



**ADDENDUM WILSON ELECTRONICS TEST REPORT FC07-022**

**FOR THE**

**IDEN 900 MHZ AMPLIFIER, 274106**

**FCC PART 22 AND RSS-131 ISSUE 2: 2003**

**COMPLIANCE**

**DATE OF ISSUE: MAY 17, 2007**

**PREPARED FOR:**

Wilson Electronics  
3301 East Deseret Drive  
St. George, UT 84790

P.O. No.: IDN274106-1

W.O. No.: 86003

**PREPARED BY:**

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

Date of test: January 16 - April 25, 2007

**Report No.: FC07-022A**

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**ADMINISTRATIVE INFORMATION**

**DATE OF TEST:** January 16 - April 25, 2007

**DATE OF RECEIPT:** January 16, 2007

**FREQUENCY RANGE TESTED:** 30 MHz-10 GHz

**MANUFACTURER:** Wilson Electronics  
3301 East Deseret Drive  
St. George, UT 84790

**REPRESENTATIVE:** Riki Kline

**TEST LOCATION:** CKC Laboratories, Inc.  
5046 Sierra Pines Drive  
Mariposa, CA 95338

**TEST METHOD:** FCC Part 22, RSS GEN and RSS-131 Issue 2: 2003

**PURPOSE OF TEST:** **Original Report:** To demonstrate the compliance of the iDEN 900 MHz Amplifier, 274106 with the requirements for FCC Part 22 and RSS-131 devices.  
**Addendum A:** To correct the frequency range tested on pages 3, 36 and 38.

**APPROVALS:**

Steve Behm, Director of Engineering Services

**QUALITY ASSURANCE:**



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Joyce Walker, Quality Assurance Administrative Manager

**TEST PERSONNEL:**



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Randy Clark, EMC Engineer



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Mike Wilkinson, EMC Engineer/Lab

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Manager

**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	N/A	N/A	RF Power Output
N/A	N/A	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)
	3082A-1		784962	Site File No.

**CONDITIONS FOR COMPLIANCE**

No modifications to the EUT were necessary to comply.



## EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The customer declares the EUT tested by CKC Laboratories was representative of a production unit. The EUT is a wireless, in-building, 900 MHz bi-directional amplifier for enhancing the range of iDEN cell phones. The amplifier is connected to an external antenna mounted outside the building, and to an internal antenna located inside the building. This combination of antennas and amplifier enables cell phones located inside the building to communicate with distant cell sites with increased power and sensitivity. Power for the amplifier is obtained from an AC power adapter. The amplifier automatically adjusts its gain which varies from 30 dB to 60 dB. The uplink frequency band is 896-901 MHz, and the downlink frequency band is 935-940 MHz.

## EQUIPMENT UNDER TEST

### iDEN 900 MHz Amplifier

Manuf: Wilson Electronics  
Model: 274106  
Serial: 2741069910001  
FCC ID: PWO274106SB (pending)  
IC ID: 4726A-274106SB

## PERIPHERAL DEVICES

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

### EUT Power Supply

Manuf: I.T.E Power Supply  
Model: HK-B118-A06  
Serial: 0106C

### Signal Generator

Manuf: Agilent  
Model: E4431B  
Serial: US38440201

### Combiner

Manuf: Motorola  
Model: NA  
Serial: NA

### Signal Generator

Manuf: Marconi  
Model: 2022D  
Serial: 119259/016



**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**

F1D

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

876-896 MHz band and 940-960 MHz band

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

876-896 MHz band 0.141 Watts and 940-960 MHz band 0.166 Watts

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

5 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**

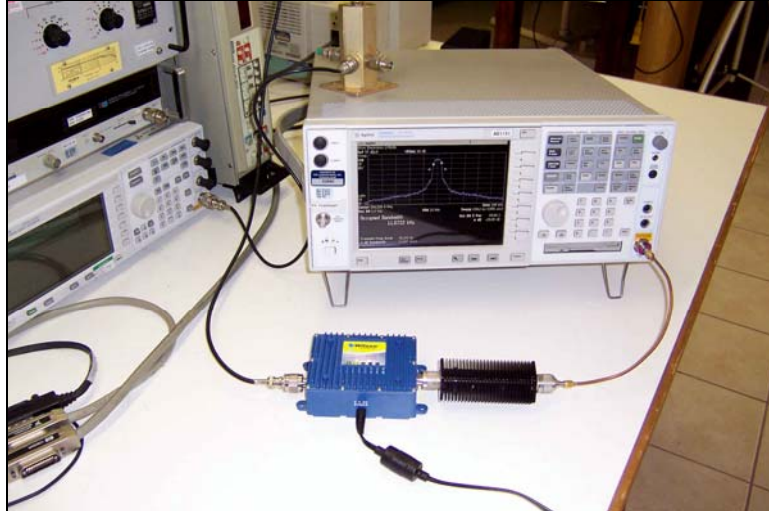
The necessary information is contained in a separate document.

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

FM

**FCC 2.1033(c)(14)/2.1046/22 - RF POWER OUTPUT**

**Test Setup Photos**



**Test Data Sheets**

Test Location: CKC Laboratories, Inc. •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Wilson Electronics**  
 Specification: **Part 22**  
 Work Order #: **86003**  
 Test Type: **Antenna Conducted**  
 Equipment: **iDEN 900 MHz Amplifier**  
 Manufacturer: Wilson Electronics  
 Model: 274106  
 S/N: 2741069910000

Date: 4/25/2007  
 Time: 11:19:02  
 Sequence#:   
 Tested By: Randal Clark  
 120V 60Hz

***Test Equipment:***

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/03/2007	01/03/2009	02660
Bird 30dB Attenuator	9949	05/20/2005	05/20/2007	P01572

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

Function	Manufacturer	Model #	S/N
iDEN 900 MHz Amplifier*	Wilson Electronics	274106	2741069910000

***Support Devices:***

Function	Manufacturer	Model #	S/N
EUT Power Supply	I.T.E Power Supply	HK-B118-A06	0106C
Signal Generator	Agilent	E4437B	MY41000126
Signal Generator	Marconi	2022D	119259/016
Combiner	Motorola	None	None



***Test Conditions / Notes:***

This is a wireless, in-building, 900 MHz bi-directional amplifier. Signal generator output is fed through a combiner prior to input to the EUT. Frequencies used: Block edge  $\pm 25\text{kHz}$  and  $\pm 300\text{kHz}$ . Signal generators are set for FM Modulation with  $\pm 12.5\text{kHz}$  deviation on a 1 kHz tone. Equipment is connected directly to a spectrum analyzer through suitable attenuation. Frequency Band Tested: Uplink and Downlink Channel Tested: Low, Mid and High. Frequency Range Investigated: Carrier. Bandwidth Settings: RBW = VBW = 300kHz. Temperature: 72°F, Relative Humidity: 27%.

***Measurement Data***

<b><i>Frequency (MHz)</i></b>	<b><i>Power Output (dBm)</i></b>	<b><i>Power Output (Watts)</i></b>	<b><i>Limit Check</i></b>
<i>876-896 MHz Band</i>			
876.025	21.1	0.129	Pass
886.000	20.0	0.100	Pass
895.985	21.5	0.141	Pass
<i>940-960 MHz Band</i>			
940.025	21.8	0.151	Pass
950.000	22.2	0.166	Pass
959.985	20.0	0.100	Pass

**RSS-131 - RF POWER OUTPUT**

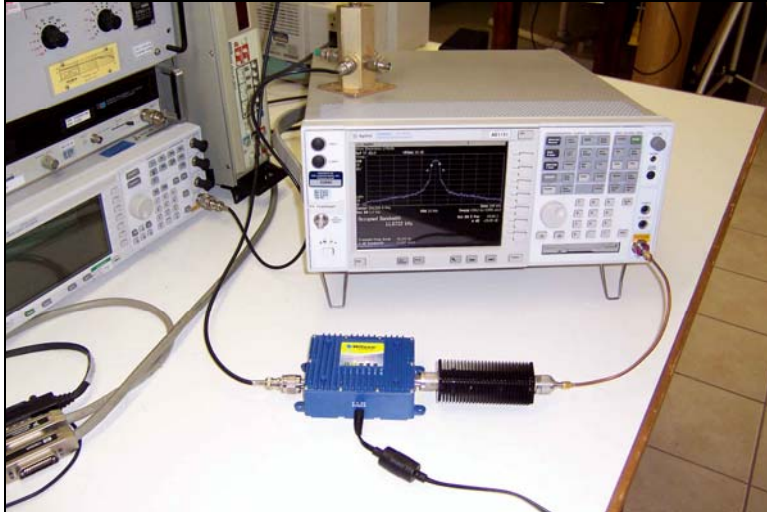
**Test Equipment**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/03/2007	01/03/2009	02660
Bird 30dB Attenuator	9949	05/20/2005	05/20/2007	P01572

**Test Conditions**

This is a wireless, in-building, 900 MHz bi-directional amplifier. Signal generator output is fed through a combiner prior to input to the EUT. Frequencies used: Block edge  $\pm 25\text{kHz}$  and  $\pm 300\text{kHz}$ . Power output test performed using two tone method. Signal generators are set for FM Modulation with  $\pm 12.5\text{kHz}$  deviation on a 1 kHz tone. Equipment is connected directly to a spectrum analyzer through suitable attenuation. Frequency Band Tested: Uplink and Downlink Channel Tested: Low, Mid and High. Frequency Range Investigated: Carrier. Bandwidth Settings: RBW = VBW = 300kHz. Temperature: 72°F, Relative Humidity: 27%.

**Test Setup Photos**



**Test Data**

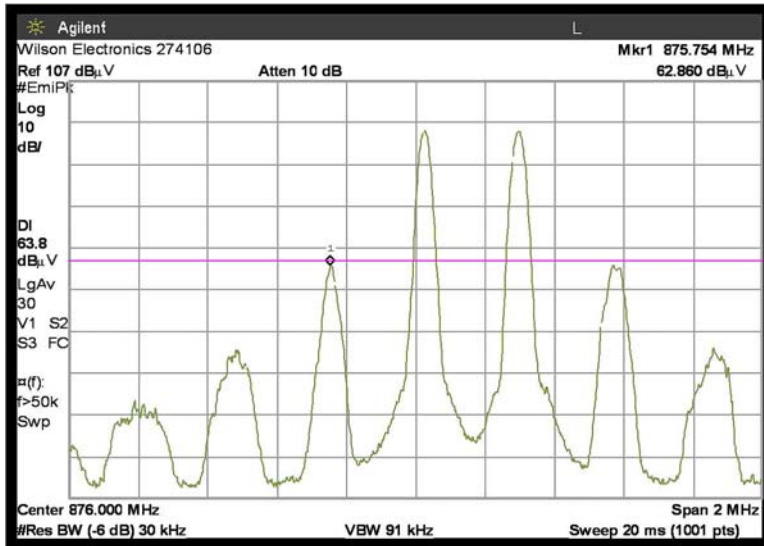
EUT is an In-Building Wireless 60dB Amplifier for the 896 to 940 MHz bands. Operating Bands are 876-896 MHz and 940-960 MHz.

**Setup:** Two Signal generators are connected to a signal combiner. The output of the signal combine is connected to the Indoor./Outdoor antenna port of the EUT. The mean power (p mean) is evaluated at the Outdoor/Indoor antenna port of the EUT with a spectrum analyzer via a directional coupler. Coupling Loss: 30.1 dB for uplink and 30.2 dB for downlink bands.

