



Test Report: 1W04499

Applicant: Radio Frequency Systems
4100 SW Research Way
Corvallis, OR
97333
USA

**Equipment Under Test:
(EUT)** 48810A & 48810B
PCS Band Signal Booster

FCC ID: 1WD48810

In Accordance With: FCC Part 24, Subpart E

Tested By: Nemko Canada Inc.
3325 River Road, R.R. 5
Ottawa, Ontario K1V 1H2

Authorized By:

R. Grant, Wireless Group Manager

Date:

Total Number of Pages: 111

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EQUIPMENT: 48810A & 48810B

FCC ID: IWD48810

Section 1. Summary of Test Results

General

All measurements are traceable to national standards.

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 24, Subpart E.

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

See “ Summary of Test Data”.

TESTED BY: Glen Westwell, Wireless Technologist

DATE: December 20, 2001

Nemko Canada Inc., a testing laboratory, is accredited by the Standards Council of Canada. The tests included in this report are within the scope of this accreditation. The results apply only to the samples tested.

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This report applies only to the items tested.

*EQUIPMENT: 48810A & 48810B**FCC ID: IWD48810*

Summary Of Test Data

Name Of Test	Para. No.	Result
RF Power Output	2.1046	Complies
Occupied Bandwidth	2.1049	Complies
Spurious Emissions at Antenna Terminals	2.1051	Complies
Field Strength of Spurious Emissions	2.1053	Complies
Frequency Stability	2.1055	Complies

Test Conditions:**Indoor**

Temperature: 23 °C

Humidity: 37 %

Outdoor

Temperature: 3 °C

Humidity: 48 %

*EQUIPMENT: 48810A & 48810B**FCC ID: IWD48810*

Section 2. General Equipment Specification

Manufacturer:	Radio Frequency Systems		
Model No.:	48810A & 48810B		
Serial No.:	A1 & B1		
Date Received In Laboratory:	December 5, 2001		
Nemko Identification No.:	Item #1 & 2		
Supplementary Voltage:	120 VAC		
Frequency Range:	48810A	Downlink:	1930-1945MHz (BLK A) 1950-1965MHz (BLK B) 1975-1990MHz (BLK C)
		Uplink:	1850-1865MHz (BLK A) 1870-1885MHz (BLK B) 1895-1910MHz (BLK C)
	48810B	Downlink:	1945-1950MHz (BLK D) 1965-1970MHz (BLK E) 1970-1975MHz (BLK F)
		Uplink:	1865-1870MHz (BLK D) 1885-1890MHz (BLK E) 1890-1895MHz (BLK F)
Output Impedance:	50 ohms		
RF Output (Rated):	15dBm (31.6 mW)		
Emission Designator:	F9W, DXW, GXW		

EQUIPMENT: 48810A & 48810B

FCC ID: IWD48810

Section 3. RF Power Output

Para. No.: 2.1046

Test Performed By: Glen Westwell

Date of Test: December 17, 2001
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Minimum Standard: Para. No.: 24.232.

Test Results: Complies.

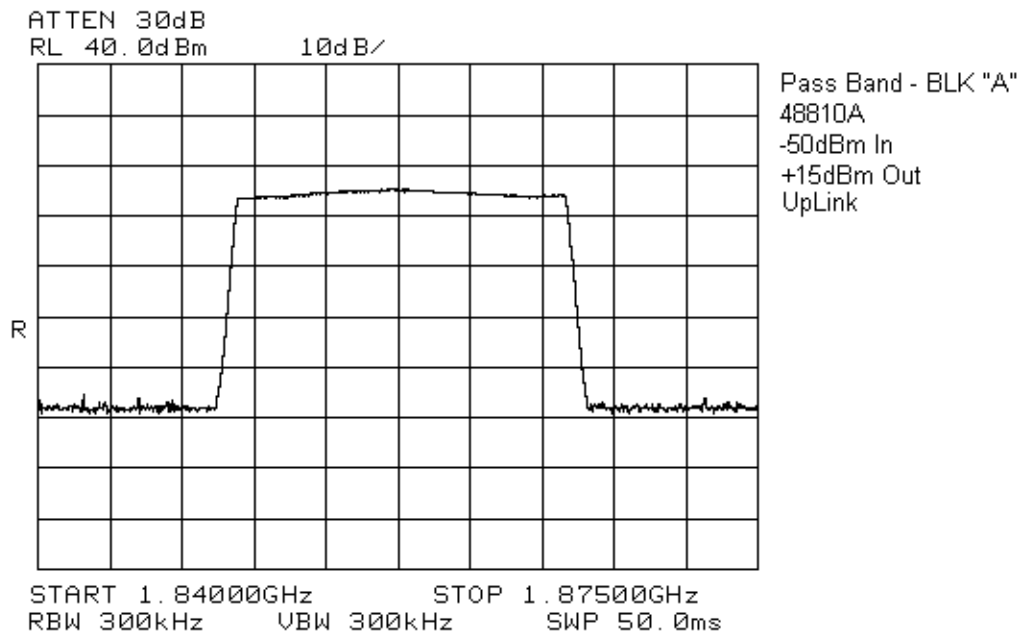
Measurement Data: See attached graphs.

The maximum RF Output Power is within +/- 1 dB of the manufacturers' rating. The RF Output Power is de-rated according to the number of channels via AGC and is equal to $P_{MAX} - 10\log N$.

P_{MAX} = Maximum RF Output Power
N = Number of Channels

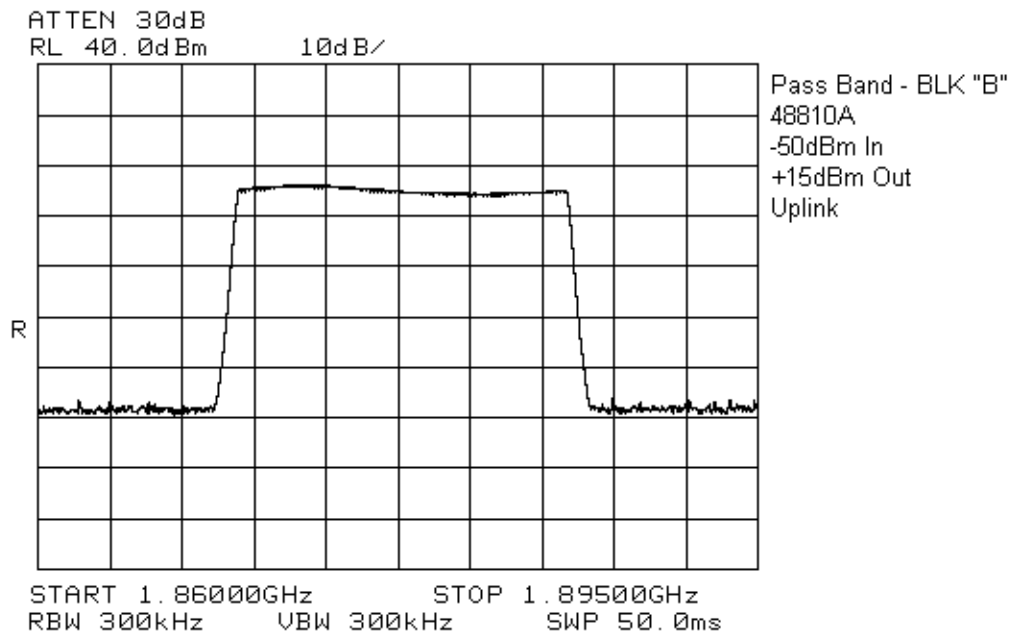
EQUIPMENT: 48810A & 48810B

FCC ID: IWD48810



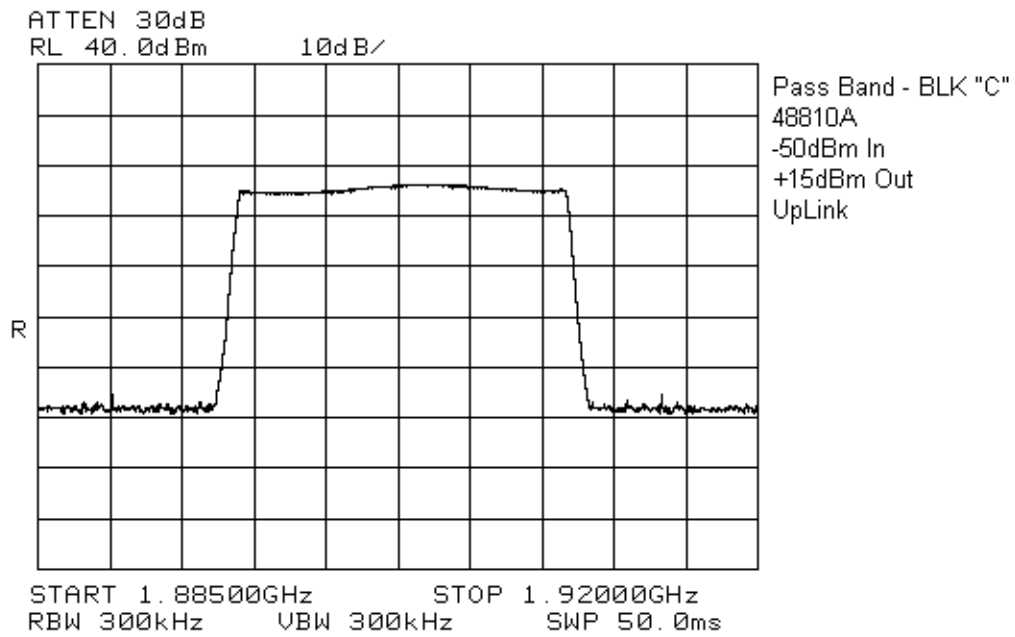
EQUIPMENT: 48810A & 48810B

FCC ID: IWD48810



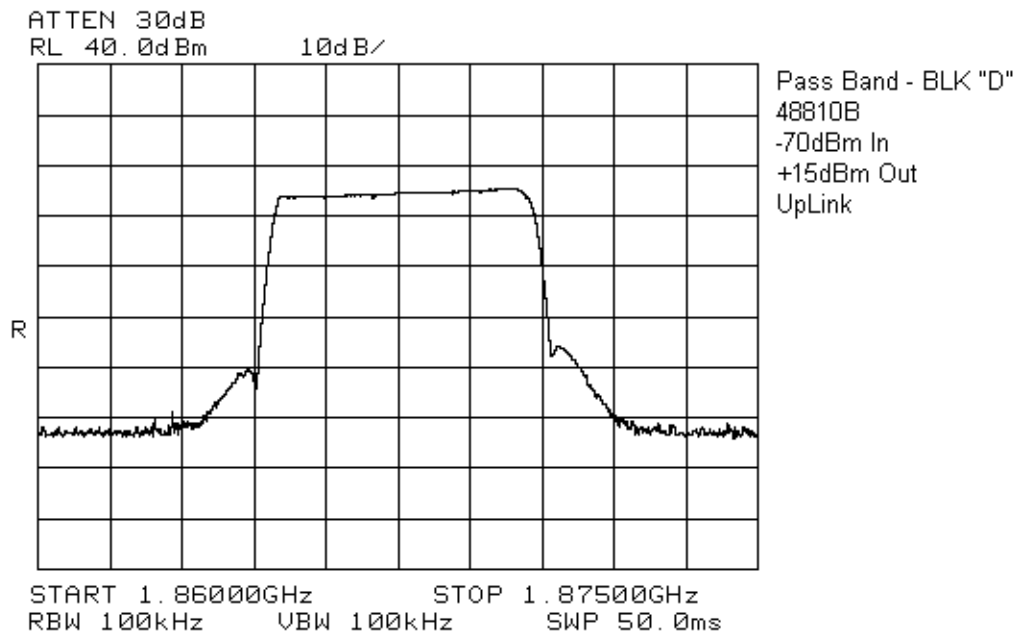
EQUIPMENT: 48810A & 48810B

FCC ID: IWD48810



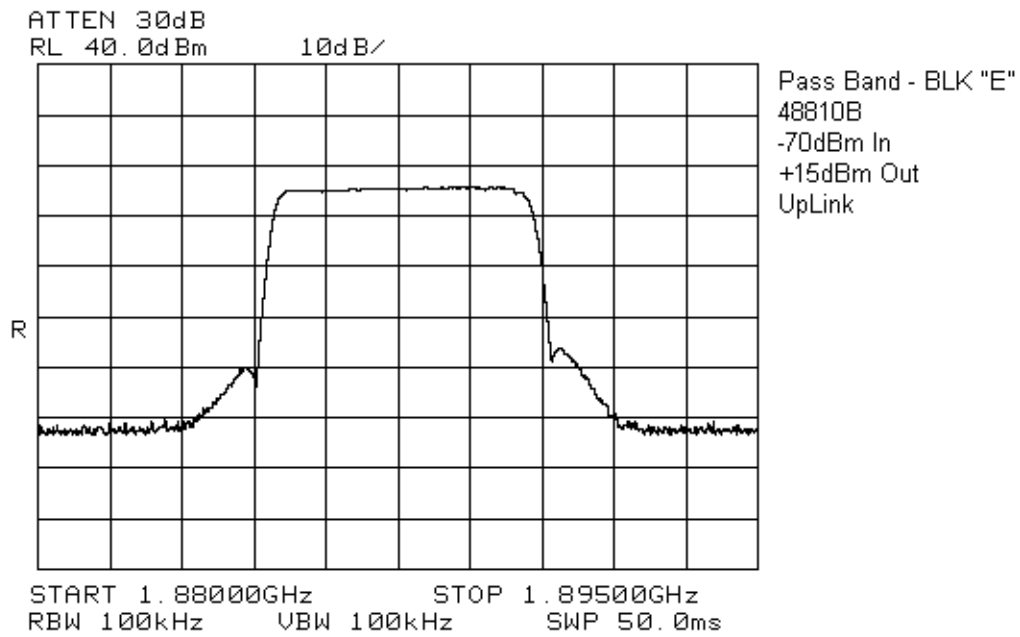
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FCC ID: IWD48810



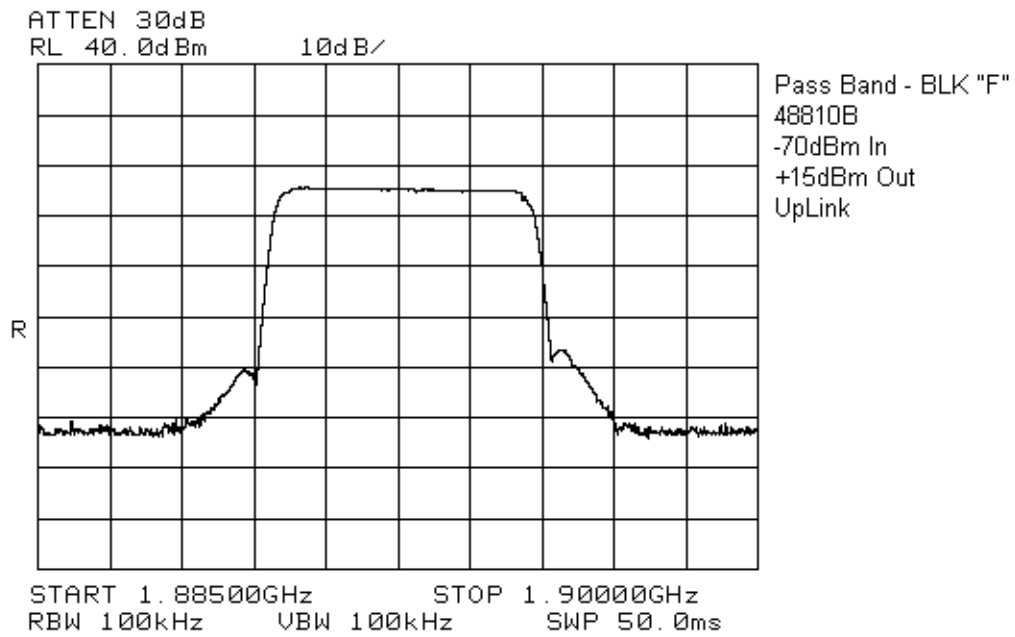
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FCC ID: IWD48810



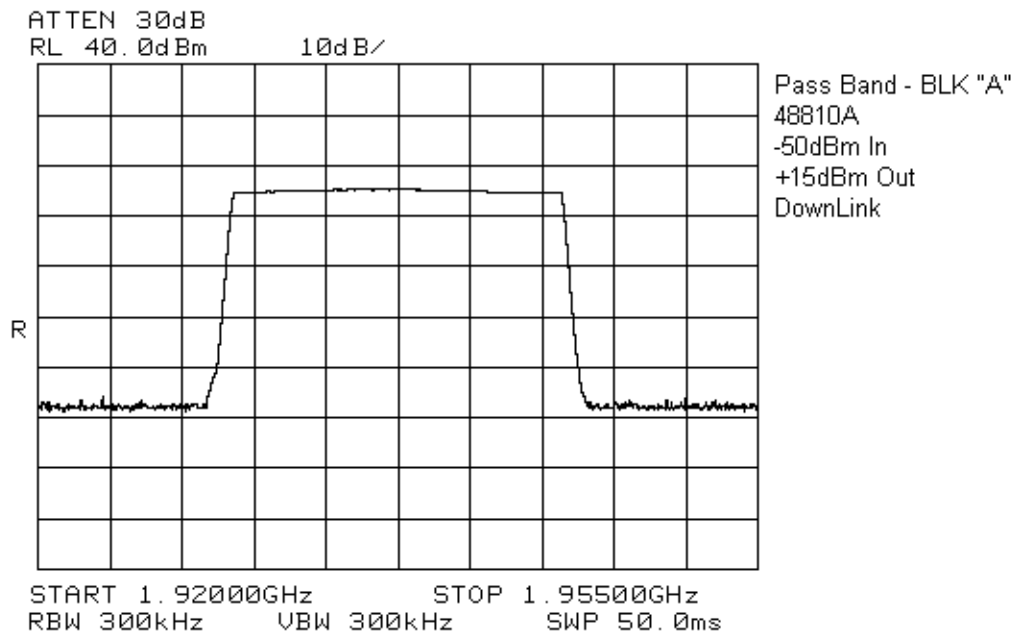
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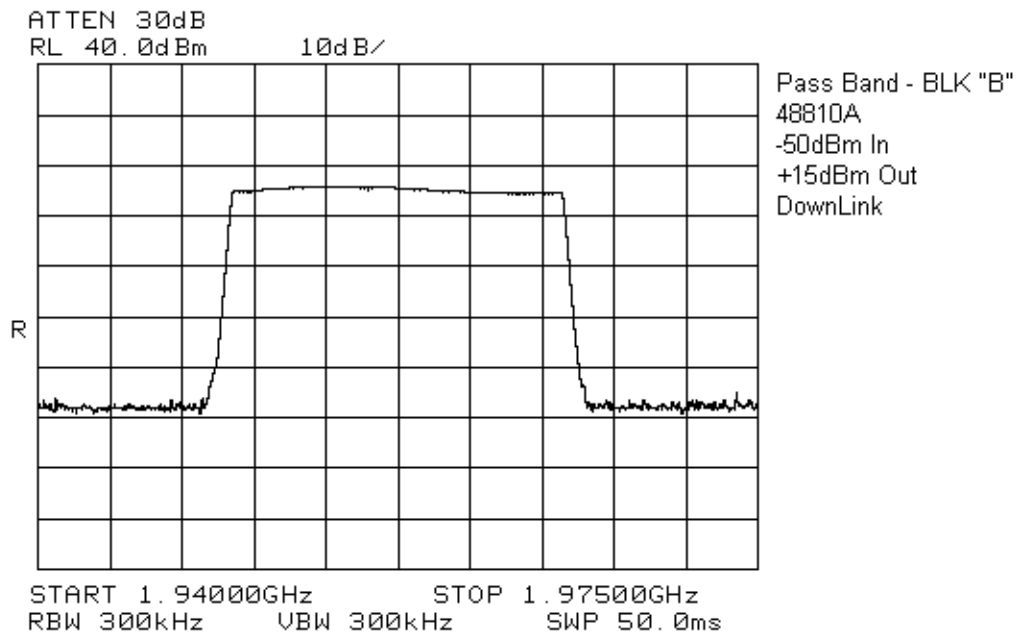
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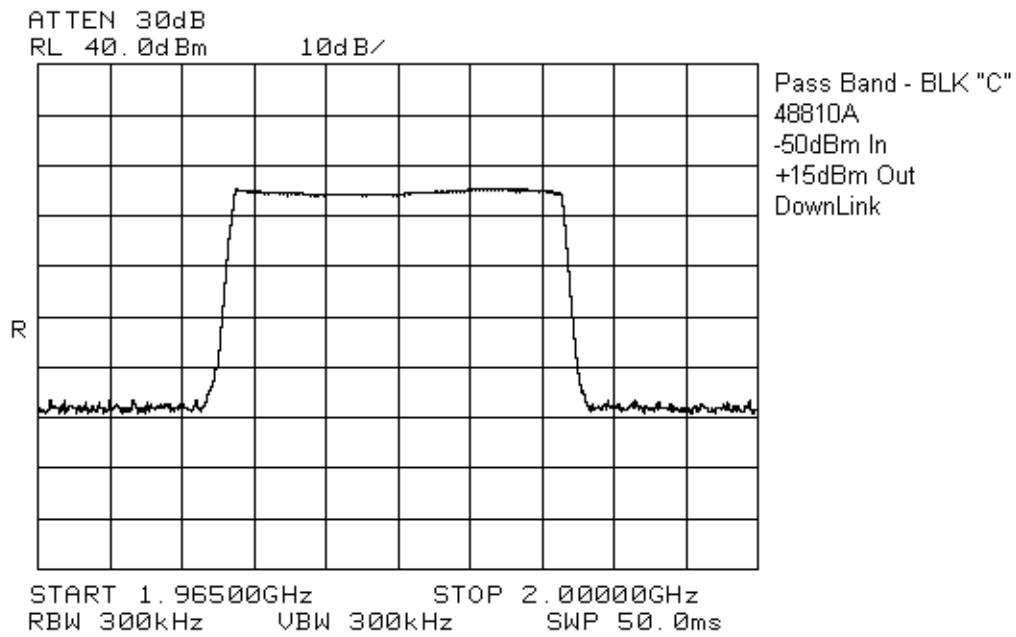
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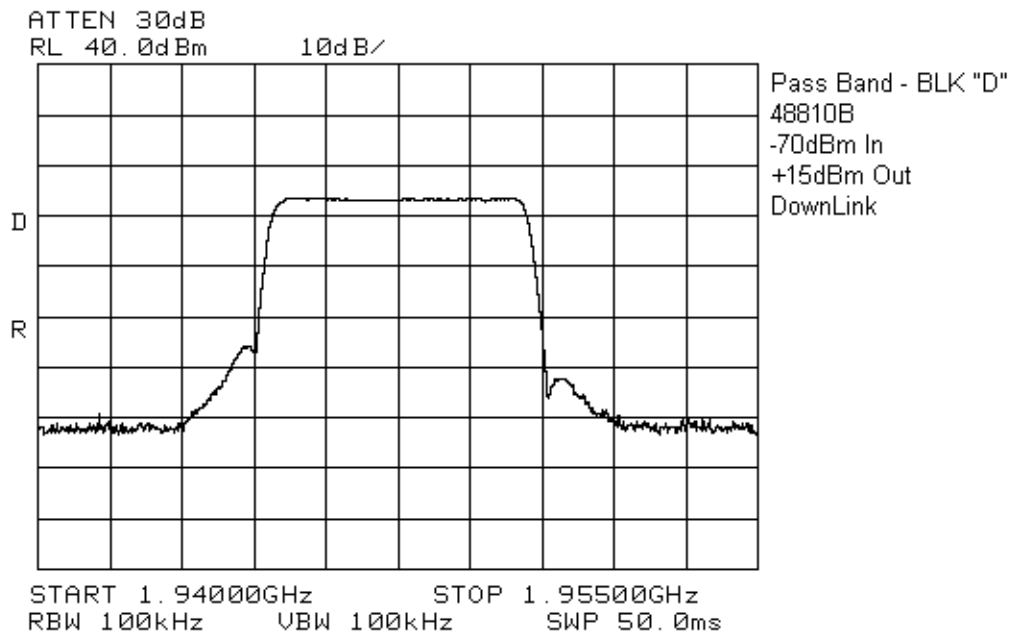
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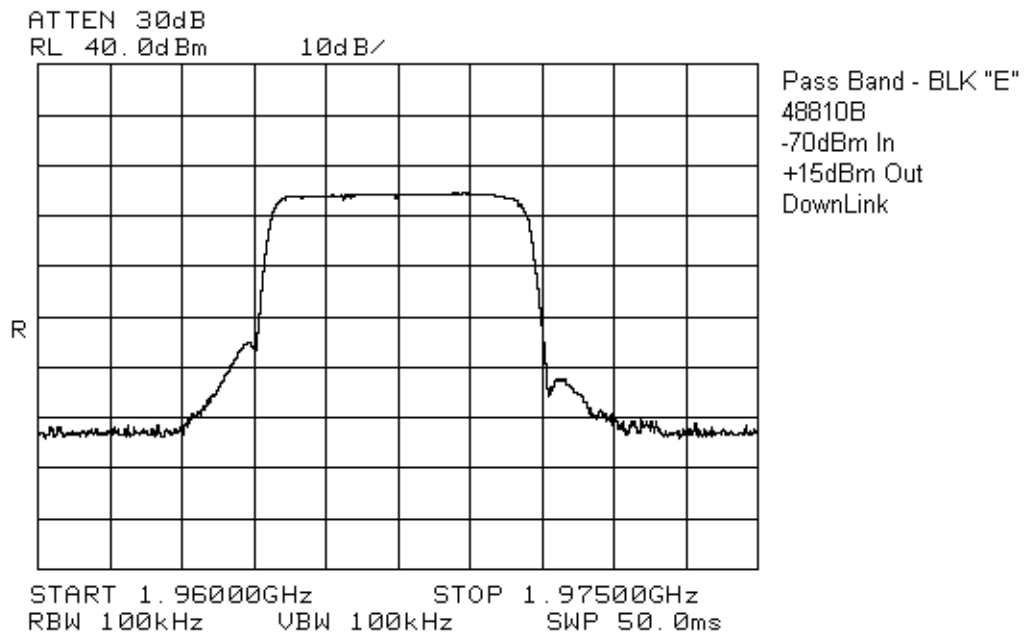
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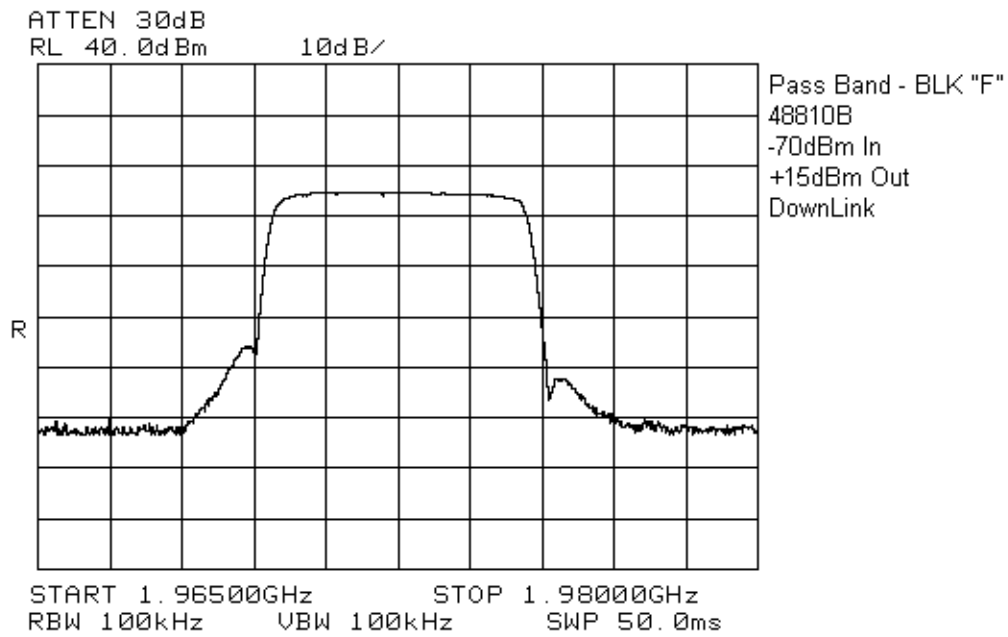
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FCC ID: IWD48810



EQUIPMENT: 48810A & 48810B

FCC ID: IWD48810



EQUIPMENT: 48810A & 48810B

FCC ID: IWD48810

Section 4. Occupied Bandwidth

Para. No.: 2.1049

Test Performed By: Glen Westwell	Date of Test: December 10, 2001
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Minimum Standard: Para. No.: 24.238.

