



**ADDENDUM TO POWERWAVE TECHNOLOGIES, INC.
TEST REPORT FC08-067**

FOR THE

REPEATER, RH300020/14A

FCC PART 24

TESTING

DATE OF ISSUE: JULY 23, 2008

PREPARED FOR:

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

P.O. No.: 119122
W.O. No.: 87961

PREPARED BY:

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

Date of test: May 19 - June 27, 2008

Report No.: FC08-067A

This report contains a total of 47 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)(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 2.1033(c)(14)/2.1046/24.232(a) - RF Power Output	7
FCC 24.238(a) – Block Edge	9
FCC 2.1033(c)(14)/2.1049(i) – Input Plots	15
FCC 2.1033(c)(14)/2.1049(i) – Output Plots	24
FCC 2.1033(c)(14)/2.1051/24.238(a) - Spurious Emissions at Antenna Terminal	33
FCC 2.1033(c)(14)/2.1053/24.238(a) - Field Strength of Spurious Radiation	37
Intermodulation	40
Out of Band Rejection	46



ADMINISTRATIVE INFORMATION

DATE OF TEST: May 19 - June 27, 2008

DATE OF RECEIPT: May 19, 2008

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-20 GHz

TEST METHOD: FCC Part 24

PURPOSE OF TEST:

Original Report: To perform the testing of the Repeater, RH300020/14A with the requirements for FCC Part 24 devices.

Addendum A: To revise the field strength of spurious emissions table with no new testing.

APPROVALS

QUALITY ASSURANCE:

Steve Behm, Director of Engineering Services

TEST PERSONNEL:

Stuart Yamamoto, Senior EMC Engineer

Septimiu Apahidean, EMC Engineer

SUMMARY OF RESULTS

Test	Specification	Results
RF Output Power	FCC 2.1046/24.232(a)	Pass
Input Plots	FCC 2.1049(i)	Pass
Output Plots	FCC 2.1049(i)	Pass
Spurious Emissions at Antenna Terminals	FCC 2.1051/24.238(a)	Pass
Field Strength of Spurious Radiation	FCC 2.1053/24.238(a)	Pass
Block Edge	FCC 24.238(a)	Pass
Intermodulation		Pass
Out of Band Rejection		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.

The following model has been tested by CKC Laboratories: **RH300020/14A**

The manufacturer states that the following additional model is 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: **RH300020/15A**

The only difference between RH300020/14A and RH300020/15A is:

- a. the fins of the heat sink of RH300020/14A are vertical for strand mount purpose
- b. the fins of the heat sink of RH300020/15A are horizontal for pole mount purpose

EQUIPMENT UNDER TEST

Repeater

Manuf: Powerwave Technologies, Inc.
Model: RH300020/14A
Serial: PD00000XDD
FCC ID: E675JS0103 (pending)

PERIPHERAL DEVICES

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

Optical Converter

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

Spectrum Analyzer

Manuf: HP
Model: 8563E
Serial: NA
FCC ID: NA

Power Meter

Manuf: Agilent
Model: E4419B
Serial: MY40510694
FCC ID: NA

ESG

Manuf: Agilent
Model: E4433B
Serial: US40051692
FCC ID: NA

Directional Coupler

Manuf: Meca
Model: 722N-20-1.500V
Serial: NA

Preamplifier

Manuf: Mini-Circuits
Model: ZHL-42
Serial: 9945



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

GXW, G7W, F9W

FCC 2.1033 (c)(5) FREQUENCY RANGE

1930 MHz to 1990 MHz

FCC 2.1033 (c)(6) OPERATING POWER

20 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, CDMA 2000, EDGE, GSM, WCDMA

FCC 2.1033(c)(14)/2.1046/24.232(a) - RF POWER OUTPUT

Test Equipment

Equipment	Asset #	Manufacturer	Model	Serial #	Cal Date	Cal Due
RF Power meter	02778	HP	EPM-441A	GB37170458	020508	021510
Power Sensor	02777	HP	E4412A	MY41499662	020508	021510

Test Setup Photos



Test Data

The equipment under test (EUT) is a strand mount repeater. The manufacture does not provide an antenna for sale with this product. 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 FCC 24.232(a)

The equipment under test (EUT) is placed stand alone on the table top. The EUT optical in port is connected to a remotely located optical converter module. The signal generator is providing the signal through a preamplifier to the converter. The EUT antenna port is connected to a power meter. Temperature: 22C, Humidity: 44%, Pressure: 100kPa. Voltage to the EUT is 120Vac 60Hz.

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

Part 24.232(a)

Frequency (MHz)	Modulation	Power (dBm)	Power (Watts)
1931	GSM	+43	20
1960	GSM	+43	20
1989	GSM	+43	20
1931	EDGE	+43	20
1960	EDGE	+43	20
1989	EDGE	+43	20
1931.2	CDMA	+43	20
1960	CDMA	+43	20
1988.8	CDMA	+43	20
1931.2	CDMA 2000	+43	20
1960	CDMA 2000	+43	20
1988.8	CDMA 2000	+43	20
1933	WCMA	+43	20
1960	WCMA	+43	20
1987	WCMA	+43	20

Sec. 24.232 Power and antenna height limits.

(a) Base stations are limited to 1640 watts peak equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters HAAT, except as described in paragraph (b) below. See Sec. 24.53 for HAAT calculation method. Base station antenna heights may exceed 300 meters with a corresponding reduction in power; see Table 1 of this section. The service area boundary limit and microwave protection criteria specified in Sec. Sec. 24.236 and 24.237 apply.

Table 1--Reduced Power for Base Station Antenna Heights Over 300 Meters

HAAT in meters	Maximum EIRP watts
<= 300.....	1640
<= 500.....	1070
<= 1000.....	490
<= 1500.....	270
<= 2000.....	160

FCC 24.238(a) – BLOCK EDGE

Test Equipment

Equipment	Asset #	Manufacturer	Model	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02869	Agilent	E4440A	MY46186290	021207	021209
Coaxial Cable	P02945	Astrolab	32022-2-2909K-36TC	(none)	091807	091809

Test Conditions

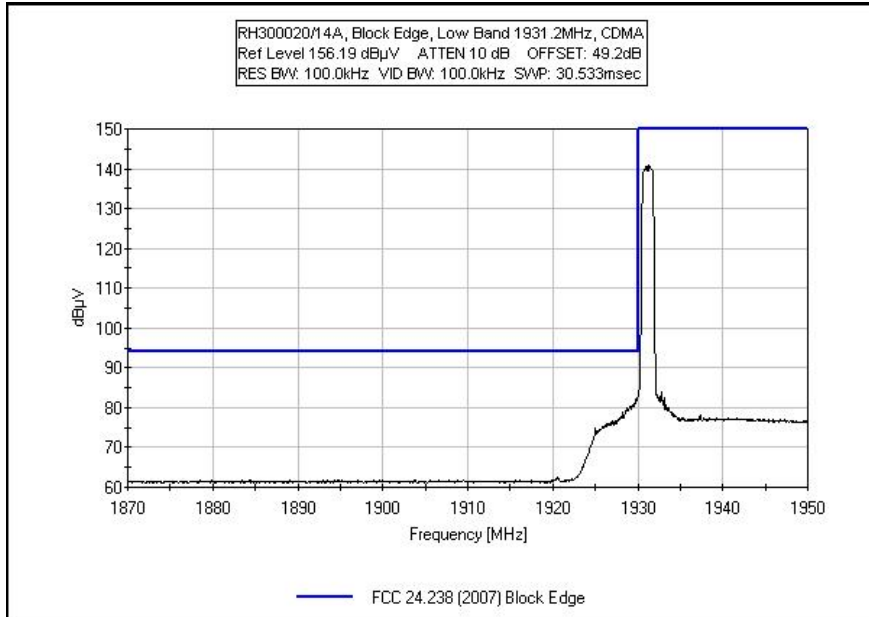
The equipment under test (EUT) is placed stand alone on the table top. The EUT optical in port is connected to a remotely located optical converter module. The signal generator is providing the signal through a preamplifier to the converter. For the block edge plots, the EUT antenna port was connected to the spectrum analyzer through high power attenuators and plots were made of the signal signature. Temperature: 22C, Humidity: 45%, Pressure: 100kPa. Voltage to the EUT is 120Vac 60Hz. Plots were made with the signal generator set to low, and high channels using GSM, EDGE, CDMA, CDMA 2000, and WCDMA modulations. Output of the EUT is set to its rated output power of 43dBm. The frequency range tested was 1931MHz to 1989MHz. The operating range of the device tested is 1930MHz to 1990MHz. The actual operating frequencies of the device used were 1931MHz, 1960MHz, and 1989MHz for GSM and EDGE. The actual operating frequencies of the device used on this datasheet is 1931.2MHz, 1960MHz, and 1988.8MHz for CDMA and CDMA 2000. The actual operating frequencies of the device used on this datasheet is 1933MHz, 1960MHz, and 1987MHz for WCDMA. Bandwidth settings: SA RES BW=100kHz, SA VID BW=100kHz.

Test Setup Photos

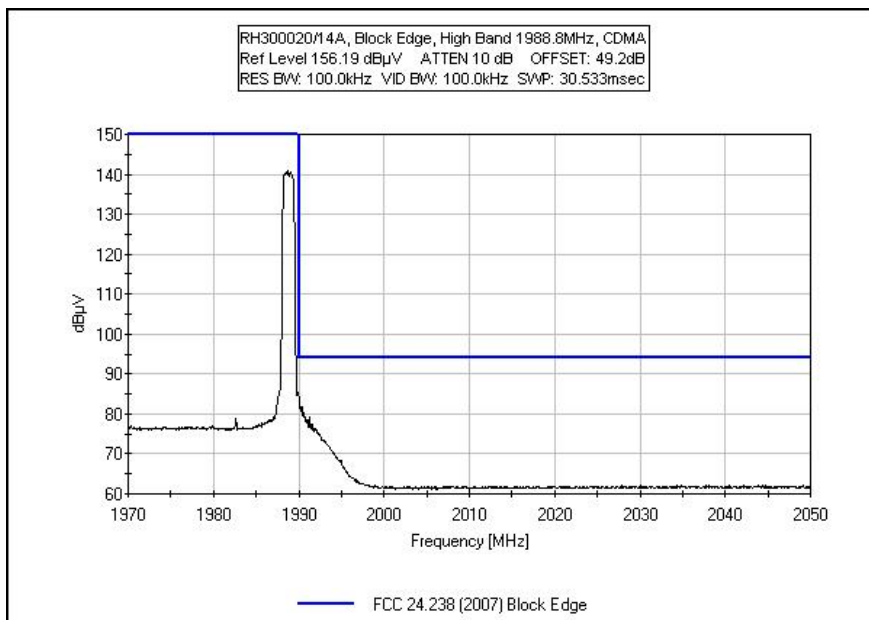


Test Plots

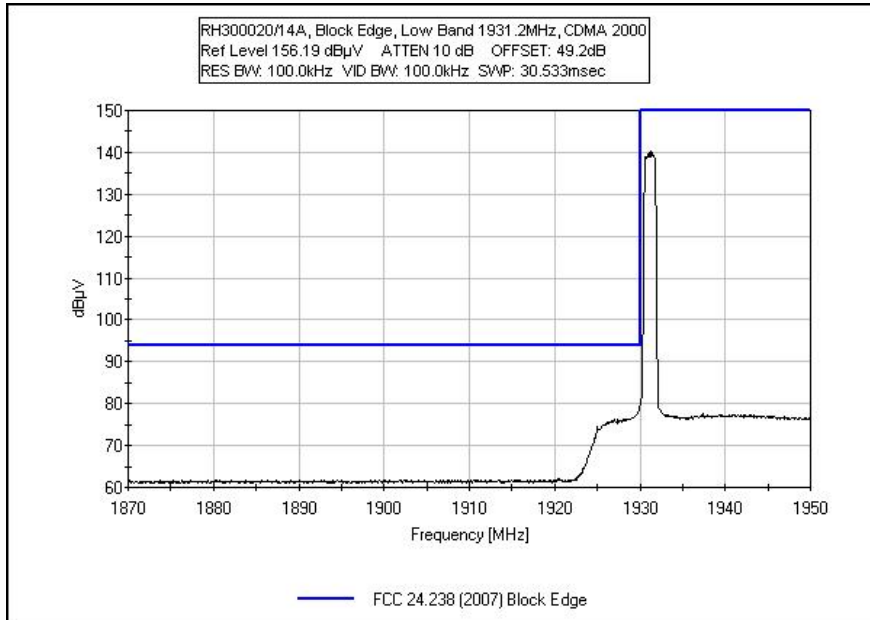
FCC 24.238(a) BLOCK EDGE CDMA LOW BAND



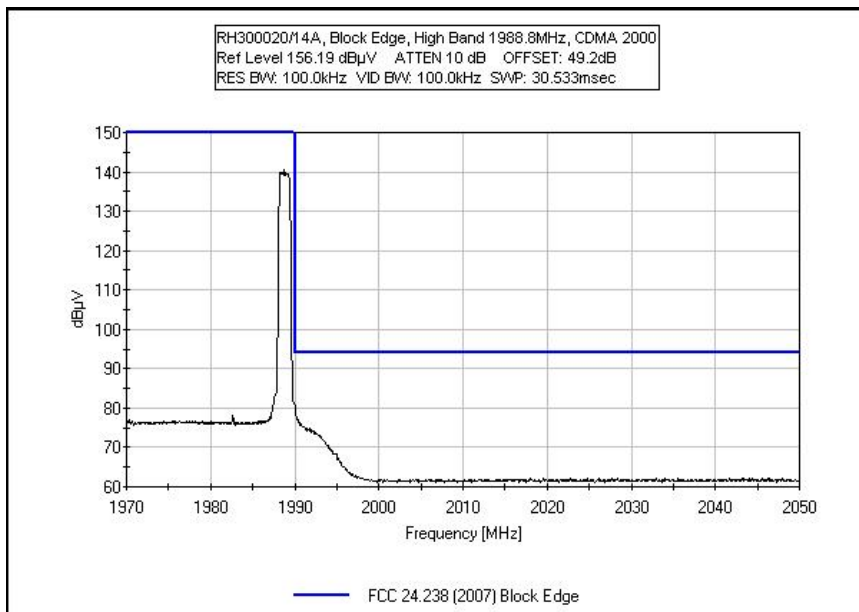
FCC 24.238(a) BLOCK EDGE CDMA HIGH BAND



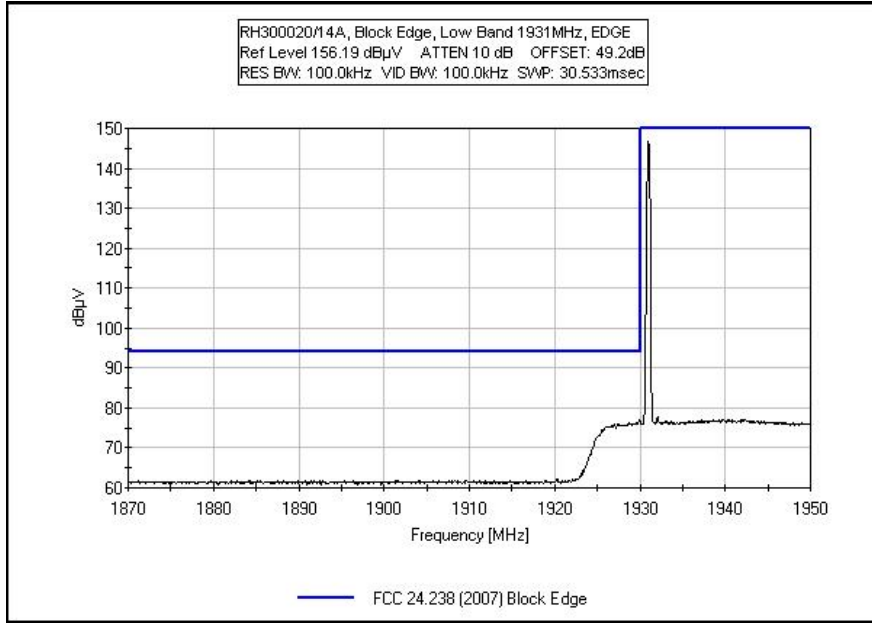
FCC 24.238(a) BLOCK EDGE CDMA 2000 LOW BAND



