



Test Report: 2W06184.3

Applicant: Spotwave Wireless Inc.
1 Hines Road
Ottawa, Ontario
K2K 3C7

**Equipment Under Test:
(EUT)** SpotCell 100 Subscriber Unit (CU)
Low Power Cellular Band Repeater

In Accordance With: FCC Part 22, Subpart H

FCC ID. : P3YSPOTCELL0004

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

Authorized By:

A handwritten signature in blue ink, appearing to read 'John Harrington', written over a light blue circular stamp.

J. Harrington, RF Group Manager

Date: 11 July 2002

Total Number of Pages: 43

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EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater

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 22, Subpart H.



New Submission



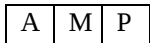
Production Unit



Class II Permissive Change



Pre-Production Unit



Equipment Code

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: 11 July 2002

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: SpotCell 100, Low Power Cellular Band Repeater

Summary Of Test Data

Name Of Test	Para. No.	Result
RF Power Output	2.1046	Complies
Audio Frequency Response	2.1047	N/A
Audio Low-Pass Filter Response	2.1047	N/A
Modulation Limiting	2.1047	N/A
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
Transient Frequency Behavior	—	N/A

Test Conditions:

Indoor Temperature: 22 °C
 Humidity: 31 %

Outdoor Temperature: 10 °C
 Humidity: 38 %

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Section 2. General Equipment Specification

Manufacturer:	Spotwave Wireless Inc.
Model No.:	SpotCell 100
Serial No.:	DDU S/N SPO-100000000001 CU "A" S/N SPO-020001500006 CU "B" S/N SPO-020001510010
Date Received In Laboratory:	June 5, 2002
Nemko Identification No.:	DDU #5 CU "A" #7 CU "B" #1
Supply Input Voltage:	120 VAC
Frequency Range:	Downlink (CU TX): 869 – 894 MHz Uplink (DU TX): 824 – 849 MHz
RF Output (Rated):	Downlink (CU): 7dBm Uplink (DU): 20 dBm
Antenna Gain (Integral):	CU (Downlink) = 3dBi DU (Uplink) = 10dBi
Emission Designator:	CDMA DXW TDMA F9W AMPS F8W

Section 3. RF Power Output

Para. No.: 2.1046

Test Performed By: Glen Westwell	Date of Test: 20 June, 2002
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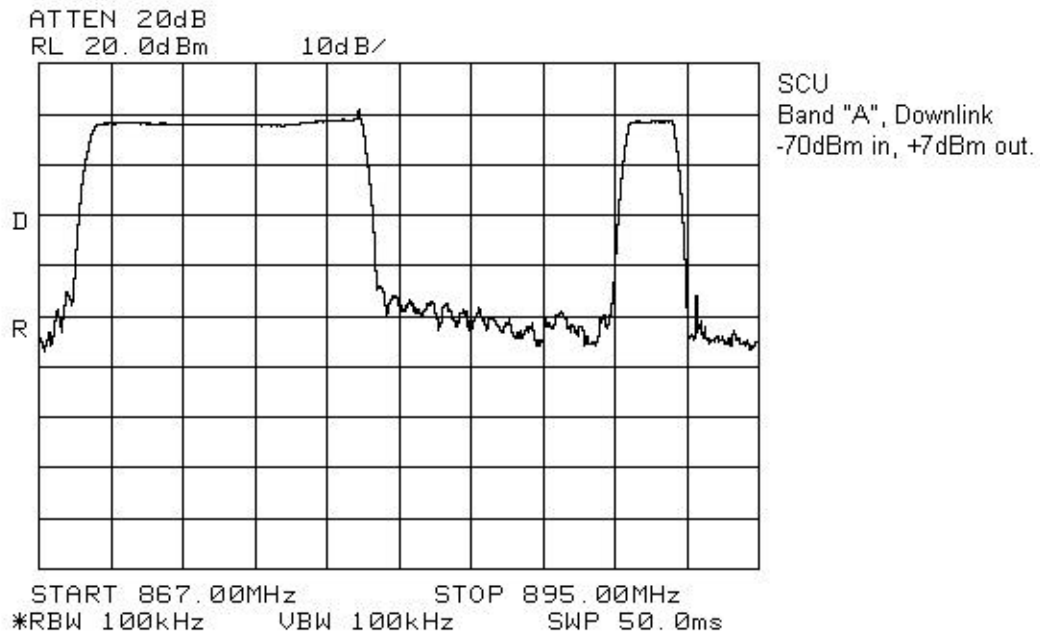
Minimum Standard: 22.913(a)

Test Results: Complies.

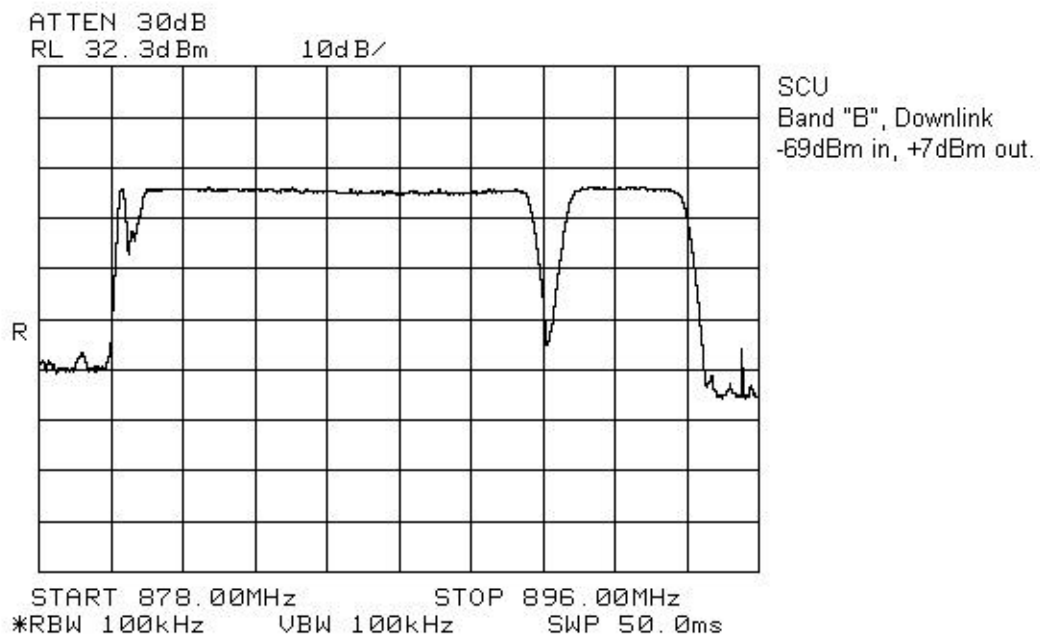
The maximum RF output power is within ± 1 dB of the manufacturer's rating. The RF output power is de-rated according to the number of channels via AGE and is equal to $P_{max} - 10\log N$.

P_{max} = Maximum RF Output Power
N = Number Of Channels

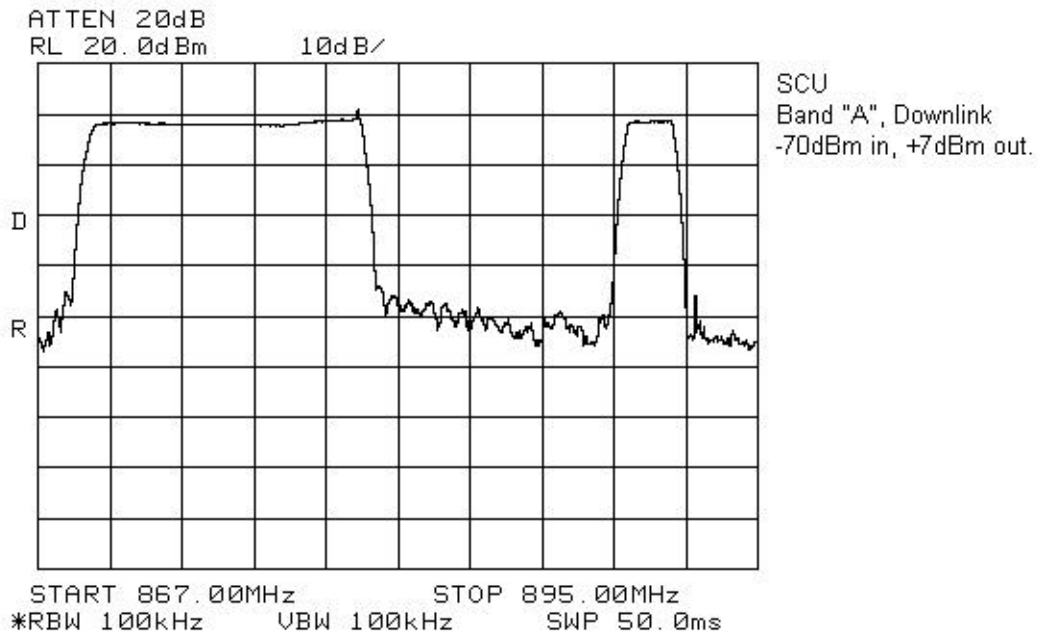
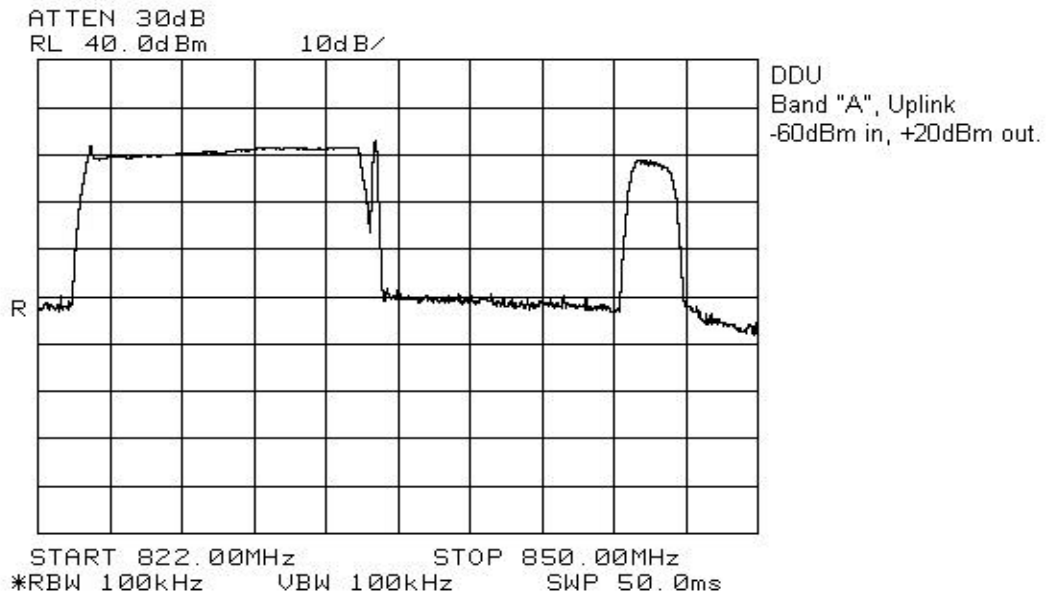
EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



