TESTING
CERT #803.01, 803.02, 803.05, 803.06

# POWERWAVE TECHNOLOGIES, INC. TEST REPORT

# FOR THE

# 2100 MHZ FEED FORWARD AMPLIFIER, G3L-2129-140

# FCC PART 27

# TESTING

**DATE OF ISSUE: APRIL 8, 2009**

**PREPARED FOR:**

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

P.O. No.: 127736
W.O. No.: 89338

**PREPARED BY:**

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

Date of test: March 17-20, 2009

**Report No.: FC09-051**

## TABLE OF CONTENTS

## ADMINISTRATIVE INFORMATION

**DATE OF TEST:** March 17-20, 2009

**DATE OF RECEIPT:** March 17, 2009

**REPRESENTATIVE:** Carmino Fiorello

**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-22 GHz

**TEST METHOD:** FCC Part 27

**PURPOSE OF TEST:** To perform the testing of the 2100 MHz Feed Forward Amplifier, G3L-2129-140 with the requirements for FCC Part 27 devices.

**APPROVALS**

| **QUALITY ASSURANCE:** | **TEST PERSONNEL:** |
|---|---|
| Steve Behm, Director of Engineering Services | Eddie Wong, Senior EMC Engineer |

## SUMMARY OF RESULTS

| Test | Specification/Method | Results |
|---|---|---|
| | | |
| RF Power Output | FCC 2.1046/27.50(d) | Pass |
| | | |
| Occupied Bandwidth | FCC 2.1049(I) | Pass |
| | | |
| Spurious Emissions at Antenna Terminal | FCC 2.1051/27.53(h) | Pass |
| | | |
| Field Strength of Spurious Radiation | FCC 2.1053/27.53(h) | Pass |
| | | |
| Blockedge Plots | | Pass |
| | | |
| Intermodulation | | Pass |
| | | |
| Out of Band Rejection | | Pass |
| | | |
| Site File No. | FCC 90473 | |
| | | |

## 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.

## EQUIPMENT UNDER TEST

**2100 MHz Feed Forward Amplifier**
Manuf: Powerwave Technologies, Inc.
Model: G3L-2129-140
Serial: PD000000XQ7

## PERIPHERAL DEVICES

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

**ESG**
Manuf: Agilent
Model: E4433B
Serial: US40051477

**Power Meter**
Manuf: Agilent
Model: E4419B
Serial: MY40510694

**Spectrum Analyzer**
Manuf: HP
Model: 8563E
Serial: NA

**Power Supply**
Manuf: HP
Model: 6032A
Serial: NA

## MEASUREMENT UNCERTAINTIES

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

The reported measurement uncertainties are calculated based on the worst case of all laboratory environments from CKC Laboratories, Inc. test sites. Only those parameters which require estimation of measurement uncertainty are reported. The reported worst case measurement uncertainty is less than the maximum values derived in CISPR 16-4-2. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Compliance is deemed to occur provided measurements are below the specified limits.

**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**
F9W

**FCC 2.1033 (c)(5) FREQUENCY RANGE**
2110MHz – 2155MHz

**FCC 2.1033 (c)(6) OPERATING POWER**
145 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**
CDMA, WCDMA

## FCC 2.1033(c)(14)/2.1046/27.50(d) - RF POWER OUTPUT

### Test Equipment

RF Output Power

| Equipment | Asset # | Manufacturer | Model | Serial # | Cal Date | Cal Due |
|---|---|---|---|---|---|---|
| RF Power meter | 02778 | HP | EPM-441A | GB37170458 | 021508 | 021510 |
| Power Sensor | 02777 | HP | E4412A | MY41499662 | 021508 | 021510 |

Peak to Average ratio

| Equipment | Asset # | Manufacturer | Model | Serial # | Cal Date | Cal Due |
|---|---|---|---|---|---|---|
| Spectrum Analyzer | 02672 | Agilent | E4446A | US44300438 | 072308 | 072310 |

Voltage variation

| Equipment | Asset # | Manufacturer | Model | Serial # | Cal Date | Cal Due |
|---|---|---|---|---|---|---|
| Programmable Power Source | 01695/ 01696 | Pacific Power | 345AMX / UPC32 | 250 / 245 | 051507 | 051509 |

### Test Conditions

27.50(d)(2) RF Power Output:
Effective radiated power limits

(2) The power of each fixed or base station transmitting in the 2110-2155 MHz band and situated in any geographic location other than that described in paragraph (d)(1) is limited to:

(A) an equivalent isotropically radiated power (EIRP) of 1640 watts when transmitting with an emission bandwidth of 1 MHz or less;

(B) an EIRP of 1640 watts/MHz when transmitting with an emission bandwidth greater than 1 MHz.

The EUT is a RF amplifier operating the 2110- 2155 MHz band under part 27. The manufacturer does not provide an antenna for sale with the product, hence EIRP is not measured nor calculated. The end user of this product is to exercise proper engineering judgment to select the appropriate antenna to comply with the EIRP limitation set forth by 27.50(d)(2)((B)

The RF power of the EUT was measured with a power meter at the antenna port. The measurement satisfies the above requirement by demonstrating the measured power is below 1640 watts.

The peak to Average ratio plots* for operation in 2110-2155MHz band under rule part 27 device was captured with a spectrum analyzer employing Complementary Cumulative Distribution Function (CCDF) technique.

* Effective: June 2,2008
1)Power measurements, for transmitters authorized under these sections, may be made either in accordance with a Commission- approved average power technique, or using peak power measurements.
2) If an average power technique is used, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.
3) Affects (Part 24) 1850- 1915 /1930- 1995 MHz – PCS bands, and (Part 27) 1710- 1755 / 2110- 2155 MHz - AWS bands.
4) Power measurements techniques need to be finalized. FCC developing 13 dB PAR test method using CCDF analyzer function.

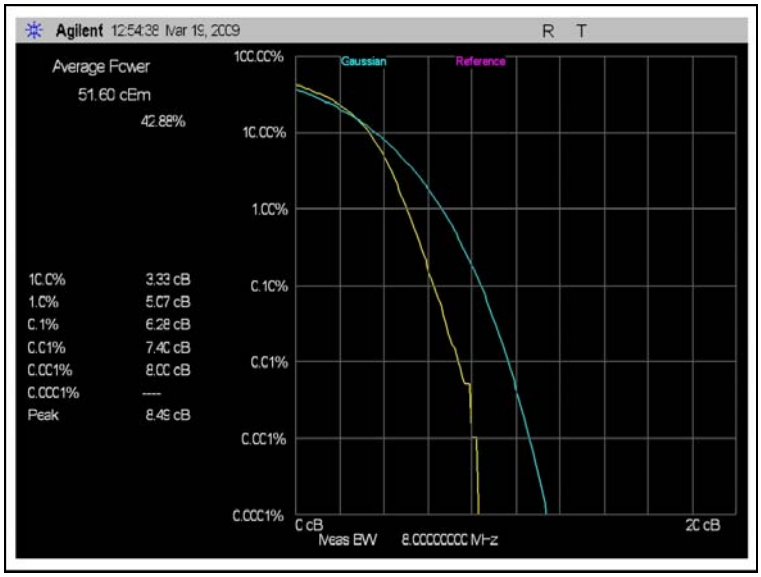
**Test Setup Photos**

**Test Data**

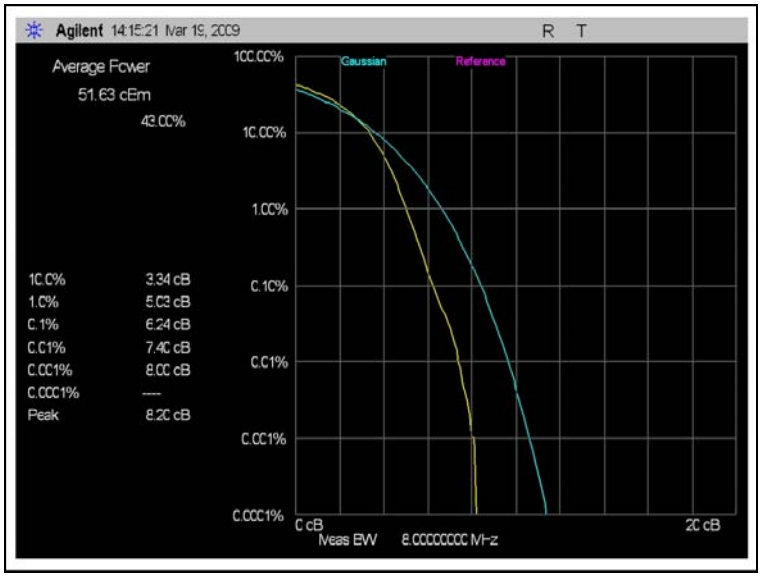
| Modulation | Frequency | Power ( dBm) | Power (Watt) |
|---|---|---|---|
| CDMA | 2110.50 MHz | 51.6 | 145 |
| CDMA | 2132.50 MHz | 51.6 | 145 |
| CDMA | 2152.50 MHz | 51.6 | 145 |
| WCDMA | 2110.75 MHz | 51.6 | 145 |
| WCDMA | 2132.50 MHz | 51.6 | 145 |
| WCDMA | 2152.25 MHz | 51.6 | 145 |

AC Voltage was varied +- 15%, no change in RF output power.
Conclusion: As indicated below, each single channel does not exceed the 1640 Watt peak power limit and the Peak to Average Ratio does not exceed the 13 dB limit.