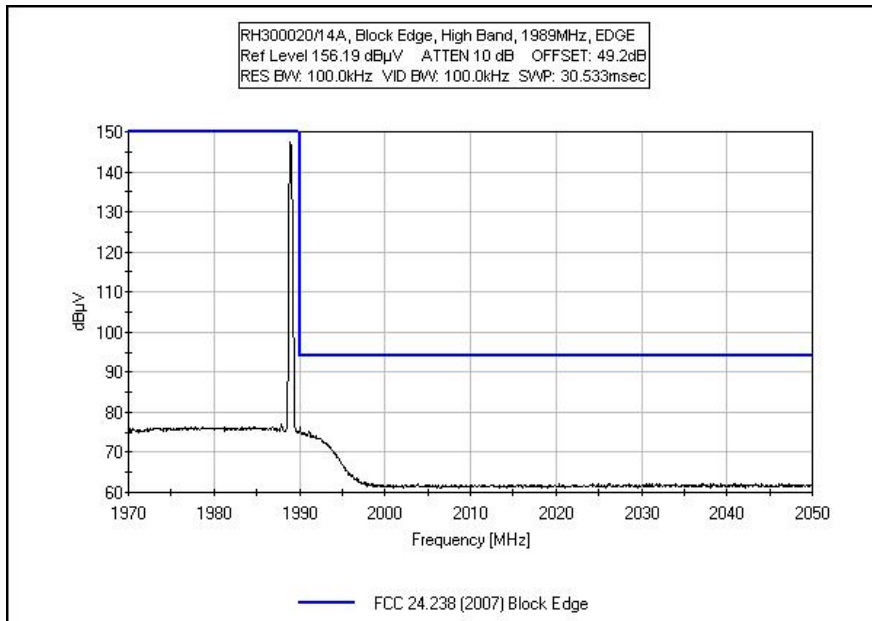
FCC 24.238(a) BLOCK EDGE CDMA 2000 HIGH BAND



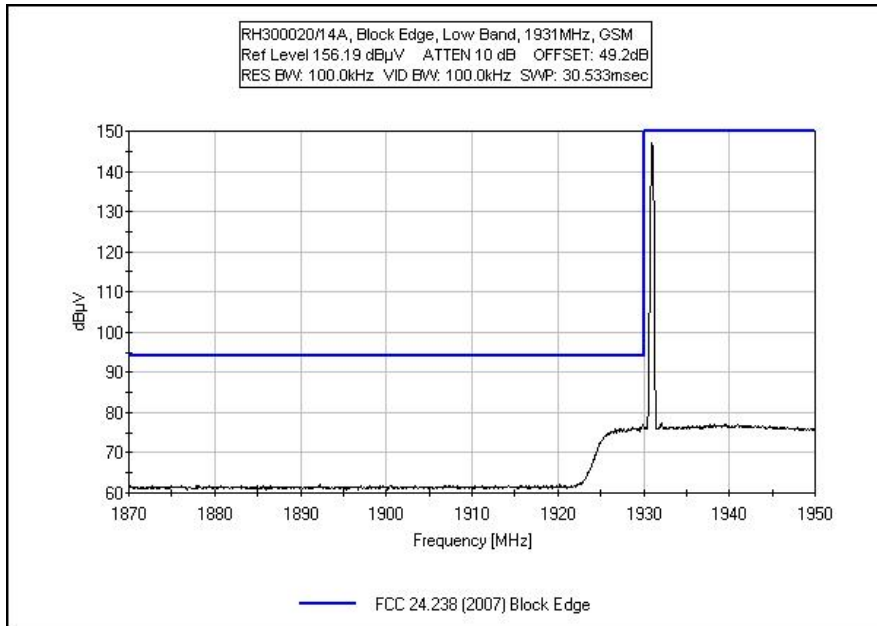
FCC 24.238(a) BLOCK EDGE EDGE LOW BAND



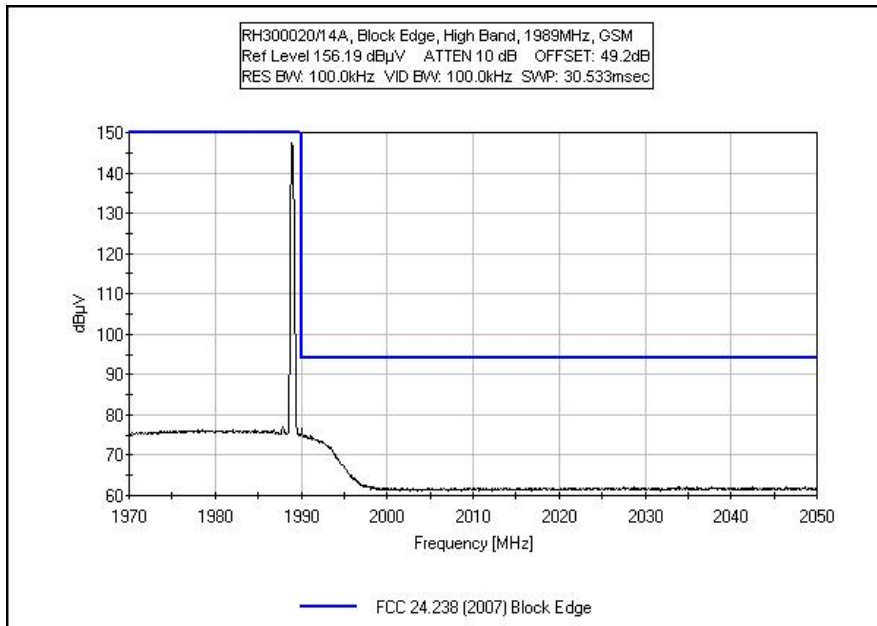
FCC 24.238(a) BLOCK EDGE EDGE HIGH BAND



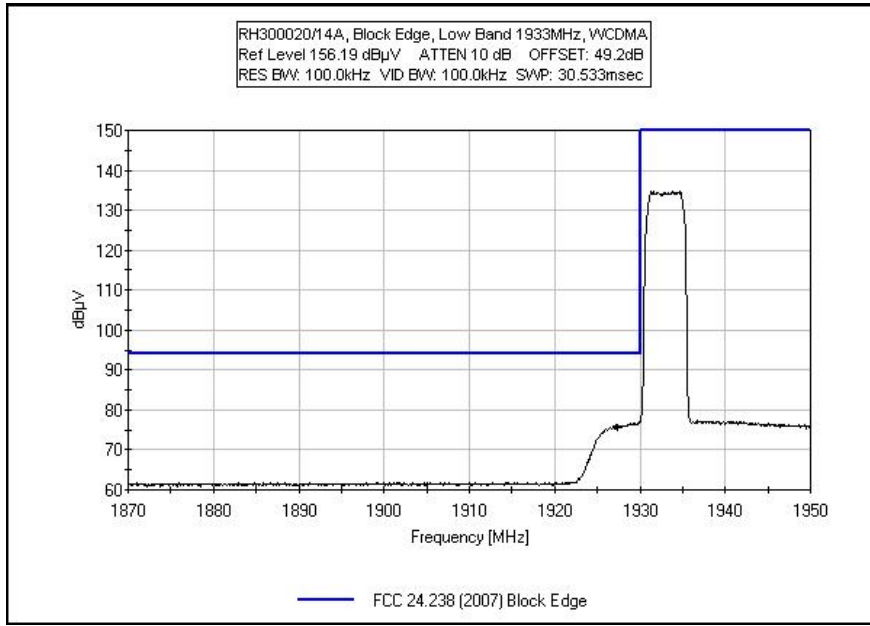
FCC 24.238(a) BLOCK EDGE GSM LOW BAND



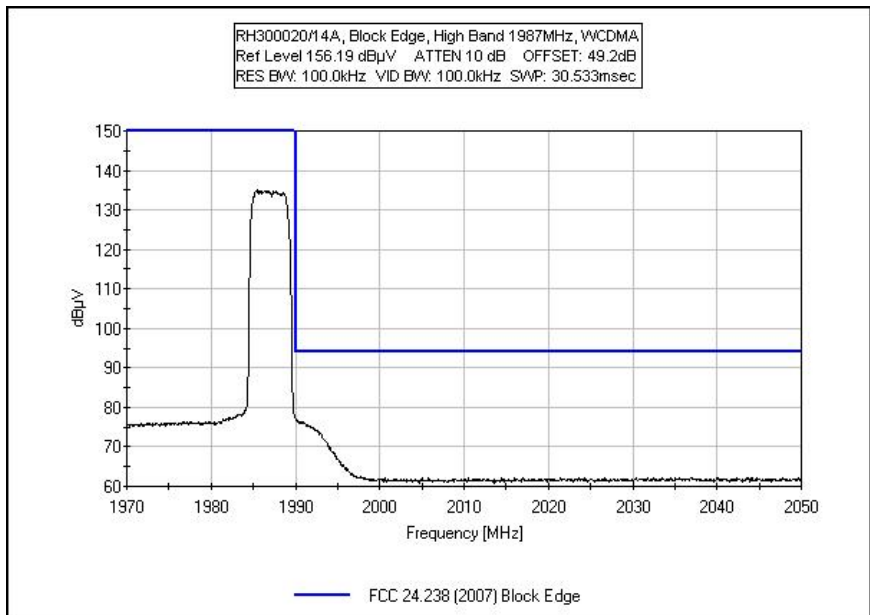
FCC 24.238(a) BLOCK EDGE GSM HIGH BAND



FCC 24.238(a) BLOCK EDGE WCDMA LOW BAND



FCC 24.238(a) BLOCK EDGE WCDMA HIGH BAND



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

Test Equipment

Equipment	Asset #	Manufacturer	Model	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02869	Agilent	E4440A	MY46186290	021207	021209
Coaxial Cable	P02945	Astrolab	32022-2-2909K-36TC	(none)	091807	091809

Test Conditions

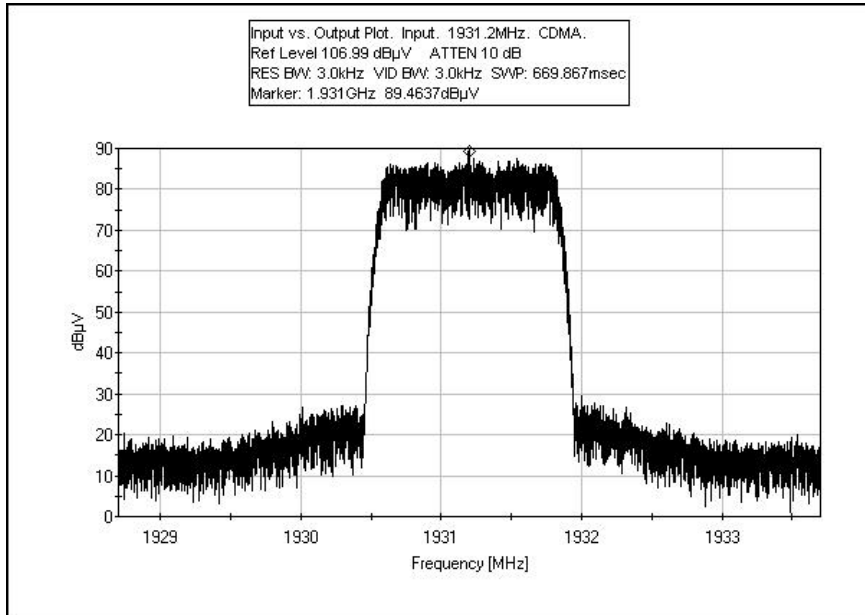
The equipment under test (EUT) is placed stand alone on the table top. The EUT optical in port is connected to a remotely located optical converter module. The signal generator is providing the signal through a preamplifier to the converter. For the input plot, the output of the signal source is fed to the input of the spectrum analyzer and a plot is made of the signal signature. For the output plot, the EUT antenna port is connected to the spectrum analyzer through high power attenuators and a plot is made of the signal signature. Temperature: 22C, Humidity: 45%, Pressure: 100kPa. Voltage to the EUT is 120Vac 60Hz. Plots were made with the signal generator set to low, middle, and high channels using GSM, EDGE, CDMA, CDMA 2000, and WCDMA modulations. Output of the EUT is set to its rated output power of 43dBm. The frequency range tested was 1931MHz to 1989MHz. The operating range of the device tested is 1930MHz to 1990MHz. The actual operating frequencies of the device used were 1931MHz, 1960MHz, and 1989MHz for GSM and EDGE. The actual operating frequencies of the device used on this datasheet is 1931.2MHz, 1960MHz, and 1988.8MHz for CDMA and CDMA 2000. The actual operating frequencies of the device used on this datasheet is 1933MHz, 1960MHz, and 1987MHz for WCDMA. Bandwidth settings: SA RES BW=3kHz, SA VID BW=3kHz.

