



**POWERWAVE TECHNOLOGIES, INC. TEST REPORT**

**FOR THE**

**WIDE BAND RADIO HEAD, RH500020/211 & RH500020/212**

**FCC PART 15 SUBPART B SECTIONS 15.107 & 15.109 CLASS B, 15.111,  
FCC PART 90, RSS-131 ISSUE 2 (JULY 2003) AND RSS-GEN ISSUE 2 (JUNE 2007)**

**TESTING**

**DATE OF ISSUE: DECEMBER 6, 2007**

**PREPARED FOR:**

Powerwave Technologies, Inc.  
1801 E. St. Andrew Place  
Santa Ana, CA 92705

P.O. No.: 116654  
W.O. No.: 87286

**PREPARED BY:**

Mary Ellen Clayton  
CKC Laboratories, Inc.  
5046 Sierra Pines Drive  
Mariposa, CA 95338

Date of test: November 5-26, 2007

**Report No.: FC07-102**

This report contains a total of 57 pages and may be reproduced in full only. Partial reproduction may only be done with the written consent of CKC Laboratories, Inc. The results in this report apply only to the items tested, as identified herein.

## TABLE OF CONTENTS

|  |    |
|--|----|
| Administrative Information .....   | 3  |
| Approvals.....   | 3  |
| Summary of Results.....  | 4  |
| Conditions During Testing.....   | 4  |
| Equipment Under Test (EUT) Description.....  | 5  |
| Equipment Under Test.....  | 5  |
| Peripheral Devices .....   | 5  |
| Temperature and Humidity During Testing.....   | 6  |
| FCC 2.1033(c)(3) User's Manual .....   | 6  |
| FCC 2.1033(c)(4) Type of Emissions.....  | 6  |
| FCC 2.1033(c)(5) Frequency Range.....  | 6  |
| FCC 2.1033(c)(6) Operating Power.....  | 6  |
| FCC 2.1033(c)(7) Maximum Power Rating .....  | 6  |
| FCC 2.1033(c)(8) DC Voltages.....  | 6  |
| FCC 2.1033(c)(9) Tune-Up Procedure .....   | 6  |
| FCC 2.1033(c)(10) Schematics and Circuitry Description.....                          | 6  |
| FCC 2.1033(c)(11) Label and Placement .....  | 6  |
| FCC 2.1033(c)(12) Submittal Photos .....   | 6  |
| FCC 2.1033(c)(13) Modulation Information .....                                       | 6  |
| FCC 15.107 – AC Conducted Emissions.....   | 7  |
| FCC 15.109 – Radiated Emissions .....  | 21 |
| FCC 15.111 – Antenna Power Conduction Limits for Receiver .....                      | 27 |
| FCC 2.1033(c)(14)/2.1046/90.635(a) - RF Power Output.....                            | 29 |
| RSS-131 Mean Output Power.....   | 30 |
| FCC 2.1033(c)(14)/2.1049(i) – Input and Output Plots.....                            | 32 |
| FCC 2.1033(c)(14)/2.1051/90.691(a)(2) - Spurious Emissions at Antenna Terminal ..... | 36 |
| FCC 2.1033(c)(14)/2.1053/90.691(a)(2) - Field Strength of Spurious Radiation .....   | 41 |
| Block Edge.....  | 45 |
| Intermodulation.....   | 47 |
| 99% Bandwidth.....   | 50 |
| RSS-131 Gain Linearity.....  | 53 |



## ADMINISTRATIVE INFORMATION

**DATE OF TEST:** November 5-26, 2007

**DATE OF RECEIPT:** November 5, 2007

**REPRESENTATIVE:** Charlotte Yu

**MANUFACTURER:**

Powerwave Technologies, Inc.  
1801 E. St. Andrew Place  
Santa Ana, CA 92705

**TEST LOCATION:**

CKC Laboratories, Inc.  
110 Olinda Place  
Brea, CA 92823

**FREQUENCY RANGE TESTED:** 9 kHz-9 GHz

**TEST METHOD:** ANSI C63.4 (2003), FCC Part 90, RSS-131 Issue 2 (July 2003) and RSS-GEN Issue 2 (June 2007)

**PURPOSE OF TEST:** To perform the testing of the Wide Band Radio Head, RH500020/211 with the requirements for FCC Part 15 Subpart B Sections 15.107 and 15.109 Class B, FCC Part 90 and RSS-131 devices.

### APPROVALS

**QUALITY ASSURANCE:**

Steve Behm, Director of Engineering Services

**TEST PERSONNEL:**

---

Eddie Wong, EMC Engineer

### SUMMARY OF RESULTS

| Test                                   | Specification/Method               | Results |
|--|------------------------------------|---------|
| Mains Conducted Emissions              | FCC Part 15 Section 15.107 Class B | Pass    |
| Radiated Emissions                     | FCC Part 15 Section 15.109 Class B | Pass    |
| Antenna Power                          | FCC Part 15 Section 15.111         | Pass    |
| RF Power Output                        | FCC Part 90.635(a)                 | Pass    |
| Mean Output Power                      | RSS-131 Section 4.3                | Pass    |
| Input and Output Plots                 | FCC Part 90                        | Pass    |
| Spurious Emissions at Antenna Terminal | FCC Part 90.691(a)(2)              | Pass    |
| Field Strength of Spurious Radiation   | FCC Part 90.691(a)(2)              | Pass    |
| Block Edge                             | FCC Part 90                        | Pass    |
| Intermodulation                        | FCC Part 90                        | Pass    |
| 99% Bandwidth                          | FCC Part 90                        | Pass    |
| Gain Linearity                         | RSS-131 Section 6.1                | Pass    |

### CONDITIONS DURING TESTING

No modifications to the EUT were necessary during testing.



## EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The customer declares the EUT tested by CKC Laboratories was representative of a production unit. Wideband Radio Heads (WRH) work as on-frequency amplifiers used to fill out uncovered areas in wireless mobile systems such as base station fringe areas, tunnels, business, convention centers, airports and industrial buildings. It receives, amplifies and transmits signals to/from a base station to/from mobile stations. The standard WRH is used for analog or digital systems, such as iDEN. It has a fiber optic donor port and a RF port for a service antenna (or RF cable) and is designed to be connected to a BTS via a BMU or OCM.

The following models have been tested by CKC Laboratories: **RH500020/211 & RH500020/212**

The manufacturer states that the following additional models are identical electrically to the one which was tested, or any differences between them do not affect their EMC characteristics, and therefore they meet the level of testing equivalent to the tested models. **RH500020/101, RH005002/000, RH005002/011, RH500020/102, RH005002/002, AND RH005002/012**

## EQUIPMENT UNDER TEST

### Wide Band Radio Head

Manuf: Powerwave Technologies, Inc.  
Model: RH500020/211  
Serial: NA  
FCC ID: E675JS0096

### Wide Band Radio Head

Manuf: Powerwave Technologies, Inc.  
Model: RH500020/212  
Serial: NA  
FCC ID: E675JS0096

## PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

### Optical Converter

Manuf: Powerwave Technologies, Inc.  
Model: NA  
Serial: 42473

### Spectrum Analyzer

Manuf: HP  
Model: 8563E  
Serial: NA

### Power Meter

Manuf: Agilent  
Model: E4419B  
Serial: GB402019/12

### Pre Amp

Manuf: Mini Circuit  
Model: ZHL-4240  
Serial: D040405

### ESG

Manuf: Aeroflex  
Model: IFR 3413  
Serial: 341005/078

### Power Supply

Manuf: HP  
Model: 6032  
Serial: 3542A12327



**TEMPERATURE AND HUMIDITY DURING TESTING**

The temperature during testing was within +15°C and + 35°C.  
The relative humidity was between 20% and 75%.

**FCC 2.1033(c)(3) USER’S MANUAL**

The necessary information is contained in a separate document.

**FCC 2.1033 (c)(4) TYPE OF EMISSIONS**

D7W

**FCC 2.1033 (c)(5) FREQUENCY RANGE**

851 MHz – 869 MHz.

**FCC 2.1033 (c)(6) OPERATING POWER**

20 Watts conducted.

**FCC 2.1033 (c)(7) MAXIMUM POWER RATING**

100 Watts.

**FCC 2.1033 (c)(8) DC VOLTAGES**

The necessary information is contained in a separate document.

**FCC 2.1033 (c)(9) TUNE-UP PROCEDURE**

The necessary information is contained in a separate document.

**FCC 2.1033(c)(10) SCHEMATICS AND CIRCUITRY DESCRIPTION**

The necessary information is contained in a separate document.

**FCC 2.1033(c)(11) LABEL AND PLACEMENT**

The necessary information is contained in a separate document.

**FCC 2.1033(c)(12) SUBMITTAL PHOTOS**

The necessary information is contained in a separate document.

**FCC 2.1033 (c)(13) MODULATION INFORMATION**

iDEN

**FCC 15.107 – AC CONDUCTED EMISSIONS**

| <b>ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE</b> |                     |                  |                   |
|--|---------------------|------------------|-------------------|
| TEST   | BEGINNING FREQUENCY | ENDING FREQUENCY | BANDWIDTH SETTING |
| CONDUCTED EMISSIONS                                    | 150 kHz             | 30 MHz           | 9 kHz             |

**Test Setup Photos**



AC



AC





DC



DC





## Test Data Sheets

Test Location: CKC Laboratories, Inc. • 110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112

Customer: **Powerwave Technologies, Inc.**  
 Specification: **FCC 15.107 Class B COND [AVE]**  
 Work Order #: **87286** Date: 11/26/2007  
 Test Type: **Conducted Emissions** Time: 10:19:19  
 Equipment: **Wide Band Radio Head** Sequence#: 9  
 Manufacturer: Powerwave Technologies, Inc. Tested By: E. Wong  
 Model: RH500020/211 110V 60Hz  
 S/N: NA

### Test Equipment:

| Function                 | S/N        | Calibration Date | Cal Due Date | Asset # |
|--------------------------|------------|------------------|--------------|---------|
| Spectrum Analyzer        | US44300438 | 01/03/2007       | 01/03/2009   | 02672   |
| LISN                     | 1104       | 11/10/2006       | 11/10/2008   | 00847   |
| 6dB Attenuator           | None       | 11/21/2006       | 11/21/2008   | P05611  |
| 150kHz HPF               | G7755      | 01/30/2006       | 01/30/2008   | 02610   |
| Conducted Emission Cable | Cable #21  | 05/09/2006       | 05/09/2008   | P04358  |

### Equipment Under Test (\* = EUT):

| Function              | Manufacturer                 | Model #      | S/N |
|-----------------------|------------------------------|--------------|-----|
| Wide Band Radio Head* | Powerwave Technologies, Inc. | RH500020/211 | NA  |

### Support Devices:

| Function          | Manufacturer                 | Model #  | S/N         |
|-------------------|------------------------------|----------|-------------|
| Optical Converter | Powerwave Technologies, Inc. | NA       | 42473       |
| Spectrum Analyzer | HP                           | 8563E    | NA          |
| Power Meter       | Agilent                      | E4419B   | GB402019/12 |
| Pre Amp           | Mini Circuit                 | ZHL-4240 | D040405     |
| ESG               | Aeroflex                     | IFR 3413 | 341005/078  |
| Power Supply      | HP                           | 6032     | 3542A12327  |

### Test Conditions / Notes:

The EUT is placed on the wooden table. The RF Output port is connected to a remote RF signal source. Optical port is connected to a support Optical converter. RF signal is sent to the antenna port of the EUT. The EUT converts the received RF signal to optical signal and sends the optical signal to a remote optical converter. RX range: 806-824MHz. Mode: Receive. Frequency = 815 MHz. Modulation: iDEN. 19°C, 47% relative humidity.

### Transducer Legend:

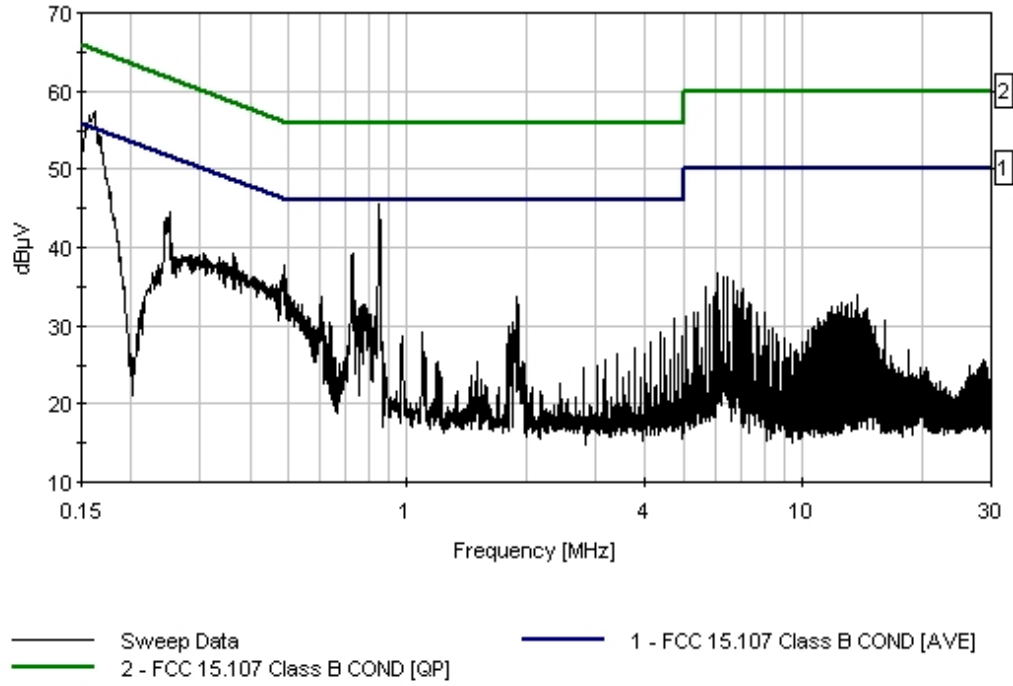
|                                      |  |
|--------------------------------------|--|
| T1=150kHz HPF Asset 02610            | T2=6dB Attenuator P05611                   |
| T3=Cable #21 Conducted Site A 050908 | T4=(L1) Insertion Loss 00847 EMCO 3816/2NM |

### Measurement Data: Reading listed by margin. Test Lead: Black

| #   | Freq MHz | Rdng dBμV | T1 dB | T2 dB | T3 dB | T4 dB | Dist Table | Corr dBμV | Spec dBμV | Margin dB | Polar Ant |
|-----|----------|-----------|-------|-------|-------|-------|------------|-----------|-----------|-----------|-----------|
| 1   | 849.189k | 36.8      | +0.1  | +6.1  | +0.0  | +0.1  | +0.0       | 43.1      | 46.0      | -2.9      | Black     |
| Ave |          |           |       |       |       |       |            |           |           |           |           |
| ^   | 848.845k | 39.3      | +0.1  | +6.1  | +0.0  | +0.1  | +0.0       | 45.6      | 46.0      | -0.4      | Black     |

|    |                 |      |      |      |      |      |      |      |      |       |       |
|----|-----------------|------|------|------|------|------|------|------|------|-------|-------|
| 3  | 727.402k        | 32.8 | +0.1 | +6.1 | +0.1 | +0.1 | +0.0 | 39.2 | 46.0 | -6.8  | Black |
| 4  | 250.354k        | 38.0 | +0.2 | +6.1 | +0.1 | +0.1 | +0.0 | 44.5 | 51.7 | -7.2  | Black |
| 5  | 487.424k        | 31.2 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 37.8 | 46.2 | -8.4  | Black |
| 6  | 363.799k        | 32.7 | +0.2 | +6.2 | +0.1 | +0.0 | +0.0 | 39.2 | 48.6 | -9.4  | Black |
| 7  | 367.435k        | 32.2 | +0.2 | +6.2 | +0.1 | +0.0 | +0.0 | 38.7 | 48.6 | -9.9  | Black |
| 8  | 491.060k        | 29.4 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 36.0 | 46.1 | -10.1 | Black |
| 9  | 605.958k        | 27.3 | +0.2 | +6.1 | +0.1 | +0.1 | +0.0 | 33.8 | 46.0 | -12.2 | Black |
| 10 | 1.889M          | 27.4 | +0.1 | +6.1 | +0.1 | +0.1 | +0.0 | 33.8 | 46.0 | -12.2 | Black |
| 11 | 735.401k        | 26.7 | +0.1 | +6.1 | +0.1 | +0.1 | +0.0 | 33.1 | 46.0 | -12.9 | Black |
| 12 | 1.906M          | 26.4 | +0.1 | +6.1 | +0.1 | +0.1 | +0.0 | 32.8 | 46.0 | -13.2 | Black |
| 13 | 769.580k        | 26.3 | +0.1 | +6.1 | +0.1 | +0.1 | +0.0 | 32.7 | 46.0 | -13.3 | Black |
| 14 | 781.215k        | 26.3 | +0.1 | +6.1 | +0.1 | +0.1 | +0.0 | 32.7 | 46.0 | -13.3 | Black |
| 15 | 6.067M          | 29.8 | +0.1 | +6.2 | +0.2 | +0.3 | +0.0 | 36.6 | 50.0 | -13.4 | Black |
| 16 | 151.426k<br>Ave | 20.7 | +2.3 | +6.2 | +0.1 | +0.1 | +0.0 | 29.4 | 55.9 | -26.5 | Black |
| 17 | 161.635k<br>Ave | 13.7 | +0.6 | +6.2 | +0.1 | +0.1 | +0.0 | 20.7 | 55.4 | -34.7 | Black |
| ^  | 161.635k        | 50.3 | +0.6 | +6.2 | +0.1 | +0.1 | +0.0 | 57.3 | 55.4 | +1.9  | Black |