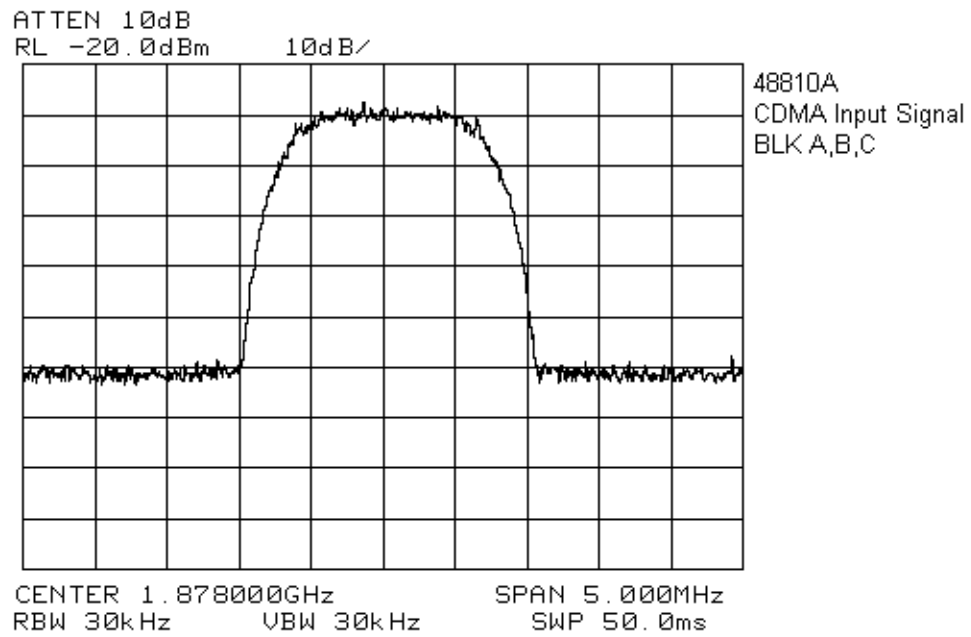
Test Results: Complies.

Test Data: See attached graphs.

The Occupied Bandwidth was measured by comparison of the input to the output signal. The plots were used to determine degradation to the output signal due to the amplification through the signal booster.

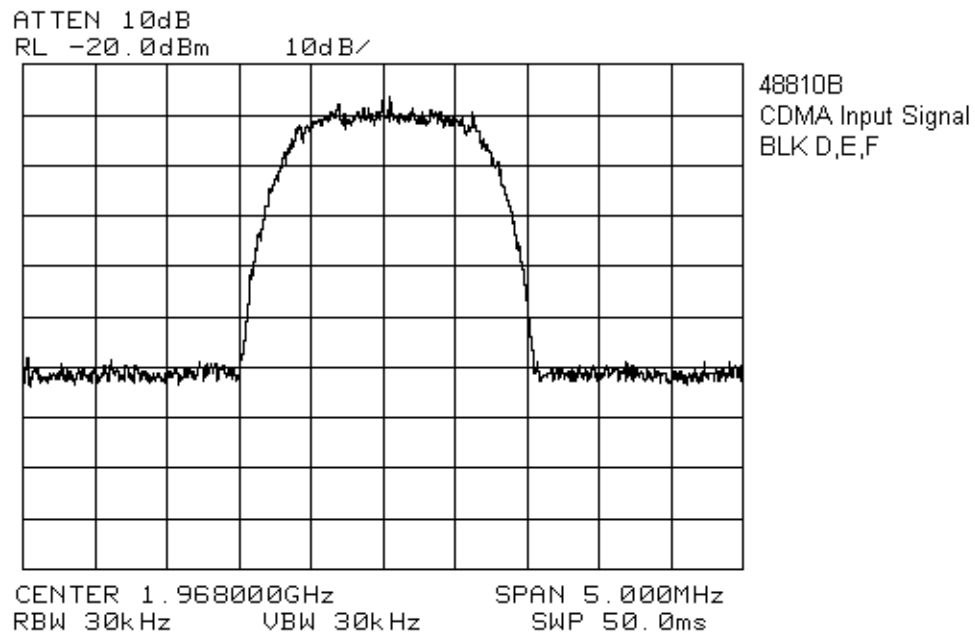
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FCC ID: IWD48810



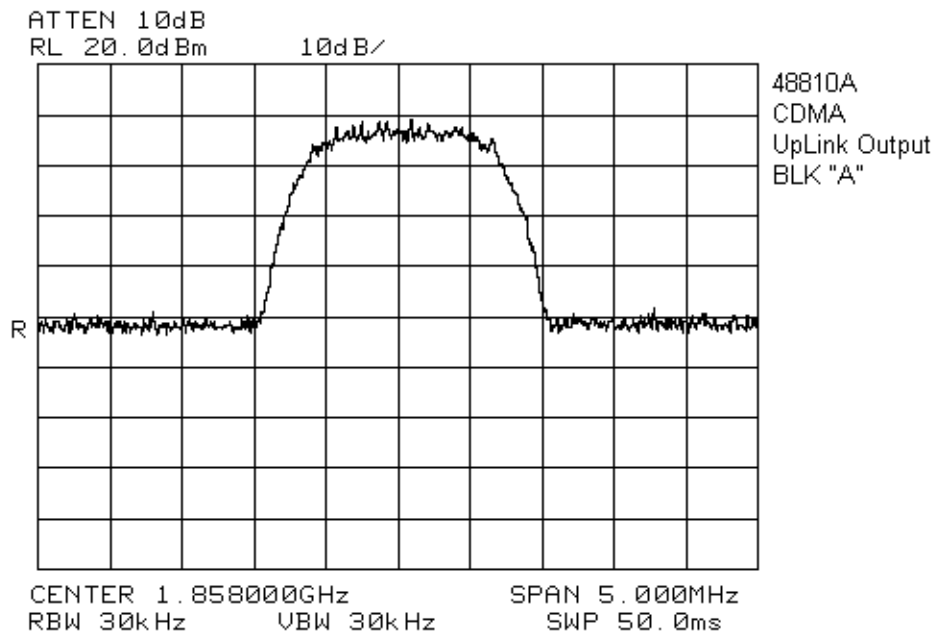
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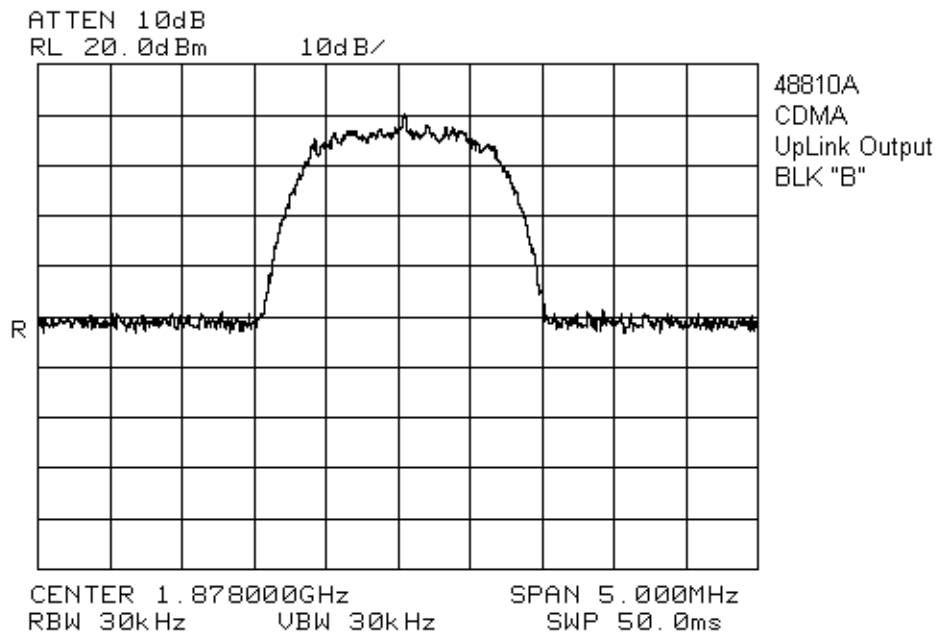
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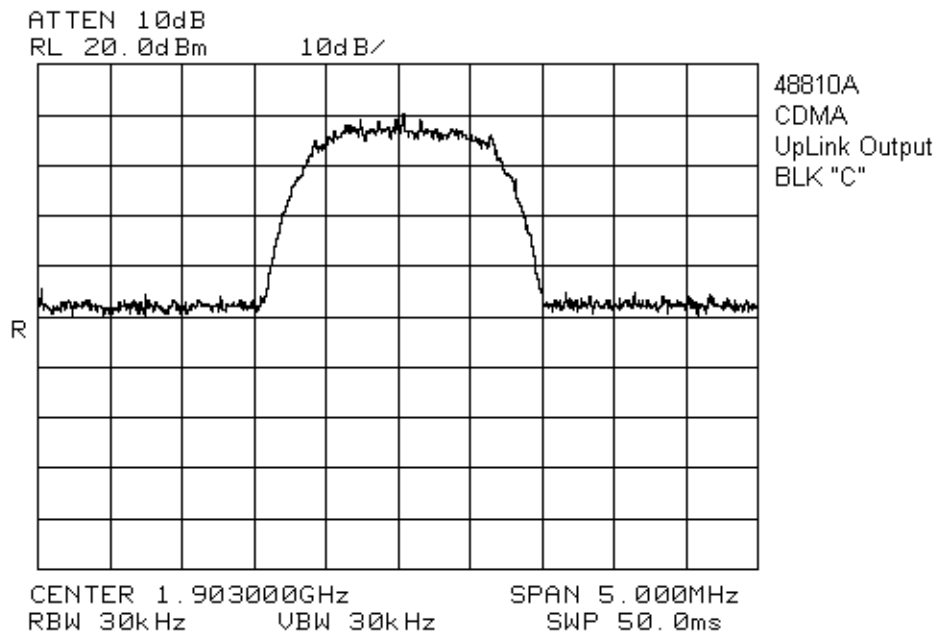
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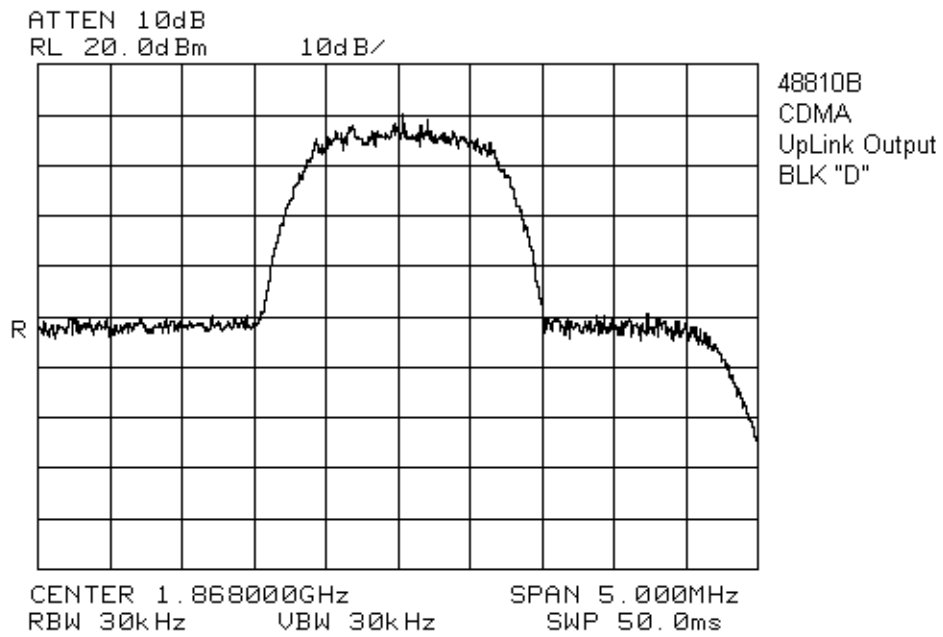
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FCC ID: IWD48810



