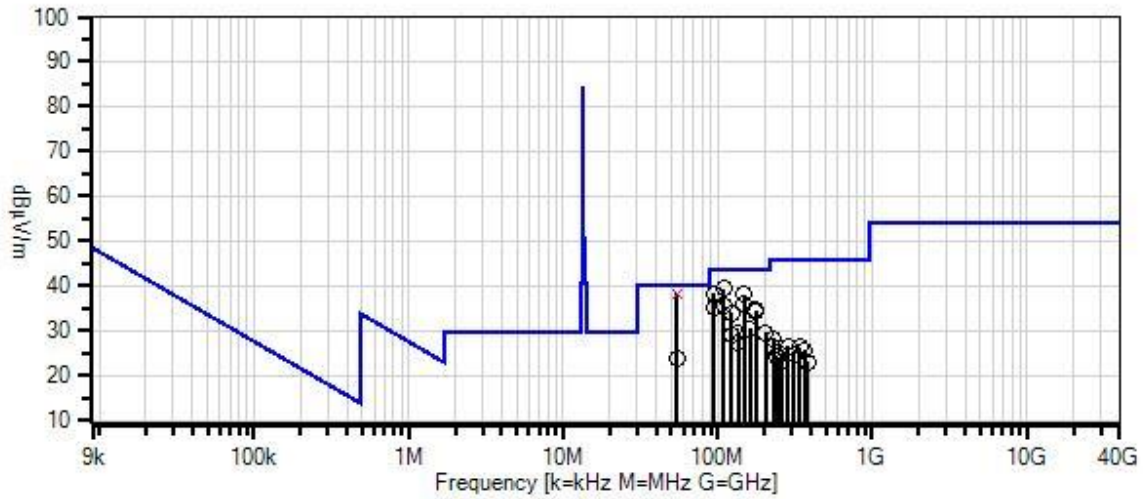
Site A

ANSI C63.10:2013

Emission profile of the EUT rotated along three orthogonal axes was investigated.
Recorded data represent worst case emission.

Modification #1 was in place during testing.

Magtek Incorporated WO#: 103582 Sequence#: 3 Date: 2/4/2020
 15.225 Carrier and Spurious Emissions (13.110-14.010 MHz Transmitter) Test Distance: 3 Meters Horiz



- Readings
 - Peak Readings
 - × QP Readings
 - * Average Readings
 - ▼ Ambient
- Software Version: 5.03.12
- 1 - 15.225 Carrier and Spurious Emissions (13.110-14.010 MHz Transmitter)

Test Equipment:

| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|----|----------|-----------------------------------|--------------------------|------------------|--------------|
| T1 | AN02869 | Spectrum Analyzer | E4440A | 7/25/2019 | 7/25/2020 |
| T2 | AN01995 | Biconilog Antenna | CBL6111C | 4/23/2018 | 4/23/2020 |
| T3 | ANP05275 | Attenuator | 1W | 4/5/2018 | 4/5/2020 |
| T4 | ANP05198 | Cable-Amplitude +15C to +45C (dB) | 8268 | 12/4/2018 | 12/4/2020 |
| T5 | AN00309 | Preamp | 8447D | 12/24/2019 | 12/24/2021 |
| T6 | ANP05050 | Cable | RG223/U | 12/24/2018 | 12/24/2020 |
| | AN00786 | Preamp | 83017A | 5/12/2018 | 5/12/2020 |
| | AN00849 | Horn Antenna | 3115 | 3/14/2018 | 3/14/2020 |
| | ANP07139 | Cable | ANDL1-PNMNM-48 | 3/4/2019 | 3/4/2021 |
| | ANP07244 | Cable | 32022-29094K-29094K-24TC | 7/5/2018 | 7/5/2020 |
| | AN03367 | Horn Antenna | 62-GH-62-25. | 8/1/2019 | 8/1/2021 |
| | AN00314 | Loop Antenna | 6502 | 5/13/2018 | 5/13/2020 |

Measurement Data:

Reading listed by margin.