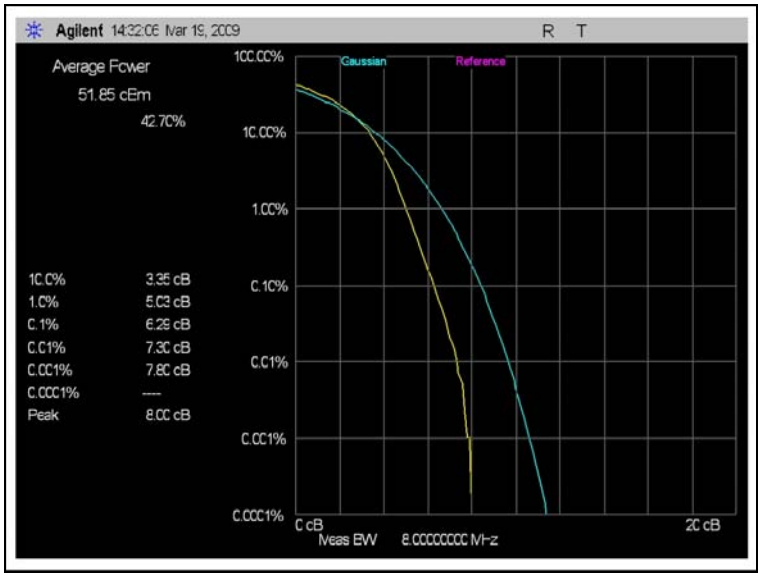
## FCC 27.50(d) RF POWER OUTPUT - CDMA 2110MHz



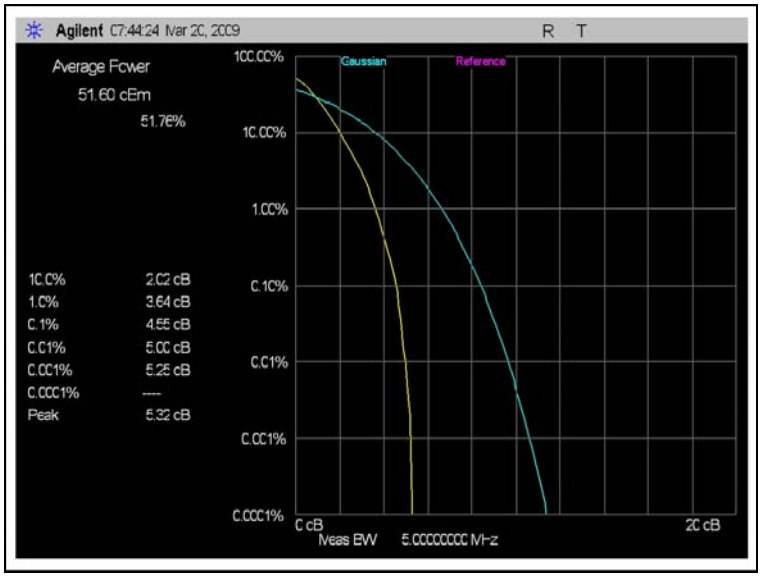

## FCC 27.50(d) RF POWER OUTPUT - CDMA 2132MHz



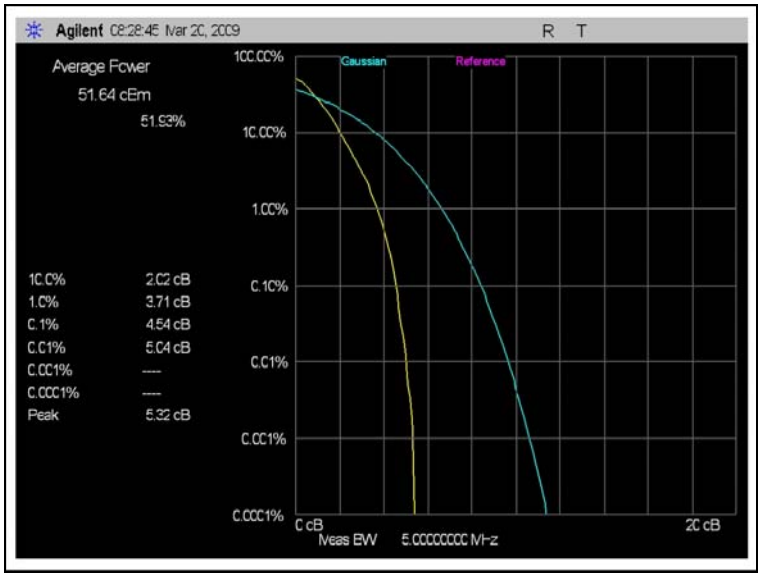
## FCC 27.50(d) RF POWER OUTPUT - CDMA 2155MHz



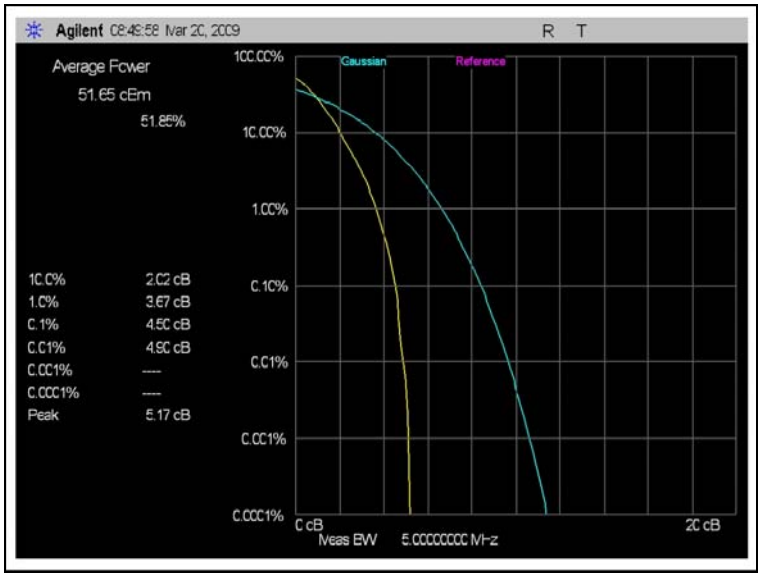

## FCC 27.50(d) RF POWER OUTPUT - WCDMA 2110MHz



## FCC 27.50(d) RF POWER OUTPUT - WCDMA 2132MHz




## FCC 27.50(d) RF POWER OUTPUT - WCDMA 2155MHz



## FCC 2.1033(c)(14)/2.1049(i)- OCCUPIED BANDWIDTH

### Test Equipment

| Equipment | Asset # | Manufacturer | Model # | Serial # | Cal Date | Cal Due |
|---|---|---|---|---|---|---|
| Spectrum Analyzer | 02672 | Agilent | E4446A | US44300438 | 072308 | 072310 |
| 36" 40GHz cable | 02945 | Strolab | NA | NA | 091807 | 091809 |

### Test Conditions

2.1029 Occupied BW, Input vs Output port

The EUT is placed on the wooden table. The RF Output port is connected to a RF load. The RF Input port is connected to remote ESG. The RF load is connected to remote power meter. The RF input signal is adjusted to maintain the rated RF output power. Emission profile evaluated at the antenna port.

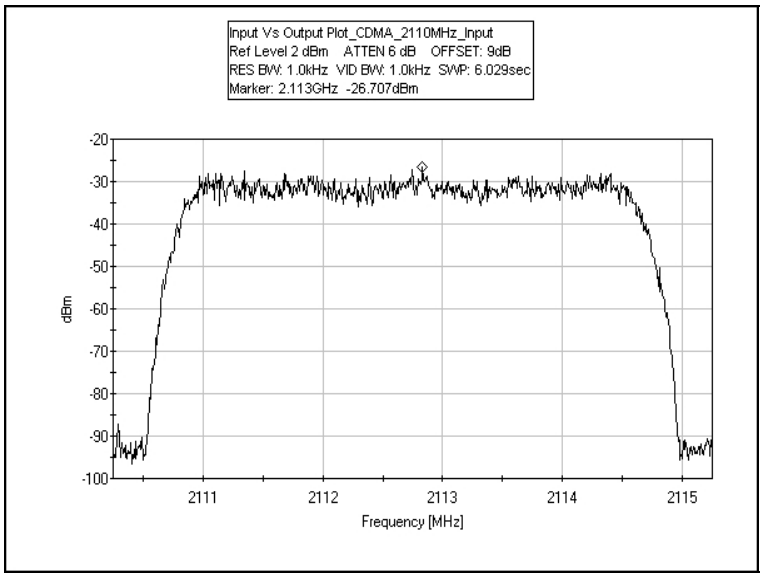
Operating Frequency = 2110-2155 MHz
Power = 50.8dBm = 145W
Modulation = CDMA (2000), W-CDMA (3GPP).
Tx Frequency = 2112.5 MHz, 2132.5MHz, 2152.5MHz. (CDMA),
= 2112.75MHz, 2132.5MHz, 2152.25MHz (WCDMA)

Output waveform is recorded with a spectrum analyzer at the Antenna port of the device.
Input waveform is recorded with a spectrum analyzer at the RF out of the support ESG.

