## PCTEST ENGINEERING LABORATORY, INC.



6660-B Dobbin Road, Columbia, MD 21045 USA Tel. 410.290.6652 / Fax 410.290.6554 http://www.pctestlab.com



# CERTIFICATE OF COMPLIANCE FCC Part 90 Certification

**Applicant Name:** 

Digital Receiver Technology, Inc. 20250 Century Boulevard, Suite 300 Germantown, MD 20874-1114 Date of Testing:
February 24 - March 12, 2009
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Test Report Serial No.:
0903310614.DRT

FCC ID: TBD

APPLICANT: DIGITAL RECEIVER TECHNOLOGY, INC.

Application Type: Certification

FCC Classification: Licensed Non-Broadcast Station Transmitter (TNB)

FCC Rule Part(s): §2; §90

**EUT Type:** Portable Base Station

Model(s): 1201B

Tx Frequency Range: 851 - 869MHz

Max. RF Output Power: 8.68dBm (7.38mW)

Emission Designator(s): 17K5D7W Mode(s): 850 Band

**Test Device Serial No.:** identical prototype [S/N: N/A]

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Grant Conditions: Power output listed is conducted.

PCTEST certifies that no party to this application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.





| FCC ID: TBD      | ENGINEERING LASORATORY, INC. | FCC Pt. 90 850 Band MEASUREMENT REPORT (CERTIFICATION) | Olphal Receiver Technology, Inc. | Reviewed by:<br>Quality Manager |
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## MEASUREMENT REPORT FCC Part 90



## §2.1033 General Information

APPLICANT: Digital Receiver Technology, Inc.

**APPLICANT ADDRESS:** 20250 Century Boulevard, Suite 300

Germantown, MD 20874-1114

**TEST SITE:** PCTEST ENGINEERING LABORATORY, INC. **TEST SITE ADDRESS:** 6660-B Dobbin Road, Columbia, MD 21045 USA

FCC RULE PART(S): §2; §90 **BASE MODEL:** 1201B FCC ID: **TBD** 

**FCC CLASSIFICATION:** Licensed Non-Broadcast Station Transmitter (TNB)

**EMISSION DESIGNATOR(S):** 17K5D7W

**FREQUENCY TOLERANCE:** ±0.00025 % (2.5 ppm)

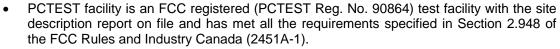
☐ Production ☐ Pre-Production ☐ Engineering **Test Device Serial No.:** N/A

DATE(S) OF TEST: February 24 - March 12, 2009

**TEST REPORT S/N:** 0903310614.DRT

## **Test Facility / Accreditations**

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21045, U.S.A.





- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing. Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451A-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.



| FCC ID: TBD      | PCTEST                       | FCC Pt. 90 850 Band MEASUREMENT REPORT | :::DRT                            | Reviewed by:    |
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| FCC ID. 1BD      | ENGINEERING LABORATORY, INC. | (CERTIFICATION)                        | Digital Receiver Sechnology, Inc. | Quality Manager |
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## INTRODUCTION

### 1.1 Scope

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission.

#### 1.2 Testing Facility

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity are, the Baltimore-Washington Internt'l (BWI) airport, the city of Baltimore and the Washington, DC area, (See Figure 1-1).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2003 on January 27, 2006.

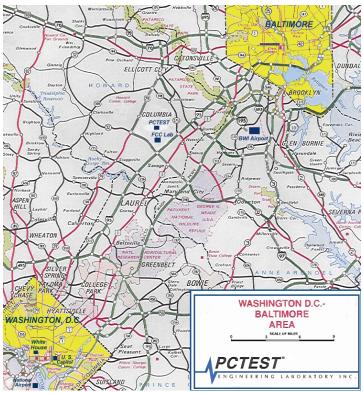


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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## PRODUCT INFORMATION

### 2.1 **Equipment Description**

The Equipment Under Test (EUT) is the DRT Portable Base Station FCC ID: TBD. The EUT consisted of the following component(s):

| Trade Name / Base Model | FCC ID | Description           |
|-------------------------|--------|-----------------------|
| DRT / Model: 1201B      | TBD    | Portable Base Station |

Table 2-1. EUT Equipment Description

The DRT1201B is configurable with up to 18 Digital Synthesizers (DEX) and Transmitters (TEX). For testing the unit was configured with an RFT Digital Tuner, WPM Processor, REF Reference Generator, CTL Computer Control, 2 DEX Digital Synthesizer, and 2 TEX Transmitter modules.

Test data in this report covers the operation of the unit operating in the 851 – 869 MHz 850 Band.

### 2.2 **EMI Suppression Device(s)/Modifications**

No EMI suppression device(s) were added and no modifications were made during testing.

### 2.3 **Labeling Requirements**

## Per 2.925

The FCC identifier shall be permanently affixed to the equipment and shall be readily visible to the purchaser at the time of purchase.

## Per 15.19; Docket 95-19

In addition to this requirement, a device subject to certification shall be labeled as follows:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name and FCC ID must be displayed on the device per Section 15.19(b)(2).

Please see attachment for FCC ID label and label location.

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## DESCRIPTION OF TESTS

#### 3.1 Measurement Procedure

The radiated spurious measurements were made indoors and validated on an outdoors 3-meter test range (See Figure 3-1). The equipment under test is placed on a wooden turntable 3meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. This power level was recorded using a broadband average power meter. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This level is recorded with the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.

Deviation from Measurement Procedure.....None

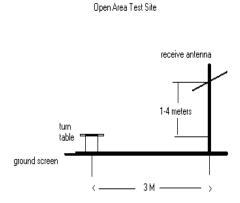


Figure 3-1. Diagram of 3-meter outdoor test range

### 3.2 **Occupied Bandwidth Emission Limits** §2.1049, §90.209, §90.210(b)

For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

- (1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.
- (2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.
- (3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.

Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

The measurement of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

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### Spurious and Harmonic Emissions at Antenna Terminal 3.3 §2.1051, §90.210

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10<sup>th</sup> harmonic.

### 3.4 Radiated Spurious and Harmonic Emissions §2.1053, §90.210

Spurious and harmonic radiated emissions are measured outdoors at our 3-meter test range. The equipment under test is placed on a wooden turntable 3-meters from the receive antenna. antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. This level is then measured with a broadband average power meter. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10<sup>th</sup> harmonic. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive average power meter reading. This spurious level is recorded with the power meter. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

### 3.5 Frequency Stability / Temperature Variation §2.1055, §90.213

The frequency stability of the transmitter is measured by:

- Temperature: The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Specification - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5$  ppm) of the center frequency.

### Time Period and Procedure:

- 1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
- 2. The equipment is turned on in a "standby" condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
- 3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

NOTE: As this device is an amplifier only with no frequency determining circuitry the frequency stability testing was not performed.

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## TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

| Manufacturer      | Model            | Description                        | Cal Date   | Cal Interval | Cal Due    | Serial Number |
|-------------------|------------------|------------------------------------|------------|--------------|------------|---------------|
| -                 | 263-10dB         | (DC-18GHz) 10 dB Attenuator        | N/A        |              | N/A        | N/A           |
| -                 | No.165           | (30MHz - 1000MHz) RG58 Coax Cable  | N/A        |              | N/A        | N/A           |
| -                 | No.166           | (1000-26500MHz) Microwave RF Cable | N/A        |              | N/A        | N/A           |
| -                 | No.167           | (100kHz - 100MHz) RG58 Coax Cable  | N/A        |              | N/A        | N/A           |
| Agilent           | 11713A           | Attenuation/Switch Driver          | 12/4/2008  | Annual       | 12/4/2009  | 3439A02645    |
| Agilent           | 8449B            | (1-26.5GHz) Pre-Amplifier          | 12/4/2008  | Annual       | 12/4/2009  | 3008A00985    |
| Agilent           | 8495A            | (0-70dB) DC-4GHz Attenuator        | N/A        |              | N/A        | N/A           |
| Agilent           | 85650A           | Quasi-Peak Adapter                 | 12/4/2008  | Annual       | 12/4/2009  | 3303A01872    |
| Agilent           | 8566B            | (100Hz-22GHz) Spectrum Analyzer    | 12/5/2008  | Annual       | 12/5/2009  | 3638A08713    |
| Agilent           | 8591A            | (9kHz-1.8GHz) Spectrum Analyzer    | 8/19/2008  | Annual       | 8/19/2009  | 3144A02458    |
| Agilent           | 8648D            | (9kHz-4GHz) Signal Generator       | 10/11/2007 | Biennial     | 10/11/2009 | 3613A00315    |
| Agilent           | 8901A            | Modulation Analyzer                | 8/18/2008  | Annual       | 8/18/2009  | 2432A03467    |
| Agilent           | 8903B            | Audio Analyzer                     | 8/18/2008  | Annual       | 8/18/2009  | 3011A09025    |
| Agilent           | E4432B           | ESG-D Series Signal Generator      | 8/18/2008  | Annual       | 8/18/2009  | US40053896    |
| Agilent           | E4448A           | PSA (3Hz-50GHz) Spectrum Analyzer  | 12/5/2008  | Annual       | 12/5/2009  | US42510244    |
| Agilent           | E8267C           | Vector Signal Generator            | 11/15/2007 | Biennial     | 11/15/2009 | US42340152    |
| Agilent           | N9020A           | MXA Signal Analyzer                | 9/17/2008  | Annual       | 9/17/2009  | US46470561    |
| Compliance Design | Roberts          | Dipole Set                         | 11/9/2007  | Biennial     | 11/9/2009  | 146           |
| Compliance Design | Roberts          | Dipole Set                         | 11/9/2007  | Biennial     | 11/9/2009  | 147           |
| Emco              | 3115             | Horn Antenna (1-18GHz)             | 9/24/2007  | Biennial     | 9/24/2009  | 9704-5182     |
| Emco              | 3115             | Horn Antenna (1-18GHz)             | 10/4/2007  | Biennial     | 10/4/2009  | 9205-3874     |
| Espec             | ESX-2CA          | Environmental Chamber              | 4/12/2008  | Annual       | 4/12/2009  | 17620         |
| Gigatronics       | 80701A           | (0.05-18GHz) Power Sensor          | 8/18/2008  | Annual       | 8/18/2009  | 1833460       |
| Gigatronics       | 8651A            | Universal Power Meter              | 8/18/2008  | Annual       | 8/18/2009  | 1835299       |
| Gigatronics       | 8651A            | Universal Power Meter              | 8/18/2008  | Annual       | 8/18/2009  | 8650319       |
| K&L               | 11SH10           | Band Pass Filter                   | N/A        | Annual       | N/A        | 1300/4000     |
| K&L               | 11SH10           | Band Pass Filter                   | N/A        | Annual       | N/A        | 4000/12000    |
| MiniCircuits      | VHF-1300+        | High Pass Filter                   | N/A        |              | N/A        | 30716         |
| MiniCircuits      | VHF-3100+        | High Pass Filter                   | N/A        |              | N/A        | 30721         |
| Pasternack        | PE2208-6         | Bidirectional Coupler              | N/A        |              | N/A        | N/A           |
| Schwarzbeck       | UHA9105          | Dipole Antenna (400 - 1GHz) Rx     | 6/19/2007  | Biennial     | 6/18/2009  | 9105-2404     |
| Schwarzbeck       | UHA9105          | Dipole Antenna (400 - 1GHz) Tx     | 6/19/2007  | Biennial     | 6/18/2009  | 9105-2403     |
| Solar Electronics | 8012-50-R-24-BNC | LISN                               | 11/8/2007  | Biennial     | 11/8/2009  | 310233        |
| Sunol             | DRH-118          | Horn Antenna (1 - 18GHz)           | 5/9/2007   | Biennial     | 5/9/2009   | A050307       |