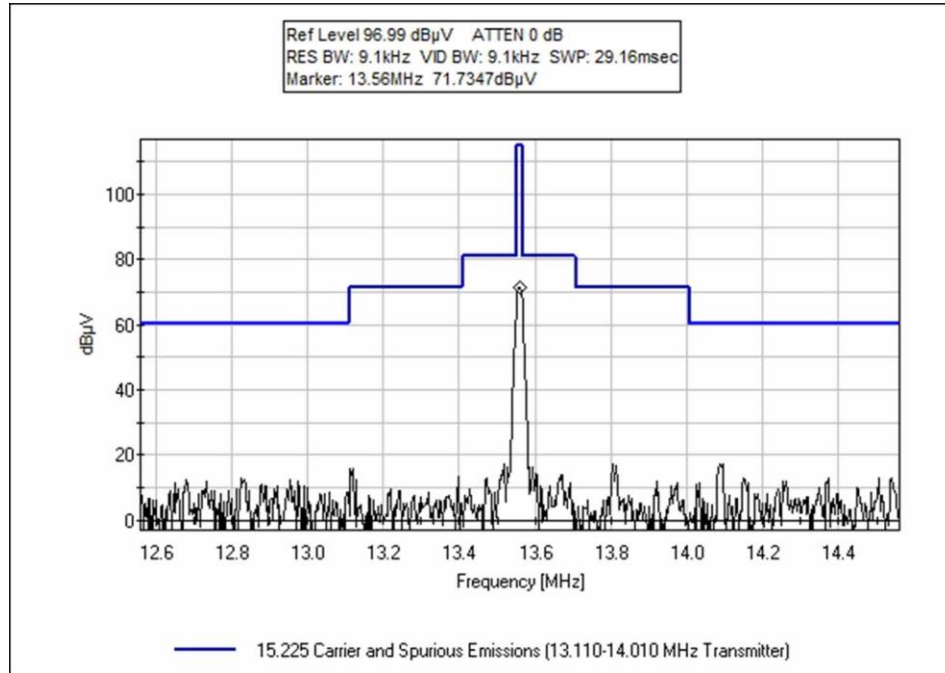
Test Distance: 3 Meters

| # | Freq MHz | Rdng dB μ V | T1 T5 dB | T2 T6 dB | T3 dB | T4 dB | Dist Table | Corr dB μ V/m | Spec dB μ V/m | Margin dB | Polar Ant |
|----|---------------|--------------------|----------------|----------------|----------|----------|---------------|----------------------|----------------------|--------------|--------------|
| 1 | 54.240M QP | 51.9 | +0.0 -28.1 | +7.1 +0.1 | +6.0 | +1.3 | +0.0 | 38.3 | 40.0 | -1.7 | Vert |
| ^ | 54.240M | 53.2 | +0.0 -28.1 | +7.1 +0.1 | +6.0 | +1.3 | +0.0 | 39.6 | 40.0 | -0.4 | Vert |
| 3 | 108.480M | 48.7 | +0.0 -28.0 | +10.8 +0.1 | +6.0 | +1.8 | +0.0 | 39.4 | 43.5 | -4.1 | Vert |
| 4 | 94.920M | 48.9 | +0.0 -28.0 | +9.4 +0.1 | +6.0 | +1.8 | +0.0 | 38.2 | 43.5 | -5.3 | Vert |
| 5 | 149.160M | 46.3 | +0.0 -28.0 | +11.3 +0.2 | +6.0 | +2.2 | +0.0 | 38.0 | 43.5 | -5.5 | Vert |
| 6 | 149.160M | 44.4 | +0.0 -28.0 | +11.3 +0.2 | +6.0 | +2.2 | +0.0 | 36.1 | 43.5 | -7.4 | Horiz |
| 7 | 108.480M | 45.0 | +0.0 -28.0 | +10.8 +0.1 | +6.0 | +1.8 | +0.0 | 35.7 | 43.5 | -7.8 | Horiz |
| 8 | 94.920M | 45.7 | +0.0 -28.0 | +9.4 +0.1 | +6.0 | +1.8 | +0.0 | 35.0 | 43.5 | -8.5 | Horiz |
| 9 | 176.280M | 44.6 | +0.0 -28.0 | +9.4 +0.2 | +6.0 | +2.4 | +0.0 | 34.6 | 43.5 | -8.9 | Horiz |
| 10 | 176.280M | 44.4 | +0.0 -28.0 | +9.4 +0.2 | +6.0 | +2.4 | +0.0 | 34.4 | 43.5 | -9.1 | Vert |
| 11 | 122.040M | 42.2 | +0.0 -28.0 | +11.8 +0.1 | +6.0 | +1.9 | +0.0 | 34.0 | 43.5 | -9.5 | Vert |
| 12 | 162.720M | 39.4 | +0.0 -28.0 | +10.5 +0.2 | +6.0 | +2.3 | +0.0 | 30.4 | 43.5 | -13.1 | Horiz |
| 13 | 162.720M | 39.2 | +0.0 -28.0 | +10.5 +0.2 | +6.0 | +2.3 | +0.0 | 30.2 | 43.5 | -13.3 | Vert |
| 14 | 203.400M | 39.3 | +0.0 -28.0 | +9.4 +0.2 | +6.0 | +2.6 | +0.0 | 29.5 | 43.5 | -14.0 | Horiz |
| 15 | 135.600M | 37.4 | +0.0 -28.0 | +11.8 +0.2 | +6.0 | +2.1 | +0.0 | 29.5 | 43.5 | -14.0 | Horiz |

| | | | | | | | | | | | |
|----|----------|------|---------------|---------------|------|------|------|------|------|-------|-------|
| 16 | 122.040M | 37.1 | +0.0 -28.0 | +11.8 +0.1 | +6.0 | +1.9 | +0.0 | 28.9 | 43.5 | -14.6 | Horiz |
| 17 | 54.240M | 37.4 | +0.0 -28.1 | +7.1 +0.1 | +6.0 | +1.3 | +0.0 | 23.8 | 40.0 | -16.2 | Horiz |
| 18 | 135.600M | 35.0 | +0.0 -28.0 | +11.8 +0.2 | +6.0 | +2.1 | +0.0 | 27.1 | 43.5 | -16.4 | Vert |
| 19 | 230.520M | 35.6 | +0.0 -27.9 | +11.5 +0.2 | +6.0 | +2.8 | +0.0 | 28.2 | 46.0 | -17.8 | Horiz |
| 20 | 284.760M | 31.9 | +0.0 -27.9 | +13.2 +0.3 | +6.0 | +3.1 | +0.0 | 26.6 | 46.0 | -19.4 | Horiz |
| 21 | 339.000M | 30.1 | +0.0 -27.9 | +14.4 +0.3 | +6.0 | +3.4 | +0.0 | 26.3 | 46.0 | -19.7 | Horiz |
| 22 | 230.520M | 33.7 | +0.0 -27.9 | +11.5 +0.2 | +6.0 | +2.8 | +0.0 | 26.3 | 46.0 | -19.7 | Vert |
| 23 | 366.120M | 28.5 | +0.0 -27.9 | +15.1 +0.3 | +6.0 | +3.6 | +0.0 | 25.6 | 46.0 | -20.4 | Horiz |
| 24 | 311.880M | 29.4 | +0.0 -27.9 | +13.7 +0.3 | +6.0 | +3.3 | +0.0 | 24.8 | 46.0 | -21.2 | Horiz |
| 25 | 257.640M | 30.6 | +0.0 -27.9 | +13.0 +0.2 | +6.0 | +2.9 | +0.0 | 24.8 | 46.0 | -21.2 | Horiz |
| 26 | 244.080M | 30.5 | +0.0 -27.9 | +12.5 +0.2 | +6.0 | +2.9 | +0.0 | 24.2 | 46.0 | -21.8 | Horiz |
| 27 | 379.680M | 25.6 | +0.0 -27.9 | +15.4 +0.3 | +6.0 | +3.6 | +0.0 | 23.0 | 46.0 | -23.0 | Horiz |
| 28 | 257.640M | 28.7 | +0.0 -27.9 | +13.0 +0.2 | +6.0 | +2.9 | +0.0 | 22.9 | 46.0 | -23.1 | Vert |

| Band Edge Summary | | | | | |
|-------------------|------------|-----------|------------------------------|---------------------|---------|
| Frequency (MHz) | Modulation | Ant. Type | Field Strength (dBuV/m @30m) | Limit (dBuV/m @30m) | Results |
| 13.110 | OOK | Integral | -12.0 | ≤29.5 | Pass |
| 14.010 | OOK | Integral | -24.3 | ≤29.5 | Pass |

Band Edge Plots



Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA • 714 993 6112
 Customer: **Magtek Incorporated**
 Specification: **15.225 Carrier and Spurious Emissions (13.110-14.010 MHz Transmitter)**
 Work Order #: **103582** Date: 1/17/2020
 Test Type: **Radiated Scan** Time: 14:48:03
 Tested By: E. Wong Sequence#: 1
 Software: EMITest 5.03.12

Equipment Tested:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 1 | | | |

Support Equipment:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 1 | | | |

Test Conditions / Notes:

The EUT is placed on Styrofoam platform, connected to a support laptop via USB cable which also charges the EUT.
 Device (AP4) has a single modular approved BLE module FCCID: QOQBGM13P IC:5123A-BGM13P installed.
 The 13.56MHz NFC radio under evaluation is placed in constant transmit mode.
 Operating at rated input power.