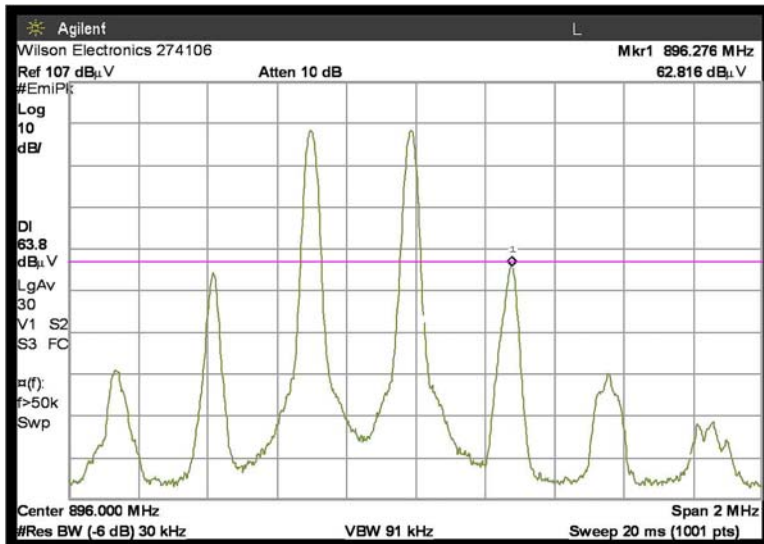
Injection Frequencies (MHz)	Highest Measured Output Power (P dBm)	Mean Output Power (P + 3dB dBm)	Mean Output Power (Watts)
<b>Uplink</b>			
876.025 & 876.3	18.1	21.1	0.129
895.985 & 895.7	18.5	21.5	0.141
<b>Downlink</b>			
940.025 & 940.3	18.8	21.8	0.151
959.985 & 959.7	17.0	20.0	0.100

## Test Plots

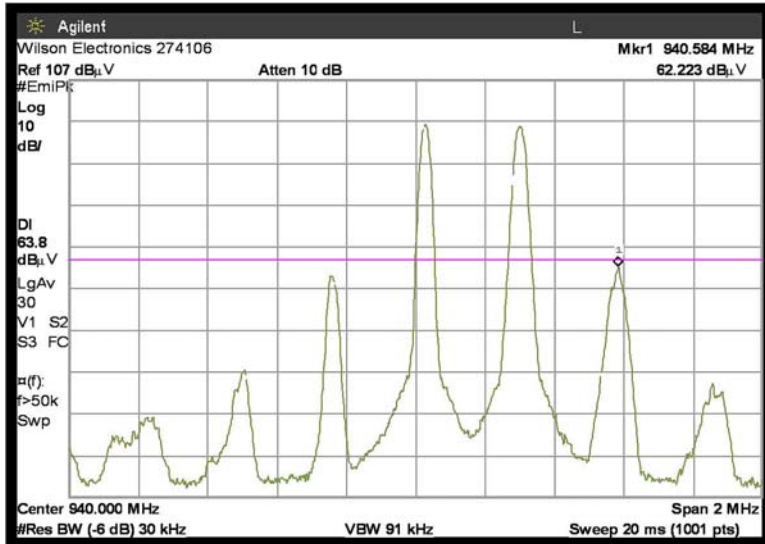
### RSS-131 MCE POWER OUTPUT - 876-896 MHz LOW CHANNEL



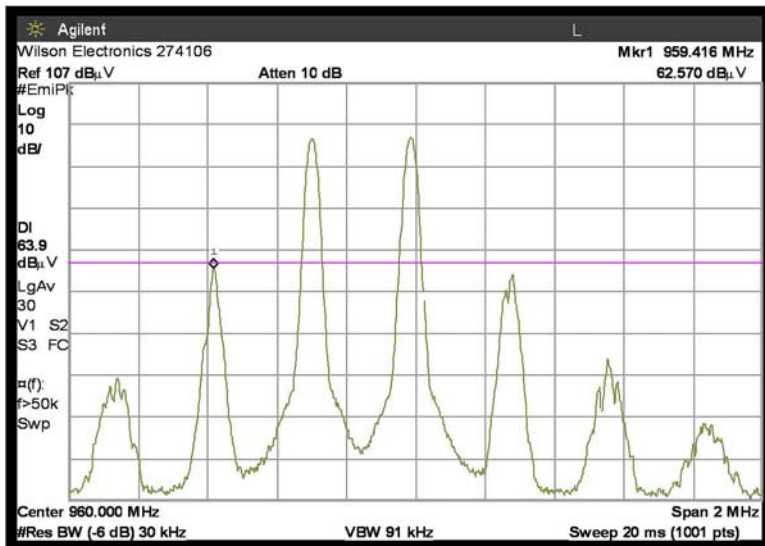
### RSS-131 MCE POWER OUTPUT - 876-896 MHz HIGH CHANNEL



**RSS-131 MCE POWER OUTPUT - 940-960 MHz LOW CHANNEL**



**RSS-131 MCE POWER OUTPUT - 940-960 MHz HIGH CHANNEL**



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

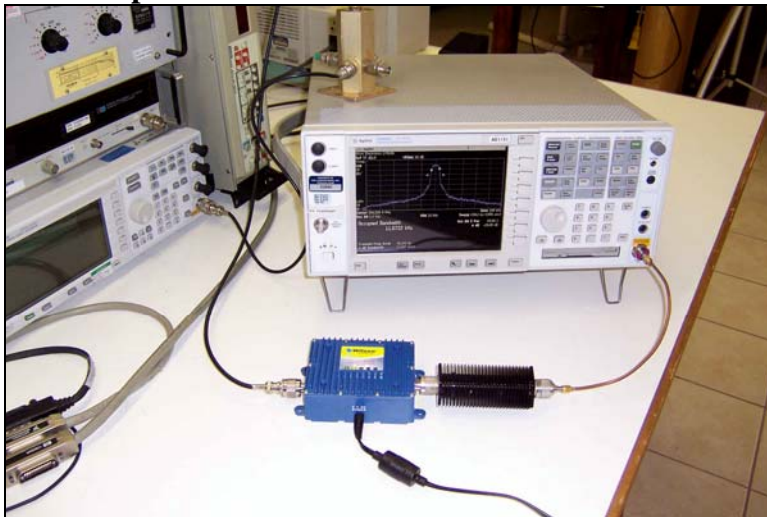
**Test Equipment**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/03/2007	01/03/2009	02660
Attenuator 30dB, Bird 25A-MFN-30	9724	05/18/2005	05/18/2007	P01577

**Test Conditions**

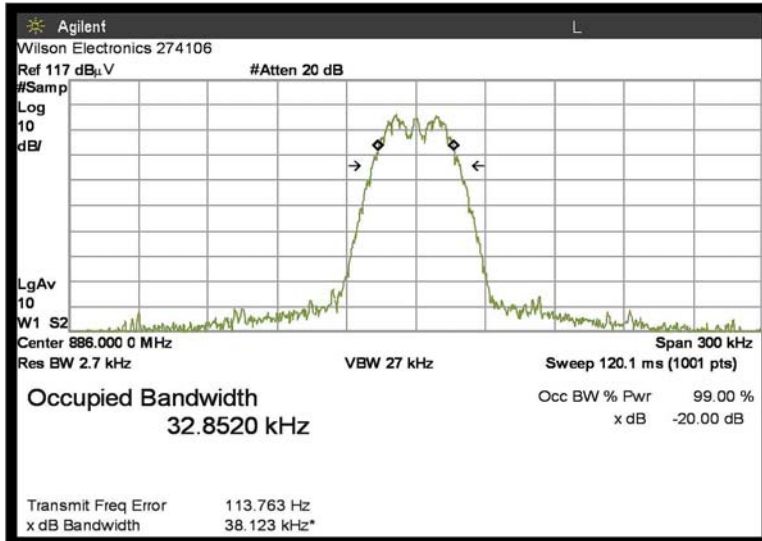
This is a wireless, in-building, 900 MHz bi-directional amplifier. Signal generator output is fed directly to input to the EUT RF output is fed to a spectrum analyzer through suitable attenuation. Signal generators are set for FM Modulation with  $\pm 12.5$  kHz deviation on a 1 kHz tone. Bandwidth Settings: RBW = 100 kHz, VBW = 300 kHz (30-1000 MHz) RBW = 1 MHz, VBW = 1 MHz (1-10 GHz) Temperature: 73°F, Relative Humidity: 27%.

**Test Setup Photos**

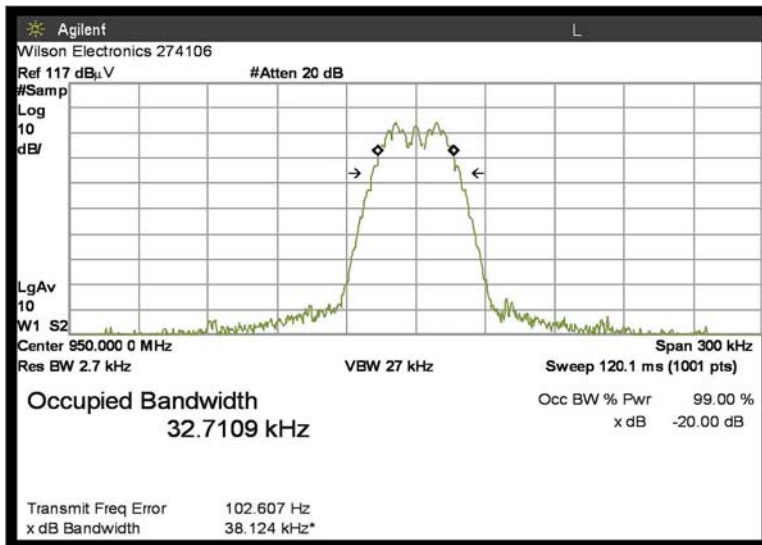


## Test Plots

### OCCUPIED BANDWIDTH – 876-896 MHz



### OCCUPIED BANDWIDTH - 940-960 MHz



## INPUT PLOTS

### Test Equipment

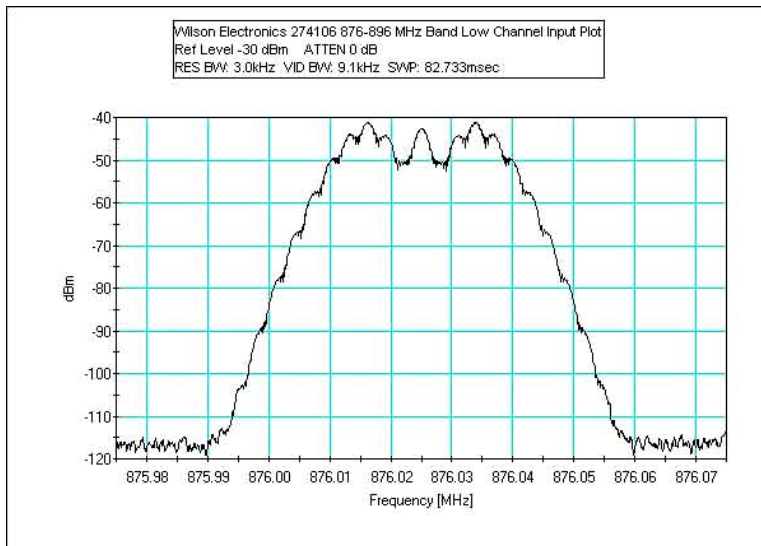
Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/03/2007	01/03/2009	02660

### Test Conditions

This is a wireless, in-building, 900 MHz bi-directional amplifier. Signal generator output is fed directly to input to the EUT RF output is fed to a spectrum analyzer through suitable attenuation. Signal generators are set for FM Modulation with  $\pm 12.5$  kHz deviation on a 1 kHz tone. Temperature: 73°F, Relative Humidity: 27%.

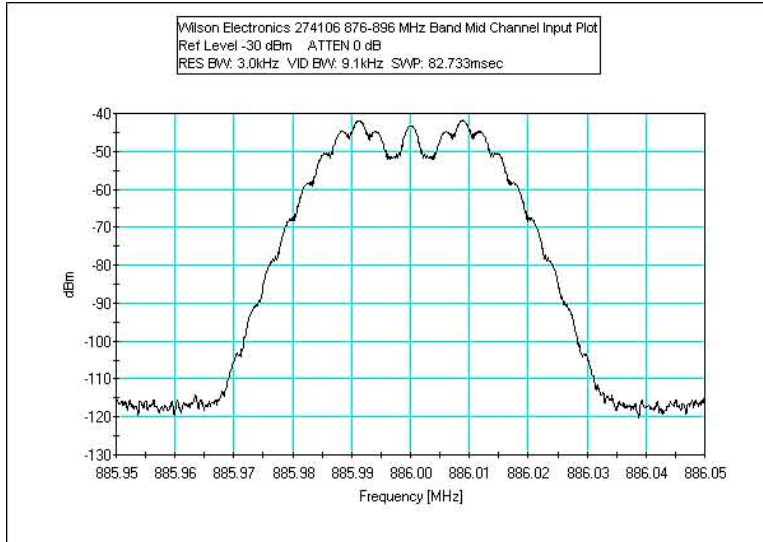
### Test Plots

#### INPUT PLOT - 876-896 MHz LOW CHANNEL

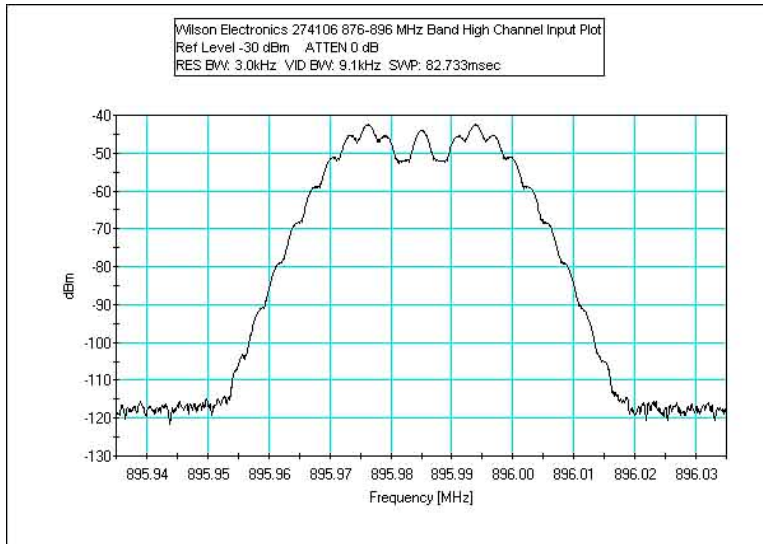




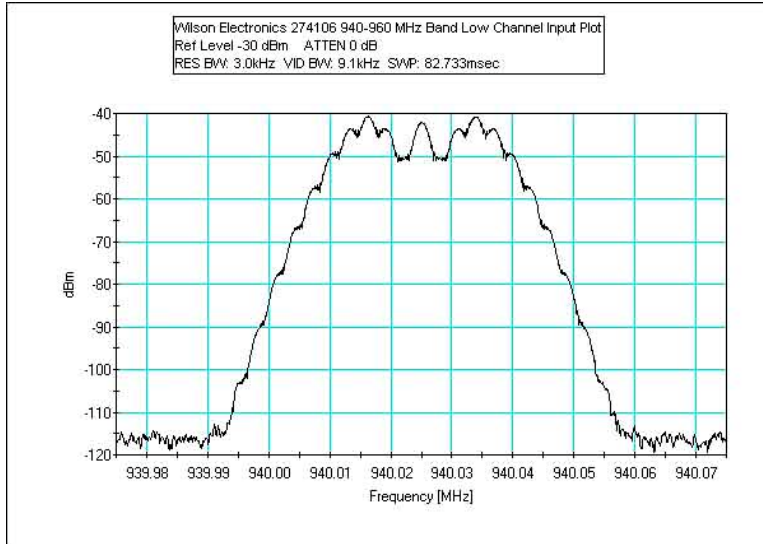
### INPUT PLOT - 876-896 MHz MID CHANNEL