CKC Laboratories, Inc. Date: 11/26/2007 Time: 10:19:19 Powerwave Technologies, Inc. WO#: 87286  
 FCC 15.107 Class B COND [AVE] Test Lead: Black 110V 60Hz Sequence#: 9





Test Location: CKC Laboratories, Inc. • 110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112

Customer: **Powerwave Technologies, Inc.**  
 Specification: **FCC 15.107 Class B COND [AVE]**  
 Work Order #: **87286** Date: 11/26/2007  
 Test Type: **Conducted Emissions** Time: 10:14:20  
 Equipment: **Wide Band Radio Head** Sequence#: 8  
 Manufacturer: Powerwave Technologies, Inc. Tested By: E. Wong  
 Model: RH500020/211 110V 60Hz  
 S/N: NA

**Test Equipment:**

| Function                 | S/N        | Calibration Date | Cal Due Date | Asset # |
|--------------------------|------------|------------------|--------------|---------|
| Spectrum Analyzer        | US44300438 | 01/03/2007       | 01/03/2009   | 02672   |
| LISN                     | 1104       | 11/10/2006       | 11/10/2008   | 00847   |
| 6dB Attenuator           | None       | 11/21/2006       | 11/21/2008   | P05611  |
| 150kHz HPF               | G7755      | 01/30/2006       | 01/30/2008   | 02610   |
| Conducted Emission Cable | Cable #21  | 05/09/2006       | 05/09/2008   | P04358  |

**Equipment Under Test (\* = EUT):**

| Function              | Manufacturer                 | Model #      | S/N |
|-----------------------|------------------------------|--------------|-----|
| Wide Band Radio Head* | Powerwave Technologies, Inc. | RH500020/211 | NA  |

**Support Devices:**

| Function          | Manufacturer                 | Model #  | S/N         |
|-------------------|------------------------------|----------|-------------|
| Optical Converter | Powerwave Technologies, Inc. | NA       | 42473       |
| Spectrum Analyzer | HP                           | 8563E    | NA          |
| Power Meter       | Agilent                      | E4419B   | GB402019/12 |
| Pre Amp           | Mini Circuit                 | ZHL-4240 | D040405     |
| ESG               | Aeroflex                     | IFR 3413 | 341005/078  |
| Power Supply      | HP                           | 6032     | 3542A12327  |

**Test Conditions / Notes:**

The EUT is placed on the wooden table. The RF antenna port is connected to a remote RF signal source. Optical port is connected to a support Optical converter. RF signal is sent to the antenna port of the EUT. The EUT converts the received RF signal to optical signal and sends the optical signal to a remote optical converter. RX range: 806-824MHz. Mode: receive. Frequency = 815 MHz. Modulation: iDEN. 19°C, 47% relative humidity.

**Transducer Legend:**

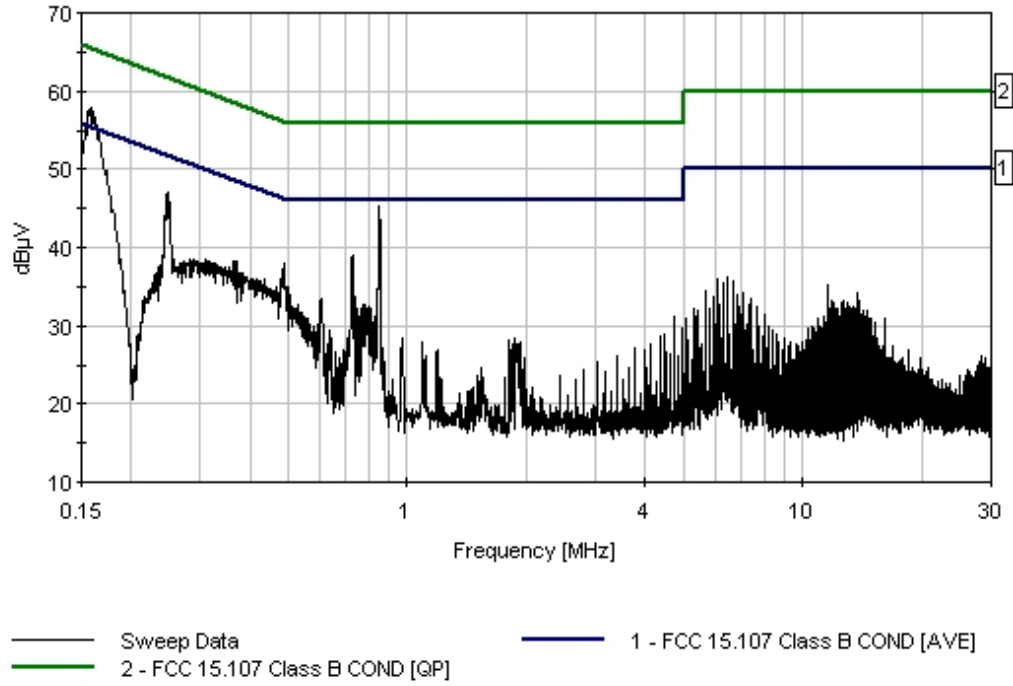
|                                      |  |
|--------------------------------------|--|
| T1=150kHz HPF Asset 02610            | T2=6dB Attenuator P05611                   |
| T3=Cable #21 Conducted Site A 050908 | T4=(L2) Insertion Loss 00847 EMCO 3816/2NM |

**Measurement Data:** Reading listed by margin. Test Lead: White

| #   | Freq MHz | Rdng dBµV | T1 dB | T2 dB | T3 dB | T4 dB | Dist Table | Corr dBµV | Spec dBµV | Margin dB | Polar Ant |
|-----|----------|-----------|-------|-------|-------|-------|------------|-----------|-----------|-----------|-----------|
| 1   | 849.572k | 36.6      | +0.1  | +6.1  | +0.0  | +0.1  | +0.0       | 42.9      | 46.0      | -3.1      | White     |
| Ave |          |           |       |       |       |       |            |           |           |           |           |
| ^   | 849.572k | 39.1      | +0.1  | +6.1  | +0.0  | +0.1  | +0.0       | 45.4      | 46.0      | -0.6      | White     |
| 3   | 247.446k | 40.5      | +0.2  | +6.1  | +0.1  | +0.1  | +0.0       | 47.0      | 51.8      | -4.8      | White     |

|    |                 |      |      |      |      |      |      |      |      |       |       |
|----|-----------------|------|------|------|------|------|------|------|------|-------|-------|
| 4  | 727.402k        | 32.6 | +0.1 | +6.1 | +0.1 | +0.1 | +0.0 | 39.0 | 46.0 | -7.0  | White |
| 5  | 488.151k        | 31.3 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 37.9 | 46.2 | -8.3  | White |
| 6  | 369.616k        | 31.7 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 38.3 | 48.5 | -10.2 | White |
| 7  | 435.065k        | 29.4 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 36.0 | 47.2 | -11.2 | White |
| 8  | 373.252k        | 30.2 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 36.8 | 48.4 | -11.6 | White |
| 9  | 506.331k        | 27.3 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 33.9 | 46.0 | -12.1 | White |
| 10 | 735.401k        | 27.2 | +0.1 | +6.1 | +0.1 | +0.1 | +0.0 | 33.6 | 46.0 | -12.4 | White |
| 11 | 606.685k        | 26.9 | +0.2 | +6.1 | +0.1 | +0.1 | +0.0 | 33.4 | 46.0 | -12.6 | White |
| 12 | 775.397k        | 26.2 | +0.1 | +6.1 | +0.1 | +0.1 | +0.0 | 32.6 | 46.0 | -13.4 | White |
| 13 | 784.851k        | 26.2 | +0.1 | +6.1 | +0.1 | +0.1 | +0.0 | 32.6 | 46.0 | -13.4 | White |
| 14 | 765.216k        | 25.9 | +0.1 | +6.1 | +0.1 | +0.1 | +0.0 | 32.3 | 46.0 | -13.7 | White |
| 15 | 6.436M          | 29.4 | +0.1 | +6.2 | +0.2 | +0.3 | +0.0 | 36.2 | 50.0 | -13.8 | White |
| 16 | 151.820k<br>Ave | 21.7 | +2.2 | +6.2 | +0.1 | +0.2 | +0.0 | 30.4 | 55.9 | -25.5 | White |
| 17 | 158.726k<br>Ave | 18.4 | +0.8 | +6.2 | +0.1 | +0.2 | +0.0 | 25.7 | 55.5 | -29.8 | White |
| ^  | 158.727k        | 50.5 | +0.8 | +6.2 | +0.1 | +0.2 | +0.0 | 57.8 | 55.5 | +2.3  | White |

CKC Laboratories, Inc. Date: 11/26/2007 Time: 10:14:20 Powerwave Technologies, Inc. WO#: 87286  
 FCC 15.107 Class B COND [AVE] Test Lead: White 110V 60Hz Sequence#: 8





Test Location: CKC Laboratories, Inc. • 110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112

Customer: **Powerwave Technologies, Inc.**  
 Specification: **FCC 15.107 Class B COND [AVE]**  
 Work Order #: **87286** Date: 11/26/2007  
 Test Type: **Conducted Emissions** Time: 09:32:28  
 Equipment: **Wide Band Radio Head** Sequence#: 6  
 Manufacturer: Powerwave Technologies, Inc. Tested By: E. Wong  
 Model: RH500020/212 27V dc  
 S/N: NA

**Test Equipment:**

| Function                 | S/N        | Calibration Date | Cal Due Date | Asset # |
|--------------------------|------------|------------------|--------------|---------|
| Spectrum Analyzer        | US44300438 | 01/03/2007       | 01/03/2009   | 02672   |
| LISN                     | 1104       | 11/10/2006       | 11/10/2008   | 00847   |
| 6dB Attenuator           | None       | 11/21/2006       | 11/21/2008   | P05611  |
| 150kHz HPF               | G7755      | 01/30/2006       | 01/30/2008   | 02610   |
| Conducted Emission Cable | Cable #21  | 05/09/2006       | 05/09/2008   | P04358  |

**Equipment Under Test (\* = EUT):**

| Function              | Manufacturer                 | Model #      | S/N |
|-----------------------|------------------------------|--------------|-----|
| Wide Band Radio Head* | Powerwave Technologies, Inc. | RH500020/212 | NA  |

**Support Devices:**

| Function          | Manufacturer                 | Model #  | S/N         |
|-------------------|------------------------------|----------|-------------|
| Optical Converter | Powerwave Technologies, Inc. | NA       | 42473       |
| Spectrum Analyzer | HP                           | 8563E    | NA          |
| Power Meter       | Agilent                      | E4419B   | GB402019/12 |
| Pre Amp           | Mini Circuit                 | ZHL-4240 | D040405     |
| ESG               | Aeroflex                     | IFR 3413 | 341005/078  |
| Power Supply      | HP                           | 6032     | 3542A12327  |

**Test Conditions / Notes:**

The EUT is placed on the wooden table. The RF antenna port is connected to a remote RF signal source. Optical port is connected to a support Optical converter. RF signal is sent to the antenna port of the EUT. The EUT converts the received RF signal to optical signal and sends the optical signal to a remote optical converter. RX range: 806-824MHz. Mode: Receive. Frequency = 815 MHz. Modulation: iDEN. 19°C, 47% relative humidity. DC 27V from a support power supply (110/60).

**Transducer Legend:**

|                                      |  |
|--------------------------------------|--|
| T1=150kHz HPF Asset 02610            | T2=6dB Attenuator P05611                   |
| T3=Cable #21 Conducted Site A 050908 | T4=(L1) Insertion Loss 00847 EMCO 3816/2NM |

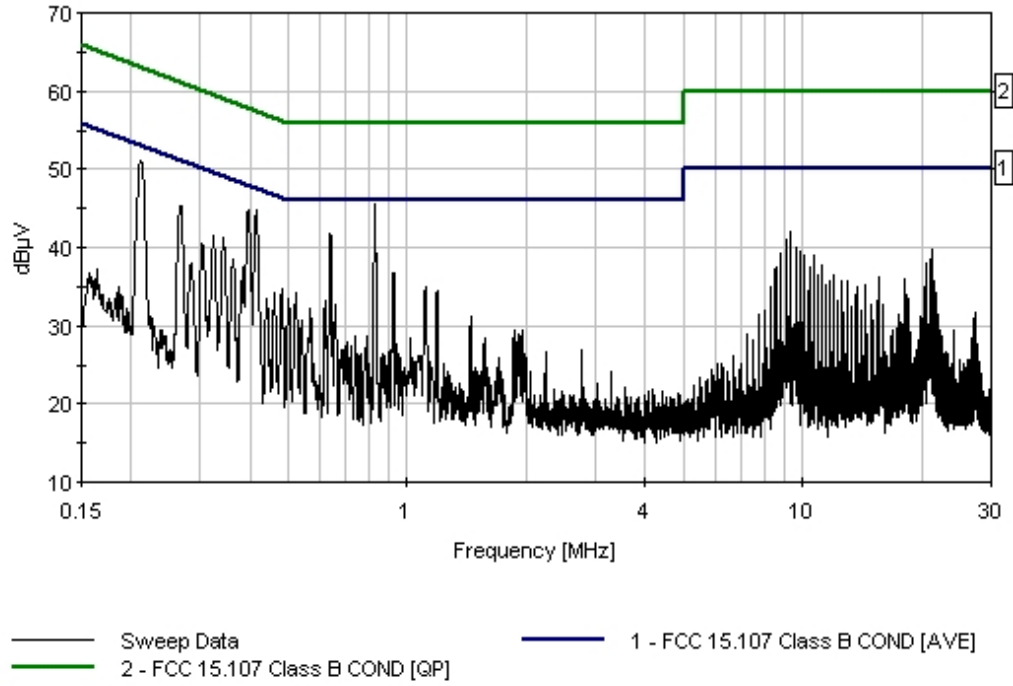
**Measurement Data:** Reading listed by margin. Test Lead: Black

| # | Freq MHz | Rdng dBµV | T1 dB | T2 dB | T3 dB | T4 dB | Dist Table | Corr dBµV | Spec dBµV | Margin dB | Polar Ant |
|---|----------|-----------|-------|-------|-------|-------|------------|-----------|-----------|-----------|-----------|
| 1 | 212.540k | 44.6      | +0.2  | +6.1  | +0.1  | +0.1  | +0.0       | 51.1      | 53.1      | -2.0      | Black     |
| 2 | 414.703k | 38.3      | +0.2  | +6.2  | +0.1  | +0.0  | +0.0       | 44.8      | 47.6      | -2.8      | Black     |



|    |                 |      |      |      |      |      |      |      |      |       |       |
|----|-----------------|------|------|------|------|------|------|------|------|-------|-------|
| 3  | 396.523k        | 38.4 | +0.2 | +6.2 | +0.1 | +0.0 | +0.0 | 44.9 | 47.9 | -3.0  | Black |
| 4  | 830.051k<br>Ave | 35.6 | +0.1 | +6.1 | +0.1 | +0.1 | +0.0 | 42.0 | 46.0 | -4.0  | Black |
| 5  | 639.410k        | 35.3 | +0.2 | +6.1 | +0.1 | +0.1 | +0.0 | 41.8 | 46.0 | -4.2  | Black |
| 6  | 827.756k<br>Ave | 33.9 | +0.1 | +6.1 | +0.1 | +0.1 | +0.0 | 40.3 | 46.0 | -5.7  | Black |
| ^  | 830.051k        | 39.8 | +0.1 | +6.1 | +0.1 | +0.1 | +0.0 | 46.2 | 46.0 | +0.2  | Black |
| ^  | 827.756k        | 39.1 | +0.1 | +6.1 | +0.1 | +0.1 | +0.0 | 45.5 | 46.0 | -0.5  | Black |
| 9  | 266.353k        | 38.8 | +0.2 | +6.1 | +0.1 | +0.1 | +0.0 | 45.3 | 51.2 | -5.9  | Black |
| 10 | 343.437k        | 34.7 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 41.3 | 49.1 | -7.8  | Black |
| 11 | 9.337M          | 35.0 | +0.1 | +6.2 | +0.3 | +0.4 | +0.0 | 42.0 | 50.0 | -8.0  | Black |
| 12 | 323.802k        | 34.9 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 41.5 | 49.6 | -8.1  | Black |
| 13 | 9.076M          | 33.9 | +0.1 | +6.2 | +0.3 | +0.4 | +0.0 | 40.9 | 50.0 | -9.1  | Black |
| 14 | 919.732k        | 30.5 | +0.1 | +6.1 | +0.0 | +0.1 | +0.0 | 36.8 | 46.0 | -9.2  | Black |
| 15 | 303.441k        | 33.8 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 40.4 | 50.1 | -9.7  | Black |
| 16 | 9.598M          | 33.0 | +0.1 | +6.2 | +0.3 | +0.4 | +0.0 | 40.0 | 50.0 | -10.0 | Black |
| 17 | 361.617k        | 32.1 | +0.2 | +6.2 | +0.1 | +0.0 | +0.0 | 38.6 | 48.7 | -10.1 | Black |
| 18 | 21.175M         | 31.6 | +0.3 | +6.1 | +0.4 | +1.3 | +0.0 | 39.7 | 50.0 | -10.3 | Black |

