# Electromagnetic Compatibility Test Report

***Prepared in accordance with***

## FCC Part 15: October 2007, RSS-210: June 2007

On

# Electronic Article Surveillance Detection System

# Evolve W10 with Integrated Metalpoint

Prepared for:

Checkpoint Systems Inc.

101 Wolf Drive

Thorofare, NJ 08086

Prepared by:

## TUV Rheinland of North America, Inc.

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| | | | |
|---|---|---|---|
| ***Auftraggeber**: Client:* | Checkpoint Systems Inc.<br>101 Wolf Drive<br>Thorofare, NJ 08086 | Bayode Olabisi<br>(856) 384-2141 / (856) 384-2366<br>bayode.olabisi@checkpt.com | |
| **Bezeichnung:** *Identification:* | Electronic Article Surveillance Detection System | **Serien-Nr.:** *Serial No.* | 724949200D11728091, 724949200D11728043 |
| ***Gegenstand der Prüfung**: Test item:* | Evolve W10 with Integrated Metalpoint | **Prüfdatum:** *Date tested:* | 05/22/09 |
| **Prüfort:** *Testing location:* | TUV Rheinland of North America<br>12 Commerce Road<br>Newtown, CT 06470-1607<br>U.S.A. | | |
| **Prüfgrundlage:** *Test specification:* | Emissions: FCC Part 15 Subpart C: October 2007 / RSS-210: June 2007<br>FCC Part 15 Subpart 15.223/RSS-210 Annex A2.3<br>FCC Part 15 Subpart 15.205 and 15.209 | | |
| **Prüfergebnis:** *Test Result* | **Der vorstehend beschriebene Prüfgegenstand wurde geprüft und entspricht oben genannter Prüfgrundlage. The above product was found to be Compliant to the above test standard(s)** | | |

| | |
|---|---|
| **geprüft** / *tested by:* David Hollis | **kontrolliert** / *reviewed by:* Bruce Fagley |
|  <br>12 June 2009<br>**Datum** *Date* / **Name** *Name* / **Unterschrift** *Signature* |  <br>12 June 2009<br>**Datum** *Date* / **Name** *Name* / **Unterschrift** *Signature* |
| **Sonstiges :** *Other Aspects:* | **None** |
| Abkürzungen: OK, Pass, Compliant, Complies = entspricht Prüfgrundlage<br>Fail, Not Compliant, Does not Comply = entspricht nicht Prüfgrundlage<br>N/A = nicht anwendbar | Abbreviations: OK, Pass, Compliant, Complies = passed<br>Fail, Not Compliant, Does Not Comply = failed<br>N/A = not applicable |

| | | |
|---|---|---|
| FC | NVLAP | **Industry Canada** |
| **US5112** | **200111-0** | **3466D-1** |

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# 1 General Information

## 1.1 Scope

This report is intended to document the status of conformance with the requirements of the FCC Part 15: October 2007, RSS-210: June 2007 based on the results of testing performed on 05/22/09 on the Electronic Article Surveillance Detection System, Model No. Evolve W10 with Integrated Metalpoint, manufactured by Checkpoint Systems Inc.. This report only applies to the specific samples tested under the stated test conditions. It is the responsibility of the manufacturer to assure that additional production units of this model are manufactured with identical or EMI equivalent electrical and mechanical components. This report is further intended to document changes and modifications to the EUT throughout its life cycle. All documentation will be included as a supplement.

## 1.2 Purpose

Testing was performed to evaluate the EMC performance of the EUT (Equipment Under Test) in accordance with the applicable requirements, procedures, and criteria defined in the application of regulations and application of standards listed in this report.

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## 1.3 *Summary of Test Results*

| | | | | | |
|---|---|---|---|---|---|
| **Applicant** | Checkpoint Systems Inc.<br>101 Wolf Drive<br>Thorofare, NJ 08086 | **Tel** | (856) 384-2141 | **Contact** | Bayode Olabisi |
| | | **Fax** | (856) 384-2366 | **e-mail** | bayode.olabisi@checkpt.com |

| | | | |
|---|---|---|---|
| **Description** | Electronic Article Surveillance Detection System | **Model Number** | Evolve W10 with Integrated Metalpoint |
| **Serial Number** | 724949200D11728091,<br>724949200D11728043 | **Test Voltage/Freq.** | 120V/60Hz |
| **Test Date Completed:** | 05/22/09 | **Test Engineer** | David Hollis |

| Standards | Description | Severity Level or Limit | Criteria | Test Result |
|---|---|---|---|---|
| FCC Part 15 Subpart C: October 2007 / RSS-210: June 2007 | Intentional Radiators / Low Power Licenced Exempt Radiocommunication Devices | See sections below | See Below | Complies |
| FCC Part 15 Subpart 15.223/RSS-210 Annex A2.3 | Operation in the band 1.705-10 MHz | 100µV/m @30m | Limit | Complies |
| FCC Part 15 Subpart 15.207 | Conducted limits | Per table in section 207, 150kHz - 30MHz | Limit | Complies |
| FCC Part 15 Subpart 15.205 and 15.209 | Radiated emission limits; general requirements | Class B and per table in section 205 From Fundamental - 1000MHz | Limit | Complies |

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# 2 Laboratory Information

## 2.1 Accreditations & Endorsements

### 2.1.1 US Federal Communications Commission

TUV Rheinland of North America located at 12 Commerce Road, Newtown CT is accredited by the commission for performing testing services for the general public on a fee basis. This laboratory test facilities have been fully described in reports submitted to and accepted by the FCC (Registration No US5112). The laboratory scope of accreditation includes: Title 47 CFR Part 15, and 18. The accreditation is updated every 3 years.

### 2.1.2 NIST / NVLAP

Program, which is administered under the auspices of the National Institute of Standards and Technology. The laboratory has been assessed and accredited in accordance with ISO Standard 17025:2005 (Lab code: 200111-0). The scope of laboratory accreditation includes emission and immunity testing. The accreditation is updated annually.

### 2.1.3 Industry Canada

Registration No.: 3466D-1. The OATS has been accepted by Industry Canada to perform testing to 3 and to 10m, based on the test procedures described in ANSI C63.4-2003.

## 2.2 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions measurements is ± 3.2 dB
The estimated combined standard uncertainty for conducted emissions measurements is ± 1.2dB

## 2.3 Calibration Traceability

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Measurement method complies with ANSI/NCSL Z540-1-1994 and ISO Standard 17025:2005. Equipment calibration records are kept on file at the test facility.

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## 2.4 Measurement Equipment Used

| Equipment | Manufacturer | Model # | Serial/Inst # | Last Cal dd/mm/yy | Next Cal dd/mm/yy | Test |
|---|---|---|---|---|---|---|
| Power Supply | California Instruments | 5001iX | HK53766 | 12/15/08 | 12/15/09 | All |
| Antenna, Bilog | Sunol Sciences | JB3 | A022707 | 12/12/08 | 12/12/10 | RE |
| Receiver | Hewlett Packard | HP 8546A, 85460A | 3330A00125, 3325A00134 | 08/28/08 | 08/28/09 | RE, CE |
| Antenna, Bilog | Schaffner | CBL6112D | 22238 | 05/01/08 | 05/01/10 | RE |
| LISN | Schwarzbeck | NSLK 8126A (4 x 25A) | 8126278 | 08/20/08 | 08/20/10 | CE |
| Magnetic Field Loop Antenna | Schwarzbeck | FMZB 1516 | 151600/94 | 11/12/08 | 11/12/10 | RE<30MHz |

Note: CE = Conducted Emissions, CI= Conducted Immunity, DP=Disturbance Power, EFT=Electrical Fast Transients, ESD = Electrostatic Discharge, FLI=Flicker, HAR=Harmonics, MF=Magnetic Field Immunity, RE=Radiated Emissions, RI=Radiated Immunity, SI=Surge Immunity, VDSI=Voltage Dips and Short Interruptions

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# 3 Product Information

## 3.1 Equipment Under Test (EUT) Description

The Evolve W10 Antenna is an Electronic Article Surveillance System (EAS). The system detects target tags attached to merchandise. The targets resonate in the region of 8.2 MHz or 9.0 MHz. When an article of merchandise is purchased, the target is deactivated which causes it to no longer resonate. The Evolve W10 Antennas monitor an area of 3-feet on either side of the antenna in the 7.4 to 10.0 MHz range and trigger an alarm when a non-deactivated target is detected.

The MetalPoint unit is an early warning system that identifies professional thieves as they enter the store so that store personnel can monitor their activities and prevent merchandise from being swept off the store's shelves.

