



WILSON ELECTRONICS TEST REPORT

FOR THE

IDEN BI-DIRECTIONAL AMPLIFIER, BD800NM

FCC PART 90

COMPLIANCE

DATE OF ISSUE: OCTOBER 23, 2002

PREPARED FOR:

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

P.O. No.: 34201
W.O. No.: 79736

PREPARED BY:

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

Date of test: October 14-18, 2002

Report No.: FC02-097

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ADMINISTRATIVE INFORMATION

DATE OF TEST:	October 14-18, 2002
DATE OF RECEIPT:	October 14, 2002
PURPOSE OF TEST:	To demonstrate the compliance of the Iden Bi-directional Amplifier, BD800NM with the requirements for FCC Part 90 devices.
TEST METHOD:	FCC Part 90
FREQUENCY RANGE TESTED:	9 kHz – 10 GHz
MANUFACTURER:	Wilson Electronics 3301 East Deseret Drive St. George, UT 84790
REPRESENTATIVE:	Patrick Cook
TEST LOCATION:	CKC Laboratories, Inc. 5473A Clouds Rest Mariposa, CA 95338

SUMMARY OF RESULTS

As received, the Wilson Electronics Iden Bi-directional Amplifier, BD800NM was found to be fully compliant with the following standards and specifications:

United States

➤ FCC Part 90

CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply.

APPROVALS

QUALITY ASSURANCE:



Steve Behm, Director of Engineering Services



Joyce Walker, Quality Assurance Administrative Manager



Chuck Kendall, EMC/Lab Manager

TEST PERSONNEL:



Monika Brandle, EMC Engineer/
Evaluation Engineer

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The Iden Bi-Directional Amplifier tested by CKC Laboratories was a production unit..

EQUIPMENT UNDER TEST

Iden Bi-Directional Amplifier

Manuf: Wilson Electronics
Model: BD800NM
Serial: 101402-001
FCC ID: PWOBD800NM (pending)

PERIPHERAL DEVICES

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

AC-DC Adaptor

Manuf: Wilson Electronics
Model: JOD-48U-36
Serial: 3G72 E149469
FCC ID: NA

Signal Generator

Manuf: HP
Model: 8656A
Serial: 2245A04338
FCC ID: DoC

TEMPERATURE AND HUMIDITY DURING TESTING

The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

2.1033(c)(3) USER'S MANUAL

The necessary information is contained in a separate document.

2.1033 (c)(4) TYPE OF EMISSIONS

F1DDXW

2.1033(c)(5) FREQUENCY RANGE

TX – 802 MHz -821 MHz, RX – 851 MHz -866 MHz

2.1033(c)(6) OPERATING POWER

Uplink 1 Watt, Downlink 10 mWatts

2.1033(c)(7) MAXIMUM POWER RATING

100 Watts

2.1033(c)(8) DC VOLTAGES

The necessary information is contained in a separate document.

2.1033(c)(9) TUNE-UP PROCEDURE

The necessary information is contained in a separate document.

2.1033(c)(10) SCHEMATICS AND CIRCUITRY DESCRIPTION

The necessary information is contained in a separate document.

2.1033(c)(11) LABEL AND PLACEMENT

The necessary information is contained in a separate document.

2.1033(c)(12) SUBMITTAL PHOTOS

The necessary information is contained in a separate document.

2.1033(c)(13) MODULATION INFORMATION

Not applicable

2.1033(c)(14)/2.1046/90.205(i)/90.2635(d) - RF POWER OUTPUT

Bandwidth settings: RBW/VBW 3 MHz.

Test Location: CKC Laboratories Inc. • 5473A Clouds Rest • Mariposa CA 95338 • 1 800 500 4EMC (4362)

Customer:	Wilson Electronics	Date:	10/16/2002
Specification:	FCC 90.205 (i)/90.635(d)	Time:	16:57:27
Work Order #:	79736	Sequence#:	4
Test Type:	2.1046 - RF Power Output	Tested By:	Monika Brandle
Equipment:	Repeater		
Manufacturer:	Wilson Electronics		
Model:	BD800NM		
S/N:	101402-001		

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Repeater*	Wilson Electronics	BD800NM	101402-001

Support Devices:

Function	Manufacturer	Model #	S/N
AC-DC Adaptor	Wilson Electronics	JOD-48U-36	3G72 E149469
Signal Generator	HP	8656A	2245A04338

Test Conditions / Notes:

EUT is a bi-directional repeater amplifier. Phone port receives and amplifies signals in the frequency range of 806-821 MHz. Antenna port receives and amplifies signals in the frequency range of 851-866 MHz. Each port retransmits signals received from the opposite port. A signal generator is set to supply a modulated signal that simulates actual signals used. The amplitude of the signal generator is set such that the output of the transmitter is at its rated maximum output power for the port being tested. Test Procedure Used: TIA/EIA 603 AMPS - RF Power Output = 5.6 mW.

Transducer Legend:

--

Measurement Data: Reading listed by margin.

Test Distance: None

#	Freq MHz	Rdng dBμV					Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	858.930M	114.5					+0.0	114.5	157.0	-42.5	None
2	866.120M	114.2					+0.0	114.2	157.0	-42.8	None
3	851.010M	113.7					+0.0	113.7	157.0	-43.3	None

Test Location: CKC Laboratories Inc. • 5473A Clouds Rest • Mariposa CA 95338 • 1 800 500 4EMC (4362)

Customer: **Wilson Electronics**
 Specification: **FCC 90.205 (i)/90.635(d)**
 Work Order #: **79736**
 Test Type: **2.1046 - RF Power Output**
 Equipment: **Repeater**
 Manufacturer: Wilson Electronics
 Model: BD800NM
 S/N: 101402-001

Date: 10/16/2002
 Time: 16:41:40
 Sequence#: 3
 Tested By: Monika Brandle

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Repeater*	Wilson Electronics	BD800NM	101402-001

Support Devices:

Function	Manufacturer	Model #	S/N
AC-DC Adaptor	Wilson Electronics	JOD-48U-36	3G72 E149469
Signal Generator	HP	8656A	2245A04338

Test Conditions / Notes:

EUT is a bi-directional repeater amplifier. Phone port receives and amplifies signals in the frequency range of 806-821 MHz. Antenna port receives and amplifies signals in the frequency range of 851-866 MHz. Each port retransmits signals received from the opposite port. A signal generator is set to supply a modulated signal that simulates actual signals used. The amplitude of the signal generator is set such that the output of the transmitter is at its rated maximum output power for the port being tested. Test Procedure Used: TIA/EIA 603 TDMA - RF Power Output = 5.2 mW.

Transducer Legend:

--

Measurement Data:

Reading listed by margin.

Test Distance: None

#	Freq MHz	Rdng dBμV					Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	859.160M	114.2					+0.0	114.2	157.0	-42.8	None
2	865.930M	113.6					+0.0	113.6	157.0	-43.4	None
3	851.010M	113.3					+0.0	113.3	157.0	-43.7	None

Test Location: CKC Laboratories Inc. • 5473A Clouds Rest • Mariposa CA 95338 • 1 800 500 4EMC (4362)

Customer: **Wilson Electronics**
 Specification: **FCC 90.205 (i)/90.635(d)**
 Work Order #: **79736**
 Test Type: **2.1046 - RF Power Output**
 Equipment: **Repeater**
 Manufacturer: Wilson Electronics
 Model: BD800NM
 S/N: 101402-001

Date: 10/15/2002
 Time: 10:05:10
 Sequence#: 2
 Tested By: Monika Brandle

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Repeater*	Wilson Electronics	BD800NM	101402-001

Support Devices:

Function	Manufacturer	Model #	S/N
AC-DC Adaptor	Wilson Electronics	JOD-48U-36	3G72 E149469
Signal Generator	HP	8656A	2245A04338

Test Conditions / Notes:

EUT is a bi-directional repeater amplifier. Phone port receives and amplifies signals in the frequency range of 806-821 MHz. Antenna port receives and amplifies signals in the frequency range of 851-866 MHz. Each port retransmits signals received from the opposite port. A signal generator is set to supply a modulated signal that simulates actual signals used. The amplitude of the signal generator is set such that the output of the transmitter is at its rated maximum output power for the port being tested. Test Procedure Used: TIA/EIA 603 AMPS - RF Power Output = 489.78 mW.

Transducer Legend:

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Measurement Data:

Reading listed by margin.

Test Distance: None

#	Freq MHz	Rdng dBμV					Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	814.962M	133.9					+0.0	133.9	157.0	-23.1	None
2	805.940M	133.7					+0.0	133.7	157.0	-23.3	None
3	820.960M	130.4					+0.0	130.4	157.0	-26.6	None

Test Location: CKC Laboratories Inc. • 5473A Clouds Rest • Mariposa CA 95338 • 1 800 500 4EMC (4362)

Customer: **Wilson Electronics**
 Specification: **FCC 90.205 (i)/90.635(d)**
 Work Order #: **79736**
 Test Type: **2.1046 - RF Power Output**
 Equipment: **Repeater**
 Manufacturer: Wilson Electronics
 Model: BD800NM
 S/N: 101402-001

Date: 10/15/2002
 Time: 09:51:41
 Sequence#: 3
 Tested By: Monika Brandle

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Repeater*	Wilson Electronics	BD800NM	101402-001

Support Devices:

Function	Manufacturer	Model #	S/N
Cell Site Test Set	HP	8921A	3519A01796
AC-DC Adaptor	Wilson Electronics	JOD-48U-36	3G72 E149469
TDMA/CDPD Cellular Adapter	HP	83204A	US37460723

Test Conditions / Notes:

EUT is a bi-directional repeater amplifier. Phone port receives and amplifies signals in the frequency range of 806-821 MHz. Antenna port receives and amplifies signals in the frequency range of 851-866 MHz. Each port retransmits signals received from the opposite port. A signal generator is set to supply a modulated signal that simulates actual signals used. The amplitude of the signal generator is set such that the output of the transmitter is at its rated maximum output power for the port being tested. Test Procedure Used: TIA/EIA 603 TDMA - RF Power Output = 457.08 mW.

Transducer Legend:

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Measurement Data: Reading listed by margin. Test Distance: None

#	Freq MHz	Rdng dBμV	dB	dB	dB	dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	814.996M	133.6					+0.0	133.6	157.0	-23.4	None
2	805.997M	133.3					+0.0	133.3	157.0	-23.7	None
3	820.992M	130.6					+0.0	130.6	157.0	-26.4	None

Test Equipment

Equipment	Manufacturer	Model #	Serial #	Asset #	Cal Date	Cal Due
QP Adapter	HP	85650A	2811A01267	00478	1/30/02	1/30/03
S/A Display	HP	8566B	2403A08241	00489	1/30/02	1/30/03
Spectrum Analyzer	HP	8566B	2209A01404	00490	1/30/02	1/30/03

DIRECT CONNECT



DIRECT CONNECT



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

Not applicable to this unit.