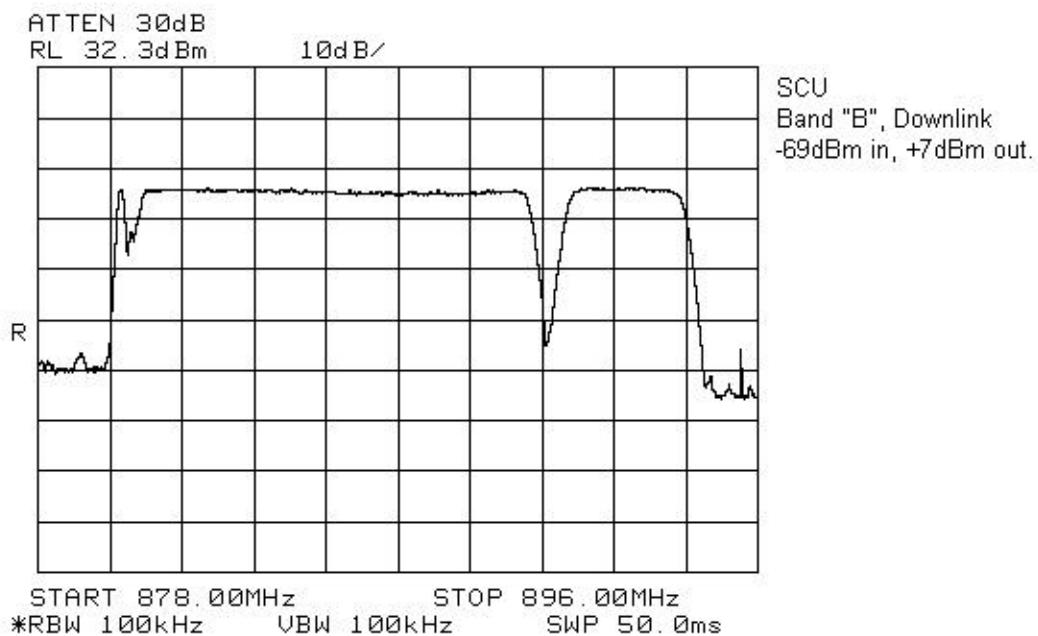
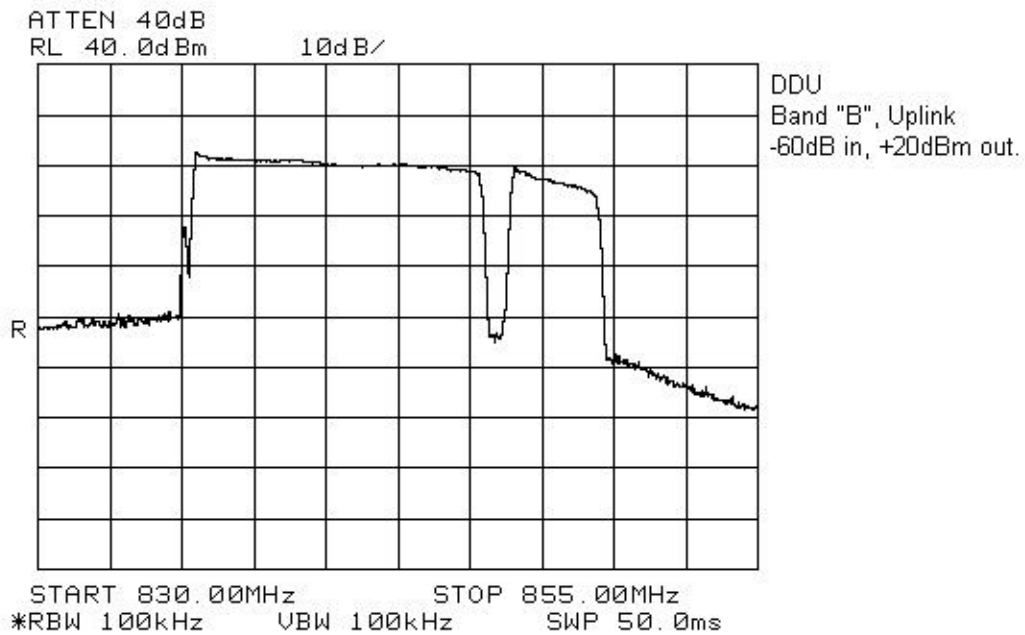
EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



Section 4. Occupied Bandwidth

Para. No.: 2.1049

Test Performed By: Glen Westwell	Date of Test: 20 June, 2002
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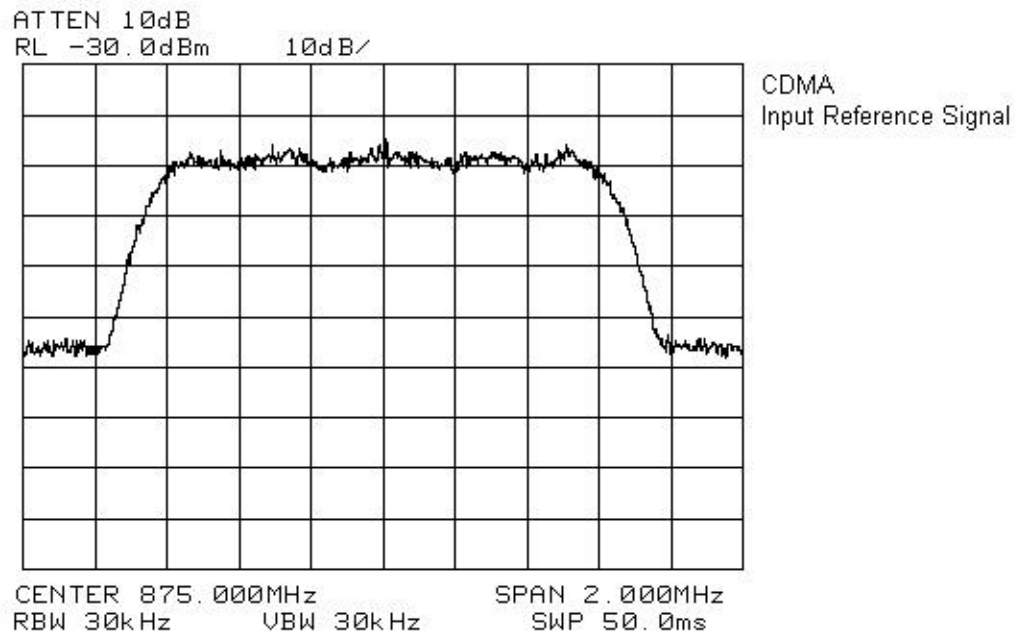
Minimum Standard: 22.917

Test Results: Complies.

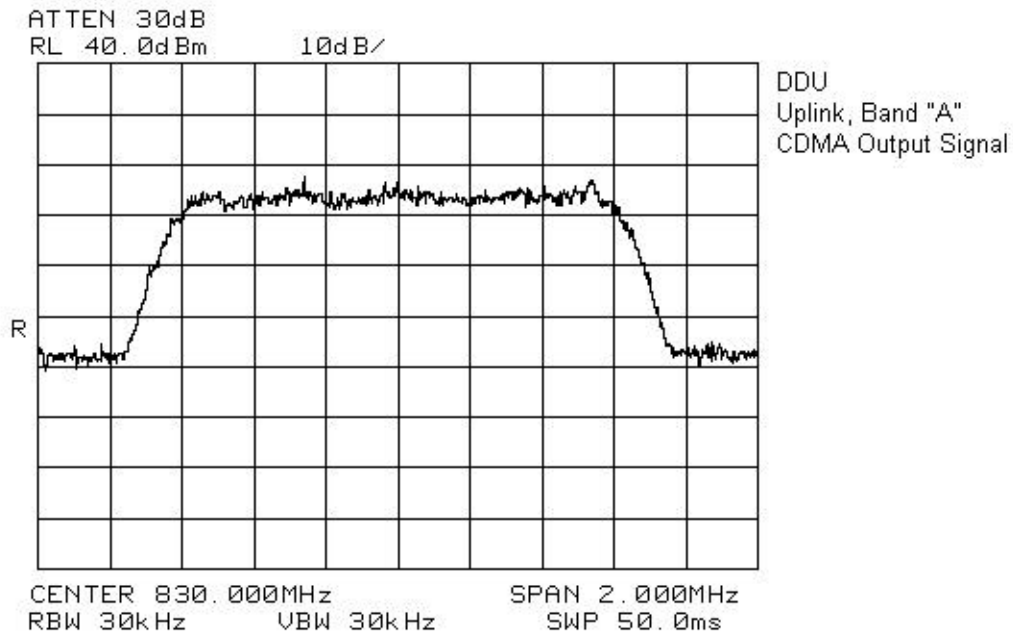
Measurement Data: See attached graphs.

The occupied bandwidth was measured by comparison of input to the output signal. This was done in order to determine if there was any degradation to the output signal due to the amplification through the repeater.