MetalPoint detector alarms are activated when a person carrying foil lined "booster" bags or wearing foil-lined clothing passes through the surveillance area. Silent alarm signals are transmitted from the MetalPoint detector to an external alarm unit to discreetly alert staff members of a potential professional thief. Thieves cannot test the system for any limitations since the alarm will only transmit a low audible signal or a flashing light to store personnel (ref-Metalpoint Sell Sheet)

## 3.2 Engineering Judgment on Selected Models

The Evolve W10 antenna is a floor standing system mounted in a hollow wooden frame. The Evolve W10 series has three separate loop antenna configurations per gate. The Metalpoint unit is integrated with the Evolve W10 antenna's O-loop.

## 3.3 General Product Information

The Evolve W10 is used for electronic article surveillance. The MetalPoint unit plays a complementary role in deterring retail theft activity by professional thieves carrying foil lined bags. Metalpoint operates by generating RF at a predetermined frequency range and once metal is detected, the unit activates an onboard relay in the Metalpoint chassis. The Evolve W10 antennas continuously scan at a predetermined frequency and detect anti-pilferage tags which pass through the field generated by the antennas. When a tag is detected the system generates an audible alarm.

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## 3.4 EUT Modes of Operation

The equipment under test was operated during the measurement under the following conditions:
- Continuous sweep mode at 8.2 MHz Band
- Continuous sweep mode at 9.0 MHz Dual Band

## 3.5 EUT Test Configurations

**W10:** 8.2 MHz band, transmit power = 28

9.0 MHz band, transmit power = 27

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## 3.6 Electrical Support Equipment

None

## 3.7 EUT Equipment/Cabling Information

| EUT Port | Connected To | Location | Cable Type | |
|---|---|---|---|---|
| | | | Length | Shielded |
| J20/J22 | Master-Submaster pcbs for Synch. | Controller | 0.3m | Yes |
| J18 or J31 | Pedestal Main Power | Controller | 0.3m | Yes |
| J14 | Inter pedestal Network Com. | Controller | 0.3 m | Yes |
| DC Power | DC Power | Controller | 2.4m | No |

## 3.8 Modifications

One clip-on ferrite – FairRite P/N 0443806406 (Checkpoint P/N 284760), 4 turns, was installed on both ends of the SYNC cable between the master and submaster Emerald control electronics.

One clip-on ferrite – FairRite P/N 0443806406 (Checkpoint P/N 284760), 4 turns, was installed at the end of the power supply DC cable connection to the DC line filter PCB on the master pedestal.

One clip-on ferrite – FairRite P/N 0443806406 (Checkpoint P/N 284760), 4 turns, was installed on both ends of the COMM cable (port J10/J14) between the master and submaster Emerald control electronics.

One clip-on ferrite – FairRite P/N 0443806406 (Checkpoint P/N 284760), 4 turns, was installed on both ends of the interpedestal DC cable connection to the DC line filter PCB.

(If Visiplus is installed), one clip-on ferrite – FairRite P/N 0443806406 (Checkpoint P/N 284760), 5 turns, was installed at the Emerald electronics ends of the Visiplus cable connected to Emerald port J72.

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# 4 Measurements

## 4.1 Operation in the band 1.705-10MHz

This test measures the electromagnetic levels of spurious signals generated by the EUT that radiated from the EUT and may affect the performance of other nearby electronic equipment.

### 4.1.1 Over View of Test

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Results** | **Complies** (as tested per this report) | | | | **Date** | 05/20/09 | |
| **Standard** | FCC Part 15 Subpart 15.223/RSS-210 Annex A2.3 | | | | | | |
| **Product Model** | Evolve W10 with Integrated Metalpoint | | | **Serial#** | 724949200D11728091, 724949200D11728043 | | |
| **Configuration** | See test plan for details | | | | | | |
| **Test Set-up** | Tested on a 10m O.A.T.S. placed on turn-table, see test plans for details | | | | | | |
| **EUT Powered By** | 120V/60Hz | **Temp** | 22ºC | **Humidity** | 45% | **Pressure** | 1001mbar |
| **Frequency Range** | 100µV @ 30m (see Note) | | | | | | |
| **Perf. Criteria** | Below Limit | | | **Perf. Verification** | Readings Under Limit | | |
| **Mod. to EUT** | None | | | **Test Performed By** | David Hollis | | |

Note: The limits were adjusted in dBµV for a 10m testing resulting in a peak limit of 80dBµV/m. Measurements have been made in all three orthogonal axes of loop antenna and the EUT was rotated to locate the maximum emissions.

### 4.1.2 Test Procedure

The emissions tests on the fundamental signal were performed using the procedures of ANSI C63.4 including methods for signal maximizations and EUT configuration.

The frequency range from 1.705 – 10MHz was investigated for this test using a magnetic field loop antenna.

### 4.1.3 Deviations

Measurement of the fundamental emissions – 1.705 to 10.0 MHz – was performed by setting a spectrum analyzer to “max-hold”, peak detector, 300 kHz bandwidth and a span from 7.4 MHz to 10 MHz. A resolution bandwidth of 300 kHz was used in performing the “true peak” measurements because increasing the bandwidth above 300 kHz did not increase the detected peak of the fundamental.

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### 4.1.4 Final Test Results

All final radiated emissions measurements were below (in compliance with) the limits.

### 4.1.5 Final Measurement Data

## 8.2 Band TX=28:

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ***Radiated Emissions Measurements*** | | | | | | | | | | |
| ***Standard:*** | 47 CFR FCC Part 15.223 | | | | ***PRESCAN or FINAL:*** | | Final | | **Date:** | 5/20/2009 |
| ***Device Tested:*** | Checkpoint - Evolve W10 w/metalpoint | | | | | ***Distance:*** | 10m | | **File Name:** | |
| ***Mode:*** | 8.2 Band TX=28 | | | | | | | | | |
| ***Modifications:*** | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Meas # | Freq (MHz) | Measured Peak (dBµV/m) | Peak Limit | Peak Margin | Final Average (dBµV/m) | Average Limit | Average Margin | Result | Orientation (X,Y,Z) | Comment |
| RBW = 300kHz VBW=300kHz (FCC Settings) | | | | | | | | | | |
| 9.0 Tx Band | | | | | | | | | | |
| 1 | 8.427 | 62.6 | 80.00 | -17.40 | 38.88 | 60.00 | -21.12 | **Complied** | X Orientation | |
| 2 | 8.427 | 78.7 | 80.00 | -1.30 | 43.80 | 60.00 | -16.20 | **Complied** | Y Orientation | |
| 3 | 8.427 | 62.94 | 80.00 | -17.06 | 31.27 | 60.00 | -28.73 | **Complied** | Z Orientation | |
| | | | | | | | | | | |
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| | | | | | | | | | | |
| Tested by: | David Hollis | | | | | | | | | |
| TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009 | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | Peak Limit = Average Limit + 20dB = 60dBµV/m + 20dB = 80dBµV/m | | | | | | | | |
| | | | | | | | | | | |
| | | Average limit = 100µV/m @ 30m | | | | | | | | |
| | | Average Limit = 20*log(100µV) = 40dBµV/m @ 30m | | | | | | | | |
| | | For 10m measurement the average limit was adjusted = 40log(10/30) = 20dB | | | | | | | | |
| | | Average limit = 60dBµV/m@10m | | | | | | | | |
| | | | | | | | | | | |

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## 9.0 Band TX=27:

| ***Radiated Emissions Measurements*** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ***Standard:*** | 47 CFR FCC Part 15.223 | | | | ***PRESCAN or FINAL:*** | | Final | | **Date:** | 5/20/2009 |
| ***Device Tested:*** | Checkpoint - Evolve W10 w/metalpoint | | | | | ***Distance:*** | 10m | | **File Name:** | |
| ***Mode:*** | 9.0 Band TX=27 | | | | | | | | | |
| ***Modifications:*** | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Meas # | Freq (MHz) | Measured Peak (dBµV/m) | Peak Limit | Peak Margin | Final Average (dBµV/m) | Average Limit | Average Margin | Result | Orientation (X,Y,Z) | Comment |
| RBW = 300kHz VBW=300kHz (FCC Settings) | | | | | | | | | | |
| 9.0 Tx Band | | | | | | | | | | |
| 1 | 9.071 | 68.72 | 80.00 | -11.28 | 40.88 | 60.00 | -19.12 | **Complied** | X Orientation | |
| 3 | 9.071 | 79.33 | 80.00 | -0.67 | 44.80 | 60.00 | -15.20 | **Complied** | Y Orientation | |
| 5 | 9.071 | 66.6 | 80.00 | -13.40 | 39.67 | 60.00 | -20.33 | **Complied** | Z Orientation | |
| | | | | | | | | | | |
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| | | | | | | | | | | |
| Tested by: | David Hollis | | | | | | | | | |
| TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009 | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | Peak Limit = Average Limit + 20dB = 60dBµV/m + 20dB = 80dBµV/m | | | | | | | | |
| | | | | | | | | | | |
| | | Average limit = 100µV/m @ 30m | | | | | | | | |
| | | Average Limit = 20*log(100µV) = 40dBµV/m @ 30m | | | | | | | | |
| | | For 10m measurement the average limit was adjusted = 40log(10/30) = 20dB | | | | | | | | |
| | | Average limit = 60dBµV/m@10m | | | | | | | | |
| | | | | | | | | | | |