The manufacturer declares the highest EUT frequency generated or used is 12MHz
 Frequency range of measurement = 13.11-14.01MHz
 RBW=9 kHz,VBW=27 kHz

Test environment conditions:
 Temperature: 20°C
 Relative Humidity: 51%
 Pressure: 99.3kPa

Site A
 ANSI C63.10-2013

Emission profile of the EUT rotated along three orthogonal axes was investigated.
 Recorded data represent worse case emission.

Modification #1 was in place during testing.

Test Equipment:

| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|----|----------|--------------------------------------|--------|------------------|--------------|
| T1 | AN02869 | Spectrum Analyzer | E4440A | 7/25/2019 | 7/25/2020 |
| T2 | ANP05198 | Cable-Amplitude +15C to +45C (dB) | 8268 | 12/4/2018 | 12/4/2020 |
| T3 | AN00314 | Loop Antenna | 6502 | 5/13/2018 | 5/13/2020 |

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq MHz | Rdng dB μ V | T1 dB | T2 dB | T3 dB | Dist Table | Corr dB μ V/m | Spec dB μ V/m | Margin dB | Polar Ant |
|---|-------------|--------------------|----------|----------|----------|---------------|----------------------|----------------------|--------------|--------------|
| 1 | 13.110M | 18.8 | +0.0 | +0.6 | +8.6 | -40.0 | -12.0 | 29.5 | -41.5 | Paral |
| | | | | | | | | | Y_bandedge L | |
| 2 | 14.010M | 6.6 | +0.0 | +0.6 | +8.5 | -40.0 | -24.3 | 29.5 | -53.8 | Paral |
| | | | | | | | | | Y_bandedge H | |

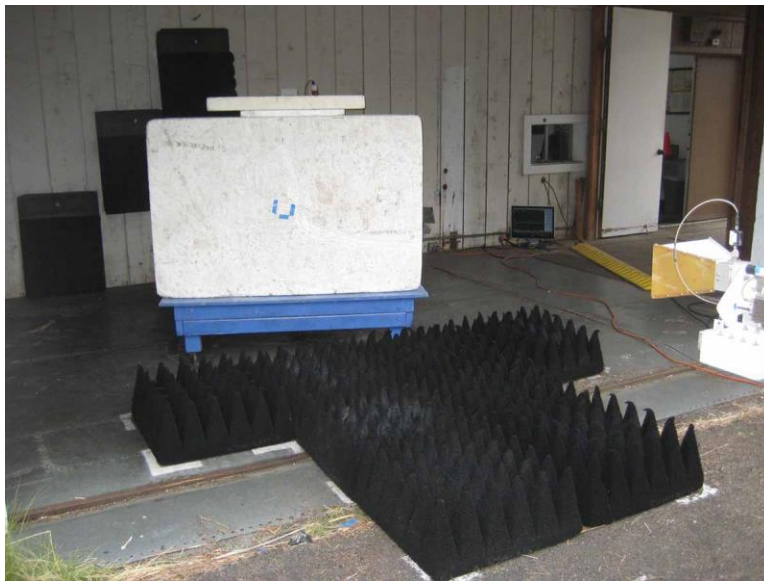
Test Setup Photo(s)



Below 1GHz



Below 1GHz



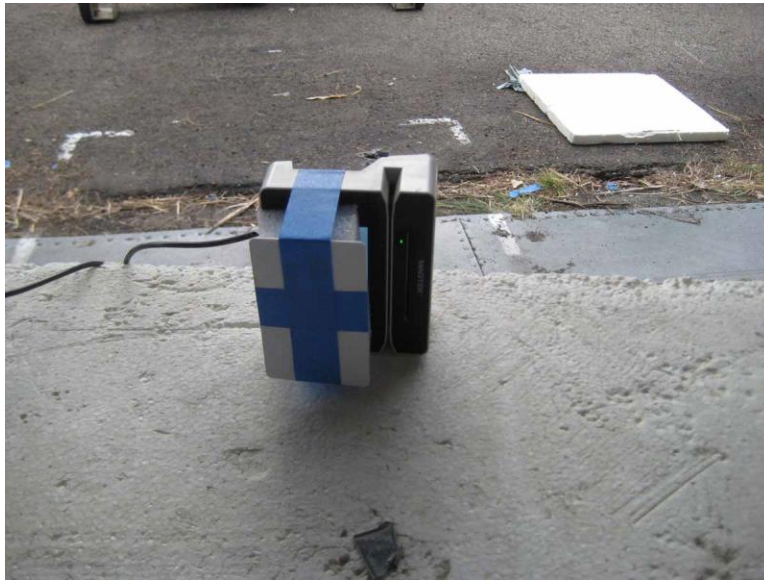
Above 1GHz



X-Axis



Y-Axis



Z-Axis

15.207 AC Conducted Emissions

Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA • 714 -993 -6112
 Customer: **Magtek Incorporated**
 Specification: **15.207 AC Mains - Average**
 Work Order #: **103582** Date: 1/21/2020
 Test Type: **Conducted Emissions** Time: 15:03:27
 Tested By: Don Nguyen Sequence#: 10
 Software: EMITest 5.03.12 120V 60Hz

Equipment Tested:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 1 | | | |

Support Equipment:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 1 | | | |

Test Conditions / Notes:

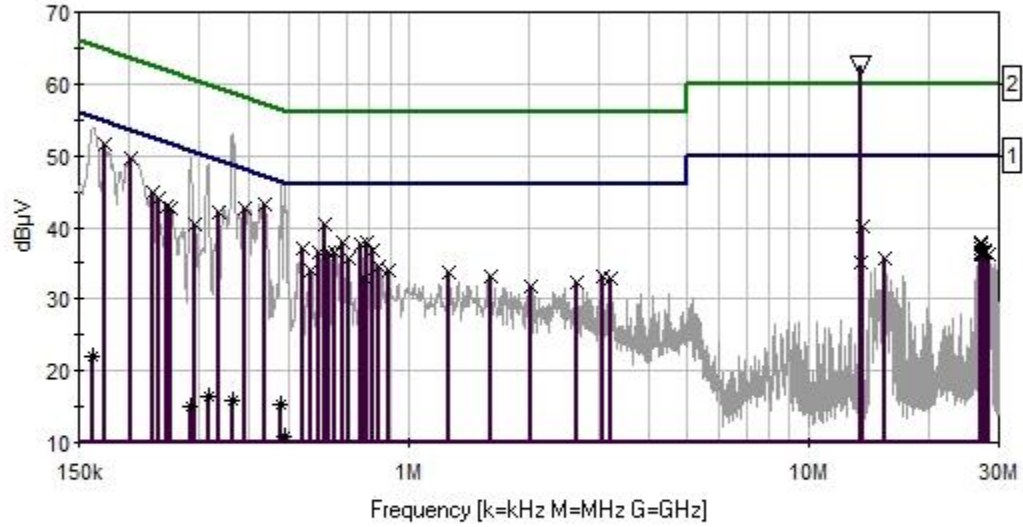
The EUT is placed on tabletop and connected to a support laptop via USB port. A credit card is on top of the EUT and the software ApolloFCC is running on the laptop to display transactions via NFC.
 Operating frequency: 13.56MHz.