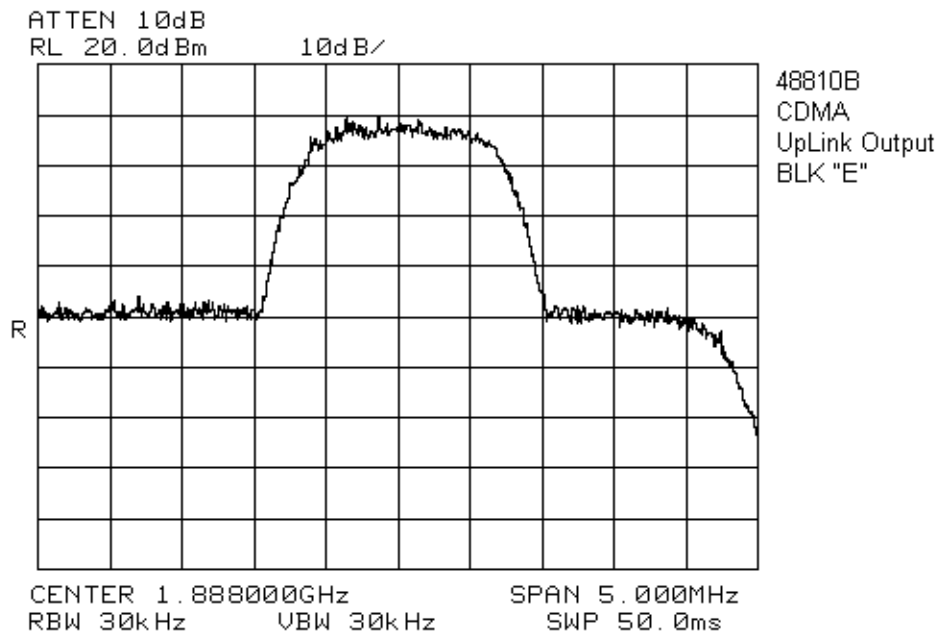
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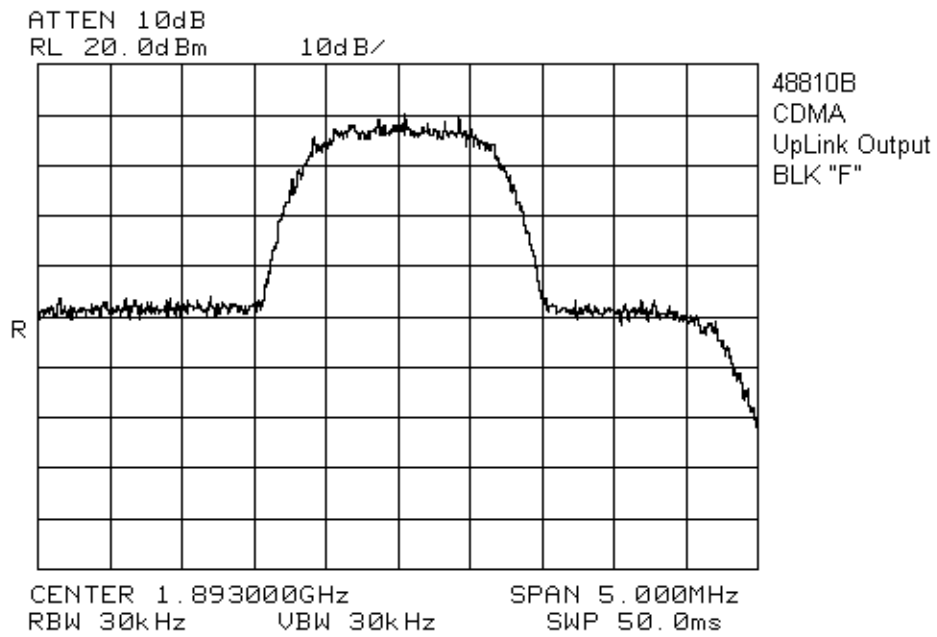
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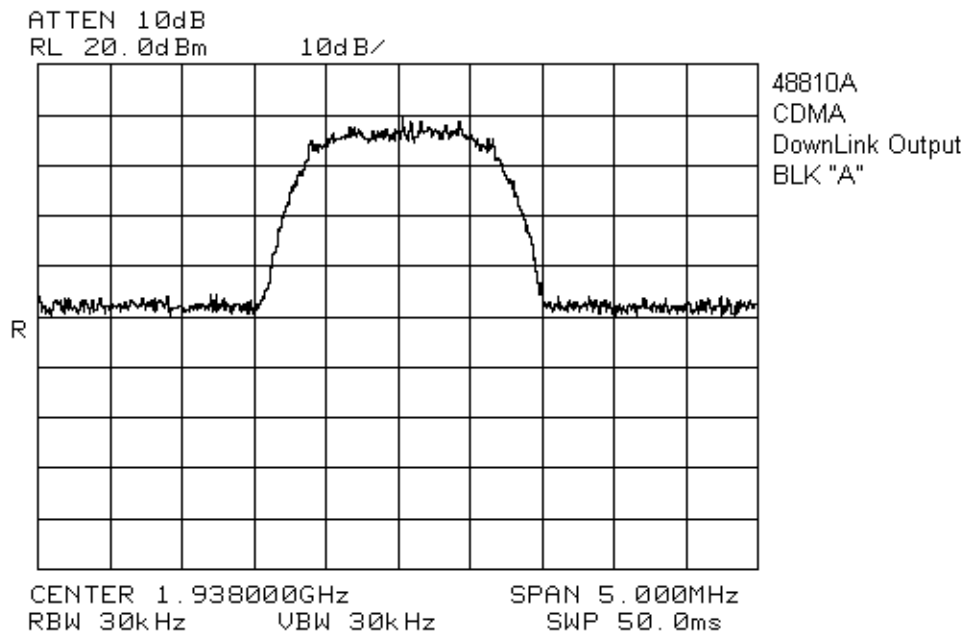
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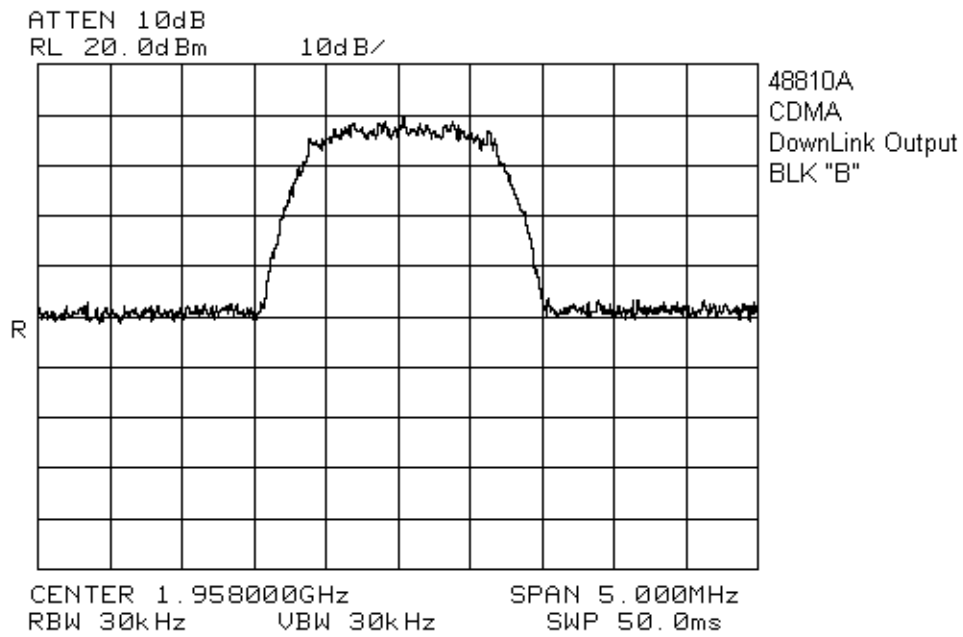
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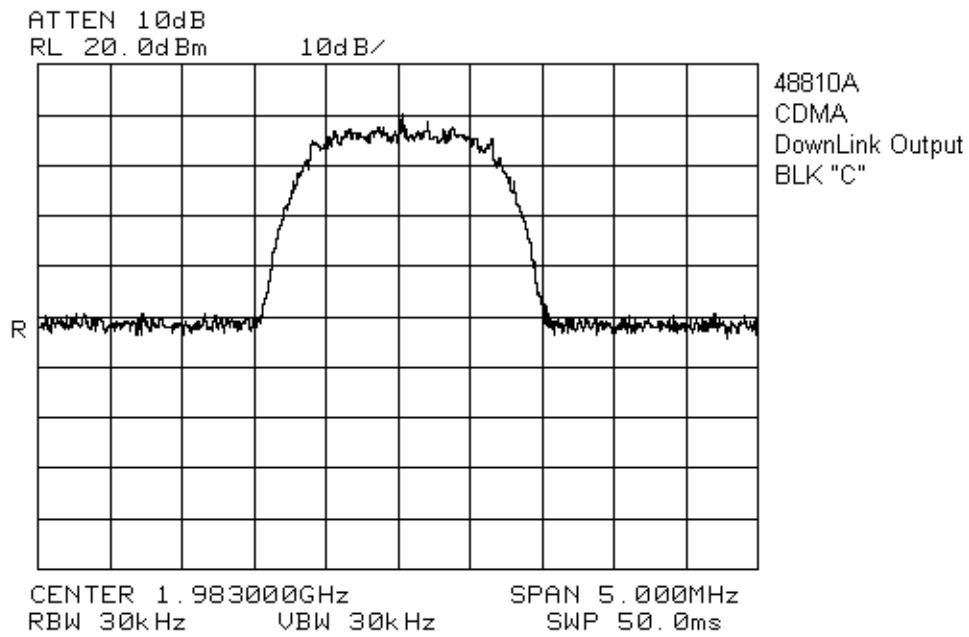
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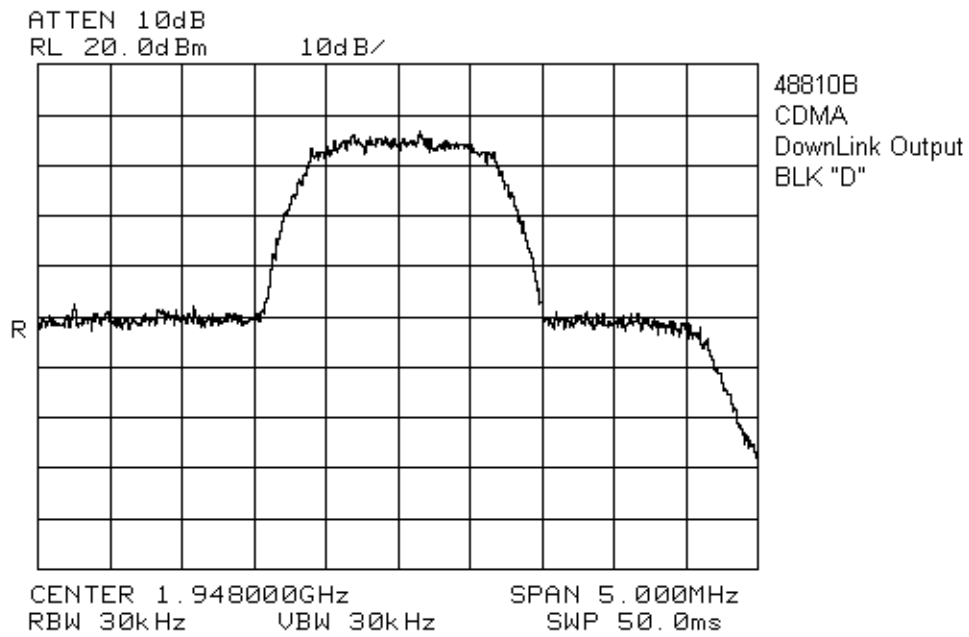
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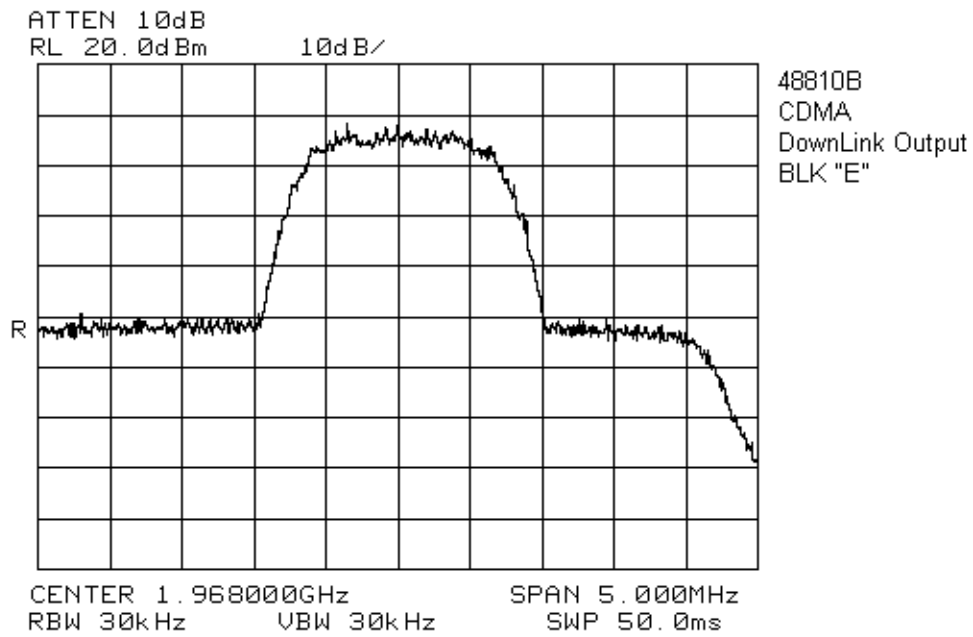
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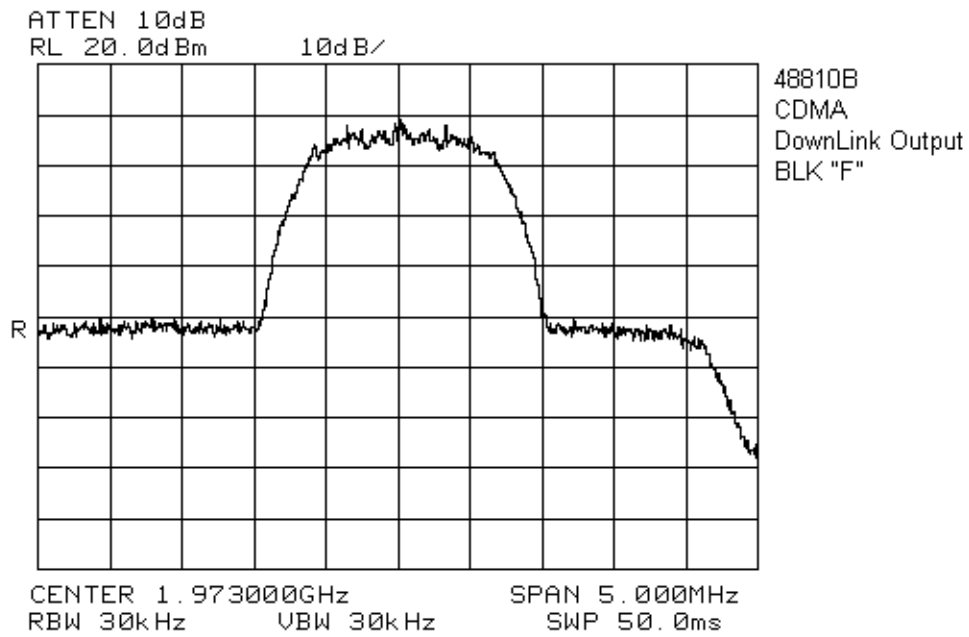
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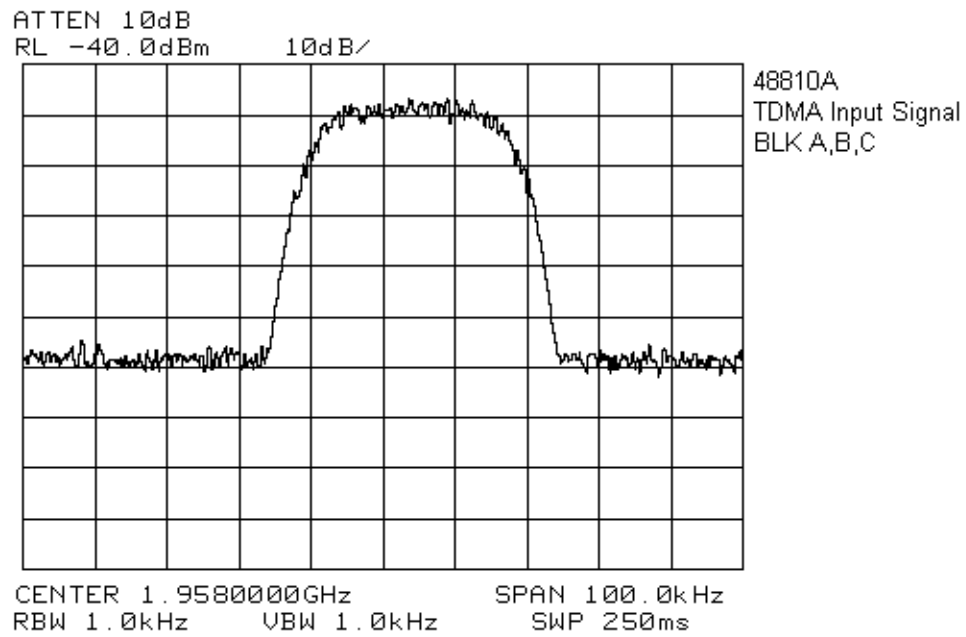
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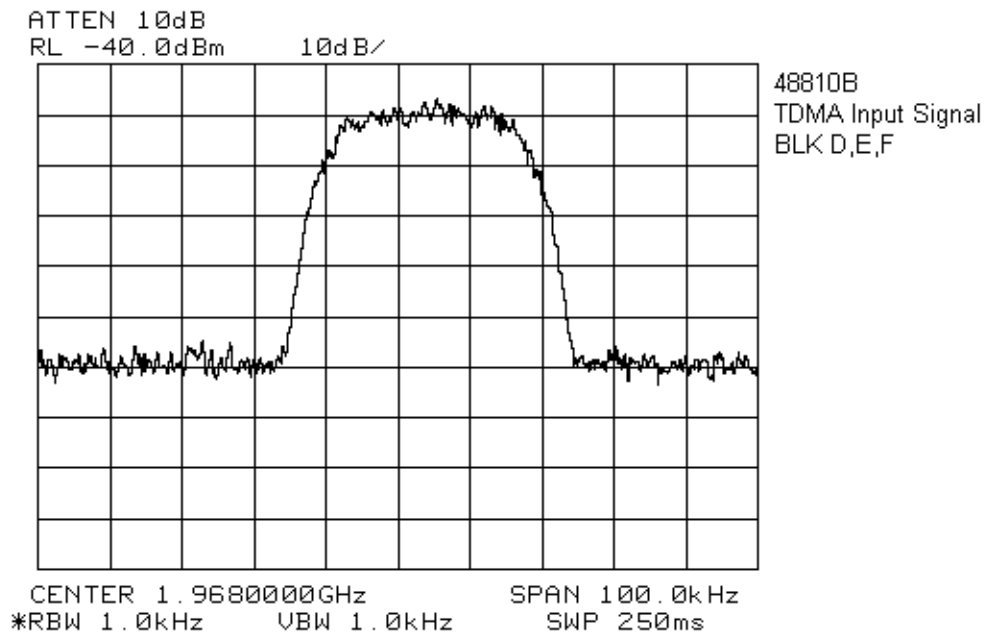
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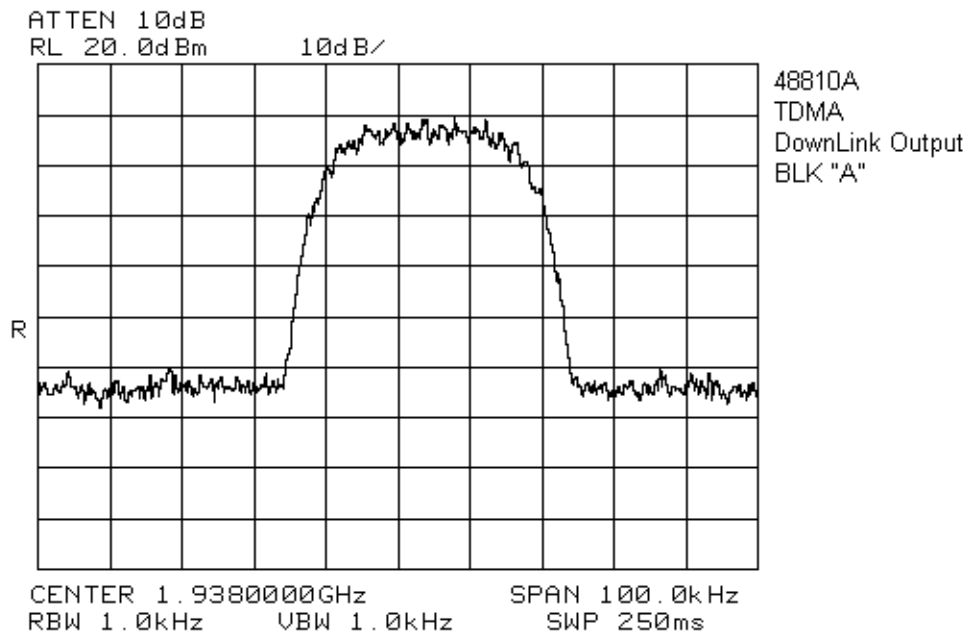
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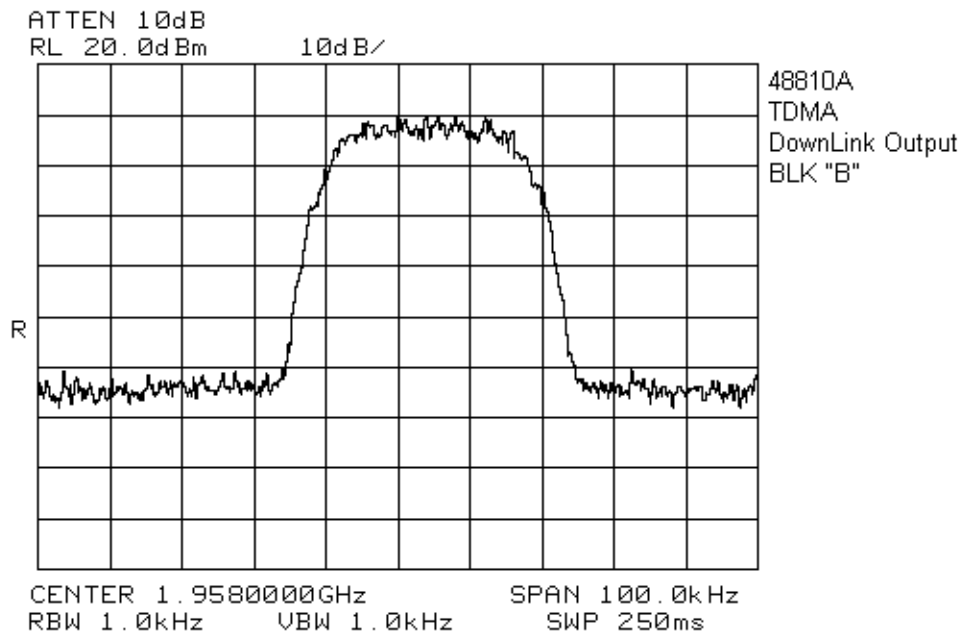
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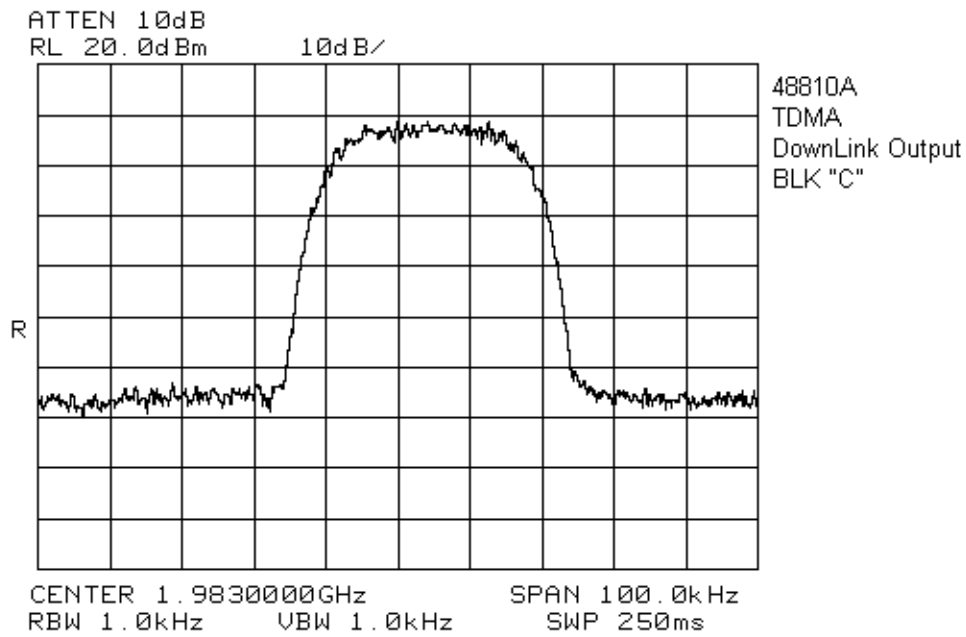
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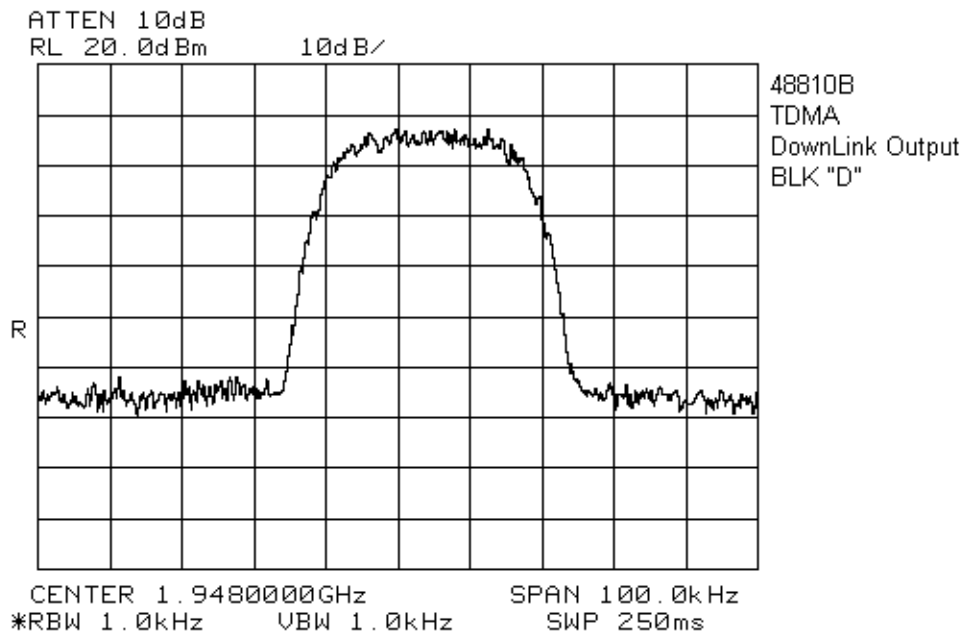
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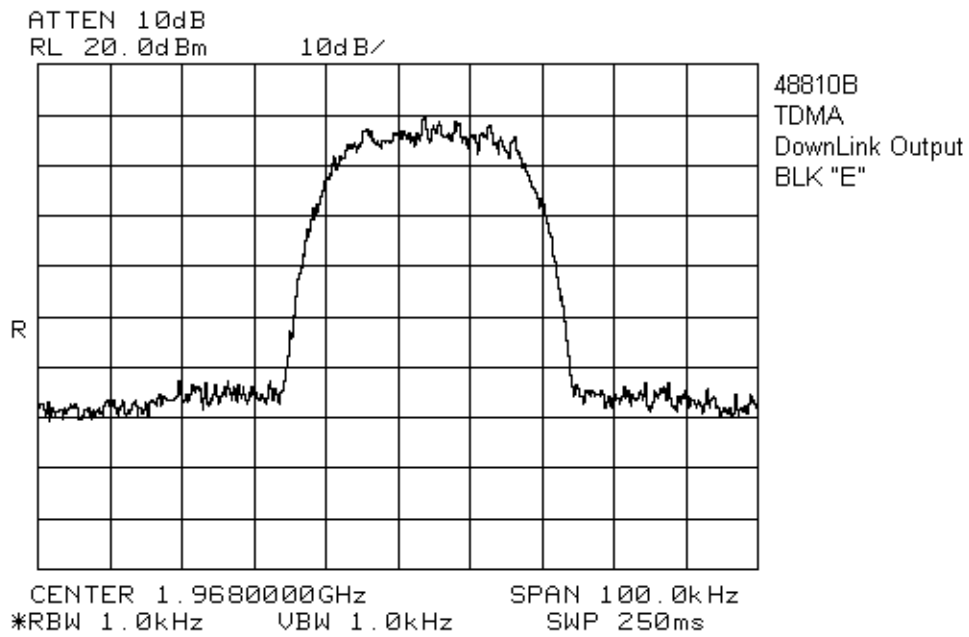
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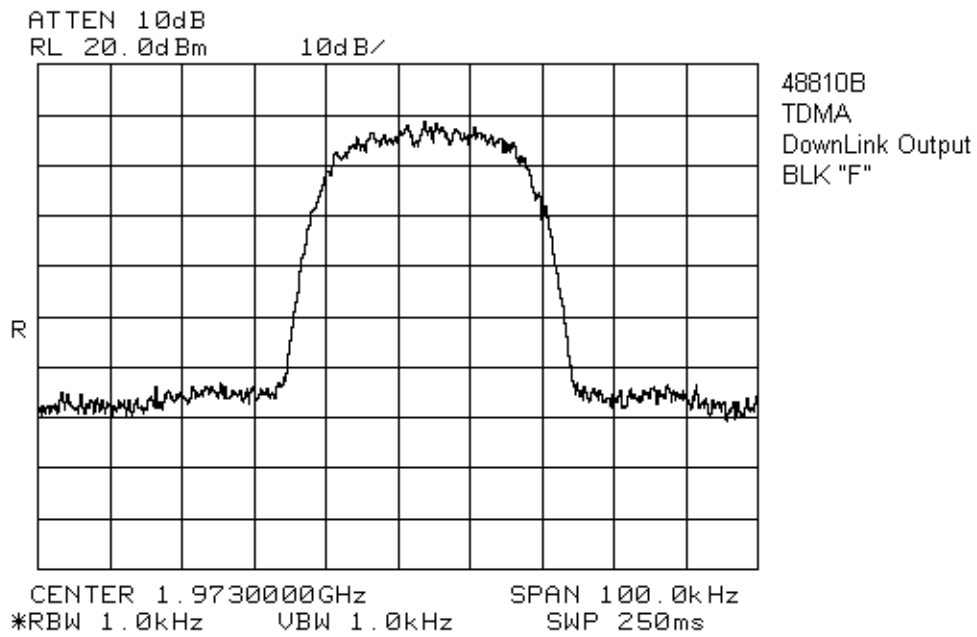
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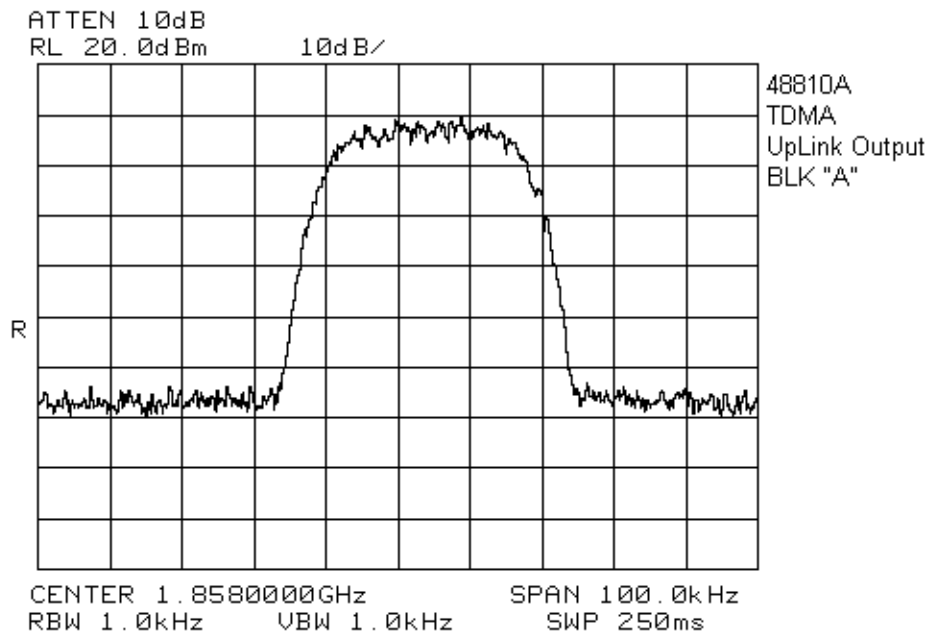
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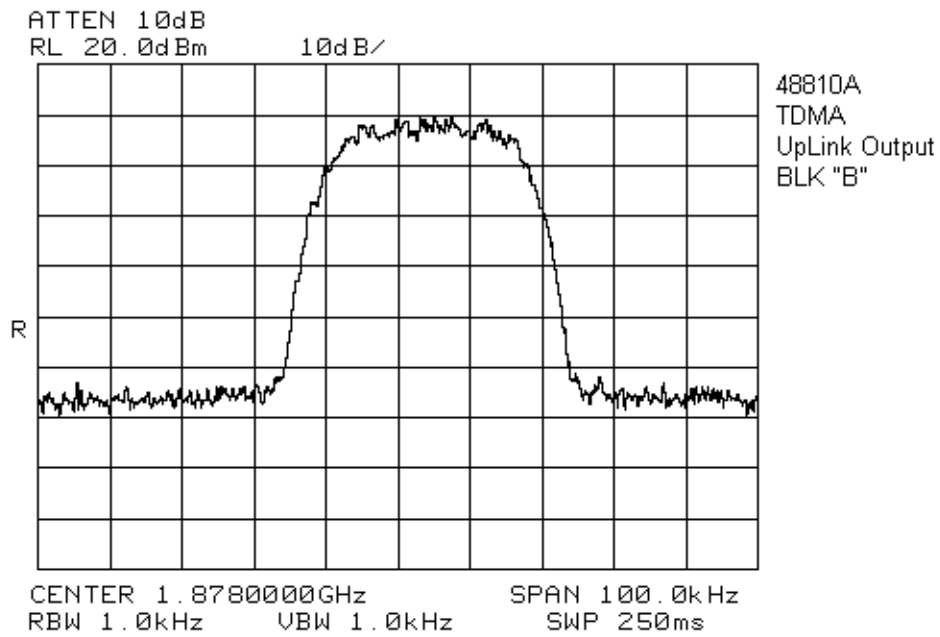
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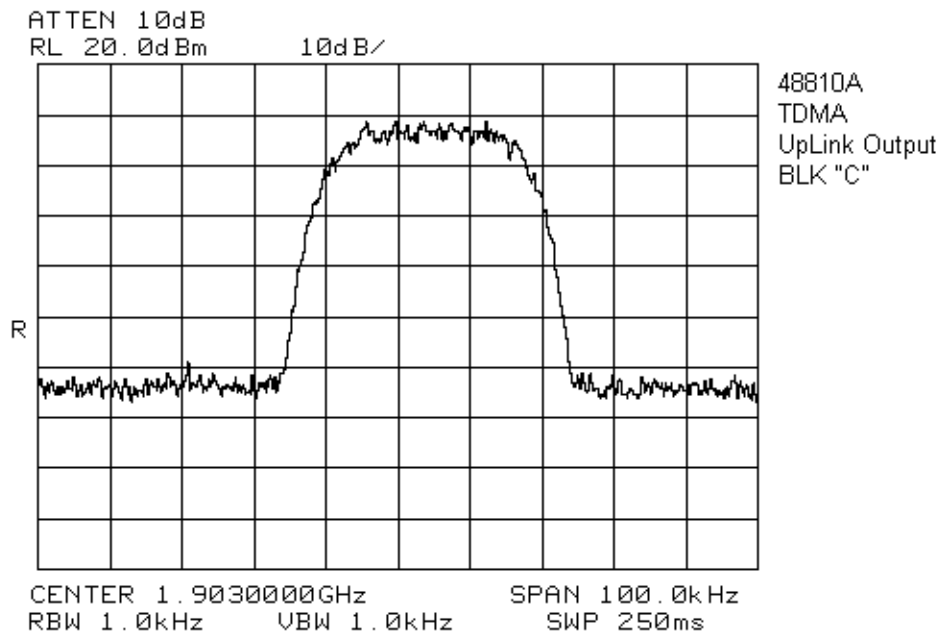
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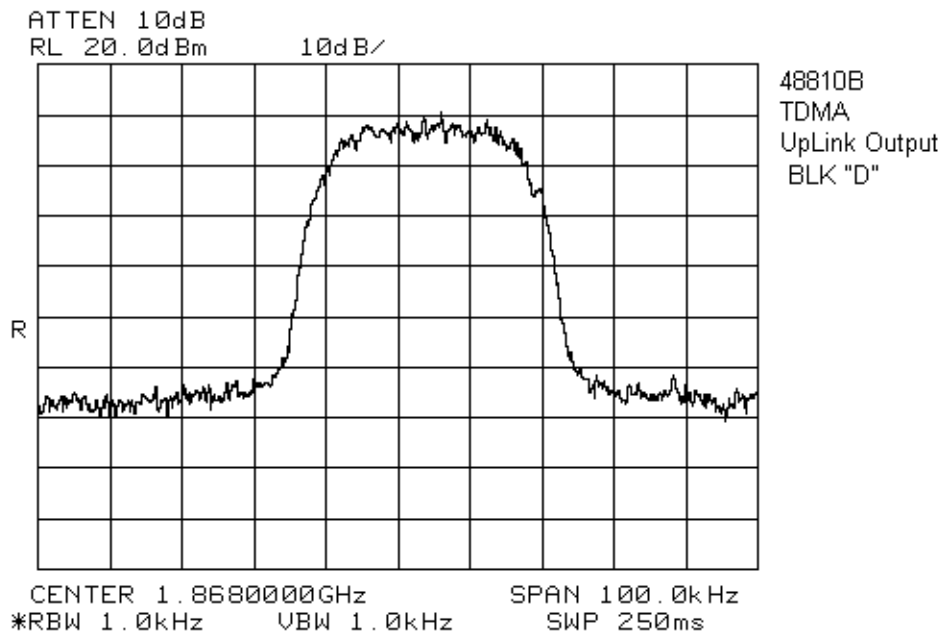
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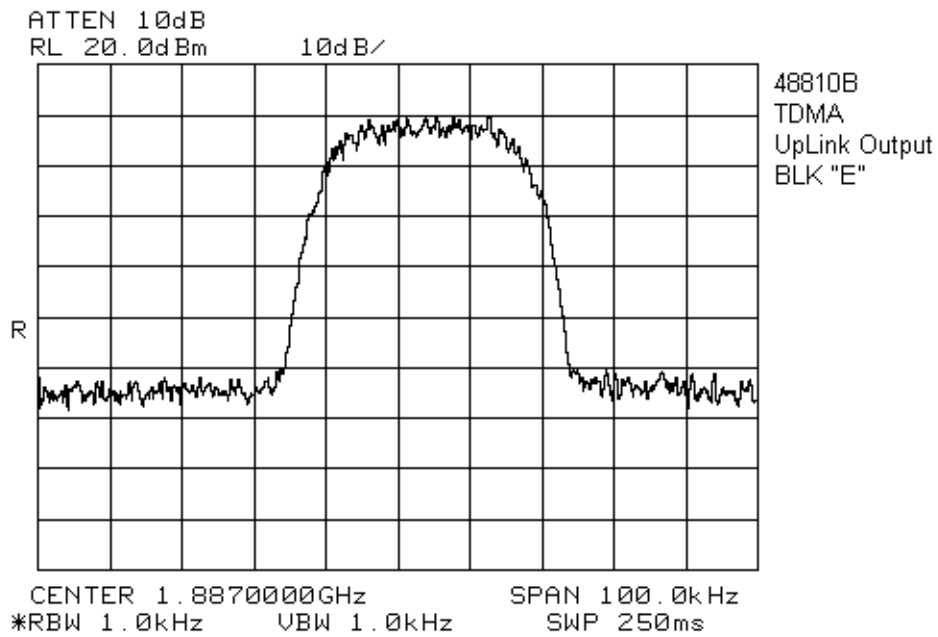
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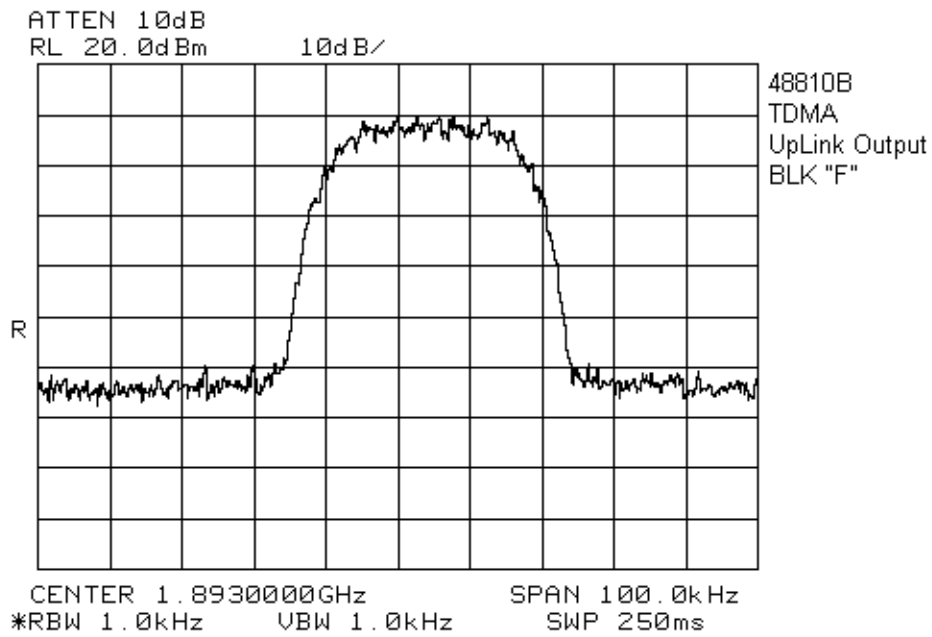
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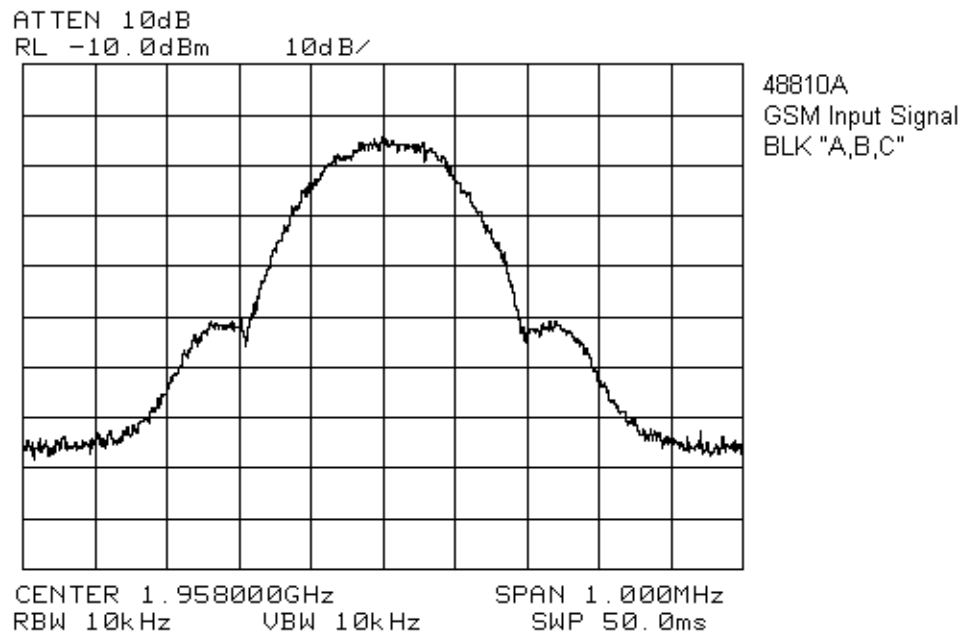
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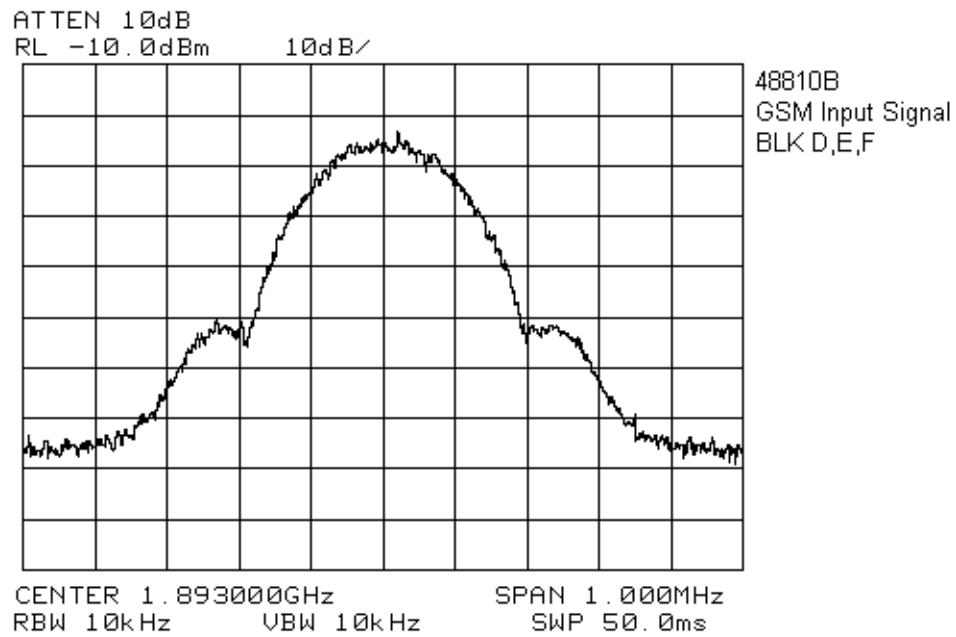
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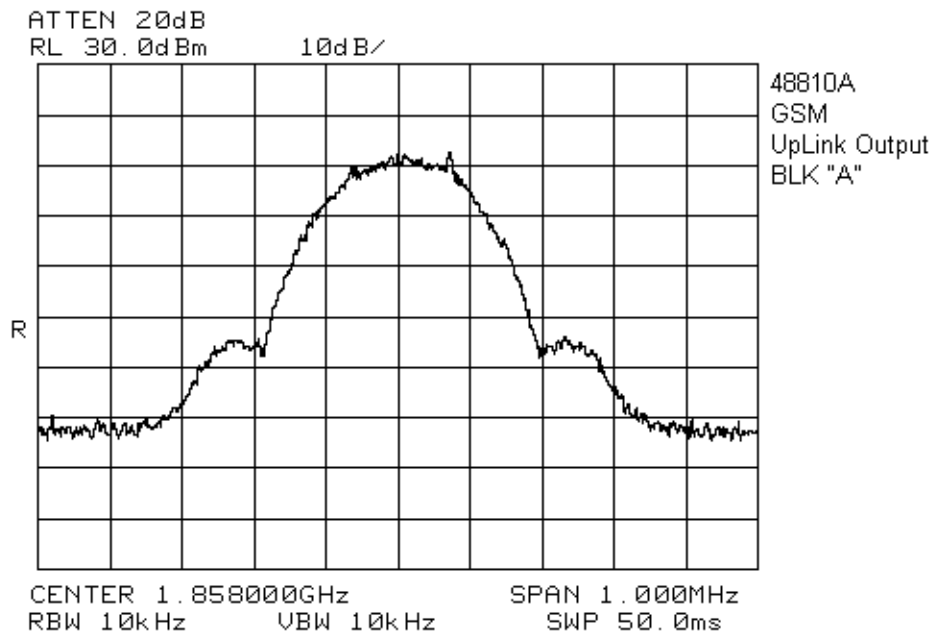
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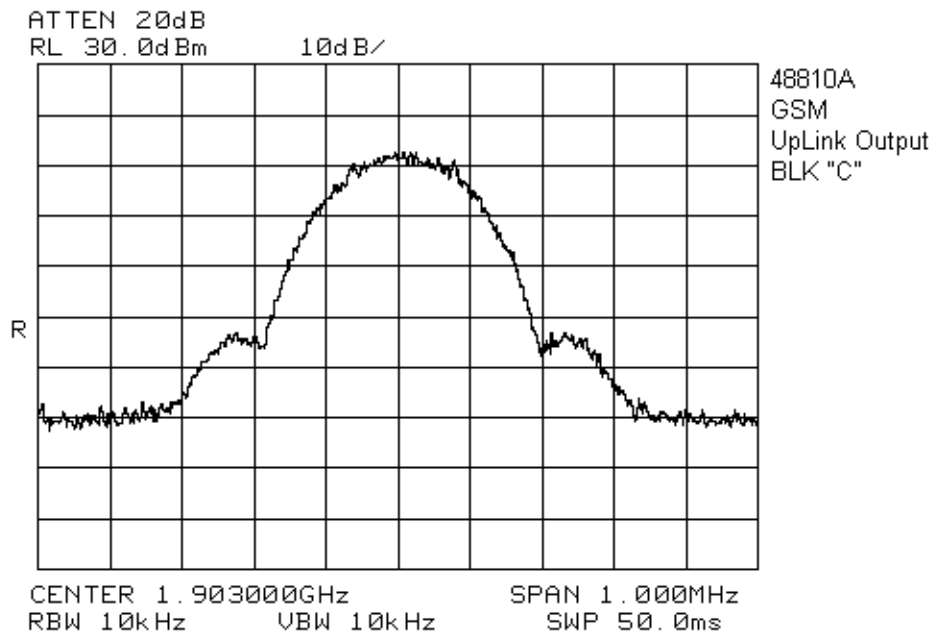
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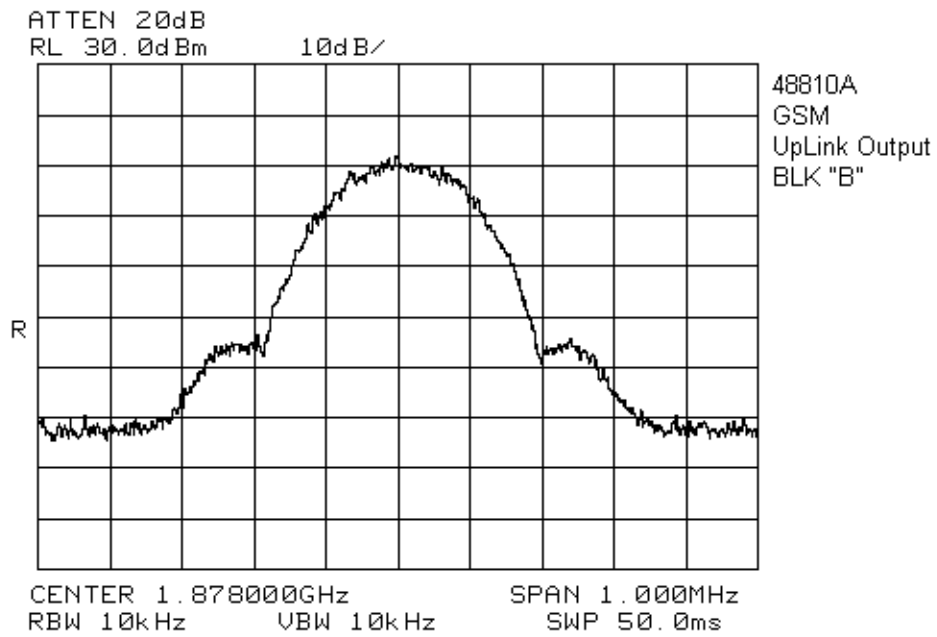
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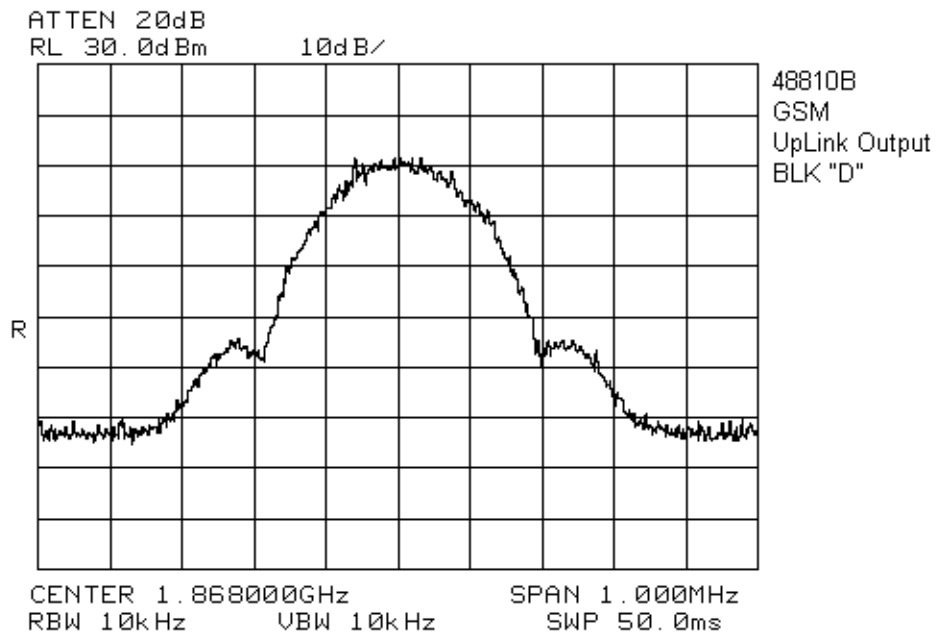
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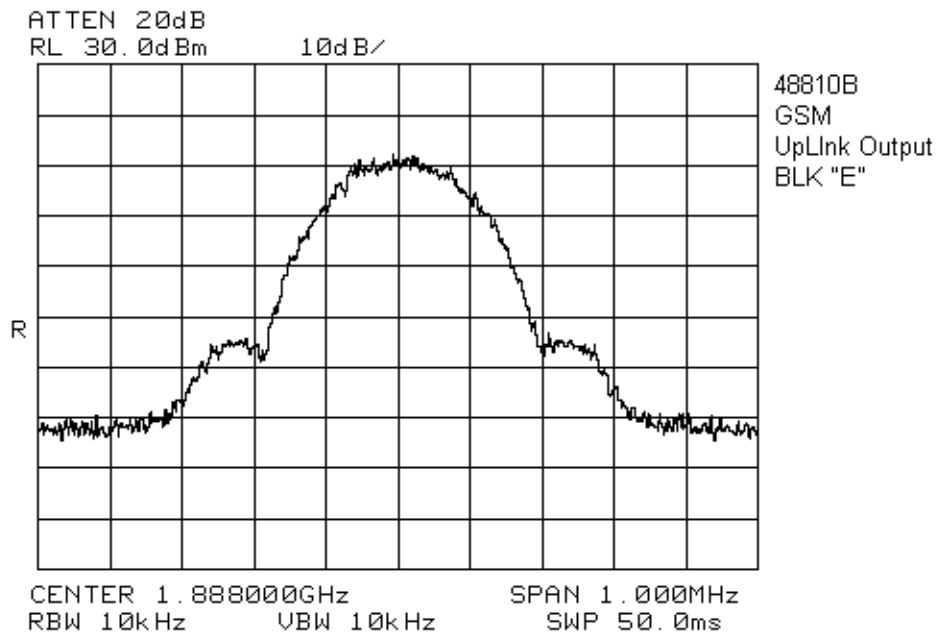
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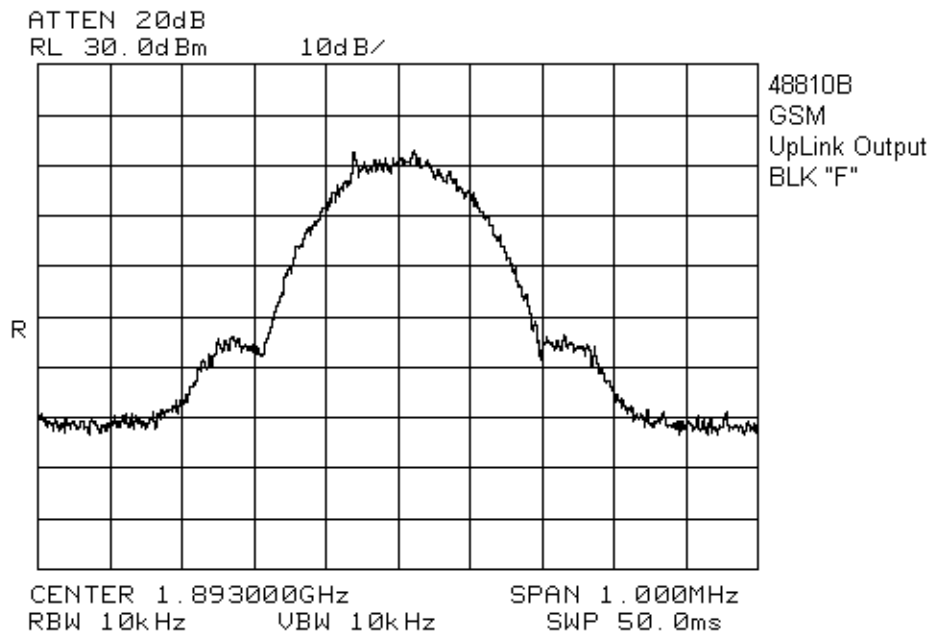
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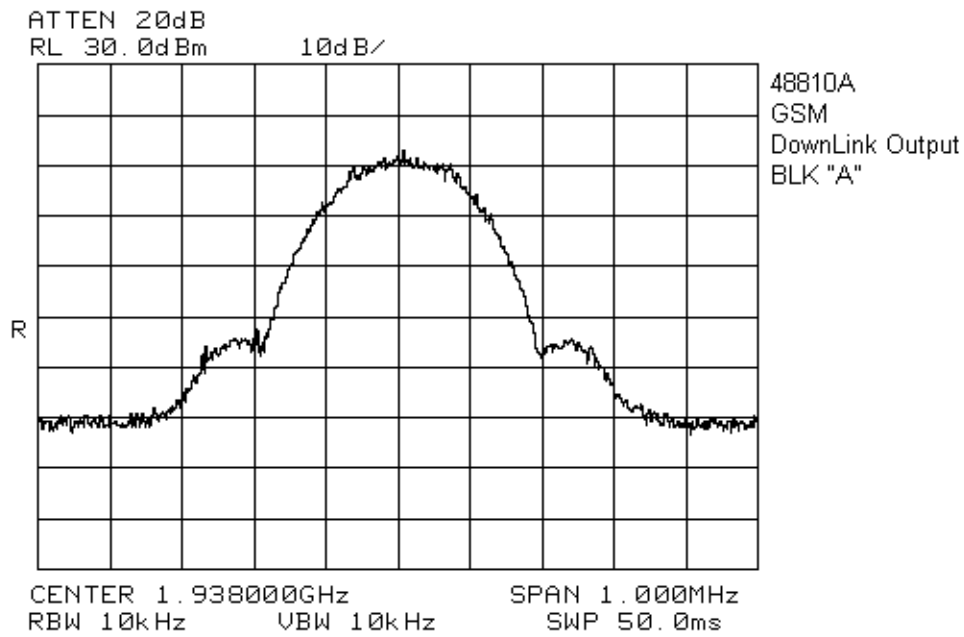
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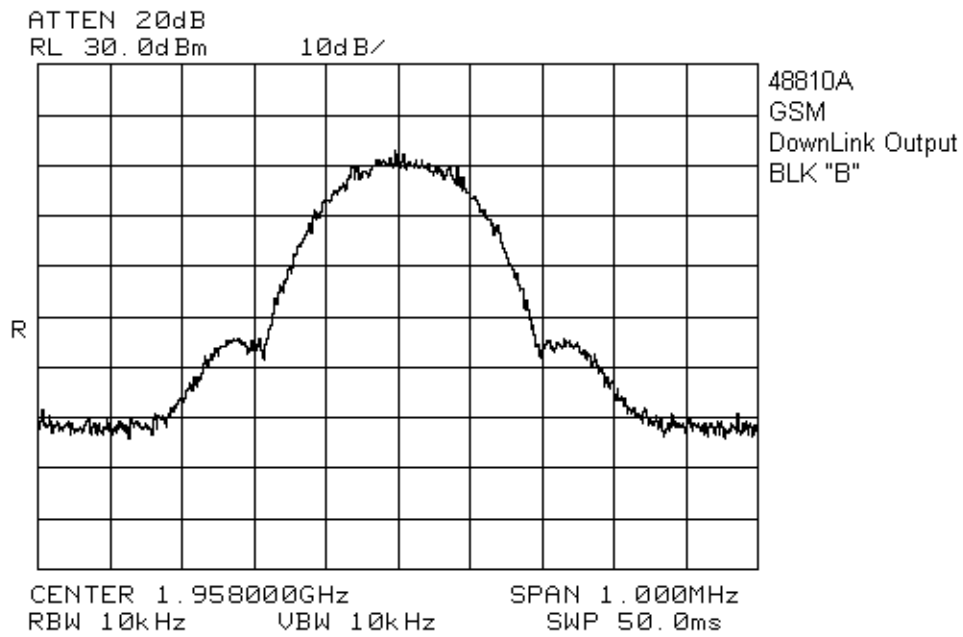
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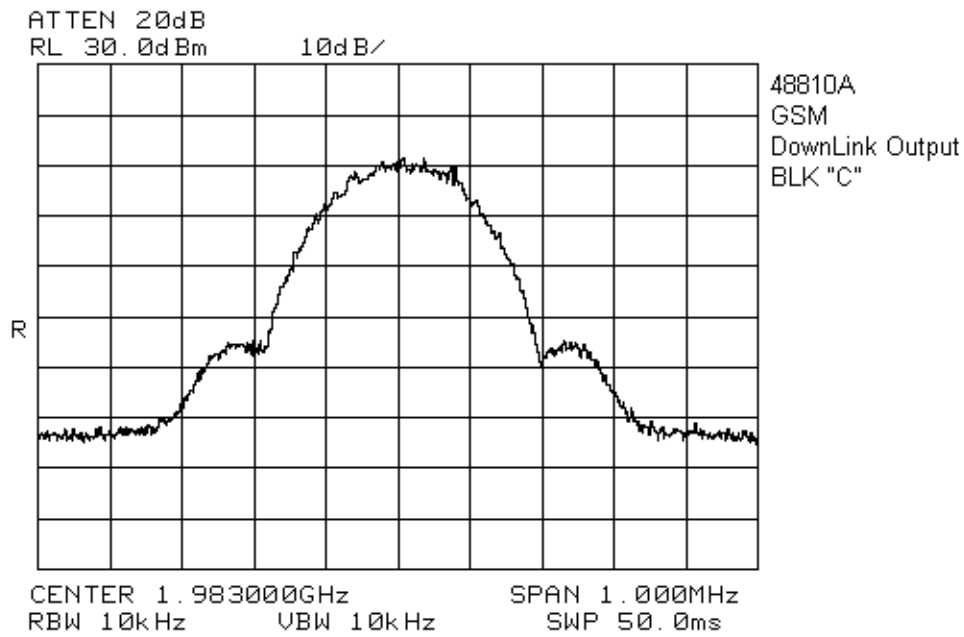
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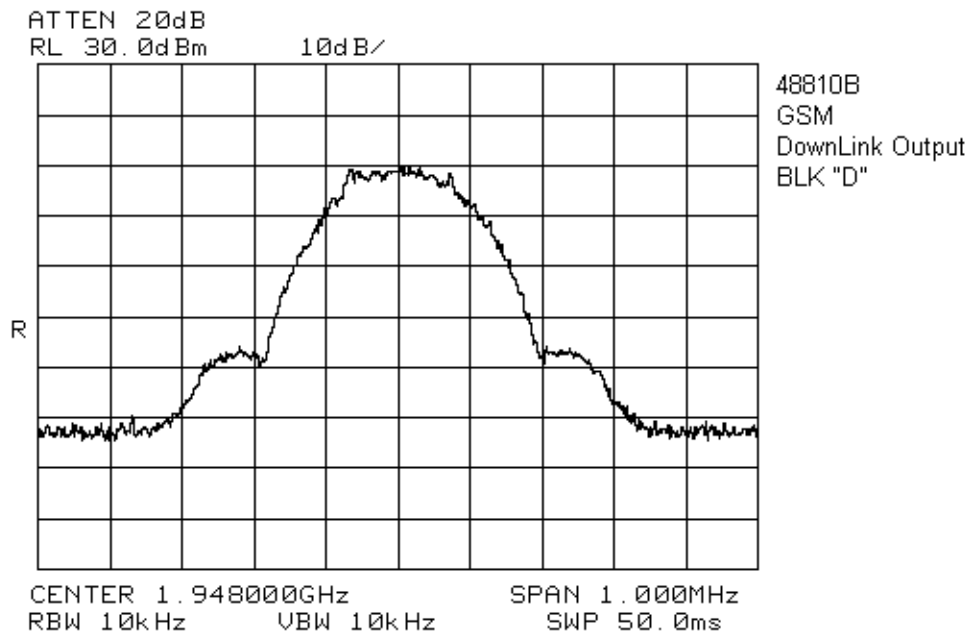
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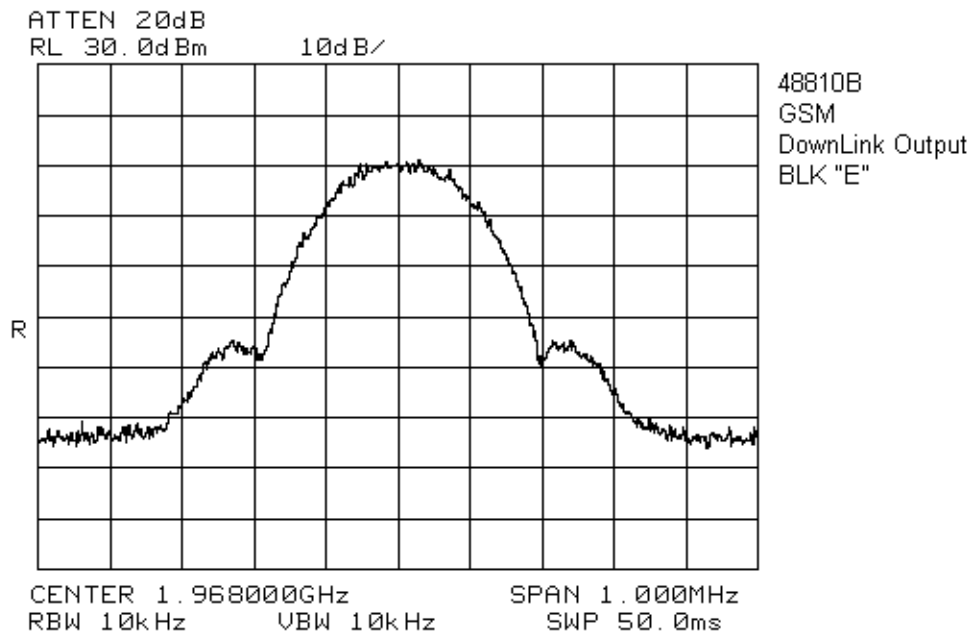