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### 4.1.6 Photos

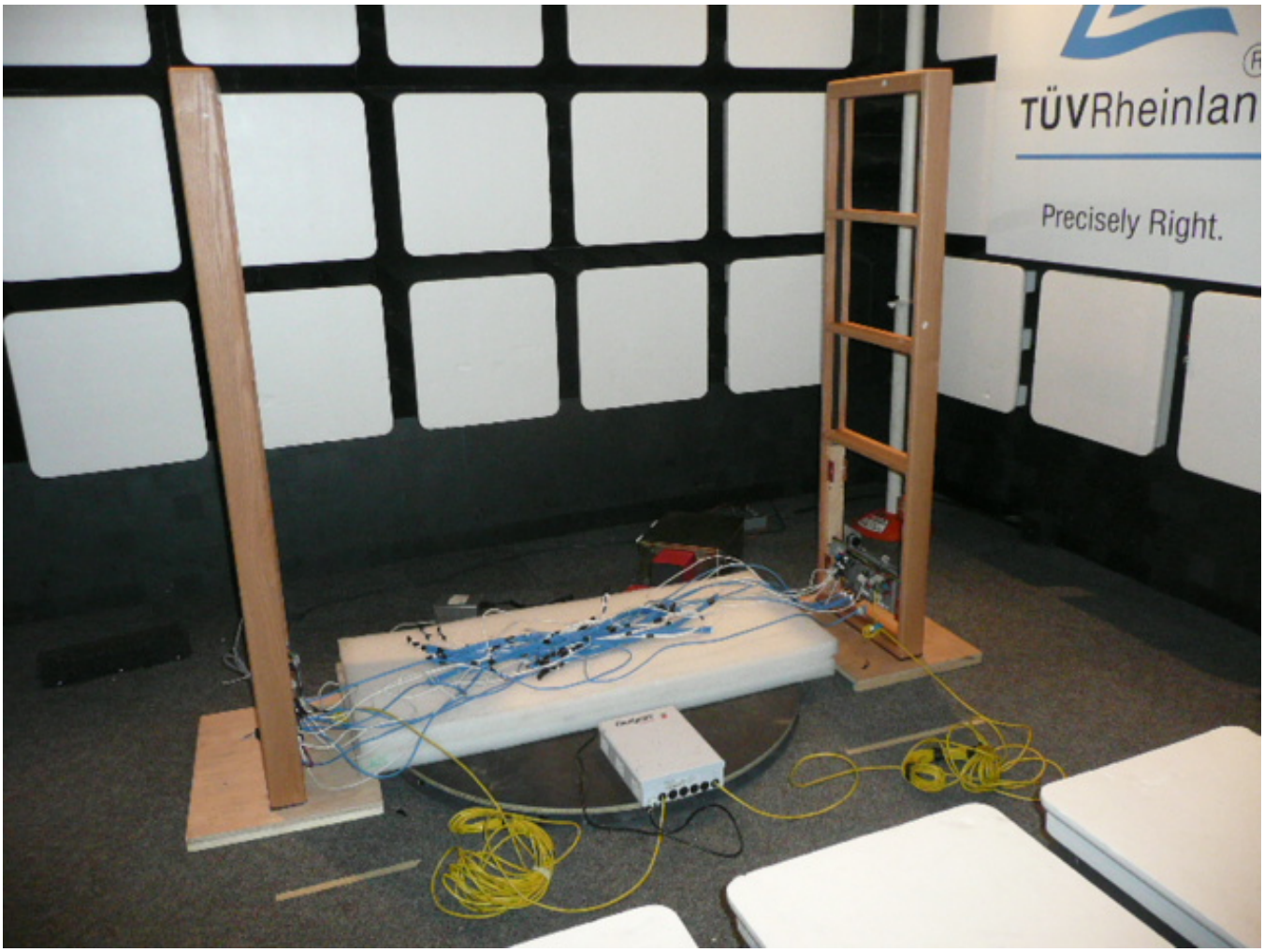


Figure 1 - Radiated Emissions Test Setup (Semi-Anechoic Chamber)

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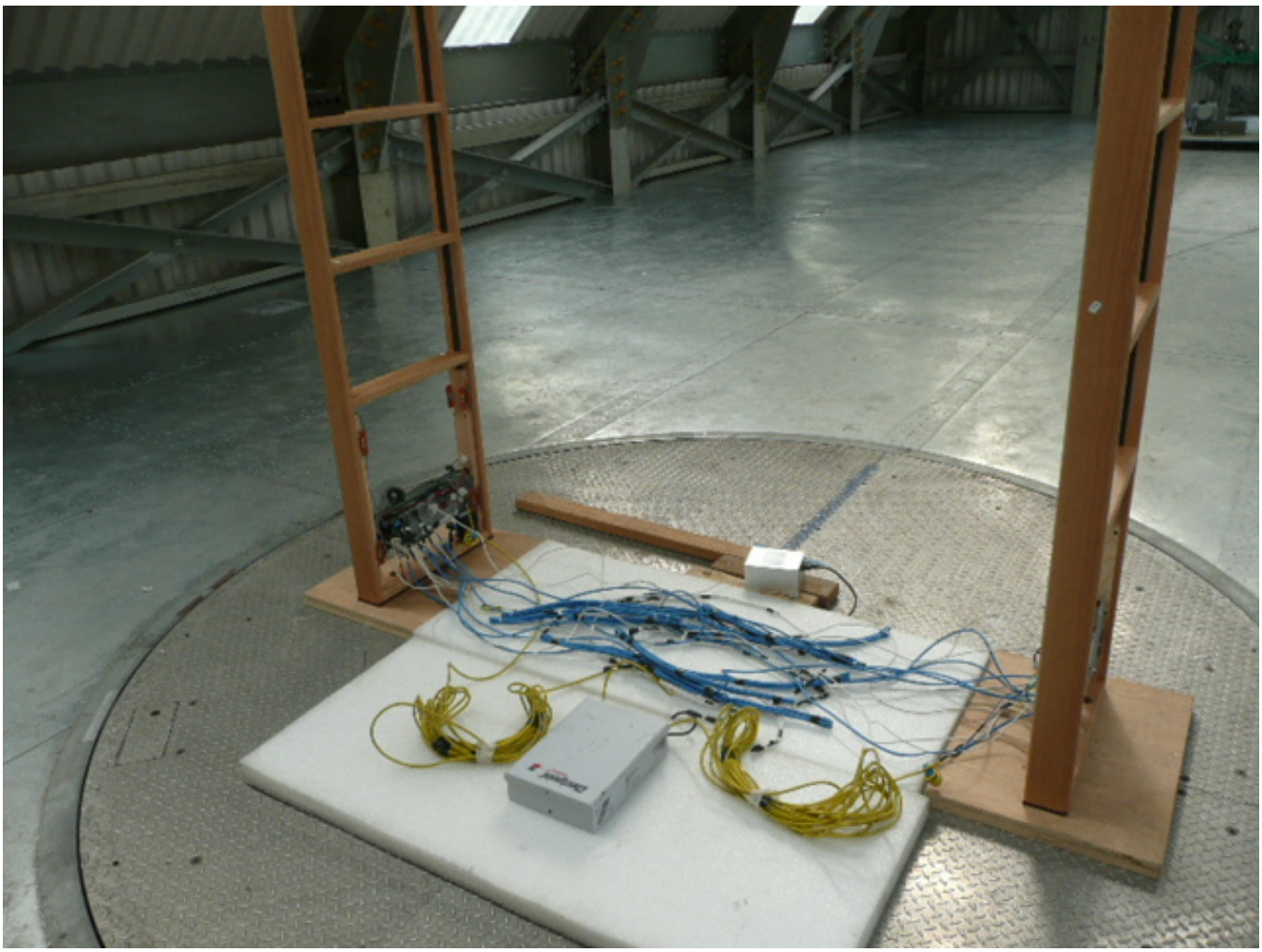

Figure 2 – Radiated Emissions Test Setup

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## 4.2 Conducted Limits

This test measures the electromagnet levels of spurious signals generated by the EUT on the AC power line that may affect the performance of other near by electronic equipment.