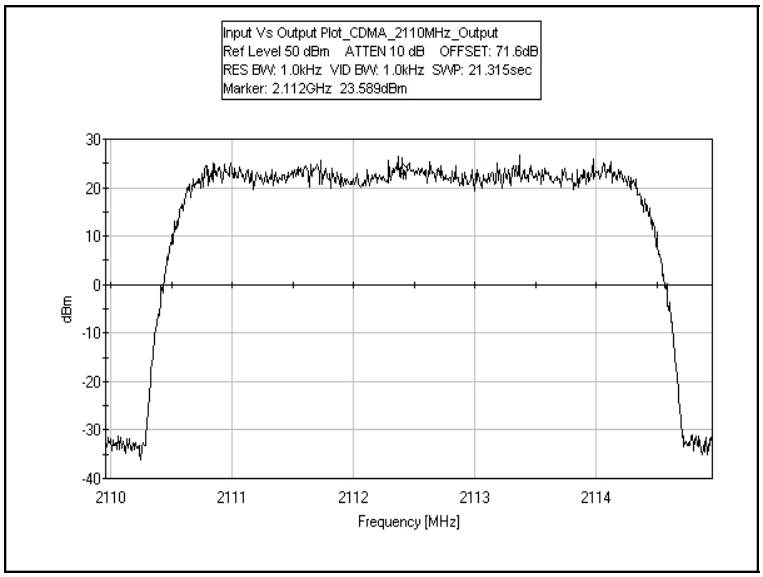
### Test Setup Photos

## Test Plots

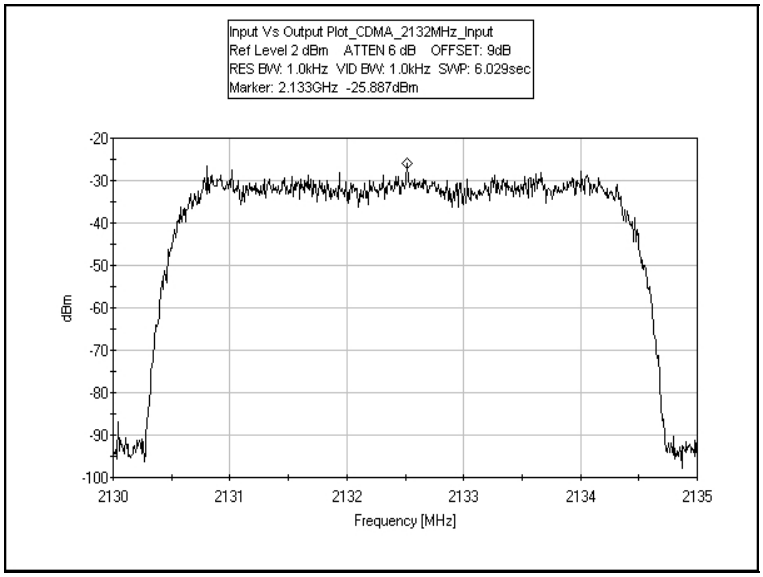
## INPUT PLOT - CDMA 2110MHz



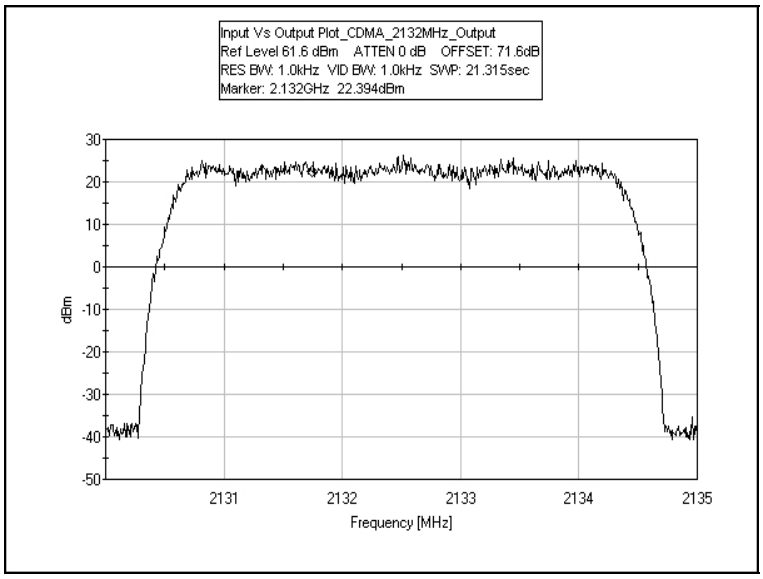

## OUTPUT PLOT - CDMA 2110MHz



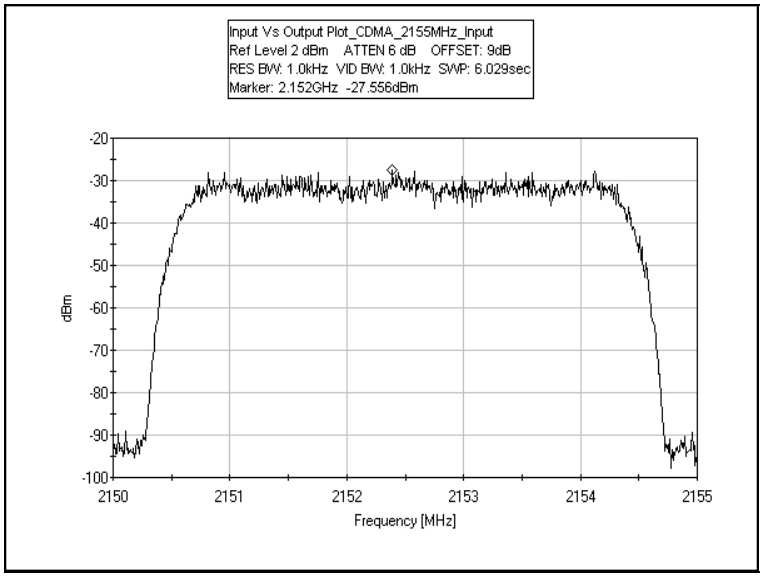
## INPUT PLOT - CDMA 2132MHz



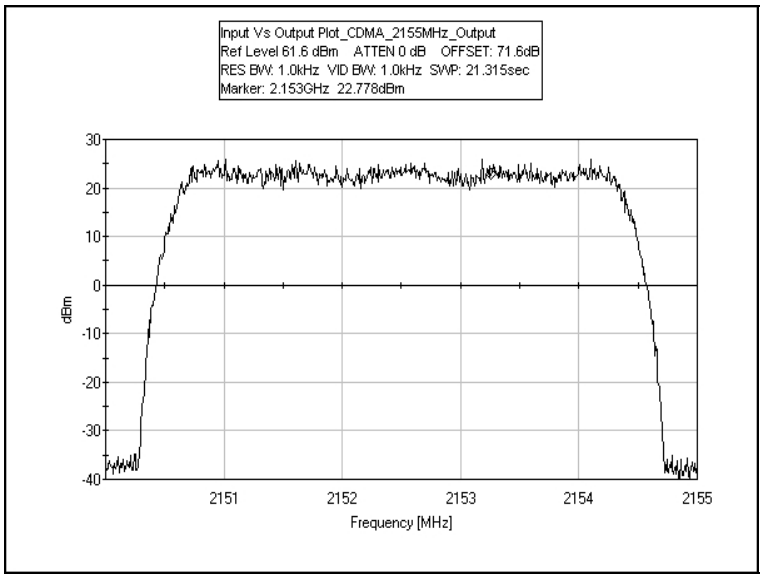

## OUTPUT PLOT - CDMA 2132MHz



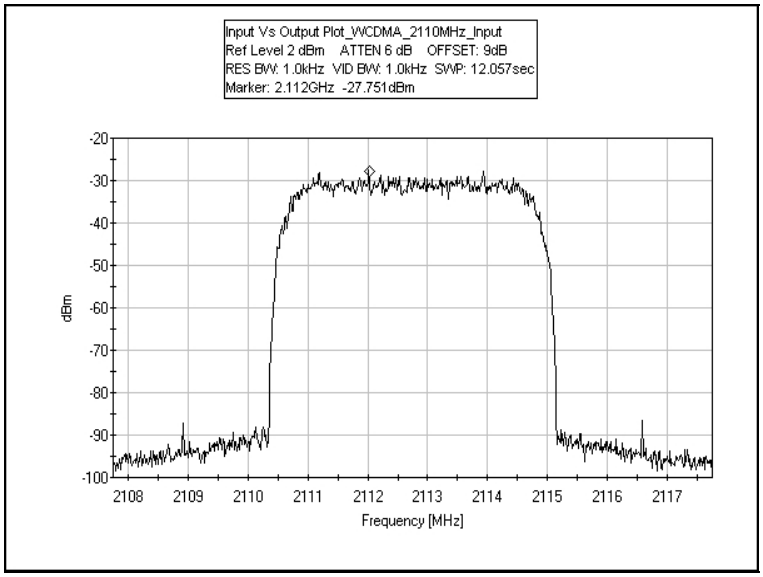
## INPUT PLOT - CDMA 2155MHz



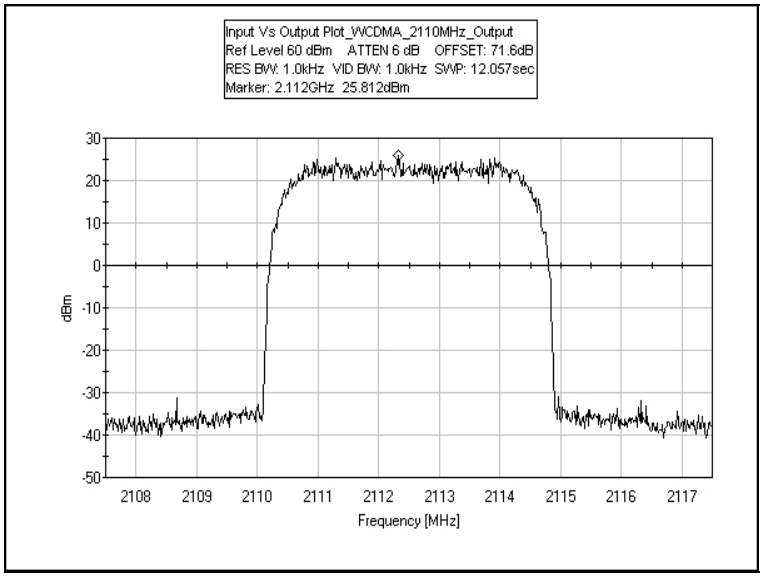

## OUTPUT PLOT - CDMA 2155MHz



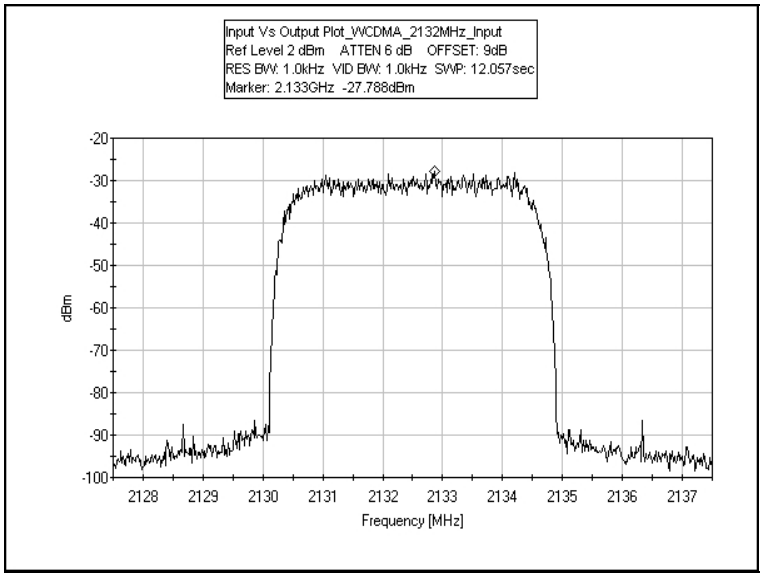
## INPUT PLOT - WCDMA 2110MHz



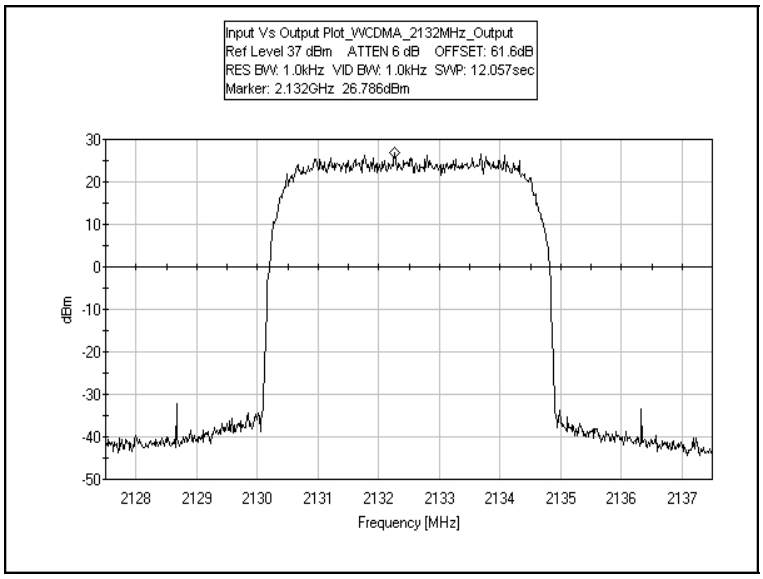

## OUTPUT PLOT - WCDMA 2110MHz



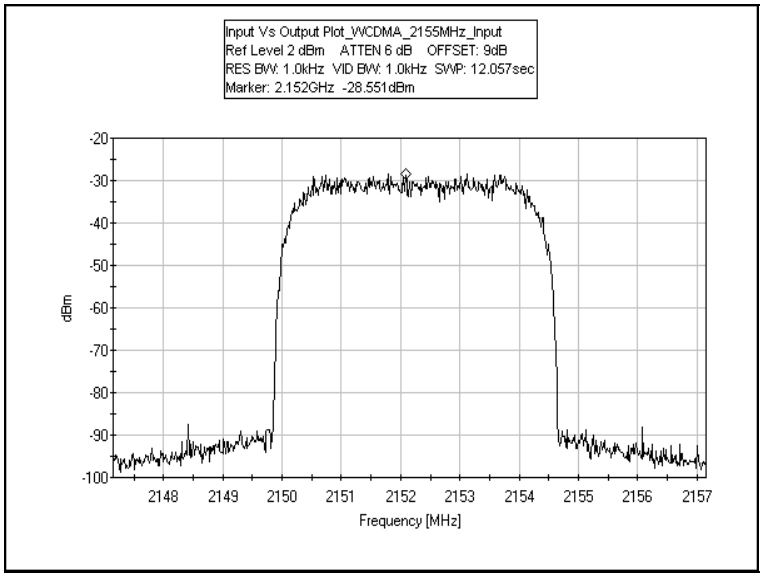
## INPUT PLOT - WCDMA 2132MHz



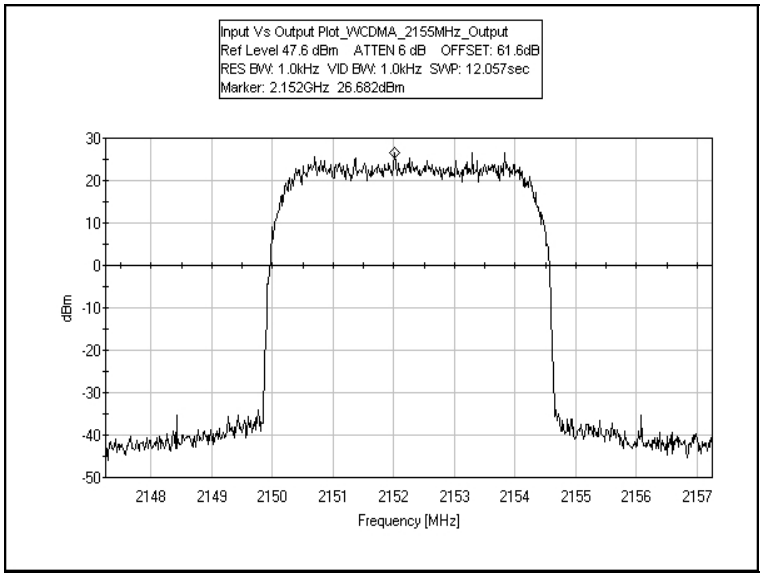

## OUTPUT PLOT - WCDMA 2132MHz



## INPUT PLOT - CDMA 2155MHz




## OUTPUT PLOT - WCDMA 2155MHz



## FCC 2.1033(c)(14)/2.1051/27.53(h) - SPURIOUS EMISSIONS AT ANTENNA TERMINAL

**Test Setup Photos**

**Test Data**

Limit line for Spurious Conducted Emission

**Required Attenuation = 43+10 Log P dB**

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

$V_{dBuV}$ = $20 \text{ Log } \frac{V}{1 \text{ x } 10^{-6}}$

= $20\left(\text{Log } V - \text{Log } 1 \text{ x } 10^{-6}\right)$

= $20 \text{ Log } V - 20 \text{ Log} 1 \text{ x } 10^{-6}$

= $20 \text{ Log } V - 20(-6)$

= $20 \text{ Log } V + 120$

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

= $43 + 10 \text{ Log } \frac{V^2}{R}$

= $43 + 10\left(\text{Log } V^2 - \text{Log } R\right)$

= $43 + 10\left(2 \text{ Log } V - \text{Log } R\right)$

= $43 + 20 \text{ Log } V - 10 \text{ Log } R$

Limit line = $V_{dBuv}$ - Attenuation

= 20 Log V + 120 – (43 + 20 Log V – 10Log R)

= 20 Log V + 120 – 43 – 20 Log V + 10Log R

= 20 Log V + 120 – 43 – 20 Log V + 10Log R

= 120 – 43 + 10 Log 50 Note : R = 50 Ω

= 120 –43 + 16.897

= 94 dBuV at any power level

| | | | |
|---|---|---|---|
| Test Location: | CKC Laboratories, Inc. •110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112 | | |