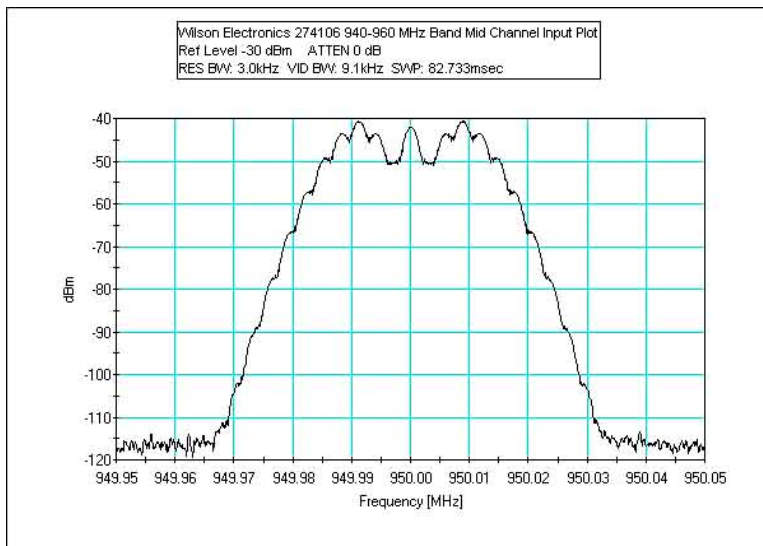
### INPUT PLOT - 876-896 MHz HIGH CHANNEL



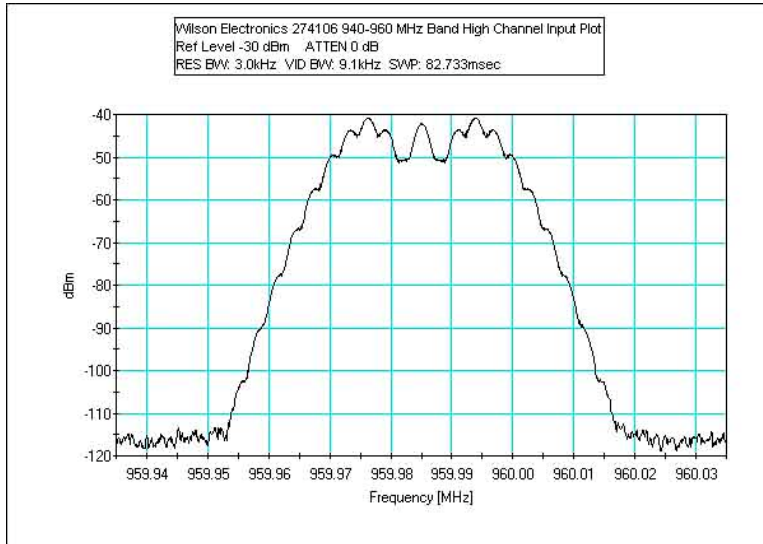
### INPUT PLOT - 940-960 MHz LOW CHANNEL



### INPUT PLOT - 940-960 MHz MID CHANNEL



### INPUT PLOT - 940-960 MHz HIGH CHANNEL



## OUTPUT PLOTS

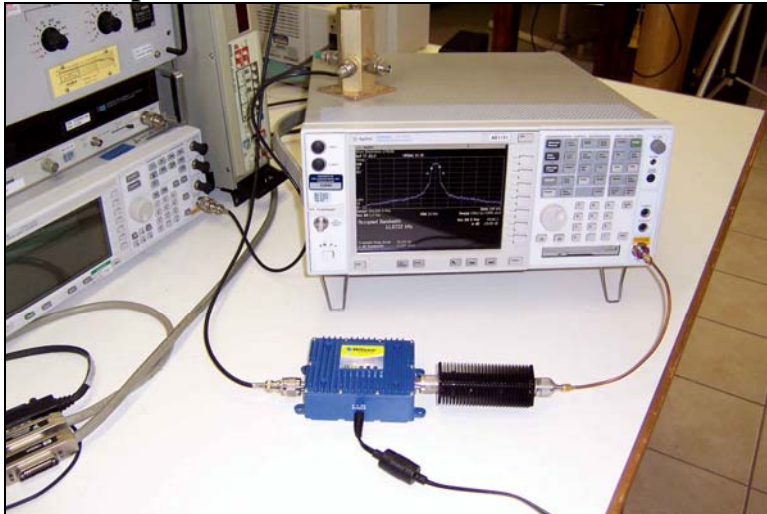
### Test Equipment

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/03/2007	01/03/2009	02660
Attenuator 30dB, Bird 25A-MFN-30	9724	05/18/2005	05/18/2007	P01577

### Test Conditions

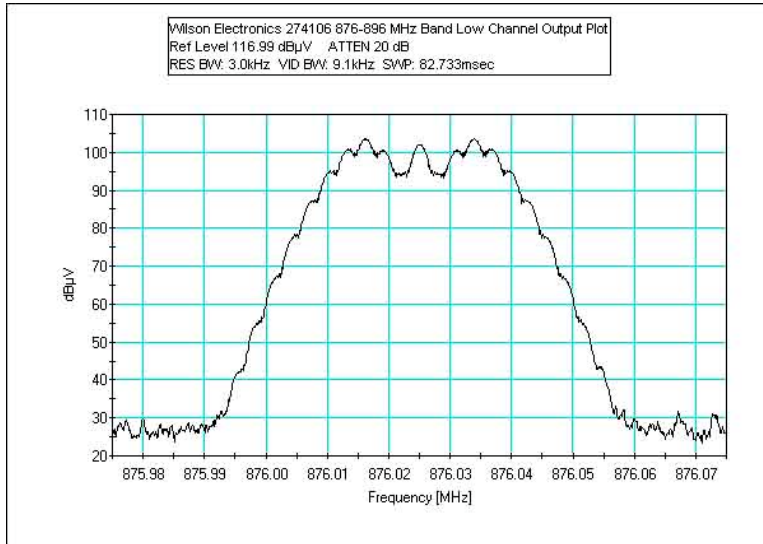
This is a wireless, in-building, 900 MHz bi-directional amplifier. Signal generator output is fed directly to input to the EUT RF output is fed to a spectrum analyzer through suitable attenuation. Signal generators are set for FM Modulation with  $\pm 12.5$  kHz deviation on a 1 kHz tone. Temperature: 73°F, Relative Humidity: 27%.

### Test Setup Photos

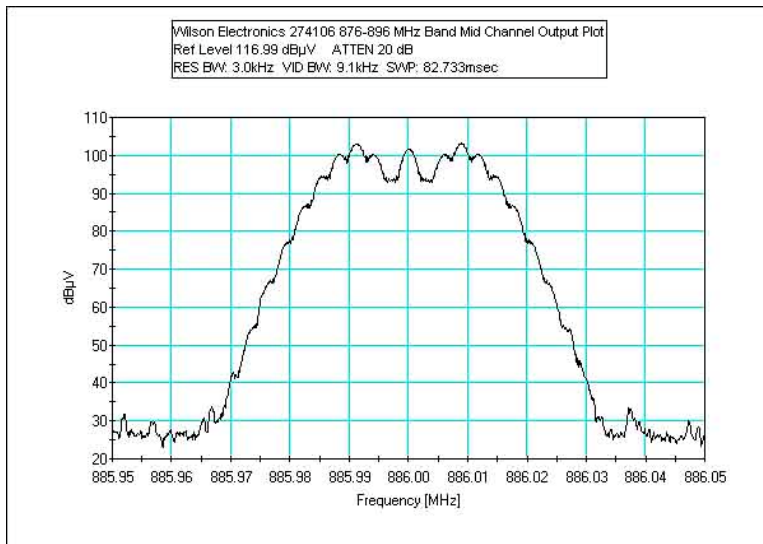


## Test Plots

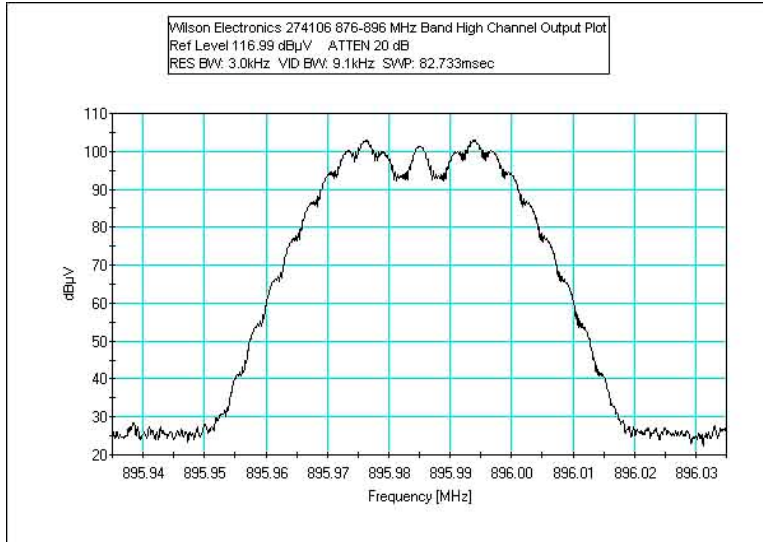
### OUTPUT PLOT - 876-896 MHz LOW CHANNEL



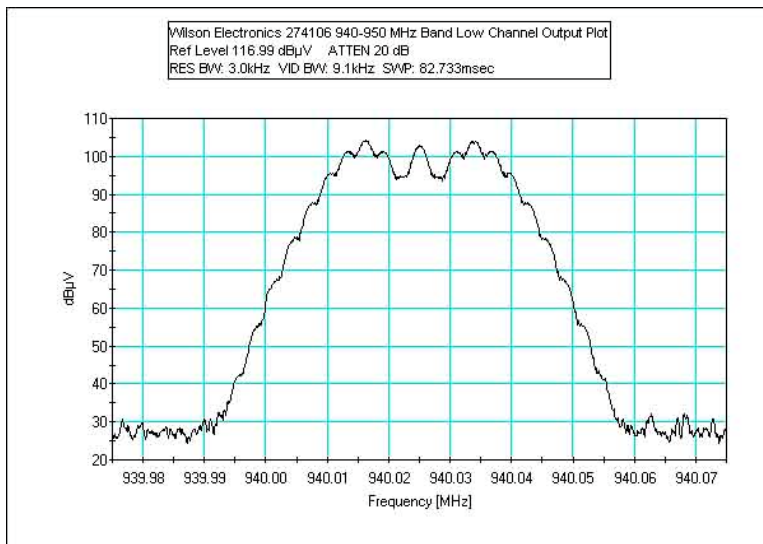
### OUTPUT PLOT - 876-896 MHz MID CHANNEL



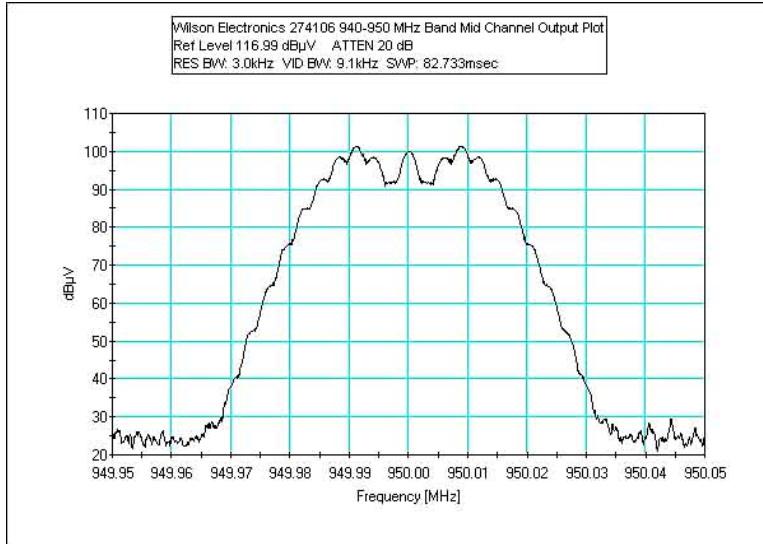
### OUTPUT PLOT - 876-896 MHz HIGH CHANNEL



