ADDENDUM TO POWERWAVE TECHNOLOGIES, INC. TEST REPORT FC06-033

FOR THE

MULTI-CARRIER RF POWER AMPLIFIER,
G3L-1929-160 (EVEREST 1900)

FCC PART 24 & RSS-131

COMPLIANCE

DATE OF ISSUE: JULY 25, 2006

PREPARED FOR:

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

P.O. No.: 107080
W.O. No.: 85227

PREPARED BY:

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

Date of test: May 31 – July 24, 2006

Report No.: FC06-033A

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ADMINISTRATIVE INFORMATION

DATE OF TEST:	May 31 – July 24, 2006
DATE OF RECEIPT:	May 31, 2006
FREQUENCY RANGE TESTED:	9kHz-20GHz
MANUFACTURER:	Powerwave Technologies, Inc. 1801 E. St. Andrew Place Santa Ana, CA 92705
REPRESENTATIVE:	Jeffrey Dale
TEST LOCATION:	CKC Laboratories, Inc. 110 Olinda Place Brea, CA 92823
TEST METHOD:	FCC Part 24 & RSS-131
PURPOSE OF TEST:	To demonstrate the compliance of the Multi-Carrier RF Power Amplifier, G3L-1929-160 (Everest 1900) with the requirements for FCC Part 24 & RSS-131 devices. **Addendum A** adds RF power for RSS-131 with new testing.

FCC TO CANADA STANDARD CORRELATION MATRIX

Canadian Standard	Canadian Section	FCC Standard	FCC Section	Test Description
RSS 131	5.4	N/A	N/A	External Controls
RSS 131	5.5	47 CFR	1.1307	RF Exposure
RSS 131	6.1	N/A	N/A	Passband Gain and Bandwidth
RSS 131	6.2	47 CFR	24.232	RF Power Output
RSS 131	6.3	TIA/EIA	603	Non-Linearity (Intermodulation Attenuation)
RSS 131	6.4	47 CFR	24.238	Spurious Emissions Limitations
RSS 131	6.5	N/A	N/A	Frequency Stability (Band Translators)
	3172-A		90473	Site File No.

CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply.

APPROVALS

Steve Behm, Director of Engineering Services

QUALITY ASSURANCE:

Joyce Walker, Quality Assurance Administrative Manager

TEST PERSONNEL:

Septimiu Apahidean, EMC Test Engineer

Eddie Wong, EMC Engineer

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The customer declares the EUT tested by CKC Laboratories was representative of a production unit.

EQUIPMENT UNDER TEST

Multi-Carrier RF Power Amplifier
Manuf: Powerwave Technologies
Model: G3L-1929-160 (Everest 1900)
Serial: NA
FCC ID: pending

PERIPHERAL DEVICES

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

Linear DC Power Supply
Manuf: HP
Model: 6269B
Serial: 2436A-11867

Preamplifier
Manuf: Mini-Circuits
Model: ZHL-4240
Serial: NA

Signal Generator
Manuf: Agilent
Model: E4433B
Serial: US40051853

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
DXW, F9W, GXW, G7W.

FCC 2.1033 (c)(5) FREQUENCY RANGE
1930-1990MHz.

FCC 2.1033 (c)(6) OPERATING POWER
61.6 Watts per channel.

FCC 2.1033 (c)(7) MAXIMUM POWER RATING
100 Watts per channel.

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, EDGE, GSM, TDMA, WCDMA

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

§24.232 Power and antenna height limits.

(a) Base stations are limited to 1640 watts peak equivalent isotropically radiated power (e.i.r.p.) with an antenna height up to 300 meters HAAT. See 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. ***In no case may the peak output power of a base station transmitter exceed 100 watts****. The service area boundary limit and microwave protection criteria specified in §§24.236 and 24.237 apply.*

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

HAAT in meters	*Maximum E.I.R.P. (watts)*
ó300	*1640*
ó500	*1070*
ó1000	*490*
ó1500	*270*
ó2000	*160*

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 end user of this product is to exercise proper engineering judgement to select the appropriate antenna to comply with the EIRP limitation set forth by FCC24.23a (a).

The RF power of the EUT was measured at the antenna port. The measurement satisfies the above requirement by demonstrating the measured power per channel is below 100 watts.

Test setup: The EUT is placed on the wooden table. The EUTs Input ports are connected to support Signal Amplifiers and Signal Generators. The RF Output is connected to a RF load and a directional coupler. The RF power of the EUT is monitored at the output of the directional coupler and the RF input signal is adjusted to maintain the output power.
RF Power = 185 watts.

Modulation	Freq	Measured power
EDGE	Block A : 1930 MHz, 1932.5 MHz, 1945. MHz Block B : 1950 MHz, 1952.5 MHz, 1965. MHz Block C : 1975 MHz, 1977.0 MHz, 1990. MHz	185 W total 61.6W per ch
GSM	Block A : 1930 MHz, 1932.5 MHz, 1945. MHz Block B : 1950 MHz, 1952.5 MHz, 1965. MHz Block C : 1975 MHz, 1977.0 MHz, 1990. MHz	185 W total 61.6W per ch
TDMA	Block A : 1930 MHz, 1932.5 MHz, 1945. MHz Block B : 1950 MHz, 1952.5 MHz, 1965. MHz Block C : 1975 MHz, 1977.0 MHz, 1990. MHz	185 W 61.6W per ch
CDMA	Block A : 1930 MHz, 1932.5 MHz, 1945. MHz Block B : 1950 MHz, 1952.5 MHz, 1965. MHz Block C : 1975 MHz, 1977.0 MHz, 1990. MHz	185 W total 61.6W per ch
WCDMA	Block A : 1930 MHz, 1932.5 MHz, 1945. MHz Block B : 1950 MHz, 1952.5 MHz, 1965. MHz Block C : 1975 MHz, 1977.0 MHz, 1990. MHz	185 W total 61.6W per ch

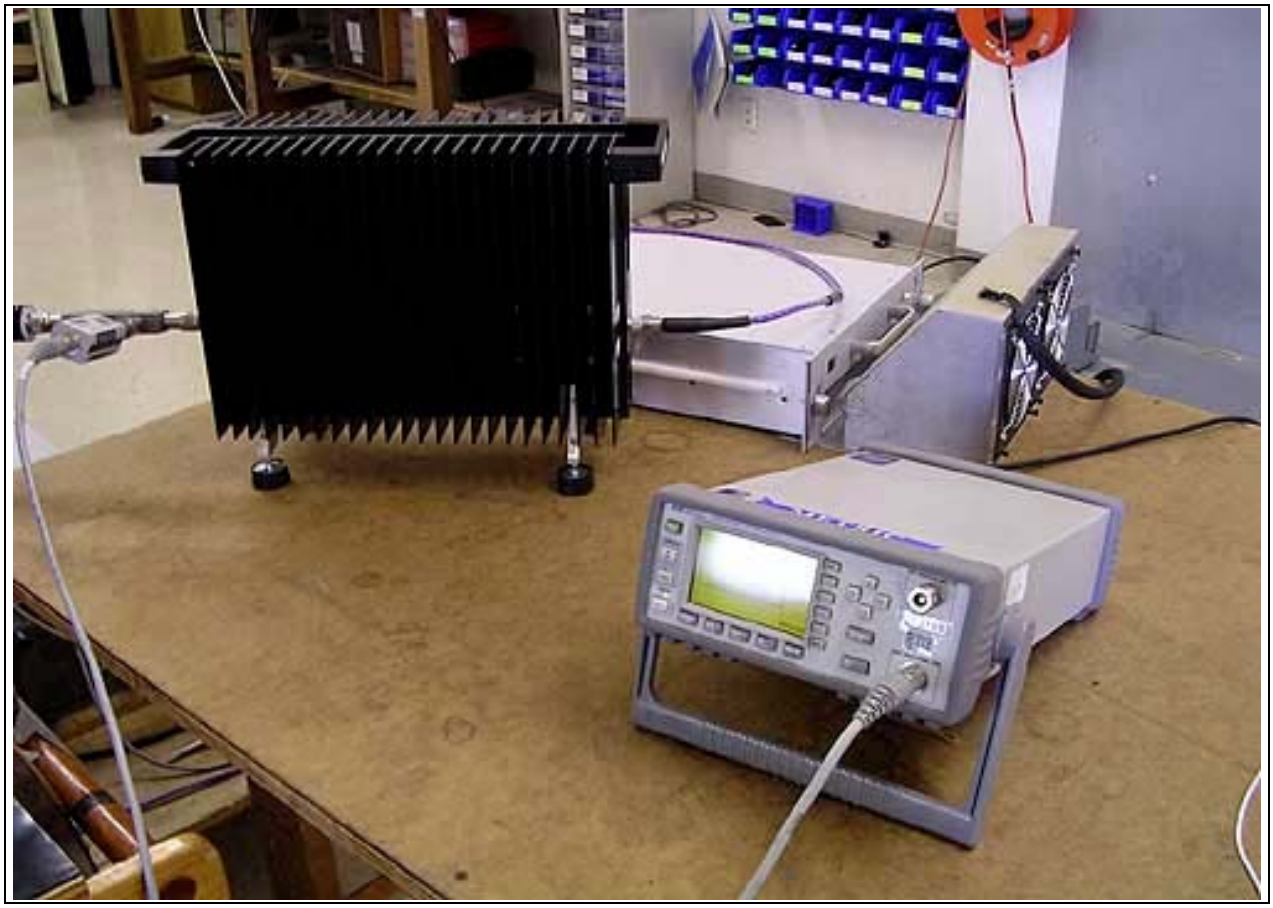
Conclusion

As indicated below, each **single channel** does not exceed the 100 Watt peak power limit.

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

PHOTOGRAPH SHOWING RF POWER OUTPUT



RSS-131 - RF POWER OUTPUT

Test setup: Two CW signals from two signal generators were combined and injected into the RF input port of the EUT. A spectrum analyzer was utilized for Output power measurement at the RF Output port. The Output power was then determined when third or forth order modulation reached -43dB within the passband of the EUT.

P1 (at p3 = -13dBm) = 46 dBm
Pmean = P1 +3 = 46+3 = 49 dBm (79.4W)

PHOTOGRAPH SHOWING RF POWER OUTPUT

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02467	Agilent	E7405A	US40240225	032205	032207

FCC 2.1033(c)(14)/2.1047(a) - MODULATION CHARACTERISTICS - AUDIO FREQUENCY RESPONSE

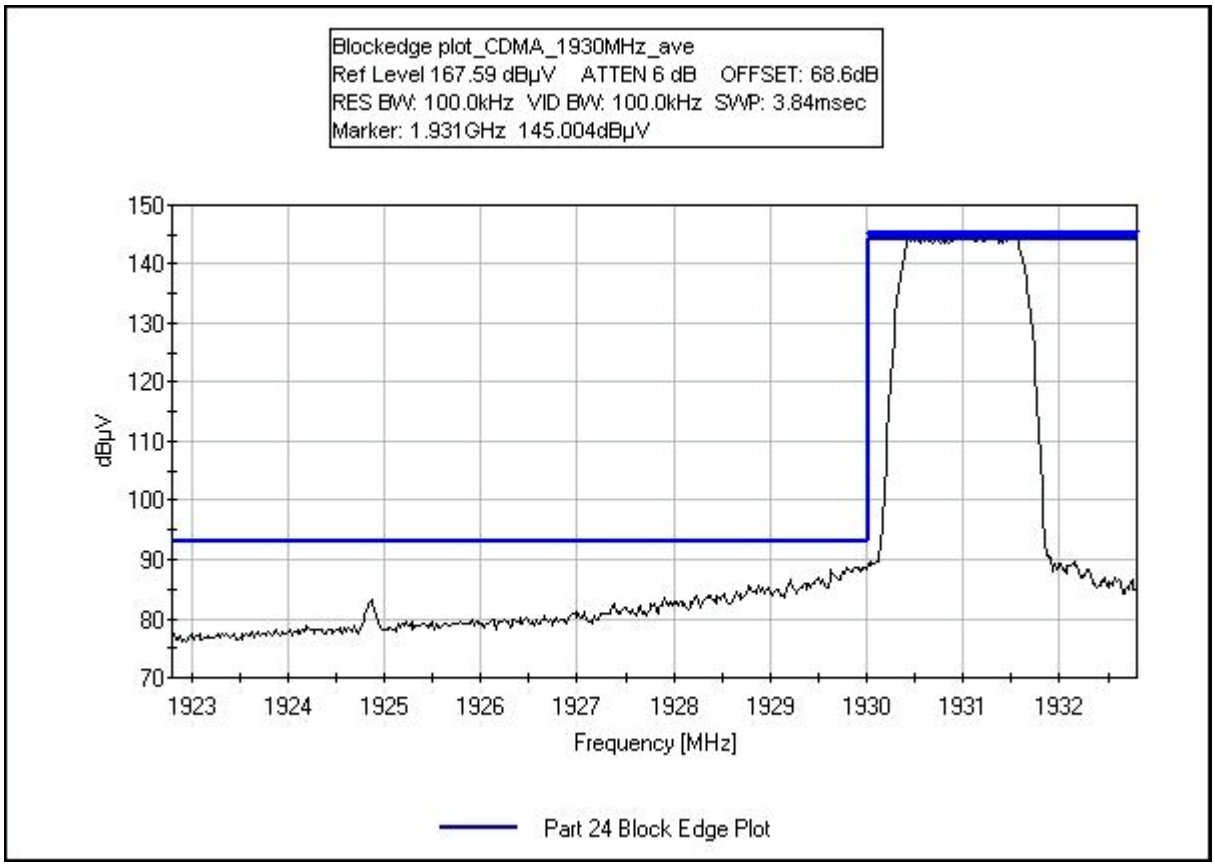
Not applicable to this unit.

FCC 2.1033(c)(14)/2.1047(b) MODULATION CHARACTERISTICS– Modulation Limiting Response

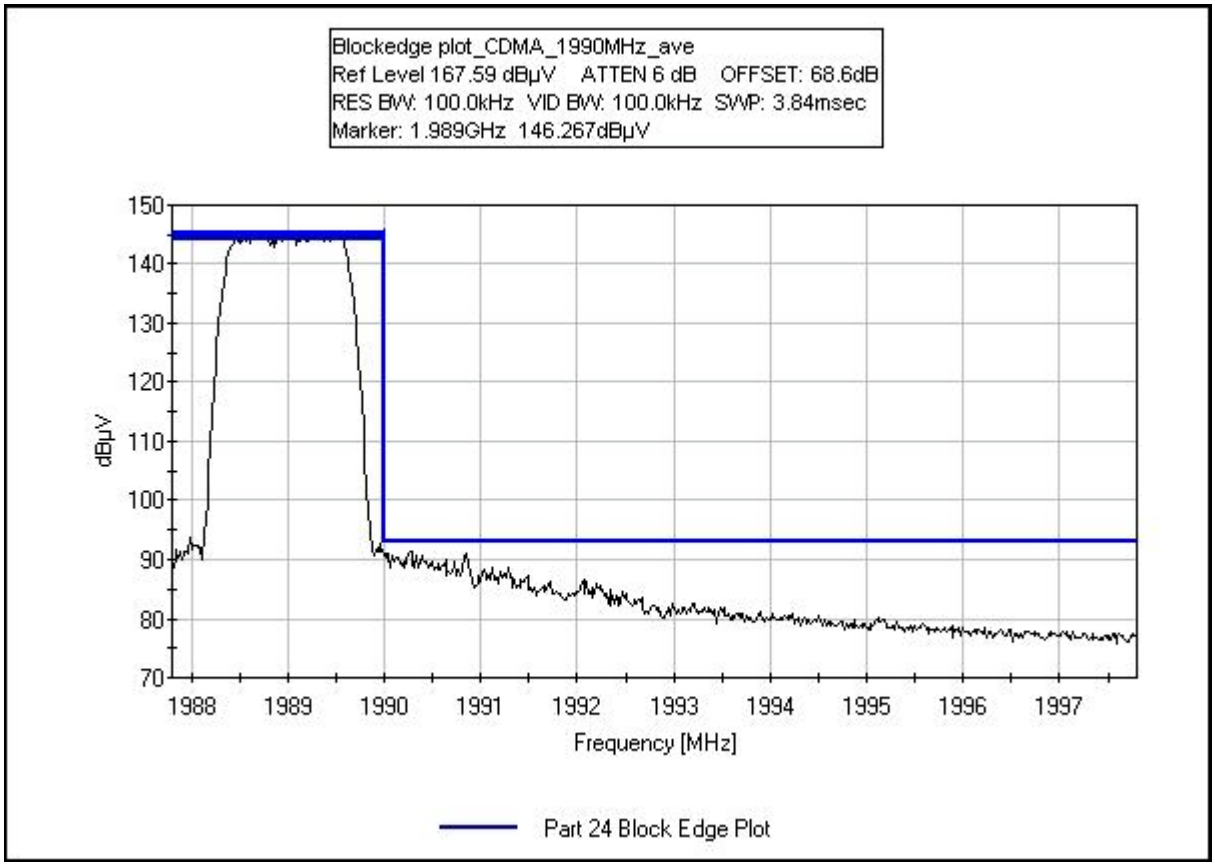
Not applicable to this unit.

BLOCKEDGE - CDMA 1930MHz

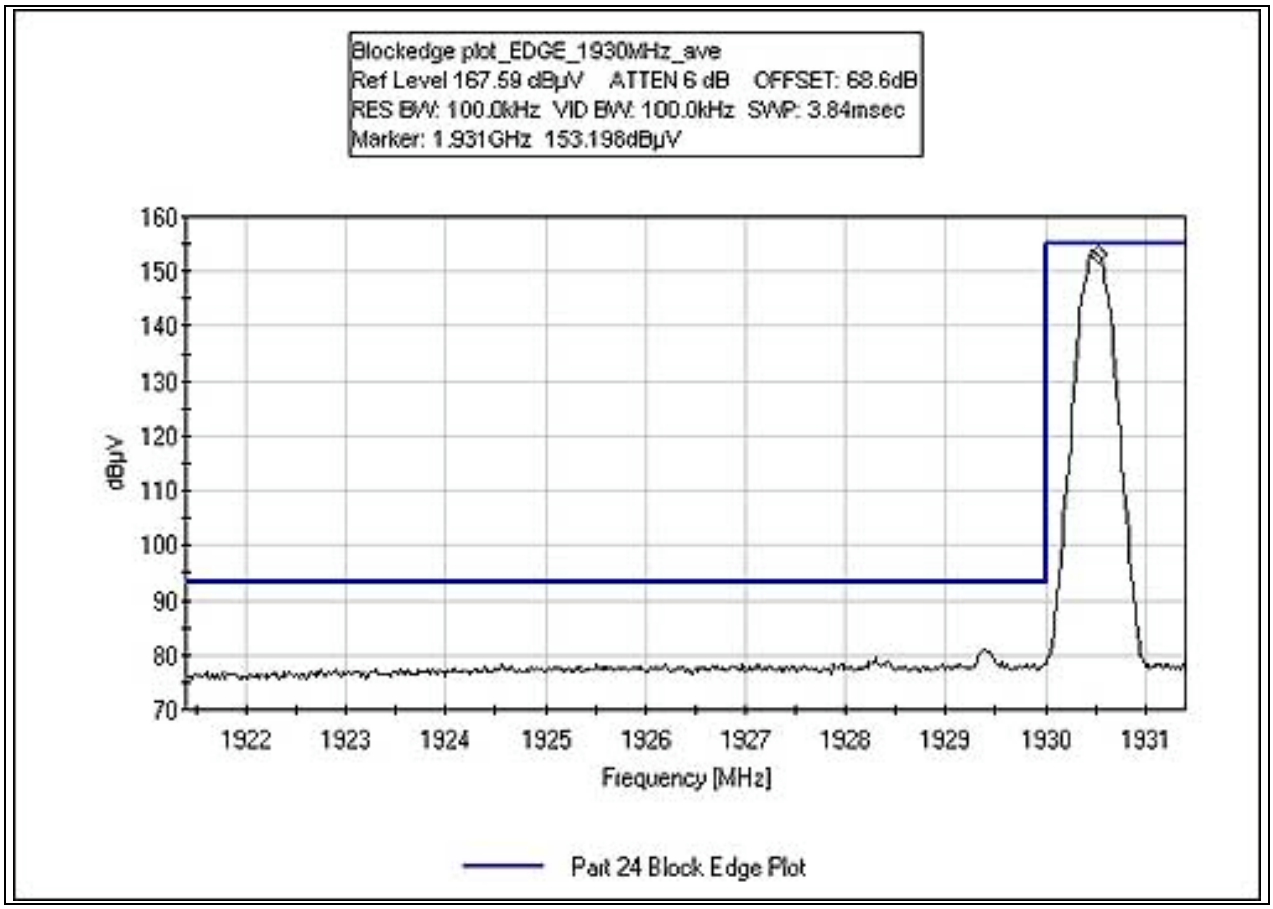
Test Conditions: The EUT is placed on the wooden table. RF out is connected to remote loadstring and power meter. RF in receives RF signal via remote ESGs and a preamp. The RF level is adjusted to maintain the transmit power. measurement performed at antenna port.