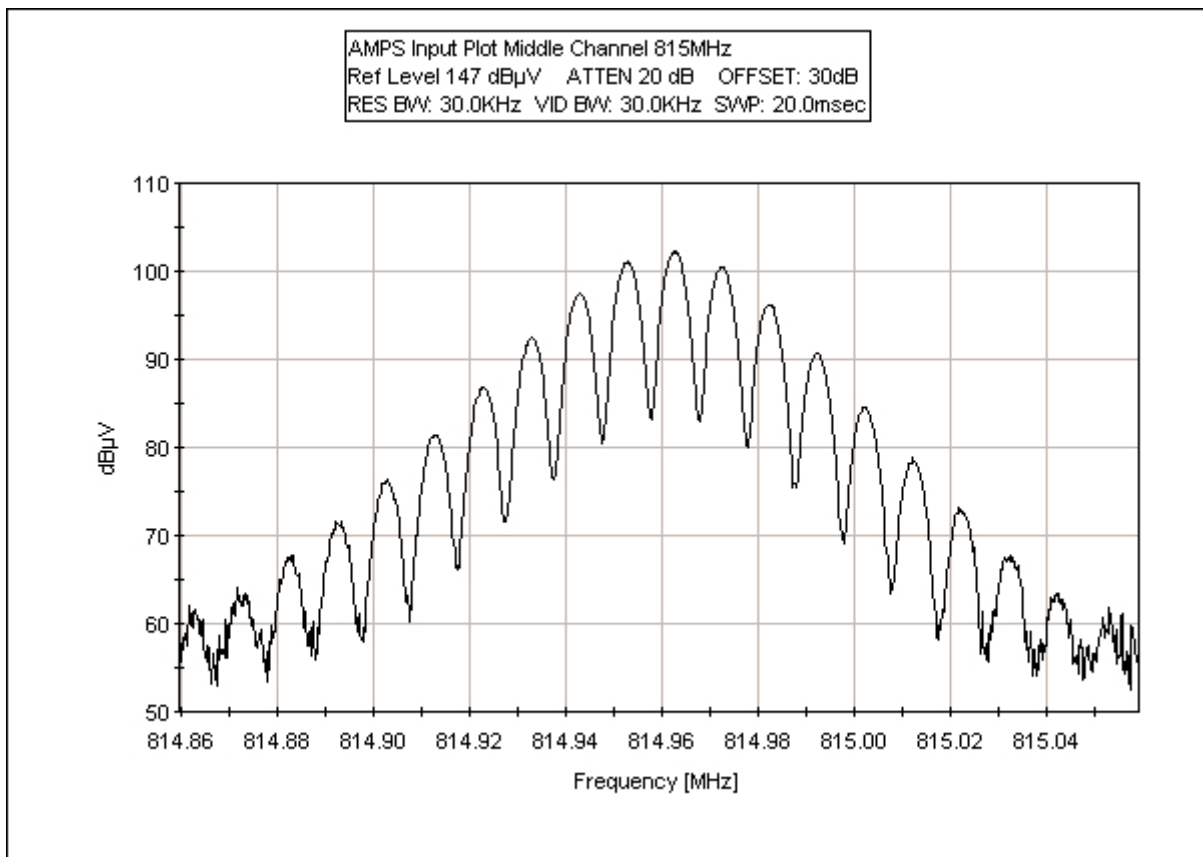
2.1033(c)(14)/2.1047(b) MODULATION CHARACTERISTICS – Modulation Limiting Response

Not applicable to this unit.

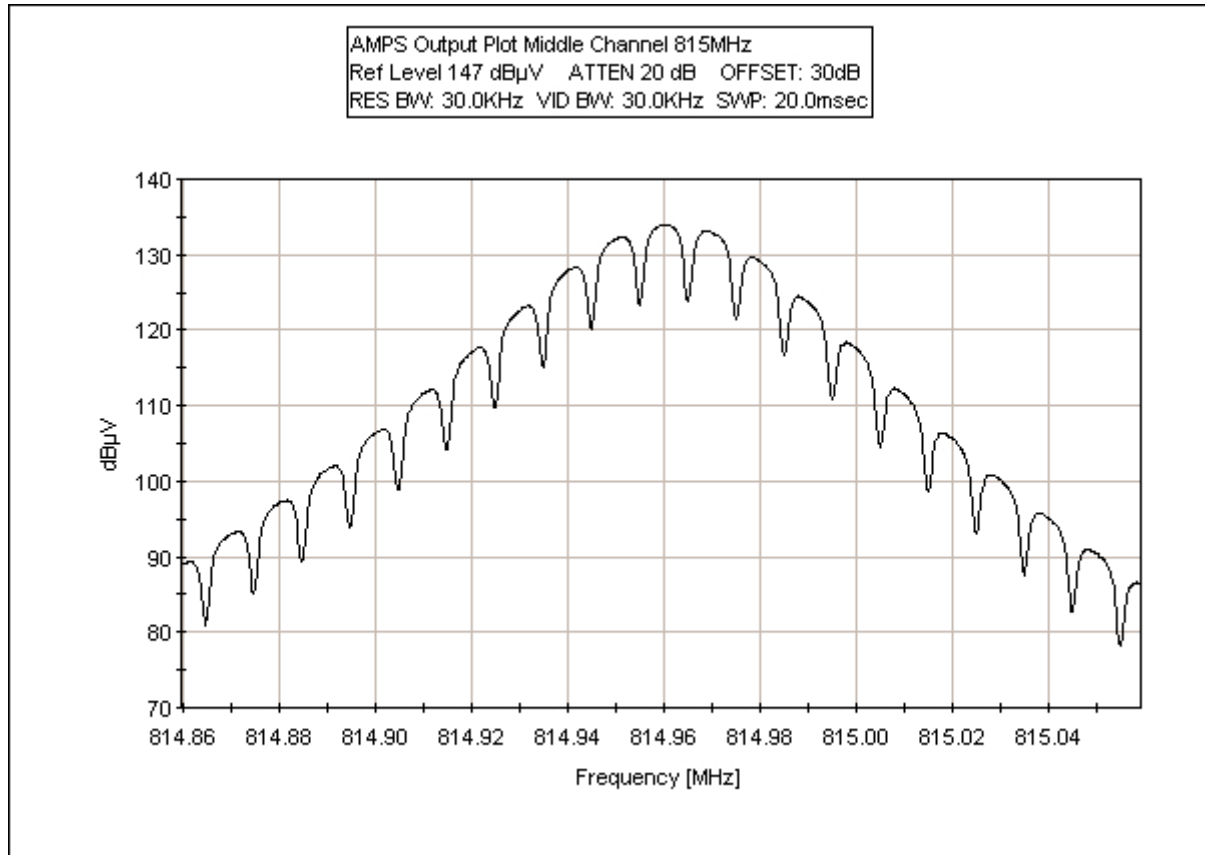
2.1033(c)(14)/2.1049(i)- OCCUPIED BANDWIDTH

Test Conditions: EUT is a bi-directional repeater amplifier. Phone port receives and amplifies signals in the frequency range of 806-821 MHz. Antenna port receives and amplifies signals in the frequency range of 851-866 MHz. Each port retransmits signals received from the opposite port. A signal generator is set to supply a modulated signal that simulates actual signals used. The amplitude of the signal generator is set such that the output of the transmitter is at its rated maximum output power for the port being tested. Test Procedure Used: TIA/EIA 603.

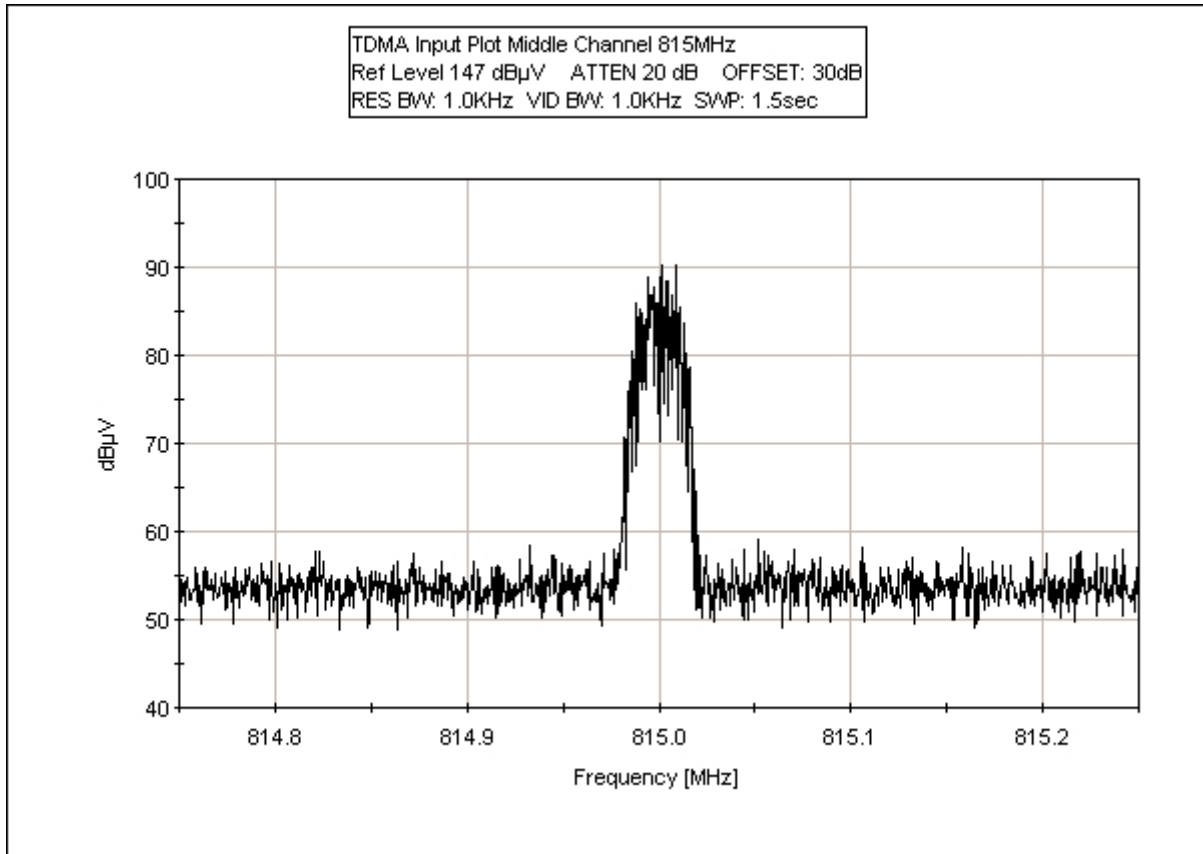
UPLINK AMPS INPUT PLOT MIDDLE CHANNEL 815 MHz



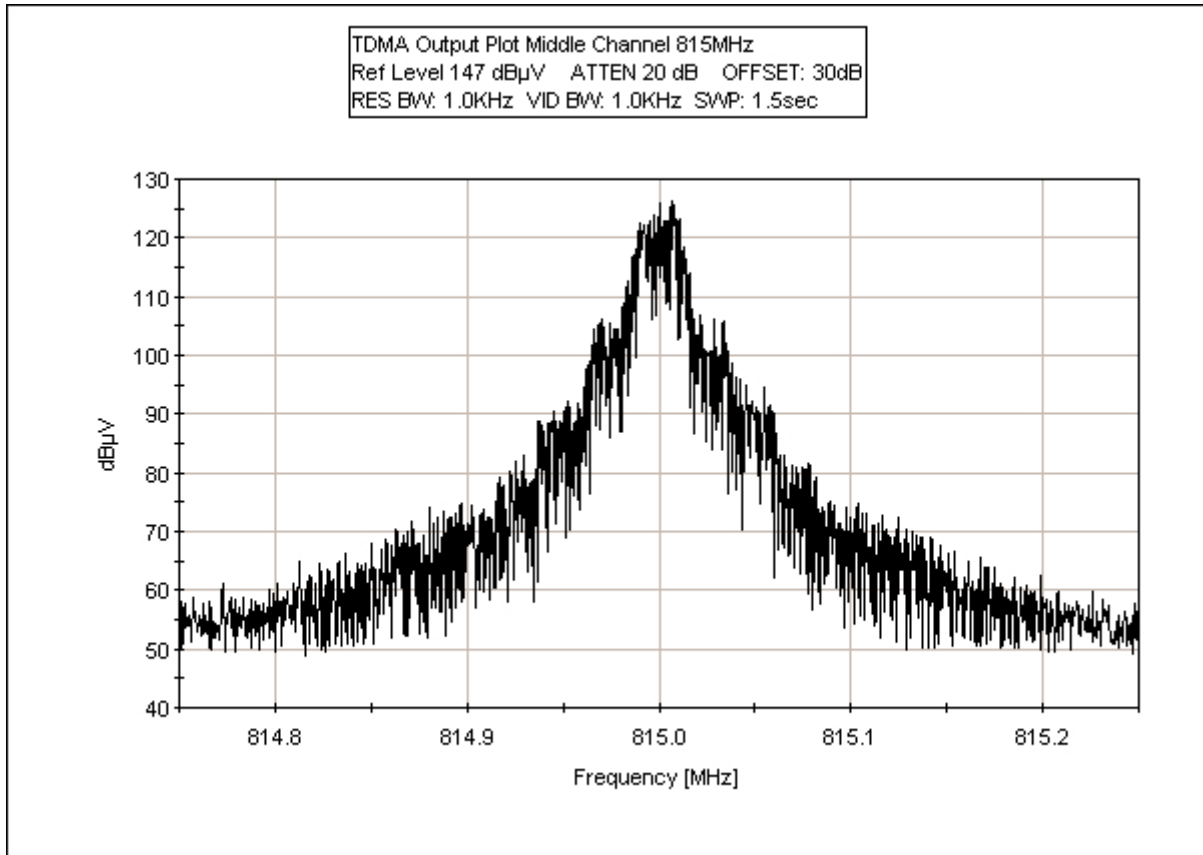
UPLINK AMPS OUTPUT PLOT MIDDLE CHANNEL 815 MHz



