CKC LABORATORIES, INC. Testing the Future

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803.05 - 803.08
EMC

ADDENDUM TO POWERWAVE TECHNOLOGIES, INC.
TEST REPORT FC04-089

FOR THE

RF AMPLIFIER, SCA9322-40C

FCC PART 22 AND RSS-131

COMPLIANCE

DRAFT

DATE OF ISSUE: FEBRUARY 10, 2005

PREPARED FOR:

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

W.O. No.: 83009

PREPARED BY:

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CKC Laboratories, Inc.
5473A Clouds Rest
Mariposa, CA 95338

Date of test: December 8-13, 2004

Report No.: FC04-089A

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ADMINISTRATIVE INFORMATION

DATE OF TEST:	December 8-13, 2004
DATE OF RECEIPT:	December 8, 2004
PURPOSE OF TEST:	To demonstrate the compliance of the RF Amplifier, SCA9322-40C with the requirements for FCC Part 22 and RSS-131 devices. **Addendum A** is to revise the modulation type on page 10 and add a statement regarding passband gain and bandwidth on page 49.
TEST METHOD:	FCC Part 22 and RSS-212
FREQUENCY RANGE TESTED:	9 kHz-9 GHz
MANUFACTURER:	Powerwave Technologies, Inc. 1801 E. St. Andrew Place Santa Ana, CA 92705
REPRESENTATIVE:	Greg Butler
TEST LOCATION:	CKC Laboratories, Inc. 110 Olinda Place Brea, CA 92621

SUMMARY OF RESULTS

As received, the Powerwave Technologies, Inc. RF Amplifier, SCA9322-40C was found to be fully compliant with the following standards and specifications:

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	22.913	RF Power Output
RSS-131	6.3	TIA/EIA	603	Non-Linearity (Intermodulation Attenuation)
RSS-131	6.4	47 CFR	22.917	Spurious Emissions Limitations
RSS-131	6.5	N/A	N/A	Frequency Stability (Band Translators)
	IC 3172-D		100638	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:

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

RF Amplifier
Manuf: Powerwave Technologies
Model: SCA9322-40C
Serial: NA
FCC ID: pending

PERIPHERAL DEVICES

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

Power Meter
Manuf: Agilent
Model: E4419B
Serial: US39400740

Power Supply
Manuf: HP
Model: 6654A
Serial: US36391129

ESG
Manuf: Agilent
Model: E4433B
Serial: US40051692

Pre Amp
Manuf: Mini Circuit
Model: ZHL-1042J
Serial: NA

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
N1E

FCC 2.1033 (c)(5) FREQUENCY RANGE
869-894 MHz

FCC 2.1033 (c)(6) OPERATING POWER
40 Watts

FCC 2.1033 (c)(7) MAXIMUM POWER RATING
500 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
EDGE and GSM.

FCC 2.1033(c)(14)/2.1046/22.913(a) - RF POWER OUTPUT

§22.913 Effective radiated power limits. - The effective radiated power (ERP) of transmitters in the Cellular Radiotelephone Service must not exceed the limits in this section.
(a) Maximum ERP. The effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

The EUT is a RF amplifier. The manufacture does not provide an antenna for sale with the product, hence ERP 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 FCC22.913(a).

The RF power of the EUT was measured at the antenna port win a RF Average Power meter. The measurement satisfies the above requirement by demonstrating the measured power is below 500 watts.

Test setup: The EUT is placed on the wooden table. The RF port is connected to a support Signal Amplifiers and Signal Generator. 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.

869.2 MHz, 881.5 MHz, 893.8 MHz

Conclusion: As indicated below, each single channel does not exceed the power limit.

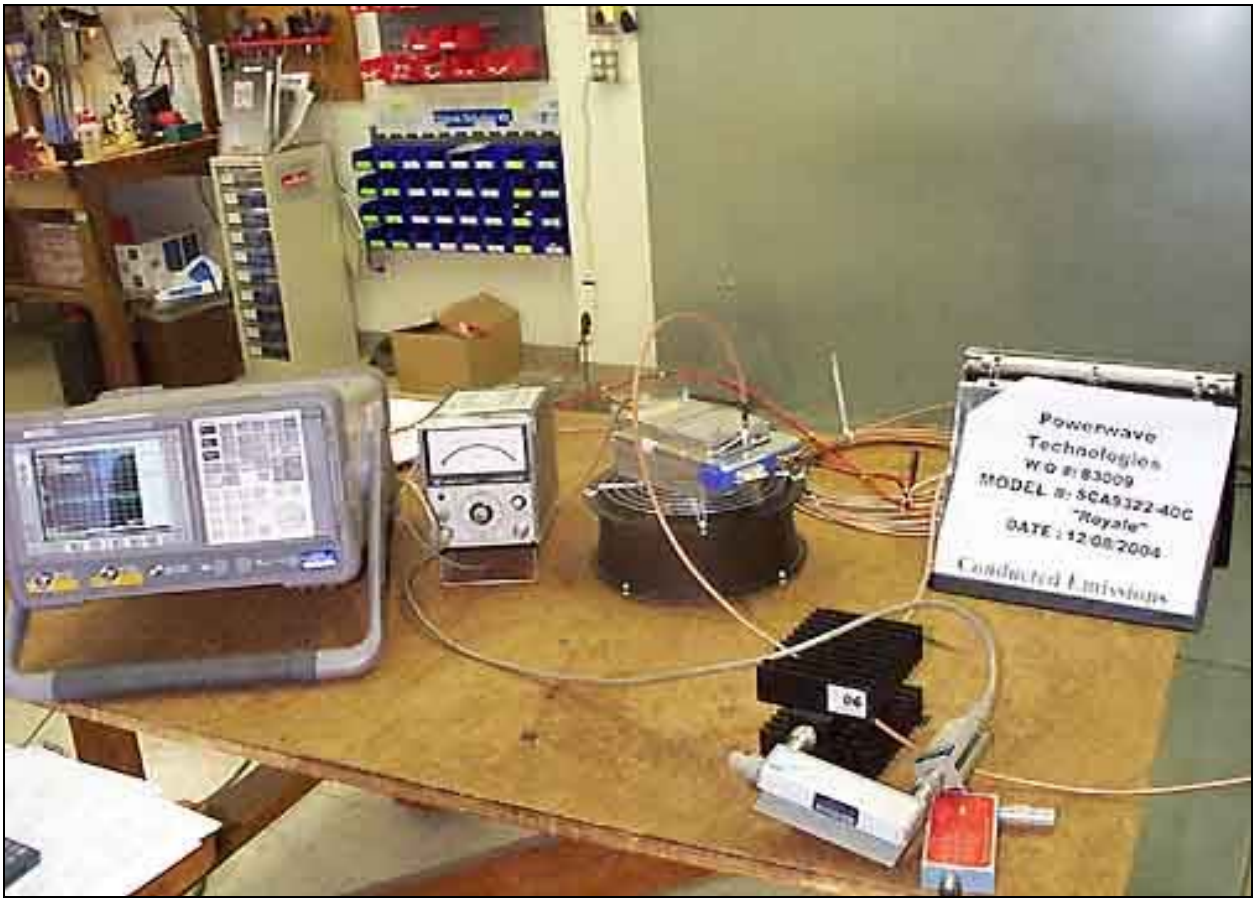
Results summary:

Frequency	**Measured Power (watts)**	
	EDGE	GSM
869.2 MHz	40	40
881.5 MHz	40	40
893.8 MHz	40	40

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
RF Power meter	02082	HP	435B	2445A11881	061704	061706
Power Sensor	02036	HP	8482A	1551A01004	061806	061806

POWER OUTPUT



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.

FCC 2.1033(c)(14)/2.1051/22.917(a) - SPURIOUS EMISSIONS AT ANTENNA TERMINAL

Limit line for Spurious Conducted Emission

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

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

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

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

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

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

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

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

= $20 \text{ Log } V + 120 - (43 + 20 \text{ Log } V - 10 \text{Log } R)$

= $20 \text{ Log } V + 120 - 43 - 20 \text{ Log } V + 10 \text{Log } R$

= $20 \text{ Log } V + 120 - 43 - 20 \text{ Log } V + 10 \text{Log } R$

= $120 - 43 + 10 \text{ Log } 50$ 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 92823 • (714) 993-6112

Customer:	**Powerwave Technologies, Inc.**		
Specification:	**FCC Part 22.917(a) Conducted Spurious Emissions**		
Work Order #:	**83009**	Date:	12/10/2004
Test Type:	**Conducted Emissions**	Time:	13:11:55
Equipment:	**RF Amplifier**	Sequence#:	13
Manufacturer:	Powerwave Technologies	Tested By:	E. Wong
Model:	SCA9322-40C		27V dc
S/N:	NA		

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

Function	Manufacturer	Model #	S/N
RF Amplifier*	Powerwave Technologies	SCA9322-40C	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Meter	Agilent	E4419B	US39400740
Power Supply	HP	6654A	US36391129
ESG	Agilent	E4433B	US40051692
Pre Amp	Mini Circuit	ZHL-1042J	NA

Test Conditions / Notes:

The EUT is placed on the wooden table. RF Input port is connected to a remote support signal amplifier and a signal generator. The RF Output is connected to a remote 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. Tx Power: 40 Watts. Modulation: EDGE. Frequency: 869.2 MHz. Chassis: Cast. Frequency range of measurement = 9 kHz - 9 GHz. 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 - 9GHz; RBW=1 MHz, VBW=1 MHz. . -27VDC, 20°C, 50% relative humidity.

Transducer Legend:

T1=SMA Cable 1-40GHz AN2604_012305	T2=HPF 2.4GHz High Pass 022005

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	869.200M	147.3	+0.0	+0.0			+0.0	147.3	94.0 Fundamental	+53.3	Anten
2	3476.700M	82.3	+0.6	+0.7			+0.0	83.6	94.0	-10.4	Anten

Test Location: CKC Laboratories, Inc. •110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **Powerwave Technologies, Inc.**
Specification: **FCC Part 22.917(a) Conducted Spurious Emissions**
Work Order #: **83009** Date: 12/10/2004
Test Type: **Conducted Emissions** Time: 13:33:13
Equipment: **RF Amplifier** Sequence#: 14
Manufacturer: Powerwave Technologies Tested By: E. Wong
Model: SCA9322-40C 27V dc
S/N: NA

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

Function	Manufacturer	Model #	S/N
RF Amplifier*	Powerwave Technologies	SCA9322-40C	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Meter	Agilent	E4419B	US39400740
Power Supply	HP	6654A	US36391129
ESG	Agilent	E4433B	US40051692
Pre Amp	Mini Circuit	ZHL-1042J	NA

Test Conditions / Notes:

The EUT is placed on the wooden table. RF Input port is connected to a remote support signal amplifier and a signal generator. The RF Output is connected to a remote 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. Tx Power: 40 Watts. Modulation: EDGE. Frequency: 881.5 MHz. Chassis: Cast. Frequency range of measurement = 9 kHz - 9 GHz. 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 - 9GHz; RBW=1 MHz, VBW=1 MHz. . -27VDC, 20°C, 50% relative humidity.

Transducer Legend:

T1=SMA Cable 1-40GHz AN2604_012305	T2=HPF 2.4GHz High Pass 022005

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	881.490M	147.7	+0.0	+0.0			+0.0	147.7	94.0 Fundamental	+53.7	Anten
2	3526.000M	80.4	+0.6	+0.8			+0.0	81.8	94.0	-12.2	Anten

Test Location: CKC Laboratories, Inc. •110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer:	**Powerwave Technologies, Inc.**		
Specification:	**FCC Part 22.917(a) Conducted Spurious Emissions**		
Work Order #:	**83009**	Date:	12/10/2004
Test Type:	**Conducted Emissions**	Time:	13:36:38
Equipment:	**RF Amplifier**	Sequence#:	15
Manufacturer:	Powerwave Technologies	Tested By:	E. Wong
Model:	SCA9322-40C		27V dc
S/N:	NA		

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

Function	Manufacturer	Model #	S/N
RF Amplifier*	Powerwave Technologies	SCA9322-40C	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Meter	Agilent	E4419B	US39400740
Power Supply	HP	6654A	US36391129
ESG	Agilent	E4433B	US40051692
Pre Amp	Mini Circuit	ZHL-1042J	NA

Test Conditions / Notes:

The EUT is placed on the wooden table. RF Input port is connected to a remote support signal amplifier and a signal generator. The RF Output is connected to a remote 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. Tx Power: 40 Watts. Modulation: EDGE. Frequency: 893.8 MHz. Chassis: Cast. Frequency range of measurement = 9 kHz - 9 GHz. 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 - 9GHz; RBW=1 MHz, VBW=1 MHz. . -27VDC, 20°C, 50% relative humidity.

Transducer Legend:

T1=SMA Cable 1-40GHz AN2604_012305	T2=HPF 2.4GHz High Pass 022005

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	893.773M	147.2	+0.0	+0.0			+0.0	147.2	94.0 Fundamental	+53.2	Anten
2	3575.100M	77.3	+0.6	+0.9			+0.0	78.8	94.0	-15.2	Anten

Test Location: CKC Laboratories, Inc. •110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer:	**Powerwave Technologies, Inc.**		
Specification:	**FCC Part 22.917(a) Conducted Spurious Emissions**		
Work Order #:	**83009**	Date:	12/10/2004
Test Type:	**Conducted Emissions**	Time:	13:45:10
Equipment:	**RF Amplifier**	Sequence#:	16
Manufacturer:	Powerwave Technologies	Tested By:	E. Wong
Model:	SCA9322-40C		27V dc
S/N:	NA		

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

Function	Manufacturer	Model #	S/N
RF Amplifier*	Powerwave Technologies	SCA9322-40C	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Meter	Agilent	E4419B	US39400740
Power Supply	HP	6654A	US36391129
ESG	Agilent	E4433B	US40051692
Pre Amp	Mini Circuit	ZHL-1042J	NA

Test Conditions / Notes:

The EUT is placed on the wooden table. RF Input port is connected to a remote support signal amplifier and a signal generator. The RF Output is connected to a remote 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. Tx Power: 40 Watts. Modulation: GSM. Frequency: 869.2 MHz. Chassis: Cast. Frequency range of measurement = 9 kHz - 9 GHz. 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 - 9GHz; RBW=1 MHz, VBW=1 MHz. . -27VDC, 20°C, 50% relative humidity.