| Customer: | **Powerwave Technologies, Inc.** | | |
| Specification: | **FCC Part 27.53(h)Conducted Spurious Emission** | | |
| Work Order #: | **89338** | Date: | 3/20/2009 |
| Test Type: | **Conducted Emissions** | Time: | 10:15:39 |
| Equipment: | **2100 MHz Feed Forward Amplifier** | Sequence#: | 3 |
| Manufacturer: | Powerwave Technologies, Inc. | Tested By: | E. Wong |
| Model: | G3L-2129-140 | | 110V 60Hz |
| S/N: | PD000000XQ7 | | |

***Test Equipment*:**

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|---|---|---|---|---|
| Spectrum Analyzer | US44300438 | 07/23/2008 | 07/23/2010 | 02672 |
| 3.0 GHz HPF | 1 | 03/25/2008 | 03/25/2010 | 02744 |
| 3'-40GHz cable | NA | 09/18/2007 | 09/18/2009 | P02945 |

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

| Function | Manufacturer | Model # | S/N |
|---|---|---|---|
| 2100 MHz Feed Forward Amplifier* | Powerwave Technologies, Inc. | G3L-2129-140 | PD000000XQ7 |

***Support Devices:***

| Function | Manufacturer | Model # | S/N |
|---|---|---|---|
| ESG | Agilent | E4433B | US40051477 |
| Power Meter | Agilent | E4419B | MY40510694 |
| Spectrum Analyzer | HP | 8563E | NA |
| Power Supply | HP | 6032A | NA |

***Test Conditions / Notes:***

FCC 27.53

The EUT is placed on the wooden table. The RF Output port is connected to a RF load. The RF Input port is connected to remote ESG. The RF load is connected to remote power meter. The RF input signal is adjusted to maintain the rated RF output power.
Emission profile evaluated at the antenna port.

Operating Frequency = 2110-2155 MHz
Power= 50.8dBm = 145W
Modulation = W-CDMA (3GPP) , CDMA (2000)
Tx Frequency = 2112.5 MHz, 2132.5MHz, 2152.5MHz. (CDMA), 2112.75MHz, 2132.5MHz, 2152.25MHz (WCDMA)
Frequency range of measurement = 9 kHz- 22000 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 - 22000 MHz RBW=1 MHz, VBW=1 MHz.

***Transducer Legend:***

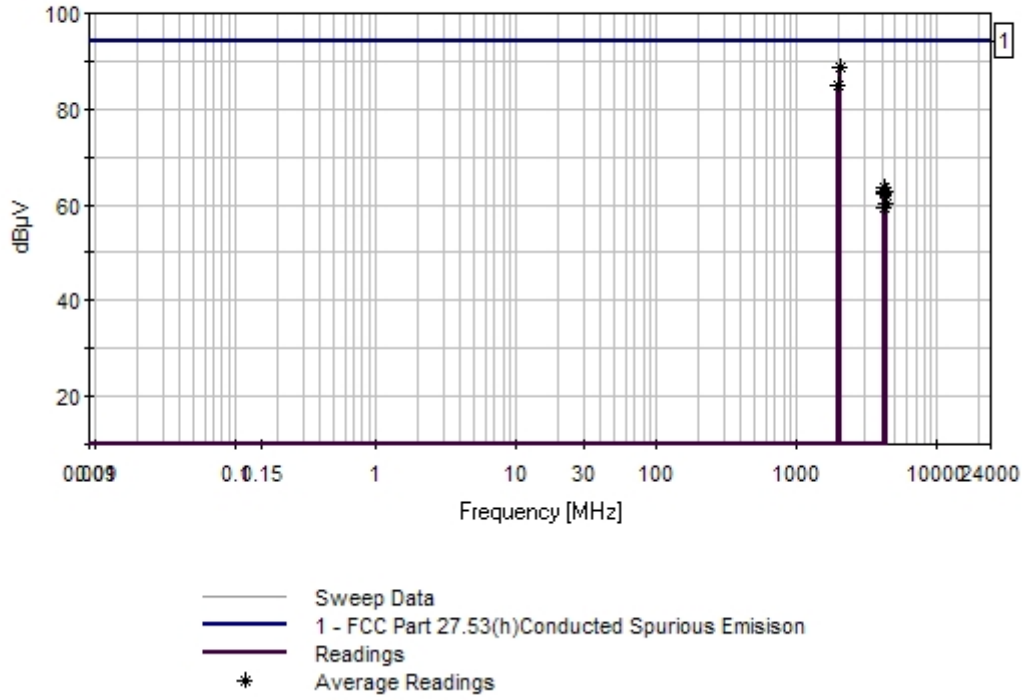
| | |
|---|---|
| T1=Hi Freq_40GHz_3ft_CAB-ANP02945-091809 | T2=HPF_3GHz-AN02744-032510 |