Test Setup Photos

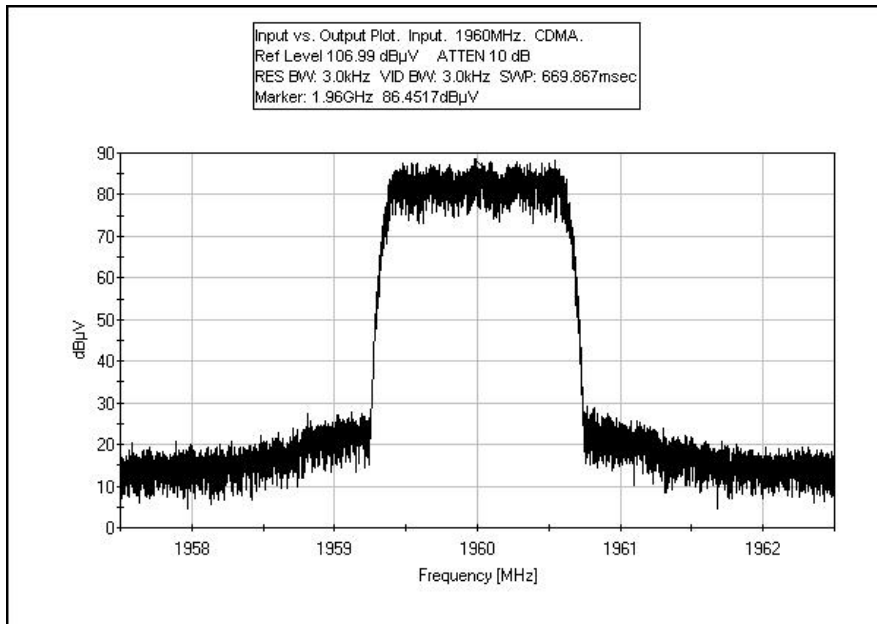


Test Plots

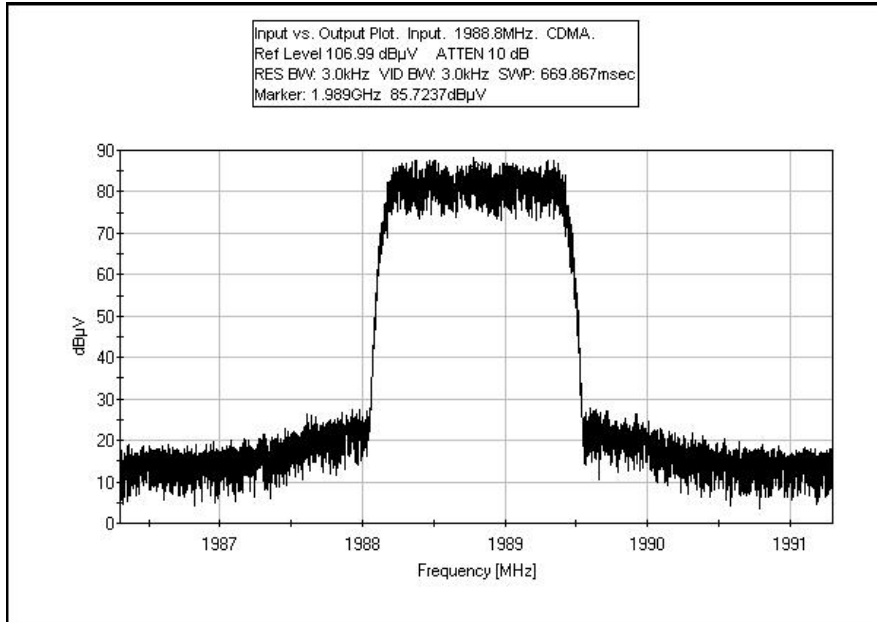
INPUT PLOT CDMA LOW CHANNEL



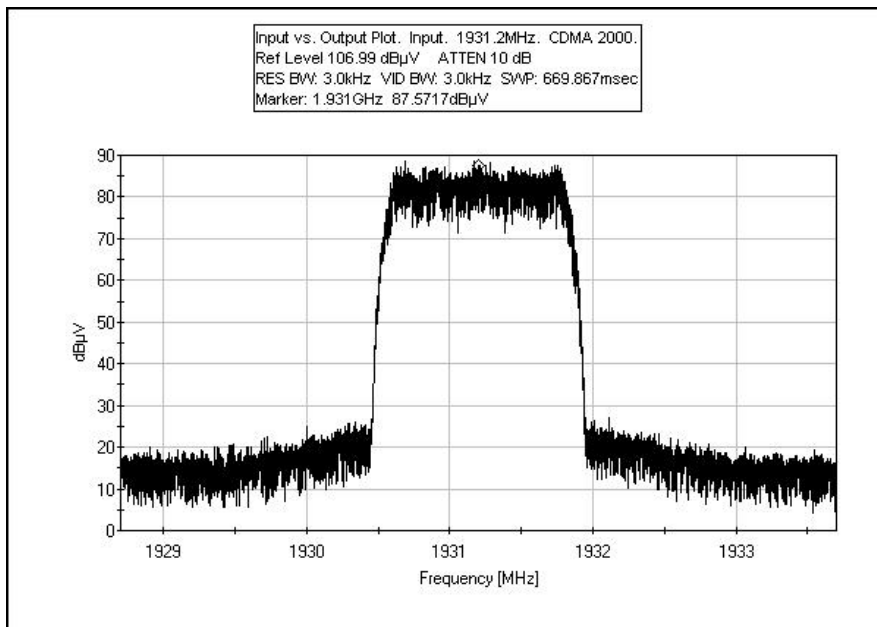
INPUT PLOT CDMA MID CHANNEL



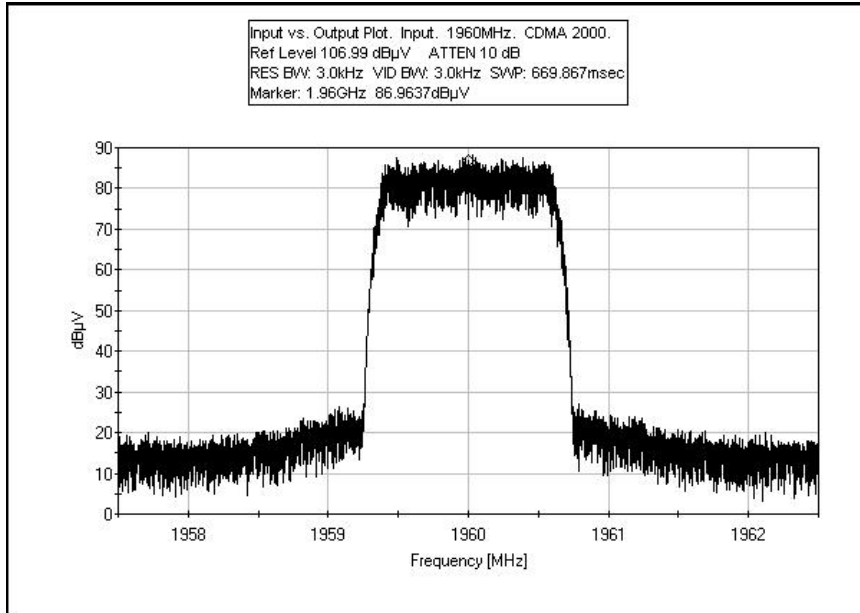
INPUT PLOT CDMA HIGH CHANNEL



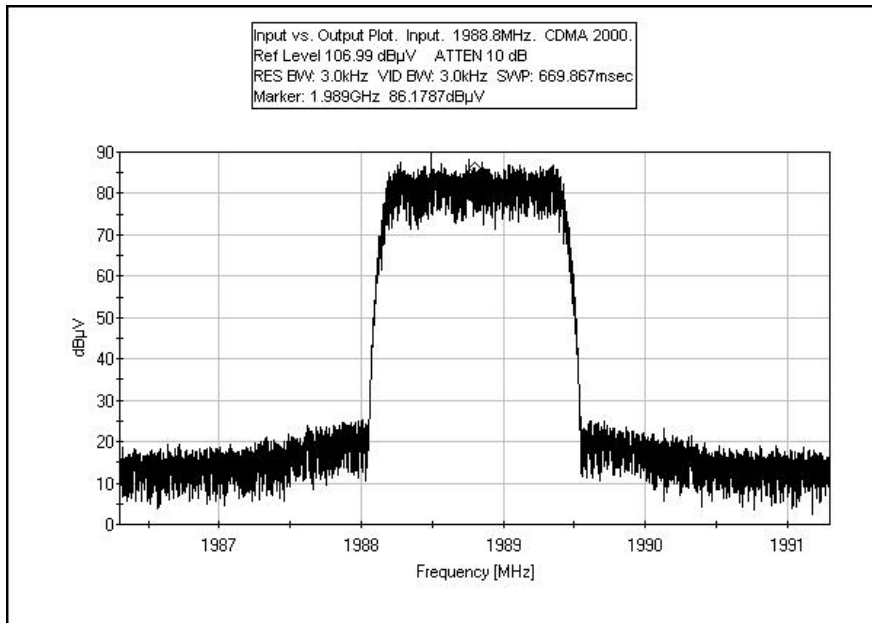
INPUT PLOT CDMA 2000 LOW CHANNEL



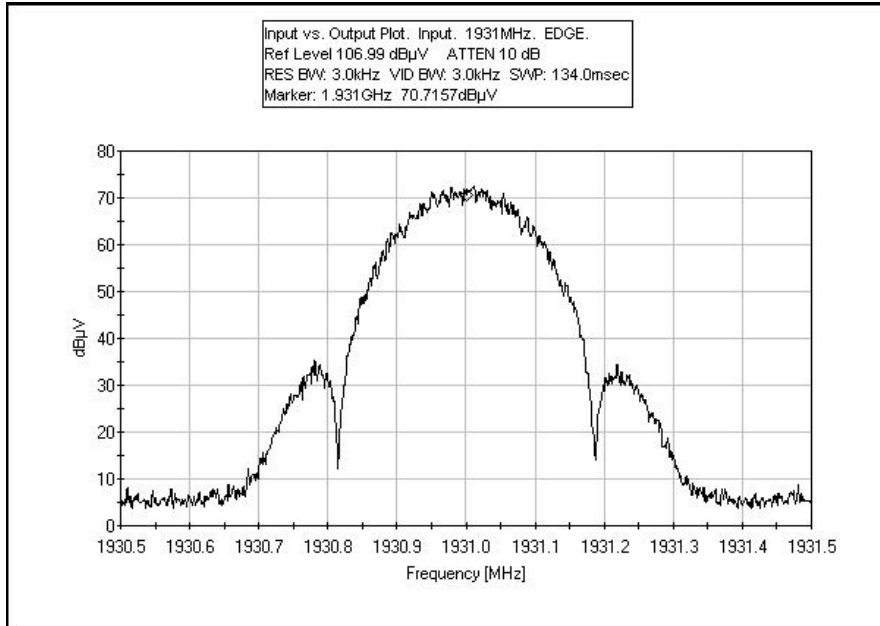
INPUT PLOT CDMA 2000 MID CHANNEL



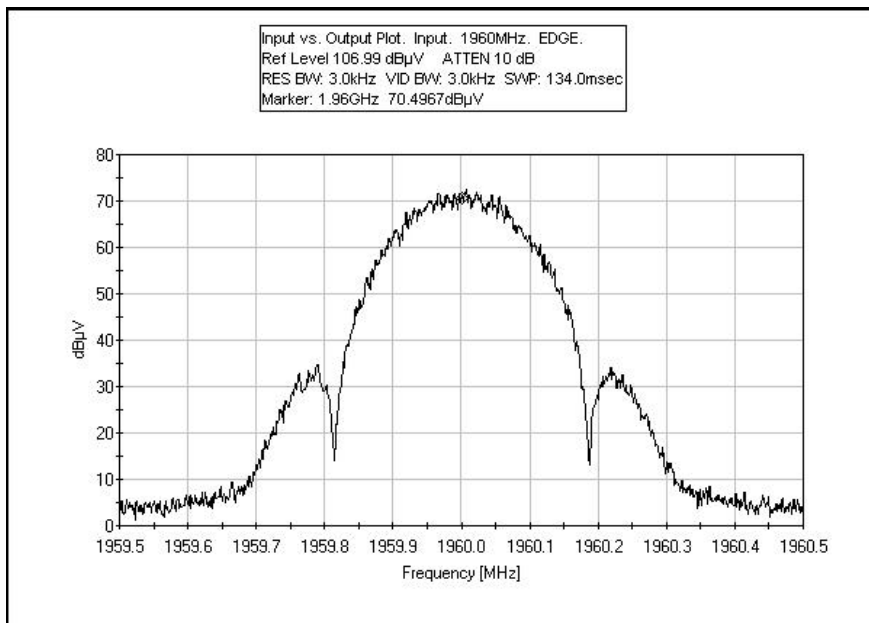
INPUT PLOT CDMA 2000 HIGH CHANNEL



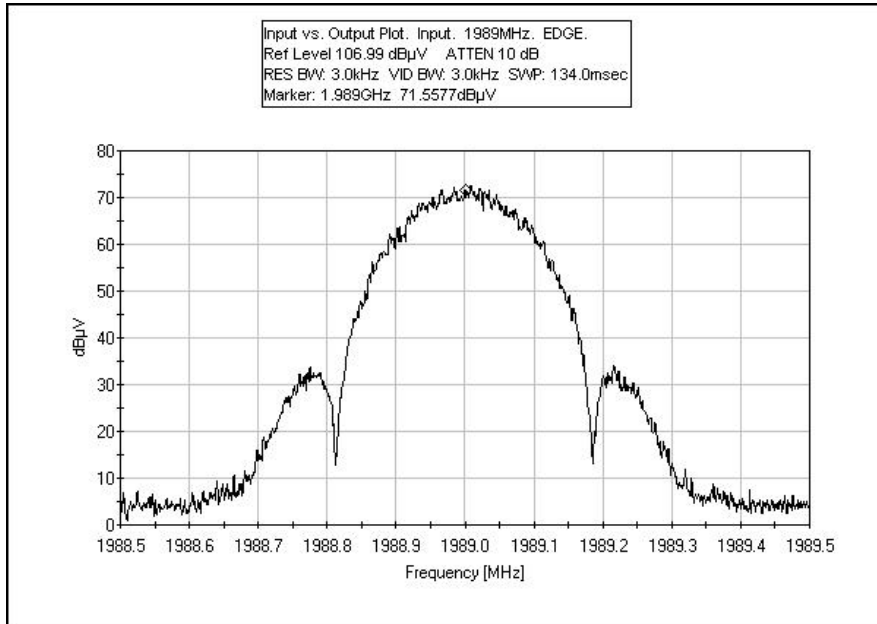
INPUT PLOT EDGE LOW CHANNEL



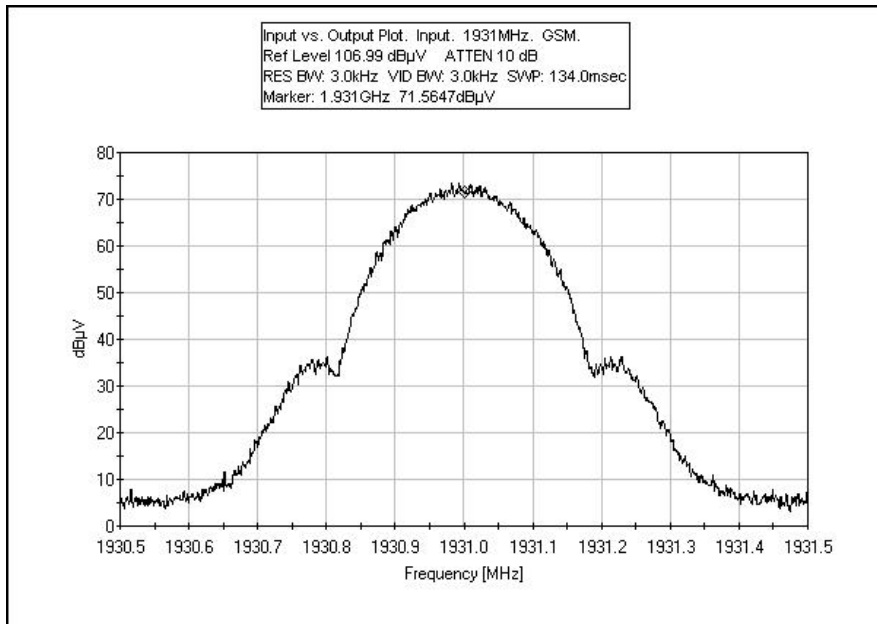
INPUT PLOT EDGE MID CHANNEL



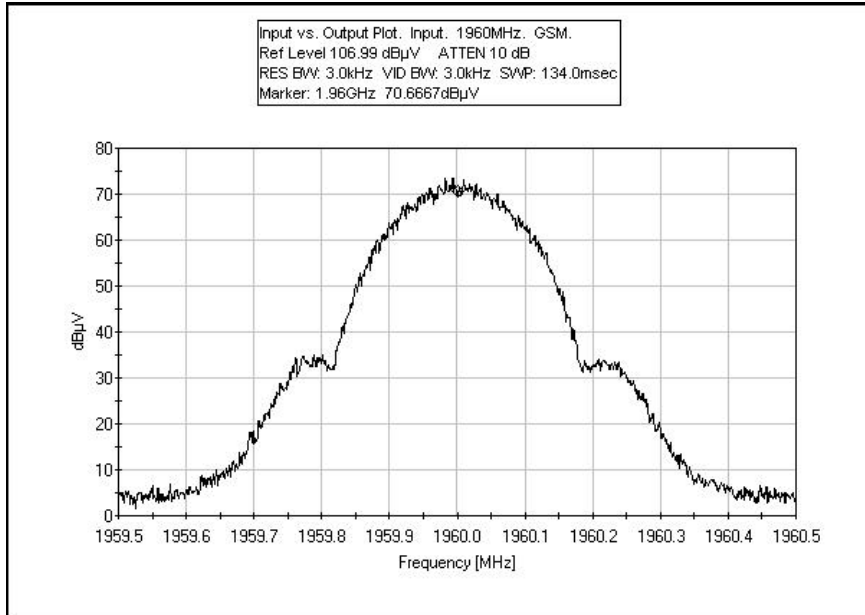
INPUT PLOT EDGE HIGH CHANNEL



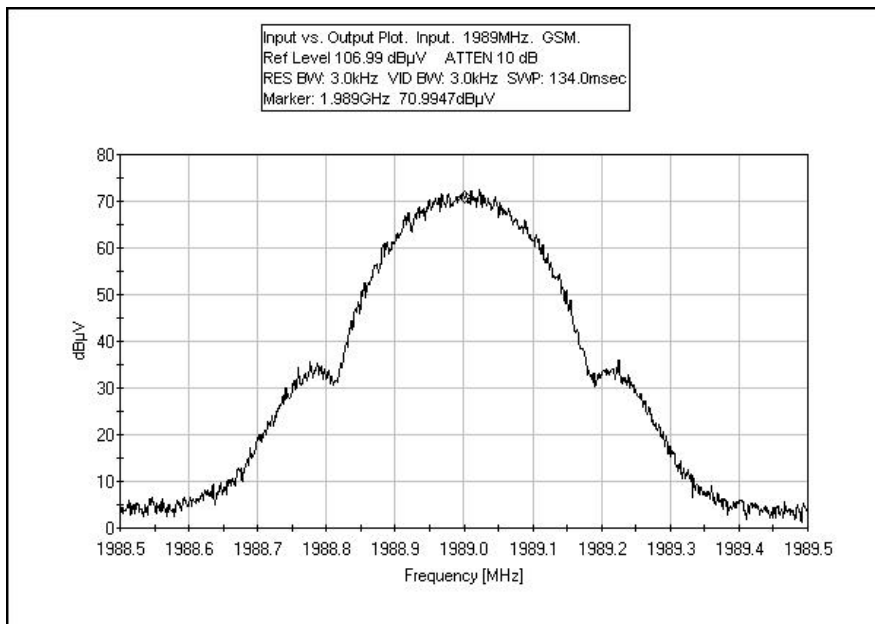
INPUT PLOT GSM LOW CHANNEL



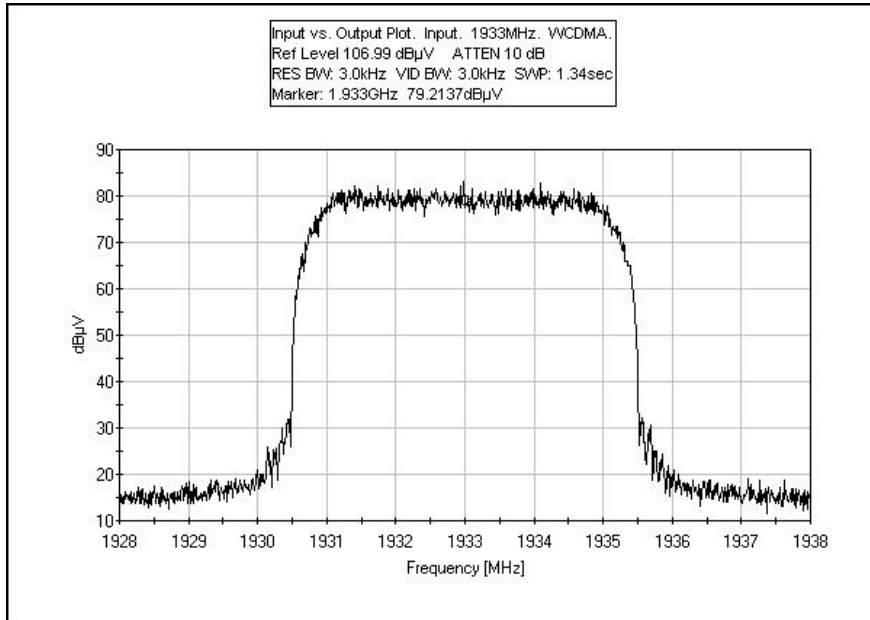
INPUT PLOT GSM MID CHANNEL



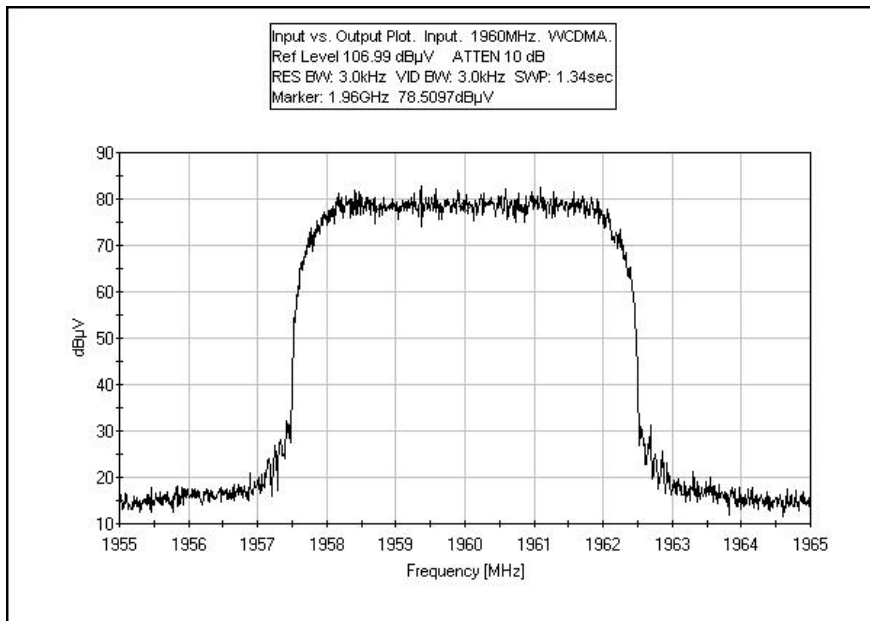
INPUT PLOT GSM HIGH CHANNEL



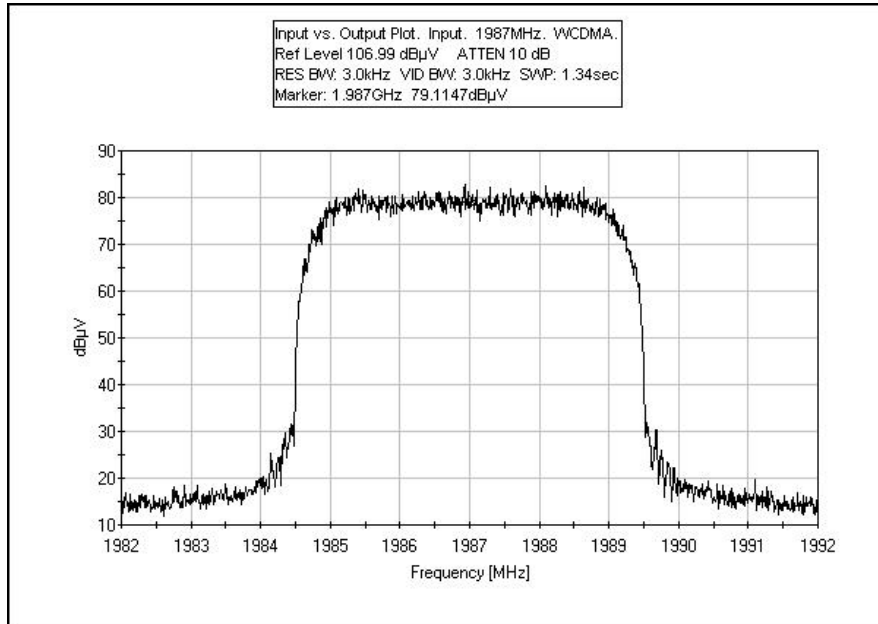
INPUT PLOT WCDMA LOW CHANNEL



INPUT PLOT WCDMA MID CHANNEL



INPUT PLOT WCDMA HIGH CHANNEL



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

Test Equipment

Equipment	Asset #	Manufacturer	Model	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02869	Agilent	E4440A	MY46186290	021207	021209
Coaxial Cable	P02945	Astrolab	32022-2-2909K-36TC	(none)	091807	091809

Test Conditions