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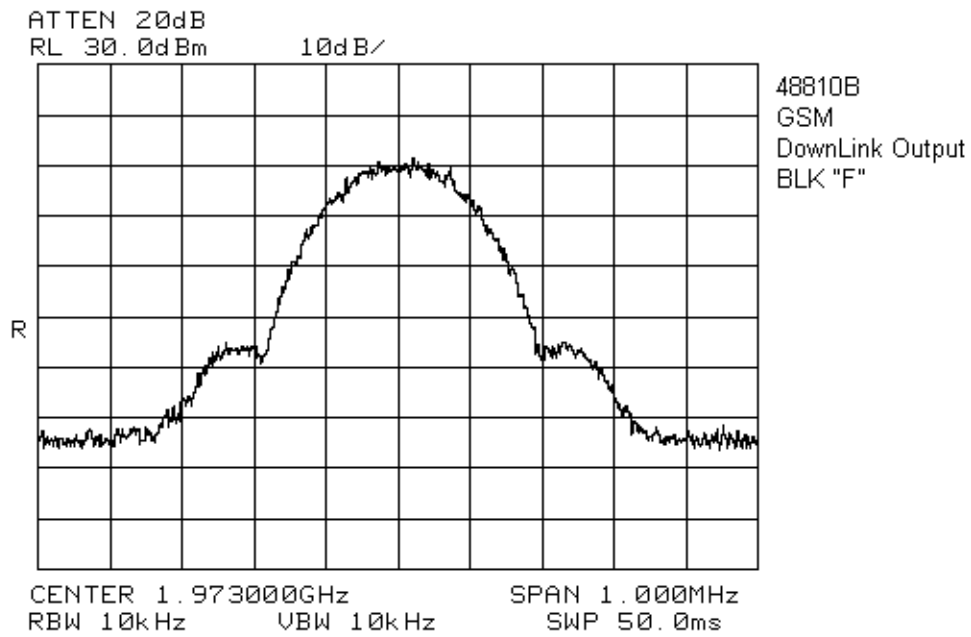