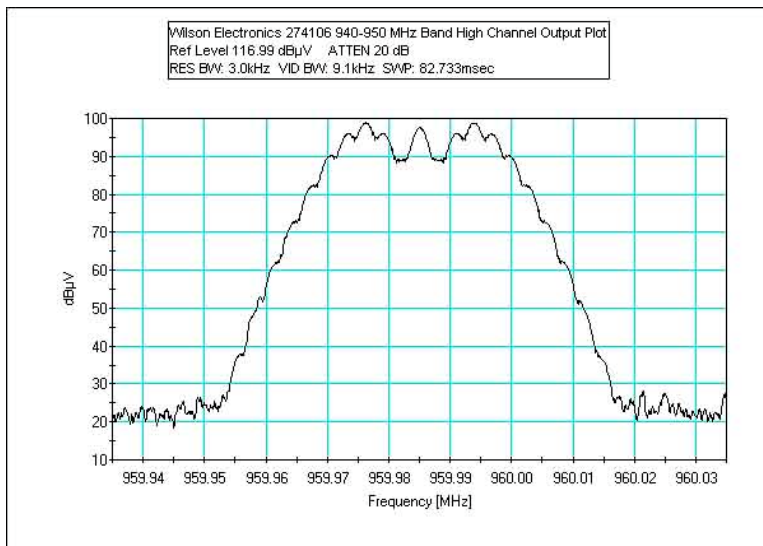
### OUTPUT PLOT - 940-950 MHz LOW CHANNEL



### OUTPUT PLOT - 940-950 MHz MID CHANNEL



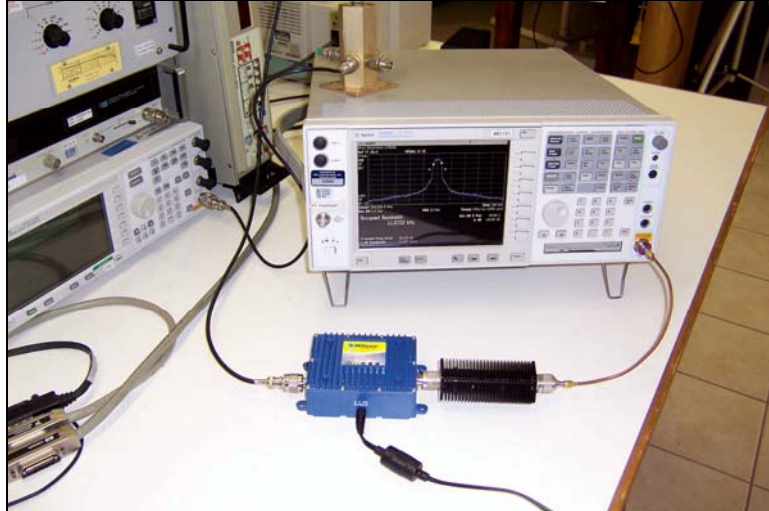
### OUTPUT PLOT - 940-950 MHz HIGH CHANNEL





**FCC 2.1033(c)(14)/2.1051/22.359 - SPURIOUS EMISSIONS AT ANTENNA TERMINAL**

**Test Setup Photos**



**Test Data Sheets**

Test Location: CKC Laboratories, Inc. •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Wilson Electronics**  
 Specification: **22.359**  
 Work Order #: **86003**  
 Test Type: **Antenna Conducted**  
 Equipment: **iDEN 900 MHz Amplifier**  
 Manufacturer: Wilson Electronics  
 Model: 274106  
 S/N: 2741069910000

Date: 4/25/2007  
 Time: 10:49:08  
 Sequence#: 15  
 Tested By: Randal Clark  
 120V 60Hz

***Test Equipment:***

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/03/2007	01/03/2009	02660
Weinschel 33-10-33 Attenuator	AH5409	05/23/2005	05/23/2007	P01681
HP 8491A 10dB Attenuator	2708A47453	11/30/2006	11/30/2008	P01350

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

Function	Manufacturer	Model #	S/N
iDEN 900 MHz Amplifier*	Wilson Electronics	274106	2741069910000

***Support Devices:***

Function	Manufacturer	Model #	S/N
EUT Power Supply	I.T.E Power Supply	HK-B118-A06	0106C
Signal Generator	Agilent	E4437B	MY41000126



**Test Conditions / Notes:**

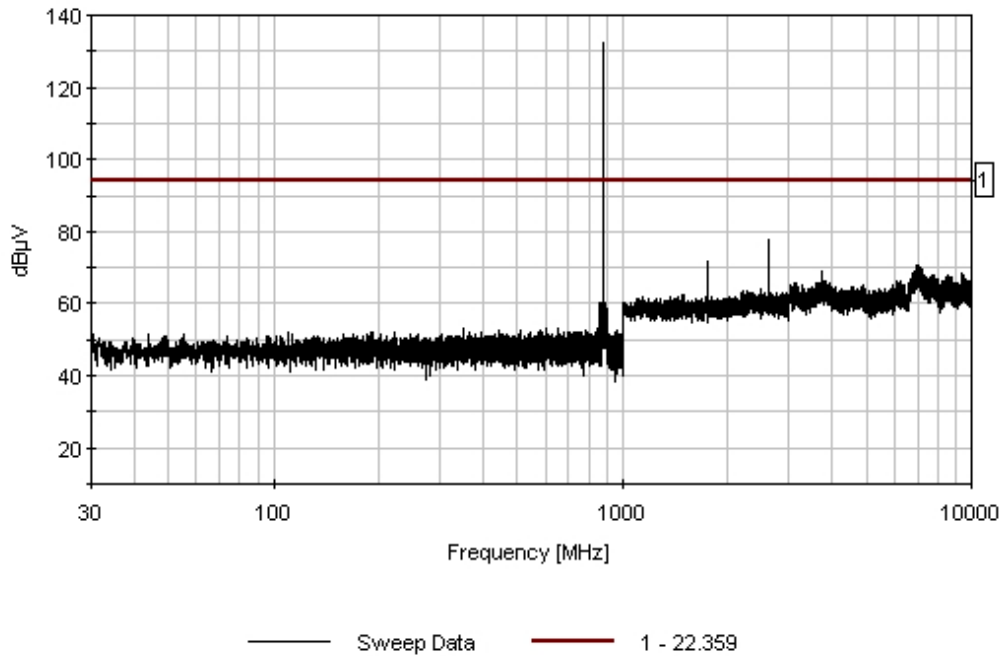
This is a wireless, in-building, 900 MHz bi-directional amplifier. Signal generator output is fed directly to input to the EUT RF output is fed to a spectrum analyzer through suitable attenuation. Frequencies used: Block edge  $\pm 25\text{kHz}$  and  $\pm 300\text{kHz}$ . Signal generators are set for FM Modulation with  $\pm 12.5\text{kHz}$  deviation on a 1 kHz tone. Frequency Band Tested: 876-896 MHz. Channel Tested: Low. Frequency Range Investigated: 30MHz to 10GHz. Bandwidth Settings: RBW = 100kHz, VBW = 300kHz (30-1000MHz) RBW = 1MHz, VBW = 1MHz (1-10GHz) Temperature: 73°F, Relative Humidity: 27%. No Spurious emissions detected within 20dB of the limit.

**Transducer Legend:**

T1=ATT ANP01681	T2=ATT P01350-113006
-----------------	----------------------

#	Freq MHz	Rdng dB $\mu$ V	Reading listed by margin.			Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
			T1 dB	T2 dB	dB					
1	876.030M	112.5	+9.7	+10.2		+0.0	132.4	132.4	+0.0	RF Ou
Carrier										
2	2628.048M	57.6	+10.2	+10.1		+0.0	77.9	94.0	-16.1	RF Ou
3	1752.076M	50.4	+10.2	+10.1		+0.0	70.7	94.0	-23.3	RF Ou
4	3504.123M	33.5	+10.2	+10.3		+0.0	54.0	94.0	-40.0	RF Ou
Ambient Noise Floor										

CKC Laboratories, Inc. Date: 4/25/2007 Time: 10:49:08 Wilson Electronics WWO#: 86003  
 22.359 Test Lead: RF Output 120V 60Hz Sequence#: 15  
 Wilson Electronics M/N 274106 876-896 MHz Band Low Channel





Test Location: CKC Laboratories, Inc. •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Wilson Electronics**  
 Specification: **22.359**  
 Work Order #: **86003** Date: 4/25/2007  
 Test Type: **Antenna Conducted** Time: 10:55:23  
 Equipment: **iDEN 900 MHz Amplifier** Sequence#: 16  
 Manufacturer: Wilson Electronics Tested By: Randal Clark  
 Model: 274106 120V 60Hz  
 S/N: 2741069910000

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/03/2007	01/03/2009	02660
Weinschel 33-10-33 Attenuator	AH5409	05/23/2005	05/23/2007	P01681
HP 8491A 10dB Attenuator	2708A47453	11/30/2006	11/30/2008	P01350

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

Function	Manufacturer	Model #	S/N
iDEN 900 MHz Amplifier*	Wilson Electronics	274106	2741069910000

**Support Devices:**

Function	Manufacturer	Model #	S/N
EUT Power Supply	I.T.E Power Supply	HK-B118-A06	0106C
Signal Generator	Agilent	E4437B	MY41000126

**Test Conditions / Notes:**

This is a wireless, in-building, 900 MHz bi-directional amplifier. Signal generator output is fed directly to input to the EUT RF output is fed to a spectrum analyzer through suitable attenuation. Frequencies used: Block edge  $\pm 25\text{kHz}$  and  $\pm 300\text{kHz}$ . Signal generators are set for FM Modulation with  $\pm 12.5\text{kHz}$  deviation on a 1 kHz tone. Frequency Band Tested: 876-896 MHz. Channel Tested: Mid. Frequency Range Investigated: 30MHz to 10GHz. Bandwidth Settings: RBW = 100kHz, VBW = 300kHz (30-1000MHz) RBW = 1MHz, VBW = 1MHz (1-10GHz) Temperature: 73°F, Relative Humidity: 27%. No Spurious emissions detected within 20dB of the limit.

**Transducer Legend:**

T1=ATT ANP01681	T2=ATT P01350-113006
-----------------	----------------------

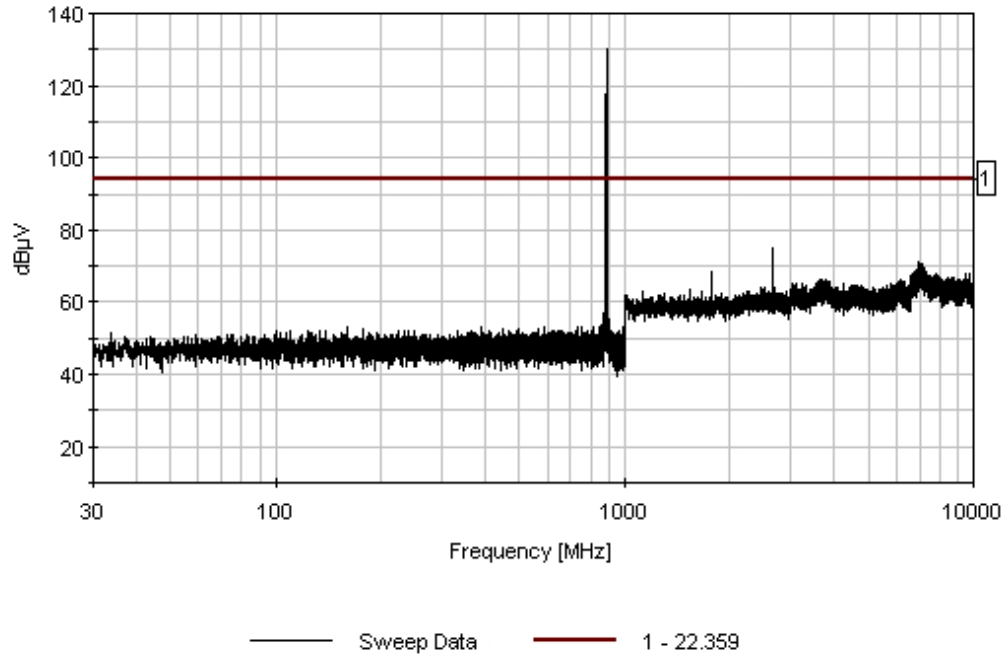
**Measurement Data:**

Reading listed by margin.