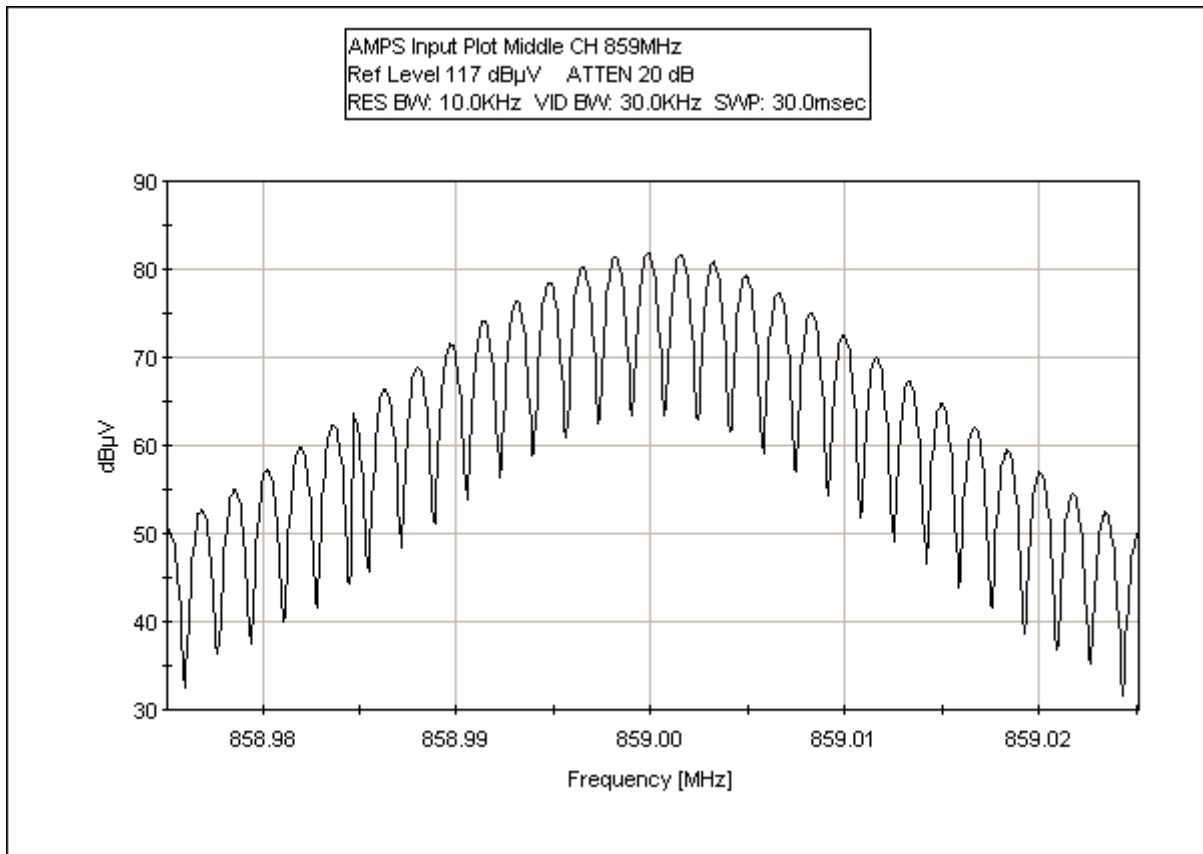
UPLINK TDMA INPUT PLOT MIDDLE CHANNEL 815 MHz



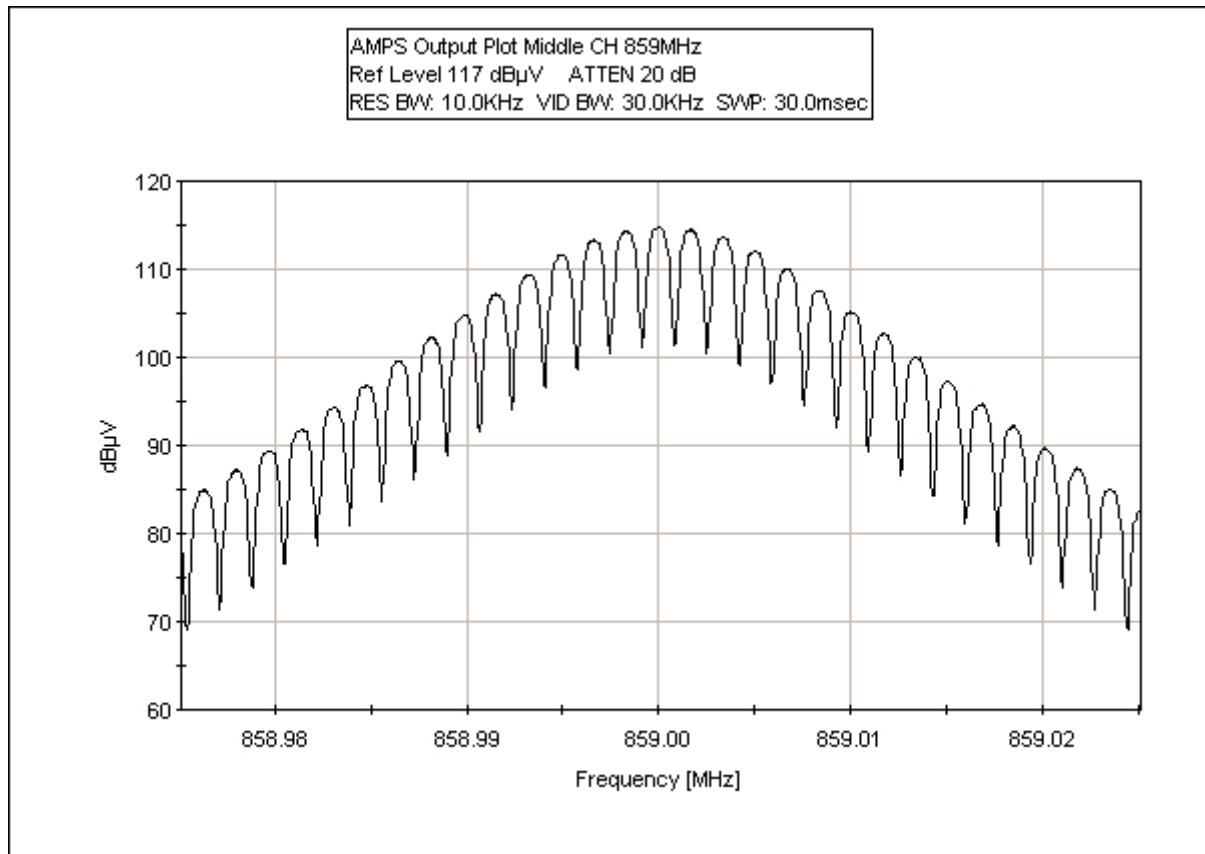
UPLINK TDMA OUTPUT PLOT MIDDLE CHANNEL 815 MHz



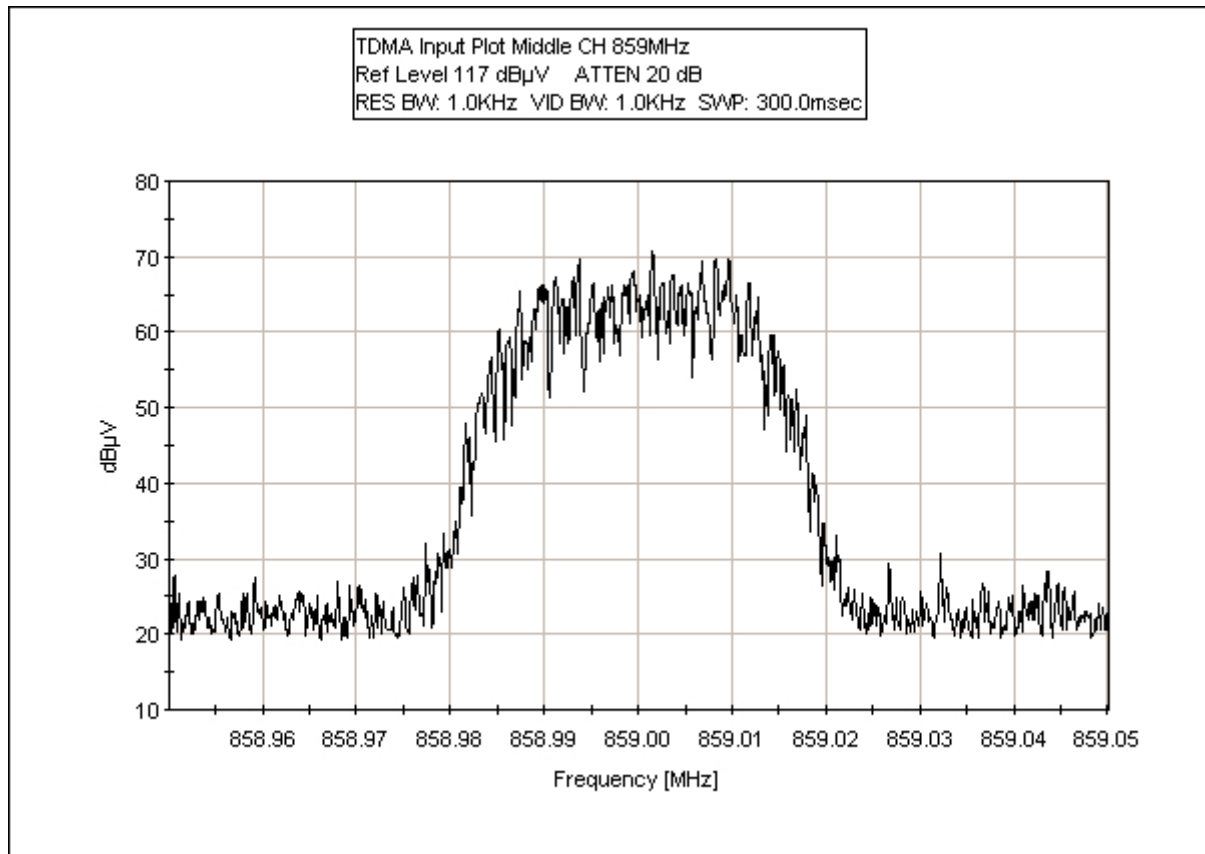
DOWNLINK AMPS INPUT PLOT MIDDLE CHANNEL 859 MHz