FCC ID: IWD48810



EQUIPMENT: 48810A & 48810B

FCC ID: IWD48810



EQUIPMENT: 48810A & 48810B

FCC ID: IWD48810

Section 5. Spurious Emissions at Antenna Terminals

Para. No.: 2.1051

Test Performed By: Glen Westwell	Date of Test: December 11, 2001
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Minimum Standard: Para. No.: 24.238, -13dBm

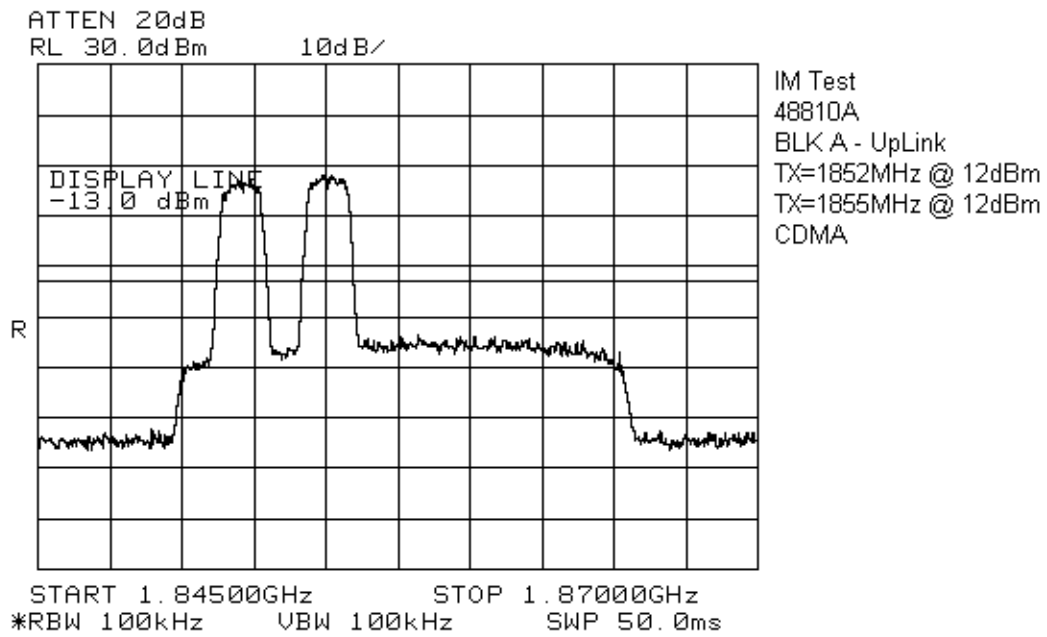
Test Results: Complies.

Test Data: See attached graphs.

Worst case data has been presented for both 48810A & 48810B
Signal Boosters.

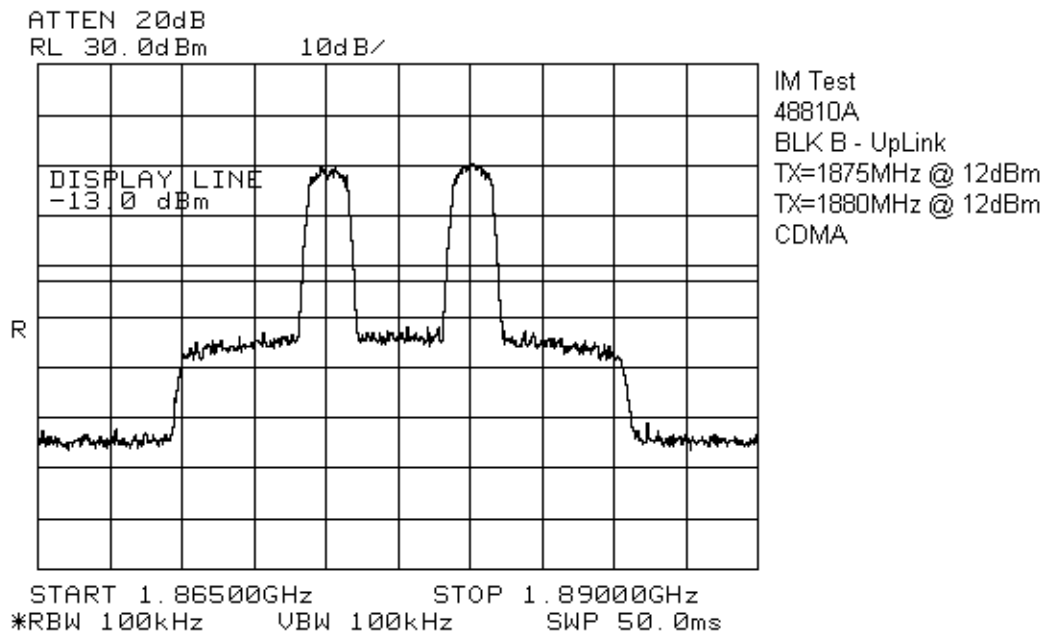
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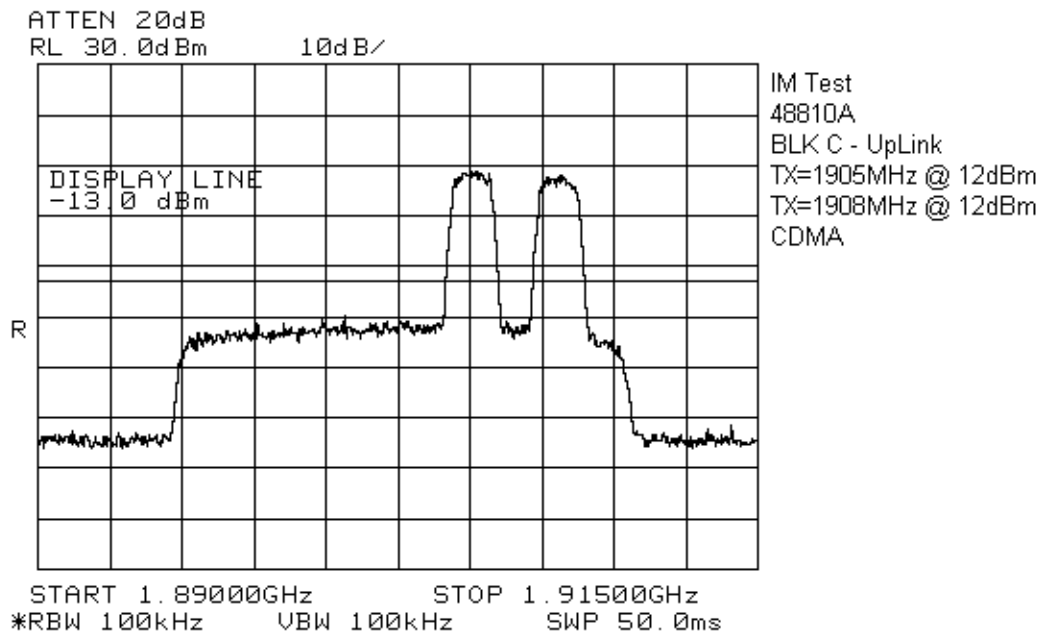
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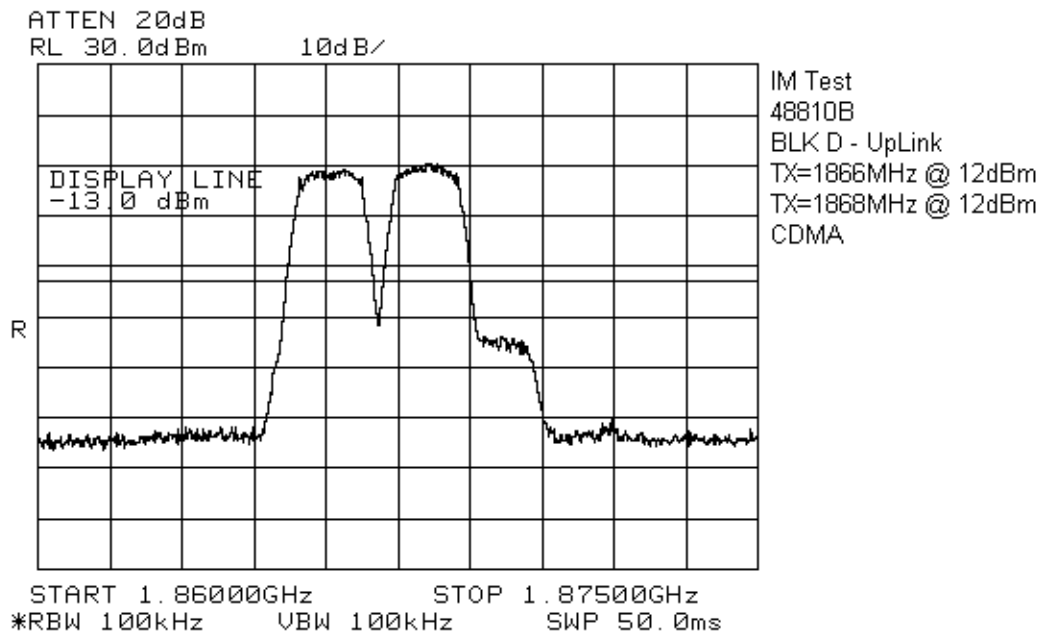
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FCC ID: IWD48810



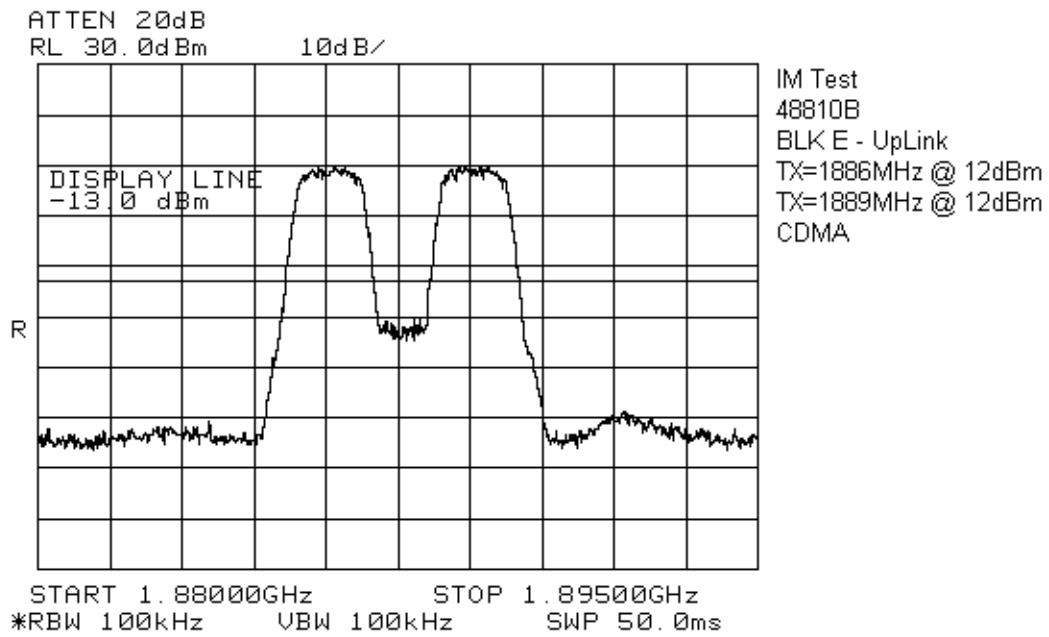
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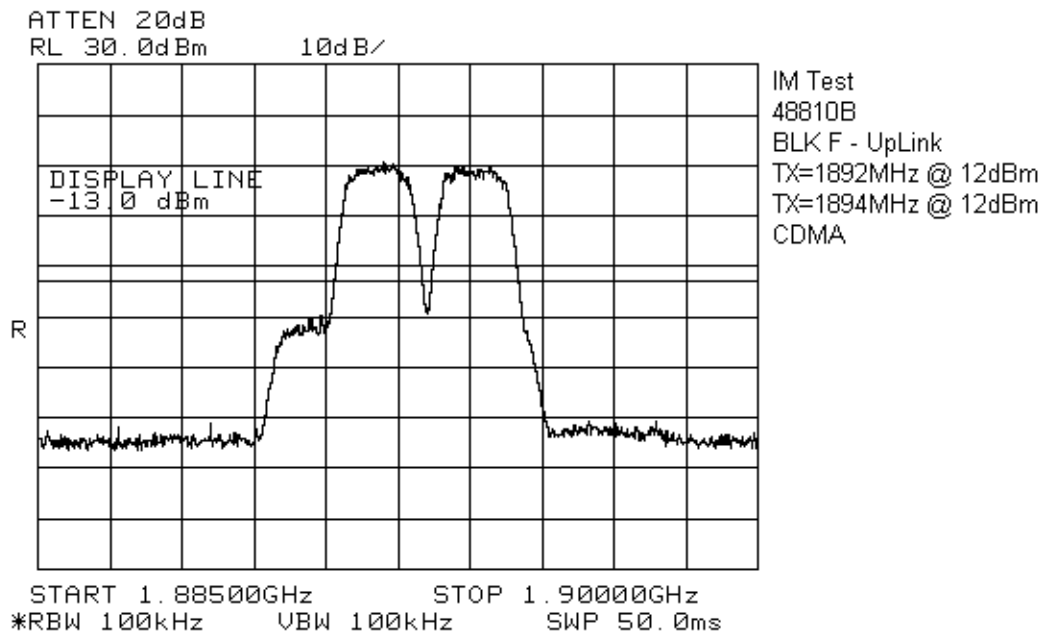
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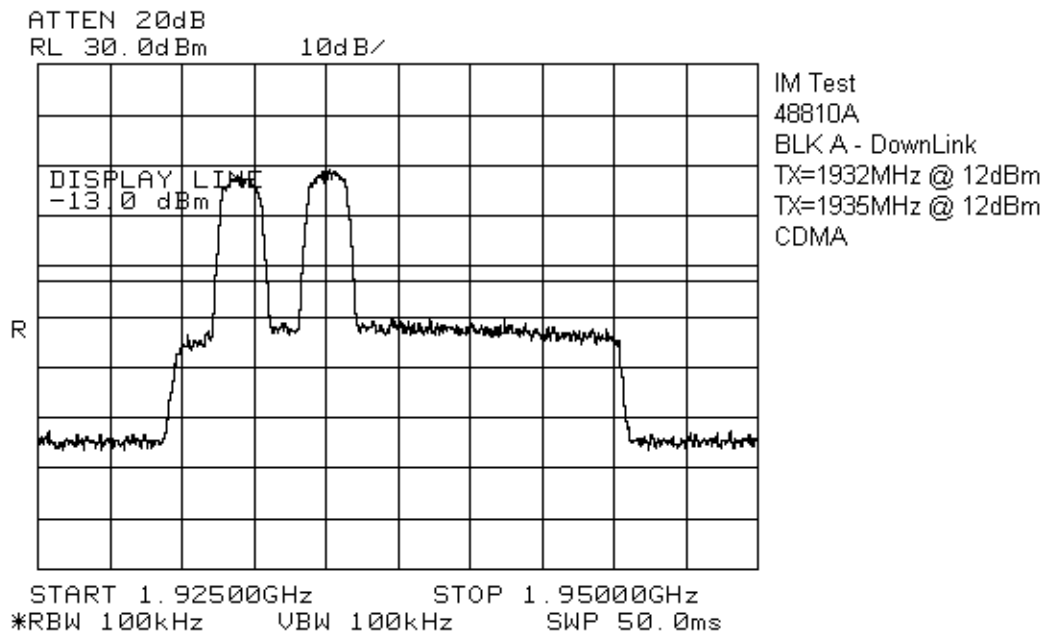
EQUIPMENT: 48810A & 48810B

FCC ID: IWD48810



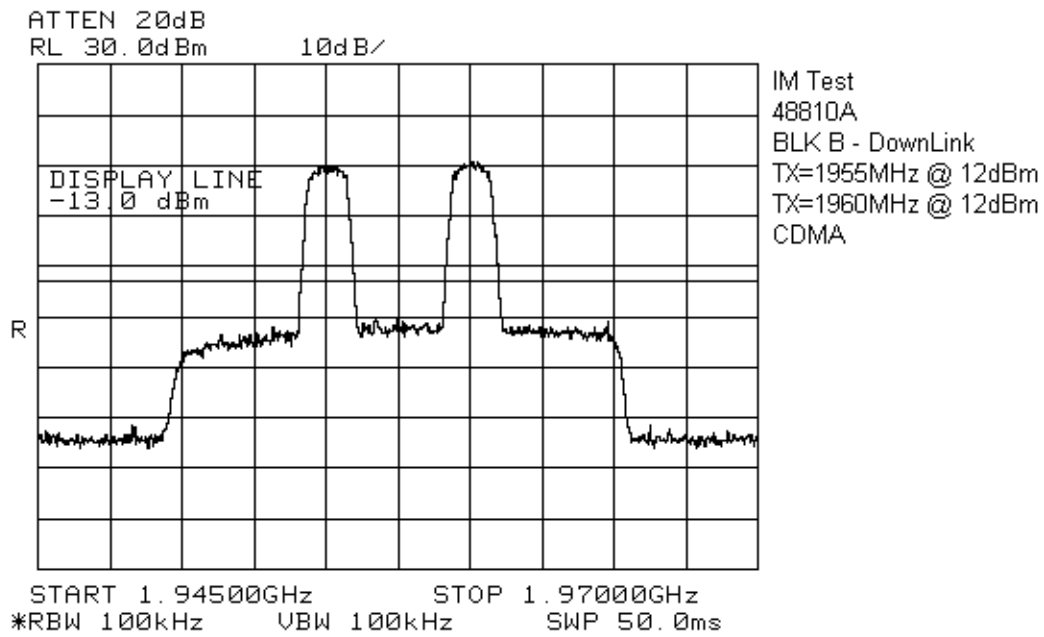
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FCC ID: IWD48810



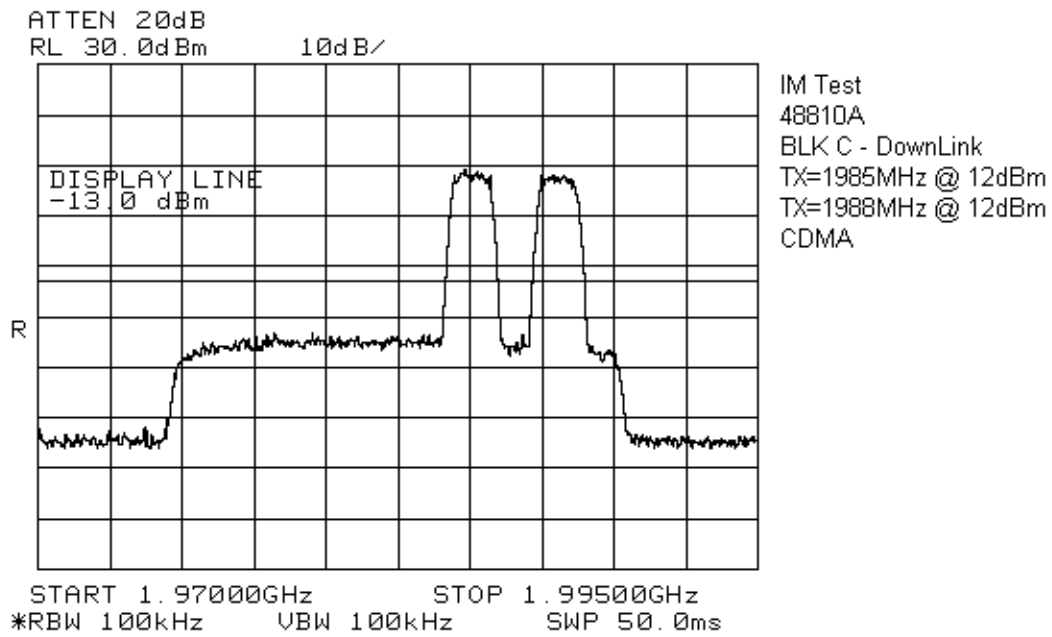
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FCC ID: IWD48810



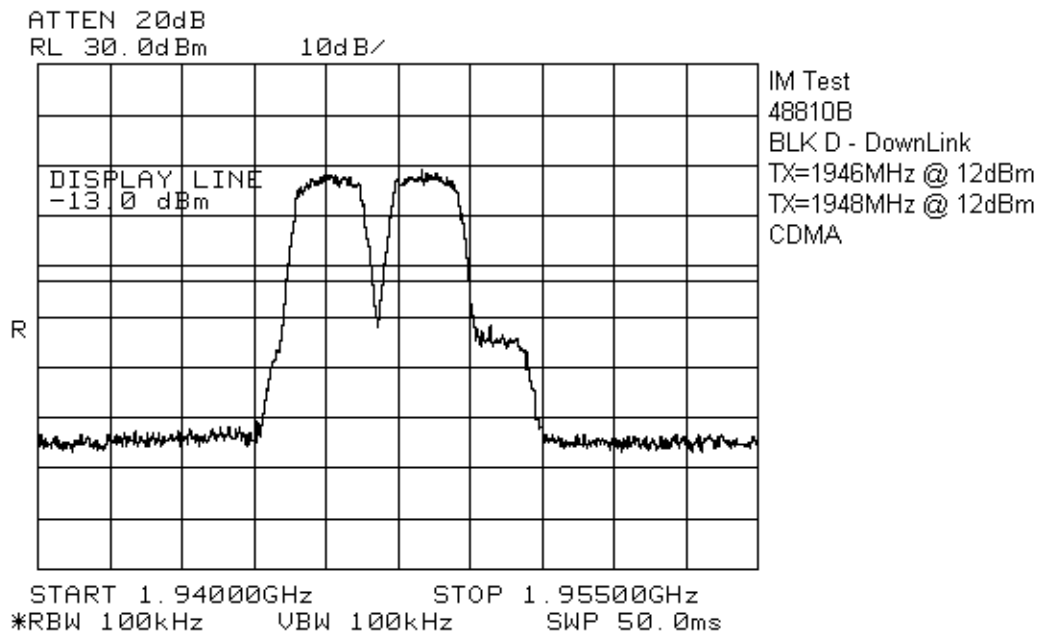
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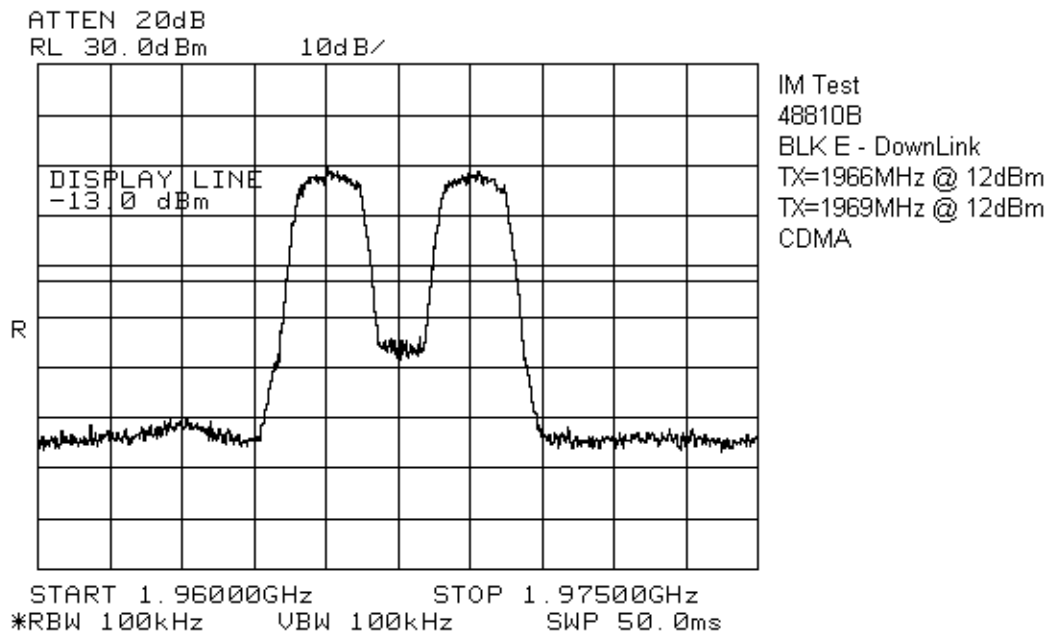
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FCC ID: IWD48810