Transducer Legend:

T1=SMA Cable 1-40GHz AN2604_012305	T2=HPF 2.4GHz High Pass 022005

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	869.095M	144.3	+0.0	+0.0			+0.0	144.3	94.0 Fundamental	+50.3	Anten
2	3476.875M	73.9	+0.6	+0.7			+0.0	75.2	94.0	-18.8	Anten

Test Location: CKC Laboratories, Inc. •110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer:	**Powerwave Technologies, Inc.**		
Specification:	**FCC Part 22.917(a) Conducted Spurious Emissions**		
Work Order #:	**83009**	Date:	12/10/2004
Test Type:	**Conducted Emissions**	Time:	13:49:47
Equipment:	**RF Amplifier**	Sequence#:	17
Manufacturer:	Powerwave Technologies	Tested By:	E. Wong
Model:	SCA9322-40C		27V dc
S/N:	NA		

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

Function	Manufacturer	Model #	S/N
RF Amplifier*	Powerwave Technologies	SCA9322-40C	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Meter	Agilent	E4419B	US39400740
Power Supply	HP	6654A	US36391129
ESG	Agilent	E4433B	US40051692
Pre Amp	Mini Circuit	ZHL-1042J	NA

Test Conditions / Notes:

The EUT is placed on the wooden table. RF Input port is connected to a remote support signal amplifier and a signal generator. The RF Output is connected to a remote 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. Tx Power: 40 Watts. Modulation: GSM. Frequency: 881.5 MHz. Chassis: Cast. Frequency range of measurement = 9 kHz - 9 GHz. 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 - 9GHz; RBW=1 MHz, VBW=1 MHz. . -27VDC, 20°C, 50% relative humidity.

Transducer Legend:

T1=SMA Cable 1-40GHz AN2604_012305

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

#	Freq MHz	Rdng dBµV	T1 dB	dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	881.530M	144.3	+0.0				+0.0	144.3	94.0 Fundamental	+50.3	Anten
2	3525.700M	74.5	+0.6				+0.0	75.1	94.0	-18.9	Anten

Test Location: CKC Laboratories, Inc. •110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer:	**Powerwave Technologies, Inc.**		
Specification:	**FCC Part 22.917(a) Conducted Spurious Emissions**		
Work Order #:	**83009**	Date:	12/10/2004
Test Type:	**Conducted Emissions**	Time:	13:53:49
Equipment:	**RF Amplifier**	Sequence#:	18
Manufacturer:	Powerwave Technologies	Tested By:	E. Wong
Model:	SCA9322-40C		27V dc
S/N:	NA		

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

Function	Manufacturer	Model #	S/N
RF Amplifier*	Powerwave Technologies	SCA9322-40C	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Meter	Agilent	E4419B	US39400740
Power Supply	HP	6654A	US36391129
ESG	Agilent	E4433B	US40051692
Pre Amp	Mini Circuit	ZHL-1042J	NA

Test Conditions / Notes:

The EUT is placed on the wooden table. RF Input port is connected to a remote support signal amplifier and a signal generator. The RF Output is connected to a remote 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. Tx Power: 40 Watts. Modulation: GSM. Frequency: 893.8 MHz. Chassis: Cast. Frequency range of measurement = 9 kHz - 9 GHz. 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 - 9GHz; RBW=1 MHz, VBW=1 MHz. . -27VDC, 20°C, 50% relative humidity.

Transducer Legend:

T1=SMA Cable 1-40GHz AN2604_012305	T2=HPF 2.4GHz High Pass 022005

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	893.835M	144.2	+0.0	+0.0			+0.0	144.2	94.0 Fundamental	+50.2	Anten
2	3575.325M	72.1	+0.6	+0.9			+0.0	73.6	94.0	-20.4	Anten

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02467	Agilent	E7405A	US40240225	033103	033105

PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP

FCC 2.1033(c)(14)/2.1053/22.917(a) - FIELD STRENGTH OF SPURIOUS RADIATION

Test Location: CKC Laboratories, Inc. •110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer:	**Powerwave Technologies, Inc.**		
Specification:	**FCC Part 22.917(a) Radiated Spurious Emissions**		
Work Order #:	**83009**	Date:	12/09/2004
Test Type:	**Radiated Scan**	Time:	14:26:12
Equipment:	**RF Amplifier**	Sequence#:	1
Manufacturer:	Powerwave Technologies	Tested By:	E. Wong
Model:	SCA9322-40C		
S/N:	NA		

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

Function	Manufacturer	Model #	S/N
RF Amplifier*	Powerwave Technologies	SCA9322-40C	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Meter	Agilent	E4419B	US39400740
Power Supply	HP	6654A	US36391129
ESG	Agilent	E4433B	US40051692
Pre Amp	Mini Circuit	ZHL-1042J	NA

Test Conditions / Notes:

The EUT is placed on the wooden table. RF input port is connected to a remote support signal amplifier and a signal generator. The RF Output is connected to a remote 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. Tx Power: 40 Watts. Modulation: EDGE and GSM. Frequencies: 869.2 MHz, 881.5 MHz, and 893.8 MHz. Chassis: Machined and Cast. Frequency range of measurement = 9 kHz - 9 GHz. 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 - 9GHz; RBW=1 MHz, VBW=1 MHz. -27VDC, 20°C, 50% relative humidity.

Operating Frequency: 869 MHz - 894 MHz EDGE Chassis: Machined
Channels: Low, Mid and High
Highest Measured Output Power: 46.02 ERP(dBm)= 40 ERP(Watts)
Distance: 3 meters
Limit: 43+10Log(P) 59.02 dBc

Freq. (MHz)	Reference Level (dBm)	Antenna Polarity (H/V)	dBc
1,738.50	-29.7	Vert	75.72
3,476.73	-31.4	Vert	77.42
1,738.35	-33.5	Horiz	79.52
3,476.73	-35.9	Horiz	81.92
1,763.05	-34.4	Horiz	80.42
3,526.05	-36.7	Horiz	82.72
1,763.03	-32.3	Vert	78.32
3,526.00	-35.2	Vert	81.22
3,575.00	-36	Vert	82.02
1,787.50	-38.2	Vert	84.22
3,575.20	-39.2	Horiz	85.22
1,787.70	-40.7	Horiz	86.72

Operating Frequency: 869 MHz - 894 MHz EDGE Chassis: Cast
Channels: Low, Mid and High
Highest Measured Output Power: 46.02 ERP(dBm)= 40 ERP(Watts)
Distance: 3 meters
Limit: 43+10Log(P) 59.02 dBc

Freq. (MHz)	Reference Level (dBm)	Antenna Polarity (H/V)	dBc
3,476.70	-30.8	Vert	76.82
3,476.70	-33.2	Horiz	79.22
1,738.50	-38.3	Vert	84.32
1,738.40	-39.7	Horiz	85.72
3,525.98	-31.3	Vert	77.32
3,525.98	-34.2	Horiz	80.22
1,763.00	-39	Vert	85.02
1,762.98	-45.8	Horiz	91.82
3,575.33	-34.5	Vert	80.52
3,575.08	-36.9	Horiz	82.92
1,787.53	-45.6	Vert	91.62
1,787.50	-49.9	Horiz	95.92

Operating Frequency: 869 MHz - 894 MHz GSM Chassis: Machined
Channels: Low, Mid and High
Highest Measured Output Power: 46.02 ERP(dBm)= 40 ERP(Watts)
Distance: 3 meters
Limit: 43+10Log(P) 59.02 dBc

Freq. (MHz)	Reference Level (dBm)	Antenna Polarity (H/V)	dBc
1,738.35	-37.1	Horiz	83.12
3,476.88	-44.4	Horiz	90.42
3,476.88	-40.6	Vert	86.62
1,738.25	-34.3	Vert	80.32
1,763.01	-38.6	Horiz	84.62
1,762.98	-39	Vert	85.02
3,526.28	-41.9	Vert	87.92
3,525.93	-44.2	Horiz	90.22
1,787.51	-42.7	Horiz	88.72
3,574.94	-43.7	Horiz	89.72
3,574.94	-42.9	Vert	88.92
1,787.49	-40.1	Vert	86.12

Operating Frequency: 869 MHz - 894 MHz GSM Chassis: Cast
Channels: Low, Mid and High
Highest Measured Output Power: 46.02 ERP(dBm)= 40 ERP(Watts)
Distance: 3 meters
Limit: 43+10Log(P) 59.02 dBc

Freq. (MHz)	Reference Level (dBm)	Antenna Polarity (H/V)	dBc
3,477.10	-40.9	Horiz	86.92
3,477.25	-43	Vert	89.02
1,738.15	-44.6	Vert	90.62
1,738.35	-44.9	Horiz	90.92
1,763.10	-43	Horiz	89.02
3,526.00	-39.9	Horiz	85.92
3,526.00	-38.6	Vert	84.62
1,763.05	-45.8	Vert	91.82
3,574.75	-43	Horiz	89.02
3,574.75	-44.6	Vert	90.62
1,787.70	-45.4	Horiz	91.42
1,787.63	-46.4	Vert	92.42

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer RF Section	02462	HP	8568B	2928A04874	100804	100806
Spectrum Analyzer Display Section	02472	HP	85662A	3001A18430	100804	100806
QP Adapter	01437	HP	85650A	3303A01884	100804	100806
Spectrum Analyzer	02467	Agilent	E7405A	US40240225	033103	033105
30 – 1000MHz						
Biconilog Antenna	01995	Chase	CBL6111C	2451	040804	040806
Pre-amp	00309	HP	8447D	1937A02548	071404	071406
Antenna cable	NA	NA	RG214	Cable#15	123003	123004
Pre-amp to SA cable	NA	Pasternack	RG223/U	Cable#10	051304	051305
1000-9000MHz						
Horn Antenna	0849	EMCO	3115	6246	072204	072206
Microwave Pre-amp	00786	HP	83017A	3123A00281	081204	081206
Heliax Antenna cable	NA	Andrew	LDF1-50	Cable#20	091604	091605
24” SMA Cable	2604	Argosy	UFA147A	0-0360-200200	012304	012305
1.5 GHz HPF	02116	HP	84300-80037	3643A00027	060603	060605
9kHz-30MHz						
Loop Antenna	00314	EMCO	6502	2014	062804	062806

PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions - Front View

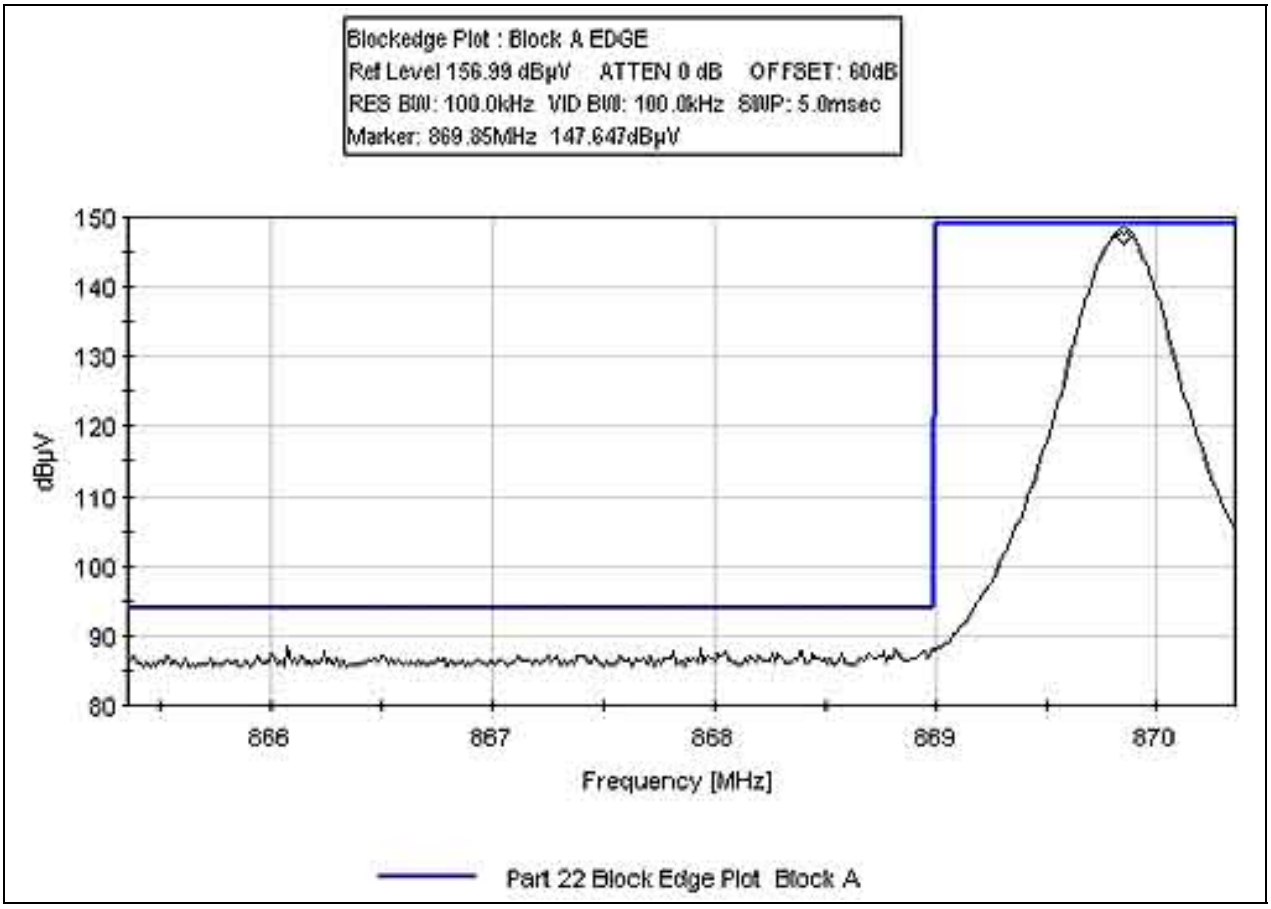
PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions – Back View