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

| # | Freq MHz | Rdng dBµV | T1 dB | T2 dB | dB | dB | Dist Table | Corr dBµV | Spec dBµV | Margin dB | Polar Ant |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2015.750M Ave | 88.3 | +0.5 | +0.0 | | | +0.0 | 88.8 | 94.0 CDMA | -5.2 | Anten |
| ^ | 2015.750M | 112.5 | +0.5 | +0.0 | | | +0.0 | 113.0 | 94.0 CDMA | +19.0 | Anten |

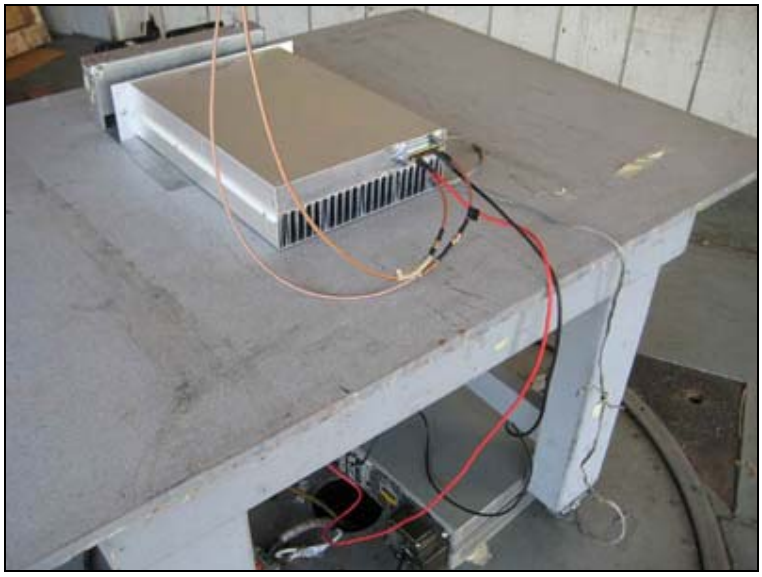
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 3 | 1994.500M Ave | 84.4 | +0.5 | +0.0 | +0.0 | 84.9 | 94.0 WCDMA | -9.1 | Anten |
| ^ | 1994.500M | 95.9 | +0.5 | +0.0 | +0.0 | 96.4 | 94.0 WCDMA | +2.4 | Anten |
| 5 | 4225.333M Ave | 62.5 | +0.7 | +0.4 | +0.0 | 63.6 | 94.0 CDMA | -30.4 | Anten |
| ^ | 4225.333M | 77.1 | +0.7 | +0.4 | +0.0 | 78.2 | 94.0 CDMA | -15.8 | Anten |
| 7 | 4304.300M Ave | 61.7 | +0.7 | +0.5 | +0.0 | 62.9 | 94.0 WCDMA | -31.1 | Anten |
| ^ | 4304.300M | 72.3 | +0.7 | +0.5 | +0.0 | 73.5 | 94.0 WCDMA | -20.5 | Anten |
| 9 | 4225.523M Ave | 61.6 | +0.7 | +0.4 | +0.0 | 62.7 | 94.0 WCDMA | -31.3 | Anten |
| ^ | 4225.520M | 71.0 | +0.7 | +0.4 | +0.0 | 72.1 | 94.0 WCDMA | -21.9 | Anten |
| 11 | 4265.167M Ave | 61.5 | +0.7 | +0.0 | +0.0 | 62.2 | 94.0 WCDMA | -31.8 | Anten |
| ^ | 4265.167M | 72.0 | +0.7 | +0.0 | +0.0 | 72.7 | 94.0 WCDMA | -21.3 | Anten |
| 13 | 4304.917M Ave | 58.9 | +0.7 | +0.5 | +0.0 | 60.1 | 94.0 CDMA | -33.9 | Anten |
| ^ | 4304.917M | 69.9 | +0.7 | +0.5 | +0.0 | 71.1 | 94.0 CDMA | -22.9 | Anten |
| 15 | 4264.750M Ave | 58.4 | +0.7 | +0.4 | +0.0 | 59.5 | 94.0 CDMA | -34.5 | Anten |
| ^ | 4264.750M | 72.1 | +0.7 | +0.4 | +0.0 | 73.2 | 94.0 CDMA | -20.8 | Anten |

CKC Laboratories, Inc. Date: 3/20/2009 Time: 10:15:39 Powerwave Technologies, Inc. WO#: 89338
FCC Part 27.53(h)Conducted Spurious Emisison Test Lead: Antenna Terminal 110V 60Hz Sequence#: 3



## FCC 2.1033(c)(14)/2.1053/27.53(h) - FIELD STRENGTH OF SPURIOUS RADIATION

**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: | **FCC 27.53 (h) Radiated Spurious Emission** | | |
| Work Order #: | **89338** | Date: | 4/2/2009 |
| Test Type: | **Radiated Scan** | Time: | 10:44:21 |
| Equipment: | **2100 MHz Feed Forward Amplifier** | Sequence#: | 3 |
| Manufacturer: | Powerwave Technologies, Inc. | Tested By: | E. Wong |
| Model: | G3L-2129-140 | | |
| S/N: | PD000000XQ7 | | |

***Test Equipment*:**

| Function | S/N | Calibration Date | Cal Due Date | Asset # |
|---|---|---|---|---|
| Spectrum Analyzer | US44300438 | 07/23/2008 | 07/23/2010 | 02672 |
| Bilog Antenna | 2451 | 01/21/2008 | 01/21/2010 | 01995 |
| Pre amp to SA Cable | Cable #10 | 05/16/2007 | 05/16/2009 | P05050 |
| Cable | Cable15 | 01/05/2009 | 01/05/2011 | P05198 |
| Pre Amp | 1937A02548 | 05/02/2008 | 05/02/2010 | 00309 |
| Loop Antenna 6502 | 2014 | 06/16/2008 | 06/16/2010 | 00314 |
| Horn Antenna | 6246 | 06/06/2008 | 06/06/2010 | 00849 |
| Microwave Pre-amp | 3123A00281 | 07/28/2008 | 07/28/2010 | 00786 |
| 2'-40GHz cable | NA | 09/18/2007 | 09/18/2009 | P2948 |
| Heliax Antenna Cable | P5565 | 09/04/2008 | 09/04/2010 | P05565 |
| 3.0 GHz HPF | 1 | 03/25/2008 | 03/25/2010 | 02744 |
| 18-26GHz Horn | 942126-003 | 11/12/2008 | 11/12/2010 | 01413 |

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

| Function | Manufacturer | Model # | S/N |
|---|---|---|---|
| 2100 MHz Feed Forward Amplifier* | Powerwave Technologies, Inc. | G3L-2129-140 | PD000000XQ7 |

***Support Devices:***

| Function | Manufacturer | Model # | S/N |
|---|---|---|---|
| ESG | Agilent | E4433B | US40051477 |
| Power Meter | Agilent | E4419B | MY40510694 |
| Spectrum Analyzer | HP | 8563E | NA |
| Power Supply | HP | 6032A | NA |

***Test Conditions / Notes:***

FCC 27.53
The EUT is placed on the wooden table. The RF Output port is connected to a RF load. The RF Input port is connected to remote ESG. The RF load is connected to remote power meter. The RF input signal is adjusted to maintain the rated RF output power.

Operating Frequency = 2110-2155 MHz
Power= 50.8dBm = 145W
Modulation = W-CDMA
Tx Frequency = 2112.5 MHz, 2132.5MHz, 2152.5MHz.
Frequency range of measurement = 9 kHz- 22000 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 - 22000 MHz RBW=1 MHz, VBW=1 MHz.
Note: Chassis housing modified, rear gasket removed.

Operating Frequency: 2110 MHz - 2155 MHz
Channels: Low, Mid and High
Highest Measured Output Power: 51.61 ERP(dBm)= 145 ERP(Watts)
Distance: 3 meters
Limit: 43+10Log(P)= 64.61 dBc

| Freq. (MHz) | Reference Level (dBm) | Antenna Polarity (H/V) | dBc |
|---|---|---|---|
| 4,304.45 | -14 | Horiz | 65.61 |
| 6,337.50 | -18 | Vert | 69.61 |
| 4,225.00 | -18.7 | Vert | 70.31 |
| 6,457.50 | -20.7 | Horiz | 72.31 |
| 4,305.00 | -20.8 | Vert | 72.41 |
| 4,266.90 | -20.8 | Horiz | 72.41 |
| 4,225.00 | -22.5 | Horiz | 74.11 |
| 6,337.50 | -24 | Horiz | 75.61 |
| 6,457.50 | -25.2 | Vert | 76.81 |
| 6,395.67 | -27.2 | Vert | 78.81 |
| 6,395.68 | -27.7 | Horiz | 79.31 |
| 4,263.17 | -29.4 | Vert | 81.01 |
| 4,263.17 | -13.8 | Vert | 65.41 |
| 10,661.48 | -31 | Vert | 82.61 |
| 12,915.50 | -32 | Horiz | 83.61 |
| 8,447.17 | -32.1 | Vert | 83.71 |
| 8,450.00 | -32.7 | Horiz | 84.31 |
| 8,450.00 | -14.2 | Horiz | 65.81 |
| 10,763.90 | -32.9 | Vert | 84.51 |
| 8,610.00 | -33 | Horiz | 84.61 |
| 8,610.00 | -15.8 | Horiz | 67.41 |
| 10,563.42 | -33.3 | Vert | 84.91 |
| 8,529.58 | -33.7 | Vert | 85.31 |
| 8,529.58 | -14.2 | Vert | 65.81 |
| 10,762.67 | -33.8 | Horiz | 85.41 |
| 10,660.35 | -33.8 | Horiz | 85.41 |
| 8,610.00 | -35 | Vert | 86.61 |
| 8,610.00 | -16.7 | Vert | 68.31 |
| 8,528.18 | -35.3 | Horiz | 86.91 |
| 8,528.18 | -15.4 | Horiz | 67.01 |
| 10,561.00 | -37 | Horiz | 88.61 |
| 12,916.40 | -39.9 | Vert | 91.51 |
| 12,796.73 | -44.4 | Vert | 96.01 |
| 4,305.02 | -17 | Horiz | 68.61 |