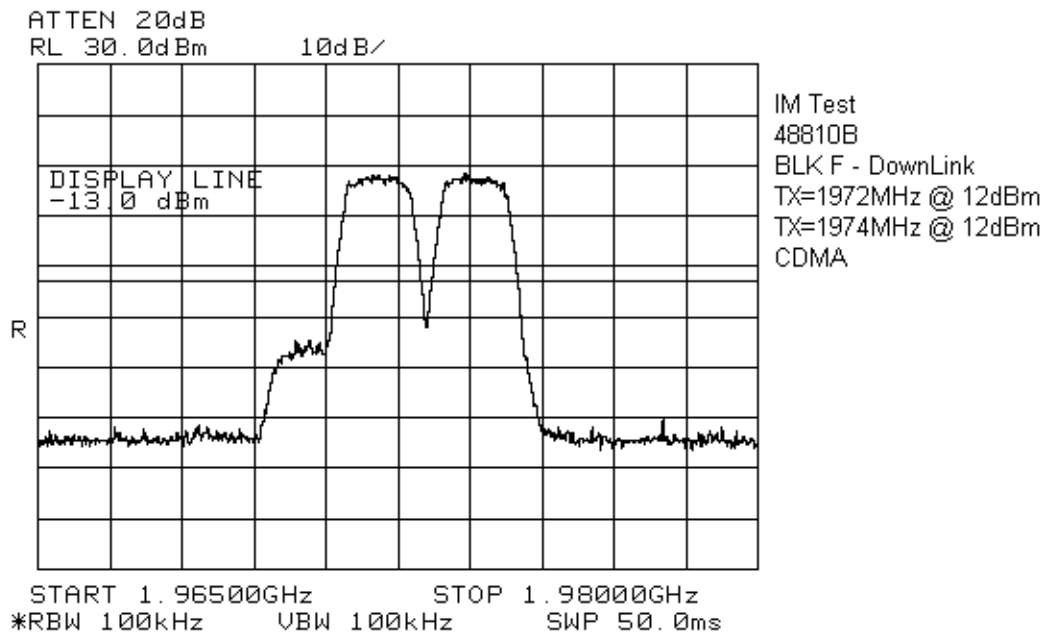
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FCC ID: IWD48810



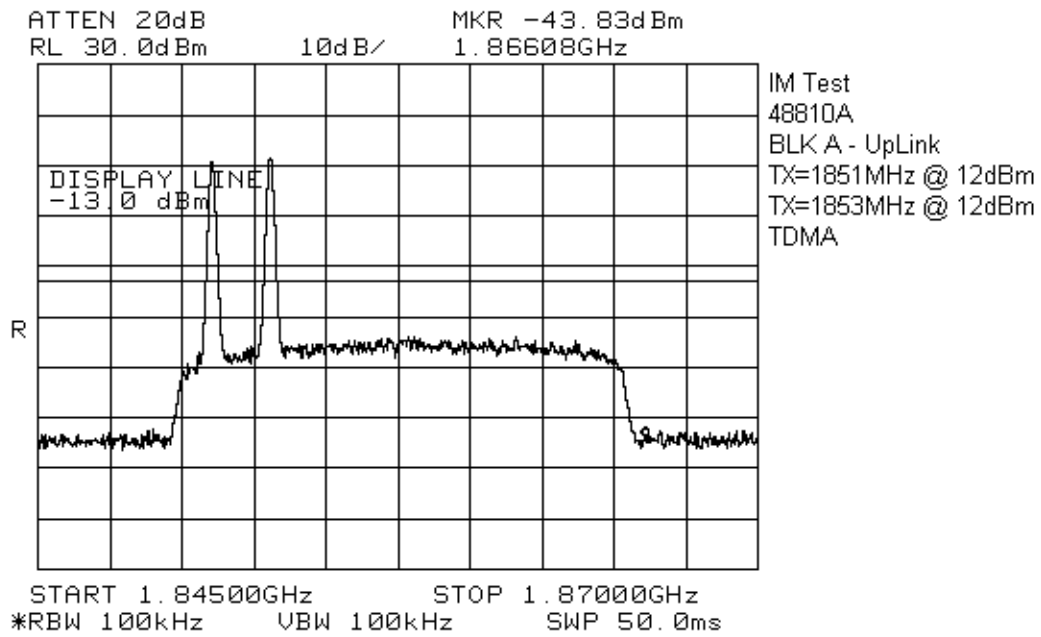
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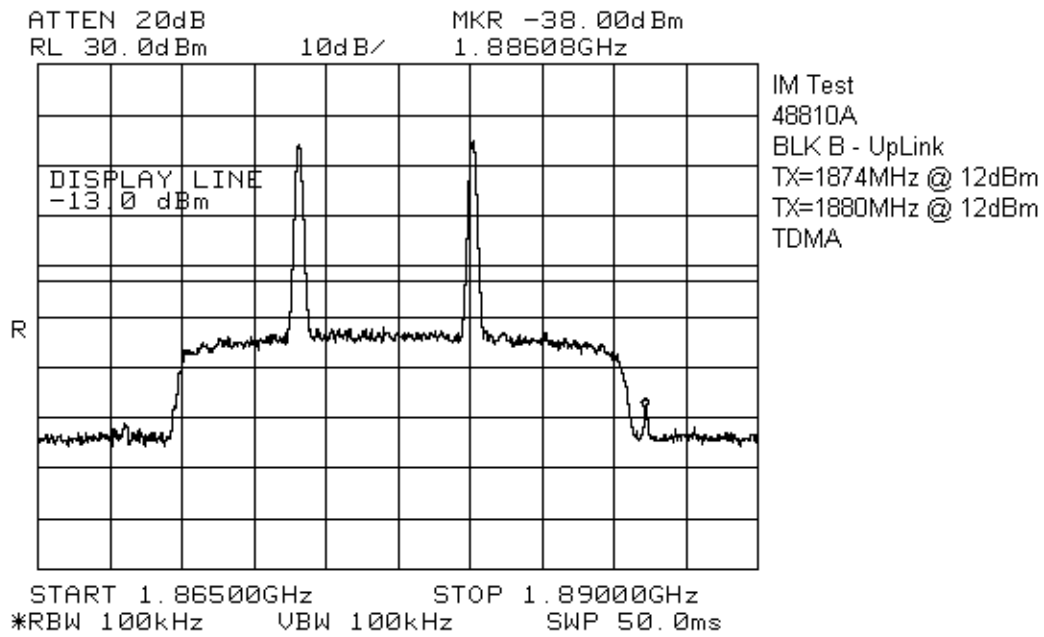
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FCC ID: IWD48810