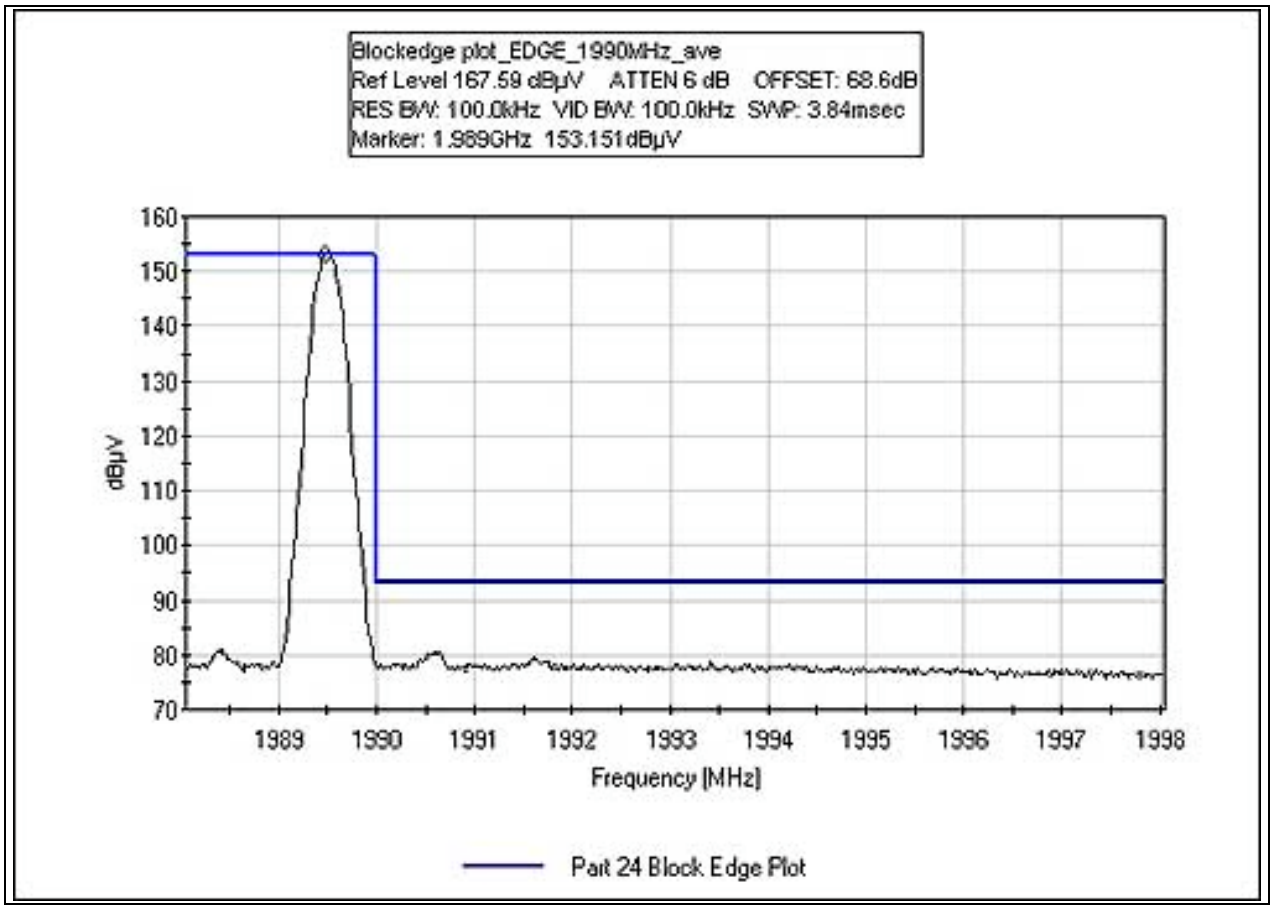
BLOCKEDGE - CDMA 1990MHz



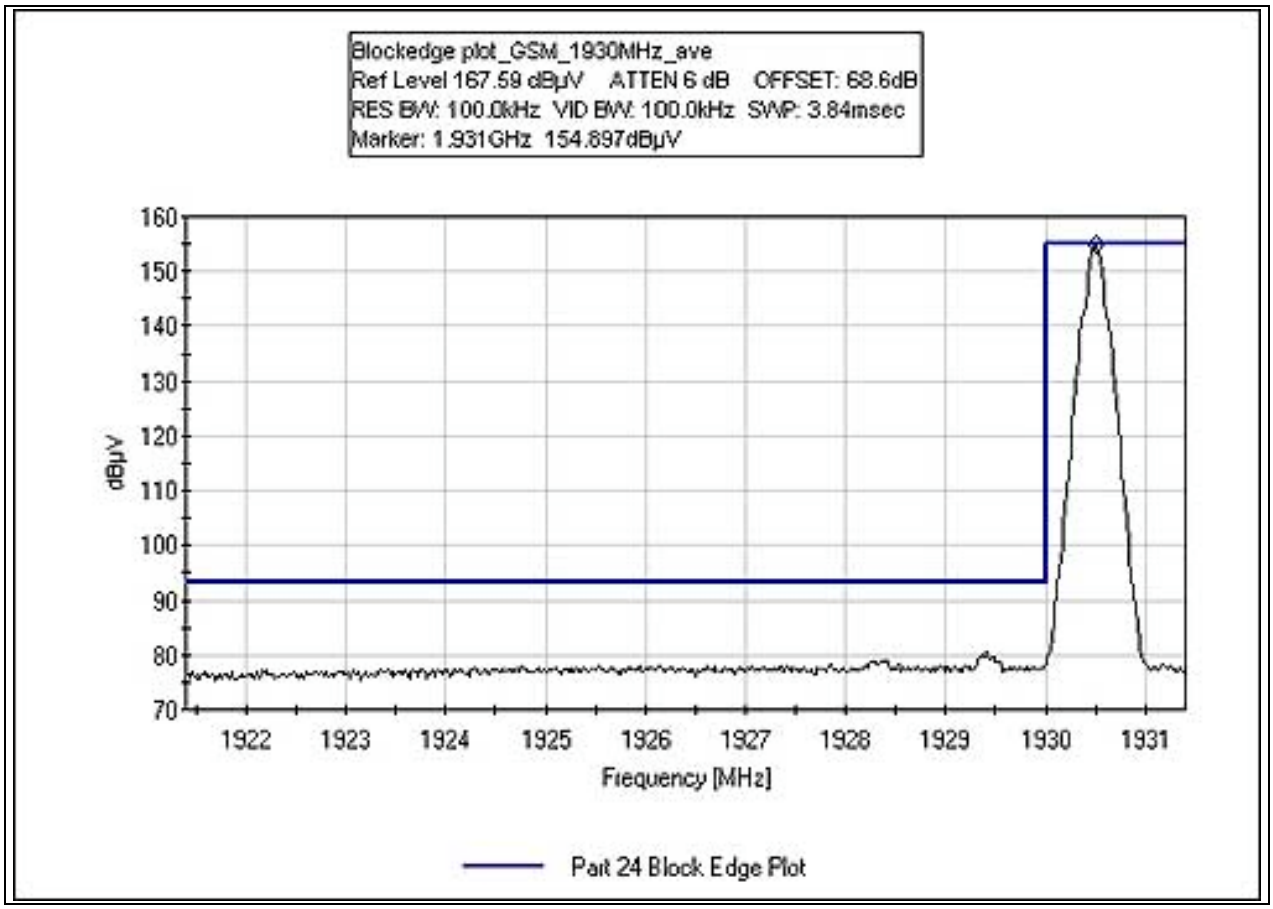
BLOCKEDGE - EDGE 1930MHz



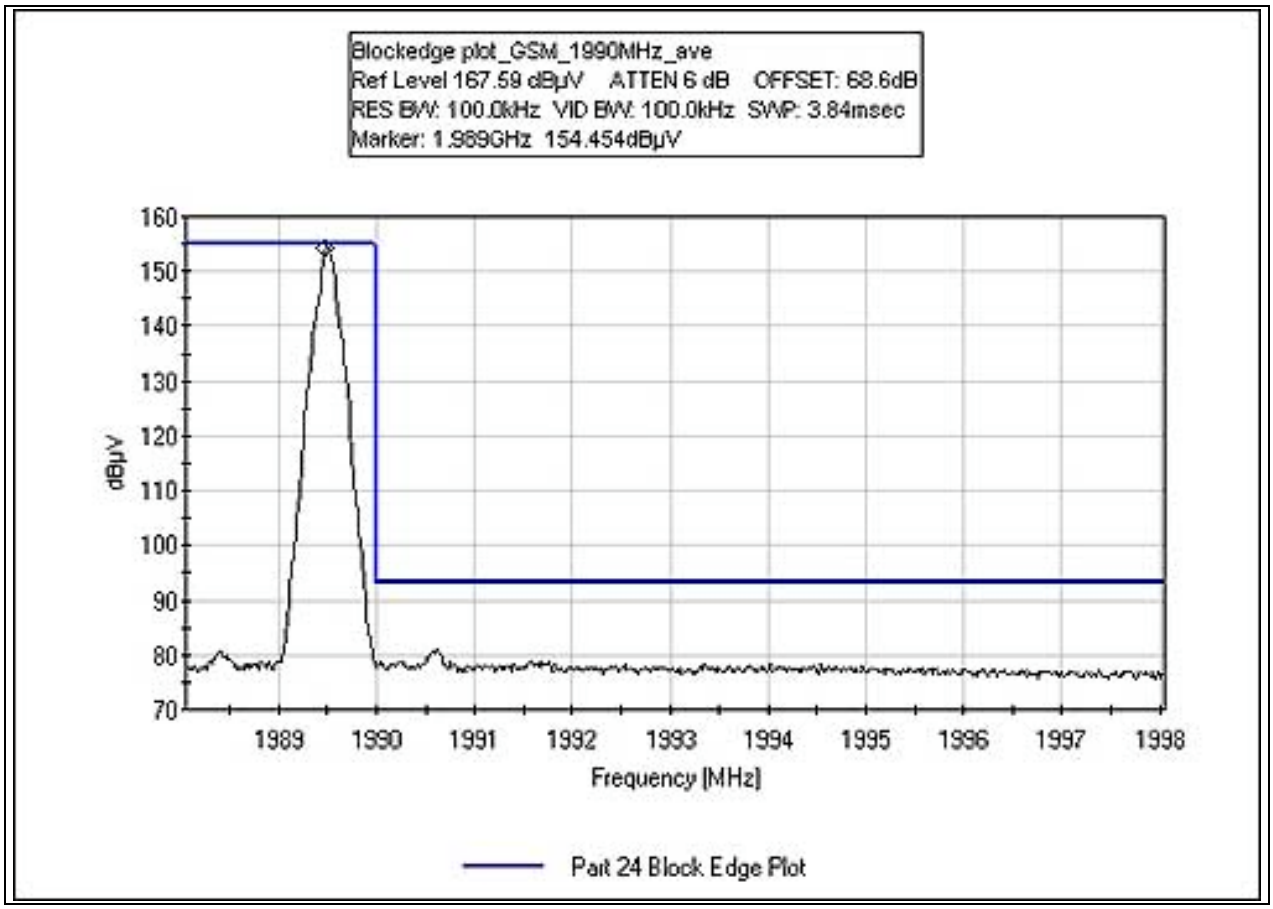
BLOCKEDGE - EDGE 1990MHz



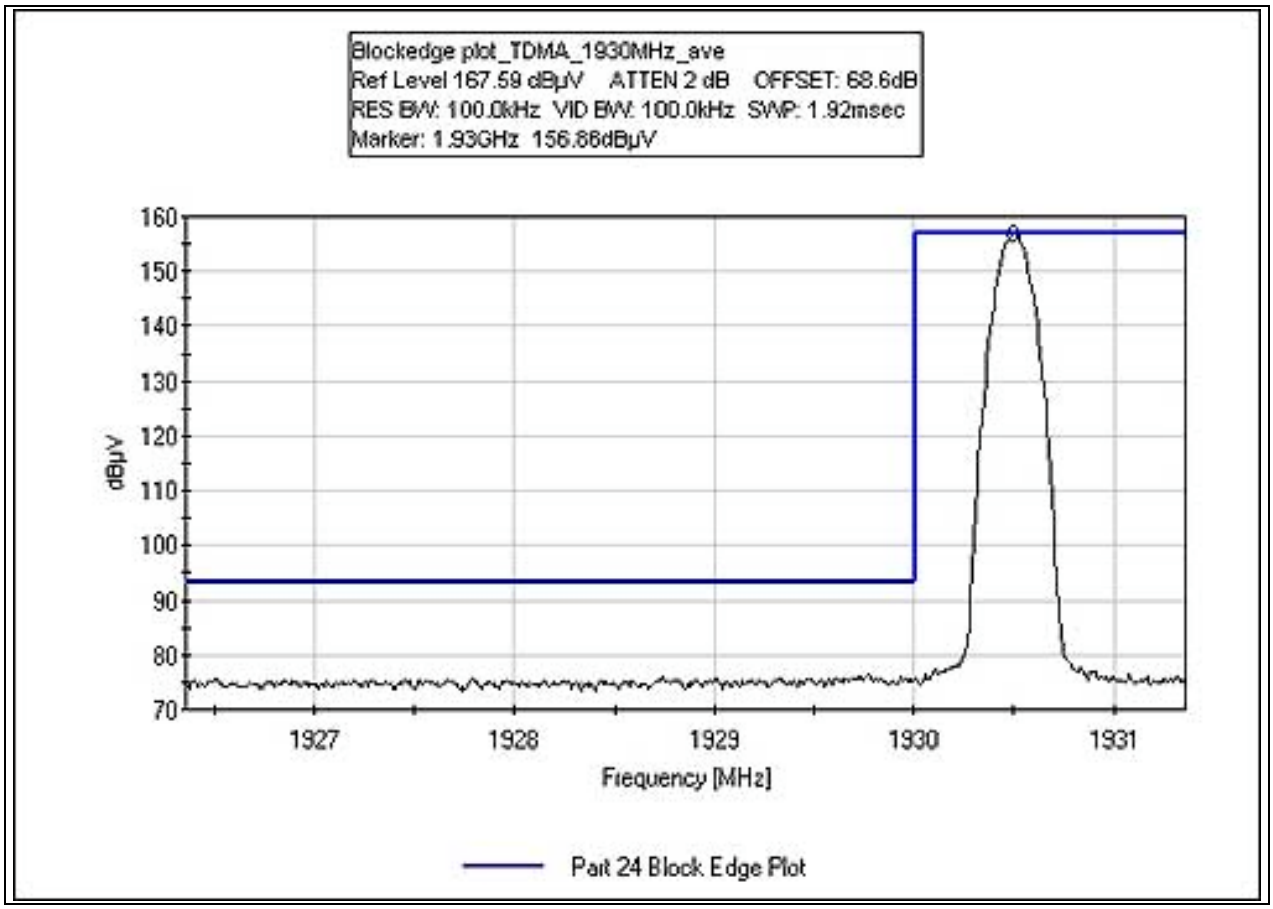
BLOCKEDGE - GSM 1930MHz



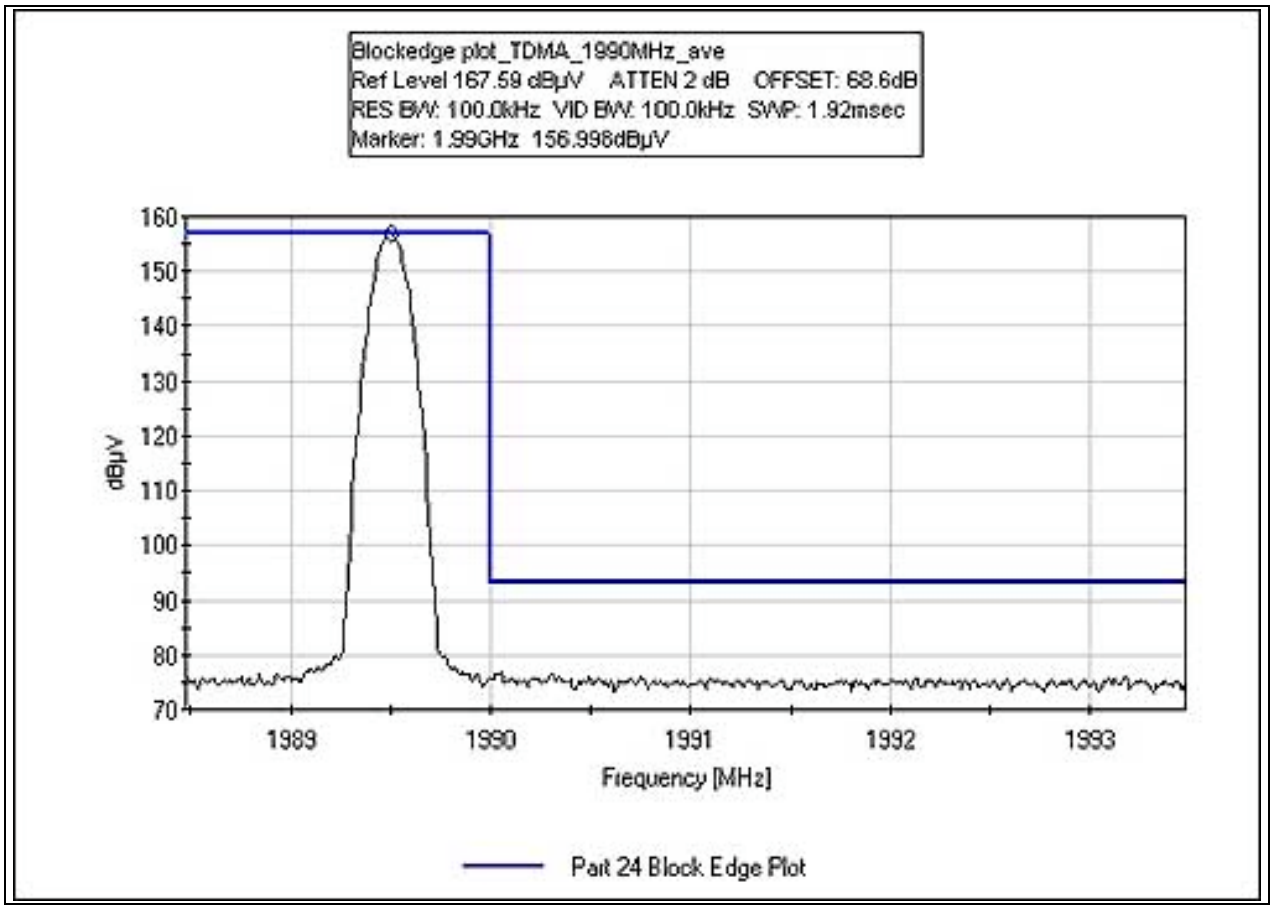
BLOCKEDGE - GSM 1990MHz



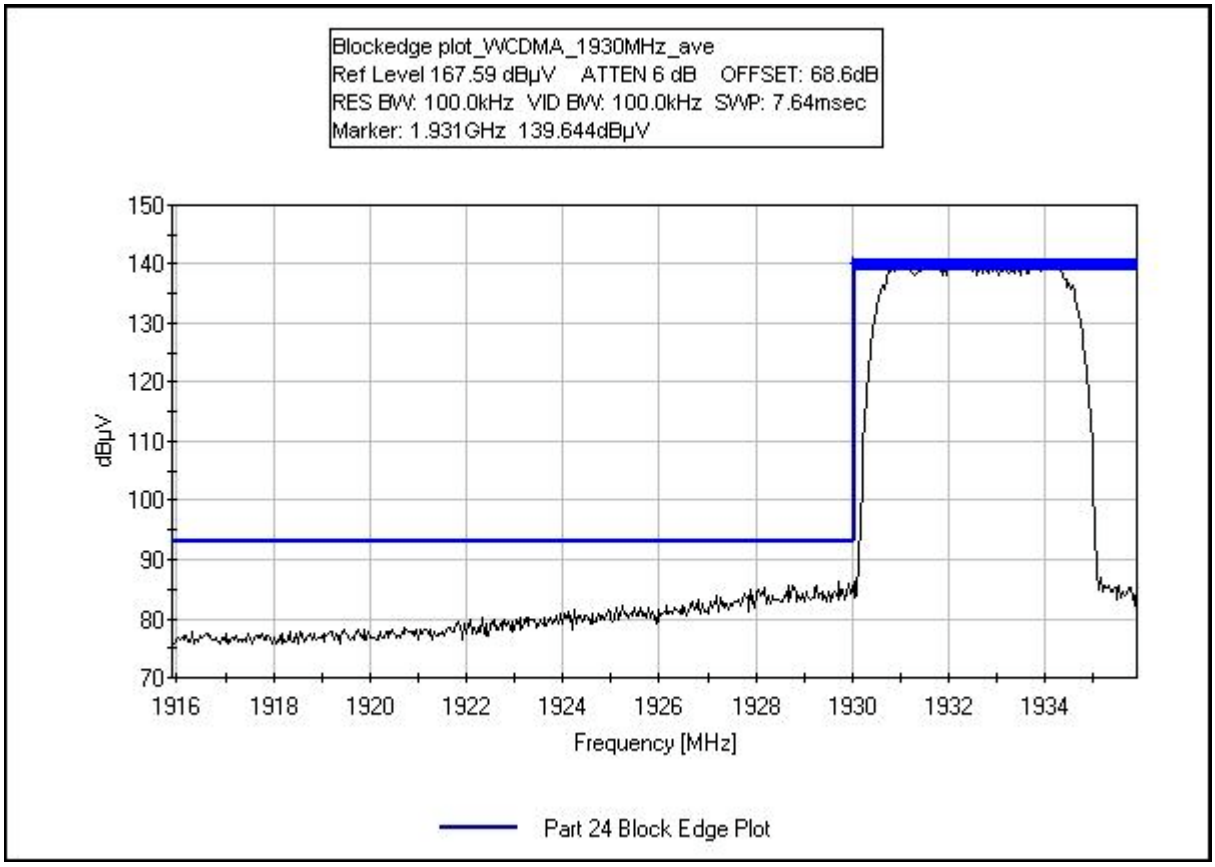
BLOCKEDGE - TDMA 1930MHz



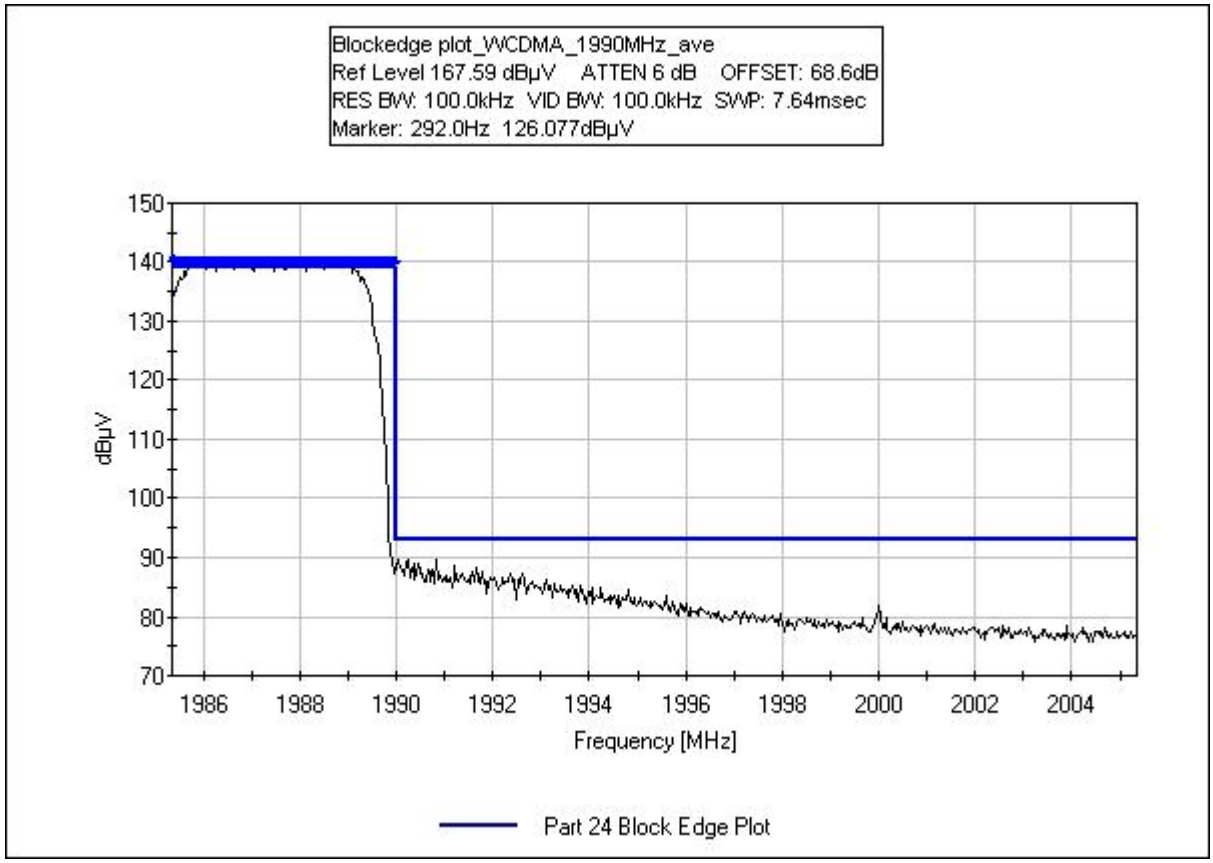
BLOCKEDGE - TDMA 1990MHz



BLOCKEDGE - WCDMA 1930MHz



BLOCKEDGE - WCDMA 1990MHz



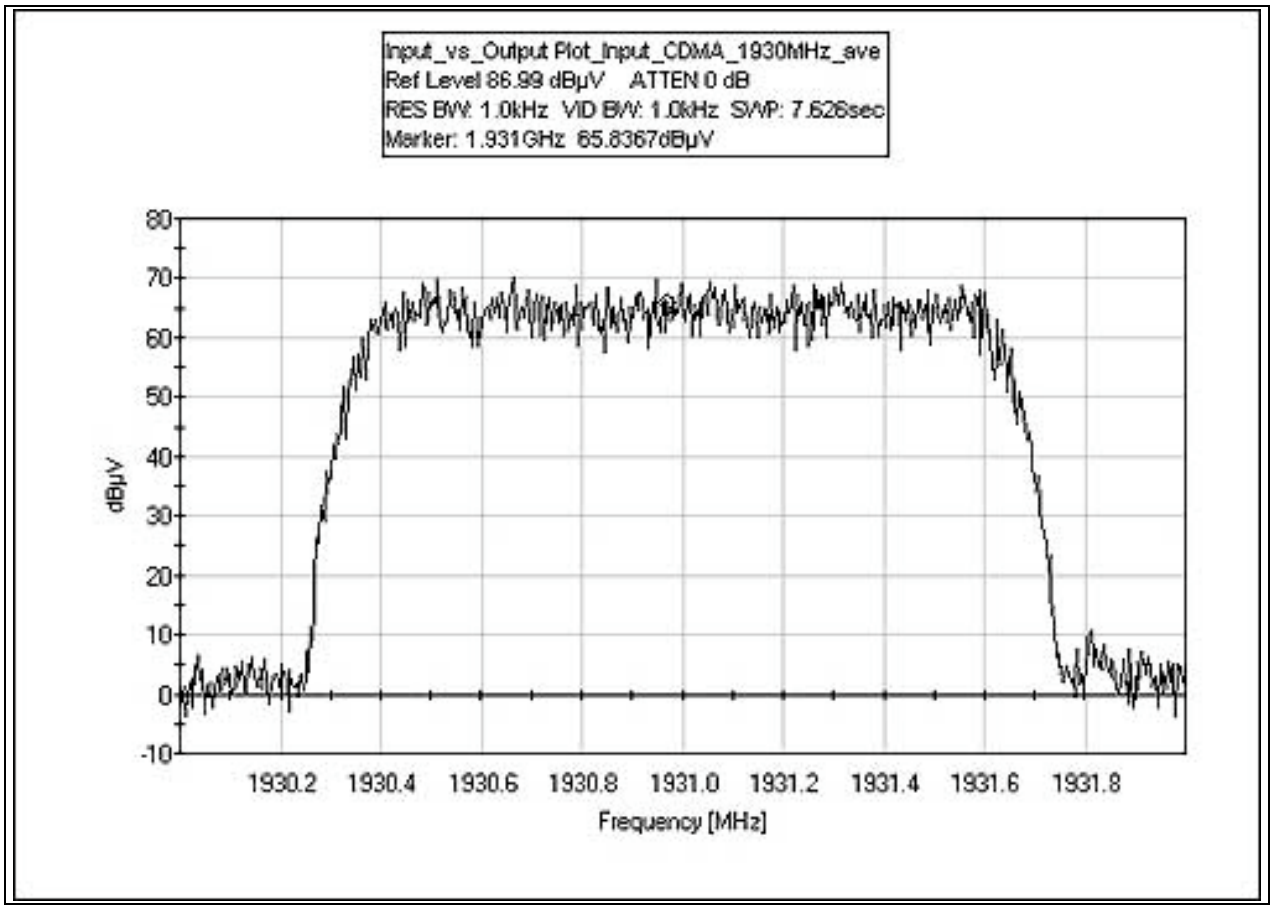
Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02672	Agilent	E4446A	US44300438	011405	011407

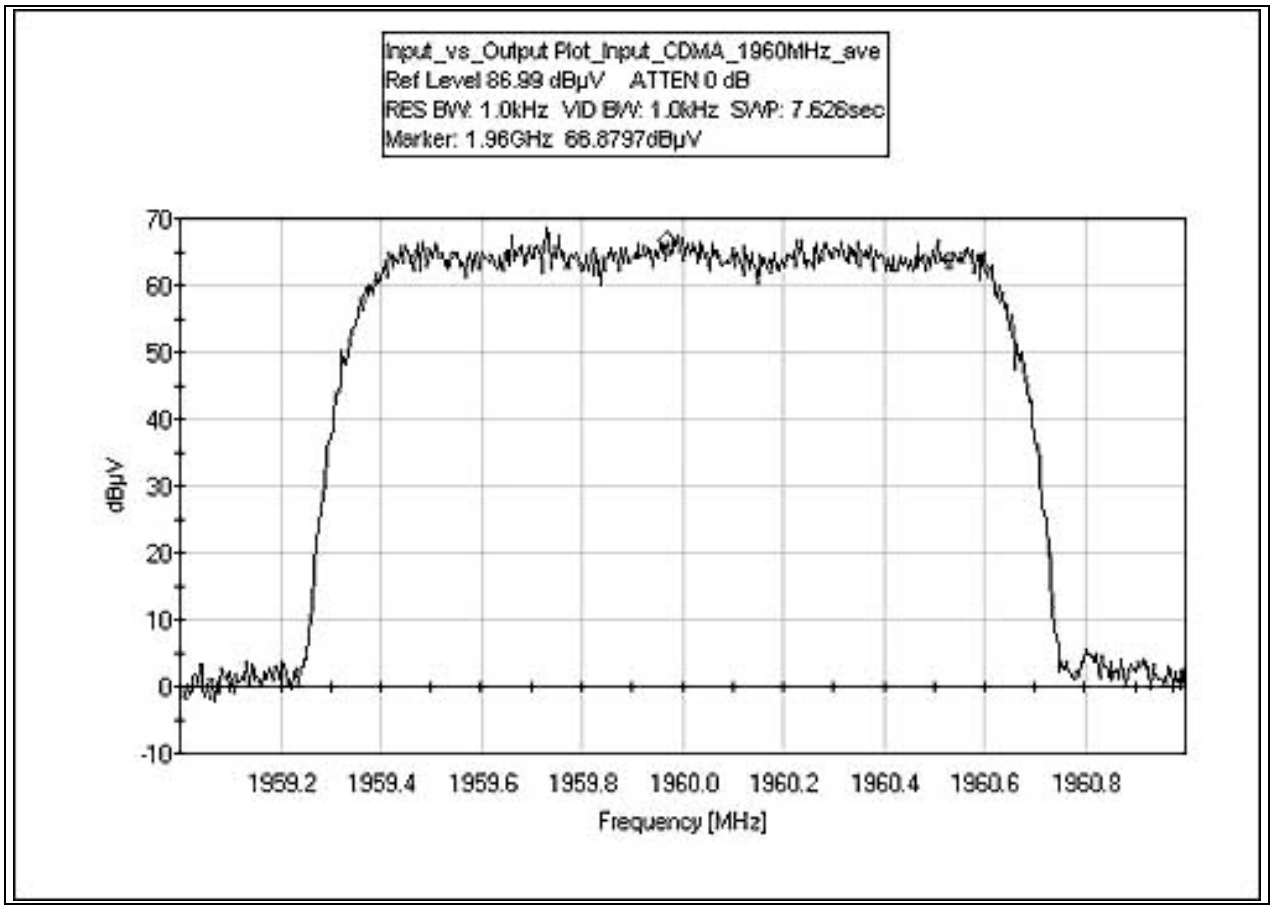
PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP

INPUT PLOT - CDMA 1930MHz

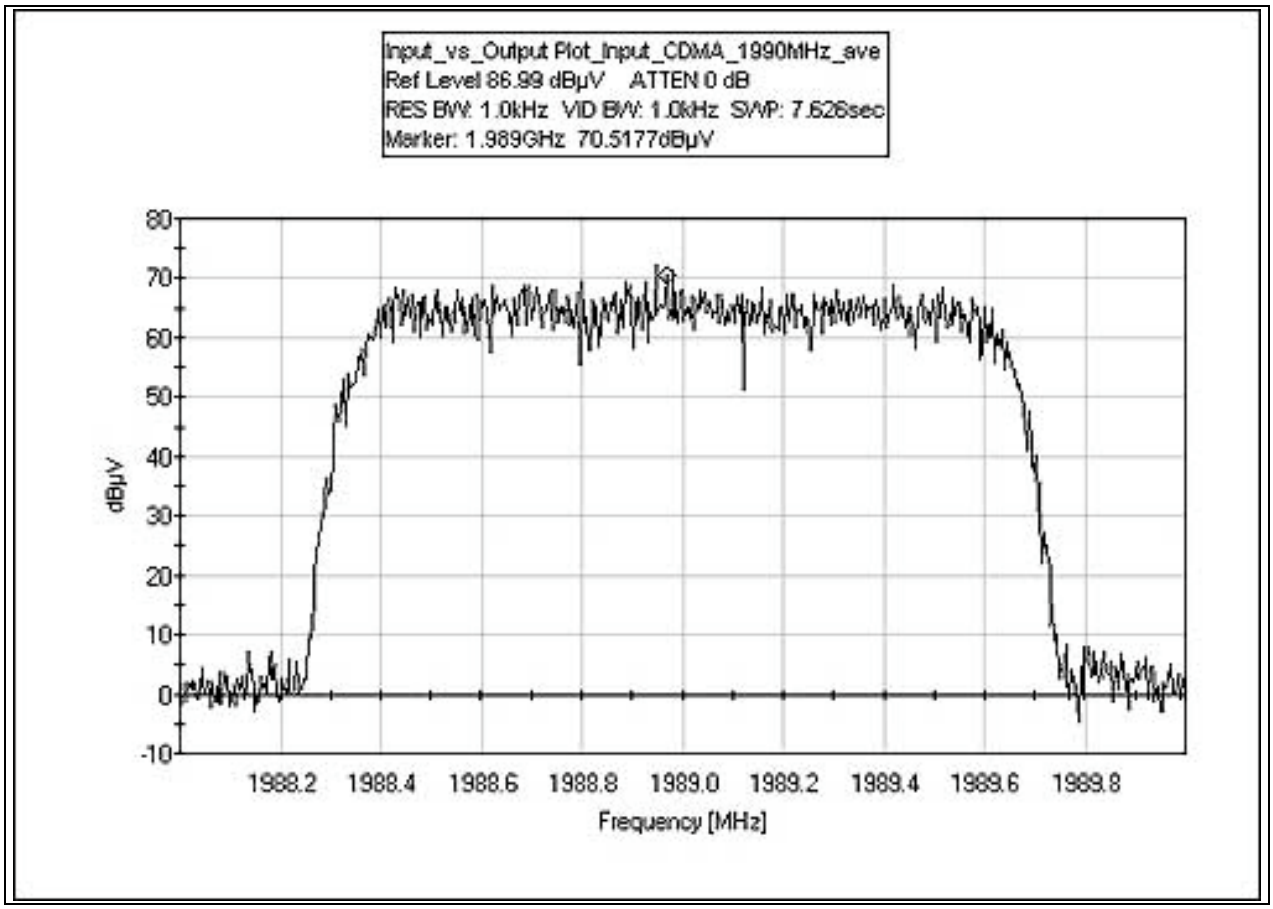
Test Conditions: The EUT is placed on the wooden table. RF out is connected to remote loadstring and power meter. RF in receives RF signal via remote ESGs and a preamp. The RF level is adjusted to maintain the transmit power. measurement performed at antenna port.