Test Lead: RF Output

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB	Dist Table dB	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
1	886.005M	110.3	+9.7	+10.2	+0.0	130.2	130.2	+0.0	RF Ou
							Carrier		
2	2657.972M	54.7	+10.2	+10.1	+0.0	75.0	94.0	-19.0	RF Ou
3	1772.020M	47.7	+10.2	+10.1	+0.0	68.0	94.0	-26.0	RF Ou
4	3544.020M	35.4	+10.3	+10.3	+0.0	56.0	94.0	-38.0	RF Ou
							Ambient Noise Floor		

CKC Laboratories, Inc. Date: 4/25/2007 Time: 10:55:23 Wilson Electronics WO#: 86003  
22.359 Test Lead: RF Output 120V 60Hz Sequence#: 16  
Wilson Electronics M/N 274106 876-896 MHz Band MidChannel





Test Location: CKC Laboratories, Inc. •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Wilson Electronics**  
 Specification: **22.359**  
 Work Order #: **86003** Date: 4/25/2007  
 Test Type: **Antenna Conducted** Time: 10:59:06  
 Equipment: **iDEN 900 MHz Amplifier** Sequence#: 17  
 Manufacturer: Wilson Electronics Tested By: Randal Clark  
 Model: 274106 120V 60Hz  
 S/N: 2741069910000

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/03/2007	01/03/2009	02660
Weinschel 33-10-33 Attenuator	AH5409	05/23/2005	05/23/2007	P01681
HP 8491A 10dB Attenuator	2708A47453	11/30/2006	11/30/2008	P01350

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

Function	Manufacturer	Model #	S/N
iDEN 900 MHz Amplifier*	Wilson Electronics	274106	2741069910000

**Support Devices:**

Function	Manufacturer	Model #	S/N
EUT Power Supply	I.T.E Power Supply	HK-B118-A06	0106C
Signal Generator	Agilent	E4437B	MY41000126

**Test Conditions / Notes:**

This is a wireless, in-building, 900 MHz bi-directional amplifier. Signal generator output is fed directly to input to the EUT RF output is fed to a spectrum analyzer through suitable attenuation. Frequencies used: Block edge  $\pm 25\text{kHz}$  and  $\pm 300\text{kHz}$ . Signal generators are set for FM Modulation with  $\pm 12.5\text{kHz}$  deviation on a 1 kHz tone. Frequency Band Tested: 876-896 MHz. Channel Tested: High. Frequency Range Investigated: 30MHz to 10GHz. Bandwidth Settings: RBW = 100kHz, VBW = 300kHz (30-1000MHz) RBW = 1MHz, VBW = 1MHz (1-10GHz) Temperature: 73°F, Relative Humidity: 27%. Other than indicated data, No Spurious emissions detected within 20dB of the limit.

**Transducer Legend:**

T1=ATT ANP01681	T2=ATT P01350-113006
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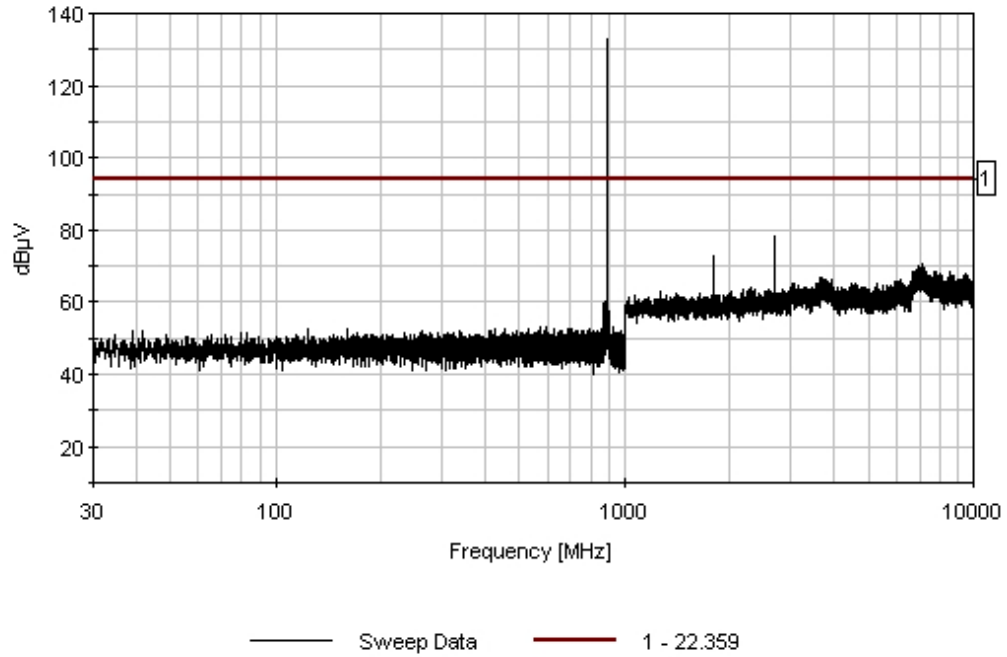
**Measurement Data:**

Reading listed by margin.

Test Lead: RF Output

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB	Dist Table dB	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
1	896.002M	112.9	+9.7	+10.2	+0.0	132.8	132.8	+0.0	RF Ou
Carrier									
2	2687.969M	58.2	+10.2	+10.1	+0.0	78.5	94.0	-15.5	RF Ou
3	1791.987M	52.6	+10.2	+10.1	+0.0	72.9	94.0	-21.1	RF Ou
4	3583.921M	40.5	+10.4	+10.3	+0.0	61.2	94.0	-32.8	RF Ou
5	5375.965M	39.4	+10.3	+10.2	+0.0	59.9	94.0	-34.1	RF Ou

CKC Laboratories, Inc. Date: 4/25/2007 Time: 10:59:06 Wilson Electronics W/O#: 86003  
22.359 Test Lead: RF Output 120V 60Hz Sequence#: 17  
Wilson Electronics M/N 274106 876-896 MHz Band High Channel





Test Location: CKC Laboratories, Inc. •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Wilson Electronics**  
 Specification: **22.359**  
 Work Order #: **86003** Date: 4/25/2007  
 Test Type: **Antenna Conducted** Time: 10:40:23  
 Equipment: **iDEN 900 MHz Amplifier** Sequence#: 14  
 Manufacturer: Wilson Electronics Tested By: Randal Clark  
 Model: 274106 120V 60Hz  
 S/N: 2741069910000

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/03/2007	01/03/2009	02660
Weinschel 33-10-33 Attenuator	AH5409	05/23/2005	05/23/2007	P01681
HP 8491A 10dB Attenuator	2708A47453	11/30/2006	11/30/2008	P01350

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

Function	Manufacturer	Model #	S/N
iDEN 900 MHz Amplifier*	Wilson Electronics	274106	2741069910000

**Support Devices:**

Function	Manufacturer	Model #	S/N
EUT Power Supply	I.T.E Power Supply	HK-B118-A06	0106C
Signal Generator	Agilent	E4437B	MY41000126

**Test Conditions / Notes:**

This is a wireless, in-building, 900 MHz bi-directional amplifier. Signal generator output is fed directly to input to the EUT RF output is fed to a spectrum analyzer through suitable attenuation. Frequencies used: Block edge  $\pm 25\text{kHz}$  and  $\pm 300\text{kHz}$ . Signal generators are set for FM Modulation with  $\pm 12.5\text{kHz}$  deviation on a 1 kHz tone. Frequency Band Tested: 940-960MHz. Channel Tested: Low. Frequency Range Investigated: 30MHz to 10GHz. Bandwidth Settings: RBW = 100kHz, VBW = 300kHz (30-1000MHz) RBW = 1MHz, VBW = 1MHz (1-10GHz) Temperature: 73°F, Relative Humidity: 27%. No Spurious emissions detected within 20dB of the limit.

**Transducer Legend:**

T1=ATT ANP01681	T2=ATT P01350-113006
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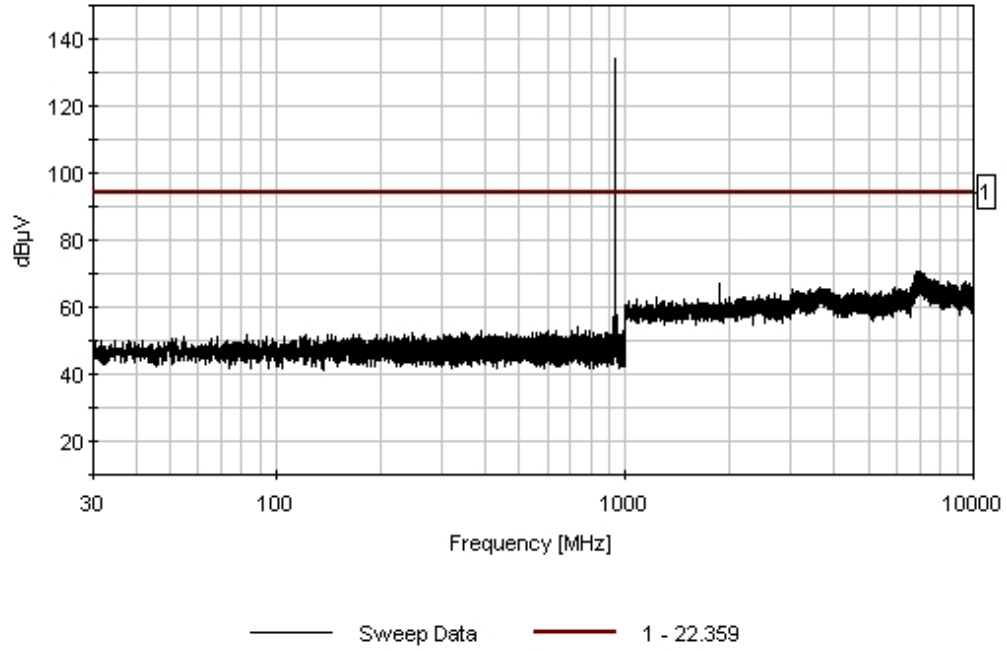
**Measurement Data:**

Reading listed by margin.

Test Lead: RF Output

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB	Dist dB	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
1	940.031M	114.4	+9.7	+10.2	+0.0	134.3	134.3	+0.0	RF Ou
							Carrier		
2	1880.061M	46.9	+10.2	+10.1	+0.0	67.2	94.0	-26.8	RF Ou
3	3760.122M	39.4	+10.3	+10.4	+0.0	60.1	94.0	-33.9	RF Ou
4	2820.092M	34.0	+10.2	+10.2	+0.0	54.4	94.0	-39.6	RF Ou

CKC Laboratories, Inc. Date: 4/25/2007 Time: 10:40:23 Wilson Electronics W/O#: 86003  
22.359 Test Lead: RF Output 120V 60Hz Sequence#: 14  
Wilson Electronics M/N 274106 940-960MHz Band Low Channel





Test Location: CKC Laboratories, Inc. •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Wilson Electronics**  
 Specification: **22.359**  
 Work Order #: **86003** Date: 4/25/2007  
 Test Type: **Antenna Conducted** Time: 10:33:12  
 Equipment: **iDEN 900 MHz Amplifier** Sequence#: 13  
 Manufacturer: Wilson Electronics Tested By: Randal Clark  
 Model: 274106 120V 60Hz  
 S/N: 2741069910000

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/03/2007	01/03/2009	02660
Weinschel 33-10-33 Attenuator	AH5409	05/23/2005	05/23/2007	P01681
HP 8491A 10dB Attenuator	2708A47453	11/30/2006	11/30/2008	P01350

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

Function	Manufacturer	Model #	S/N
iDEN 900 MHz Amplifier*	Wilson Electronics	274106	2741069910000

**Support Devices:**

Function	Manufacturer	Model #	S/N
EUT Power Supply	I.T.E Power Supply	HK-B118-A06	0106C
Signal Generator	Agilent	E4437B	MY41000126

**Test Conditions / Notes:**

This is a wireless, in-building, 900 MHz bi-directional amplifier. Signal generator output is fed directly to input to the EUT RF output is fed to a spectrum analyzer through suitable attenuation. Frequencies used: Block edge ±25kHz and ±300kHz. Signal generators are set for FM Modulation with ±12.5kHz deviation on a 1 kHz tone. Frequency Band Tested: 940-960 MHz. Channel Tested: Mid. Frequency Range Investigated: 30MHz to 10GHz. Bandwidth Settings: RBW = 100kHz, VBW = 300kHz (30-1000MHz) RBW = 1MHz, VBW = 1MHz (1-10GHz) Temperature: 73°F, Relative Humidity: 27%. No Spurious emissions detected within 20dB of the limit.