| | | | |
|---|---|---|---|
| 4,305.07 | -21.5 | Vert | 73.11 |
| 4,225.00 | -21.7 | Vert | 73.31 |
| 6,334.65 | -22 | Vert | 73.61 |
| 4,266.75 | -22.1 | Horiz | 73.71 |
| 8,450.32 | -23.3 | Vert | 74.91 |
| 8,530.43 | -25.3 | Vert | 76.91 |
| 8,530.43 | -25.3 | Vert | 76.91 |
| 8,609.67 | -26.3 | Vert | 77.91 |
| 8,610.00 | -26.4 | Horiz | 78.01 |
| 4,223.12 | -26.4 | Horiz | 78.01 |
| 4,223.12 | -16.2 | Horiz | 67.81 |
| 8,450.12 | -26.8 | Horiz | 78.41 |
| 6,336.04 | -27.7 | Horiz | 79.31 |
| 6,336.04 | -15.8 | Horiz | 67.41 |
| 6,458.87 | -28.2 | Horiz | 79.81 |
| 6,458.87 | -16.2 | Horiz | 67.81 |
| 8,530.53 | -28.3 | Horiz | 79.91 |
| 6,396.02 | -29.5 | Vert | 81.11 |
| 6,396.02 | -17.8 | Vert | 69.41 |
| 6,396.20 | -29.9 | Horiz | 81.51 |
| 6,396.20 | -18.9 | Horiz | 70.51 |
| 6,458.83 | -30.4 | Vert | 82.01 |
| 6,458.83 | -19.6 | Vert | 71.21 |
| 4,263.03 | -31.5 | Vert | 83.11 |
| 4,263.03 | -18.5 | Vert | 70.11 |

## BLOCKEDGE

### Test Equipment

| Equipment | Asset # | Manufacturer | Model # | Serial # | Cal Date | Cal Due |
|---|---|---|---|---|---|---|
| Spectrum Analyzer | 02672 | Agilent | E4446A | US44300438 | 072308 | 072310 |
| 36" 40GHz cable | 02945 | Strolab | NA | NA | 091807 | 091809 |

### Test Conditions

The EUT is placed on the wooden table. The RF Output port is connected to a RF load. The RF Input port is connected to remote ESG. The RF load is connected to remote power meter. The RF input signal is adjusted to maintain the rated RF output power.
Emission profile evaluated at the antenna port.

Operating Frequency = 2110-2155 MHz
Power = 50.8dBm = 145W
Modulation = CDMA (2000), W-CDMA (3GPP).
Tx Frequency = 2112.5 MHz, 2132.5MHz, 2152.5MHz. (CDMA),
= 2112.75MHz, 2132.5MHz, 2152.25MHz (WCDMA)

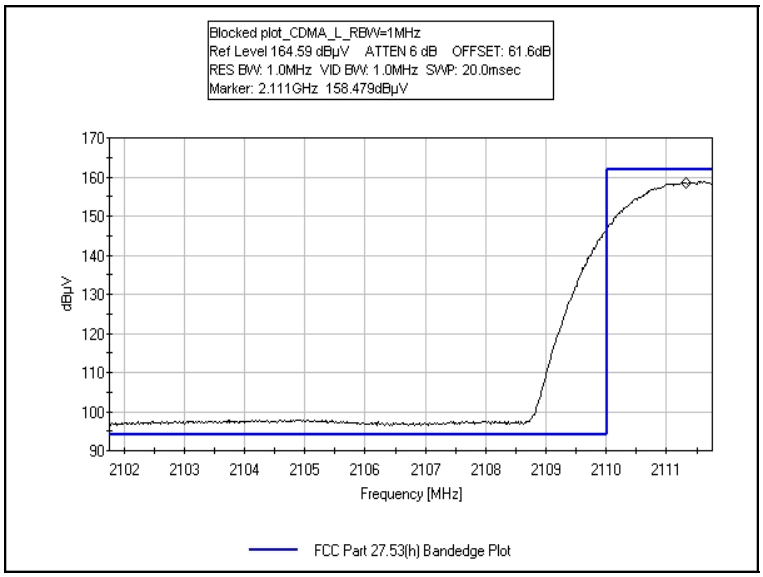
Blockedge plot is recorded with a spectrum analyzer at the Antenna port of the device.

Delta marker correction was applied to eliminate erroneous trace reading within 1 MHz of the bandedge due to resolution bandwidth employed. The reduction in amplitude measured with reduced bandwidth is compensated. For CDMA modulation, additional plots where Adjacent channel power integrated within 1 MHz band were captured with reduced resolution bandwidth.

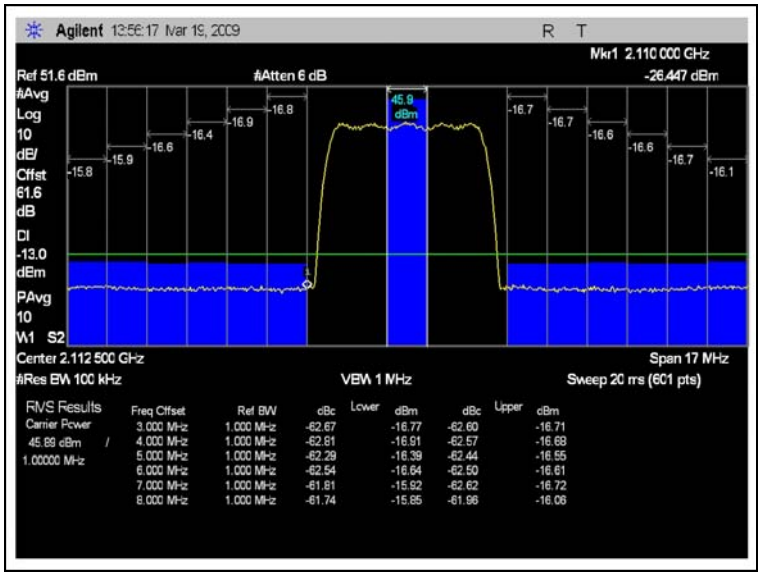
**Test Setup Photos**

## Test Plots

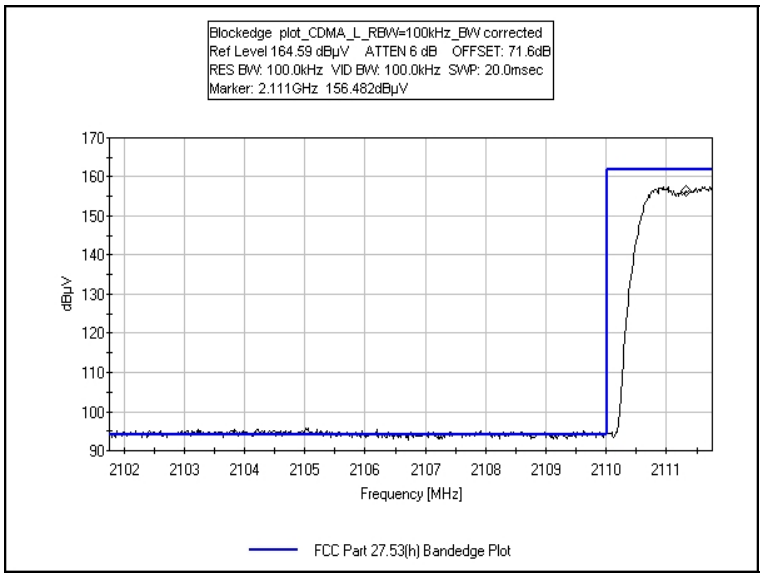
## BLOCKEDGE - CDMA LOW CHANNEL RBW=1MHz



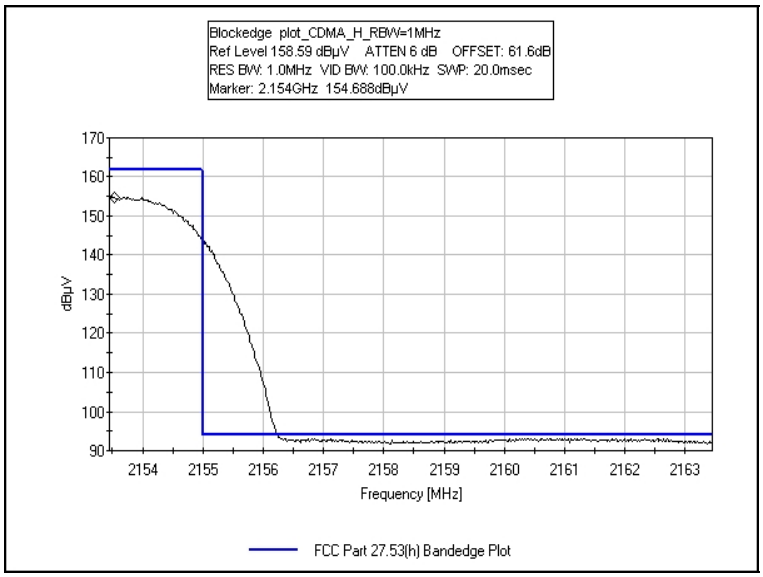

## BLOCKEDGE - CDMA LOW CHANNEL RBW=1MHz_ACP



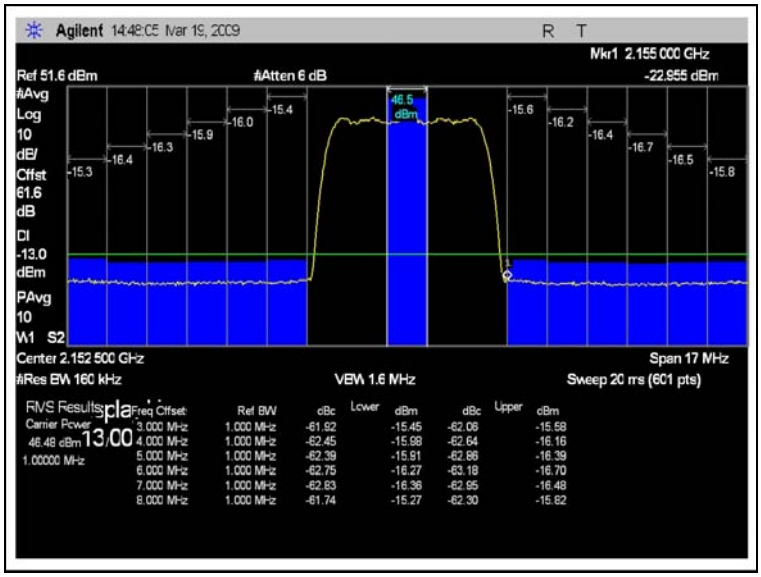
## BLOCKEDGE - CDMA LOW CHANNEL RBW=100kHz_BW CORRECTED