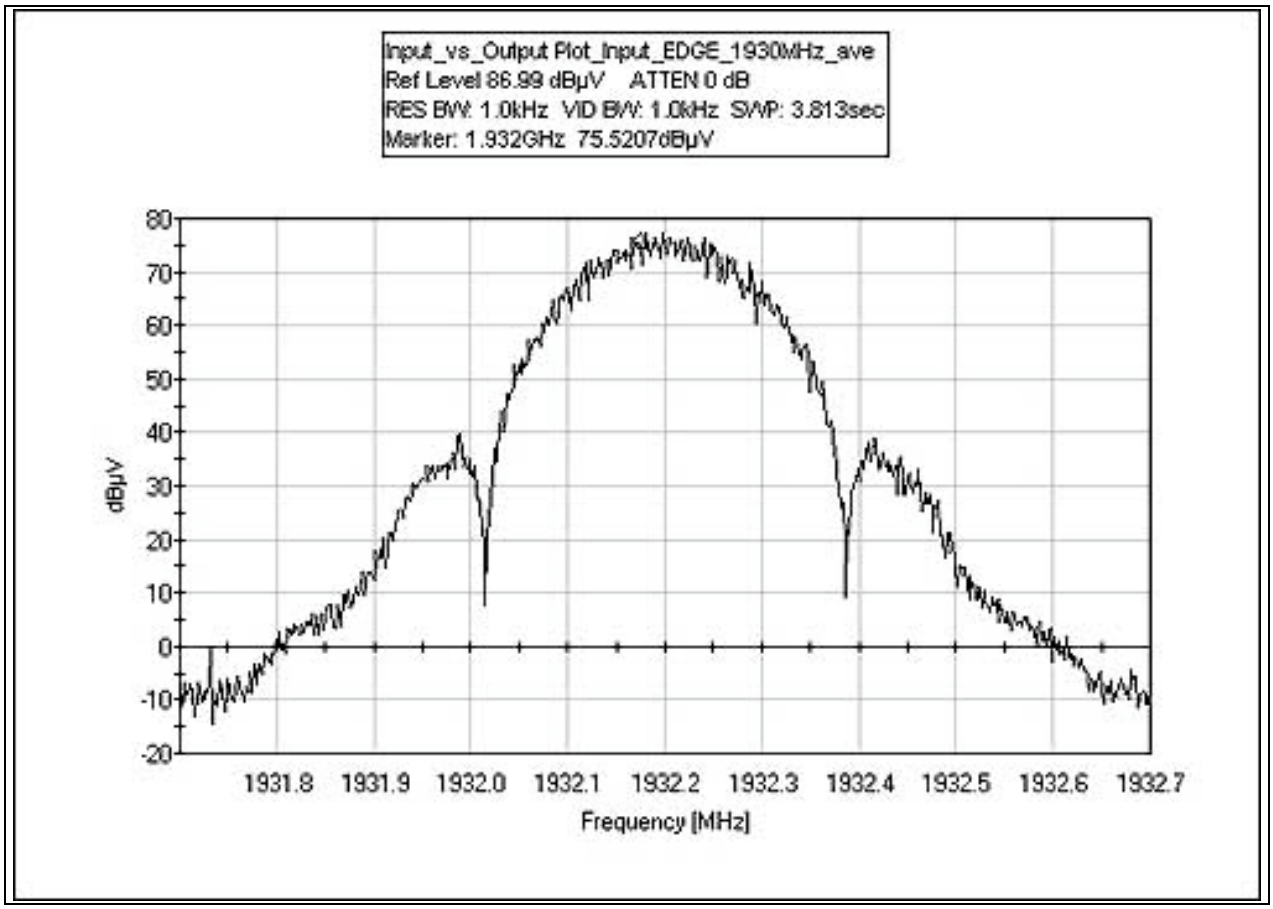
INPUT PLOT - CDMA 1960MHz



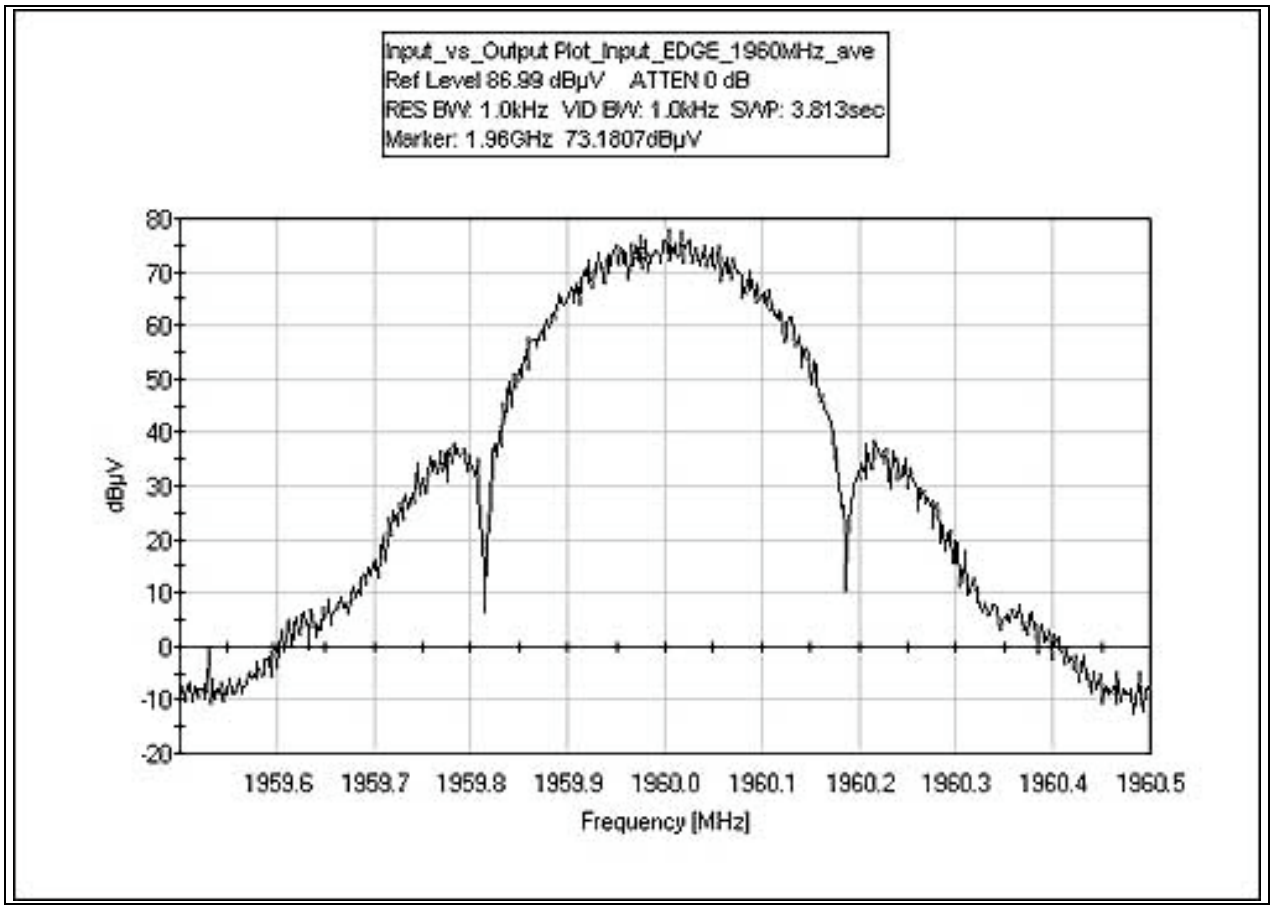
INPUT PLOT - CDMA 1990MHz



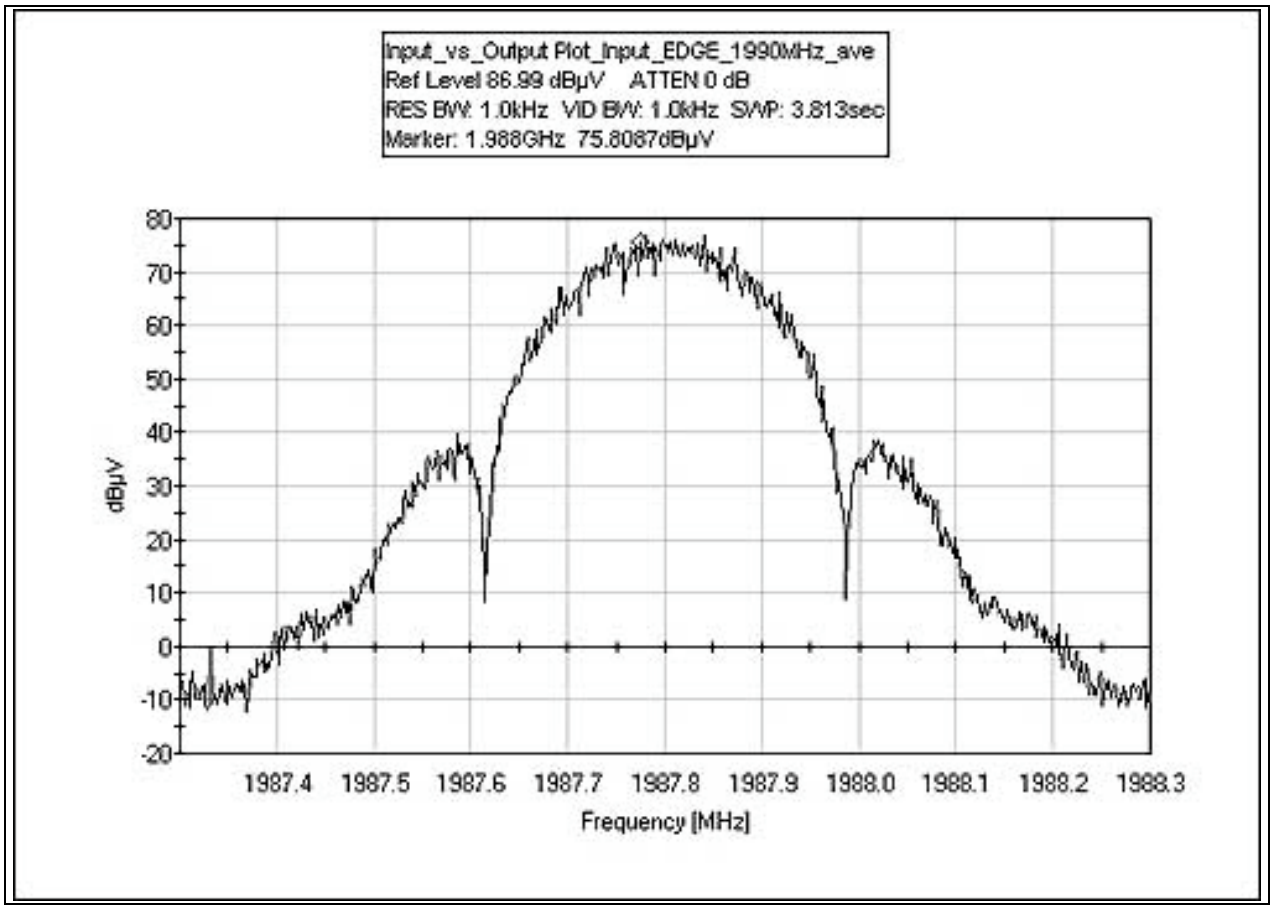
INPUT PLOT - EDGE 1930MHz



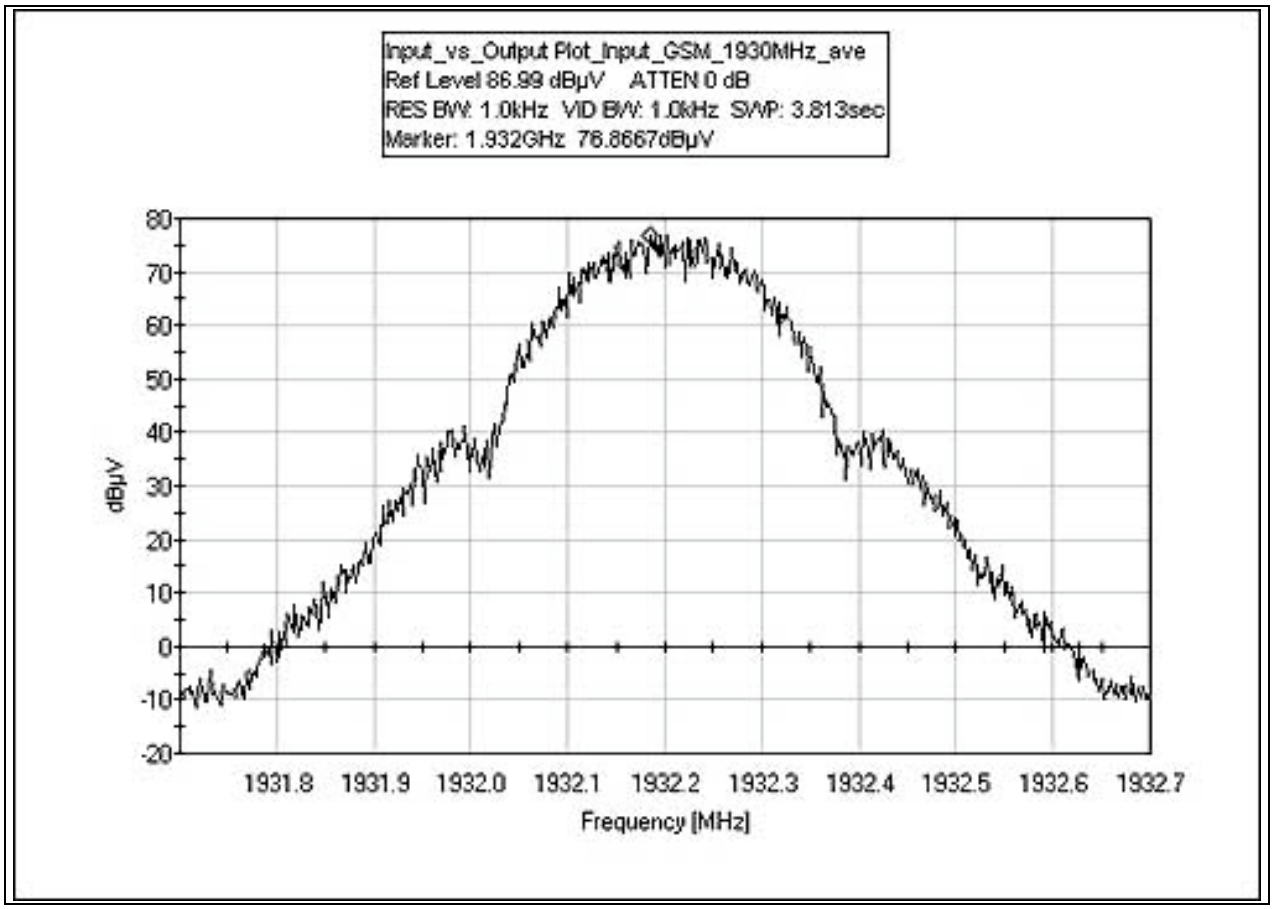
INPUT PLOT - EDGE 1960MHz



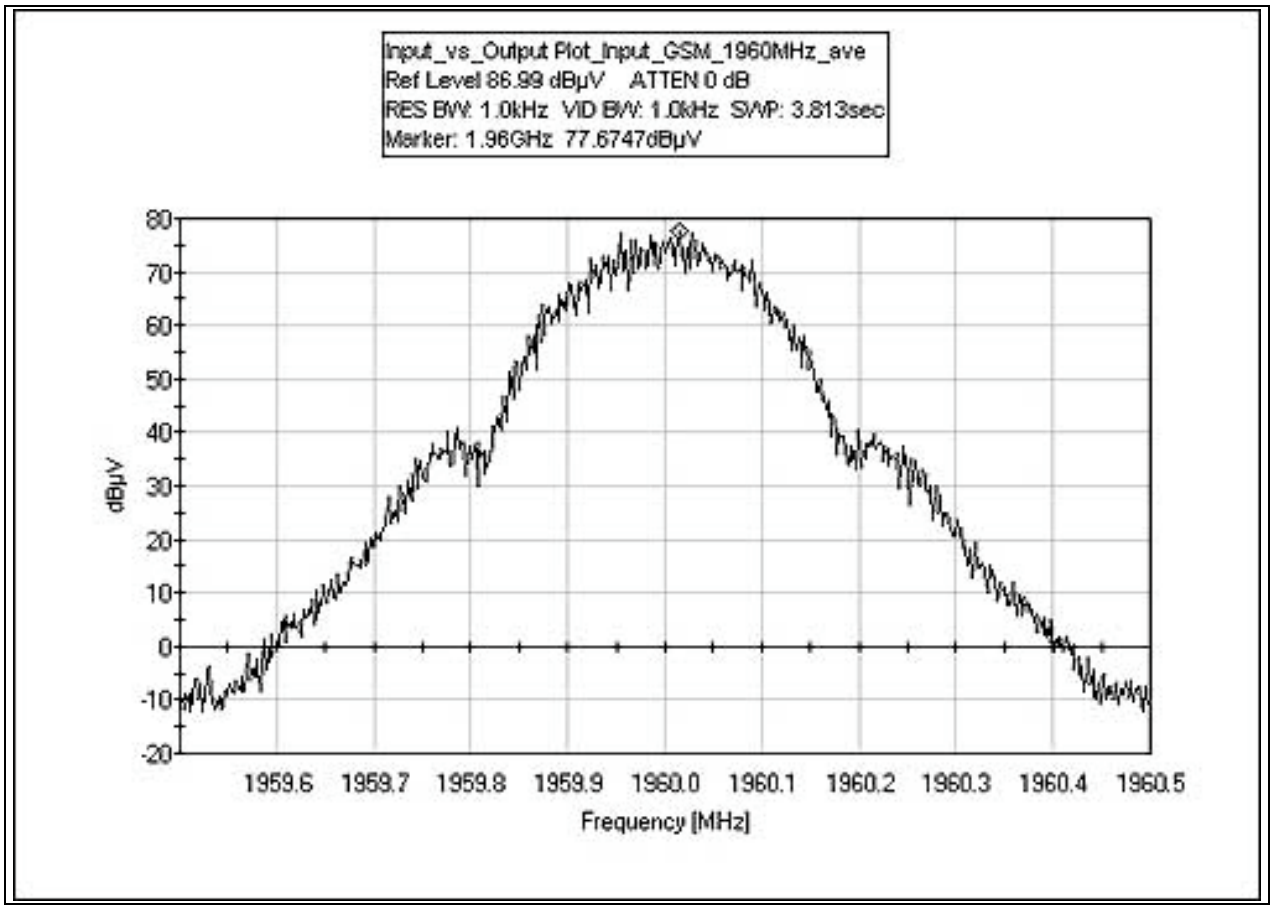
INPUT PLOT - EDGE 1990MHz



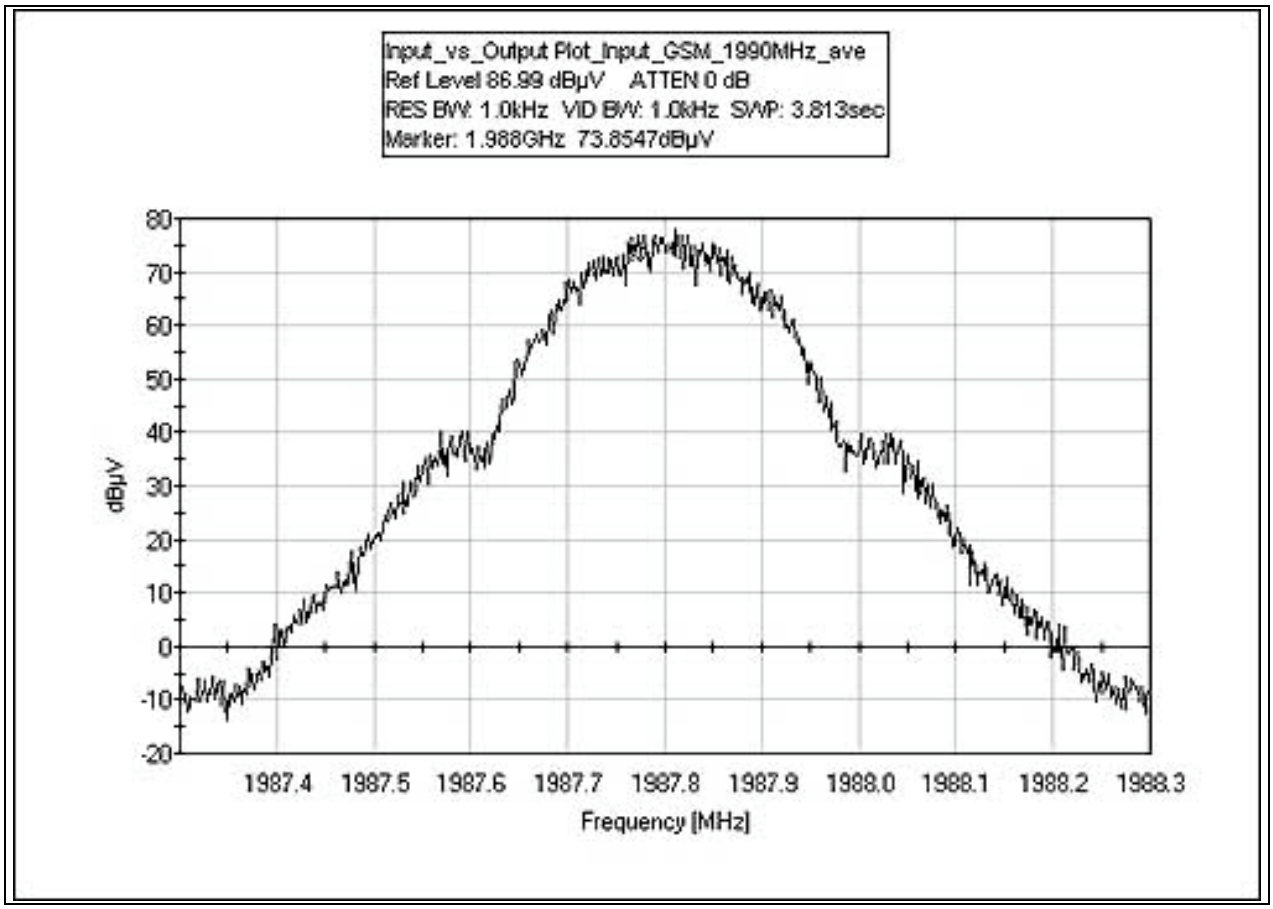
INPUT PLOT - GSM 1930MHz



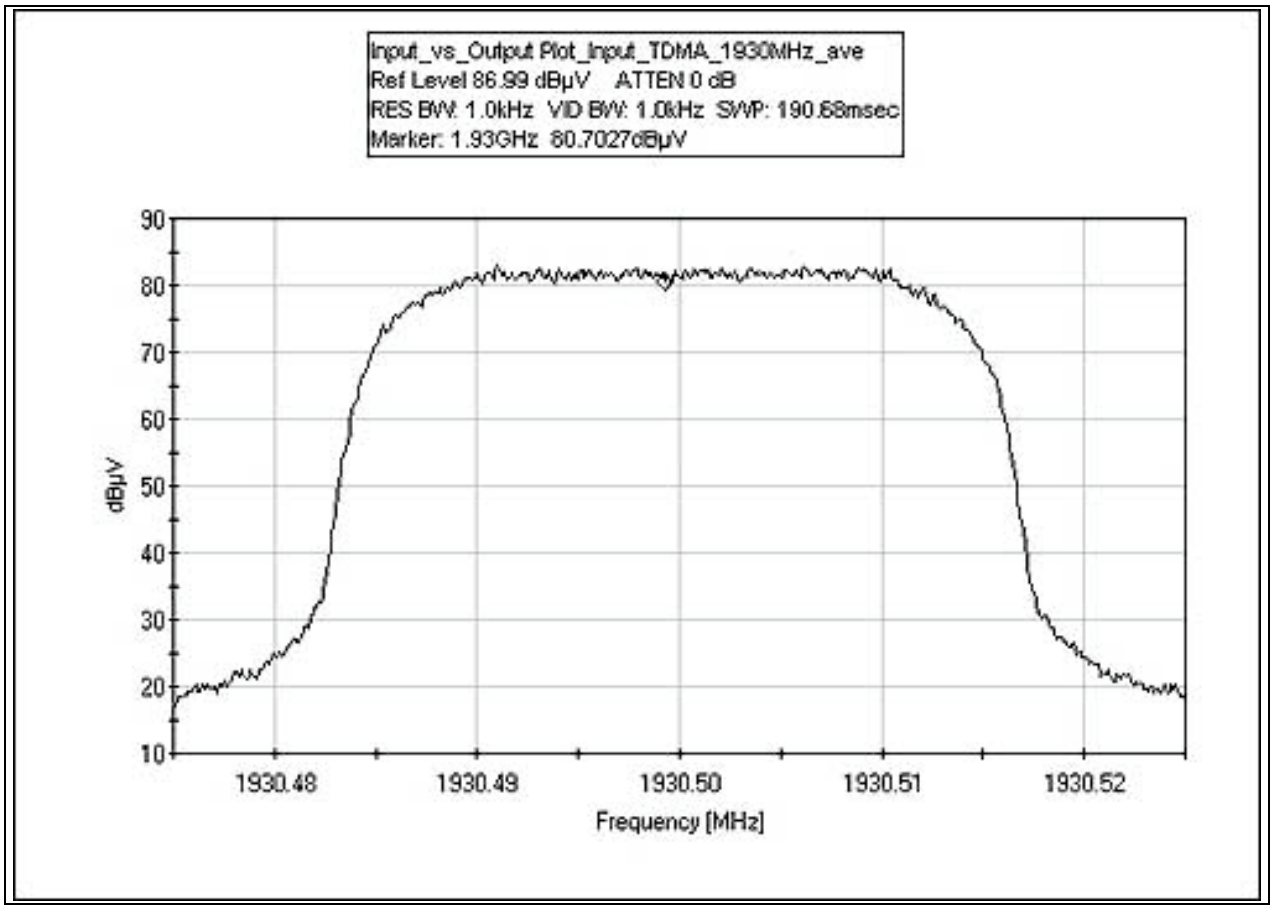
INPUT PLOT - GSM 1960MHz



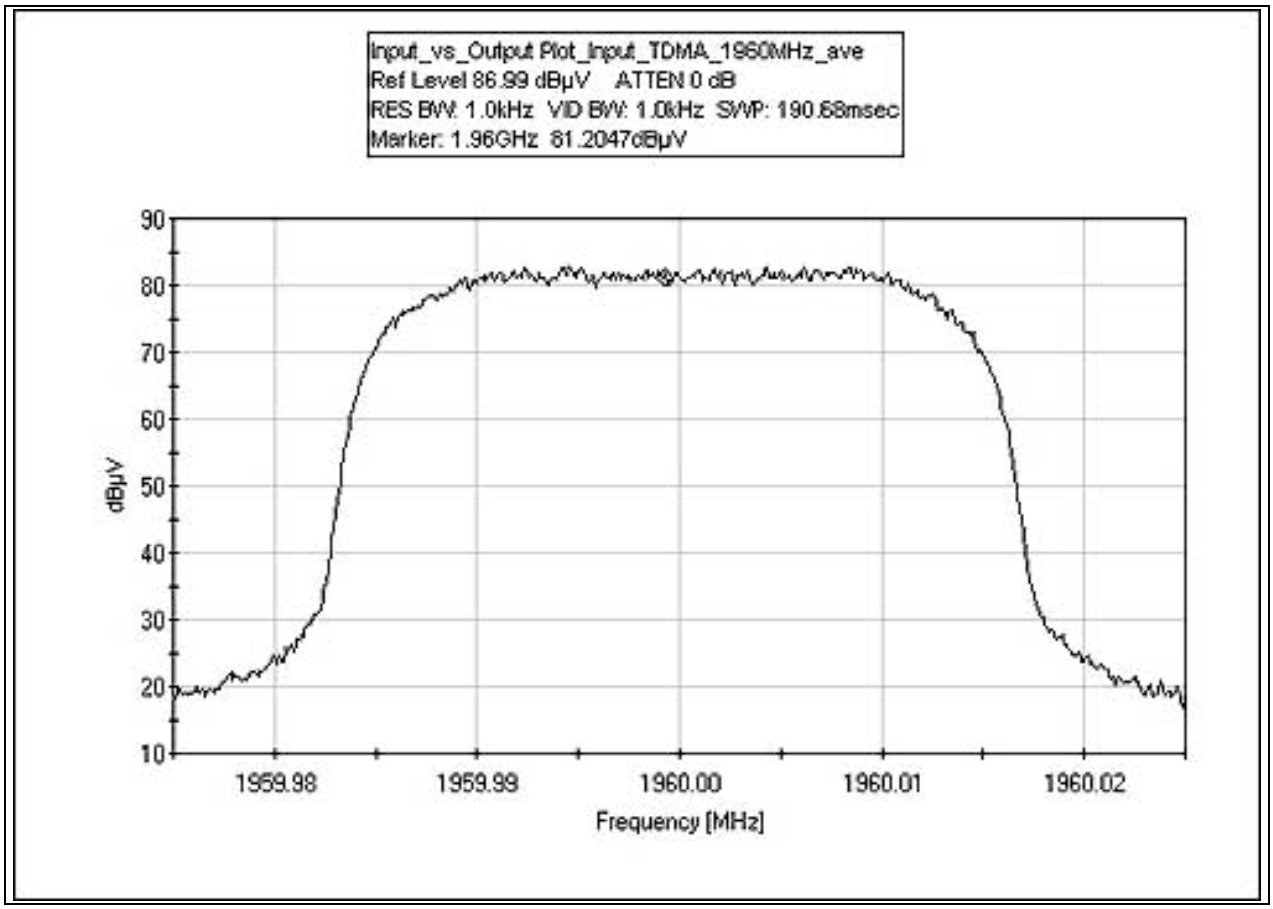
INPUT PLOT - GSM 1990MHz



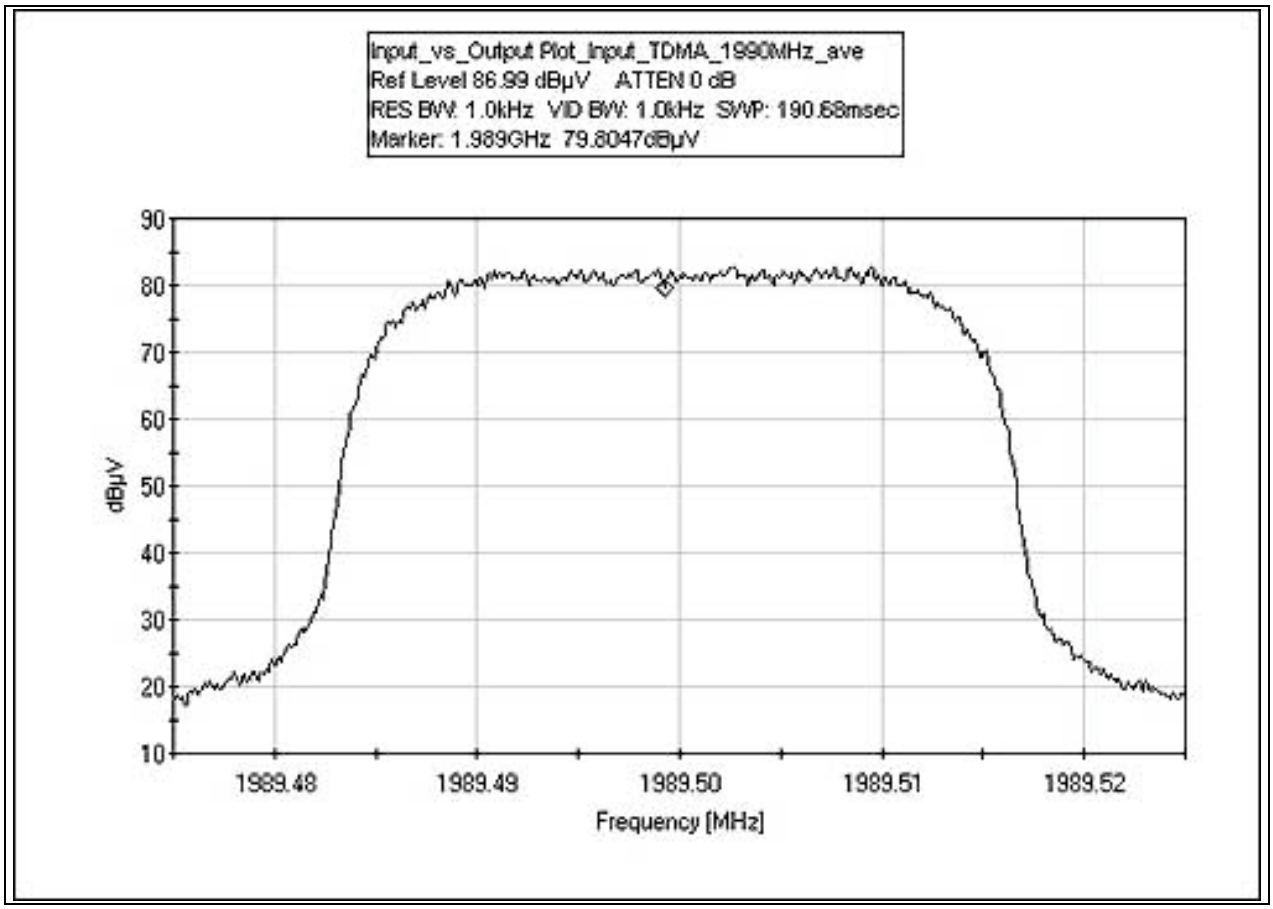
INPUT PLOT - TDMA 1930MHz



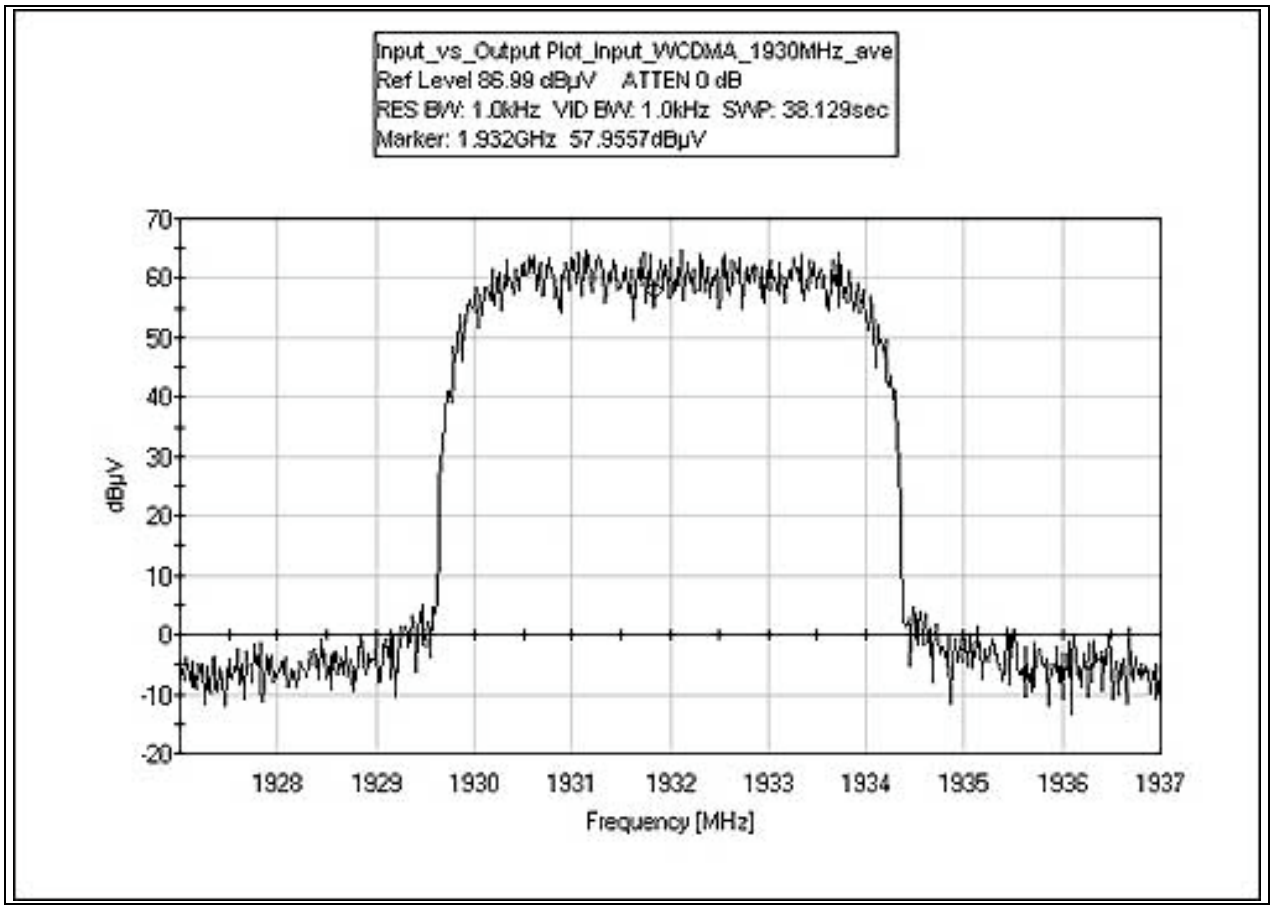
INPUT PLOT - TDMA 1960MHz



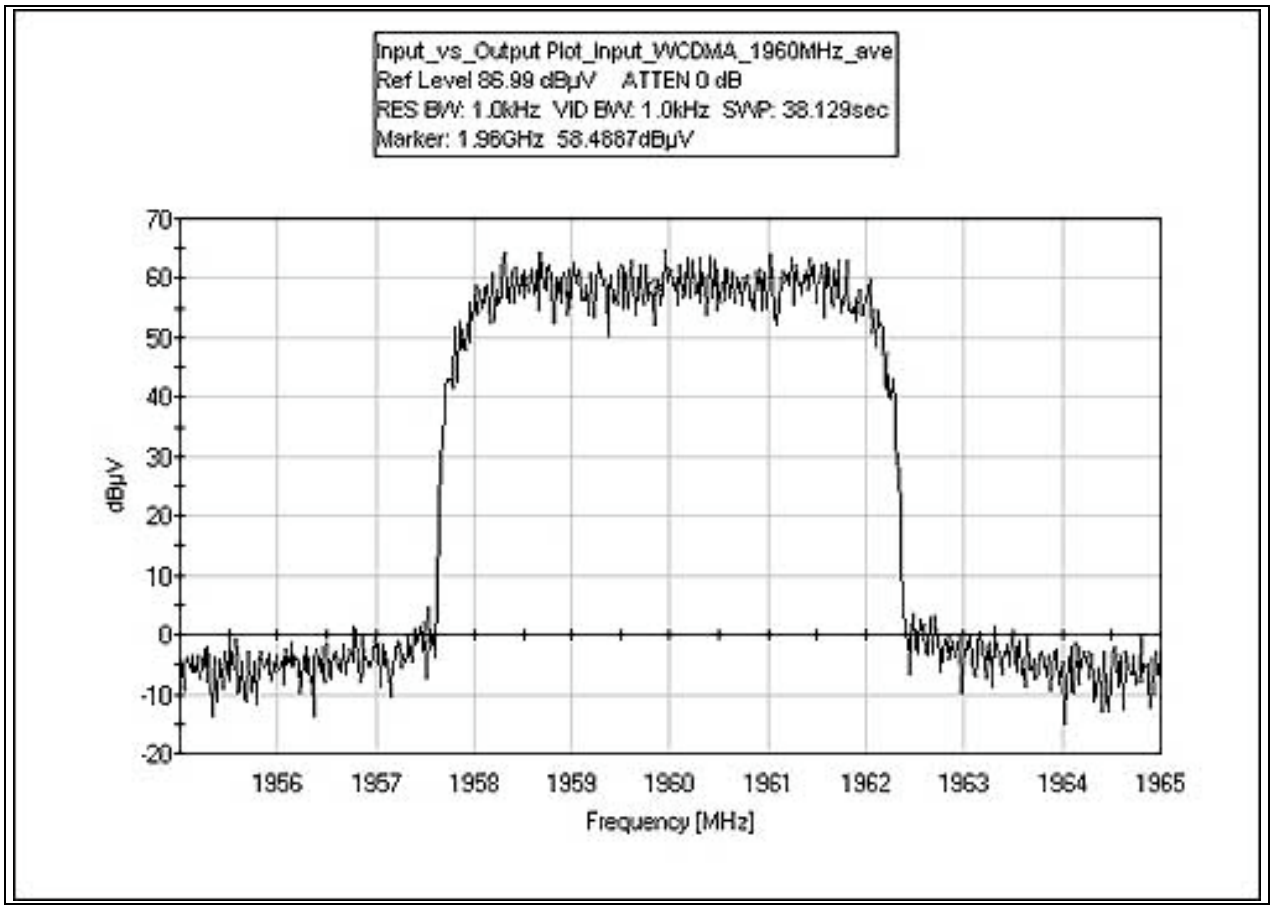
INPUT PLOT - TDMA 1990MHz



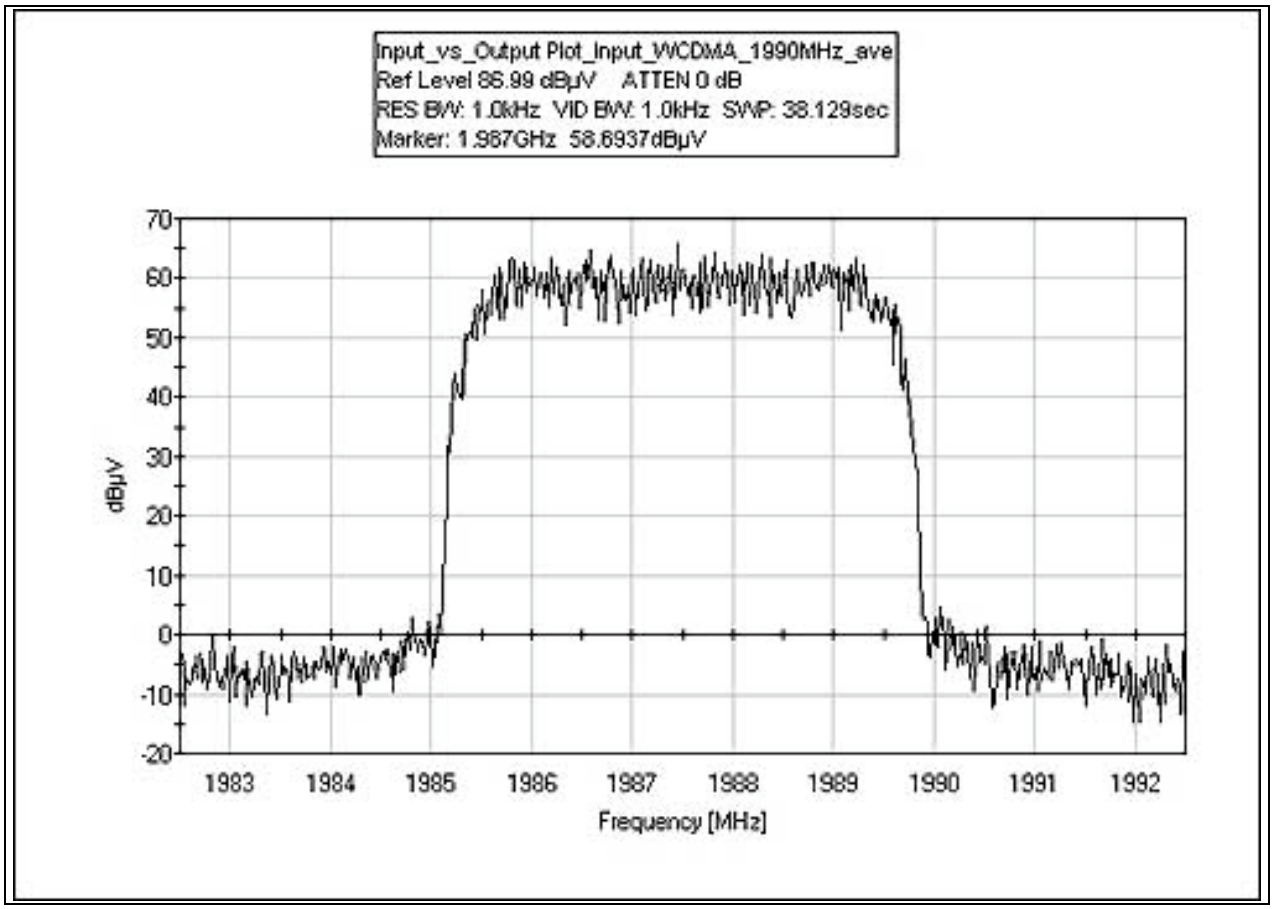
INPUT PLOT - WCDMA 1930MHz



INPUT PLOT - WCDMA 1960MHz



INPUT PLOT - WCDMA 1990MHz



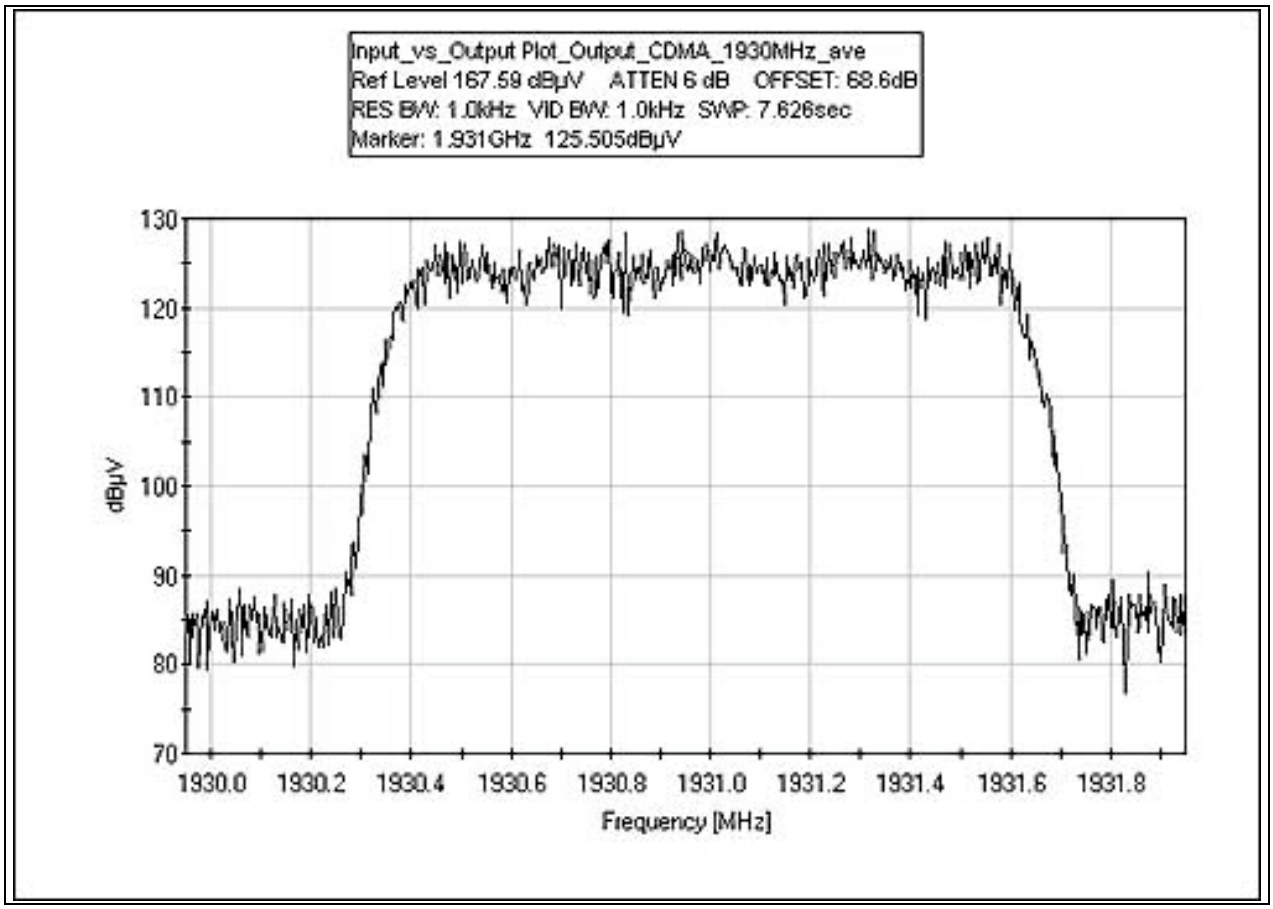
Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02672	Agilent	E4446A	US44300438	011405	011407