### 4.2.1 Over View of Test

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Results** | **Complies** (as tested per this report) | | | | **Date** | 05/21/09 | |
| **Standard** | FCC Part 15 Subpart 15.223/RSS-210 Annex A2.3 | | | | | | |
| **Product Model** | Evolve W10 with Integrated Metalpoint | | | **Serial#** | 724949200D11728091, 724949200D11728043 | | |
| **Configuration** | See test plan for details | | | | | | |
| **Test Set-up** | Tested in shielded room EUT placed on table see test plans for details | | | | | | |
| **EUT Powered By** | 120V/60Hz | **Temp** | 22º C | **Humidity** | 45% | **Pressure** | 1004mbar |
| **Frequency Range** | 150kHz - 30MHz | | | | | | |
| **Perf. Criteria** | Per table in section 207 (Below Limit ) | | | **Perf. Verification** | Readings Under Limit for L1 and L2 | | |
| **Mod. to EUT** | None | | | **Test Performed By** | David Hollis | | |

### 4.2.2 Test Procedure

Conducted and FCC emissions tests were performed using the procedures of ANSI C63.4 including methods for signal maximizations and EUT configuration.

The frequency range from 150kHz - 30MHz was investigated for conducted emissions.

Conducted Emissions measurements were performed in the shielded room using procedures specified in the test plan and standard.

### 4.2.3 Deviations

There were no deviations from the test methodology listed in the test plan for the conducted emission test.

### 4.2.4 Final Test Results

All final conducted emissions measurements were below (in compliance with) the limits.

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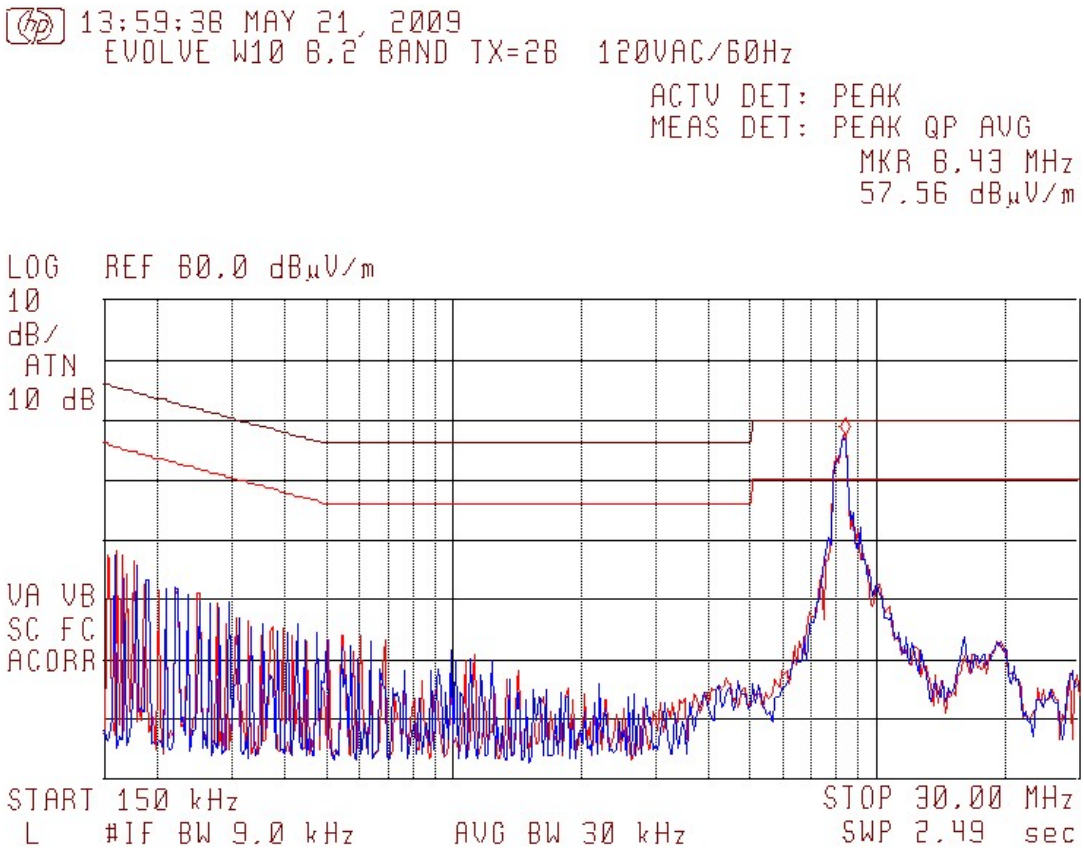
### 4.2.5 Final Measurement Data

NOTES:

**Conducted Emissions @ 120V/60Hz**
**8.2Tx Band**
**Line / Neutral**

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| ***Conducted Emissions Measurements*** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Standard:*** | FCC Part 15.207 | | | | | | | | | ***Date:*** 5/21/09 | | |
| ***Device Tested:*** | Checkpoint W10 8.2 band tx=28 120/60 | | | | | | | | | ***File: .xls*** | | |
| Signal Num | Freq | Peak Amp | QP Amp | Avg Amp | QP Limit | Avg Limit | Conductor | QP Δ | QP Result | Avg Δ | Average Result | Mode |
| | MHz | dBuV | dBuV | dBuV | dBuV | dBuV | | dB | | dB | | |
| 1 | 0.1599 | 37.68 | 29.56 | 4.12 | 65.47 | 55.47 | Line | -35.91 | Complied | -51.35 | Complied | |
| 2 | 0.5599 | 25.58 | 17.08 | 9.83 | 56.00 | 46.00 | Line | -38.92 | Complied | -36.17 | Complied | |
| 3 | 1.1791 | 20.96 | 11.92 | 5.38 | 56.00 | 46.00 | Line | -44.08 | Complied | -40.62 | Complied | |
| 4 | 8.4535 | 59.42 | 54.35 | 40.20 | 60.00 | 50.00 | Line | -5.65 | Complied | -9.80 | Complied | |
| 5 | 16.2201 | 26.03 | 21.62 | 10.96 | 60.00 | 50.00 | Line | -38.38 | Complied | -39.04 | Complied | |
| 6 | 19.2012 | 23.72 | 20.83 | 10.99 | 60.00 | 50.00 | Line | -39.17 | Complied | -39.01 | Complied | |
| 7 | 0.1599 | 38.52 | 30.17 | 4.42 | 65.47 | 55.47 | Neutral | -35.30 | Complied | -51.05 | Complied | |
| 8 | 0.5599 | 26.28 | 17.78 | 12.33 | 56.00 | 46.00 | Neutral | -38.22 | Complied | -33.67 | Complied | |
| 9 | 1.1791 | 23.15 | 14.80 | 11.65 | 56.00 | 46.00 | Neutral | -41.20 | Complied | -34.35 | Complied | |
| **10** | **8.4535** | **59.45** | **54.53** | **40.39** | **60.00** | **50.00** | **Neutral** | **-5.47** | **Complied** | **-9.61** | **Complied** | **Maximum Emissions** |
| 11 | 16.2201 | 26.15 | 22.04 | 11.59 | 60.00 | 50.00 | Neutral | -37.96 | Complied | -38.41 | Complied | |
| 12 | 19.2012 | 23.74 | 21.04 | 11.55 | 60.00 | 50.00 | Neutral | -38.96 | Complied | -38.45 | Complied | |
| Tested by: David Hollis | | | | | | | | | | | | |
| TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009 | | | | | | | | | | | | CE22_B.xlt Revised 21OCT2005 |