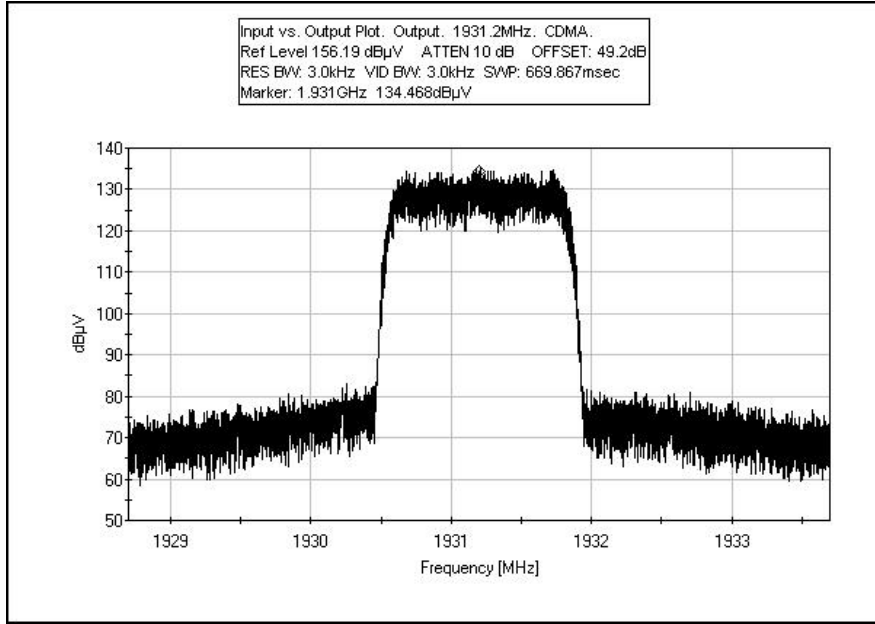
The equipment under test (EUT) is placed stand alone on the table top. The EUT optical in port is connected to a remotely located optical converter module. The signal generator is providing the signal through a preamplifier to the converter. For the input plot, the output of the signal source is fed to the input of the spectrum analyzer and a plot is made of the signal signature. For the output plot, the EUT antenna port is connected to the spectrum analyzer through high power attenuators and a plot is made of the signal signature. Temperature: 22C, Humidity: 45%, Pressure: 100kPa. Voltage to the EUT is 120Vac 60Hz. Plots were made with the signal generator set to low, middle, and high channels using GSM, EDGE, CDMA, CDMA 2000, and WCDMA modulations. Output of the EUT is set to its rated output power of 43dBm. The frequency range tested was 1931MHz to 1989MHz. The operating range of the device tested is 1930MHz to 1990MHz. The actual operating frequencies of the device used were 1931MHz, 1960MHz, and 1989MHz for GSM and EDGE. The actual operating frequencies of the device used on this datasheet is 1931.2MHz, 1960MHz, and 1988.8MHz for CDMA and CDMA 2000. The actual operating frequencies of the device used on this datasheet is 1933MHz, 1960MHz, and 1987MHz for WCDMA. Bandwidth settings: SA RES BW=3kHz, SA VID BW=3kHz.