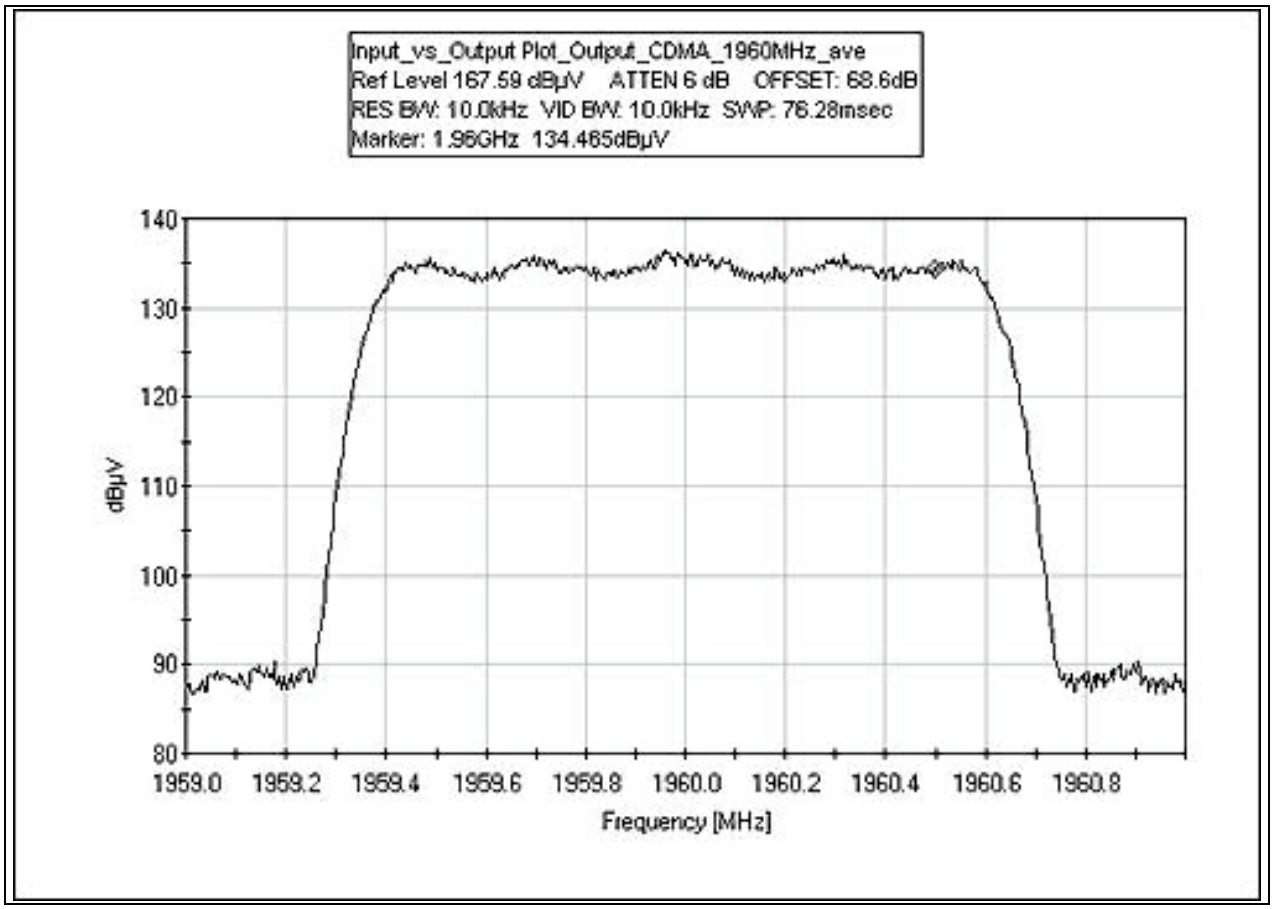
PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP

OUTPUT PLOT - CDMA 1930MHz

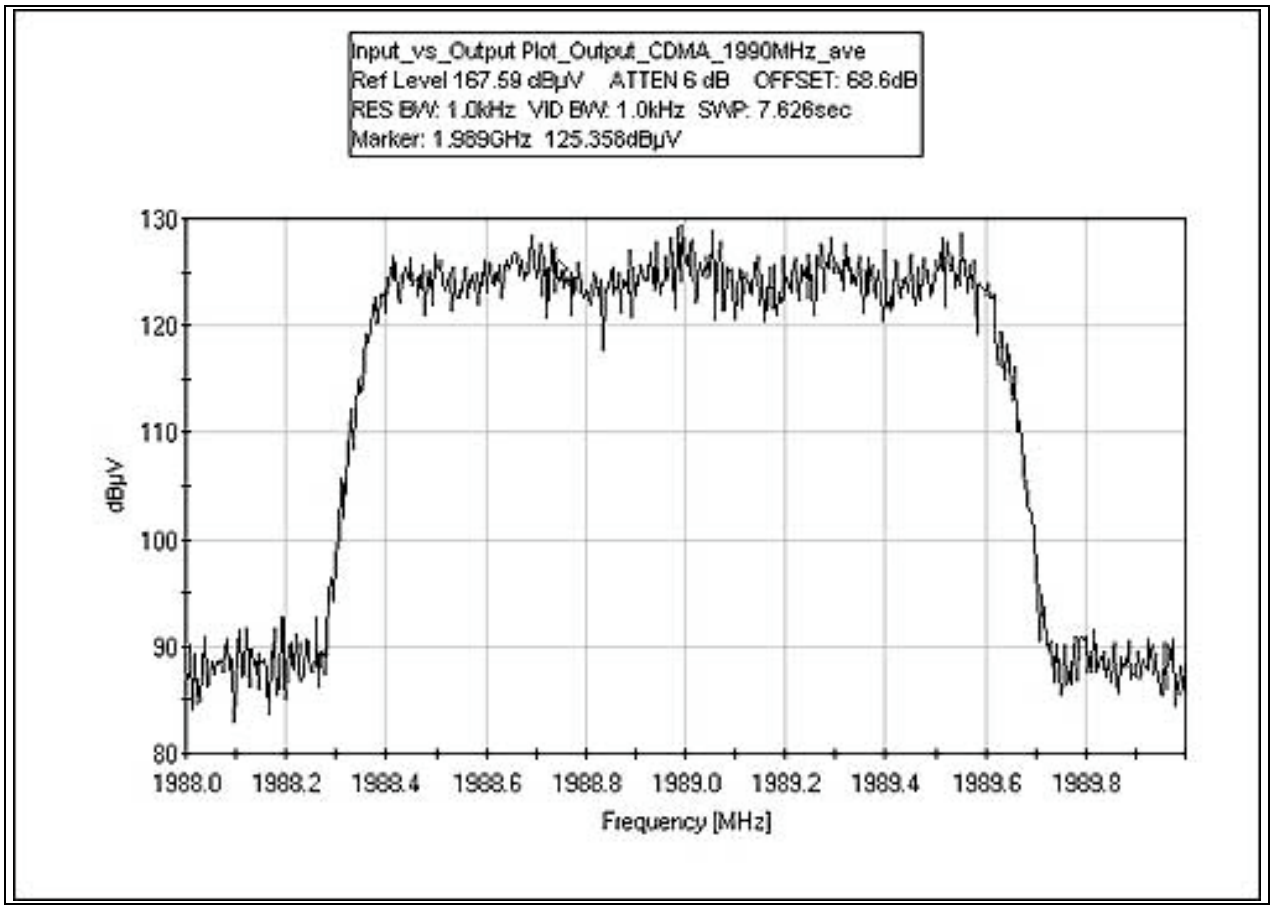
Test Conditions: The EUT is placed on the wooden table. RF out is connected to remote loadstring and power meter. RF in receives RF signal via remote ESGs and a preamp. The RF level is adjusted to maintain the transmit power. measurement performed at antenna port.