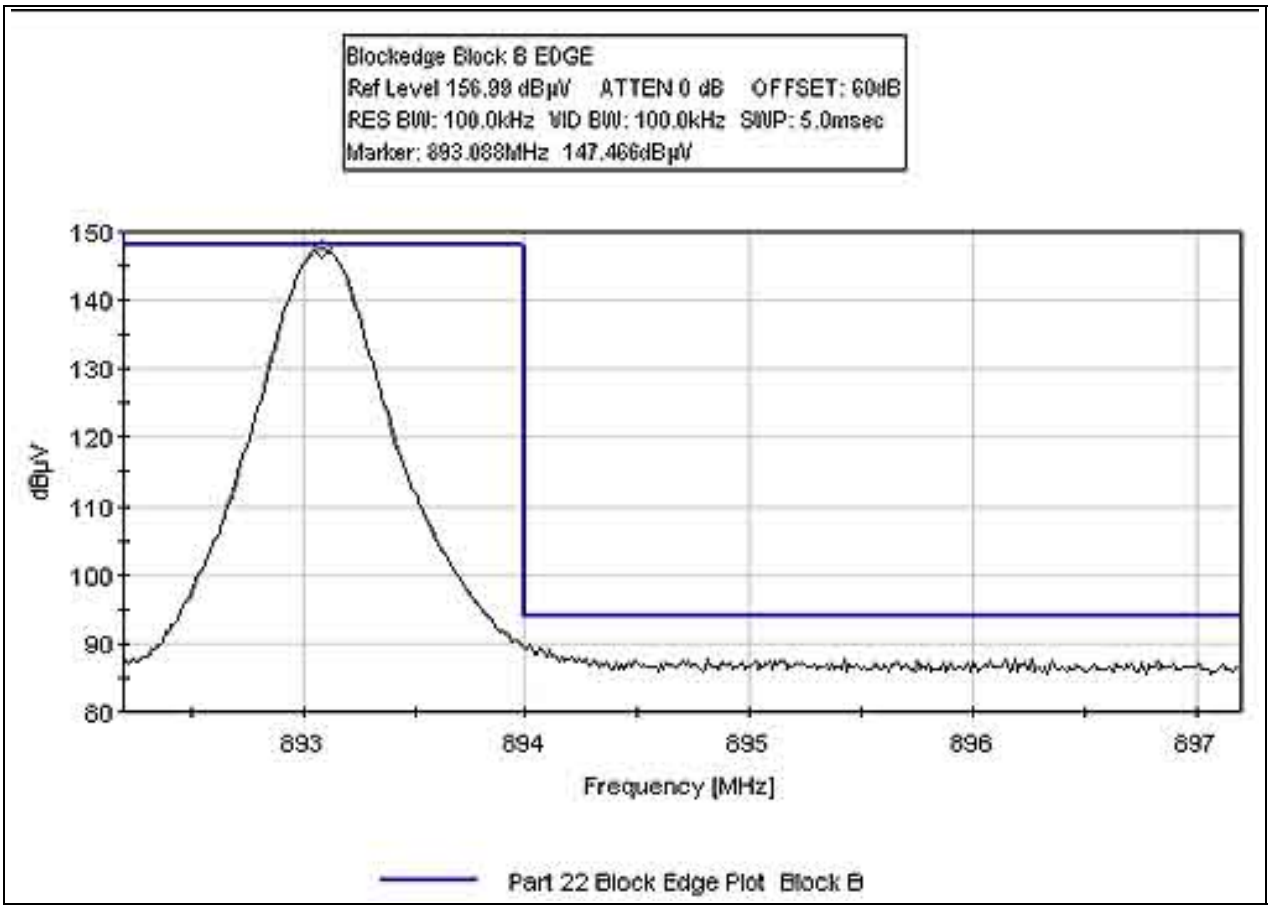
PHOTOGRAPH SHOWING RADIATED EMISSIONS

Loop Antenna

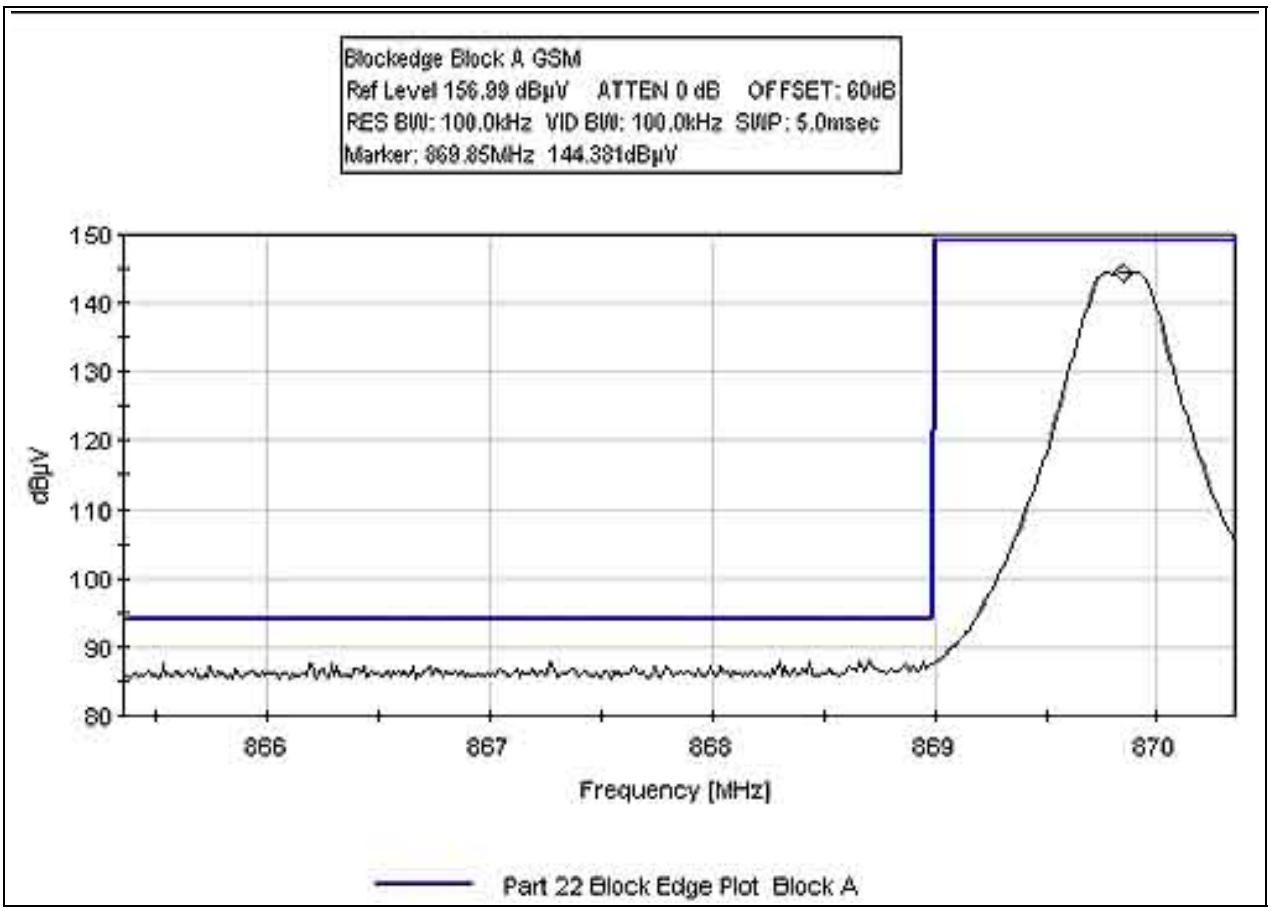
BLOCKEDGE EDGE BLOCK A



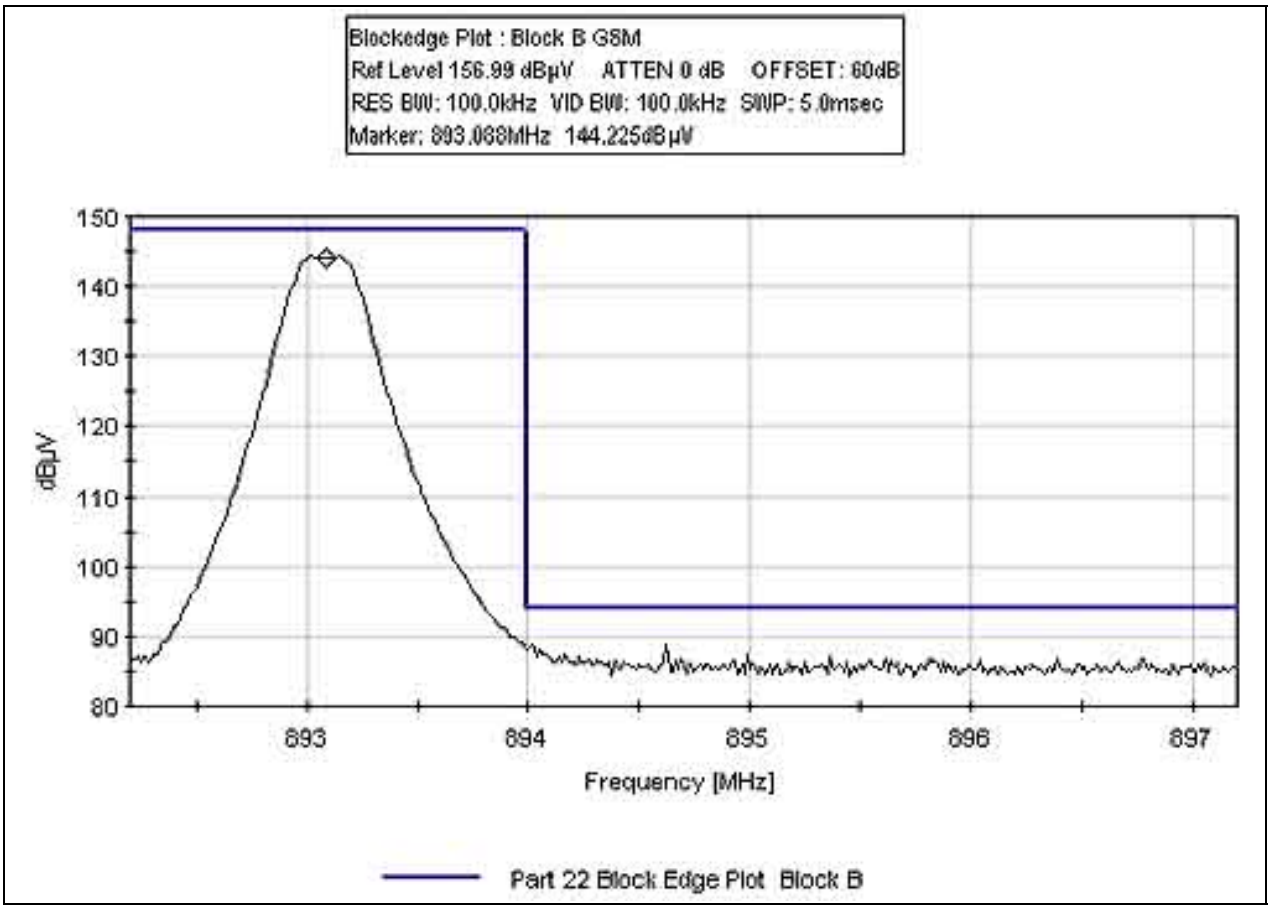
BLOCKEDGE EDGE BLOCK B



BLOCKEDGE GSM BLOCK A



BLOCKEDGE GSM BLOCK B

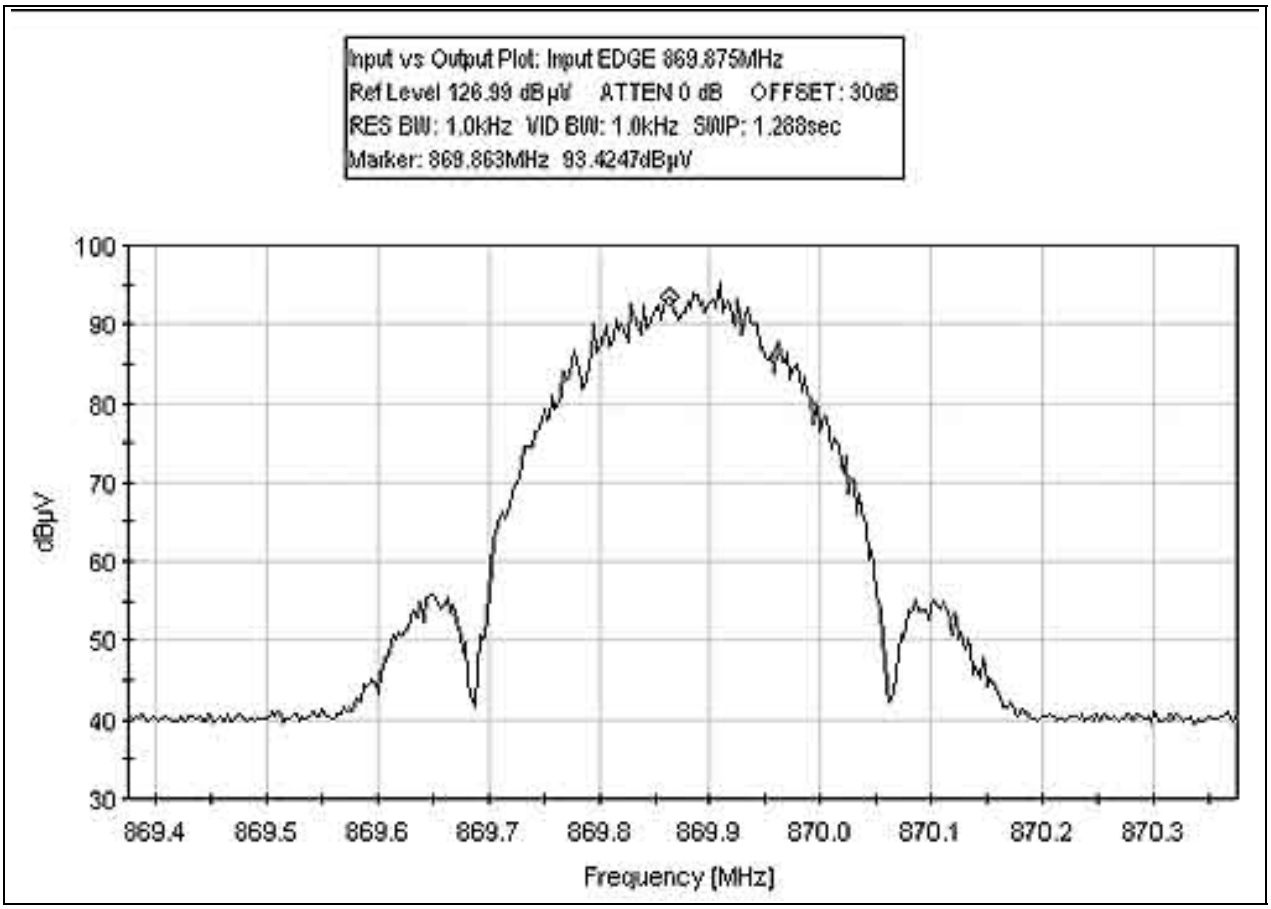


Test Equipment

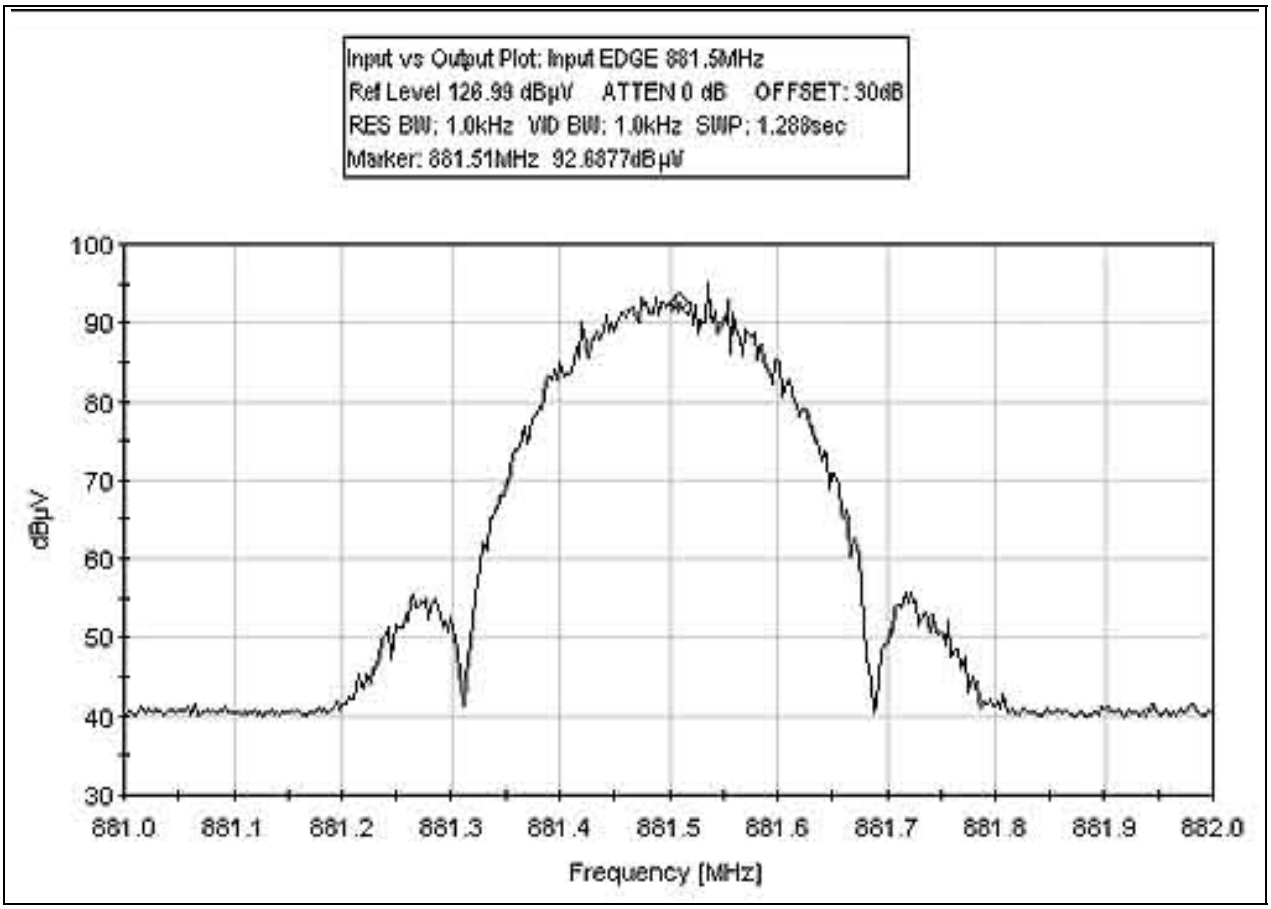
Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02467	Agilent	E7405A	US40240225	033103	033105

PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP

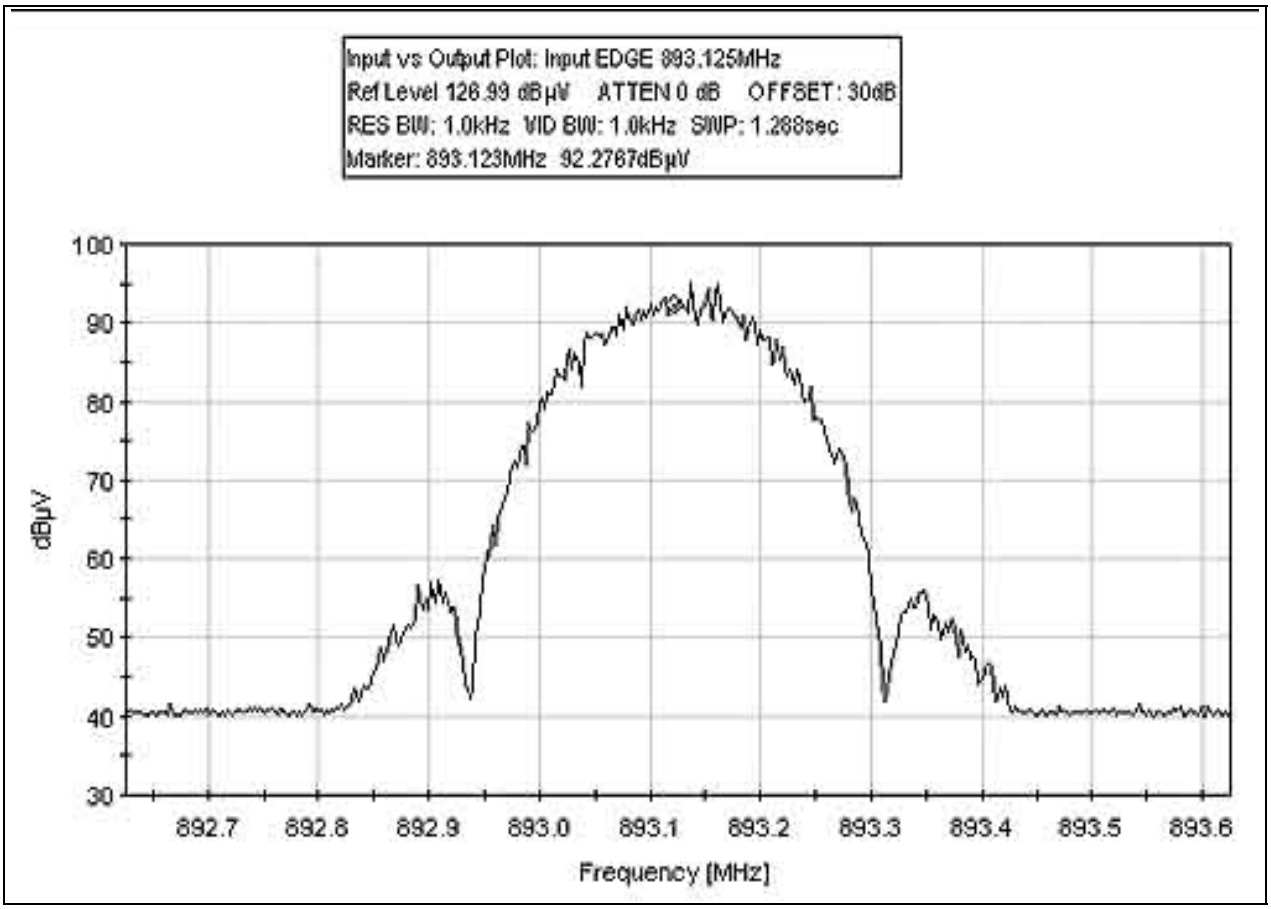
INPUT PLOT EDGE 869.875 MHz



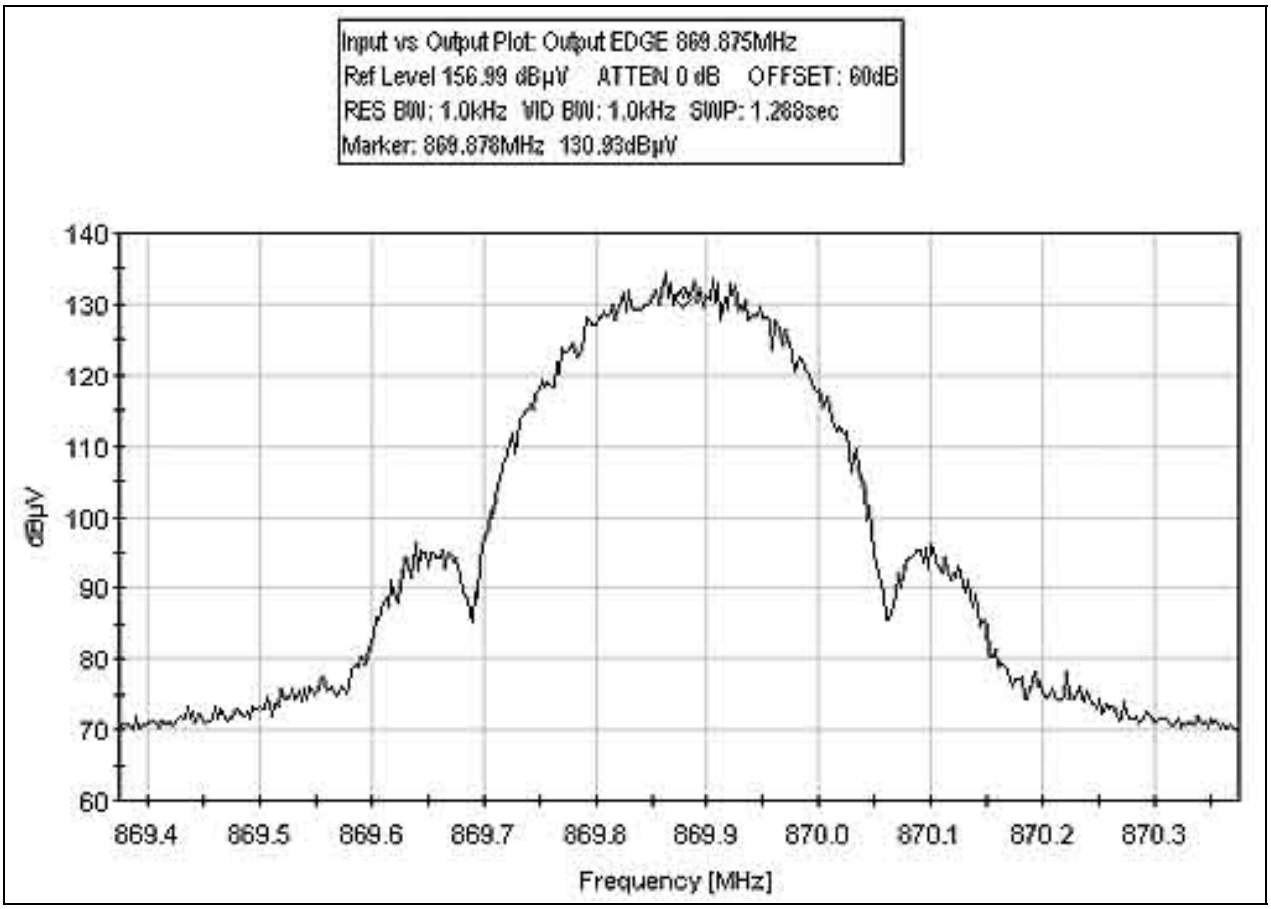
INPUT PLOT EDGE 881.5 MHz



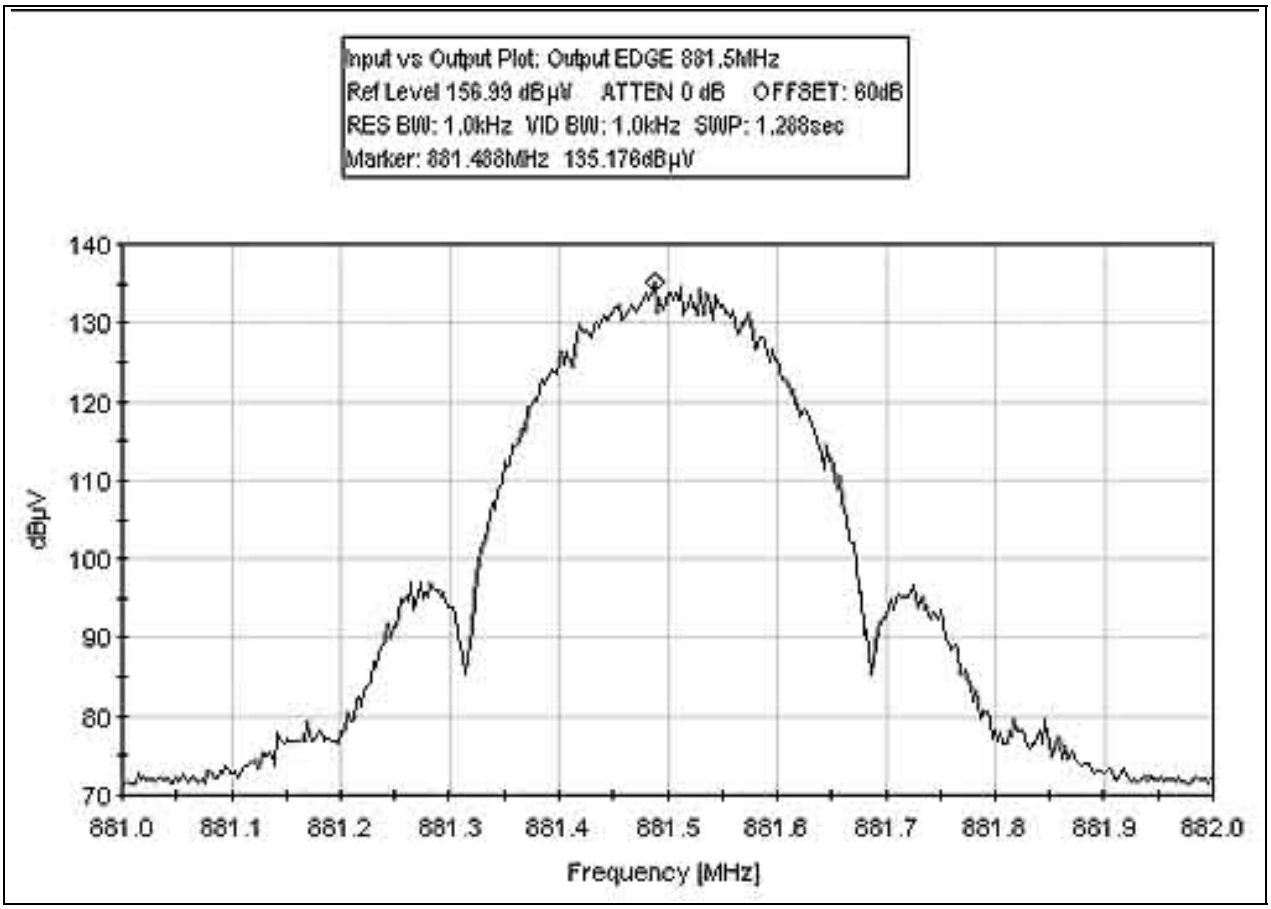
INPUT PLOT EDGE 893.125 MHz



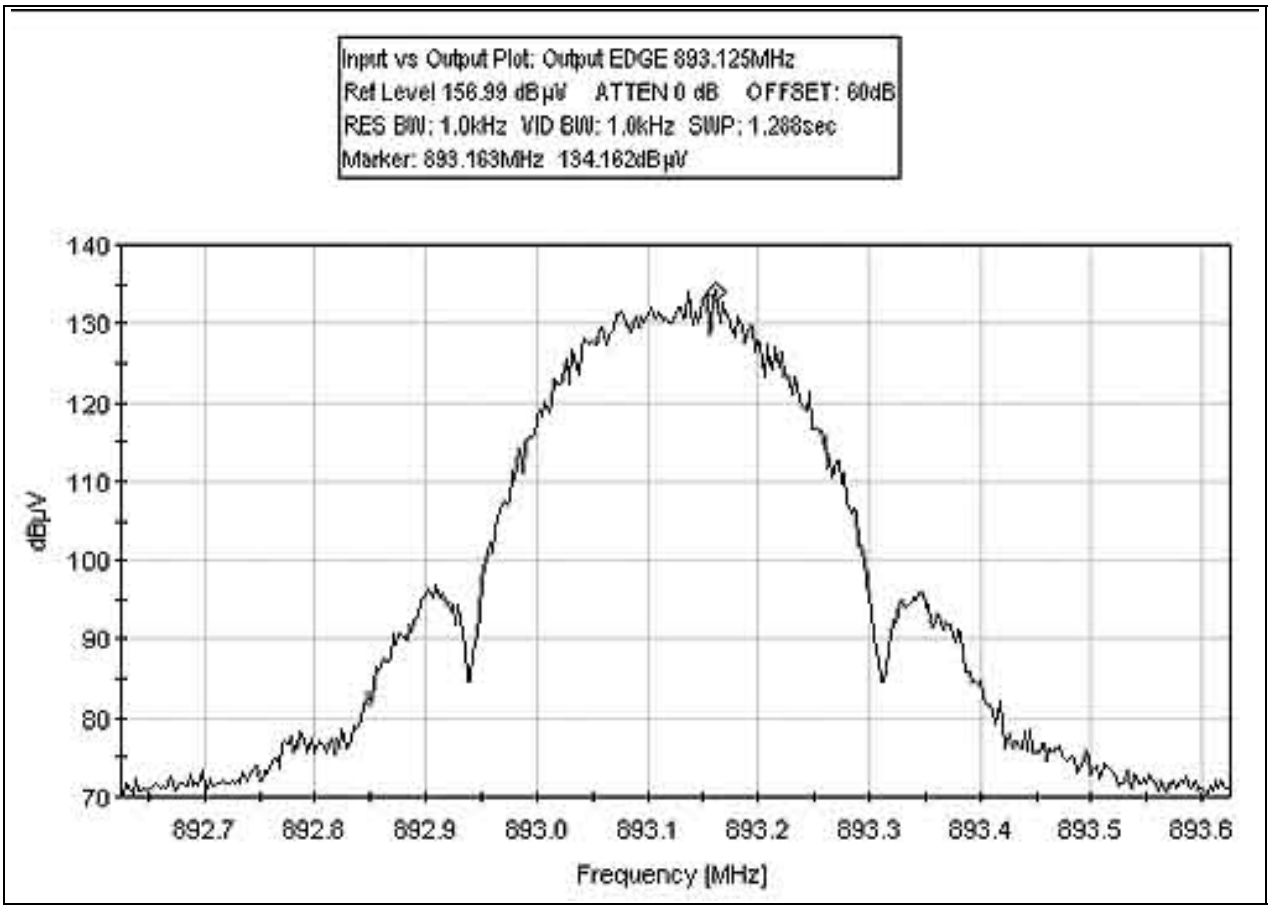