CKC Laboratories, Inc. Date: 11/26/2007 Time: 09:32:28 Powerwave Technologies, Inc. WO#: 87286  
 FCC 15.107 Class B COND [AVE] Test Lead: Black 27V dc Sequence#: 6





Test Location: CKC Laboratories, Inc. • 110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112

Customer: **Powerwave Technologies, Inc.**  
 Specification: **FCC 15.107 Class B COND [AVE]**  
 Work Order #: **87286** Date: 11/26/2007  
 Test Type: **Conducted Emissions** Time: 09:38:52  
 Equipment: **Wide Band Radio Head** Sequence#: 7  
 Manufacturer: Powerwave Technologies, Inc. Tested By: E. Wong  
 Model: RH500020/212 110V 60Hz  
 S/N: NA

**Test Equipment:**

| Function                 | S/N        | Calibration Date | Cal Due Date | Asset # |
|--------------------------|------------|------------------|--------------|---------|
| Spectrum Analyzer        | US44300438 | 01/03/2007       | 01/03/2009   | 02672   |
| LISN                     | 1104       | 11/10/2006       | 11/10/2008   | 00847   |
| 6dB Attenuator           | None       | 11/21/2006       | 11/21/2008   | P05611  |
| 150kHz HPF               | G7755      | 01/30/2006       | 01/30/2008   | 02610   |
| Conducted Emission Cable | Cable #21  | 05/09/2006       | 05/09/2008   | P04358  |

**Equipment Under Test (\* = EUT):**

| Function              | Manufacturer                 | Model #      | S/N |
|-----------------------|------------------------------|--------------|-----|
| Wide Band Radio Head* | Powerwave Technologies, Inc. | RH500020/212 | NA  |

**Support Devices:**

| Function          | Manufacturer                 | Model #  | S/N         |
|-------------------|------------------------------|----------|-------------|
| Optical Converter | Powerwave Technologies, Inc. | NA       | 42473       |
| Spectrum Analyzer | HP                           | 8563E    | NA          |
| Power Meter       | Agilent                      | E4419B   | GB402019/12 |
| Pre Amp           | Mini Circuit                 | ZHL-4240 | D040405     |
| ESG               | Aeroflex                     | IFR 3413 | 341005/078  |
| Power Supply      | HP                           | 6032     | 3542A12327  |

**Test Conditions / Notes:**

The EUT is placed on the wooden table. The RF antenna port is connected to a remote RF signal source. Optical port is connected to a support Optical converter. RF signal is sent to the antenna port of the EUT. The EUT converts the received RF signal to optical signal and sends the optical signal to a remote optical converter. RX range: 806-824MHz. Mode: Receive. Frequency = 815 MHz. Modulation: iDEN. 19°C, 47% relative humidity.

**Transducer Legend:**

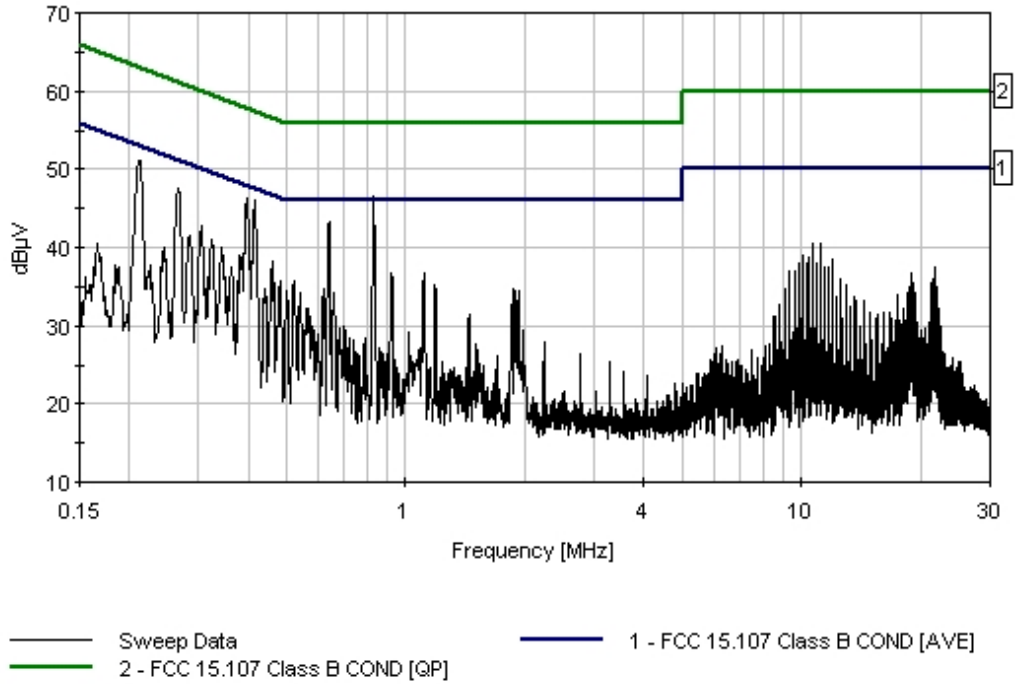
|                                      |  |
|--------------------------------------|--|
| T1=150kHz HPF Asset 02610            | T2=6dB Attenuator P05611                   |
| T3=Cable #21 Conducted Site A 050908 | T4=(L2) Insertion Loss 00847 EMCO 3816/2NM |

**Measurement Data:** Reading listed by margin. Test Lead: White

| # | Freq MHz | Rdng dBµV | T1 dB | T2 dB | T3 dB | T4 dB | Dist Table | Corr dBµV | Spec dBµV | Margin dB | Polar Ant |
|---|----------|-----------|-------|-------|-------|-------|------------|-----------|-----------|-----------|-----------|
| 1 | 213.267k | 44.5      | +0.2  | +6.1  | +0.1  | +0.2  | +0.0       | 51.1      | 53.1      | -2.0      | White     |
| 2 | 640.864k | 36.7      | +0.2  | +6.1  | +0.1  | +0.1  | +0.0       | 43.2      | 46.0      | -2.8      | White     |

|    |          |      |      |      |      |      |      |      |      |      |       |
|----|----------|------|------|------|------|------|------|------|------|------|-------|
| 3  | 414.703k | 37.8 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 44.4 | 47.6 | -3.2 | White |
|    | Ave      |      |      |      |      |      |      |      |      |      |       |
| ^  | 414.703k | 39.5 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 46.1 | 47.6 | -1.5 | White |
| 5  | 395.422k | 37.6 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 44.2 | 47.9 | -3.7 | White |
|    | Ave      |      |      |      |      |      |      |      |      |      |       |
| ^  | 396.523k | 39.7 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 46.3 | 47.9 | -1.6 | White |
| 7  | 267.080k | 41.0 | +0.2 | +6.1 | +0.1 | +0.1 | +0.0 | 47.5 | 51.2 | -3.7 | White |
| 8  | 830.388k | 35.0 | +0.1 | +6.1 | +0.1 | +0.1 | +0.0 | 41.4 | 46.0 | -4.6 | White |
|    | Ave      |      |      |      |      |      |      |      |      |      |       |
| ^  | 829.938k | 40.1 | +0.1 | +6.1 | +0.1 | +0.1 | +0.0 | 46.5 | 46.0 | +0.5 | White |
| 10 | 304.895k | 36.2 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 42.8 | 50.1 | -7.3 | White |
| 11 | 461.971k | 31.7 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 38.3 | 46.7 | -8.4 | White |
| 12 | 323.802k | 34.5 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 41.1 | 49.6 | -8.5 | White |
| 13 | 459.790k | 31.5 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 38.1 | 46.7 | -8.6 | White |
| 14 | 283.806k | 35.0 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 41.6 | 50.7 | -9.1 | White |
| 15 | 344.164k | 33.3 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 39.9 | 49.1 | -9.2 | White |
| 16 | 381.252k | 32.5 | +0.2 | +6.2 | +0.1 | +0.1 | +0.0 | 39.1 | 48.3 | -9.2 | White |
| 17 | 919.732k | 30.5 | +0.1 | +6.1 | +0.0 | +0.1 | +0.0 | 36.8 | 46.0 | -9.2 | White |
| 18 | 1.111M   | 30.3 | +0.1 | +6.1 | +0.0 | +0.1 | +0.0 | 36.6 | 46.0 | -9.4 | White |

CKC Laboratories, Inc. Date: 11/26/2007 Time: 09:38:52 Powerwave Technologies, Inc. WO#: 87286  
 FCC 15.107 Class B COND [AVE] Test Lead: White 110V 60Hz Sequence#: 7



**FCC 15.109 – RADIATED EMISSIONS**

**Test Setup Photos**



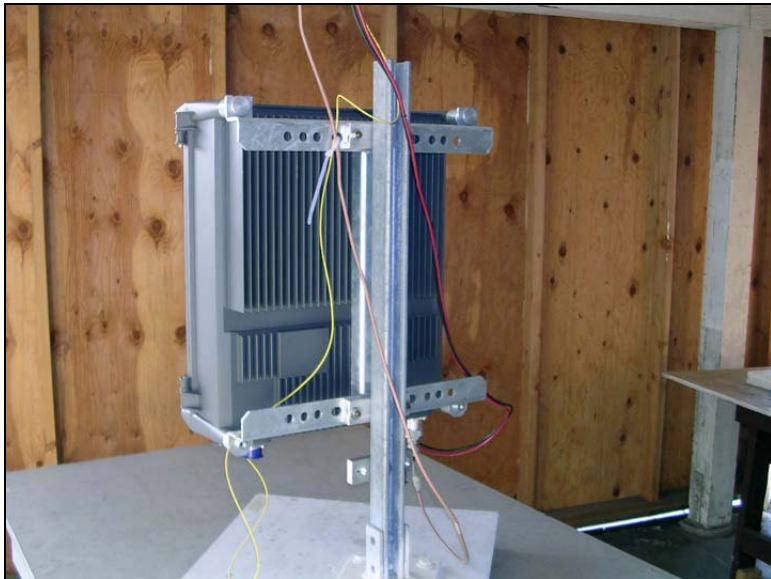
AC



AC



DC



DC



**Test Data Sheets**

Test Location: CKC Laboratories, Inc. • 110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112

Customer: **Powerwave Technologies, Inc.**  
 Specification: **FCC 15.109 Class B**  
 Work Order #: **87286** Date: 11/20/2007  
 Test Type: **Radiated Scan** Time: 11:36:18  
 Equipment: **Wide Band Radio Head** Sequence#: 4  
 Manufacturer: Powerwave Technologies, Inc. Tested By: E. Wong  
 Model: RH500020/211  
 S/N: NA

**Test Equipment:**

| Function             | S/N        | Calibration Date | Cal Due Date | Asset # |
|----------------------|------------|------------------|--------------|---------|
| Spectrum Analyzer    | US44300438 | 01/03/2007       | 01/03/2009   | 02672   |
| Bilog Antenna        | 2451       | 02/02/2006       | 02/02/2008   | 01995   |
| Pre amp to SA Cable  | Cable #10  | 05/16/2007       | 05/16/2009   | P05050  |
| Cable                | Cable15    | 01/05/2007       | 01/05/2009   | P05198  |
| Pre Amp              | 1937A02548 | 06/01/2006       | 06/01/2008   | 00309   |
| Horn Antenna         | 6246       | 06/29/2006       | 06/29/2008   | 00849   |
| Microwave Pre-amp    | 3123A00281 | 07/19/2006       | 07/19/2008   | 00786   |
| 2'-40GHz cable       | NA         | 09/18/2007       | 09/18/2009   | P2948   |
| HeliAx Antenna Cable | P5565      | 09/18/2006       | 09/18/2008   | P05565  |

**Equipment Under Test (\* = EUT):**

| Function              | Manufacturer                 | Model #      | S/N |
|-----------------------|------------------------------|--------------|-----|
| Wide Band Radio Head* | Powerwave Technologies, Inc. | RH500020/211 | NA  |

**Support Devices:**

| Function          | Manufacturer                 | Model #  | S/N         |
|-------------------|------------------------------|----------|-------------|
| Optical Converter | Powerwave Technologies, Inc. | NA       | 42473       |
| Spectrum Analyzer | HP                           | 8563E    | NA          |
| Power Meter       | Agilent                      | E4419B   | GB402019/12 |
| Pre Amp           | Mini Circuit                 | ZHL-4240 | D040405     |
| ESG               | Aeroflex                     | IFR 3413 | 341005/078  |

**Test Conditions / Notes:**

The EUT is placed on the wooden table. The RF antenna port is connected to a remote RF signal source. Optical port is connected to a support Optical converter. RF signal is sent to the antenna port of the EUT. The EUT converts the received RF signal to optical signal and sends the optical signal to a remote optical converter. RX range: 806-824MHz. Mode: Receive. Frequency = 815 MHz. Modulation: iDEN. 19°C, 47% relative humidity. Frequency range of measurement = 30 MHz- 9 GHz. Frequency 30 MHz - 1000 MHz RBW=120 kHz, VBW=120 kHz; 1000 MHz - 9000 MHz RBW=1 MHz, VBW=1 MHz.