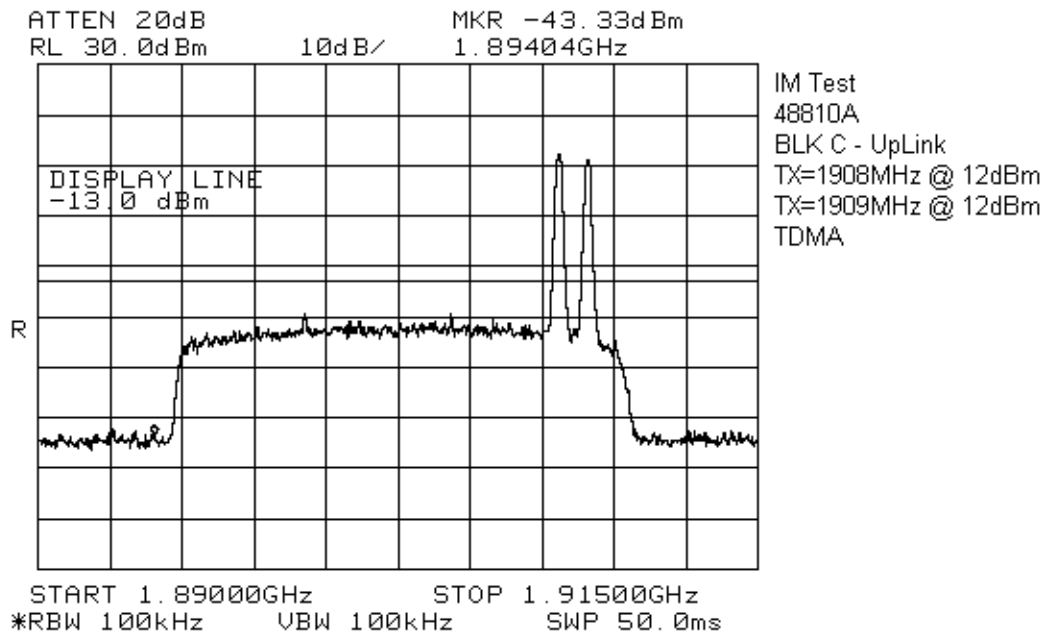
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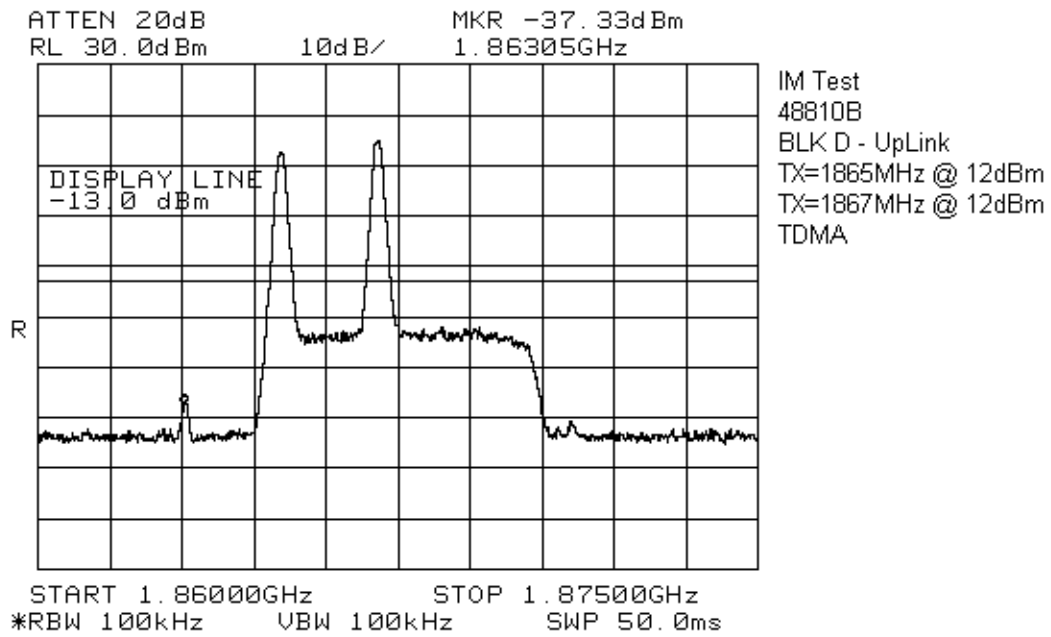
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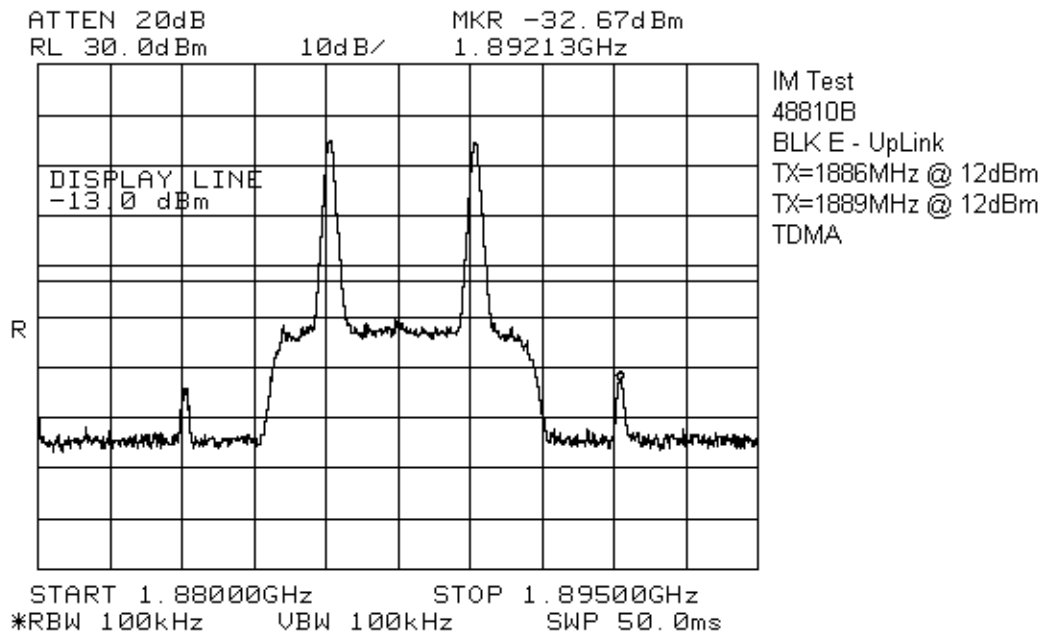
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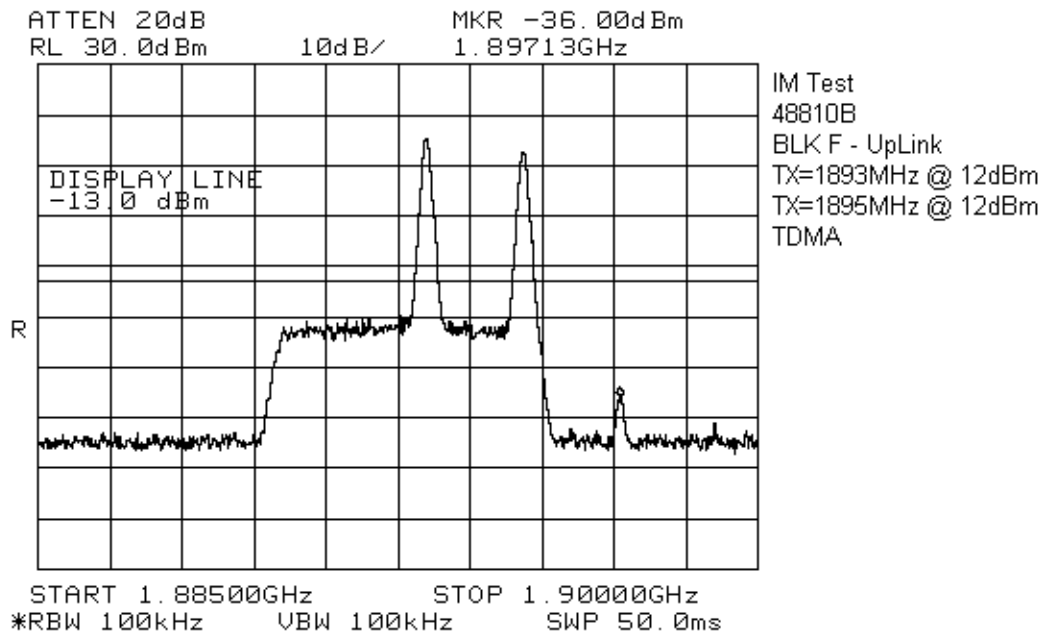
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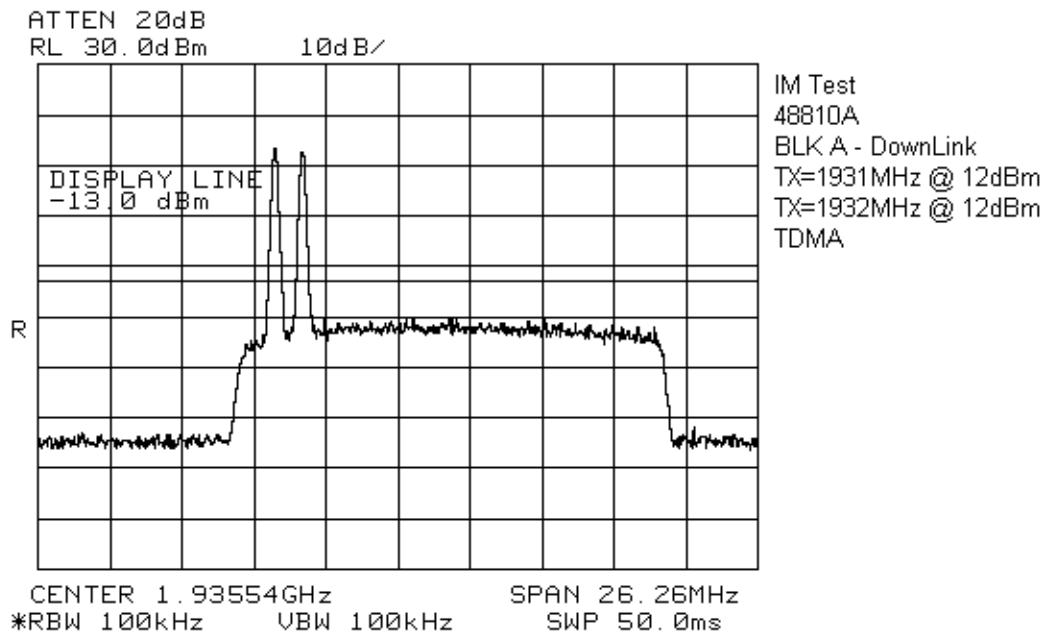
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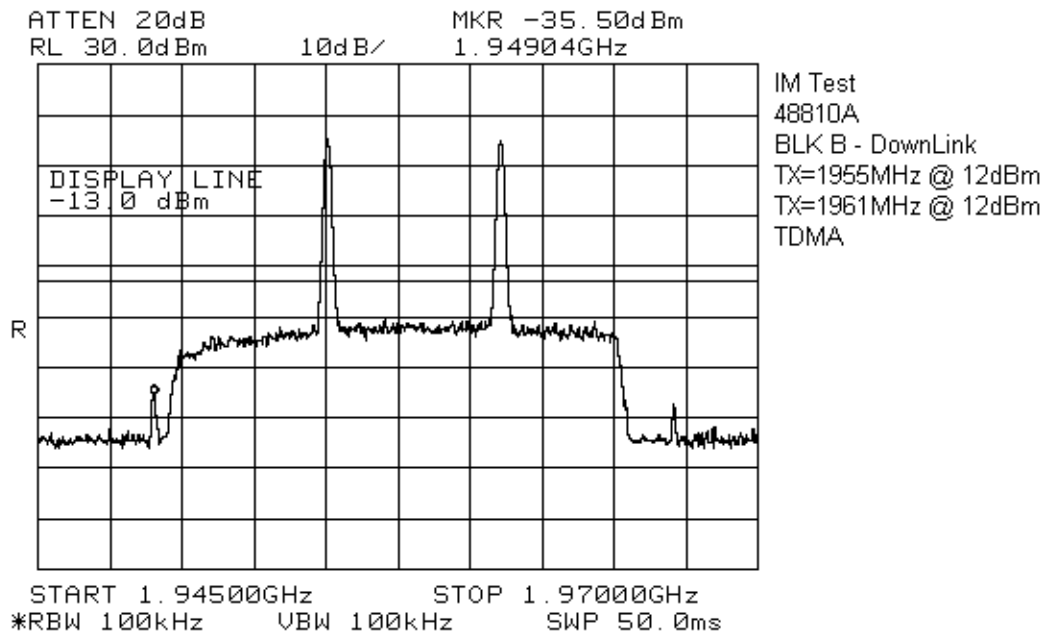
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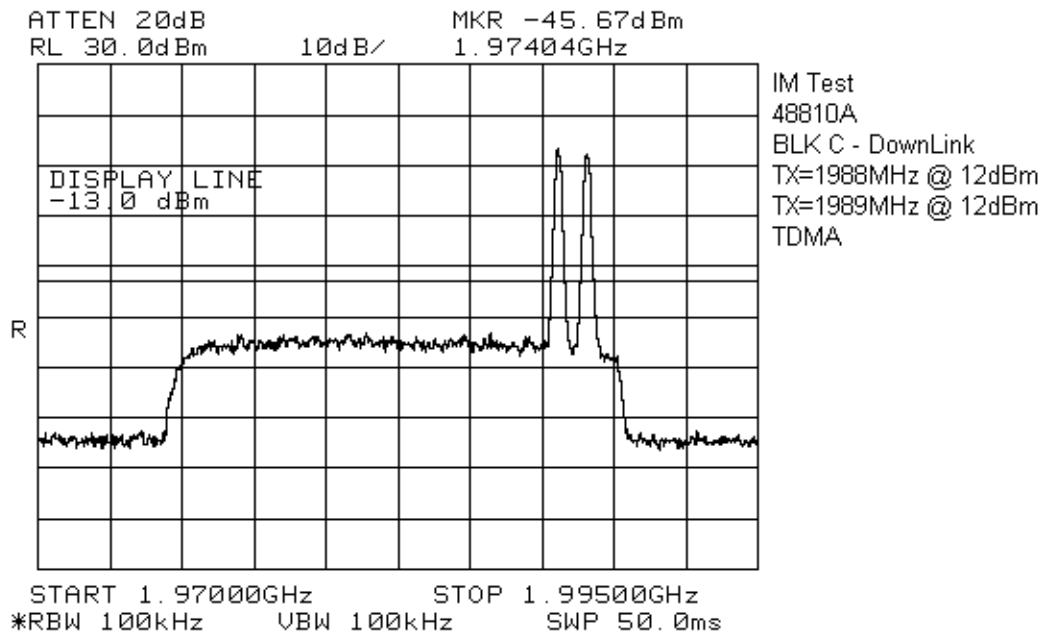
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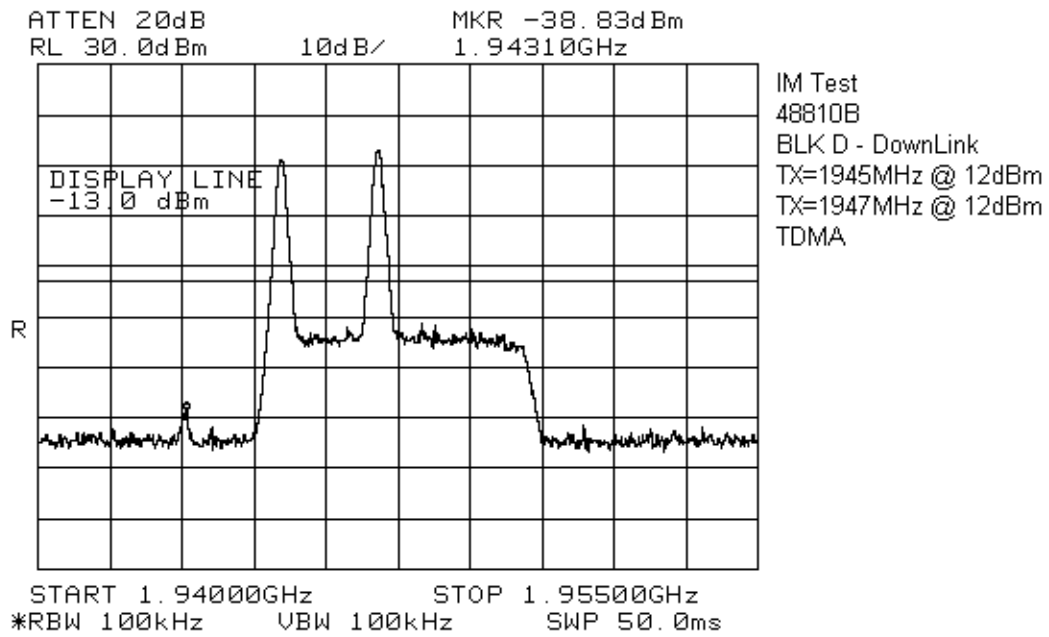
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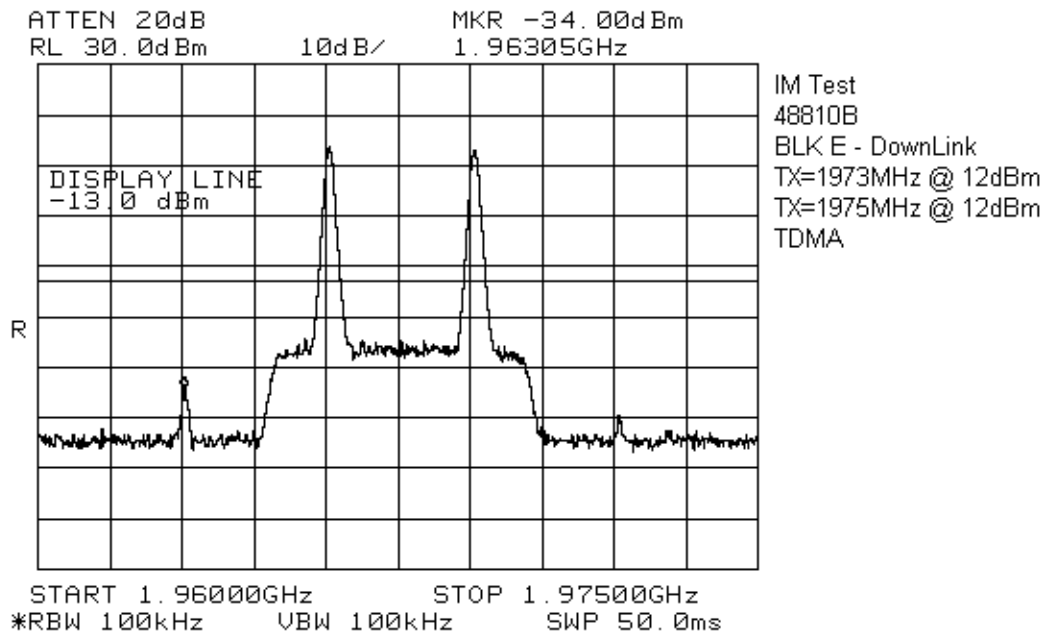
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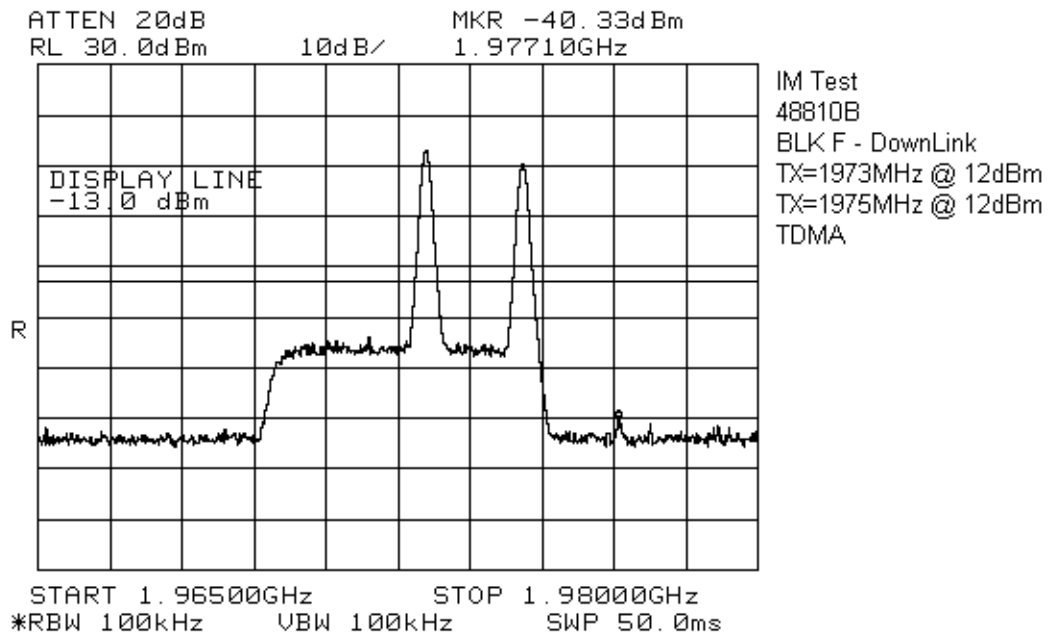
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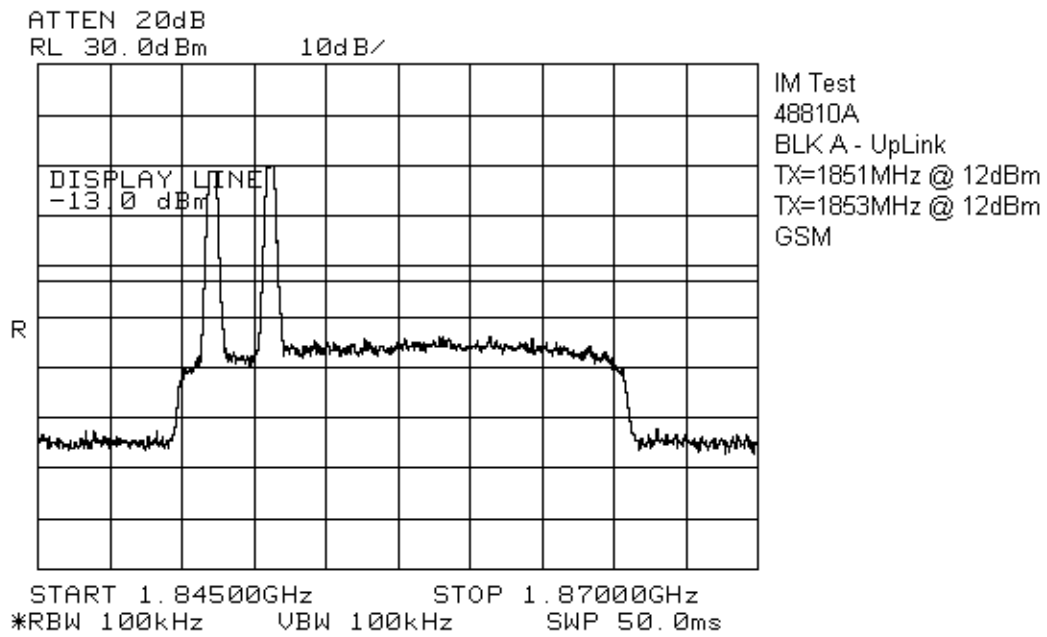
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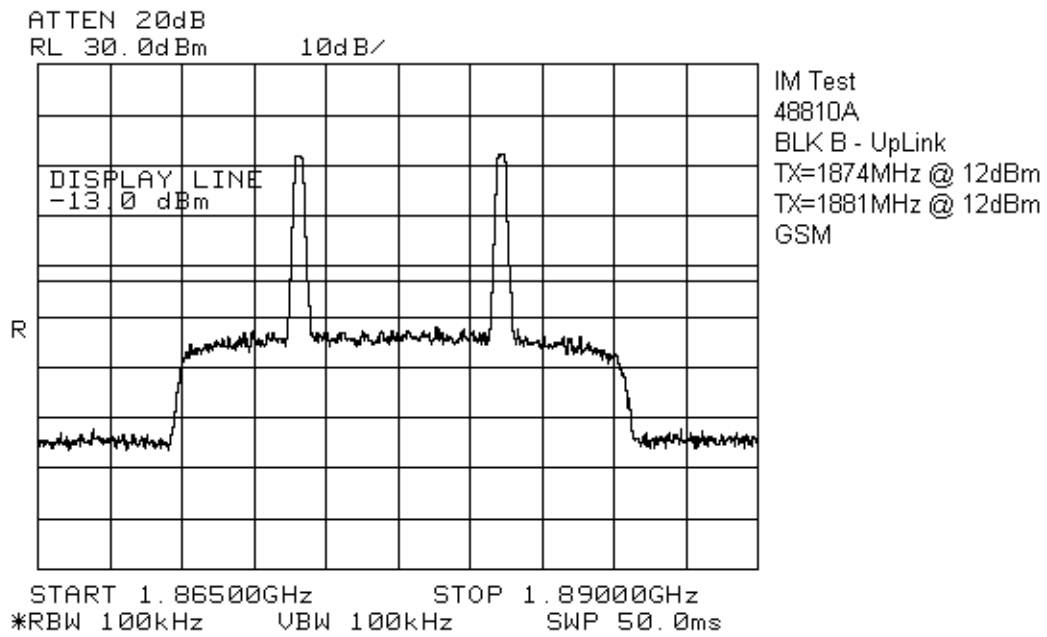
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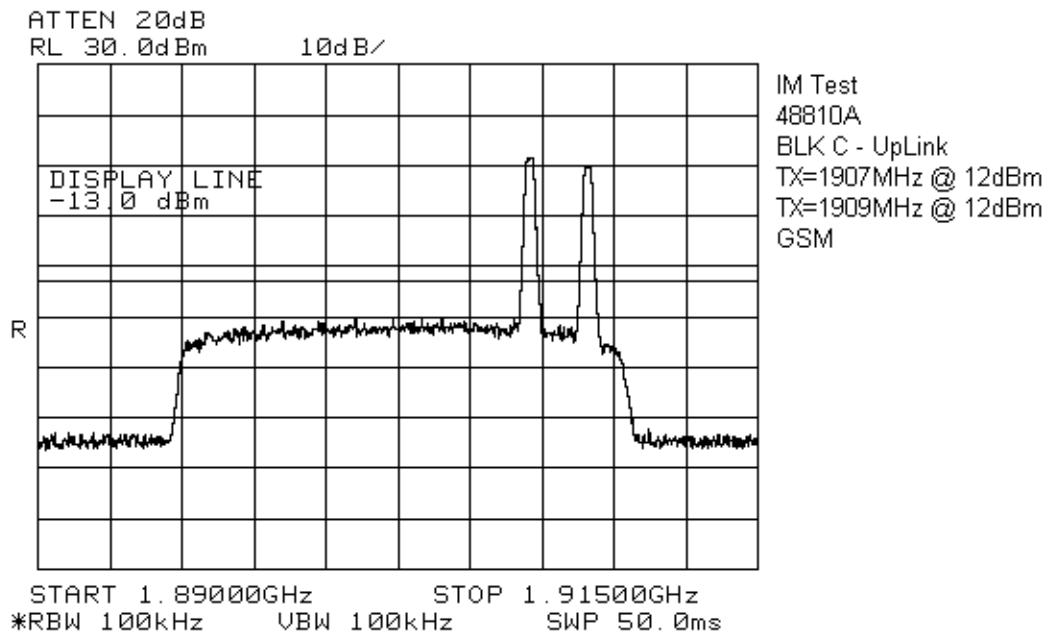
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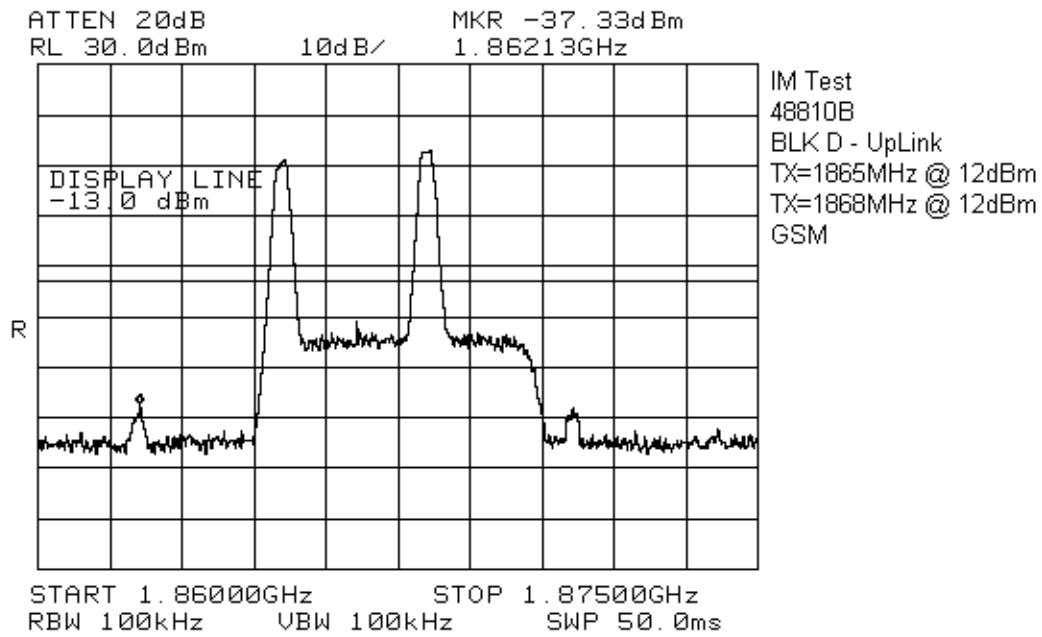
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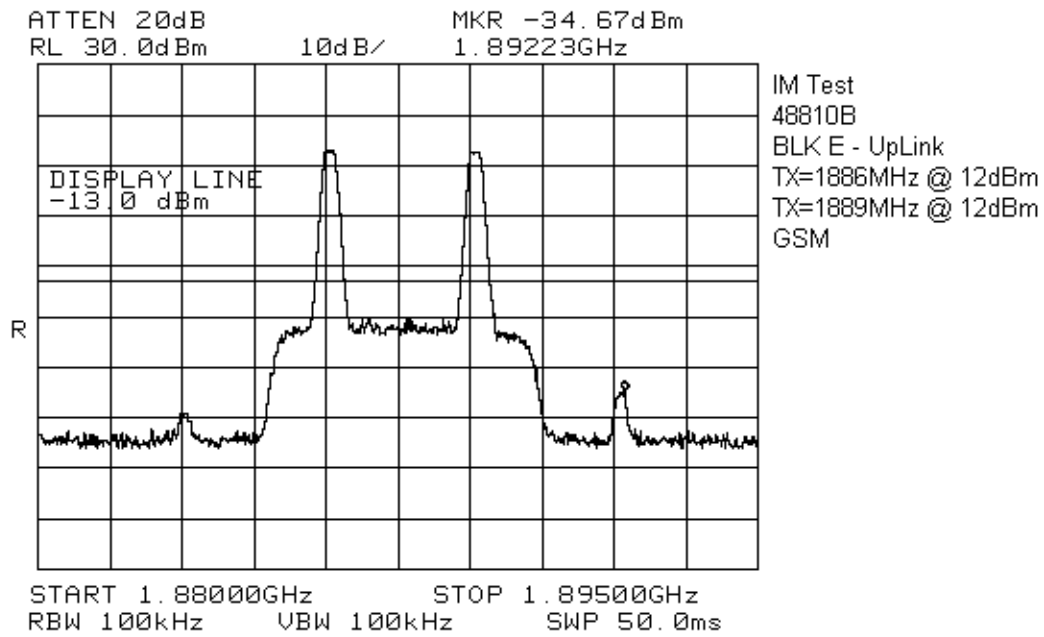
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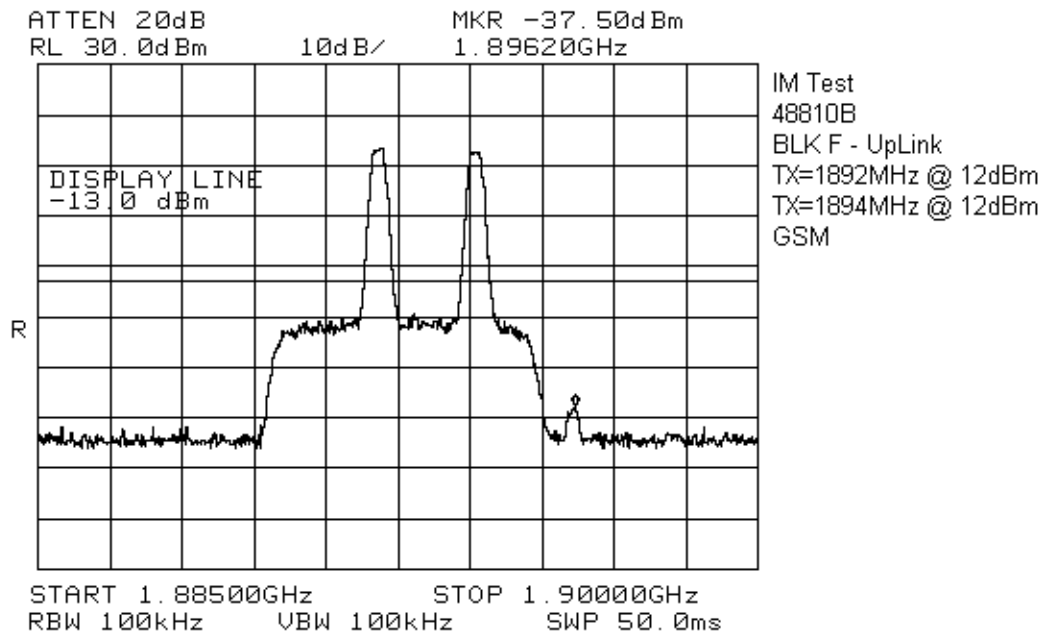
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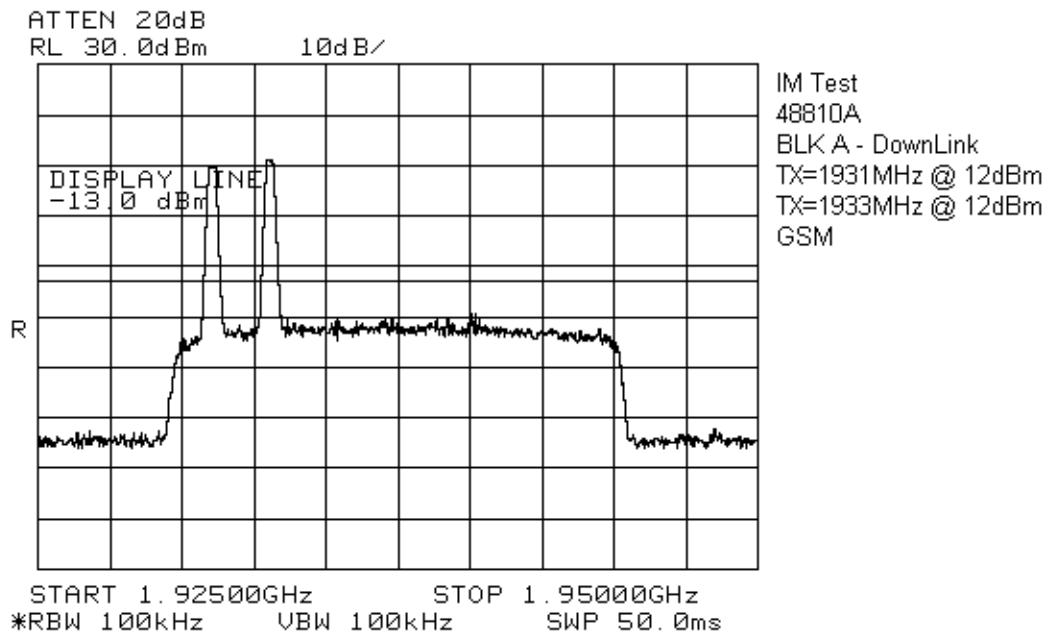
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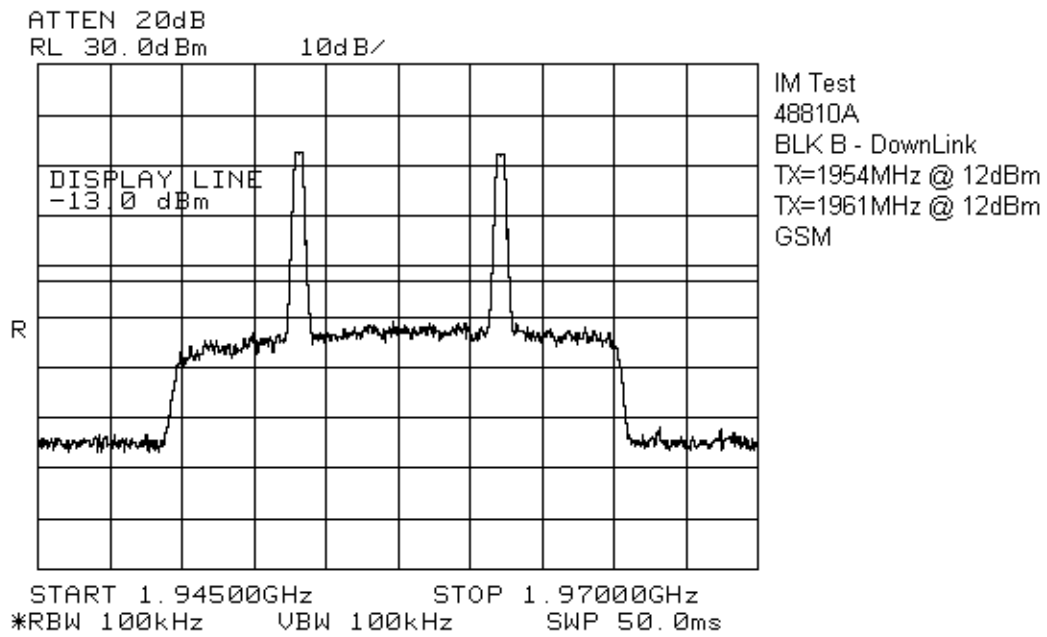
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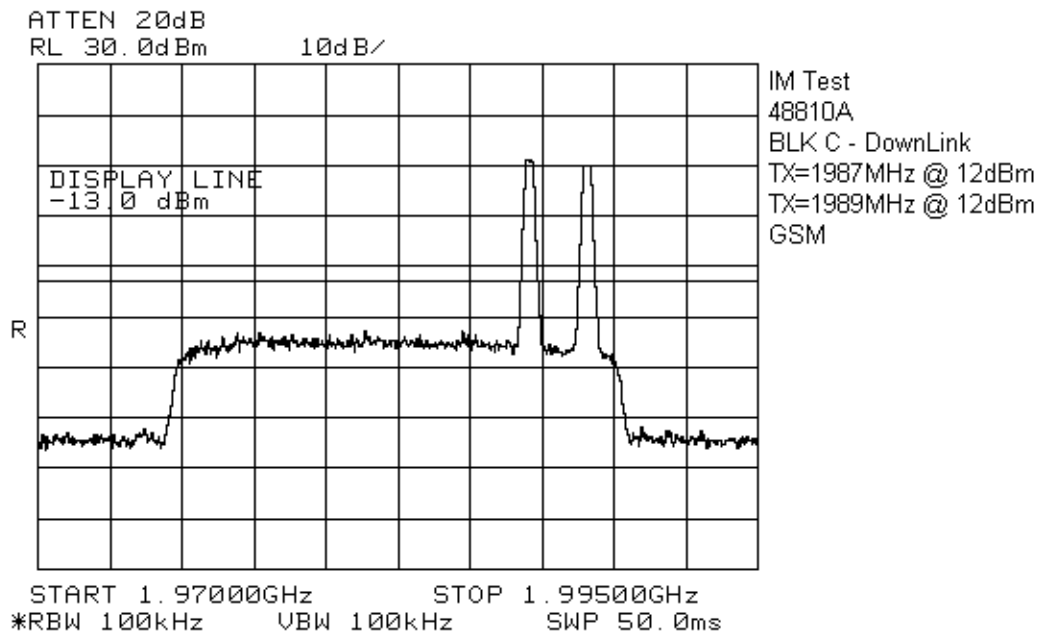
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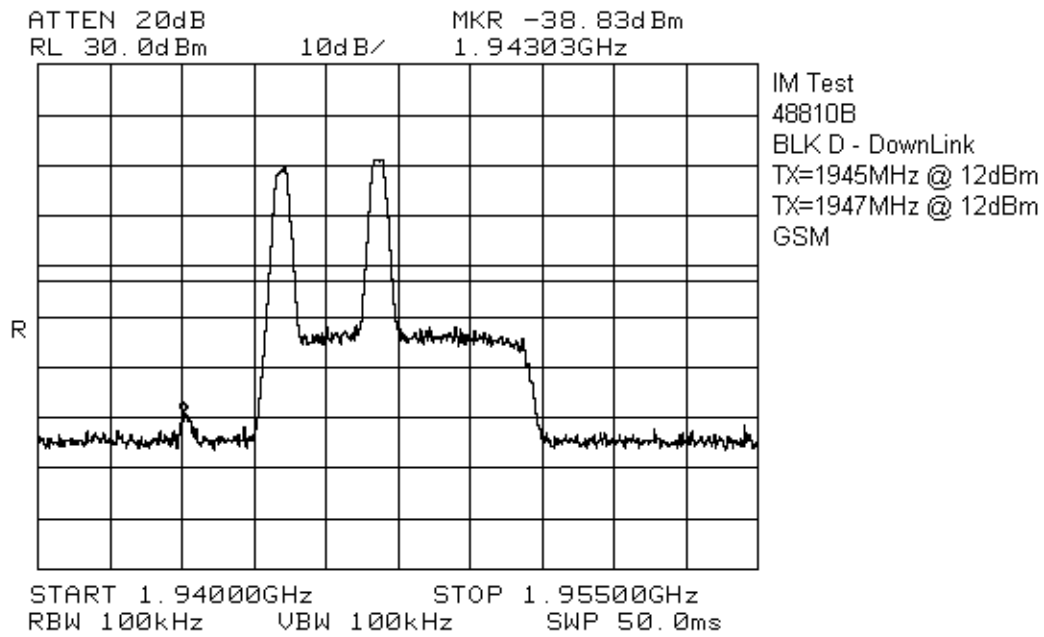
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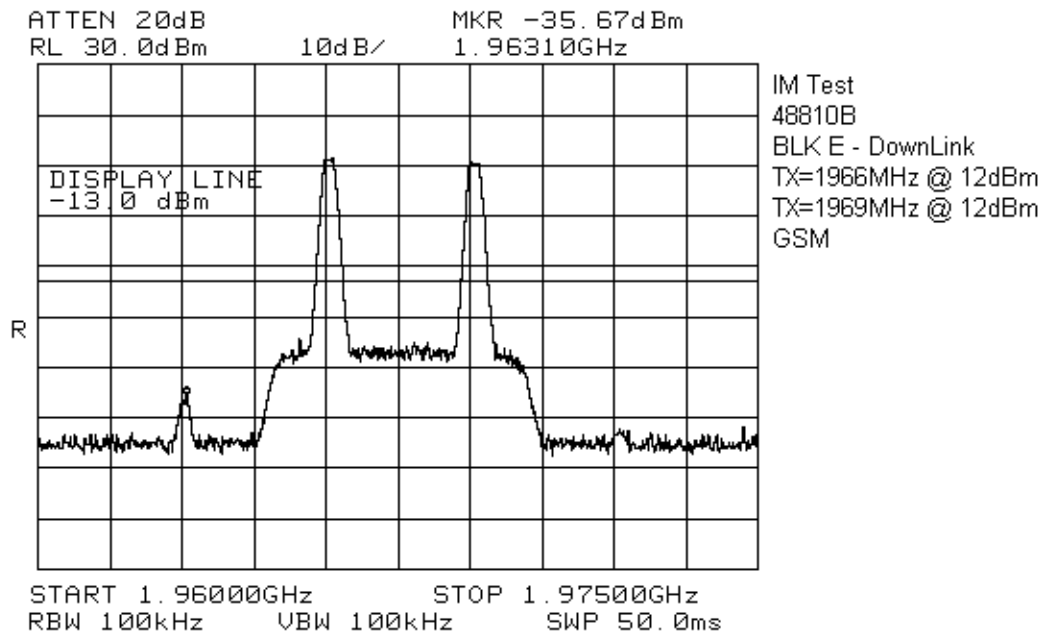
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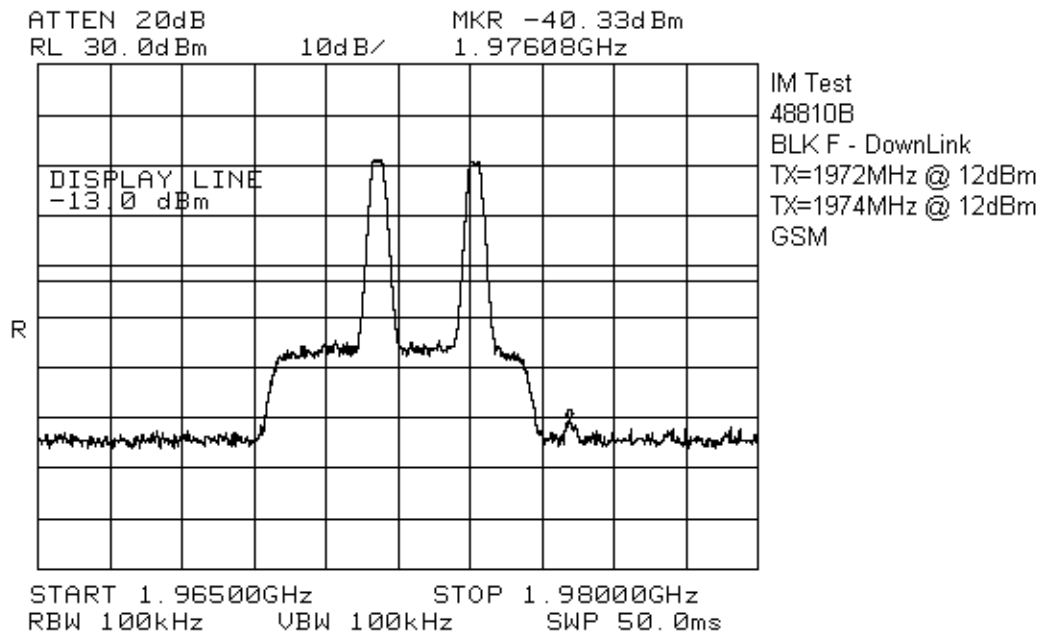
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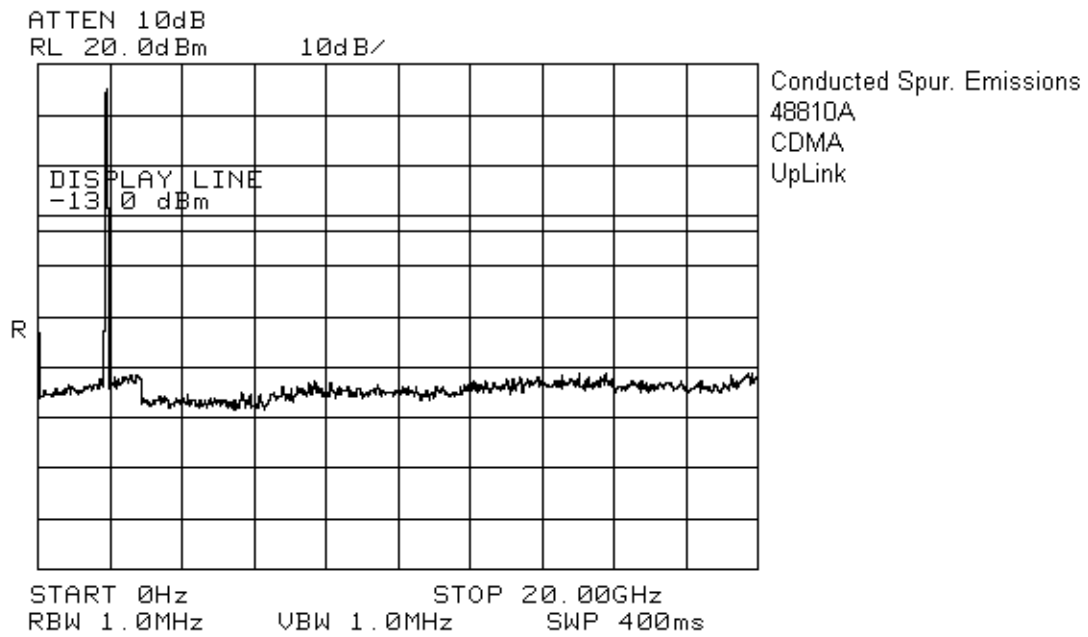
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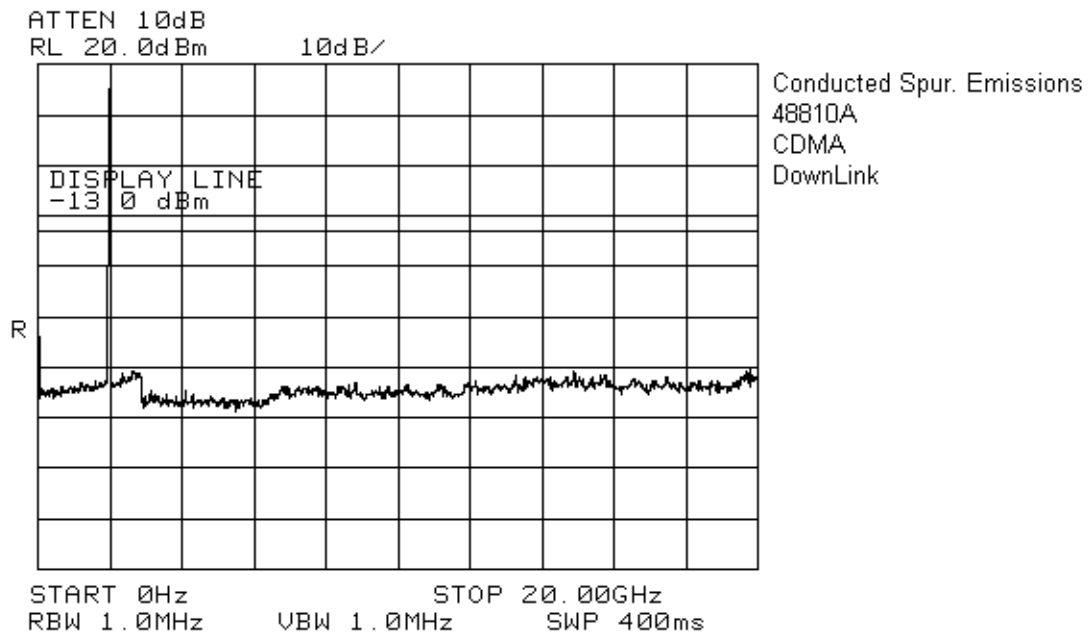
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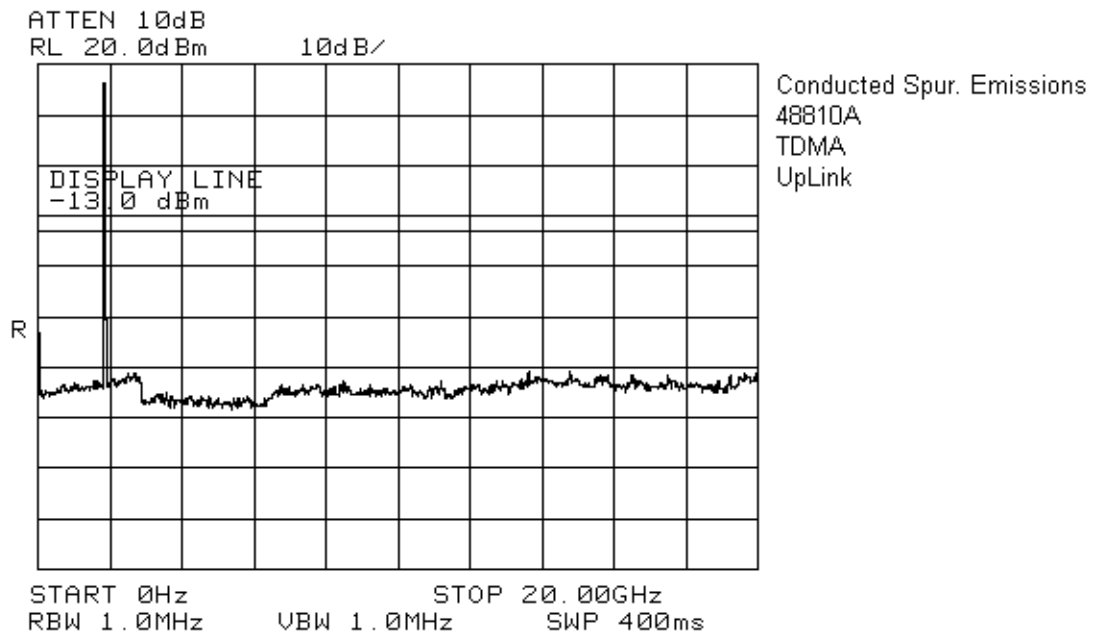
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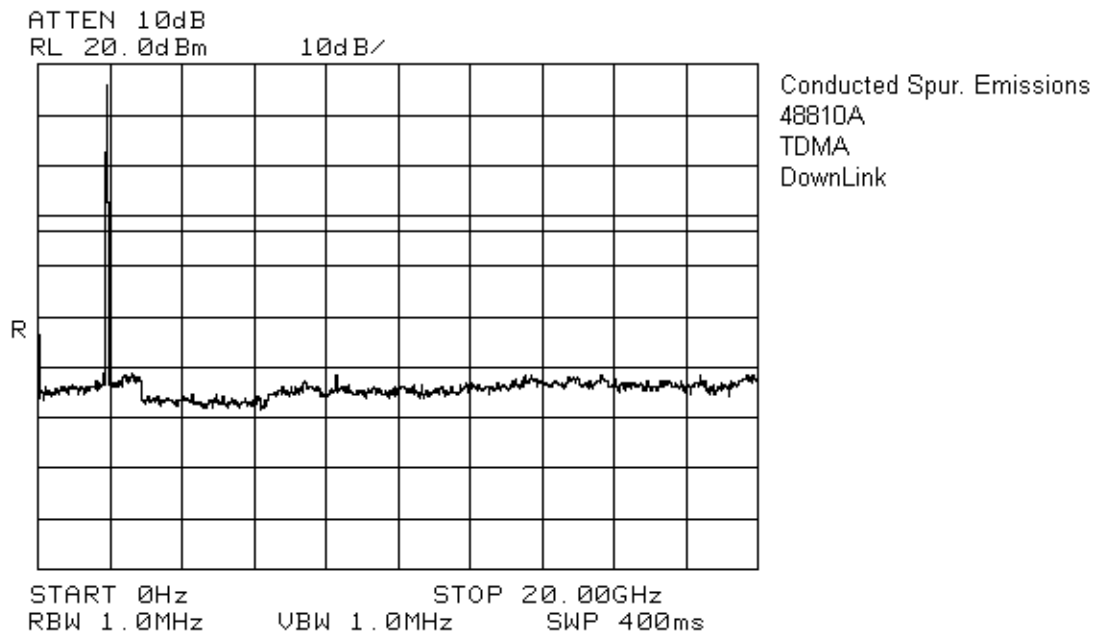
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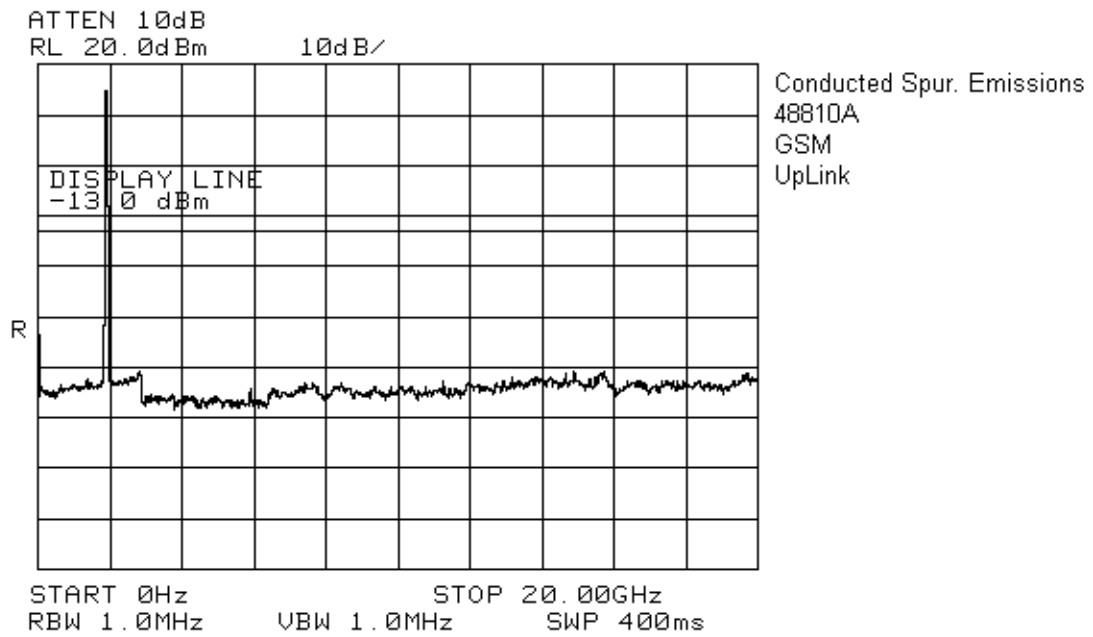
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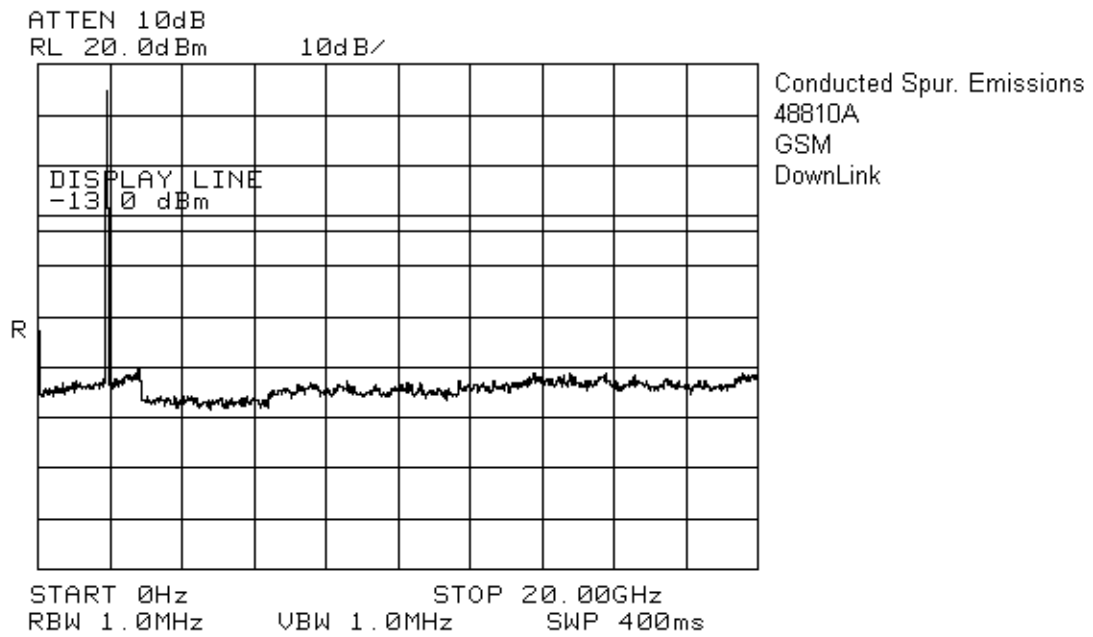
EQUIPMENT: 48810A & 48810B