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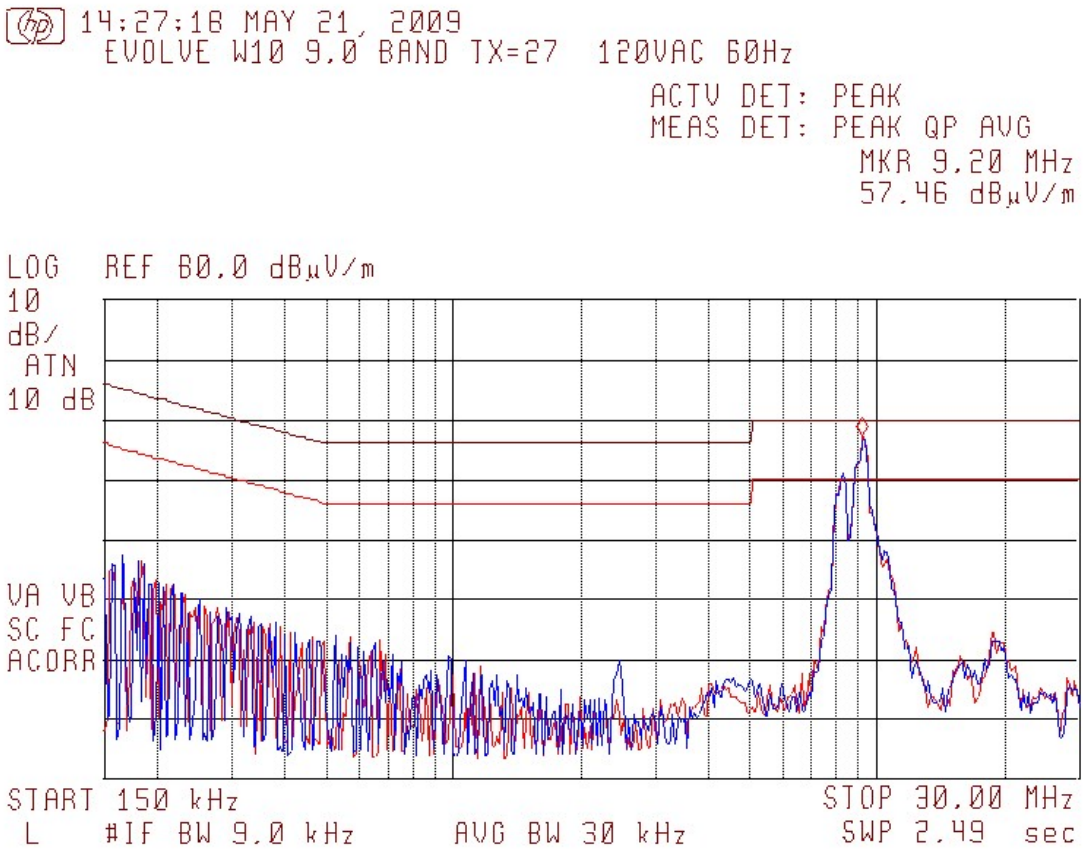
NOTES:

**Conducted Emissions @ 120V/60Hz**
**9.0 Tx Band**
**Line / Neutral**

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| ***Conducted Emissions Measurements*** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Standard:*** | FCC Part 15.207 | | | | | | | | | ***Date:*** 5/21/09 | | |
| ***Device Tested:*** | Checkpoint W10 9.0 band tx=27 120/60 | | | | | | | | | ***File: .xls*** | | |
| | | | | | | | | | | | | |
| Signal Num | Freq | Peak Amp | QP Amp | Avg Amp | QP Limit | Avg Limit | Conductor | QP Δ | QP Result | Avg Δ | Average Result | Mode |
| | MHz | dBuV | dBuV | dBuV | dBuV | dBuV | | dB | | dB | | |
| | | | | | | | | | | | | |
| 1 | 0.1700 | 36.40 | 28.43 | 2.58 | 64.96 | 54.96 | Line | -36.53 | Complied | -52.38 | Complied | |
| 2 | 0.6207 | 24.71 | 15.95 | 6.02 | 56.00 | 46.00 | Line | -40.05 | Complied | -39.98 | Complied | |
| 3 | 8.3323 | 51.53 | 47.89 | 31.54 | 60.00 | 50.00 | Line | -12.11 | Complied | -18.46 | Complied | |
| 4 | 9.3261 | 57.40 | 54.15 | 37.20 | 60.00 | 50.00 | Line | -5.85 | Complied | -12.80 | Complied | |
| 5 | 15.9288 | 21.44 | 17.11 | 5.51 | 60.00 | 50.00 | Line | -42.89 | Complied | -44.49 | Complied | |
| 6 | 19.0500 | 20.91 | 17.20 | 3.47 | 60.00 | 50.00 | Line | -42.80 | Complied | -46.53 | Complied | |
| 7 | 0.1700 | 36.55 | 28.19 | 1.93 | 64.96 | 54.96 | Neutral | -36.77 | Complied | -53.03 | Complied | |
| 8 | 0.6207 | 23.33 | 16.57 | 10.00 | 56.00 | 46.00 | Neutral | -39.43 | Complied | -36.00 | Complied | |
| 9 | 8.3323 | 51.48 | 47.89 | 30.08 | 60.00 | 50.00 | Neutral | -12.11 | Complied | -19.92 | Complied | |
| **10** | **9.3261** | **57.36** | **54.17** | **37.26** | **60.00** | **50.00** | **Neutral** | **-5.83** | **Complied** | **-12.74** | **Complied** | **Maximum Emissions** |
| 11 | 15.9288 | 20.59 | 16.93 | 4.85 | 60.00 | 50.00 | Neutral | -43.07 | Complied | -45.15 | Complied | |
| 12 | 19.0500 | 20.69 | 16.79 | 2.88 | 60.00 | 50.00 | Neutral | -43.21 | Complied | -47.12 | Complied | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Tested by: David Hollis | | | | | | | | | | | | |
| TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009 | | | | | | | | | | | | CE22_B.xlt Revised 21OCT2005 |

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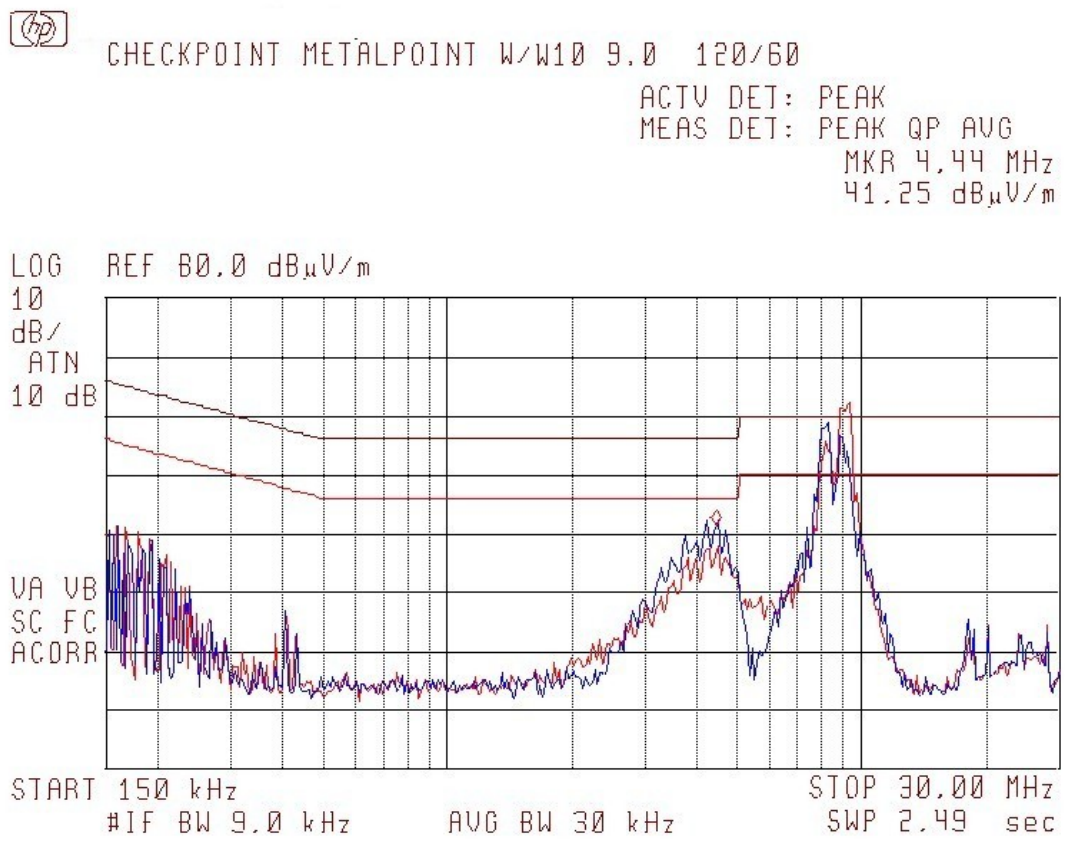
NOTES:

**Conducted Emissions @ 120V/60Hz**
**Metalpoint w/P10**
**Line / Neutral**

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| ***Conducted Emissions Measurements*** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Standard:*** | FCC Part 15.207 | | | | | | | | | ***Date:*** 05/21/09 | | |
| ***Device Tested:*** | Checkpoint Metalpoint w/W10 9.0 120VAC/60Hz | | | | | | | | | ***File: .xls*** | | |
| Signal Num | Freq | Peak Amp | QP Amp | Avg Amp | QP Limit | Avg Limit | Conductor | QP Δ | QP Result | Avg Δ | Average Result | Mode |
| | MHz | dBuV | dBuV | dBuV | dBuV | dBuV | | dB | | dB | | |
| 1 | 0.1700 | 40.90 | 33.52 | 7.93 | 64.96 | 54.96 | Line | -31.44 | Complied | -47.03 | Complied | |
| 2 | 0.4115 | 26.76 | 19.33 | 4.68 | 57.62 | 47.62 | Line | -38.29 | Complied | -42.94 | Complied | |
| 3 | 4.2486 | 38.48 | 34.97 | 26.08 | 56.00 | 46.00 | Line | -21.03 | Complied | -19.92 | Complied | |
| 4 | 8.3103 | 56.72 | 51.88 | 34.65 | 60.00 | 50.00 | Line | -8.12 | Complied | -15.35 | Complied | |
| **5** | **9.3237** | **63.53** | **58.23** | **42.10** | **60.00** | **50.00** | **Line** | **-1.77** | **Complied** | **-7.90** | **Complied** | **Maximum Emissions** |
| 6 | 18.0600 | 22.83 | 17.22 | 9.07 | 60.00 | 50.00 | Line | -42.78 | Complied | -40.93 | Complied | |
| 7 | 0.1700 | 40.81 | 33.61 | 7.80 | 64.96 | 54.96 | Neutral | -31.35 | Complied | -47.16 | Complied | |
| 8 | 0.4115 | 27.11 | 19.82 | 4.62 | 57.62 | 47.62 | Neutral | -37.80 | Complied | -43.00 | Complied | |
| 9 | 4.2486 | 38.36 | 34.87 | 26.05 | 56.00 | 46.00 | Neutral | -21.13 | Complied | -19.95 | Complied | |
| 10 | 8.3103 | 57.57 | 52.58 | 35.09 | 60.00 | 50.00 | Neutral | -7.42 | Complied | -14.91 | Complied | |
| 11 | 9.3237 | 63.13 | 58.04 | 41.85 | 60.00 | 50.00 | Neutral | -1.96 | Complied | -8.15 | Complied | |
| 12 | 18.0600 | 24.13 | 17.35 | 9.20 | 60.00 | 50.00 | Neutral | -42.65 | Complied | -40.80 | Complied | |
| Tested by: David Hollis | | | | | | | | | | | | |
| TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009 | | | | | | | | | | | | CE22_B.xlt Revised 21OCT2005 |

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### 4.2.6 Photos

Figure 3 – Conducted Emissions Test Setup

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## 4.3 Radiated Emissions Limits

This test measures the electromagnetic levels of spurious signals generated by the EUT that radiated from the EUT and may affect the performance of other nearby electronic equipment.

### 4.3.1 Test Over View

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Results** | **Complies** (as tested per this report) | | | | **Date** | 05/19/09 | |
| **Standard** | FCC Part 15 Subpart 15.205 and 15.209 | | | | | | |
| **Product Model** | Evolve W10 with Integrated Metalpoint | | | **Serial#** | 724949200D11728091, 724949200D11728043 | | |
| **Configuration** | See test plan for details | | | | | | |
| **Test Set-up** | Tested on a 10m O.A.T.S. placed on turn-table, see test plans for details | | | | | | |
| **EUT Powered By** | 120V/60Hz | **Temp** | 22º C | **Humidity** | 45% | **Pressure** | 1004mbar |
| **Frequency Range** | From Fundamental - 1000MHz | | | | | | |
| **Perf. Criteria** | Below Limit | | **Perf. Verification** | | Readings under Limit | | |
| **Mod to EUT** | None | | **Test Performed By** | | David Hollis | | |

### 4.3.2 Test Procedure

Radiated emissions tests were performed using the procedures of ANSI C63.4 including methods for signal maximizations and EUT configuration.

The frequency range of 30MHz to 1000MHz was investigated for radiated emissions.

Radiated emission testing was first performed at a distance of 3 meters in the semi-anechoic chamber in order to identify the specific frequencies for which these measurements will be made. Harmonics and spurious emissions testing <30MHz were performed at 10m distance on the OATS using a magnetic field loop antenna. Harmonics and spurious emissions test >30MHz were performed on the 3 m OATS using a Bilog antenna

### 4.3.3 Deviations

There were no deviations from the test methodology listed in the test plan for the harmonic current emissions test.

### 4.3.4 Final Test

All final radiated emissions measurements were below (in compliance with) the limits.

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### 4.3.5 Final Measurement Data

## 8.2 Band TX=28 Final <30MHz (Harmonics):

| ***Radiated Emissions Measurements*** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Standard:*** | 47 CFR 15.209,Harmonics Below 30MHz | | | | | ***PRESCAN or FINAL:*** | | Final | | ***Date:*** | 5/20/09 | |
| ***Device Tested:*** | Checkpoint Evolve W10 w/ Metalpoint. 8.2 band TX=28 | | | | | ***Distance:*** | | 10m | | ***File:*** | | |
| | | | | | | | | | | | | |
| | | Measured Level | | | | | | | | | | |
| Meas # | Freq (MHz) | Peak | Quasi-Peak | Average | Quasi-Peak Limit | Quasi-Peak Δ | Antenna + Cable Correction Factor (included in measured levels) | Result | Polarization | Angle (degrees) | Antenna Height (meters) | Comment |
| 1 | 16.4000 | 29.95 | 24.17 | 18.25 | 49.54 | -25.37 | 19.51 | **Complied** | X | 0 | 1.00 | |
| 2 | 24.6000 | 30.82 | 24.41 | 18.45 | 49.54 | -25.13 | 20.65 | **Complied** | X | 0 | 1.00 | |
| 3 | 16.4000 | 30.81 | 24.38 | 18.32 | 49.54 | -25.16 | 19.51 | **Complied** | Y | 0 | 1.00 | |
| 4 | 24.6000 | 31.89 | 24.84 | 18.57 | 49.54 | -24.70 | 20.65 | **Complied** | Y | 0 | 1.00 | |
| 5 | 16.4000 | 31.89 | 24.22 | 18.28 | 49.54 | -25.32 | 19.51 | **Complied** | Z | 0 | 1.00 | |
| 6 | 24.6000 | 31.66 | 25.36 | 19.13 | 49.54 | -24.18 | 20.65 | **Complied** | Z | 0 | 1.00 | |
| Tested by: David Hollis | | | | | | | | | | | | |
| TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009 | | | | | | | | | | | REFCC15B.xlt Revised 10MAR03 | |

## 8.2 Band TX=28 RE Final >30MHz:

| ***Radiated Emissions Measurements*** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Standard:*** | 47 CFR 15.209, Class B | | | | | ***PRESCAN or FINAL:*** | | Final | | ***Date:*** | 5/19/2009 | |
| ***Device Tested:*** | Checkpoint Evolve W-10 w/Metalpoint 8.2 Band TX=28 | | | | | ***Distance:*** | | 3.0m | | ***File:*** | | |
| | | | | | | | | | | | | |
| | | Measured Level | | | | | | | | | | |
| Meas # | Freq (MHz) | Peak | Quasi-Peak | Average | Quasi-Peak Limit | Quasi-Peak Δ | Antenna + Cable Correction Factor (included in measured levels) | Result | Polarization | Angle (degrees) | Antenna Height (meters) | Comment |
| 1 | 39.6875 | 45.06 | 34.68 | 6.22 | 40.00 | -5.32 | 12.47 | **Complied** | Vertical | 360 | 1.00 | |
| 2 | 41.5500 | 48.16 | 38.40 | 7.31 | 40.00 | -1.60 | 11.70 | **Complied** | Vertical | 360 | 1.00 | |
| 3 | 74.0125 | 37.24 | 24.72 | 5.39 | 40.00 | -15.28 | 7.11 | **Complied** | Vertical | 120 | 1.00 | |
| 4 | 91.5038 | 37.28 | 31.51 | 27.99 | 43.50 | -11.99 | 10.65 | **Complied** | Vertical | 120 | 1.00 | |
| 5 | 96.9000 | 39.84 | 34.52 | 14.97 | 43.50 | -8.98 | 11.44 | **Complied** | Vertical | 100 | 1.00 | |
| 6 | 101.7100 | 35.93 | 27.12 | 23.93 | 43.50 | -16.38 | 12.03 | **Complied** | Vertical | 100 | 1.00 | |
| 7 | 240.0000 | 29.45 | 27.21 | 22.30 | 46.00 | -18.79 | 13.17 | **Complied** | Vertical | 360 | 1.00 | |
| 8 | 449.6092 | 28.43 | 21.59 | 10.17 | 46.00 | -24.41 | 19.40 | **Complied** | Vertical | 360 | 1.00 | |
| 9 | 540.0054 | 29.30 | 26.26 | 21.01 | 46.00 | -19.74 | 21.14 | **Complied** | Vertical | 110 | 1.00 | |
| Tested by: David Hollis | | | | | | | | | | | | |
| TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009 | | | | | | | | | | | REFCC15B.xlt Revised 10MAR03 | |