**Transducer Legend:**

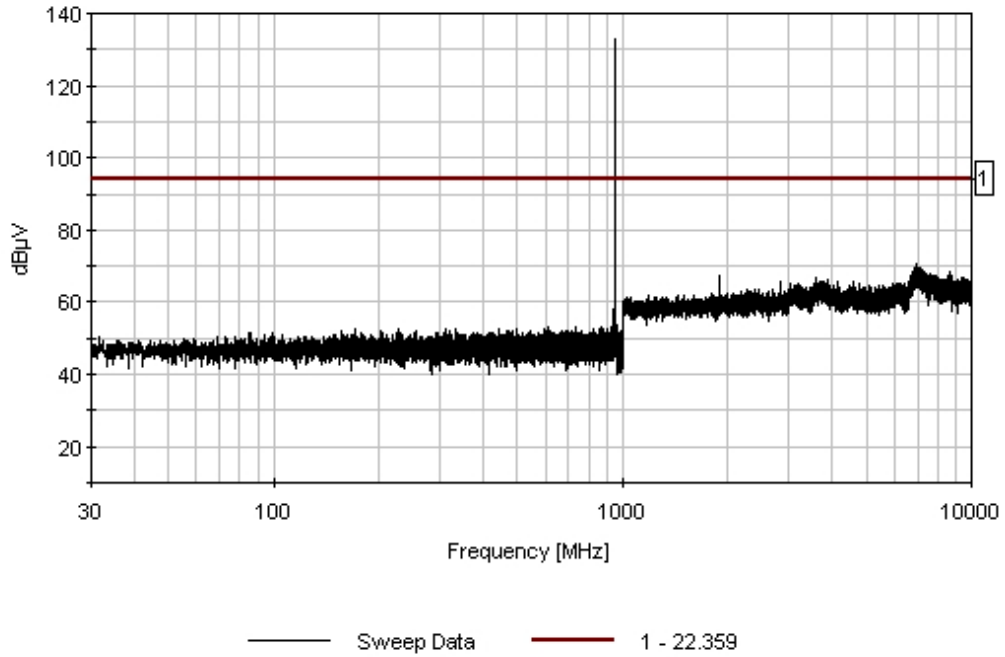
T1=ATT ANP01681	T2=ATT P01350-113006
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**Measurement Data:** Reading listed by margin. Test Lead: RF Output

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	Dist Table dB	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	950.005M	112.9	+9.8	+10.1	+0.0	132.8	132.8	+0.0	RF Ou
							Carrier		
2	1900.009M	46.3	+10.2	+10.1	+0.0	66.6	94.0	-27.4	RF Ou
3	2849.984M	42.9	+10.2	+10.2	+0.0	63.3	94.0	-30.7	RF Ou
4	3799.989M	38.2	+10.3	+10.4	+0.0	58.9	94.0	-35.1	RF Ou



CKC Laboratories, Inc. Date: 4/25/2007 Time: 10:33:12 Wilson Electronics W/O#: 86003  
22.359 Test Lead: RF Output 120V 60Hz Sequence#: 13  
Wilson Electronics M/N 274106 940-960MHz Band Mid Channel





Test Location: CKC Laboratories, Inc. •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Wilson Electronics**  
 Specification: **22.359**  
 Work Order #: **86003** Date: 4/25/2007  
 Test Type: **Antenna Conducted** Time: 10:30:05  
 Equipment: **iDEN 900 MHz Amplifier** Sequence#: 12  
 Manufacturer: Wilson Electronics Tested By: Randal Clark  
 Model: 274106 120V 60Hz  
 S/N: 2741069910000

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/03/2007	01/03/2009	02660
Weinschel 33-10-33 Attenuator	AH5409	05/23/2005	05/23/2007	P01681
HP 8491A 10dB Attenuator	2708A47453	11/30/2006	11/30/2008	P01350

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

Function	Manufacturer	Model #	S/N
iDEN 900 MHz Amplifier*	Wilson Electronics	274106	2741069910000

**Support Devices:**

Function	Manufacturer	Model #	S/N
EUT Power Supply	I.T.E Power Supply	HK-B118-A06	0106C
Signal Generator	Agilent	E4437B	MY41000126

**Test Conditions / Notes:**

This is a wireless, in-building, 900 MHz bi-directional amplifier. Signal generator output is fed directly to input to the EUT RF output is fed to a spectrum analyzer through suitable attenuation. Frequencies used: Block edge  $\pm 25\text{kHz}$  and  $\pm 300\text{kHz}$ . Signal generators are set for FM Modulation with  $\pm 12.5\text{kHz}$  deviation on a 1 kHz tone. Frequency Band Tested: 940-960 MHz. Channel Tested: High. Frequency Range Investigated: 30MHz to 10GHz. Bandwidth Settings: RBW = 100kHz, VBW = 300kHz (30-1000MHz) RBW = 1MHz, VBW = 1MHz (1-10GHz) Temperature: 73°F, Relative Humidity: 27%. No Spurious emissions detected within 20dB of the limit.

**Transducer Legend:**

T1=ATT ANP01681	T2=ATT P01350-113006
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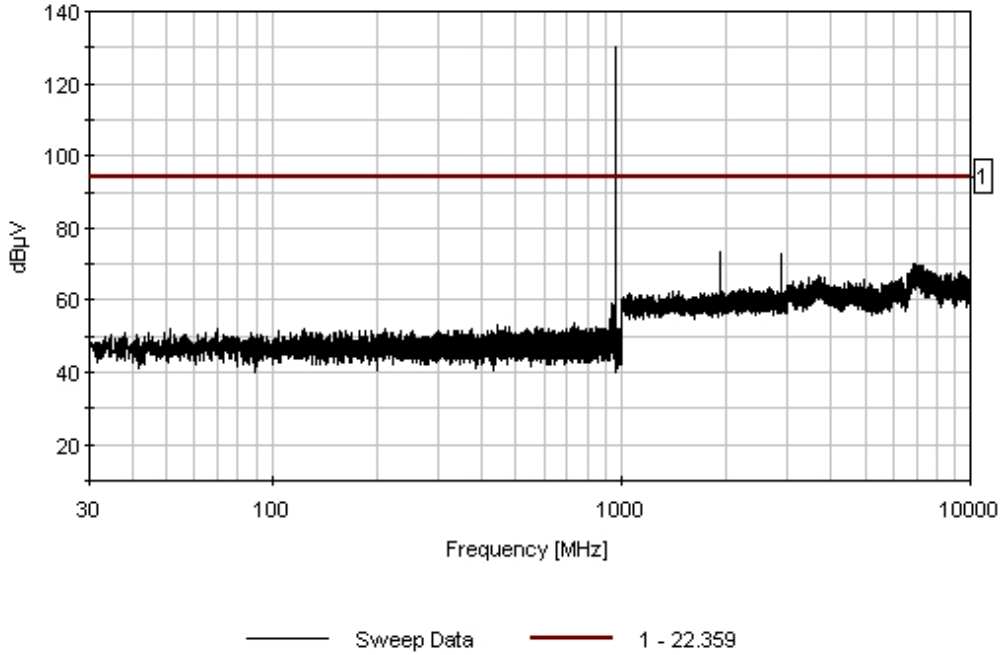
**Measurement Data:**

Reading listed by margin.

Test Lead: RF Output

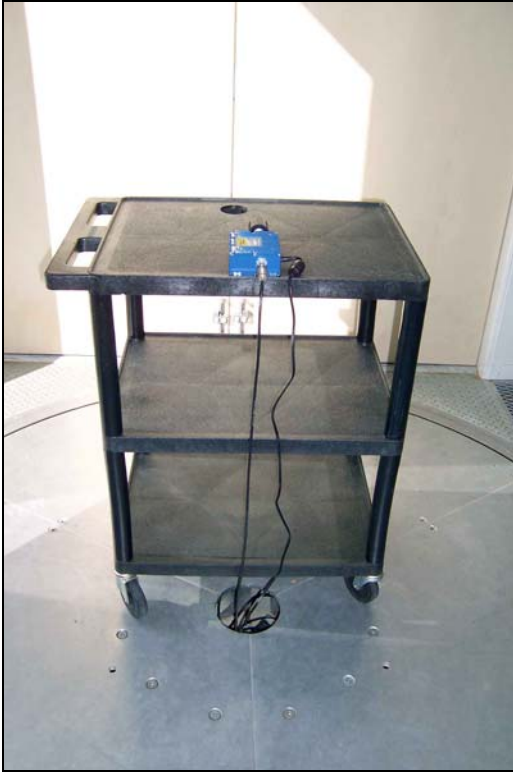
#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB	Dist Table dB	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
1	959.978M	110.4	+9.8	+10.1	+0.0	130.3	130.3	+0.0	RF Ou
							Carrier		
2	1920.000M	53.6	+10.2	+10.1	+0.0	73.9	94.0	-20.1	RF Ou
3	2879.923M	52.6	+10.2	+10.2	+0.0	73.0	94.0	-21.0	RF Ou
4	3839.938M	38.2	+10.2	+10.4	+0.0	58.8	94.0	-35.2	RF Ou

CKC Laboratories, Inc. Date: 4/25/2007 Time: 10:30:05 Wilson Electronics WO#: 86003  
22.359 Test Lead: RF Output 120V 60Hz Sequence#: 12  
Wilson Electronics M/N 274106 940-960MHz Band High Channel



**FCC 2.1033(c)(14)/2.1053/22.359 - FIELD STRENGTH OF SPURIOUS RADIATION**

**Test Setup Photos**





**Test Data Sheets**

Test Location: CKC Laboratories, Inc. •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)  
 Customer: **Wilson Electronics**  
 Specification: **22.359**  
 Work Order #: **86003** Date: 1/17/2007  
 Test Type: **Maximized Emissions** Time: 08:23:47  
 Equipment: **iDEN 900 MHz Amplifier** Sequence#: 8  
 Manufacturer: Wilson Electronics Tested By: Randal Clark  
 Model: 274106  
 S/N: 2741069910000

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/03/2007	01/03/2009	02660
Chase CBL6111C Bilog	2456	06/07/2005	06/07/2007	01991
EMCO Loop Antenna	1074	05/13/2005	05/13/2007	00226
Cable, Andrews Hardline HF-005-20	NA	05/27/2005	05/27/2007	P04275
EMCO 3115 Horn Antenna	8006-3413	03/17/2007	03/17/2009	00327
HP 8449B Preamp	3008A00301	12/13/2006	12/13/2008	2010

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

Function	Manufacturer	Model #	S/N
iDEN 900 MHz Amplifier*	Wilson Electronics	274106	2741069910000

**Support Devices:**

Function	Manufacturer	Model #	S/N
EUT Power Supply	I.T.E Power Supply	HK-B118-A06	0106C
Signal Generator	Agilent	E4437B	MY41000126

**Test Conditions / Notes:**

This is a wireless, in-building, 900 MHz bi-directional amplifier for enhancing the range of cell phones. Equipment is an amplifier is the 876-896MHz and 940-960 MHz frequency ranges. Equipment is connected directly to a matched termination. Frequency Band Tested: 876-896MHz and 940-960 MHz. Channel Tested: Low, Middle and High. Frequency Range Investigated: 30MHz - 10GHz. Bandwidth Settings: RBW = 100kHz, VBW = 300kHz (30-1000MHz) RBW = 1MHz, VBW = 1MHz (1-10GHz) Temperature: 72°F, Relative Humidity: 27%. **No EUT emissions detected within 20dB of the limit.**

**Transducer Legend:**

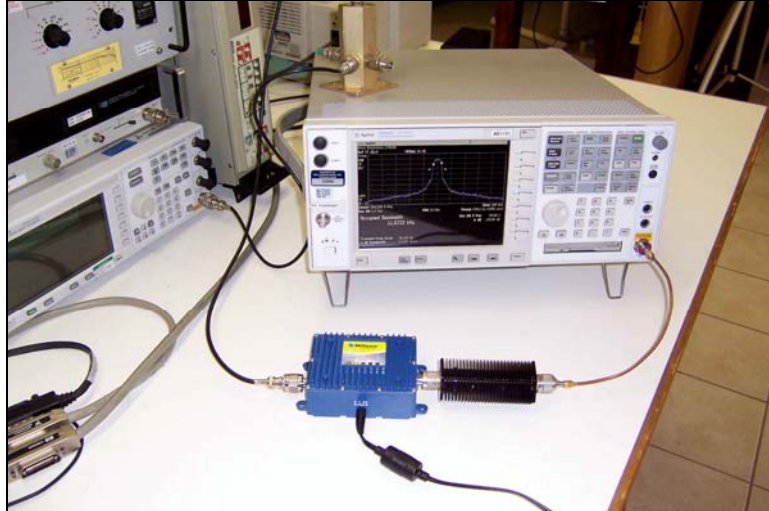
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**Measurement Data:** Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant

**INTERMODULATION ATTENUATION**

**Test Setup Photos**



**Test Data**

Test Location: CKC Laboratories, Inc. •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Wilson Electronics**  
 Specification: **22.359**  
 Work Order #: **86003** Date: 4/25/2007  
 Test Type: **Antenna Conducted** Time: 09:21:17  
 Equipment: **iDEN 900 MHz Amplifier** Sequence#: 10  
 Manufacturer: Wilson Electronics Tested By: Randal Clark  
 Model: 274106 120V 60Hz  
 S/N: 2741069910000

***Test Equipment:***

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/03/2007	01/03/2009	02660
Attenuator 30dB, Bird 9724 25A-MFN-30		05/18/2005	05/18/2007	P01577

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

Function	Manufacturer	Model #	S/N
iDEN 900 MHz Amplifier*	Wilson Electronics	274106	2741069910000

***Support Devices:***

Function	Manufacturer	Model #	S/N
EUT Power Supply	I.T.E Power Supply	HK-B118-A06	0106C
Combiner	Motorola	None	None
Signal Generator	Agilent	E4437B	MY41000126
Signal Generator	Marconi	2022D	119259/016

***Test Conditions / Notes:***

This is a wireless, in-building, 900 MHz bi-directional amplifier. Signal generator output is fed through a combiner prior to input to the EUT. Frequencies used: Block edge  $\pm 25\text{kHz}$  and  $\pm 300\text{kHz}$ . Intermodulation test performed using two tone method. Signal generators are set for FM Modulation with  $\pm 12.5\text{kHz}$  deviation on a 1 kHz tone. Frequency Band Tested: 876-896 and 940-960 MHz. Channel Tested: Intermodulation Attenuation. Frequency Range Investigated: 30MHz to 10GHz. Bandwidth Settings: RBW = 30kHz, VBW = 90kHz. Temperature: 73°F, Relative Humidity: 27%. Except for indicated measurements, no intermodulation emissions detected within 20dB of the limit.

***Transducer Legend:***

T1=Pad 30dB

***Measurement Data:***

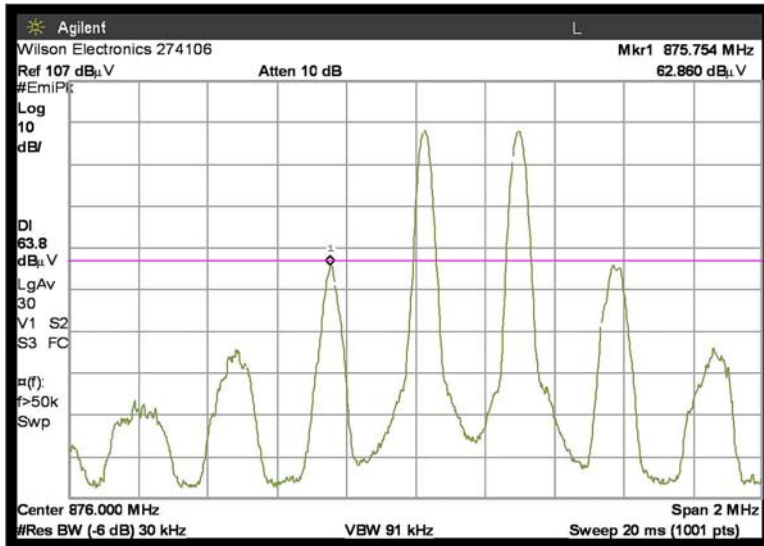
Reading listed by margin.

Test Lead: RF Output

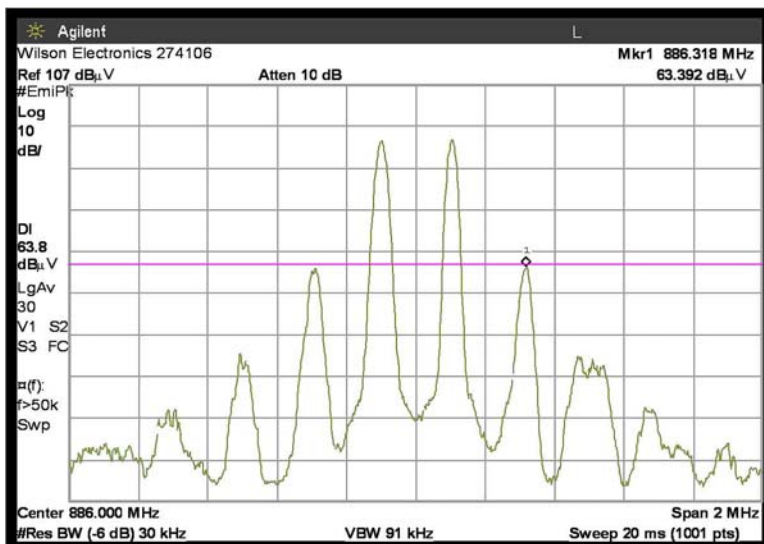
#	Freq MHz	Rdng dB $\mu$ V	T1 dB	dB			Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
1	886.318M	63.4	+30.2				+0.0	93.6	94.0	-0.4	RF Ou
2	949.700M	63.2	+30.1				+0.0	93.3	94.0	-0.7	RF Ou
3	885.712M	63.0	+30.2				+0.0	93.2	94.0	-0.8	RF Ou
4	875.754M	62.9	+30.2				+0.0	93.1	94.0	-0.9	RF Ou
5	896.276M	62.8	+30.2				+0.0	93.0	94.0	-1.0	RF Ou
6	876.570M	62.8	+30.2				+0.0	93.0	94.0	-1.0	RF Ou
7	959.416M	62.6	+30.1				+0.0	92.7	94.0	-1.3	RF Ou
8	940.584M	62.2	+30.1				+0.0	92.3	94.0	-1.7	RF Ou
9	895.416M	61.3	+30.2				+0.0	91.5	94.0	-2.5	RF Ou
10	950.294M	61.3	+30.1				+0.0	91.4	94.0	-2.6	RF Ou
11	960.280M	61.1	+30.1				+0.0	91.2	94.0	-2.8	RF Ou
12	939.756M	60.1	+30.1				+0.0	90.2	94.0	-3.8	RF Ou

## Test Plots

### INTERMODULATION ATTENUATION - 876-896 MHz LOW CHANNEL

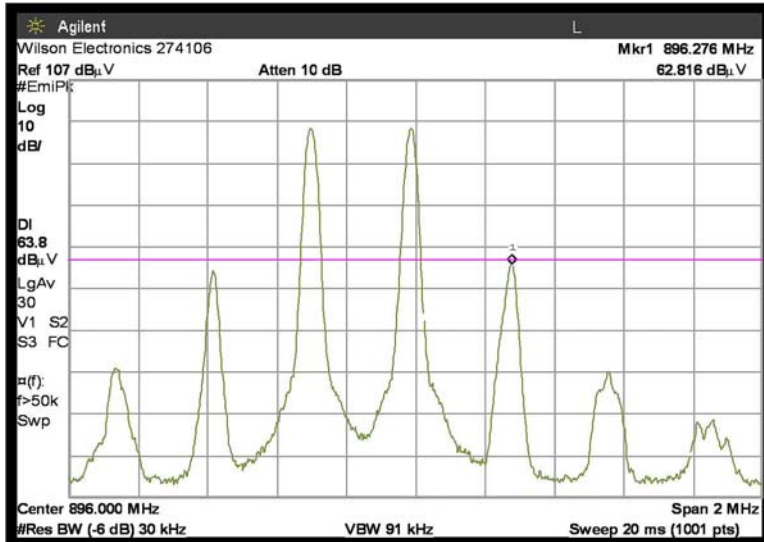


### INTERMODULATION ATTENUATION – 876-896 MHz MID CHANNEL

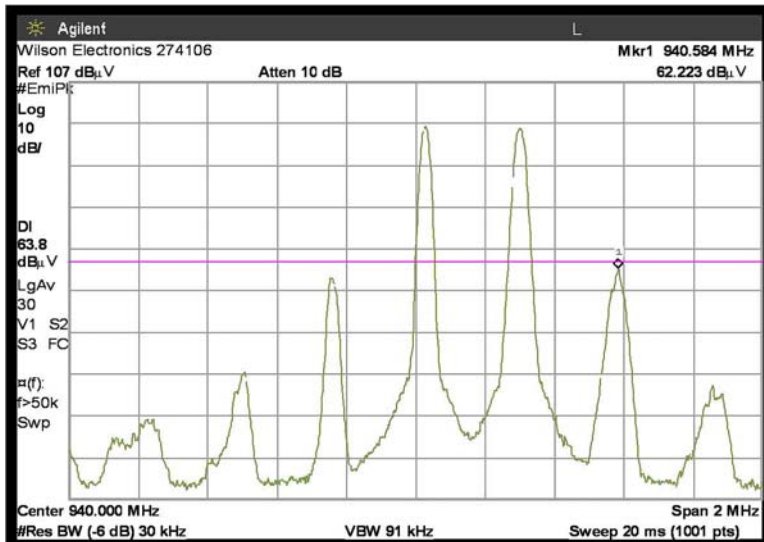




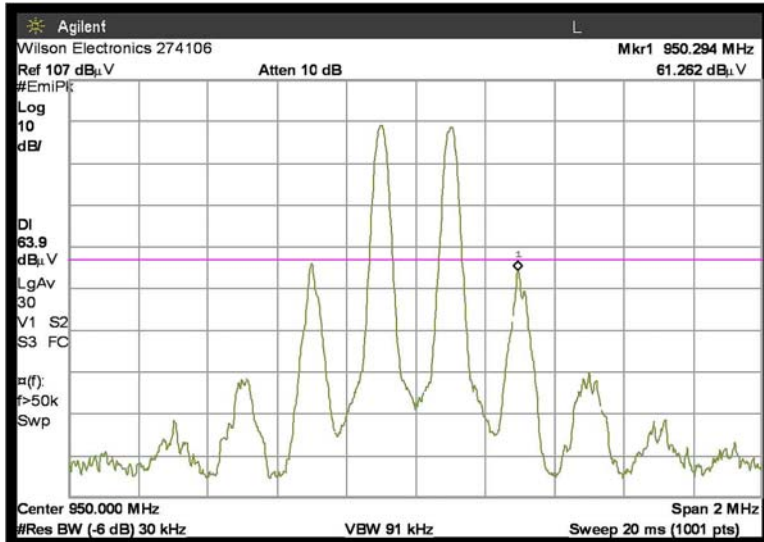
### INTERMODULATION ATTENUATION - 876-896 MHz HIGH CHANNEL



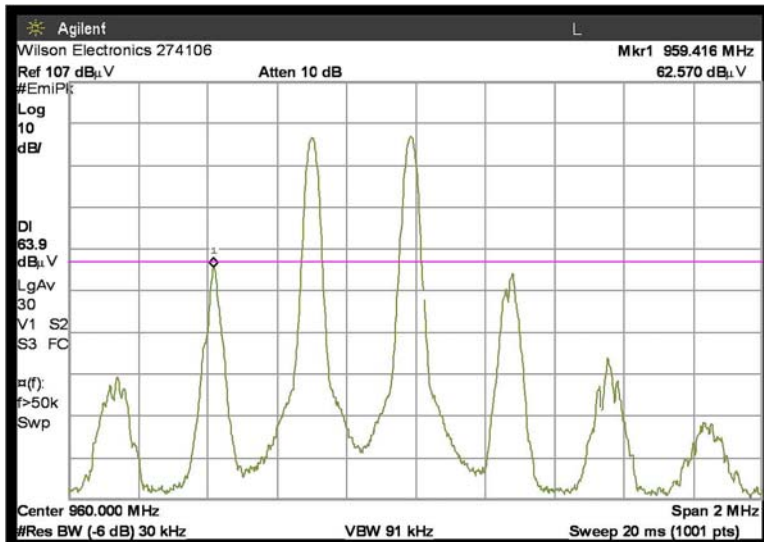
### INTERMODULATION ATTENUATION - 940-960 MHz LOW CHANNEL



### INTERMODULATION ATTENUATION - 940-960 MHz MID CHANNEL



### INTERMODULATION ATTENUATION - 940-960 MHz HIGH CHANNEL



## OUT OF BAND AMPLIFICATION

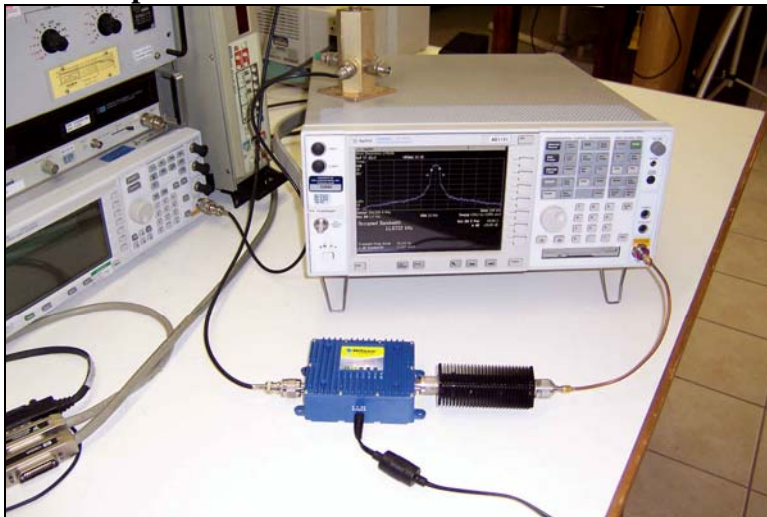
### Test Equipment

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/03/2007	01/03/2009	02660
Attenuator 30dB, Bird 25A-MFN-30	9724	05/18/2005	05/18/2007	P01577

### Test Conditions

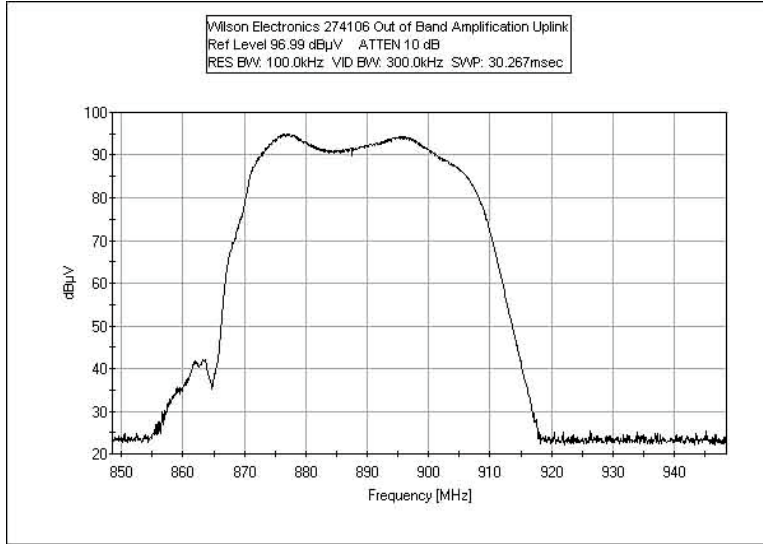
This is a wireless, in-building, 900 MHz bi-directional amplifier. Signal generator output is fed directly to input to the EUT RF output is fed to a spectrum analyzer through suitable attenuation. Signal generators are set for FM Modulation with  $\pm 12.5$  kHz deviation on a 1 kHz tone. Bandwidth Settings: RBW = 100 kHz, VBW = 300 kHz (30-1000 MHz) RBW = 1 MHz, VBW = 1 MHz (1-10 GHz) Temperature: 73°F, Relative Humidity: 27%.