FCC ID: IWD48810



EQUIPMENT: 48810A & 48810B

FCC ID: IWD48810



EQUIPMENT: 48810A & 48810B

FCC ID: IWD48810

Section 6. Field Strength of Spurious

Para. No.: 2.1053

Test Performed By: Glen Westwell

Date of Test: December 18, 2001
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Minimum Standard: Para. No.: 24.238, -13dBm

Test Results: Complies.

Test Data: 48810A & 48810B

- All emissions up to the 10th harmonic was searched.
- No emissions were detected within 20dB of the emission limit.

EQUIPMENT: 48810A & 48810B

FCC ID: IWD48810

Field Strength of Spurious Photograph

Rear View:



FCC ID: IWD48810

Para. No.: 2.1055

Test Performed By: Glen Westwell

Date of Test: December 19, 2001

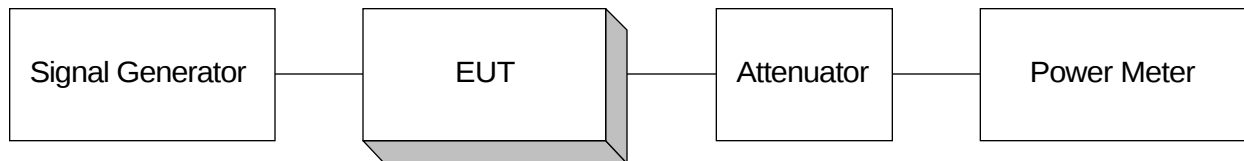
Standard Test Voltage: 12 VAC
-30°C to +50°C
20°C ± 15% Standard Test Voltage

EQUIPMENT: 48810A & 48810B

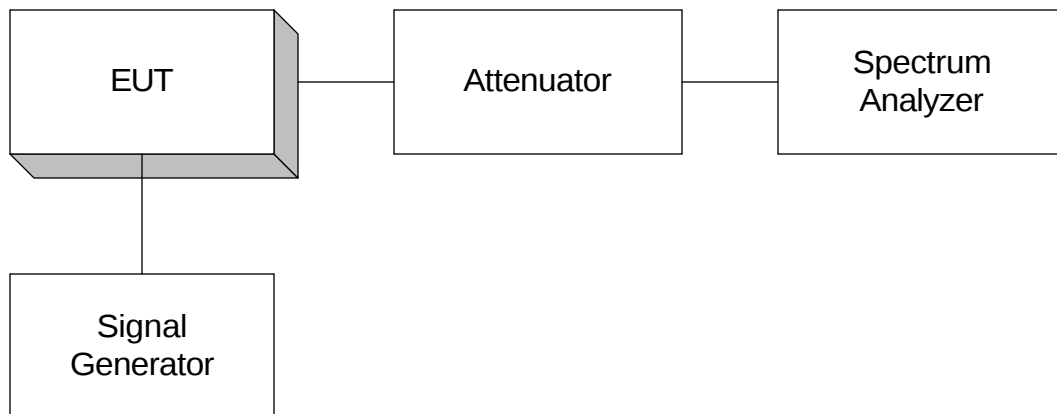
FCC ID: IWD48810

Section 8. Block Diagrams

Para. No. 1046 - R.F. Power Output



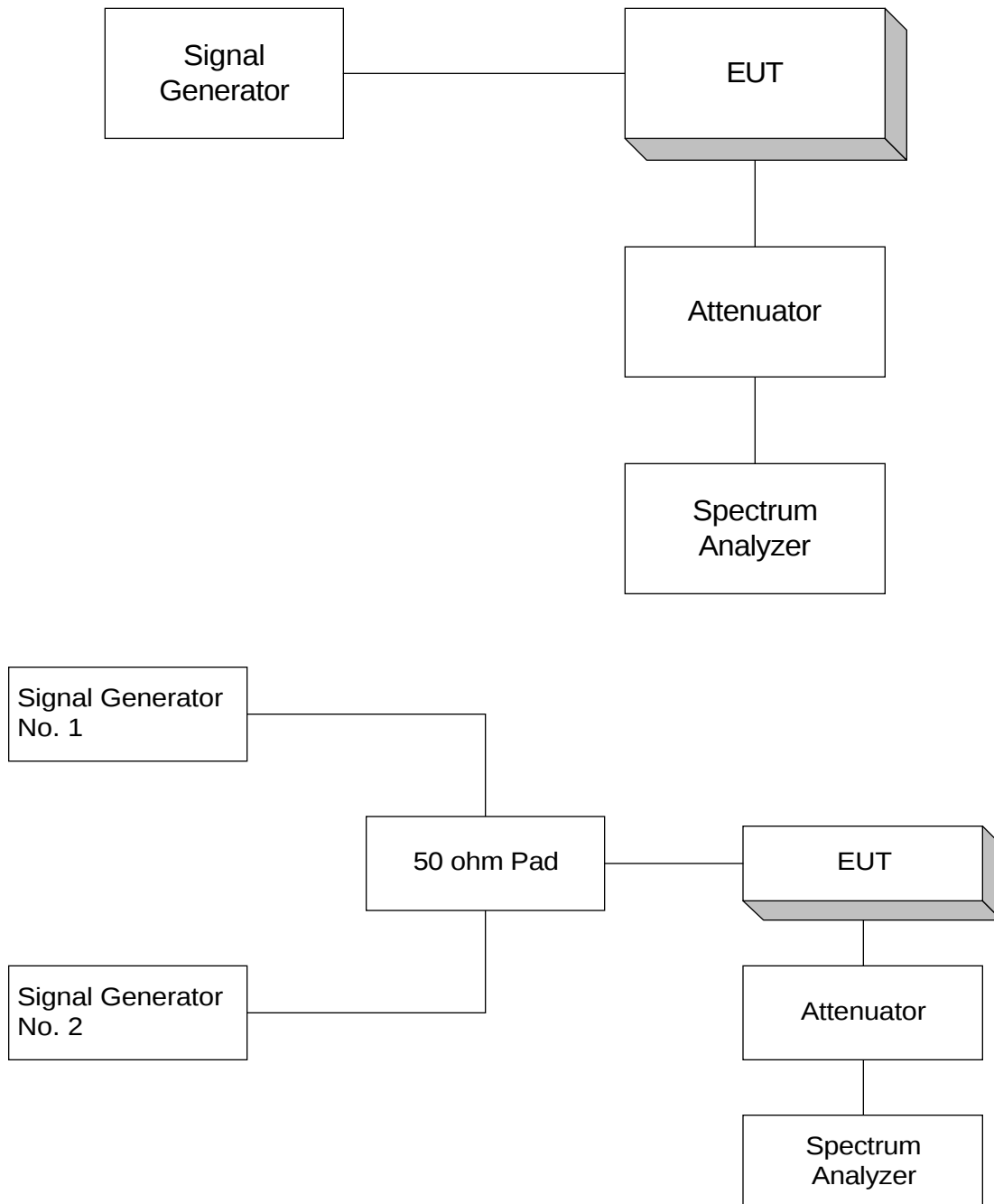
Para. No. 2.1049 - Occupied Bandwidth



EQUIPMENT: 48810A & 48810B

FCC ID: IWD48810

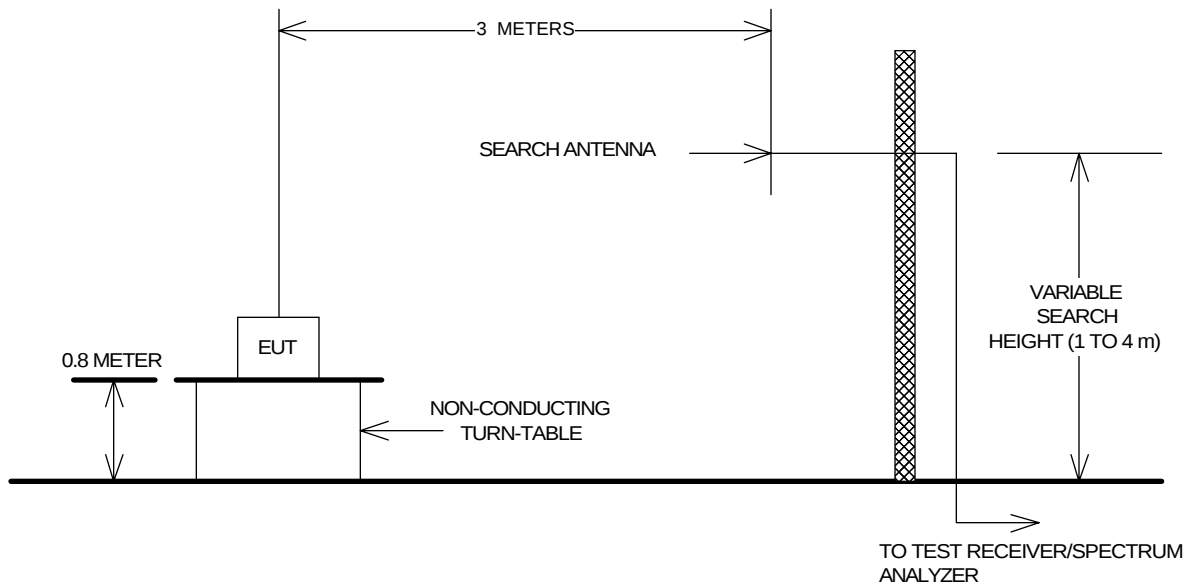
Para. No. 2.1051 - Spurious Emissions at Antenna Terminals



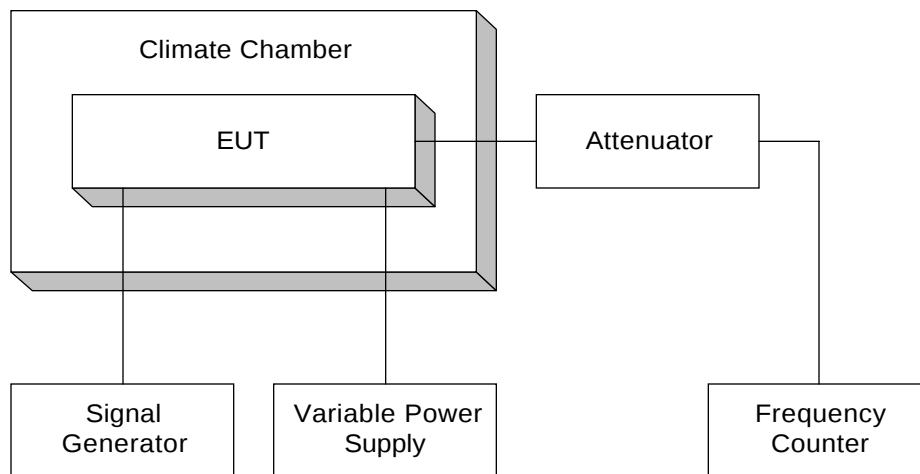
EQUIPMENT: 48810A & 48810B

FCC ID: IWD48810

Para. No. 2.1053 - Field Strength of Spurious Radiation



Para. No. 2.1055 - Frequency Stability



*EQUIPMENT: 48810A & 48810B**FCC ID: IWD48810*

Section 9. Test Equipment List

CAL CYCLE	EQUIPMENT	MANUFACTURER	MODEL	SERIAL	LAST CAL.	NEXT CAL.
1 Year	Spectrum Analyzer	Hewlett Packard	8565E	FA000981	June 08/01	June 08/02
1 Year	Climate Chamber	Thermotron	SM-16C	15649-S	COU	COU
1 Year	Attenuator	Narda	769-20	4153	COU	COU
1 Year	Horn Antenna	EMCO #2	3115	4336	Dec. 1/01	Dec. 1/02
3 Year	Signal Generator	Rohde & Schwarz	SM1Q03	DE22004	Sept. 18/00	Sept. 18/03
3 Year	Signal Generator	Rohde & Schwarz	SM1Q03E	DE24154	Oct. 04/99	Oct. 04/02
1 Year	RF AMP	JCA	2-4 GHz	FA001496	COU	COU
1 Year	RF AMP	JCA	1-2 GHz	FA001498	COU	COU
1 Year	RF AMP	JCA	4-8 GHz	FA001497	COU	COU
1Year	Frequency Counter	Hewlett Packard	HP5350A	2444A00135	May 7/00	Feb. 4/02
1 Year	Power Meter	Hewlett Packard	E4418B	FA001413	Jan. 16/01	Jan. 16/02
1 Year	Power Sensor	Hewlett Packard	8487A	FA001419	Jan. 27/01	Jan 27/02

NA: Not Applicable
NCR: No Cal Required
COU: CAL On Use