Table 4-1. Test Equipment

| FCC ID: TBD      | PCTEST*                      | FCC Pt. 90 850 Band MEASUREMENT REPORT (CERTIFICATION) | Olgital Receiver Technology, Inc. | Reviewed by:<br>Quality Manager |
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## SAMPLE CALCULATIONS

## **Emission Designator**

Emission Designator = 250KGXW

GSM BW = 250 kHzG = Phase Modulation X = Cases not otherwise covered W = Combination (Audio/Data)

## Spurious Radiated Emission - PCS Band

Example: Channel 512 PCS Mode 2<sup>nd</sup> Harmonic (3700.40 MHz)

The average receive power meter reading at 3 meters with the EUT on the turntable was -81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of -81.0 dBm on the power meter. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 3700.40 MHz. So 6.1 dB is added to the power meter reading of -30.9 dBm yielding -24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm - (-24.80) = 50.3 dBc.

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### 6.0 **TEST RESULTS**

### 6.1 **Summary**

Company Name: Digital Receiver Technology, Inc.

FCC ID: **TBD** 

Licensed Non-Broadcast Station Transmitter (TNB) FCC Classification:

Mode(s): 850 Band

| FCC Part<br>Section(s) | Test Description   | Test Limit   | Test<br>Condition                      | Test<br>Result | Reference              |  |
|------------------------|--|--|--|----------------|------------------------|--|
| TRANSMITTER MO         | DDE (TX)   |  |  |                |                        |  |
| 2.1049, 90.209         | Occupied<br>Bandwidth  | N/A  |  | PASS           | Section 7.0            |  |
| 2.1051, 90.210         | Band Edge /<br>Conducted Spurious<br>Emissions   | < 43 + log <sub>10</sub> (P[Watts]) at Band<br>Edge and for all out-of-band<br>emissions | CONDUCTED                              | PASS           | Section 7.0            |  |
| 2.1046, 90.635         | Transmitter<br>Conducted Output<br>Power   | N/A  |  | PASS           | Section 6.1            |  |
| 2.1053, 90.210         | Undesirable<br>Emissions   | < 43 + log <sub>10</sub> (P[Watts]) for all out-of-band emissions                        | RADIATED                               | PASS           | Section 6.2            |  |
| 2.1055, 90.213         | Frequency Stability  | 851 – 854M < 1 ppm<br>854 – 869M < 1.5 ppm   | KADIATED                               | N/A            | N/A                    |  |
| RECEIVER MODE          | (RX) / DIGITAL EMISSI  | <u>ONS</u>   |  |                | _                      |  |
| 15.107                 | AC Conducted<br>Emissions 150kHz –<br>30MHz  | < FCC 15.107 limits  | LINE<br>CONDUCTED                      | PASS           | Pt. 15B Test<br>Report |  |
| 15.109                 | General Field<br>Strength Limits<br>(Restricted Bands<br>and Radiated<br>Emissions Limits) | < FCC 15.109 limits  | RADIATED<br>(30MHz-1GHz)<br>(1-25 GHz) | PASS           | Pt. 15B Test<br>Report |  |
| RF EXPOSURE            | RF EXPOSURE  |  |  |                |                        |  |
| 2.1091 / 2.1093        | MPE Test   | 1 mW/cm² (MPE Limit) @ 20 cm   | MPE                                    | PASS           | MPE Report             |  |

Table 6-1. Summary of Test Results

| FCC ID: TBD      | ENGINEERING LABORATORY, INC. | FCC Pt. 90 850 Band MEASUREMENT REPORT (CERTIFICATION) | DRT Digital Receiver Technology, Inc. | Reviewed by:<br>Quality Manager |
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### **Conducted Output Power** 6.1 §2.1046

The device was tested with the maximum output setting provided by the DRT 1201B. The 850 Band conducted output powers were measured at the TEX module output.

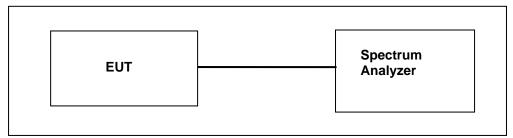


Figure 6-1: Test Setup Diagram

| Band     | Channel | Conducted<br>Power<br>[dBm] | Conducted<br>Power<br>[mW] |
|----------|---------|-----------------------------|----------------------------|
|          | 1       | 8.68                        | 7.38                       |
| 850 Band | 743     | 7.71                        | 5.90                       |
|          | 1439    | 8.10                        | 6.46                       |

Table 6-2. Maximum Conducted Output Power Table for 1201B (850 Band)

| FCC ID: TBD                                   | ENGINEERING LABORATORY, INC. | FCC Pt. 90 850 Band MEASUREMENT REPORT (CERTIFICATION) | Ogleti Receiver Technology, Inc. | Reviewed by:<br>Quality Manager |
|---|------------------------------|--|----------------------------------|---------------------------------|
| Test Report S/N:                              | Test Dates:                  | EUT Type:  |                                  | Page 11 of 27                   |
| 0903310614.DRT                                | February 24 - March 12, 2009 | Portable Base Station                                  |                                  | rage 11 01 27                   |
| A COCCA POTEOT Estimated at the contract land |                              |  |                                  |                                 |