### Test Setup Photos

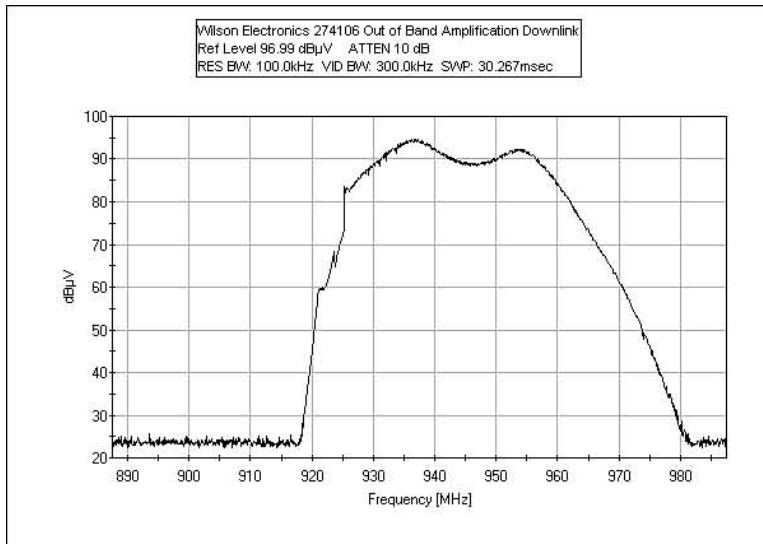


**Test Plots**

**OUT OF BAND AMPLIFICATION - UPLINK 876-896 MHz**



**OUT OF BAND AMPLIFICATION - DOWNLINK 940-960 MHz**



**RSS-131 6.1 PASS BAND GAIN**

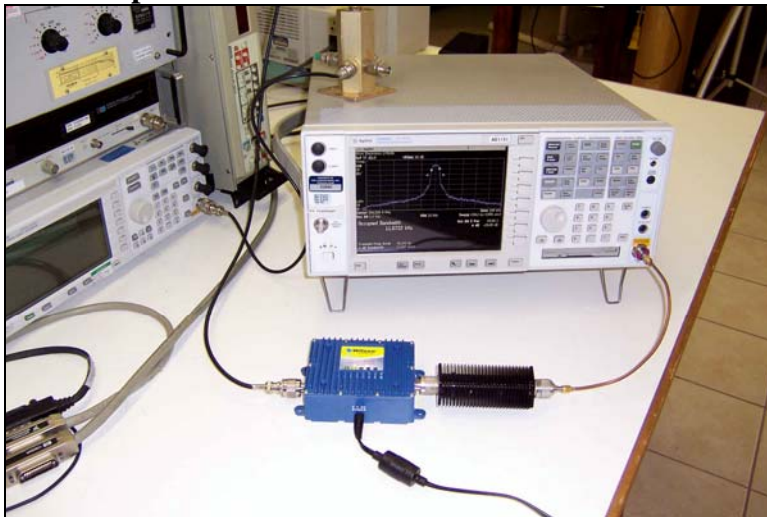
**Test Equipment**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/03/2007	01/03/2009	02660
Attenuator 30dB, Bird 25A-MFN-30	9724	05/18/2005	05/18/2007	P01577

**Test Conditions**

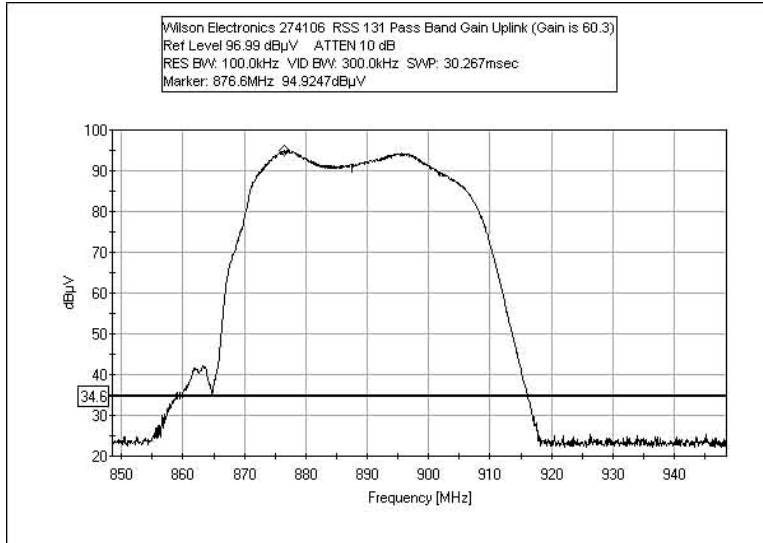
This is a wireless, in-building, 900 MHz bi-directional amplifier. Signal generator output is fed directly to input to the EUT RF output is fed to a spectrum analyzer through suitable attenuation. Signal generators are set for FM Modulation with  $\pm 12.5$  kHz deviation on a 1 kHz tone. Bandwidth Settings: RBW = 100 kHz, VBW = 300 kHz (30-1000 MHz) RBW = 1 MHz, VBW = 1 MHz (1-10 GHz) Temperature: 73°F, Relative Humidity: 27%.

**Test Setup Photos**

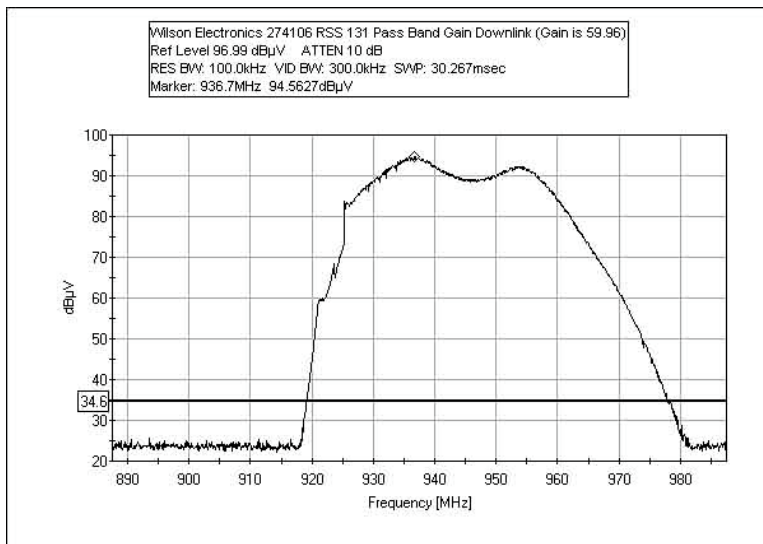


## Test Plots

### RSS-131 PASS BAND GAIN - UPLINK



### RSS-131 PASS BAND GAIN - DOWNLINK



**RSS-131 6.1 PASS BAND WIDTH**

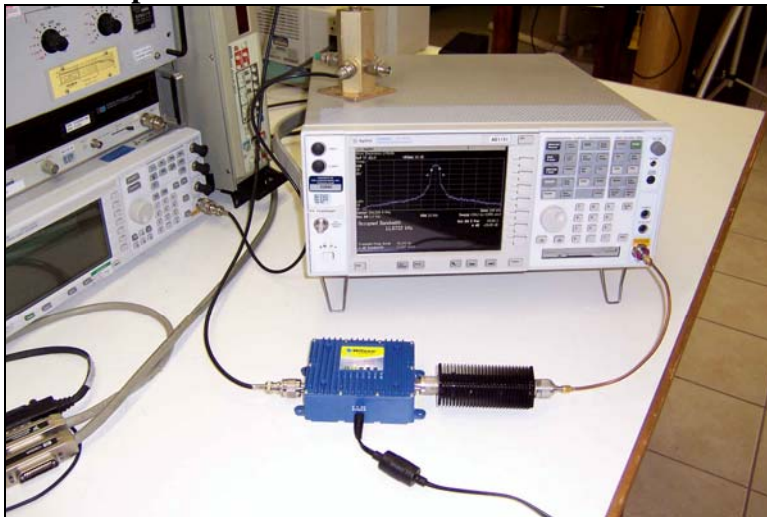
**Test Equipment**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/03/2007	01/03/2009	02660
Attenuator 30dB, Bird 25A-MFN-30	9724	05/18/2005	05/18/2007	P01577

**Test Conditions**

This is a wireless, in-building, 900 MHz bi-directional amplifier. Signal generator output is fed directly to input to the EUT RF output is fed to a spectrum analyzer through suitable attenuation. Signal generators are set for FM Modulation with  $\pm 12.5$  kHz deviation on a 1 kHz tone. Bandwidth Settings: RBW = 100 kHz, VBW = 300 kHz (30-1000 MHz) RBW = 1 MHz, VBW = 1 MHz (1-10 GHz) Temperature: 73°F, Relative Humidity: 27%.

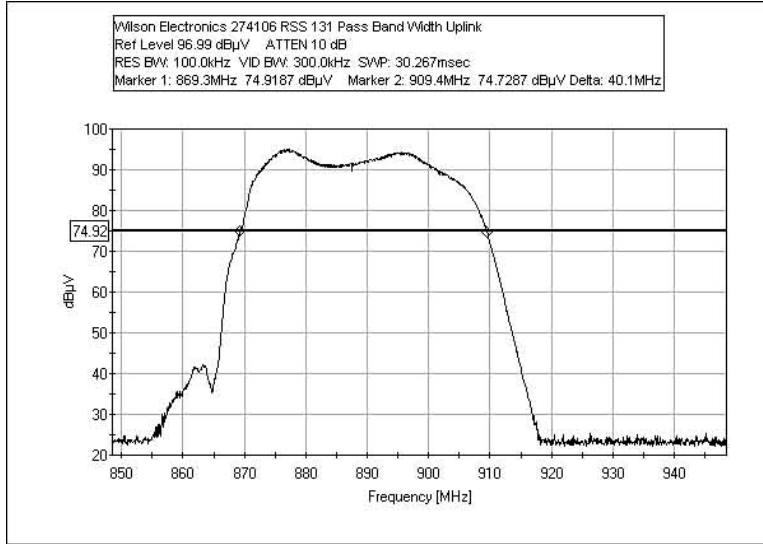
**Test Setup Photos**



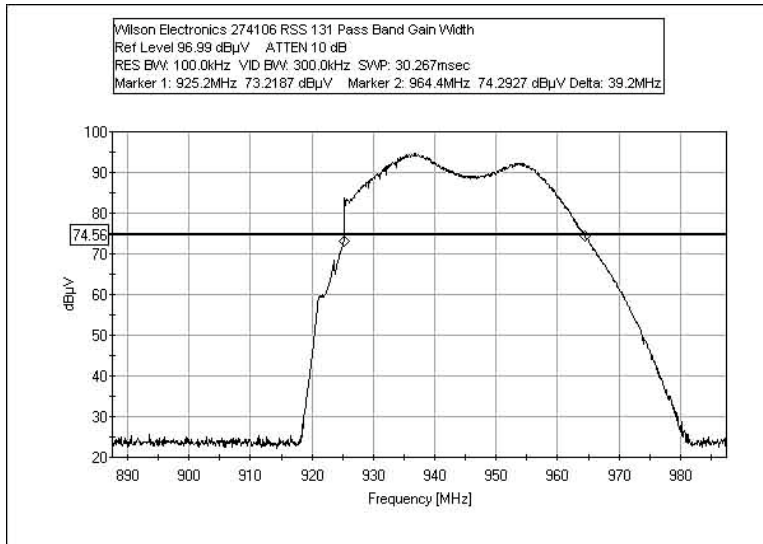


## Test Plots

### RSS-131 PASS BAND WIDTH - UPLINK



### RSS-131 PASS BAND WIDTH - 940-960 MHz





**RSS-131 6.2 MCE OUTPUT POWER**

**Test Equipment**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/03/2007	01/03/2009	02660
Attenuator 30dB, Bird 25A-MFN-30	9724	05/18/2005	05/18/2007	P01577

**Test Conditions**

This is a wireless, in-building, 900 MHz bi-directional amplifier. Signal generator output is fed directly to input to the EUT RF output is fed to a spectrum analyzer through suitable attenuation. Signal generators are set for FM Modulation with  $\pm 12.5$  kHz deviation on a 1 kHz tone. Bandwidth Settings: RBW = 100 kHz, VBW = 300 kHz (30-1000 MHz) RBW = 1 MHz, VBW = 1 MHz (1-10 GHz) Temperature: 73°F, Relative Humidity: 27%.

**Test Setup Photos**