**Transducer Legend:**

|                        |                               |
|------------------------|-------------------------------|
| T1=Preamp 8447D 060108 | T2=Bilog AN01995 020208 Chase |
| T3=Cable #10 051609    | T4=Cable #15, Site A, 010509  |

**Measurement Data:** Reading listed by margin. Test Distance: 3 Meters

| #  | Freq<br>MHz | Rdng<br>dB $\mu$ V | T1<br>dB | T2<br>dB | T3<br>dB | T4<br>dB | Dist<br>Table | Corr<br>dB $\mu$ V/m | Spec<br>dB $\mu$ V/m | Margin<br>dB | Polar<br>Ant |
|----|-------------|--------------------|----------|----------|----------|----------|---------------|----------------------|----------------------|--------------|--------------|
| 1  | 400.001M    | 44.6               | -27.8    | +15.8    | +0.4     | +3.7     | +0.0          | 36.7                 | 46.0                 | -9.3         | Horiz        |
| 2  | 240.017M    | 46.8               | -27.7    | +11.8    | +0.3     | +2.8     | +0.0          | 34.0                 | 46.0                 | -12.0        | Horiz        |
| 3  | 303.883M    | 44.5               | -27.6    | +13.3    | +0.2     | +3.2     | +0.0          | 33.6                 | 46.0                 | -12.4        | Vert         |
| 4  | 549.220M    | 34.4               | -27.4    | +19.7    | +0.5     | +4.5     | +0.0          | 31.7                 | 46.0                 | -14.3        | Horiz        |
| 5  | 223.920M    | 45.6               | -27.6    | +10.7    | +0.2     | +2.7     | +0.0          | 31.6                 | 46.0                 | -14.4        | Horiz        |
| 6  | 295.880M    | 40.9               | -27.6    | +13.1    | +0.2     | +3.2     | +0.0          | 29.8                 | 46.0                 | -16.2        | Vert         |
| 7  | 311.850M    | 39.3               | -27.6    | +13.5    | +0.2     | +3.3     | +0.0          | 28.7                 | 46.0                 | -17.3        | Vert         |
| 8  | 287.980M    | 39.7               | -27.6    | +13.0    | +0.2     | +3.1     | +0.0          | 28.4                 | 46.0                 | -17.6        | Vert         |
| 9  | 263.900M    | 40.0               | -27.7    | +12.7    | +0.3     | +3.0     | +0.0          | 28.3                 | 46.0                 | -17.7        | Vert         |
| 10 | 247.917M    | 38.5               | -27.7    | +12.4    | +0.3     | +2.9     | +0.0          | 26.4                 | 46.0                 | -19.6        | Vert         |
| 11 | 223.250M    | 35.1               | -27.6    | +10.6    | +0.2     | +2.7     | +0.0          | 21.0                 | 46.0                 | -25.0        | Vert         |
| 12 | 200.750M    | 33.5               | -27.6    | +8.9     | +0.2     | +2.6     | +0.0          | 17.6                 | 43.5                 | -25.9        | Vert         |



Test Location: CKC Laboratories, Inc. • 110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112

Customer: **Powerwave Technologies, Inc.**  
 Specification: **FCC 15.109 Class B**  
 Work Order #: **87286** Date: 11/20/2007  
 Test Type: **Radiated Scan** Time: 15:11:10  
 Equipment: **Wide Band Radio Head** Sequence#: 5  
 Manufacturer: Powerwave Technologies, Inc. Tested By: E. Wong  
 Model: RH500020/212  
 S/N: NA

**Test Equipment:**

| Function            | S/N        | Calibration Date | Cal Due Date | Asset # |
|---------------------|------------|------------------|--------------|---------|
| Spectrum Analyzer   | US44300438 | 01/03/2007       | 01/03/2009   | 02672   |
| Bilog Antenna       | 2451       | 02/02/2006       | 02/02/2008   | 01995   |
| Pre amp to SA Cable | Cable #10  | 05/16/2007       | 05/16/2009   | P05050  |
| Cable               | Cable15    | 01/05/2007       | 01/05/2009   | P05198  |
| Pre Amp             | 1937A02548 | 06/01/2006       | 06/01/2008   | 00309   |
| Horn Antenna        | 6246       | 06/29/2006       | 06/29/2008   | 00849   |
| Microwave Pre-amp   | 3123A00281 | 07/19/2006       | 07/19/2008   | 00786   |
| 2'-40GHz cable      | NA         | 09/18/2007       | 09/18/2009   | P2948   |
| Helix Antenna Cable | P5565      | 09/18/2006       | 09/18/2008   | P05565  |

**Equipment Under Test (\* = EUT):**

| Function              | Manufacturer                 | Model #      | S/N |
|-----------------------|------------------------------|--------------|-----|
| Wide Band Radio Head* | Powerwave Technologies, Inc. | RH500020/212 | NA  |

**Support Devices:**

| Function          | Manufacturer                 | Model #  | S/N         |
|-------------------|------------------------------|----------|-------------|
| Optical Converter | Powerwave Technologies, Inc. | NA       | 42473       |
| Spectrum Analyzer | HP                           | 8563E    | NA          |
| Power Meter       | Agilent                      | E4419B   | GB402019/12 |
| Pre Amp           | Mini Circuit                 | ZHL-4240 | D040405     |
| ESG               | Aeroflex                     | IFR 3413 | 341005/078  |
| Power Supply      | HP                           | 6032     | 3542A12327  |

**Test Conditions / Notes:**

The EUT is placed on the wooden table. The RF antenna port is connected to a remote RF signal source. Optical port is connected to a support Optical converter. RF signal is sent to the antenna port of the EUT. The EUT converts the received RF signal to optical signal and sends the optical signal to a remote optical converter. RX range: 806-824MHz. Mode: Receive. Frequency = 815 MHz. Modulation: iDEN. 19°C, 47% relative humidity. Frequency range of measurement = 30 MHz - 9 GHz. Frequency 30 MHz - 1000 MHz RBW=120 kHz, VBW=120 kHz; 1000 MHz-9,000 MHz RBW=1 MHz, VBW=1 MHz. DC 27V from a support power supply (110/60).



**Transducer Legend:**

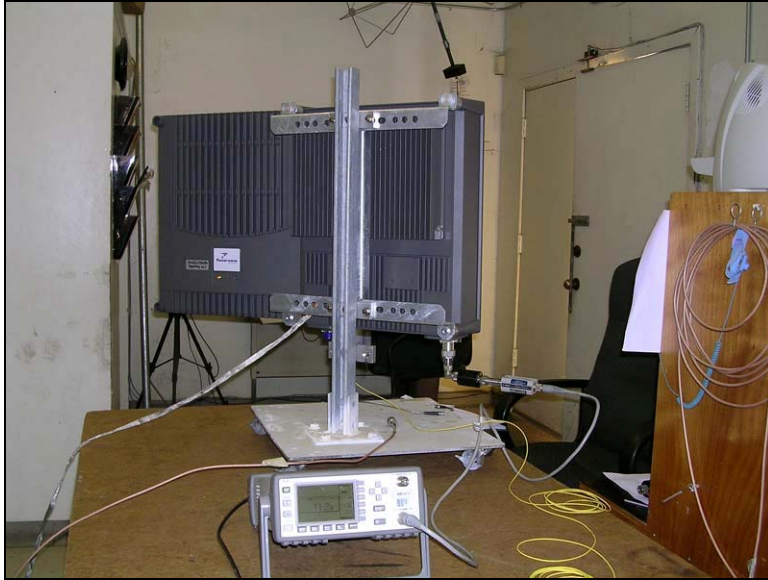
|                        |                               |
|------------------------|-------------------------------|
| T1=Preamp 8447D 060108 | T2=Bilog AN01995 020208 Chase |
| T3=Cable #10 051609    | T4=Cable #15, Site A, 010509  |

**Measurement Data:**      Reading listed by margin.      Test Distance: 3 Meters

| #  | Freq<br>MHz | Rdng<br>dB $\mu$ V | T1<br>dB | T2<br>dB | T3<br>dB | T4<br>dB | Dist<br>Table | Corr<br>dB $\mu$ V/m | Spec<br>dB $\mu$ V/m | Margin<br>dB | Polar<br>Ant |
|----|-------------|--------------------|----------|----------|----------|----------|---------------|----------------------|----------------------|--------------|--------------|
| 1  | 247.914M    | 46.7               | -27.7    | +12.4    | +0.3     | +2.9     | +0.0          | 34.6                 | 46.0                 | -11.4        | Vert         |
| 2  | 351.900M    | 41.7               | -27.6    | +14.6    | +0.3     | +3.5     | +0.0          | 32.5                 | 46.0                 | -13.5        | Horiz        |
| 3  | 399.990M    | 39.1               | -27.8    | +15.8    | +0.4     | +3.7     | +0.0          | 31.2                 | 46.0                 | -14.8        | Vert         |
| 4  | 351.870M    | 40.2               | -27.6    | +14.6    | +0.3     | +3.5     | +0.0          | 31.0                 | 46.0                 | -15.0        | Vert         |
| 5  | 287.960M    | 42.2               | -27.6    | +13.0    | +0.2     | +3.1     | +0.0          | 30.9                 | 46.0                 | -15.1        | Vert         |
| 6  | 285.500M    | 39.6               | -27.7    | +13.0    | +0.3     | +3.1     | +0.0          | 28.3                 | 46.0                 | -17.7        | Horiz        |
| 7  | 375.020M    | 35.9               | -27.7    | +15.2    | +0.4     | +3.6     | +0.0          | 27.4                 | 46.0                 | -18.6        | Vert         |
| 8  | 263.940M    | 37.7               | -27.7    | +12.7    | +0.3     | +3.0     | +0.0          | 26.0                 | 46.0                 | -20.0        | Vert         |
| 9  | 193.620M    | 39.2               | -27.6    | +8.9     | +0.2     | +2.6     | +0.0          | 23.3                 | 43.5                 | -20.2        | Horiz        |
| 10 | 238.290M    | 37.6               | -27.7    | +11.7    | +0.3     | +2.8     | +0.0          | 24.7                 | 46.0                 | -21.3        | Vert         |
| 11 | 311.870M    | 35.0               | -27.6    | +13.5    | +0.2     | +3.3     | +0.0          | 24.4                 | 46.0                 | -21.6        | Vert         |

**FCC 15.111 – ANTENNA POWER CONDUCTION LIMITS FOR RECEIVER**

**Test Setup Photos**





**Test Data Sheets**

Test Location: CKC Laboratories, Inc. • 110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112

Customer: **Powerwave Technologies, Inc.**  
 Specification: **FCC15.111 Antenna Power Conduction limits for Receiver**  
 Work Order #: **87286** Date: 11/26/2007  
 Test Type: **Conducted Emissions** Time: 10:58:49  
 Equipment: **Wide Band Radio Head** Sequence#: 10  
 Manufacturer: Powerwave Technologies, Inc. Tested By: E. Wong  
 Model: RH500020/212 110V 60Hz  
 S/N: NA

**Test Equipment:**

| Function          | S/N        | Calibration Date | Cal Due Date | Asset # |
|-------------------|------------|------------------|--------------|---------|
| Spectrum Analyzer | US44300438 | 01/03/2007       | 01/03/2009   | 02672   |
| 3'-40GHz cable    | NA         | 09/18/2007       | 09/18/2009   | P02945  |

**Equipment Under Test (\* = EUT):**

| Function              | Manufacturer                 | Model #      | S/N |
|-----------------------|------------------------------|--------------|-----|
| Wide Band Radio Head* | Powerwave Technologies, Inc. | RH500020/212 | NA  |

**Support Devices:**

| Function          | Manufacturer                 | Model #  | S/N         |
|-------------------|------------------------------|----------|-------------|
| Optical Converter | Powerwave Technologies, Inc. | NA       | 42473       |
| Spectrum Analyzer | HP                           | 8563E    | NA          |
| Power Meter       | Agilent                      | E4419B   | GB402019/12 |
| Pre Amp           | Mini Circuit                 | ZHL-4240 | D040405     |
| ESG               | Aeroflex                     | IFR 3413 | 341005/078  |
| Power Supply      | HP                           | 6032     | 3542A12327  |

**Test Conditions / Notes:**

The EUT is placed on the wooden table. The RF antenna port is connected to spectrum analyzer. Optical port is connected to a support Optical converter. Emission profile is evaluated at the antenna port. RX range: 806-824MHz. Mode: Receive. Frequency = 815 MHz. Modulation: iDEN. 19°C, 47% relative humidity. Frequency range of measurement = 9 kHz- 9 GHz. Frequency 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; 1000 MHz - 9000 MHz RBW=1 MHz, VBW=1 MHz. No emission found, data represents noise floor level.

**Transducer Legend:**

T1=Hi Freq 40GHz 3ft CAB-ANP02945-091809

**Measurement Data:** Reading listed by margin. Test Lead: Antenna Terminal

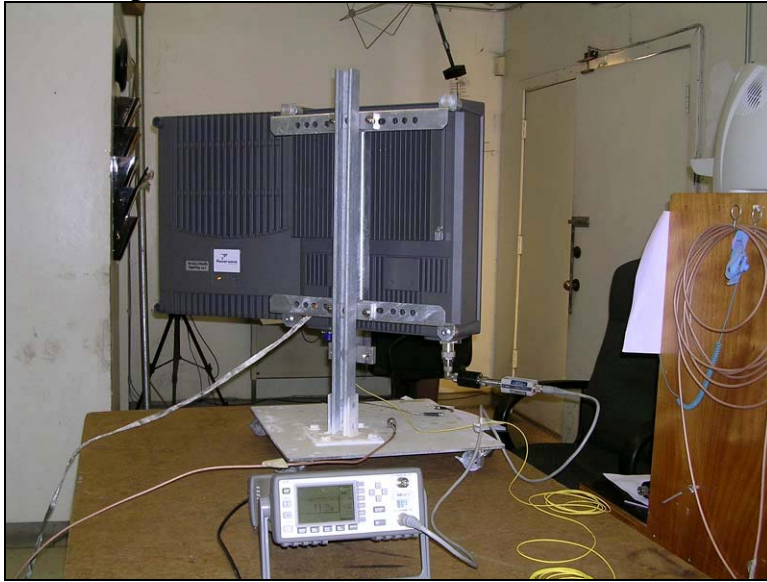
| # | Freq MHz  | Rdng dBµV | T1 dB | dB | dB | dB | Dist Table | Corr dBµV | Spec dBµV | Margin dB | Polar Ant |
|---|-----------|-----------|-------|----|----|----|------------|-----------|-----------|-----------|-----------|
| 1 | 2650.000M | 8.3       | +0.5  |    |    |    | +0.0       | 8.8       | 50.0      | -41.2     | Anten     |

**FCC 2.1033(c)(14)/2.1046/90.635(a) - RF POWER OUTPUT**

**Test Equipment**

| Equipment      | Asset # | Manufacturer | Model #  | Serial #   | Cal Date | Cal Due |
|----------------|---------|--------------|----------|------------|----------|---------|
| RF Power meter | 02778   | HP           | EPM-441A | GB37170458 | 012706   | 012708  |
| Power Sensor   | 02777   | HP           | E4412A   | MY41499662 | 012706   | 012708  |

**Test Setup Photos**



**Test Data**

The EUT is a RF amplifier. The manufacture does not provide an antenna for sale with the product, hence EIRP is not measured nor calculated.

The RF output power of the EUT was measured at the antenna port, the measured conducted output power meets the rated output power of the product.