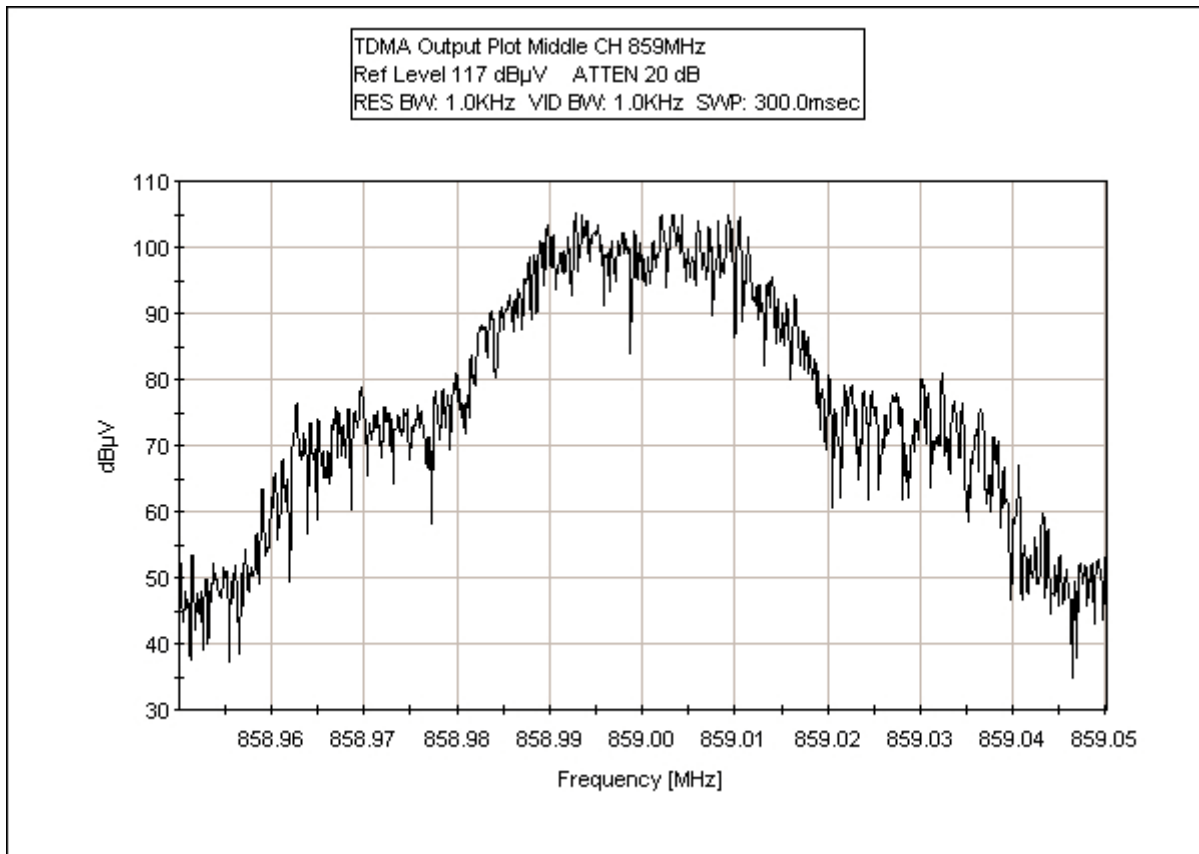
DOWNLINK AMPS OUTPUT PLOT MIDDLE CHANNEL 859 MHz



DOWNLINK TDMA INPUT PLOT MIDDLE CHANNEL 859 MHz



DOWNLINK TDMA OUTPUT PLOT MIDDLE CHANNEL 859 MHz



Test Equipment

<i>Equipment</i>	<i>Manufacturer</i>	<i>Model #</i>	<i>Serial #</i>	<i>Asset #</i>	<i>Cal Date</i>	<i>Cal Due</i>
QP Adapter	HP	85650A	2811A01267	00478	1/30/02	1/30/03
S/A Display	HP	8566B	2403A08241	00489	1/30/02	1/30/03
Spectrum Analyzer	HP	8566B	2209A01404	00490	1/30/02	1/30/03

DIRECT CONNECT



DIRECT CONNECT



2.1033(c)(14)/2.1051/90.210/90.691- SPURIOUS EMISSIONS AT ANTENNA TERMINAL

Bandwidth settings: RBW/VBW 3 MHz.

Test Location: CKC Laboratories Inc. •5473A Clouds Rest • Mariposa CA 95338 • 1 800 500 4EMC (4362)

Customer: **Wilson Electronics**

Specification: **FCC 90.691**

Work Order #: **79736**

Date: 10/16/2002

Test Type: **2.1051 -Spurious Emissions At Antenna Terminal**

Time: 16:12:51

Equipment: **Repeater**

Sequence#: 8

Manufacturer: Wilson Electronics

Tested By: Monika Brandle

Model: BD800NM

S/N: 101402-001

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Repeater*	Wilson Electronics	BD800NM	101402-001

Support Devices:

Function	Manufacturer	Model #	S/N
Cell Site Test Set	HP	8921A	3519A01796
AC-DC Adaptor	Wilson Electronics	JOD-48U-36	3G72 E149469
TDMA/CDPD Cellular Adapter	HP	83204A	US37460723

Test Conditions / Notes:

EUT is a bi-directional repeater amplifier. Phone port receives and amplifies signals in the frequency range of 806-821 MHz. Antenna port receives and amplifies signals in the frequency range of 851-866 MHz. Each port retransmits signals received from the opposite port. A signal generator is set to supply a modulated signal that simulates actual signals used. The amplitude of the signal generator is set such that the output of the transmitter is at its rated maximum output power for the port being tested. Test Procedure Used: TIA/EIA 603 Test performed on Low, Middle and High Channels. No spurious emissions found within 20dB of limit.

Transducer Legend:

T1=Cable GHz #1	T2=Cable GHz #4
-----------------	-----------------

Measurement Data:

Reading listed by margin.

Test Distance: None

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	Dist dB	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	5810.000M	57.4	+6.0	+8.5	+0.0	71.9	94.0	-22.1	None
2	2596.000M	52.2	+4.9	+7.1	+0.0	64.2	94.0	-29.8	None
3	4780.000M	50.9	+5.2	+6.6	+0.0	62.7	94.0	-31.3	None
4	3308.000M	50.1	+4.7	+6.9	+0.0	61.7	94.0	-32.3	None
5	1732.000M	54.3	+2.3	+3.7	+0.0	60.3	94.0	-33.7	None

Test Location: CKC Laboratories Inc. •5473A Clouds Rest • Mariposa CA 95338 • 1 800 500 4EMC (4362)

Customer: **Wilson Electronics**

Specification: **FCC 90.691**

Work Order #: **79736**

Date: 10/16/2002

Test Type: **2.1051 -Spurious Emissions At Antenna Terminal**

Time: 14:17:20

Equipment: **Repeater**

Sequence#: 7

Manufacturer: Wilson Electronics

Tested By: Monika Brandle

Model: BD800NM

S/N: 101402-001

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Repeater*	Wilson Electronics	BD800NM	101402-001

Support Devices:

Function	Manufacturer	Model #	S/N
Cell Site Test Set	HP	8921A	3519A01796
AC-DC Adaptor	Wilson Electronics	JOD-48U-36	3G72 E149469
TDMA/CDPD Cellular Adapter	HP	83204A	US37460723
Signal Generator	Marconi	2022D	119259/016

Test Conditions / Notes:

EUT is a bi-directional repeater amplifier. Phone port receives and amplifies signals in the frequency range of 806-821 MHz. Antenna port receives and amplifies signals in the frequency range of 851-866 MHz. Each port retransmits signals received from the opposite port. A signal generator is set to supply a modulated signal that simulates actual signals used. The amplitude of the signal generator is set such that the output of the transmitter is at its rated maximum output power for the port being tested. Test Procedure Used: TIA/EIA 603. Test performed on Low, Middle and High Channels. No spurious emissions found within 20dB of limit.

Transducer Legend:

T1=Cable GHz #1	T2=Cable GHz #4
-----------------	-----------------

Measurement Data:

Reading listed by margin.

Test Distance: None

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	2553.020M	64.2	+4.9	+7.1			+0.0	76.2	94.0	-17.8	None
2	5223.500M	60.7	+5.3	+7.1			+0.0	73.1	94.0	-20.9	None
3	4255.060M	62.1	+4.5	+6.2			+0.0	72.8	94.0	-21.2	None
4	3206.500M	59.5	+4.9	+7.1			+0.0	71.5	94.0	-22.5	None
5	1705.500M	59.5	+2.3	+3.7			+0.0	65.5	94.0	-28.5	None

Test Location: CKC Laboratories Inc. •5473A Clouds Rest • Mariposa CA 95338 • 1 800 500 4EMC (4362)

Customer: **Wilson Electronics**

Specification: **FCC 90.691**

Work Order #: **79736**

Date: 10/16/2002

Test Type: **2.1051 -Spurious Emissions At Antenna Terminal**

Time: 09:04:29

Equipment: **Repeater**

Sequence#: 5

Manufacturer: Wilson Electronics

Tested By: Monika Brandle

Model: BD800NM

S/N: 101402-001

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Repeater*	Wilson Electronics	BD800NM	101402-001

Support Devices:

Function	Manufacturer	Model #	S/N
Cell Site Test Set	HP	8921A	3519A01796
AC-DC Adaptor	Wilson Electronics	JOD-48U-36	3G72 E149469
TDMA/CDPD Cellular Adapter	HP	83204A	US37460723
Signal Generator	HP	8656A	2245A04338

Test Conditions / Notes:

EUT is a bi-directional repeater amplifier. Phone port receives and amplifies signals in the frequency range of 806-821 MHz. Antenna port receives and amplifies signals in the frequency range of 851-866 MHz. Each port retransmits signals received from the opposite port. A signal generator is set to supply a modulated signal that simulates actual signals used. The amplitude of the signal generator is set such that the output of the transmitter is at its rated maximum output power for the port being tested. Test Procedure Used: TIA/EIA 603. Test performed on Low, Middle and High Channels. No spurious emissions were found within 20dB of limit.

Transducer Legend:

T1=Cable GHz #1	T2=Cable GHz #4
-----------------	-----------------

Measurement Data:

Reading listed by margin.

Test Distance: None

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	6451.880M	56.1	+6.4	+9.4			+0.0	71.9	94.0	-22.1	None
2	5646.040M	49.5	+5.5	+7.9			+0.0	62.9	94.0	-31.1	None
3	2419.980M	49.9	+4.5	+6.6			+0.0	61.0	94.0	-33.0	None
4	3220.960M	48.9	+4.9	+7.1			+0.0	60.9	94.0	-33.1	None
5	4029.840M	49.9	+4.2	+6.2			+0.0	60.3	94.0	-33.7	None
6	1615.000M	49.2	+2.3	+3.6			+0.0	55.1	94.0	-38.9	None

Test Location: CKC Laboratories Inc. •5473A Clouds Rest • Mariposa CA 95338 • 1 800 500 4EMC (4362)

Customer: **Wilson Electronics**

Specification: **FCC 90.691**

Work Order #: **79736**

Date: 10/18/2002

Test Type: **2.1051 -Spurious Emissions At Antenna Terminal**

Time: 09:28:57

Equipment: **Repeater**

Sequence#: 6

Manufacturer: Wilson Electronics

Tested By: Monika Brandle

Model: BD800NM

S/N: 101402-001

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Repeater*	Wilson Electronics	BD800NM	101402-001

Support Devices:

Function	Manufacturer	Model #	S/N
Cell Site Test Set	HP	8921A	3519A01796
AC-DC Adaptor	Wilson Electronics	JOD-48U-36	3G72 E149469
TDMA/CDPD Cellular Adapter	HP	83204A	US37460723
Signal Generator	HP	8656A	2245A04338

Test Conditions / Notes:

EUT is a bi-directional repeater amplifier. Phone port receives and amplifies signals in the frequency range of 806-821 MHz. Antenna port receives and amplifies signals in the frequency range of 851-866 MHz. Each port retransmits signals received from the opposite port. A signal generator is set to supply a modulated signal that simulates actual signals used. The amplitude of the signal generator is set such that the output of the transmitter is at its rated maximum output power for the port being tested. Test Procedure Used: TIA/EIA 603. Test performed on Low, Middle and High Channels. No spurious emissions found within 20dB of limit.

Transducer Legend:

T1=Cable GHz #1	T2=Cable GHz #4
-----------------	-----------------

Measurement Data:

Reading listed by margin.

Test Distance: None

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	4836.042M	51.3	+5.3	+6.7			+0.0	63.3	94.0	-30.7	None
2	5642.252M	49.8	+5.5	+7.9			+0.0	63.2	94.0	-30.8	None
3	3224.052M	50.0	+4.9	+7.1			+0.0	62.0	94.0	-32.0	None
4	2418.178M	49.8	+4.5	+6.6			+0.0	60.9	94.0	-33.1	None
5	4030.452M	49.9	+4.2	+6.2			+0.0	60.3	94.0	-33.7	None
6	1611.922M	49.7	+2.3	+3.6			+0.0	55.6	94.0	-38.4	None

Test Equipment

<i>Equipment</i>	<i>Manufacturer</i>	<i>Model #</i>	<i>Serial #</i>	<i>Asset #</i>	<i>Cal Date</i>	<i>Cal Due</i>
QP Adapter	HP	85650A	2811A01267	00478	1/30/02	1/30/03
S/A Display	HP	8566B	2403A08241	00489	1/30/02	1/30/03
Spectrum Analyzer	HP	8566B	2209A01404	00490	1/30/02	1/30/03

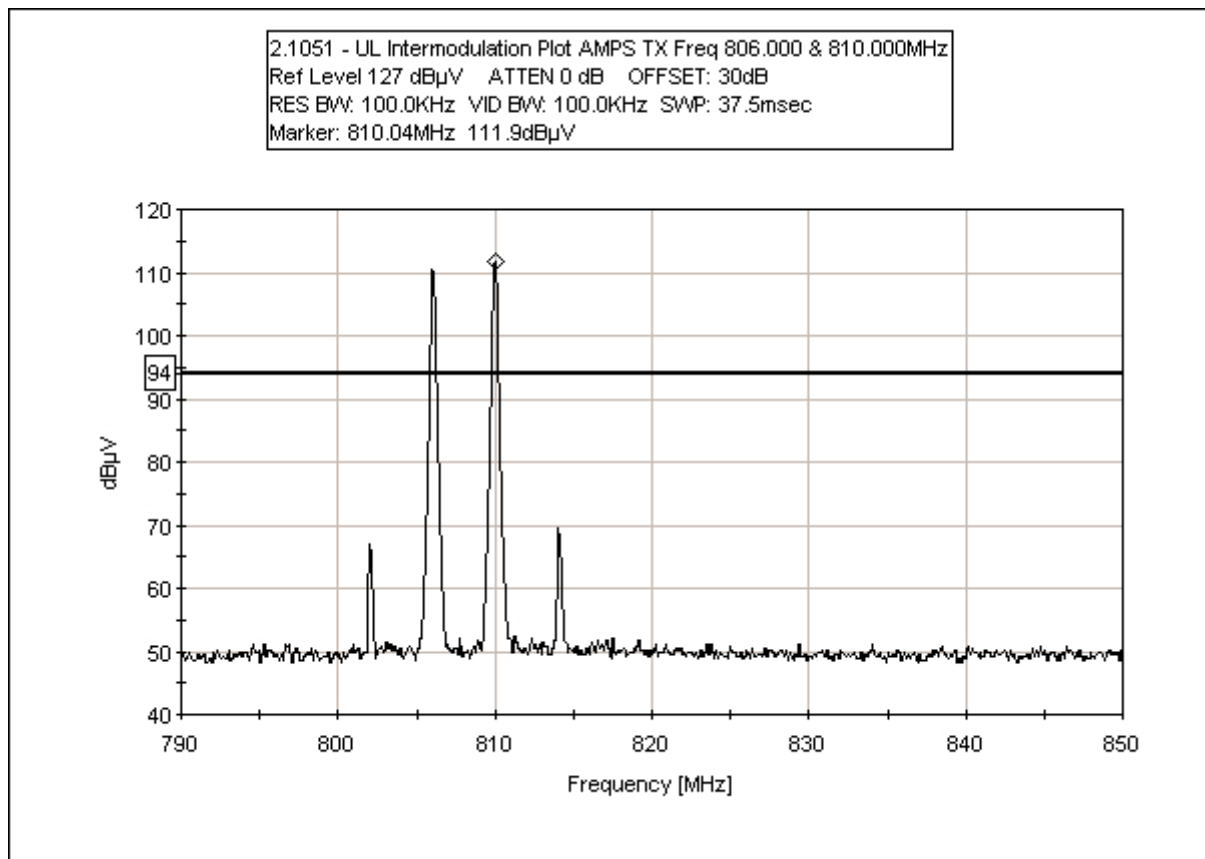
DIRECT CONNECT



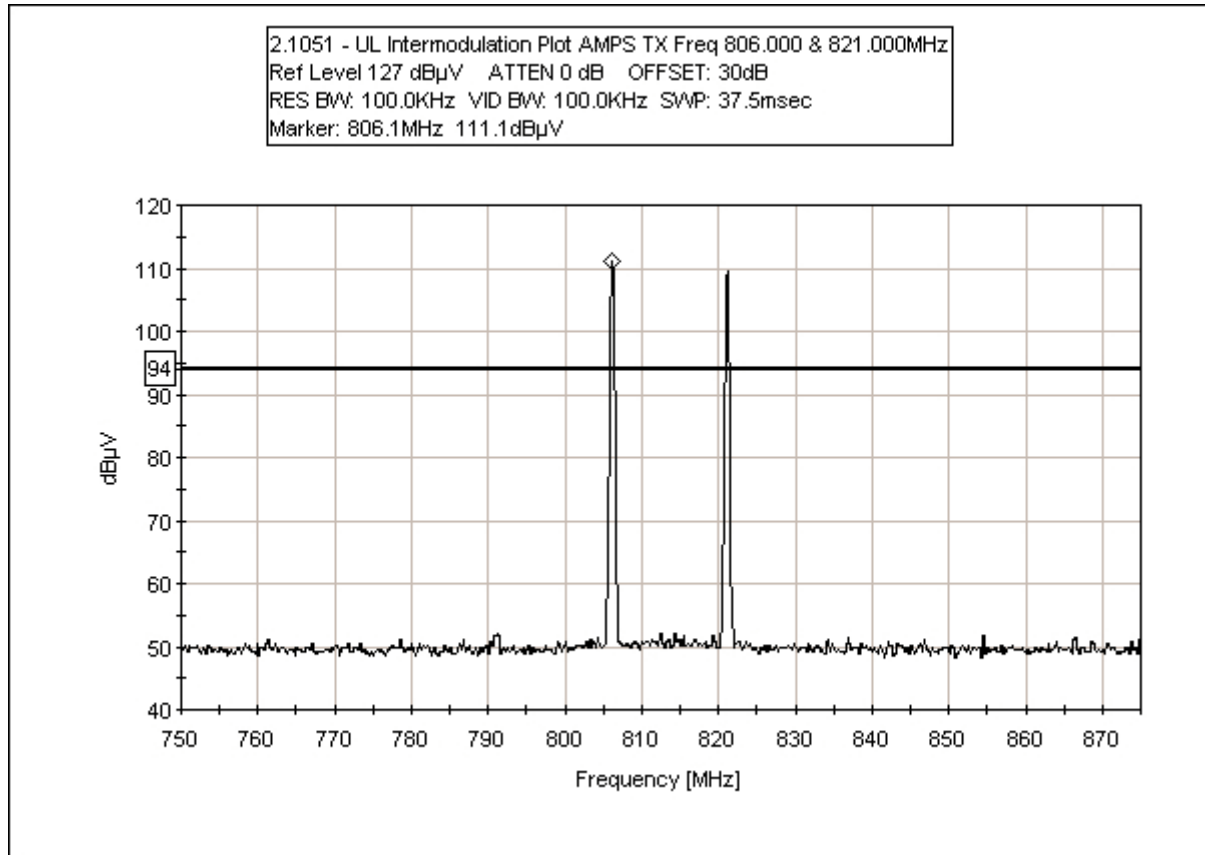
DIRECT CONNECT



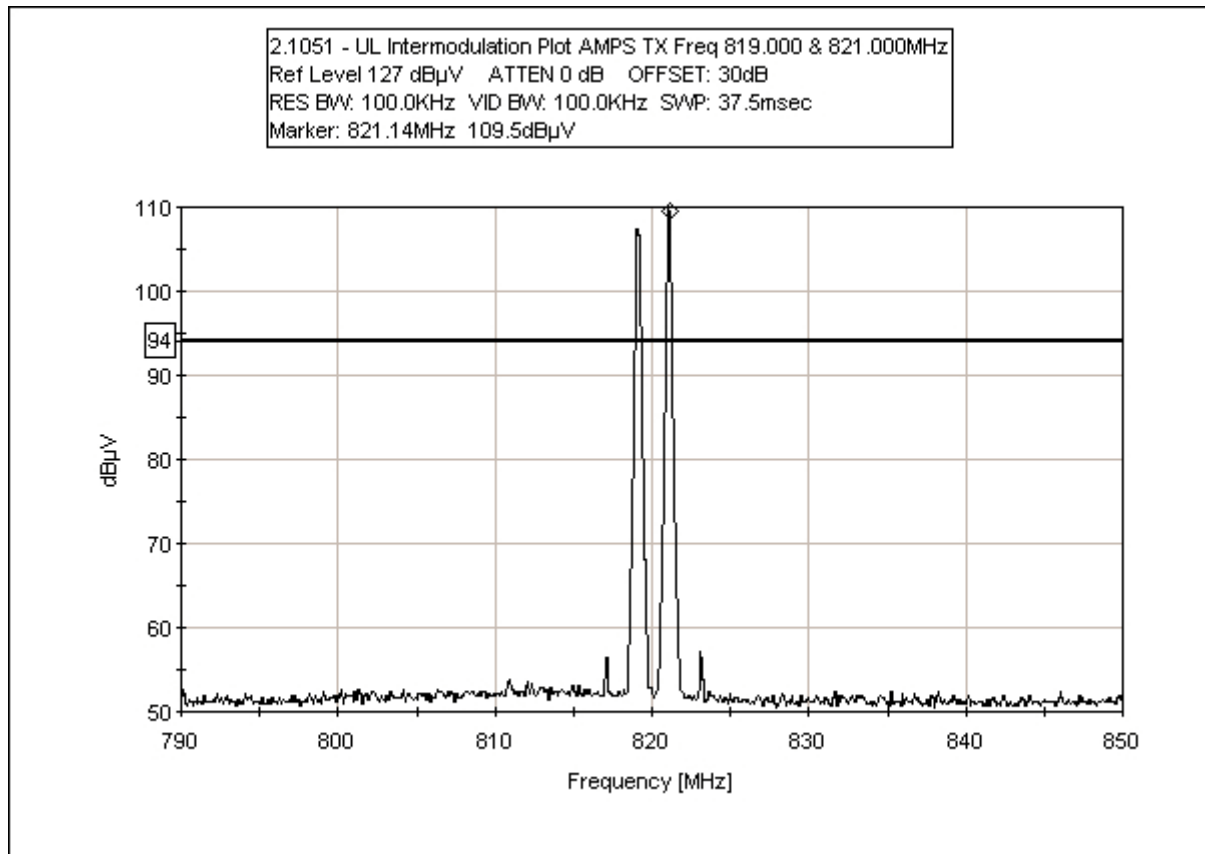
UPLINK AMPS INTERMODULATION PLOT FREQUENCIES 806.000 & 810.000 MHz



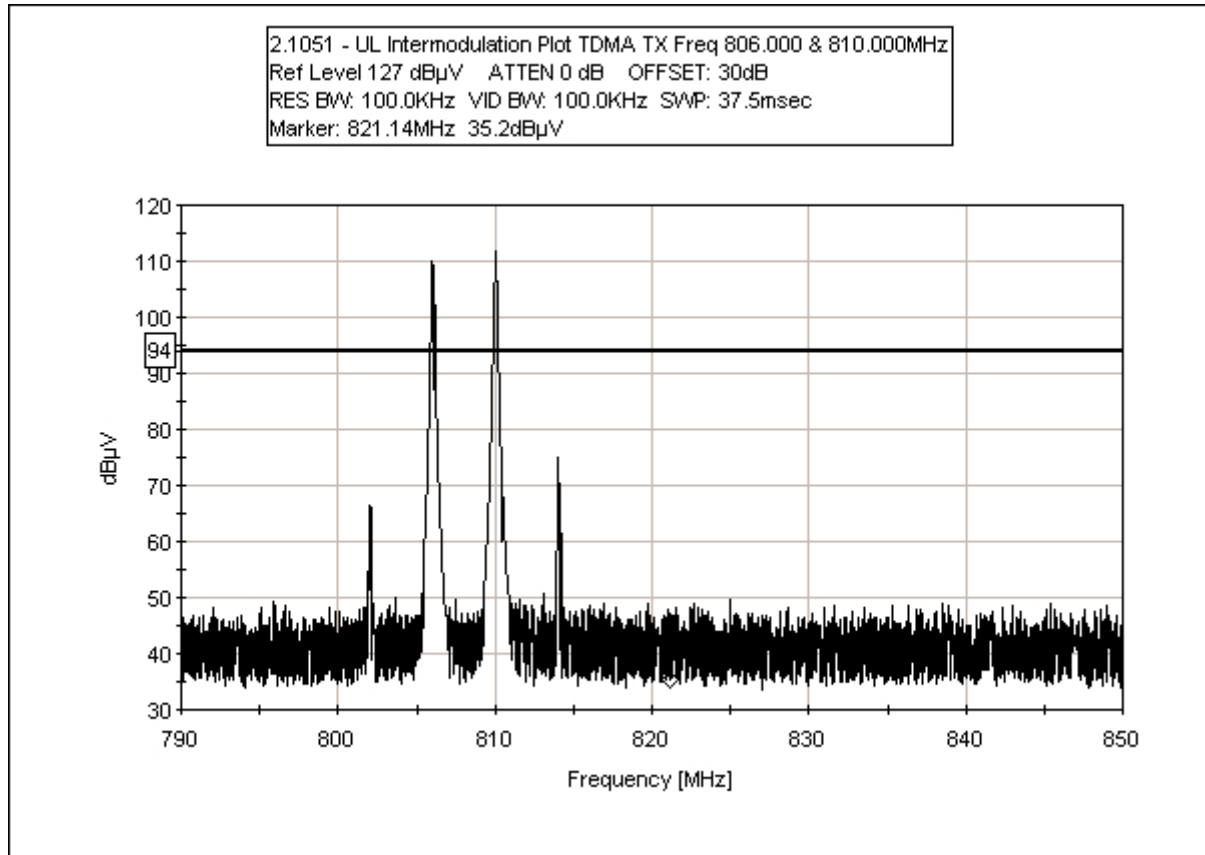
UPLINK AMPS INTERMODULATION PLOT FREQUENCIES 806.000 & 821.000 MHz



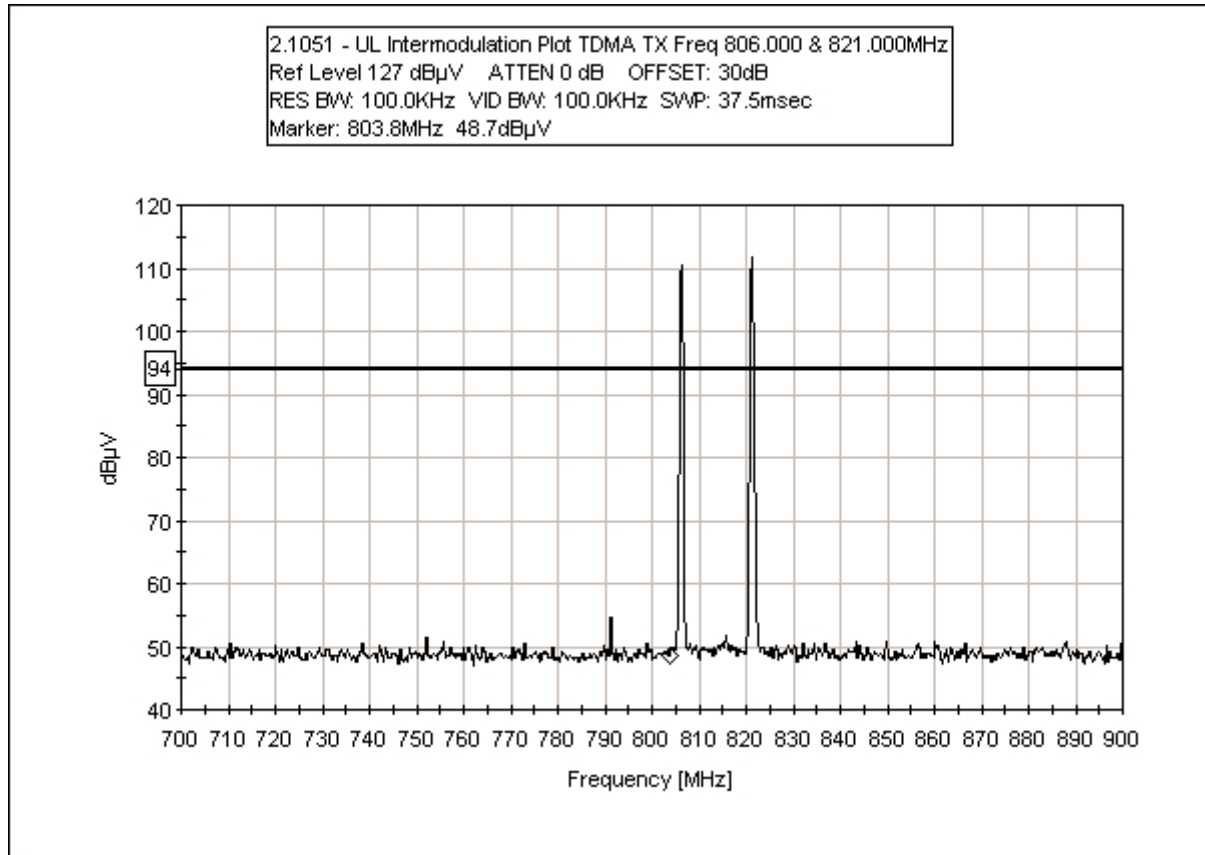
UPLINK AMPS INTERMODULATION PLOT FREQUENCIES 819.000 & 821.000 MHz



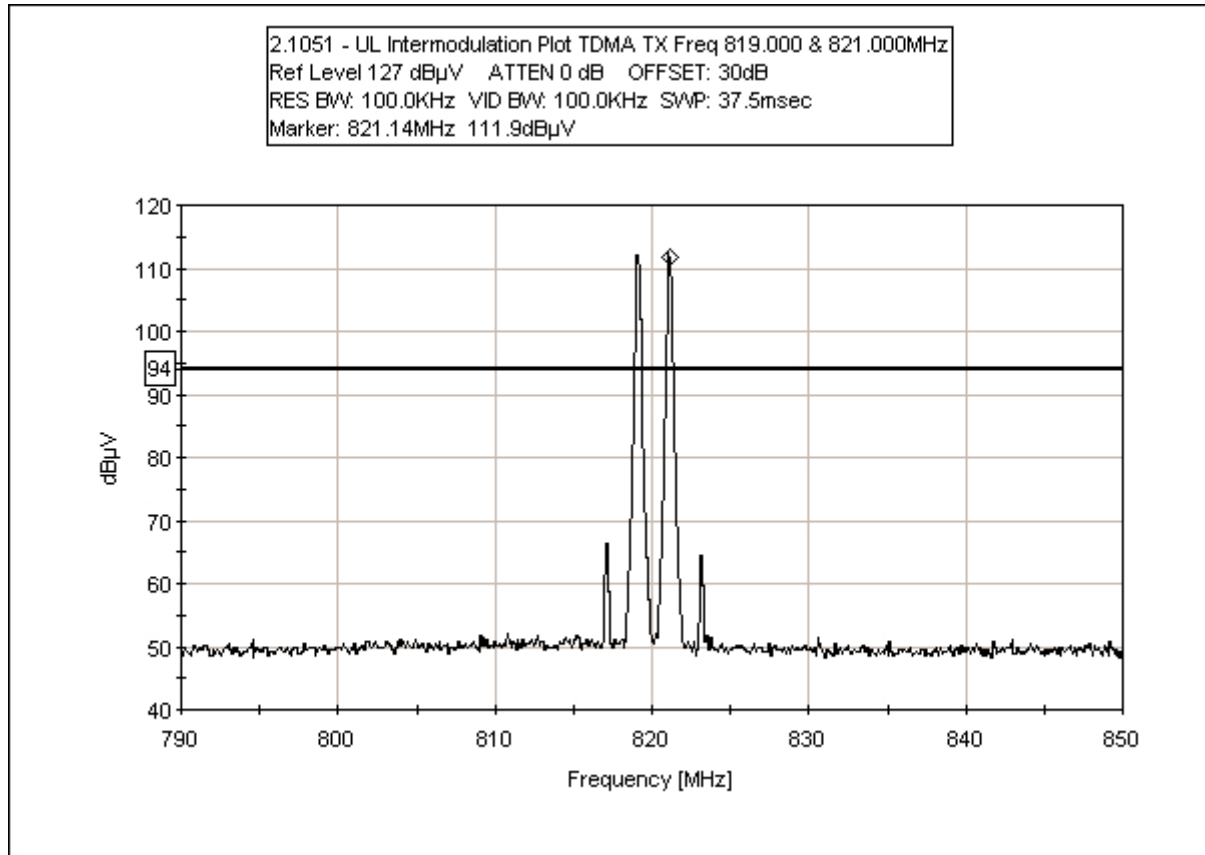
UPLINK TDMA INTERMODULATION PLOT FREQUENCIES 806.000 & 810.000 MHz



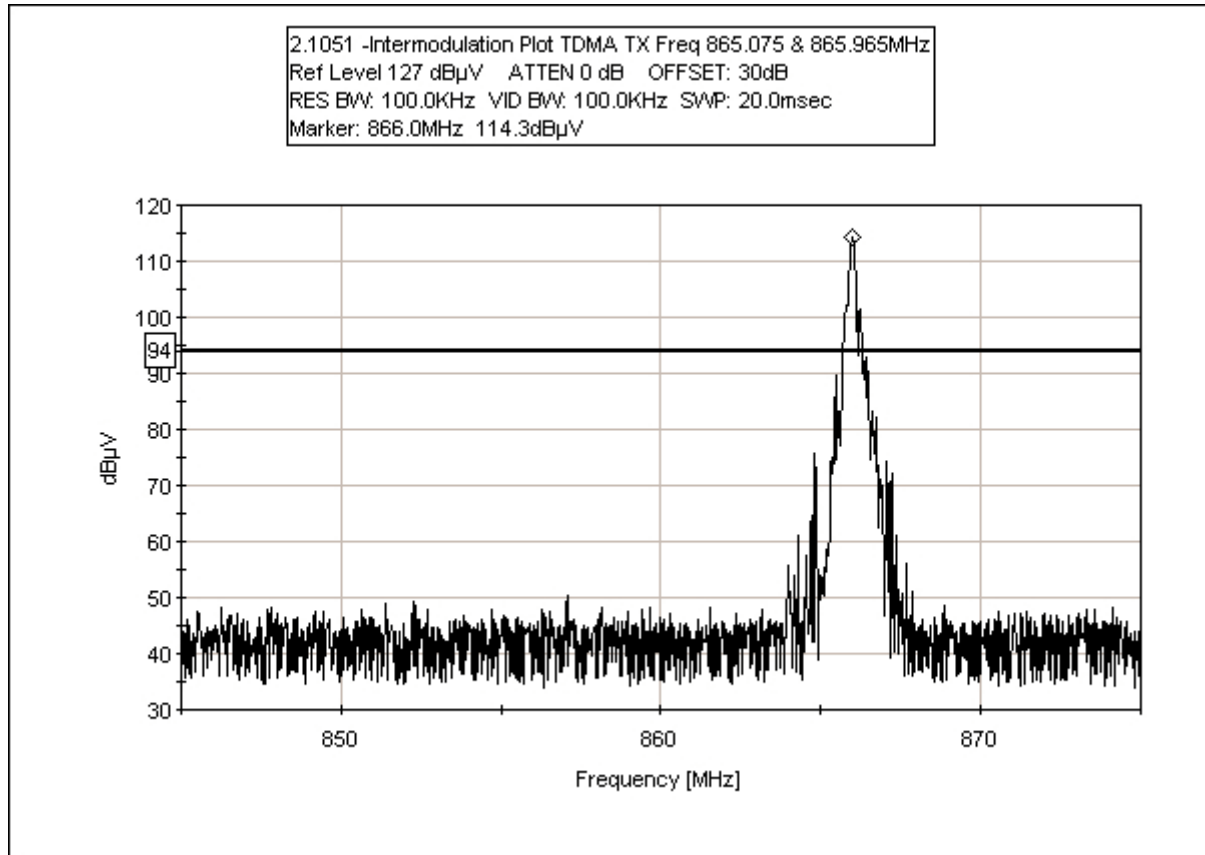
UPLINK TDMA INTERMODULATION PLOT FREQUENCIES 806.000 & 810.000 MHz



