

KTL Test Report No.:

0L0494RUS1

Applicant:

Andrew Corporation

FCC ID.:

KUWPCSSSR1900

Equipment Under Test:

PCS Side-to-Side Repeater

In Accordance With:

FCC Part 24, Subpart E
Broadband PCS Repeaters

Tested By:

KTL Dallas Inc.
802 N. Kealy
Lewisville, Texas 75057-3136



Authorized By:

Tom Tidwell, RF Group Manager

Date:

12/28/00

Total Number of Pages:

91

EQUIPMENT: **PCS Side-to-Side Repeater**

FCC ID: **KUWPCSSSR1900**

PROJECT NO.: **0L0494RUS1**

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EQUIPMENT: PCS Side-to-Side Repeater**FCC ID: KUWPCSSSR1900****PROJECT NO.: 0L0494RUS1**

Section 1. Summary of Test Results

Manufacturer: Andrew Corporation

Model No.: PCSSSR1900

Sample No.: 45

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.



New Submission



Production Unit



Class II Permissive Change



Pre-Production Unit

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”.

**NVLAP LAB CODE: 100426-0**

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EQUIPMENT: PCS Side-to-Side Repeater**FCC ID: KUWPCSSSR1900****PROJECT NO.: 0L0494RUS1**

Summary Of Test Data

NAME OF TEST	PARA. NO.	SPEC.	MEAS.	RESULT
RF Power Output	24.232	100W	0.1W eirp	Complies
Occupied Bandwidth (CDMA)	24.238	Input/Output	Plots	Complies
Occupied Bandwidth (GSM)	24.238	Input/Output	Plots	Complies
Occupied Bandwidth (NADC)	24.238	Input/Output	Plots	Complies
Spurious Emissions at Antenna Terminals	24.238(a)	-13 dBm	-13 dBm (See plots)	Complies
Field Strength of Spurious Emissions	24.238(a)	-13 dBm E.I.R.P.	-16 dBm	Complies
Frequency Stability	24.235	N/A	N/A	N/A

Footnotes:

- (1) Modulation characteristics were not tested since the E.U.T. processes but does not produce a modulated waveform.
- (2) Frequency stability was not tested since the E.U.T. processes but does not produce a modulated waveform.

Measurement uncertainty for each test configuration is expressed to 95% probability.

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Section 2. General Equipment Specification**

Supply Voltage Input:		120 VAC		
Frequency Bands:	Downlink:	☒	Block A :	1930 – 1945 MHz
		☒	Block D :	1945 – 1950 MHz
		☒	Block B :	1950 – 1965 MHz
		☒	Block E :	1965 – 1970 MHz
		☒	Block F :	1970 – 1975 MHz
		☒	Block C :	1975 – 1990 MHz
Frequency Bands:	Uplink:	☒	Block A :	1850 – 1865 MHz
		☒	Block B :	1865 – 1870 MHz
		☒	Block C :	1870 – 1885 MHz
		☒	Block D :	1885 – 1890 MHz
		☒	Block E :	1890 – 1895 MHz
		☒	Block F :	1895 – 1910 MHz
Type of Modulation and Designator:		CDMA (G7W) ☒	GSM (GXW) ☒	NADC (DXW) ☒
System Gain:		45 dB / 50 dB		
Output Impedance:		50 ohms		
Max Input:		-35 dBm		
RF Output (Rated):	Uplink	0.0126 W @ antenna input		
RF Output (Rated):	Downlink	0.0126 W @ antenna input		
Frequency Translation:		F1-F1 ☐	F1-F2 ☐	N/A ☒
Band Selection:		Software ☐	Duplexer ☒	Fullband ☐

KTL Dallas

FCC PART 24, SUBPART E
BROADBAND PCS REPEATERS

EQUIPMENT: **PCS Side-to-Side Repeater**

FCC ID: **KUWPCSSSR1900**

PROJECT NO.: **0L0494RUS1**

Description of Modifications For Class II Permissive Change

Not Applicable

KTL Dallas

FCC PART 24, SUBPART E
BROADBAND PCS REPEATERS

EQUIPMENT: **PCS Side-to-Side Repeater**

FCC ID: **KUWPCSSSR1900**

PROJECT NO.: **0L0494RUS1**

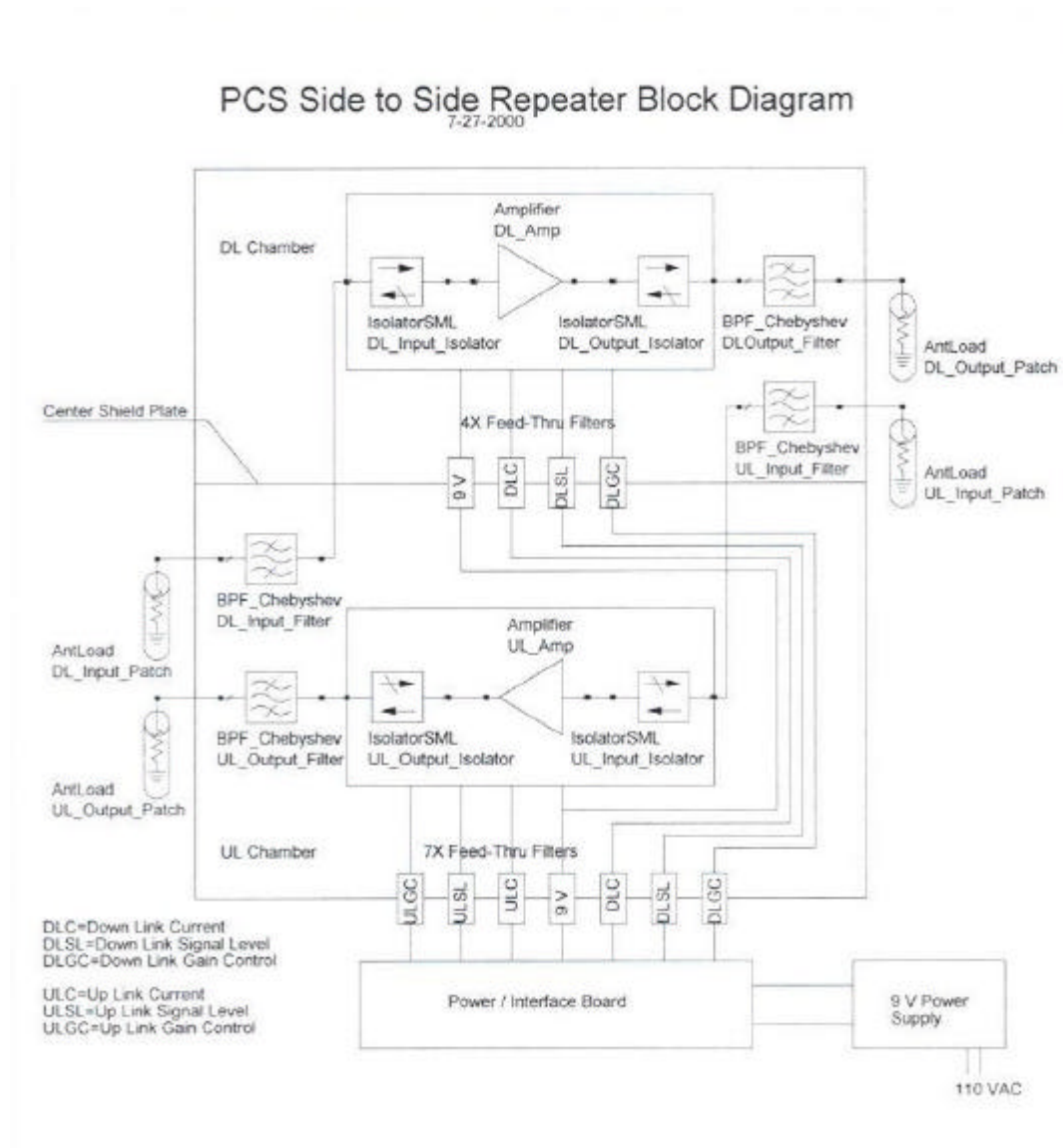
Modifications Made During Testing

Not Applicable

EQUIPMENT: **PCS Side-to-Side Repeater***FCC ID:* **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1**

Description of Operation

Separate antennas provide receive and transmit functions for the complementary uplink and downlink bands. In operation, the appropriate receive antenna feeds its' signal to a band pass filter that functions to reject undesired signals and isolate the complementary band's signal. The signal from the band pass filter feeds an amplifier with an AGC loop that limits maximum output power to approximately 100 milliwatts eirp (+11.5 dBm + 7.5 dBi antenna gain). The amplifier output feeds a second band pass filter functioning to limit spurious amplifier output signals and further isolate the complementary band's signal. The complementary band's signal path is identical to that previously described, except in the reverse direction. Both amplifiers include crude RSSI circuitry and over-current protection circuitry.

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****System Diagram**

EQUIPMENT: PCS Side-to-Side Repeater**FCC ID: KUWPCSSSR1900****PROJECT NO.: 0L0494RUS1**

Section 3. RF Power Output

NAME OF TEST: RF Power Output	PARA. NO.: 2.1046
TESTED BY: David Light	DATE: 12/4/00

Test Results: Complies.**Measurement Data:**

	Modulation Type	Per Channel Output Power (dBm)	Composite Output Power (dBm)
Uplink	CDMA	8.0 (2 Carriers)	11.0
Downlink	CDMA	8.0 (2 Carriers)	11.0
Uplink	GSM	4.5 (5 Carriers)	11.5
Downlink	GSM	4.5 (5 Carriers)	11.5
Uplink	NADC	8.0 (2 Carriers)	11.0
Downlink	NADC	8.0 (2 Carriers)	11.0

Equipment Used: 1036-1045-1466-1052-1053-1083**Measurement Uncertainty:** +/- 1.6 dB**Temperature:** 22 °C**Relative Humidity:** 50 %

EQUIPMENT: **PCS Side-to-Side Repeater***FCC ID:* **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1**

Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth (CDMA)	PARA. NO.: 2.1049
TESTED BY: David Light	DATE: 12/04/00

Test Results: Complies.**Test Data:** See attached plot(s).**Equipment Used:** 1036-1045-1466-1052-1053-1083**Measurement Uncertainty:** +/- 1.6 dB**Temperature:** 22 °C**Relative
Humidity:** 50 %

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data- Occupied Bandwidth - CDMA****Test Plot: Occupied Bandwidth - CDMA**

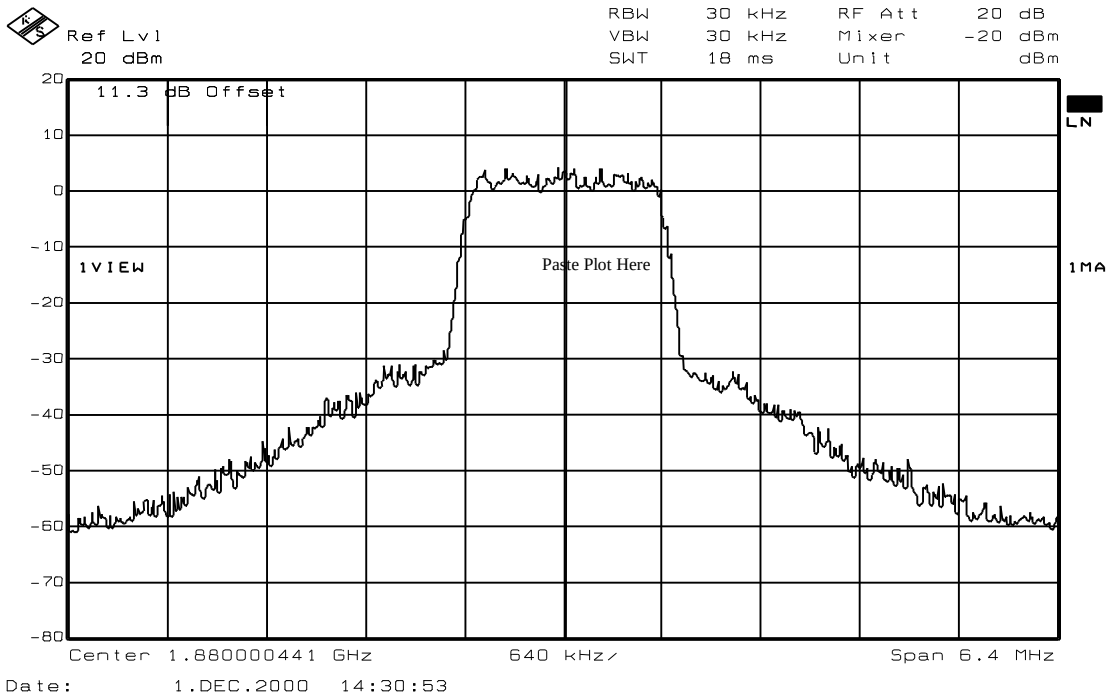
Page 1 of 4

Job No.: 0L0494R Date: 12/01/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT MID BAND
Serial Number: 45
Location: Lab 1 RBW: 30 kHz
Detector Type: Peak VBW: 30 kHz

Test Equipment Used

Antenna: #N/A Directional Coupler: #N/A
Pre-Amp: #N/A Cable #1: 1045
Filter: #N/A Cable #2: #N/A
Receiver: 1036 Cable #3: #N/A
Attenuator #1: 1466 Cable #4: #N/A
Attenuator #2: #N/A Mixer: #N/A

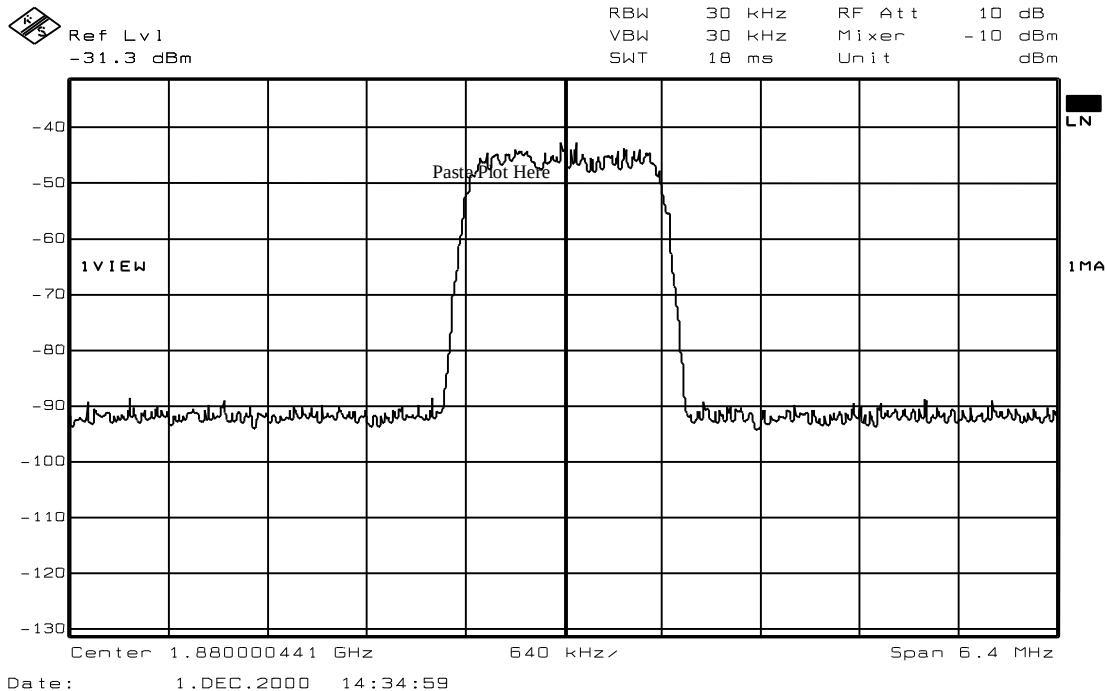
Additional equipment used:
Measurement
Uncertainty: #N/A



Notes: OUTPUT - UPLINK - CDMA

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data- Occupied Bandwidth - CDMA****Test Plot: Occupied Bandwidth - CDMA**

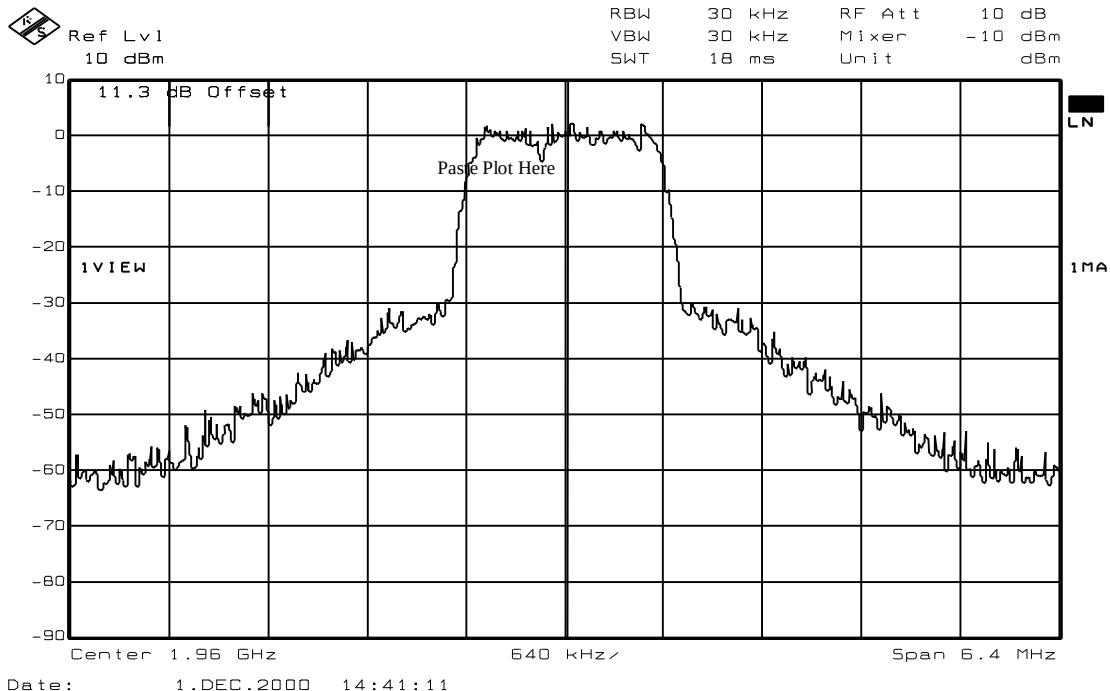
Page 2 of 4
Job No.: 0L0494R Date: 12/1/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT MID BAND



Notes: INPUT - UPLINK - CDMA

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data- Occupied Bandwidth - CDMA****Test Plot: Occupied Bandwidth - CDMA**

Page 3 of 4
Job No.: 0L0494R Date: 12/1/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT MID BAND



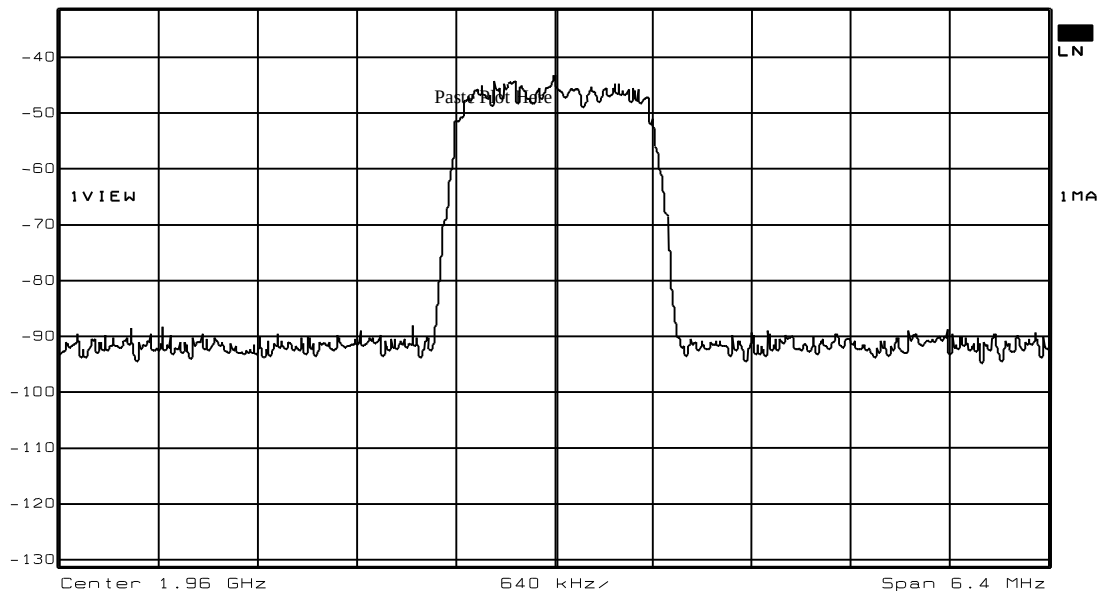
Notes: OUTPUT - DOWNLINK - CDMA

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data- Occupied Bandwidth - CDMA****Test Plot: Occupied Bandwidth - CDMA**

Page 4 of 4
Job No.: 0L0494R Date: 12/1/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT MID BAND

Ref Lvl
-31.3 dBm

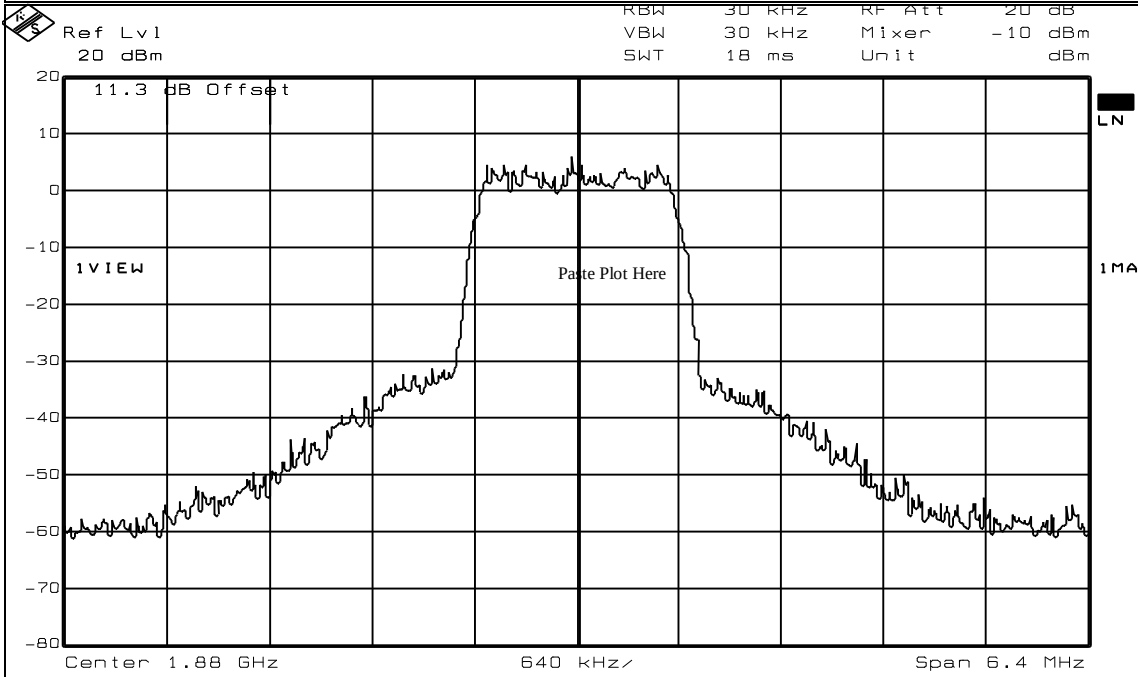
RBW	30 kHz	RF Att	10 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	18 ms	Unit	dBm



Date: 1.DEC.2000 14:38:51

Notes: INPUT - DOWNLINK - CDMA

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data- Occupied Bandwidth – CDMA – High Gain Repeater**

Test Plot: Occupied Bandwidth - CDMA			
Page 1 of 4			
Job No.:	0L0494R	Date:	12/01/00
Specification:	PART 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	50
E.U.T.:			
Configuration:	TRANSMIT MID BAND		
Serial Number:	45		
Location:	Lab 1	RBW:	30 kHz
Detector Type:	Peak	VBW:	30 kHz
Test Equipment Used			
Antenna:	#N/A	Directional Coupler:	#N/A
Pre-Amp:	#N/A	Cable #1:	1045
Filter:	#N/A	Cable #2:	#N/A
Receiver:	1036	Cable #3:	#N/A
Attenuator #1:	1466	Cable #4:	#N/A
Attenuator #2:	#N/A	Mixer:	#N/A
Additional equipment used:			
Measurement Uncertainty:	#N/A		
 The plot shows the occupied bandwidth of the CDMA signal. The y-axis represents power in dBm, ranging from -80 to 20. The x-axis represents frequency in MHz, ranging from 1.88 to 6.4. The signal is centered at 1.88 GHz with a span of 6.4 MHz. The plot shows a noisy signal with a peak level of approximately 11.3 dBm. The signal is labeled '11.3 dB Offset' and '1 VIEW'. The plot is titled 'Paste Plot Here'.			
Ref Lvl 20 dBm RBW 30 kHz RF Att 20 dB VBW 30 kHz Mixer -10 dBm SWT 18 ms Unit dBm			
Date: 5.DEC.2000 15:01:10			
Notes: OUTPUT - UPLINK - CDMA			

EQUIPMENT: PCS Side-to-Side Repeater

FCC ID: KUWPCSSSR1900

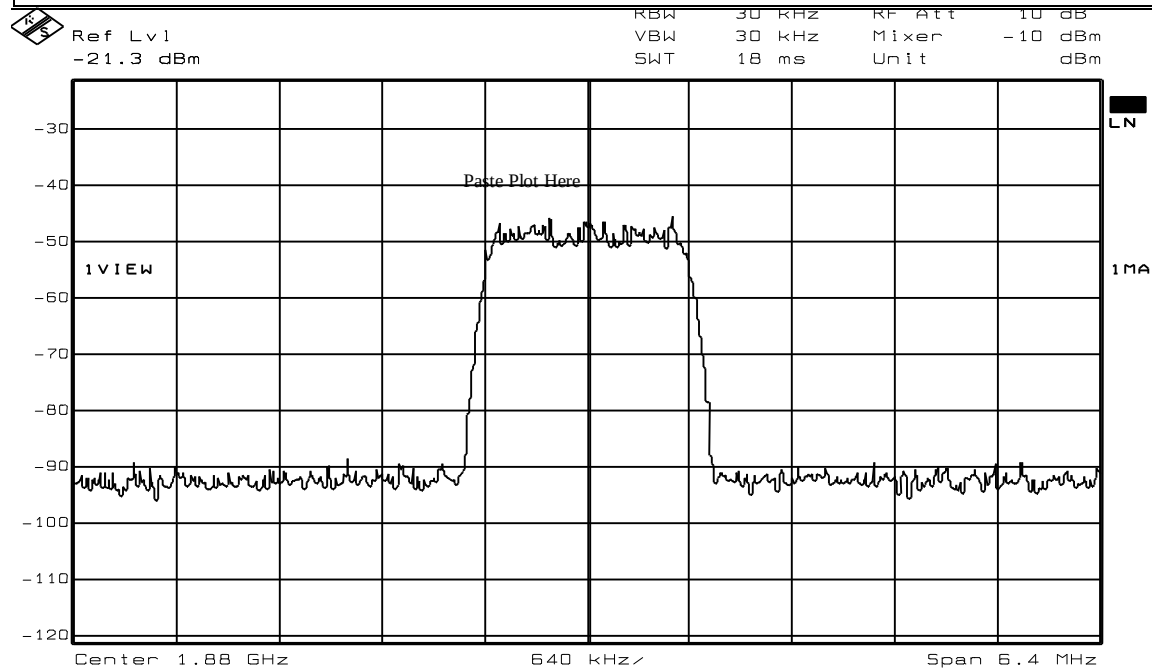
PROJECT NO.: 0L0494RUS1

Test Data- Occupied Bandwidth - CDMA- High Gain Repeater

Test Plot: Occupied Bandwidth - CDMA

Page 2 of 4

Job No.: 0L0494R Date: 12/1/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.:
Configuration: TRANSMIT MID BAND



Date: 5 DEC 2000 15:08:02

Notes: INPUT - UPLINK - CDMA

EQUIPMENT: PCS Side-to-Side Repeater

FCC ID: KUWPCSSSR1900

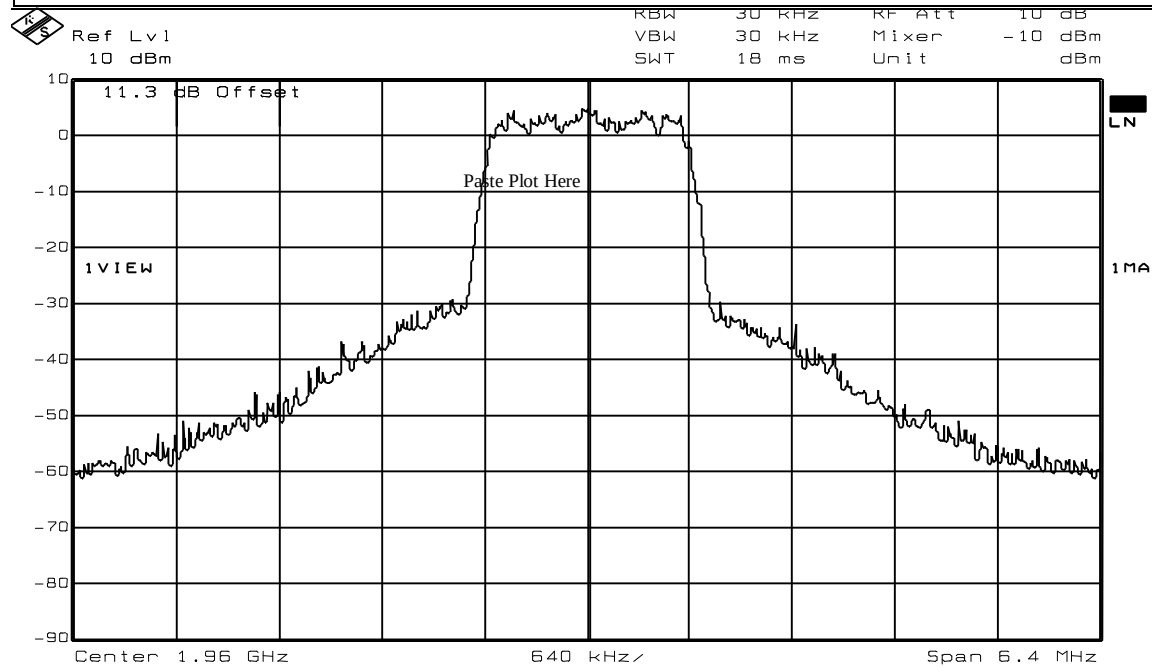
PROJECT NO.: 0L0494RUS1

Test Data- Occupied Bandwidth - CDMA- High Gain Repeater

Test Plot: Occupied Bandwidth - CDMA

Page 3 of 4

Job No.: 0L0494R Date: 12/1/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.:
Configuration: TRANSMIT MID BAND



Date: 5 DEC 2000 15:32:52

Notes: OUTPUT - DOWNLINK - CDMA

EQUIPMENT: PCS Side-to-Side Repeater

FCC ID: KUWPCSSSR1900

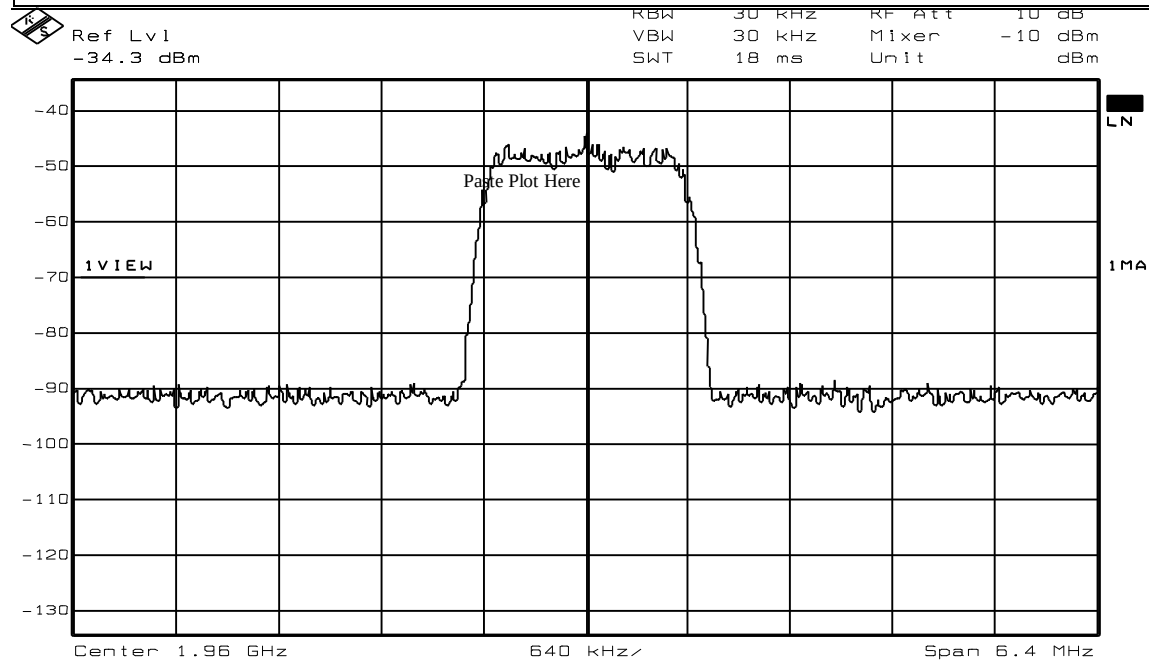
PROJECT NO.: 0L0494RUS1

Test Data- Occupied Bandwidth - CDMA- High Gain Repeater

Test Plot: Occupied Bandwidth - CDMA

Page 4 of 4

Job No.: 0L0494R Date: 12/1/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.:
Configuration: TRANSMIT MID BAND



Date: 5 DEC 2000 15:34:22

Notes: INPUT - DOWNLINK - CDMA

EQUIPMENT: PCS Side-to-Side Repeater**FCC ID: KUWPCSSSR1900****PROJECT NO.: 0L0494RUS1**

NAME OF TEST: Occupied Bandwidth (GSM)

PARA. NO.: 2.1049

TESTED BY: David Light

DATE: 12/01/00

Test Results: Complies.**Test Data:** See attached plot(s).**Equipment Used:****Measurement Uncertainty:** +/- 1.6 dB**Temperature:** 22 °C**Relative Humidity:** 50 %

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data- Occupied Bandwidth - GSM****Test Plot: Occupied Bandwidth - GSM**

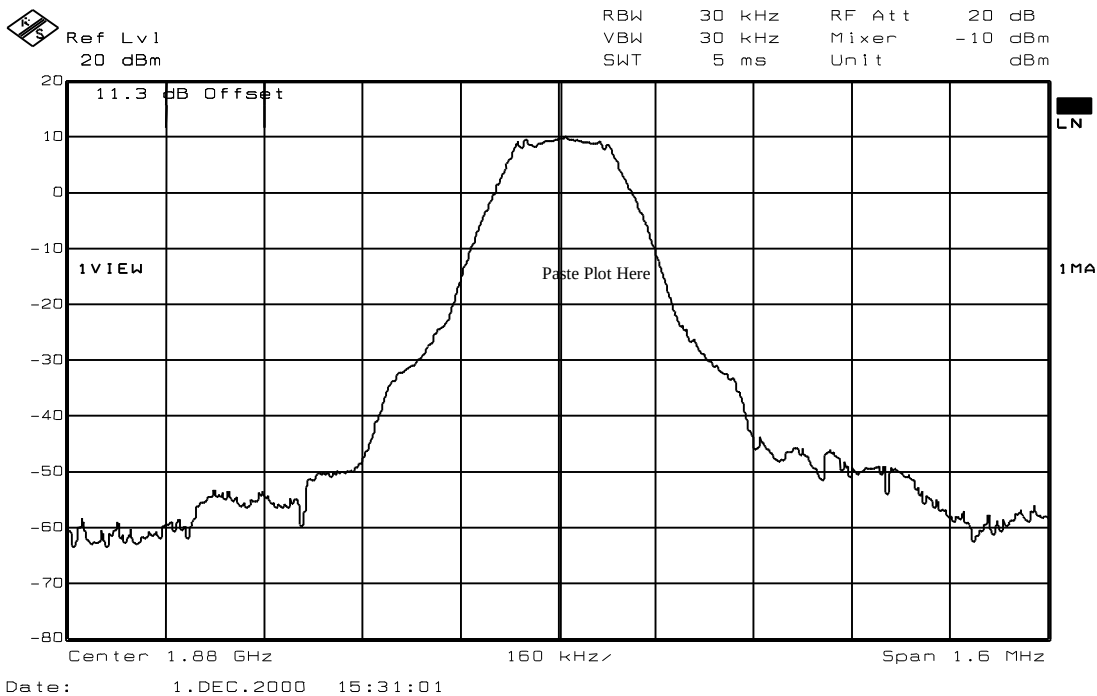
Page 1 of 4

Job No.: 0L0494R Date: 12/01/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT MID BAND
Serial Number: 45
Location: Lab 1 RBW: 30 kHz
Detector Type: Peak VBW: 30 kHz

Test Equipment Used

Antenna: #N/A Directional Coupler: #N/A
Pre-Amp: #N/A Cable #1: 1045
Filter: #N/A Cable #2: #N/A
Receiver: 1036 Cable #3: #N/A
Attenuator #1: 1466 Cable #4: #N/A
Attenuator #2: #N/A Mixer: #N/A

Additional equipment used:
Measurement
Uncertainty: #N/A



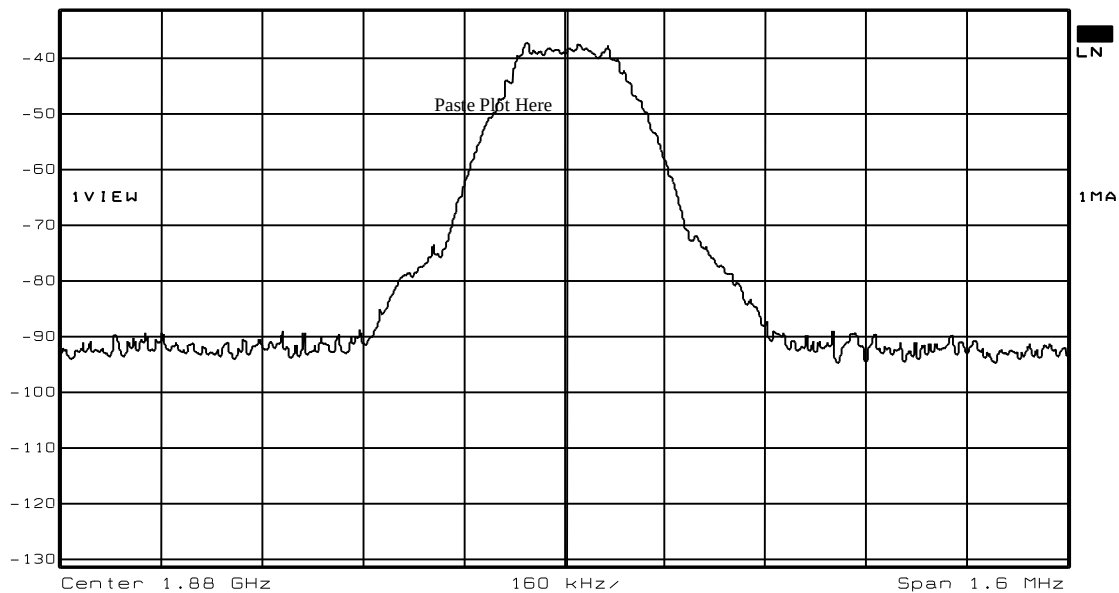
Notes: OUTPUT - UPLINK - GSM

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data- Occupied Bandwidth - GSM****Test Plot: Occupied Bandwidth - GSM**

Page 2 of 4
Job No.: 0L0494R Date: 12/1/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT MID BAND

Ref Lvl
-31.3 dBm

RBW	30 kHz	RF Att	10 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	5 ms	Unit	dBm

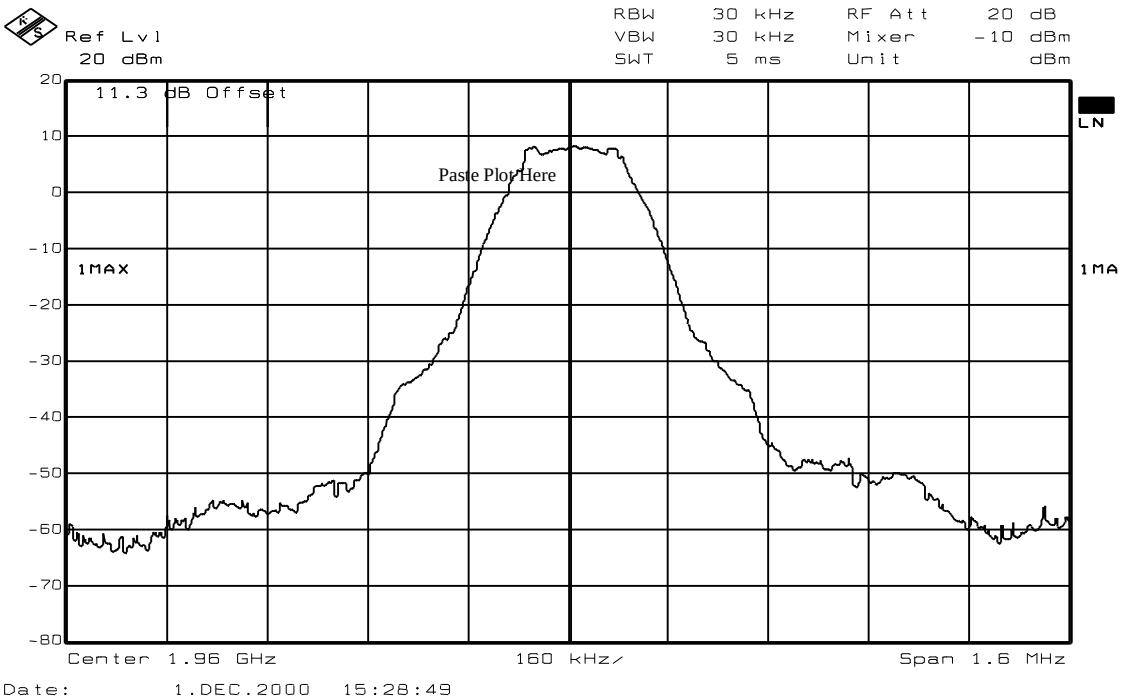


Date: 1.DEC.2000 15:35:21

Notes: INPUT - UPLINK - GSM

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data- Occupied Bandwidth - GSM****Test Plot: Occupied Bandwidth - GSM**

Page 3 of 4
Job No.: 0L0494R Date: 12/1/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT MID BAND



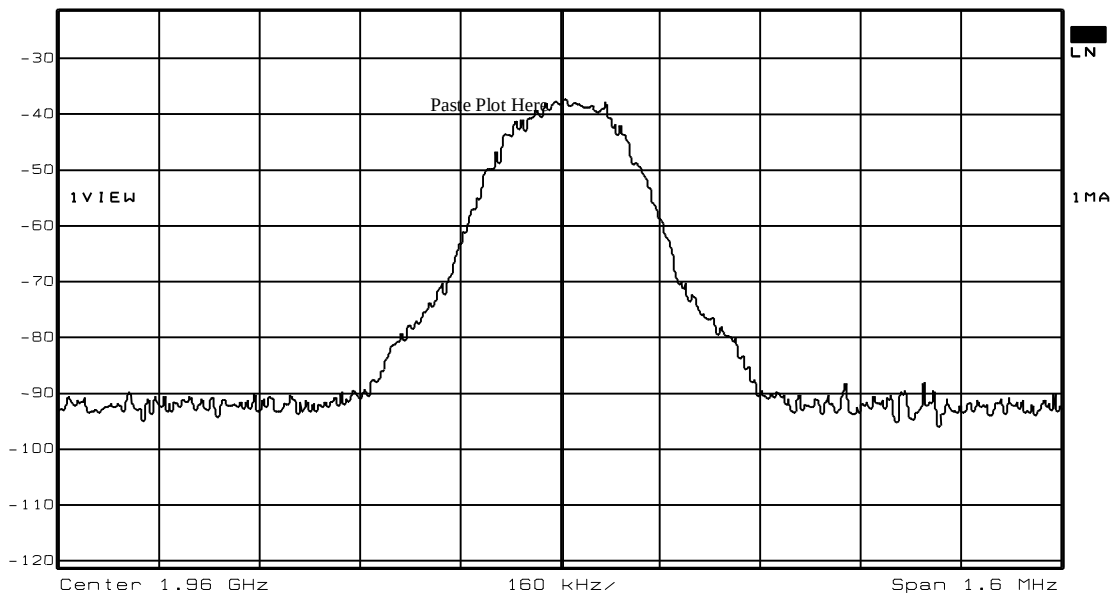
Notes: OUTPUT - DOWNLINK - GSM

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data- Occupied Bandwidth - GSM****Test Plot: Occupied Bandwidth - GSM**

Page 4 of 4
Job No.: 0L0494R Date: 12/1/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT MID BAND

Ref Lvl
-21.3 dBm

RBW	30 kHz	RF Att	10 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	5 ms	Unit	dBm



Date: 1.DEC.2000 15:26:46

Notes: INPUT - DOWNLINK - GSM

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data- Occupied Bandwidth – GSM**

Test Plot: Occupied Bandwidth - GSM			
Page 1 of 4			
Job No.:	0L0494R	Date:	12/01/00
Specification:	PART 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	50
E.U.T.:	PCS REPEATER - HIGH GAIN		
Configuration:	TRANSMIT MID BAND		
Serial Number:	45		
Location:	Lab 1	RBW:	30 kHz
Detector Type:	Peak	VBW:	30 kHz
Test Equipment Used			
Antenna:	#N/A	Directional Coupler:	#N/A
Pre-Amp:	#N/A	Cable #1:	1045
Filter:	#N/A	Cable #2:	#N/A
Receiver:	1036	Cable #3:	#N/A
Attenuator #1:	1466	Cable #4:	#N/A
Attenuator #2:	#N/A	Mixer:	#N/A
Additional equipment used:			
Measurement Uncertainty:	#N/A		

Ref	Lvl	RBW	30 kHz	RF Att	20 dB
	20 dBm	VBW	30 kHz	Mixer	-10 dBm
		SWT	5 ms	Unit	dBm

11.3 dB Offset

1 VIEW

Paste Plot Here

1 MA

Center 1.88 GHz

Span 1.6 MHz

Date: 5 DEC 2000 15:12:19

Notes: OUTPUT - UPLINK - GSM

EQUIPMENT: **PCS Side-to-Side Repeater**

FCC ID: **KUWPCSSSR1900**

PROJECT NO.: **0L0494RUS1**

Test Data- Occupied Bandwidth – GSM

Test Plot: Occupied Bandwidth - GSM

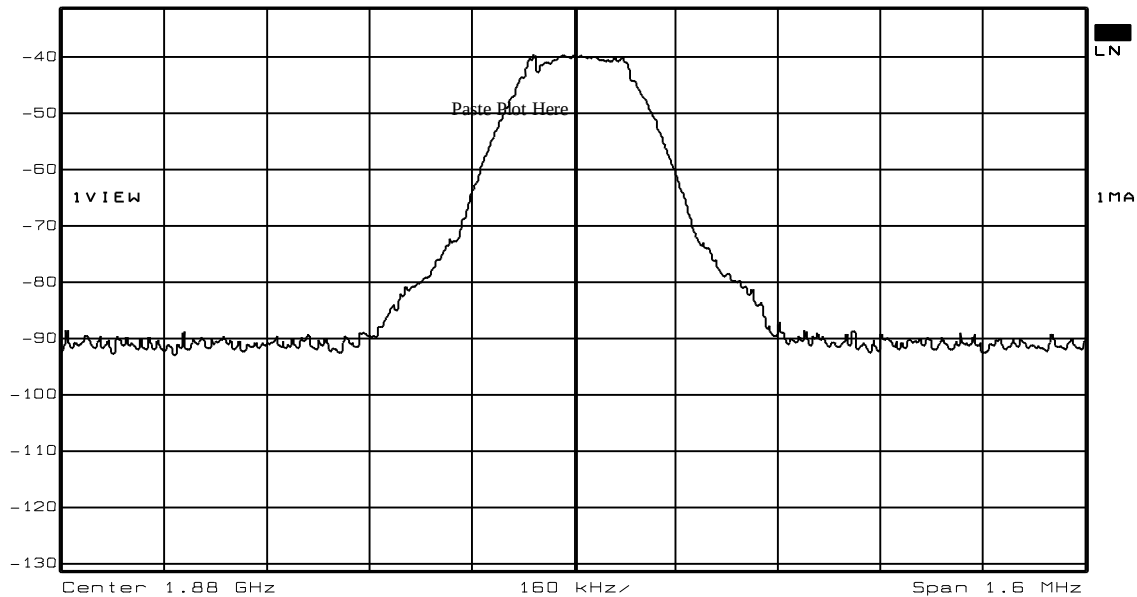
Page 2 of 4

Job No.: 0L0494R Date: 12/1/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER - HIGH GAIN
Configuration: TRANSMIT MID BAND



Ref Lvl
-31.3 dBm

RBW 30 kHz RF Att 10 dB
VBW 30 kHz Mixer -10 dBm
SWT 5 ms Unit dBm



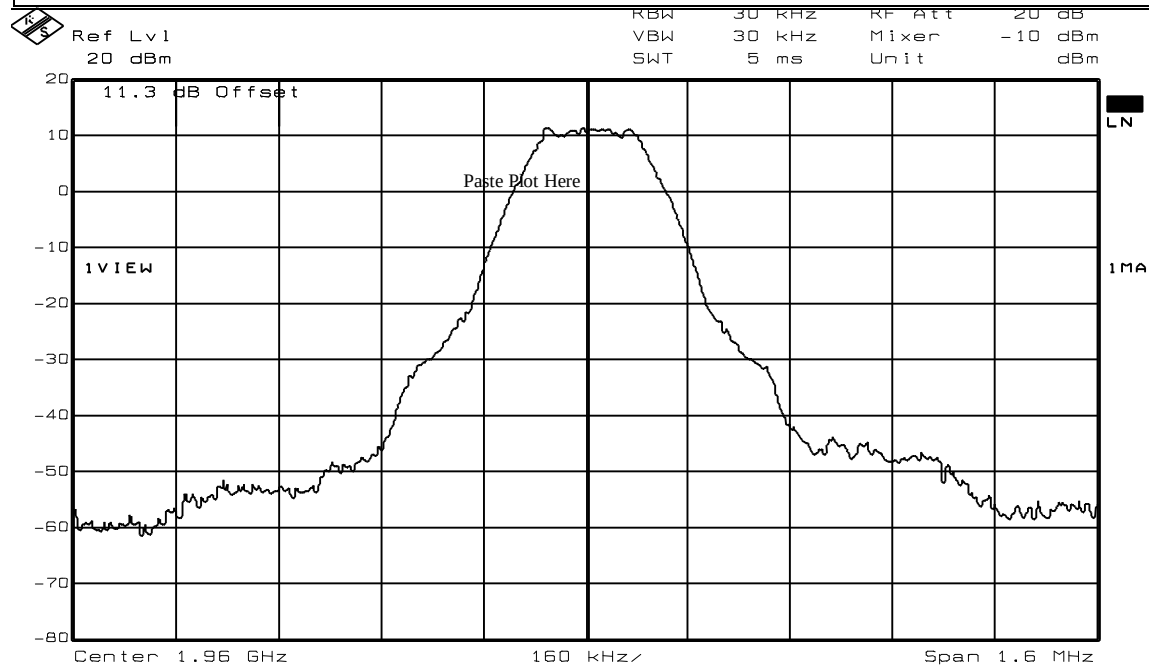
Date: 5.DEC.2000 15:13:59

Notes:	INPUT - UPLINK - GSM

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data- Occupied Bandwidth – GSM****Test Plot: Occupied Bandwidth - GSM**

Page 3 of 4

Job No.: 0L0494R Date: 12/1/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER - HIGH GAIN
Configuration: TRANSMIT MID BAND



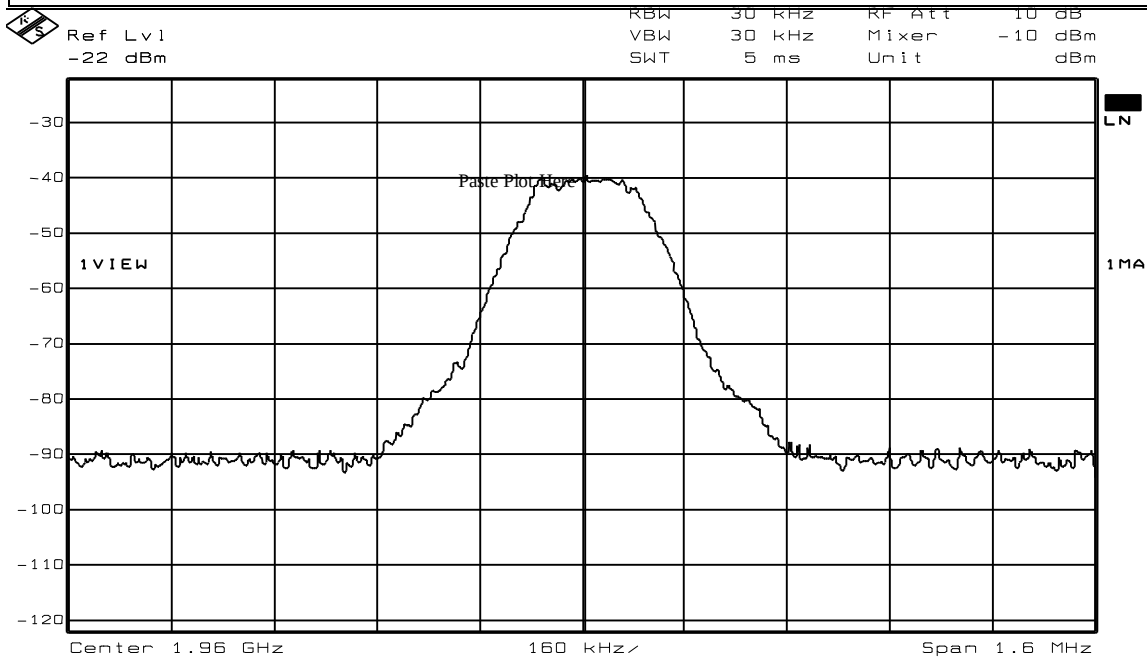
Date: 5.DEC.2000 15:28:10

Notes: OUTPUT - DOWNLINK - GSM

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data- Occupied Bandwidth – GSM****Test Plot: Occupied Bandwidth - GSM**

Page 4 of 4

Job No.: 0L0494R Date: 12/1/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER - HIGH GAIN
Configuration: TRANSMIT MID BAND



Notes: INPUT - DOWNLINK - GSM

EQUIPMENT: PCS Side-to-Side Repeater**FCC ID: KUWPCSSSR1900****PROJECT NO.: 0L0494RUS1**

NAME OF TEST: Occupied Bandwidth (NADC)

PARA. NO.: 2.1049

TESTED BY: David Light

DATE: 12/01/00

Test Results: Complies.**Test Data:** See attached plot(s).**Equipment Used:****Measurement Uncertainty:** +/- 1.6 dB**Temperature:** 22 °C**Relative Humidity:** 50 %

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data- Occupied Bandwidth - NADC****Test Plot: Occupied Bandwidth - TDMA**

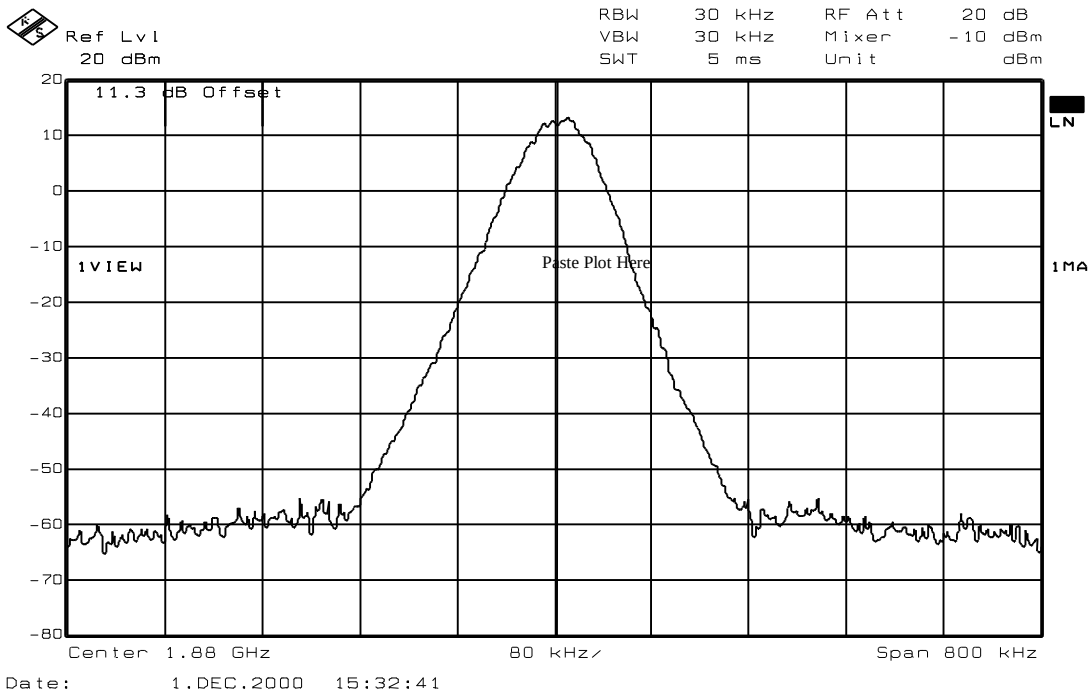
Page 1 of 4

Job No.: 0L0494R Date: 12/01/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT MID BAND
Serial Number: 45
Location: Lab 1 RBW: 30 kHz
Detector Type: Peak VBW: 30 kHz

Test Equipment Used

Antenna: #N/A Directional Coupler: #N/A
Pre-Amp: #N/A Cable #1: 1045
Filter: #N/A Cable #2: #N/A
Receiver: 1036 Cable #3: #N/A
Attenuator #1: 1466 Cable #4: #N/A
Attenuator #2: #N/A Mixer: #N/A

Additional equipment used:
Measurement
Uncertainty: #N/A



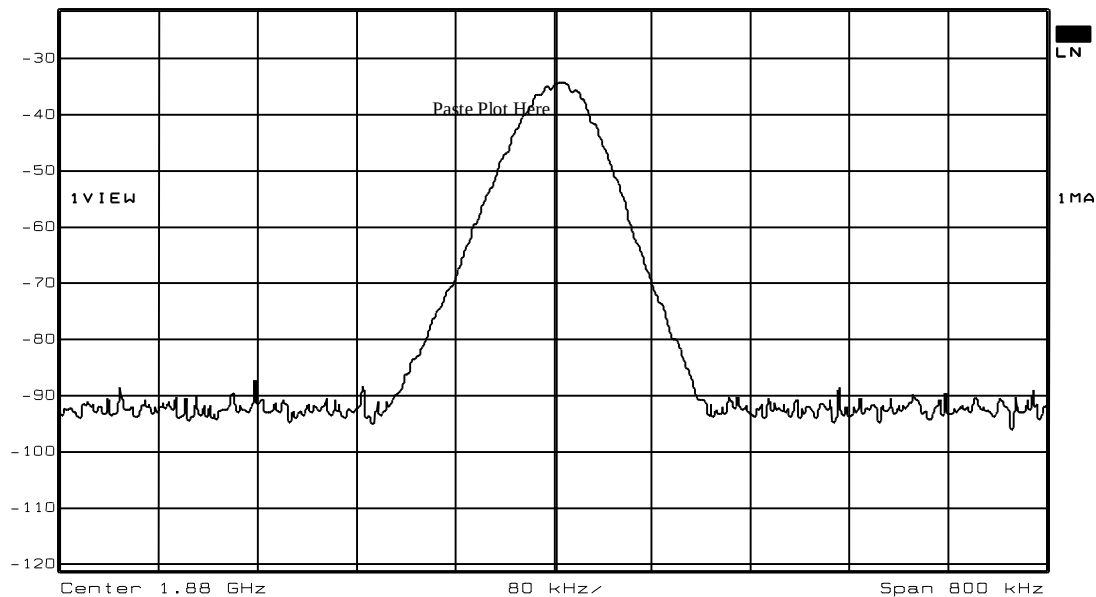
Notes: OUTPUT - UPLINK - TDMA

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data- Occupied Bandwidth - NADC****Test Plot: Occupied Bandwidth - TDMA**

Page 2 of 4
Job No.: 0L0494R Date: 12/1/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT MID BAND

Ref Lvl
-21.3 dBm

RBW	30 kHz	RF Att	10 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	5 ms	Unit	dBm

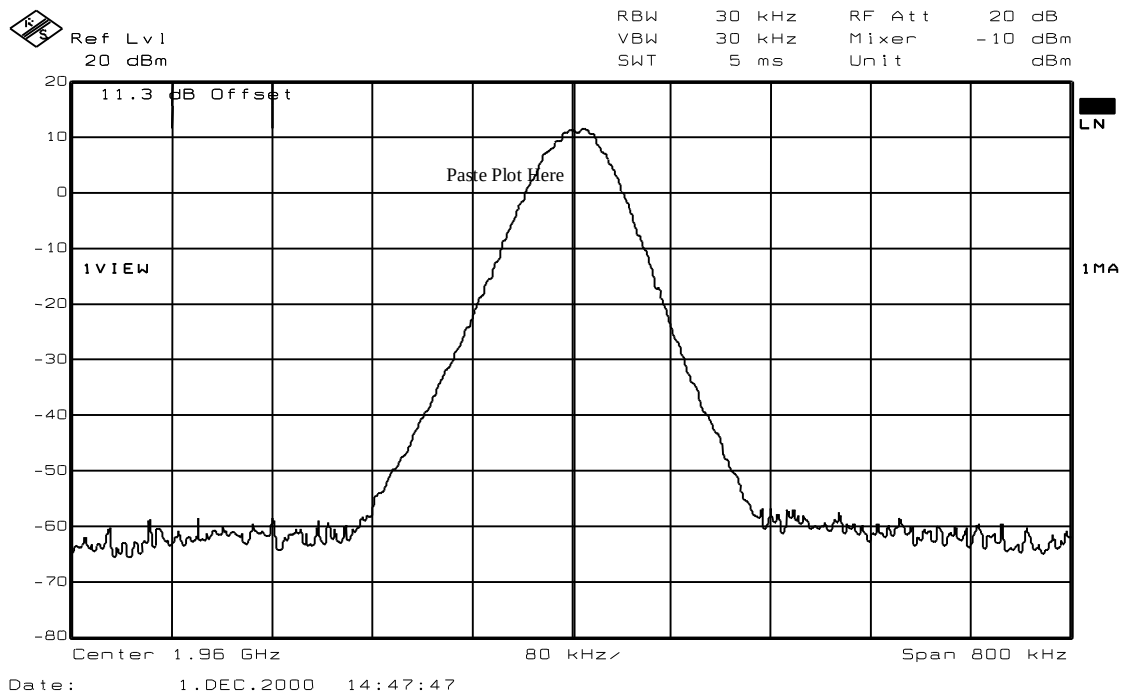


Notes:

INPUT - UPLINK - TDMA

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data- Occupied Bandwidth - NADC****Test Plot: Occupied Bandwidth - TDMA**

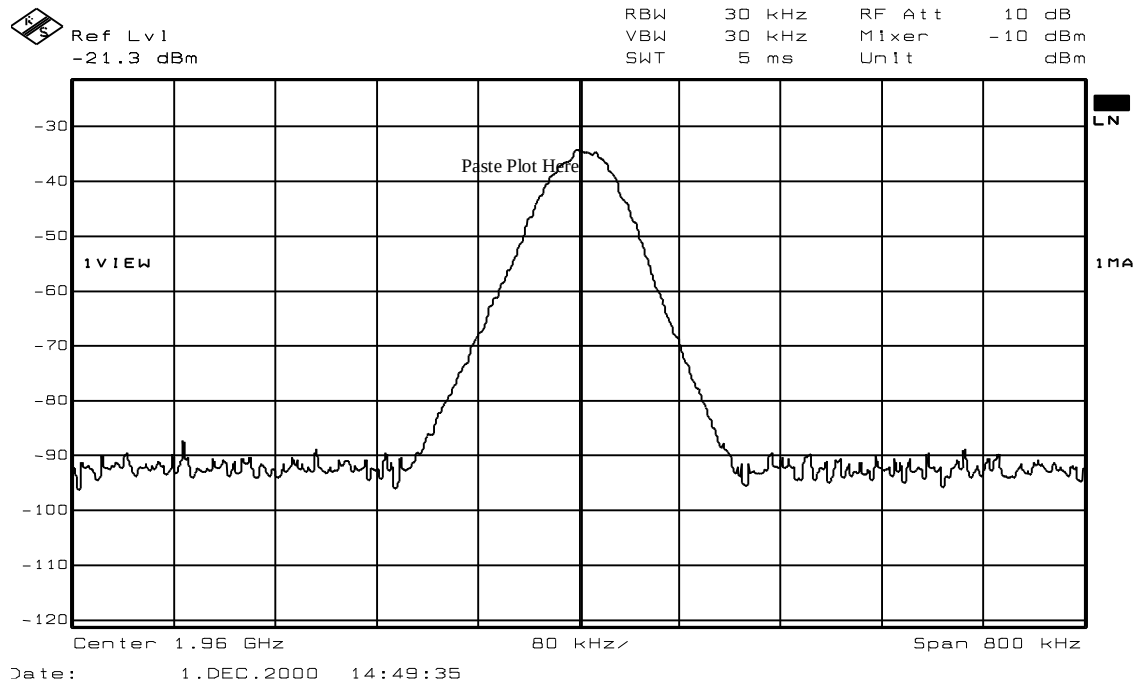
Page 3 of 4
Job No.: 0L0494R Date: 12/1/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT MID BAND



Notes: OUTPUT - DOWNLINK - TDMA

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data- Occupied Bandwidth - NADC****Test Plot: Occupied Bandwidth - TDMA**

Page 4 of 4
Job No.: 0L0494R Date: 12/1/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT MID BAND



Notes: INPUT - DOWNLINK - TDMA

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data- Occupied Bandwidth – NADC**

Test Plot: Occupied Bandwidth - TDMA	
Page 1 of 4	
Job No.:	0L0494R
Specification:	PART 24
Tested By:	David Light
E.U.T.:	PCS REPEATER - HIGH GAIN
Configuration:	TRANSMIT MID BAND
Serial Number:	45
Location:	Lab 1
Detector Type:	Peak
Date:	12/01/00
Temperature(°C):	22
Relative Humidity(%)	50
RBW:	30 kHz
VBW:	30 kHz
Test Equipment Used	
Antenna:	#N/A
Pre-Amp:	#N/A
Filter:	#N/A
Receiver:	1036
Attenuator #1:	1466
Attenuator #2:	#N/A
Additional equipment used:	
Measurement Uncertainty:	#N/A
Directional Coupler:	#N/A
Cable #1:	1045
Cable #2:	#N/A
Cable #3:	#N/A
Cable #4:	#N/A
Mixer:	#N/A

Ref Lvl	RBW	VBW	SWT	RF Att	Mixer	Unit
20 dBm	30 kHz	30 kHz	5 ms	20 dB	-10 dBm	dBm

Center 1.88 GHz 80 kHz Span 800 kHz

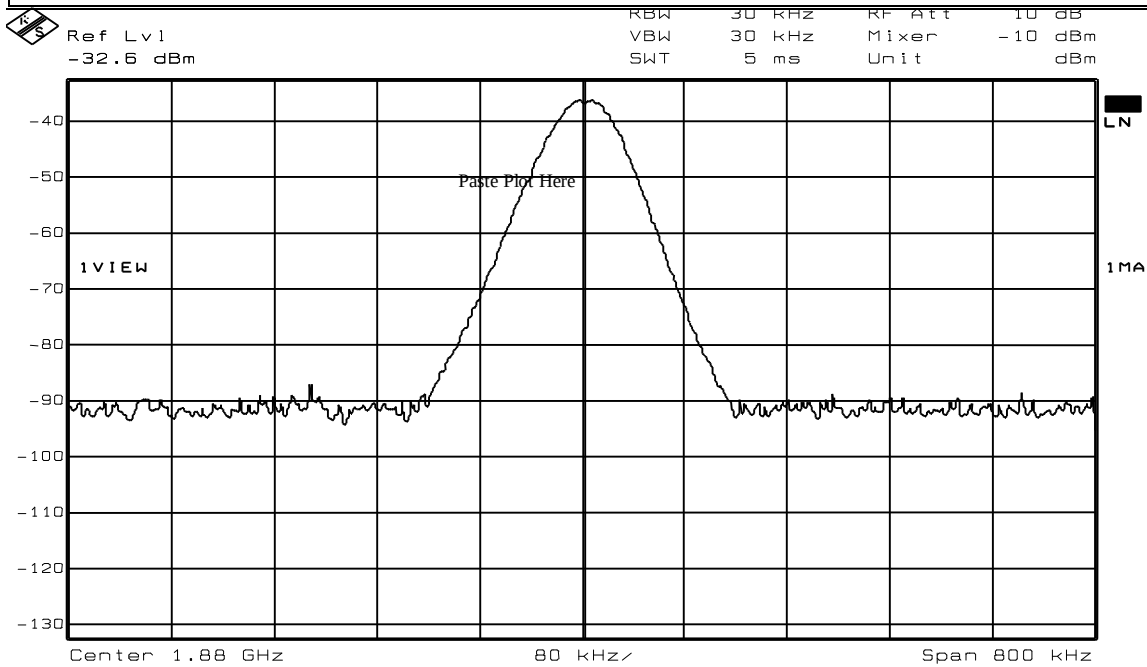
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Notes: OUTPUT - UPLINK - TDMA

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data- Occupied Bandwidth – NADC****Test Plot: Occupied Bandwidth - TDMA**

Page 2 of 4

Job No.: 0L0494R Date: 12/1/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER - HIGH GAIN
Configuration: TRANSMIT MID BAND



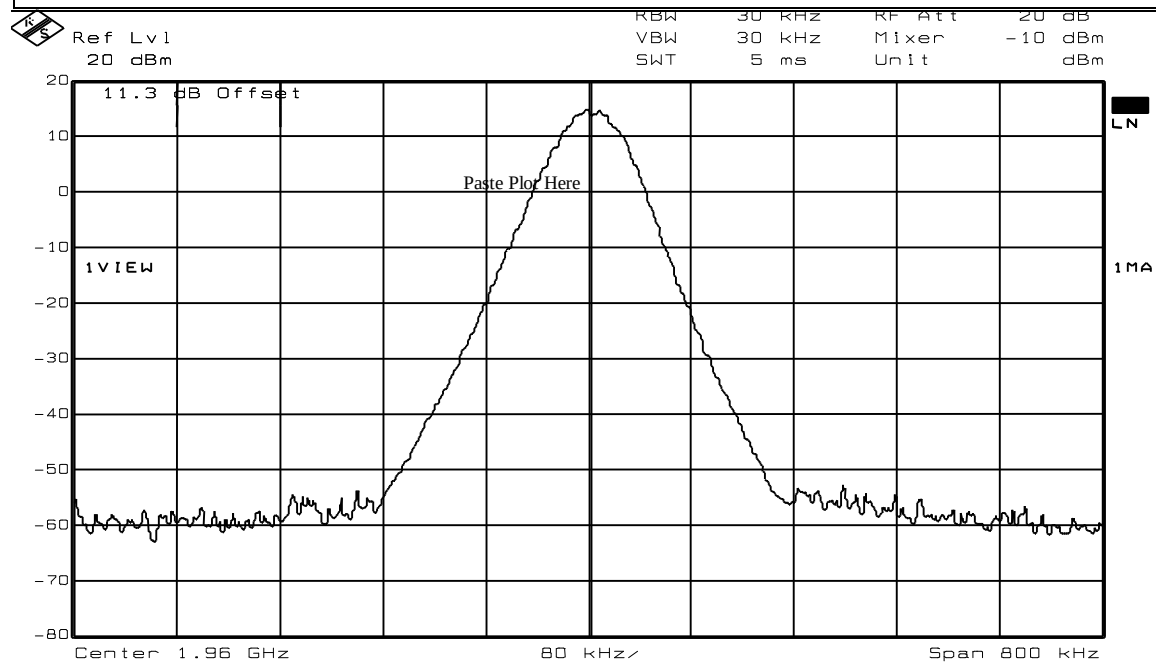
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Notes: INPUT - UPLINK - TDMA

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data- Occupied Bandwidth – NADC****Test Plot: Occupied Bandwidth - TDMA**

Page 3 of 4

Job No.: 0L0494R Date: 12/1/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER - HIGH GAIN
Configuration: TRANSMIT MID BAND



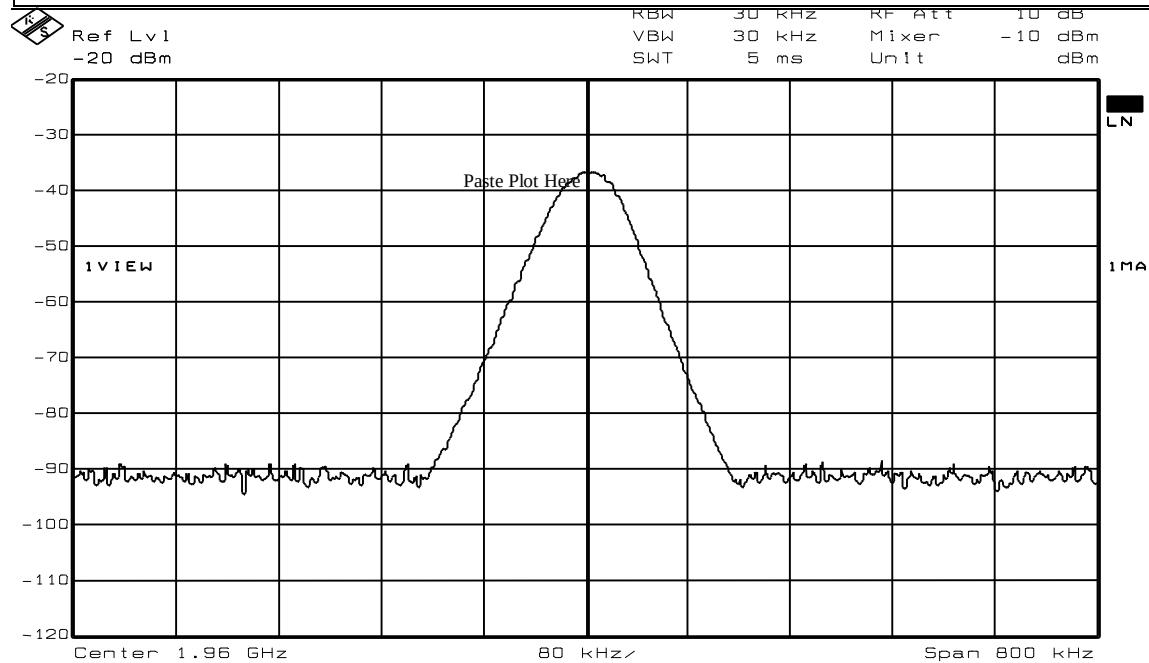
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Notes:	OUTPUT - DOWNLINK - TDMA

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data- Occupied Bandwidth – NADC****Test Plot: Occupied Bandwidth - TDMA**

Page 4 of 4

Job No.: 0L0494R Date: 12/1/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER - HIGH GAIN
Configuration: TRANSMIT MID BAND



Date: 5.DEC.2000 15:24:46

Notes: INPUT - DOWNLINK - TDMA

EQUIPMENT: PCS Side-to-Side Repeater

FCC ID: KUWPCSSSR1900

PROJECT NO.: 0L0494RUS1

Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 2.1051
TESTED BY: David Light	DATE: 12/04/00

Test Results: Complies.

Test Data: See attached plot(s).

Equipment Used: 1036-1045-1466-1052-1053-1083

Measurement Uncertainty: +/- 1.6 dB

Temperature: 22 °C

Relative Humidity: 50 %

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: Antenna Port Spurious Emissions - CDMA**

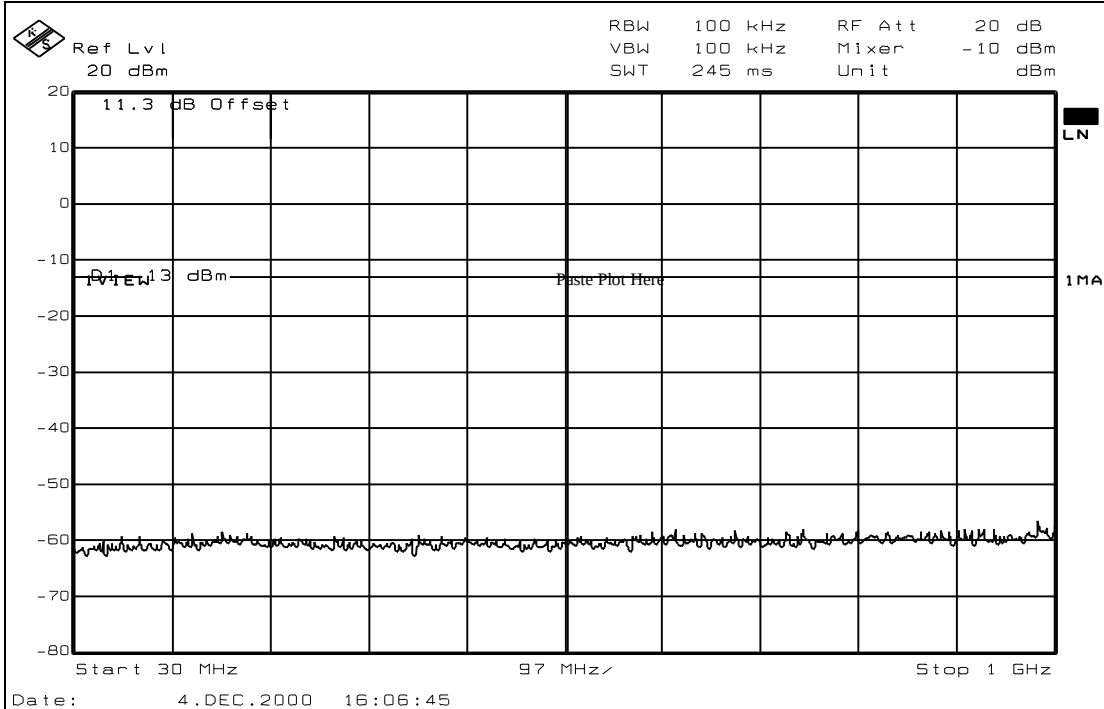
Page 1 of 4

Job No.: 0L0494R Date: 12/04/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT 2 CDMA CARRIERS AT MAX POWER
Serial Number: 45
Location: Lab 1 RBW: 100 kHz < 1 GHz, 1 MHz > 1 GHz
Detector Type: Peak VBW: 100 kHz < 1 GHz, 1 MHz > 1 GHz

Test Equipment Used

Antenna: #N/A Directional Coupler: #N/A
Pre-Amp: #N/A Cable #1: 1045
Filter: #N/A Cable #2: #N/A
Receiver: 1036 Cable #3: #N/A
Attenuator #1: 1466 Cable #4: #N/A
Attenuator #2: #N/A Mixer: #N/A

Additional equipment used:
Measurement
Uncertainty: #N/A

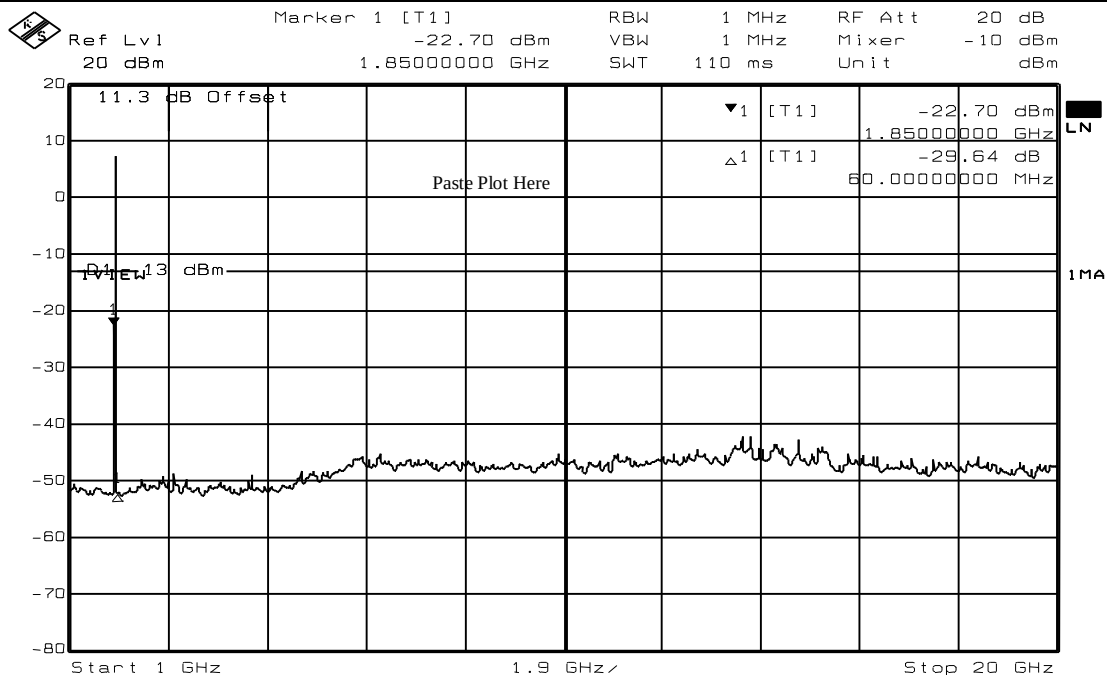


Notes: UPLINK

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: Antenna Port Spurious Emissions - CDMA**

Page 2 of 4

Job No.: 0L0494R Date: 12/4/00
Specification: PART 24 Temperature(°C): 1/22/00
Tested By: David Light Relative Humidity(%) 2/19/00
E.U.T.: PCS REPEATER
Configuration: TRANSMIT 2 CDMA CARRIERS AT MAX POWER



Date: 4.DEC.2000 16:07:53

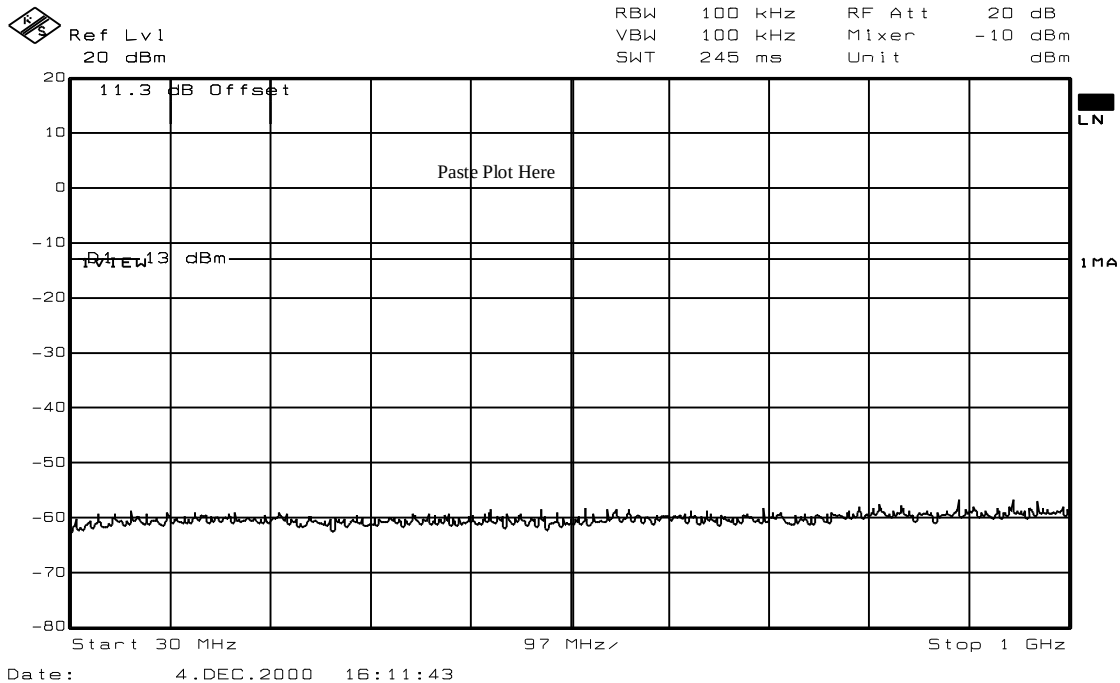
Notes:

UPLINK

MARKERS INDICATE TRANSMIT BAND

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: Antenna Port Spurious Emissions - CDMA**

Page 3 of 4
Job No.: 0L0494R Date: 12/4/00
Specification: PART 24 Temperature(°C): 1/22/00
Tested By: David Light Relative Humidity(%) 2/19/00
E.U.T.: PCS REPEATER
Configuration: TRANSMIT 2 CDMA CARRIERS AT MAX POWER



Notes: DOWNLINK

EQUIPMENT: PCS Side-to-Side Repeater

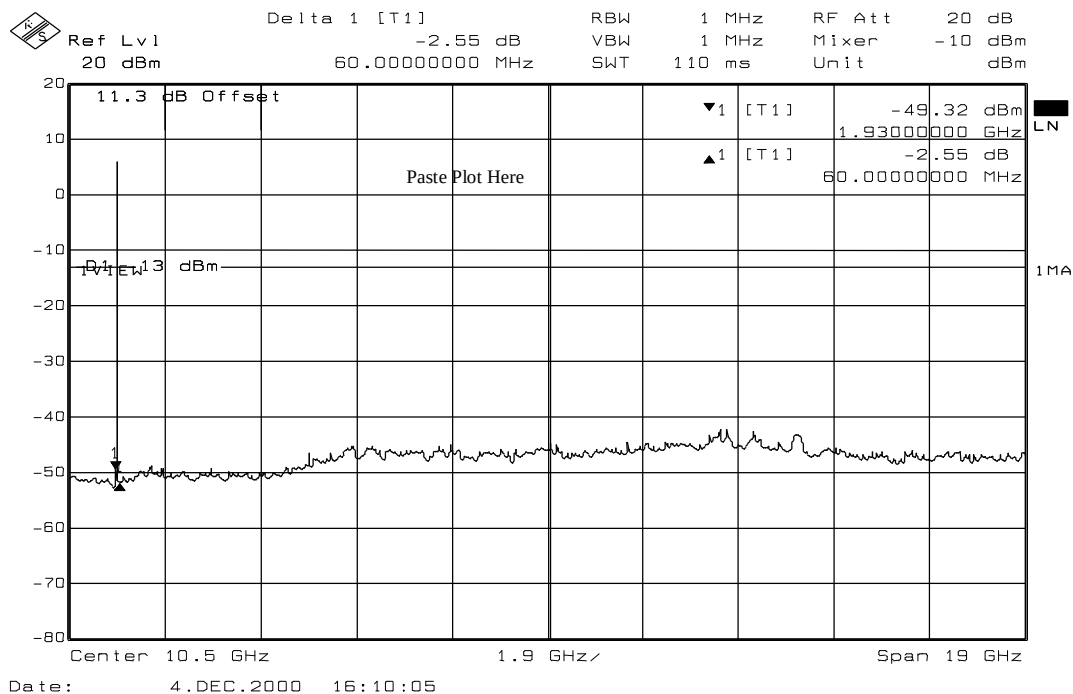
FCC ID: KUWPCSSSR1900

PROJECT NO.: 0L0494RUS1

Test Data - Spurious Emissions at Antenna Terminals

Test Plot: Antenna Port Spurious Emissions - CDMA

Page 4 of 4
Job No.: 0L0494R Date: 12/4/00
Specification: PART 24 Temperature(°C): 1/22/00
Tested By: David Light Relative Humidity(%) 2/19/00
E.U.T.: PCS REPEATER
Configuration: TRANSMIT 2 CDMA CARRIERS AT MAX POWER



Notes:

DOWNLINK

MARKERS INDICATE TRANSMIT BAND

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: Intermodulation Characteristics - CDMA - Inband**

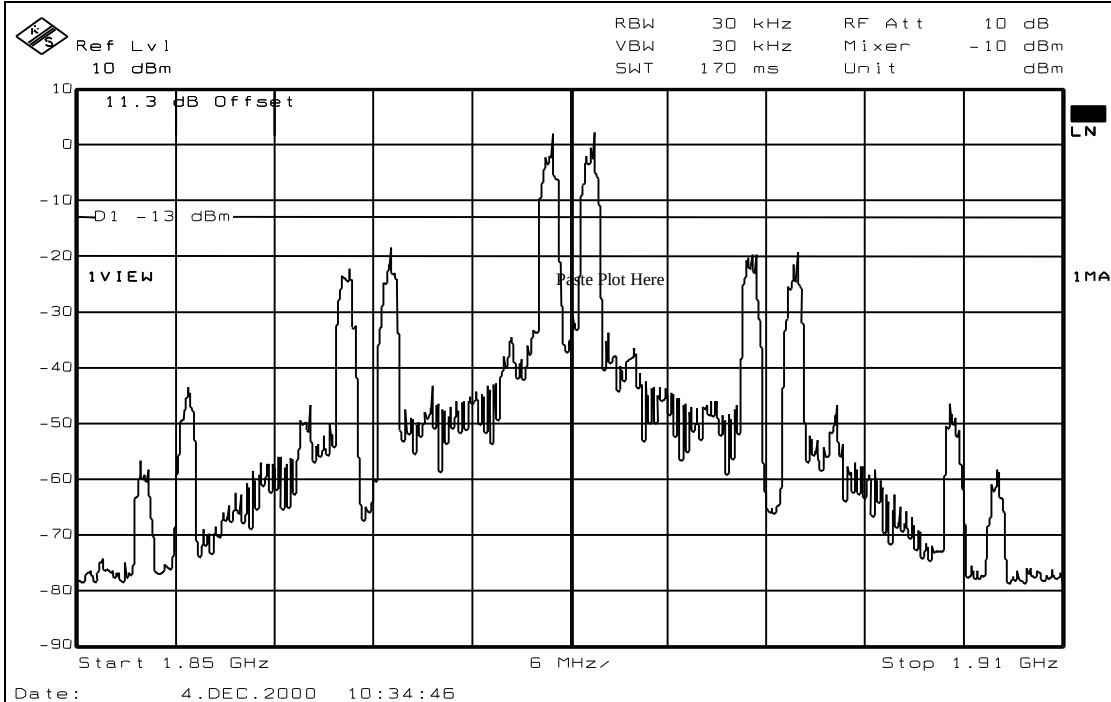
Page 1 of 2

Job No.: 0L0494R Date: 12/04/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT 2 CARRIERS
Serial Number: 45
Location: Lab 1 RBW: 30 kHz
Detector Type: Peak VBW: 30 kHz

Test Equipment Used

Antenna: #N/A Directional Coupler: #N/A
Pre-Amp: #N/A Cable #1: 1045
Filter: #N/A Cable #2: #N/A
Receiver: 1036 Cable #3: #N/A
Attenuator #1: 1466 Cable #4: #N/A
Attenuator #2: #N/A Mixer: #N/A

Additional equipment used:
Measurement
Uncertainty: #N/A



Notes: UPLINK - 2 CARRIERS

EQUIPMENT: PCS Side-to-Side Repeater

FCC ID: KUWPCSSSR1900

PROJECT NO.: 0L0494RUS1

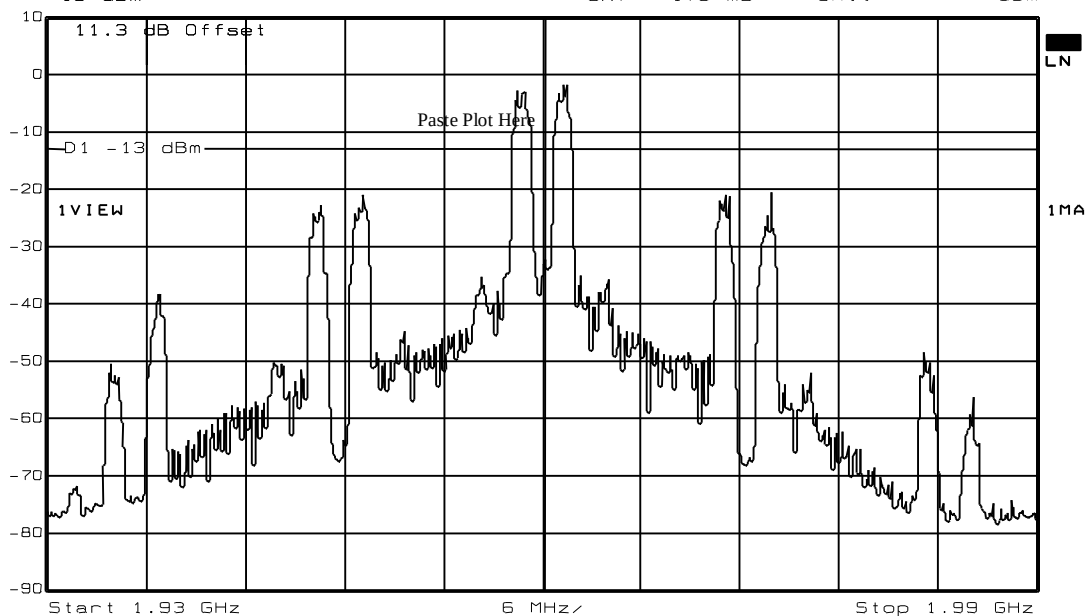
Test Data - Spurious Emissions at Antenna Terminals

Test Plot: Intermodulation Characteristics - CDMA - Inband

Page 2 of 2
Job No.: 0L0494R Date: 12/4/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT 2 CARRIERS

Ref Lvl
10 dBm

RBW 30 kHz RF Att 10 dB
VBW 30 kHz Mixer -10 dBm
SWT 170 ms Unit dBm



Date: 4.DEC.2000 10:32:06

Notes: DOWNLINK - 2 CARRIERS

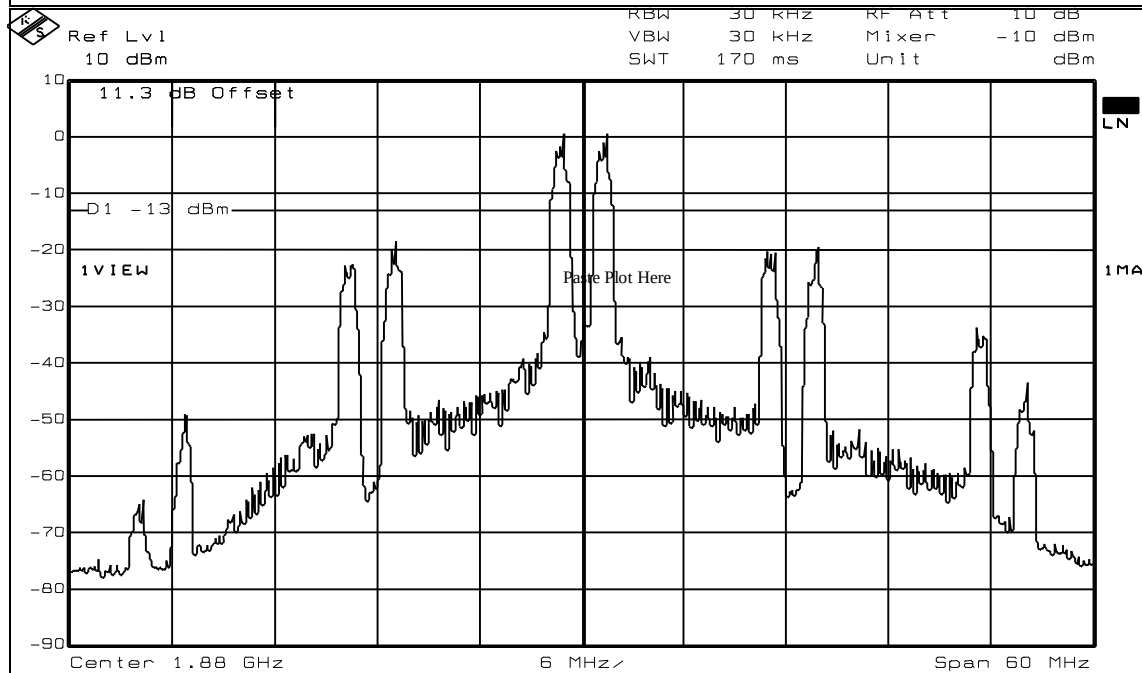
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Page 1 of 2

Job No.: 0L0494R Date: 12/04/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER - HIGH GAIN
Configuration: TRANSMIT 2 CARRIERS
Serial Number: 45
Location: Lab 1 RBW: 30 kHz
Detector Type: Peak VBW: 30 kHz

Test Equipment Used

Antenna: #N/A Directional Coupler: #N/A
Pre-Amp: #N/A Cable #1: 1045
Filter: #N/A Cable #2: #N/A
Receiver: 1036 Cable #3: #N/A
Attenuator #1: 1466 Cable #4: #N/A
Attenuator #2: #N/A Mixer: #N/A
Additional equipment used:
Measurement
Uncertainty: #N/A



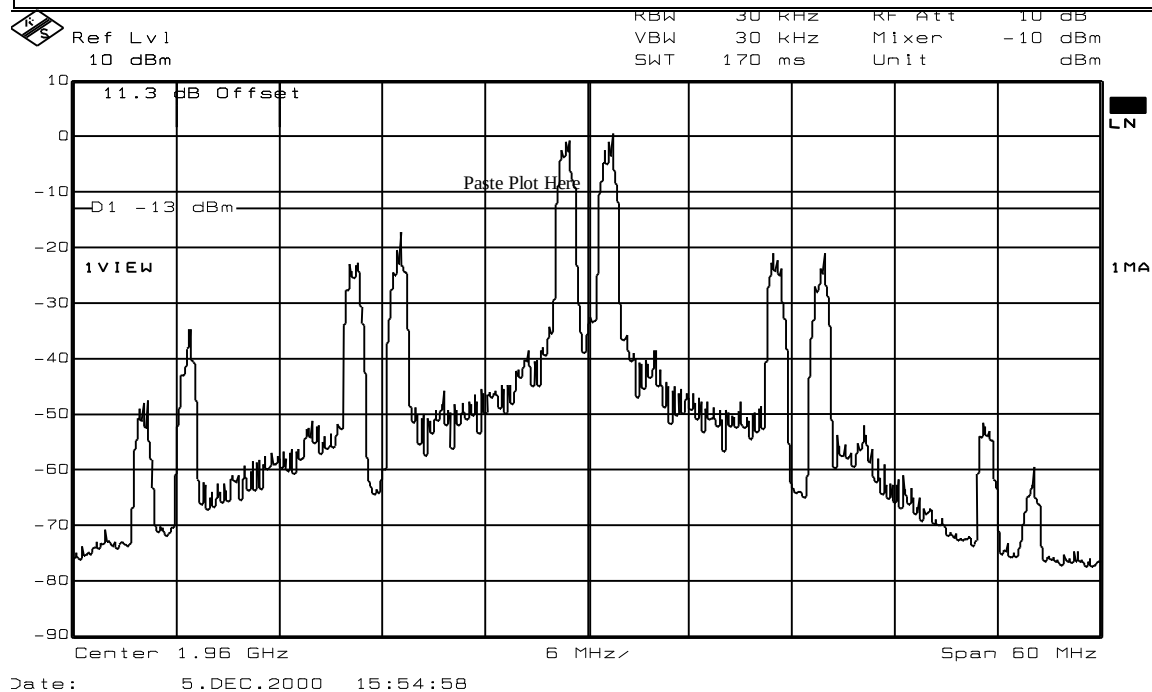
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Notes: UPLINK - 2 CARRIERS

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: Intermodulation Characteristics - CDMA - Inband**

Page 2 of 2

Job No.: 0L0494R Date: 12/4/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER - HIGH GAIN
Configuration: TRANSMIT 2 CARRIERS



Notes: DOWNLINK - 2 CARRIERS

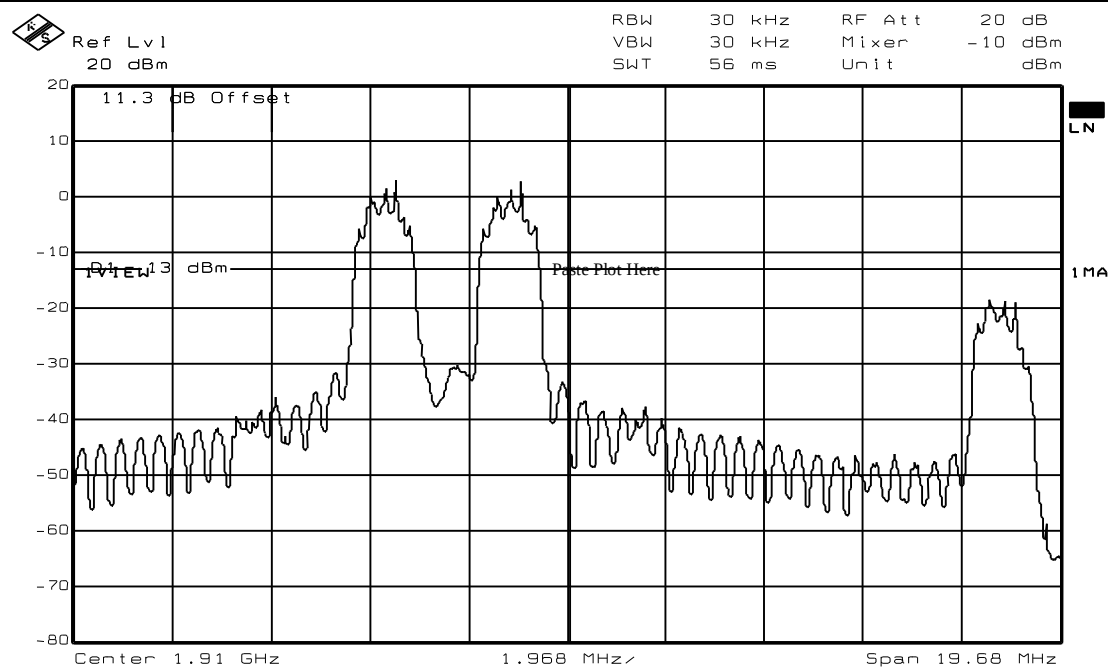
EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: Intermodulation Characteristics - CDMA - Out of Band**

Page 1 of 2

Job No.: 0L0494R Date: 12/06/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT 2 CARRIERS
Serial Number: 45
Location: Lab 1 RBW: 30 kHz
Detector Type: Peak VBW: 30 kHz

Test Equipment Used

Antenna: #N/A Directional Coupler: #N/A
Pre-Amp: #N/A Cable #1: 1045
Filter: #N/A Cable #2: #N/A
Receiver: 1036 Cable #3: #N/A
Attenuator #1: 1466 Cable #4: #N/A
Attenuator #2: #N/A Mixer: #N/A
Additional equipment used:
Measurement
Uncertainty: #N/A



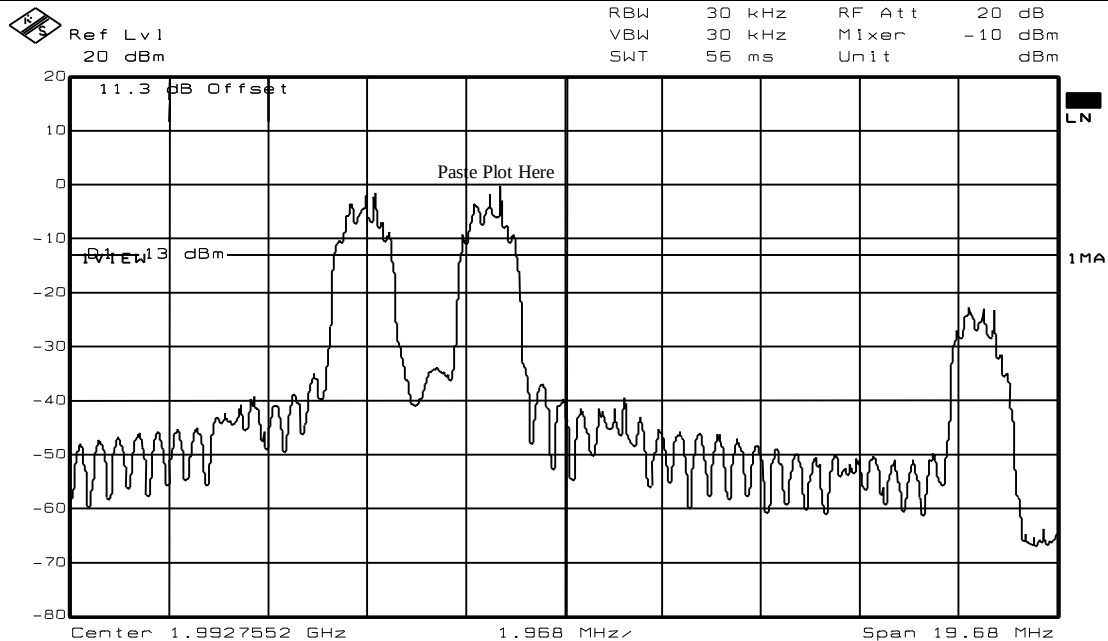
Date: 6.DEC.2000 13:57:05

Notes: **UPLINK - 2 CARRIERS**

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: Intermodulation Characteristics - CDMA - Out of Band**

Page 2 of 2

Job No.:	0L0494R	Date:	12/6/00
Specification:	PART 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	50
E.U.T.:	PCS REPEATER		
Configuration:	TRANSMIT 2 CARRIERS		



Date: 6.DEC.2000 13:59:15

Notes: DOWNLINK - 2 CARRIERS

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals**

Test Plot: BAND EDGES - CDMA	
Page 1 of 4	
Job No.: 0L0494R	Date: 1206/00
Specification: PART 24	Temperature(°C): 22
Tested By: David Light	Relative Humidity(%) 50
E.U.T.: PCS REPEATER	
Configuration: TRANSMIT CDMA FULL POWER	
Serial Number: 2	
Location: Lab 1	RBW: 30 kHz
Detector Type: Peak	VBW: 30 kHz
Test Equipment Used	
Antenna: #N/A	Directional Coupler: #N/A
Pre-Amp: #N/A	Cable #1: 1045
Filter: #N/A	Cable #2: #N/A
Receiver: 1036	Cable #3: #N/A
Attenuator #1: 1466	Cable #4: #N/A
Attenuator #2: #N/A	Mixer: #N/A
Additional equipment used:	
Measurement	
Uncertainty: #N/A	

Ref Lvl 1		RBW	30 kHz	RF Att	20 dB
20 dBm <td>VBW<td>30 kHz<td>Mixer<td>-10 dBm</td></td></td></td>		VBW <td>30 kHz<td>Mixer<td>-10 dBm</td></td></td>	30 kHz <td>Mixer<td>-10 dBm</td></td>	Mixer <td>-10 dBm</td>	-10 dBm
<td>SWT<td>7 ms<td>Unit<td>dBm</td></td></td></td>		SWT <td>7 ms<td>Unit<td>dBm</td></td></td>	7 ms <td>Unit<td>dBm</td></td>	Unit <td>dBm</td>	dBm

Center 1.93 GHz 246 kHz Span 2.46 MHz

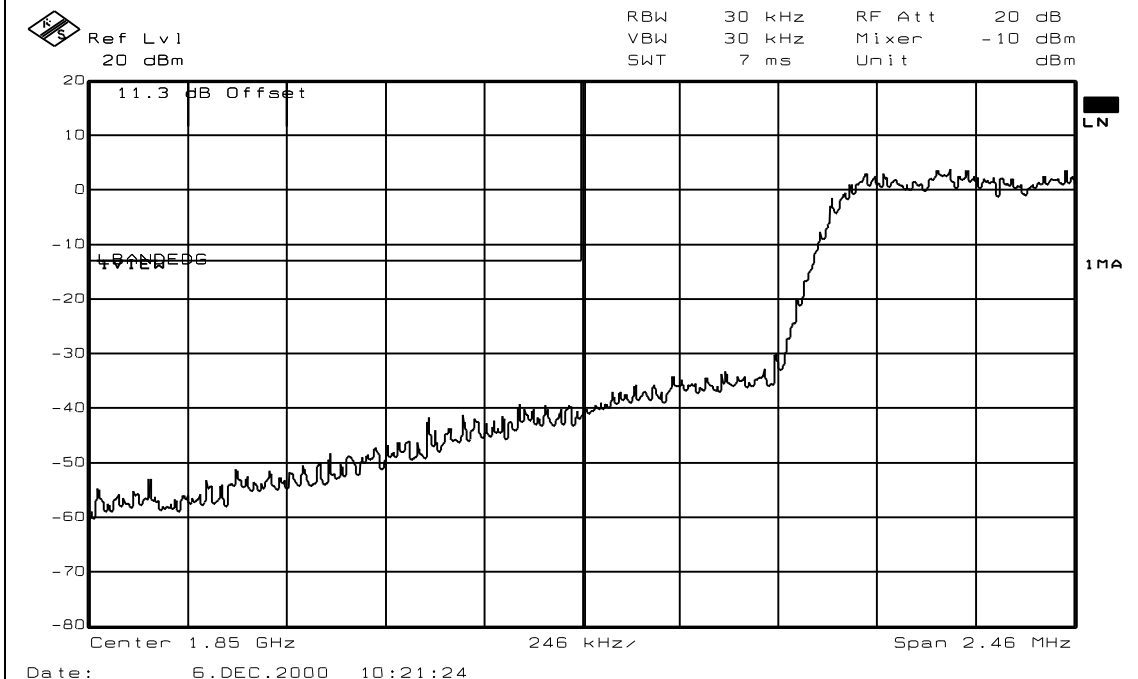
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Notes: **LOWER BAND EDGE - DOWNLINK**

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: BAND EDGES - CDMA**

Page 2 of 4

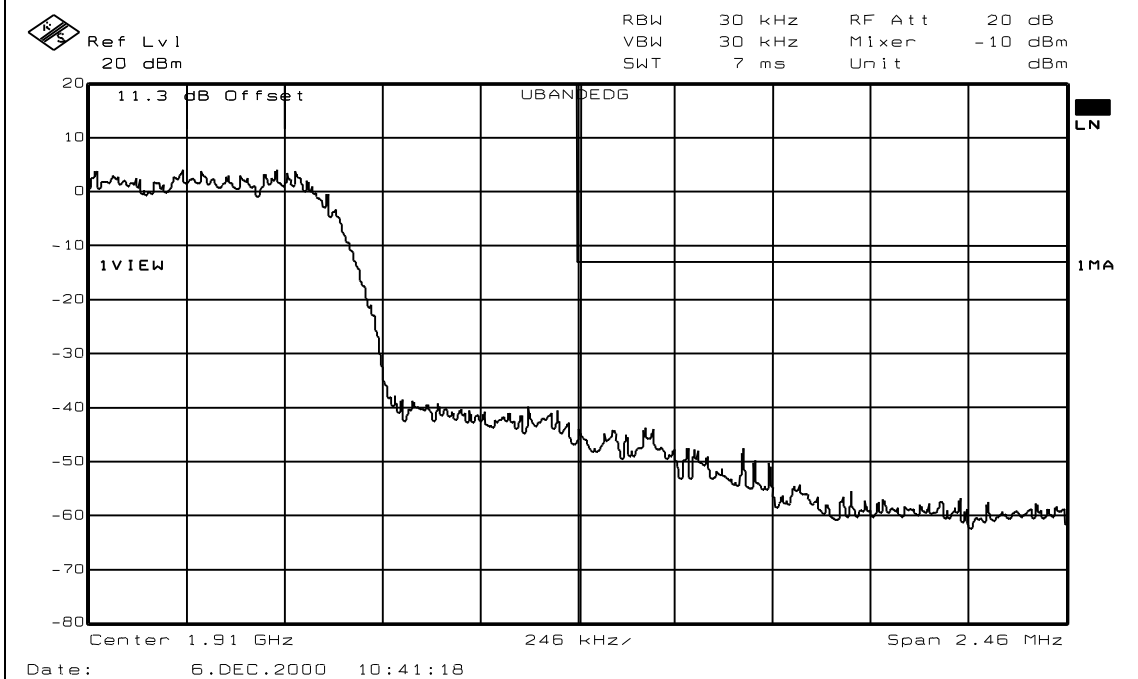
Job No.: 0L0494R Date: 1206/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT CDMA FULL POWER

Notes: **LOWER BAND EDGE - UPLINK**

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: BAND EDGES - CDMA**

Page 3 of 4

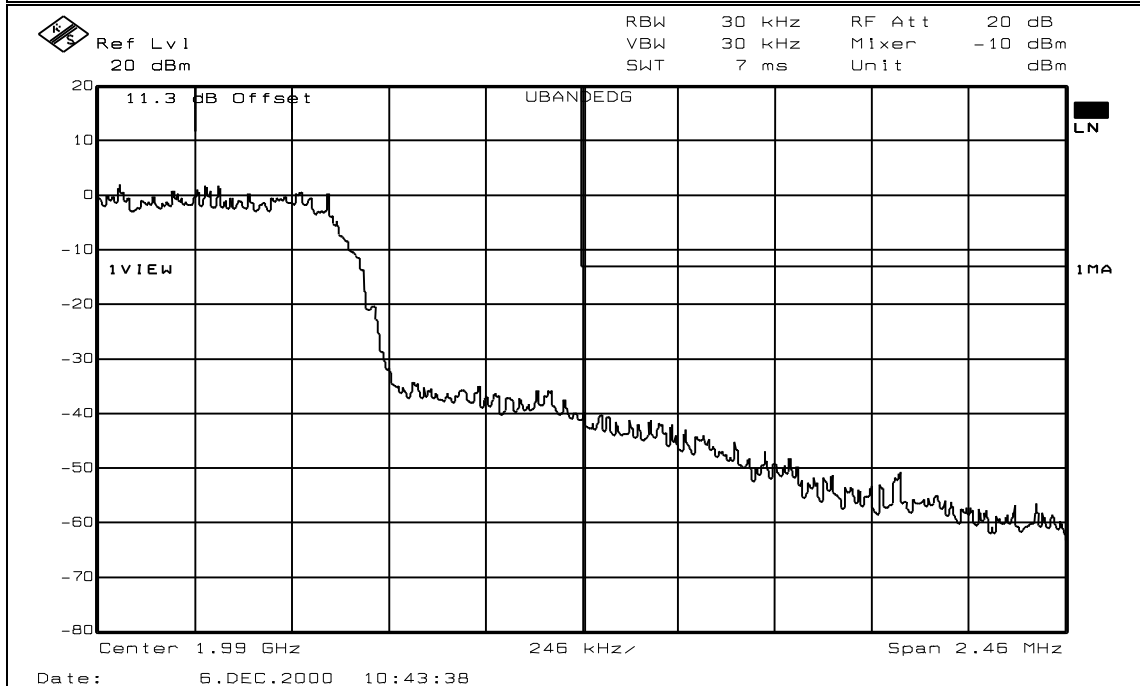
Job No.: 0L0494R Date: 1206/00
Specification: PART 24 Temperature(°C):
Tested By: David Light Relative Humidity(%):
E.U.T.: PCS REPEATER
Configuration: TRANSMIT CDMA FULL POWER

Notes: **UPPER BAND EDGE - UPLINK**

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: BAND EDGES - CDMA**

Page 4 of 4

Job No.: 0L0494R Date: 1206/00
Specification: PART 24 Temperature(°C):
Tested By: David Light Relative Humidity(%):
E.U.T.: PCS REPEATER
Configuration: TRANSMIT CDMA FULL POWER

Notes: **UPPER BAND EDGE - DOWNLINK**

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: Antenna Port Spurious Emissions - GSM**

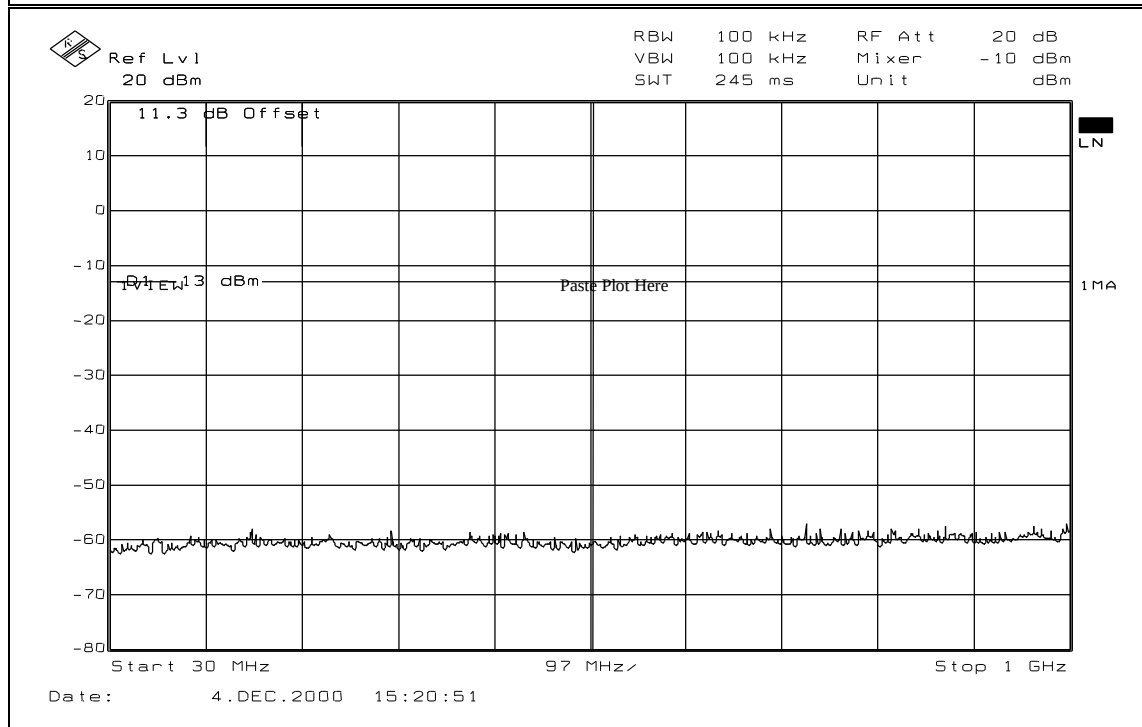
Page 1 of 4

Job No.: 0L0494R Date: 12/04/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT 5 GSM CARRIERS AT MAX POWER
Serial Number: 45
Location: Lab 1 RBW: 100 kHz < 1 GHz, 1 MHz > 1 GHz
Detector Type: Peak VBW: 100 kHz < 1 GHz, 1 MHz > 1 GHz

Test Equipment Used

Antenna: #N/A Directional Coupler: #N/A
Pre-Amp: #N/A Cable #1: 1045
Filter: #N/A Cable #2: #N/A
Receiver: 1036 Cable #3: #N/A
Attenuator #1: 1466 Cable #4: #N/A
Attenuator #2: #N/A Mixer: #N/A

Additional equipment used:
Measurement
Uncertainty: #N/A



Notes: UPLINK

EQUIPMENT: PCS Side-to-Side Repeater

FCC ID: KUWPCSSSR1900

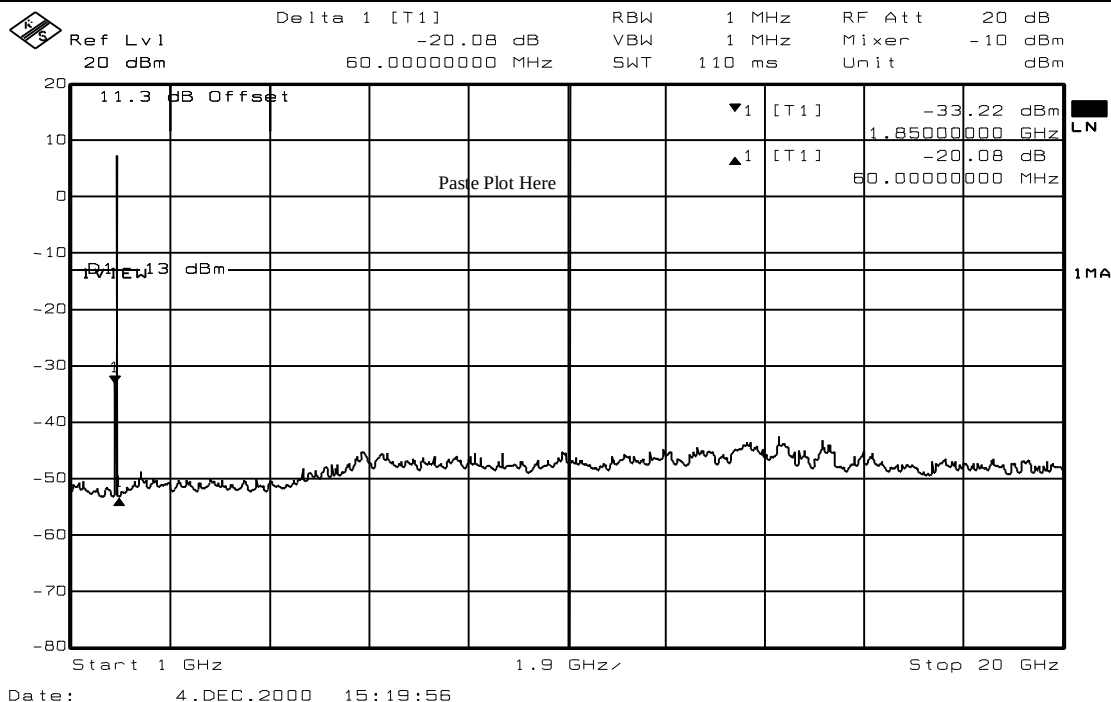
PROJECT NO.: 0L0494RUS1

Test Data - Spurious Emissions at Antenna Terminals

Test Plot: Antenna Port Spurious Emissions - GSM

Page 2 of 4

Job No.: 0L0494R Date: 12/4/00
Specification: PART 24 Temperature(°C): 1/22/00
Tested By: David Light Relative Humidity(%) 2/19/00
E.U.T.: PCS REPEATER
Configuration: TRANSMIT 5 GSM CARRIERS AT MAX POWER



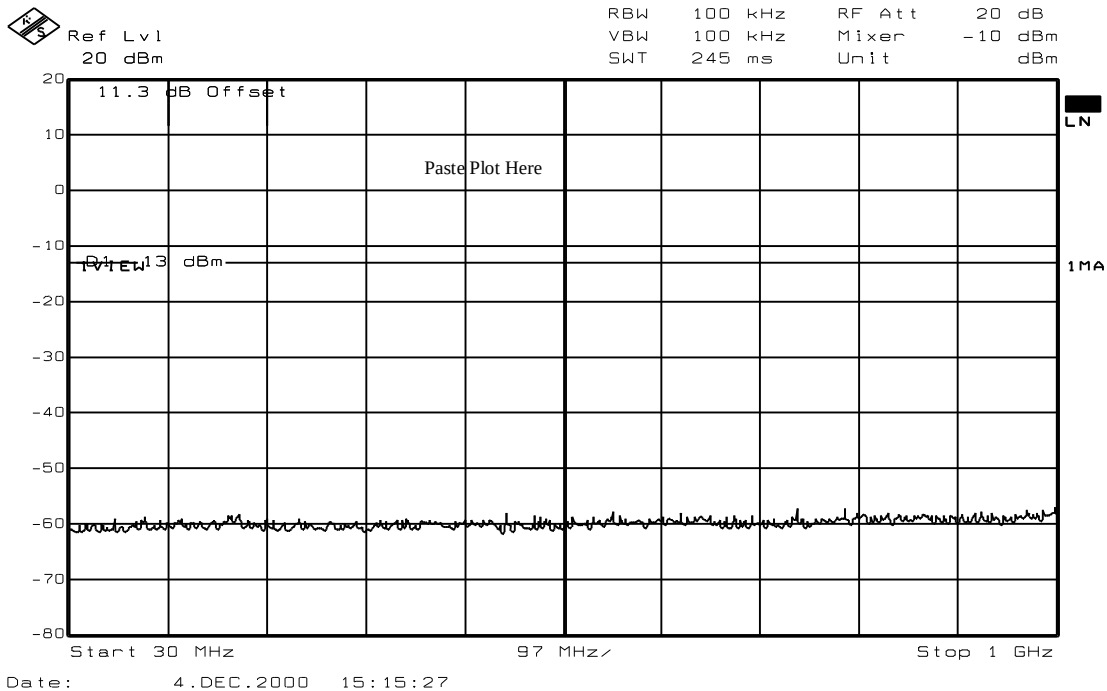
Notes:

UPLINK

MARKERS INDICATE TRANSMIT BAND

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: Antenna Port Spurious Emissions - GSM**

Page 3 of 4
Job No.: 0L0494R Date: 12/4/00
Specification: PART 24 Temperature(°C): 1/22/00
Tested By: David Light Relative Humidity(%) 2/19/00
E.U.T.: PCS REPEATER
Configuration: TRANSMIT 5 GSM CARRIERS AT MAX POWER

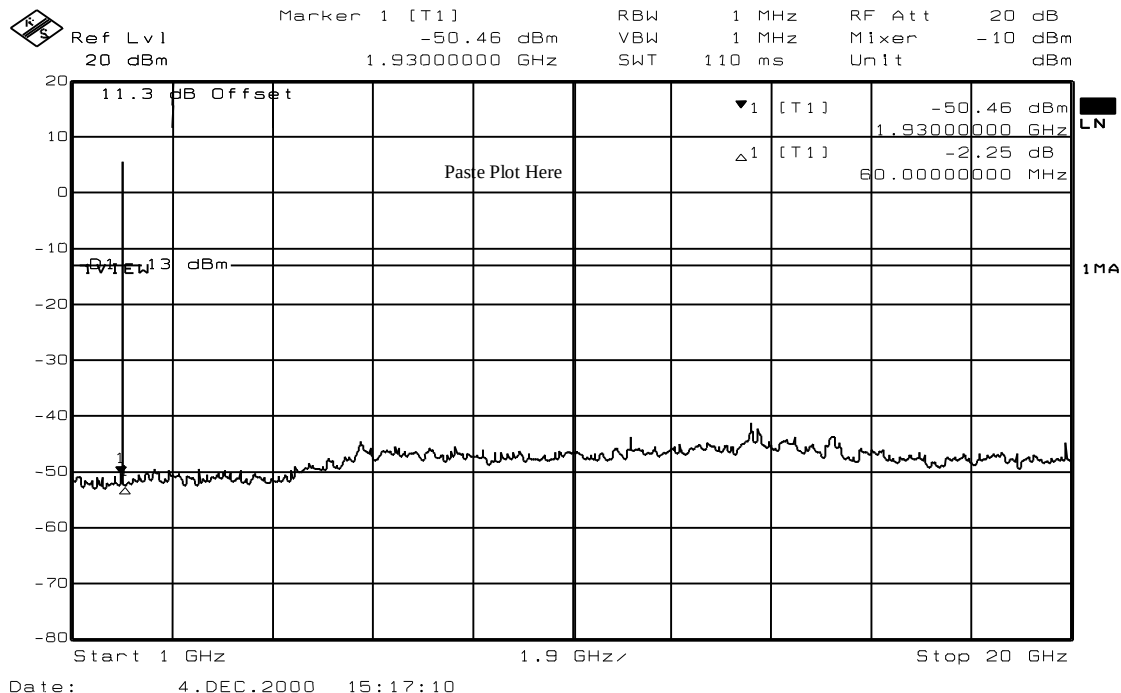


Notes: DOWNLINK

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: Antenna Port Spurious Emissions - GSM**

Page 4 of 4

Job No.:	0L0494R	Date:	12/4/00
Specification:	PART 24	Temperature(°C):	1/22/00
Tested By:	David Light	Relative Humidity(%)	2/19/00
E.U.T.:	PCS REPEATER		
Configuration:	TRANSMIT 5 GSM CARRIERS AT MAX POWER		



Notes:

DOWNLINK

MARKERS INDICATE TRANSMIT BAND

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: Intermodulation Characteristics - GSM - Inband**

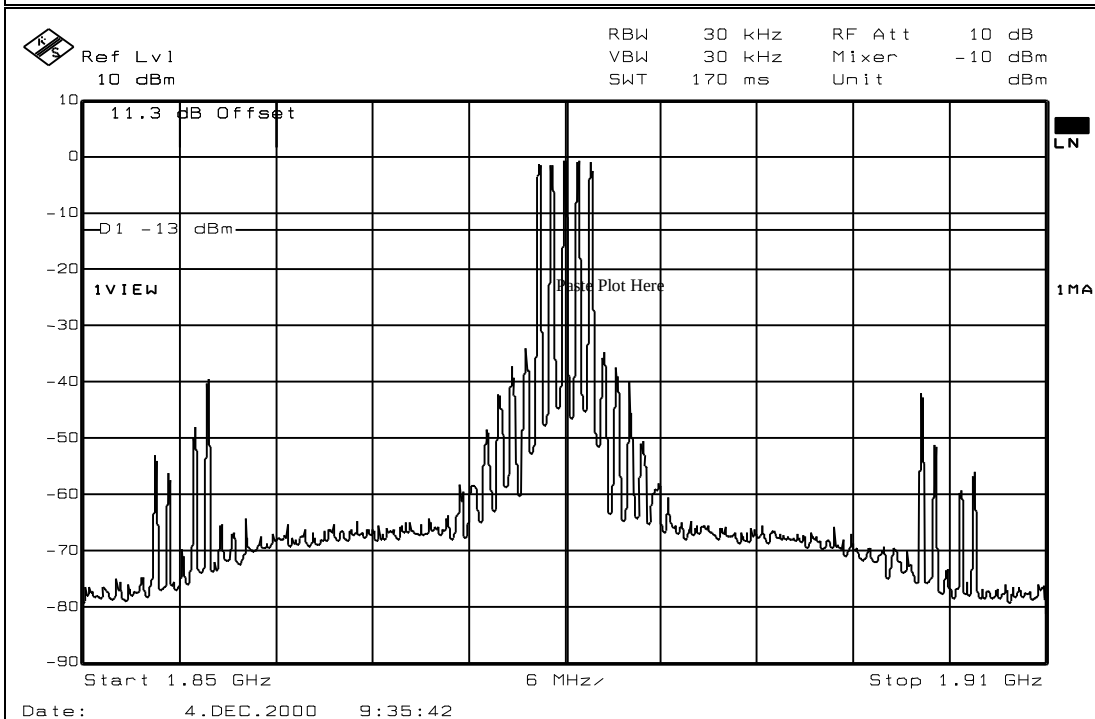
Page 1 of 2

Job No.: 0L0494R Date: 12/04/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT 5 CARRIERS
Serial Number: 45
Location: Lab 1 RBW: 30 kHz
Detector Type: Peak VBW: 30 kHz

Test Equipment Used

Antenna: #N/A Directional Coupler: #N/A
Pre-Amp: #N/A Cable #1: 1045
Filter: #N/A Cable #2: #N/A
Receiver: 1036 Cable #3: #N/A
Attenuator #1: 1466 Cable #4: #N/A
Attenuator #2: #N/A Mixer: #N/A

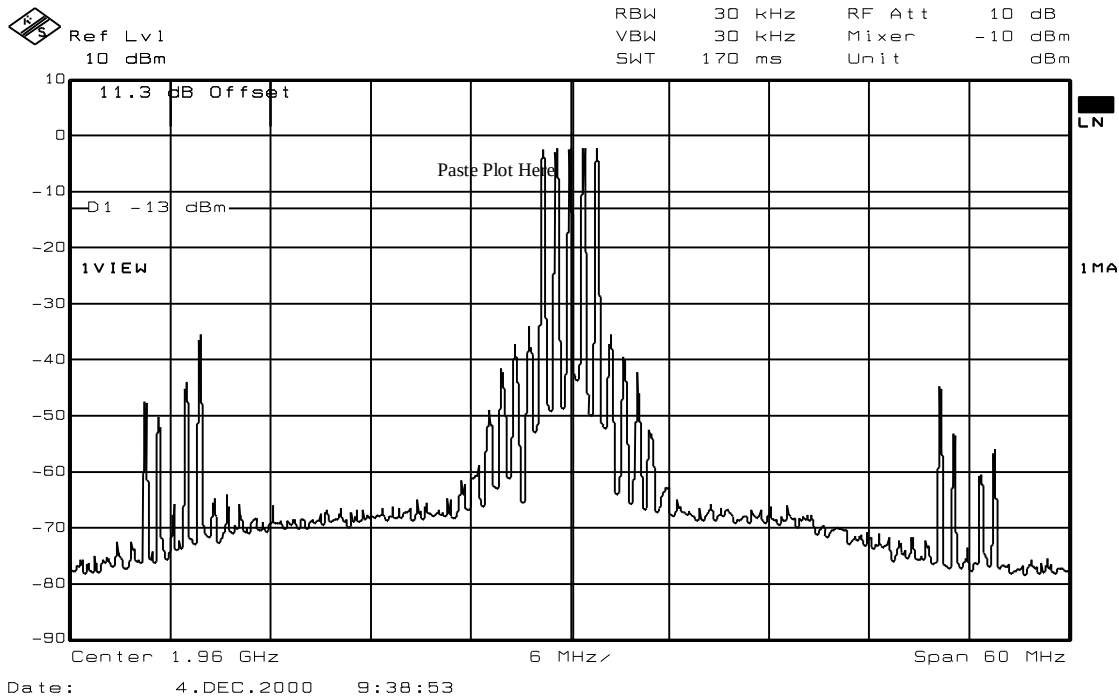
Additional equipment used:
Measurement
Uncertainty: #N/A



Notes: UPLINK - FIVE CARRIERS

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: Intermodulation Characteristics - GSM - Inband**

Page 2 of 2
Job No.: 0L0494R Date: 12/4/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT 5 CARRIERS



Notes: DOWNLINK - 5 CARRIERS

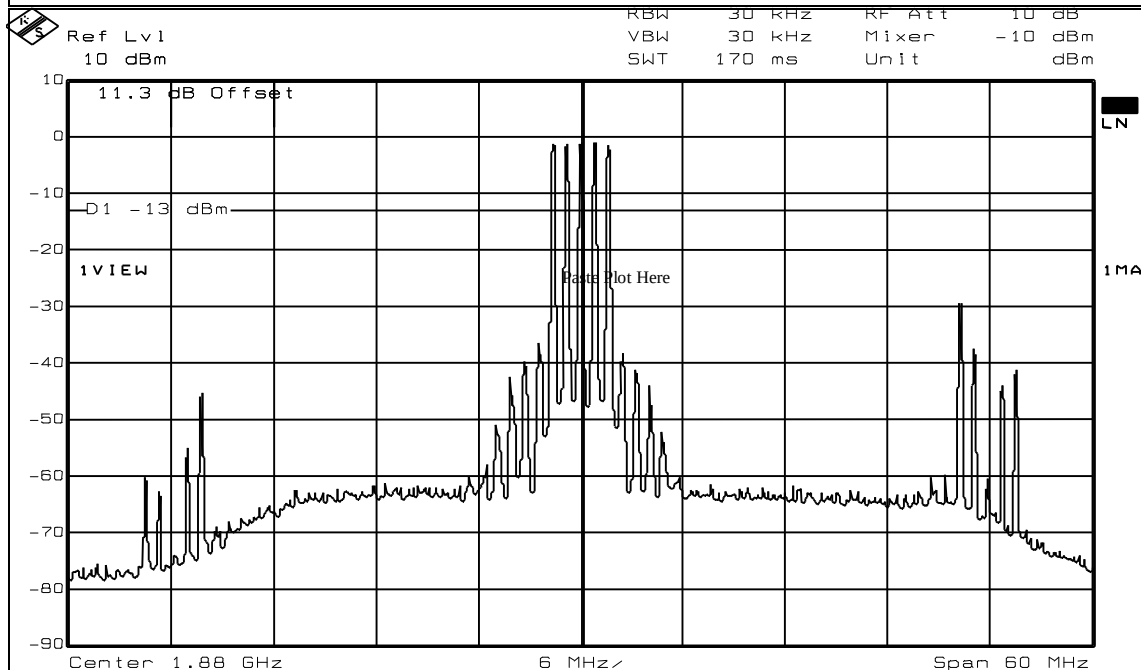
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Page 1 of 2

Job No.: 0L0494R Date: 12/04/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER - HIGH GAIN
Configuration: TRANSMIT 5 CARRIERS
Serial Number: 45
Location: Lab 1 RBW: 30 kHz
Detector Type: Peak VBW: 30 kHz

Test Equipment Used

Antenna: #N/A Directional Coupler: #N/A
Pre-Amp: #N/A Cable #1: 1045
Filter: #N/A Cable #2: #N/A
Receiver: 1036 Cable #3: #N/A
Attenuator #1: 1466 Cable #4: #N/A
Attenuator #2: #N/A Mixer: #N/A
Additional equipment used:
Measurement
Uncertainty: #N/A



Date: 5 DEC 2000 16:06:22

Notes: UPLINK - FIVE CARRIERS

EQUIPMENT: PCS Side-to-Side Repeater

FCC ID: KUWPCSSSR1900

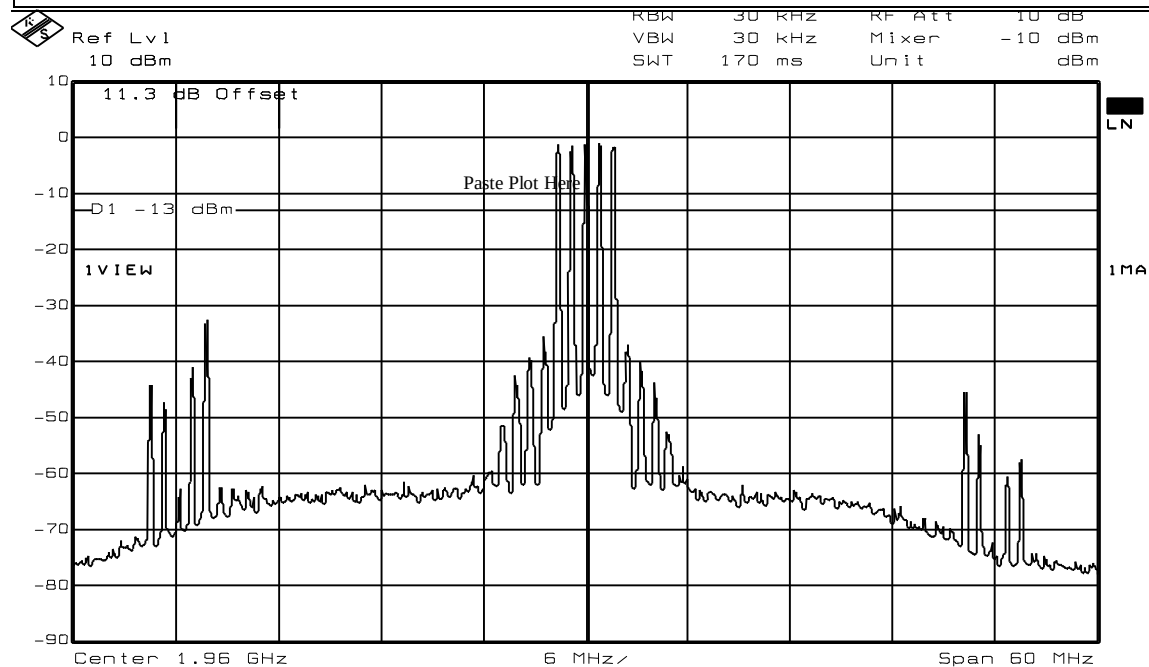
PROJECT NO.: 0L0494RUS1

Test Data - Spurious Emissions at Antenna Terminals

Test Plot: Intermodulation Characteristics - GSM - Inband

Page 2 of 2

Job No.: 0L0494R Date: 12/4/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER - HIGH GAIN
Configuration: TRANSMIT 5 CARRIERS



Date: 5.DEC.2000 16:07:46

Notes: DOWNLINK - 5 CARRIERS

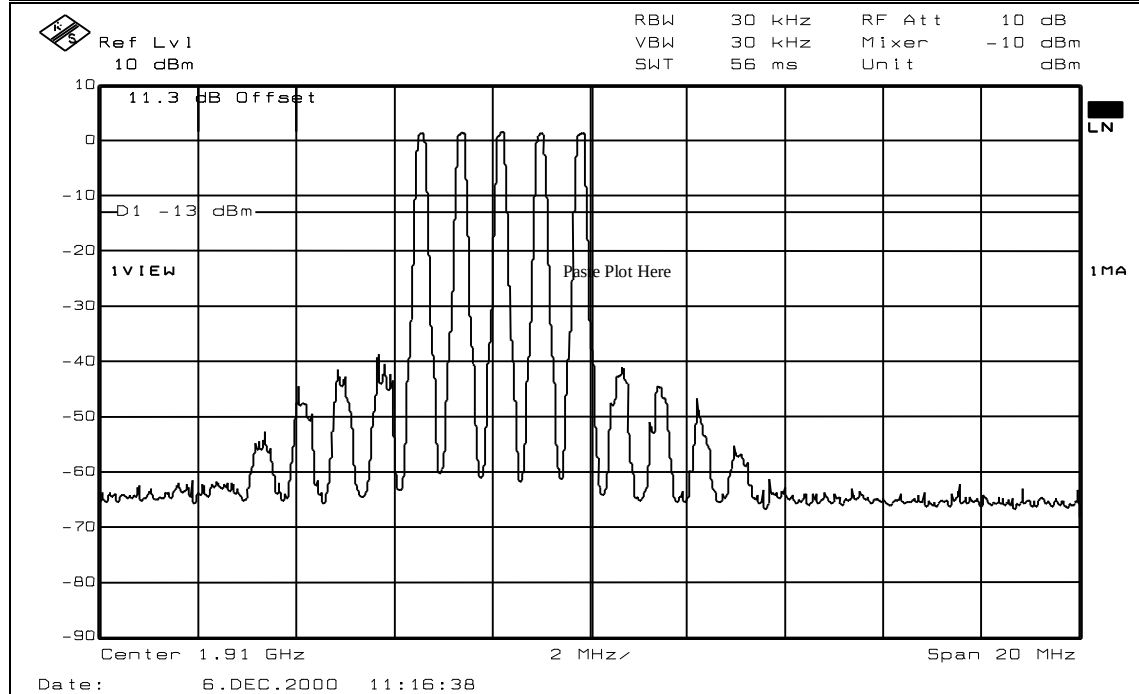
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Page 1 of 2

Job No.: 0L0494R Date: 12/06/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT 5 CARRIERS
Serial Number: 45
Location: Lab 1 RBW: 30 kHz
Detector Type: Peak VBW: 30 kHz

Test Equipment Used

Antenna: #N/A Directional Coupler: #N/A
Pre-Amp: #N/A Cable #1: 1045
Filter: #N/A Cable #2: #N/A
Receiver: 1036 Cable #3: #N/A
Attenuator #1: 1466 Cable #4: #N/A
Attenuator #2: #N/A Mixer: #N/A
Additional equipment used:
Measurement
Uncertainty: #N/A

Notes: **UPLINK - FIVE CARRIERS**

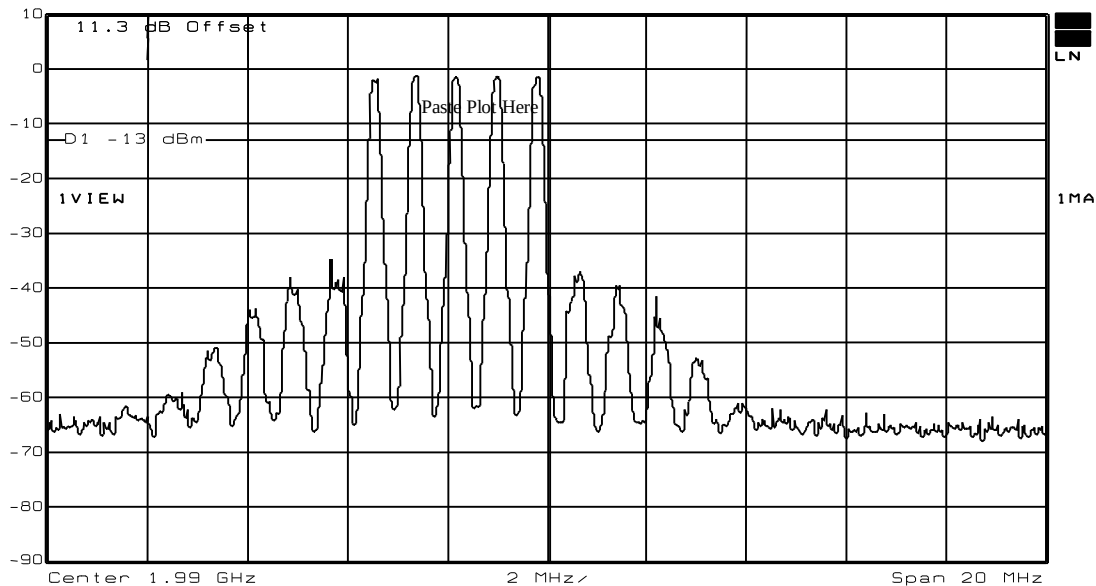
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Page 2 of 2

Job No.: 0L0494R Date: 12/6/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT 5 CARRIERS

Ref Lvl
10 dBm

RBW 30 kHz RF Att 10 dB
VBW 30 kHz Mixer -10 dBm
SWT 56 ms Unit dBm



Date: 6 DEC 2000 11:13:43

Notes: DOWNLINK - 5 CARRIERS

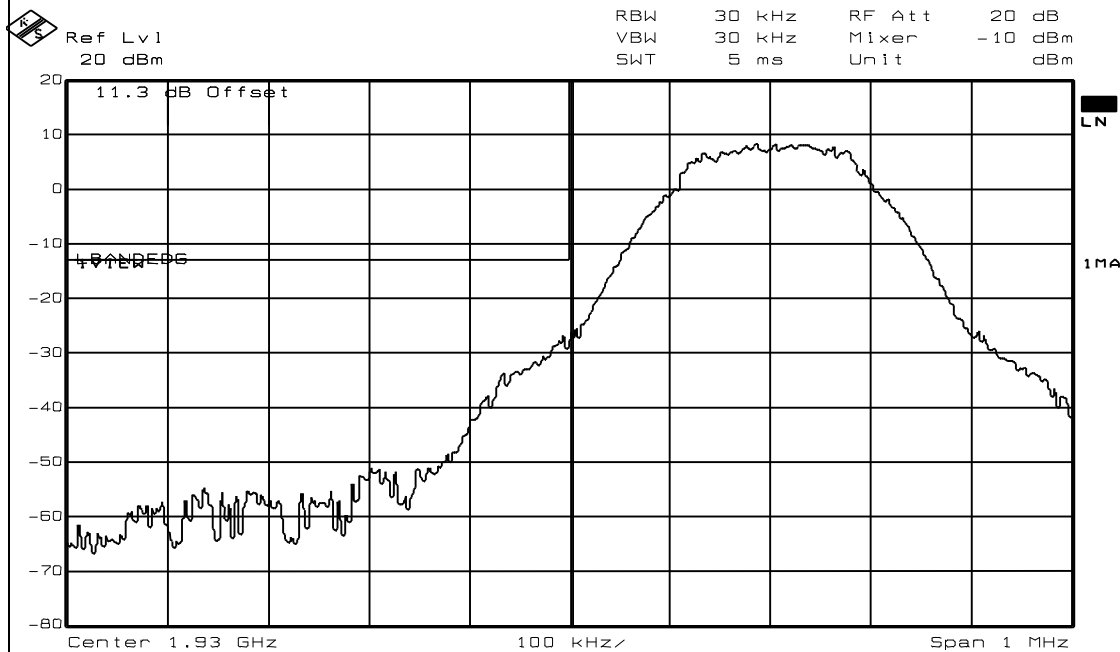
EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: BAND EDGES - GSM**

Page 1 of 4

Job No.: 0L0494R Date: 1206/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT GSM FULL POWER
Serial Number: 2
Location: Lab 1 RBW: 30 kHz
Detector Type: Peak VBW: 30 kHz

Test Equipment Used

Antenna: #N/A Directional Coupler: #N/A
Pre-Amp: #N/A Cable #1: 1045
Filter: #N/A Cable #2: #N/A
Receiver: 1036 Cable #3: #N/A
Attenuator #1: 1466 Cable #4: #N/A
Attenuator #2: #N/A Mixer: #N/A
Additional equipment used:
Measurement
Uncertainty: #N/A



Date: 6 DEC. 2000 10:13:16

Notes: **LOWER BAND EDGE - DOWNLINK**

EQUIPMENT: PCS Side-to-Side Repeater

FCC ID: **KUWPCSSSR1900**

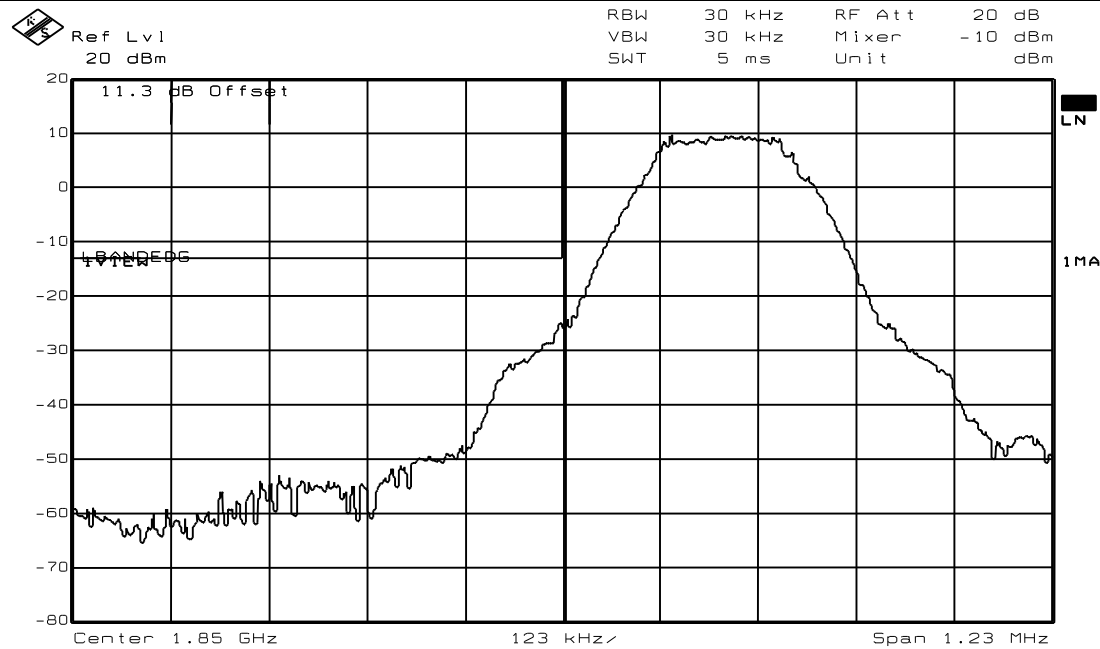
PROJECT NO.: **0L0494RUS1**

Test Data - Spurious Emissions at Antenna Terminals

Test Plot: BAND EDGES - GSM

Page 2 of 4

Job No.:	0L0494R	Date:	1206/00
Specification:	PART 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	50
E.U.T.:	PCS REPEATER		
Configuration:	TRANSMIT GSM FULL POWER		



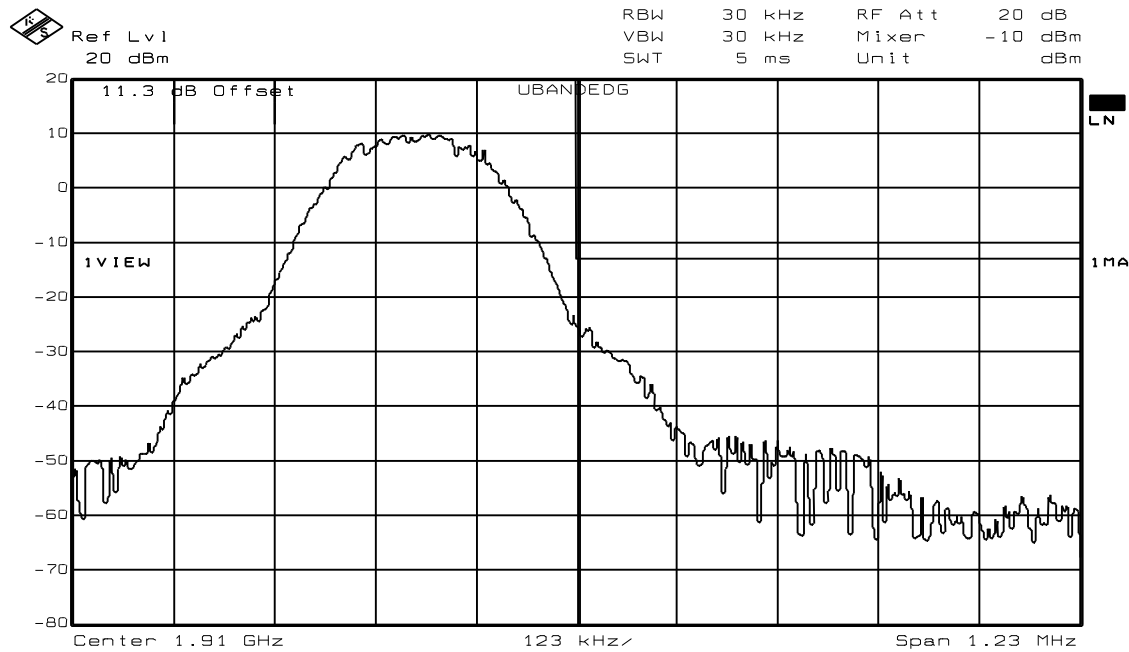
Date: 6.DEC.2000 10:23:08

Notes: **LOWER BAND EDGE - UPLINK**

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: BAND EDGES - GSM**

Page 3 of 4

Job No.: 0L0494R Date: 1206/00
Specification: PART 24 Temperature(°C):
Tested By: David Light Relative Humidity(%):
E.U.T.: PCS REPEATER
Configuration: TRANSMIT GSM FULL POWER



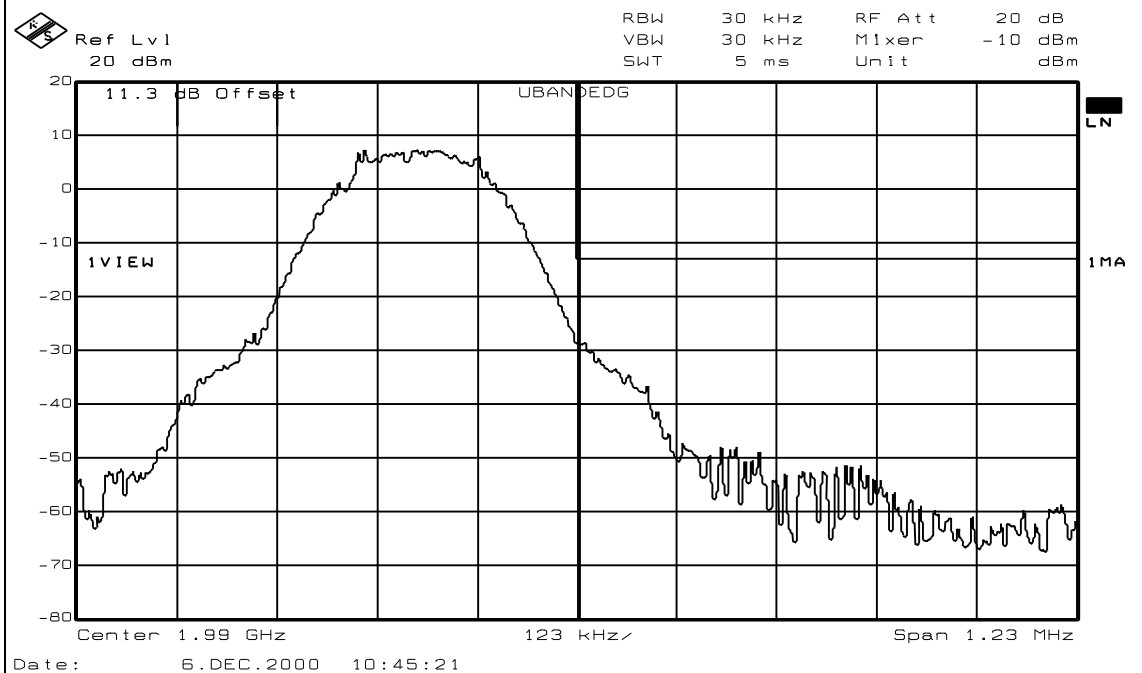
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Notes: **UPPER BAND EDGE - UPLINK**

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: BAND EDGES - GSM**

Page 4 of 4

Job No.: 0L0494R Date: 1206/00
Specification: PART 24 Temperature(°C):
Tested By: David Light Relative Humidity(%):
E.U.T.: PCS REPEATER
Configuration: TRANSMIT GSM FULL POWER



EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: Antenna Port Spurious Emissions - TDMA**

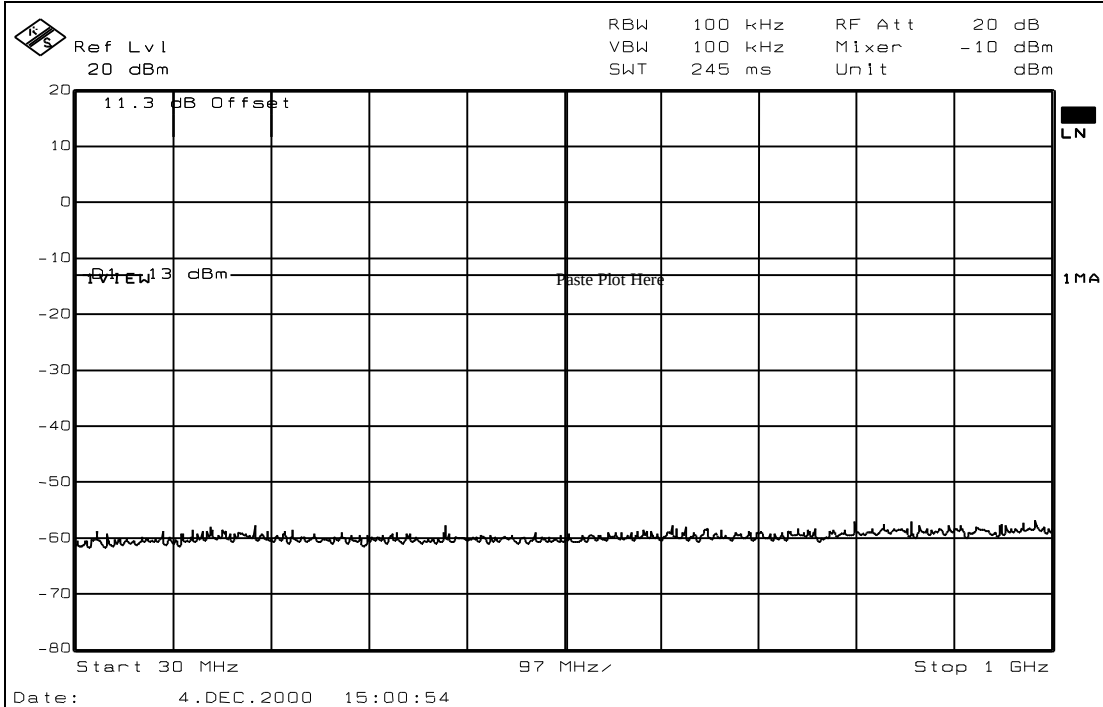
Page 1 of 4

Job No.: 0L0494R Date: 12/04/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT 2 TDMA CARRIERS AT MAX POWER
Serial Number: 45
Location: Lab 1 RBW: 100 kHz < 1 GHz, 1 MHz > 1 GHz
Detector Type: Peak VBW: 100 kHz < 1 GHz, 1 MHz > 1 GHz

Test Equipment Used

Antenna: #N/A Directional Coupler: #N/A
Pre-Amp: #N/A Cable #1: 1045
Filter: #N/A Cable #2: #N/A
Receiver: 1036 Cable #3: #N/A
Attenuator #1: 1466 Cable #4: #N/A
Attenuator #2: #N/A Mixer: #N/A

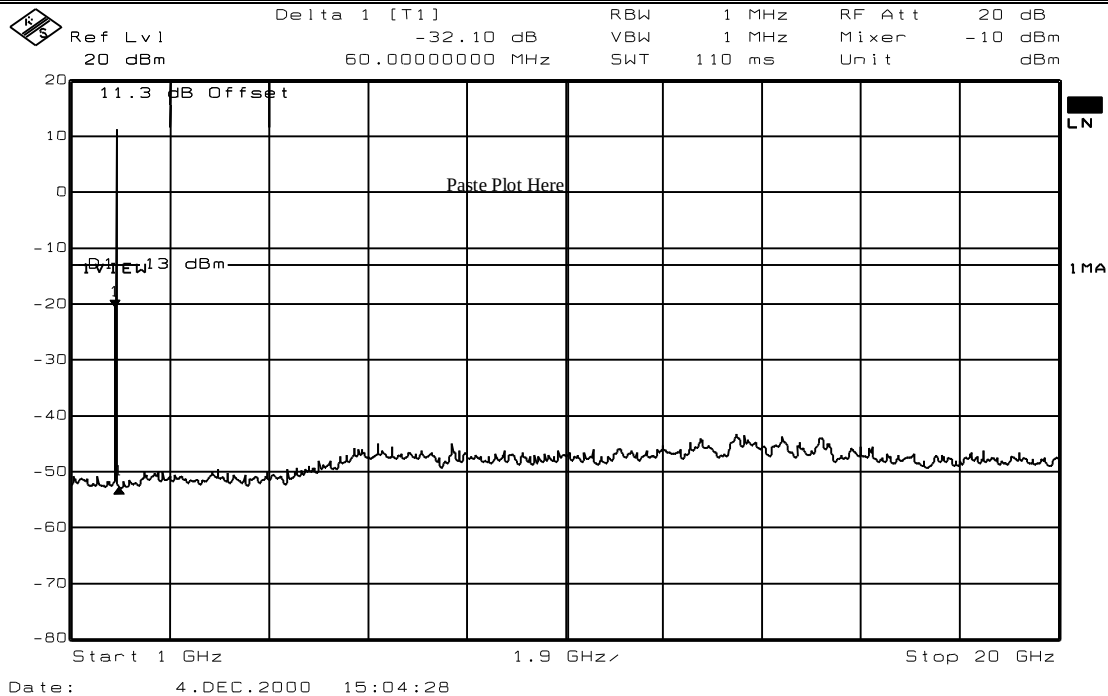
Additional equipment used:
Measurement
Uncertainty: #N/A



Notes: UPLINK

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: Antenna Port Spurious Emissions - TDM**

Page 2 of 4
Job No.: 0L0494R Date: 12/4/00
Specification: PART 24 Temperature(°C): 1/22/00
Tested By: David Light Relative Humidity(%) 2/19/00
E.U.T.: PCS REPEATER
Configuration: TRANSMIT 2 TDMA CARRIERS AT MAX POWER



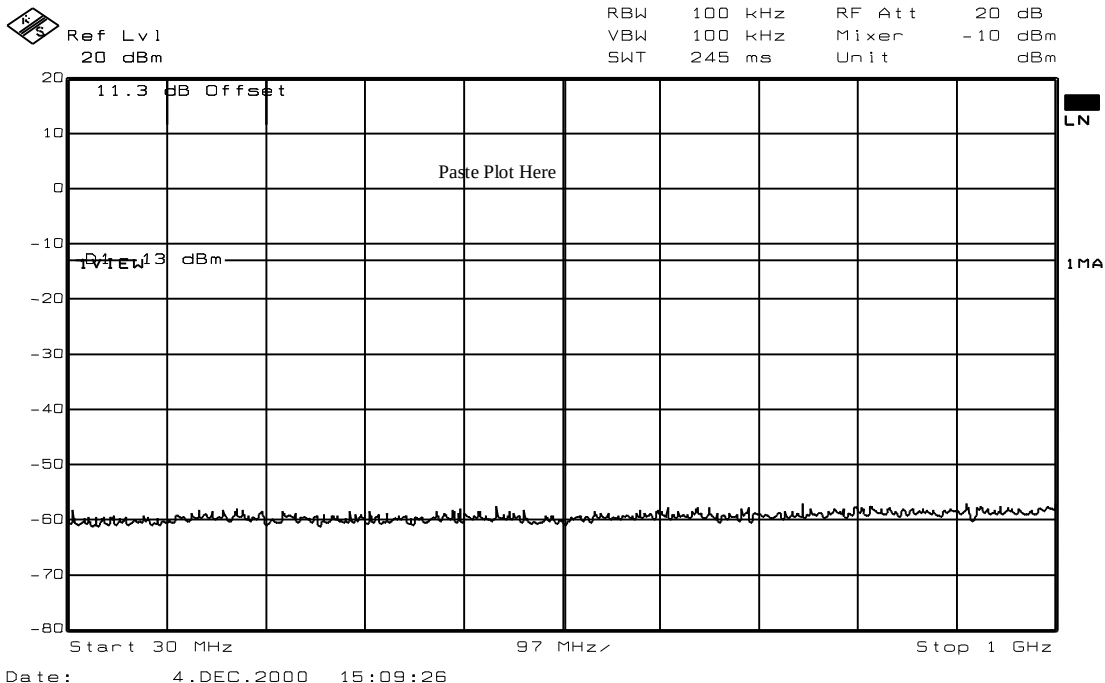
Notes:

UPLINK

MARKERS INDICATE TRANSMIT BAND

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: Antenna Port Spurious Emissions - TDMA**

Page 3 of 4
Job No.: 0L0494R Date: 12/4/00
Specification: PART 24 Temperature(°C): 1/22/00
Tested By: David Light Relative Humidity(%) 2/19/00
E.U.T.: PCS REPEATER
Configuration: TRANSMIT 2 TDMA CARRIERS AT MAX POWER

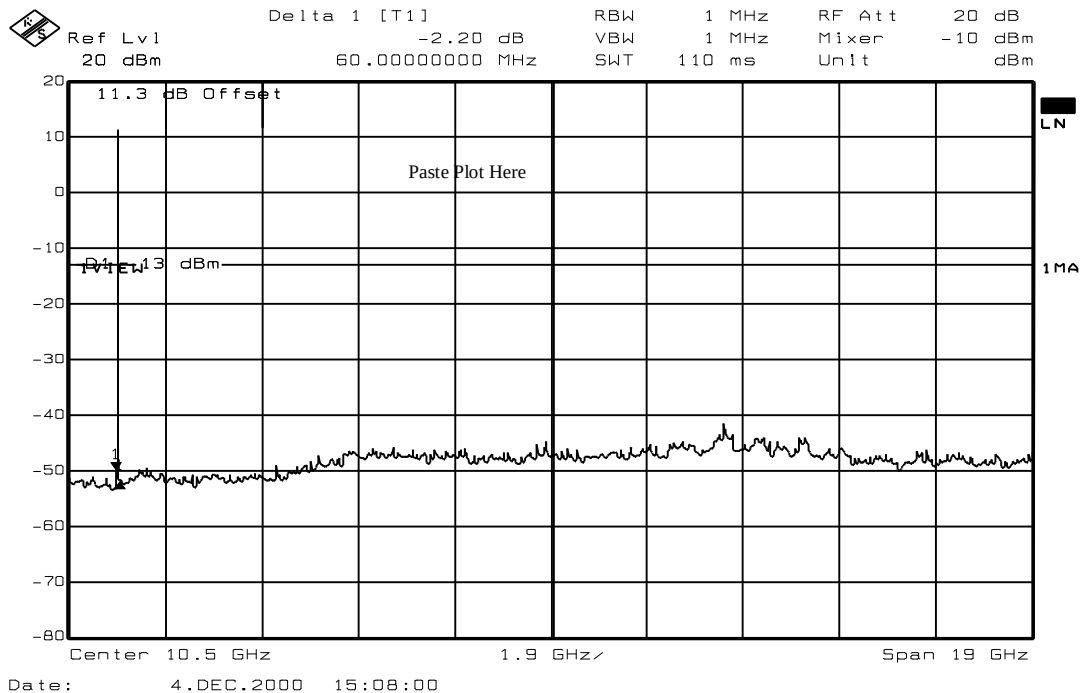


Notes: DOWNLINK

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: Antenna Port Spurious Emissions - TDM**

Page 4 of 4

Job No.:	0L0494R	Date:	12/4/00
Specification:	PART 24	Temperature(°C):	1/22/00
Tested By:	David Light	Relative Humidity(%)	2/19/00
E.U.T.:	PCS REPEATER		
Configuration:	TRANSMIT 2 TDMA CARRIERS AT MAX POWER		



Notes:

DOWNLINK

MARKERS INDICATE TRANSMIT BAND

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: Intermodulation Characteristics - TDMA - Inband**

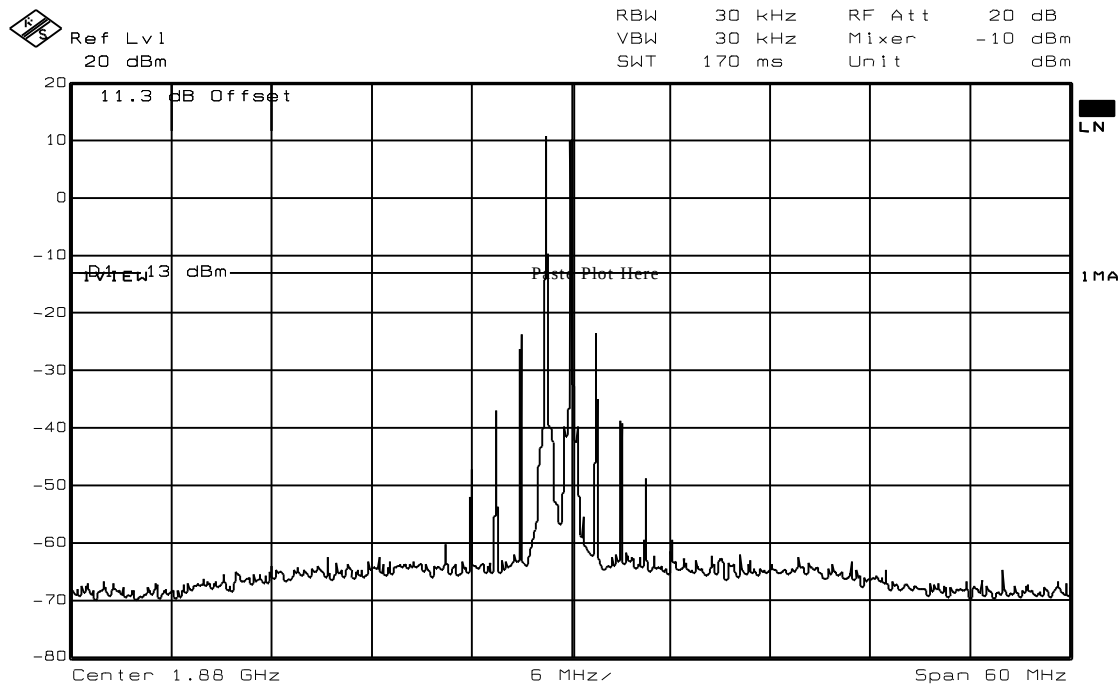
Page 1 of 2

Job No.: 0L0494R Date: 12/04/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT 2 CARRIERS
Serial Number: 45
Location: Lab 1 RBW: 30 kHz
Detector Type: Peak VBW: 30 kHz

Test Equipment Used

Antenna: #N/A Directional Coupler: #N/A
Pre-Amp: #N/A Cable #1: 1045
Filter: #N/A Cable #2: #N/A
Receiver: 1036 Cable #3: #N/A
Attenuator #1: 1466 Cable #4: #N/A
Attenuator #2: #N/A Mixer: #N/A

Additional equipment used:
Measurement
Uncertainty: #N/A

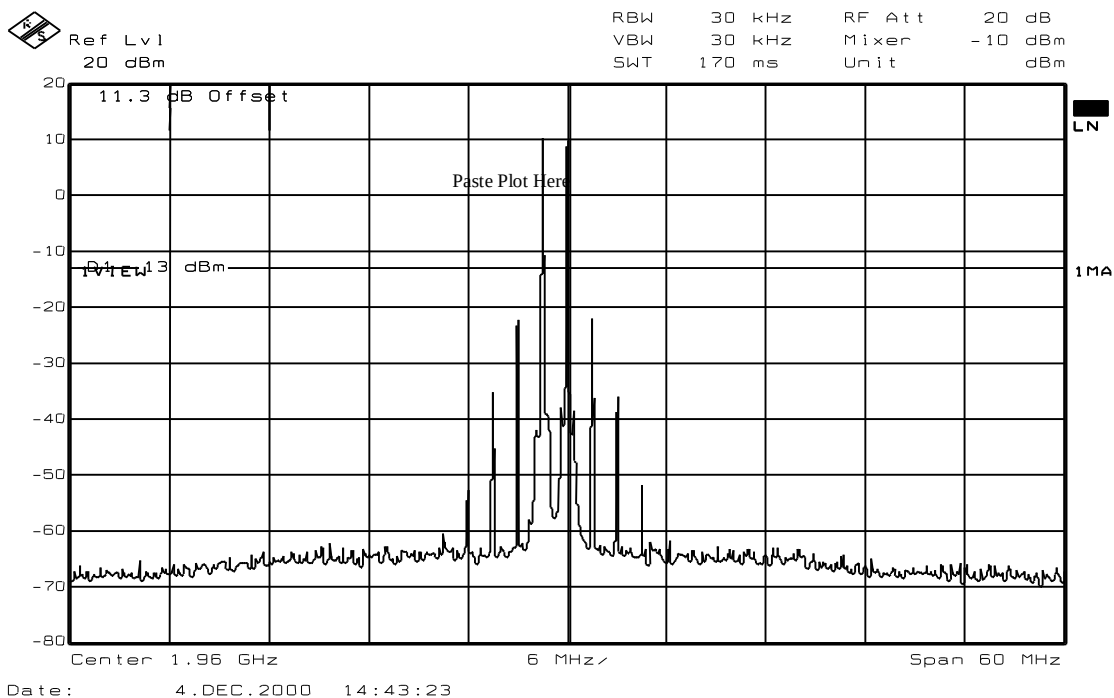


Date: 4 DEC 2000 14:46:13

Notes: UPLINK - 2 CARRIERS

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: Intermodulation Characteristics - TDMA - Inband**

Page 2 of 2
Job No.: 0L0494R Date: 12/4/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT 2 CARRIERS



Notes: DOWNLINK - 2 CARRIERS

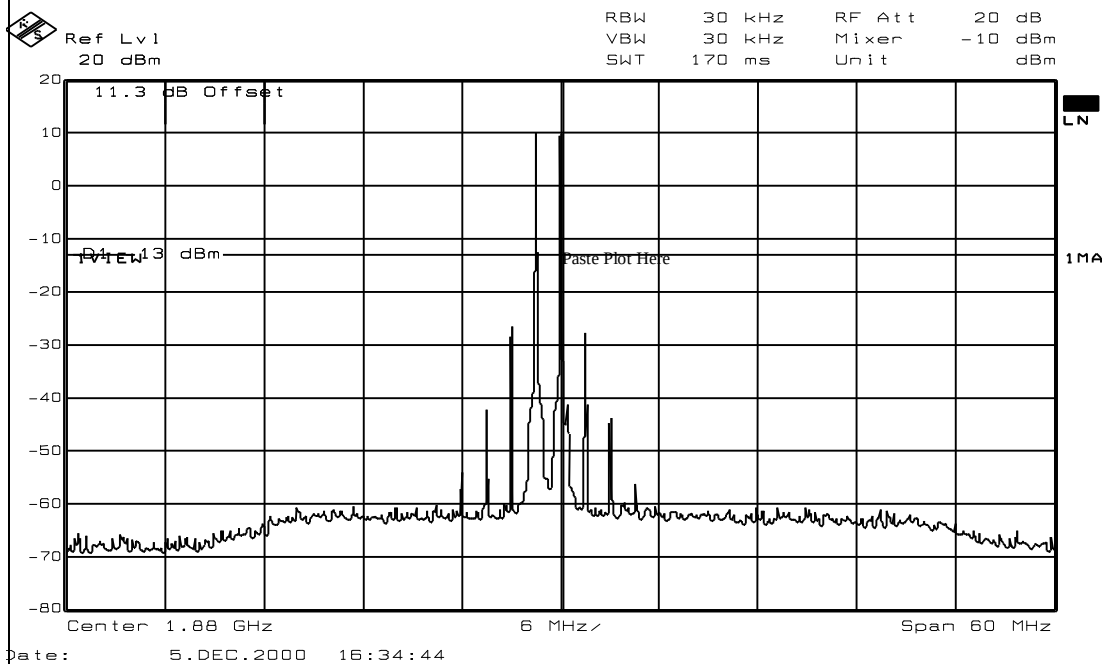
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Page 1 of 2

Job No.: 0L0494R Date: 12/04/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER - HIGH GAIN
Configuration: TRANSMIT 2 CARRIERS
Serial Number: 45
Location: Lab 1 RBW: 30 kHz
Detector Type: Peak VBW: 30 kHz

Test Equipment Used

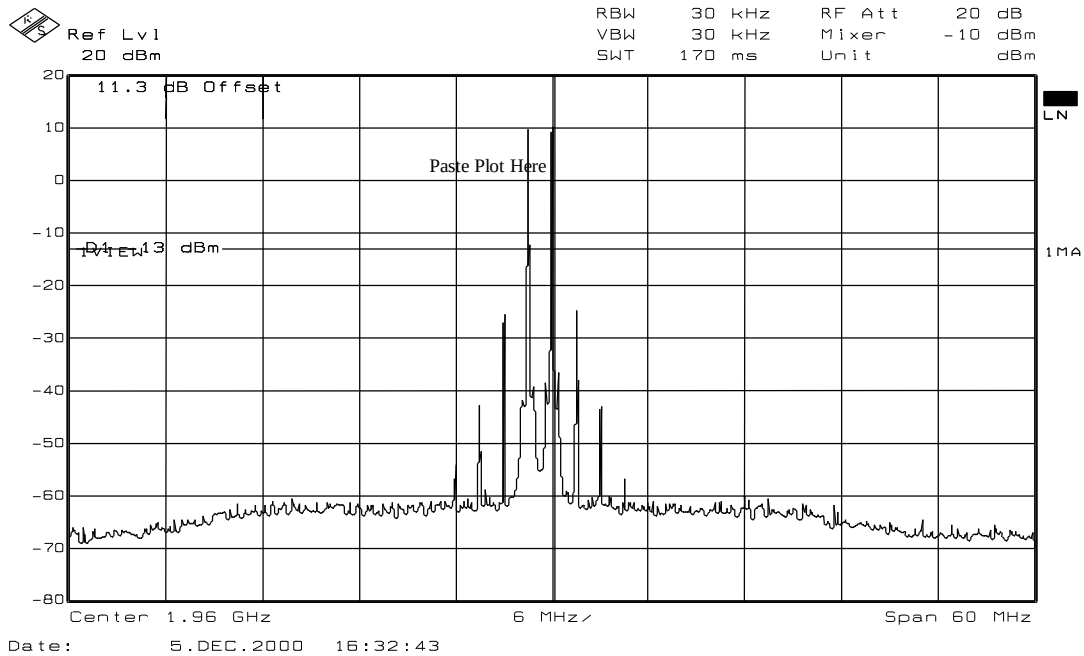
Antenna: #N/A Directional Coupler: #N/A
Pre-Amp: #N/A Cable #1: 1045
Filter: #N/A Cable #2: #N/A
Receiver: 1036 Cable #3: #N/A
Attenuator #1: 1466 Cable #4: #N/A
Attenuator #2: #N/A Mixer: #N/A
Additional equipment used:
Measurement
Uncertainty: #N/A

Notes: **UPLINK - 2 CARRIERS**

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Test Data - Spurious Emissions at Antenna Terminals****Test Plot: Intermodulation Characteristics - TDMA - Inband**

Page 2 of 2

Job No.:	0L0494R	Date:	12/4/00
Specification:	PART 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	50
E.U.T.:	PCS REPEATER - HIGH GAIN		
Configuration:	TRANSMIT 2 CARRIERS		



Notes: DOWNLINK - 2 CARRIERS

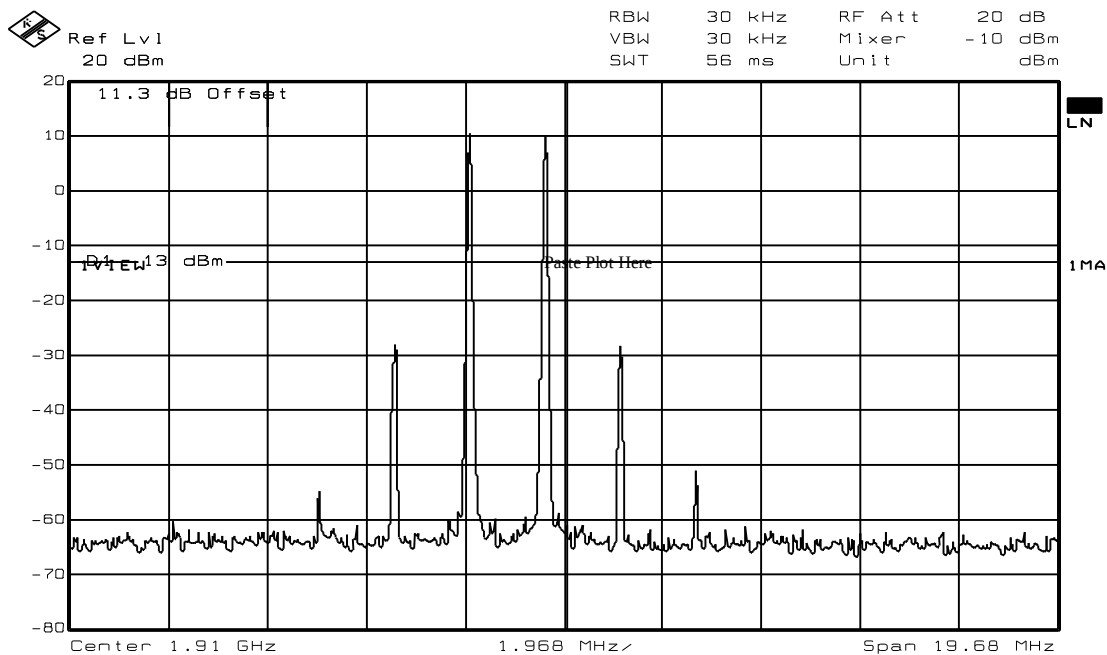
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Page 1 of 2

Job No.: 0L0494R Date: 12/06/00
Specification: PART 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 50
E.U.T.: PCS REPEATER
Configuration: TRANSMIT 2 CARRIERS
Serial Number: 45
Location: Lab 1 RBW: 30 kHz
Detector Type: Peak VBW: 30 kHz

Test Equipment Used

Antenna: #N/A Directional Coupler: #N/A
Pre-Amp: #N/A Cable #1: 1045
Filter: #N/A Cable #2: #N/A
Receiver: 1036 Cable #3: #N/A
Attenuator #1: 1466 Cable #4: #N/A
Attenuator #2: #N/A Mixer: #N/A
Additional equipment used:
Measurement
Uncertainty: #N/A

Notes: **UPLINK - 2 CARRIERS**

EQUIPMENT: PCS Side-to-Side Repeater

FCC ID: KUWPCSSSR1900

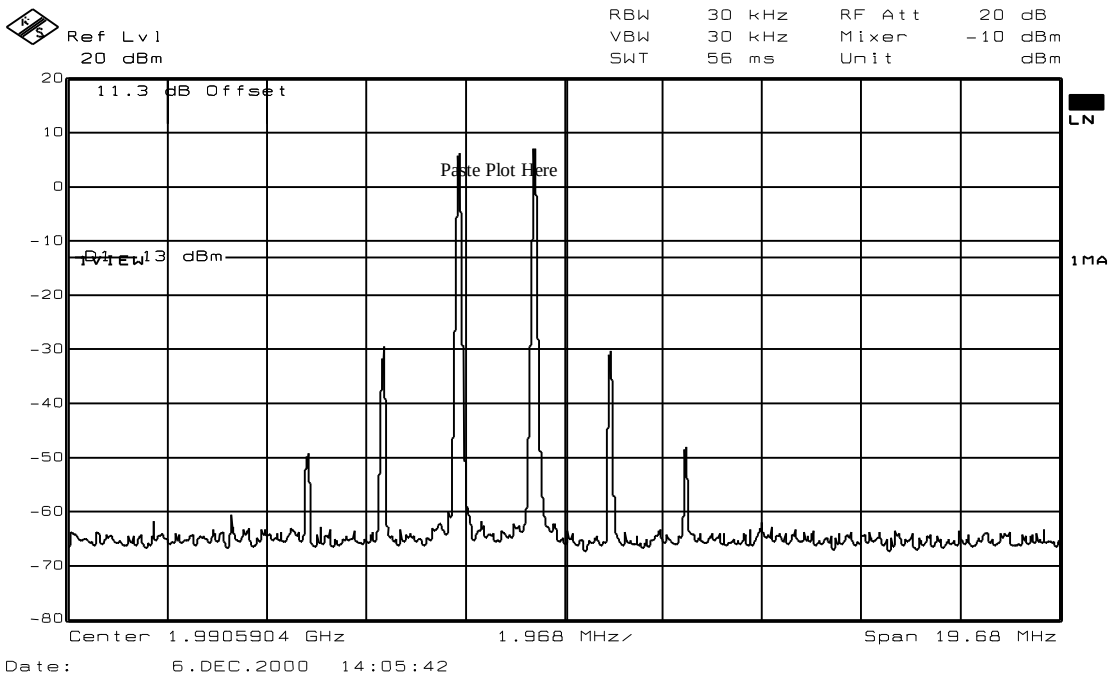
PROJECT NO.: 0L0494RUS1

Test Data - Spurious Emissions at Antenna Terminals

Test Plot: Intermodulation Characteristics - TDMA - Out of Band

Page 2 of 2

Job No.:	0L0494R	Date:	12/6/00
Specification:	PART 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	50
E.U.T.:	PCS REPEATER		
Configuration:	TRANSMIT 2 CARRIERS		



Notes: DOWNLINK - 2 CARRIERS

EQUIPMENT: PCS Side-to-Side Repeater**FCC ID: KUWPCSSSR1900****PROJECT NO.: 0L0494RUS1**

Section 6. Field Strength of Spurious

NAME OF TEST: Field Strength of Spurious Emissions	PARA. NO.: 2.1051
TESTED BY: Kevin Rose	DATE: 12/5/00

Test Results: Complies.**Test Data:** See attached table.**Measurement Uncertainty:** +/- 3.6 dB**Temperature:** 21 °C**Relative Humidity:** 45 %

EQUIPMENT: PCS Side-to-Side Repeater

FCC ID: **KUWPCSSSR1900**

PROJECT NO.: **0L0494RUS1**

Test Data – Field Strength of Spurious

[illegible]

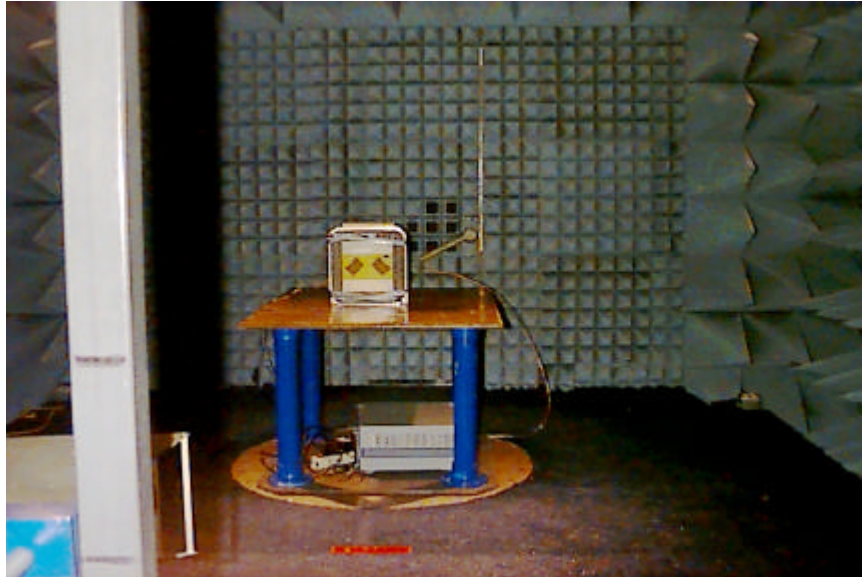
EQUIPMENT: **PCS Side-to-Side Repeater**

FCC ID: **KUWPCSSSR1900**

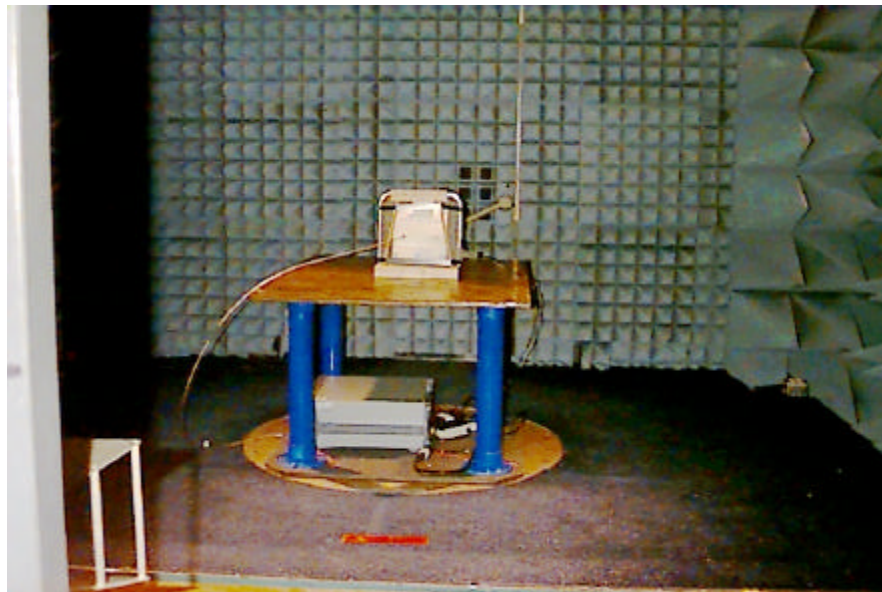
PROJECT NO.: **0L0494RUS1**

Photographs of Test Setup

FRONT VIEW



REAR VIEW



EQUIPMENT: PCS Side-to-Side Repeater

FCC ID: KUWPCSSSR1900

PROJECT NO.: 0L0494RUS1

Section 7. Frequency Stability

NAME OF TEST: Frequency Stability

PARA. NO.: 2.1055

TESTED BY:

DATE:

Test Results:

Complies.

Measurement Data:

Not Applicable

Standard Test Frequency:

MHz

Standard Test Voltage:

Equipment Used:

Measurement Uncertainty: +/- 1.6 dB

Lab Temperature: °C

Relative Humidity: %

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****Section 8. Test Equipment List**

KTL ID	Description	Manufacturer Model Number	Serial Number	Calibration Date
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	06/14/99 2 YR CYCLE
1045	CABLE 2m	Astrolab 32027-2-29094-72TC	N/A	05/23/00
1466	10 db Attenuator DC 8.0 Ghz	Midwest Microwave 292/10db	NONE	CBU
993	Horn antenna	A.H. Systems SAS-200/571	XXX	07/16/99 2 YR CYCLE
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	11/03/99 2 YR CYCLE
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	05/25/00
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	05/25/00
1052	I/Q MODULATION GENERATOR	Rhode & Schwarz AMIQ	DE30619	09/25/00
1053	SIGNAL GENERATOR	ROHDE & SCHWARZ SMIQ 03	DE22081	CNR
1083	Cable 2m	Astrolab 32027-2-29094-72TC	N/A	05/23/00

KTL Dallas

FCC PART 24, SUBPART E
BROADBAND PCS REPEATERS

EQUIPMENT: **PCS Side-to-Side Repeater**

FCC ID: **KUWPCSSSR1900**

PROJECT NO.: **0L0494RUS1**

ANNEX A - TEST DETAILS

EQUIPMENT: **PCS Side-to-Side Repeater**FCC ID: **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1****NAME OF TEST: RF Power Output****PARA. NO.: 2.1046**

Minimum Standard: Para. No.24.232. Base stations are limited to 1640 watts peak E.I.R.P. with an antenna height up to 300 meters HAAT. In no case may the peak output power of a base station transmitter exceed 100 watts.

Method Of Measurement:Detachable Antenna:

The peak power at antenna terminals is measured using an in-line peak power meter. Power output is measured with the maximum rated input level.

Integral Antenna:

If the antenna is not detachable from the circuit then the Peak Power Output is derived from the peak radiated field strength of the fundamental emission by using the plane wave relation $GP/4\pi R^2 = E^2/120\pi$ and proceeding as follows:

$$P = \frac{E^2 R^2}{30G} = \frac{E^2 3^2}{30G}$$

where,

P = the equivalent isotropic radiated power in watts

E = the maximum measured field strength in V/m

R = the measurement range (3 meters)

G = the numeric gain of the transmit antenna in relation to an isotropic radiator

EQUIPMENT: PCS Side-to-Side Repeater**FCC ID: KUWPCSSSR1900****PROJECT NO.: 0L0494RUS1**

NAME OF TEST: Occupied Bandwidth**PARA. NO.: 2.1047**

Minimum Standard: Para. No. 24.238(b). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB.

Method Of Measurement:CDMA

Spectrum analyzer settings:

RBW: 30 kHz

VBW: $\geq$ RBW

Span: 5 MHz

Sweep: Auto

Mask: Set markers to -26 dB from peak of CW.

GSM

RBW: 3 kHz

VBW: $\geq$ RBW

Span: 2 MHz

Sweep: Auto

Mask: Set markers to -26 dB from peak of CW.

NADC

RBW: 1 kHz

VBW: $\geq$ RBW

Span: 1 MHz

Sweep: Auto

Mask: Set markers to -26 dB from peak of CW.

EQUIPMENT: PCS Side-to-Side Repeater**FCC ID: KUWPCSSSR1900****PROJECT NO.: 0L0494RUS1****NAME OF TEST: Spurious Emission at Antenna Terminals PARA. NO.: 2.1051**

Minimum Standard: Para. No.24.238(a). On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power by at least $43 + 10 \log (P)$ dB.

Method Of Measurement:

Spectrum analyzer settings:

CDMA

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 30 kHz (< 1 MHz from Band Edge)
VBW: $\geq$ RBW
Sweep: Auto
Video Avg: 6 Sweeps

GSM

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 3 kHz (< 1 MHz from Band Edge)
VBW: $\geq$ RBW
Sweep: Auto
Video Avg: Disabled

NADC

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 3 kHz (< 1 MHz from Band Edge)
VBW: $\geq$ RBW
Sweep: Auto
Video Avg: Disabled

To demonstrate compliance at band edges the frequency of the input signal is set to the lowest and highest assigned channel and the center frequency of the spectrum analyzer is set to the upper and lower edges of the appropriate frequency block.

EQUIPMENT: **PCS Side-to-Side Repeater***FCC ID:* **KUWPCSSSR1900**PROJECT NO.: **0L0494RUS1**

NAME OF TEST: Field Strength of Spurious Radiation**PARA. NO.: 2.1053****Minimum Standard:**

Para. No.24.238(a). On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power by at least $43 + 10 \log (P)$ dB.

The maximum received level is measured using a horn antenna. A substitution horn antenna is fed with a substitution signal to transmit at the measured spurious frequency. The gain of the substitution antenna with reference to a dipole is known.

EQUIPMENT: PCS Side-to-Side Repeater**FCC ID: KUWPCSSSR1900****PROJECT NO.: 0L0494RUS1**

NAME OF TEST: Frequency Stability**PARA. NO.: 2.1055**

Minimum Standard: Para. No. 24.235. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Method Of Measurement:Frequency Stability With Voltage Variation

The E.U.T. is placed in an environmental chamber and allowed to stabilize at +20 degrees Celsius for at least 15 minutes. The frequency counter and signal generator are phase locked with the same 10 MHz reference frequency by connecting the 10 MHz ref. out of the counter to the 10 MHz ref, in of the signal generator. With the voltage input to the E.U.T. set to 85% S.T.V., the frequency is measured in 30 second intervals for a period of 5 minutes. This procedure is repeated at 100% S.T.V. and 115% S.T.V.

Frequency Stability With Temperature Variation

The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the frequency is measured in 30 second intervals for a period of 5 minutes.

KTL Dallas

FCC PART 24, SUBPART E
BROADBAND PCS REPEATERS

EQUIPMENT: **PCS Side-to-Side Repeater**

FCC ID: **KUWPCSSSR1900**

PROJECT NO.: **0L0494RUS1**

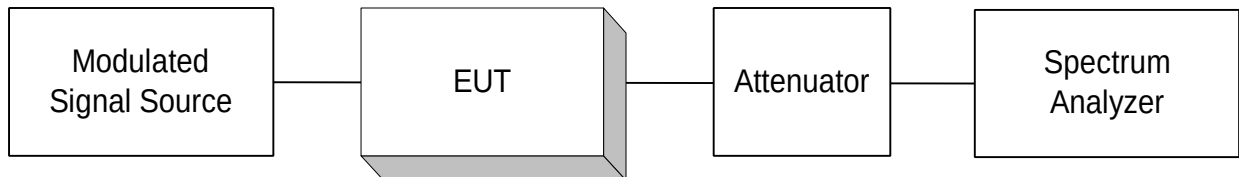
ANNEX B - TEST DIAGRAMS

EQUIPMENT: **PCS Side-to-Side Repeater**

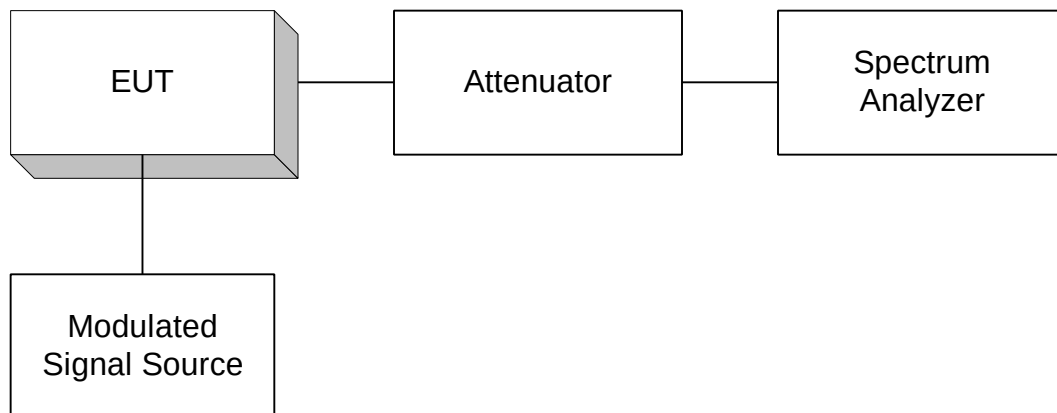
FCC ID: **KUWPCSSSR1900**

PROJECT NO.: **0L0494RUS1**

Para. No. 2.985 - R.F. Power Output



Para. No. 2.989 - Occupied Bandwidth

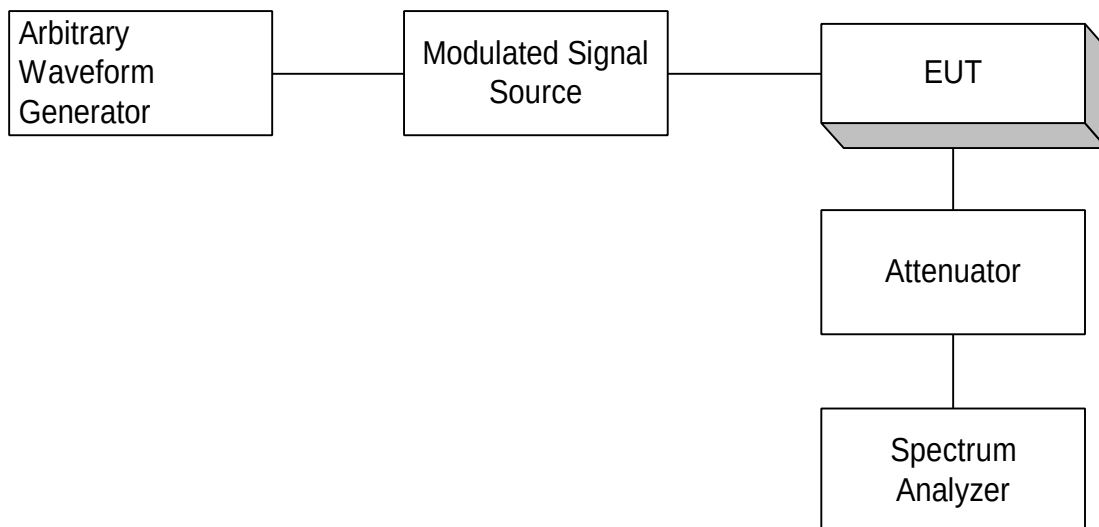
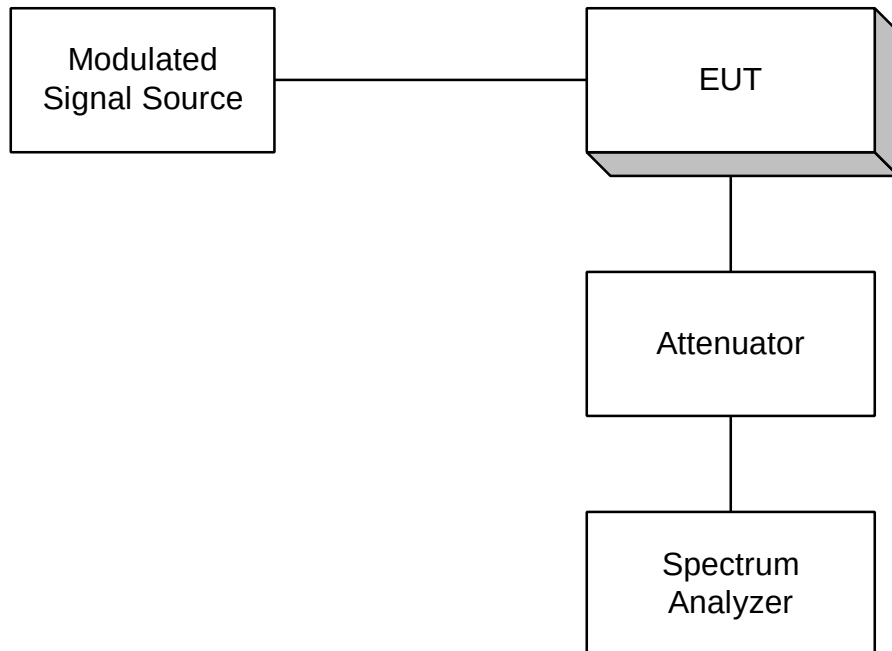


EQUIPMENT: **PCS Side-to-Side Repeater**

FCC ID: **KUWPCSSSR1900**

PROJECT NO.: **0L0494RUS1**

Para. No. 2.991 Spurious Emissions at Antenna Terminals

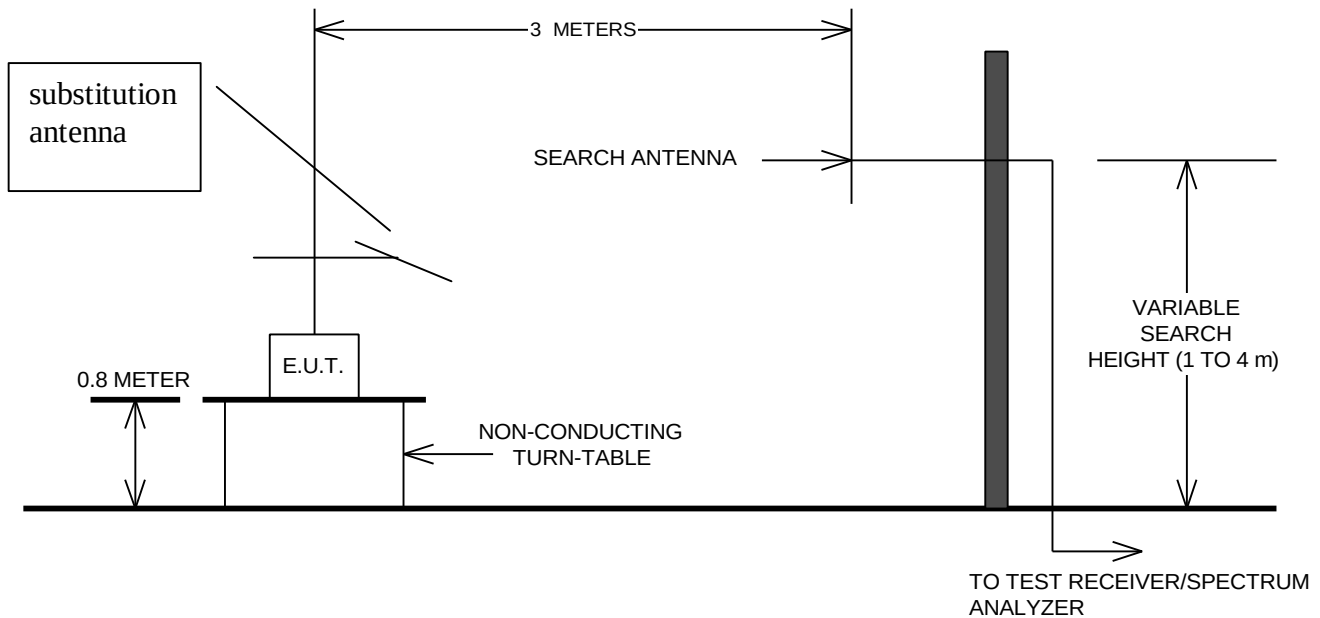


EQUIPMENT: PCS Side-to-Side Repeater

FCC ID: KUWPCSSSR1900

PROJECT NO.: 0L0494RUS1

Para. No. 2.993 - Field Strength of Spurious Radiation



Para. No. 2.995 - Frequency Stability