Part90

| Modulation: iDEN | Power (dBm) | Power (Watts) |
|------------------|-------------|---------------|
| 851.0MHz         | 43          | 20            |
| 860.0 MHz        | 43          | 20            |
| 868.5 MHz        | 43          | 20            |

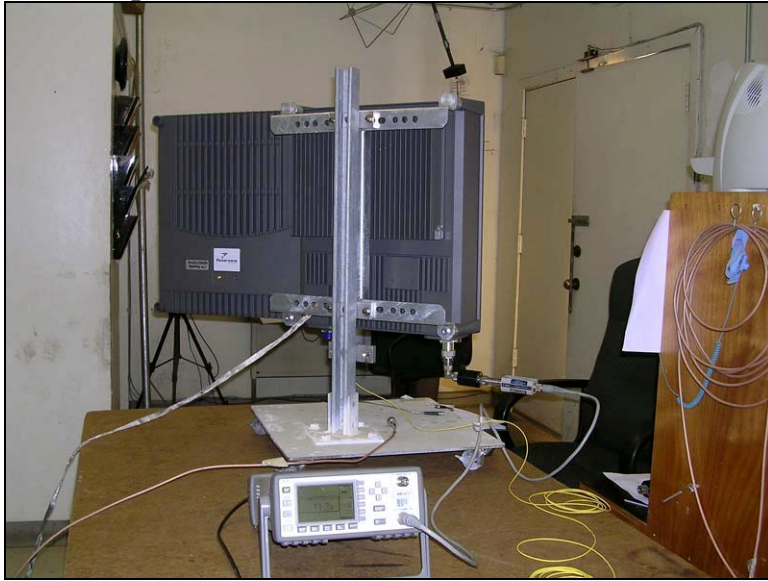


**RSS-131 MEAN OUTPUT POWER**

**Test Equipment**

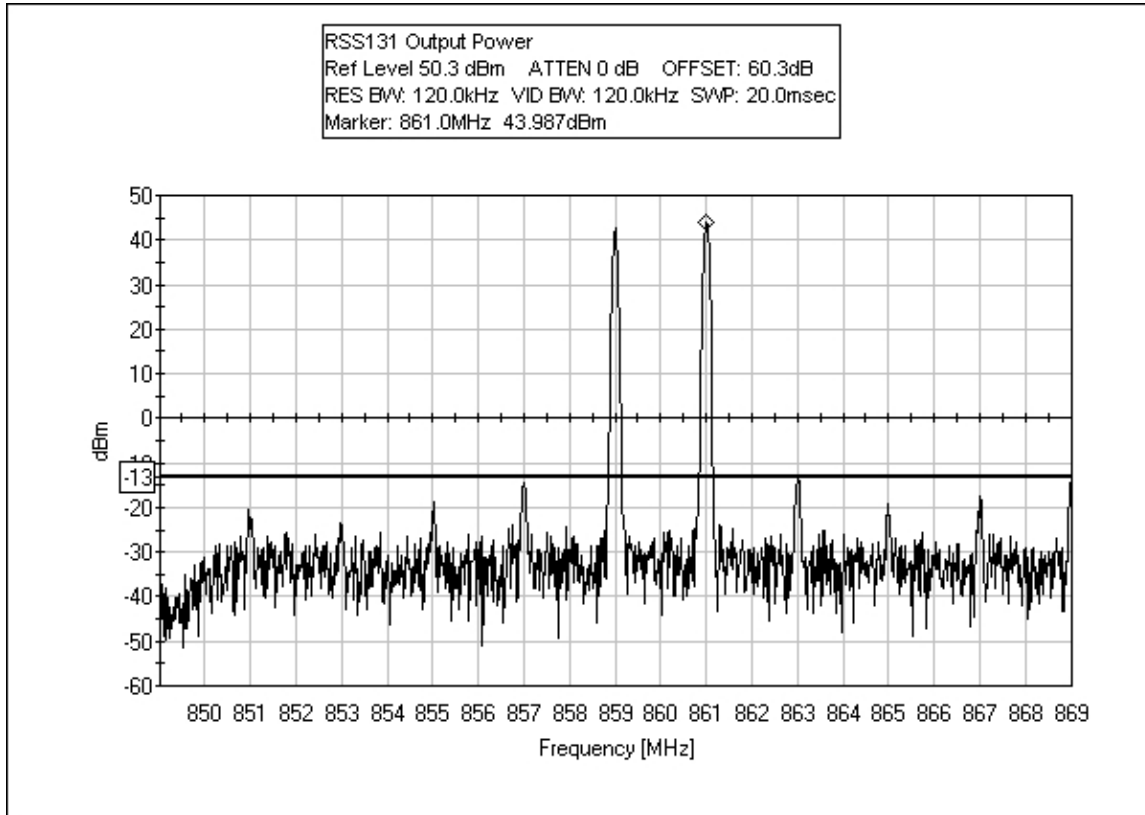
| <b>Equipment</b>  | <b>Asset #</b> | <b>Manufacturer</b> | <b>Model #</b> | <b>Serial #</b> | <b>Cal Date</b> | <b>Cal Due</b> |
|-------------------|----------------|---------------------|----------------|-----------------|-----------------|----------------|
| Spectrum Analyzer | 02672          | Agilent             | E4446A         | US44300438      | 010307          | 010309         |

**Test Setup Photos**



## Test Data

### 4.3 Mean Output power.



The EUT is a RF amplifier. The manufacturer does not provide an antenna for sale with the product, hence EIRP is not measured nor calculated. The RF power of the EUT was measured at the antenna port IAW **RSS 131, 4.3.1** requirement.

Measured Po1 =+ 44. dBm

$P_{\text{mean}} = P_{o1} + 3 \text{ dB} = 44 + 3 \text{ dBm} = 47 \text{ dBm} = 50 \text{ W}$

**FCC 2.1033(c)(14)/2.1049(i)- INPUT AND OUTPUT PLOTS**

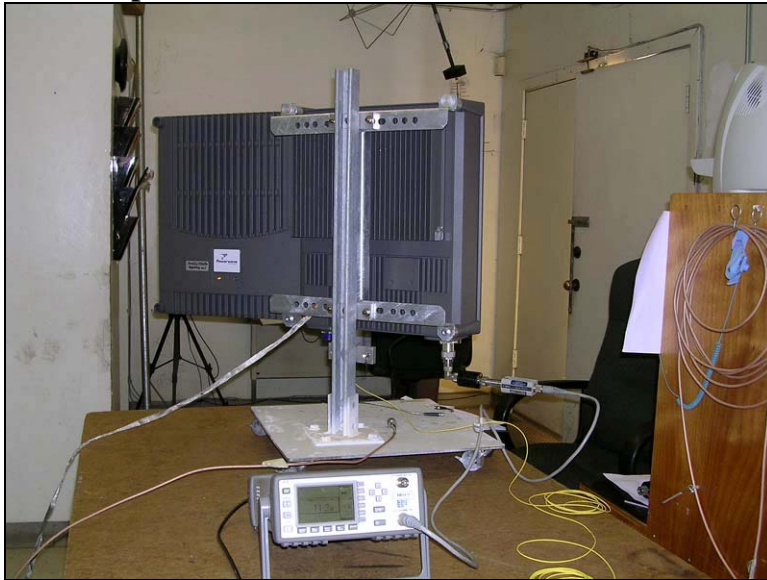
**Test Equipment**

| Equipment         | Asset # | Manufacturer | Model # | Serial #   | Cal Date | Cal Due |
|-------------------|---------|--------------|---------|------------|----------|---------|
| Spectrum Analyzer | 02672   | Agilent      | E4446A  | US44300438 | 010307   | 010309  |

**Test Conditions**

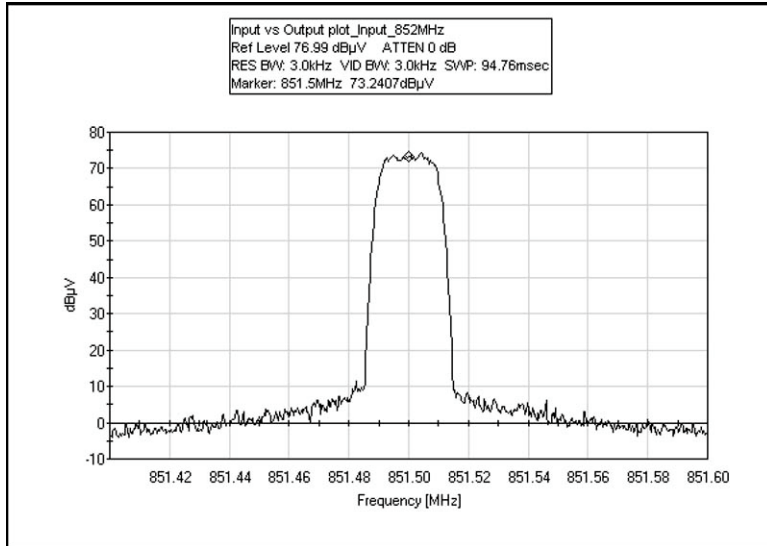
The EUT is placed on the wooden table. The RF Output port is connected to a load string. Optical in port is connected to a support Optical converter. Support optical converter receives RF signal, converts the signal to optical and sends it to the EUT. The EUT decodes the optical signal and generates a RF signal. Output Emission profile evaluated at the RF antenna port. Modulation: iDEN. Input signal measured at the RF in of optical converter.

**Test Setup Photos**

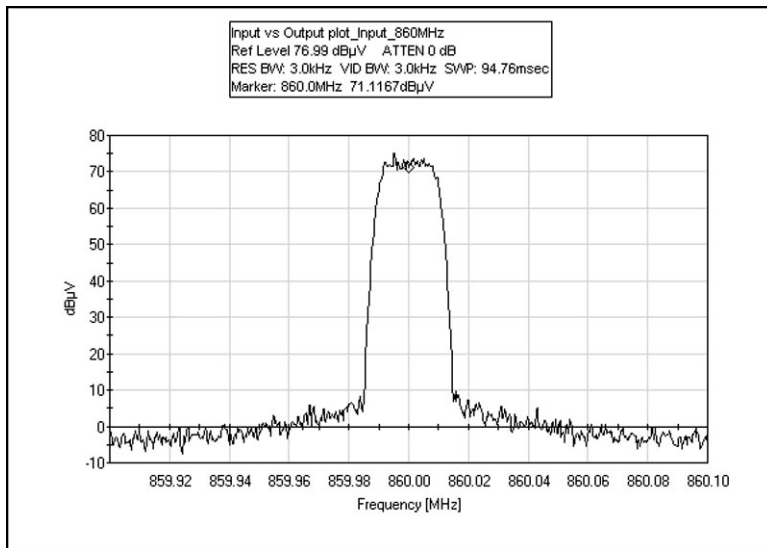


## Test Plots

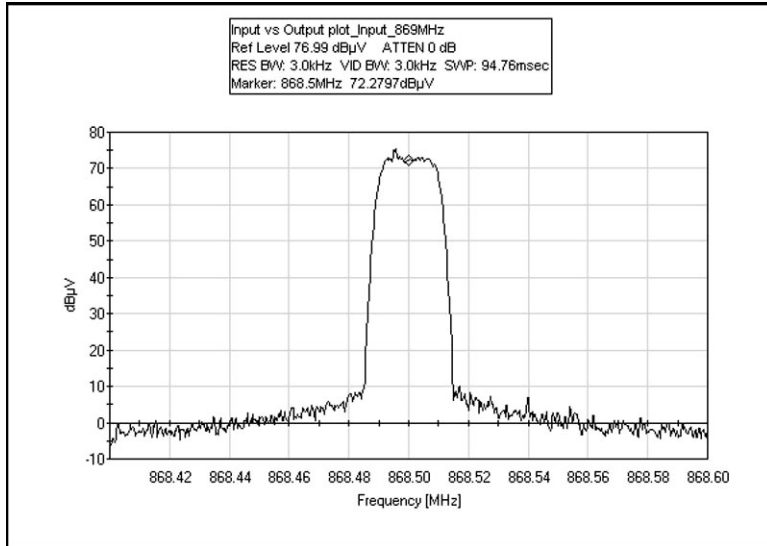
### INPUT PLOT 852MHz



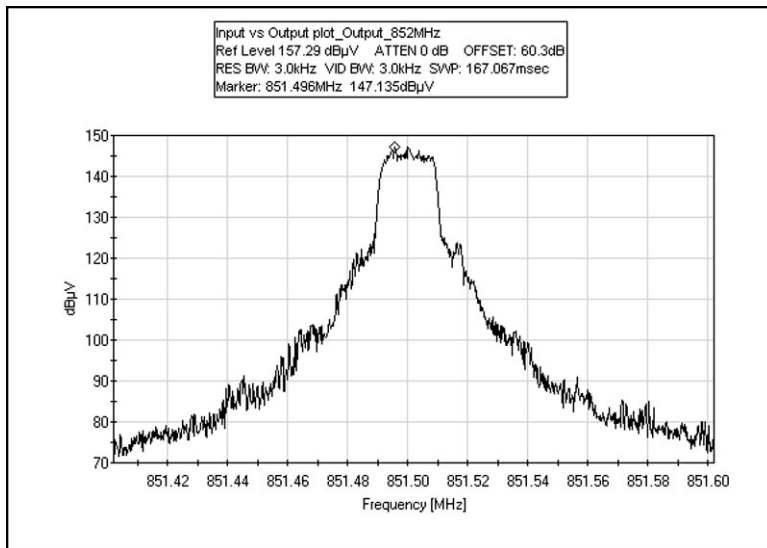
### INPUT PLOT 860MHz



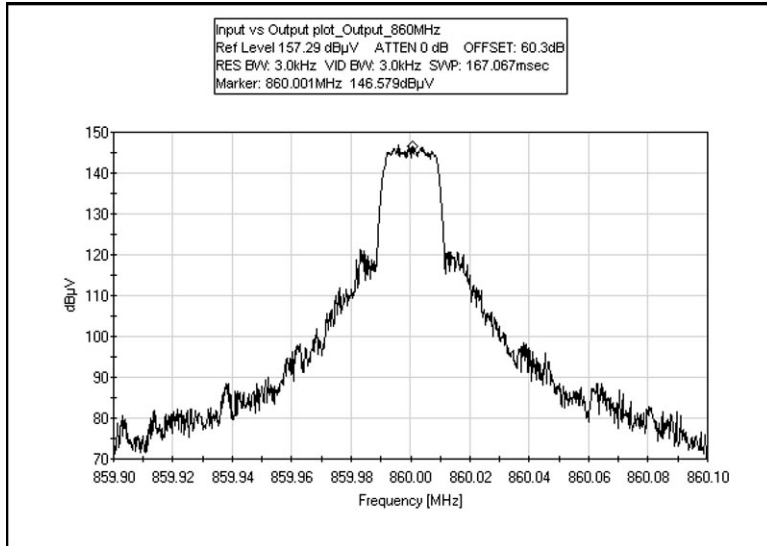
### INPUT PLOT 869MHz



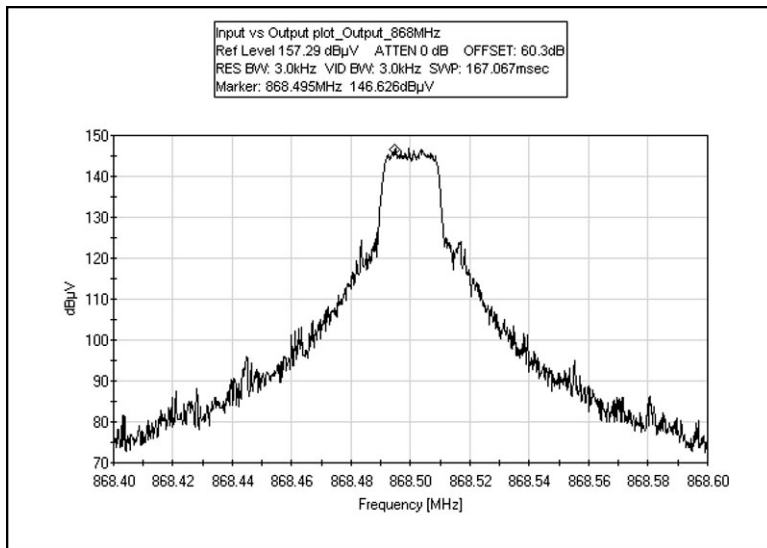
### OUTPUT PLOT 852MHz



### OUTPUT PLOT 860MHz

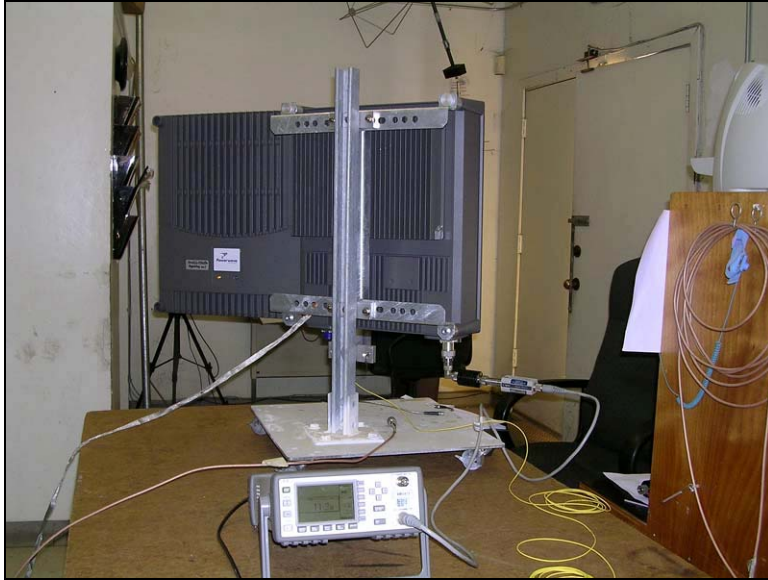


### OUTPUT PLOT 868MHz



**FCC 2.1033(c)(14)/2.1051/90.691(a)(2) - SPURIOUS EMISSIONS AT ANTENNA  
TERMINAL**

**Test Setup Photos**



## Test Data

### Limit line for Spurious Conducted Emission

$$\underline{\text{Required Attenuation}} = \underline{43+10 \text{ Log } P \text{ dB}}$$

$$\text{Limit line (dBuV)} = V_{\text{dBuV}} - \text{Attenuation}$$

$$\begin{aligned} V_{\text{dBuV}} &= 20 \text{ Log } \frac{V}{1 \times 10^{-6}} \\ &= 20 (\text{Log } V - \text{Log } 1 \times 10^{-6}) \\ &= 20 \text{ Log } V - 20 \text{ Log } 1 \times 10^{-6} \\ &= 20 \text{ Log } V - 20 (-6) \\ &= 20 \text{ Log } V + 120 \end{aligned}$$

$$\begin{aligned} \text{Attenuation} &= 43 + 10 \text{ Log } P \\ &= 43 + 10 \text{ Log } \frac{V^2}{R} \\ &= 43 + 10 (\text{Log } V^2 - \text{Log } R) \\ &= 43 + 10 (2 \text{ Log } V - \text{Log } R) \\ &= 43 + 20 \text{ Log } V - 10 \text{ Log } R \end{aligned}$$

$$\begin{aligned} \text{Limit line} &= V_{\text{dBuV}} - \text{Attenuation} \\ &= 20 \text{ Log } V + 120 - (43 + 20 \text{ Log } V - 10 \text{ Log } R) \\ &= 20 \text{ Log } V + 120 - 43 - 20 \text{ Log } V + 10 \text{ Log } R \\ &= 20 \text{ Log } V + 120 - 43 - 20 \text{ Log } V + 10 \text{ Log } R \\ &= 120 - 43 + 10 \text{ Log } 50 \quad \text{Note : } R = 50 \Omega \\ &= 120 - 43 + 16.897 \\ &= 94 \text{ dBuV at any power level} \end{aligned}$$





Test Location: CKC Laboratories, Inc. • 110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112

Customer: **Powerwave Technologies, Inc.**  
 Specification: **FCC 90.691 (a) Conducted Spurious emissions**  
 Work Order #: **87286** Date: 11/26/2007  
 Test Type: **Conducted Emissions** Time: 14:21:28  
 Equipment: **Wide Band Radio Head** Sequence#: 4  
 Manufacturer: Powerwave Technologies, Inc. Tested By: E. Wong  
 Model: RH500020/211 110V 60Hz  
 S/N: NA

**Test Equipment:**

| Function          | S/N        | Calibration Date | Cal Due Date | Asset # |
|-------------------|------------|------------------|--------------|---------|
| Spectrum Analyzer | US44300438 | 01/03/2007       | 01/03/2009   | 02672   |
| 1.0 GHz HPF       | 1          | 03/07/2006       | 03/07/2008   | 02749   |
| 3'-40GHz cable    | NA         | 09/18/2007       | 09/18/2009   | P02945  |

**Equipment Under Test (\* = EUT):**

| Function              | Manufacturer                 | Model #      | S/N |
|-----------------------|------------------------------|--------------|-----|
| Wide Band Radio Head* | Powerwave Technologies, Inc. | RH500020/211 | NA  |

**Support Devices:**

| Function          | Manufacturer                 | Model #  | S/N         |
|-------------------|------------------------------|----------|-------------|
| Optical Converter | Powerwave Technologies, Inc. | NA       | 42473       |
| Spectrum Analyzer | HP                           | 8563E    | NA          |
| Power Meter       | Agilent                      | E4419B   | GB402019/12 |
| Pre Amp           | Mini Circuit                 | ZHL-4240 | D040405     |
| ESG               | Aeroflex                     | IFR 3413 | 341005/078  |

**Test Conditions / Notes:**

The EUT is placed on the wooden table. The RF Output port is connected to a load string . Optical in port is connected to a support Optical converter. Support optical converter receives RF signal converts the signal to optic and sends it to the EUT. The EUT decodes the optical signal and generates a RF signal. Emission profile evaluated at the RF antenna port. Operating range: 851-869MHz. Power = 20 watts. Frequency = 860 MHz. Modulation: iDEN. 19°C, 47% relative humidity. Frequency range of measurement = 9 kHz - 9 GHz. Frequency 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; 1000 MHz - 9000 MHz RBW=1 MHz, VBW=1 MHz.

**Transducer Legend:**

|  |                           |
|--|---------------------------|
| T1=Hi Freq 40GHz 3ft CAB-ANP02945-091809 | T2=Filter 1GHz HP AN02749 |
|--|---------------------------|

**Measurement Data:** Reading listed by margin. Test Lead: Antenna Terminal

| # | Freq MHz  | Rdng dBμV | T1 dB | T2 dB | Dist dB | Corr dBμV | Spec dBμV | Margin dB | Polar Ant |
|---|-----------|-----------|-------|-------|---------|-----------|-----------|-----------|-----------|
| 1 | 1720.000M | 69.1      | +0.4  | +0.4  | +0.0    | 69.9      | 94.0      | -24.1     | Anten     |
| 2 | 2579.900M | 68.1      | +0.5  | +0.4  | +0.0    | 69.0      | 94.0      | -25.0     | Anten     |



Test Location: CKC Laboratories, Inc. • 110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112

Customer: **Powerwave Technologies, Inc.**  
 Specification: **FCC 90.691 (a) Conducted Spurious emissions**  
 Work Order #: **87286** Date: 11/26/2007  
 Test Type: **Conducted Emissions** Time: 14:17:06  
 Equipment: **Wide Band Radio Head** Sequence#: 3  
 Manufacturer: Powerwave Technologies, Inc. Tested By: E. Wong  
 Model: RH500020/211 110V 60Hz  
 S/N: NA

**Test Equipment:**

| Function          | S/N        | Calibration Date | Cal Due Date | Asset # |
|-------------------|------------|------------------|--------------|---------|
| Spectrum Analyzer | US44300438 | 01/03/2007       | 01/03/2009   | 02672   |
| 1.0 GHz HPF       | 1          | 03/07/2006       | 03/07/2008   | 02749   |
| 3'-40GHz cable    | NA         | 09/18/2007       | 09/18/2009   | P02945  |

**Equipment Under Test (\* = EUT):**

| Function              | Manufacturer                 | Model #      | S/N |
|-----------------------|------------------------------|--------------|-----|
| Wide Band Radio Head* | Powerwave Technologies, Inc. | RH500020/211 | NA  |

**Support Devices:**

| Function          | Manufacturer                 | Model #  | S/N         |
|-------------------|------------------------------|----------|-------------|
| Optical Converter | Powerwave Technologies, Inc. | NA       | 42473       |
| Spectrum Analyzer | HP                           | 8563E    | NA          |
| Power Meter       | Agilent                      | E4419B   | GB402019/12 |
| Pre Amp           | Mini Circuit                 | ZHL-4240 | D040405     |
| ESG               | Aeroflex                     | IFR 3413 | 341005/078  |

**Test Conditions / Notes:**

The EUT is placed on the wooden table. The RF Output port is connected to a load string . Optical in port is connected to a support Optical converter. Support optical converter receives RF signal converts the signal to optic and sends it to the EUT. The EUT decodes the optical signal and generates a RF signal. Emission profile evaluated at the RF antenna port. Operating range: 851-869MHz. Power = 20 watts. Frequency = 851.5 MHz. Modulation: iDEN. 19°C, 47% relative humidity. Frequency range of measurement = 9 kHz - 9 GHz. Frequency 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; 1000 MHz - 9000 MHz RBW=1 MHz, VBW=1 MHz.

**Transducer Legend:**

|  |                           |
|--|---------------------------|
| T1=Hi Freq 40GHz 3ft CAB-ANP02945-091809 | T2=Filter 1GHz HP AN02749 |
|--|---------------------------|

**Measurement Data:** Reading listed by margin. Test Lead: Antenna Terminal

| # | Freq MHz  | Rdng dBμV | T1 dB | T2 dB | Dist dB | Corr dB | Spec dBμV | Margin dB | Polar Ant |
|---|-----------|-----------|-------|-------|---------|---------|-----------|-----------|-----------|
| 1 | 1704.000M | 66.4      | +0.4  | +0.4  | +0.0    | 67.2    | 94.0      | -26.8     | Anten     |
| 2 | 2556.000M | 63.5      | +0.5  | +0.4  | +0.0    | 64.4    | 94.0      | -29.6     | Anten     |



Test Location: CKC Laboratories, Inc. • 110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112

Customer: **Powerwave Technologies, Inc.**  
 Specification: **FCC90.691 (a) Conducted Spurious emissions**  
 Work Order #: **87286** Date: 11/26/2007  
 Test Type: **Conducted Emissions** Time: 14:24:30  
 Equipment: **Wide Band Radio Head** Sequence#: 5  
 Manufacturer: Powerwave Technologies, Inc. Tested By: E. Wong  
 Model: RH500020/211 110V 60Hz  
 S/N: NA

**Test Equipment:**

| Function          | S/N        | Calibration Date | Cal Due Date | Asset # |
|-------------------|------------|------------------|--------------|---------|
| Spectrum Analyzer | US44300438 | 01/03/2007       | 01/03/2009   | 02672   |
| 1.0 GHz HPF       | 1          | 03/07/2006       | 03/07/2008   | 02749   |
| 3'-40GHz cable    | NA         | 09/18/2007       | 09/18/2009   | P02945  |

**Equipment Under Test (\* = EUT):**

| Function              | Manufacturer                 | Model #      | S/N |
|-----------------------|------------------------------|--------------|-----|
| Wide Band Radio Head* | Powerwave Technologies, Inc. | RH500020/211 | NA  |

**Support Devices:**

| Function          | Manufacturer                 | Model #  | S/N         |
|-------------------|------------------------------|----------|-------------|
| Optical Converter | Powerwave Technologies, Inc. | NA       | 42473       |
| Spectrum Analyzer | HP                           | 8563E    | NA          |
| Power Meter       | Agilent                      | E4419B   | GB402019/12 |
| Pre Amp           | Mini Circuit                 | ZHL-4240 | D040405     |
| ESG               | Aeroflex                     | IFR 3413 | 341005/078  |

**Test Conditions / Notes:**

The EUT is placed on the wooden table. The RF Output port is connected to a load string . Optical in port is connected to a support Optical converter. Support optical converter receives RF signal converts the signal to optic and sends it to the EUT. The EUT decodes the optical signal and generates a RF signal. Emission profile evaluated at the RF antenna port. Operating range: 851-869MHz. Power = 20 watts. Frequency = 868.5 MHz. Modulation: iDEN. 19°C, 47% relative humidity. Frequency range of measurement = 9 kHz - 9 GHz. Frequency 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; 1000 MHz - 9000 MHz RBW=1 MHz, VBW=1 MHz.

**Transducer Legend:**

|  |                           |
|--|---------------------------|
| T1=Hi Freq 40GHz 3ft CAB-ANP02945-091809 | T2=Filter 1GHz HP AN02749 |
|--|---------------------------|

**Measurement Data:** Reading listed by margin. Test Lead: Antenna Terminal

| # | Freq MHz  | Rdng dBµV | T1 dB | T2 dB | Dist dB | Corr dB | Spec dBµV | Margin dB | Polar Ant |
|---|-----------|-----------|-------|-------|---------|---------|-----------|-----------|-----------|
| 1 | 1735.970M | 70.5      | +0.4  | +0.4  | +0.0    | 71.3    | 94.0      | -22.7     | Anten     |
| 2 | 2603.976M | 66.9      | +0.5  | +0.4  | +0.0    | 67.8    | 94.0      | -26.2     | Anten     |

**FCC 2.1033(c)(14)/2.1053/90.691(a)(2) - FIELD STRENGTH OF SPURIOUS RADIATION**

**Test Setup Photos**



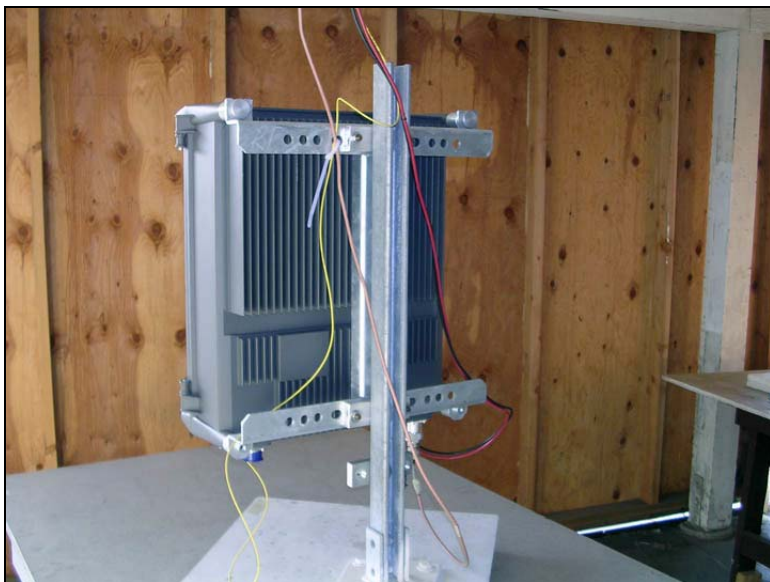
AC



AC



DC



DC



**Test Data Sheets**

Test Location: CKC Laboratories, Inc. •110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112

Customer: **Powerwave Technologies, Inc.**  
 Specification: **90.669(a) Radiated Spurious Emission**  
 Work Order #: **87286** Date: 11/20/2007  
 Test Type: **Radiated Scan** Time: 13:35:38  
 Equipment: **Wide Band Radio Head** Sequence#: 2  
 Manufacturer: Powerwave Technologies, Inc. Tested By: E. Wong  
 Model: RH500020/211  
 S/N: NA

**Test Equipment:**

| Function             | S/N        | Calibration Date | Cal Due Date | Asset # |
|----------------------|------------|------------------|--------------|---------|
| Spectrum Analyzer    | US44300438 | 01/03/2007       | 01/03/2009   | 02672   |
| Bilog Antenna        | 2451       | 02/02/2006       | 02/02/2008   | 01995   |
| Pre amp to SA Cable  | Cable #10  | 05/16/2007       | 05/16/2009   | P05050  |
| Cable                | Cable15    | 01/05/2007       | 01/05/2009   | P05198  |
| Pre Amp              | 1937A02548 | 06/01/2006       | 06/01/2008   | 00309   |
| Horn Antenna         | 6246       | 06/29/2006       | 06/29/2008   | 00849   |
| Microwave Pre-amp    | 3123A00281 | 07/19/2006       | 07/19/2008   | 00786   |
| 2'-40GHz cable       | NA         | 09/18/2007       | 09/18/2009   | P2948   |
| Heliac Antenna Cable | P5565      | 09/18/2006       | 09/18/2008   | P05565  |
| Loop Antenna         | 2014       | 06/14/2006       | 06/14/2008   | 00314   |
| 1.0 GHz HPF          | 1          | 03/07/2006       | 03/07/2008   | 02749   |

**Equipment Under Test (\* = EUT):**

| Function              | Manufacturer                 | Model #      | S/N |
|-----------------------|------------------------------|--------------|-----|
| Wide Band Radio Head* | Powerwave Technologies, Inc. | RH500020/211 | NA  |

**Support Devices:**

| Function          | Manufacturer                 | Model #  | S/N         |
|-------------------|------------------------------|----------|-------------|
| Optical Converter | Powerwave Technologies, Inc. | NA       | 42473       |
| Spectrum Analyzer | HP                           | 8563E    | NA          |
| Power Meter       | Agilent                      | E4419B   | GB402019/12 |
| Pre Amp           | Mini Circuit                 | ZHL-4240 | D040405     |
| ESG               | Aeroflex                     | IFR 3413 | 341005/078  |

**Test Conditions / Notes:**

The EUT is placed on the wooden table. The RF Output port is connected to a remote power meter . Optical in port is connected to a support Optical converter. Support optical converter receives RF signal converts the signal to optic and sends it to the EUT. The EUT decodes the optical signal and generates a RF signal. Operating range: 851-869MHz. Power = 20 watts. Frequency = 851.5 MHz, 860 MHz & 868 MHz. Modulation: iDEN. 19°C, 47% relative humidity. Frequency range of measurement = 9 kHz - 9 GHz. Frequency 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; 1000 MHz - 9000 MHz RBW=1 MHz, VBW=1 MHz.

Operating Frequency: 852 MHz - 868 MHz  
 Channels: Low, Mid and High  
 Highest Measured Output Power: 43.01 EIRP(dBm)= 20 EIRP(Watts)  
 Distance: 3 meters  
 Limit:  $43+10\text{Log}(P)$  56.01 dBc

| Freq. (MHz) | Reference Level (dBm) | Antenna Polarity (H/V) | dBc    |
|-------------|-----------------------|------------------------|--------|
| 3,408.00    | -56.1                 | Horiz                  | 99.11  |
| 1,704.00    | -61.8                 | Horiz                  | 104.81 |
| 2,580.00    | -56                   | Horiz                  | 99.01  |
| 3,440.00    | -56.1                 | Horiz                  | 99.11  |
| 1,720.00    | -60.1                 | Horiz                  | 103.11 |
| 6,944.00    | -51.8                 | Vert                   | 94.81  |
| 5,208.00    | -55.2                 | Vert                   | 98.21  |
| 2,604.00    | -58.9                 | Vert                   | 101.91 |
| 4,340.00    | -59.4                 | Vert                   | 102.41 |
| 3,472.00    | -59.8                 | Vert                   | 102.81 |

**BLOCK EDGE**

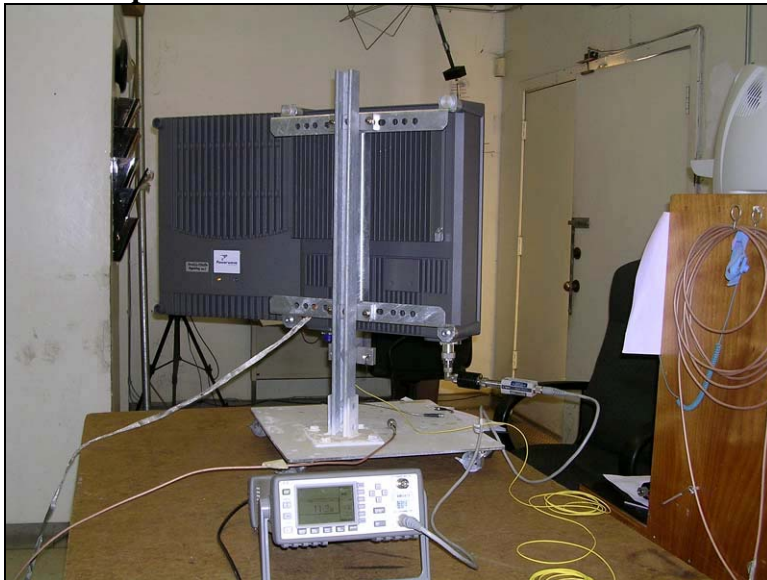
**Test Equipment**

| Equipment         | Asset # | Manufacturer | Model # | Serial #   | Cal Date | Cal Due |
|-------------------|---------|--------------|---------|------------|----------|---------|
| Spectrum Analyzer | 02672   | Agilent      | E4446A  | US44300438 | 010307   | 010309  |

**Test Conditions**

The EUT is placed on the wooden table. The RF Output port is connected to a load string. Optical in port is connected to a support Optical converter. Support optical converter receives RF signal, converts the signal to optic and sends it to the EUT. The EUT decodes the optical signal and generates a RF signal. Emission profile evaluated at the RF antenna port. Modulation: iDEN.

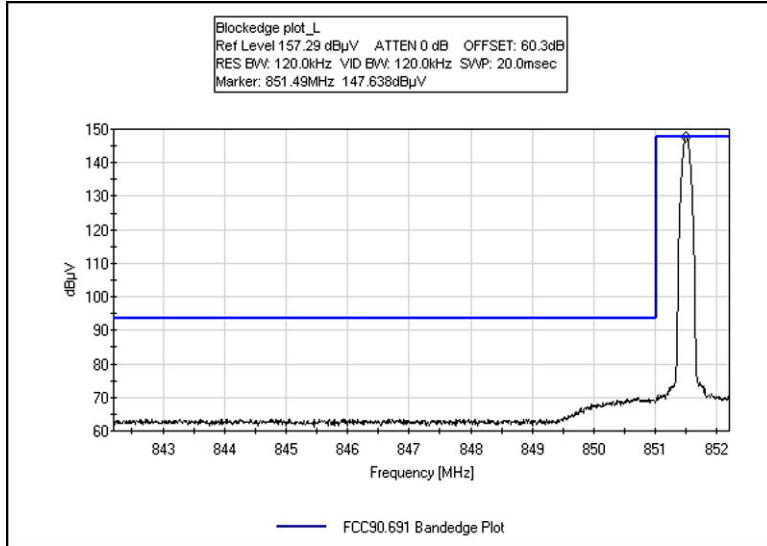
**Test Setup Photos**



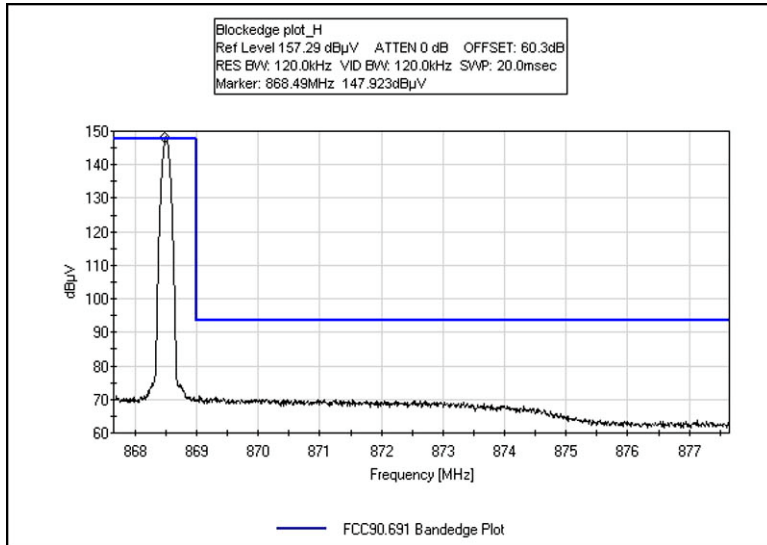


## Test Plots

### BLOCKEDGE PLOT LOW



### BLOCKEDGE PLOT HIGH



**INTERMODULATION**

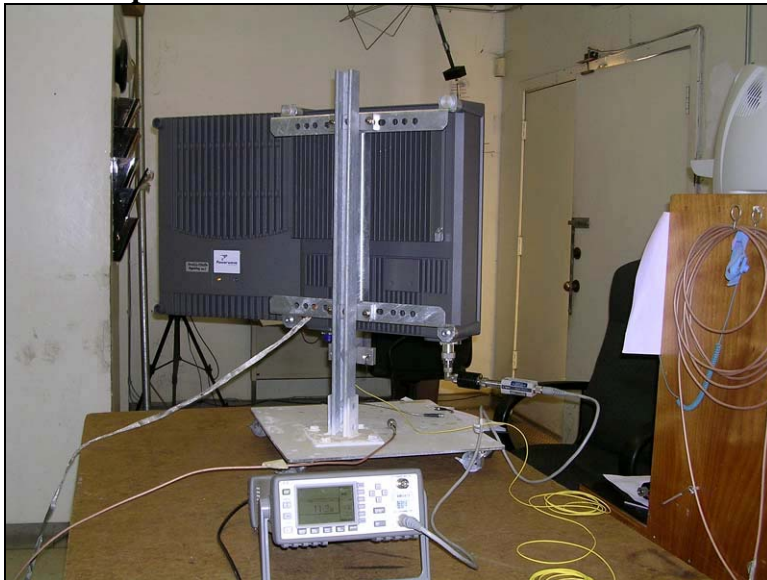
**Test Equipment**

| Equipment         | Asset # | Manufacturer | Model # | Serial #   | Cal Date | Cal Due |
|-------------------|---------|--------------|---------|------------|----------|---------|
| Spectrum Analyzer | 02672   | Agilent      | E4446A  | US44300438 | 010307   | 010309  |

**Test Conditions**

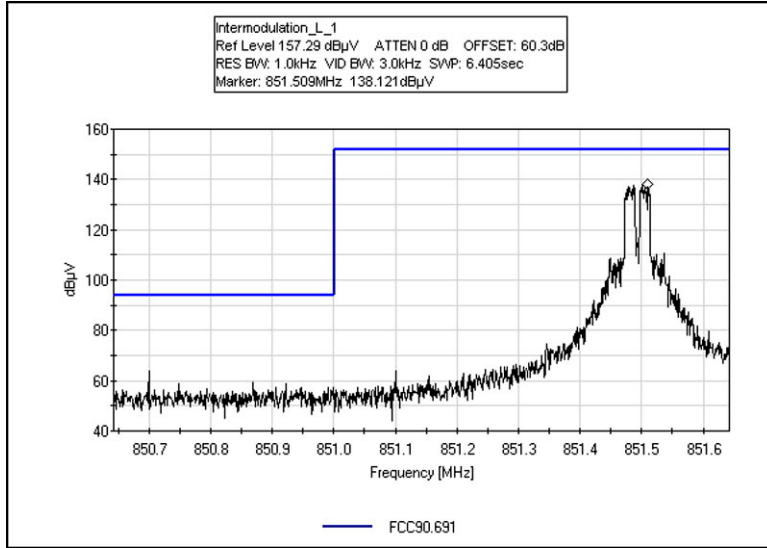
The EUT is placed on the wooden table. The RF Output port is connected to a load string. Optical in port is connected to a support Optical converter. Support optical converter receives RF signal, converts the signal to optic and sends it to the EUT. The EUT decodes the optical signal and generates a RF signal. Two RF signals spaced a channel apart were injected to the EUT. Emission profile evaluated at the RF antenna port. Modulation: iDEN.

**Test Setup Photos**

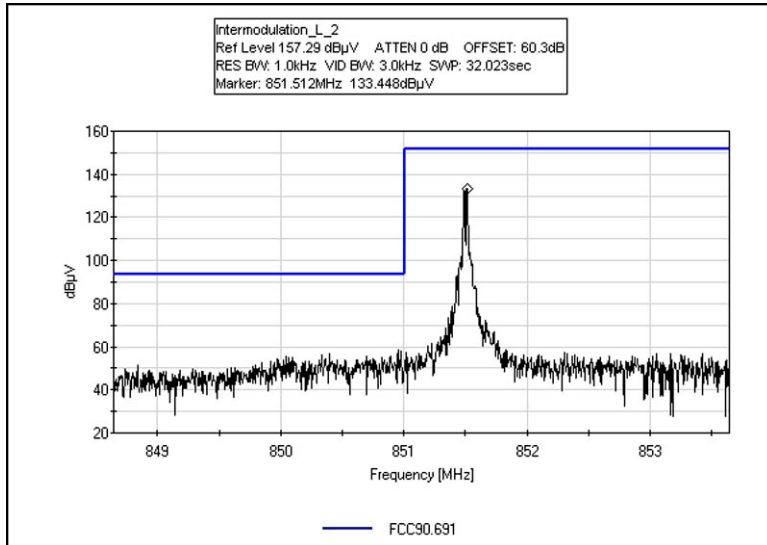


## Test Plots

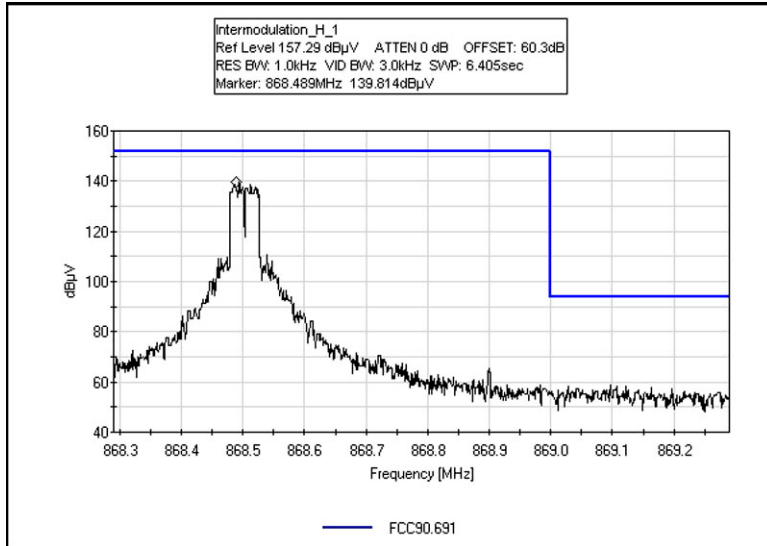
### INTERMODULATION LOW 1



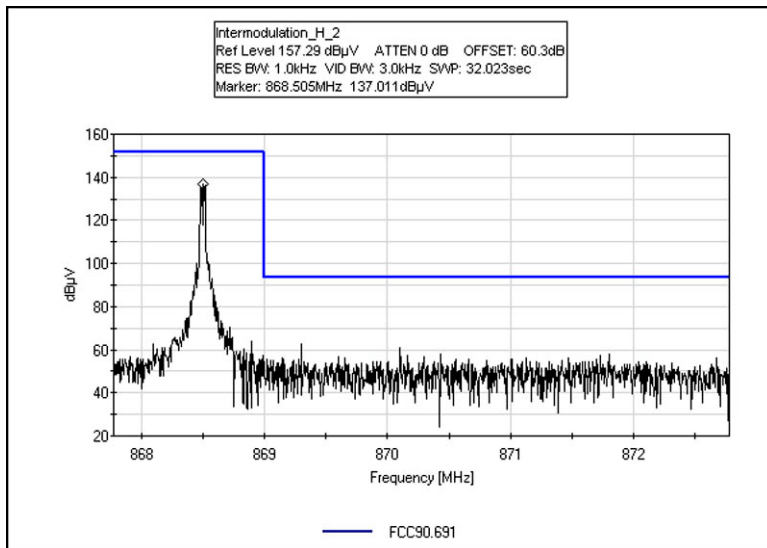
### INTERMODULATION LOW 2



## INTERMODULATION HIGH 1



## INTERMODULATION HIGH 2



**99% BANDWIDTH**

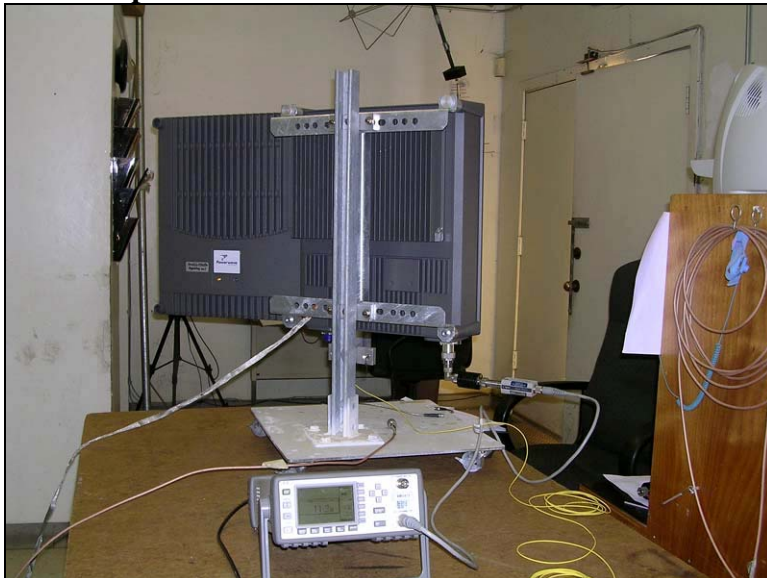
**Test Equipment**

| Equipment         | Asset # | Manufacturer | Model # | Serial #   | Cal Date | Cal Due |
|-------------------|---------|--------------|---------|------------|----------|---------|
| Spectrum Analyzer | 02672   | Agilent      | E4446A  | US44300438 | 010307   | 010309  |

**Test Conditions**

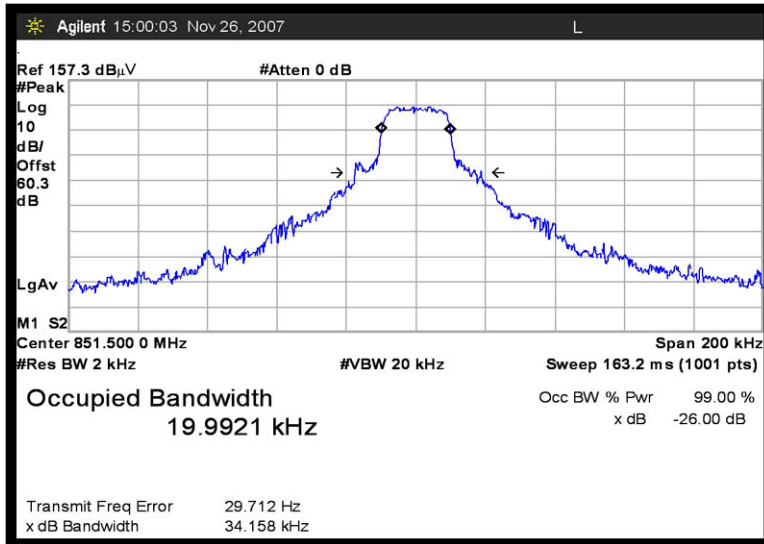
The EUT is placed on the wooden table. The RF Output port is connected to a load string. Optical in port is connected to a support Optical converter. Support optical converter receives RF signal, converts the signal to optic and sends it to the EUT. The EUT decodes the optical signal and generates a RF signal. Emission profile evaluated at the RF antenna port. Modulation: iDEN.