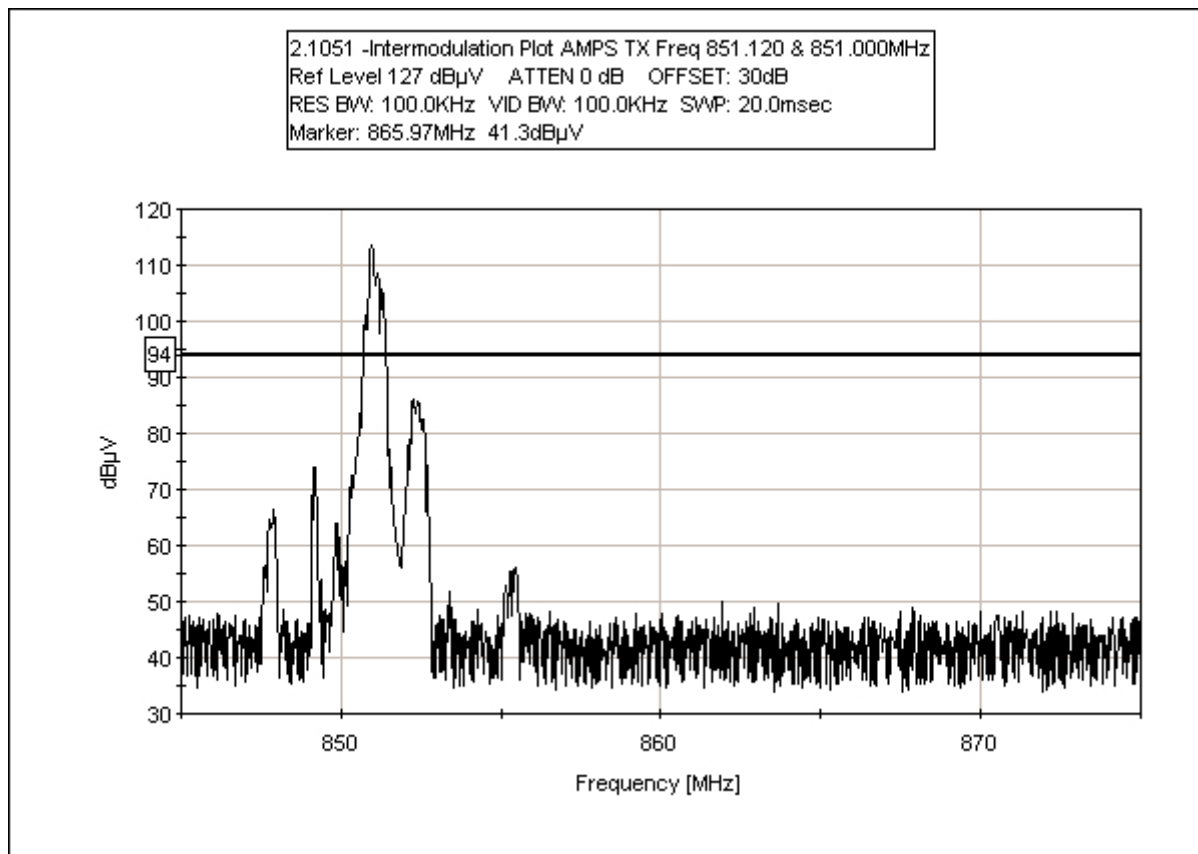
UPLINK TDMA INTERMODULATION PLOT FREQUENCIES 819.000 & 821.000 MHz



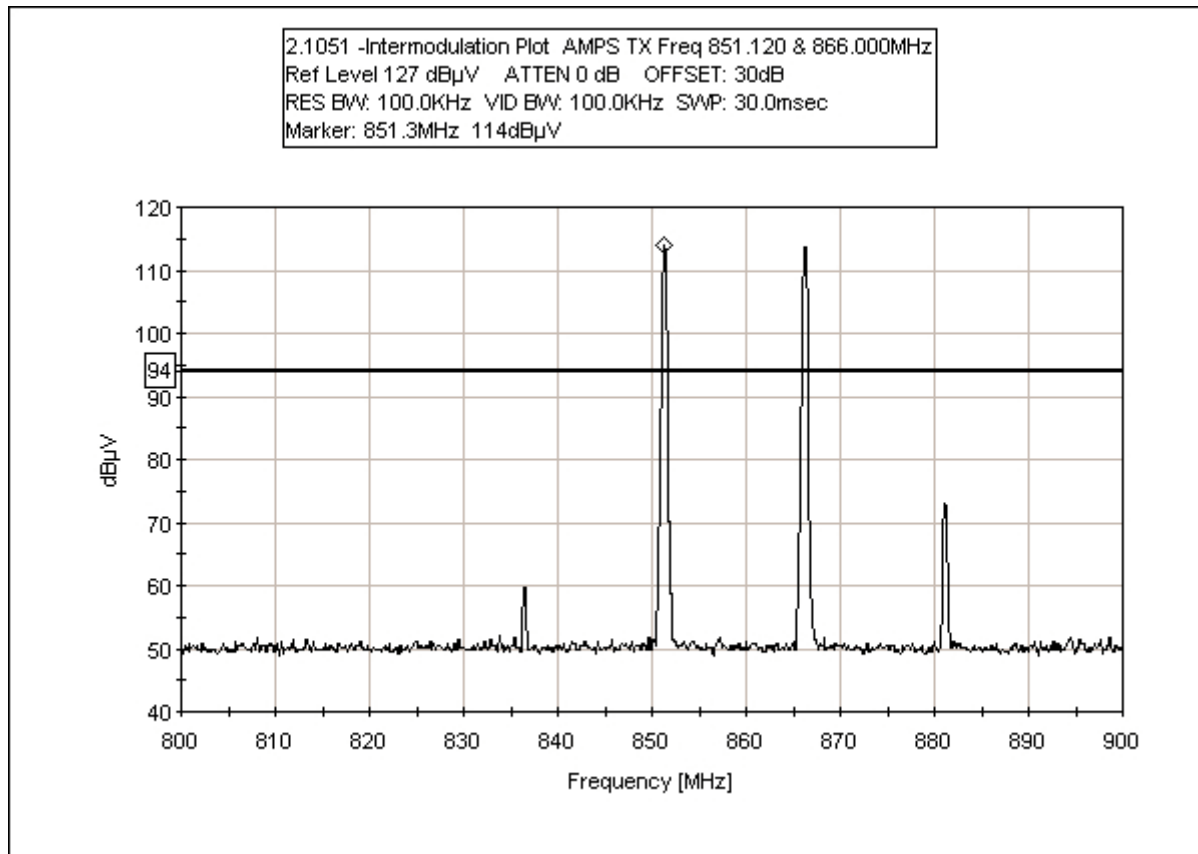
UPLINK TDMA INTERMODULATION PLOT FREQUENCIES 865.075 & 865.965 MHz