OUTPUT PLOT EDGE 869.875 MHz



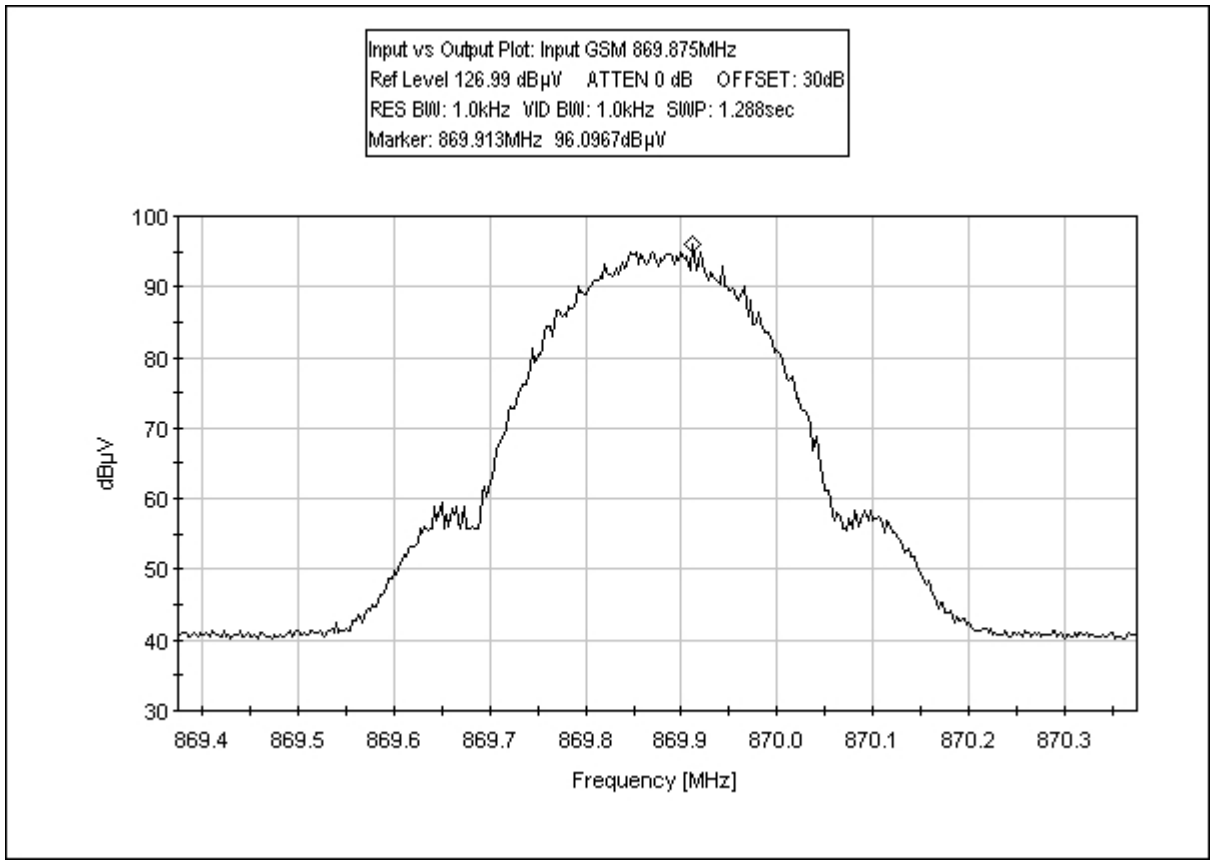
OUTPUT PLOT EDGE 881.5 MHz



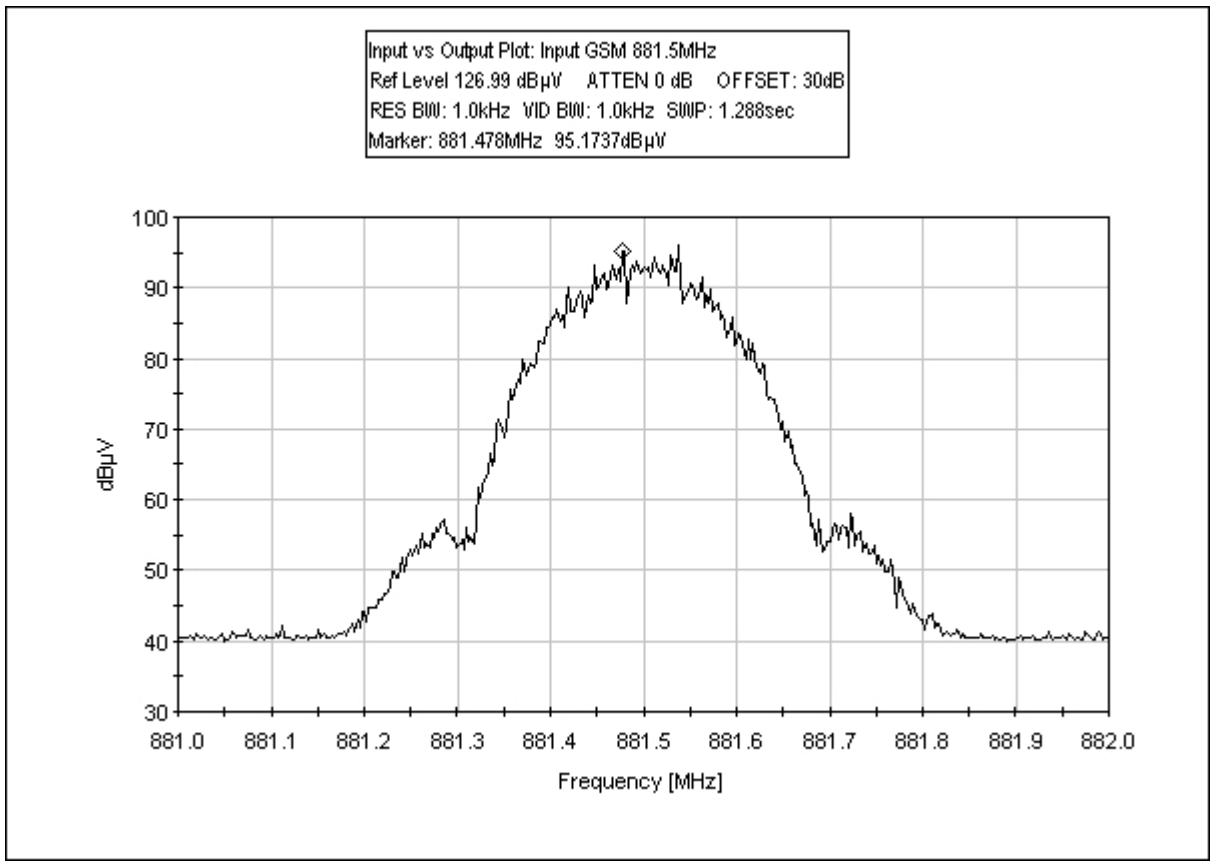
OUTPUT PLOT EDGE 893.125 MHz



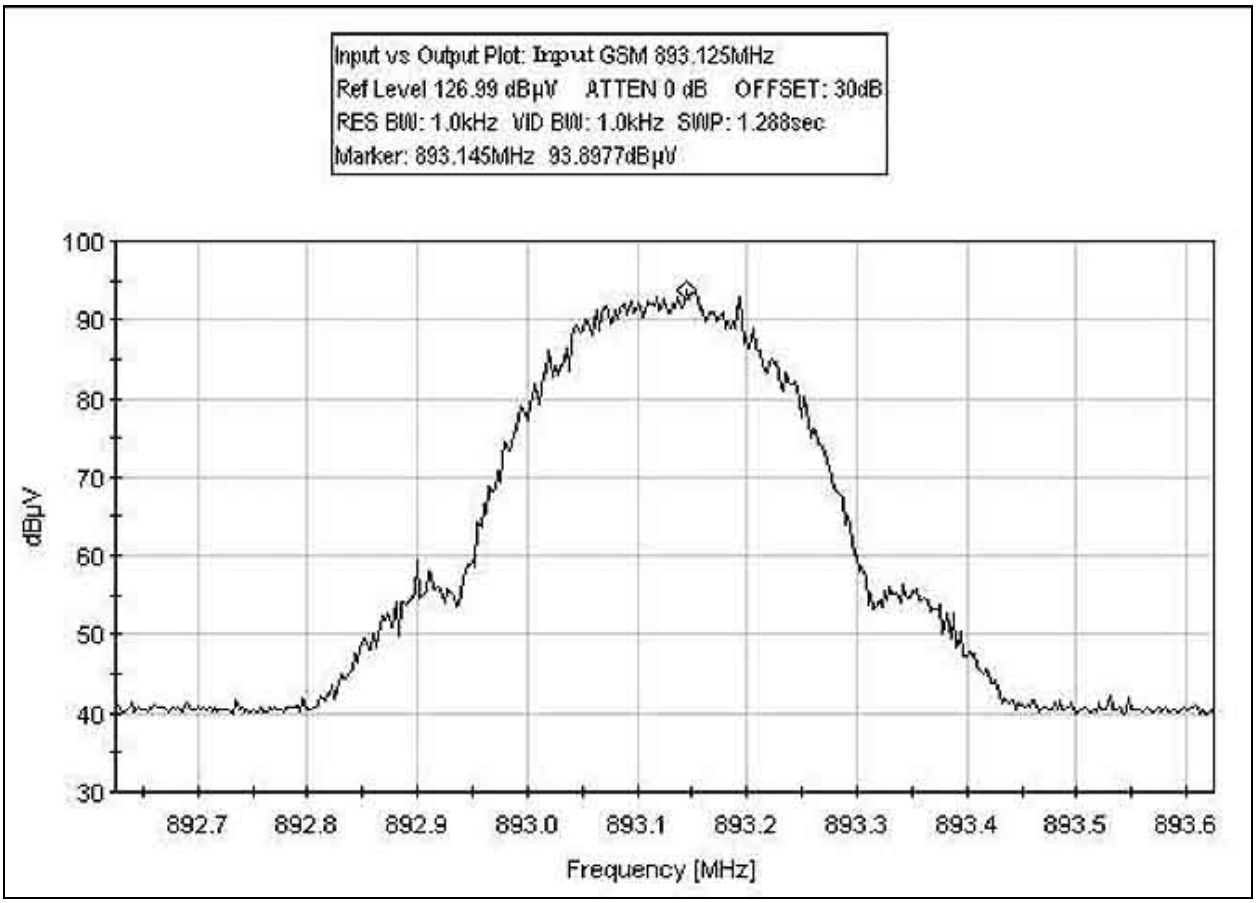
INPUT PLOT GSM 869.875 MHz



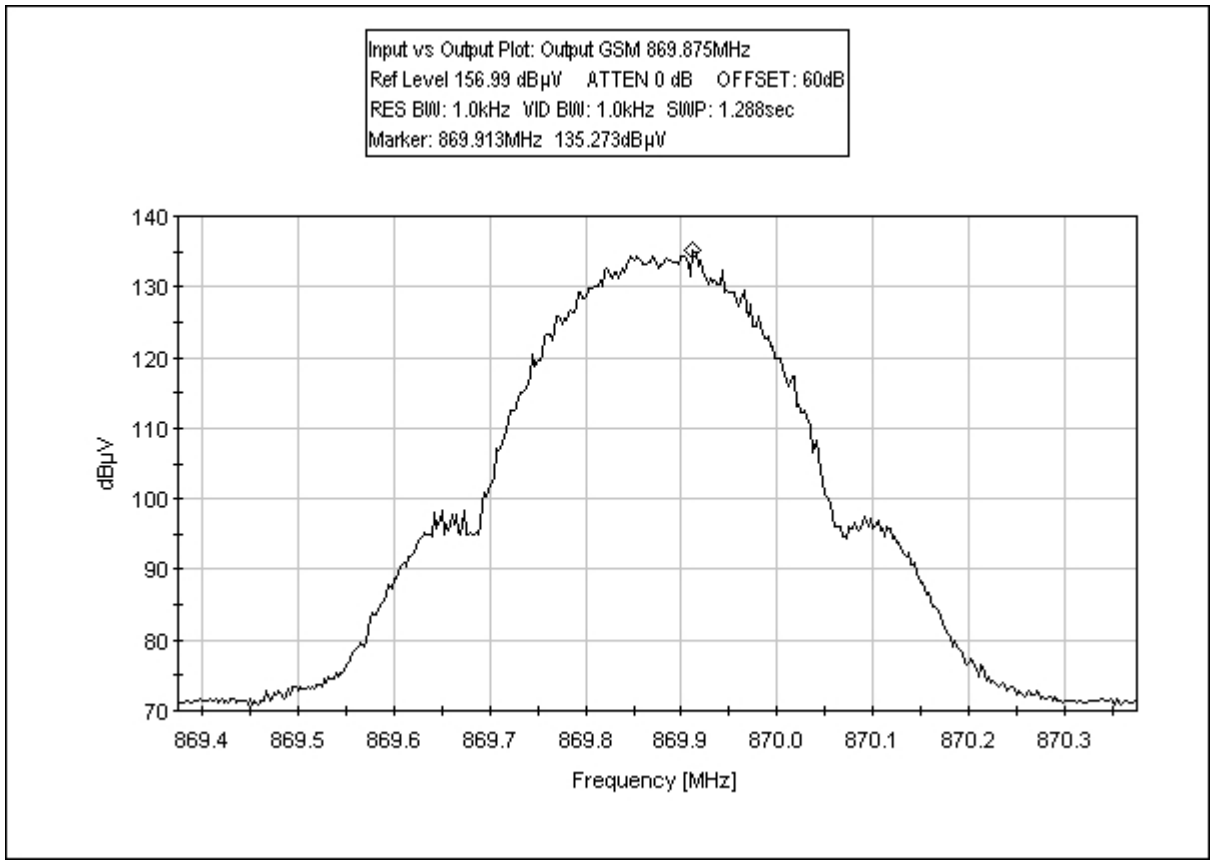