Frequency range of measurement = 150kHz-30MHz
 RBW=9kHz, VBW=30kHz

Test environmental conditions:
 Temperature: 19.6°C
 Relative Humidity: 51%
 Atmospheric Pressure: 99.4kPa

Site A
 ANSI C63.10:2013

Magtek Incorporated WO#: 103582 Sequence#: 10 Date: 1/21/2020
 15.207 AC Mains - Average Test Lead: 120V 60Hz L1-Line



| | | | |
|---|----------------------------------|---|-------------------------------|
| — | Sweep Data | — | 1 - 15.207 AC Mains - Average |
| — | 2 - 15.207 AC Mains - Quasi-peak | — | Readings |
| x | Peak Readings | * | Average Readings |
| ▽ | Ambient | | Software Version: 5.03.12 |

Test Equipment:

| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|----|-----------|-------------------|---------------------|------------------|--------------|
| T1 | ANP07545 | Attenuator | SA18N10W-06 | 1/18/2019 | 1/18/2021 |
| T2 | ANP07338 | Cable | 2249-Y-240 | 12/24/2019 | 12/24/2021 |
| T3 | AN02869 | Spectrum Analyzer | E4440A | 7/25/2019 | 7/25/2020 |
| T4 | AN02610 | High Pass Filter | HE9615-150K-50-720B | 10/22/2019 | 10/22/2021 |
| T5 | AN00847.1 | 50uH LISN-Line 1 | 3816/2NM | 3/11/2019 | 3/11/2020 |
| | AN00847.1 | 50uH LISN-Line 2 | 3816/2NM | 3/11/2019 | 3/11/2020 |

Measurement Data: Reading listed by frequency. Test Lead: L1-Line

| # | Freq MHz | Rdng dB μ V | T1 T5 dB | T2 dB | T3 dB | T4 dB | Dist Table | Corr dB μ V | Spec dB μ V | Margin dB | Polar Ant |
|----|-----------------|--------------------|----------------|----------|----------|----------|---------------|--------------------|--------------------|--------------|--------------|
| 1 | 162.363k | 47.4 | +5.8 +0.1 | +0.0 | +0.0 | +0.5 | +0.0 | 53.8 | 55.3 | -1.5 | L1-Li |
| 2 | 162.363k Ave | 15.5 | +5.8 +0.1 | +0.0 | +0.0 | +0.5 | +0.0 | 21.9 | 55.3 | -33.4 | L1-Li |
| 3 | 173.998k | 45.3 | +5.8 +0.1 | +0.0 | +0.0 | +0.3 | +0.0 | 51.5 | 54.8 | -3.3 | L1-Li |
| 4 | 201.632k | 43.6 | +5.8 +0.1 | +0.0 | +0.0 | +0.2 | +0.0 | 49.7 | 53.5 | -3.8 | L1-Li |
| 5 | 230.720k | 38.8 | +5.8 +0.1 | +0.0 | +0.0 | +0.2 | +0.0 | 44.9 | 52.4 | -7.5 | L1-Li |
| 6 | 237.265k | 37.9 | +5.8 +0.1 | +0.0 | +0.0 | +0.2 | +0.0 | 44.0 | 52.2 | -8.2 | L1-Li |
| 7 | 248.900k | 37.0 | +5.8 +0.1 | +0.0 | +0.0 | +0.1 | +0.0 | 43.0 | 51.8 | -8.8 | L1-Li |
| 8 | 255.445k | 36.6 | +5.8 +0.1 | +0.0 | +0.0 | +0.1 | +0.0 | 42.6 | 51.6 | -9.0 | L1-Li |
| 9 | 285.988k | 43.7 | +5.8 +0.1 | +0.0 | +0.0 | +0.1 | +0.0 | 49.7 | 50.6 | -0.9 | L1-Li |
| 10 | 285.988k Ave | 9.0 | +5.8 +0.1 | +0.0 | +0.0 | +0.1 | +0.0 | 15.0 | 50.6 | -35.6 | L1-Li |
| 11 | 291.805k | 34.5 | +5.8 +0.1 | +0.0 | +0.0 | +0.1 | +0.0 | 40.5 | 50.5 | -10.0 | L1-Li |
| 12 | 315.803k | 42.8 | +5.8 +0.1 | +0.0 | +0.0 | +0.1 | +0.0 | 48.8 | 49.8 | -1.0 | L1-Li |
| 13 | 315.803k Ave | 10.4 | +5.8 +0.1 | +0.0 | +0.0 | +0.1 | +0.0 | 16.4 | 49.8 | -33.4 | L1-Li |
| 14 | 334.710k | 36.2 | +5.8 +0.0 | +0.0 | +0.0 | +0.1 | +0.0 | 42.1 | 49.3 | -7.2 | L1-Li |
| 15 | 362.344k Ave | 9.9 | +5.8 +0.0 | +0.0 | +0.0 | +0.2 | +0.0 | 15.9 | 48.7 | -32.8 | L1-Li |
| 16 | 362.344k | 46.9 | +5.8 +0.0 | +0.0 | +0.0 | +0.2 | +0.0 | 52.9 | 48.7 | +4.2 | L1-Li |
| 17 | 392.160k | 36.6 | +5.8 +0.1 | +0.0 | +0.0 | +0.2 | +0.0 | 42.7 | 48.0 | -5.3 | L1-Li |
| 18 | 435.792k | 37.1 | +5.8 +0.1 | +0.0 | +0.0 | +0.2 | +0.0 | 43.2 | 47.1 | -3.9 | L1-Li |