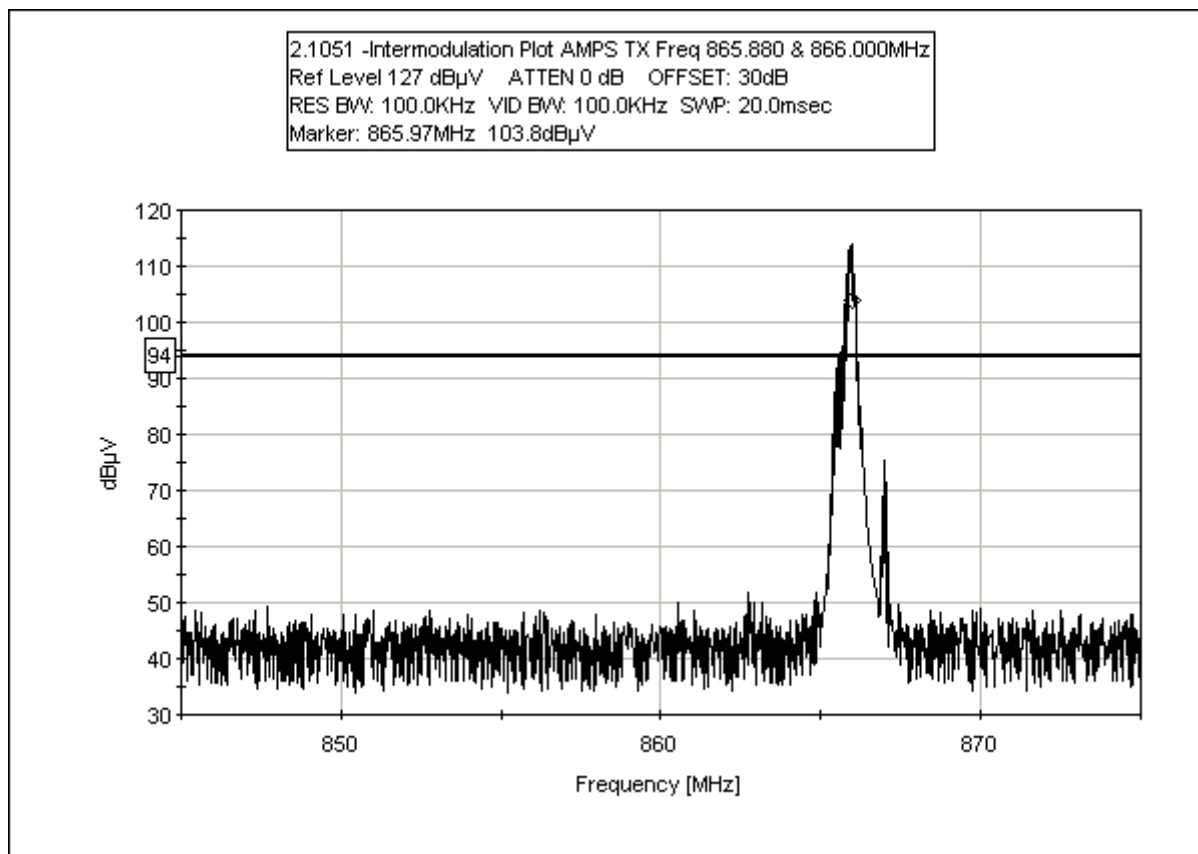
**DOWNLINK AMPS INTERMODULATION PLOT FREQUENCIES 851.120 & 866.000
MHz**



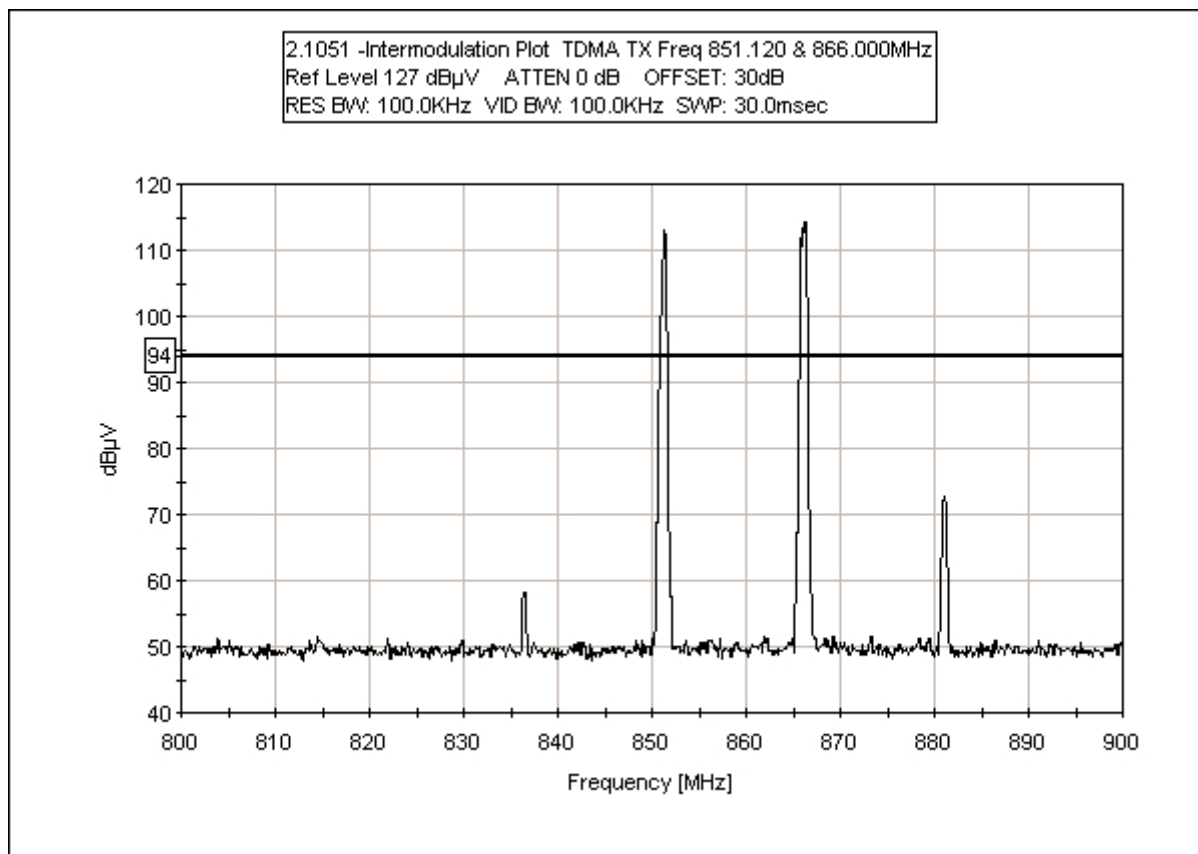
**DOWNLINK AMPS INTERMODULATION PLOT FREQUENCIES 851.120 & 866.000
MHz**



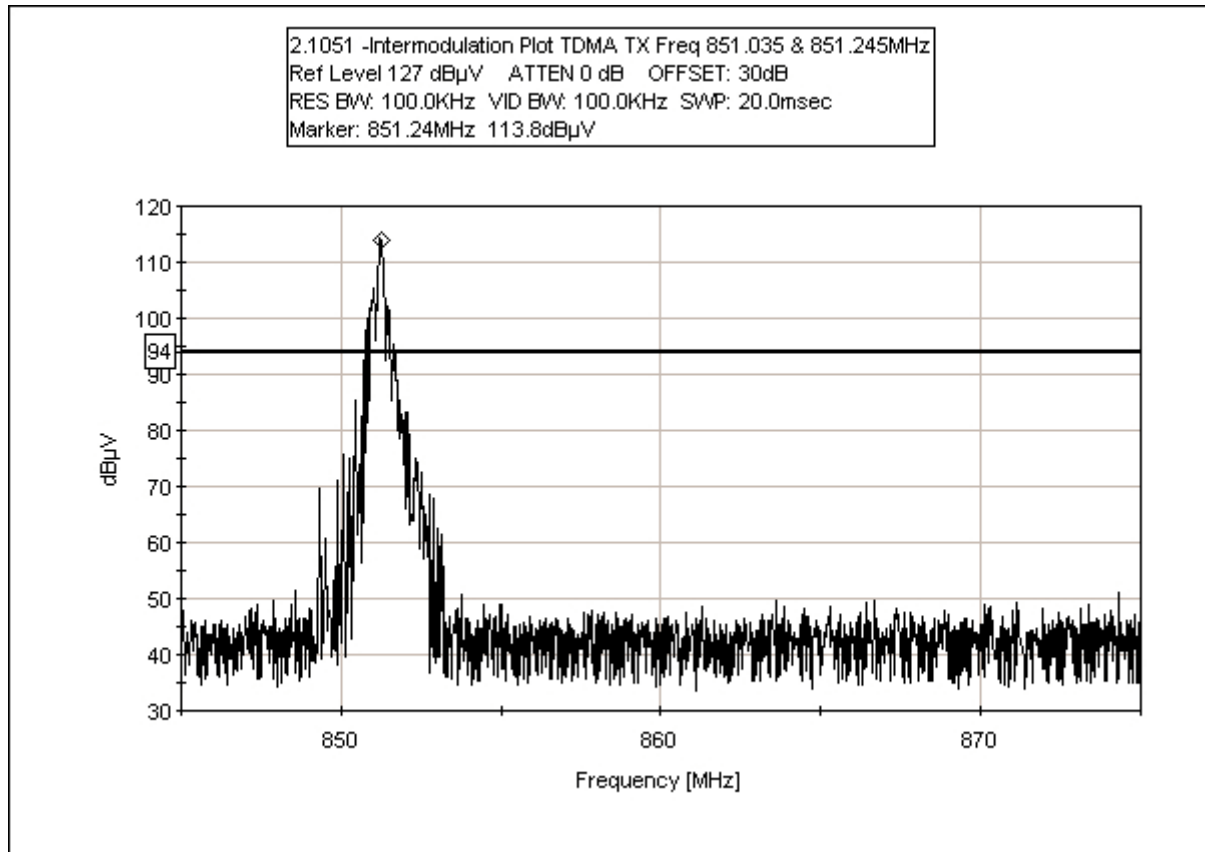
**DOWNLINK AMPS INTERMODULATION PLOT FREQUENCIES 865.880 & 866.000
MHz**



**DOWNLINK TDMA INTERMODULATION PLOT FREQUENCIES 851.120 & 866.000
MHz**



**DOWNLINK TDMA INTERMODULATION PLOT FREQUENCIES 851.035 & 851.245
MHz**



UPLINK INTERMODULATION



DOWNLINK INTERMODULATION



2.1033(c)(14)/2.1053/90.210/90.691 - FIELD STRENGTH OF SPURIOUS RADIATION

Test Conditions: EUT is a bi-directional repeater amplifier. Phone port receives and amplifies signals in the frequency range of 806-821 MHz. Antenna port receives and amplifies signals in the frequency range of 851-866 MHz. Each port retransmits signals received from the opposite port. A signal generator is set to supply a modulated signal that simulates actual signals used. The amplitude of the signal generator is set such that the output of the transmitter is at its rated maximum output power for the port being tested. Test Procedure Used: TIA/EIA 603. Test performed on Low, Middle and High Channels. Only worst case modulation reported. The AMPS modulation was determined to be worst case. No spurious emissions found within 20dB of limit.

Downlink

Antenna Gain = 2dBi

ERP = 0.00541W

Uplink

Antenna Gain = 5.12dBi

ERP = 0.97086W

Bandwidth settings: RBW/VBW 3 MHz.

Uplink

Operating Frequency: 806 MHz, 815 MHz, 821 MHz

Channels: Low, middle, high

Highest Measured Output Power: 29.87 ERP(dBm) = 0.97086 ERP(Watts)

Distance: 3 meters

Limit: $43+10\log(P)$ 42.87 dBc

Freq. (MHz)	Reference Level (dBm)	Antenna Polarity (H/V)	dBc
815.04	-29.3	Vert	59.17
806.06	-30.30	Vert	60.17
820.94	-34.00	Vert	63.87
815.02	-39.70	Horiz	69.57
806.06	-40.20	Horiz	70.07
820.98	-44.10	Horiz	73.97
1,630.07	-51.70	Vert	81.57
2,445.05	-51.90	Vert	81.77
4,890.09	-52.60	Vert	82.47
4,075.15	-54.60	Vert	84.47
3,259.59	-56.20	Vert	86.07
5,705.00	-58.40	Vert	88.27
6,519.57	-59.00	Vert	88.87

Downlink

Operating Frequency: 851 MHz, 859 MHz, 866 MHz

Channels: Low, middle, high

Highest Measured Output Power: 7.33 ERP(dBm) = 0.00541 ERP(Watts)

Distance: 3 meters

Limit: $43+10\log(P)$ 20.33 dBc

Freq. (MHz)	Reference Level (dBm)	Antenna Polarity (H/V)	dBc
851.09	-64.1	Vert	71.43
851.16	-67.10	Horiz	74.43
859.16	-64.90	Horiz	72.23
859.17	-60.50	Vert	67.83
866.16	-64.70	Vert	72.03
866.17	-61.30	Vert	68.63
1,732.16	-75.60	Vert	82.93
2,598.21	-75.70	Vert	83.03
3,464.28	-72.60	Vert	79.93
4,330.24	-71.50	Vert	78.83
5,195.74	-75.80	Vert	83.13
6,062.39	-73.20	Vert	80.53

Test Equipment

<i>Equipment</i>	<i>Manufacturer</i>	<i>Model #</i>	<i>Serial #</i>	<i>Asset #</i>	<i>Cal Date</i>	<i>Cal Due</i>
Antenna, Bicon	A&H	SAS-200/542	156	00225	12/06/01	12/6/02
Antenna, Log	A&H	SAS-200/510	154	01330	6/19/02	6/19/03
Antenna, Loop	EMCO	6502	1074	00226	5/31/02	5/31/03
Preamp	HP	8447D	1937A02604	00099	3/21/02	3/21/03
Preamp	HP	8449B	3008A00301	02010	10/19/01	10/19/02
QP Adapter	HP	85650A	2811A01267	00478	1/30/02	1/30/03
S/A Display	HP	8566B	2403A08241	00489	1/30/02	1/30/03
Spectrum Analyzer	HP	8566B	2209A01404	00490	1/30/02	1/30/03
Antenna, Horn	EMCO	3115	4085	00656	3/19/02	3/19/03

OATS DOWNLINK



Oats Downlink - Front View

OATS DOWNLINK



Oats Downlink - Back View

OATS UPLINK



Oats Uplink - Front View

OATS UPLINK



Oats Uplink - Back View

2.1033(c)(14)/2.1055/- FREQUENCY STABILITY

Not applicable to this unit.

2.1091 – MPE CALCULATIONS

Calculations prepared for:

Wilson Electronics

Model Number: BD800NM

FCC Identification:

806-821MHz

Maximum Rated Output Power: 1 Watts

Measured Output Power (Ant Conducted): 489.78mW

851-866MHz

Maximum Rated Output Power: 10mWatts

Measured Output Power (Ant Conducted): 5.6mW

Calculations prepared by:

Monika Brandle

CKC Laboratories, Inc.

5473A Clouds Rest Road

Mariposa, CA 95338

Power Output and Operating Frequency Information used for these calculations were from:
CKC Laboratories, Inc.

MPE Limit = $f/1500$, where f = Frequency in MHz

MPE Limit for 806-821MHz = $806/1500 - 821/1500 = 0.537333\text{mW/cm}^2 - .5473333\text{mW/cm}^2$

MPE Limit for 851-866MHz = $851/1500 - 866/1500 = 0.5673333\text{mW/cm}^2 - .5773333\text{mW/cm}^2$

Frequency Range	Power Output EIRP (Watts)	Antenna Gain	Power Density Limit (mW/cm ²)	Minimum Distance (Centimeters)
806-821 MHz UP	1.61065	5.2dBi	0.537333	15.3
851-866MHz DOWN	.08875	2dBi	0.5673333	3.5

Power Density (mW/cm²) = $(\text{EIRP}) / (d^2 * 4 * \pi)$

$$d(\text{cm}) = \sqrt{\frac{\text{EIRP}}{4\pi S}}$$

EIRP = Measured or Calculated EIRP, in mWatts

d = Distance in centimeters

This device can be installed in a vehicle. Under normal operating conditions, the antenna is designed to maintain a separation distance of 15.3 centimeters from all persons. As can be seen from the MPE results, this device passes the limits specified in 1.1310 at a distance of 15.3cm at a rated output power of 489mWatts.