Nemko Test Report No.:	**2L0288RUS1rev2**
Applicant:	**DeKolink Wireless** 16 Bazel St. Qiryat-Arieh Petah-Tikva Israel 49510
Equipment Under Test:	**Compact Bi Directional Amplifier**
In Accordance With:	**FCC Part 24, Subpart E** Broadband PCS Repeaters
Tested By:	Nemko Dallas Inc. 802 N. Kealy Lewisville, Texas 75057-3136
Authorized By:	Tom Tidwell, Wireless Group Manager
Date:	7/16/2002
Total Number of Pages:	79

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Section 1. Summary of Test Results

Manufacturer: DeKolink Wireless

Model No.: MW-CBDA-PCS-X-1W65 (X indicates PCS block of operation)

Serial No.: 02039040/02039042

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".

Summary Of Test Data

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

Footnotes:

(1) Modulation characteristics were 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.

Section 2. General Equipment Specification

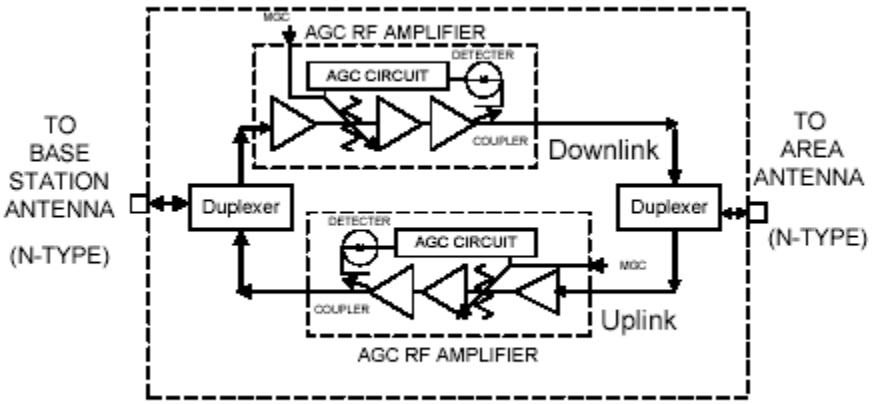
Supply Voltage Input:		115 VAC
Frequency Bands:	**Downlink:**	☒ Block A : 1930 – 1945 MHz ☒ Block D : 1945 – 1950 MHz ☒ Block B : 1950 – 1965 MHz ☒ Block E : 1965 – 1970 MHz ☒ Block F : 1970 – 1975 MHz ☒ Block C : 1975 – 1990 MHz
Frequency Bands:	**Uplink:**	☒ Block A : 1850 – 1865 MHz ☒ Block D : 1865 – 1870 MHz ☒ Block B : 1870 – 1885 MHz ☒ Block E : 1885 – 1890 MHz ☒ Block F : 1890 – 1895 MHz ☒ Block C : 1895 – 1910 MHz
Type of Modulation and Designator:		**CDMA (1M25G7W)** ☒ **GSM (200KGXW)** ☒
System Gain (rated):		65 dB
Output Impedance:		50 ohms
Max Input:		-45 dBm
RF Output (Rated):	**Uplink** **Downlink**	0.25 W Total: 0.50 W
Frequency Translation:		**F1-F1** ☒ **F1-F2** ☐ **N/A** ☐
Band Selection:		**Software** ☐ **Duplexer** ☒ **Full band** ☐

Description of Operation

The Compact Bi-Directional Amplifier (CBDA) assembly provides a repeater/booster to extend the coverage area of radio communications in buildings and RF shielded environments.

The CBDA Downlink amplifier receives the RF signals from base station amplifies and transmits them to the subscriber. The BDA Uplink amplifier receives the RF signals from the subscriber amplifies and transmits them to the base station.

Diagram



Section 3. RF Power Output

NAME OF TEST: RF Power Output	PARA. NO.: 2.1046
TESTED BY: Kevin Rose & David Light	DATE: 5/23/02

Test Results: Complies.

Measurement Data:

	Modulation Type	Channel Output Power (dBm)	Channel Output Power (Watts)
Downlink A	CDMA	26.8	0.479
Uplink A	CDMA	24.1	0.257
Downlink C	CDMA	27.1	0.513
Uplink C	CDMA	23.9	0.245
Downlink A	GSM	27.3	0.537
Uplink A	GSM	25.6	0.363
Downlink C	GSM	26.8	0.479
Uplink C	GSM	25.2	0.380

Note - Device was tested at +/- 15% nominal voltage with no effect on output power

Equipment Used: 1464-1604-1052-1053-1036

Measurement Uncertainty: +/- 1.7 dB

Temperature: 23 °C

Relative Humidity: 38 %

Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth (CDMA)	PARA. NO.: 2.1049
TESTED BY: Kevin Rose & David Light	DATE: 5/23/02

Test Results: Complies.

Test Data: See attached plot(s).

Equipment Used: 1464-1604-1052-1053

Measurement Uncertainty: +/- 1.7 dB

Temperature: 21 °C

Relative Humidity: 35 %

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Data Plot — Occupied Bandwidth

Page 1 of 4

Complete: x
Preliminary:

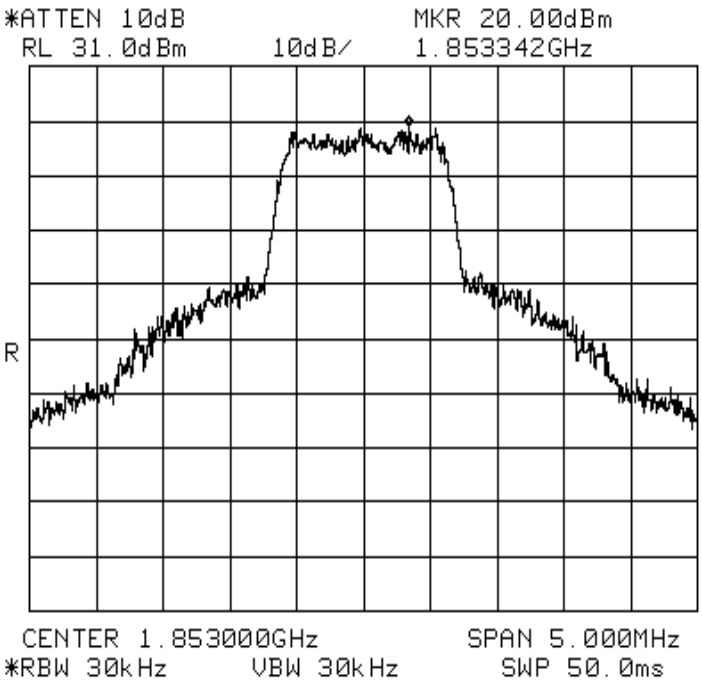
Job No.:	2l0288r	Date:	May 23 2002
Specification:	2.1049	Temperature(°C):	23
Tested By:	Kevin Rose	Relative Humidity(%)	38
E.U.T.:	A Band repeater Dekolink		
Configuration:	TX full Power		
Sample Number:	2039040		
Location:	Lab 1	RBW:	Refer to plots
Detector Type:	Peak	VBW:	Refer to plots

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1043
Filter:		Cable #2:	1046
Receiver:	1464	Cable #3:	
Attenuator #1	1604	Cable #4:	
Attenuator #2:	i wave model 392	Mixer:	

Additional equipment used: 1053 1052

Measurement Uncertainty: +/-1.7 dB



Notes: **Band A Output signal CDMA UPlink**

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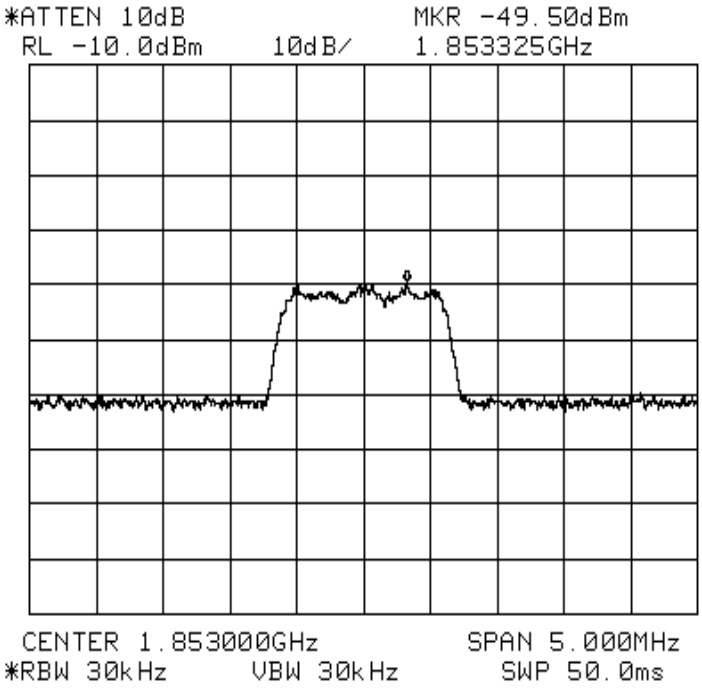
Data Plot **Occupied Bandwidth**

Page 2 of 4

Job No.:	2l0288r	Date:	May 23 2002
Specification:	2.1	Temperature(°C):	23
Tested By:	Kevin Rose	Relative Humidity(%)	38
E.U.T.:	A Band repeater Dekolink		
Configuration:	TX full Power		



Notes: **Band A input signal CDMA UPlink**

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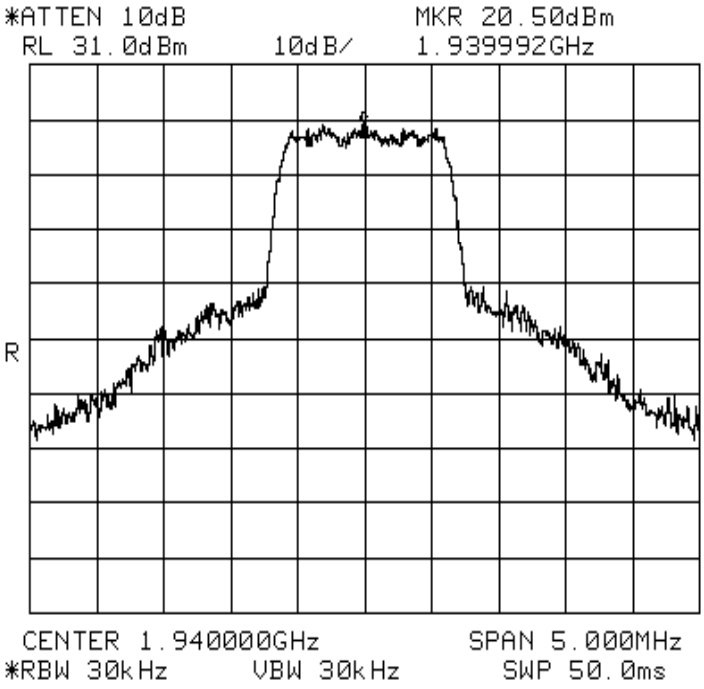
Data Plot **Occupied Bandwidth**

Page 3 of 4

Job No.:	2l0288r	Date:	May 23 2002
Specification:	2.1049	Temperature(°C):	23
Tested By:	Kevin Rose	Relative Humidity(%)	38
E.U.T.:	A Band repeater Dekolink		
Configuration:	TX full Power		



Notes: **Band A output signal CDMA downlink**

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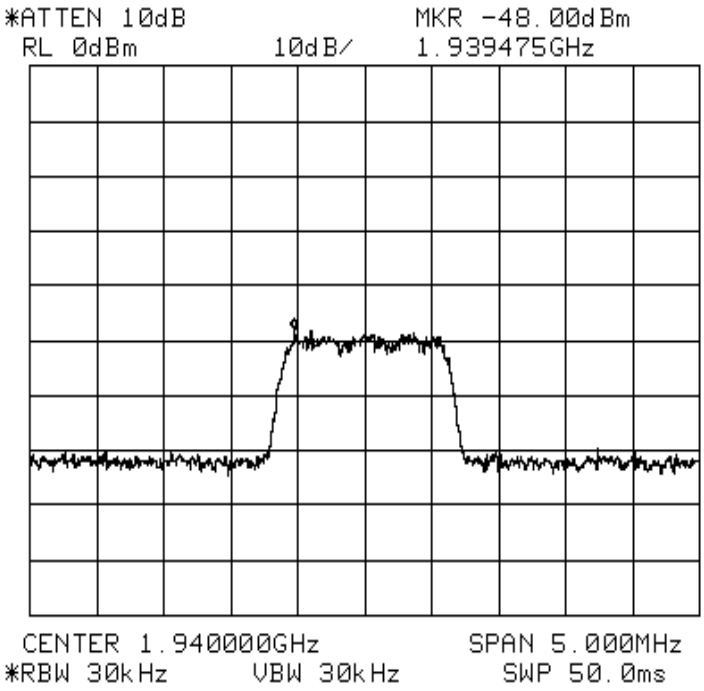
Test Plot: **Occupied Bandwidth**

Page 4 of 4

Job No.:	2l0288r	Date:	May 23 2002
Specification:	2.1049	Temperature(°C):	23
Tested By:	Kevin Rose	Relative Humidity(%)	38
E.U.T.:	A Band repeater Dekolink		
Configuration:	TX full Power		



Notes: **Band A input signal CDMA Downlink**

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Data Plot — Occupied Bandwidth

Page 1 of 4 | Complete x | Preliminary:

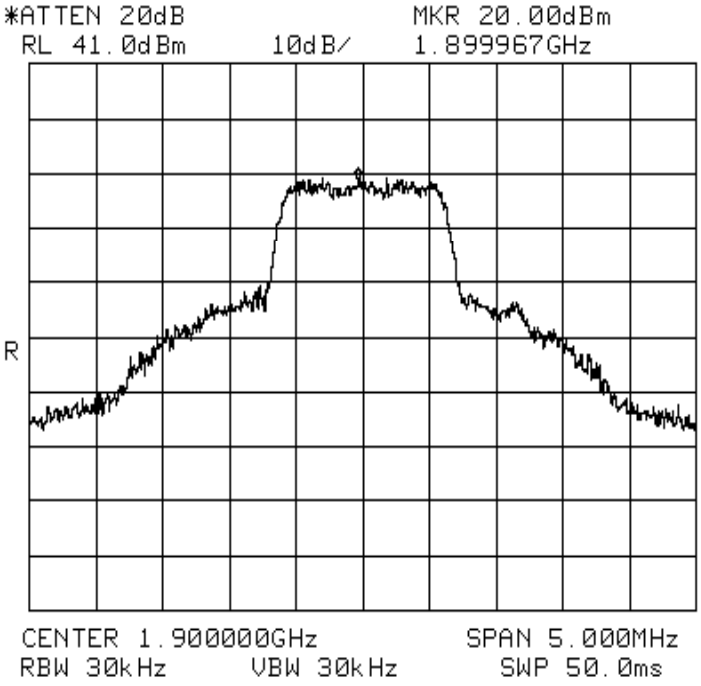
Job No.:	2l0288r	Date:	May 23 2002
Specification:	2.1049	Temperature(°C):	23
Tested By:	Kevin Rose	Relative Humidity(%)	38
E.U.T.:	C Band repeater Dekolink		
Configuration:	TX full Power		
Sample Number:	2039042		
Location:	Lab 1	RBW:	Refer to plots
Detector Type:	Peak	VBW:	Refer to plots

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1043
Filter:		Cable #2:	1046
Receiver:	1464	Cable #3:	
Attenuator #1	1604	Cable #4:	
Attenuator #2:	i wave model 392	Mixer:	

Additional equipment used: 1053 1052

Measurement Uncertainty: +/-1.7 dB



Notes: **Band C Output signal CDMA uplink**

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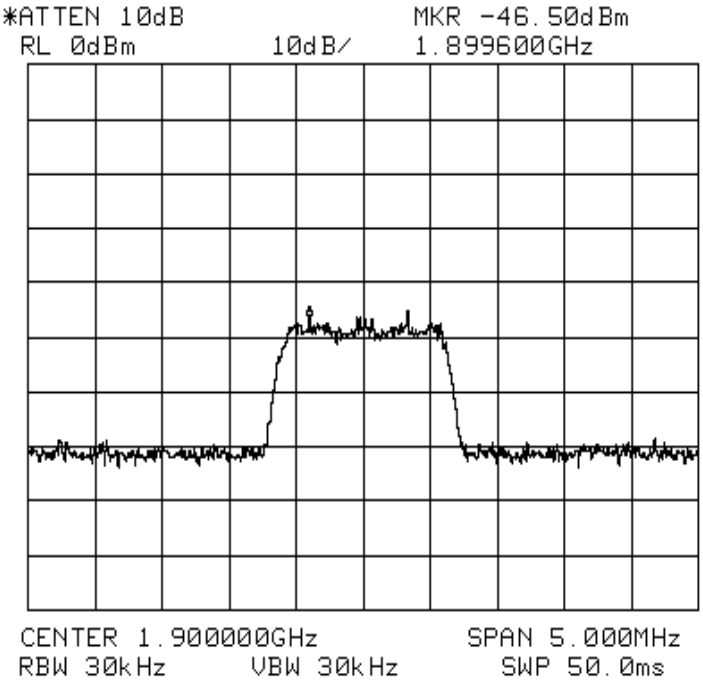
Data Plot **Occupied Bandwidth**

Page 2 of 4

Job No.:	2l0288r	Date:	May 23 2002
Specification:	2.1049	Temperature(°C):	23
Tested By:	Kevin Rose	Relative Humidity(%)	38
E.U.T.:	C Band repeater Dekolink		
Configuration:	TX full Power		



Notes: **Band C input signal CDMA Uplink**

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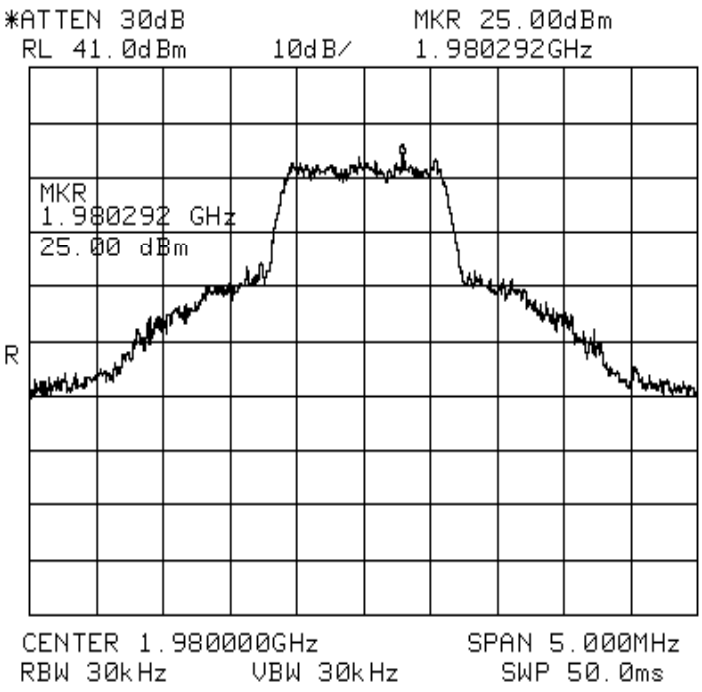
Data Plot — Occupied Bandwidth

Page 3 of 4

Job No.:	2l0288r	Date:	May 23 2002
Specification:	2.1049	Temperature(°C):	23
Tested By:	Kevin Rose	Relative Humidity(%)	38
E.U.T.:	C Band repeater Dekolink		
Configuration:	TX full Power		



Notes: **Band C output signal CDMA Downlink**

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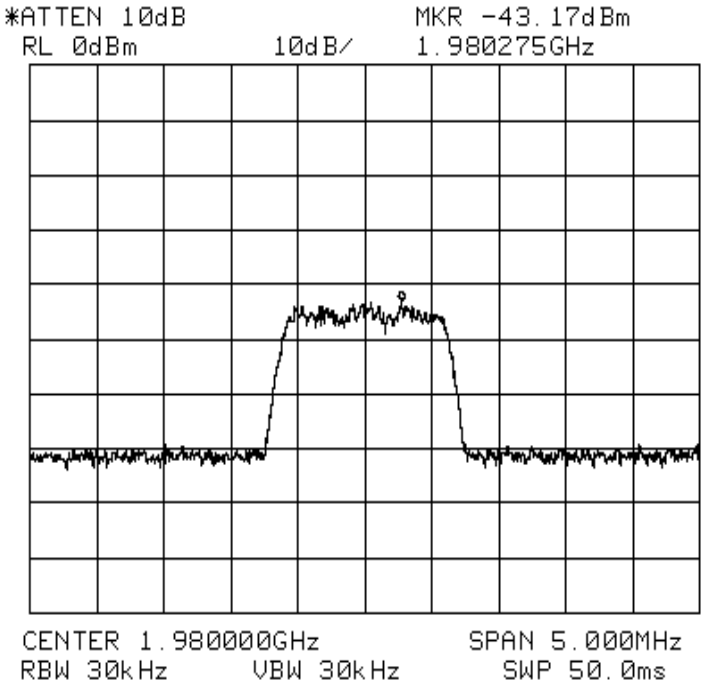
Test Plot: **Occupied Bandwidth**

Page 4 of 4

Job No.:	2l0288r	Date:	May 23 2002
Specification:	2.1049	Temperature(°C):	23
Tested By:	Kevin Rose	Relative Humidity(%)	38
E.U.T.:	C Band repeater Dekolink		
Configuration:	TX full Power		



Notes: **Band C input signal CDMA Downlink**

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Data Plot — Occupied Bandwidth

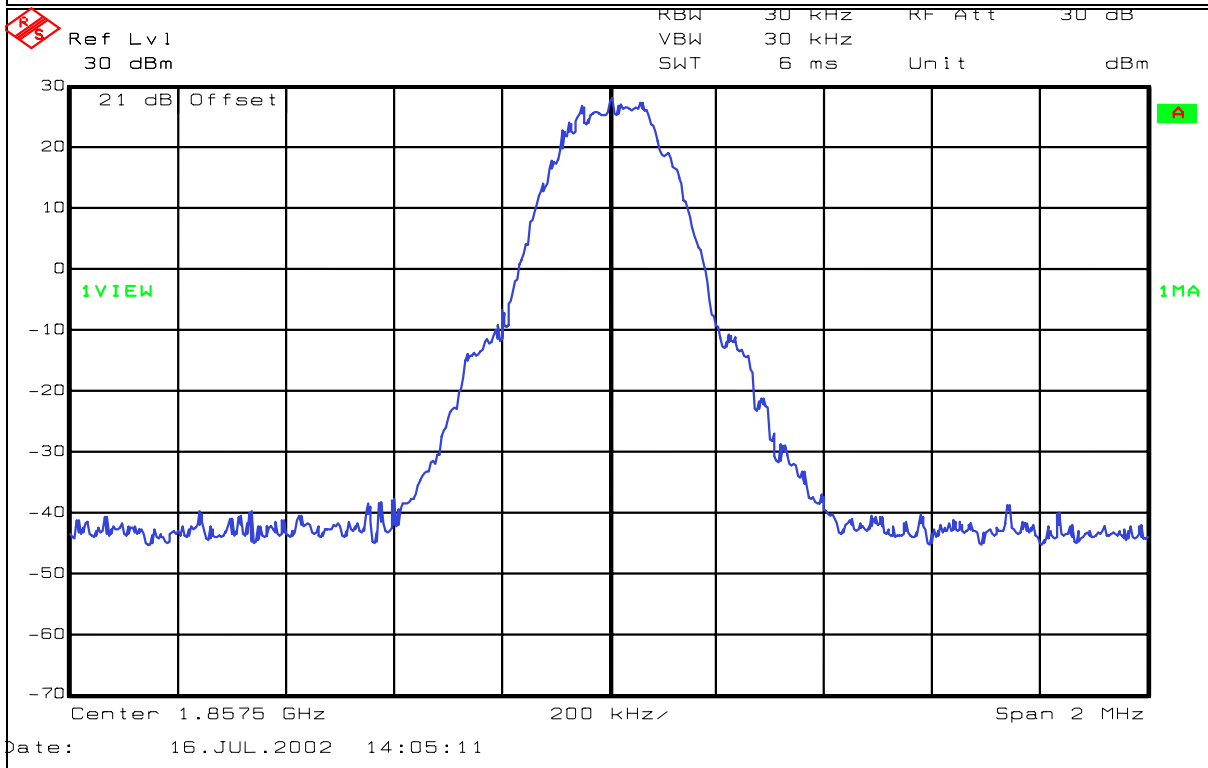
Page 1 of 4

Complete x
Preliminary:

Job No.: 2L0288 Date: 7/16/2002
Specification: Part 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 55
E.U.T.: BDA
Configuration: TX FULL POWER
Sample Number: 1
Location: Lab 1 RBW: Refer to plots Measurement
Detector Type: Peak VBW: Refer to plots Distance: NA m

Test Equipment Used

Antenna: Directional Coupler:
Pre-Amp: Cable #1: 1082
Filter: Cable #2:
Receiver: 1036 Cable #3:
Attenuator #1 1604 Cable #4:
Attenuator #2: Mixer:
Additional equipment used:
Measurement Uncertainty: +/-1.7 dB



Notes: **OUTPUT - UPLINK - A BLOCK**

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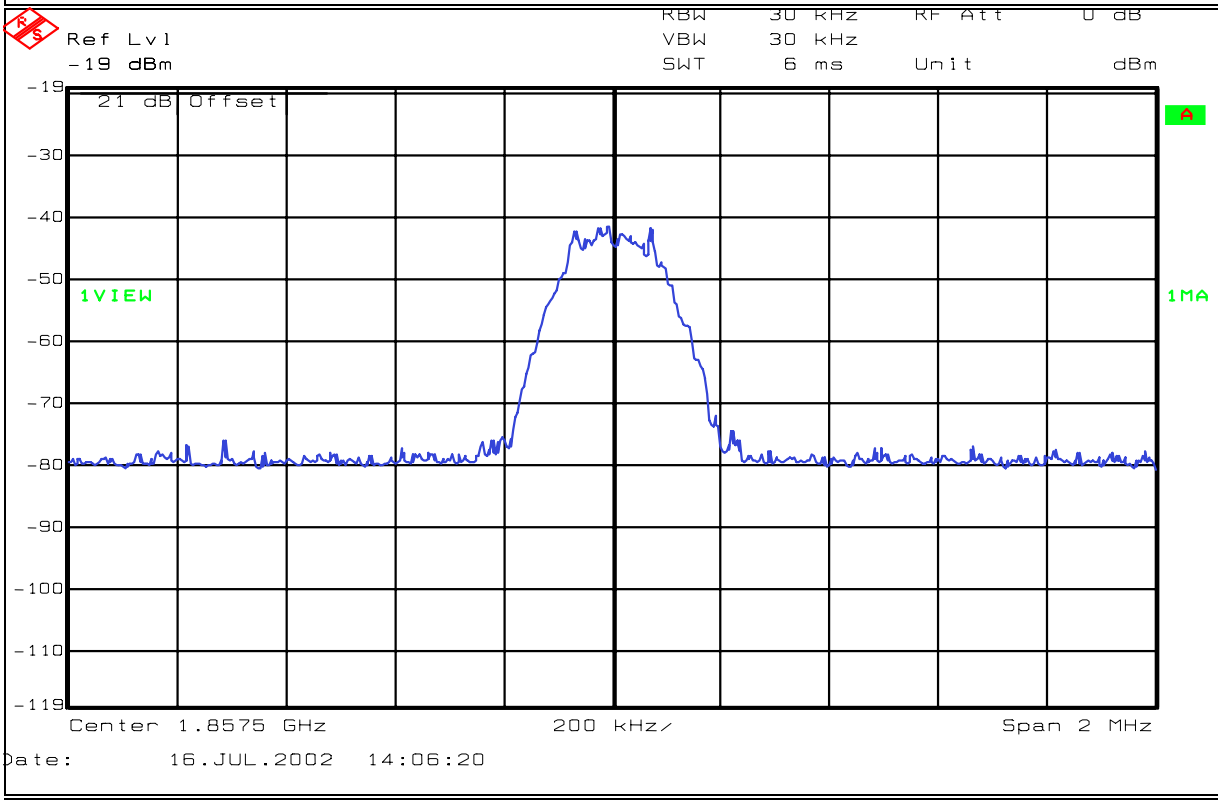
Data Plot — Occupied Bandwidth

Page 2 of 4

Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes: INPUT - UPLINK - A BLOCK

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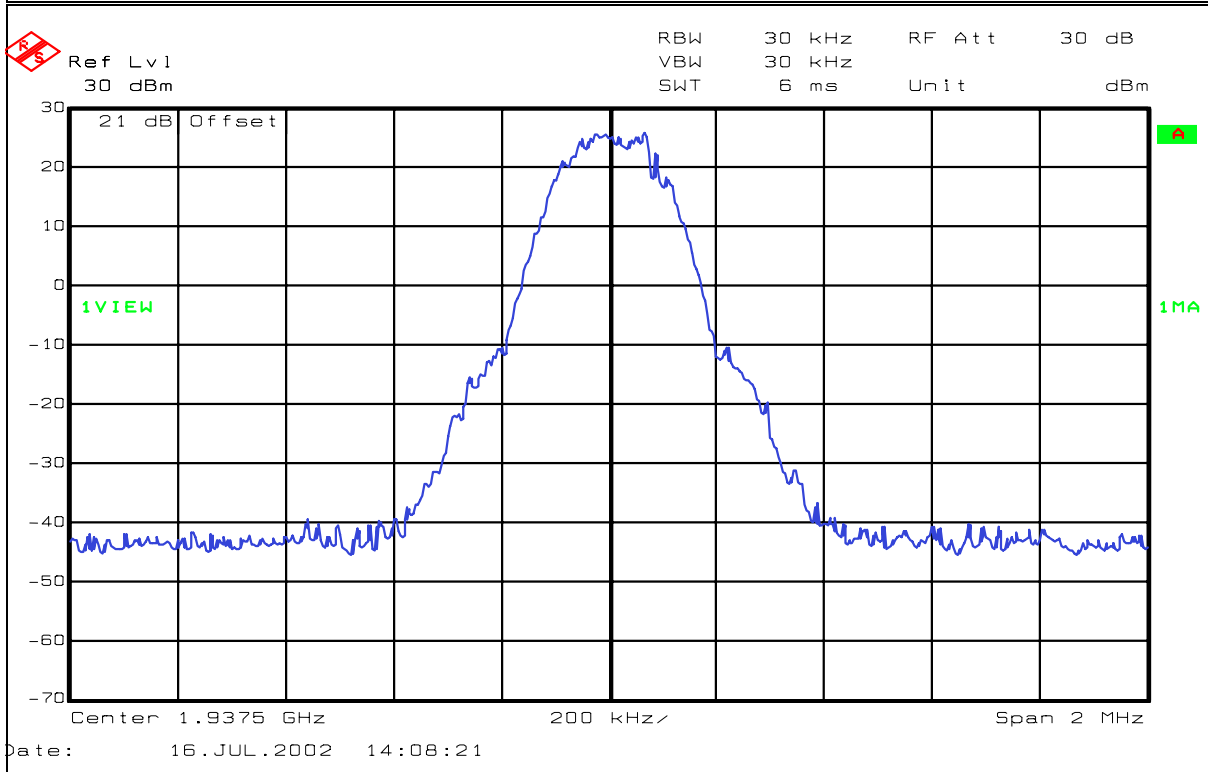
Data Plot — Occupied Bandwidth

Page 3 of 4

Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes: OUT PUT - DOWNLINK - A BLOCK

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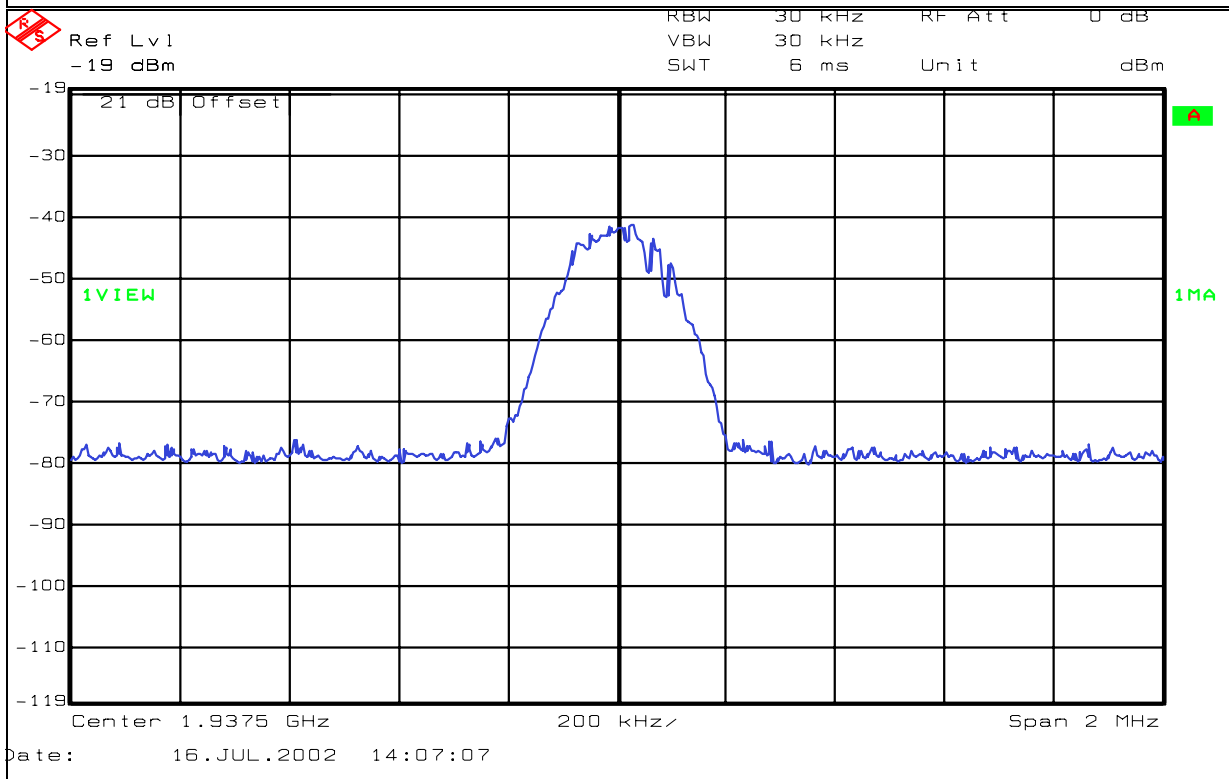
Test Plot: Occupied Bandwidth

Page 4 of 4

Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes: INPUT - DOWNLINK - A BLOCK

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Data Plot — Occupied Bandwidth

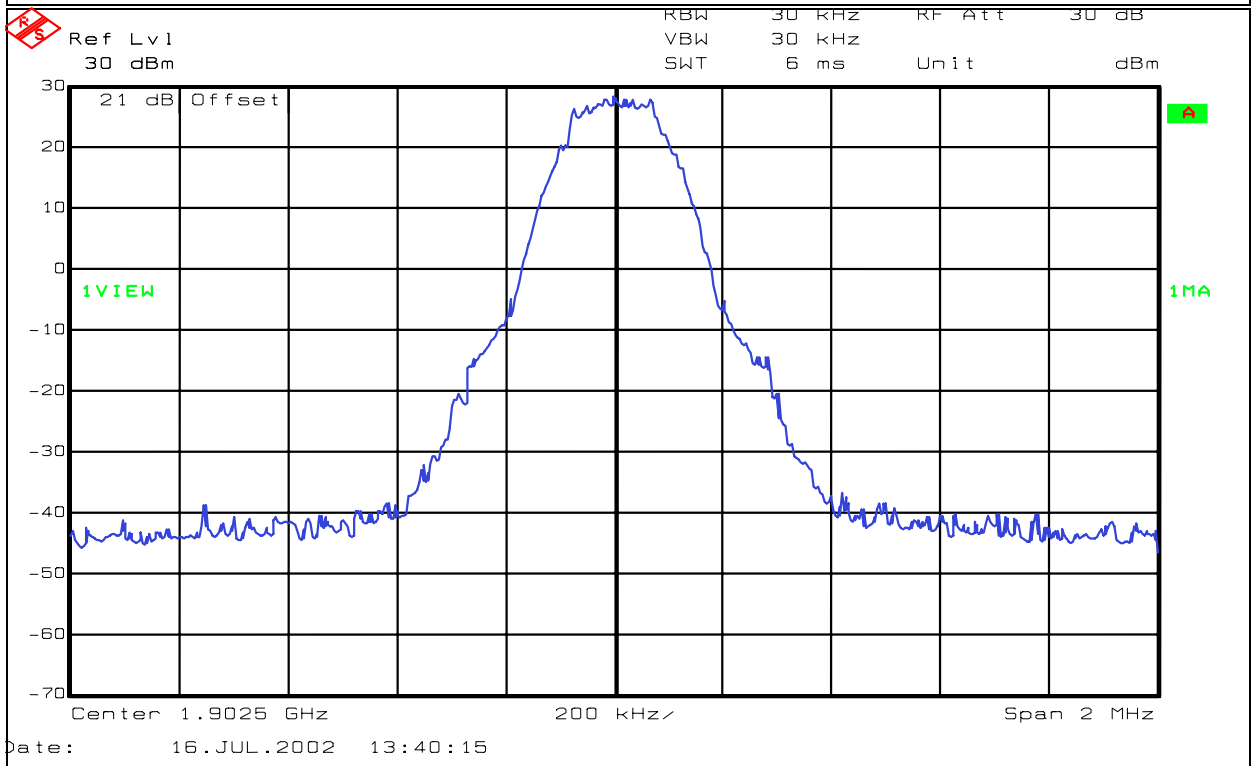
Page 1 of 4

Complete x
Preliminary:

Job No.: 2L0288 Date: 7/16/2002
Specification: Part 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 55
E.U.T.: BDA
Configuration: TX FULL POWER
Sample Number: 1
Location: Lab 1 RBW: Refer to plots Measurement
Detector Type: Peak VBW: Refer to plots Distance: NA m

Test Equipment Used

Antenna: Directional Coupler:
Pre-Amp: Cable #1: 1082
Filter: Cable #2:
Receiver: 1036 Cable #3:
Attenuator #1 1604 Cable #4:
Attenuator #2: Mixer:
Additional equipment used:
Measurement Uncertainty: +/-1.7 dB



Notes: OUTPUT - UPLINK - C BLOCK

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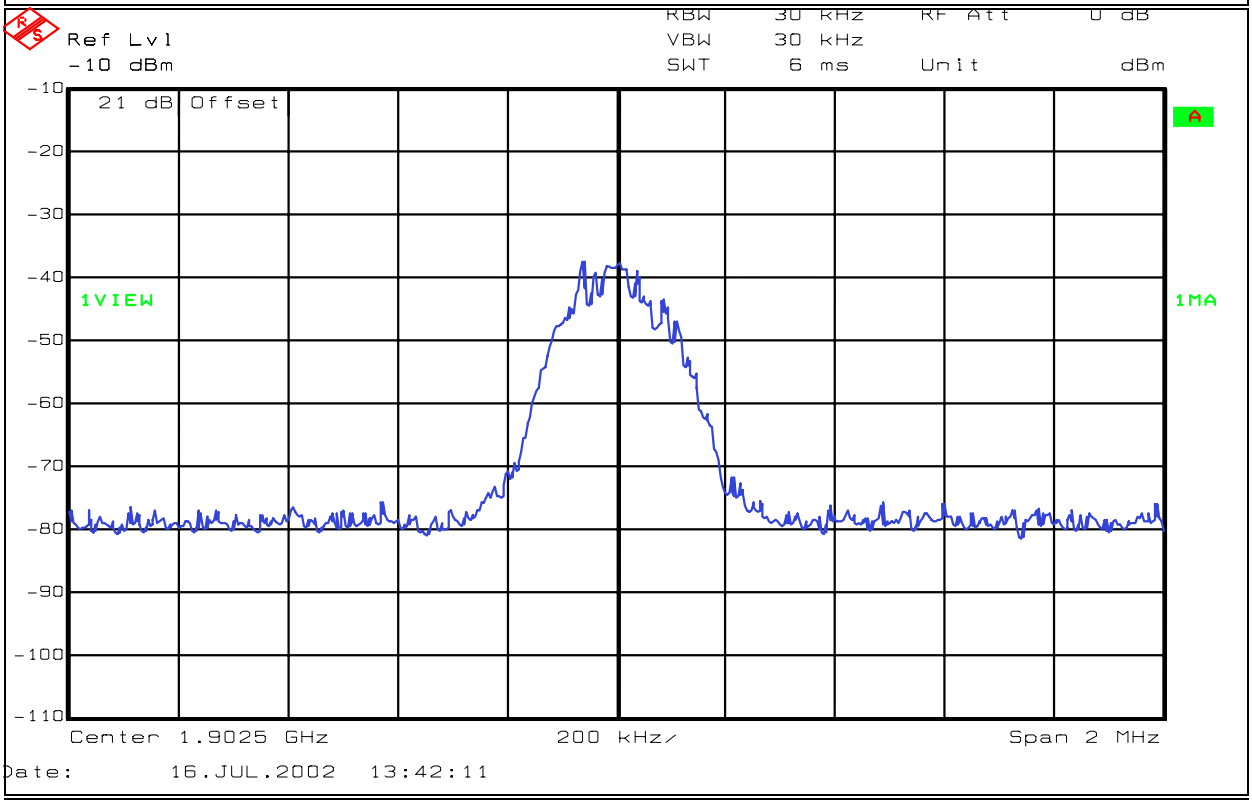
Data Plot — Occupied Bandwidth

Page 2 of 4

Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes: INPUT - UPLINK - C BLOCK

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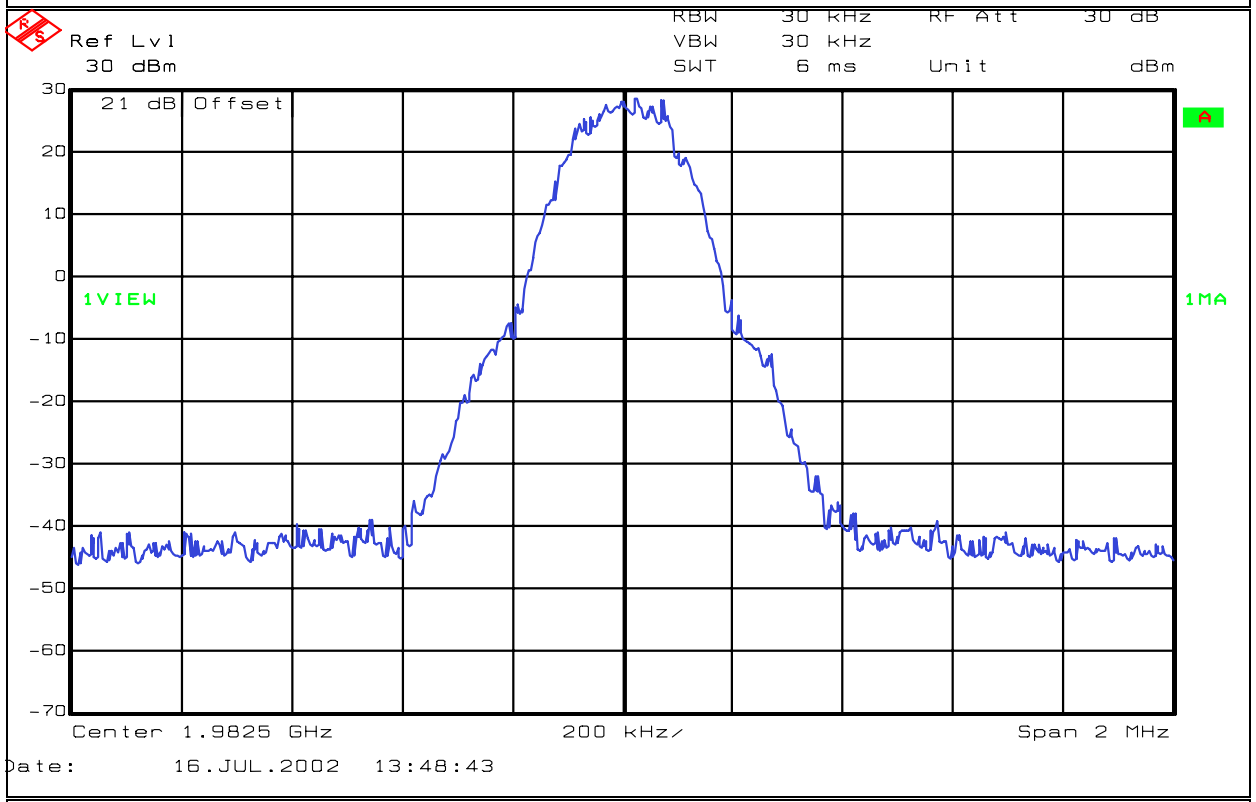
Data Plot — Occupied Bandwidth

Page 3 of 4

Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes: OUT PUT - DOWNLINK - C BLOCK

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Test Plot: Occupied Bandwidth

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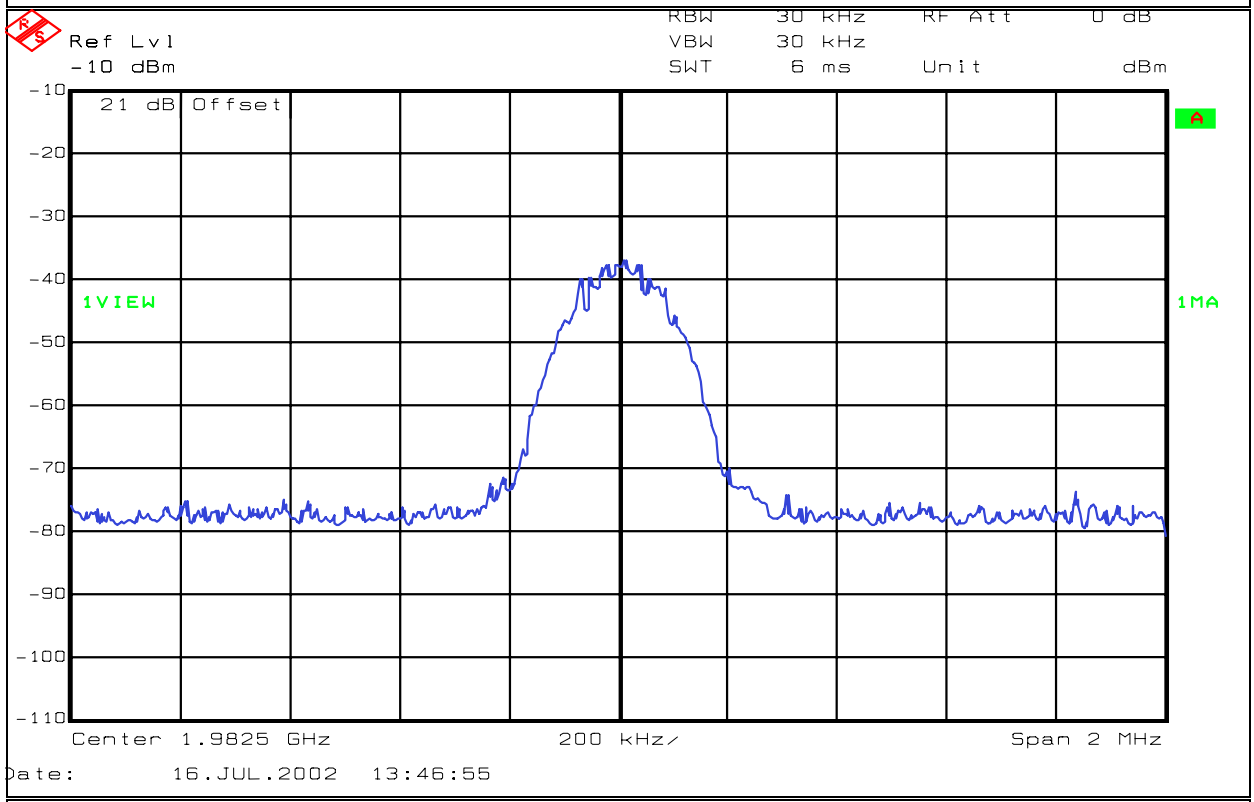
Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes: INPUT - DOWNLINK - C BLOCK

Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 2.1051
TESTED BY: Kevin Rose & David Light	DATE: 5/23/02

Test Results: Complies.

Test Data: See attached plot(s).

Equipment Used: 1464-1604-1052-1053

Measurement Uncertainty: +/- 1.6 dB

Temperature: 23 °C

Relative Humidity: 38 %

Test Data --- Spurious Emissions at Antenna Terminals

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Data Plot **Spurious Emissions at Antenna Terminals**

Page 1 of 4 Complete x

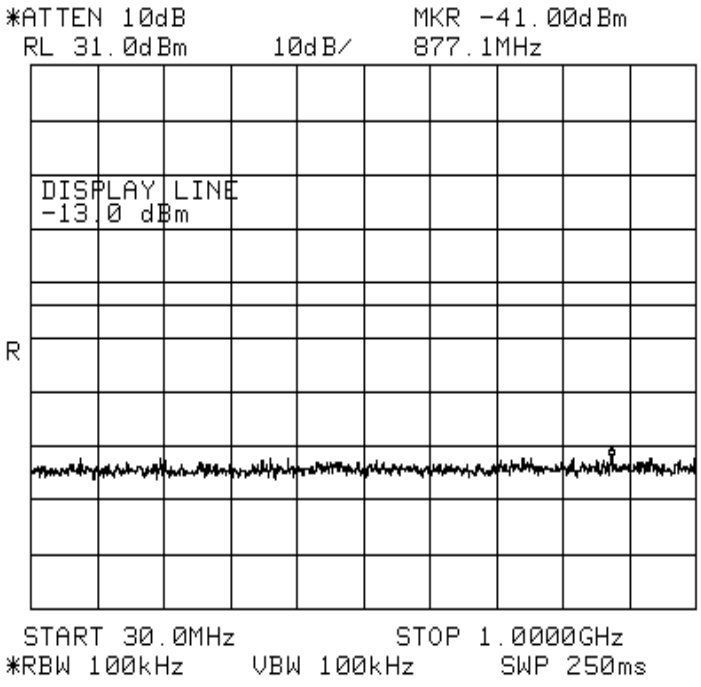
Job No.:	2l0288r	Date:	May 23 2002	Preliminary:	
Specification:	2.1051	Temperature(°C):	23		
Tested By:	Kevin Rose	Relative Humidity(%)	38		
E.U.T.:	A Band repeater Dekolink				
Configuration:	TX full Power				
Sample Number:	2039040				
Location:	Lab 1	RBW:	Refer to plots		
Detector Type:	Peak	VBW:	Refer to plots		

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1043
Filter:		Cable #2:	1046
Receiver:	1464	Cable #3:	
Attenuator #1	1604	Cable #4:	
Attenuator #2:	i wave model 392	Mixer:	

Additional equipment used: 1053 1052

Measurement Uncertainty: +/-1.7 dB



Notes: **Band A 30 Mhz - 1 Ghz display line -13dBm**
Downlink. Marker indicates the highest emission

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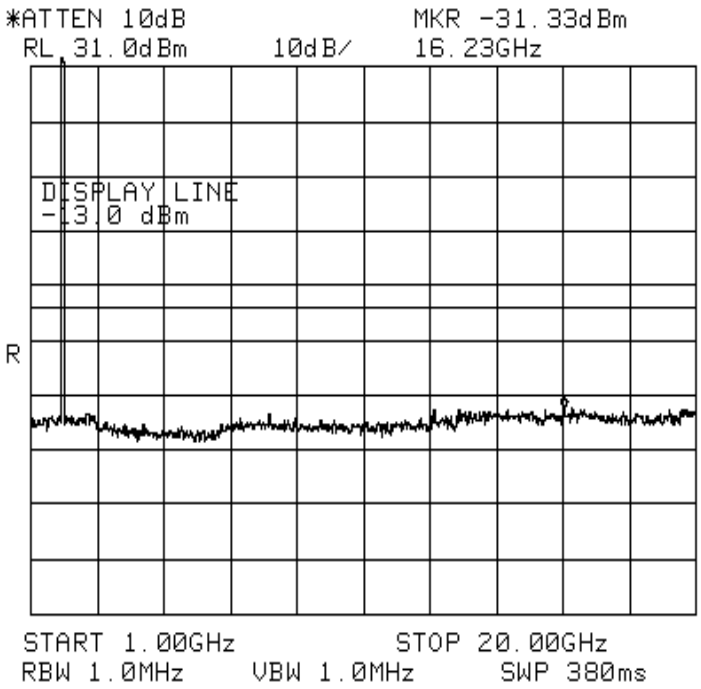
Data Plot **Spurious Emissions at Antenna Terminals**

Page 2 of 4

Job No.:	2l0288r	Date:	May 23 2002
Specification:	2.1051	Temperature(°C):	23
Tested By:	Kevin Rose	Relative Humidity(%)	38
E.U.T.:	A Band repeater Dekolink		
Configuration:	TX full Power		



Notes: **Band A 1Ghz-20Ghz display line -13dBm**
Downlink. Marker indicates the highest emission

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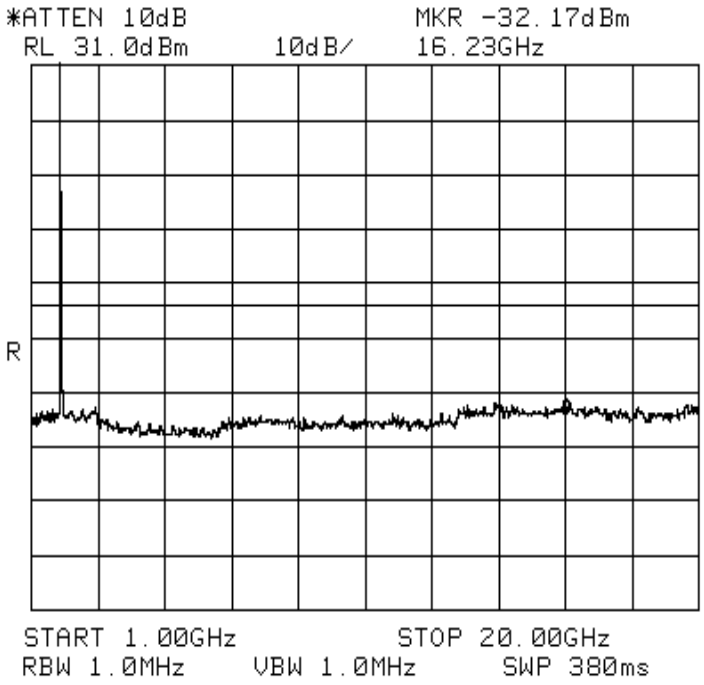
Data Plot — Spurious Emissions at Antenna Terminals

Page 3 of 4

Job No.:	2l0288r	Date:	May 23 2002
Specification:	2.1051	Temperature(°C):	23
Tested By:	Kevin Rose	Relative Humidity(%)	38
E.U.T.:	A Band repeater Dekolink		
Configuration:	TX full Power		



Notes: **Band A 1Ghz-20Ghz display line -13dBm**
UPlink marker indicates the highest emission

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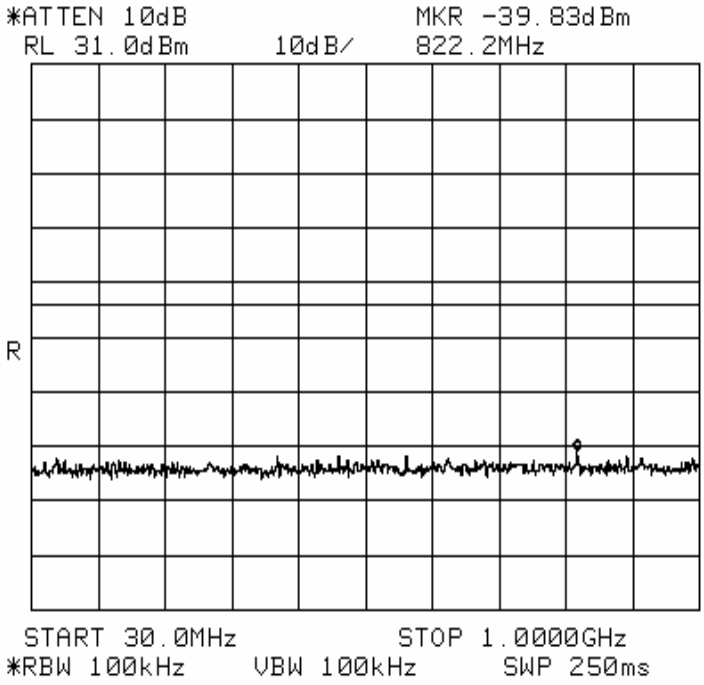
Test Plot: Spurious Emissions at Antenna Terminals

Page 4 of 4

Job No.: 2l0288r Date: May 23 2002
Specification: 2.1051 Temperature(°C): 23
Tested By: Kevin Rose Relative Humidity(%) 38
E.U.T.: A Band repeater Dekolink
Configuration: TX full Power



Notes: **Band A 30 Mhz - 1 Ghz display line -13dBm**
Uplink. Marker indicates the highest emission

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Data Plot — Spurious Emissions at Antenna Terminals

Page 1 of 2 | Complete x | Preliminary:

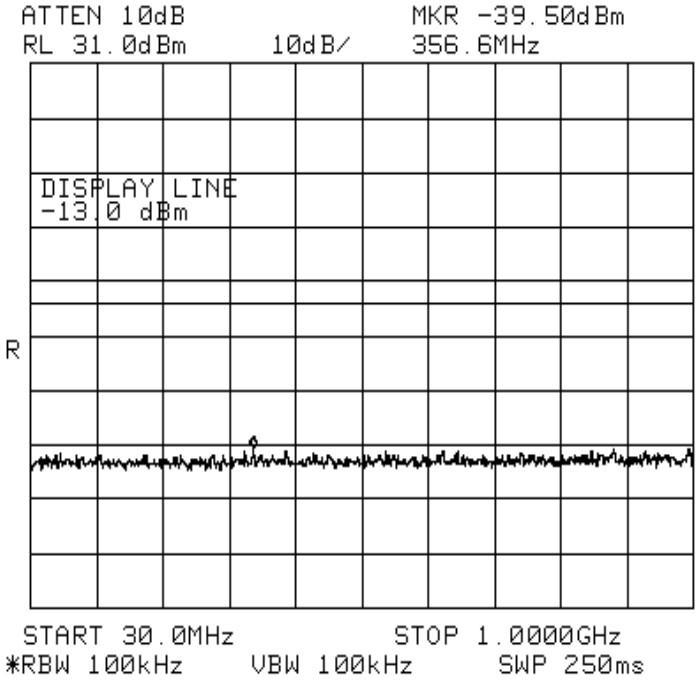
Job No.:	2l0288r	Date:	May 23 2002
Specification:	2.1051	Temperature(°C):	23
Tested By:	Kevin Rose	Relative Humidity(%)	38
E.U.T.:	C Band repeater Dekolink		
Configuration:	TX full Power		
Sample Number:	2039042		
Location:	Lab 1	RBW:	Refer to plots
Detector Type:	Peak	VBW:	Refer to plots

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1043
Filter:		Cable #2:	1046
Receiver:	1464	Cable #3:	
Attenuator #1	1604	Cable #4:	
Attenuator #2:	i wave model 392	Mixer:	

Additional equipment used: 1053 1052

Measurement Uncertainty: +/-1.7 dB



Notes: **Band C 30 Mhz - 1 Ghz display line -13dBm**
downlink marker indicates the highest emission

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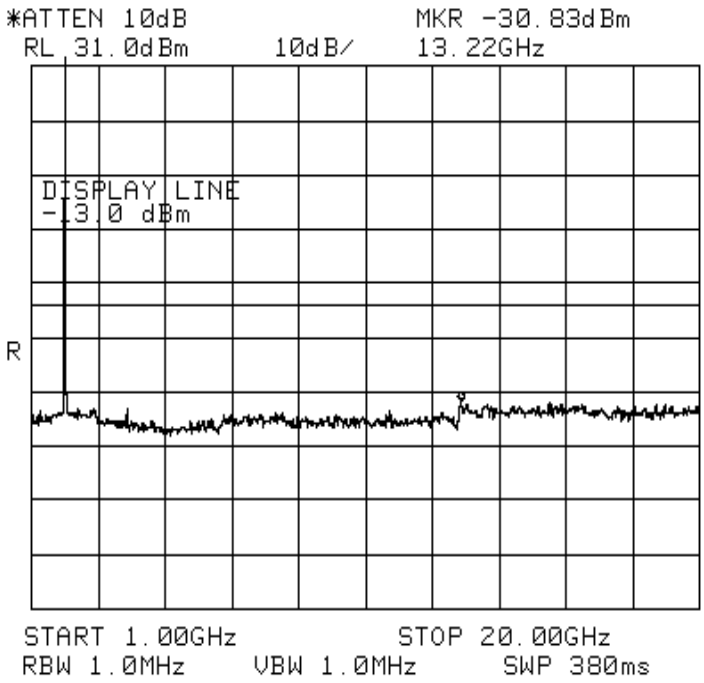
Data Plot — Spurious Emissions at Antenna Terminals

Page 2 of 2

Job No.:	2l0288r	Date:	May 23 2002
Specification:	2.1051	Temperature(°C):	23
Tested By:	Kevin Rose	Relative Humidity(%)	38
E.U.T.:	C Band repeater Dekolink		
Configuration:	TX full Power		



Notes: **Band C 1Ghz-20Ghz display line -13dBm**
Downlink. Marker indicates the highest emission

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Data Plot — Spurious Emissions at Antenna Terminals

Page 1 of 2 | Complete x | Preliminary:

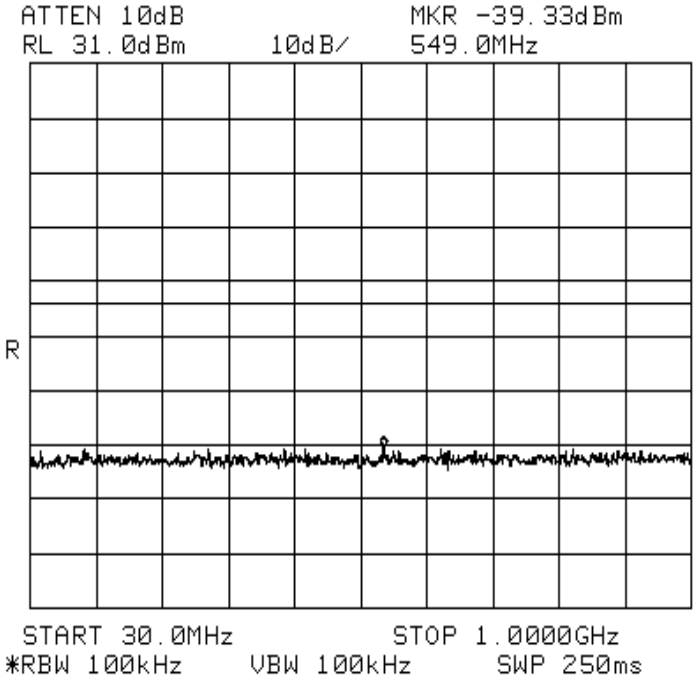
Job No.:	2l0288r	Date:	May 23 2002
Specification:	2.1051	Temperature(°C):	23
Tested By:	Kevin Rose	Relative Humidity(%)	38
E.U.T.:	C Band repeater Dekolink		
Configuration:	TX full Power		
Sample Number:	2039042		
Location:	Lab 1	RBW:	Refer to plots
Detector Type:	Peak	VBW:	Refer to plots

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1043
Filter:		Cable #2:	1046
Receiver:	1464	Cable #3:	
Attenuator #1	1604	Cable #4:	
Attenuator #2:	i wave model 392	Mixer:	

Additional equipment used: 1053 1052

Measurement Uncertainty: +/-1.7 dB



Notes: **Band C 30MHz - 1GHz display line -13dBm**
Uplink. Marker indicates the highest emission

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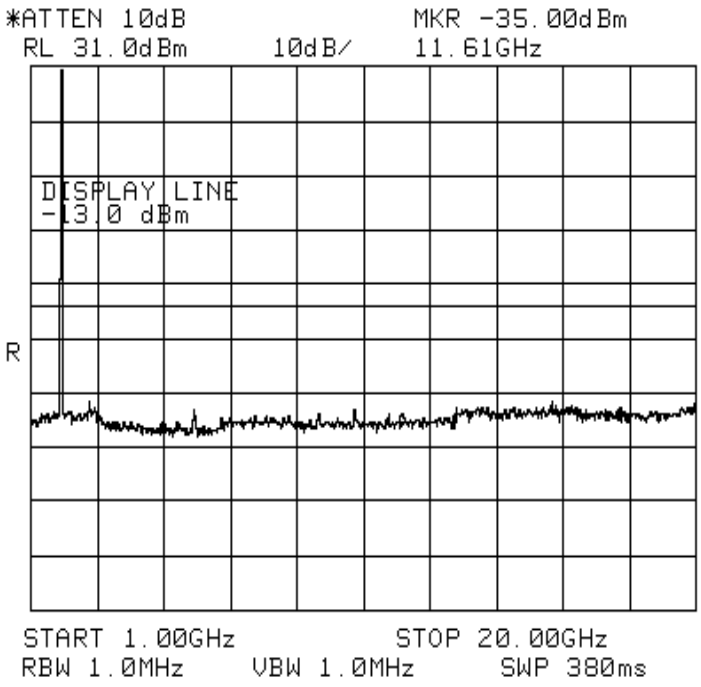
Data Plot — Spurious Emissions at Antenna Terminals

Page 2 of 2

Job No.:	2l0288r	Date:	May 23 2002
Specification:	2.1051	Temperature(°C):	23
Tested By:	Kevin Rose	Relative Humidity(%)	38
E.U.T.:	C Band repeater Dekolink		
Configuration:	TX full Power		



Notes: **Band C 1GHz-20GHz display line -13dBm**
Uplink. Marker indicates the highest emission

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Data Plot — Bandedges

Page 1 of 2

Complete x

Job No.: 2l0288r Date: May 23 2002 Preliminary:

Specification: 24.238 Temperature(°C): 23

Tested By: Kevin Rose Relative Humidity(%) 38

E.U.T.: A Band repeater Dekolink

Configuration: TX full Power

Sample Number: 2039040

Location: Lab 1 RBW: Refer to plots

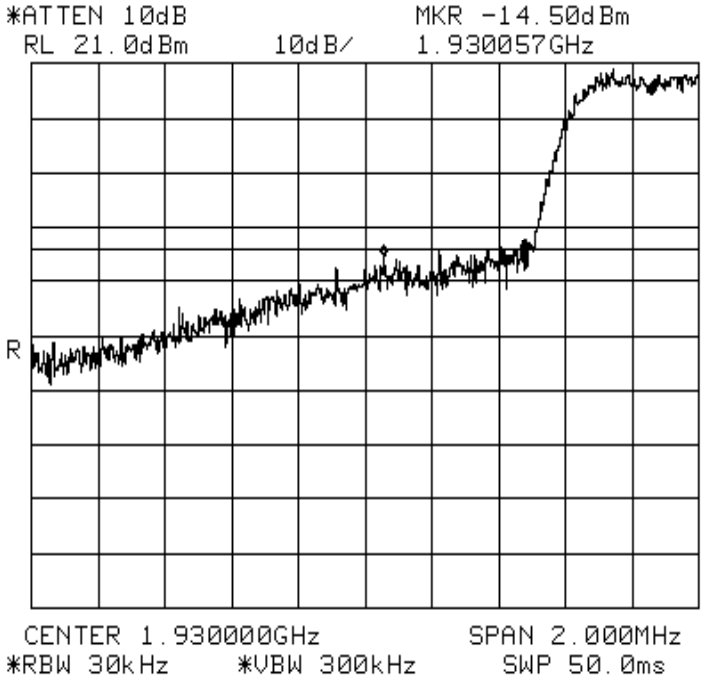
Detector Type: Peak VBW: Refer to plots

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1043
Filter:		Cable #2:	1046
Receiver:	1464	Cable #3:	
Attenuator #1	1604	Cable #4:	
Attenuator #2:	i wave model 392	Mixer:	

Additional equipment used: 1053 1052

Measurement Uncertainty: +/-1.7 dB



Notes: **Band A Output signal CDMA downlink**
band edge 1.93Ghz display line is -13dBm

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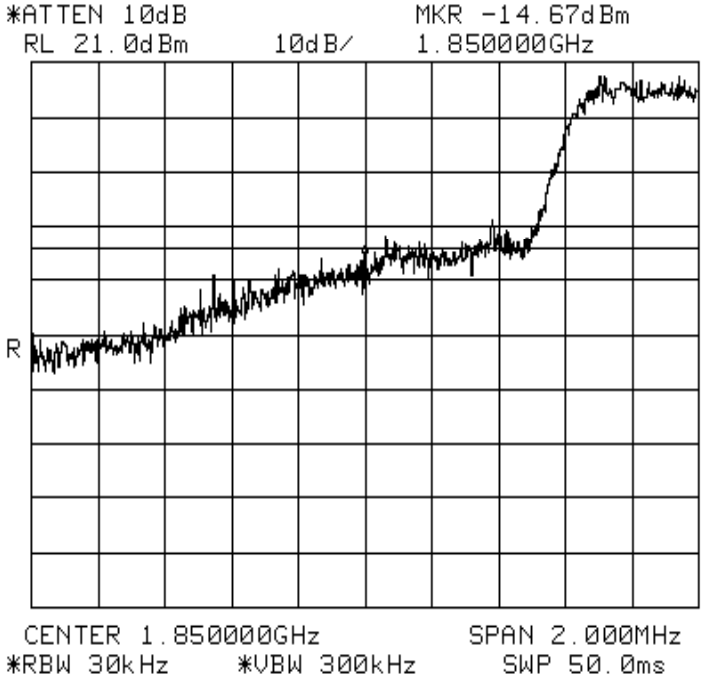
Data Plot **Bandedges**

Page 2 of 2

Job No.:	2l0288r	Date:	May 23 2002
Specification:	24.2380	Temperature(°C):	23
Tested By:	Kevin Rose	Relative Humidity(%)	38
E.U.T.:	A Band repeater Dekolink		
Configuration:	TX full Power		



Notes: **Band C input signal CDMA Downlink**
Band Edge 1.85Ghz display line is -13dBm

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Data Plot — Bandedges

Page 1 of 2 — Complete: x — Preliminary:

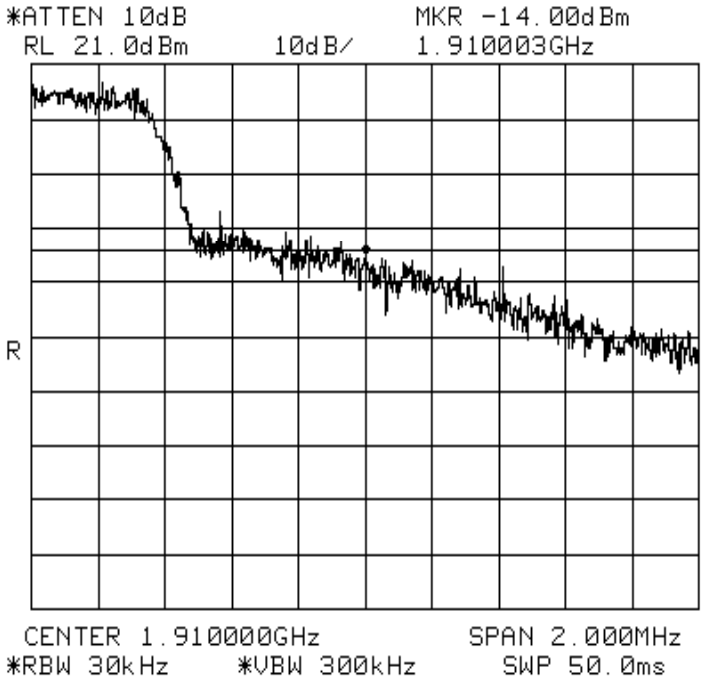
Job No.:	2l0288r	Date:	May 23 2002
Specification:	24.238	Temperature(°C):	23
Tested By:	Kevin Rose	Relative Humidity(%)	38
E.U.T.:	C Band repeater Dekolink		
Configuration:	TX full Power		
Sample Number:	2039042		
Location:	Lab 1	RBW:	Refer to plots
Detector Type:	Peak	VBW:	Refer to plots

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1043
Filter:		Cable #2:	1046
Receiver:	1464	Cable #3:	
Attenuator #1	1604	Cable #4:	
Attenuator #2:	i wave model 392	Mixer:	

Additional equipment used: 1053 1052

Measurement Uncertainty: +/-1.7 dB



Notes: **Band C Output signal CDMA uplink band edge 1.91Ghz**

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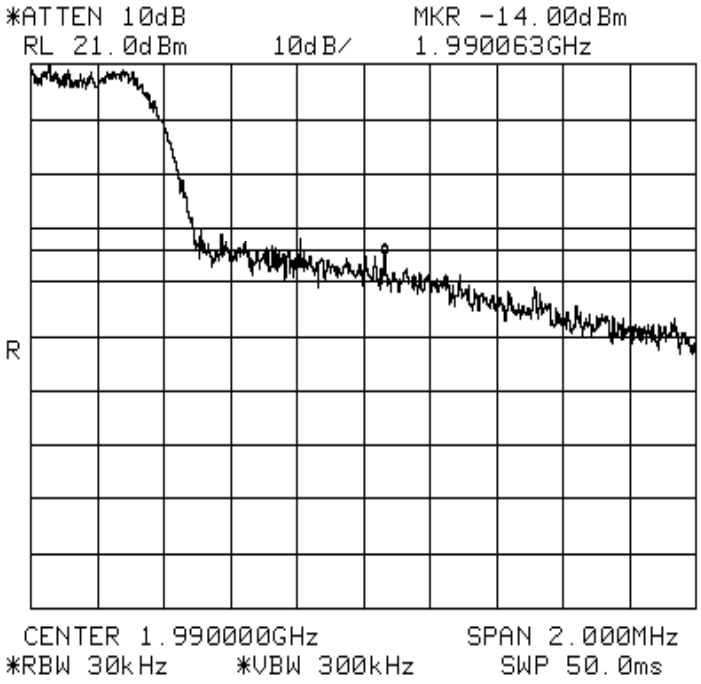
Data Plot **Bandedges**

Page 2 of 2

Job No.:	2l0288r	Date:	May 23 2002
Specification:	24.2	Temperature(°C):	23
Tested By:	Kevin Rose	Relative Humidity(%)	38
E.U.T.:	C Band repeater Dekolink		
Configuration:	TX full Power		



Notes: **Band C input signal CDMA downlink**
Band Edge 1.99Mhz

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Data Plot — Intermodulation Characteristics

Page 1 of 4 | Complete x | Preliminary:

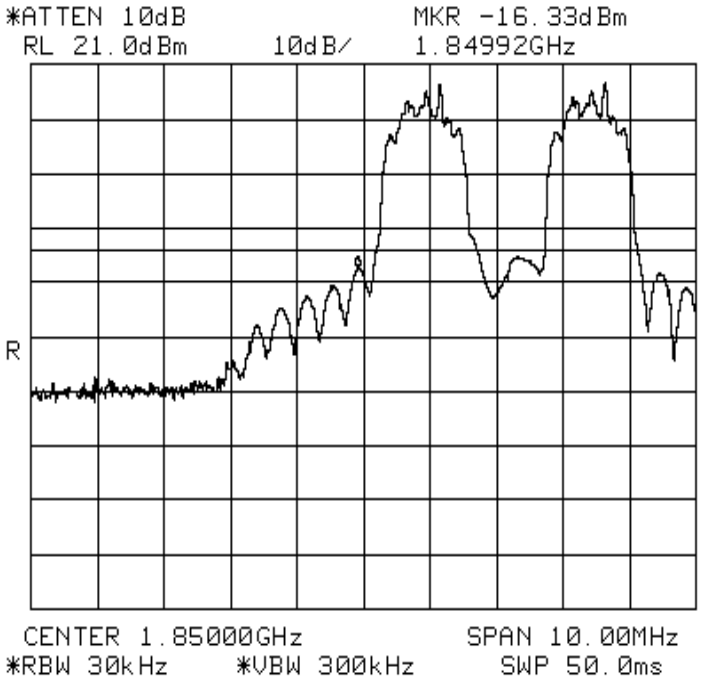
Job No.:	2l0288r	Date:	May 23 2002
Specification:	2.1049	Temperature(°C):	23
Tested By:	Kevin Rose	Relative Humidity(%)	38
E.U.T.:	A Band repeater Dekolink		
Configuration:	TX full Power		
Sample Number:	2039042		
Location:	Lab 1	RBW:	Refer to plots
Detector Type:	Peak	VBW:	Refer to plots

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1043
Filter:		Cable #2:	1046
Receiver:	1464	Cable #3:	
Attenuator #1	1604	Cable #4:	
Attenuator #2:	i wave model 392	Mixer:	

Additional equipment used: 1053 1052

Measurement Uncertainty: +/-1.7 dB



Notes: **Band A band peak emission out of band CDMA down link**

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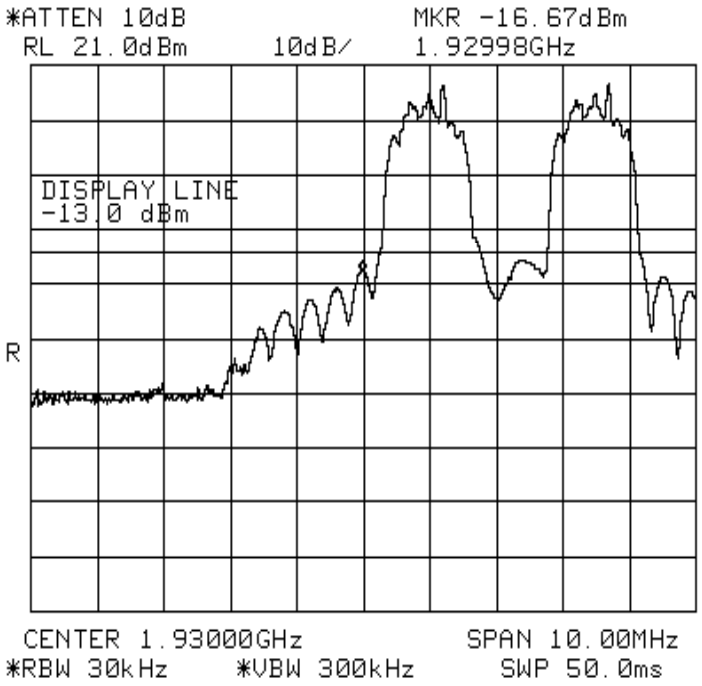
Data Plot — Intermodulation Characteristics

Page 3 of 4

Job No.:	2l0288r	Date:	May 23 2002
Specification:	2.1049	Temperature(°C):	23
Tested By:	Kevin Rose	Relative Humidity(%)	38
E.U.T.:	A Band repeater Dekolink		
Configuration:	TX full Power		



Notes: **Band A band peak emission out of band CDMA Uplink**

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Data Plot — Intermodulation Characteristics

Page 1 of 4

Complete x

Job No.: 2l0288r — Date: May 23 2002 — Preliminary:

Specification: 2.1049 — Temperature(°C): 23

Tested By: Kevin Rose — Relative Humidity(%) 38

E.U.T.: C Band repeater Dekolink

Configuration: TX full Power

Sample Number: 2039042

Location: Lab 1 — RBW: Refer to plots

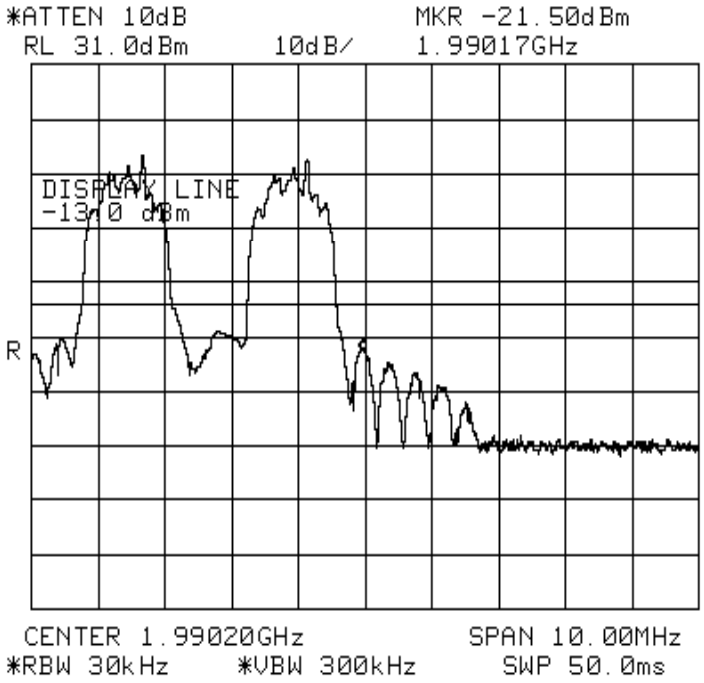
Detector Type: Peak — VBW: Refer to plots

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1043
Filter:		Cable #2:	1046
Receiver:	1464	Cable #3:	
Attenuator #1	1604	Cable #4:	
Attenuator #2:	i wave model 392	Mixer:	

Additional equipment used: 1053 1052

Measurement Uncertainty: +/-1.7 dB



Notes: **Band C upper band peak emission out of band CDMA Uplink**
down link

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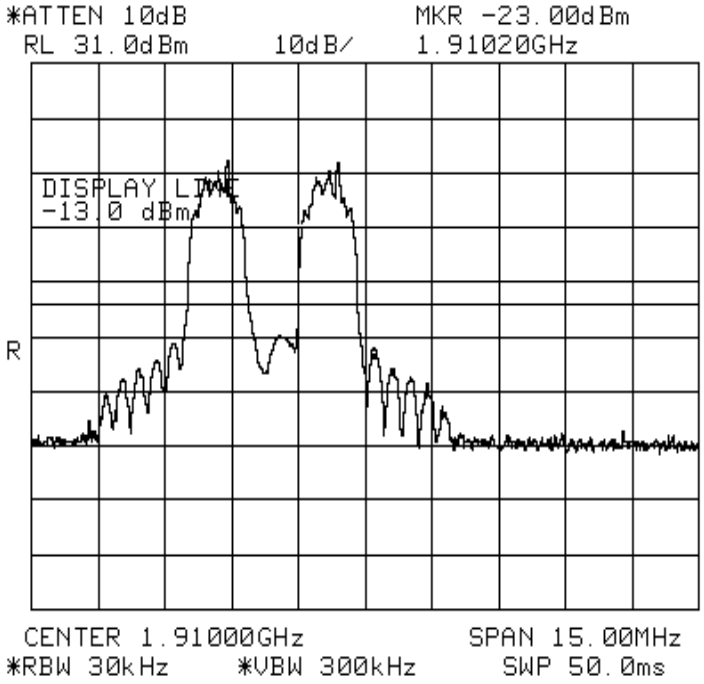
Data Plot — Intermodulation Characteristics

Page 3 of 4

Job No.:	2l0288r	Date:	May 23 2002
Specification:	2.1049	Temperature(°C):	23
Tested By:	Kevin Rose	Relative Humidity(%)	38
E.U.T.:	C Band repeater Dekolink		
Configuration:	TX full Power		



Notes: **Band C upper band peak emission out of band CDMA Uplink**
uplink

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Data Plot — Spurious Emissions at Antenna Terminals

Page 1 of 5

Complete x
Preliminary:

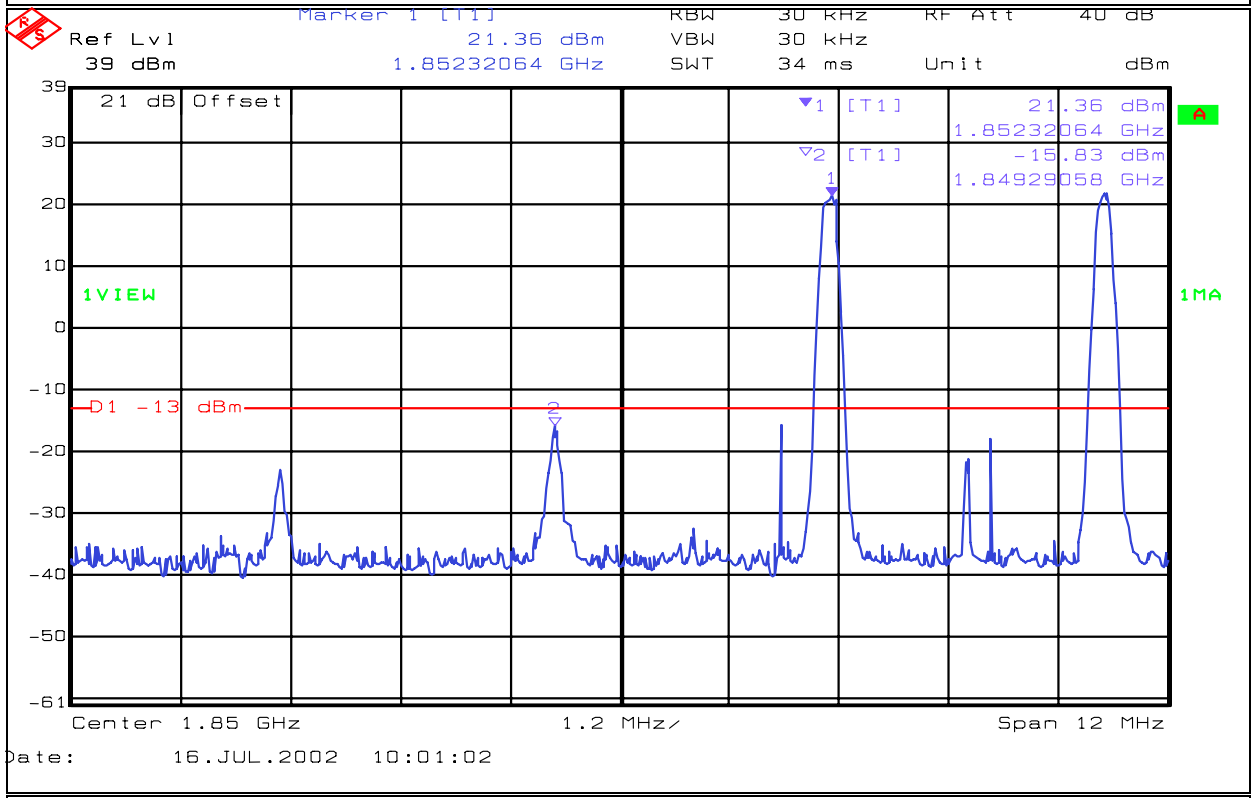
Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		
Sample Number:	1		
Location:	Lab 1	RBW:	Refer to plots
Detector Type:	Peak	VBW:	Refer to plots

Measurement Distance: NA m

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1082
Filter:		Cable #2:	
Receiver:	1036	Cable #3:	
Attenuator #1	1604	Cable #4:	
Attenuator #2:		Mixer:	

Additional equipment used:
Measurement Uncertainty: +/-1.7 dB



Notes:
MARKER 1 INDICATES CARRIER LEVEL
MARKER 2 INDICATES HIGHEST OUT OF BAND EMISSION
LOWER BANDEDGE - A BLOCK

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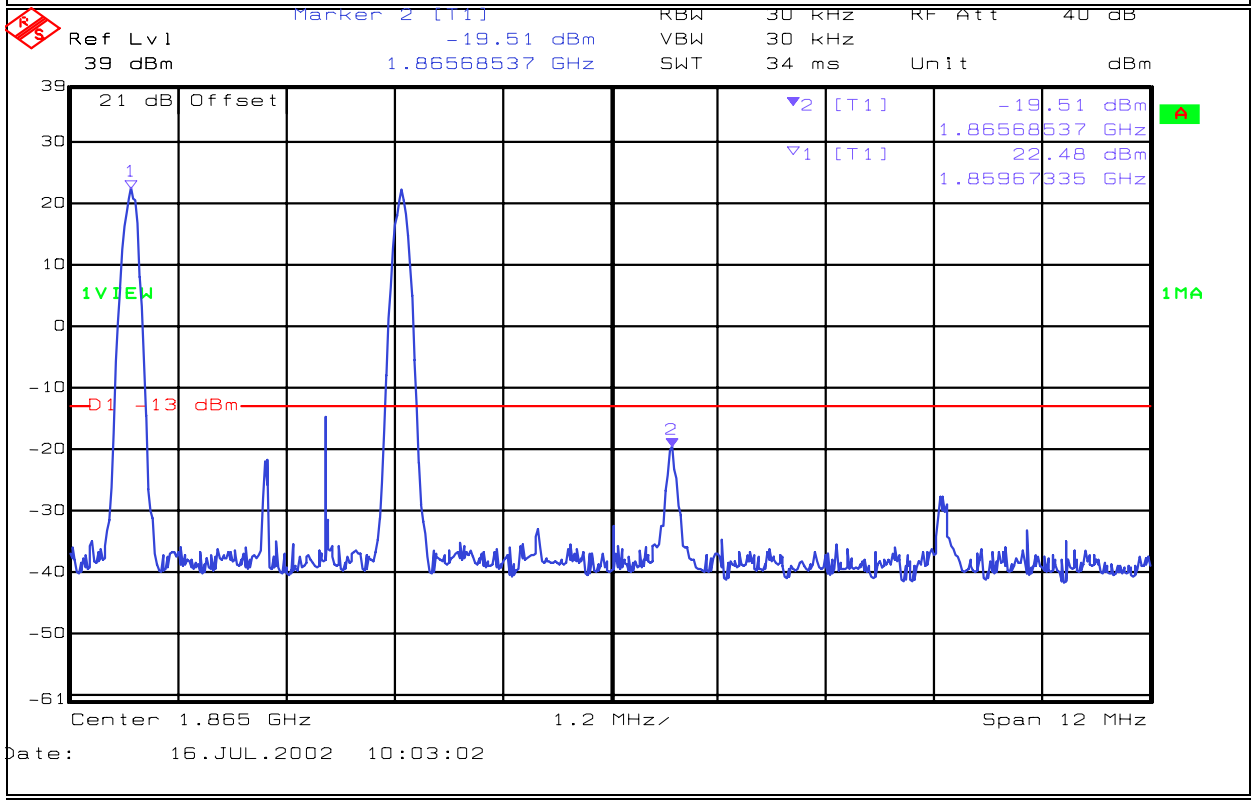
Data Plot — Spurious Emissions at Antenna Terminals

Page 2 of 5

Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes:
MARKER 1 INDICATES CARRIER LEVEL
MARKER 2 INDICATES HIGHEST OUT OF BAND EMISSION
UPPER BANDEDGE - A BLOCK
Uplink

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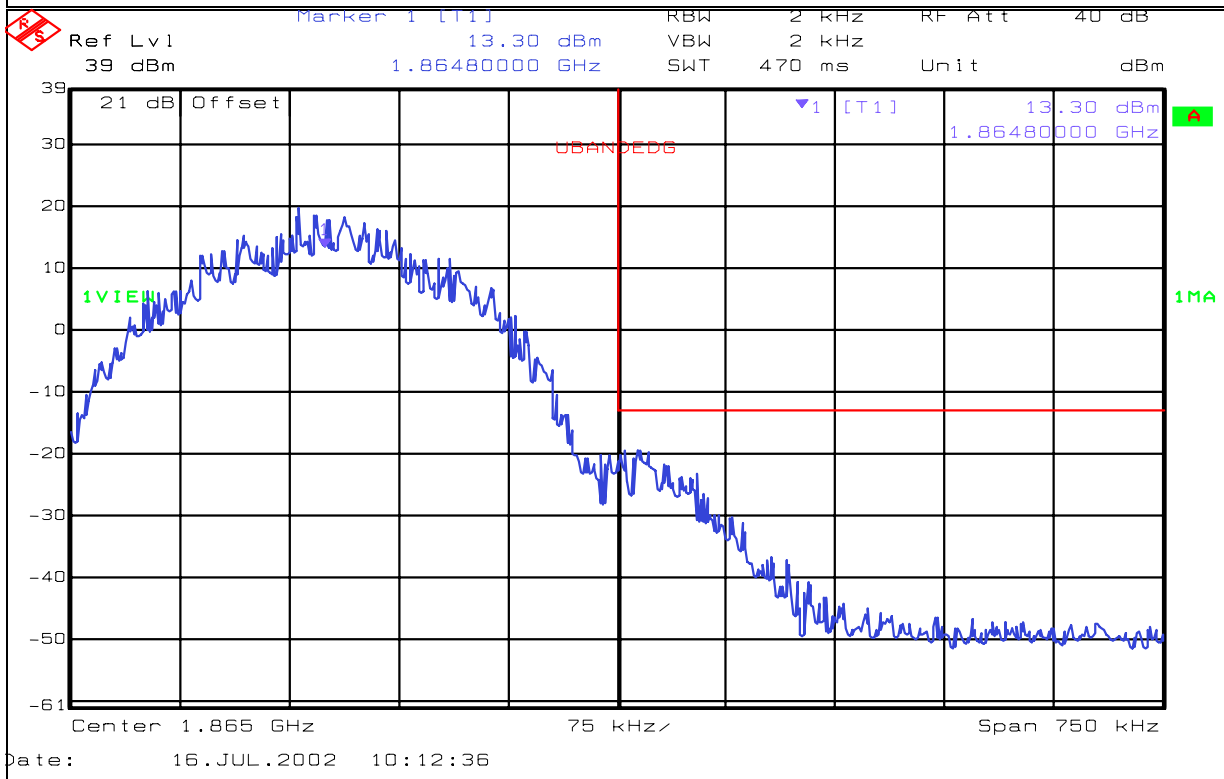
Data Plot — Spurious Emissions at Antenna Terminals

Page 3 of 5

Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes:
UPPER BANDEDGE
MARKER INDICATES CARRIER FREQUENCY
Uplink

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Test Plot: Spurious Emissions at Antenna Terminals

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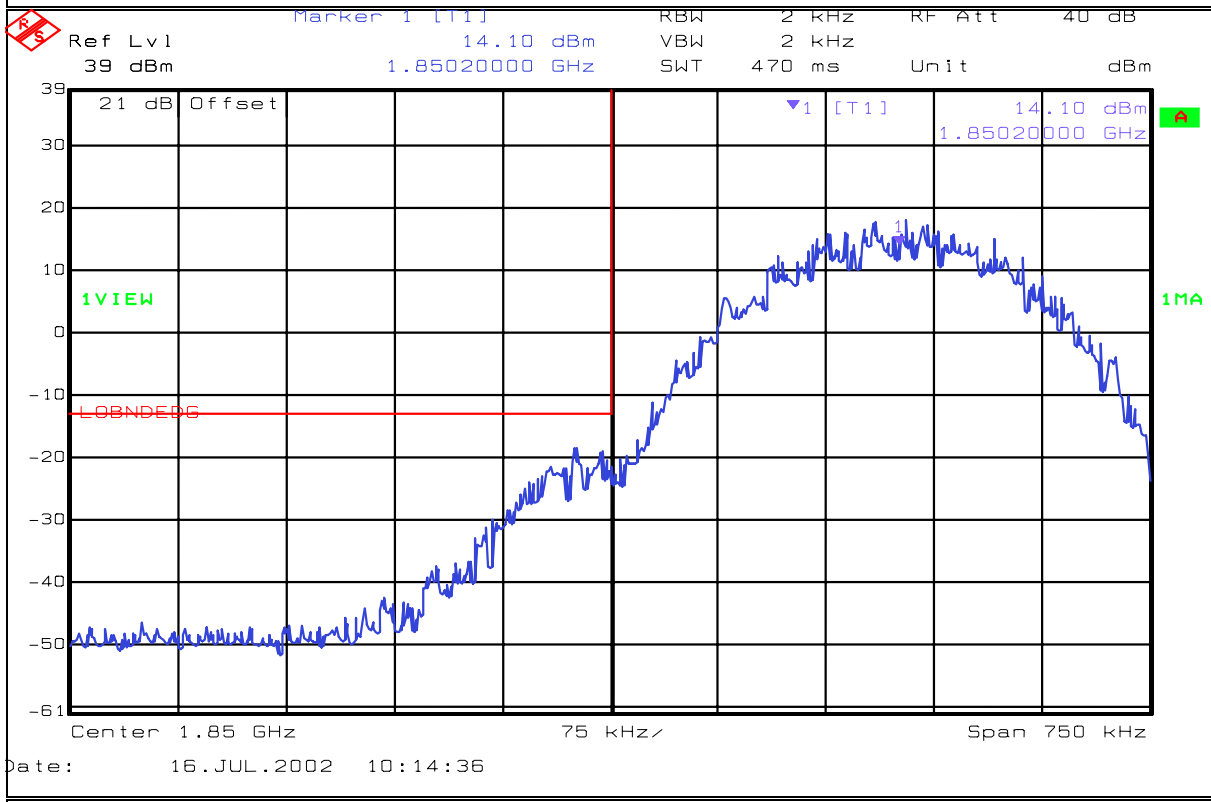
Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes:	
	Lower bandedge
	Marker indicates carrier frequency
	Uplink

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Test Plot: Spurious Emissions at Antenna Terminals

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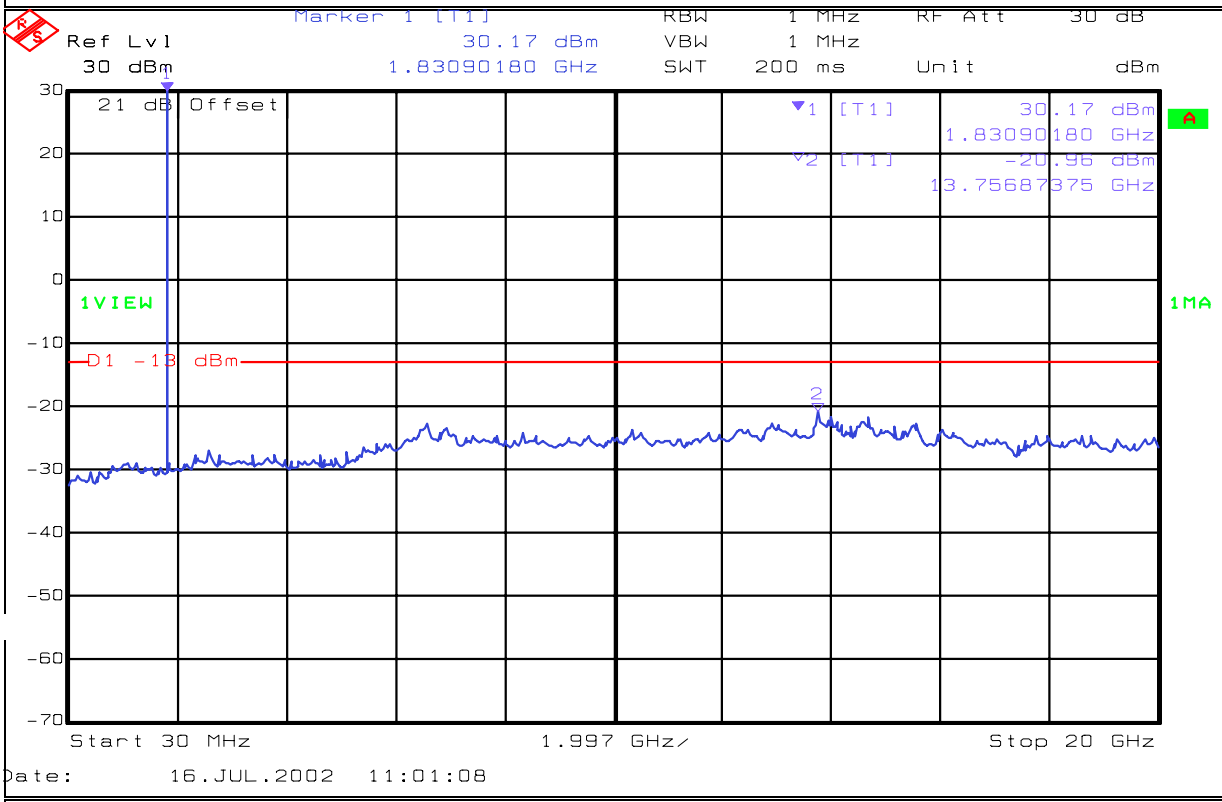
Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes: **Harmonic emissions - Uplink**

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Data Plot

Spurious Emissions at Antenna Terminals

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Complete x
Preliminary:

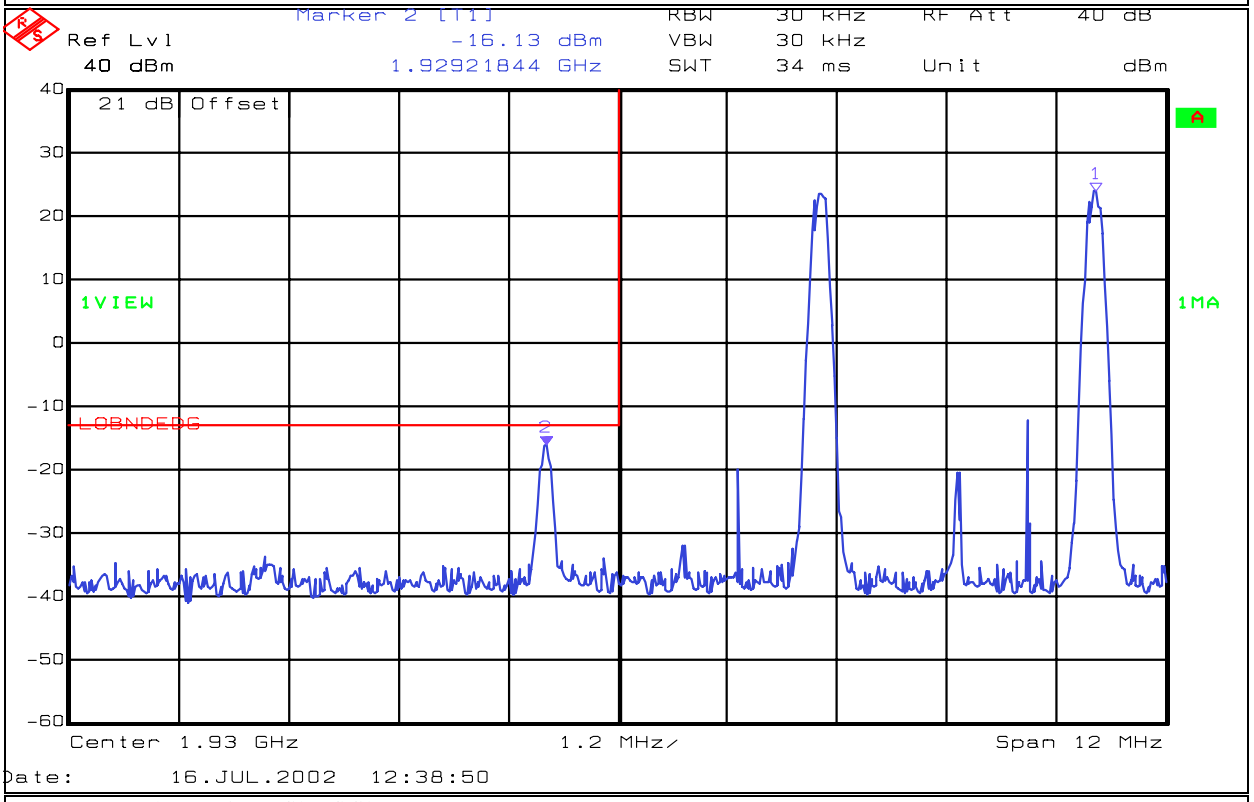
Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		
Sample Number:	1		
Location:	Lab 1	RBW:	Refer to plots
Detector Type:	Peak	VBW:	Refer to plots

Measurement Distance: NA m

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1082
Filter:		Cable #2:	
Receiver:	1036	Cable #3:	
Attenuator #1	1604	Cable #4:	
Attenuator #2:		Mixer:	

Additional equipment used:
Measurement Uncertainty: +/-1.7 dB



Notes:
MARKER 1 INDICATES CARRIER LEVEL
MARKER 2 INDICATES HIGHEST OUT OF BAND EMISSION
LOWER BANDEDGE - A BLOCK

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Data Plot — Spurious Emissions at Antenna Terminals

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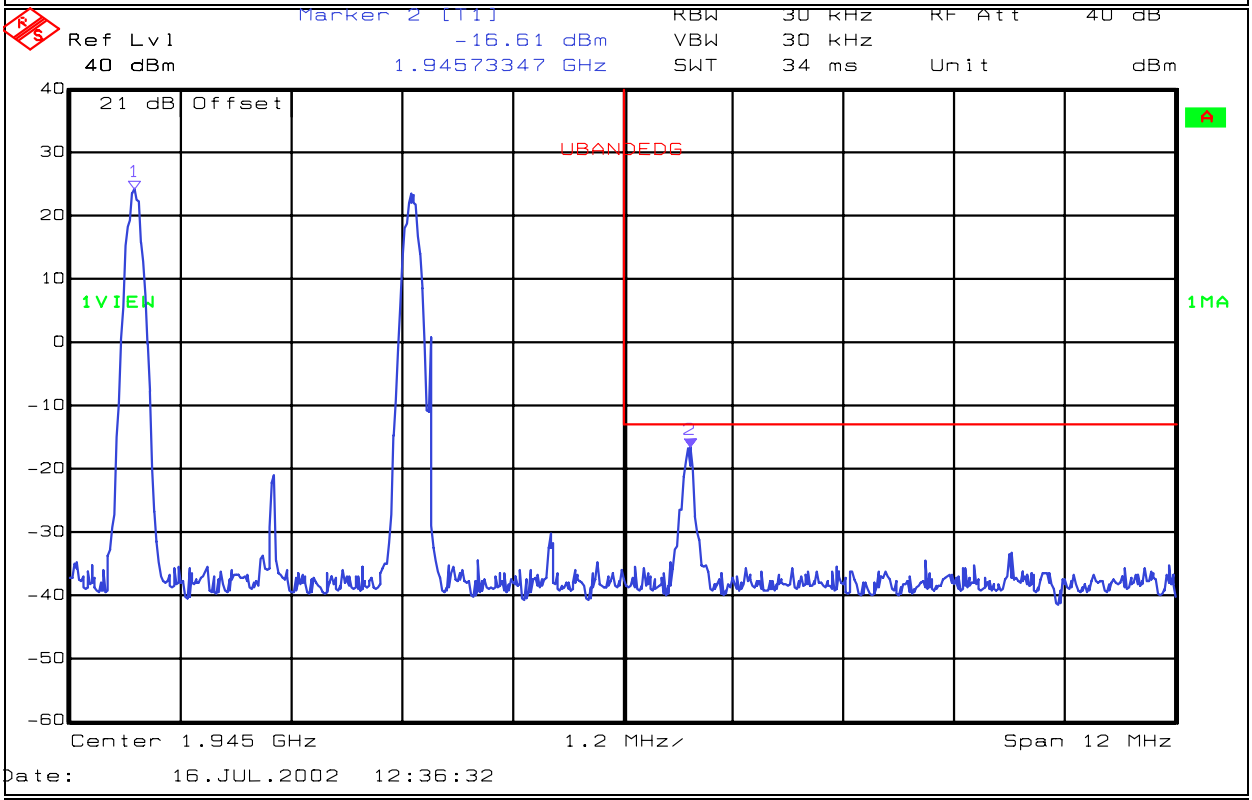
Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes:	
	MARKER 1 INDICATES CARRIER LEVEL
	MARKER 2 INDICATES HIGHEST OUT OF BAND EMISSION
	UPPER BANDEDGE - A BLOCK
	DOWNLINK

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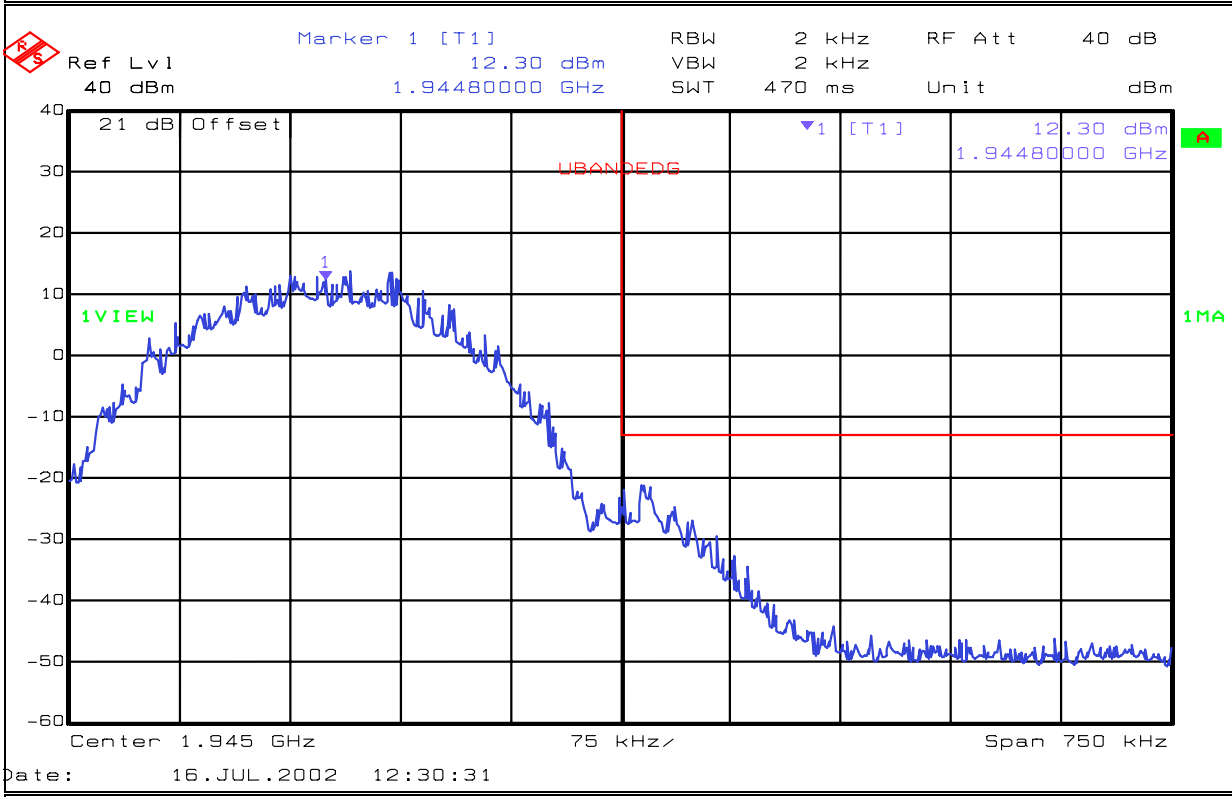
Data Plot — Spurious Emissions at Antenna Terminals

Page 3 of 5

Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes:
UPPER BANDEDGE
MARKER INDICATES CARRIER FREQUENCY
DOWNLINK

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Test Plot: Spurious Emissions at Antenna Terminals

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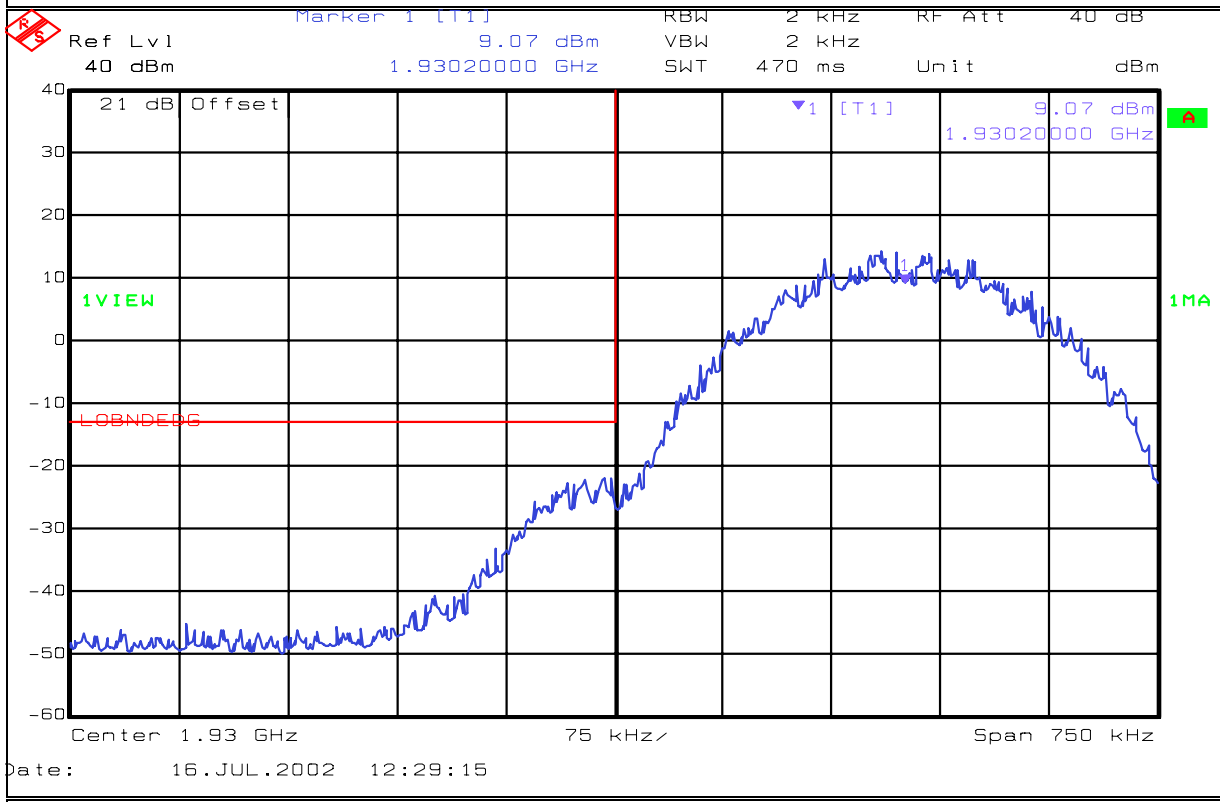
Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes:
Lower bandedge
Marker indicates carrier frequency
DOWNLINK

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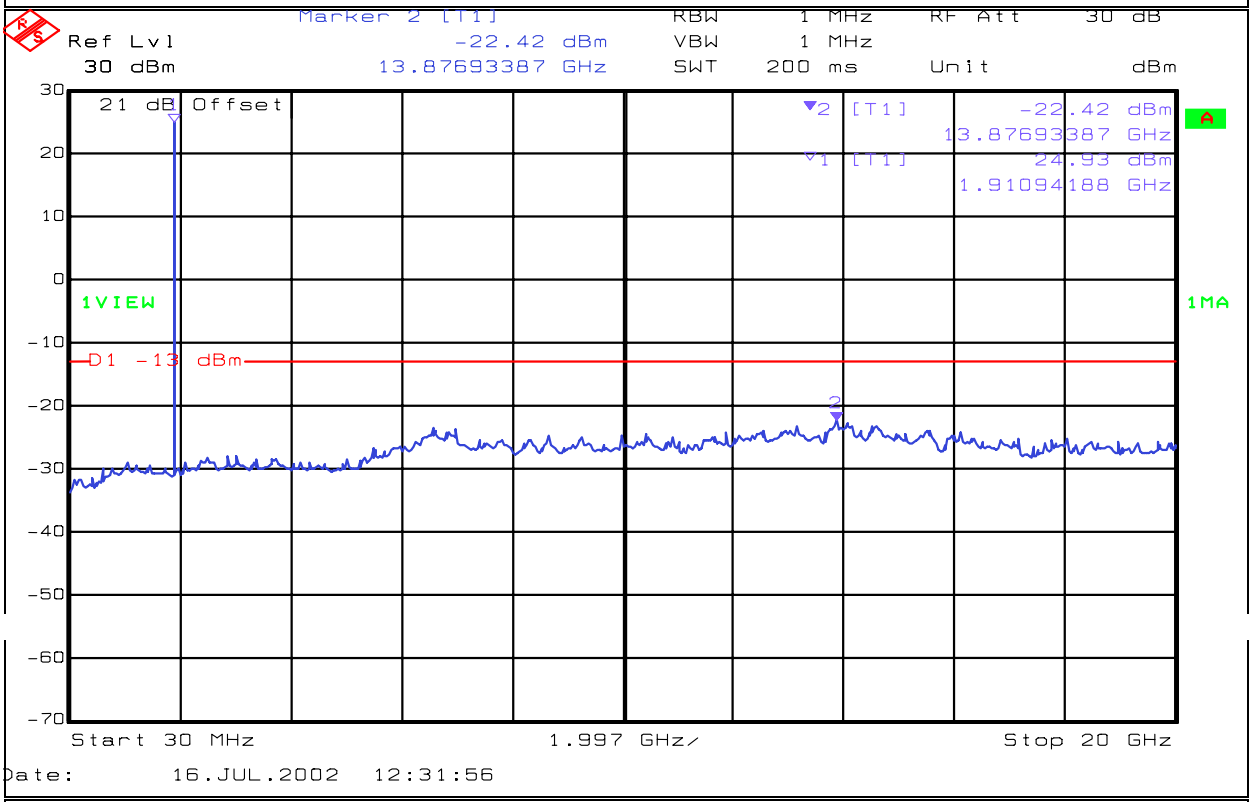
Test Plot: Spurious Emissions at Antenna Terminals

Page 5 of 5

Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes: **Harmonic emissions - DOWNLINK**

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Data Plot — Spurious Emissions at Antenna Terminals

Page 1 of 5

Complete x
Preliminary:

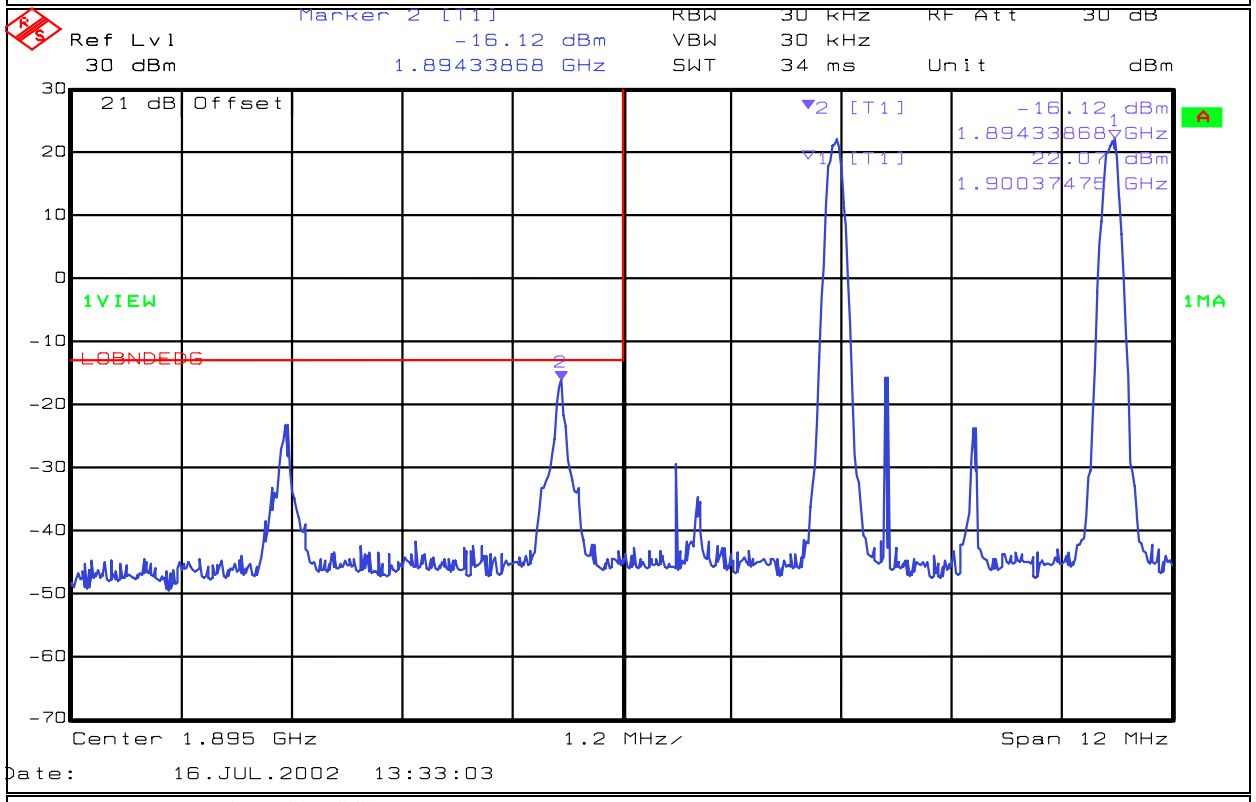
Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		
Sample Number:	1		
Location:	Lab 1	RBW:	Refer to plots
Detector Type:	Peak	VBW:	Refer to plots

Measurement Distance: NA m

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1082
Filter:		Cable #2:	
Receiver:	1036	Cable #3:	
Attenuator #1	1604	Cable #4:	
Attenuator #2:		Mixer:	

Additional equipment used:
Measurement Uncertainty: +/-1.7 dB



Notes:
MARKER 1 INDICATES CARRIER LEVEL
MARKER 2 INDICATES HIGHEST OUT OF BAND EMISSION
LOWER BANDEDGE - C BLOCK

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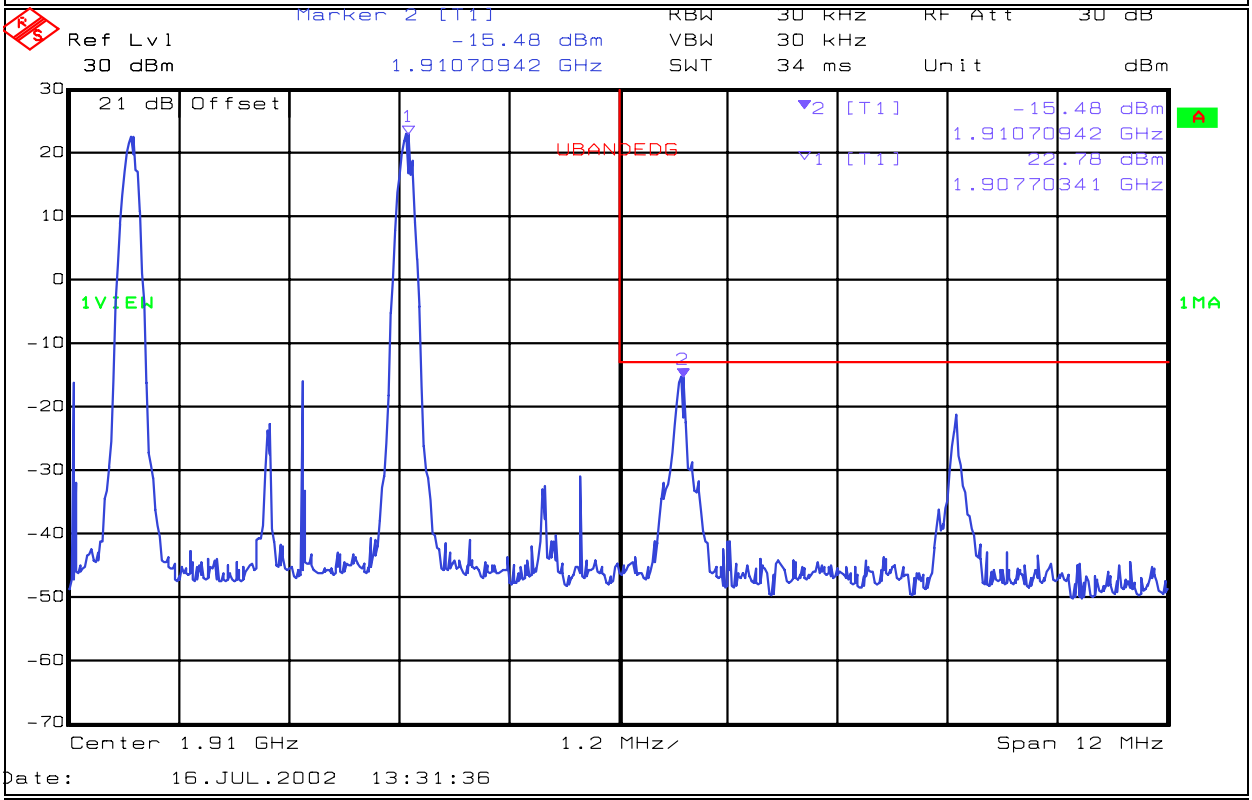
Data Plot — Spurious Emissions at Antenna Terminals

Page 2 of 5

Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes:	
	MARKER 1 INDICATES CARRIER LEVEL
	MARKER 2 INDICATES HIGHEST OUT OF BAND EMISSION
	UPPER BANDEDGE - C BLOCK
	UPLINK

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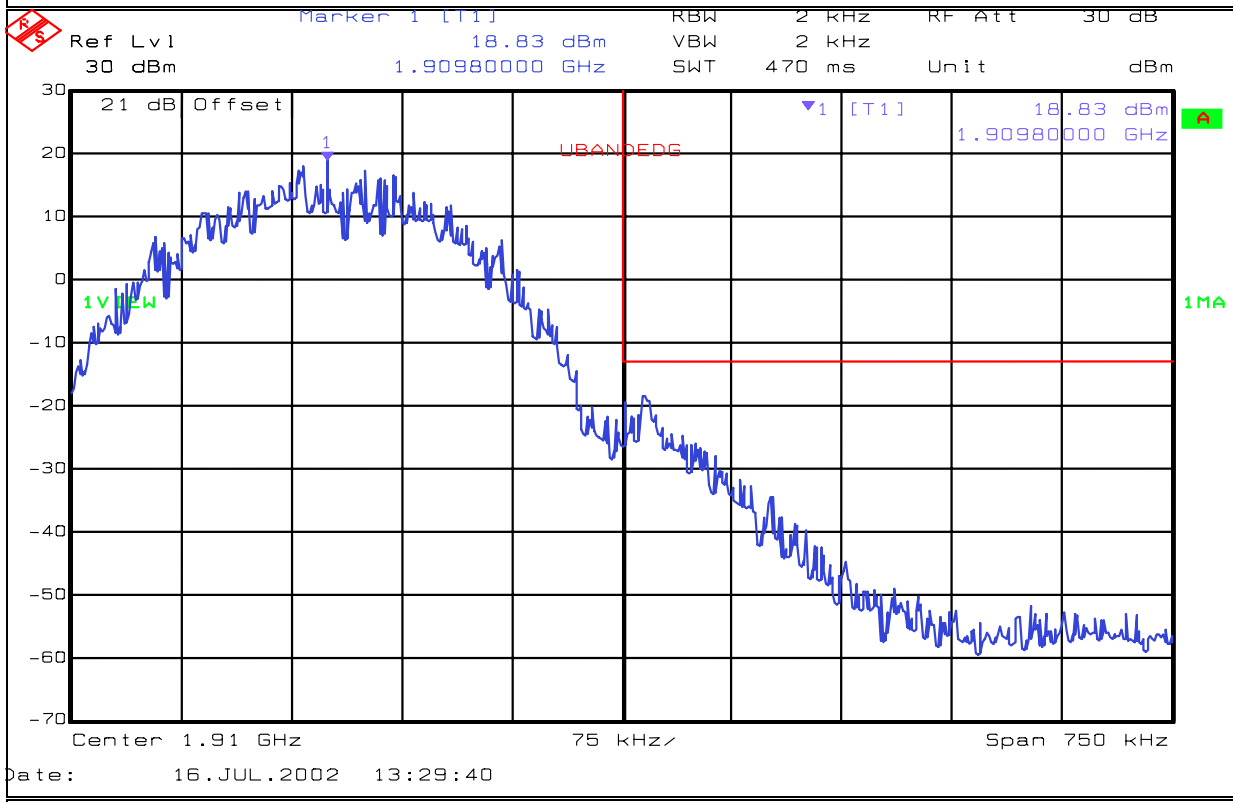
Data Plot — Spurious Emissions at Antenna Terminals

Page 3 of 5

Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes:
- **UPPER BANDEDGE**
- **MARKER INDICATES CARRIER FREQUENCY**
- **UPLINK**

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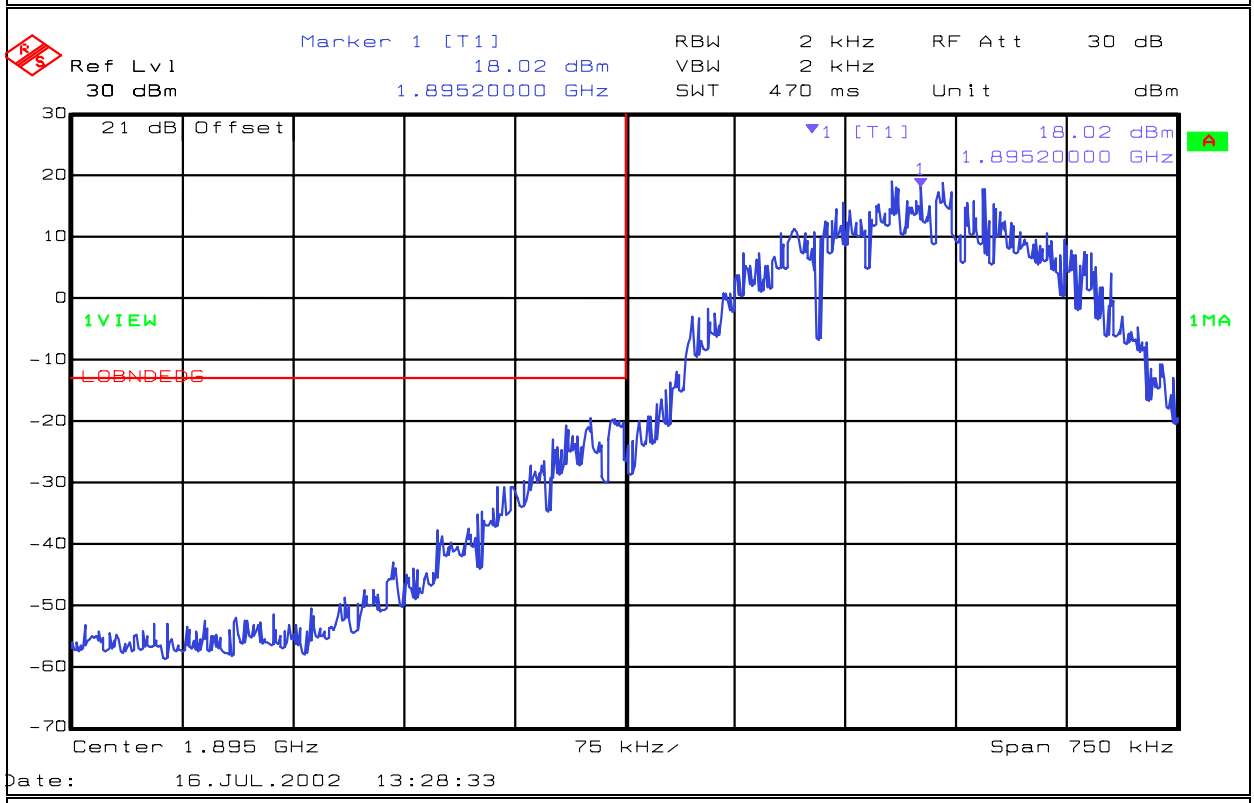
Test Plot: Spurious Emissions at Antenna Terminals

Page 4 of 5

Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes:
Lower bandedge
Marker indicates carrier frequency
UPLINK

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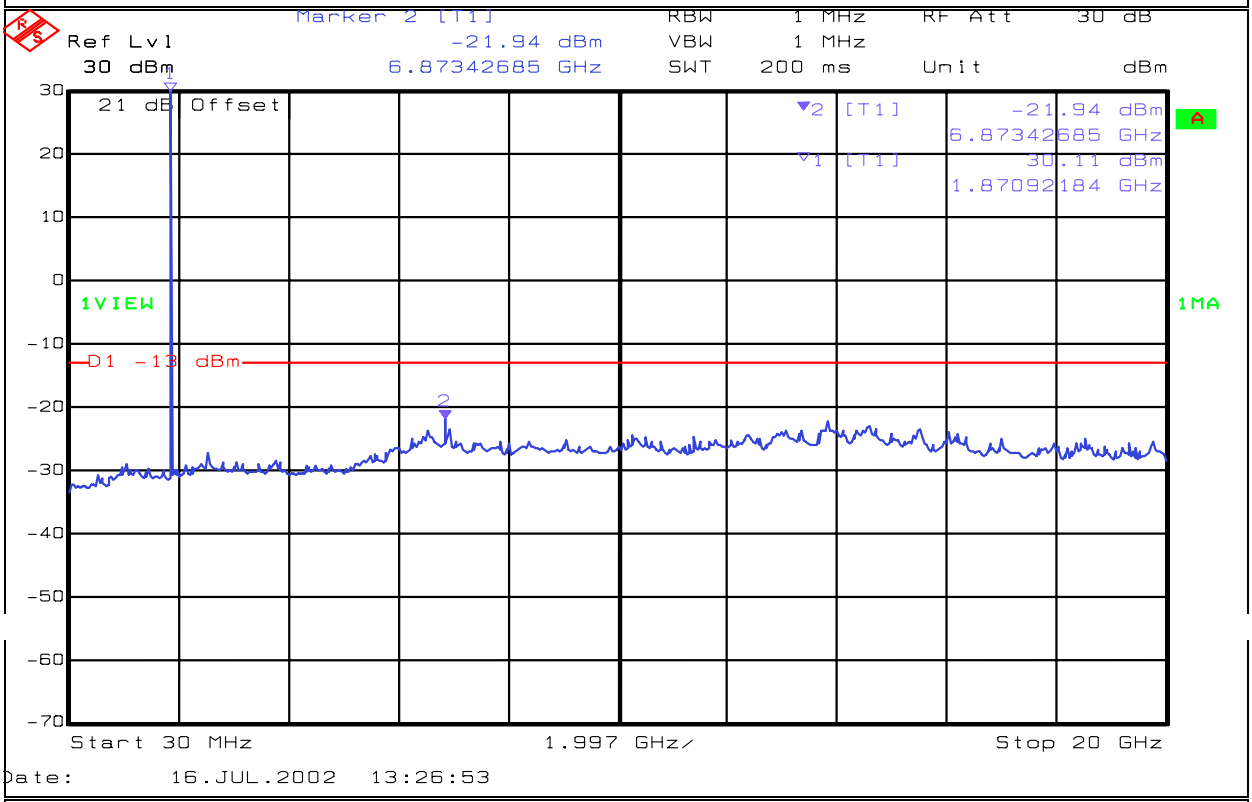
Test Plot: Spurious Emissions at Antenna Terminals

Page 5 of 5

Job No.: 2L0288 Date: 7/16/2002
Specification: Part 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 55
E.U.T.: BDA
Configuration: TX FULL POWER



Notes: **Harmonic emissions - UPLINK**

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Data Plot

Spurious Emissions at Antenna Terminals

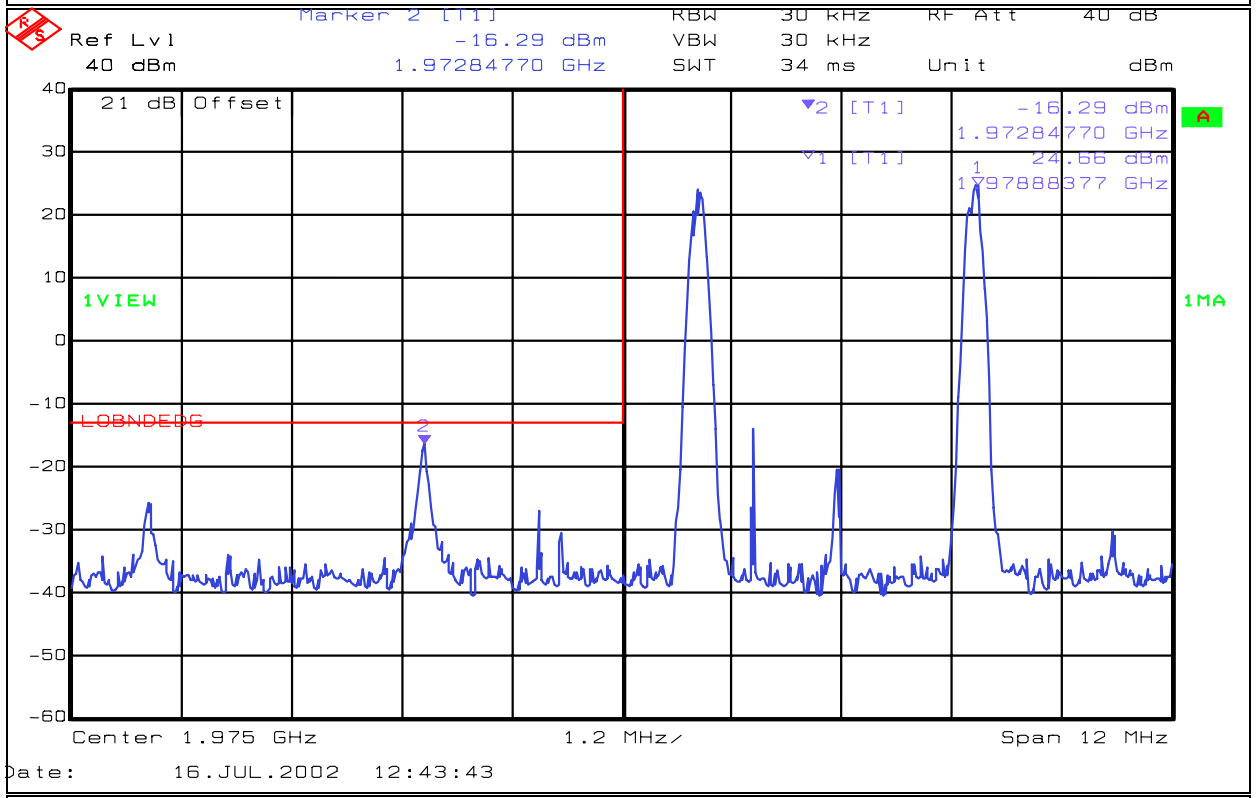
Page 1 of 5

Complete x
Preliminary:

Job No.: 2L0288 Date: 7/16/2002
Specification: Part 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 55
E.U.T.: BDA
Configuration: TX FULL POWER
Sample Number: 1
Location: Lab 1 RBW: Refer to plots Measurement
Detector Type: Peak VBW: Refer to plots Distance: NA m

Test Equipment Used

Antenna: Directional Coupler:
Pre-Amp: Cable #1: 1082
Filter: Cable #2:
Receiver: 1036 Cable #3:
Attenuator #1 1604 Cable #4:
Attenuator #2: Mixer:
Additional equipment used:
Measurement Uncertainty: +/-1.7 dB



Notes: MARKER 1 INDICATES CARRIER LEVEL
MARKER 2 INDICATES HIGHEST OUT OF BAND EMISSION
LOWER BANDEDGE - C BLOCK

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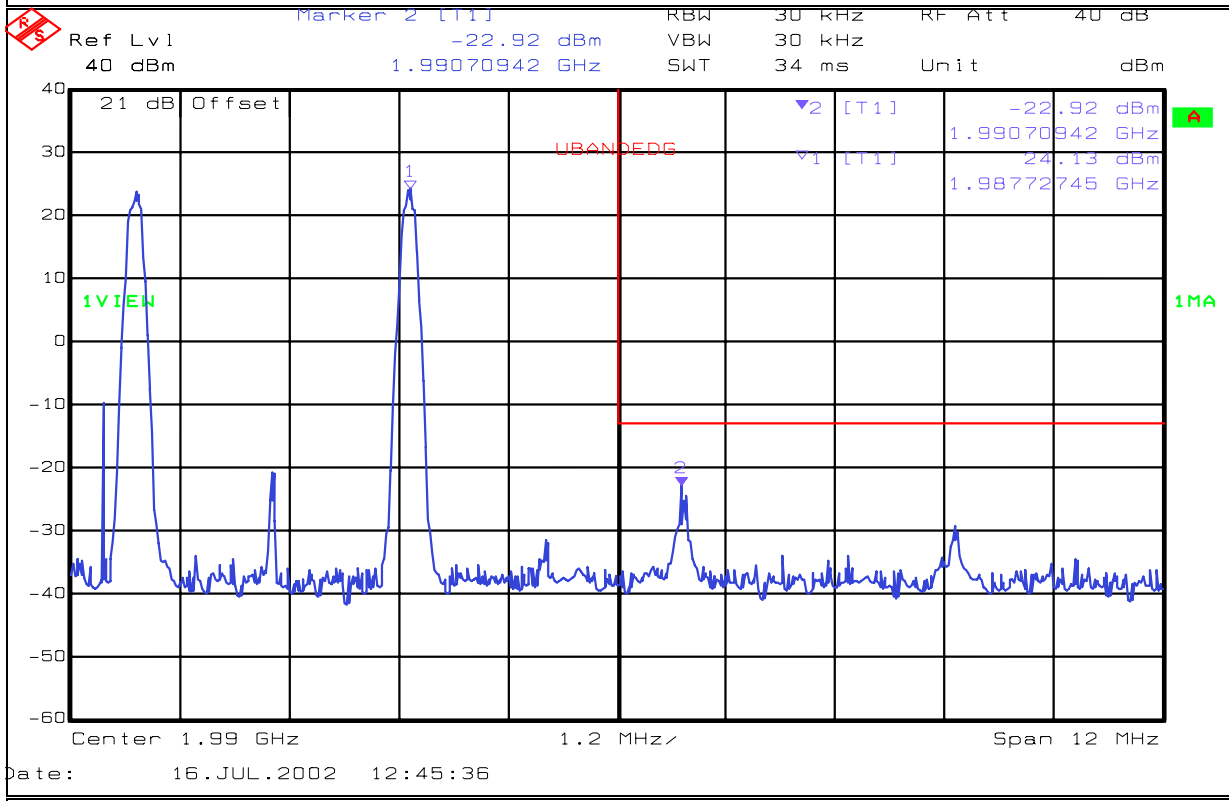
Data Plot — Spurious Emissions at Antenna Terminals

Page 2 of 5

Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes:	
	MARKER 1 INDICATES CARRIER LEVEL
	MARKER 2 INDICATES HIGHEST OUT OF BAND EMISSION
	UPPER BANDEDGE - C BLOCK
	DOWNLINK

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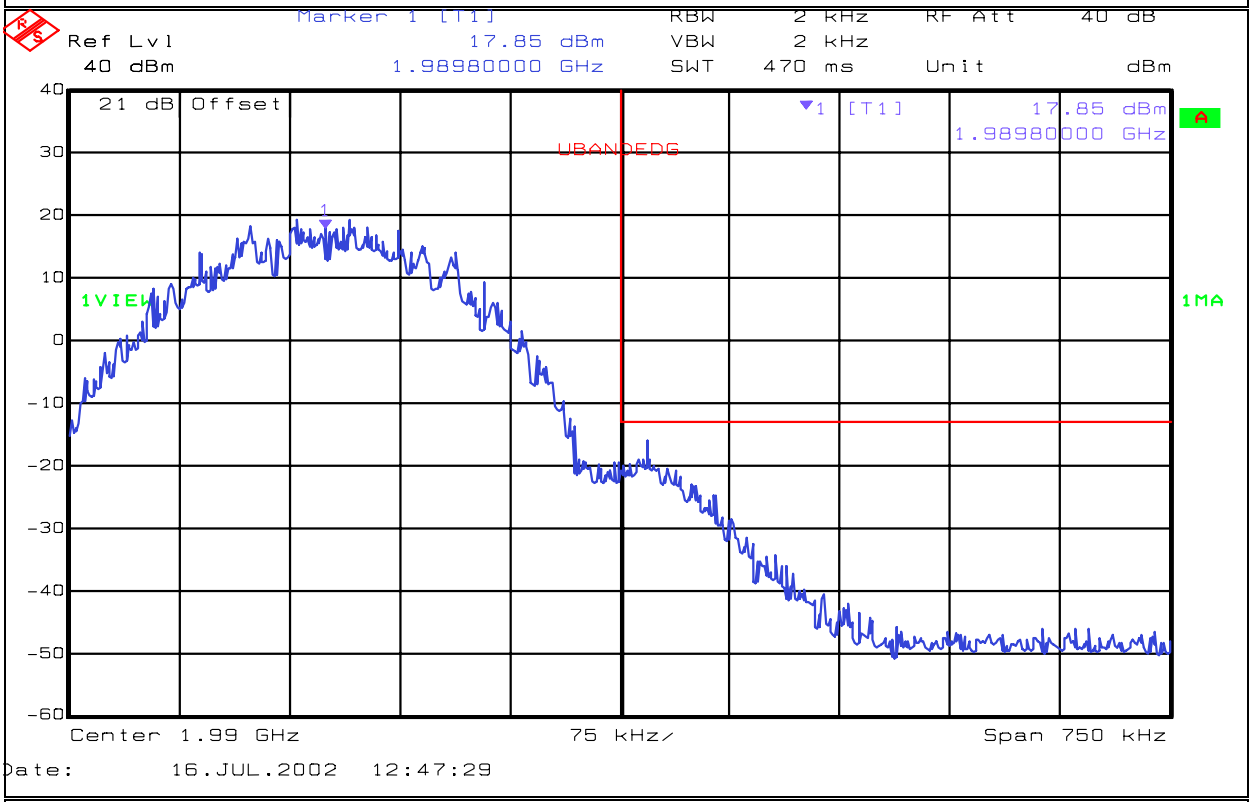
Data Plot — Spurious Emissions at Antenna Terminals

Page 3 of 5

Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes:
UPPER BANDEDGE
MARKER INDICATES CARRIER FREQUENCY
DOWNLINK

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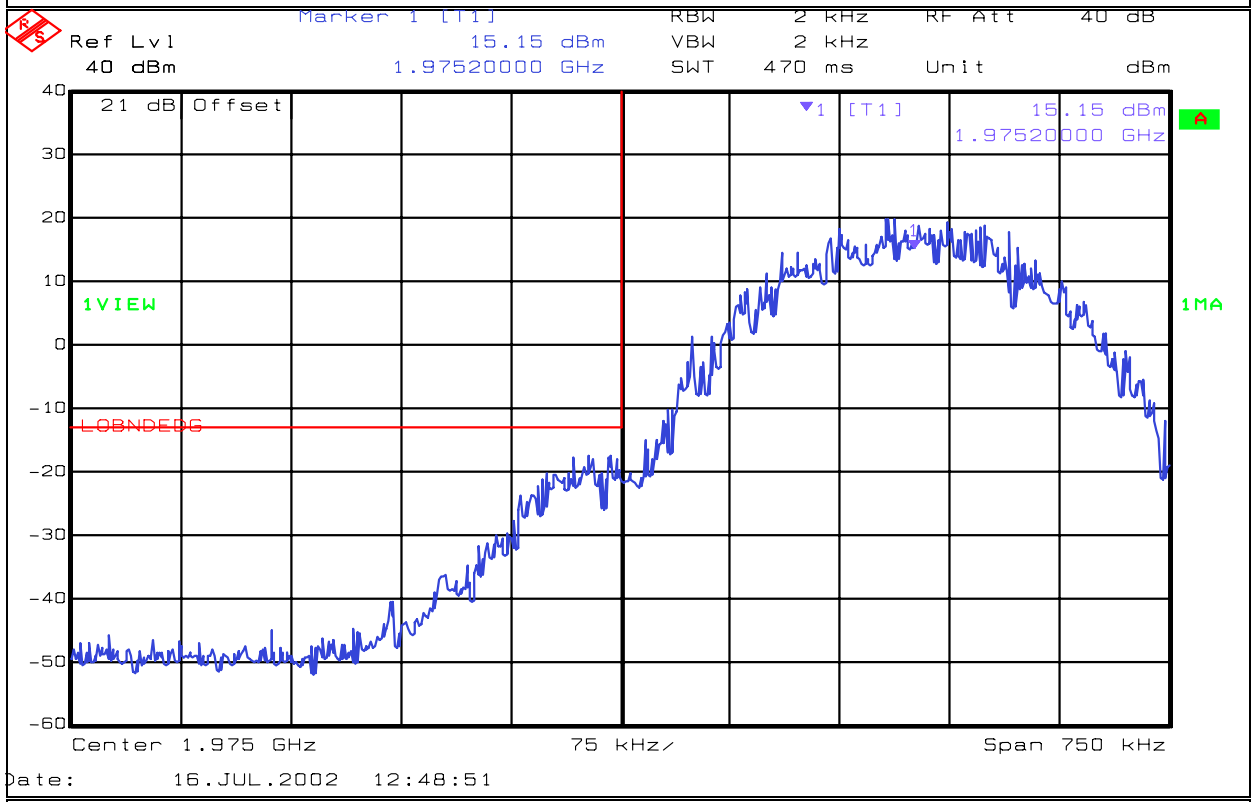
Test Plot: Spurious Emissions at Antenna Terminals

Page 4 of 5

Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes:
Lower bandedge
Marker indicates carrier frequency
DOWNLINK

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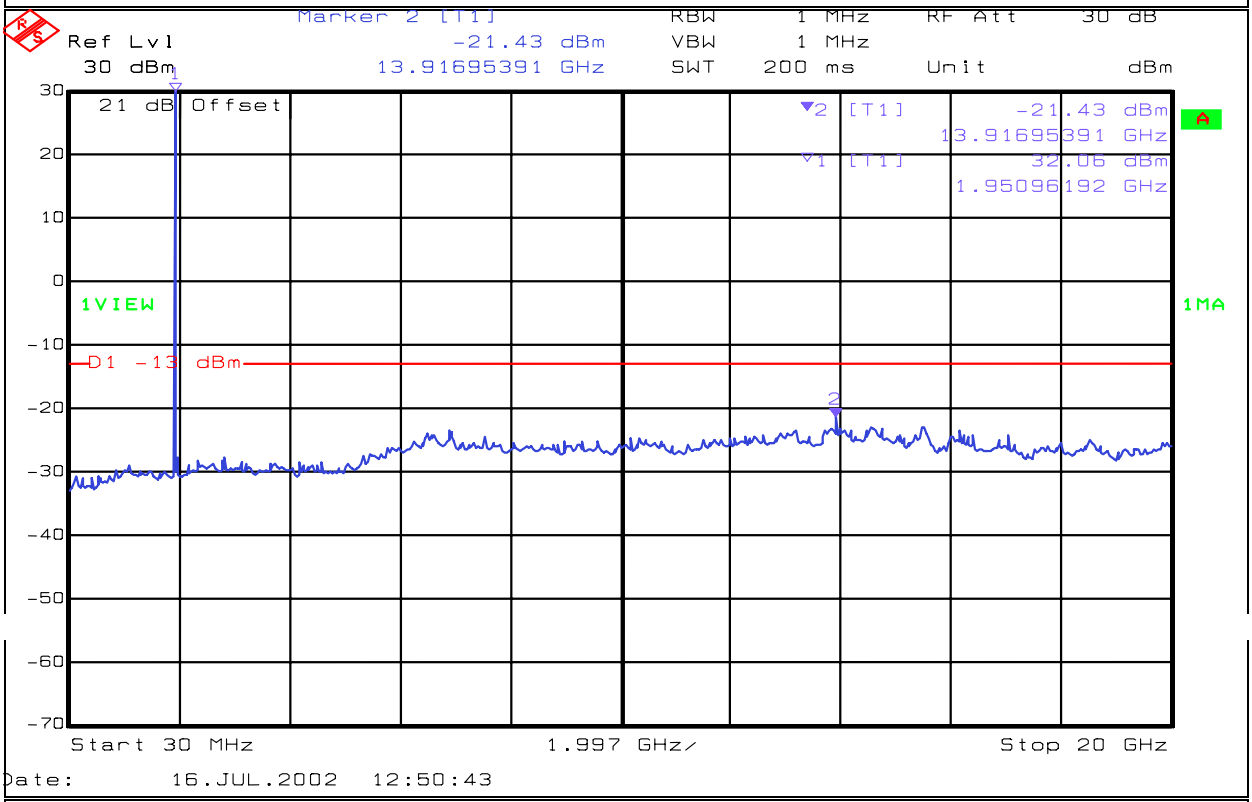
Test Plot: Spurious Emissions at Antenna Terminals

Page 5 of 5

Job No.:	2L0288	Date:	7/16/2002
Specification:	Part 24	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	55
E.U.T.:	BDA		
Configuration:	TX FULL POWER		



Notes: **Harmonic emissions - DOWNLINK**

Section 6. Field Strength of Spurious

NAME OF TEST: Field Strength of Spurious Emissions	PARA. NO.: 2.1051
TESTED BY: Kevin Rose	DATE: 5/24/02

Test Results: Complies.

Test Data: See attached table.

Equipment Used: 1016-1464-1043-1484-1485

Measurement Uncertainty: +/-1.7 dB

Temperature: 23 °C

Relative Humidity: 38 %

Test Data --- Field Strength of Spurious

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Field Strength of Spurious Emissions

Page 1 of 1 — Complete X — Preliminary

Job No.: 2l0288r — Date: 5/24/2002

Specification: 2.1053 — Temperature(°C): 21

Tested By: Kevin Rose — Relative Humidity(%) 48

E.U.T.: band A PCS CDMA repeater uplink

Configuration: Tx Full Power

Sample No: 2039040

Location: AC 3 — RBW: 1 MHz — Measurement Distance: 3 m

Detector Type: Peak — VBW: 1 MHz

Test Equipment Used

Antenna:	1304	Directional Coupler:	
Pre-Amp:	1016	Cable #1:	1043
Filter:		Cable #2:	1484
Receiver:	1464	Cable #3:	1485
Attenuator #1		Cable #4:	
Attenuator #2:		Mixer:	

Additional equipment used:

Measurement Uncertainty: +/-3.6 dB

Frequency (MHz)	Meter Reading (dBm)	Correction Factor (dB)		Pre-Amp Gain (dB)	Substitution Antenna Gain (dBd)		ERP (dBm)	ERP (mW)	Polarity	Comments
3706	-59.3	40.4		33.3	8.0		-44.2	0.000038	V	uplink
5559	-62.4	38.5		32.5	9.1		-47.3	0.000018	V	uplink
7412	-61.3	39.4		33.4	10.0		-45.3	0.000030	V	uplink
9265	-61.6	39.3		36.1	10.1		-48.4	0.000015	V	uplink
11118	-61.5	42.0		36.1	11.1		-44.6	0.000035	V	uplink / NF
12971	-61.3	44.5		34.2	11.7		-39.3	0.000118	V	uplink / NF
14824	-62.4	48.1		34.5	10.1		-38.7	0.000135	V	uplink / NF
16677	-62.5	44.3		34.9	13.0		-40.1	0.000099	V	uplink / NF
18530	-61.2	53.1		34.2	6.4		-36.0	0.000254	V	uplink / NF
3706	-58.3	34.3		33.3	8.0		-49.3	0.000012	H	uplink
5559	-61.7	36.0		32.5	9.1		-49.1	0.000012	H	uplink
7412	-61.5	38.7		33.4	10.0		-46.2	0.000024	H	uplink
9265	-62.1	41.4		36.1	10.1		-46.8	0.000021	H	uplink
11118	-62.3	44.4		36.1	11.1		-42.9	0.000051	H	uplink / NF
12971	-62.4	47.5		34.2	11.7		-37.4	0.000183	H	uplink / NF
14824	-61.8	48.7		34.5	10.1		-37.5	0.000177	H	uplink / NF
16677	-61.5	46.1		34.9	13.0		-37.2	0.000189	H	uplink / NF
18530	-60.9	54.6		34.2	6.4		-34.1	0.000393	H	uplink / NF

Notes: **uplink 1853 MHz / Scanned to the 10th harmonic**

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Field Strength of Spurious Emissions

Page 1 of 1 — Complete X — Preliminary

Job No.: 2l0288r — Date: 5/24/2002

Specification: 2.1053 — Temperature(°C): 21

Tested By: Kevin Rose — Relative Humidity(%) 48

E.U.T.: band A PCS CDMA repeater downlink

Configuration: Tx Full Power

Sample No: 2039040

Location: AC 3 — RBW: 1 MHz — Measurement Distance: 3 m

Detector Type: Peak — VBW: 1 MHz

Test Equipment Used

Antenna: 1304 — Directional Coupler:

Pre-Amp: 1016 — Cable #1: 1043

Filter: — Cable #2: 1484

Receiver: 1464 — Cable #3: 1485

Attenuator #1 — Cable #4:

Attenuator #2: — Mixer:

Additional equipment used:

Measurement Uncertainty: +/-3.6 dB

Frequency (MHz)	Meter Reading (dBm)	Correction Factor (dB)		Pre-Amp Gain (dB)	Substitution Antenna Gain (dBd)		ERP (dBm)	ERP (mW)	Polarity	Comments
3880	-60.8	40.4		33.3	8.0		-45.7	0.000027	V	downlink
5820	-61.0	38.5		32.5	9.1		-45.9	0.000025	V	downlink
7760	-61.5	40.4		33.4	9.4		-45.0	0.000031	V	downlink
9700	-61.8	40.4		36.1	10.5		-47.0	0.000020	V	downlink
77640	-61.3	53.1		36.1	6.4		-38.0	0.000160	V	downlink / NF
13580	-61.5	47.6		34.2	10.4		-37.7	0.000171	V	downlink / NF
15520	-60.8	43.2		34.5	13.6		-38.5	0.000142	V	downlink / NF
17460	-62.3	47.0		34.9	11.7		-38.4	0.000143	V	downlink / NF
19400	-61.9	53.1		34.2	6.4		-36.7	0.000216	V	downlink / NF
3880	-59.3	34.3		33.3	8.0		-50.3	0.000009	H	downlink
5820	-61.2	36.0		32.5	9.1		-48.6	0.000014	H	downlink
7760	-60.3	39.8		33.4	9.4		-44.5	0.000036	H	downlink
9700	-60.5	42.6		36.1	10.5		-43.5	0.000045	H	downlink
77640	-61.2	54.6		36.1	6.4		-36.3	0.000237	H	downlink / NF
13580	-61.5	50.8		34.2	10.4		-34.5	0.000359	H	downlink / NF
15520	-61.9	44.0		34.5	13.6		-38.8	0.000132	H	downlink / NF
17460	-61.8	50.5		34.9	11.7		-34.5	0.000357	H	downlink / NF
19400	-60.9	54.6		34.2	6.4		-34.1	0.000393	H	downlink / NF

Notes: **downlink 1940 MHz / Scanned to the 10th harmonic**

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Field Strength of Spurious Emissions

Page 1 of 1 — Complete X — Preliminary

Job No.: 2l0288r — Date: 5/24/2002

Specification: 2.1053 — Temperature(°C): 21

Tested By: Kevin Rose — Relative Humidity(%) 48

E.U.T.: band C PCS CDMA repeater downlink

Configuration: Tx Full Power

Sample No: 2039042

Location: AC 3 — RBW: 1 MHz — Measurement Distance: 3 m

Detector Type: Peak — VBW: 1 MHz

Test Equipment Used

Antenna: 1304 — Directional Coupler:

Pre-Amp: 1016 — Cable #1: 1043

Filter: — Cable #2: 1484

Receiver: 1464 — Cable #3: 1485

Attenuator #1 — Cable #4:

Attenuator #2: — Mixer:

Additional equipment used:

Measurement Uncertainty: +/-3.6 dB

Frequency (MHz)	Meter Reading (dBm)	Correction Factor (dB)		Pre-Amp Gain (dB)	Substitution Antenna Gain (dBd)		ERP (dBm)	ERP (mW)	Polarity	Comments
3960	-61.5	40.4		33.3	8.0		-46.4	0.000023	V	Downlink
5940	-61.0	38.5		32.5	9.1		-45.9	0.000025	V	Downlink
7920	-61.8	40.4		33.4	9.4		-45.3	0.000029	V	Downlink
9900	-60.8	40.4		36.1	10.5		-46.0	0.000025	V	Downlink
11880	-60.2	-49.3		36.1	11.0		-134.6	0.000000	V	Downlink / NF
13860	-60.4	47.6		34.2	10.4		-36.6	0.000221	V	Downlink / NF
15840	-60.9	43.2		34.5	13.6		-38.6	0.000138	V	Downlink / NF
17820	-61.2	51.0		34.9	8.7		-36.4	0.000229	V	Downlink / NF
19800	-60.9	53.1		34.2	6.4		-35.7	0.000272	V	Downlink / NF
3960	-61.8	34.3		33.3	8.0		-52.8	0.000005	H	Downlink
5940	-61.0	36.0		32.5	9.1		-48.4	0.000014	H	Downlink
7920	-63.0	39.8		33.4	9.4		-47.2	0.000019	H	Downlink
9900	-61.8	42.6		36.1	10.5		-44.8	0.000033	H	Downlink
11880	-62.0	46.0		36.1	11.0		-41.1	0.000078	H	Downlink / NF
13860	-61.0	50.8		34.2	10.4		-34.0	0.000403	H	Downlink / NF
15840	-61.0	44.0		34.5	13.6		-37.9	0.000162	H	Downlink / NF
17820	-61.3	53.6		34.9	8.7		-33.9	0.000407	H	Downlink / NF
19800	-62.2	54.6		34.2	6.4		-35.4	0.000291	H	Downlink / NF

Notes: **Downlink 1980 MHz / Scanned to the 10th harmonic**

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Field Strength of Spurious Emissions

Page 1 of 1 — Complete X — Preliminary

Job No.: 2l0288r — Date: 5/24/2002

Specification: 2.1053 — Temperature(°C): 21

Tested By: Kevin Rose — Relative Humidity(%) 48

E.U.T.: band C PCS CDMA repeater uplink

Configuration: Tx Full Power

Sample No: 2039042

Location: AC 3 — RBW: 1 MHz — Measurement Distance: 3 m

Detector Type: Peak — VBW: 1 MHz

Test Equipment Used

Antenna: 1304 — Directional Coupler:

Pre-Amp: 1016 — Cable #1: 1043

Filter: — Cable #2: 1484

Receiver: 1464 — Cable #3: 1485

Attenuator #1 — Cable #4:

Attenuator #2: — Mixer:

Additional equipment used:

Measurement Uncertainty: +/-3.6 dB

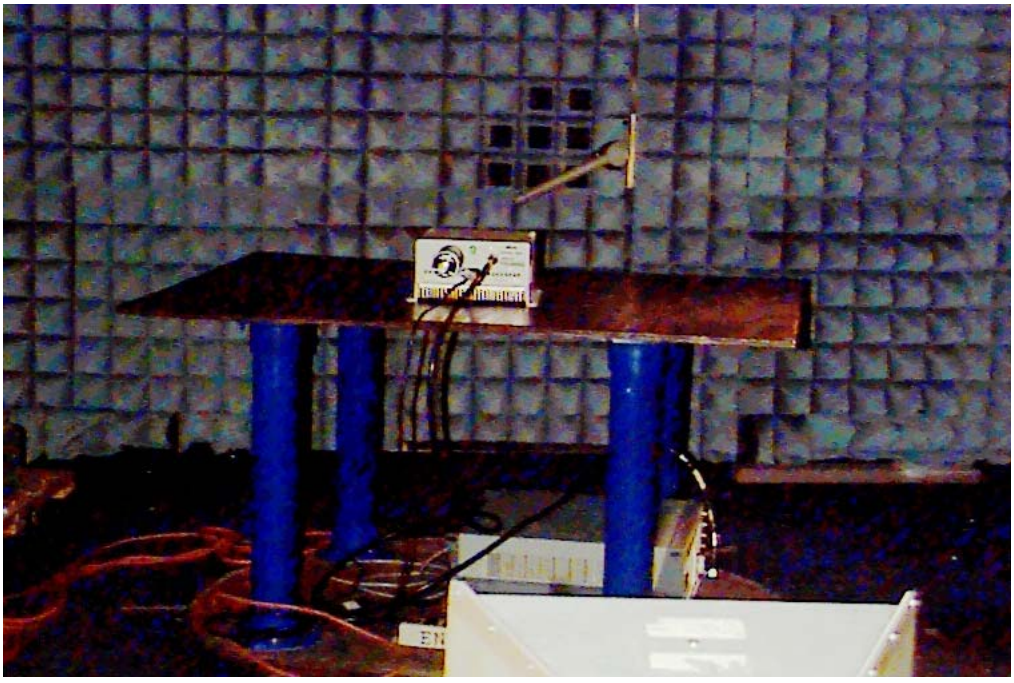
Frequency (MHz)	Meter Reading (dBm)	Correction Factor (dB)		Pre-Amp Gain (dB)	Substitution Antenna Gain (dBd)		ERP (dBm)	ERP (mW)	Polarity	Comments
3802	-58.7	40.4		33.3	8.0		-43.6	0.000043	V	uplink
5703	-63.5	38.5		32.5	9.1		-48.4	0.000014	V	uplink
7604	-63.0	40.4		33.4	9.4		-46.5	0.000022	V	uplink
9505	-60.1	40.4		36.1	10.5		-45.3	0.000030	V	uplink
1140.6	-61.2	31.5		36.1	4.8		-61.1	0.000001	V	uplink / NF
1330.7	-62.5	31.5		34.2	4.8		-60.5	0.000001	V	uplink / NF
1520.8	-60.9	29.9		34.5	6.4		-59.2	0.000001	V	uplink / NF
1710.9	-61.3	29.9		34.9	6.4		-60.0	0.000001	V	uplink / NF
1901	-61.6	29.9		34.2	6.4		-59.6	0.000001	V	uplink / NF
3802	-59.5	34.3		33.3	8.0		-50.5	0.000009	H	uplink
5703	-62.3	36.0		32.5	9.1		-49.7	0.000011	H	uplink
7604	-62.0	39.8		33.4	9.4		-46.2	0.000024	H	uplink
9505	-62.2	42.6		36.1	10.5		-45.2	0.000030	H	uplink
1140.6	-62.6	31.1		36.1	4.8		-62.9	0.000001	H	uplink / NF
1330.7	-61.3	31.1		34.2	4.8		-59.7	0.000001	H	uplink / NF
1520.8	-62.5	32.7		34.5	6.4		-58.0	0.000002	H	uplink / NF
1710.9	-61.8	32.7		34.9	6.4		-57.7	0.000002	H	uplink / NF
1901	-61.3	32.7		34.2	6.4		-56.5	0.000002	H	uplink / NF

Notes: **uplink 1901 MHz / Scanned to the 10th harmonic**

Photographs of Test Setup

FRONT VIEW

REAR VIEW



Section 7. Frequency Stability

NAME OF TEST: Frequency Stability	PARA. NO.: 2.1055
TESTED BY:	DATE:

Test Results: Complies.

Measurement Data: See attached table.

Standard Test Frequency: MHz
Standard Test Voltage:

Equipment Used:

Measurement Uncertainty: +/- 1.6 dB

Lab Temperature: °C

Relative Humidity: %

Section 8. Test Equipment List

NEMKO	Description	Manufacturer	Model	Serial #	Cal. Date	Due Date
1464	Spectrum analyzer	Hewlett Packard	8563E	3551A04428	1/2/01	1/3/03
1604	ATTENUATOR	NARDA	776B-20	NONE	9/13/01	9/13/02
1043	Flexable cable 1m	Astrolab Inc.	32027-2-29094K-1M		1/18/02	1/18/03
1046	Flex cable 1m	Astrolab Inc.	32022-2-29094K-1M	N/A	1/18/02	1/18/03
1053	SIGNAL GENERATOR	ROHDE & SCHWARZ	SMIQ 03	DE22081	8/9/01	8/9/02
1052	I/Q MODULATION GENERATOR	Rhode & Schwarz	AMIQ	DE30619	9/25/00	9/27/03
1484	Cable 2.0-18.0 Ghz	Storm	PR90-010-072	N/A	6/1/01	6/1/02
1485	Cable 2.0-18.0 Ghz	Storm	PR90-010-216	N/A	6/1/01	6/1/02
1036	Spectrum analyzer	Rohde & Schwarz	FSEK30	830844/006	12/18/01	12/18/03

ANNEX A - TEST DETAILS

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

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: ≥ RBW
Span: 5 MHz
Sweep: Auto
Mask: Set markers to -26 dB from peak of CW.

GSM

RBW: 3 kHz
VBW: ≥ RBW
Span: 2 MHz
Sweep: Auto
Mask: Set markers to -26 dB from peak of CW.

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 (< 1MHz from Band Edge)
VBW: ≥ RBW
Sweep: Auto
Video Avg: 6 Sweeps

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.

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.

Calculation Of Field Strength Limit

An example of attenuation requirement of 43 + 10 Log P is equivalent to -13 dBm (5×10^{-5} Watts) at the antenna terminal. We determine the field strength limit by using the plane wave relation.

$GP/4\pi R^2 = E^2/120\pi$

For emissions ≤ 1 GHz:

G = 1.64 (Dipole Gain)
P = 10^{-5} Watts (Maximum spurious output power)
R = 3m (Measurement Distance)

$$E = \frac{\sqrt{30GP}}{R}$$

$$E = \frac{\sqrt{30 \times 1.64 \times 5 \times 10^{-5}}}{3} = 0.016533 \text{ V / m} = 84.4 \text{ dB}\mu\text{V / m}$$

For emissions > 1 GHz:

G = 1 (Isotropic Gain)
P = 1 x 10^{-5} Watts (Maximum spurious output power)
R = 3m (Measurement Distance)

$$E = 84.4 - 20Log\sqrt{1.64} = 82.3 dB\mu V \text{ / } m@3m$$

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

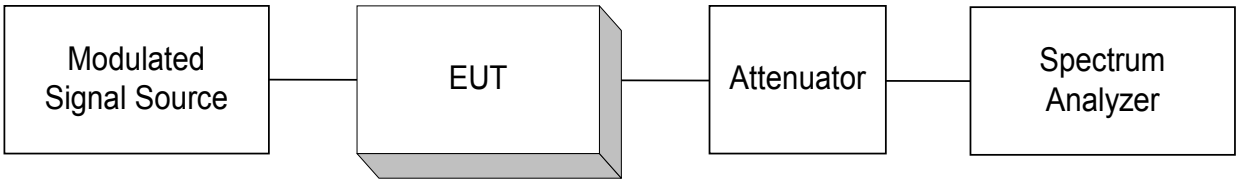
The E.U.T. is placed in an environmental chamber and allowed to stabilize at +20 degrees Celsius for at least 15 minutes. The frequency counter and signal generator are phase locked with the same 10 MHz reference frequency by connecting the 10 MHz ref. out of the counter to the 10 MHz ref, in of the 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

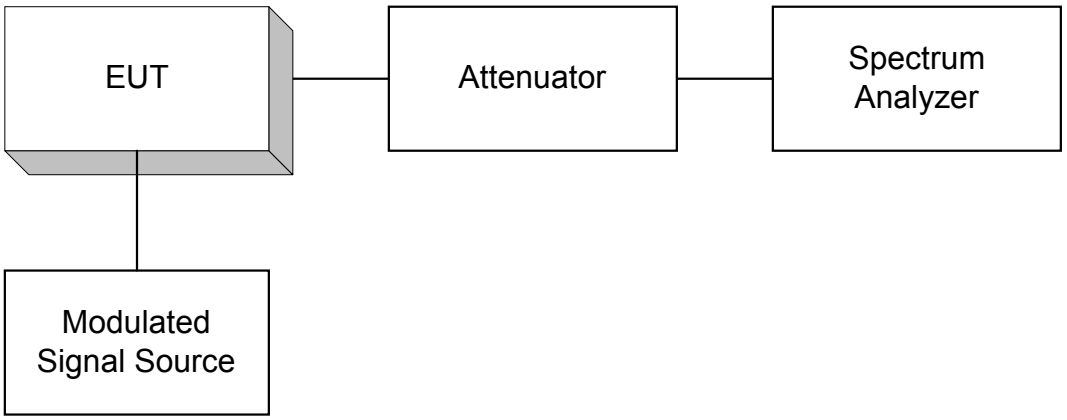
The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the frequency is measured in 30 second intervals for a period of 5 minutes.

ANNEX B - TEST DIAGRAMS

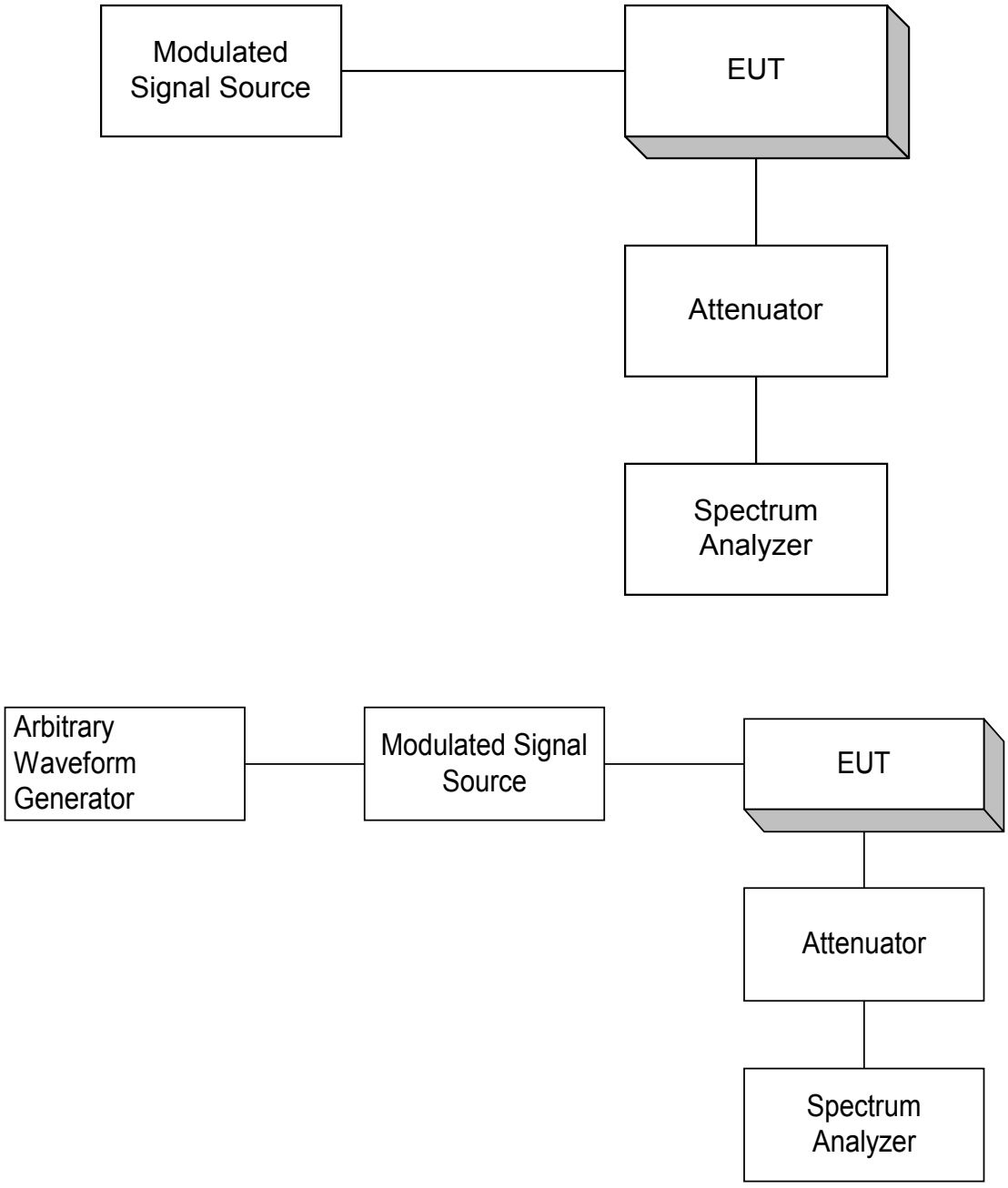
Para. No. 2.985 - R.F. Power Output



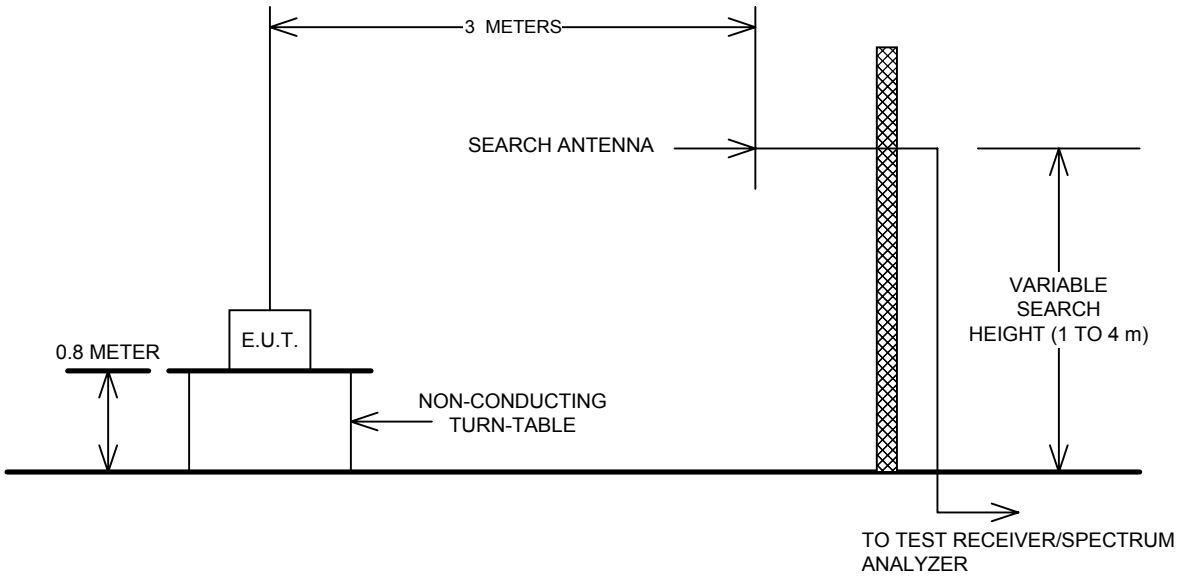
Para. No. 2.989 - Occupied Bandwidth



Para. No. 2.991 Spurious Emissions at Antenna Terminals



Para. No. 2.993 - Field Strength of Spurious Radiation



Para. No. 2.995 - Frequency Stability