Test Setup Photos

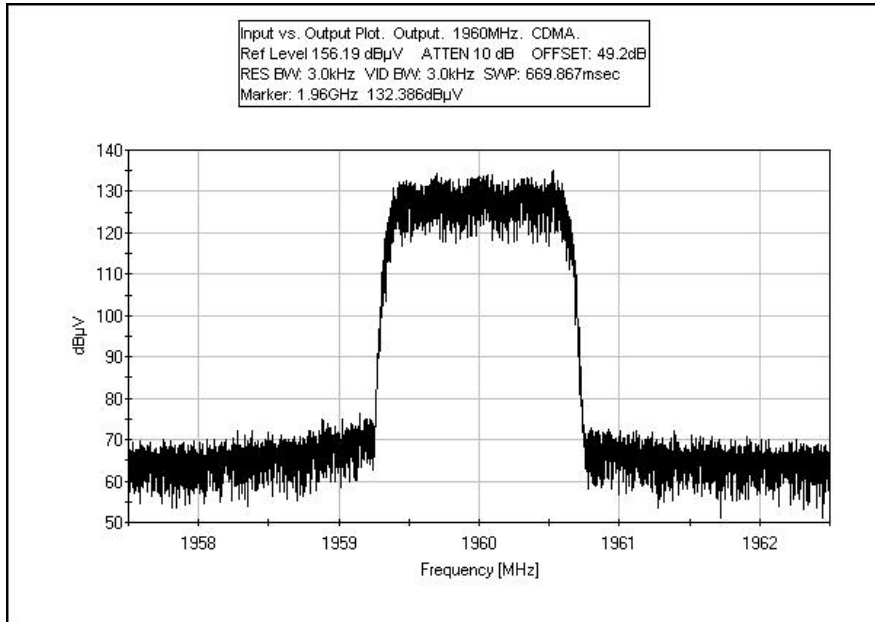


Test Plots

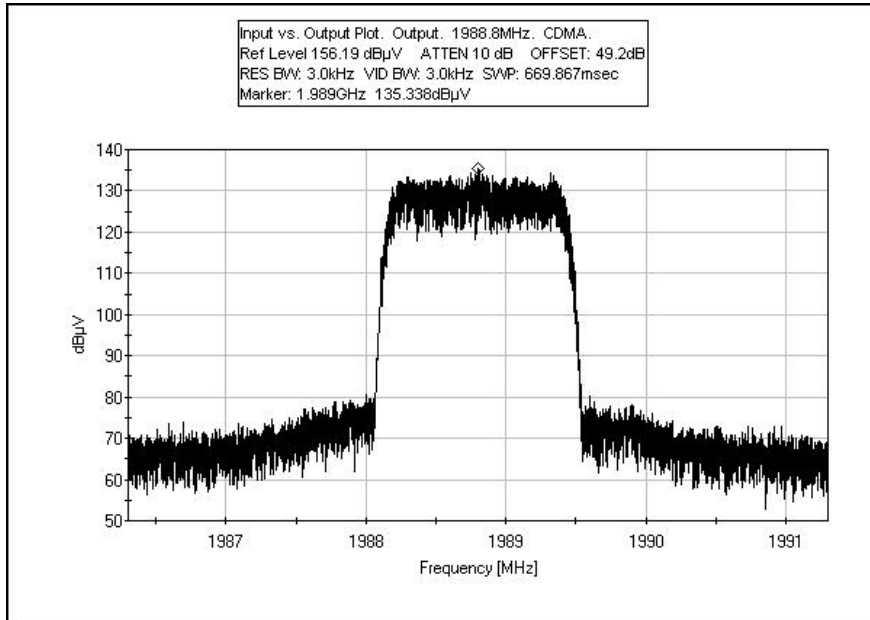
OUTPUT PLOT CDMA LOW CHANNEL



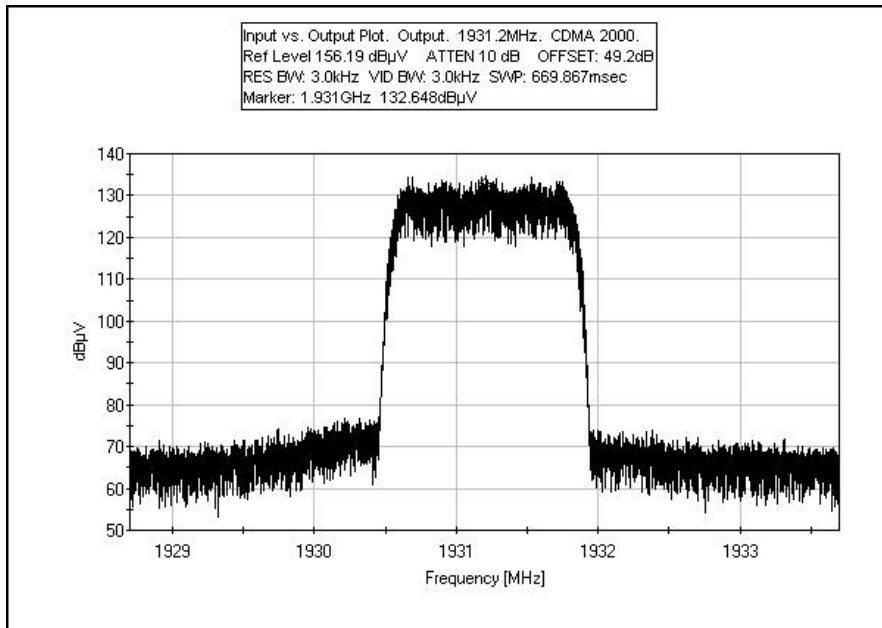
OUTPUT PLOT CDMA MID CHANNEL



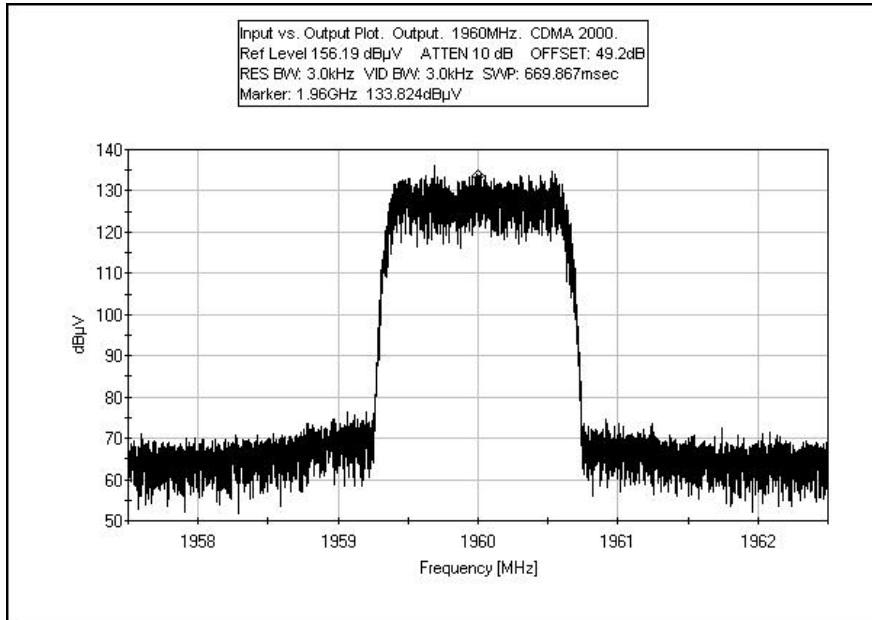
OUTPUT PLOT CDMA HIGH CHANNEL



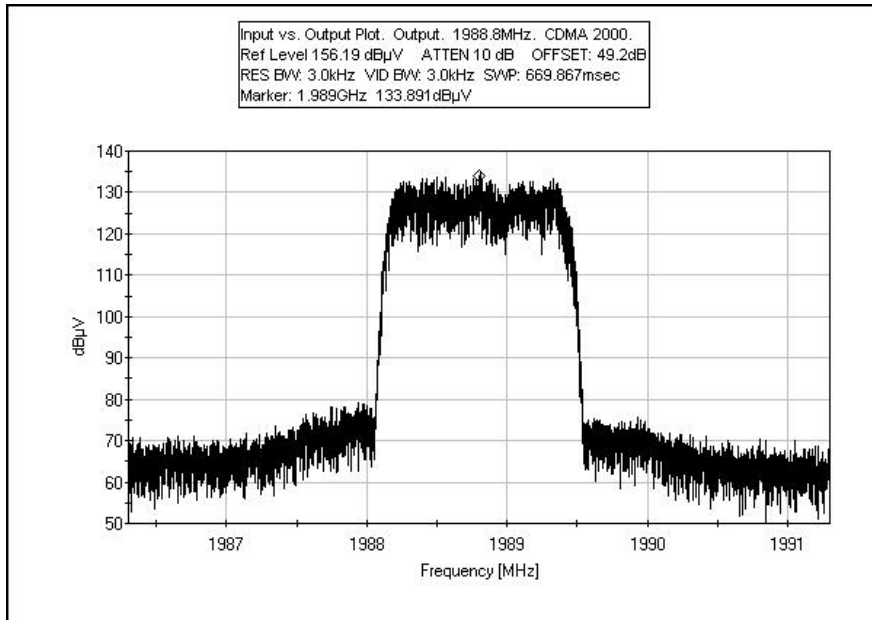
OUTPUT PLOT CDMA 2000 LOW CHANNEL



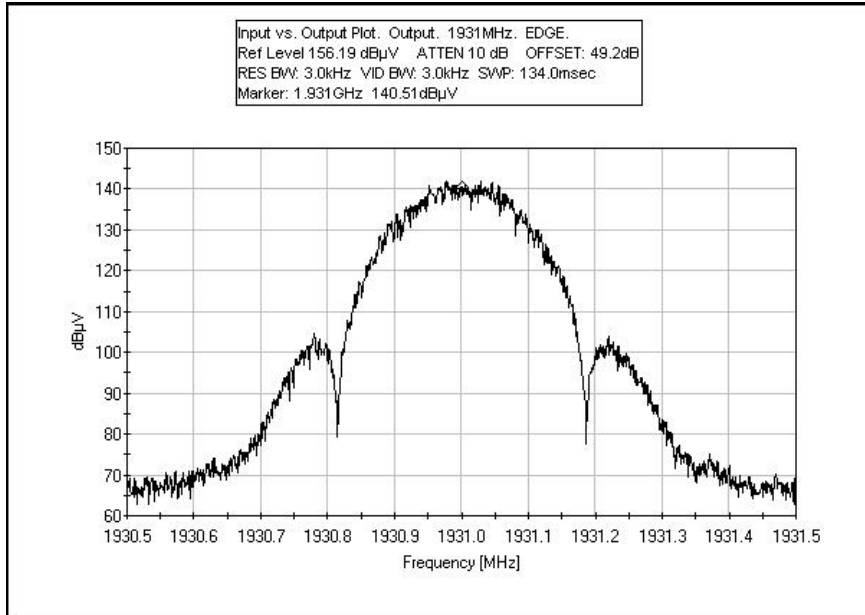
OUTPUT PLOT CDMA 2000 MID CHANNEL



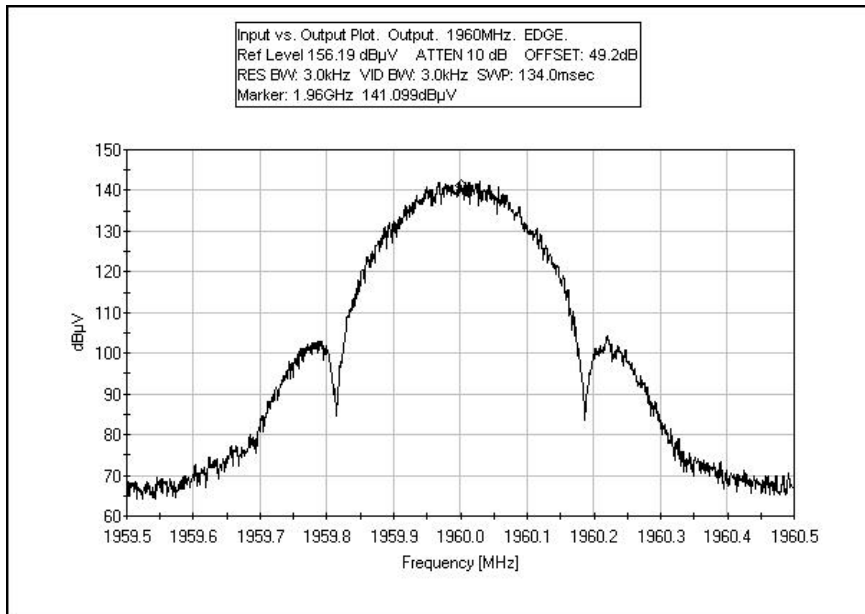
OUTPUT PLOT CDMA 2000 HIGH CHANNEL



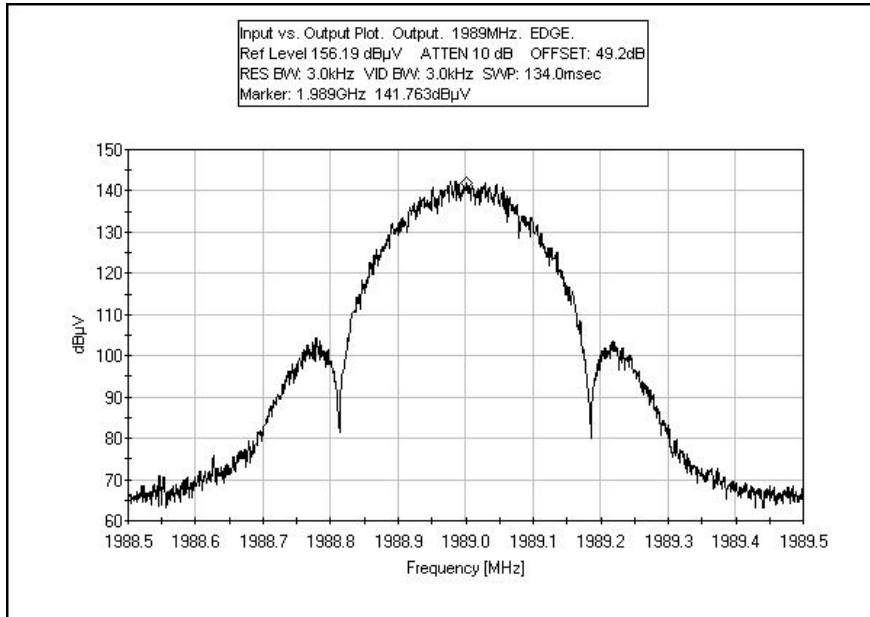
OUTPUT PLOT EDGE LOW CHANNEL



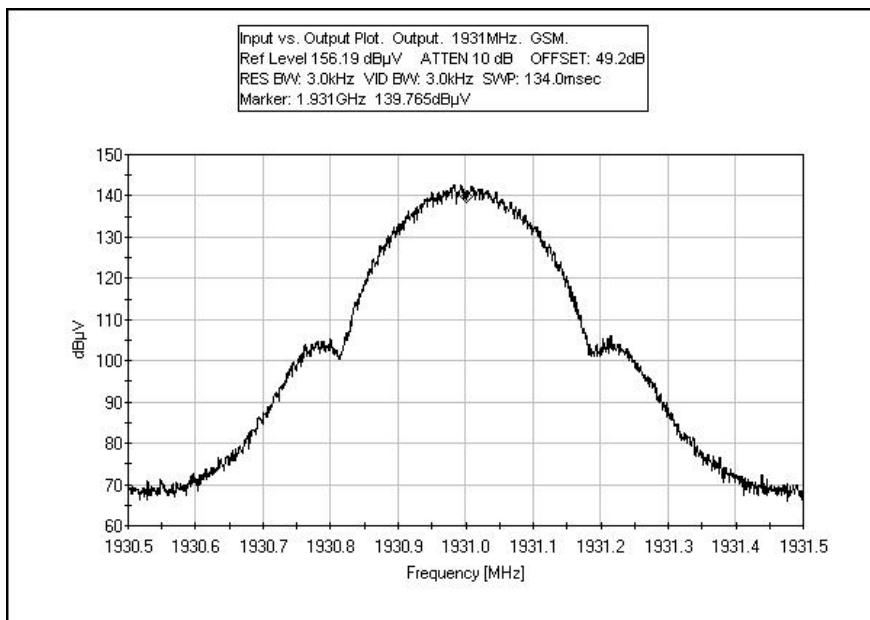
OUTPUT PLOT EDGE MID CHANNEL



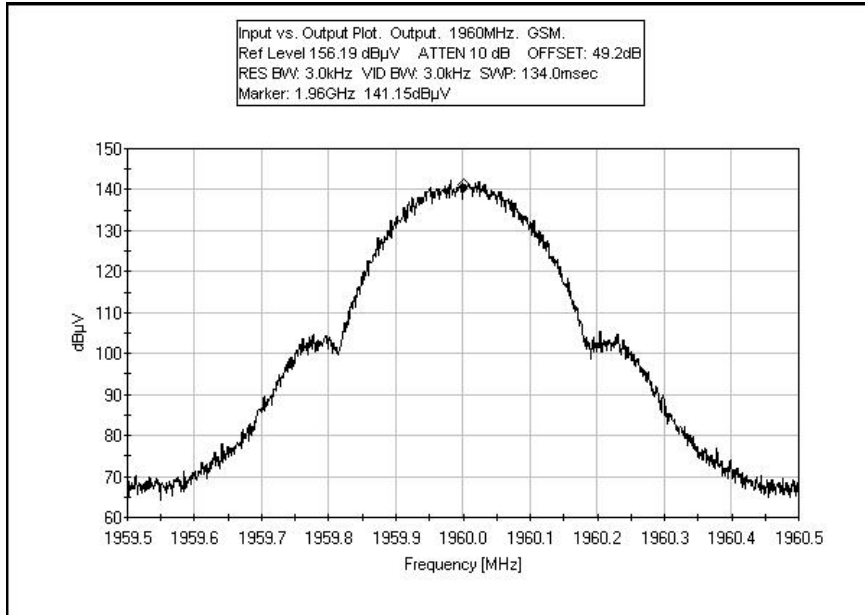
OUTPUT PLOT EDGE HIGH CHANNEL



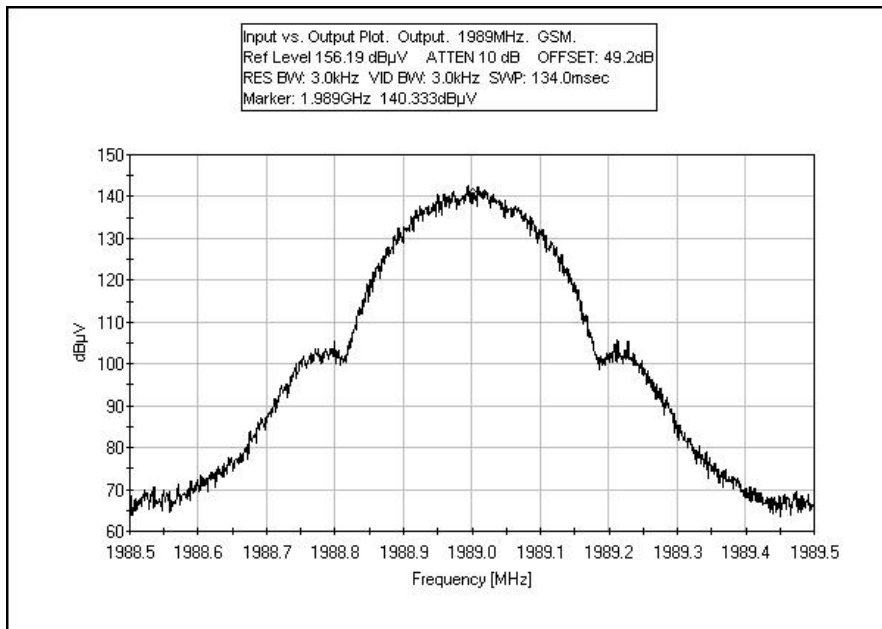
OUTPUT PLOT GSM LOW CHANNEL



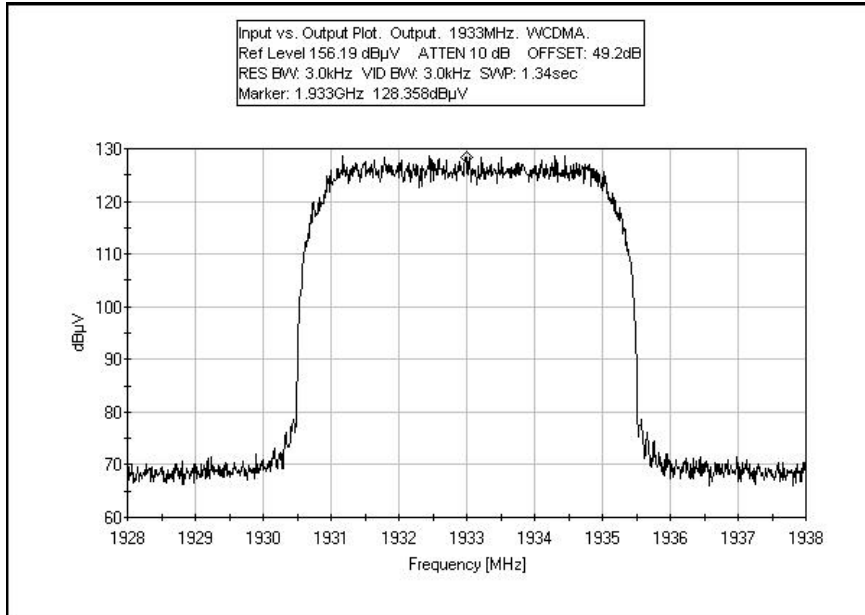
OUTPUT PLOT GSM MID CHANNEL



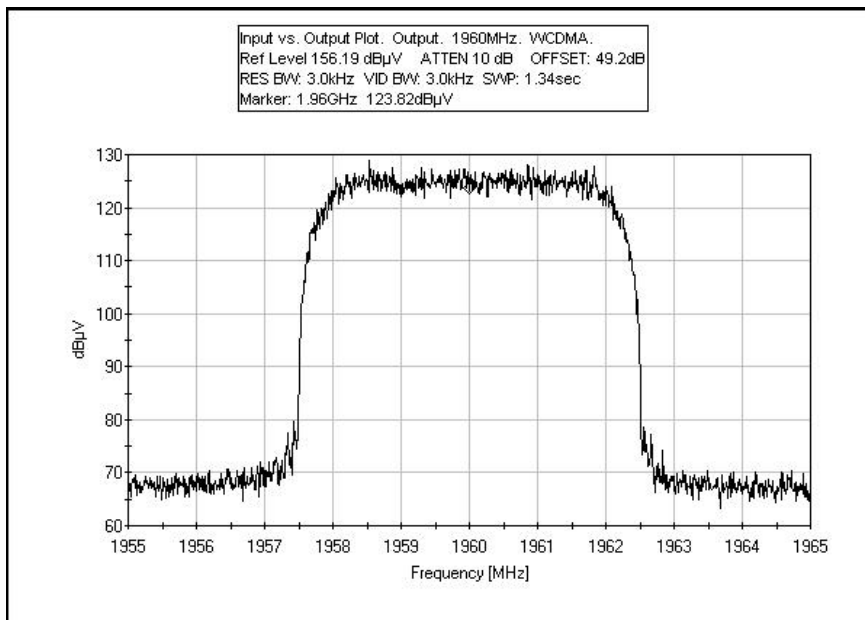
OUTPUT PLOT GSM HIGH CHANNEL



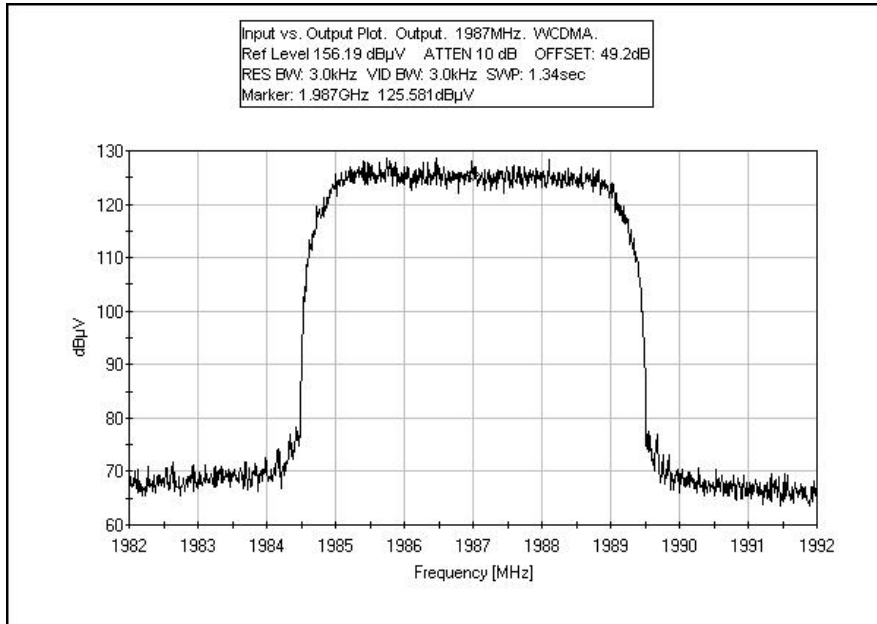
OUTPUT PLOT WCDMA LOW CHANNEL



OUTPUT PLOT WCDMA MID CHANNEL



OUTPUT PLOT WCDMA HIGH CHANNEL



FCC 2.1033(c)(14)/2.1051/24.238(a) - SPURIOUS EMISSIONS AT ANTENNA TERMINAL

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 24.238(a) (2007) Conducted Spurious Emission**
 Work Order #: **87961** Date: 6/26/2008
 Test Type: **Conducted Emissions** Time: 15:30:21
 Equipment: **Repeater** Sequence#: 7
 Manufacturer: Powerwave Technologies, Inc. Tested By: Stuart Yamamoto
 Model: RH300020/14A 120Vac 60Hz
 S/N: PD00000XDD

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
Spectrum Analyzer	MY46186290	02/12/2007	02/12/2009	02869
3.0 GHz HPF	1	03/25/2008	03/25/2010	02744
Coaxial Cable		09/18/2007	09/18/2009	02945

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Repeater*	Powerwave Technologies, Inc.	RH300020/14A	PD00000XDD

Support Devices:

Function	Manufacturer	Model #	S/N
Optical Converter	Powerwave Technologies, Inc.	NA	42473
Spectrum Analyzer	HP	8563E	NA
Power Meter	Agilent	E4419B	MY40510694
ESG	Agilent	E4433B	US40051692
Directional Coupler	Meca	722N-20-1.500V	
Preamplifier	Mini-Circuits	ZHL-42	9945

Test Conditions / Notes:

The equipment under test (EUT) is placed stand alone on the table top. The EUT optical in port is connected to a remotely located optical converter module. The signal generator is providing the signal through a preamplifier to the converter. The EUT antenna port is connected to a spectrum analyzer. Temperature: 22°C, Humidity: 44%, Pressure: 100kPa. Voltage to the EUT is 120Vac 60Hz. Signal generator is set to low, middle, and high channels using GSM, EDGE, CDMA, CDMA 2000, and WCDMA modulations. Output of the EUT is set to its rated output power of 43dBm. The frequency range scanned and maximized for this datasheet is 9kHz to 20GHz. The operating range of the device tested is 1930MHz to 1990MHz. The actual operating frequencies of the device used on this datasheet is 1931MHz, 1960MHz, and 1989MHz for GSM and EDGE. The actual operating frequencies of the device used on this datasheet is 1931.2MHz, 1960MHz, and 1988.8MHz for CDMA and CDMA 2000. The actual operating frequencies of the device used on this datasheet is 1933MHz, 1960MHz, and 1987MHz for WCDMA. Bandwidth settings: SA RES BW=1MHz, SA VID BW=1MHz.

Transducer Legend:

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

Measurement Data:

Reading listed by margin.

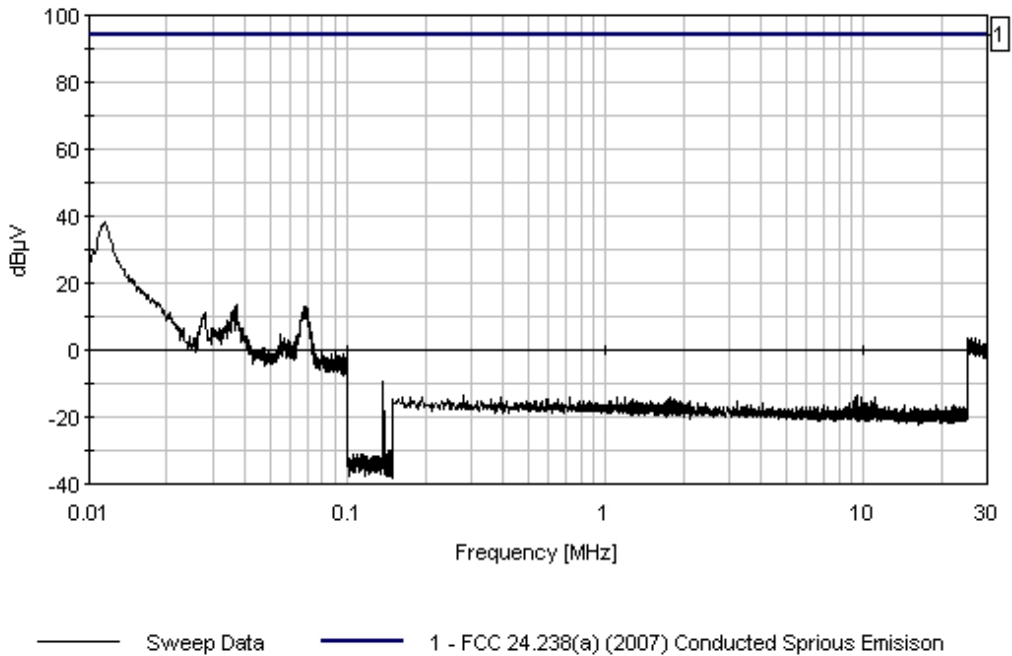
Test Lead: Antenna Port

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	Dist dB	Corr dB	Spec dB μ V	Margin dB	Polar Ant
1	3920.090M	87.3	+0.7	+0.4	+0.0	88.4	94.0 CDMA	-5.6	Anten
2	3976.900M	86.8	+0.7	+0.4	+0.0	87.9	94.0 CDMA	-6.1	Anten
3	3920.040M	83.8	+0.7	+0.4	+0.0	84.9	94.0 CDMA 2000	-9.1	Anten
4	3862.890M	83.8	+0.7	+0.4	+0.0	84.9	94.0 CDMA	-9.1	Anten
5	3976.820M	83.1	+0.7	+0.4	+0.0	84.2	94.0 CDMA 2000	-9.8	Anten
6	3862.760M	80.3	+0.7	+0.4	+0.0	81.4	94.0 CDMA 2000	-12.6	Anten
7	5794.500M	77.9	+0.8	+0.4	+0.0	79.1	94.0 CDMA	-14.9	Anten
8	3978.040M	77.8	+0.7	+0.4	+0.0	78.9	94.0 EDGE	-15.1	Anten
9	3920.130M	77.8	+0.7	+0.4	+0.0	78.9	94.0 EDGE	-15.1	Anten
10	5880.090M	76.4	+0.8	+0.4	+0.0	77.6	94.0 CDMA	-16.4	Anten
11	5794.240M	75.3	+0.8	+0.4	+0.0	76.5	94.0 CDMA 2000	-17.5	Anten
12	3919.920M	75.1	+0.7	+0.4	+0.0	76.2	94.0 GSM	-17.8	Anten