### 850 Band Mode Radiated Measurements 6.2 §2.1053, §90.210

## Field Strength of SPURIOUS Radiation

851.04 OPERATING FREQUENCY: MHz

CHANNEL:

MODULATION SIGNAL: 850 Band (Internal)

DISTANCE: meters LIMIT: -13.00 dBm

| FREQUENCY<br>(MHz) | LEVEL @<br>ANTENNA<br>TERMINALS<br>(dBm) | SUBSTITUTE<br>ANTENNA GAIN<br>(dBd) | CORRECT<br>GENERATOR<br>LEVEL<br>(dBm) | POL<br>(H/V) | MARGIN<br>(dB) |
|--------------------|--|-------------------------------------|--|--------------|----------------|
| 1702.08            | -73.21                                   | 6.10                                | -67.11                                 | Н            | -54.1          |
| 2553.12            | -69.20                                   | 6.58                                | -62.62                                 | Н            | -49.6          |
| 3404.16            | -66.80                                   | 6.92                                | -59.88                                 | Н            | -46.9          |
| 4255.20            | -66.10                                   | 7.77                                | -58.33                                 | Н            | -45.3          |
| 5106.24            | -63.95                                   | 8.32                                | -55.63                                 | Н            | -42.6          |

Table 6-3. Radiated Spurious Data (850 Band Mode – Ch. 1)

### NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. Final power measurements are made with a broadband average power meter. A halfwave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

| FCC ID: TBD      | PCTEST                       | FCC Pt. 90 850 Band MEASUREMENT REPORT | DRT                               | Reviewed by:    |
|------------------|------------------------------|--|-----------------------------------|-----------------|
| FCC ID. 1BD      | ENGINEERING LABORATORY, INC. | (CERTIFICATION)                        | Digital Receiver Technology, Inc. | Quality Manager |
| Test Report S/N: | Test Dates:                  | EUT Type:                              |                                   | Page 12 of 27   |
| 0903310614.DRT   | February 24 - March 12, 2009 | Portable Base Station                  |                                   | rage 12 01 21   |



## 850 Band Mode Radiated Measurements (Cont'd) §2.1053, §90.210

## Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 860.29 MHz

> CHANNEL: 743

MODULATION SIGNAL: 850 Band (Internal)

DISTANCE: meters LIMIT: -13.00 dBm

| FREQUENCY<br>(MHz) | LEVEL @<br>ANTENNA<br>TERMINALS<br>(dBm) | SUBSTITUTE<br>ANTENNA GAIN<br>(dBd) | CORRECT<br>GENERATOR<br>LEVEL<br>(dBm) | POL<br>(H/V) | MARGIN<br>(dB) |
|--------------------|--|-------------------------------------|--|--------------|----------------|
| 1720.58            | -72.49                                   | 6.10                                | -66.40                                 | Н            | -53.4          |
| 2580.86            | -69.53                                   | 6.58                                | -62.94                                 | Н            | -49.9          |
| 3441.15            | -64.39                                   | 6.93                                | -57.46                                 | Н            | -44.5          |
| 4301.44            | -66.30                                   | 7.86                                | -58.44                                 | Н            | -45.4          |
| 5161.73            | -61.90                                   | 8.32                                | -53.59                                 | Н            | -40.6          |

Table 6-4. Radiated Spurious Data (850 Band Mode – Ch. 743)

### NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. Final power measurements are made with a broadband average power meter. A halfwave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

| FCC ID: TBD      | PCTEST ENGINEERING LABORATORY, INC. | FCC Pt. 90 850 Band MEASUREMENT REPORT (CERTIFICATION) | DRT Digital Receiver Technology, Inc. | Reviewed by:<br>Quality Manager |
|------------------|-------------------------------------|--|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates:                         | EUT Type:  |                                       | Dogg 12 of 27                   |
| 0903310614.DRT   | February 24 - March 12, 2009        | Portable Base Station                                  |                                       | Page 13 of 27                   |



## 850 Band Mode Radiated Measurements (Cont'd) §2.1053, §90.210

## Field Strength of SPURIOUS Radiation

**OPERATING FREQUENCY:** 868.96 MHz

> CHANNEL: 1439

MODULATION SIGNAL: 850 Band (Internal)

DISTANCE: \_\_ meters -13.00 LIMIT: dBm

| FREQUENCY<br>(MHz) | LEVEL @<br>ANTENNA<br>TERMINALS<br>(dBm) | SUBSTITUTE<br>ANTENNA GAIN<br>(dBd) | CORRECT<br>GENERATOR<br>LEVEL<br>(dBm) | POL<br>(H/V) | MARGIN<br>(dB) |
|--------------------|--|-------------------------------------|--|--------------|----------------|
| 1737.92            | -72.13                                   | 6.10                                | -66.03                                 | Н            | -53.0          |
| 2606.88            | -68.10                                   | 6.59                                | -61.51                                 | Н            | -48.5          |
| 3475.84            | -66.82                                   | 6.94                                | -59.88                                 | Н            | -46.9          |
| 4344.80            | -64.90                                   | 7.96                                | -56.94                                 | Н            | -43.9          |
| 5213.76            | -64.69                                   | 8.31                                | -56.38                                 | Н            | -43.4          |

Table 6-5. Radiated Spurious Data (850 Band Mode – Ch. 1439)

## NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

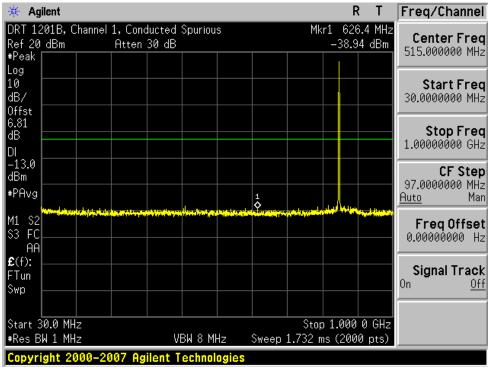
The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. Final power measurements are made with a broadband average power meter. A halfwave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

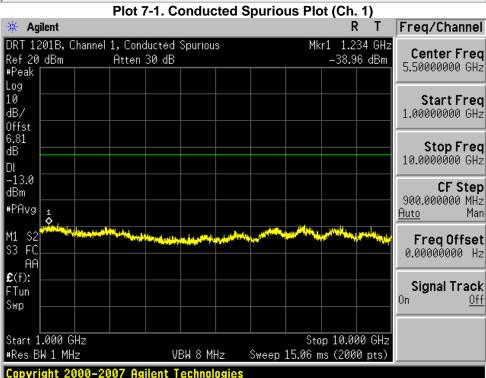
| FCC ID: TBD      | PCTEST                         | FCC Pt. 90 850 Band MEASUREMENT REPORT | DRT                                   | Reviewed by:    |
|------------------|--------------------------------|--|---------------------------------------|-----------------|
|                  | V ENGINEERING LABORATORY, INC. | (CERTIFICATION)                        | · · · · · · · · · · · · · · · · · · · | Quality Manager |
| Test Report S/N: | Test Dates:                    | EUT Type:                              |                                       | Page 14 of 27   |
| 0903310614.DRT   | February 24 - March 12, 2009   | Portable Base Station                  |                                       | rage 14 01 21   |



### PLOTS OF EMISSIONS 7.0

### 7.1 Low Channel (Ch. 1)

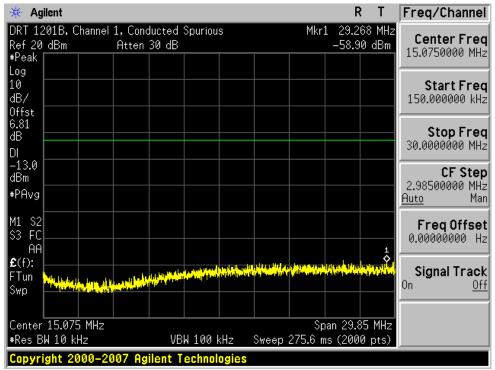




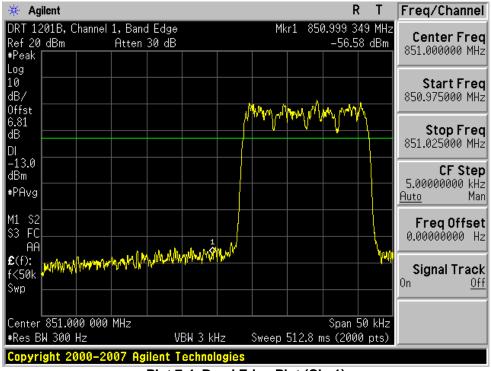
| FCC ID: TBD      | PCTEST ENGINEERING LASORATORY, INC. | FCC Pt. 90 850 Band MEASUREMENT REPORT (CERTIFICATION) | Optal Receiver Technology, Inc. | Reviewed by:<br>Quality Manager |  |
|------------------|-------------------------------------|--|---------------------------------|---------------------------------|--|
| Test Report S/N: | Test Dates:                         | EUT Type:  |                                 | Page 15 of 27                   |  |
| 0903310614.DRT   | February 24 - March 12, 2009        | Portable Base Station                                  |                                 | Page 15 01 27                   |  |
|                  |                                     |  |                                 |                                 |  |



Plot 7-2. Conducted Spurious Plot (Ch. 1)



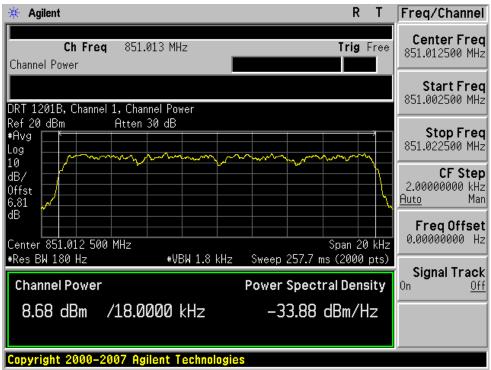
Plot 7-3. Conducted Spurious Plot (Ch. 1)



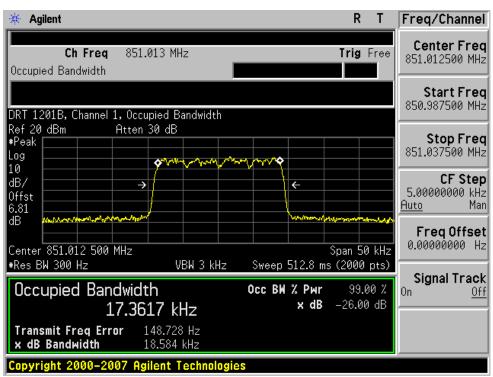
Plot 7-4. Band Edge Plot (Ch. 1)

| FCC ID: TBD                                | ENGINEERING LABORATORY, INC. | FCC Pt. 90 850 Band MEASUREMENT REPORT (CERTIFICATION) | DRT Digital Receiver Technology, Inc. | Reviewed by:<br>Quality Manager |
|--|------------------------------|--|---------------------------------------|---------------------------------|
| Test Report S/N:                           | Test Dates:                  | EUT Type:  |                                       | Page 16 of 27                   |
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Plot 7-5. Channel Power (Ch. 1)