| | | | | | | | | | | | |
|----|--------------------|------|--------------|------|------|------|------|------|--------------------------------------|-------|-------|
| 19 | 479.424k Ave | 9.1 | +5.8 +0.1 | +0.0 | +0.0 | +0.3 | +0.0 | 15.3 | 46.3 | -31.0 | L1-Li |
| 20 | 479.424k | 39.7 | +5.8 +0.1 | +0.0 | +0.0 | +0.3 | +0.0 | 45.9 | 46.3 | -0.4 | L1-Li |
| 21 | 490.332k Ave | 4.8 | +5.8 +0.1 | +0.0 | +0.0 | +0.3 | +0.0 | 11.0 | 46.2 | -35.2 | L1-Li |
| 22 | 490.332k | 40.1 | +5.8 +0.1 | +0.0 | +0.0 | +0.3 | +0.0 | 46.3 | 46.2 | +0.1 | L1-Li |
| 23 | 544.873k | 31.0 | +5.8 +0.1 | +0.0 | +0.0 | +0.3 | +0.0 | 37.2 | 46.0 | -8.8 | L1-Li |
| 24 | 570.325k | 27.7 | +5.8 +0.1 | +0.1 | +0.0 | +0.3 | +0.0 | 34.0 | 46.0 | -12.0 | L1-Li |
| 25 | 600.141k | 30.2 | +5.8 +0.1 | +0.1 | +0.0 | +0.3 | +0.0 | 36.5 | 46.0 | -9.5 | L1-Li |
| 26 | 616.866k | 34.0 | +5.8 +0.1 | +0.1 | +0.0 | +0.3 | +0.0 | 40.3 | 46.0 | -5.7 | L1-Li |
| 27 | 629.956k | 30.1 | +5.8 +0.1 | +0.1 | +0.0 | +0.3 | +0.0 | 36.4 | 46.0 | -9.6 | L1-Li |
| 28 | 653.227k | 30.1 | +5.8 +0.1 | +0.1 | +0.0 | +0.3 | +0.0 | 36.4 | 46.0 | -9.6 | L1-Li |
| 29 | 682.315k | 31.5 | +5.8 +0.1 | +0.1 | +0.0 | +0.3 | +0.0 | 37.8 | 46.0 | -8.2 | L1-Li |
| 30 | 706.313k | 29.3 | +5.8 +0.1 | +0.1 | +0.0 | +0.3 | +0.0 | 35.6 | 46.0 | -10.4 | L1-Li |
| 31 | 763.035k | 31.3 | +5.8 +0.1 | +0.1 | +0.0 | +0.3 | +0.0 | 37.6 | 46.0 | -8.4 | L1-Li |
| 32 | 779.033k | 26.7 | +5.8 +0.1 | +0.1 | +0.0 | +0.3 | +0.0 | 33.0 | 46.0 | -13.0 | L1-Li |
| 33 | 787.033k | 31.5 | +5.8 +0.1 | +0.1 | +0.0 | +0.3 | +0.0 | 37.8 | 46.0 | -8.2 | L1-Li |
| 34 | 816.121k | 30.4 | +5.8 +0.1 | +0.1 | +0.0 | +0.3 | +0.0 | 36.7 | 46.0 | -9.3 | L1-Li |
| 35 | 848.118k | 28.3 | +5.8 +0.1 | +0.1 | +0.0 | +0.3 | +0.0 | 34.6 | 46.0 | -11.4 | L1-Li |
| 36 | 894.216k | 27.6 | +5.8 +0.1 | +0.1 | +0.0 | +0.3 | +0.0 | 33.9 | 46.0 | -12.1 | L1-Li |
| 37 | 1.268M | 27.4 | +5.8 +0.1 | +0.1 | +0.0 | +0.2 | +0.0 | 33.6 | 46.0 | -12.4 | L1-Li |
| 38 | 1.604M | 27.1 | +5.8 +0.1 | +0.1 | +0.0 | +0.2 | +0.0 | 33.3 | 46.0 | -12.7 | L1-Li |
| 39 | 2.034M | 25.6 | +5.8 +0.1 | +0.1 | +0.0 | +0.2 | +0.0 | 31.8 | 46.0 | -14.2 | L1-Li |
| 40 | 2.638M | 26.0 | +5.8 +0.1 | +0.1 | +0.0 | +0.2 | +0.0 | 32.2 | 46.0 | -13.8 | L1-Li |
| 41 | 3.076M | 27.0 | +5.8 +0.1 | +0.1 | +0.0 | +0.2 | +0.0 | 33.2 | 46.0 | -12.8 | L1-Li |
| 42 | 3.195M | 26.9 | +5.8 +0.1 | +0.1 | +0.0 | +0.1 | +0.0 | 33.0 | 46.0 | -13.0 | L1-Li |
| 43 | 13.560M Ambient | 56.0 | +5.8 +0.2 | +0.3 | +0.0 | +0.2 | +0.0 | 62.5 | 50.0 NFC fundamental frequency | +12.5 | L1-Li |

| | | | | | | | | | | | |
|----------------------------------|---------|------|--------------|------|------|------|------|------|------|-------|-------|
| 44 | 13.560M | 28.3 | +5.8 +0.1 | +0.3 | +0.0 | +0.2 | +0.0 | 35.1 | 50.0 | -14.9 | L1-Li |
| Antenna is terminated with 24ohm | | | | | | | | | | | |
| 45 | 13.770M | 33.6 | +5.8 +0.2 | +0.3 | +0.0 | +0.2 | +0.0 | 40.1 | 50.0 | -9.9 | L1-Li |
| 46 | 15.490M | 29.3 | +5.8 +0.2 | +0.3 | +0.0 | +0.2 | +0.0 | 35.8 | 50.0 | -14.2 | L1-Li |
| 47 | 26.917M | 31.0 | +5.8 +0.4 | +0.4 | +0.0 | +0.2 | +0.0 | 37.8 | 50.0 | -12.2 | L1-Li |
| 48 | 26.937M | 29.4 | +5.8 +0.4 | +0.4 | +0.0 | +0.2 | +0.0 | 36.2 | 50.0 | -13.8 | L1-Li |
| 49 | 26.992M | 30.7 | +5.8 +0.4 | +0.4 | +0.0 | +0.2 | +0.0 | 37.5 | 50.0 | -12.5 | L1-Li |
| 50 | 27.026M | 30.4 | +5.8 +0.4 | +0.4 | +0.0 | +0.2 | +0.0 | 37.2 | 50.0 | -12.8 | L1-Li |
| 51 | 27.095M | 29.6 | +5.8 +0.4 | +0.4 | +0.0 | +0.2 | +0.0 | 36.4 | 50.0 | -13.6 | L1-Li |
| 52 | 27.273M | 29.5 | +5.8 +0.4 | +0.4 | +0.0 | +0.2 | +0.0 | 36.3 | 50.0 | -13.7 | L1-Li |
| 53 | 27.410M | 29.5 | +5.8 +0.4 | +0.5 | +0.0 | +0.2 | +0.0 | 36.4 | 50.0 | -13.6 | L1-Li |
| 54 | 27.526M | 29.5 | +5.8 +0.4 | +0.5 | +0.0 | +0.2 | +0.0 | 36.4 | 50.0 | -13.6 | L1-Li |
| 55 | 27.670M | 29.5 | +5.8 +0.4 | +0.5 | +0.0 | +0.2 | +0.0 | 36.4 | 50.0 | -13.6 | L1-Li |
| 56 | 27.773M | 29.8 | +5.8 +0.4 | +0.5 | +0.0 | +0.2 | +0.0 | 36.7 | 50.0 | -13.3 | L1-Li |
| 57 | 28.260M | 29.2 | +5.8 +0.4 | +0.5 | +0.0 | +0.2 | +0.0 | 36.1 | 50.0 | -13.9 | L1-Li |

Test Location: CKC Laboratories, Inc • 110 N. Olinda Place • Brea, CA • 714 993 6112
 Customer: **Magtek Incorporated**
 Specification: **15.207 AC Mains - Average**
 Work Order #: **103582** Date: 1/21/2020
 Test Type: **Conducted Emissions** Time: 14:58:47
 Tested By: Don Nguyen Sequence#: 9
 Software: EMITest 5.03.12 120V 60Hz

Equipment Tested:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 1 | | | |

Support Equipment:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 1 | | | |

Test Conditions / Notes:

The EUT is placed on tabletop and connected to a support laptop via USB port. A credit card is on top of the EUT and the software ApolloFCC is running on the laptop to display transactions via NFC.
 Operating frequency: 13.56MHz.