**Test Setup Photos**

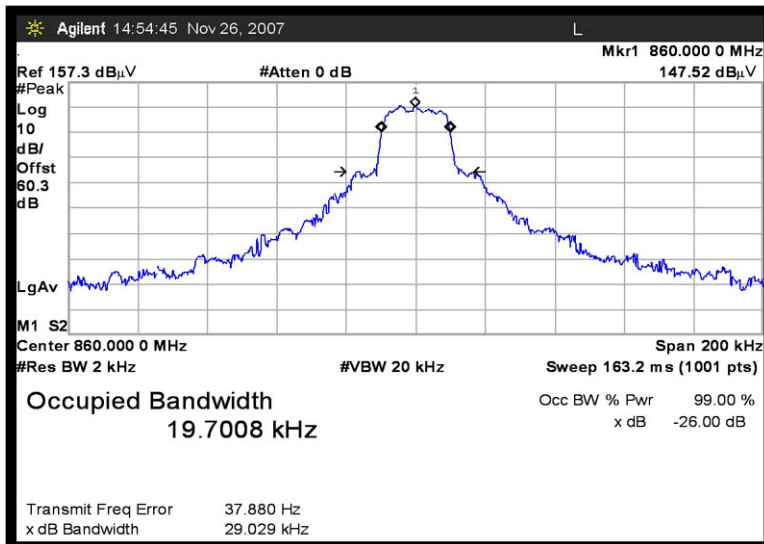


## Test Plots

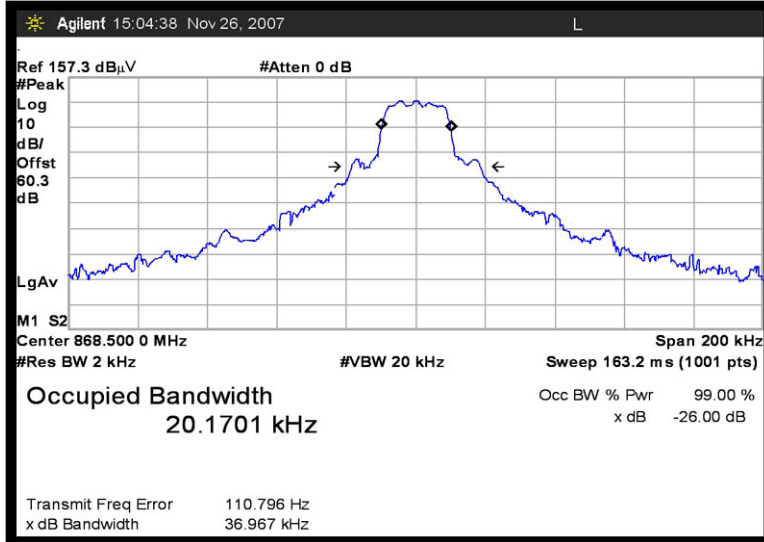
### 99% BANDWIDTH 852MHz



### 99% BANDWIDTH 860MHz



**99% BANDWIDTH 868MHz**





**RSS-131 GAIN LINEARITY**

**Test Equipment**

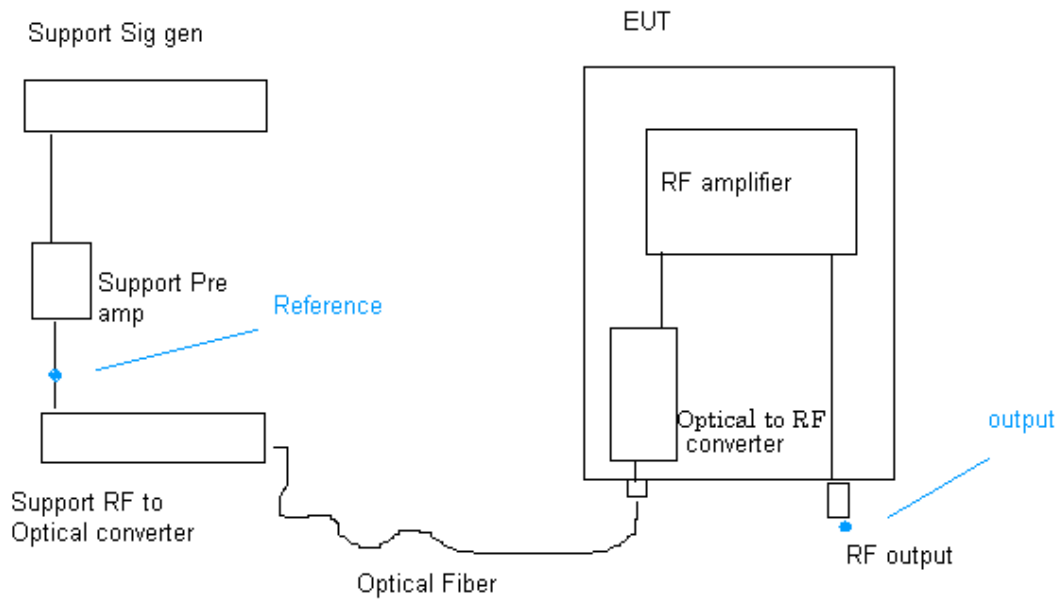
| Equipment        | Asset # | Manufacturer | Model # | Serial #   | Cal Date | Cal Due |
|------------------|---------|--------------|---------|------------|----------|---------|
| Network analyzer | C00012  | HP           | 8753E   | Us38432770 | 050206   | 050208  |

**Test Setup Photos**





Setup



Measured gain = Output – Reference (dB)

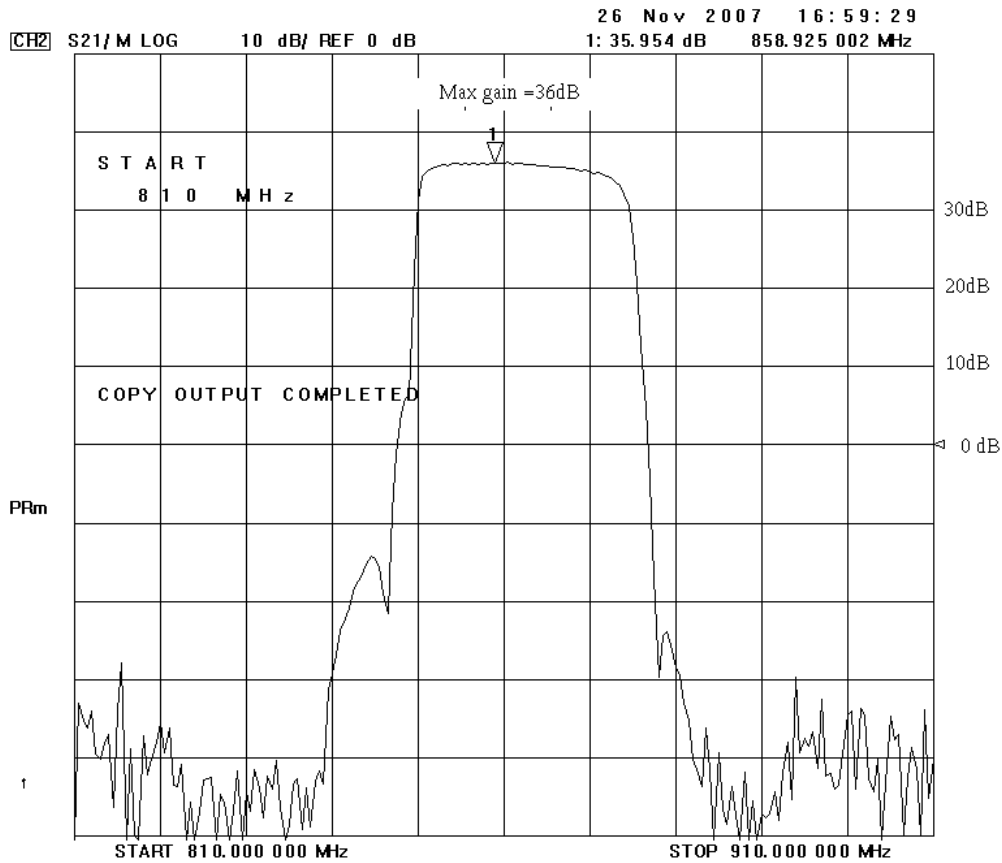
The nominal bandwidth and nominal pass band gain (dB) of the RF enhancer or translator shall be stated by the manufacturer or equipment certification applicant and indicated in the test report.

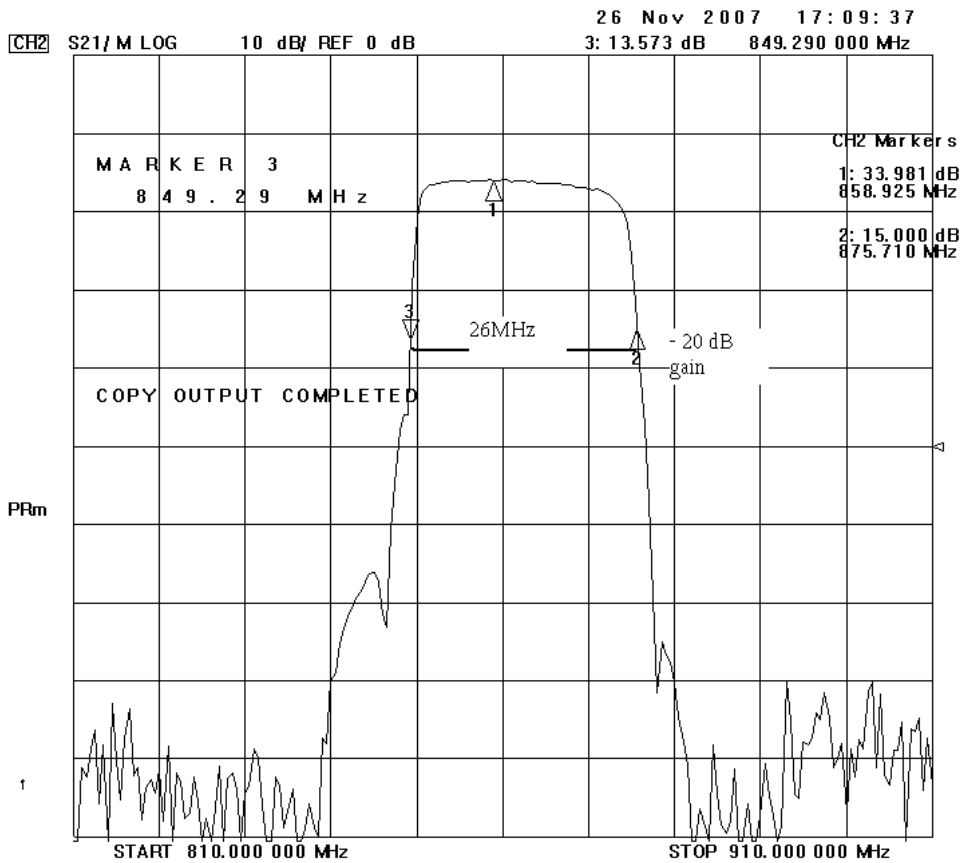
Manufacturer stated gain = 45-70 dB

### Test Plots

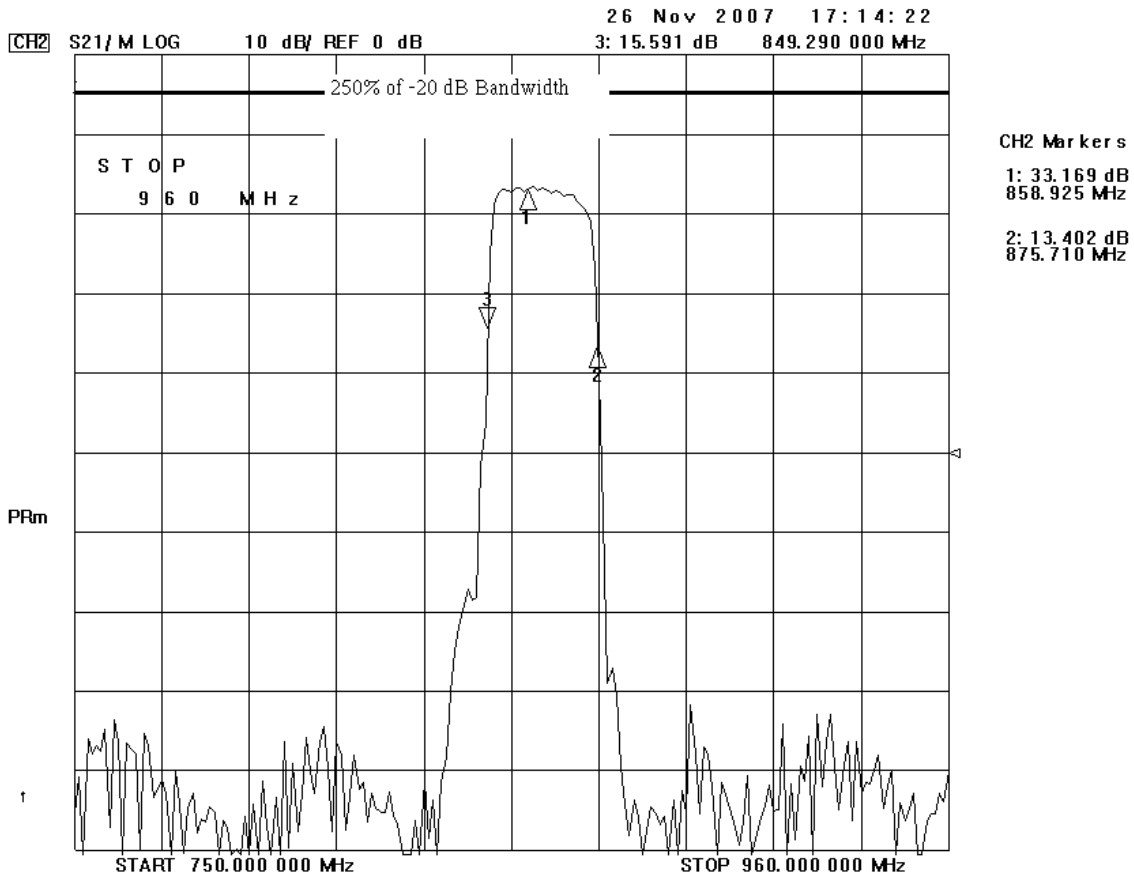
The internal control is adjusted to the nominal gain for which equipment certification is sought.

Maximum measured gain = 36dB





With the aid of a Vector Network analyzer, the 20 dB Bandwidth is measured.



The gain-versus-frequency response of the amplifier from the mid band  $F_0$  of the pass band up to at least  $f_0 \pm 250\%$  of the 20dB Bandwidth.

**Minimum standard:**

The pass band gain response shall not exceed the nominal gain by more than 1 dB. The 20 dB bandwidth shall not exceed the nominal bandwidth that is stated by the manufacturer. Outside of the 20dB bandwidth the gain shall not exceed that at the 20dB point.