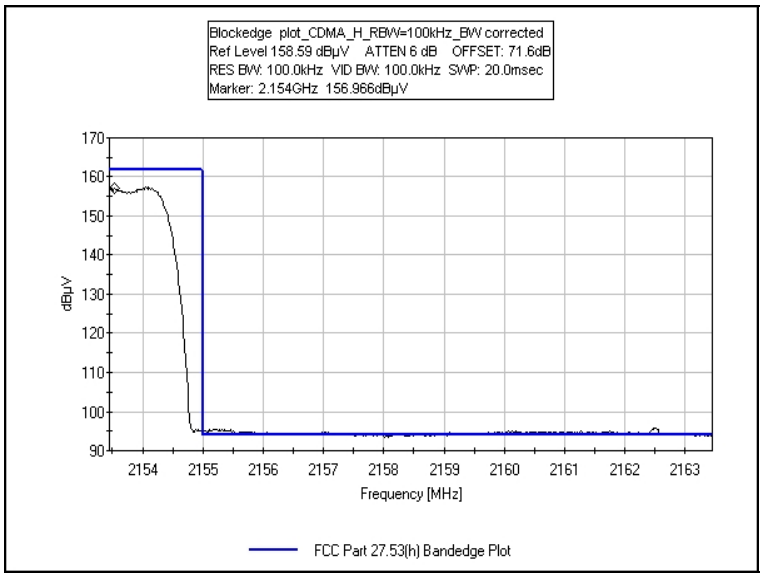

## BLOCKEDGE - CDMA HIGH CHANNEL RBW=1MHz



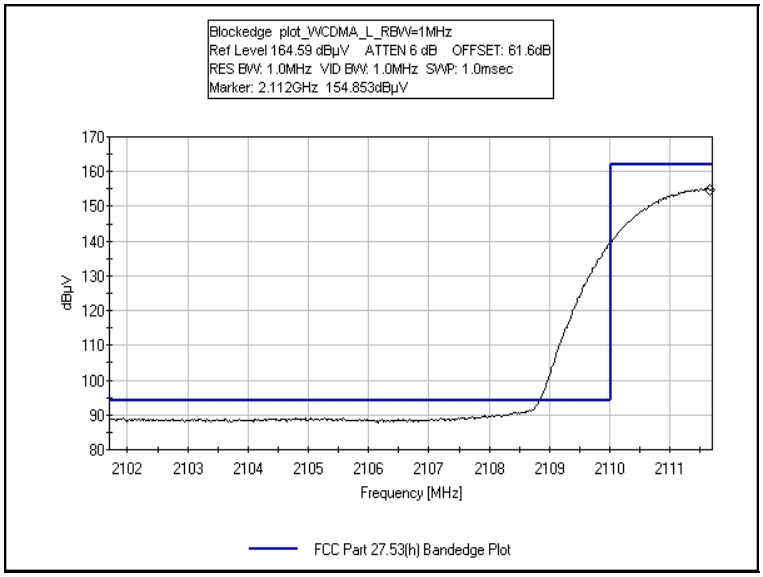
## BLOCKEDGE - CDMA HIGH CHANNEL RBW=1MHz_ACP



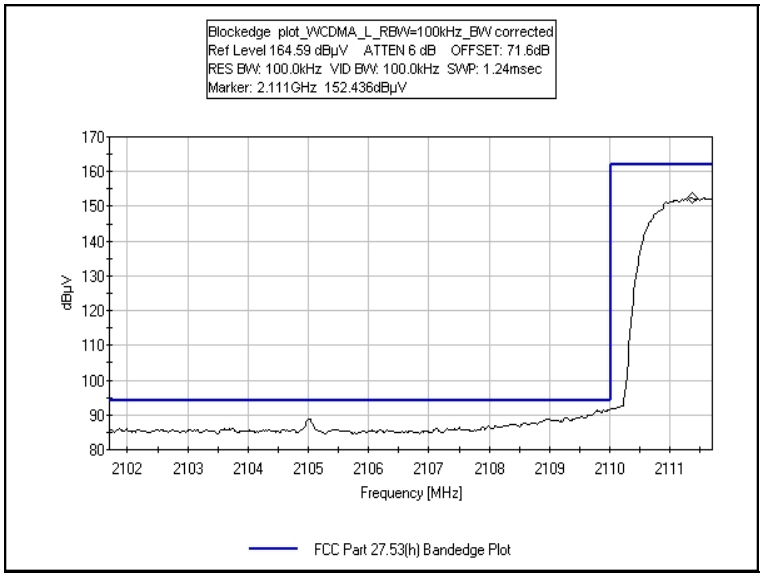

## BLOCKEDGE - CDMA HIGH CHANNEL RBW=100kHz_BW CORRECTED



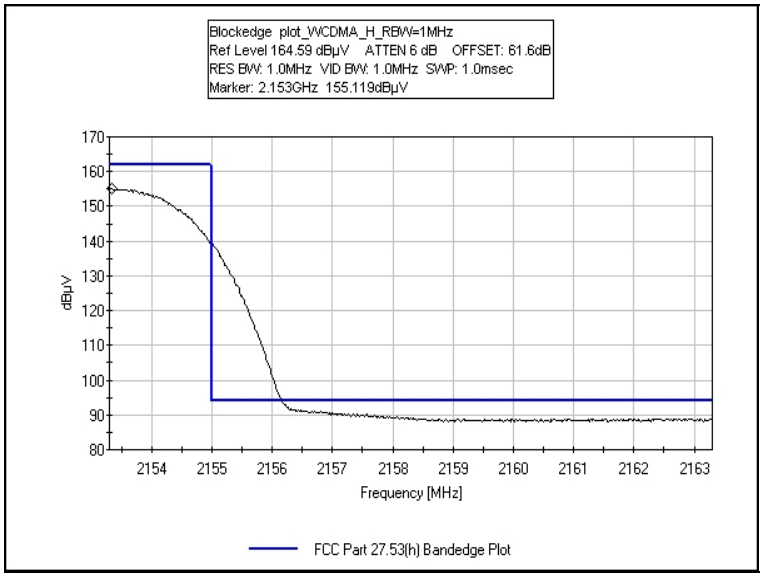
## BLOCKEDGE - WCDMA LOW CHANNEL RBW=1MHz



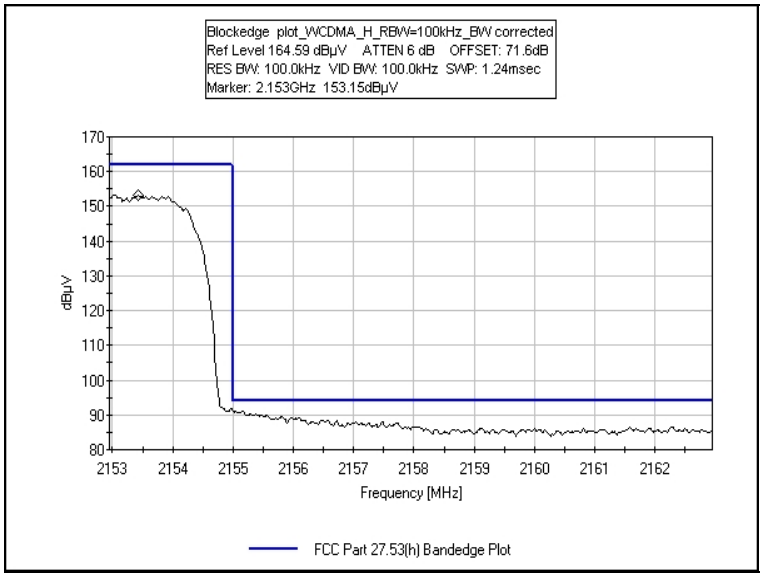

## BLOCKEDGE - WCDMA LOW CHANNEL RBW=100kHz_BW CORRECTED



## BLOCKEDGE - WCDMA HIGH CHANNEL RBW=1MHz




## BLOCKEDGE - WCDMA HIGH CHANNEL RBW=100kHz_BW CORRECTED



## INTERMODULATION

### Test Equipment

| Equipment | Asset # | Manufacturer | Model # | Serial # | Cal Date | Cal Due |
|---|---|---|---|---|---|---|
| Spectrum Analyzer | 02672 | Agilent | E4446A | US44300438 | 072308 | 072310 |
| 36" 40GHz cable | 02945 | Strolab | NA | NA | 091807 | 091809 |

### Test Conditions

The EUT is placed on the wooden table. The RF Output port is connected to a RF load. The RF Input port is connected to remote ESG. The RF load is connected to remote power meter. The RF input signal is adjusted to maintain the rated RF output power.
Emission profile evaluated at the antenna port.

Operating Frequency = 2110-2155 MHz
Power = 50.8dBm = 145W
Modulation = CDMA (2000), W-CDMA (3GPP).

Three modulated signal from the support ESG is injected into the device and the intermodulation product is measured at the RF antenna port under investigation. Reduced RBW was employed to detect the created Intermodulation product.