13	7840.060M	73.2	+1.0	+0.3	+0.0	74.5	94.0	-19.5	Anten
							CDMA		
14	3862.015M	73.2	+0.7	+0.4	+0.0	74.3	94.0	-19.7	Anten
							EDGE		
15	7954.720M	72.9	+1.0	+0.3	+0.0	74.2	94.0	-19.8	Anten
							CDMA		
16	5965.580M	72.7	+0.8	+0.4	+0.0	73.9	94.0	-20.1	Anten
							CDMA		
17	3978.012M	72.2	+0.7	+0.4	+0.0	73.3	94.0	-20.7	Anten
							GSM		
18	5880.040M	70.9	+0.8	+0.4	+0.0	72.1	94.0	-21.9	Anten
							GSM		
19	3862.156M	70.8	+0.7	+0.4	+0.0	71.9	94.0	-22.1	Anten
							GSM		
20	5880.300M	70.6	+0.8	+0.4	+0.0	71.8	94.0	-22.2	Anten
							CDMA 2000		
21	3920.920M	70.1	+0.7	+0.4	+0.0	71.2	94.0	-22.8	Anten
							WCDMA		
22	3974.300M	69.8	+0.7	+0.4	+0.0	70.9	94.0	-23.1	Anten
							WCDMA		
23	5792.970M	69.5	+0.8	+0.4	+0.0	70.7	94.0	-23.3	Anten
							EDGE		
24	5966.970M	68.9	+0.8	+0.4	+0.0	70.1	94.0	-23.9	Anten
							EDGE		
25	5879.950M	68.5	+0.8	+0.4	+0.0	69.7	94.0	-24.3	Anten
							EDGE		
26	3865.880M	67.9	+0.7	+0.4	+0.0	69.0	94.0	-25.0	Anten
							WCDMA		
27	7728.600M	67.2	+1.0	+0.3	+0.0	68.5	94.0	-25.5	Anten
							WCDMA		
28	5965.920M	67.3	+0.8	+0.4	+0.0	68.5	94.0	-25.5	Anten
							CDMA 2000		
29	5793.012M	66.9	+0.8	+0.4	+0.0	68.1	94.0	-25.9	Anten
							GSM		
30	7945.880M	66.0	+1.0	+0.3	+0.0	67.3	94.0	-26.7	Anten
							WCDMA		
31	7842.280M	65.3	+1.0	+0.3	+0.0	66.6	94.0	-27.4	Anten
							WCDMA		
32	5800.100M	64.8	+0.8	+0.4	+0.0	66.0	94.0	-28.0	Anten
							WCDMA		
33	7954.400M	64.7	+1.0	+0.3	+0.0	66.0	94.0	-28.0	Anten
							CDMA 2000		
34	7840.360M	64.3	+1.0	+0.3	+0.0	65.6	94.0	-28.4	Anten
							CDMA 2000		
35	5967.012M	64.3	+0.8	+0.4	+0.0	65.5	94.0	-28.5	Anten
							GSM		
36	7724.012M	64.0	+1.0	+0.3	+0.0	65.3	94.0	-28.7	Anten
							GSM		

37	7723.970M	63.9	+1.0	+0.3	+0.0	65.2	94.0	-28.8	Anten
							EDGE		
38	7726.040M	63.8	+1.0	+0.3	+0.0	65.1	94.0	-28.9	Anten
							CDMA 2000		
39	5878.560M	63.8	+0.8	+0.4	+0.0	65.0	94.0	-29.0	Anten
							WCDMA		
40	5957.180M	63.5	+0.8	+0.4	+0.0	64.7	94.0	-29.3	Anten
							WCDMA		
41	7726.000M	63.4	+1.0	+0.3	+0.0	64.7	94.0	-29.3	Anten
							CDMA		
42	7956.012M	63.4	+1.0	+0.3	+0.0	64.7	94.0	-29.3	Anten
							GSM		
43	7955.970M	63.1	+1.0	+0.3	+0.0	64.4	94.0	-29.6	Anten
							EDGE		
44	7840.030M	62.4	+1.0	+0.3	+0.0	63.7	94.0	-30.3	Anten
							EDGE		
45	7840.040M	62.3	+1.0	+0.3	+0.0	63.6	94.0	-30.4	Anten
							GSM		

CKC Laboratories, Inc. Date: 6/26/2008 Time: 15:30:21 Powerwave Technologies, Inc. W/O#: 87961
 FCC 24.238(a) (2007) Conducted Spurious Emision Test Lead: Antenna Port 120Vac 60Hz Sequence#: 7
 Powerwave Technologies, Inc. RH300020/14A



FCC 2.1033(c)(14)/2.1053/24.238(a) - 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 24.238(a) (2007) Radiated Spurious Emission**
 Work Order #: **87961** Date: 6/27/2008
 Test Type: **Maximized Emissions** Time: 14:28:09
 Equipment: **Repeater** Sequence#: 8
 Manufacturer: Powerwave Technologies, Inc. Tested By: Stuart Yamamoto
 Model: RH300020/14A
 S/N: PD00000XDD

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
Pre Amp	1937A02548	05/02/2008	05/02/2010	00309
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	01/05/2007	01/05/2009	P05198
Spectrum Analyzer	MY46186290	02/12/2007	02/12/2009	02869
Loop Antenna	2014	06/16/2008	06/16/2010	00314
HeliAx Antenna Cable	P5565	09/18/2006	09/18/2008	P05565
Coaxial Cable		09/18/2007	09/18/2009	02945
Microwave Pre-amp	3123A00281	07/19/2006	07/19/2008	00786
Horn Antenna	6246	06/06/2008	06/06/2010	00849
18-26.5 GHz Horn Antenna	3643A00027	11/27/2006	11/27/2008	02112

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Repeater*	Powerwave Technologies, Inc.	RH300020/14A	PD00000XDD

Support Devices:

Function	Manufacturer	Model #	S/N
Optical Converter	Powerwave Technologies, Inc.	NA	42473
Spectrum Analyzer	HP	8563E	NA
Power Meter	Agilent	E4419B	MY40510694
ESG	Agilent	E4433B	US40051692
Directional Coupler	Meca	722N-20-1.500V	
Preamplifier	Mini-Circuits	ZHL-42	9945

Test Conditions / Notes:

The equipment under test (EUT) is placed stand alone on the table top. The EUT optical in port is connected to a remotely located optical converter module. The signal generator is providing the signal through a preamplifier to the converter. The EUT antenna port is connected to a remotely located spectrum analyzer and power meter through high power attenuators and a directional coupler. Temperature: 24°C, Humidity: 48%, Pressure: 100kPa. Voltage to the EUT is 120Vac 60Hz. This data sheet presents the device under test with the signal generator set to low, middle, and high channels using CDMA modulation. Output of the EUT is set to its rated output power of 43dBm. The frequency range scanned and maximized for this datasheet is 9kHz to 20GHz. The operating range of the device tested is 1930MHz to 1990MHz. Bandwidth settings: SA RES BW=1MHz, SA VID BW=1MHz.

Operating Frequency: 1930-1990 MHz
 Channels: Low, Mid and High
 Highest Measured Output Power: 43.01 ERP(dBm)= 20 ERP(Watts)
 Distance: 3 meters
 Limit: $43+10\text{Log}(P)$ 56.01 dBc

Freq. (MHz)	Reference Level (dBm)	Antenna Polarity (H/V)	dBc
5,880.81	-26.4	Vert	69.41
5,965.26	-28.5	Vert	71.51
5,965.40	-28.9	Horiz	71.91
7,725.94	-32.1	Horiz	75.11
11,760.04	-32.3	Horiz	75.31
7,840.24	-33.4	Horiz	76.41
7,953.50	-33.5	Horiz	76.51
5,794.33	-33.6	Horiz	76.61
5,879.54	-34	Horiz	77.01
9,800.59	-34.3	Horiz	77.31
9,942.65	-34.5	Vert	77.51
5,795.23	-35	Vert	78.01
7,840.49	-35.1	Vert	78.11
9,799.97	-35.5	Vert	78.51
9,942.60	-36	Horiz	79.01
3,862.98	-36.3	Horiz	79.31
7,954.17	-37.6	Vert	80.61
7,725.51	-38.2	Vert	81.21
3,863.08	-42.3	Vert	85.31
3,920.06	-42.7	Horiz	85.71
3,919.63	-46.1	Vert	89.11
3,977.52	-47.7	Vert	90.71
3,976.60	-48.5	Horiz	91.51

INTERMODULATION

Test Equipment

Equipment	Asset #	Manufacturer	Model	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02869	Agilent	E4440A	MY46186290	021207	021209
Coaxial Cable	P02945	Astrolab	32022-2-2909K-36TC	(none)	091807	091809

Test Conditions

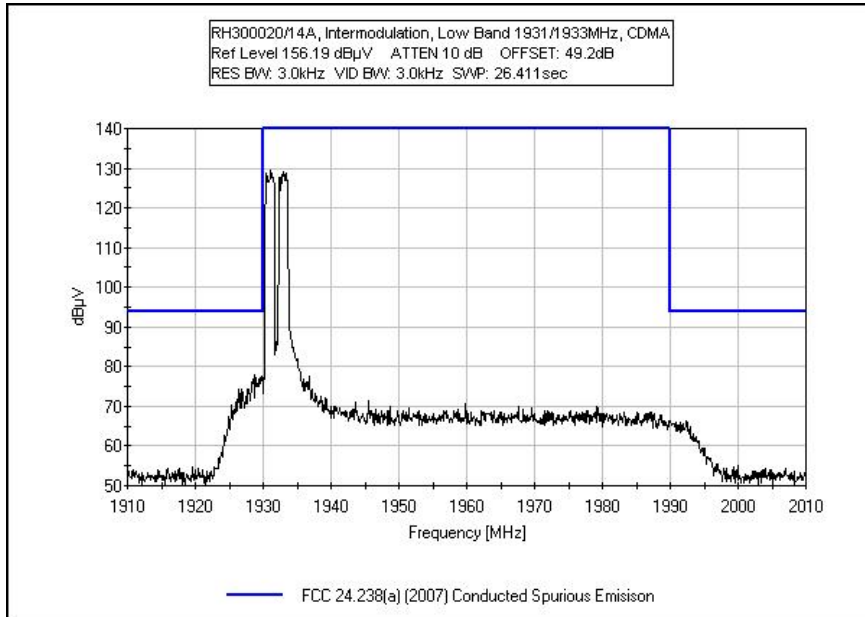
The equipment under test (EUT) is placed stand alone on the table top. The EUT optical in port is connected to a remotely located optical converter module. The signal generator is providing the signal through a preamplifier to the converter. For the intermodulation plots, the EUT antenna port was connected to the spectrum analyzer through high power attenuators and plots were made from 50MHz below the band to 50MHz above the band edge. Temperature: 22°C, Humidity: 45%, Pressure: 100kPa. Voltage to the EUT is 120Vac 60Hz. Plots were made with two signal generators set to the low band and then two signal generators set to the high band using GSM, EDGE, CDMA, CDMA 2000, and WCDMA modulations. Output of the EUT is set to its rated output power of 43dBm. The frequency range tested was 1931MHz to 1989MHz. The operating range of the device tested is 1930MHz to 1990MHz. Bandwidth settings: SA RES BW=3kHz, SA VID BW=3kHz.