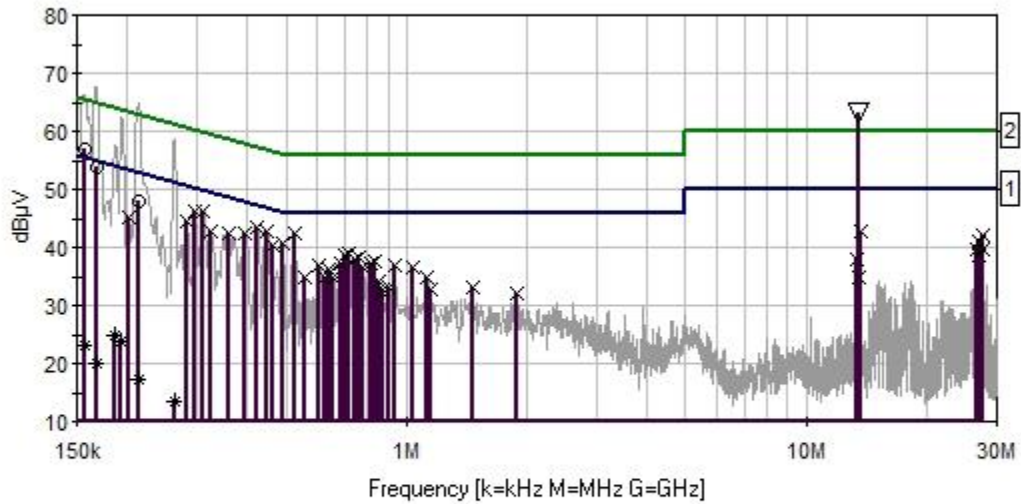
Frequency range of measurement = 150kHz-30MHz
 RBW=9kHz, VBW=30kHz

Test environmental conditions:
 Temperature: 19.6°C
 Relative Humidity: 51%
 Atmospheric Pressure: 99.4kPa

Site A

ANSI C63.10:2013

Magtek Incorporated WO#: 103582 Sequence#: 9 Date: 1/21/2020
 15.207 AC Mains - Average Test Lead: 120V 60Hz L2-Neutral



| | | | |
|---|----------------------------------|---|-------------------------------|
| — | Sweep Data | — | 1 - 15.207 AC Mains - Average |
| — | 2 - 15.207 AC Mains - Quasi-peak | — | Readings |
| × | Peak Readings | ○ | QP Readings |
| * | Average Readings | ▽ | Ambient |

Software Version: 5.03.12

Test Equipment:

| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|----|-----------|-------------------|---------------------|------------------|--------------|
| T1 | ANP07545 | Attenuator | SA18N10W-06 | 1/18/2019 | 1/18/2021 |
| T2 | ANP07338 | Cable | 2249-Y-240 | 12/24/2019 | 12/24/2021 |
| T3 | AN02869 | Spectrum Analyzer | E4440A | 7/25/2019 | 7/25/2020 |
| T4 | AN02610 | High Pass Filter | HE9615-150K-50-720B | 10/22/2019 | 10/22/2021 |
| | AN00847.1 | 50uH LISN-Line 1 | 3816/2NM | 3/11/2019 | 3/11/2020 |
| T5 | AN00847.1 | 50uH LISN-Line 2 | 3816/2NM | 3/11/2019 | 3/11/2020 |

Measurement Data:

Reading listed by frequency.