INPUT PLOT GSM 881.5 MHz



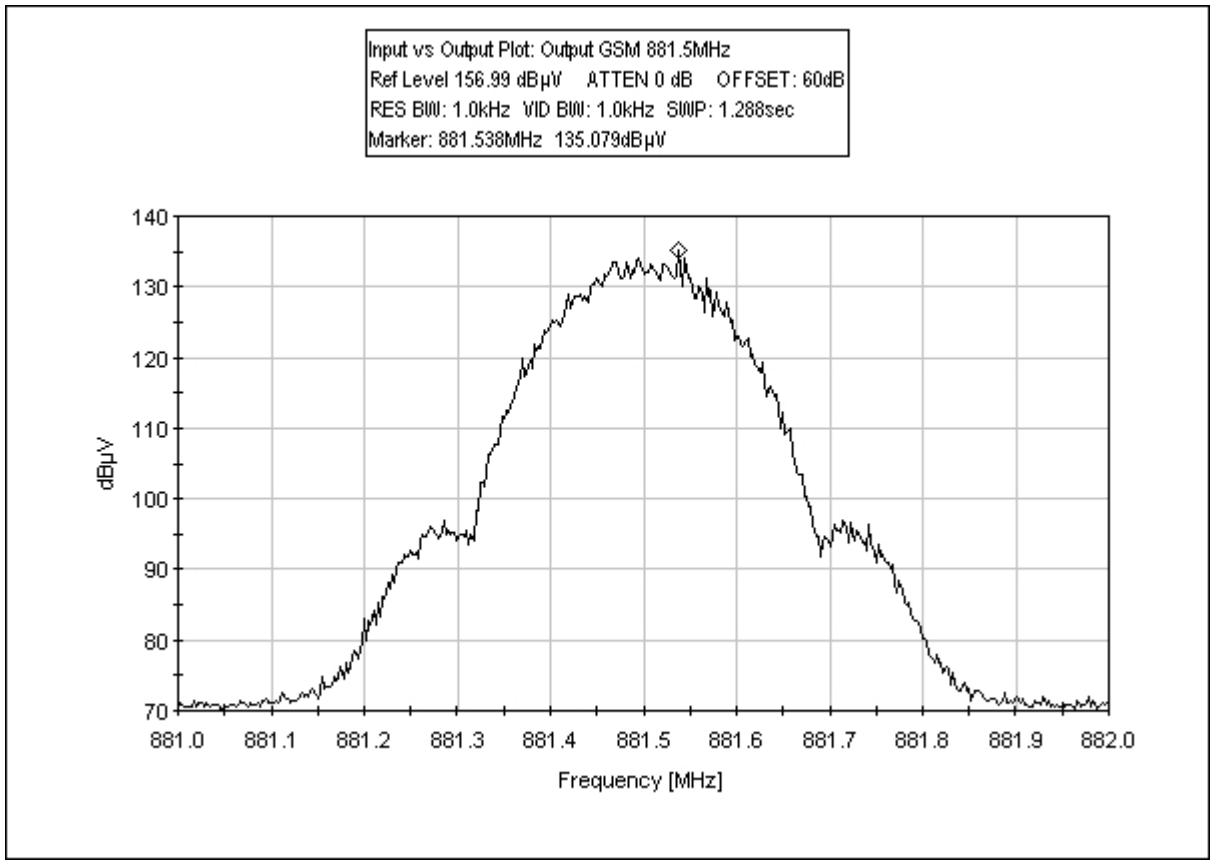
INPUT PLOT GSM 893.125 MHz



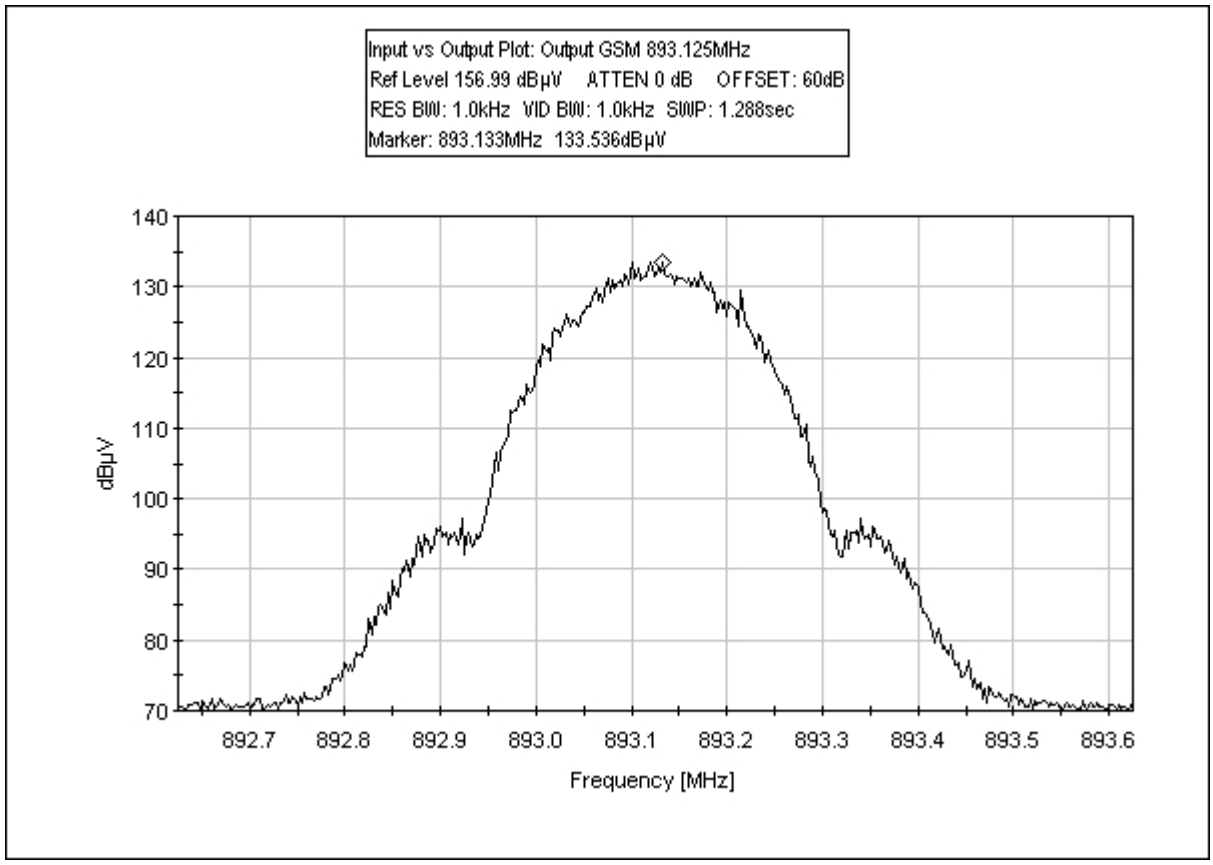
OUTPUT PLOT GSM 869.875 MHz



OUTPUT PLOT GSM 881.5 MHz



OUTPUT PLOT GSM 893.125 MHz

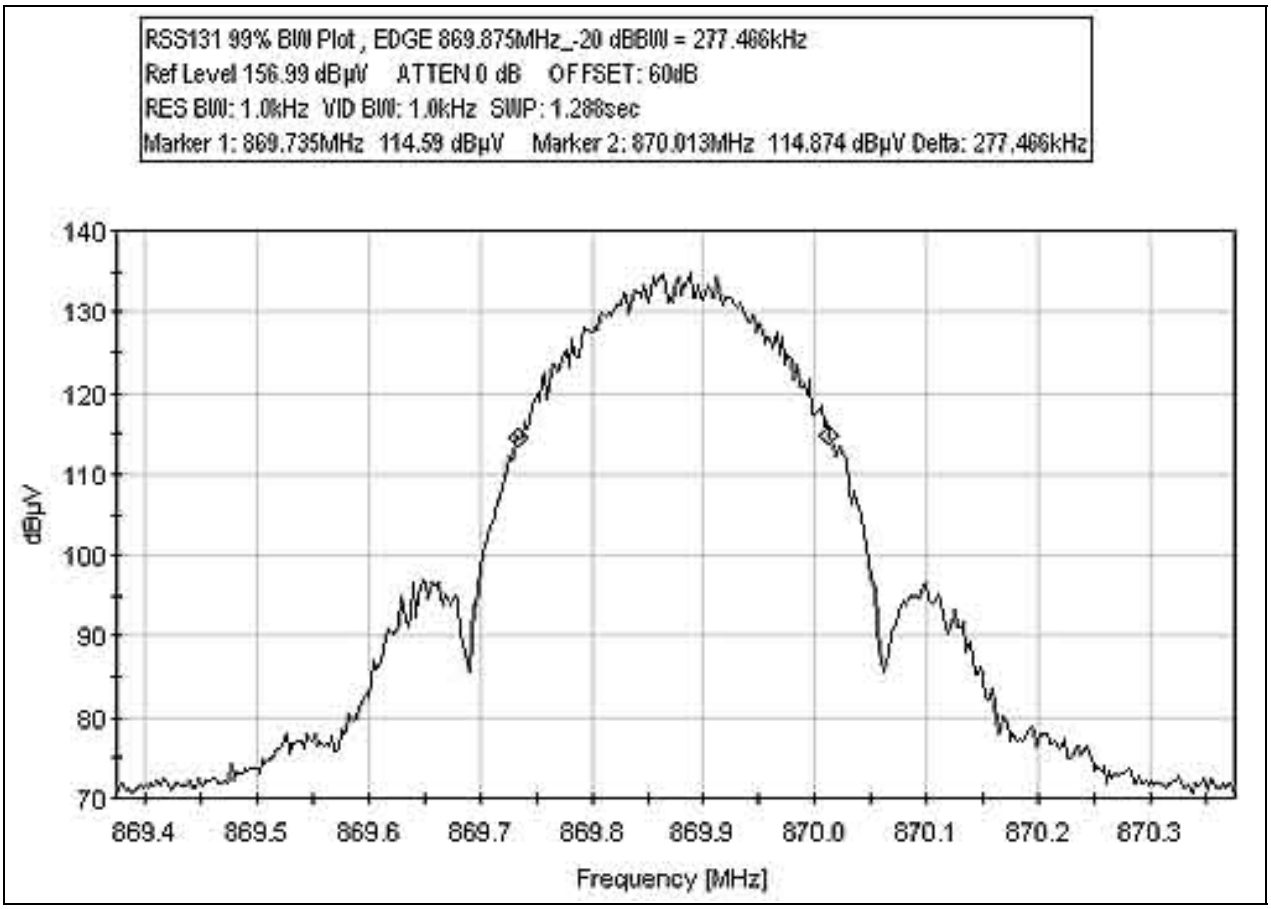


Test Equipment