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## 9.0 Band TX=27 Final <30MHz (Harmonics)

| ***Radiated Emissions Measurements*** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Standard:*** | 47 CFR 15.209,Harmonics Below 30MHz | | | | | ***PRESCAN or FINAL:*** | | Final | | ***Date:*** | 5/20/09 | |
| ***Device Tested:*** | Checkpoint Evolve W10 w/ Metalpoint. 9.0 band TX=27 | | | | | ***Distance:*** | | 10m | | ***File:*** | | |
| | | | | | | | | | | | | |
| | | Measured Level | | | | | | | | | | |
| Meas # | Freq (MHz) | Peak | Quasi-Peak | Average | Quasi-Peak Limit | Quasi-Peak Δ | Antenna + Cable Correction Factor (included in measured levels) | Result | Polarization | Angle (degrees) | Antenna Height (meters) | Comment |
| 1 | 18.1350 | 30.85 | 24.29 | 18.32 | 49.54 | -25.25 | 19.72 | **Complied** | X | 0 | 1.00 | |
| 2 | 27.2100 | 31.88 | 25.68 | 19.20 | 49.54 | -23.86 | 21.41 | **Complied** | X | 0 | 1.00 | |
| 3 | 18.1350 | 30.08 | 24.48 | 18.31 | 49.54 | -25.06 | 19.72 | **Complied** | Y | 0 | 1.00 | |
| 4 | 27.2100 | 31.30 | 25.10 | 19.27 | 49.54 | -24.44 | 21.41 | **Complied** | Y | 0 | 1.00 | |
| 5 | 18.1350 | 31.89 | 24.57 | 18.50 | 49.54 | -24.97 | 19.72 | **Complied** | Z | 0 | 1.00 | |
| 6 | 27.2100 | 32.09 | 25.46 | 19.36 | 49.54 | -24.08 | 21.41 | **Complied** | Z | 0 | 1.00 | |
| Tested by: David Hollis | | | | | | | | | | | | |
| TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009 | | | | | | | | | | | REFCC15B.xlt Revised 10MAR03 | |

## 9.0 Band TX=27 Final >30MHz (Harmonics)

| ***Radiated Emissions Measurements*** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Standard:*** | 47 CFR 15.209, Class B | | | | | ***PRESCAN or FINAL:*** | | Final | | ***Date:*** | 5/20/2009 | |
| ***Device Tested:*** | Checkpoint Evolve W-10 w/Metalpoint9.0 Band TX=27 | | | | | ***Distance:*** | | 3.0m | | ***File:*** | | |
| | | | | | | | | | | | | |
| | | Measured Level | | | | | | | | | | |
| Meas # | Freq (MHz) | Peak | Quasi-Peak | Average | Quasi-Peak Limit | Quasi-Peak Δ | Antenna + Cable Correction Factor (included in measured levels) | Result | Polarization | Angle (degrees) | Antenna Height (meters) | Comment |
| 1 | 40.4225 | 40.06 | 34.96 | 10.56 | 40.00 | -5.04 | 12.15 | **Complied** | Vertical | 0 | 2.00 | |
| 2 | 41.6000 | 43.25 | 37.98 | 14.08 | 40.00 | -2.02 | 11.69 | **Complied** | Vertical | 0 | 2.00 | |
| 3 | 83.8775 | 33.84 | 27.83 | 11.58 | 40.00 | -12.17 | 8.82 | **Complied** | Vertical | 90 | 2.00 | |
| 4 | 91.6000 | 40.47 | 32.43 | 22.87 | 43.50 | -11.07 | 10.66 | **Complied** | Vertical | 90 | 1.50 | |
| 5 | 97.0000 | 36.97 | 31.36 | 23.56 | 43.50 | -12.14 | 11.46 | **Complied** | Vertical | 0 | 1.50 | |
| 6 | 448.1300 | 36.85 | 34.70 | 34.44 | 46.00 | -11.30 | 19.36 | **Complied** | Vertical | 0 | 1.70 | |
| 7 | 560.0125 | 34.18 | 32.26 | 30.57 | 46.00 | -13.74 | 21.70 | **Complied** | Vertical | 0 | 1.70 | |
| Tested by: David Hollis | | | | | | | | | | | | |
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### 4.3.6 Operation in Restricted Bands

The EUT is a digital swept frequency hopping transmitter. The EUT hops on discrete frequencies. The discrete frequencies that can be transmitted by the EUT are as follows:

Original Emerald frequency tables
/* Center frequency 8.2MHz +/- 410KHz */
Value CT_8200_300[] = {8610, 8555, 8500, 8446, 8391, 8337, 8282, 8227, 8173, 8118, 8063, 8009, 7954, 7899, 7845, 7790};

/* Center frequency 8.6MHz +/- 430KHz */
Value CT_8600_300[] = {9030, 8973, 8915, 8858, 8801, 8743, 8686, 8629, 8571, 8514, 8457, 8399, 8342, 8285, 8227, 8170};

/* Center frequency 9.0MHz +/- 450KHz */
Value CT_9000_300[] = {9450, 9390, 9330, 9270, 9210, 9150, 9090, 9030, 8970, 8910, 8850, 8790, 8730, 8670, 8610, 8550};

/* Center frequency 9.2MHz +/- 460KHz */
Value CT_9200_300[] = {9660, 9599, 9537, 9476, 9415, 9353, 9292, 9231, 9169, 9108, 9047, 8985, 8924, 8863, 8801, 8740}; /* Center frequency 9.5MHz +/- 480KHz */ Value CT_9500_300[] = {9980, 9916, 9852, 9788, 9724, 9660, 9596, 9532, 9468, 9404, 9340, 9276, 9212, 9148, 9084, 9020};

/* Mult tag with bins 0-7 center frequency 9.2MHz and bins 8-16 center frequency 8.2MHz each range +/- 300KHz */
Value CTMult_9200_8200_300[] = {9500, 9404, 9329, 9243, 9157, 9071, 8986, 8900, 8500, 8414, 8329, 8243, 8157, 8071, 7986, 7900}; Skinny Pulse frequency tables…..

/* This table is used for mult band (8.2/9.2) skinny pulse, using PW of 4us JRG_SP */
Value CTMult_sp[] = {9325, 9325, 9325, 9325, 9075, 9075, 9075, 9075, 8325, 8325, 8325, 8325, 8075, 8075, 8075, 8075};

/* This table is used for 8.2 band skinny pulse, using PW of 4us JRG_SP */ Value CT_8200_sp[] = {8450, 8450, 8450, 8450, 8325, 8325, 8325, 8325, 8075, 8075, 8075, 8075, 7950, 7950, 7950, 7950};
The restricted frequency bands (per FCC Part 15 Clause 15.205) in the operating frequency band of the EUT are as follows:

8.291 – 8.294 MHz
8.362 – 8.366 MHz
8.37625 – 8.38675 MHz
8.41425 – 8.41475 MHz

The transmitter is not capable of hopping into, or operating, in the restricted frequency bands and therefore complies with the restriction.