Plot 7-6. Occupied Bandwidth Plot (Ch. 1)

| FCC ID: TBD                                | ENGINEERING LASORATORY, INC. | FCC Pt. 90 850 Band MEASUREMENT REPORT (CERTIFICATION) | Optal Receiver Technology, Inc. | Reviewed by:<br>Quality Manager |
|--|------------------------------|--|---------------------------------|---------------------------------|
| Test Report S/N:                           | Test Dates:                  | EUT Type:  |                                 | Page 17 of 27                   |
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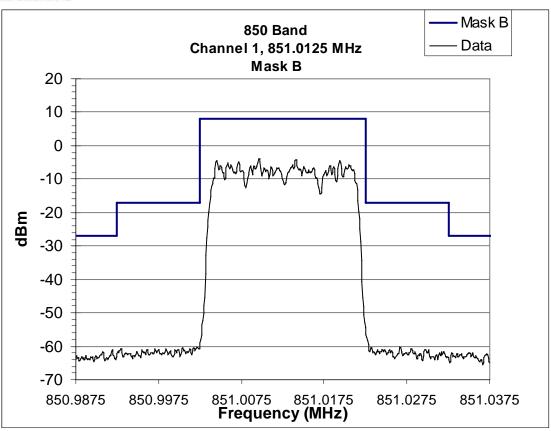


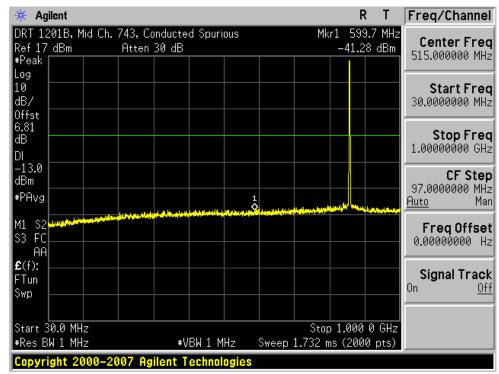
Figure 7-1: 850 Band Emission Mask, Channel 1 (§90.210(b))

| FCC ID: TBD                   | ENGINEERING LABORATORY, INC. | FCC Pt. 90 850 Band MEASUREMENT REPORT (CERTIFICATION) | DRT<br>Optal Receiver Technology, Inc. | Reviewed by:<br>Quality Manager |
|-------------------------------|------------------------------|--|--|---------------------------------|
| Test Report S/N:              | Test Dates:                  | EUT Type:  |  | Page 18 of 27                   |
| 0903310614.DRT                | February 24 - March 12, 2009 | Portable Base Station                                  |  | rage 10 01 21                   |
| O COOCO POTEOTE : : : ! ! ! ! |                              |  |  |                                 |

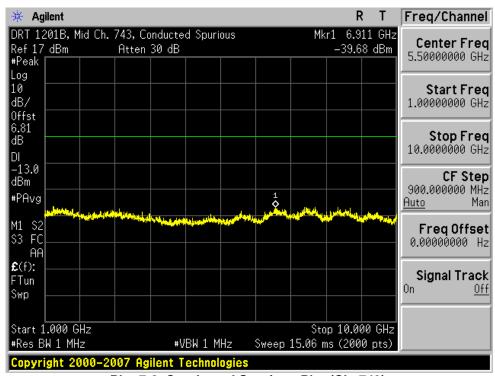
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### 7.2 Mid-Channel (Ch. 743)



Plot 7-7. Conducted Spurious Plot (Ch. 743)

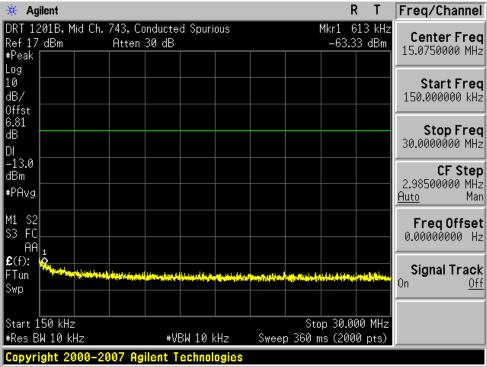


Plot 7-8. Conducted Spurious Plot (Ch. 743)

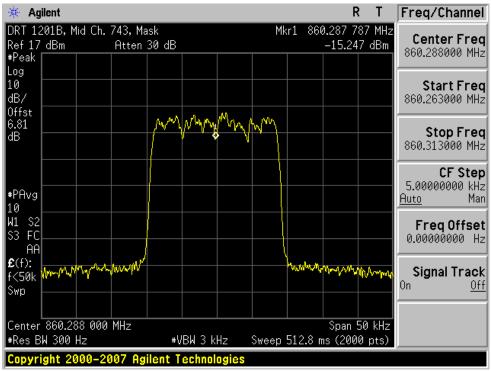
| FCC ID: TBD                                | ENGINEERING LABORATORY, INC. | FCC Pt. 90 850 Band MEASUREMENT REPORT (CERTIFICATION) | DRT Digital Receiver Technology, Inc. | Reviewed by:<br>Quality Manager |
|--|------------------------------|--|---------------------------------------|---------------------------------|
| Test Report S/N:                           | Test Dates:                  | EUT Type:  |                                       | Page 19 of 27                   |
| 0903310614.DRT                             | February 24 - March 12, 2009 | Portable Base Station                                  |                                       | Fage 19 01 21                   |
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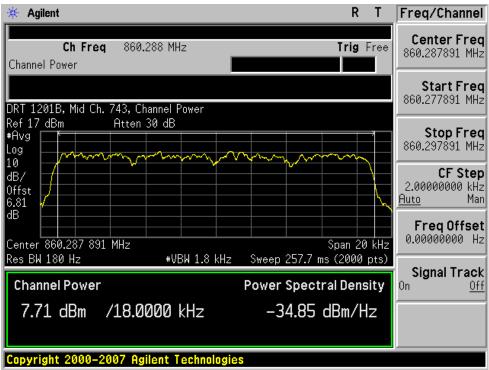
Plot 7-9. Conducted Spurious Plot (Ch. 743)