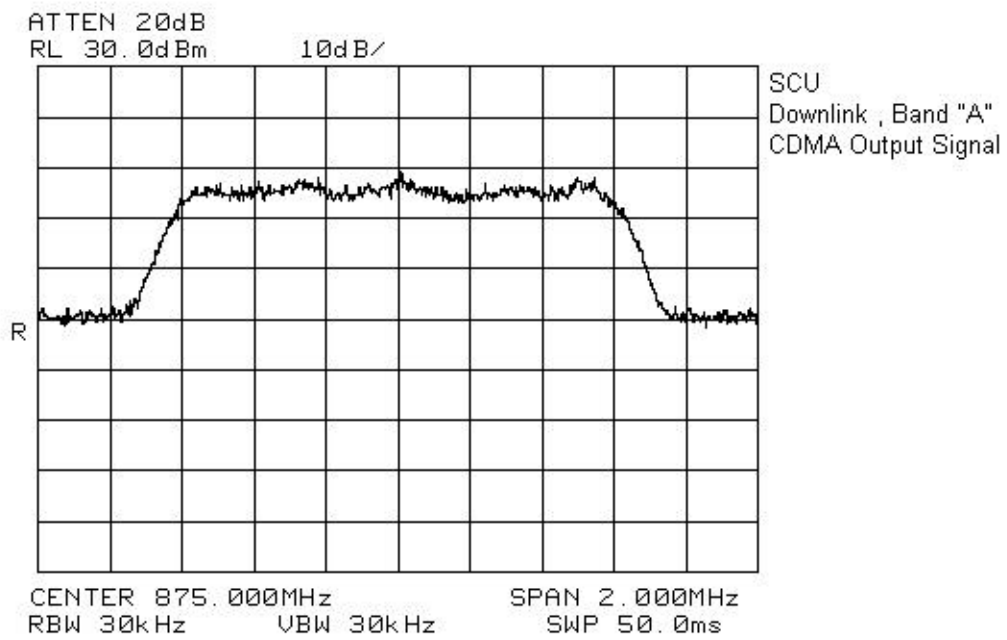
EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



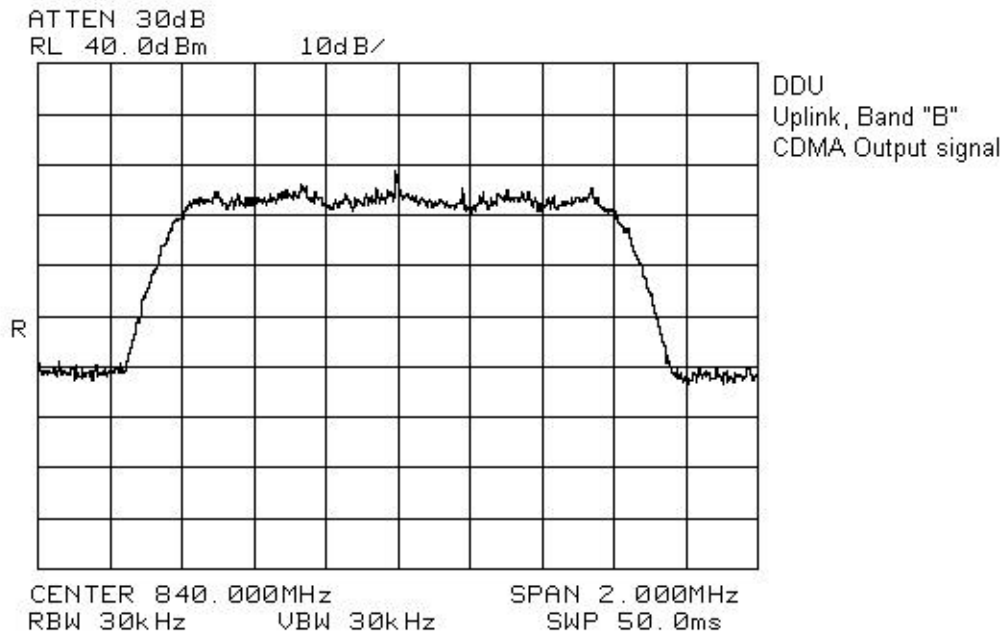
EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



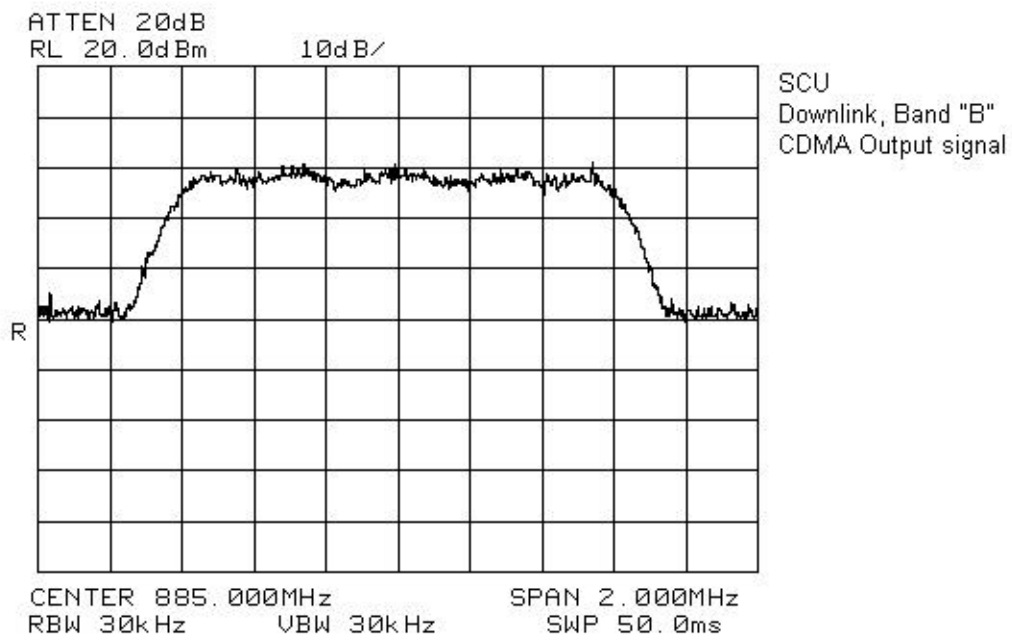
EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



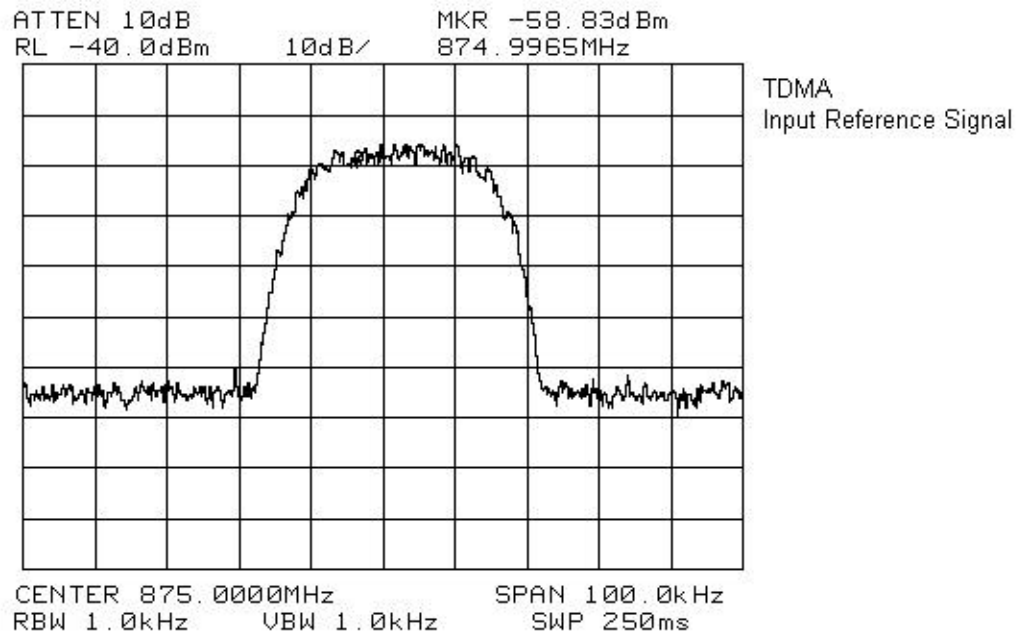
EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



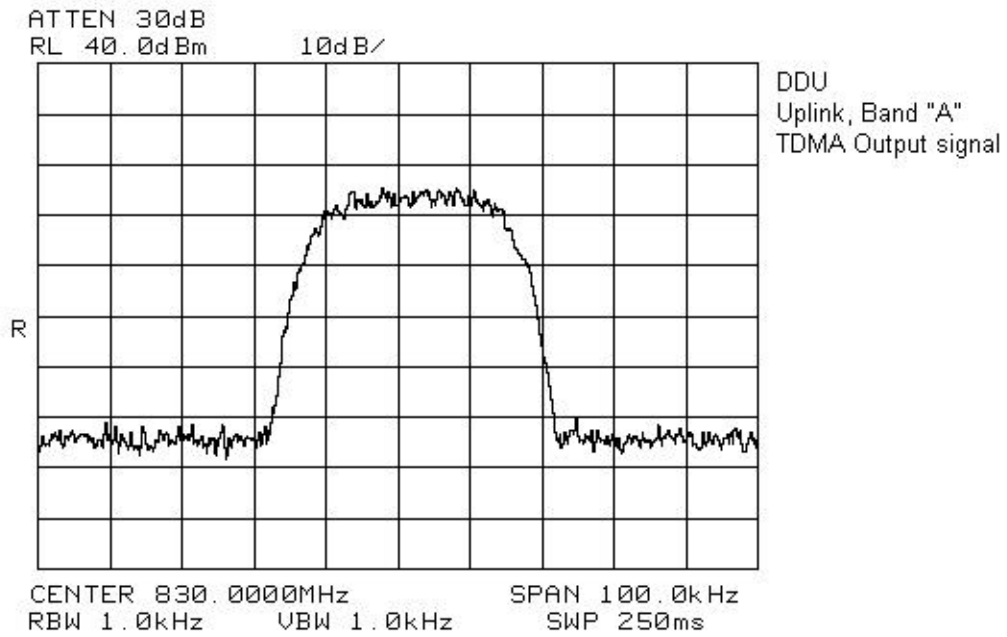
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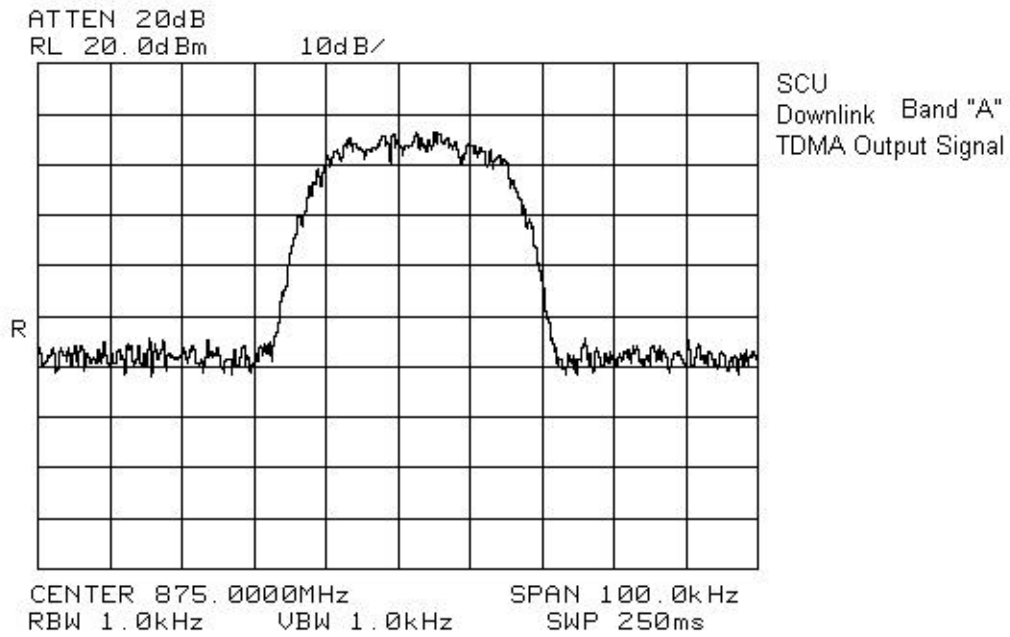
EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



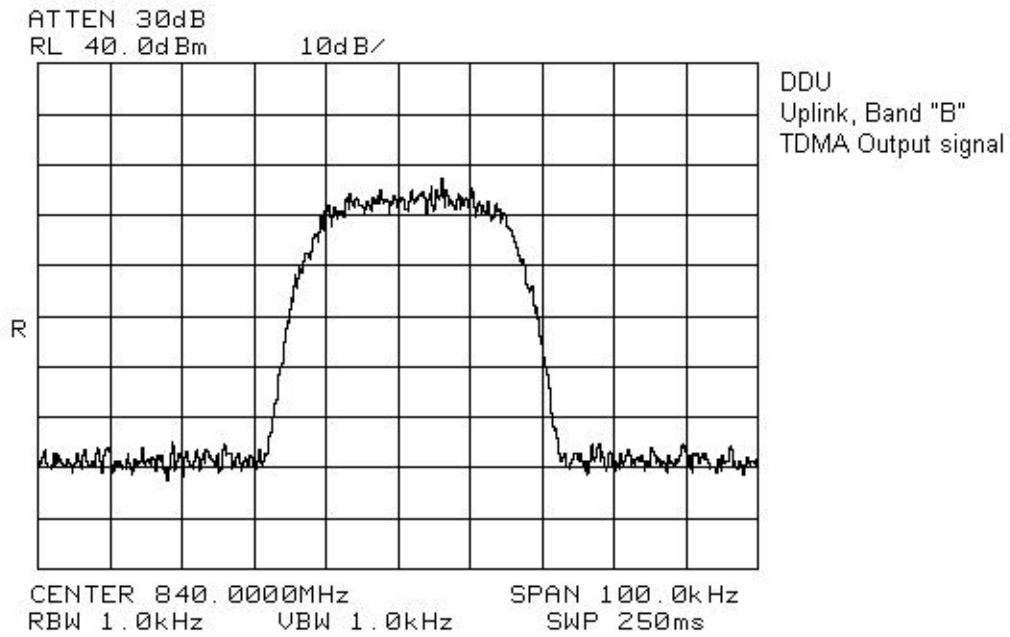
EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



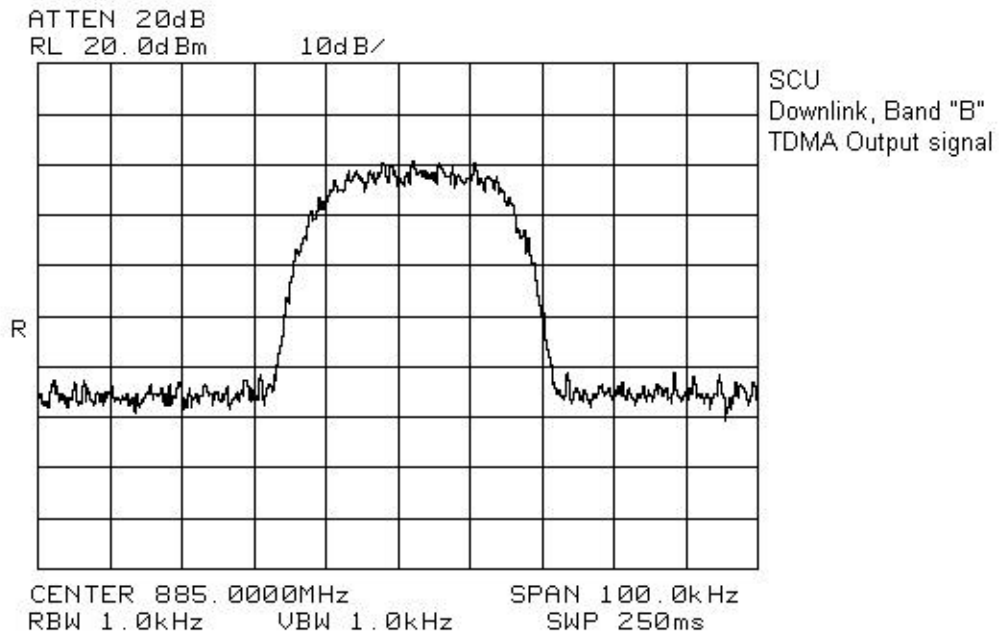
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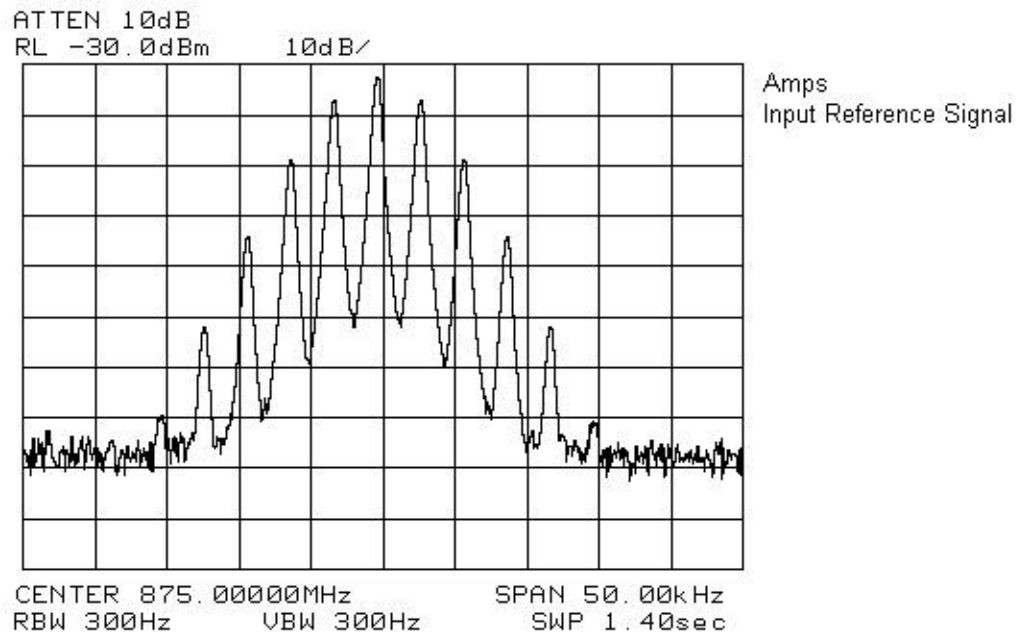
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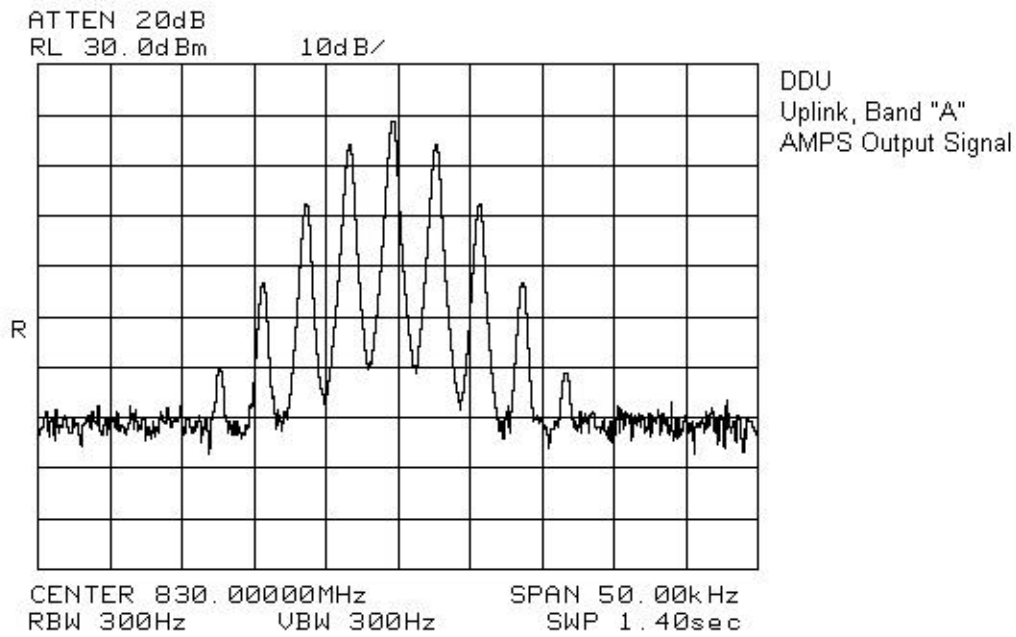
EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



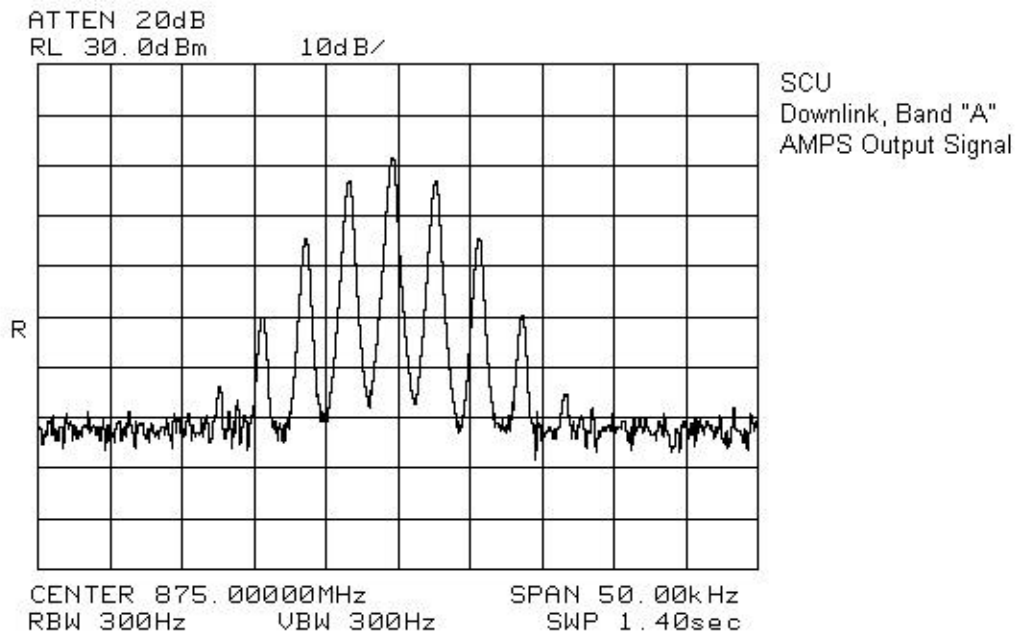
EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



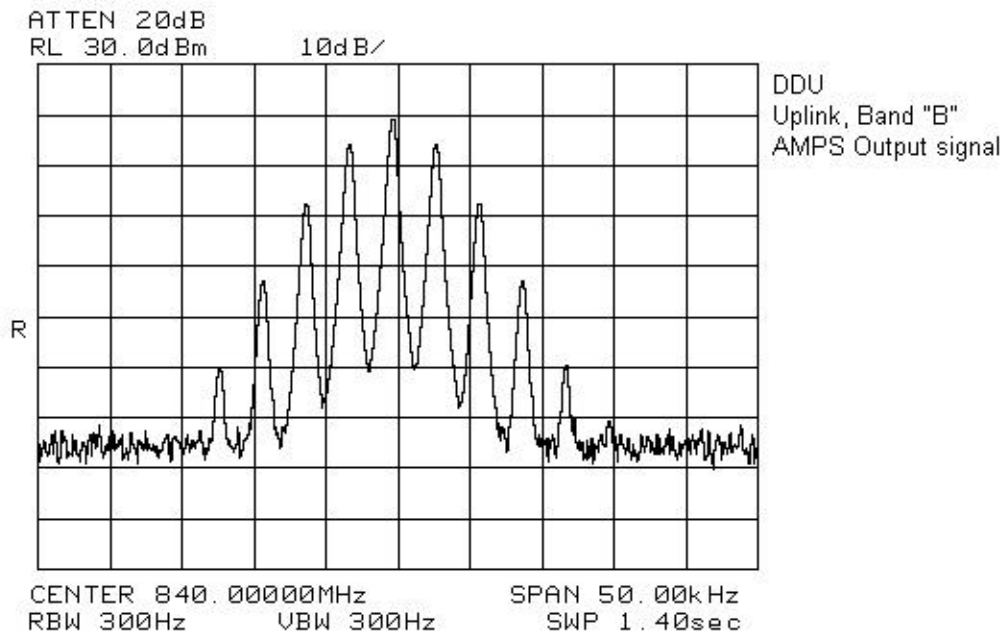
EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



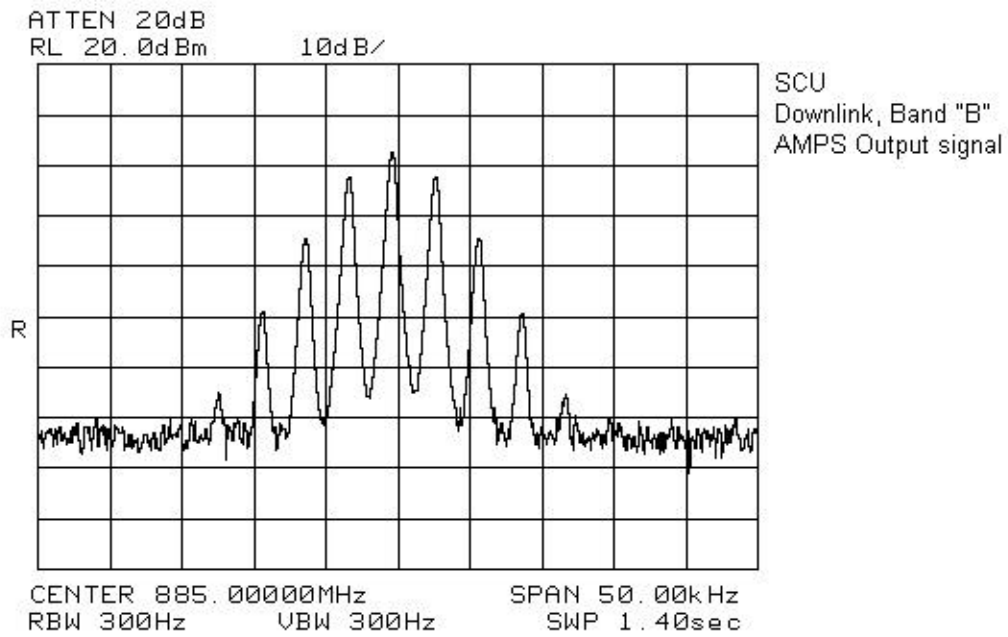
EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater

Section 5. Spurious Emissions at Antenna Terminals

Para. No.: 2.1051

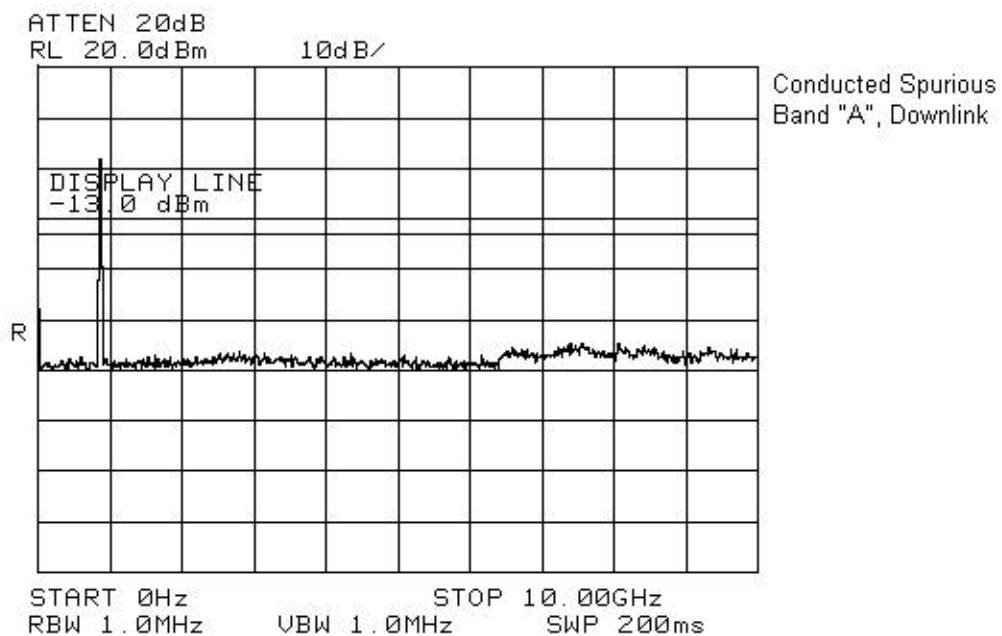
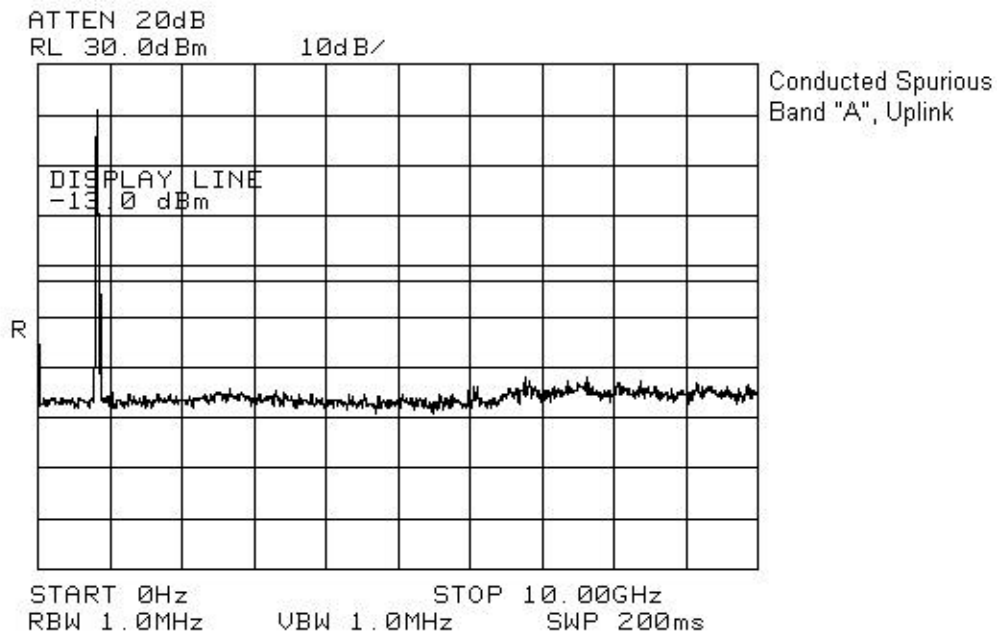
Test Performed By: Glen Westwell	Date of Test: 21 June, 2002
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Minimum Standard: 22.917 (e); -13 dBm
 (f); -80 dBm Conducted

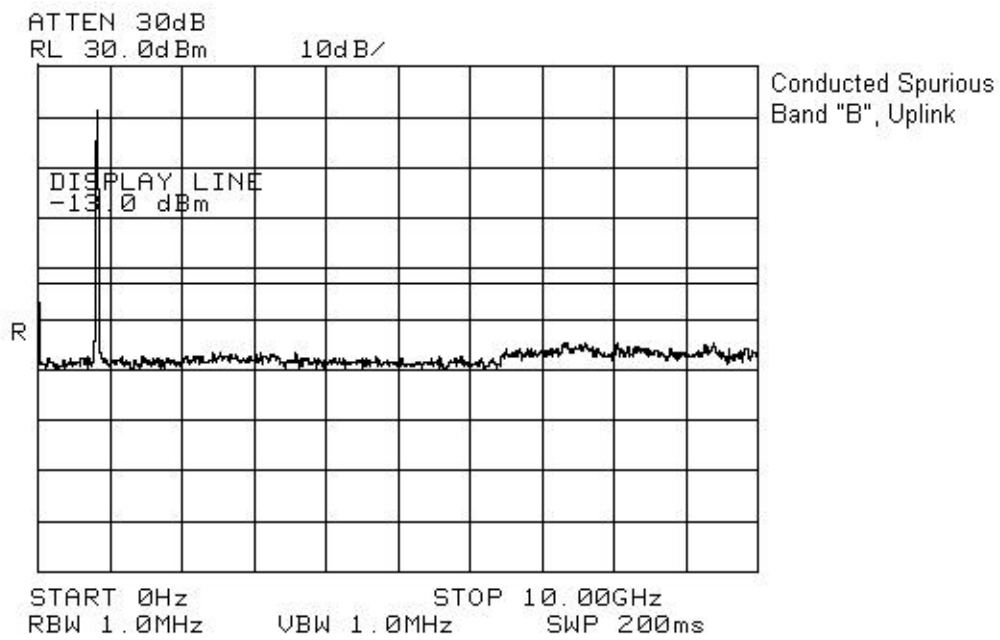
Test Results: Complies.

Measurement Data: See attached graphs (worst case).

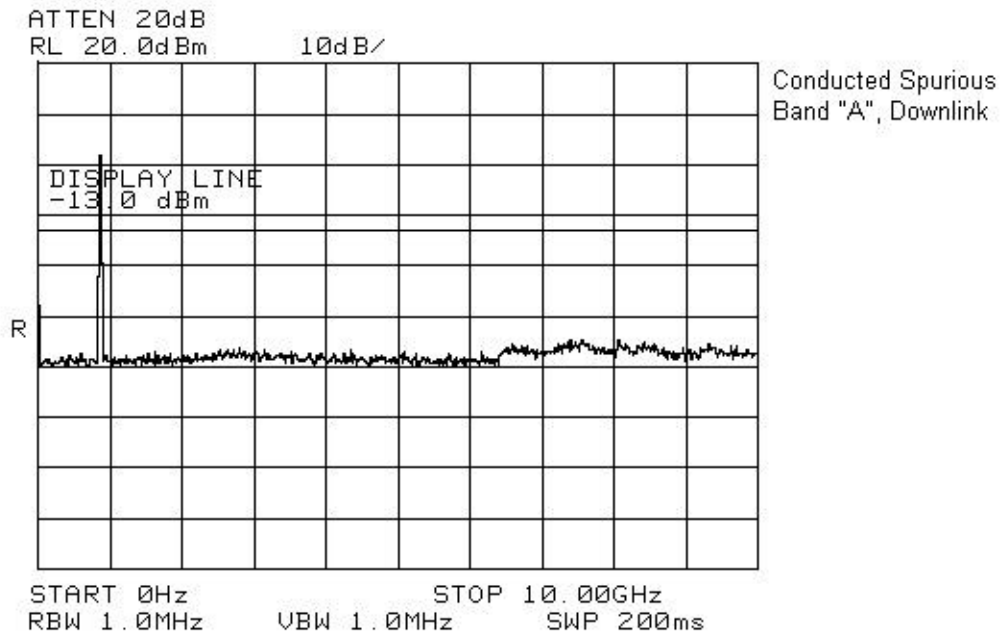
EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



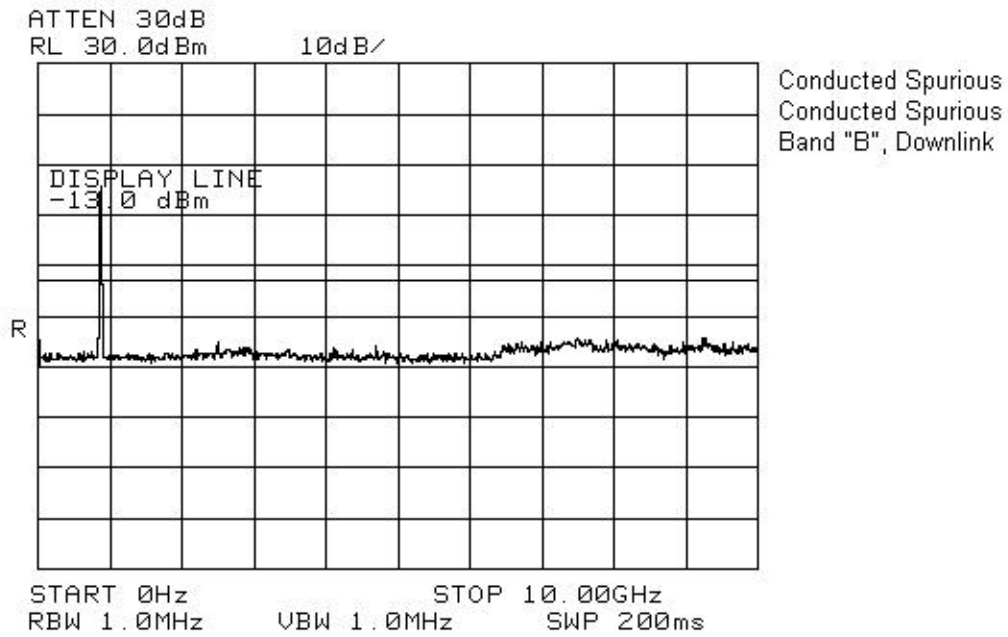
EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



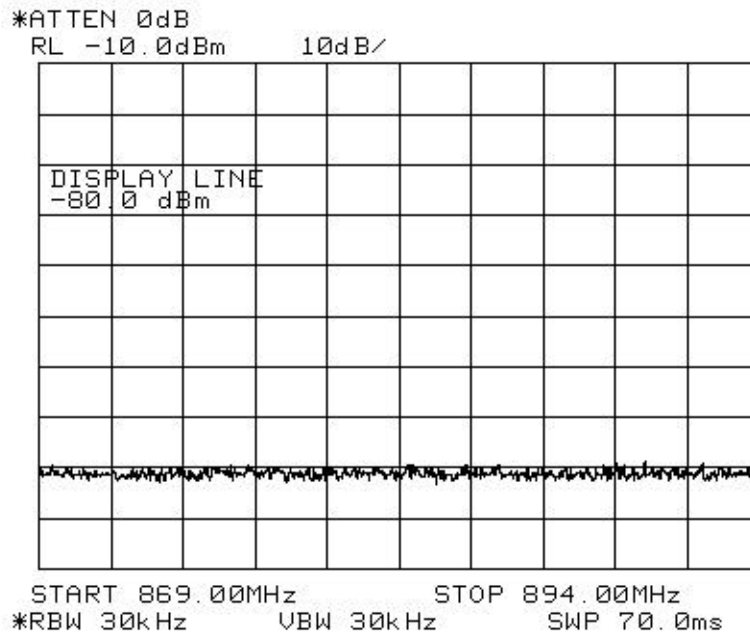
EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater

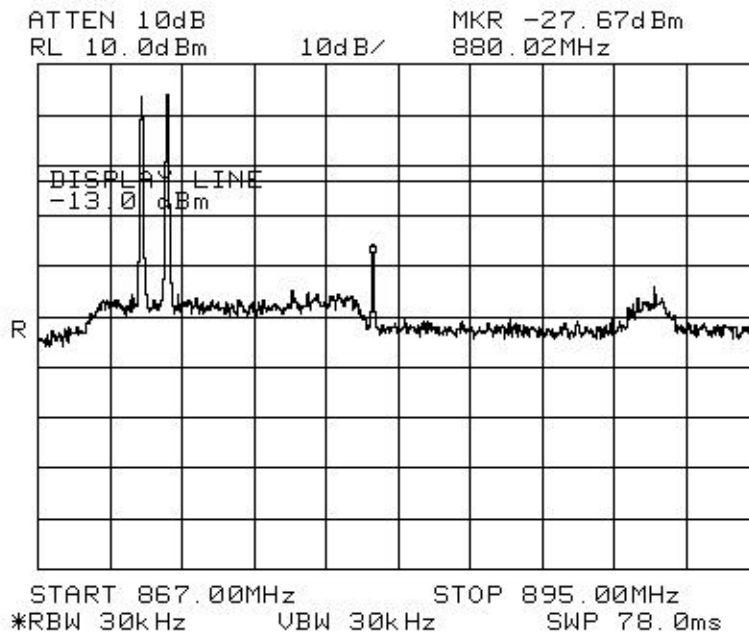


EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater

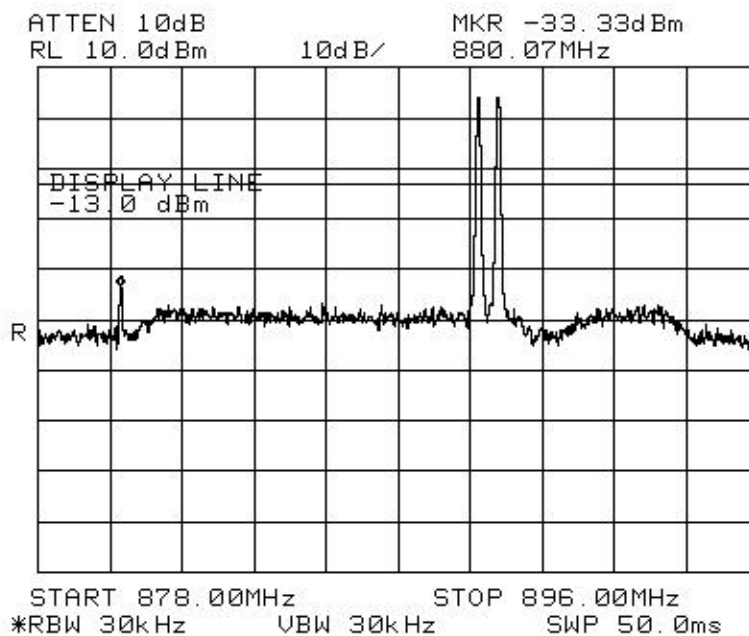


Mobile Emissions in the Base
Freq. Range.
Uplink TX = 840MHz
+20dBm Output Power

EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater

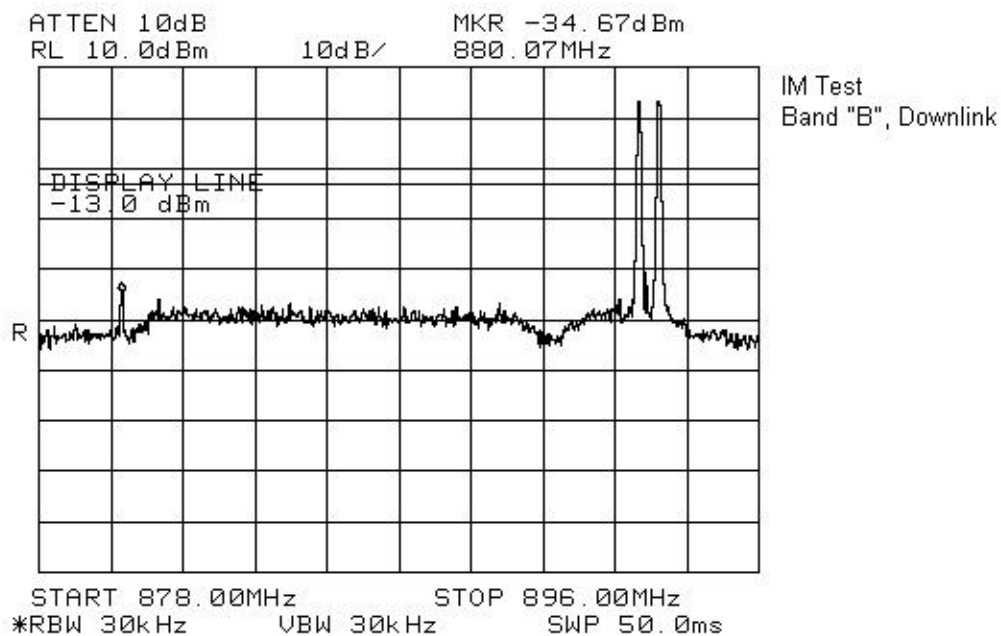
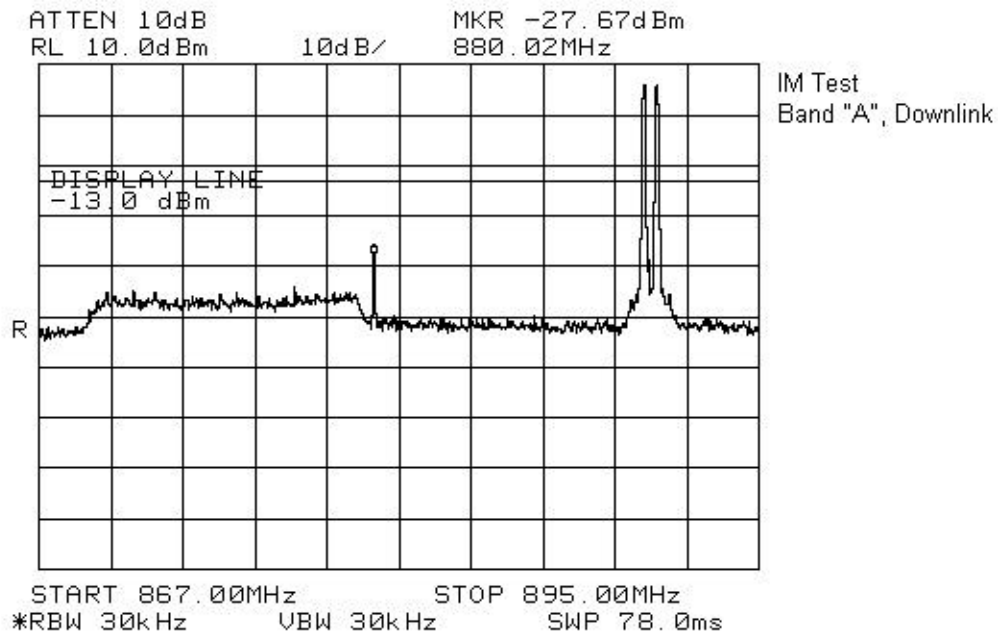


IM Test
Band "A", Downlink

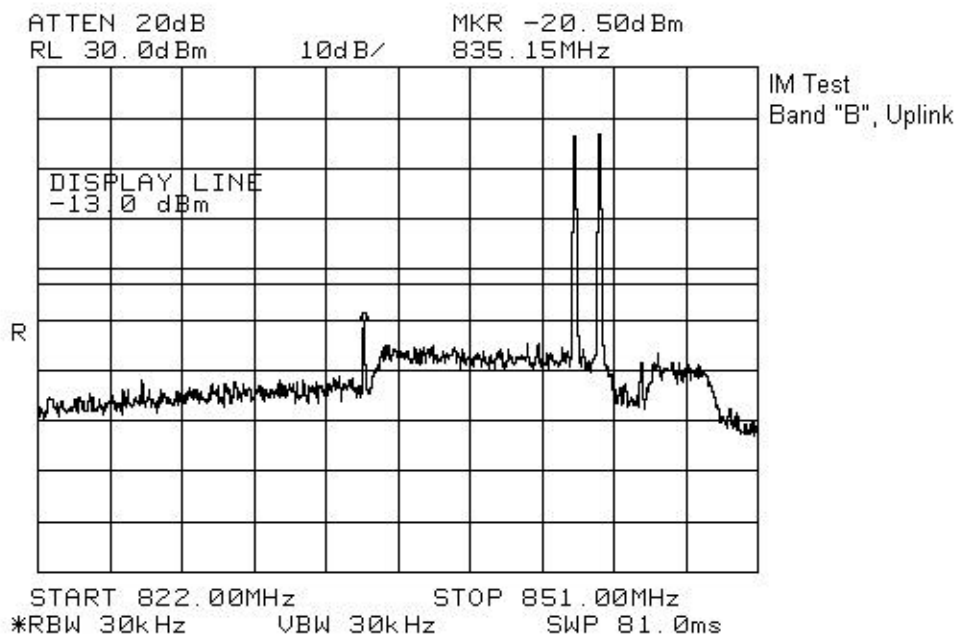
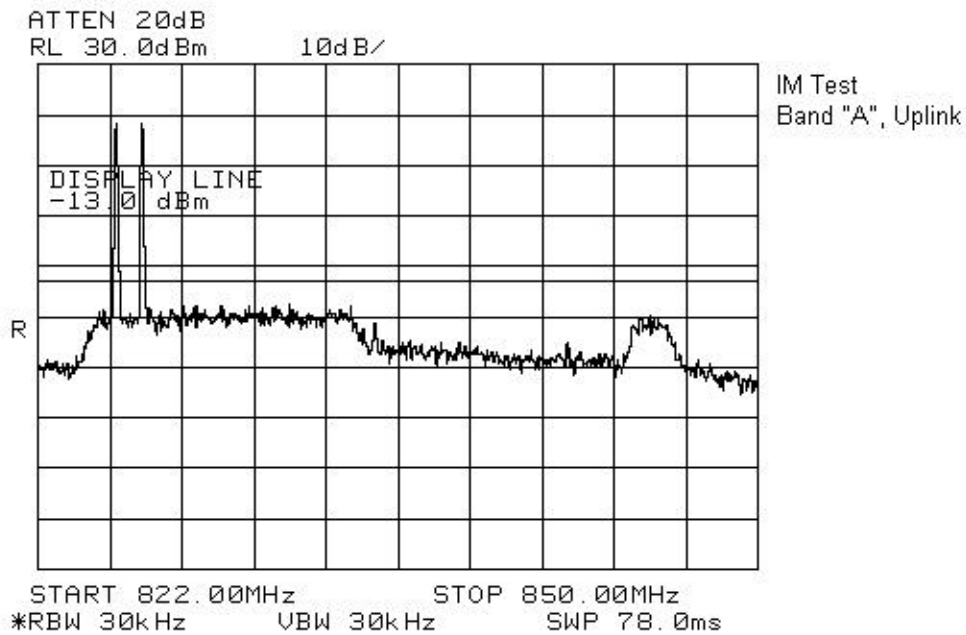


IM Test
Band "B", Downlink

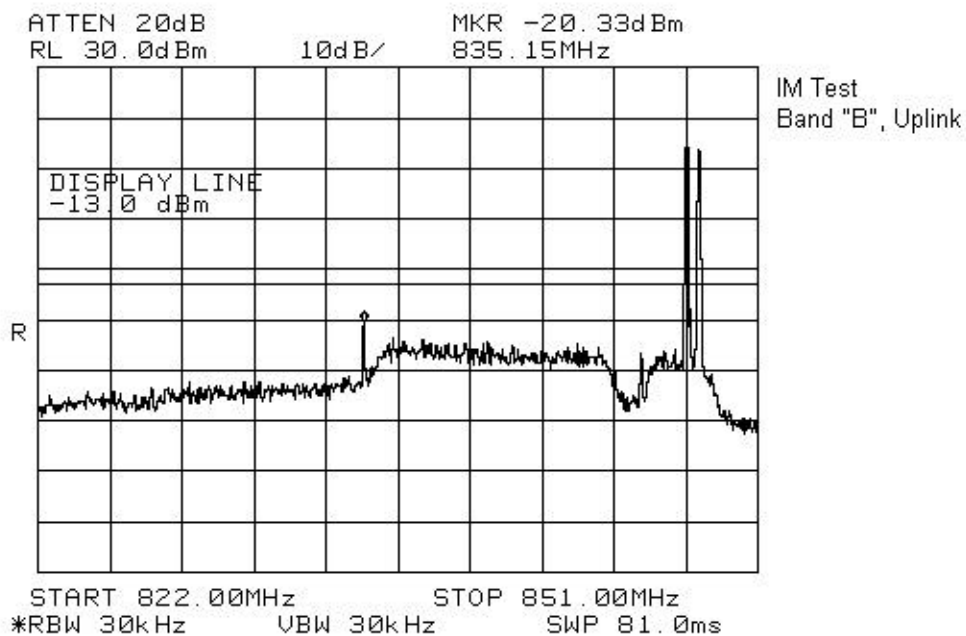
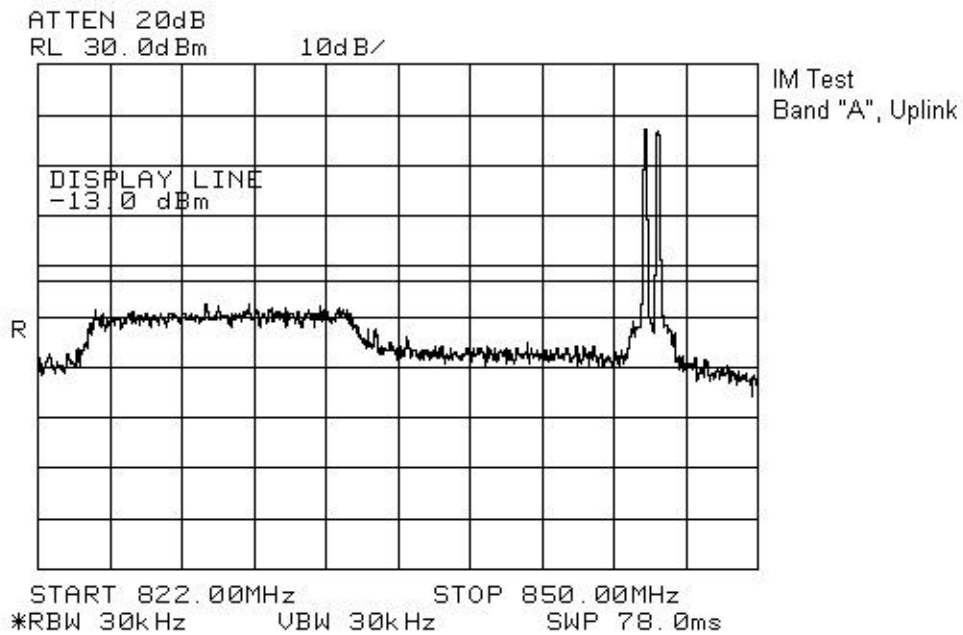
EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater



EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater

Section 6. Field Strength of Spurious Emissions

Para. No.: 2.1053

Test Performed By: Glen Westwell	Date of Test: 21 June, 2002
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Minimum Standard: 22.917(e); -13dBm

Test Results: Complies.

Measurement Data: See attached data (worst case).

EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater

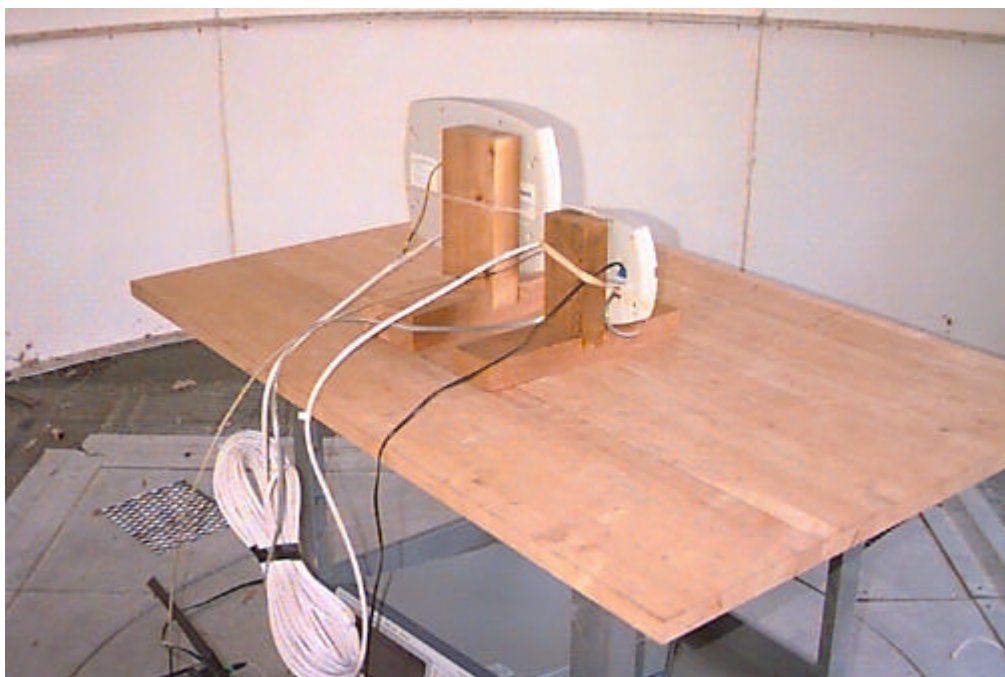
Test Data - Field Strength of Spurious Emissions

Test Distance (meters) : 3		Range: A Tower		Receiver: 8565E		RBW(kHz): 1000		Detector: Peak	
Freq. (MHz)	Ant. *	Pol. (V/H)	RCVD Signal (dBµV/m)	Signal Substitution Conversion Factor (dB)**	Amp. Gain (dB)***	Dist. Corr. (dB)	Field Strength (dBm)	Limit (dBm)	Margin (dB)
1680.0	SSV	V	85.8	-117.4			-31.6	-13.0	18.6
1680.0	SSH	H	60.1	-117.8			-57.7	-13.0	44.7
2520.0	SSV	V	55.2	-123.2			-68.0	-13.0	55.0
2520.0	SSH	H	59.0	-123.0			-64.0	-13.0	51.0
3660.0	SSV	V	74.8	-118.8			-44.0	-13.0	31.0
3660.0	SSH	H	63.4	-120.4			-57.0	-13.0	44.0
Notes: B/C = Biconical, B/L = Biconilog, L/P = Log-Periodic, H = Horn, D/P = Dipole * Re-measured using dipole antenna. ** Includes cable loss when amplifier is not used. *** Includes cable loss. () Denotes failing emission level. N.D. = Not Detected									

All spurious and harmonic emissions to the 10th harmonic for both uplink and downlink were searched.

EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater

Field Strength of Spurious Emissions - Photograph
SpotCell 100



Section 7. Frequency Stability

Para. No.: 2.1055

Test Performed By: Glen Westwell	Date of Test: 24 June, 2002
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Minimum Standard: 22.355

Test Results: Complies. The maximum frequency drift is 0 Hz.

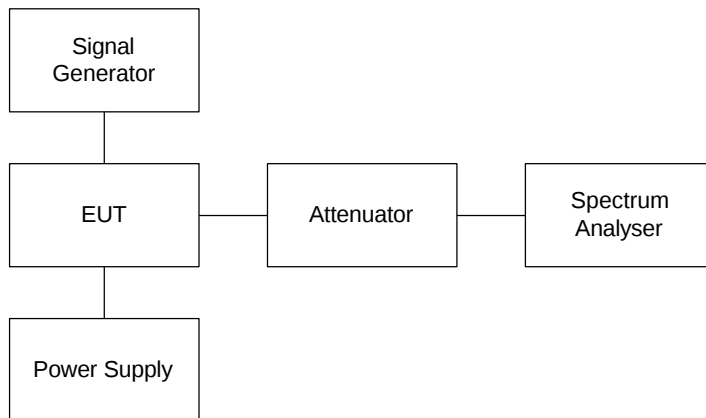
Measurement Data: Standard Test Frequency: (-30°C to +50°C)

Uplink: 840.000 000 MHz

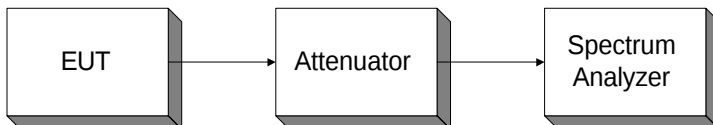
Downlink: 885.000 000 MHz

Section 8. Block Diagrams

Para. No. 2.1046 - R.F. Power Output



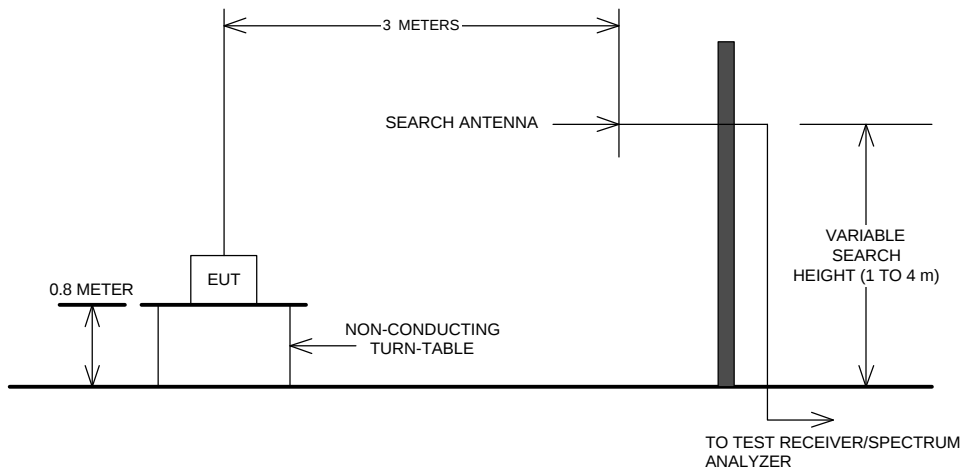
Para. No. 2.1049 - Occupied Bandwidth



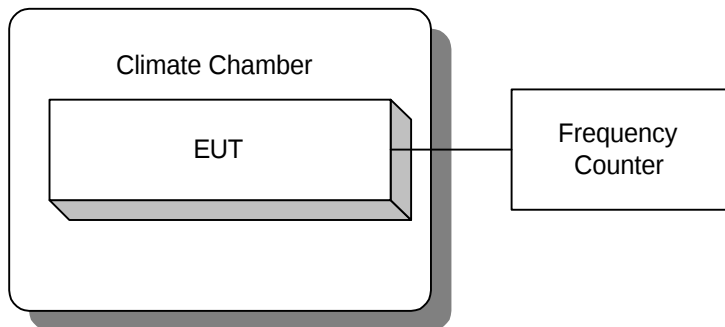
Para. No. 2.1051 - Spurious Emissions at Antenna Terminals



Para. No. 2.1053 - Field Strength of Spurious Radiation



Para. No. 2.1055 - Frequency Stability



EQUIPMENT: SpotCell 100, Low Power Cellular Band Repeater

Section 9. Test Equipment List

CAL CYCLE	EQUIPMENT	MANUFACTURER	MODEL	SERIAL	LAST CAL.	NEXT CAL.
1 Year	Spectrum Analyzer	Hewlett Packard	8565E	FA000981	6 Mar. 02	6 Mar. 03
1 Year	Spectrum Analyzer-1	Hewlett Packard	8566B	2311A02238	27 Nov 2001	27 Nov 2002
1 Year	Spectrum Analyzer Display-1	Hewlett Packard	8566B	2314A04759	27 Nov 2001	27 Nov 2002
1 Year	Quasi-peak adapter-1	Hewlett-Packard	85650A	2043A00302	27 Nov 2001	27 Nov 2002
1 Year	Climate Chamber	Thermotron	SM-16C	15649-S	COU	COU
1 Year	Horn Antenna	EMCO #2	3115	4336	Dec. 1/01	Dec. 1/02
1 Year	Log Periodic Antenna 1	EMCO	LPA-25	1141	Aug. 28/01	Aug. 28/02
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	11 Jan 2002	11 Jan 2003
3 Year	RF Generator	Rohde & Schwarz	SIMIQ03	DE22004	Sept. 10/00	Sept. 18/03
3 Year	RF Generator	Rohde & Schwarz	SIMIQ03E	DE24154	Oct. 4/99	Oct. 4/02

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