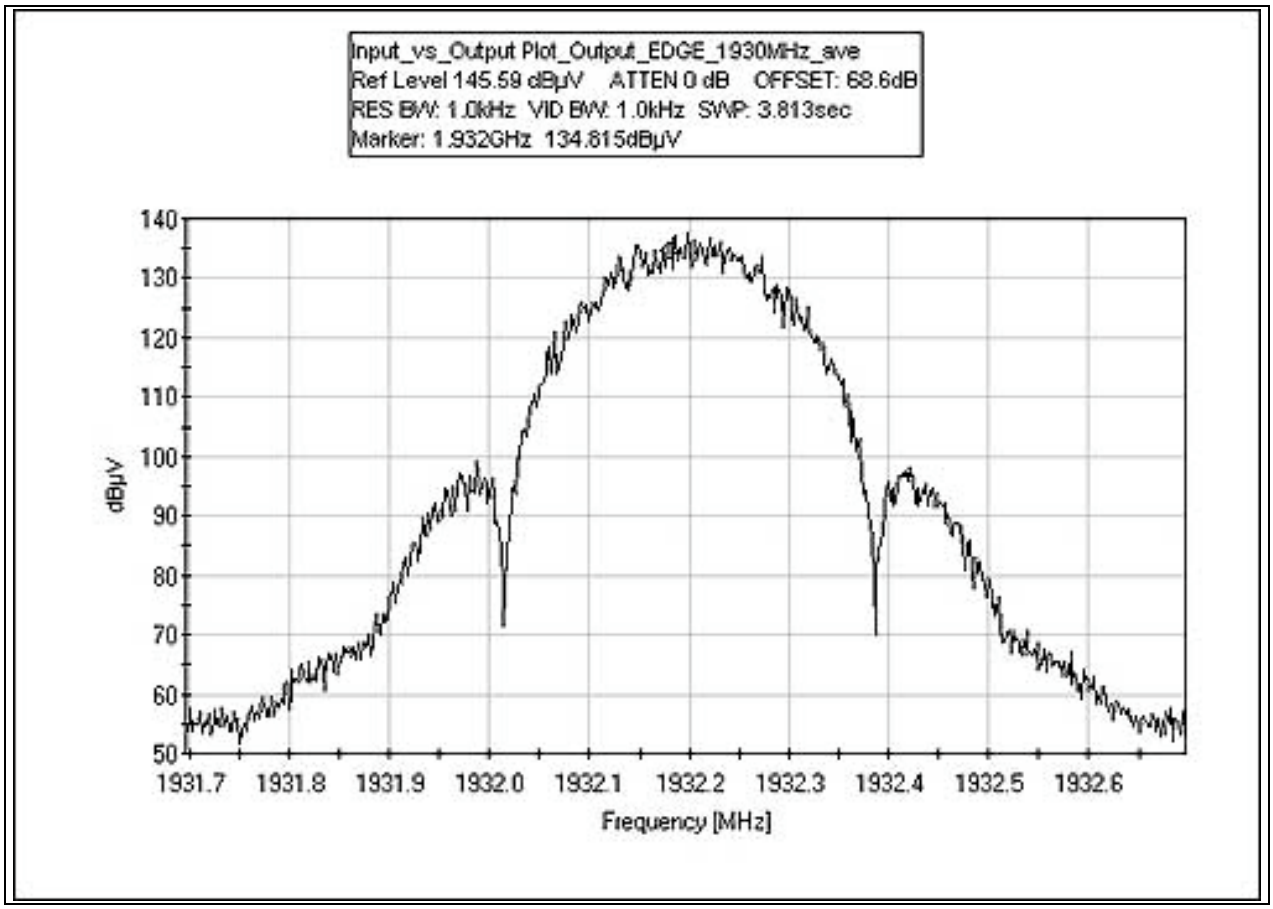
OUTPUT PLOT - CDMA 1960MHz



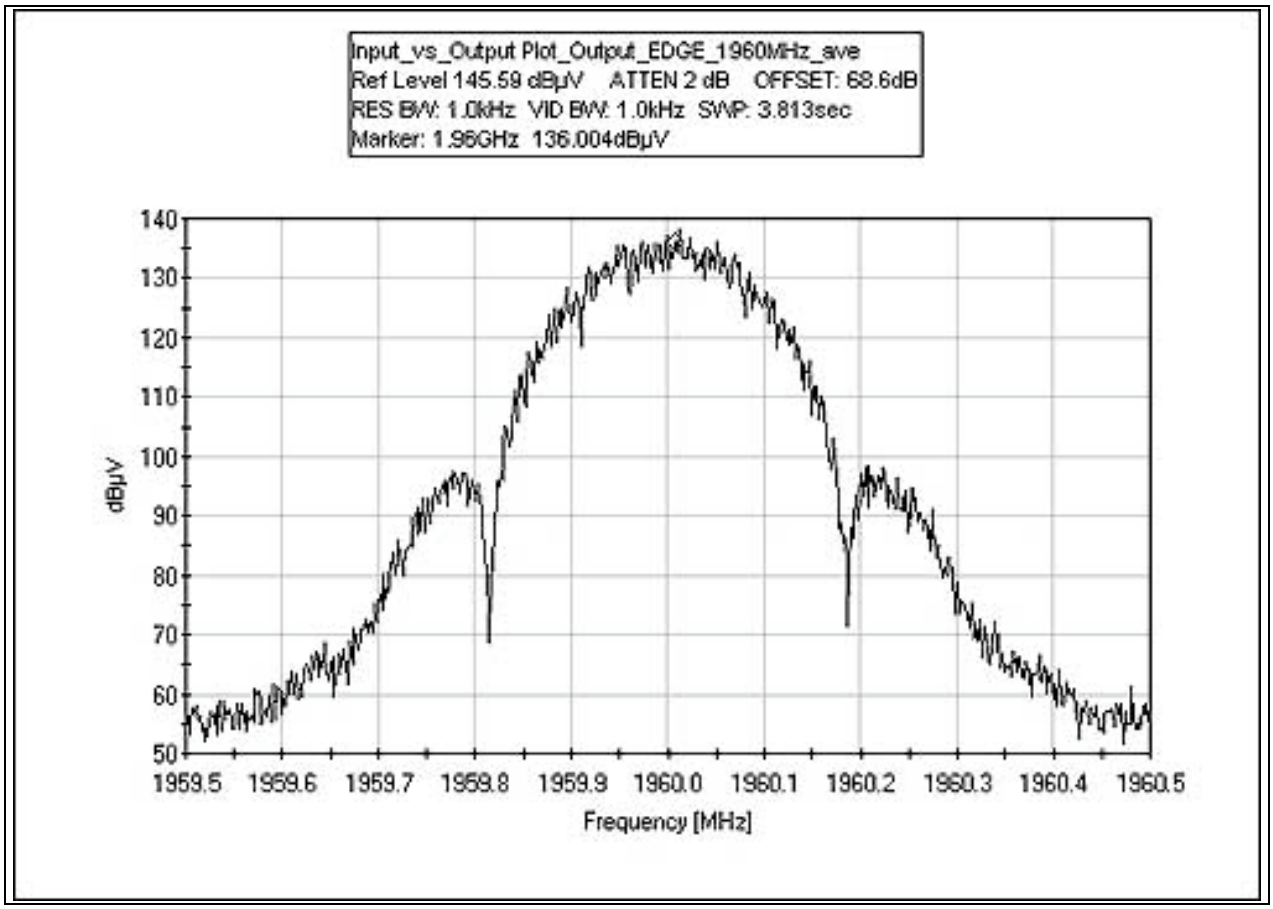
OUTPUT PLOT - CDMA 1990MHz



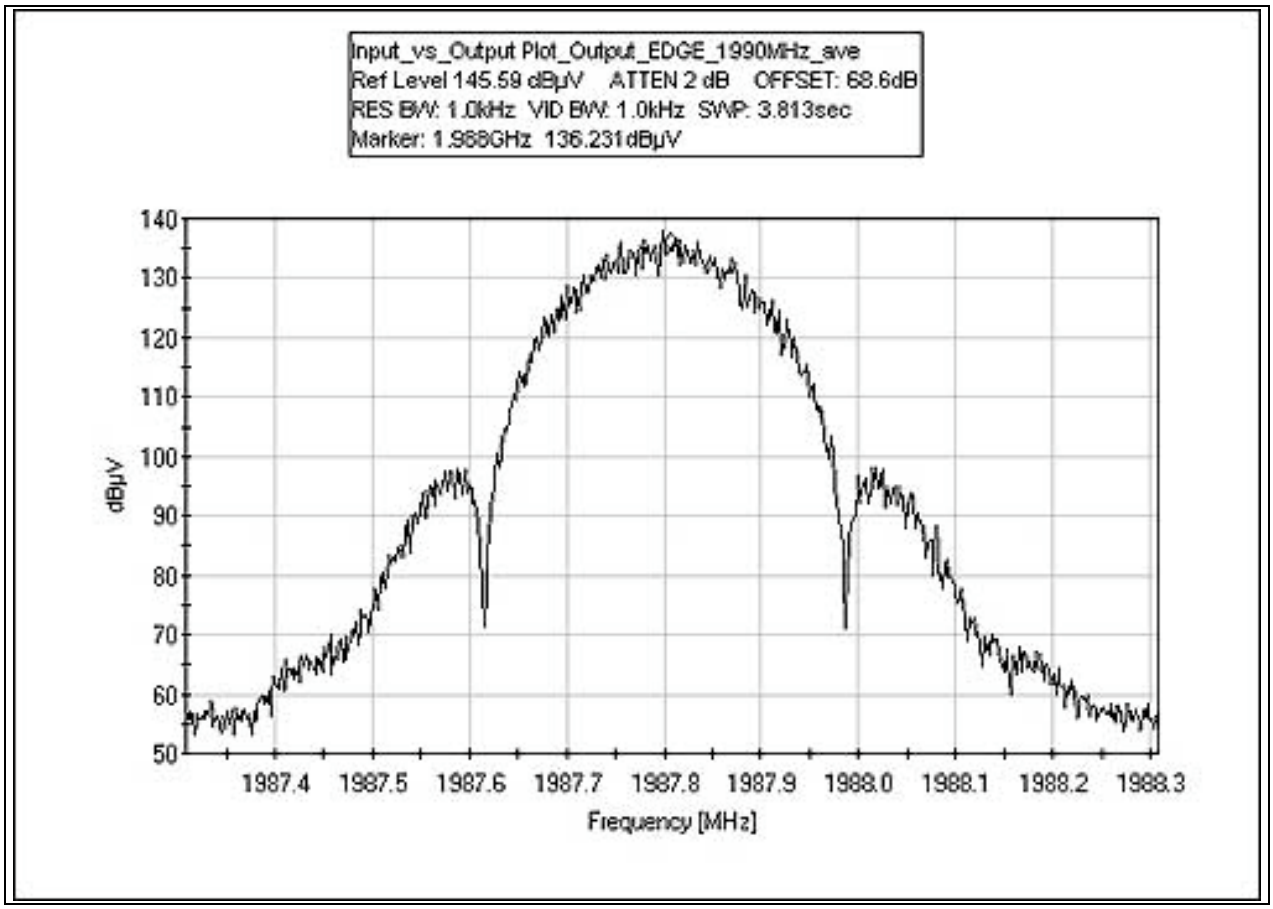
OUTPUT PLOT - EDGE 1930MHz



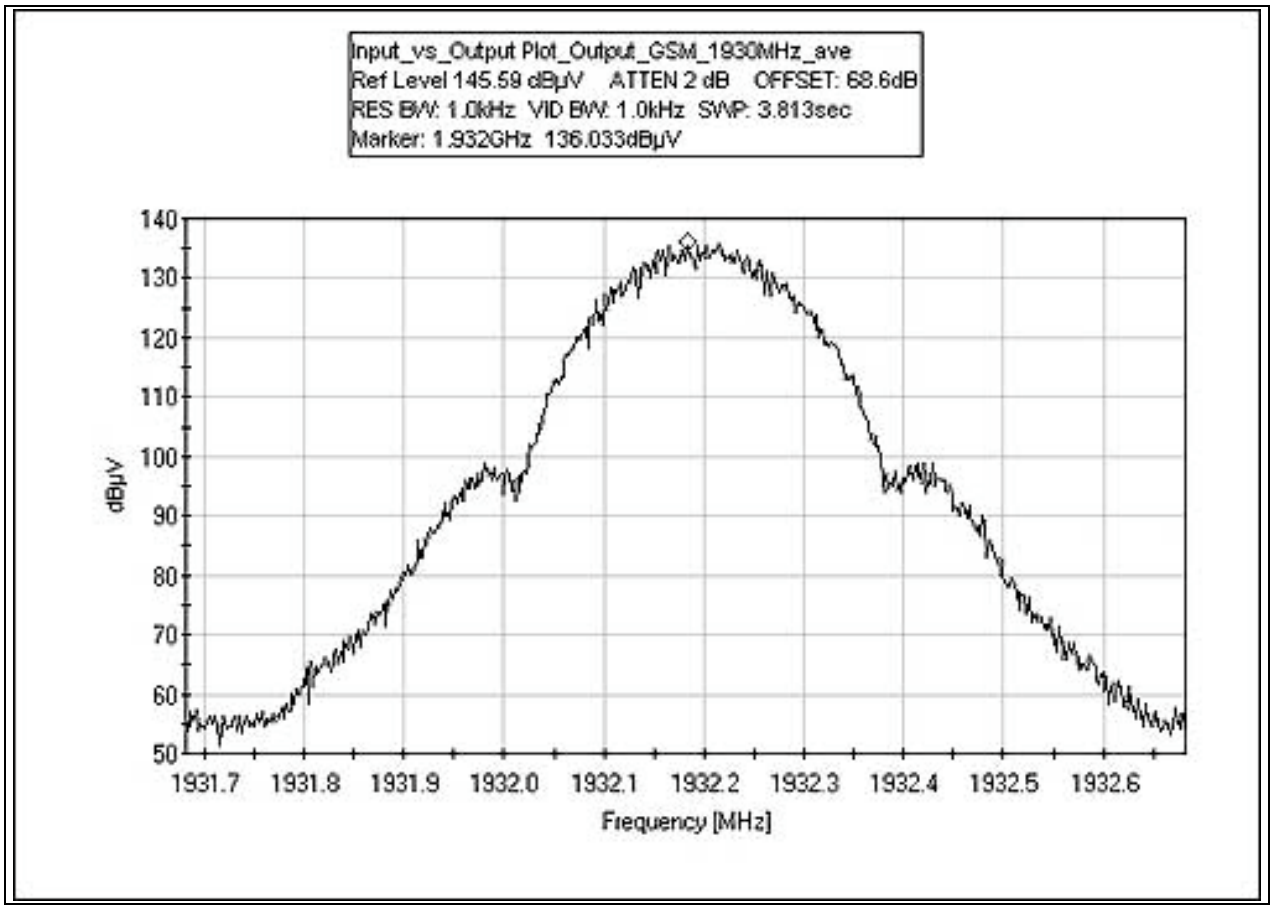
OUTPUT PLOT - EDGE 1960MHz



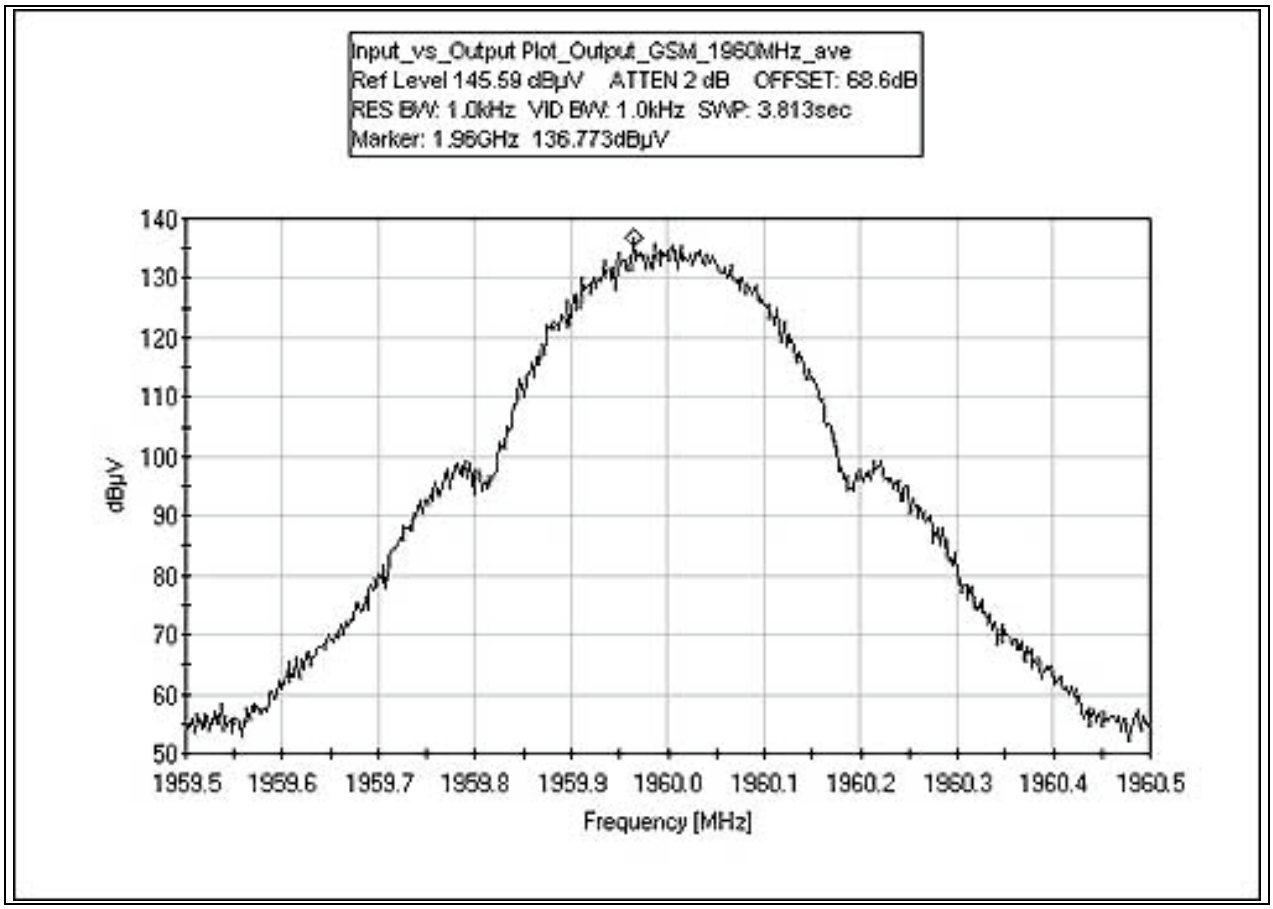
OUTPUT PLOT - EDGE 1990MHz



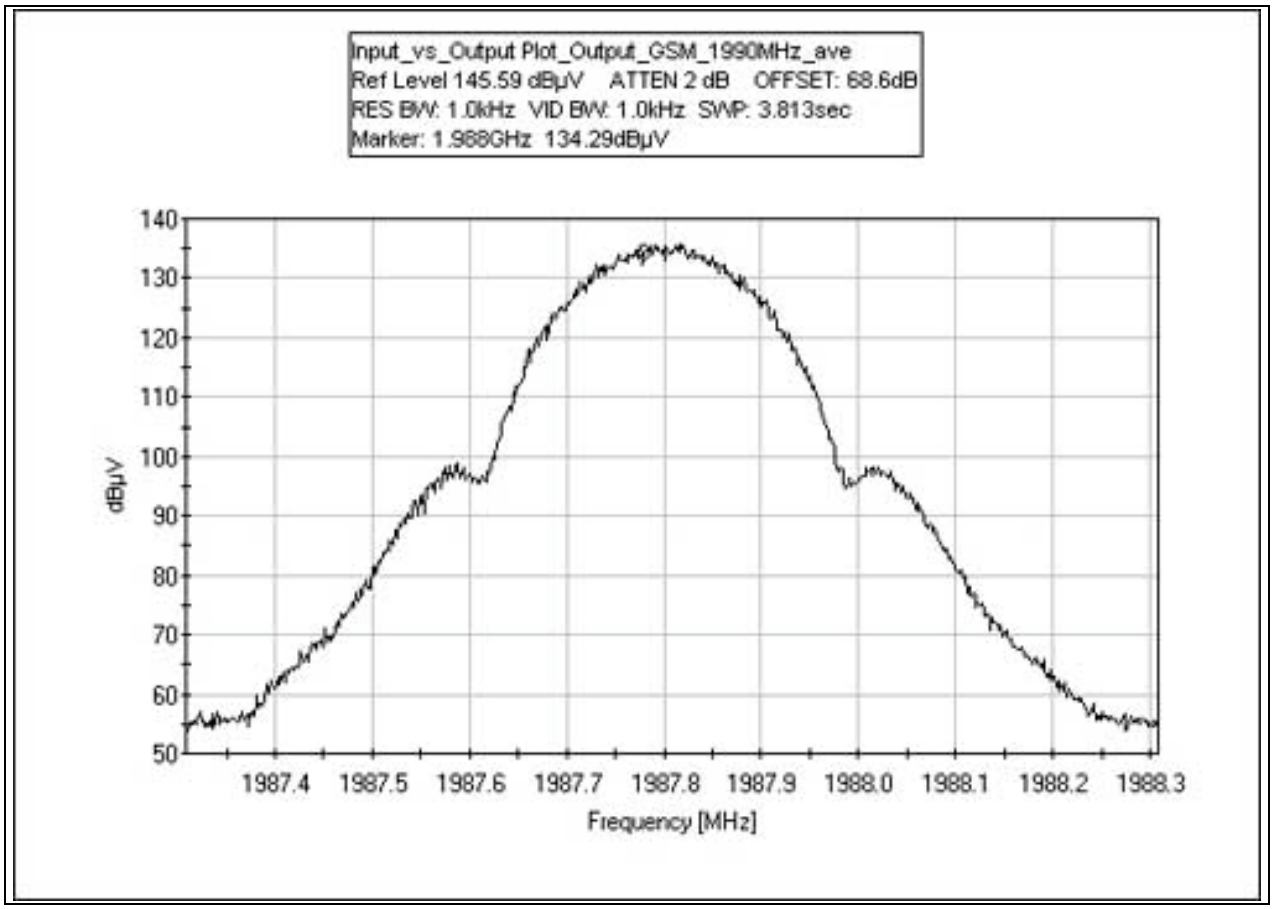
OUTPUT PLOT - GSM 1930MHz



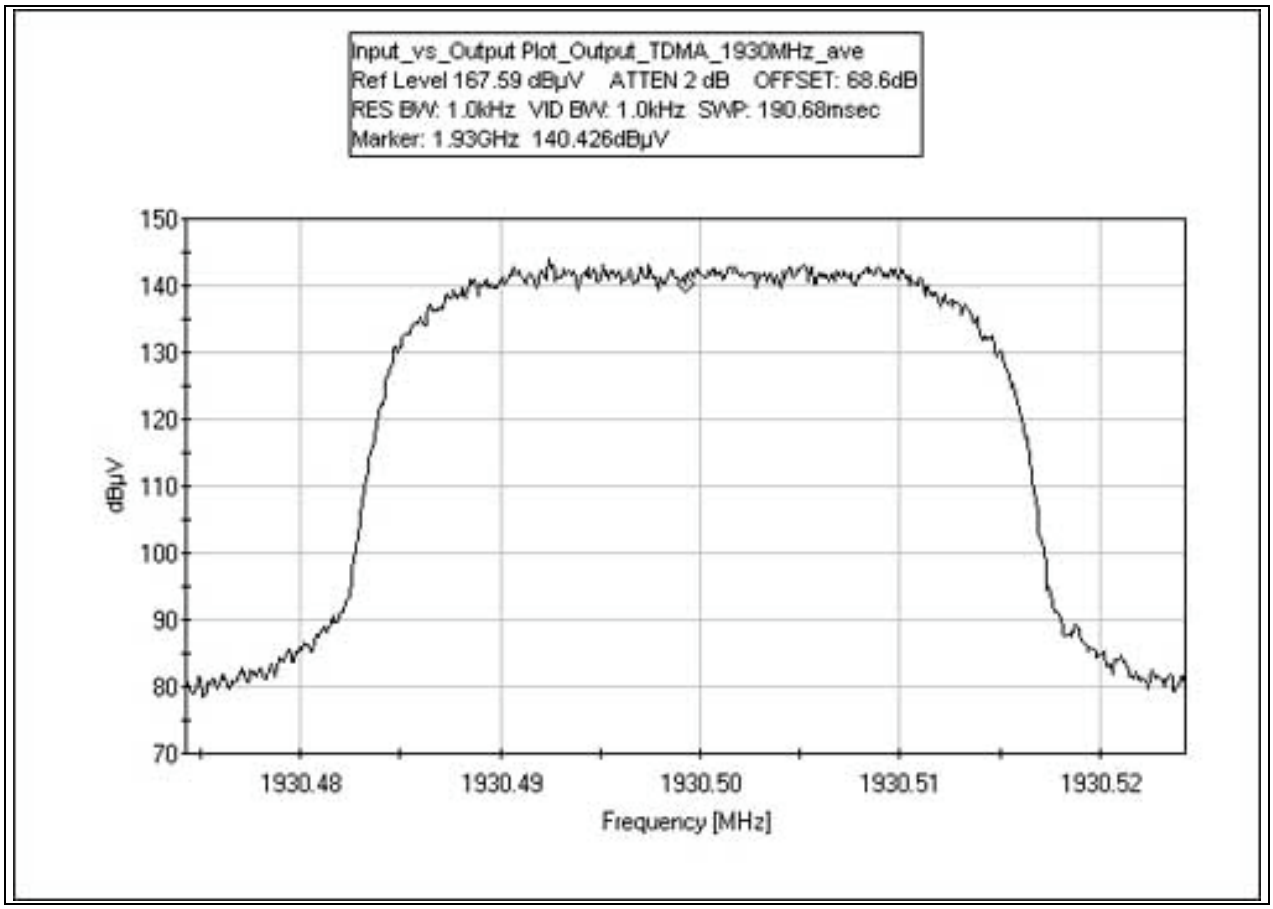
OUTPUT PLOT - GSM 1960MHz



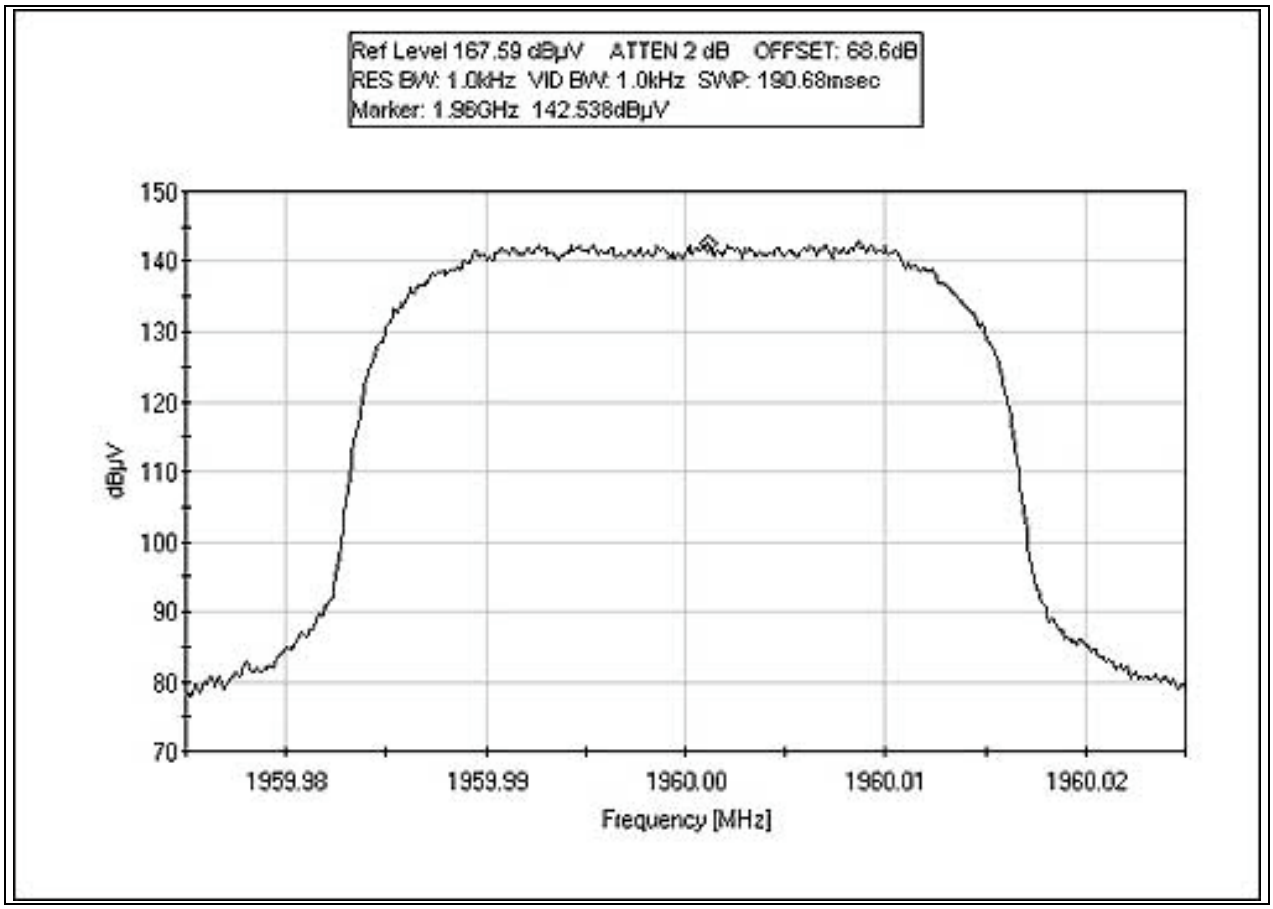
OUTPUT PLOT - GSM 1990MHz



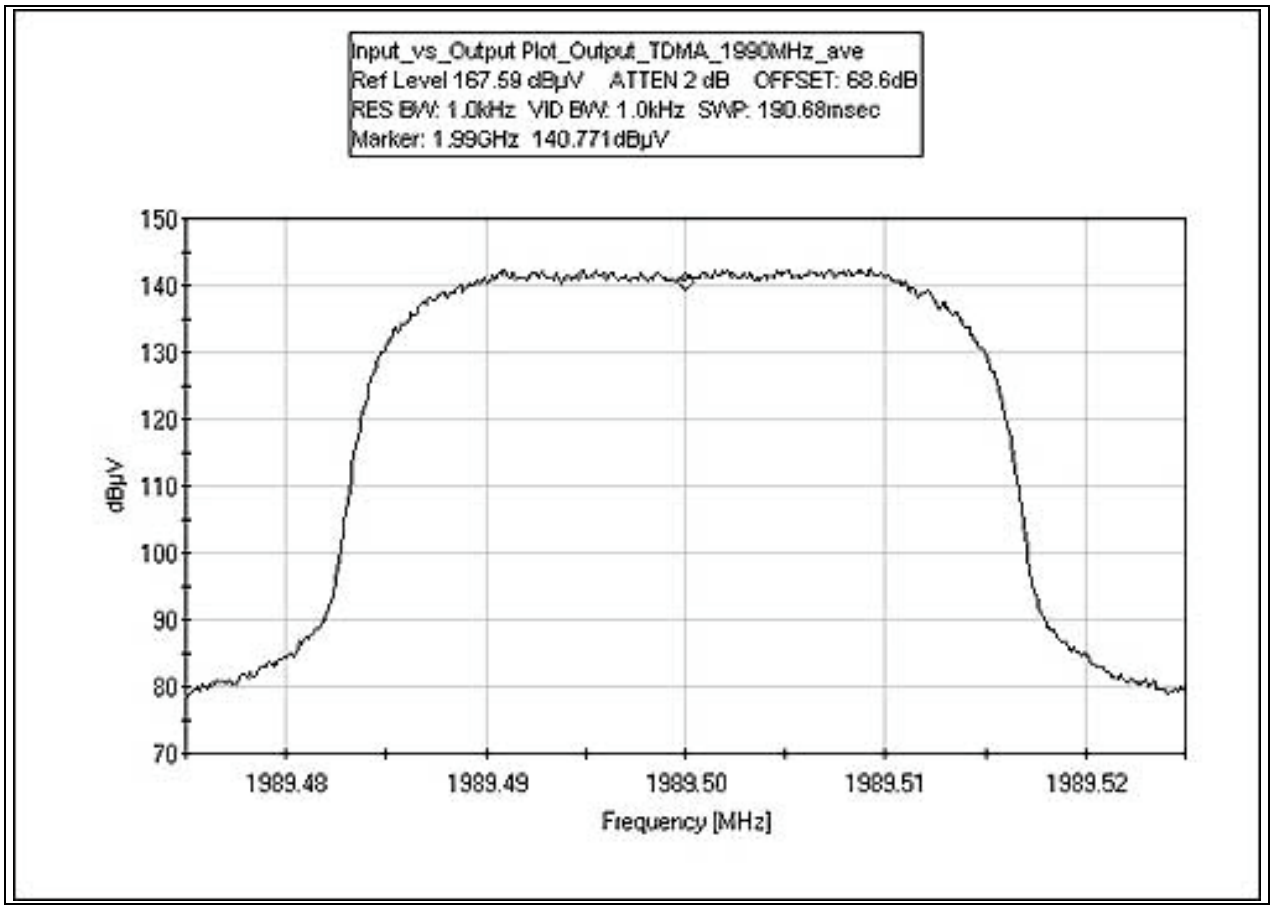
OUTPUT PLOT - TDMA 1930MHz



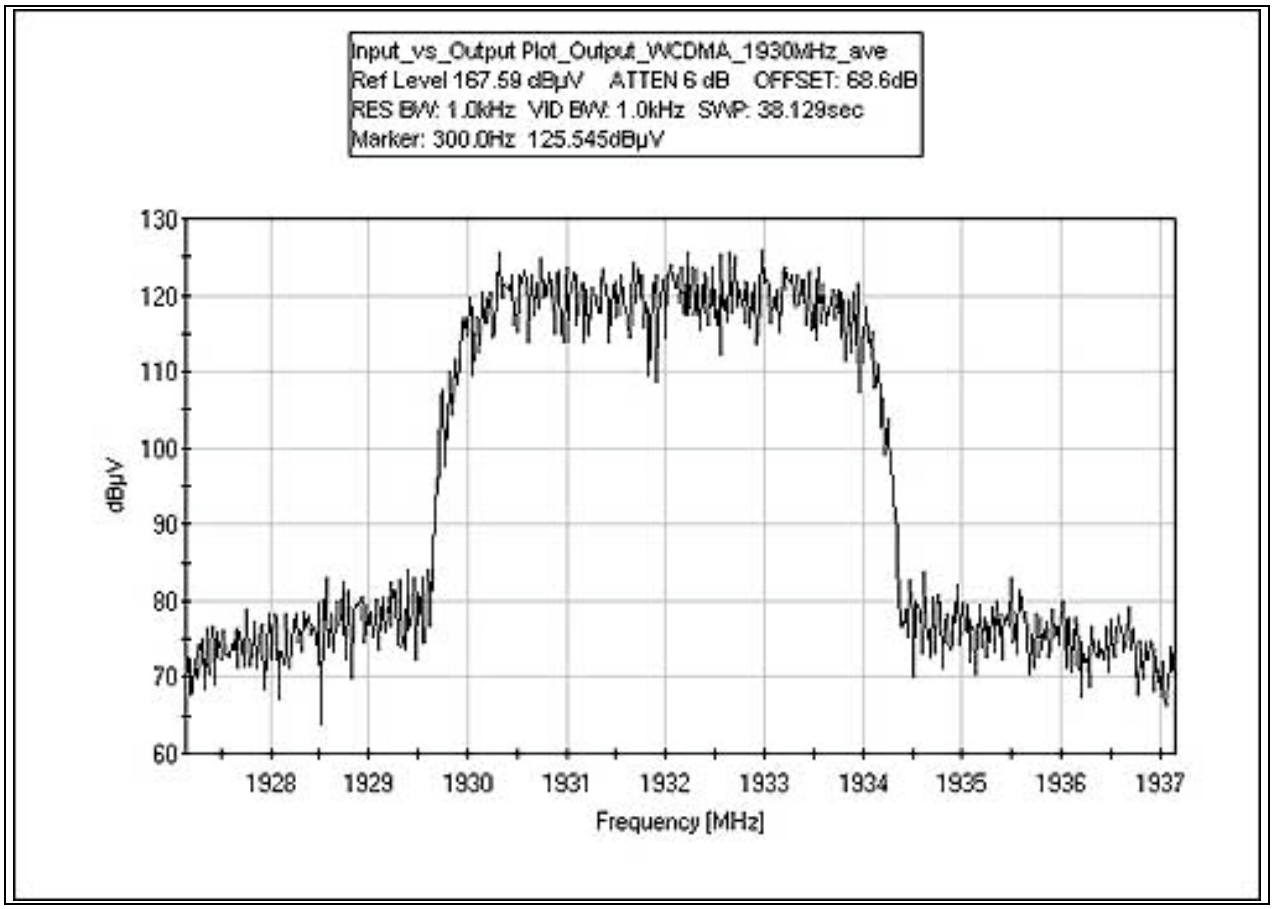
OUTPUT PLOT - TDMA 1960MHz



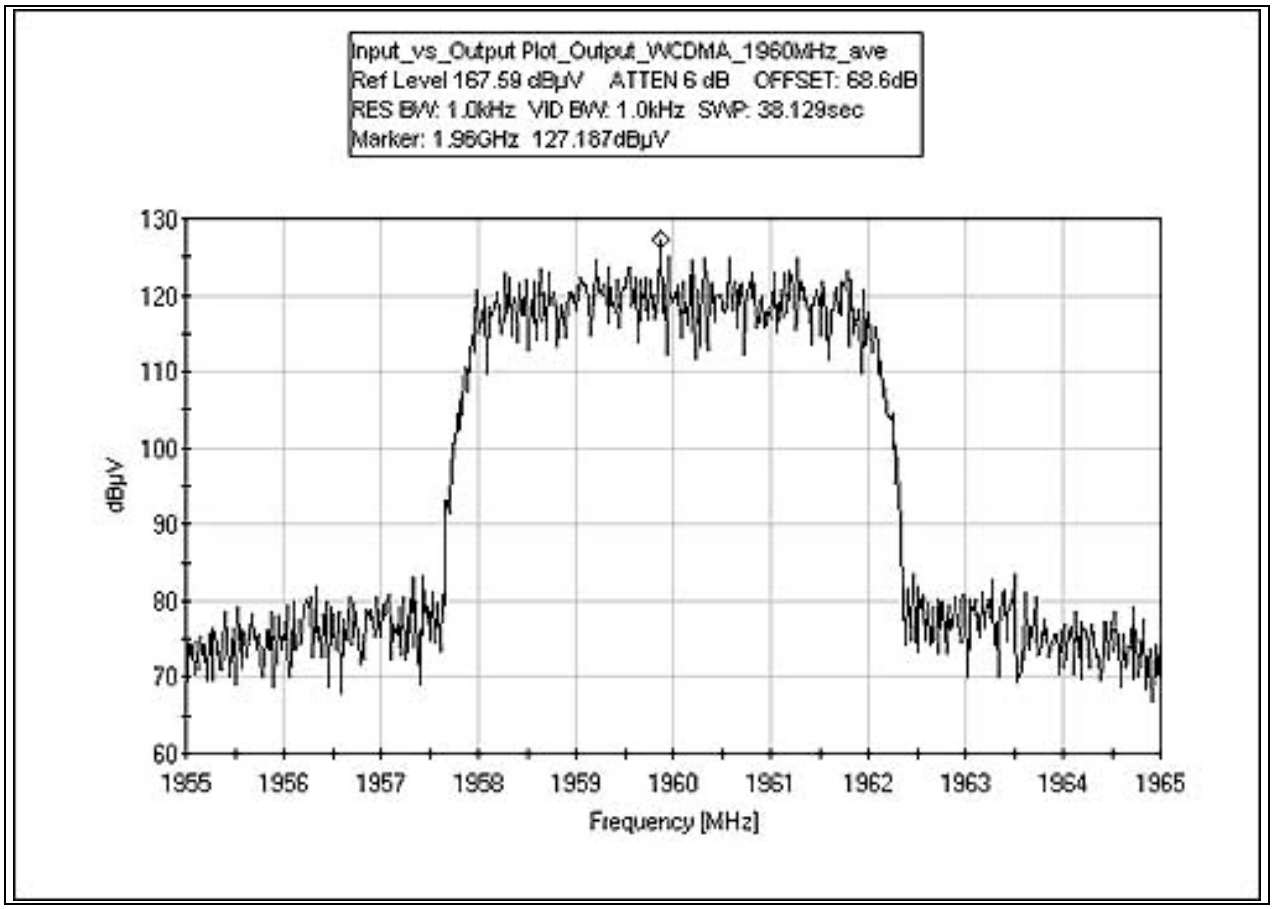
OUTPUT PLOT - TDMA 1990MHz



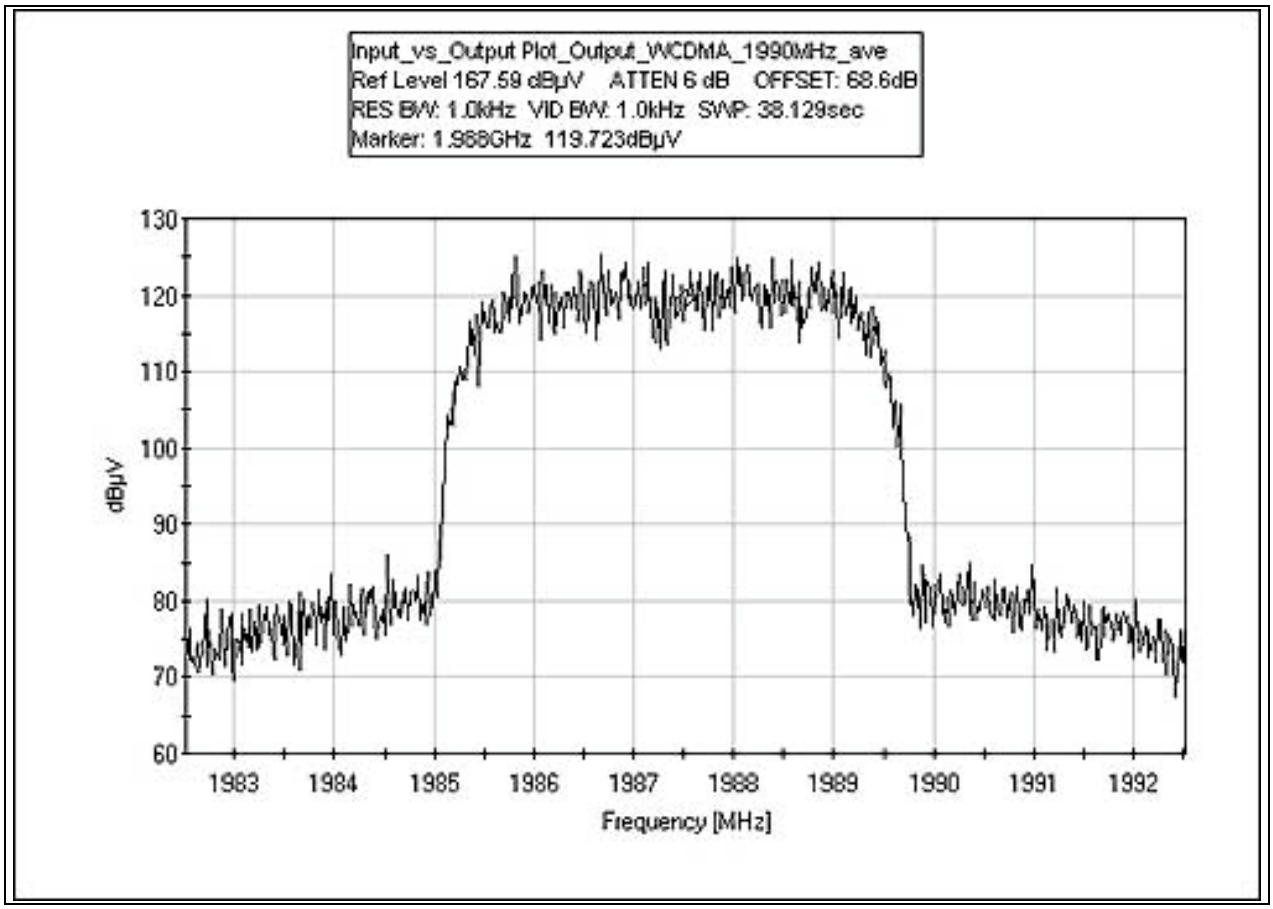
OUTPUT PLOT - WCDMA 1930MHz



OUTPUT PLOT - WCDMA 1960MHz



OUTPUT PLOT - WCDMA 1990MHz



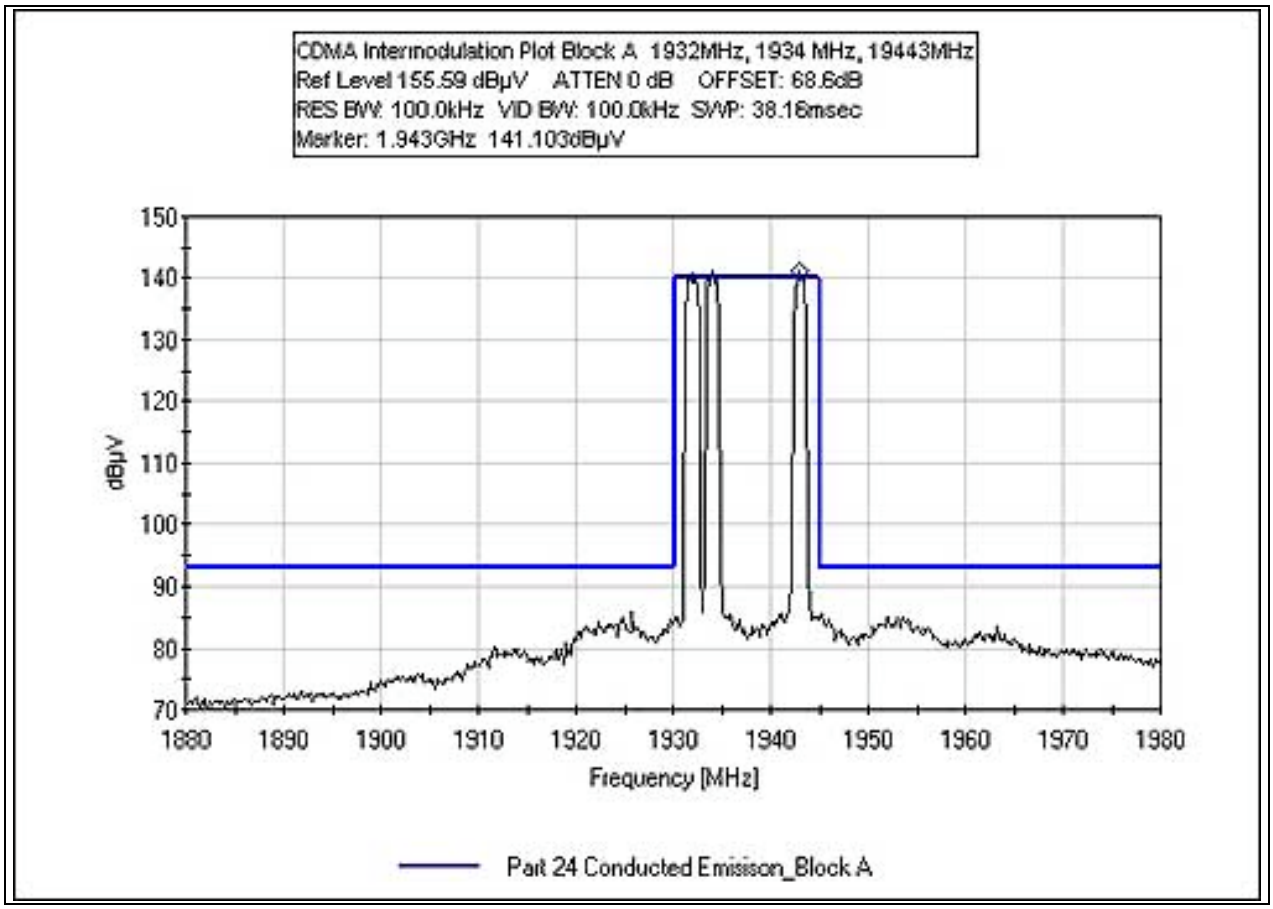
Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02672	Agilent	E4446A	US44300438	011405	011407

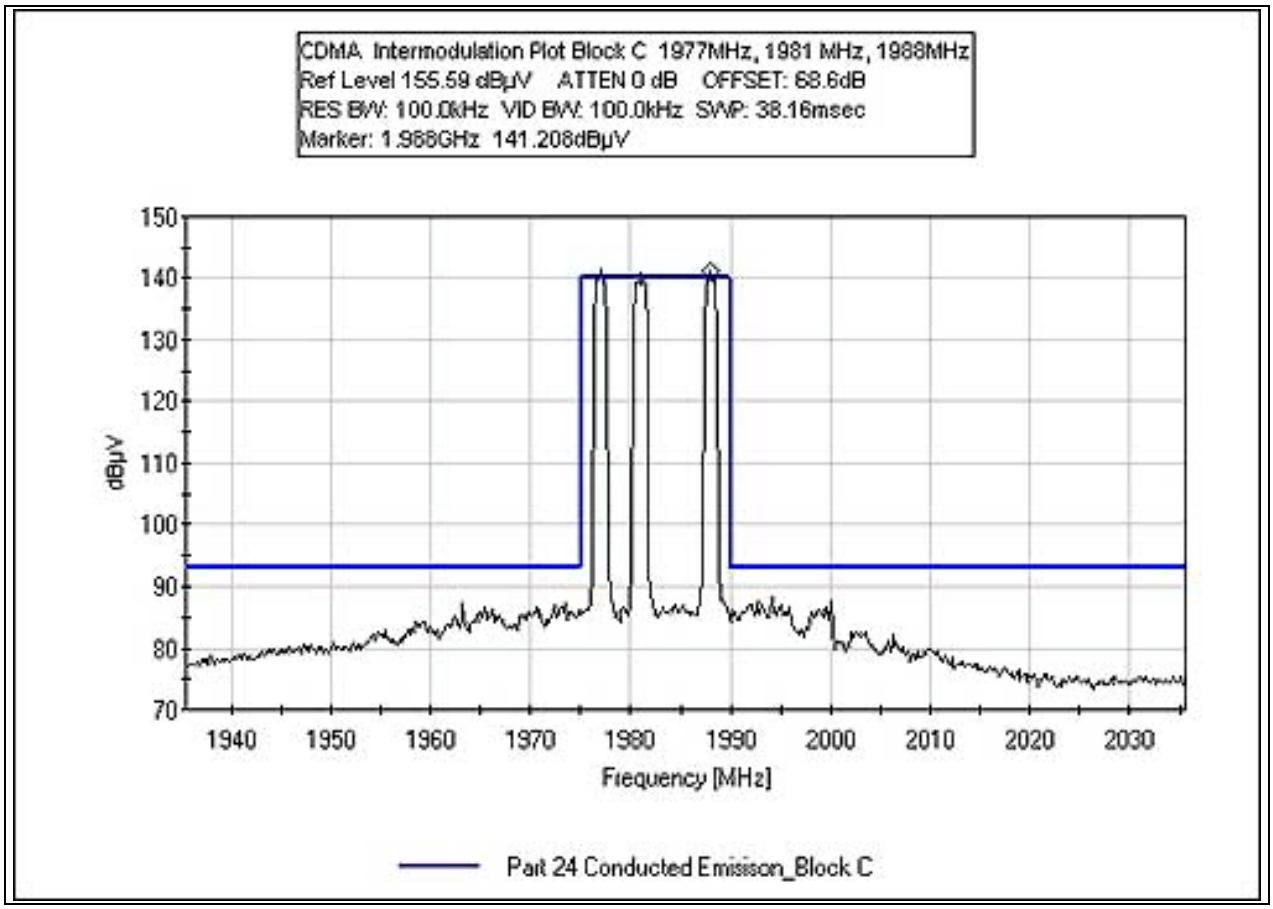
PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP

INTERMODULATION - CDMA BLOCK A

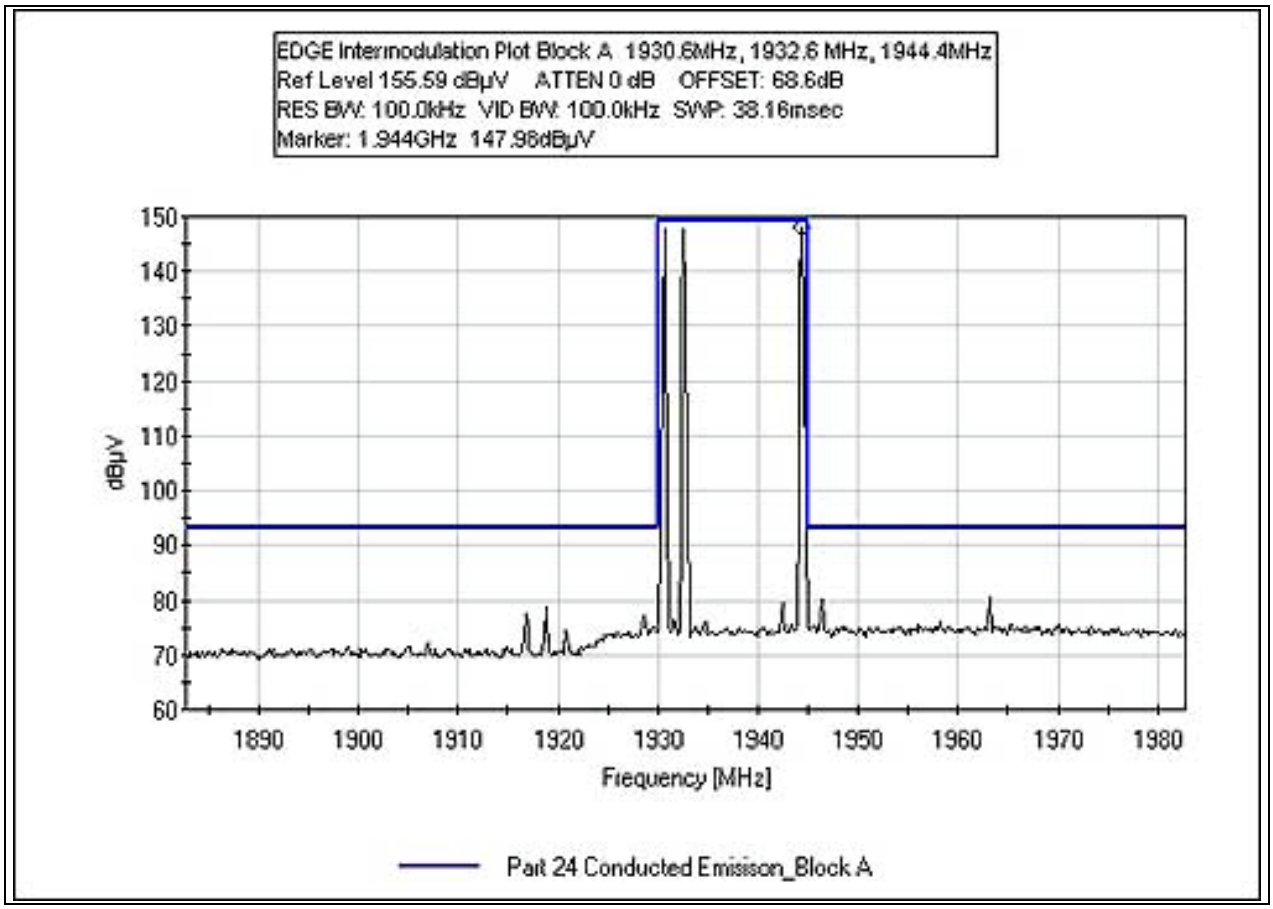
Test Conditions: The EUT is placed on the wooden table. RF out is connected to remote loadstring and power meter. RF in receives RF signal via remote ESGs and a preamp. The RF level is adjusted to maintain the transmit power. measurement performed at antenna port.