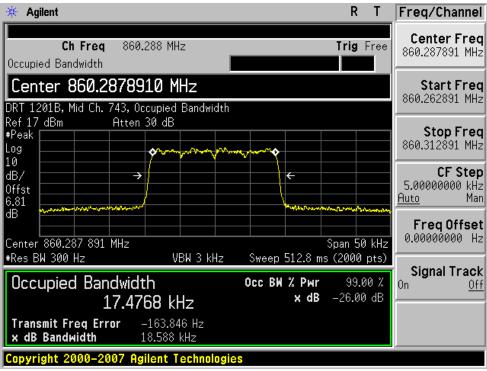
Plot 7-10. Emission Mask Plot (Ch. 743)

| FCC ID: TBD                                | ENGINEERING LASORATORT, INC. | FCC Pt. 90 850 Band MEASUREMENT REPORT (CERTIFICATION) | Optal Receiver Technology, Inc. | Reviewed by:<br>Quality Manager |
|--|------------------------------|--|---------------------------------|---------------------------------|
| Test Report S/N:                           | Test Dates:                  | EUT Type:  |                                 | Page 20 of 27                   |
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Plot 7-11. Channel Power (Ch. 743)



Plot 7-12. Occupied Bandwidth Plot (Ch. 743)

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|--|------------------------------|--|----------------------------------|---------------------------------|
| Test Report S/N:                           | Test Dates:                  | EUT Type:  |                                  | Page 21 of 27                   |
| 0903310614.DRT                             | February 24 - March 12, 2009 | Portable Base Station                                  |                                  | Page 21 01 21                   |
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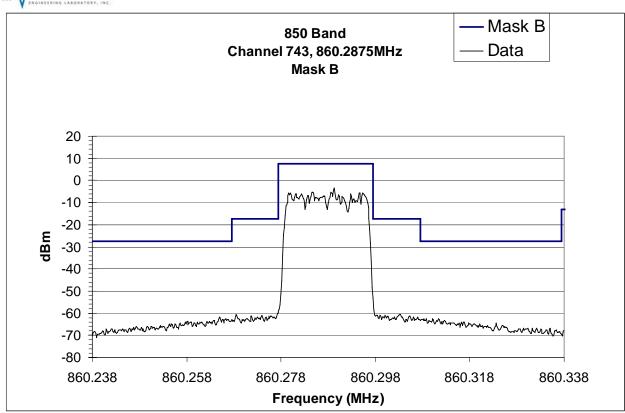


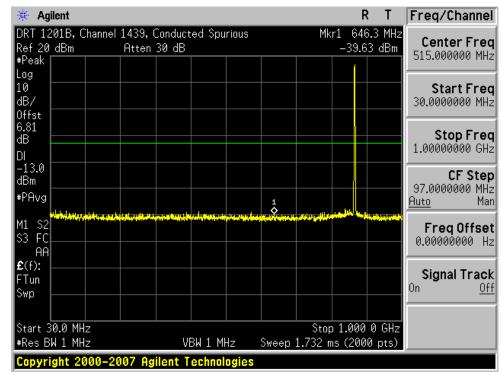
Figure 7-2: 850 Band Emission Mask, Channel 743 (§90.210(b))

| FCC ID: TBD      | PCTEST' ENGINEERING LABORATORY, INC. | FCC Pt. 90 850 Band MEASUREMENT REPORT (CERTIFICATION) | Clipital Receiver Technology, Inc. | Reviewed by:<br>Quality Manager |
|------------------|--------------------------------------|--|------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates:                          | EUT Type:  |                                    | Page 22 of 27                   |
| 0903310614.DRT   | February 24 - March 12, 2009         | Portable Base Station                                  |                                    | Faye 22 01 21                   |

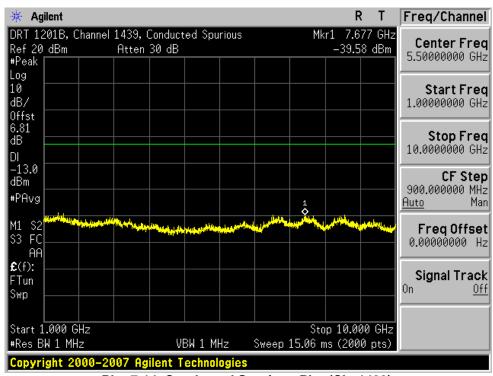
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### High Channel (Ch. 1439) 7.3



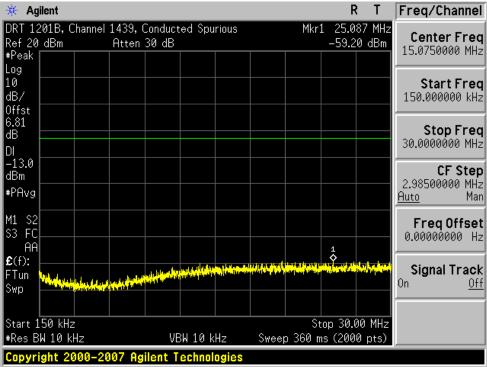
Plot 7-13. Conducted Spurious Plot (Ch. 1439)