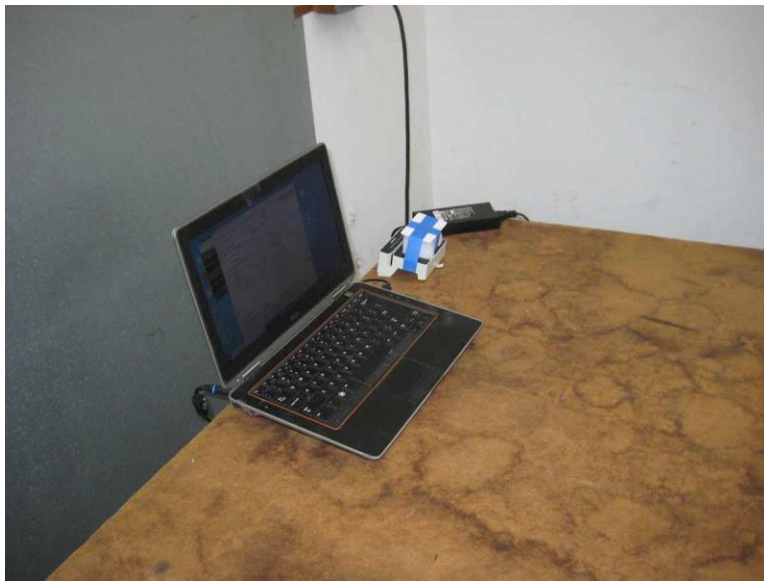
Test Lead: L2-Neutral

| # | Freq MHz | Rdng dB μ V | T1 T5 dB | T2 dB | T3 dB | T4 dB | Dist Table | Corr dB μ V | Spec dB μ V | Margin dB | Polar Ant |
|----|-----------------|--------------------|----------------|----------|----------|----------|---------------|--------------------|--------------------|--------------|--------------|
| 1 | 156.545k | 59.9 | +5.8 +0.0 | +0.0 | +0.0 | +0.6 | +0.0 | 66.3 | 55.6 | +10.7 | L2-Ne |
| 2 | 156.545k Ave | 16.8 | +5.8 +0.0 | +0.0 | +0.0 | +0.6 | +0.0 | 23.2 | 55.6 | -32.4 | L2-Ne |
| 3 | 156.545k QP | 50.6 | +5.8 +0.0 | +0.0 | +0.0 | +0.6 | +0.0 | 57.0 | 65.6 | -8.6 | L2-Ne |
| 4 | 167.453k | 61.6 | +5.8 +0.0 | +0.0 | +0.0 | +0.3 | +0.0 | 67.7 | 55.1 | +12.6 | L2-Ne |
| 5 | 167.453k QP | 47.6 | +5.8 +0.0 | +0.0 | +0.0 | +0.3 | +0.0 | 53.7 | 65.1 | -11.4 | L2-Ne |
| 6 | 167.453k Ave | 13.8 | +5.8 +0.0 | +0.0 | +0.0 | +0.3 | +0.0 | 19.9 | 55.1 | -35.2 | L2-Ne |
| 7 | 186.360k Ave | 18.9 | +5.8 +0.0 | +0.0 | +0.0 | +0.2 | +0.0 | 24.9 | 54.2 | -29.3 | L2-Ne |
| 8 | 186.360k | 51.5 | +5.8 +0.0 | +0.0 | +0.0 | +0.2 | +0.0 | 57.5 | 54.2 | +3.3 | L2-Ne |
| 9 | 194.360k | 56.3 | +5.8 +0.0 | +0.0 | +0.0 | +0.2 | +0.0 | 62.3 | 53.8 | +8.5 | L2-Ne |
| 10 | 194.360k Ave | 17.7 | +5.8 +0.0 | +0.0 | +0.0 | +0.2 | +0.0 | 23.7 | 53.8 | -30.1 | L2-Ne |
| 11 | 202.359k | 39.2 | +5.8 +0.0 | +0.0 | +0.0 | +0.2 | +0.0 | 45.2 | 53.5 | -8.3 | L2-Ne |
| 12 | 213.994k Ave | 11.3 | +5.8 +0.0 | +0.0 | +0.0 | +0.2 | +0.0 | 17.3 | 53.0 | -35.7 | L2-Ne |
| 13 | 213.994k QP | 42.0 | +5.8 +0.0 | +0.0 | +0.0 | +0.2 | +0.0 | 48.0 | 63.0 | -15.0 | L2-Ne |
| 14 | 213.994k | 58.7 | +5.8 +0.0 | +0.0 | +0.0 | +0.2 | +0.0 | 64.7 | 53.0 | +11.7 | L2-Ne |
| 15 | 262.717k | 52.6 | +5.8 +0.0 | +0.0 | +0.0 | +0.1 | +0.0 | 58.5 | 51.3 | +7.2 | L2-Ne |
| 16 | 262.717k Ave | 7.4 | +5.8 +0.0 | +0.0 | +0.0 | +0.1 | +0.0 | 13.3 | 51.3 | -38.0 | L2-Ne |
| 17 | 283.079k | 38.5 | +5.8 +0.0 | +0.0 | +0.0 | +0.1 | +0.0 | 44.4 | 50.7 | -6.3 | L2-Ne |
| 18 | 296.168k | 40.3 | +5.8 +0.0 | +0.0 | +0.0 | +0.1 | +0.0 | 46.2 | 50.3 | -4.1 | L2-Ne |

| | | | | | | | | | | | |
|----|----------|------|--------------|------|------|------|------|------|------|-------|-------|
| 19 | 311.440k | 40.2 | +5.8 +0.0 | +0.0 | +0.0 | +0.1 | +0.0 | 46.1 | 49.9 | -3.8 | L2-Ne |
| 20 | 323.802k | 37.0 | +5.8 +0.0 | +0.0 | +0.0 | +0.1 | +0.0 | 42.9 | 49.6 | -6.7 | L2-Ne |
| 21 | 359.435k | 36.3 | +5.8 +0.0 | +0.0 | +0.0 | +0.2 | +0.0 | 42.3 | 48.7 | -6.4 | L2-Ne |
| 22 | 395.796k | 36.4 | +5.8 +0.0 | +0.0 | +0.0 | +0.2 | +0.0 | 42.4 | 47.9 | -5.5 | L2-Ne |
| 23 | 423.429k | 37.3 | +5.8 +0.0 | +0.0 | +0.0 | +0.2 | +0.0 | 43.3 | 47.4 | -4.1 | L2-Ne |
| 24 | 449.609k | 36.5 | +5.8 +0.0 | +0.0 | +0.0 | +0.3 | +0.0 | 42.6 | 46.9 | -4.3 | L2-Ne |
| 25 | 461.244k | 34.4 | +5.8 +0.0 | +0.0 | +0.0 | +0.3 | +0.0 | 40.5 | 46.7 | -6.2 | L2-Ne |
| 26 | 491.060k | 34.5 | +5.8 +0.0 | +0.0 | +0.0 | +0.3 | +0.0 | 40.6 | 46.1 | -5.5 | L2-Ne |
| 27 | 524.511k | 36.4 | +5.8 +0.0 | +0.0 | +0.0 | +0.3 | +0.0 | 42.5 | 46.0 | -3.5 | L2-Ne |
| 28 | 555.781k | 28.5 | +5.8 +0.0 | +0.1 | +0.0 | +0.3 | +0.0 | 34.7 | 46.0 | -11.3 | L2-Ne |
| 29 | 605.958k | 30.6 | +5.8 +0.0 | +0.1 | +0.0 | +0.3 | +0.0 | 36.8 | 46.0 | -9.2 | L2-Ne |
| 30 | 625.593k | 28.7 | +5.8 +0.0 | +0.1 | +0.0 | +0.3 | +0.0 | 34.9 | 46.0 | -11.1 | L2-Ne |
| 31 | 637.228k | 30.1 | +5.8 +0.0 | +0.1 | +0.0 | +0.3 | +0.0 | 36.3 | 46.0 | -9.7 | L2-Ne |
| 32 | 644.500k | 29.7 | +5.8 +0.0 | +0.1 | +0.0 | +0.3 | +0.0 | 35.9 | 46.0 | -10.1 | L2-Ne |
| 33 | 657.590k | 28.6 | +5.8 +0.0 | +0.1 | +0.0 | +0.3 | +0.0 | 34.8 | 46.0 | -11.2 | L2-Ne |
| 34 | 689.587k | 31.2 | +5.8 +0.0 | +0.1 | +0.0 | +0.3 | +0.0 | 37.4 | 46.0 | -8.6 | L2-Ne |
| 35 | 700.495k | 32.5 | +5.8 +0.0 | +0.1 | +0.0 | +0.3 | +0.0 | 38.7 | 46.0 | -7.3 | L2-Ne |
| 36 | 715.039k | 32.8 | +5.8 +0.0 | +0.1 | +0.0 | +0.3 | +0.0 | 39.0 | 46.0 | -7.0 | L2-Ne |
| 37 | 741.219k | 31.9 | +5.8 +0.0 | +0.1 | +0.0 | +0.3 | +0.0 | 38.1 | 46.0 | -7.9 | L2-Ne |
| 38 | 757.944k | 32.1 | +5.8 +0.0 | +0.1 | +0.0 | +0.3 | +0.0 | 38.3 | 46.0 | -7.7 | L2-Ne |
| 39 | 776.852k | 30.4 | +5.8 +0.0 | +0.1 | +0.0 | +0.3 | +0.0 | 36.6 | 46.0 | -9.4 | L2-Ne |
| 40 | 813.212k | 31.0 | +5.8 +0.0 | +0.1 | +0.0 | +0.3 | +0.0 | 37.2 | 46.0 | -8.8 | L2-Ne |
| 41 | 835.755k | 31.5 | +5.8 +0.0 | +0.1 | +0.0 | +0.3 | +0.0 | 37.7 | 46.0 | -8.3 | L2-Ne |
| 42 | 854.663k | 27.9 | +5.8 +0.0 | +0.1 | +0.0 | +0.3 | +0.0 | 34.1 | 46.0 | -11.9 | L2-Ne |
| 43 | 870.661k | 26.6 | +5.8 +0.0 | +0.1 | +0.0 | +0.3 | +0.0 | 32.8 | 46.0 | -13.2 | L2-Ne |
| 44 | 877.205k | 25.7 | +5.8 +0.0 | +0.1 | +0.0 | +0.3 | +0.0 | 31.9 | 46.0 | -14.1 | L2-Ne |