Test Setup Photos

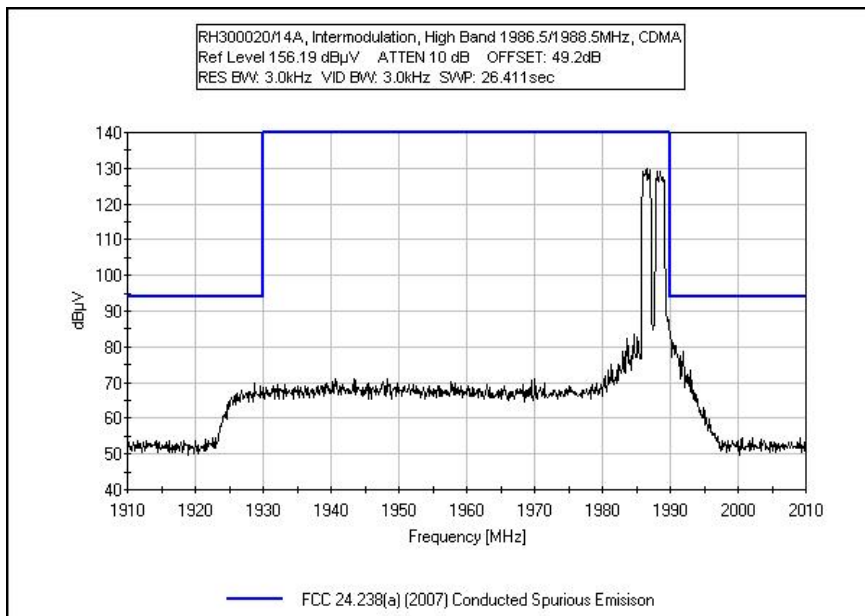


Test Plots

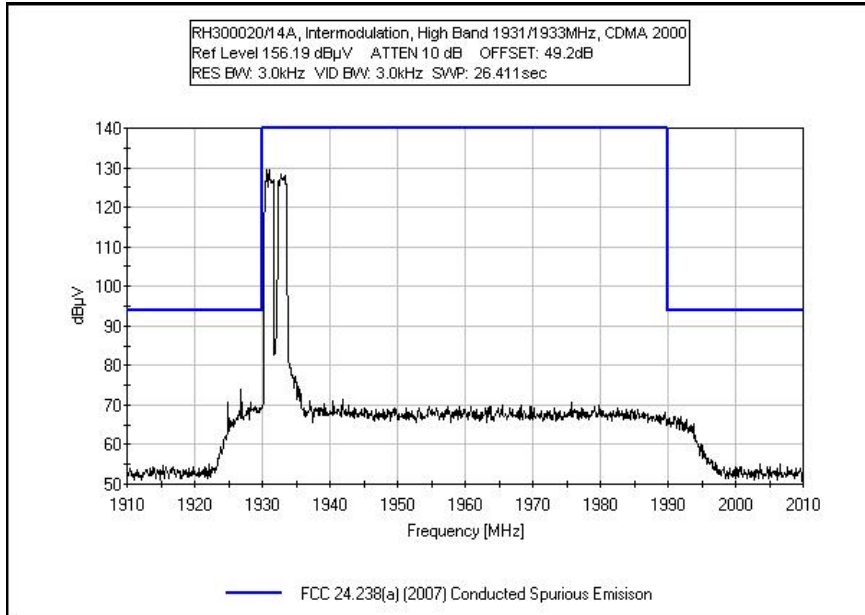
INTERMODULATION CDMA LOW BAND



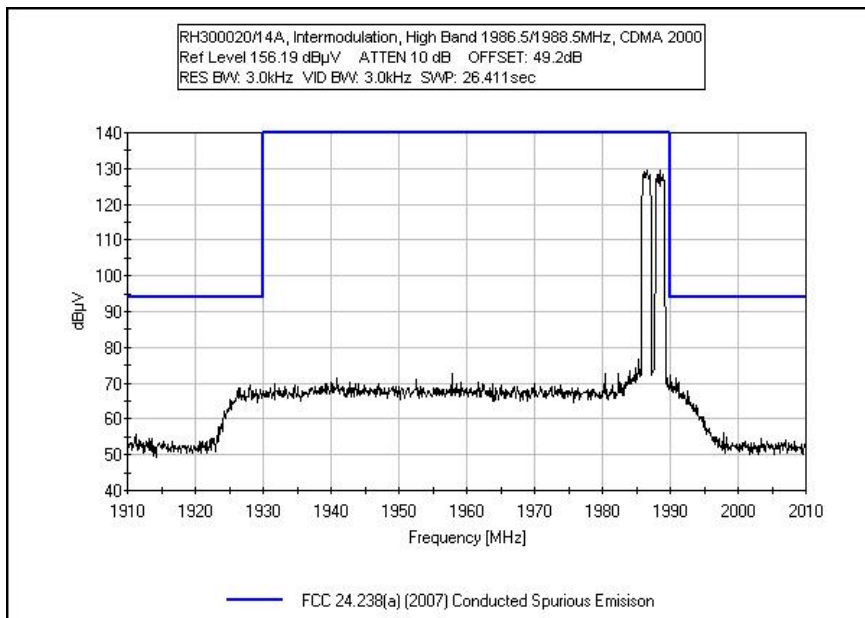
INTERMODULATION CDMA HIGH BAND



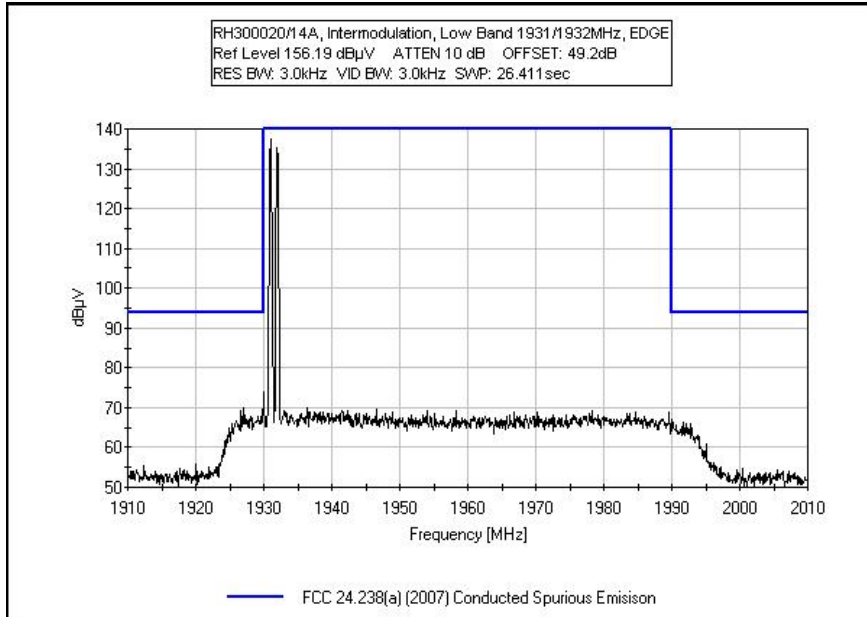
INTERMODULATION CDMA 2000 LOW BAND



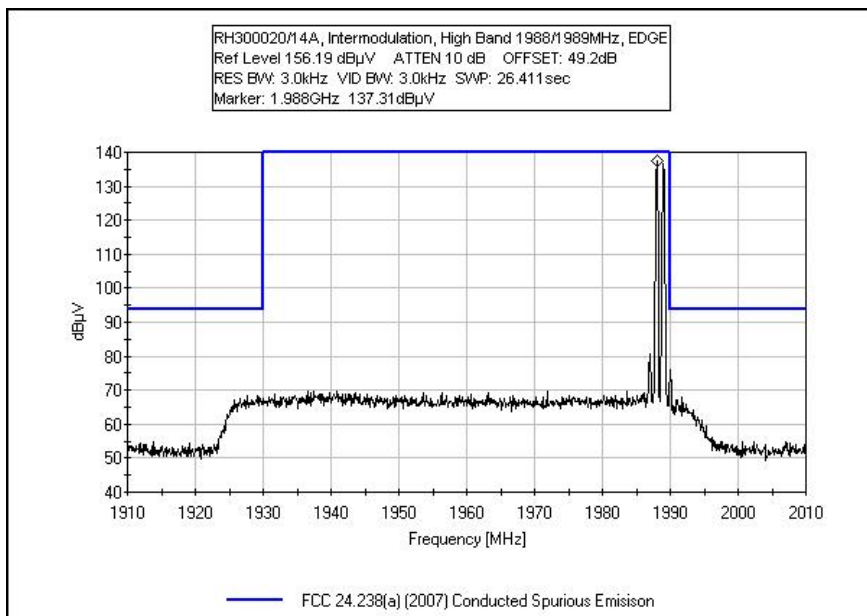
INTERMODULATION CDMA 2000 HIGH BAND



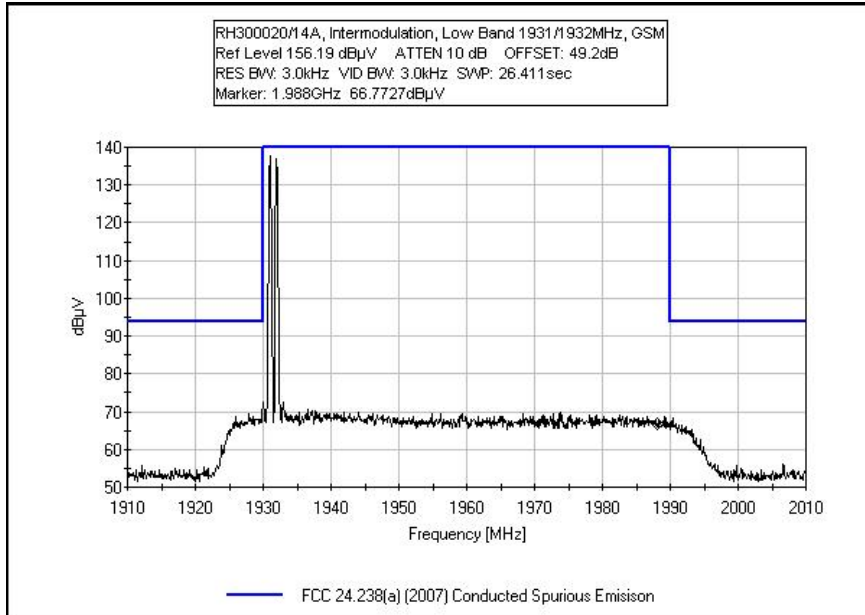
INTERMODULATION EDGE LOW BAND



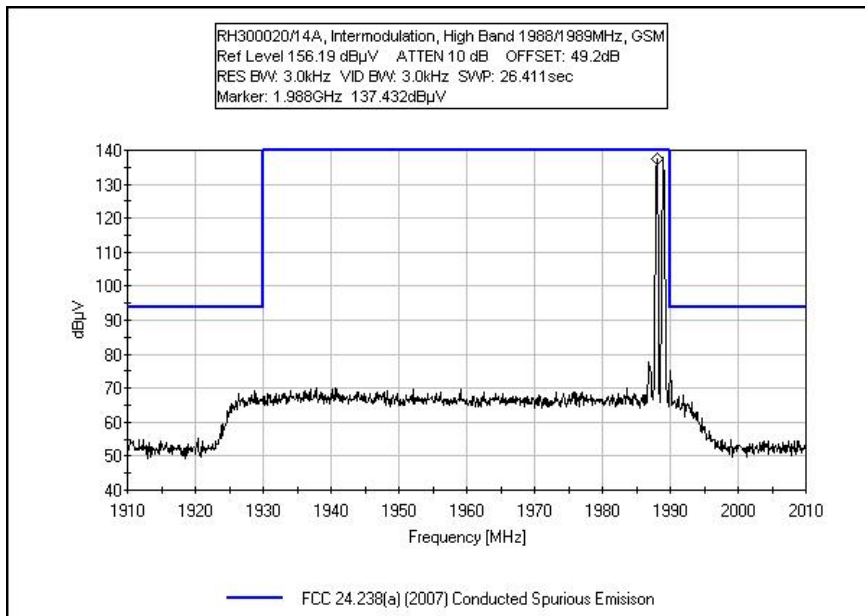
INTERMODULATION EDGE HIGH BAND



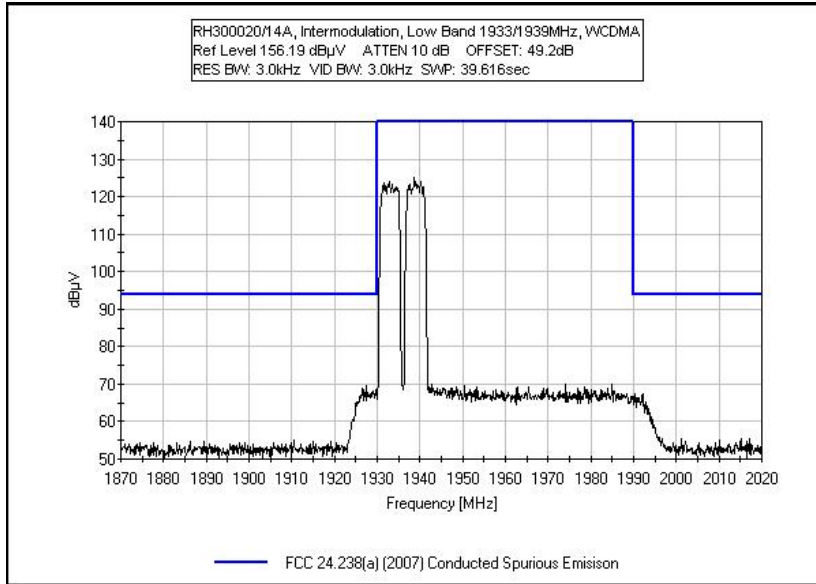
INTERMODULATION GSM LOW BAND



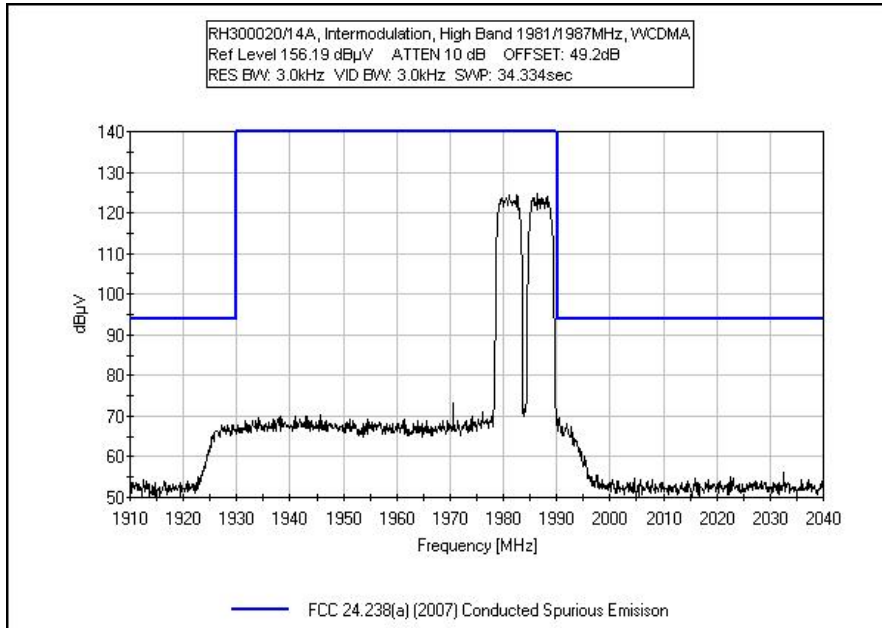
INTERMODULATION GSM HIGH BAND



INTERMODULATION WCDMA LOW BAND



INTERMODULATION WCDMA HIGH BAND



OUT OF BAND REJECTION

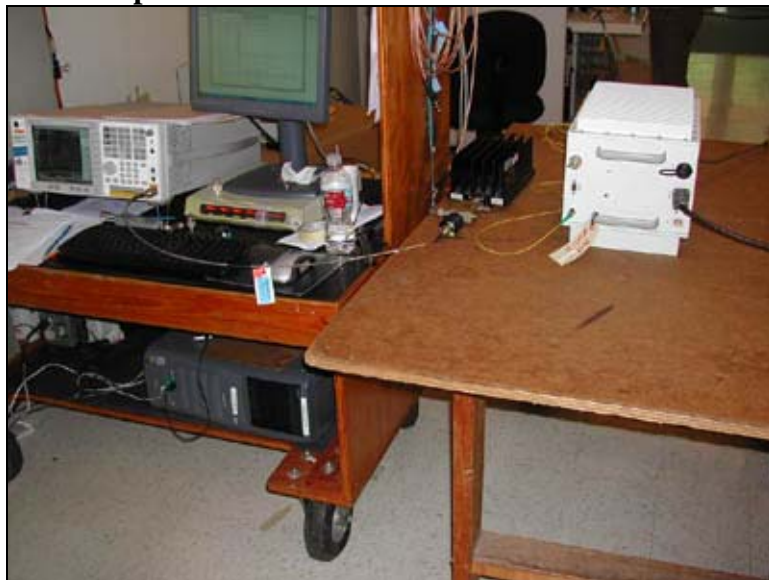
Test Equipment

Equipment	Asset #	Manufacturer	Model	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02869	Agilent	E4440A	MY46186290	021207	021209
Coaxial Cable	P02945	Astrolab	32022-2-2909K-36TC	(none)	091807	091809

Test Conditions

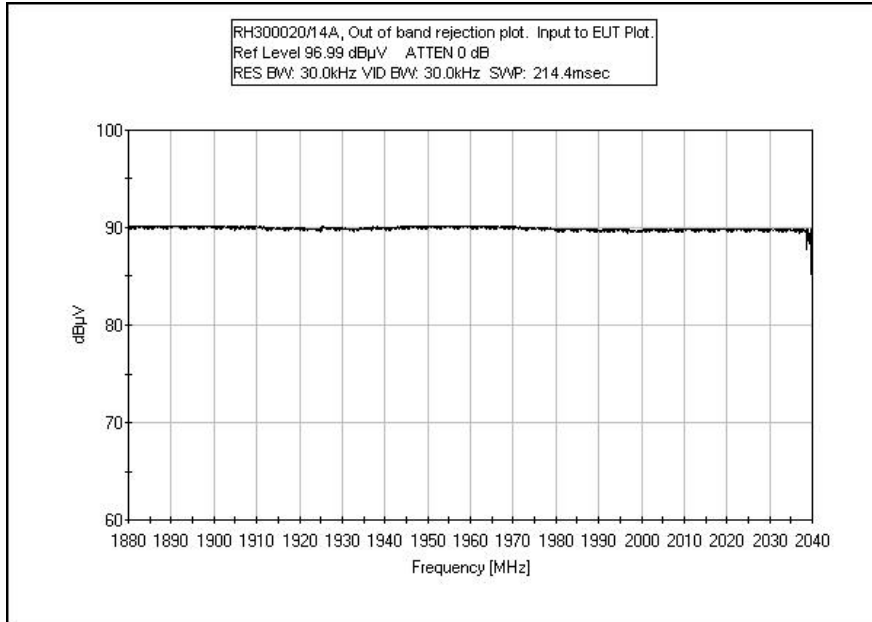
The equipment under test (EUT) is placed stand alone on the table top. The EUT optical in port is connected to a remotely located optical converter module. The signal generator is providing the signal through a preamplifier to the converter. For the input plot, the output of the signal source is fed to the input of the spectrum analyzer and a plot is made of the output level with the spectrum analyzer in a max hold function. For the output plot, the EUT antenna port is connected to the spectrum analyzer through high power attenuators and a plot is made of output of the EUT with the spectrum analyzer in a max hold function. Temperature: 22°C, Humidity: 45%, Pressure: 100kPa. Voltage to the EUT is 120Vac 60Hz. Plots were made with the signal generator set to sweep from 1880MHz to 2040MHz using no modulation. Output of the EUT is set to its rated output power of 43dBm. The frequency range tested was 1880MHz to 2040MHz. The operating range of the device tested is 1930MHz to 1990MHz. Bandwidth settings: SA RES BW=30kHz, SA VID BW=30kHz.

Test Setup Photos



Test Plots

OUT OF BAND REJECTION INPUT



OUT OF BAND REJECTION OUTPUT