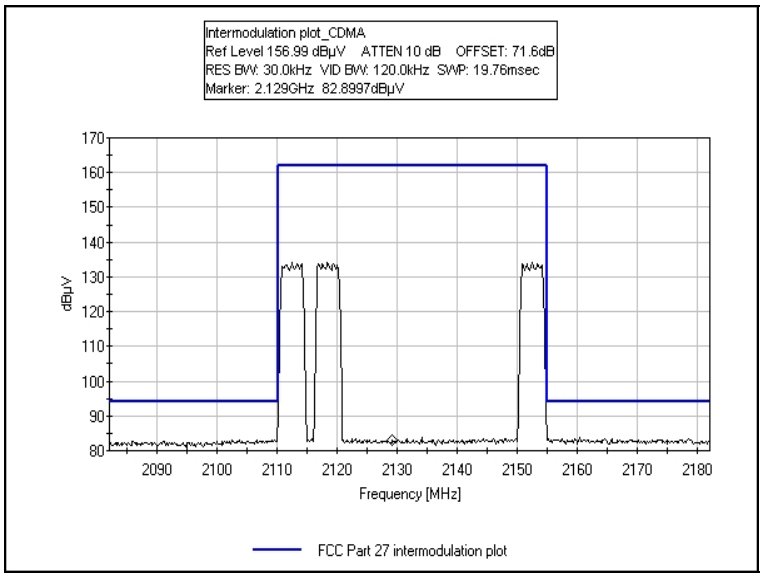
A Duplexer PN: H100-3R2101_200RO is installed at the RF output; the duplexer is to be used with the device.

Result: No intermodulation product was found.

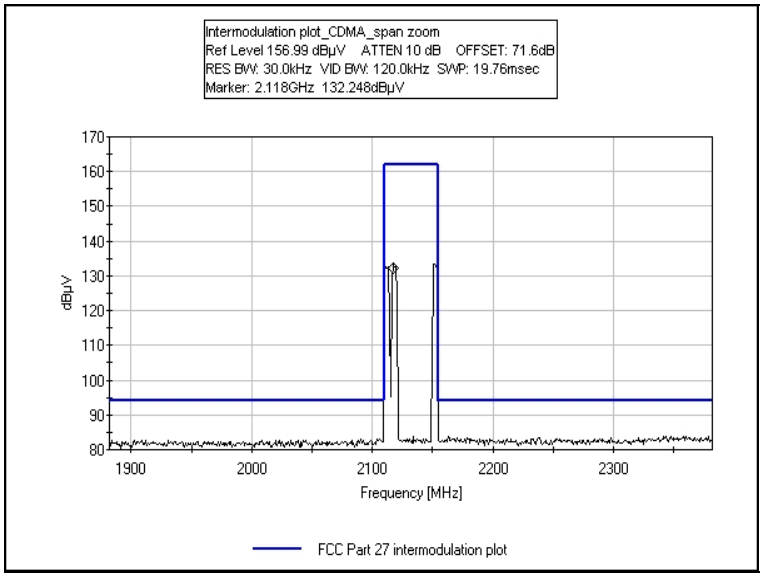
### Test Setup Photos

## Test Plots

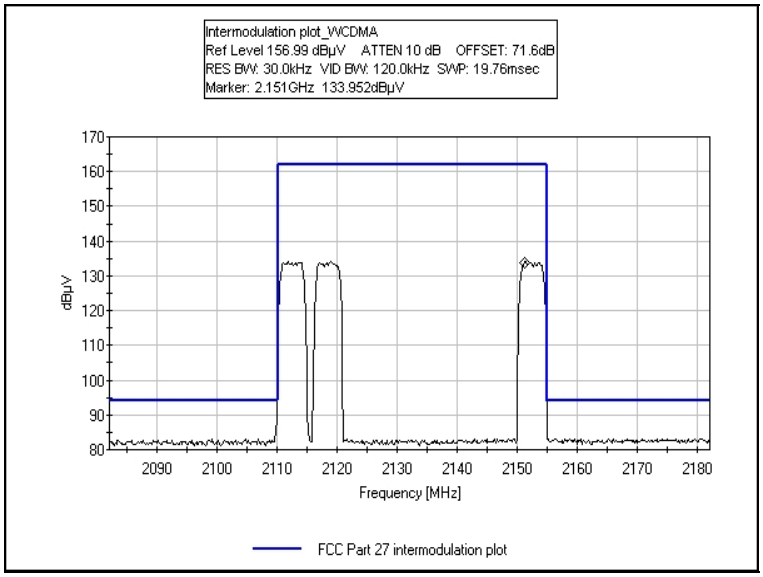
## INTERMODULATION PLOT - CDMA



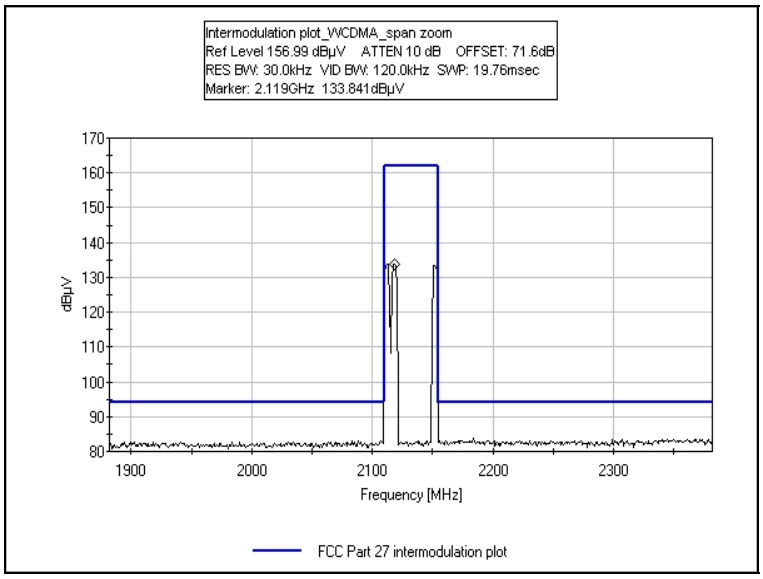

## INTERMODULATION PLOT - CDMA SPAN ZOOM



## INTERMODULATION PLOT - WCDMA




## INTERMODULATION PLOT - WCDMA SPAN ZOOM



## OUT OF BAND REJECTION

### Test Equipment

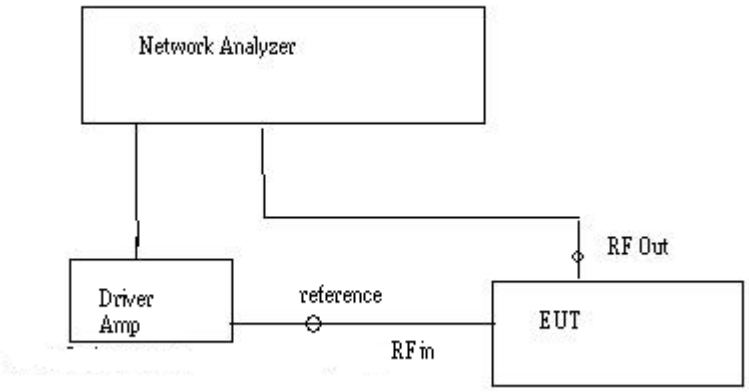
| Equipment | Asset # | Manufacturer | Model # | Serial # | Cal Date | Cal Due |
|---|---|---|---|---|---|---|
| Network analyzer | C00012 | HP | 8753E | Us38432770 | 091208 | 091210 |

### Test Setup Photos

### Test Data

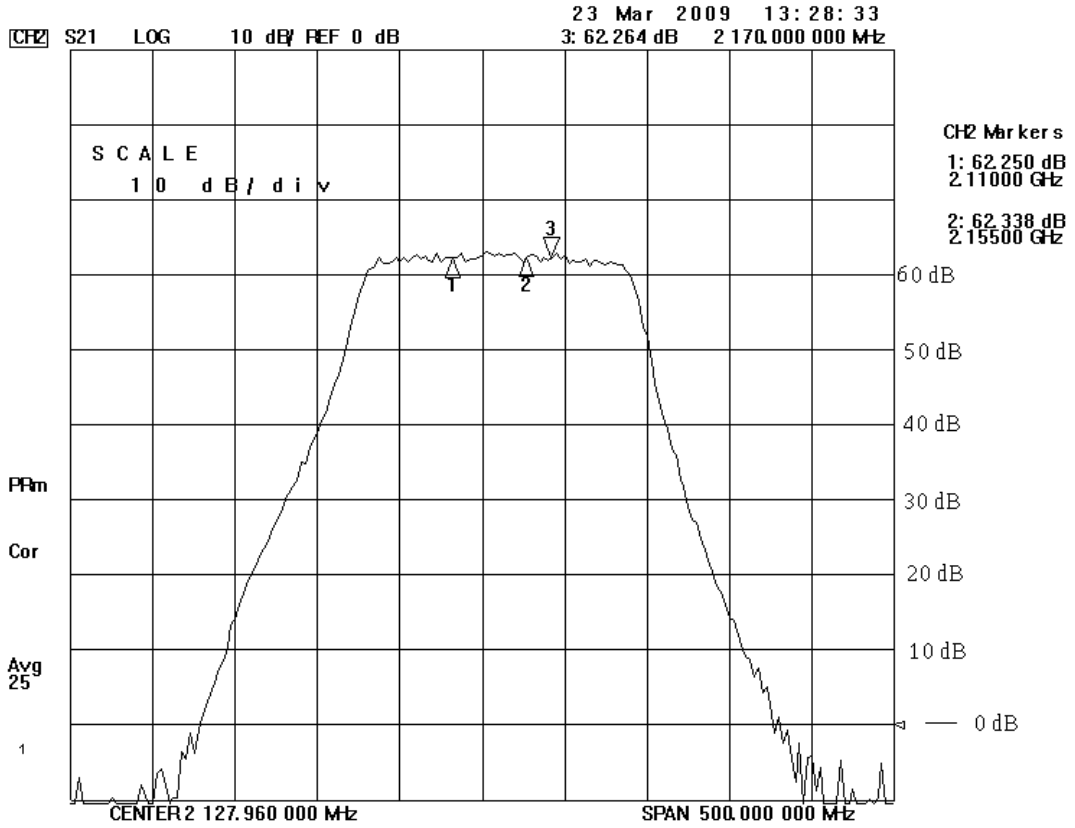
Out of band rejection

Setup



Measured gain = Output – Reference (dB)

The internal control is adjusted to the nominal gain of 63 dB for which equipment certification is sought.




With the aid of a Vector Network analyzer, the Out of band rejection ratio of the device was captured.