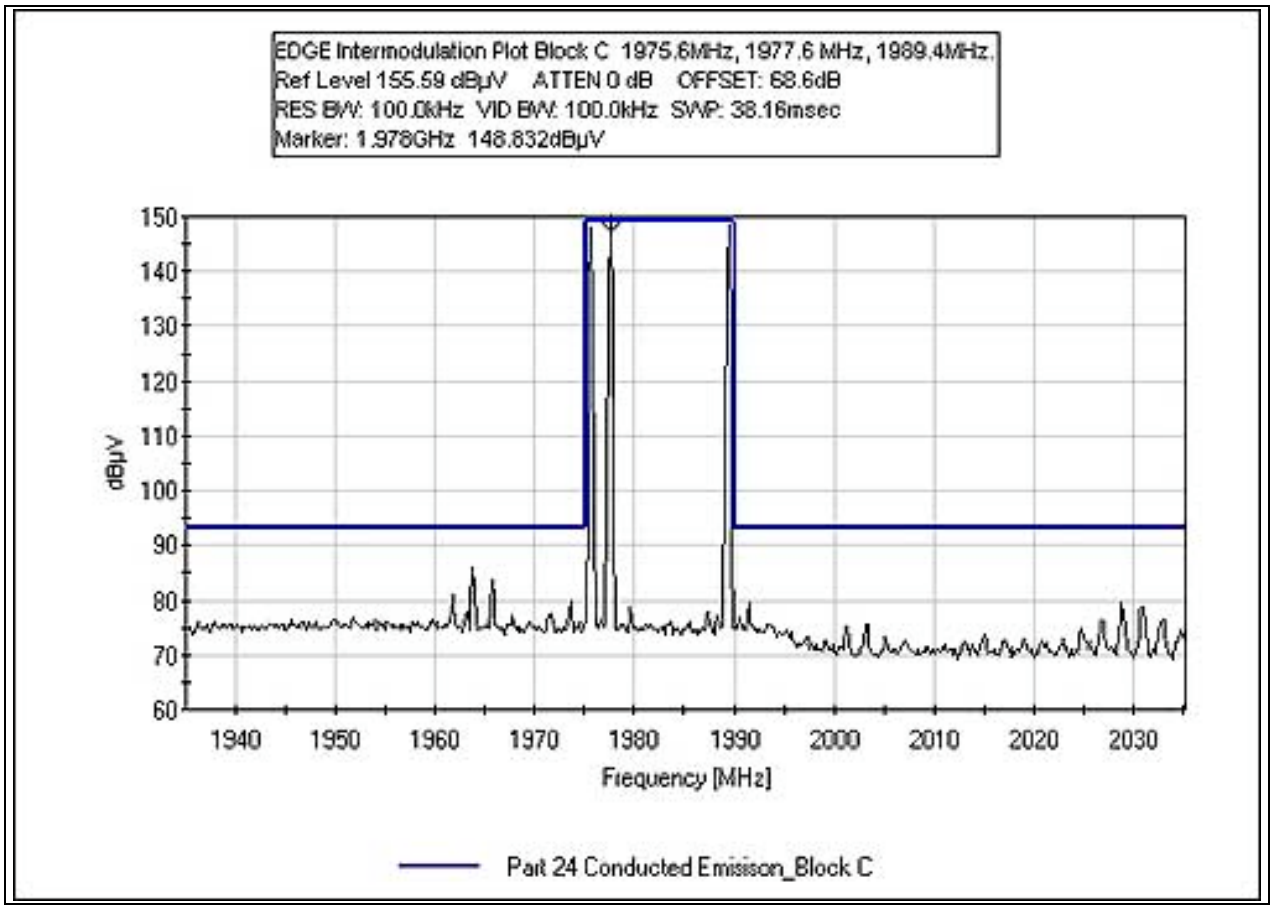
INTERMODULATION - CDMA BLOCK C



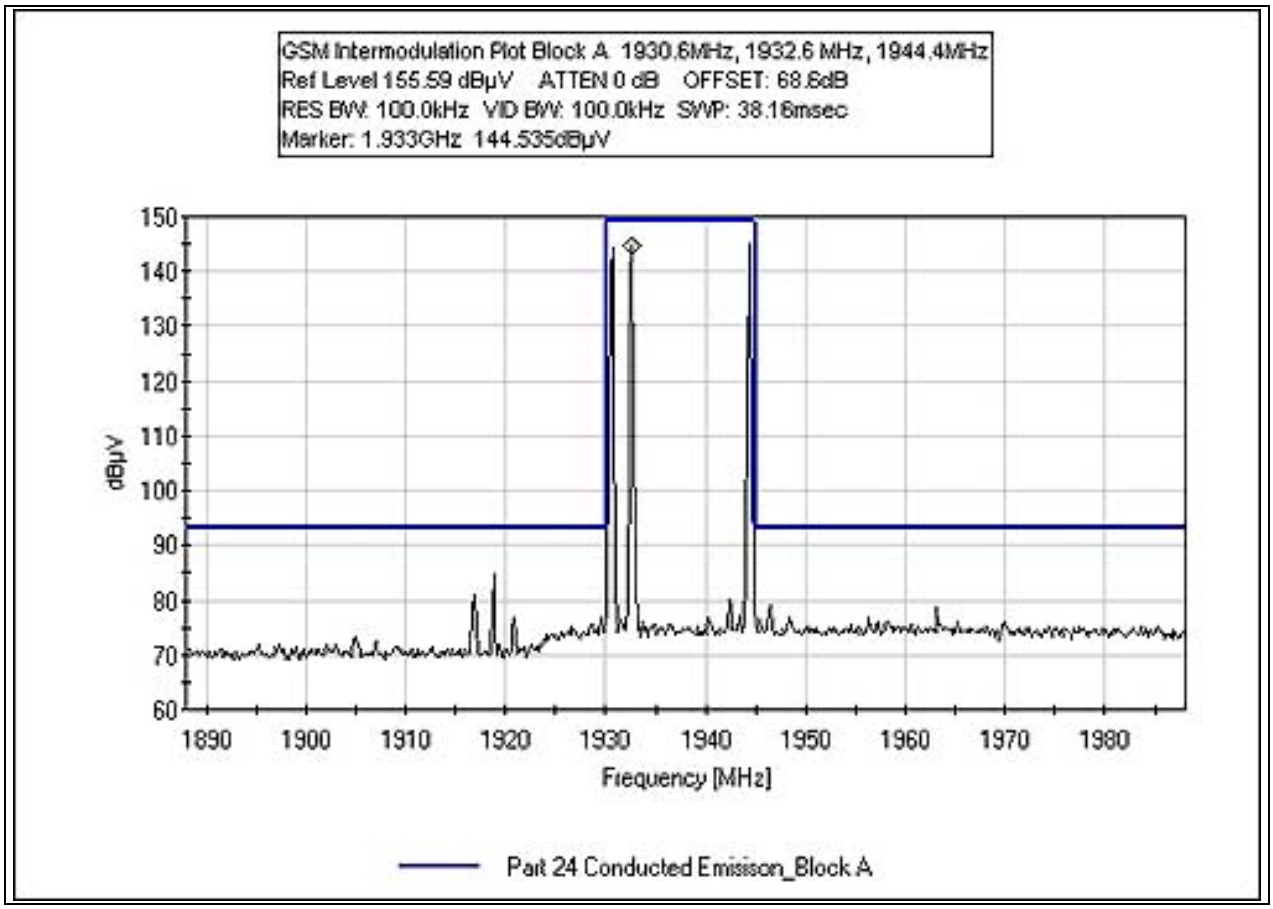
INTERMODULATION - EDGE BLOCK A



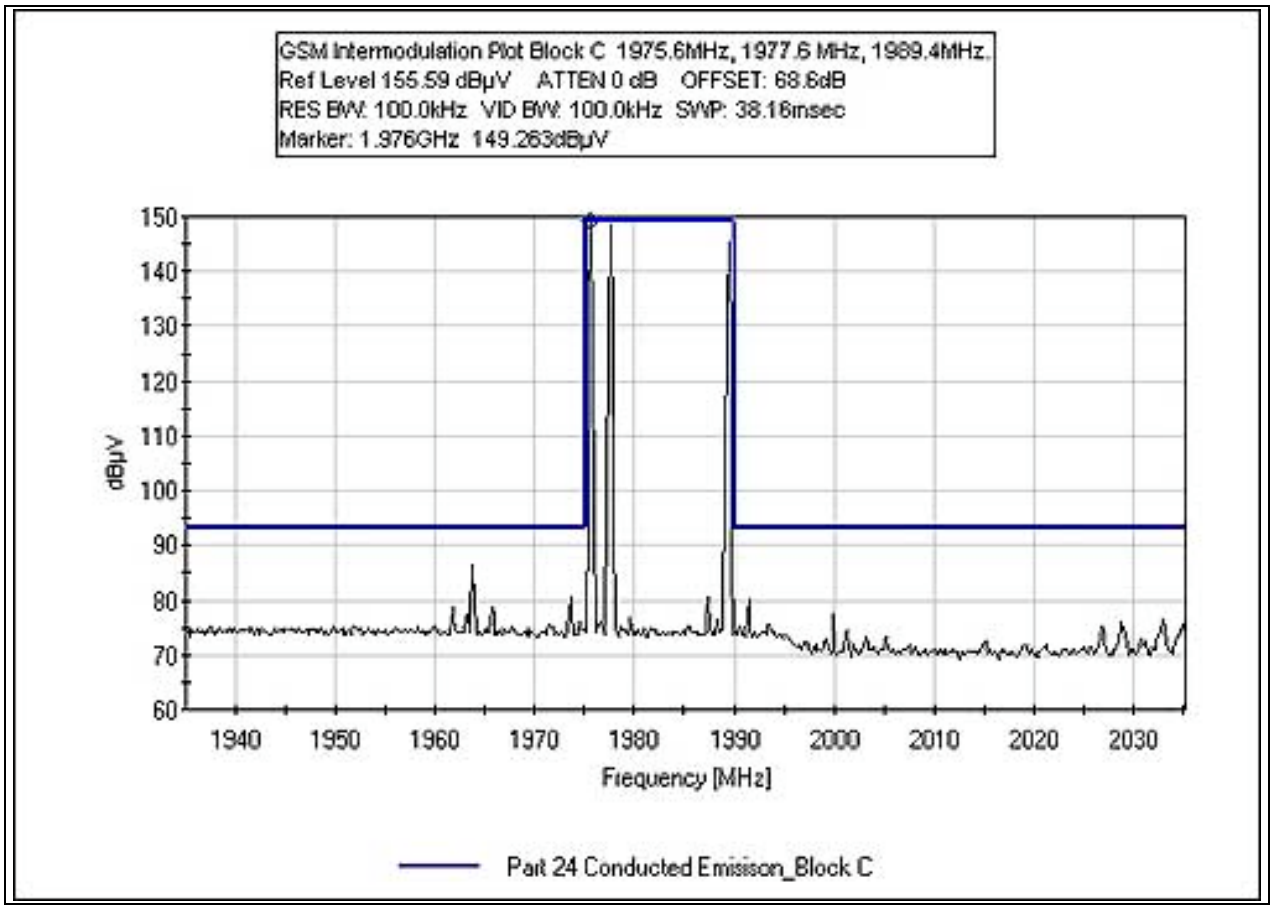
INTERMODULATION - EDGE BLOCK C



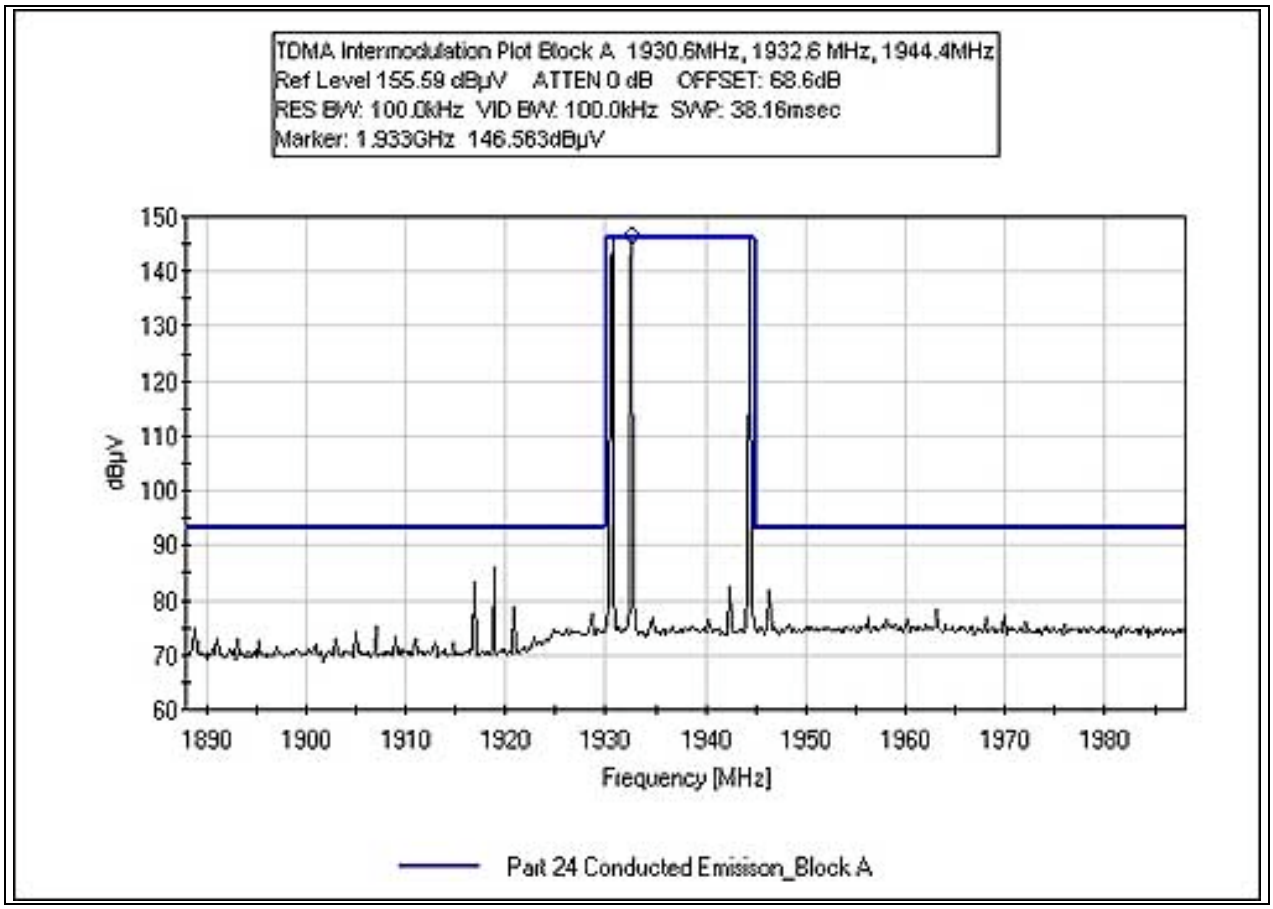
INTERMODULATION - GSM BLOCK A



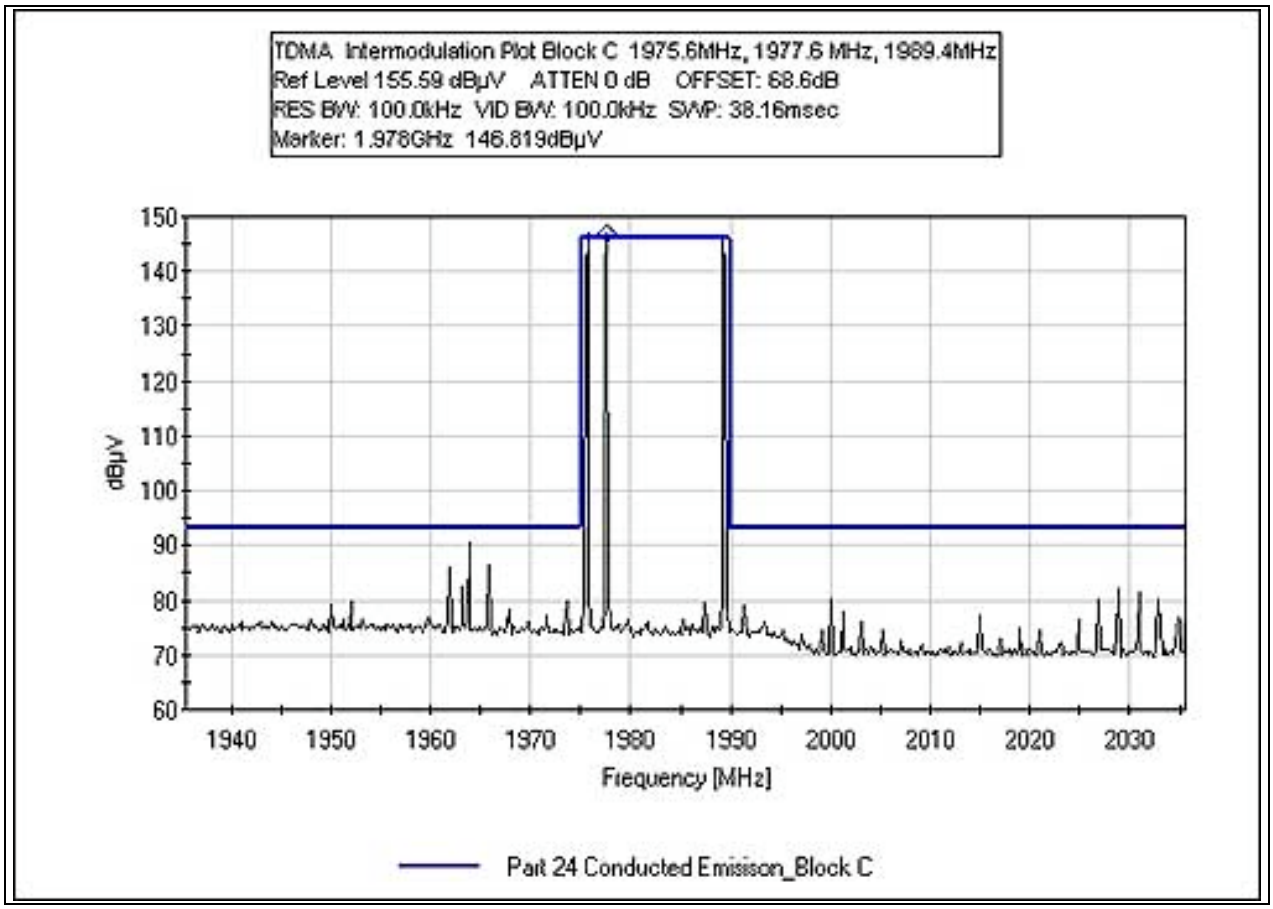
INTERMODULATION - GSM BLOCK C



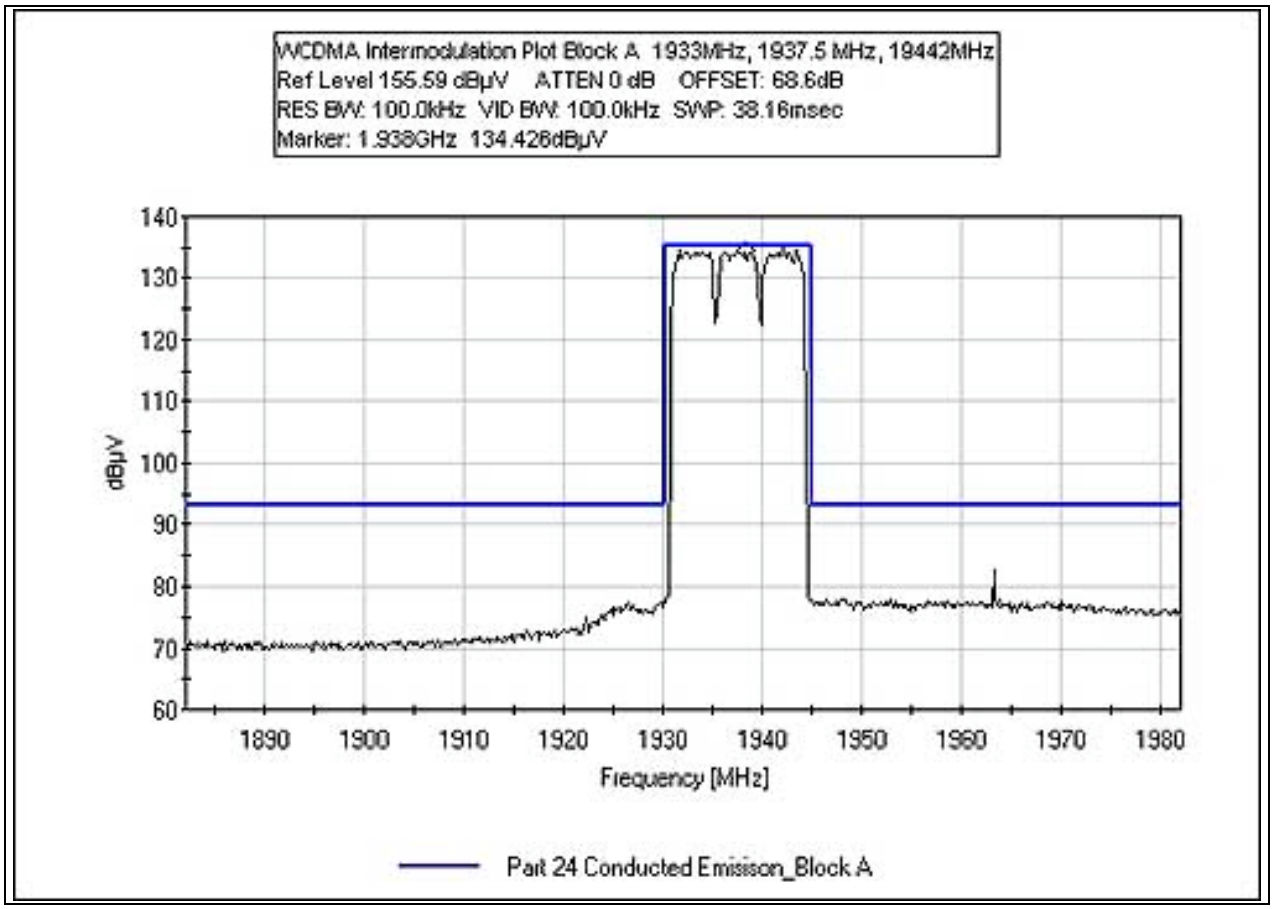
INTERMODULATION - TDMA BLOCK A



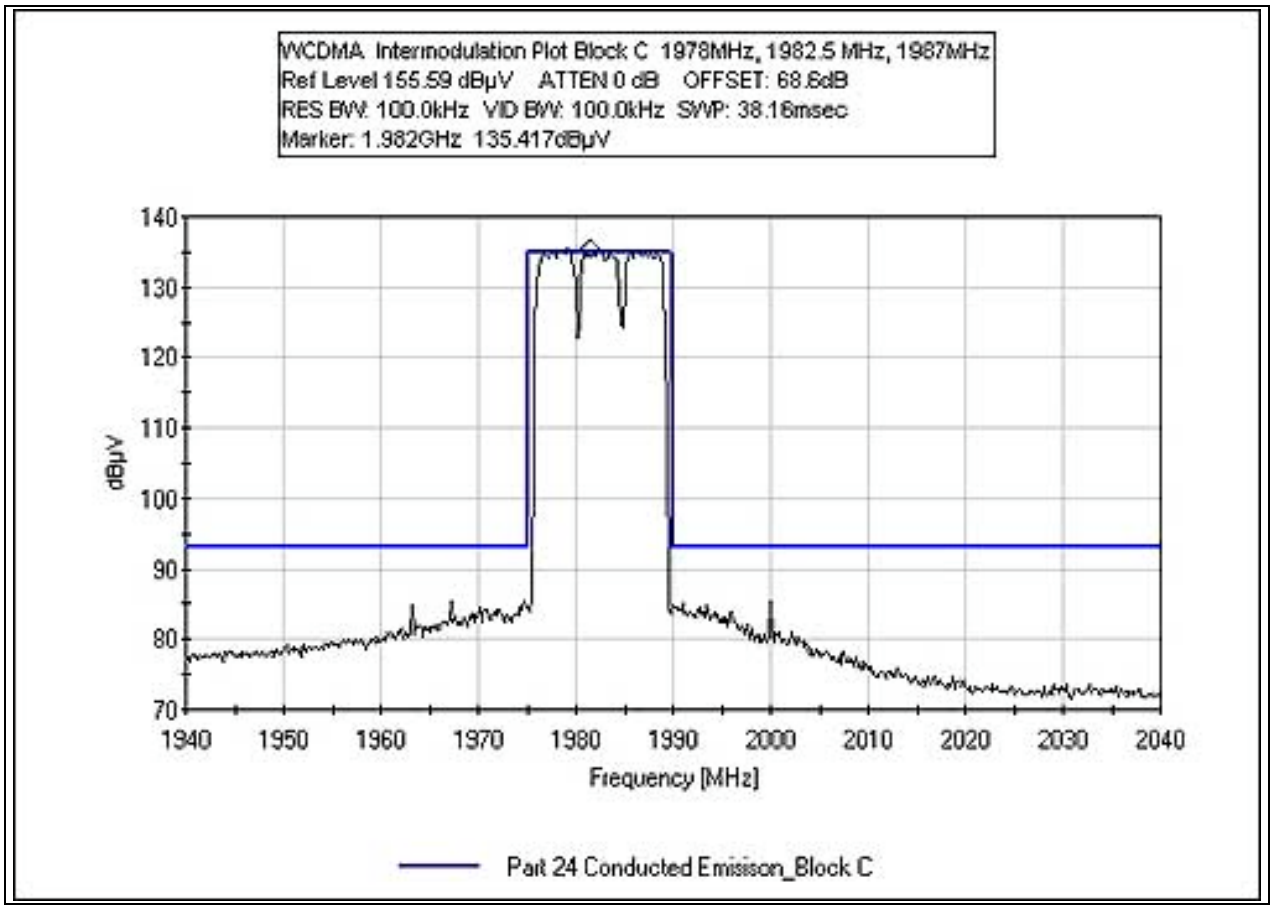
INTERMODULATION - TDMA BLOCK C



INTERMODULATION - WCDMA BLOCK A



INTERMODULATION - WCDMA BLOCK C



Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02672	Agilent	E4446A	US44300438	011405	011407

PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP

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

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

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

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

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

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

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:	**Part 24 Conducted Emisison_Block A**		
Work Order #:	**85227**	Date:	6/22/2006
Test Type:	**Conducted Emissions**	Time:	09:54:11
Equipment:	**Multi-Carrier RF Power Amplifier**	Sequence#:	10
Manufacturer:	Powerwave Technologies	Tested By:	E. Wong
Model:	G3L-1929-160 (Everest 1900)		27V dc
S/N:	NA		

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

Function	Manufacturer	Model #	S/N
Multi-Carrier RF Power Amplifier*	Powerwave Technologies	G3L-1929-160 (Everest 1900)	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Linear DC Power Supply	HP	6269B	2436A-11867
Preamplifier	Mini-Circuits	ZHL-4240	
Signal Generator	Agilent	E4433B	US40051853

Test Conditions / Notes:

The EUT is placed on the wooden table. RF out is connected to remote loadstring and power meter. RF in receives RF signal via remote ESGs and a preamp. The RF level is adjusted to maintain the transmit power. Measurement performed at antenna port. Modulation: EDGE, GSM, TDMA, CDMA, WCDMA. Frequency = 1930MHz, 1960 MHz, 1990 MHz. Power= 185 watts. Frequency range of measurement = 9 kHz - 20 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 - 20,000 MHz RBW=1 MHz, VBW=1 MHz.

Transducer Legend:

T1=1-40 GHz Cable_020807	T2=Filter 3GHz HPF AN02744

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	3861.010M Ave	89.1	+1.3	+0.3			+0.0	90.7	94.0 EDGE 1930MHz	-3.3	Anten
2	3920.060M Ave	86.6	+1.3	+0.3			+0.0	88.2	94.0 TDMA 1960MHz	-5.8	Anten
3	3860.367M Ave	86.5	+1.3	+0.3			+0.0	88.1	94.0 TDMA 1930MHz	-5.9	Anten
^	3860.367M	93.5	+1.3	+0.3			+0.0	95.1	94.0 TDMA 1930MHz	+1.1	Anten
5	3920.000M Ave	86.0	+1.3	+0.3			+0.0	87.6	94.0 EDGE 1960MHz	-6.4	Anten
6	3920.000M Ave	85.9	+1.3	+0.3			+0.0	87.5	94.0 GSM 1960MHz	-6.5	Anten

7	3861.100M Ave	85.3	+1.3	+0.3		+0.0	86.9	94.0	-7.1	Anten GSM 1930MHz
^	3861.010M	96.9	+1.3	+0.3		+0.0	98.5	94.0	+4.5	Anten EDGE 1930 MHz
^	3861.100M	87.9	+1.3	+0.3		+0.0	89.5	94.0	-4.5	Anten GSM 1930MHz
10	3920.050M Ave	84.7	+1.3	+0.3		+0.0	86.3	94.0	-7.7	Anten CDMA 1960MHz
11	3864.067M Ave	84.1	+1.3	+0.3		+0.0	85.7	94.0	-8.3	Anten CDMA 1930MHz
^	3864.067M	100.4	+1.3	+0.3		+0.0	102.0	94.0	+8.0	Anten CDMA 1930MHz
13	3979.717M Ave	82.4	+1.3	+0.3		+0.0	84.0	94.0	-10.0	Anten TDMA 1990MHz
^	3979.717M	89.2	+1.3	+0.3		+0.0	90.8	94.0	-3.2	Anten TDMA 1990MHz
15	3979.036M Ave	82.2	+1.3	+0.3		+0.0	83.8	94.0	-10.2	Anten GSM 1990MHz
^	3979.036M	84.8	+1.3	+0.3		+0.0	86.4	94.0	-7.6	Anten GSM 1990MHz
17	3978.903M Ave	82.0	+1.3	+0.3		+0.0	83.6	94.0	-10.4	Anten EDGE 1990MHz
^	3978.903M	89.2	+1.3	+0.3		+0.0	90.8	94.0	-3.2	Anten EDGE 1990MHz
19	3864.250M Ave	81.0	+1.3	+0.3		+0.0	82.6	94.0	-11.4	Anten WCDMA 1930MHz
^	3864.250M	98.1	+1.3	+0.3		+0.0	99.7	94.0	+5.7	Anten WCDMA 1930MHz
21	3976.067M Ave	80.7	+1.3	+0.3		+0.0	82.3	94.0	-11.7	Anten CDMA 1990MHz
^	3976.067M	97.3	+1.3	+0.3		+0.0	98.9	94.0	+4.9	Anten CDMA 1990MHz
23	3920.000M Ave	78.1	+1.3	+0.3		+0.0	79.7	94.0	-14.3	Anten WCDMA 1960MHz
^	3920.050M	101.4	+1.3	+0.3		+0.0	103.0	94.0	+9.0	Anten CDMA 1960MHz
^	3920.000M	94.8	+1.3	+0.3		+0.0	96.4	94.0	+2.4	Anten WCDMA 1960MHz
^	3920.060M	93.6	+1.3	+0.3		+0.0	95.2	94.0	+1.2	Anten TDMA 1960MHz
^	3920.000M	92.7	+1.3	+0.3		+0.0	94.3	94.0	+0.3	Anten EDGE 1960MHz
^	3920.000M	87.4	+1.3	+0.3		+0.0	89.0	94.0	-5.0	Anten GSM 1960MHz

29	3976.200M Ave	76.4	+1.3	+0.3		+0.0	78.0	94.0 WCDMA 1990MHz	-16.0	Anten
^	3976.200M	93.7	+1.3	+0.3		+0.0	95.3	94.0 WCDMA 1990MHz	+1.3	Anten
31	7840.060M Ave	70.4	+1.9	+0.2		+0.0	72.5	94.0 TDMA 1960MHz	-21.5	Anten
32	7840.000M Ave	70.2	+1.9	+0.2		+0.0	72.3	94.0 CDMA 1960MHz	-21.7	Anten
^	7840.000M	87.4	+1.9	+0.2		+0.0	89.5	94.0 CDMA 1960MHz	-4.5	Anten
^	7840.060M	81.8	+1.9	+0.2		+0.0	83.9	94.0 TDMA 1960MHz	-10.1	Anten
35	7841.400M Ave	67.0	+1.9	+0.2		+0.0	69.1	94.0 WCDMA 1960MHz	-24.9	Anten
^	7841.400M	80.7	+1.9	+0.2		+0.0	82.8	94.0 WCDMA 1960MHz	-11.2	Anten
37	5964.900M Ave	64.6	+1.6	+0.4		+0.0	66.6	94.0 CDMA 1990MHz	-27.4	Anten
^	5964.900M	85.0	+1.6	+0.4		+0.0	87.0	94.0 CDMA 1990MHz	-7.0	Anten
39	5963.700M Ave	64.2	+1.6	+0.4		+0.0	66.2	94.0 WCDMA 1990MHz	-27.8	Anten
^	5963.700M	82.8	+1.6	+0.4		+0.0	84.8	94.0 WCDMA 1990MHz	-9.2	Anten
41	5796.533M Ave	64.0	+1.6	+0.2		+0.0	65.8	94.0 CDMA 1930MHz	-28.2	Anten
^	5796.533M	81.5	+1.6	+0.2		+0.0	83.3	94.0 CDMA 1930MHz	-10.7	Anten

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02672	Agilent	E4446A	US44300438	011405	011407

PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP

FCC 2.1033(c)(14)/2.1053/24.238(a) - FIELD STRENGTH OF SPURIOUS RADIATION

Test Location:	CKC Laboratories, Inc. •110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112		
Customer:	**Powerwave Technologies, Inc.**		
Specification:	**FCC 24.238 Radiated Spurious Emission**		
Work Order #:	**85227**	Date:	6/13/2006
Test Type:	**Radiated Scan**	Time:	16:13:36
Equipment:	**Multi-Carrier RF Power Amplifier**	Sequence#:	26
Manufacturer:	Powerwave Technologies	Tested By:	Septimiu Apahidean
Model:	G3L-1929-160 (Everest 1900)		
S/N:	EP2		

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

Function	Manufacturer	Model #	S/N
Multi-Carrier RF Power Amplifier*	Powerwave Technologies	G3L-1929-160 (Everest 1900)	EP2

Support Devices:

Function	Manufacturer	Model #	S/N
Linear DC Power Supply	HP	6269B	2436A-11867
Preamplifier	Mini-Circuits	ZHL-4240	
Signal Generator	Agilent	E4433B	US40051853

Test Conditions / Notes:

The EUT is placed on the wooden table. RF out is connected to remote loadstring and power meter. RF in receives RF signal via remote ESGs and a preamp. The RF level is adjusted to maintain the transmit power. Modulation: EDGE. Frequency = 1930.5MHz, 1960MHz and 1990MHz. Power= 185 watts. Frequency range of measurement = 9 kHz - 20 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 - 20,000 MHz RBW=1 MHz, VBW=1 MHz.

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02672	Agilent	E4446A	US44300438	011405	011407
30 -1000MHz						
Bilog Antenna	01995	Chase	CBL6111C	2451	020206	020208
Pre-amp	00309	HP	8447D	1937A02548	071404	071406
Antenna cable	P05198	Belden	8268 (RG-214)	Cable#15	010305	010307
Pre-amp to SA cable	P05050	Pasternack	RG223/U	Cable#10	051605	051607
1GHz-18GHz						
Horn Antenna	00849	EMCO	3115	6246	072204	072206
Microwave Pre-amp	00786	HP	83017A	3123A00281	081204	081206
Heliax Antenna cable	P04384	Andrew	LDF1-50	Cable#20	091604	091606
24" SMA Cable (White)	P05204	Pasterneck	35591-48	1-40GHz_white	020805	020807
9kHz-30MHz						
Loop Antenna	00314	EMCO	6502	2014	062804	062806
18-20GHz						
18-26.5 GHz Horn Antenna	02112	HP	84125-80008	3643A00027	110504	110506

Operating Frequency: 1930-1990MHz
Channels: Low, Mid and High
Highest Measured Output Power: 47.90 EIRP(dBm)= 61.6 EIRP(Watts)
Distance: 3 meters
Limit: 43+10Log(P) 60.90 dBc

Freq. (MHz)	Reference Level (dBm)	Antenna Polarity (H/V)	dBc
5,791.52	-17.7	Vert	65.60
5,791.52	-19.1	Horiz	67.00
5,791.31	-21	Horiz	68.90
5,791.52	-21.7	Vert	69.60
5,791.31	-22.4	Vert	70.30
7,721.96	-23.4	Vert	71.30
7,721.99	-24	Horiz	71.90
5,791.34	-25.2	Horiz	73.10
7,721.96	-25.9	Horiz	73.80
7,721.97	-27	Vert	74.90
9,652.59	-27.2	Horiz	75.10
9,652.48	-27.3	Horiz	75.20
9,652.48	-27.3	Vert	75.20
9,652.45	-27.9	Vert	75.80
9,652.27	-28.1	Horiz	76.00
9,652.47	-30.4	Vert	78.30
3,860.88	-32.1	Vert	80.00
3,861.04	-33.4	Horiz	81.30
3,860.92	-34.3	Horiz	82.20
3,860.88	-35.6	Horiz	83.50
3,860.99	-38	Vert	85.90
5,879.94	-18.1	Vert	66.00
5,879.91	-21.5	Horiz	69.40
7,840.00	-22.6	Vert	70.50
7,840.00	-22.9	Horiz	70.80
3,919.93	-30.3	Horiz	78.20
9,799.79	-30.7	Horiz	78.60
9,799.84	-31.4	Vert	79.30
3,919.96	-32.3	Vert	80.20
7,958.14	-19.8	Horiz	67.70
7,958.07	-20.6	Vert	68.50
5,968.64	-24.6	Vert	72.50
3,978.95	-24.9	Horiz	72.80
9,947.03	-27.2	Horiz	75.10
5,968.64	-28.9	Horiz	76.80
3,979.05	-30.6	Vert	78.50
9,947.56	-32	Vert	79.90

PHOTOGRAPH SHOWING RADIATED EMISSIONS

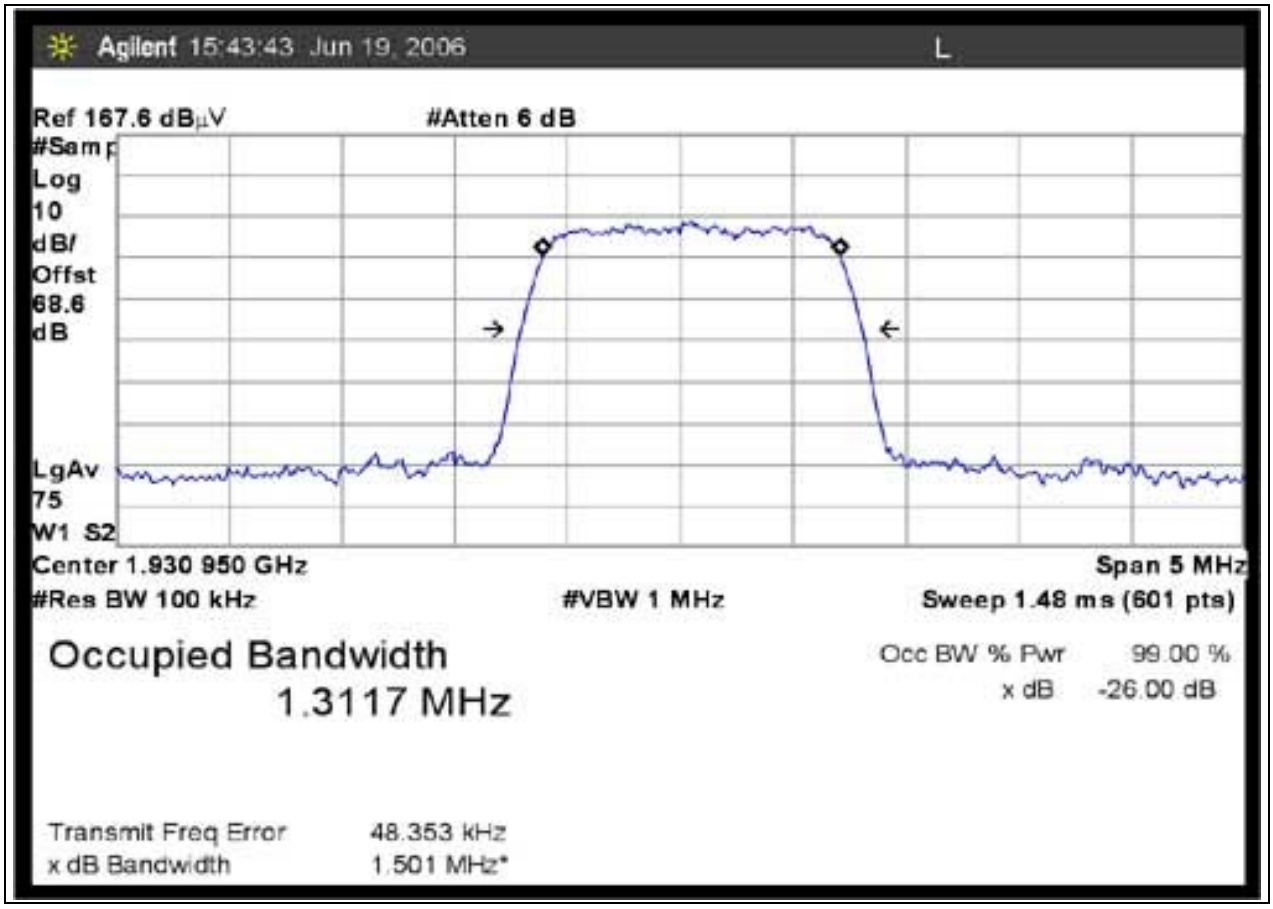
Radiated Emissions - Front View

PHOTOGRAPH SHOWING RADIATED EMISSIONS

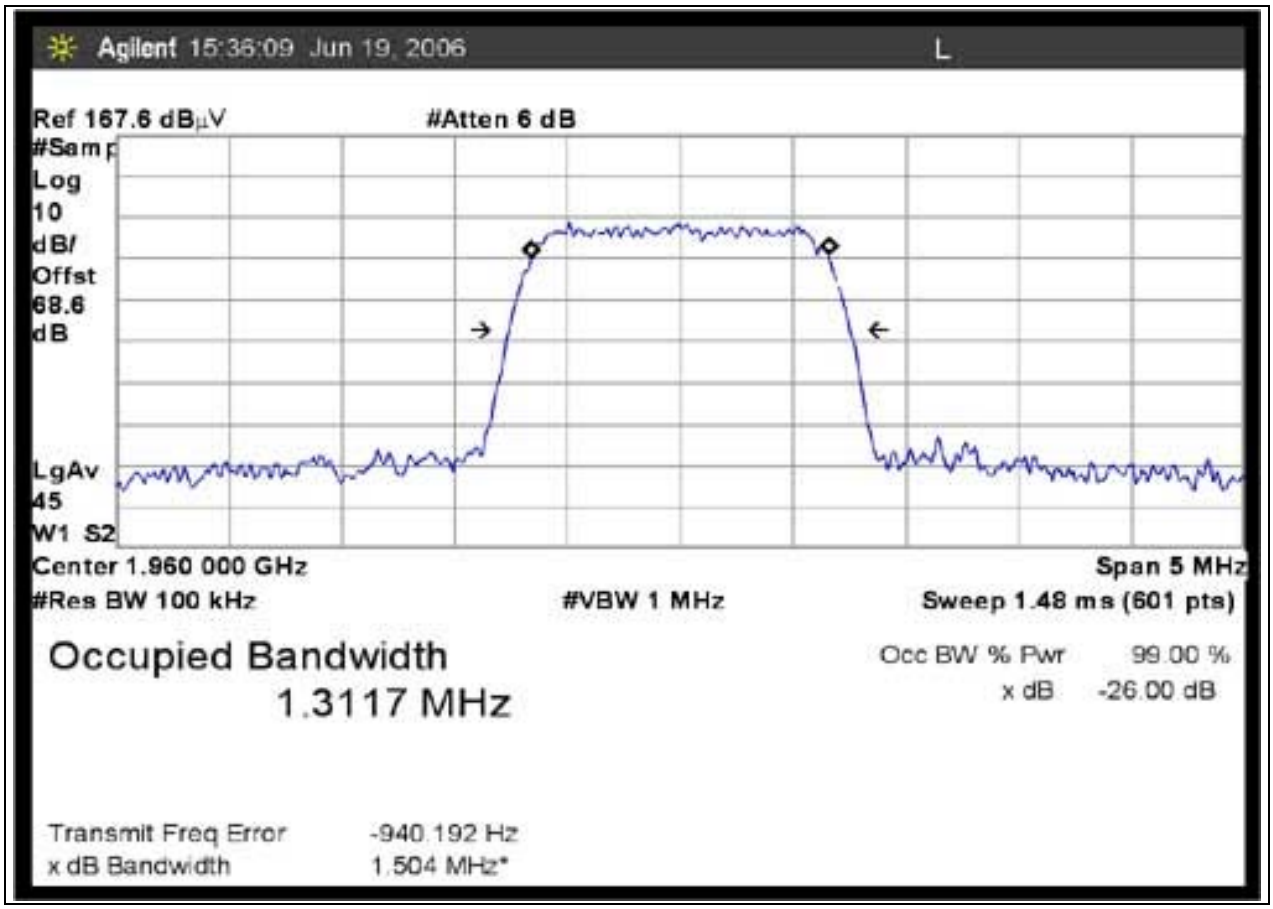
Radiated Emissions - Back View

RSS-131 - 99% BANDWIDTH - CDMA 1930MHz 1.3MHz

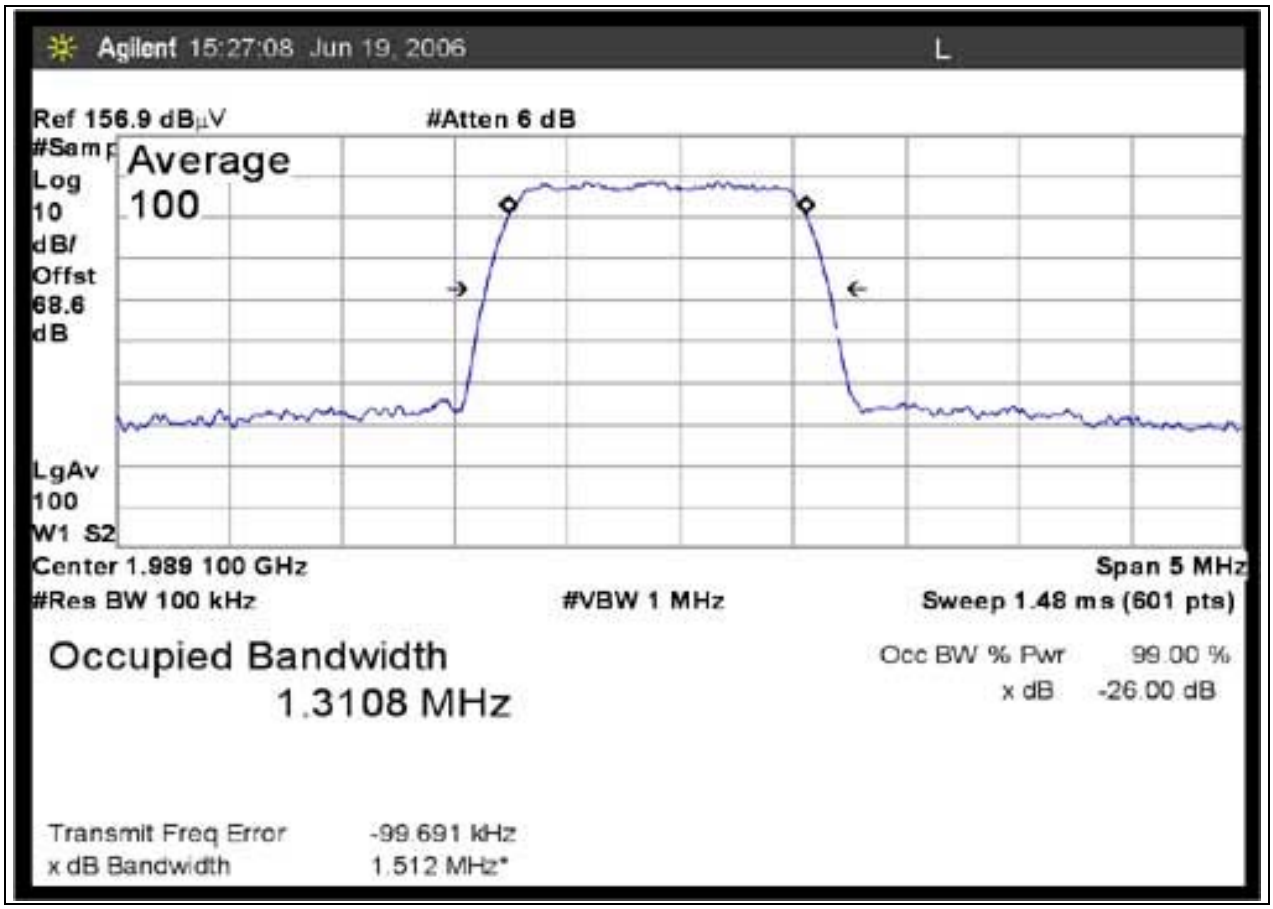
Test Conditions: The EUT is placed on the wooden table. RF out is connected to remote loadstring and power meter. RF in receives RF signal via remote ESGs and a preamp. The RF level is adjusted to maintain the transmit power. measurement performed at antenna port.



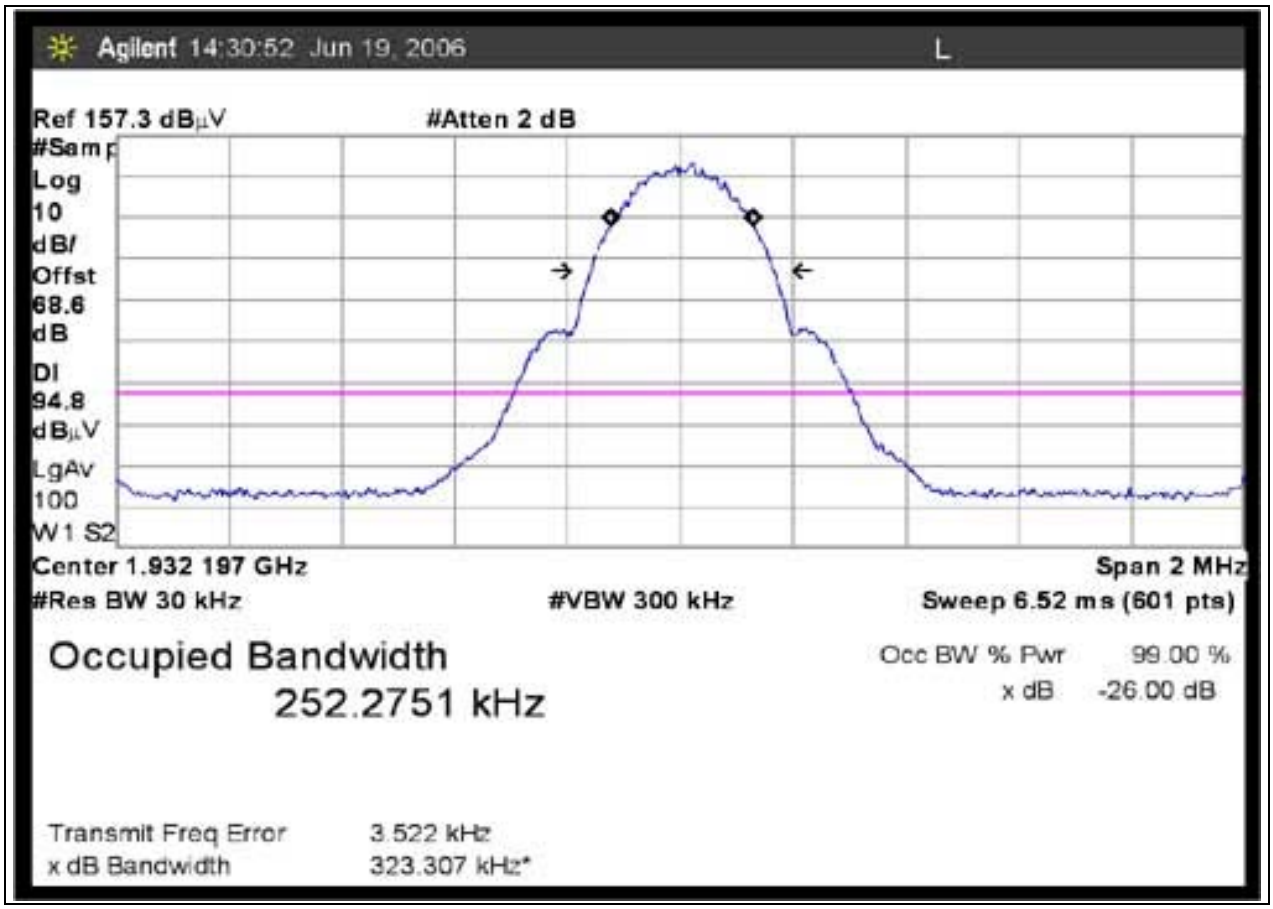
RSS-131 - 99% BANDWIDTH - CDMA 1960MHz 1.3MHz



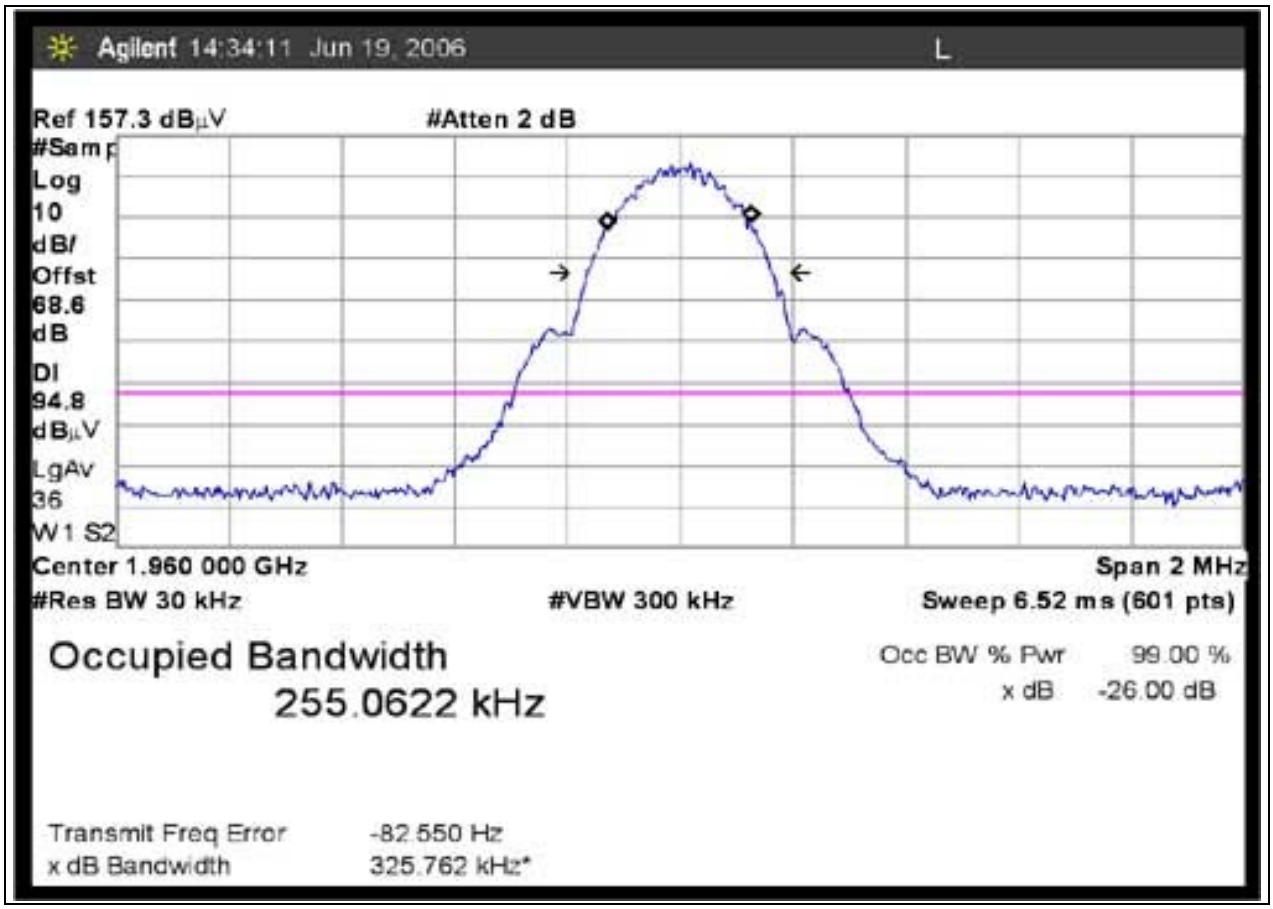
RSS-131 - 99% BANDWIDTH - CDMA 1990MHz 1.3MHz



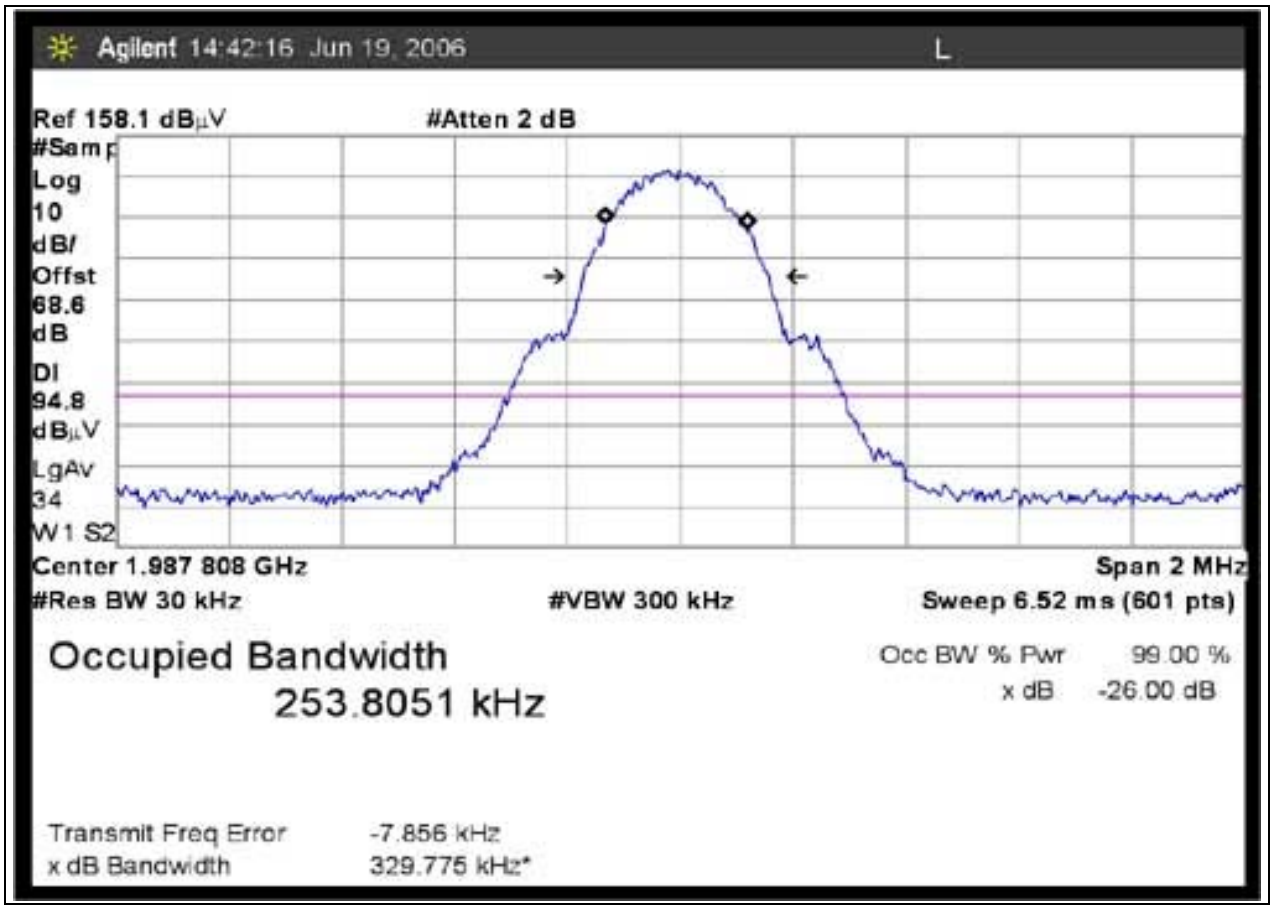
RSS-131 - 99% BANDWIDTH - EDGE 1930MHz 252kHz



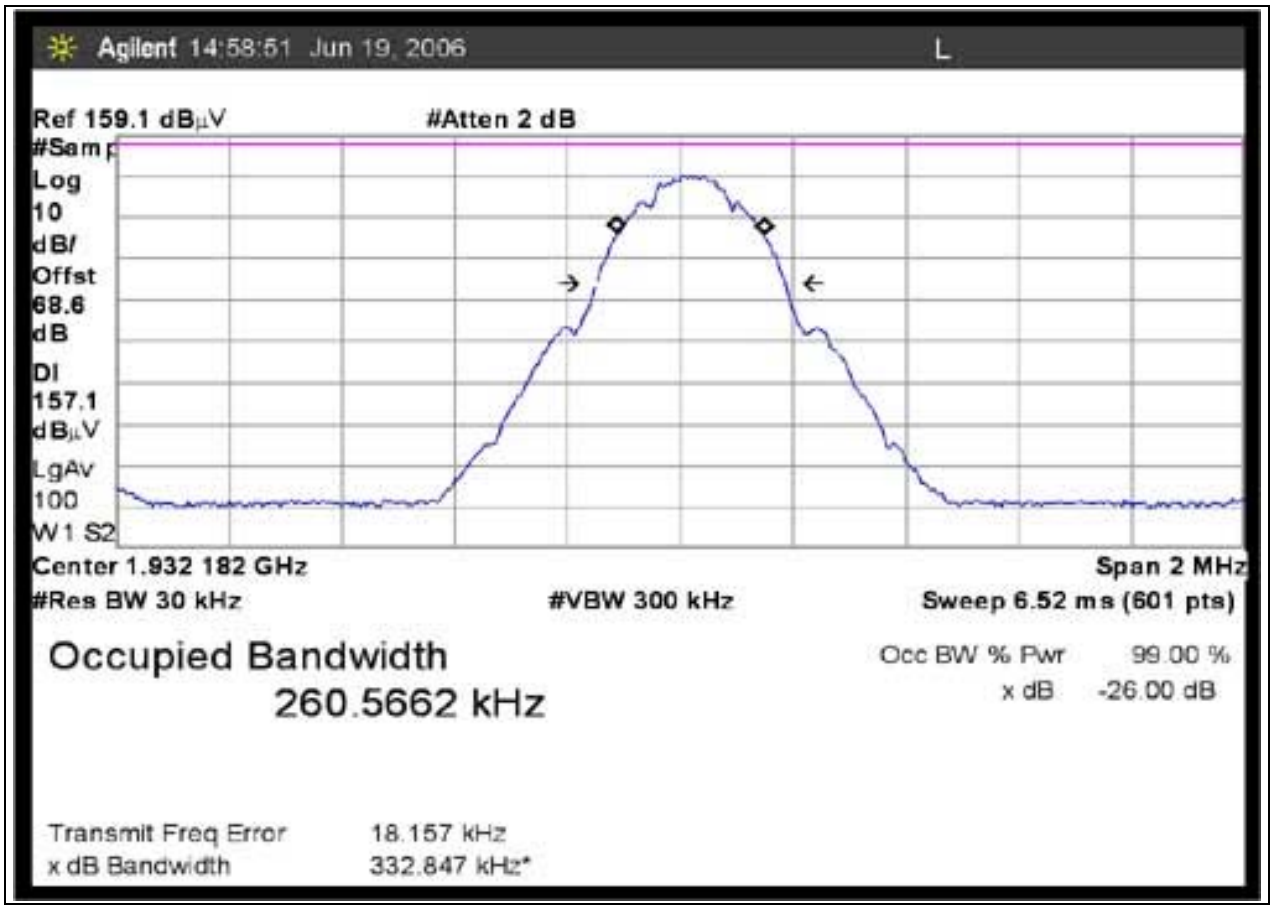
RSS-131 - 99% BANDWIDTH - EDGE 1960MHz 255kHz



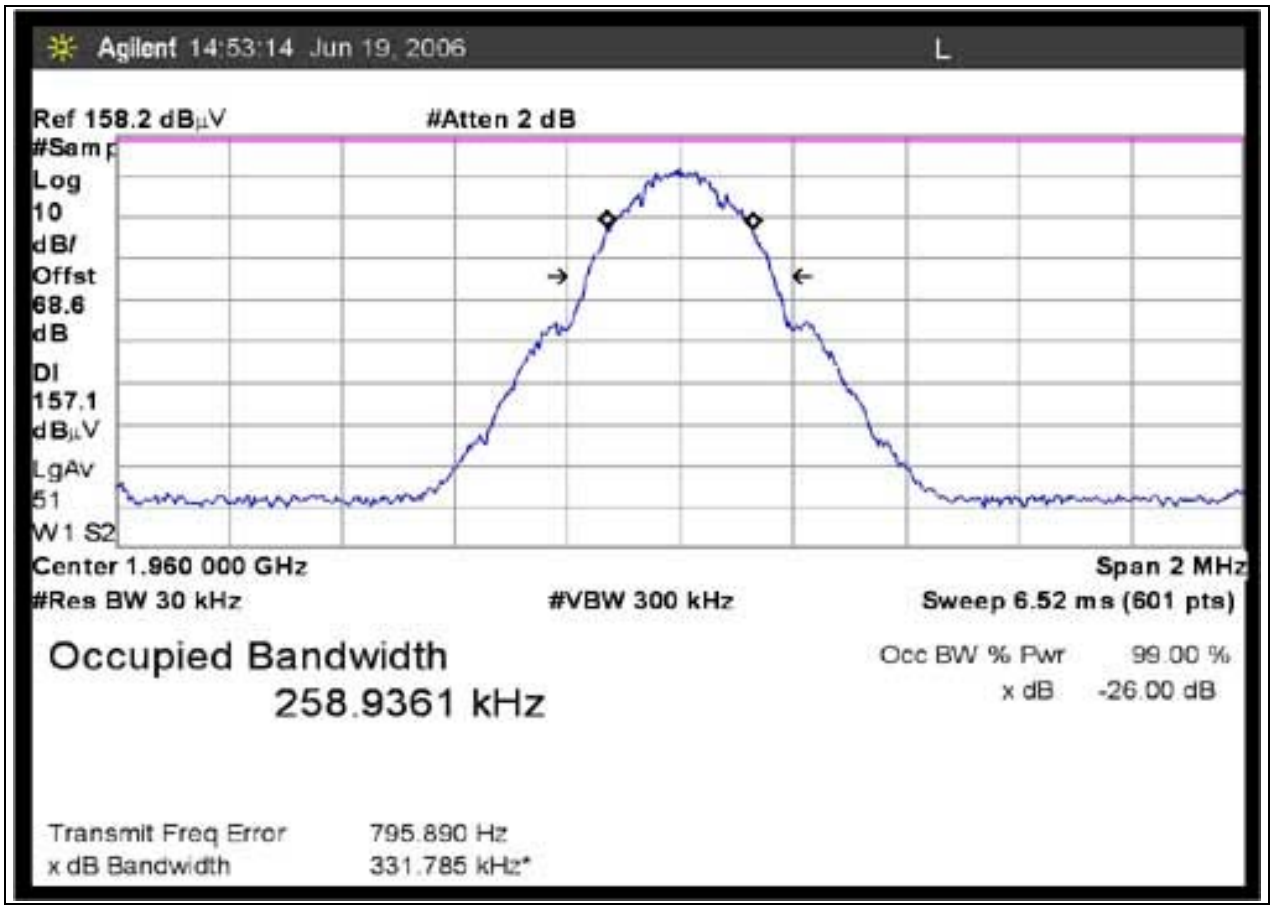
RSS-131 - 99% BANDWIDTH - EDGE 1990MHz 253kHz



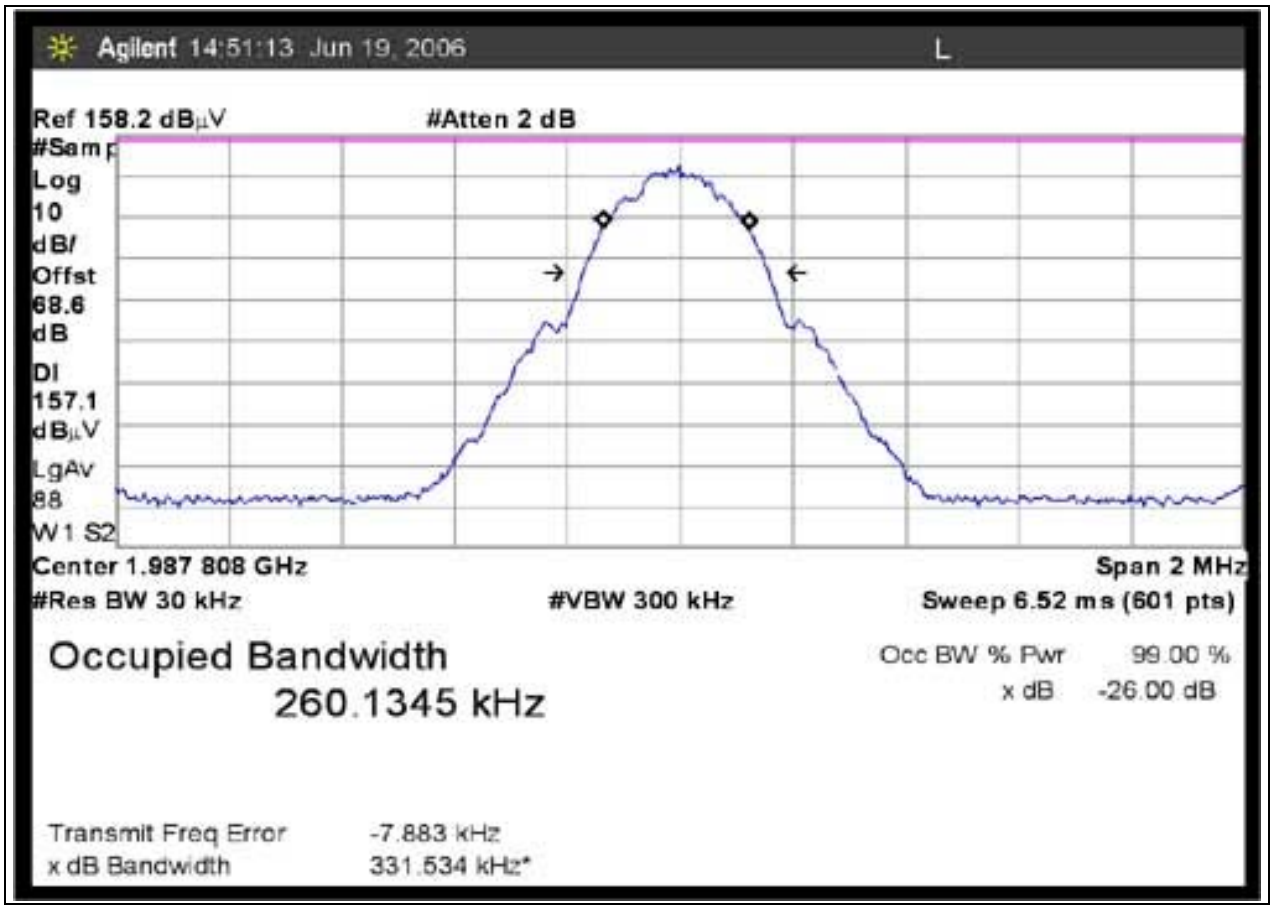
RSS-131 - 99% BANDWIDTH - GSM 1930MHz 260kHz



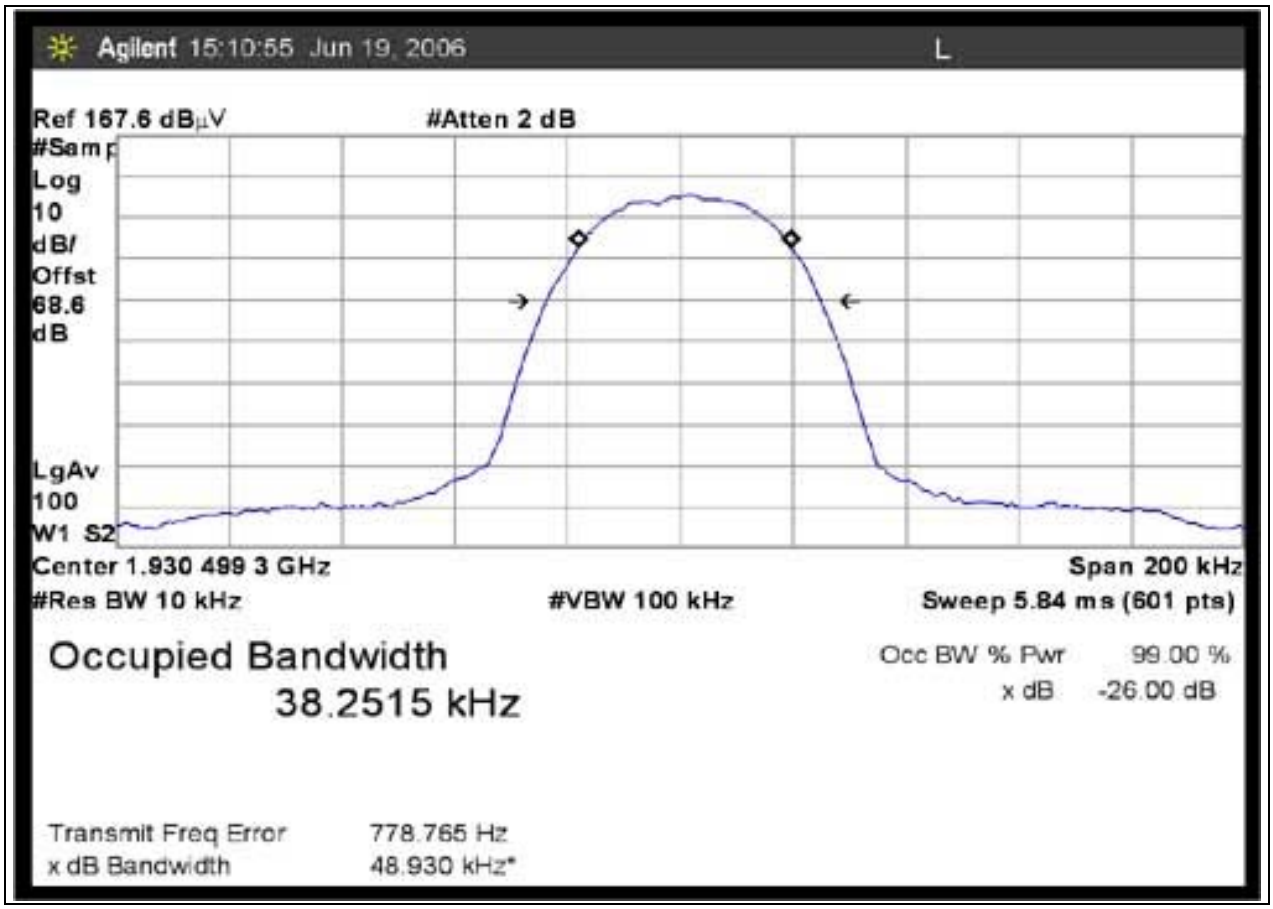
RSS-131 - 99% BANDWIDTH - GSM 1960MHz 261kHz



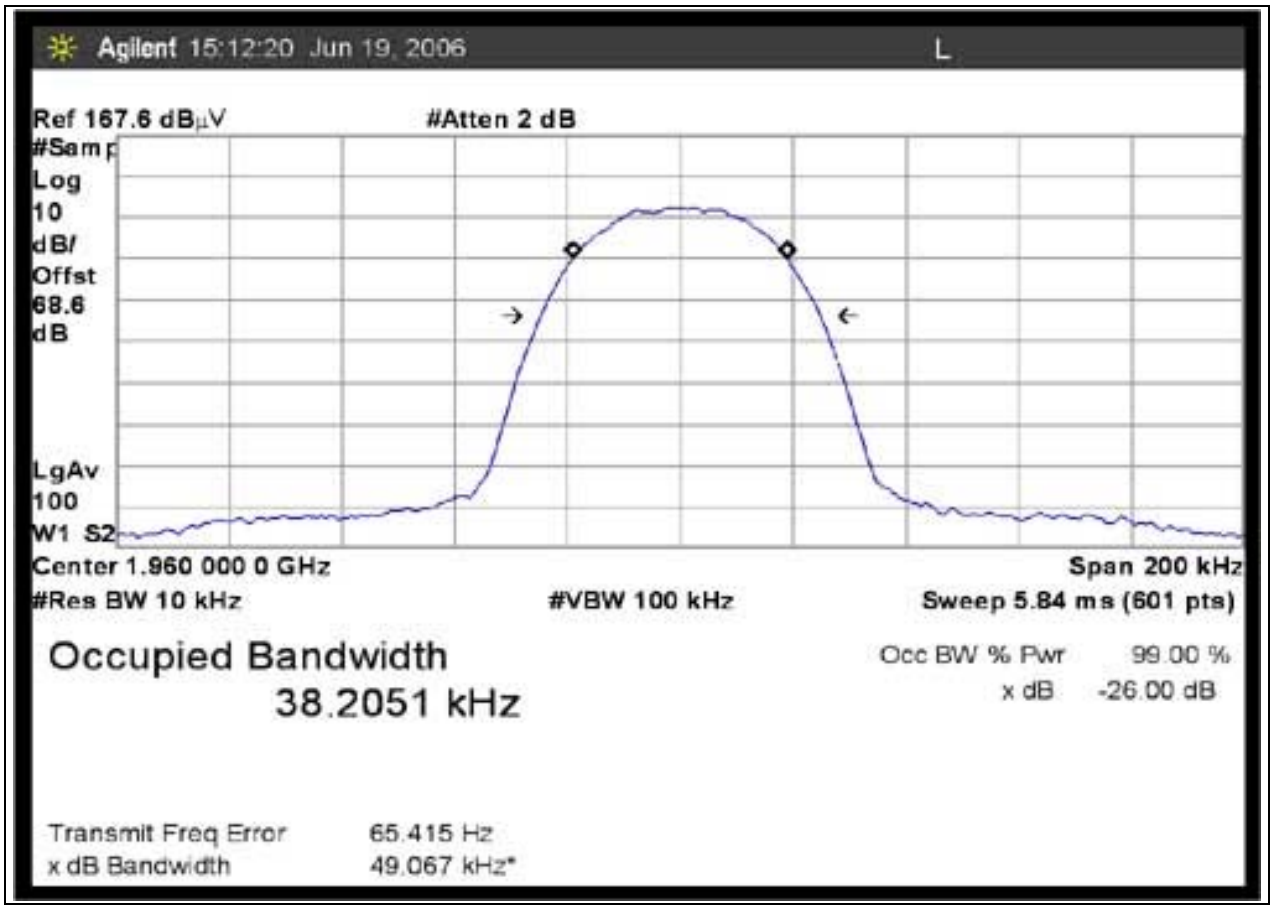
RSS-131 - 99% BANDWIDTH - GSM 1990MHz 260kHz



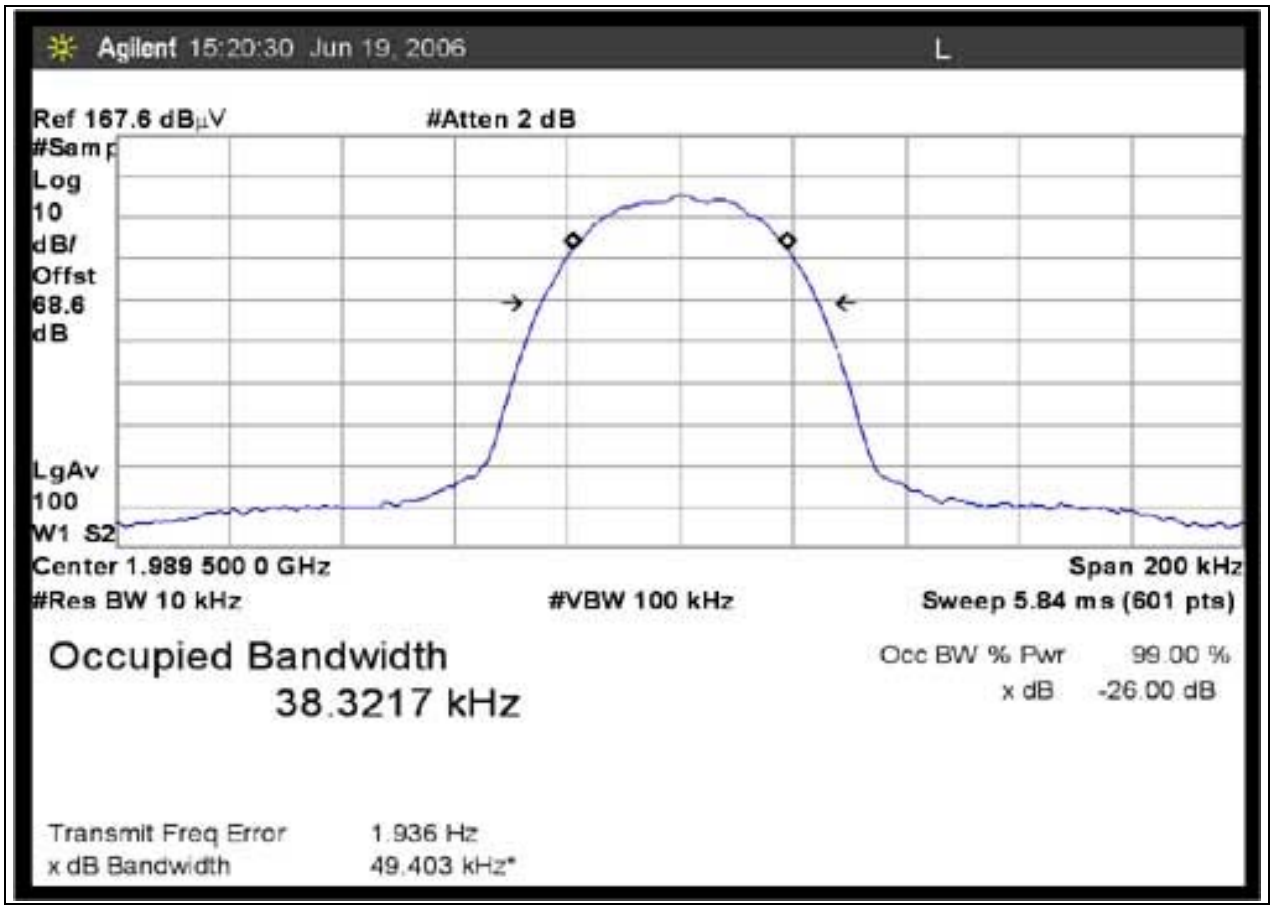
RSS-131 - 99% BANDWIDTH - TDMA 1930MHz 38kHz



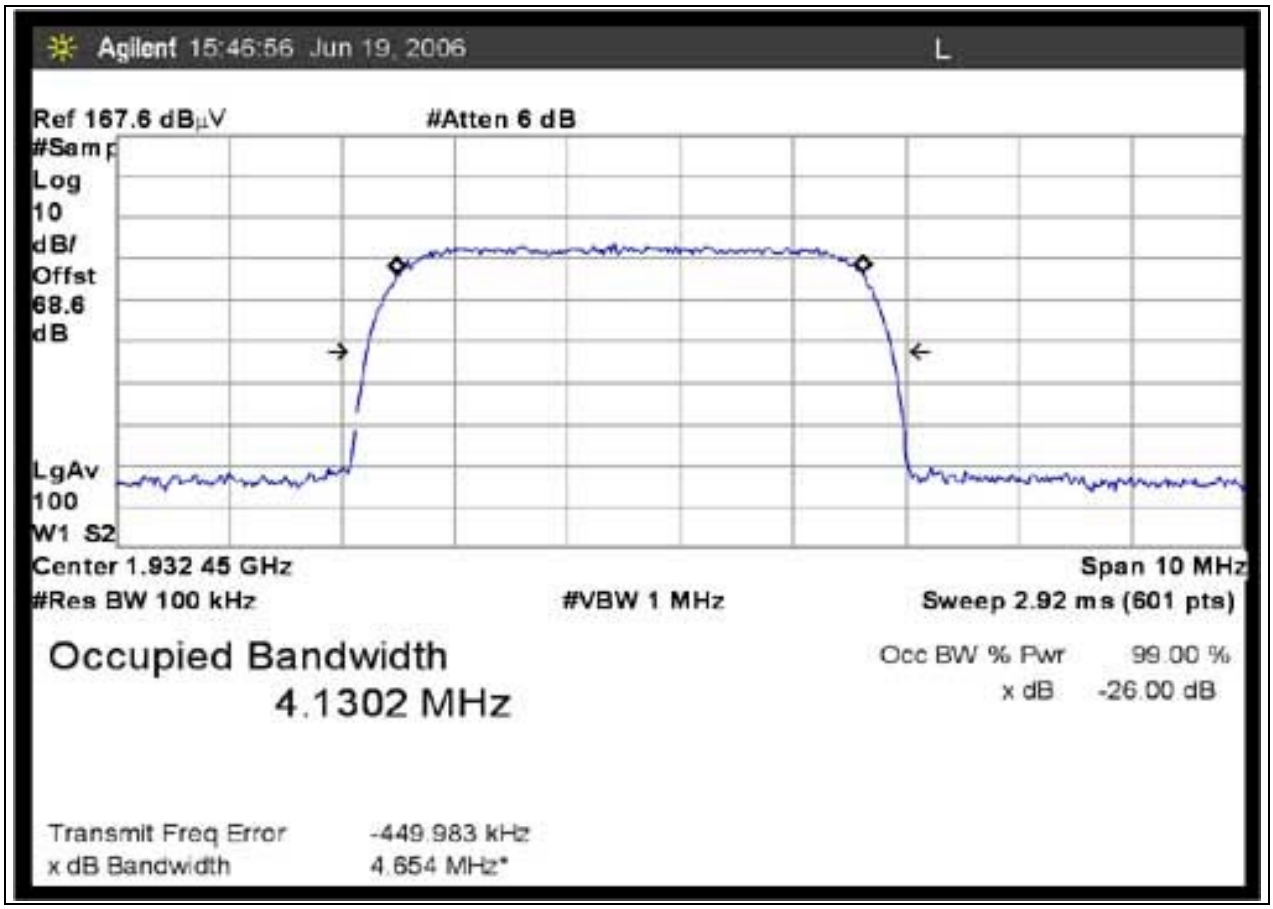
RSS-131 - 99% BANDWIDTH - TDMA 1960MHz 38kHz



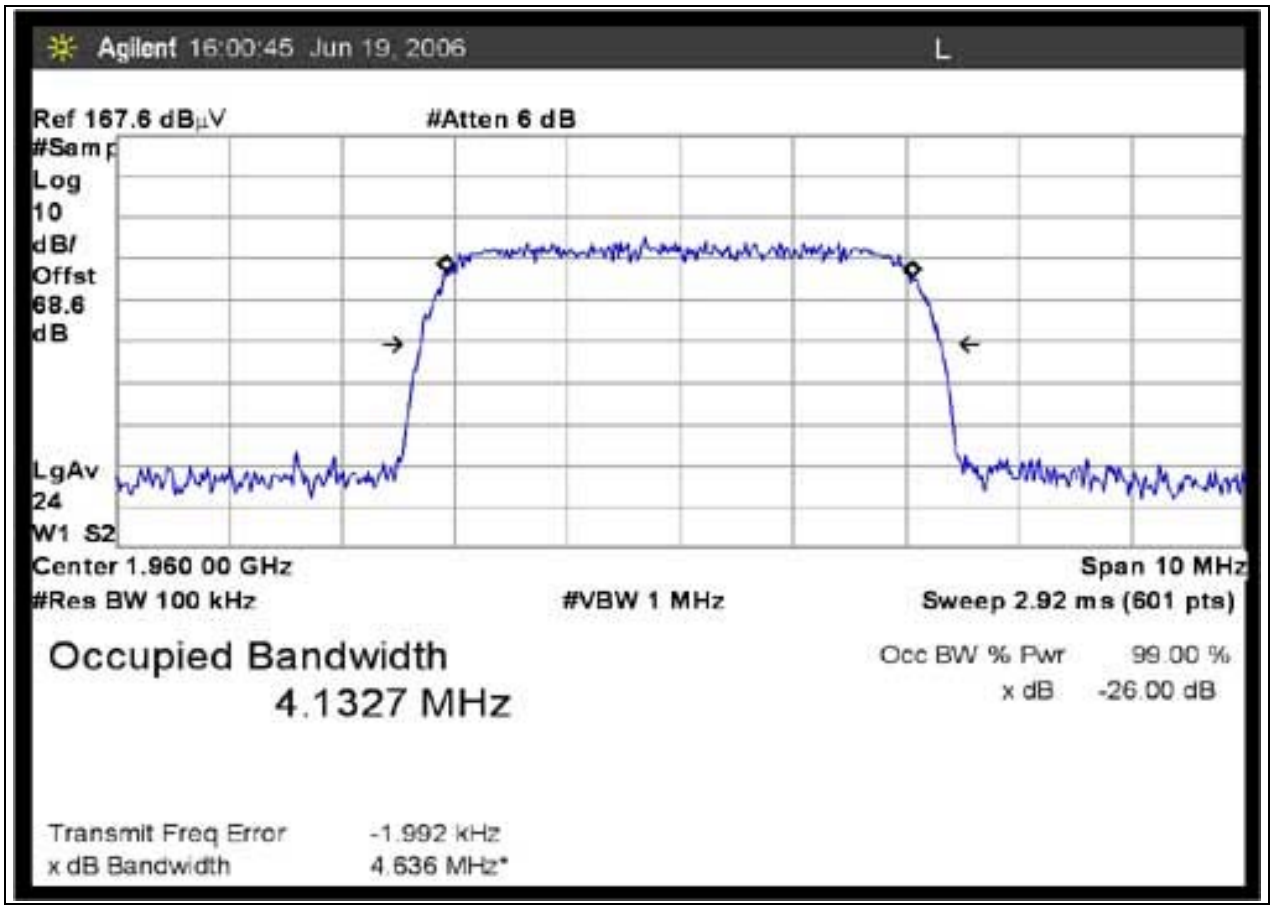
RSS-131 - 99% BANDWIDTH - TDMA 1990MHz 38kHz



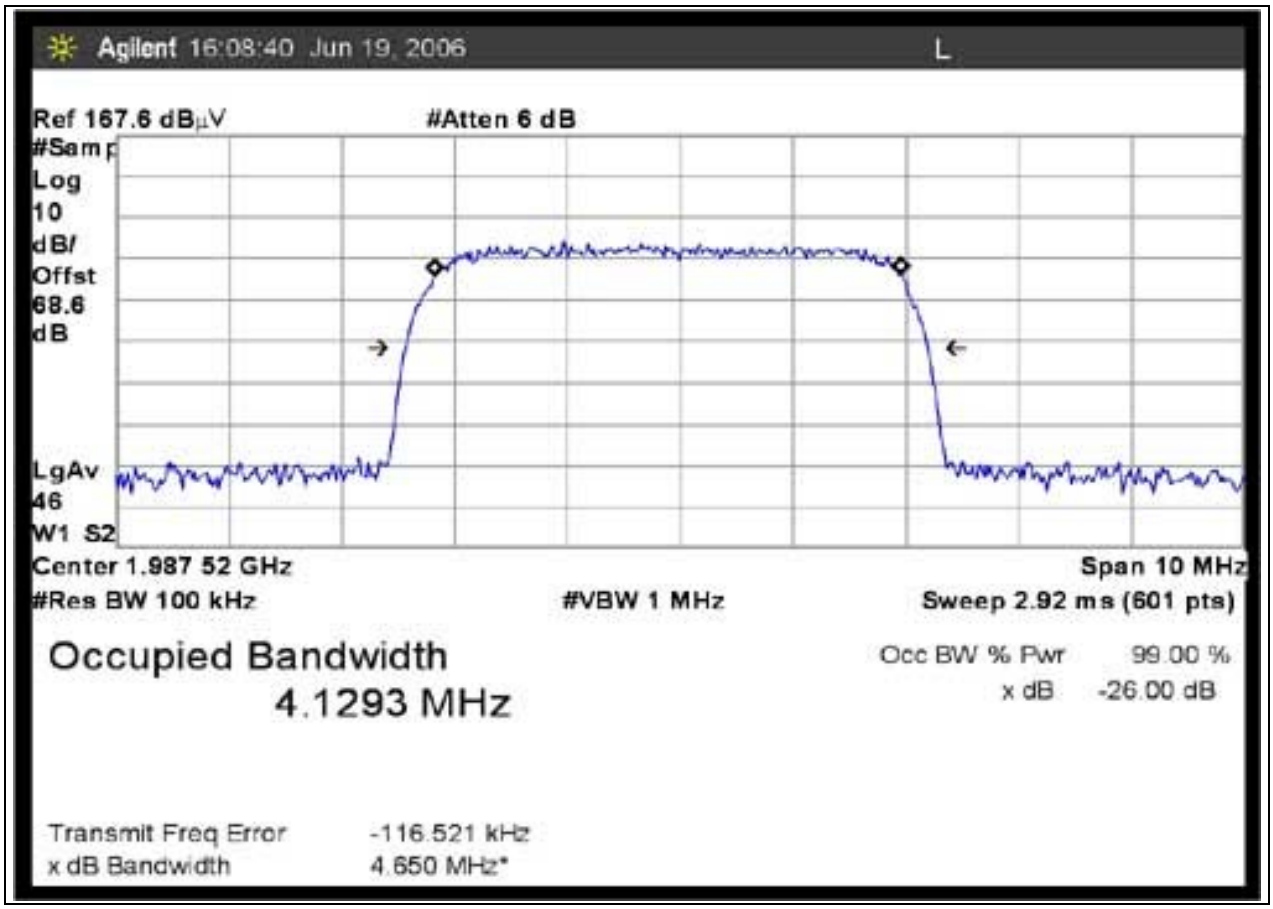
RSS-131 - 99% BANDWIDTH - WCDMA 1930MHz 4.1MHz



RSS-131 - 99% BANDWIDTH - WCDMA 1960MHz 4.1MHz



RSS-131 - 99% BANDWIDTH - WCDMA 1990MHz 4.1MHz



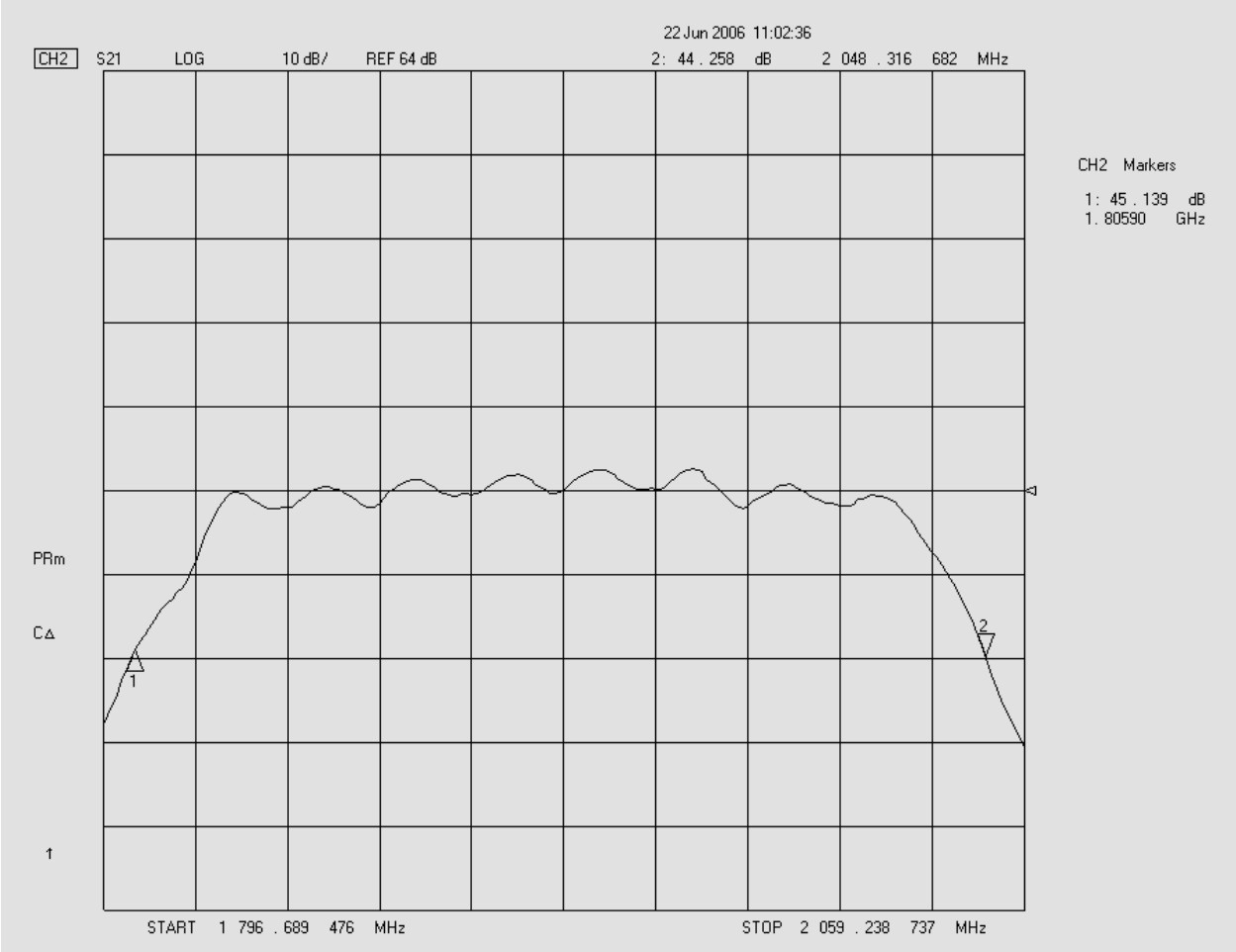
Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02672	Agilent	E4446A	US44300438	011405	011407

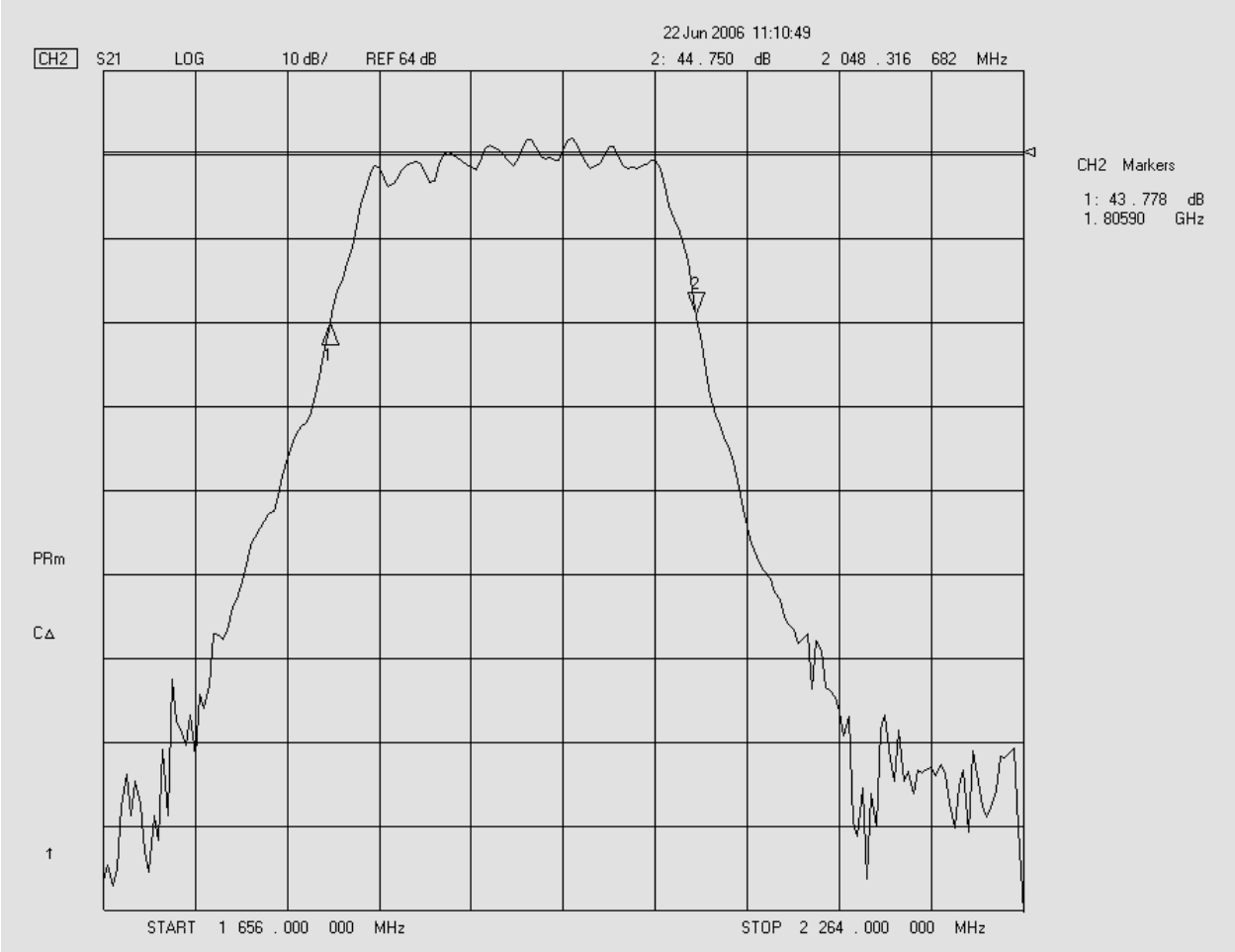
PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP

RSS-131 - GAIN LINEARITY

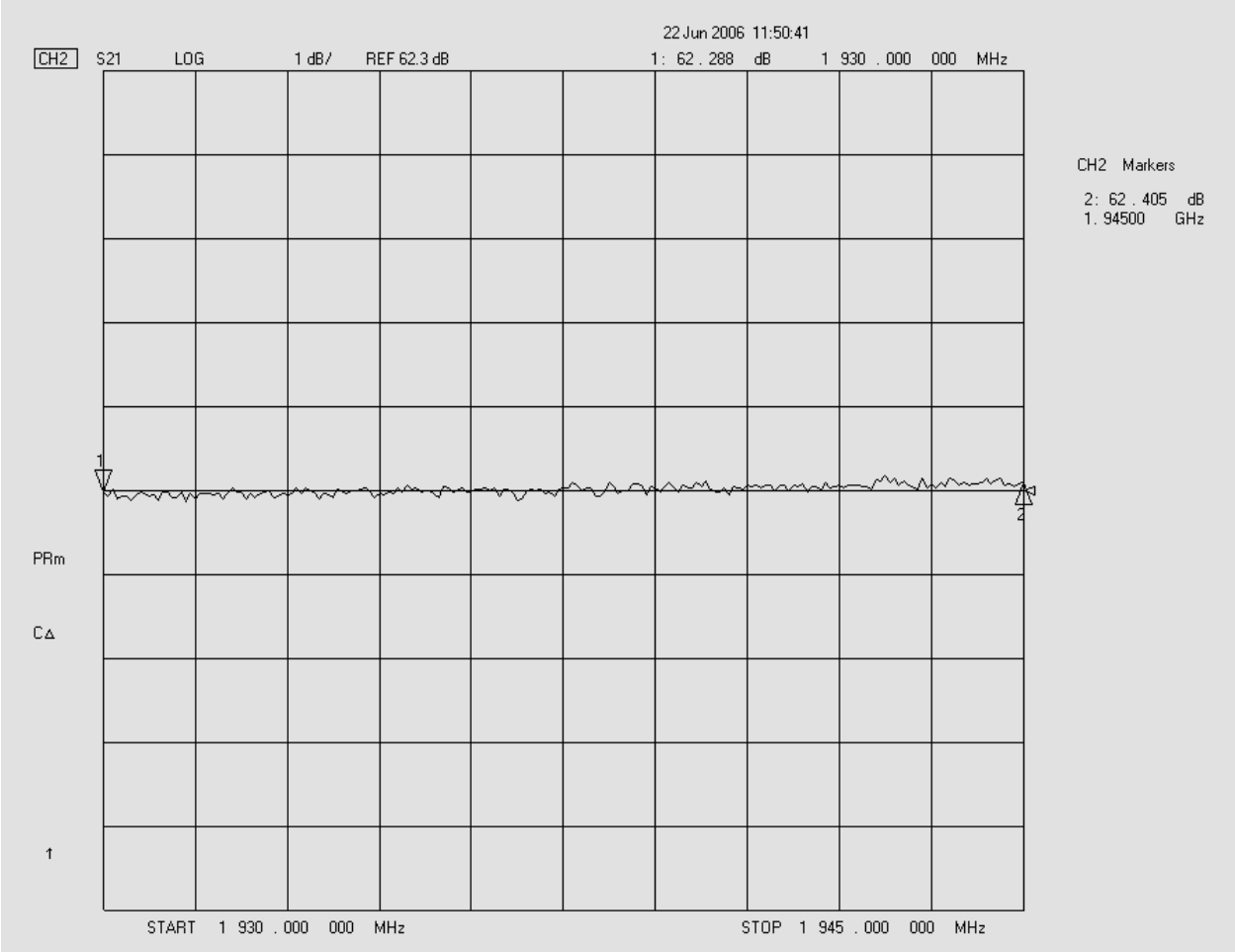
Test Conditions: The EUT is placed on the wooden table. RF out is connected to remote loadstring and power meter. RF in receives RF signal via remote ESGs and a preamp. The RF level is adjusted to maintain the transmit power. measurement performed at antenna port.



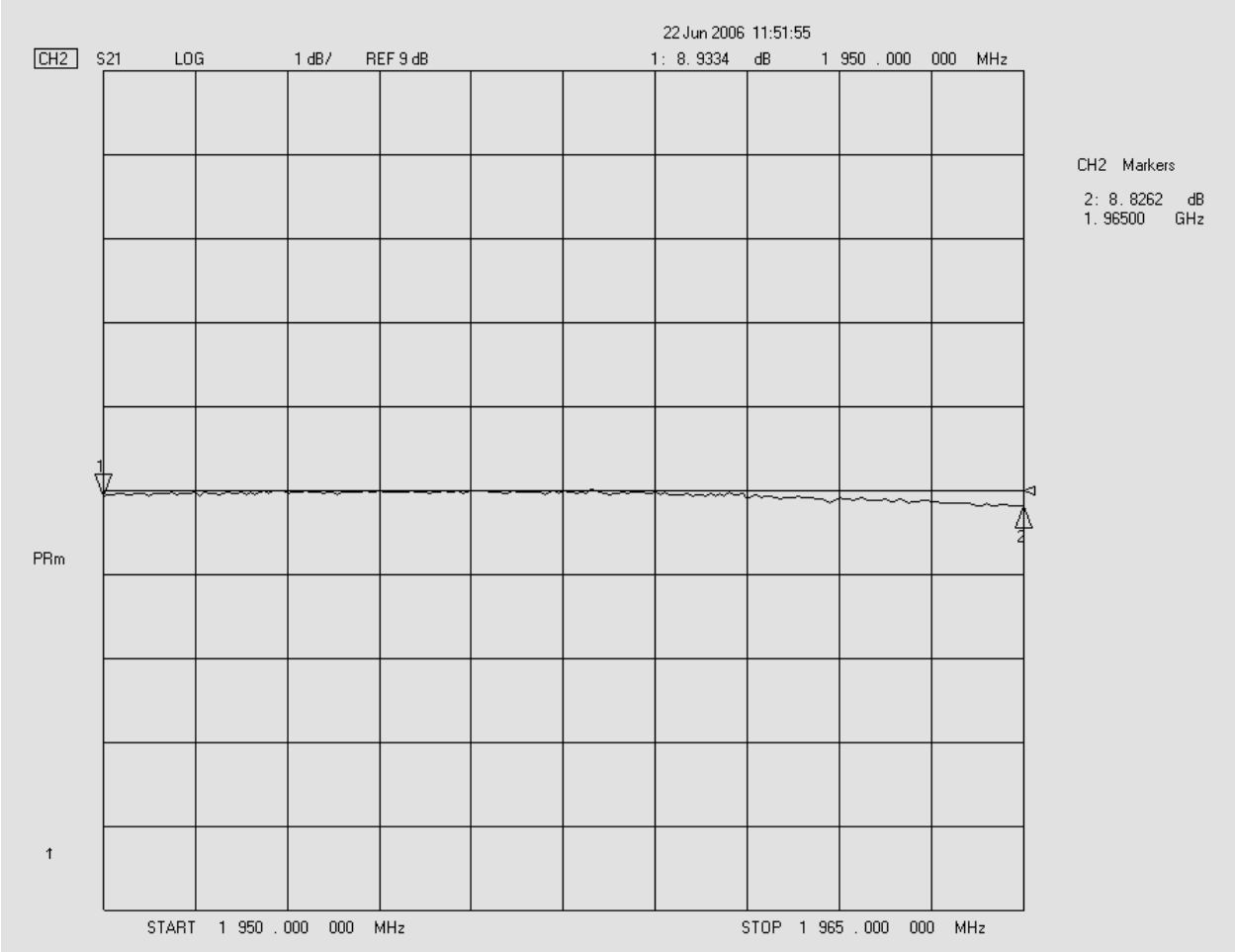
20dB gain BW = 243 MHz



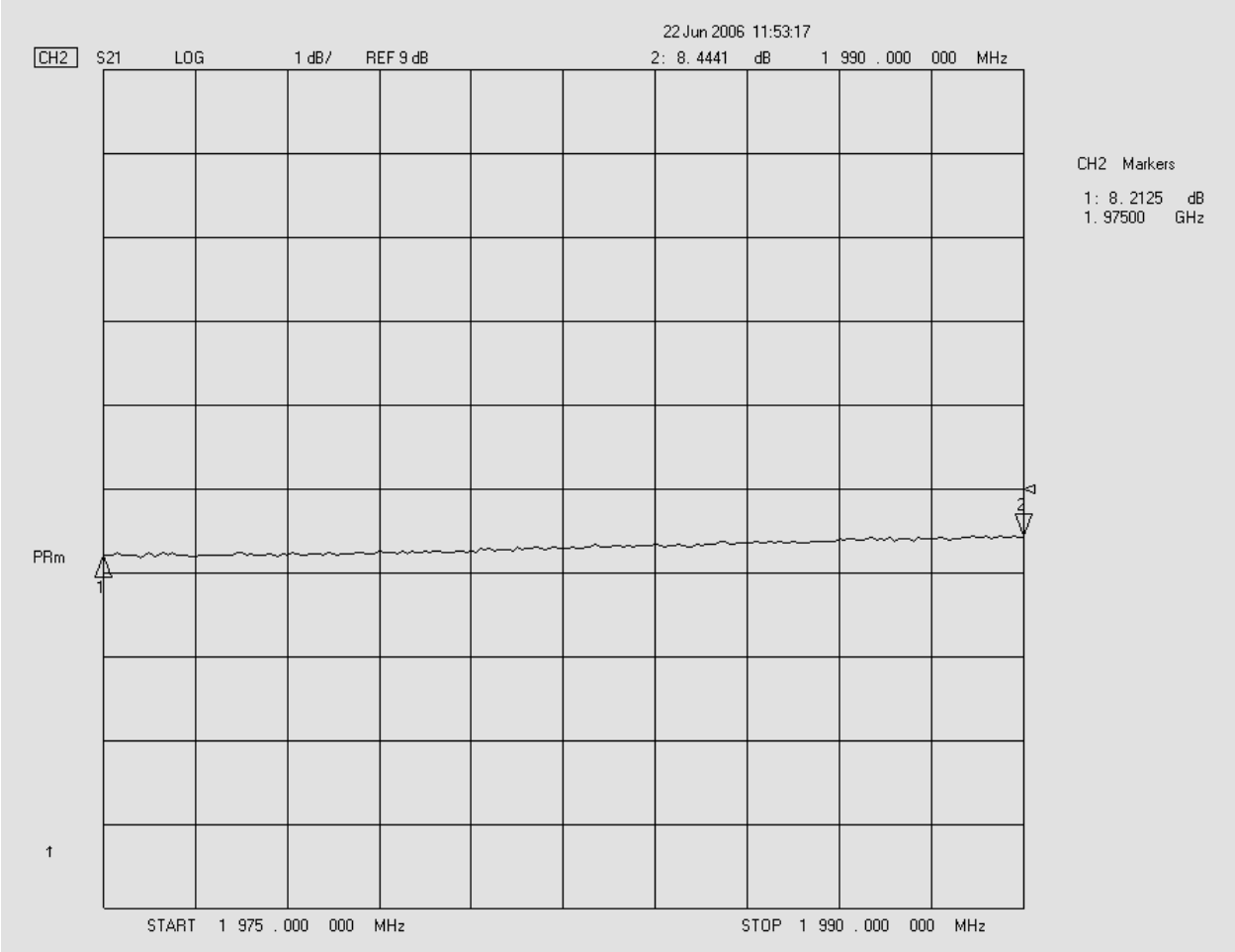
Gain linearity from 250% of 20dB BW.



Block A : Gain linearity: +- 1 dB from manufacturer's declaration.



Block B : Gain linearity: +- 1 dB from manufacturer's declaration.



Block C : Gain linearity: +- 1 dB from manufacturer's declaration.

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Network analyzer	PWAV	HP	8753E	Us38432770	072204	070026

PHOTOGRAPH SHOWING GAIN LINEARITY