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## 4.4 Emissions Bandwidth

This test measures the emission bandwidth of the fundamental frequency generated by the EUT that may be outside the allowed transmission frequency

### 4.4.1 Test Over View

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Results** | **Complies** (as tested per this report) | | | | **Date** | 05/20/09 | |
| **Standard** | FCC Part 15 Subpart 15.215 and RSS-210 | | | | | | |
| **Product Model** | Evolve W10 with Integrated Metalpoint | | | **Serial#** | 724949200D11728091, 724949200D11728043 | | |
| **Configuration** | See test plan for details | | | | | | |
| **Test Set-up** | Tested on a 10m O.A.T.S. placed on turn-table, see test plans for details | | | | | | |
| **EUT Powered By** | 120V/60Hz | **Temp** | 22º C | **Humidity** | 45% | **Pressure** | 1004mbar |
| **Frequency Range** | 8.2MHz and 9.0MHz Band | | | | | | |
| **Perf. Criteria** | Within Frequency Range | | **Perf. Verification** | | Readings under Limit | | |
| **Mod to EUT** | None | | **Test Performed By** | | David Hollis | | |

### 4.4.2 Test Procedure

The emissions of the fundamental were measured with a loop antenna in 3 orthogonal orientations. The measurement of the bandwidth was done at -6db and -20dB on each side of the fundamental frequency. The test method includes signal maximizations of EUT configuration, by turning the turntable 360degres and recording the highest emissions.

### 4.4.3 Deviations

There were no deviations from the test methodology listed in the test plan for the Bandwidth Emissions test.

### 4.4.4 Final Test

All final radiated emissions measurements were below (in compliance with) the limits.

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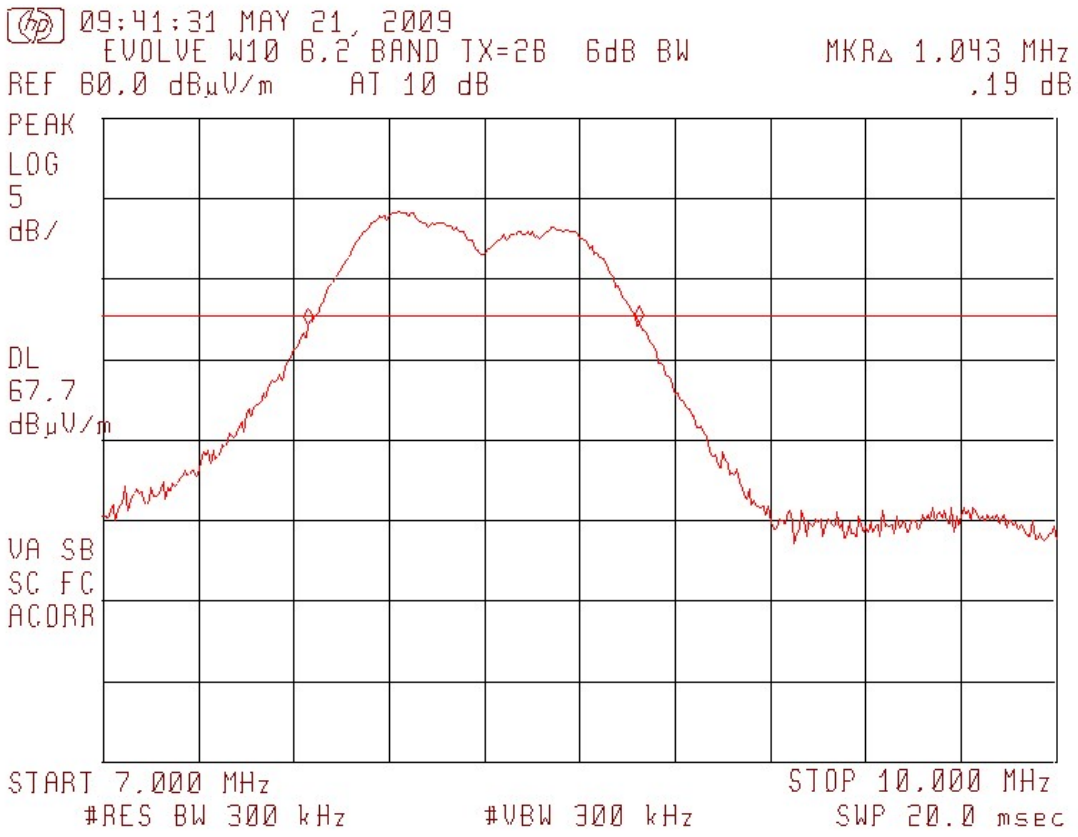
### 4.4.5 Final Measurement Data

NOTES:

**Emission Bandwidth**
**8.2 Band**
**6dB Bandwidth**

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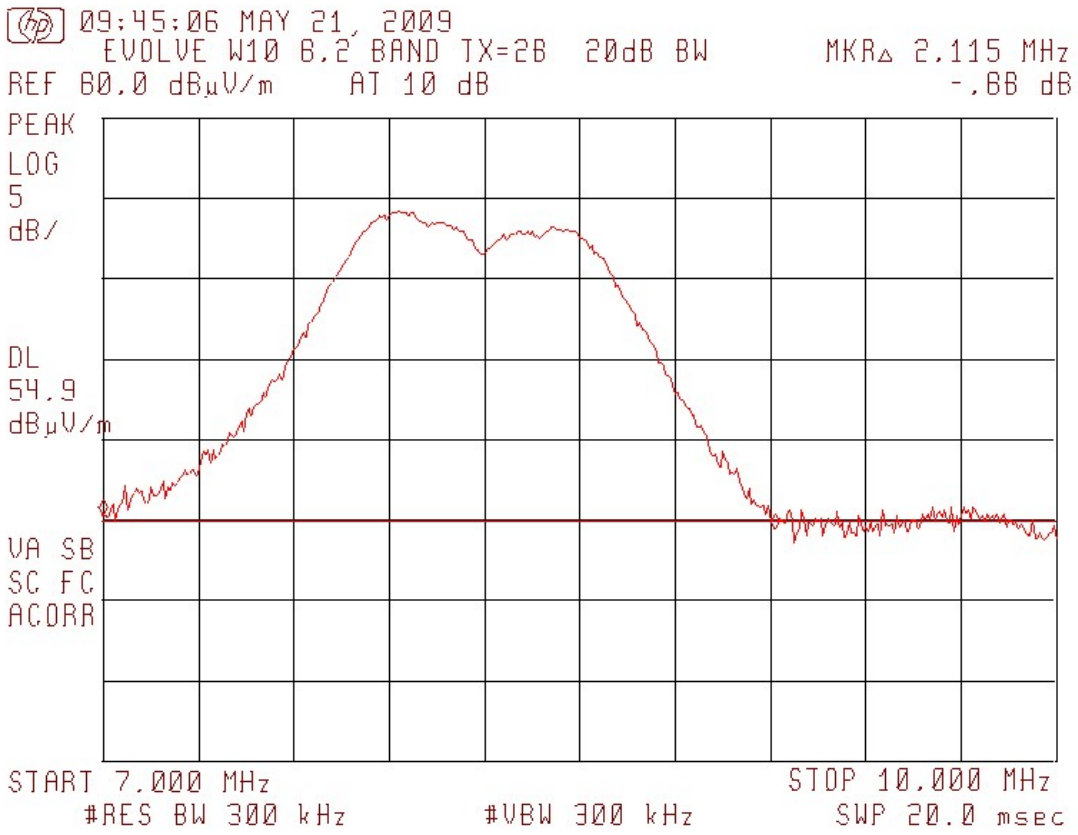
NOTES:

**Emission Bandwidth**
**8.2 Band**
**20 dB Bandwidth**

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NOTES:

**Emission Bandwidth**
**9.0 Band**
**6 dB Bandwidth**


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NOTES:

**Emission Bandwidth**
**9.0 Band**
**20 dB Bandwidth**


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| ***Band Edge Measurement*** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ***Standard:*** | 47 CFR FCC Part 15.215 /RSS-210 | | | | ***PRESCAN or FINAL:*** | | Final | ***Date:*** | 5/20/2009 |
| ***Device Tested:*** | Checkpoint - W10 8.2 Band TX=28, 9.0 Band TX=27 | | | | | ***Distance:*** | 3m | ***File:*** | W10 Bandedge.xls |
| | | | | | | | | | |
| | Measured Level | | | | | | | | |
| Meas # | TX Band | -6dB Low End (MHz) | -6dB High End (MHz) | Measured Bandwith (MHz) | -20dB Low End (MHz) | -20dB High End (MHz) | Measured Bandwith (MHz) | | Comment |
| RBW = 300kHz VBW=300kHz (FCC Settings) | | | | | | | | | |
| | | | | | | | | | |
| 1 | 8.2 | 7.645 | 8.680 | 1.043 | 6.985 | 9.115 | 2.115 | | |
| | | | | | | | | | |
| 2 | 9.0 | 8.83 | 9.72 | 0.95 | 7.06 | 10.18 | 3.12 | | |
| | | | | | | | | | |
| Tested by: | David Hollis | | | | | | | | |
| TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009 | | | | | | | | | |

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