| | | | | | | | | | | | |
|----|--------------------|------|--------------|------|------|------|------|------|--|-------|-------|
| 45 | 902.721k | 27.1 | +5.8 +0.0 | +0.1 | +0.0 | +0.2 | +0.0 | 33.2 | 46.0 | -12.8 | L2-Ne |
| 46 | 940.996k | 30.7 | +5.8 +0.0 | +0.1 | +0.0 | +0.2 | +0.0 | 36.8 | 46.0 | -9.2 | L2-Ne |
| 47 | 1.035M | 30.5 | +5.8 +0.0 | +0.1 | +0.0 | +0.2 | +0.0 | 36.6 | 46.0 | -9.4 | L2-Ne |
| 48 | 1.128M | 28.6 | +5.8 +0.0 | +0.1 | +0.0 | +0.2 | +0.0 | 34.7 | 46.0 | -11.3 | L2-Ne |
| 49 | 1.149M | 26.8 | +5.8 +0.0 | +0.1 | +0.0 | +0.2 | +0.0 | 32.9 | 46.0 | -13.1 | L2-Ne |
| 50 | 1.464M | 27.1 | +5.8 +0.0 | +0.1 | +0.0 | +0.2 | +0.0 | 33.2 | 46.0 | -12.8 | L2-Ne |
| 51 | 1.881M | 25.8 | +5.8 +0.1 | +0.1 | +0.0 | +0.2 | +0.0 | 32.0 | 46.0 | -14.0 | L2-Ne |
| 52 | 13.427M | 31.5 | +5.8 +0.2 | +0.3 | +0.0 | +0.2 | +0.0 | 38.0 | 50.0 | -12.0 | L2-Ne |
| 53 | 13.560M Ambient | 56.7 | +5.8 +0.2 | +0.3 | +0.0 | +0.2 | +0.0 | 63.2 | 50.0 NFC fundamental frequency | +13.2 | L2-Ne |
| 54 | 13.560M | 28.0 | +5.8 +0.2 | +0.3 | +0.0 | +0.2 | +0.0 | 35.0 | 50.0 Antenna is terminated with 24ohm | -15.0 | L2-Ne |
| 55 | 13.652M | 36.4 | +5.8 +0.2 | +0.3 | +0.0 | +0.2 | +0.0 | 42.9 | 50.0 | -7.1 | L2-Ne |
| 56 | 26.875M | 32.7 | +5.8 +0.6 | +0.4 | +0.0 | +0.2 | +0.0 | 39.7 | 50.0 | -10.3 | L2-Ne |
| 57 | 26.944M | 31.5 | +5.8 +0.6 | +0.4 | +0.0 | +0.2 | +0.0 | 38.5 | 50.0 | -11.5 | L2-Ne |
| 58 | 27.074M | 33.9 | +5.8 +0.6 | +0.4 | +0.0 | +0.2 | +0.0 | 40.9 | 50.0 | -9.1 | L2-Ne |
| 59 | 27.574M | 32.7 | +5.8 +0.6 | +0.5 | +0.0 | +0.2 | +0.0 | 39.8 | 50.0 | -10.2 | L2-Ne |
| 60 | 27.711M | 34.8 | +5.8 +0.6 | +0.5 | +0.0 | +0.2 | +0.0 | 41.9 | 50.0 | -8.1 | L2-Ne |

Test Setup Photo(s)



APPENDIX A: MANUFACTURER DECLARATION

The following models have been tested by CKC Laboratories:

DynaFlex Pro with USB/Bluetooth, DynaFlex Pro with USB/802.11

The manufacturer states that the following additional models do not affect their EMC characteristics, and therefore they meet the level of testing equivalent to the tested models.

DynaFlex USB only, DynaFlex with USB/Bluetooth, DynaFlex Pro USB only

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

| Uncertainty Value | Parameter |
|-------------------|---------------------------|
| 4.73 dB | Radiated Emissions |
| 3.34 dB | Mains Conducted Emissions |
| 3.30 dB | Disturbance Power |

Uncertainties reported are worst case for all CKC Laboratories’ sites and represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

Unless otherwise indicated, the following configuration parameters are used for equipment setup: The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula. This reading was then compared to the applicable specification limit. Individual measurements were compared with the displayed limit value in the margin column. The margin was calculated based on subtracting the limit value from the corrected measurement value; a positive margin represents a measurement exceeding the limit, while a negative margin represents a measurement less than the limit.

| SAMPLE CALCULATIONS | | |
|---------------------|---------------------|----------|
| | Meter reading | (dBµV) |
| + | Antenna Factor | (dB/m) |
| + | Cable Loss | (dB) |
| - | Distance Correction | (dB) |
| - | Preamplifier Gain | (dB) |
| = | Corrected Reading | (dBµV/m) |

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. Unless otherwise specified, the following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

| MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE | | | |
|---|----------------------------|-------------------------|--------------------------|
| TEST | BEGINNING FREQUENCY | ENDING FREQUENCY | BANDWIDTH SETTING |
| CONDUCTED EMISSIONS | 150 kHz | 30 MHz | 9 kHz |
| RADIATED EMISSIONS | 9 kHz | 150 kHz | 200 Hz |
| RADIATED EMISSIONS | 150 kHz | 30 MHz | 9 kHz |
| RADIATED EMISSIONS | 30 MHz | 1000 MHz | 120 kHz |
| RADIATED EMISSIONS | 1000 MHz | >1 GHz | 1 MHz |

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or caret ("^") was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point, the measuring device is set into the linear mode and the scan time is reduced.