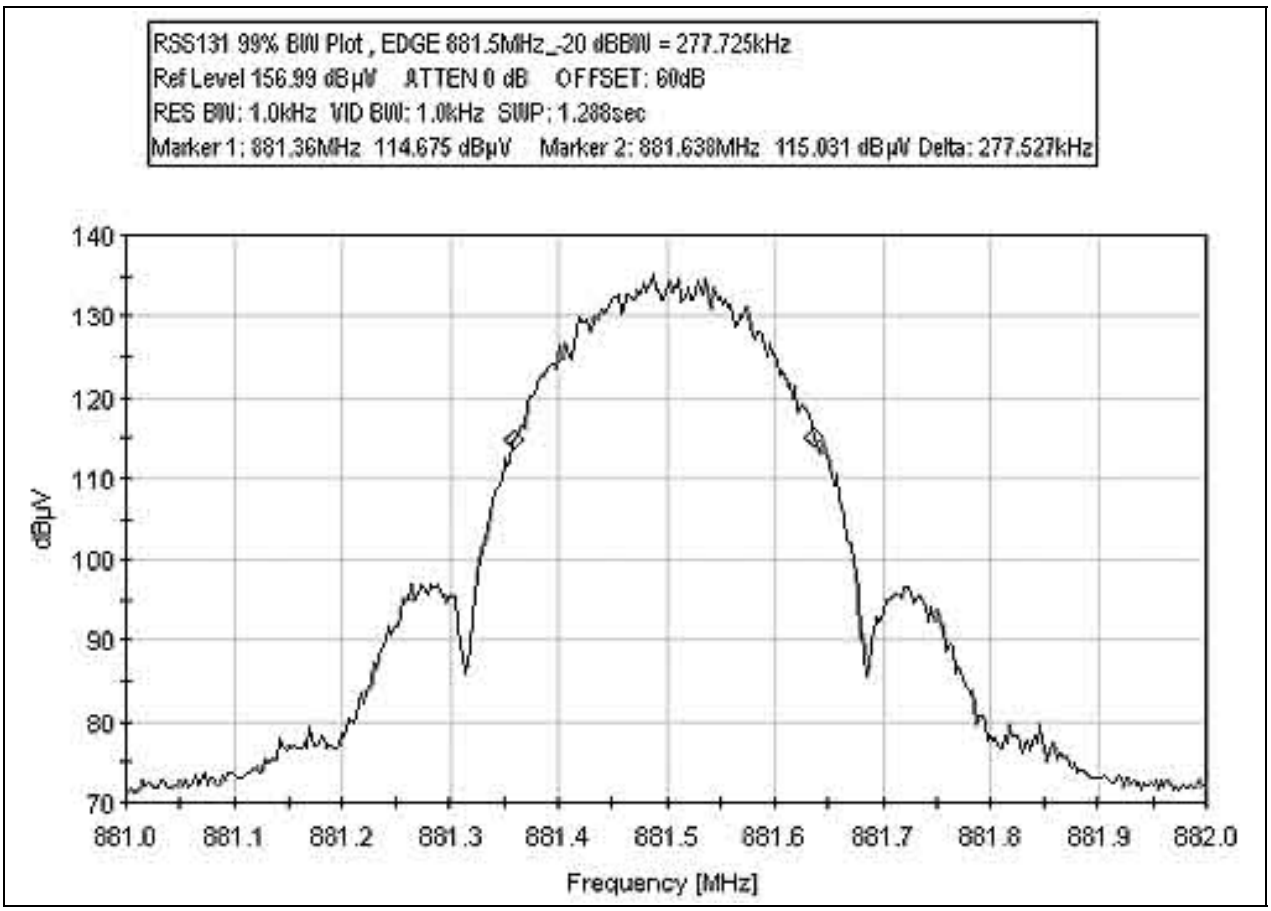
Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02467	Agilent	E7405A	US40240225	033103	033105

PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP

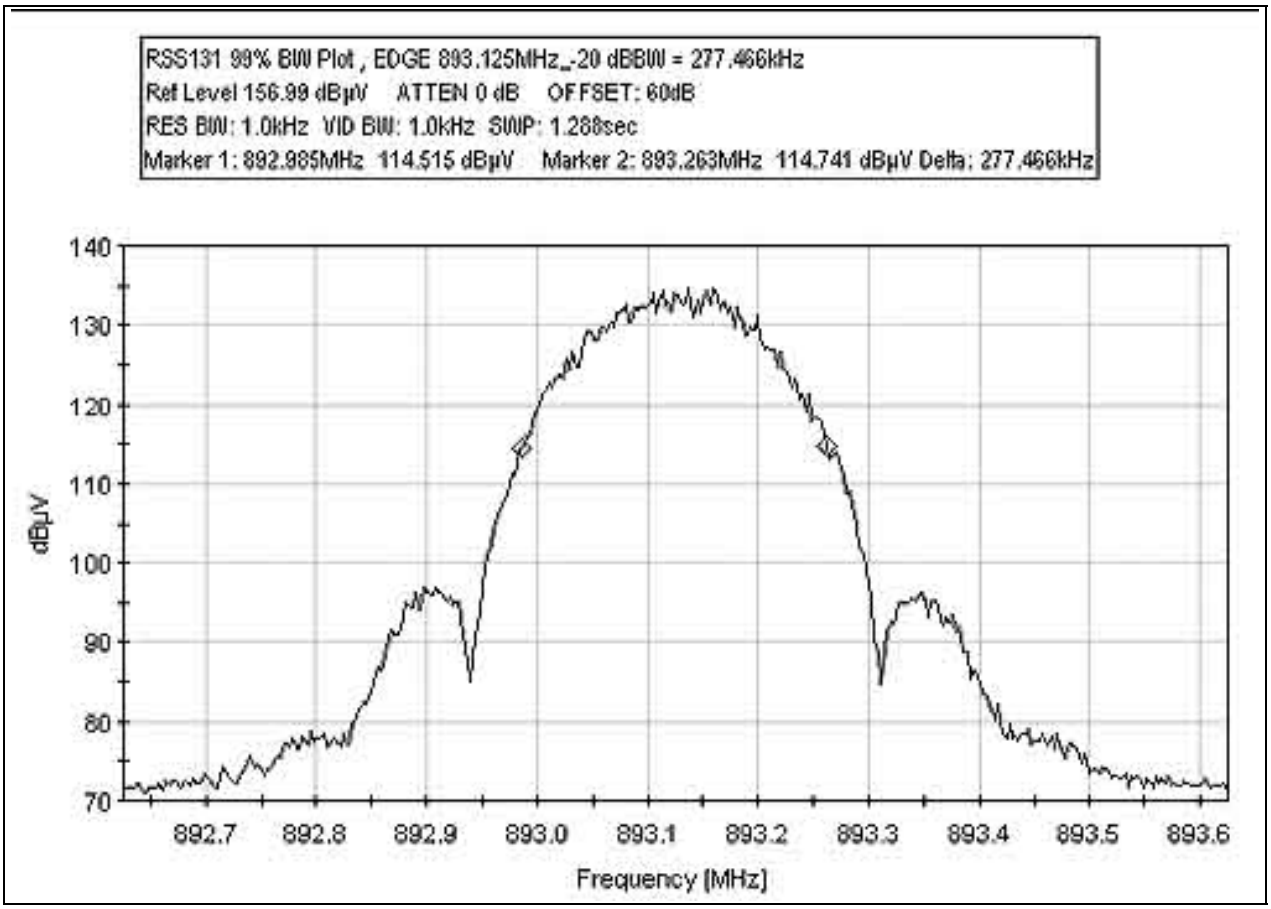
RSS-131 99% BANDWIDTH PLOT EDGE 869.875 MHz