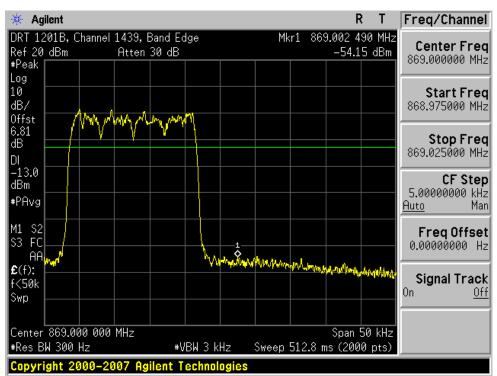
Plot 7-14. Conducted Spurious Plot (Ch. 1439)

| FCC ID: TBD                                | ENGINEERING LASORATORT, INC. | FCC Pt. 90 850 Band MEASUREMENT REPORT (CERTIFICATION) | Optal Receiver Technology, Inc. | Reviewed by:<br>Quality Manager |
|--|------------------------------|--|---------------------------------|---------------------------------|
| Test Report S/N:                           | Test Dates:                  | EUT Type:  |                                 | Page 23 of 27                   |
| 0903310614.DRT                             | February 24 - March 12, 2009 | Portable Base Station                                  |                                 | Page 23 01 27                   |
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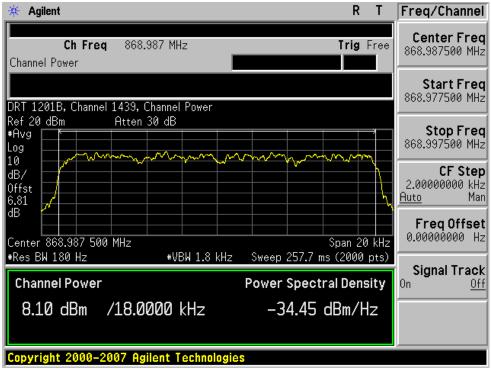
Plot 7-15. Conducted Spurious Plot (Ch. 1439)



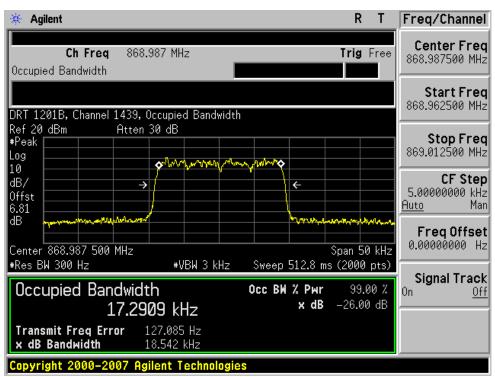
Plot 7-16. Band Edge Plot (Ch. 1439)

| FCC ID: TBD                                | ENGINEERING LASORATORT, INC. | FCC Pt. 90 850 Band MEASUREMENT REPORT (CERTIFICATION) | Optal Receiver Technology, Inc. | Reviewed by:<br>Quality Manager |
|--|------------------------------|--|---------------------------------|---------------------------------|
| Test Report S/N:                           | Test Dates:                  | EUT Type:  |                                 | Page 24 of 27                   |
| 0903310614.DRT                             | February 24 - March 12, 2009 | Portable Base Station                                  |                                 | Fage 24 01 27                   |
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Plot 7-17. Channel Power (Ch. 1439)



Plot 7-18. Occupied Bandwidth Plot (Ch. 1439)

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|--|------------------------------|--|---------------------------------|---------------------------------|
| Test Report S/N:                           | Test Dates:                  | EUT Type:  |                                 | Page 25 of 27                   |
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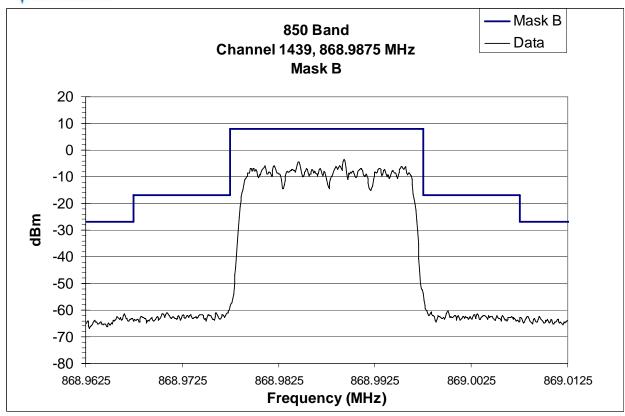


Figure 7-3: 850 Band Emission Mask, Channel 1439 (§90.210(b))

| FCC ID: TBD                                | ENGINEERING LABORATORY, INC. | FCC Pt. 90 850 Band MEASUREMENT REPORT (CERTIFICATION) | DRT Digital Receiver Technology, Inc. | Reviewed by:<br>Quality Manager |
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### CONCLUSION 8.0

The data collected relate only to the item(s) tested and show that the DRT Portable Base Station FCC **ID: TBD** complies with all the requirements of Parts 2 and 90 of the FCC rules.

| FCC ID: TBD      | PCTEST                         | FCC Pt. 90 850 Band MEASUREMENT REPORT (CERTIFICATION) | DRT  | Reviewed by:    |
|------------------|--------------------------------|--|------|-----------------|
|                  | V ENGINEERING LABORATORY, INC. | (CERTIFICATION)  | *::: | Quality Manager |
| Test Report S/N: | Test Dates:                    | EUT Type:  |      | Page 27 of 27   |
| 0903310614.DRT   | February 24 - March 12, 2009   | Portable Base Station                                  |      | rage 27 of 27   |