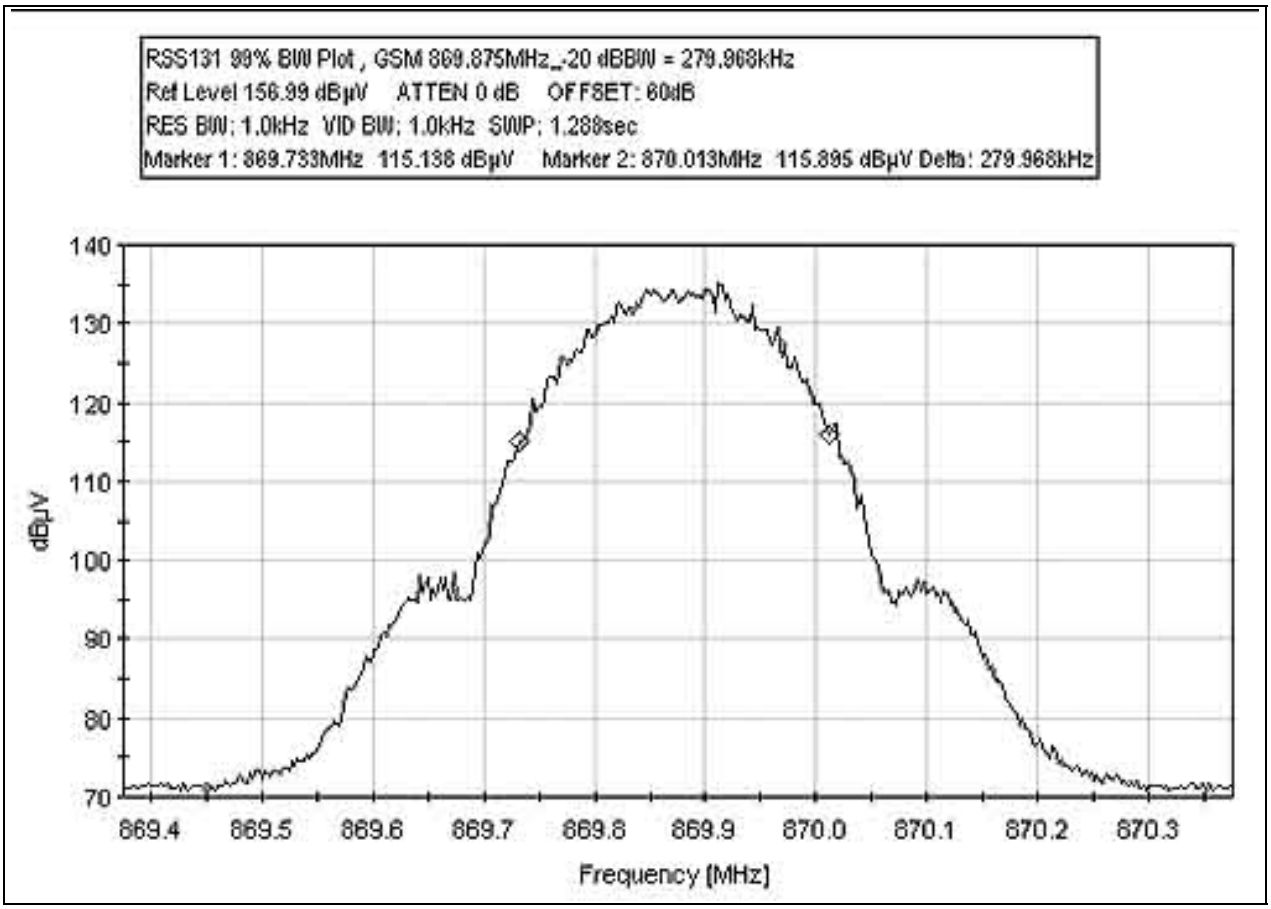
RSS-131 99% BANDWIDTH PLOT EDGE 881.5 MHz



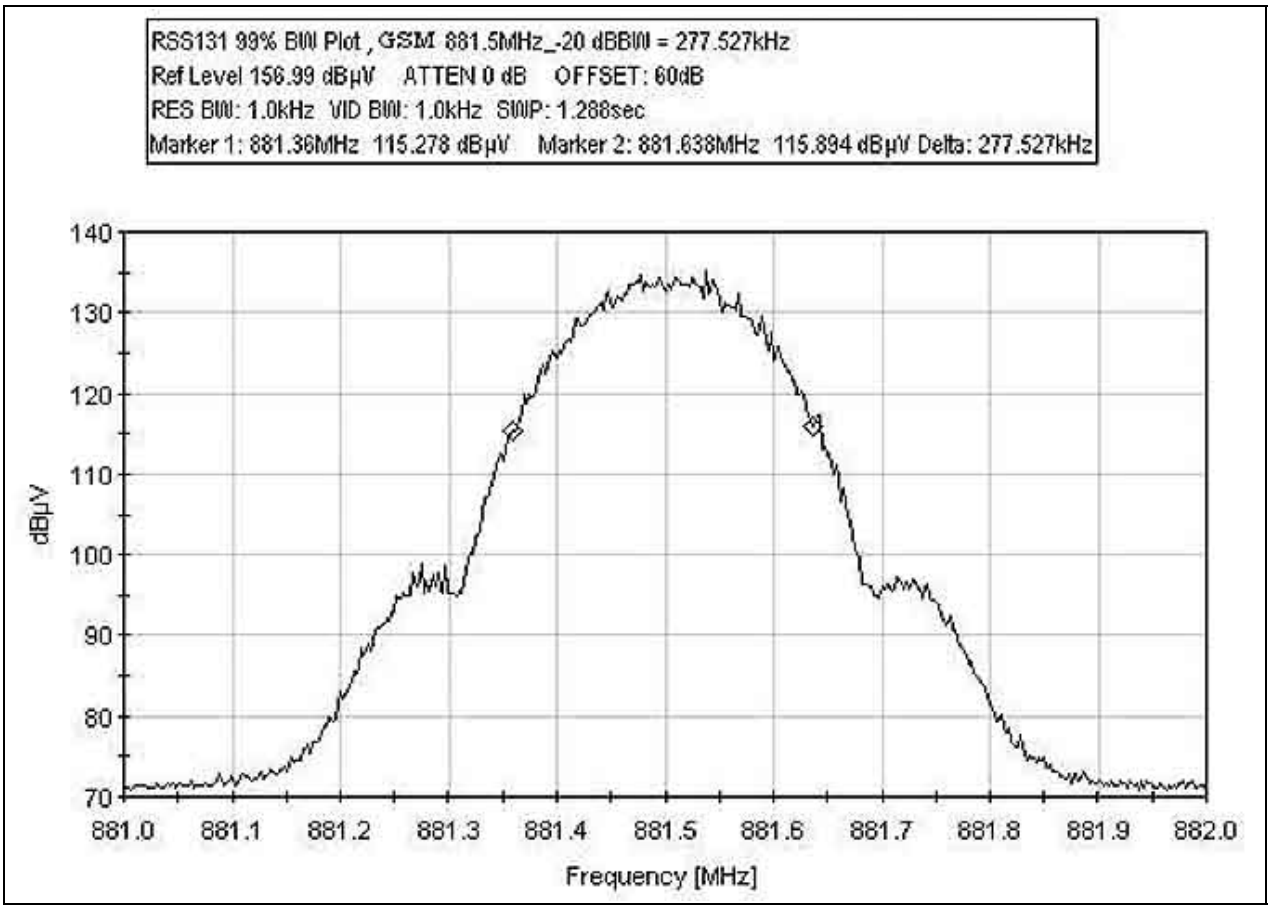
RSS-131 99% BANDWIDTH PLOT EDGE 893.125 MHz



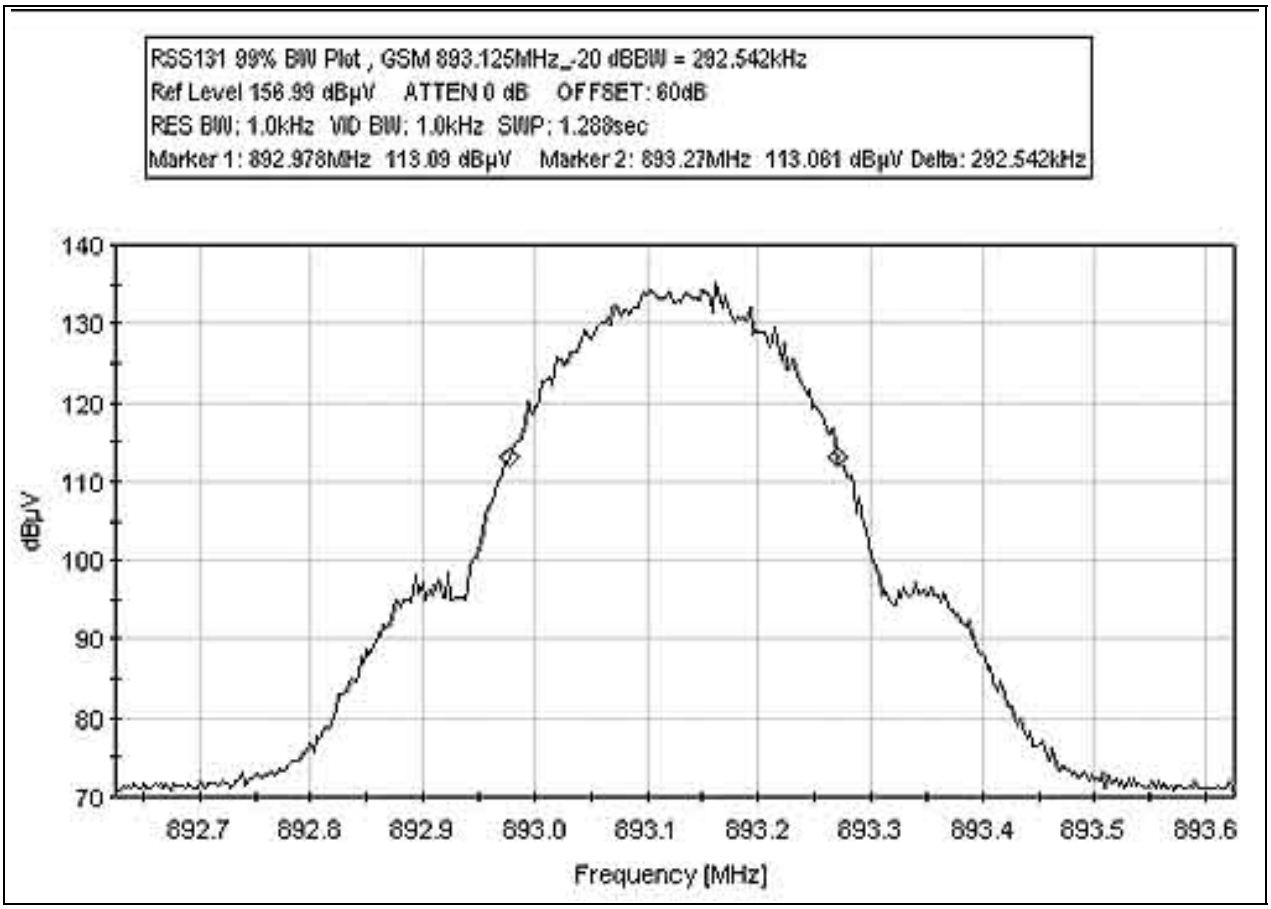
RSS-131 99% BANDWIDTH PLOT GSM 869.875 MHz



RSS-131 99% BANDWIDTH PLOT GSM 881.5 MHz



RSS-131 99% BANDWIDTH PLOT GSM 893.125 MHz

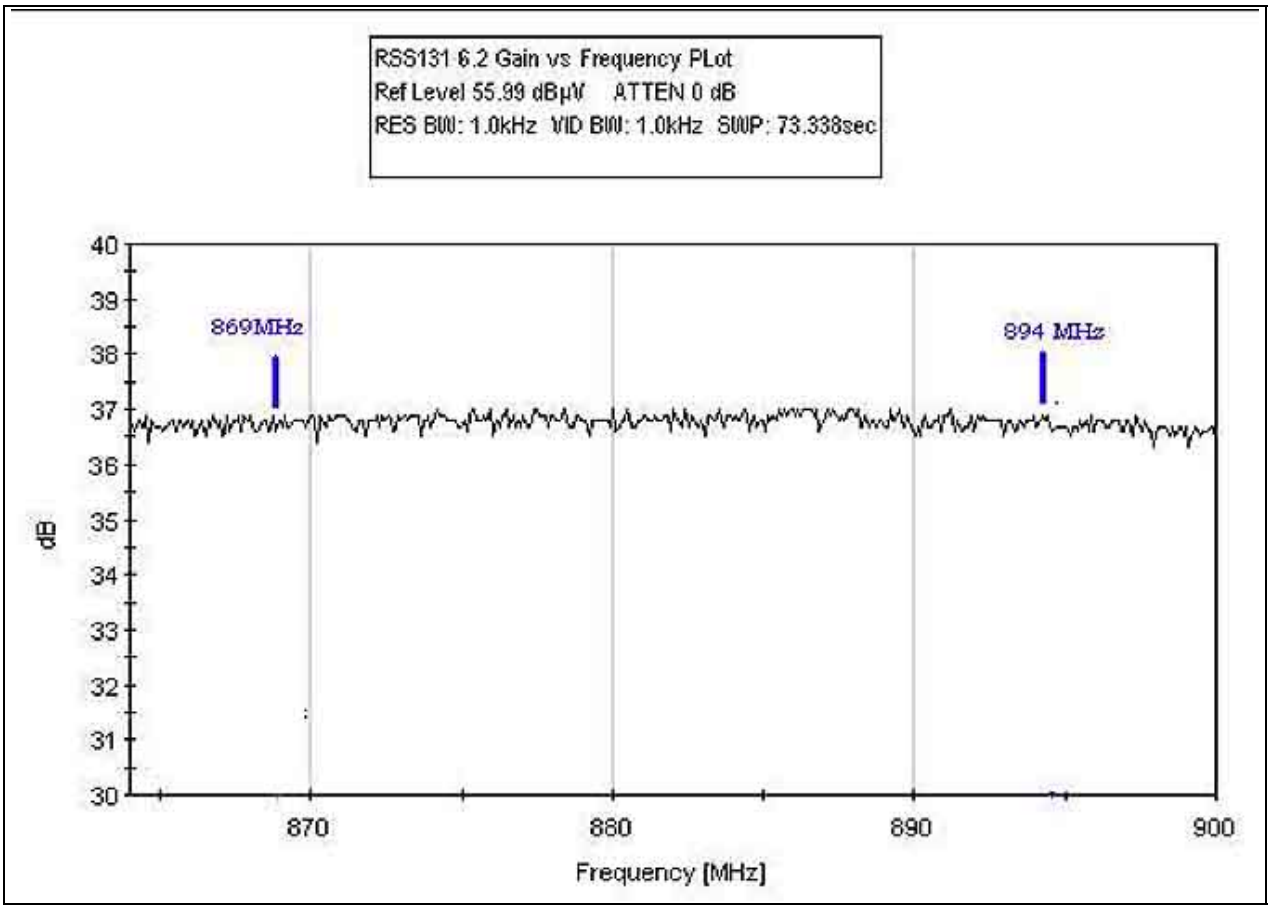


Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02467	Agilent	E7405A	US40240225	033103	033105

PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP

RSS-131 6.2 GAIN VS FREQUENCY PLOT



The manufacturer states that the passband RF gain is 39-48 db and the passband bandwidth is 35 MHz.

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02467	Agilent	E7405A	US40240225	033103	033105

PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP