

Nemko Test Report No.:

2L0027RUS2

Applicant:

Andrew Corporation
2601 Telecom Parkway
Richardson, TX 7508

Equipment Under Test:

Enhanced Remote Antenna Unit (ERAU)
Part No. AEO4A-D0602-001

In Accordance With:

FCC Part 24, Subpart E
Broadband PCS Repeaters

Tested By:

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

A handwritten signature in blue ink, appearing to read "Tom Tidwell", is positioned above the authorized by text.

Authorized By:

Tom Tidwell, RF Group Manager

Date:

3/22/02

Total Number of Pages:

45

Table of Contents

Section 1.	Summary of Test Results	3
Section 2.	General Equipment Specification	5
Section 3.	RF Power Output.....	9
Section 4.	Occupied Bandwidth.....	10
Section 5.	Spurious Emissions at Antenna Terminals	17
Section 6.	Field Strength of Spurious	33
Section 7.	Test Equipment List.....	36
ANNEX A - TEST DETAILS.....		37
ANNEX B - TEST DIAGRAMS.....		43

EQUIPMENT: **Enhanced Remote Antenna Unit
(ERAU)**

PROJECT NO: **2L0027RUS2**

Section 1. Summary of Test Results

Manufacturer : Andrew Corporation
Model No.: Enhanced Remote Antenna Unit (ERAU)
Serial No.: None

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".

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EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)**PROJECT NO:** 2L0027RUS2**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
Occupied Bandwidth (GSM)	24.238	Input/Output	Complies
Occupied Bandwidth (NADC)	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.

EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

Section 2. General Equipment Specification

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)
	☒	☒	☒
Output Impedance:	50 ohms		
Max Input:	0 dBm		
RF Output (Rated):	Uplink	Per channel:	N/A W
		Total:	N/A W
RF Output (Rated):	Downlink	Per channel:	0.5 W
		Total:	1.0 W
Frequency Translation:	F1-F1	F1-F2	N/A
	☐	☐	☒

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FCC PART 24, SUBPART E
BROADBAND PCS REPEATERS

EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: **2L0027RUS2**

Band Selection:	Software ☐	Duplexer ☐	Fullband ☐
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EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

Description of Modifications For Class II Permissive Change

Not Applicable

Modifications Made During Testing

Not Applicable

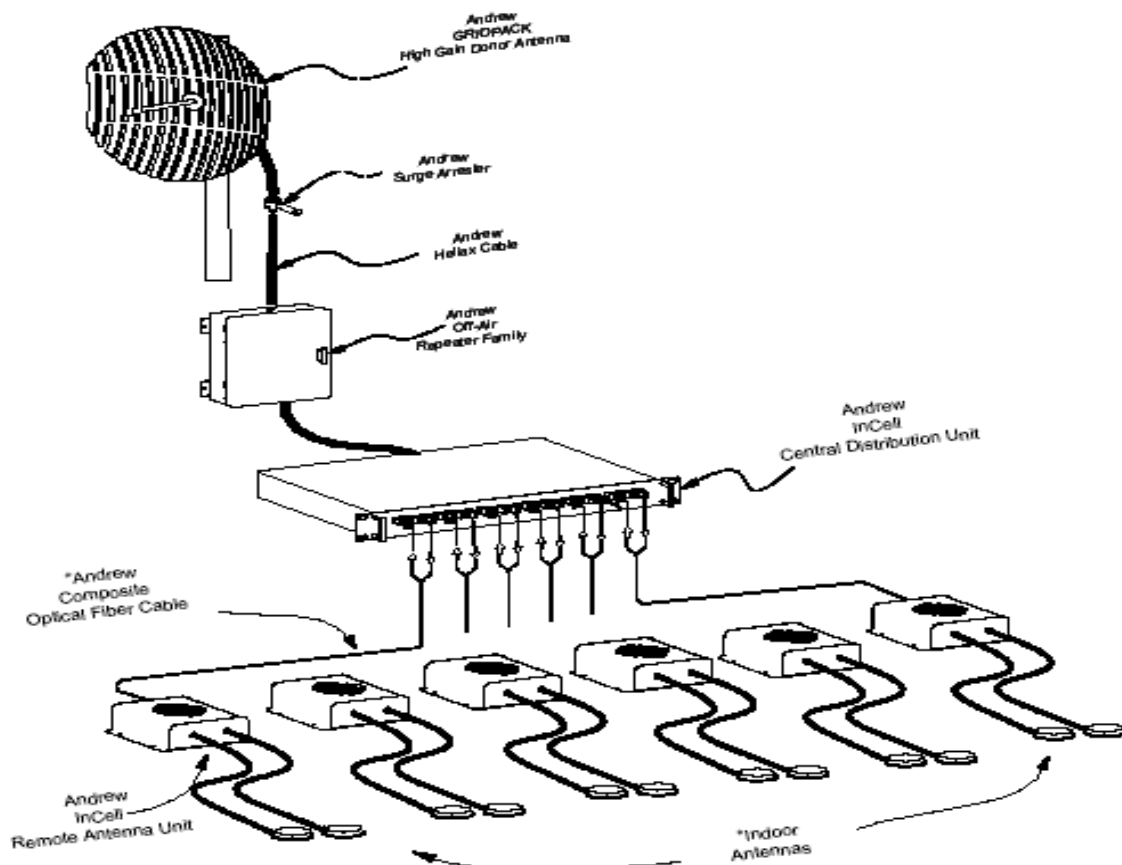
EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

Description of Operation

The Andrew InCell™ Fiber Distributed Antenna System is designed to provide improved RF performance in buildings that suffer from poor wireless coverage. The InCell™ interfaces directly with a BTS or off-air antenna and distributes RF signals to indoor antennas that provide improved downlink and uplink performance. The InCell™ system uses multiple Enhanced Remote Antenna Units (ERAU) located within the building to optimize communications with handheld mobile phones and wireless office equipment. Each ERAU is connected to a central distribution unit (CDU) by two low-loss, single mode fiber optic cables that provide downlink signals to the remote antenna and uplink signals from the mobile phone or wireless office equipment.

System Diagram



EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

Section 3. RF Power Output

NAME OF TEST: RF Power Output	PARA. NO.: 2.1046
TESTED BY: David Light	DATE:3/19/2002

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

	Modulation Type	Per Channel Output Power 2 Carriers (dBm)	Composite Output Power (dBm)
Uplink	CDMA	N/A	N/A
Downlink	CDMA	25.8	28.8
Uplink	GSM	N/A	N/A
Downlink	GSM	26.0	29.0
Uplink	NADC	N/A	N/A
Downlink	NADC	26.0	29.0

Note 1 – The device was tested at +/- 15% of nominal (48 Vdc) with no change in output power.**Note 2** – The device will output 30.0 dBm with one carrier only.**Equipment Used:** 1036-1429-1478-1471**Measurement Uncertainty:** +/- 1.6 dB**Temperature:** 20 °C**Relative Humidity:** 60 %

EQUIPMENT: **Enhanced Remote Antenna Unit
(ERAU)**

PROJECT NO: **2L0027RUS2**

Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 2.1049
TESTED BY: David Light	DATE:3/19/2002

Test Results: Complies.

Test Data: See attached plot(s).

Measurement Uncertainty: +/- 1.6 dB

EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

Test Data – Occupied Bandwidth



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Data Plot

OCCUPIED BANDWIDTH

Page 1 of 6

Job No.: 2L0027R Date: 3/19/2002
 Specification: PT 24 Temperature(°C): 22
 Tested By: David Light Relative Humidity(%): 60
 E.U.T.: DUAL BAND REPEATER
 Configuration: TX FULL POWER
 Sample Number: 1
 Location: Lab 1 RBW: Refer to plots
 Detector Type: Refer to plot VBW: Refer to plots

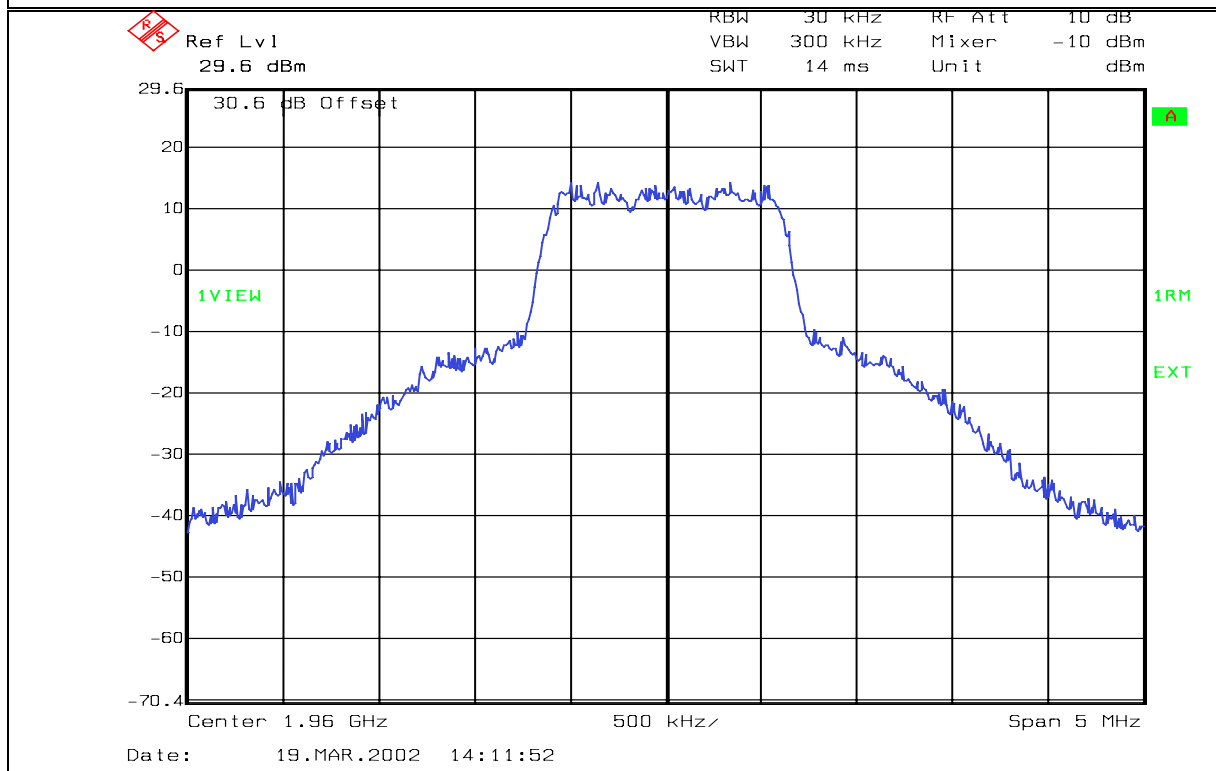
Complete: X

Preliminary:

Measurement
Distance: N/A m

Test Equipment Used

Antenna: Directional Coupler:
 Pre-Amp: Cable #1: 1627
 Filter: Cable #2: 1628
 Receiver: 1036 Cable #3: 1629
 Attenuator #1: 1478 Cable #4:
 Attenuator #2: 1471 Mixer:
 Additional equipment used: 1052 1051 1092 1053
 Measurement Uncertainty: +/-1.7 dB



Notes: CDMA OUTPUT

EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

Test Data – Occupied Bandwidth



Dallas Headquarters:

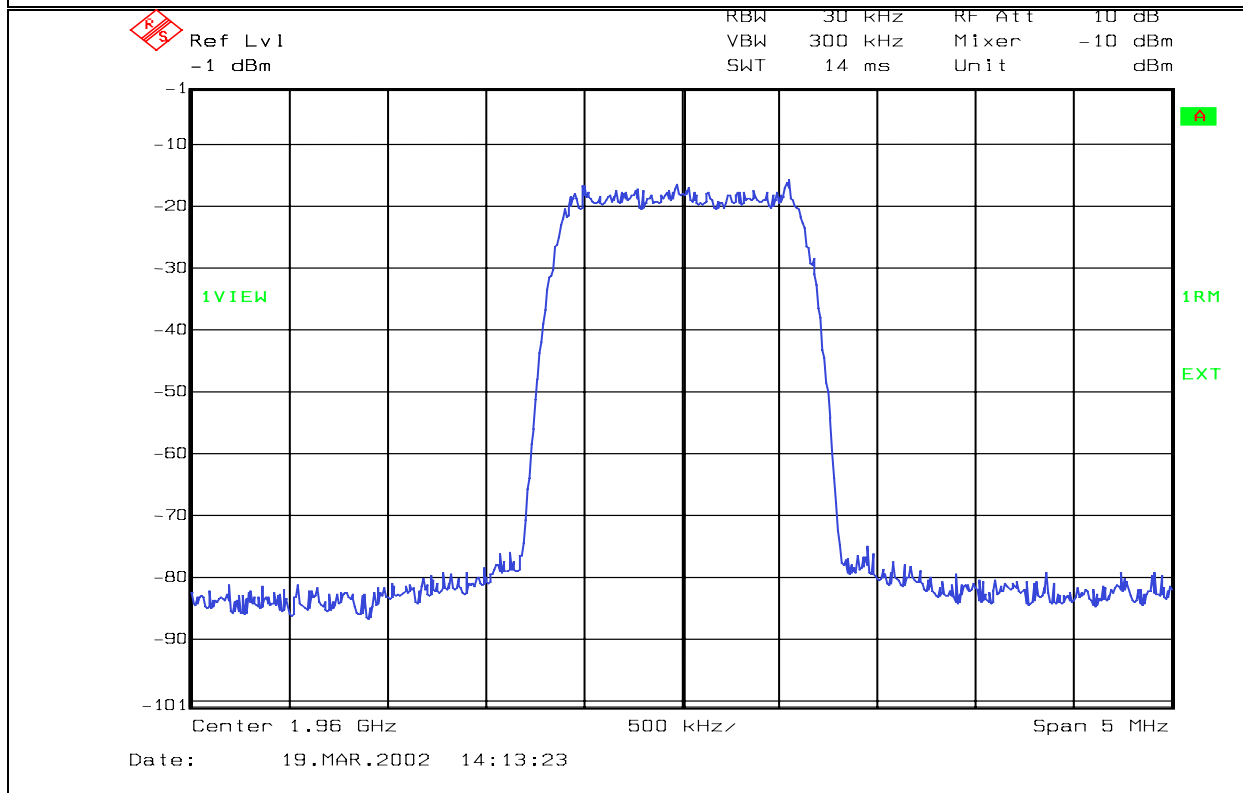
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Data Plot**OCCUPIED BANDWIDTH**

Page 2 of 6

Job No.: 2L0027R Date: 3/19/2002
Specification: PT 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 60
E.U.T.: DUAL BAND REPEATER
Configuration: TX FULL POWER



Notes: CDMA INPUT

EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

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Test Data – Occupied Bandwidth



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Dallas Headquarters:

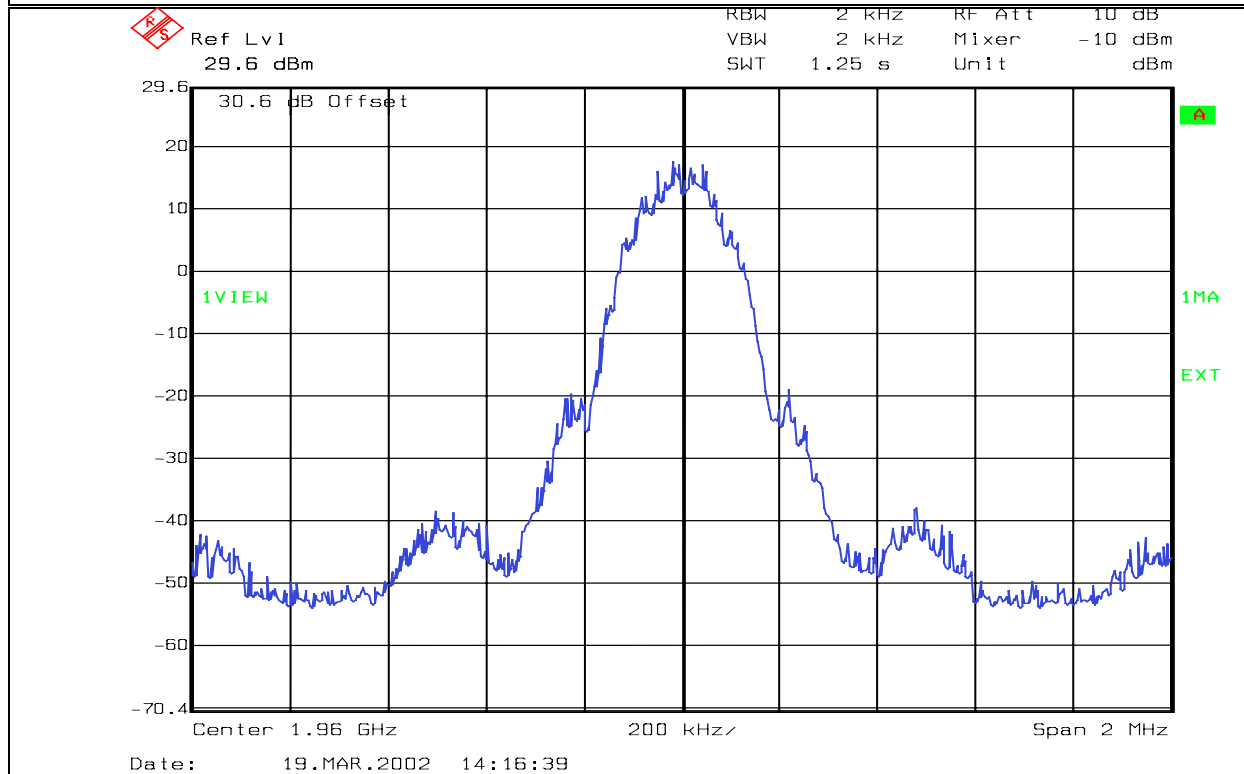
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Data Plot

Page 3 of 6

OCCUPIED BANDWIDTH

Job No.: 2L0027R Date: 3/19/2002
 Specification: PT 24 Temperature(°C): 22
 Tested By: David Light Relative Humidity(%) 60
 E.U.T.: DUAL BAND REPEATER
 Configuration: TX FULL POWER



Notes: GSM OUTPUT

EQUIPMENT: Enhanced Remote Antenna Unit
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Test Data – Occupied Bandwidth



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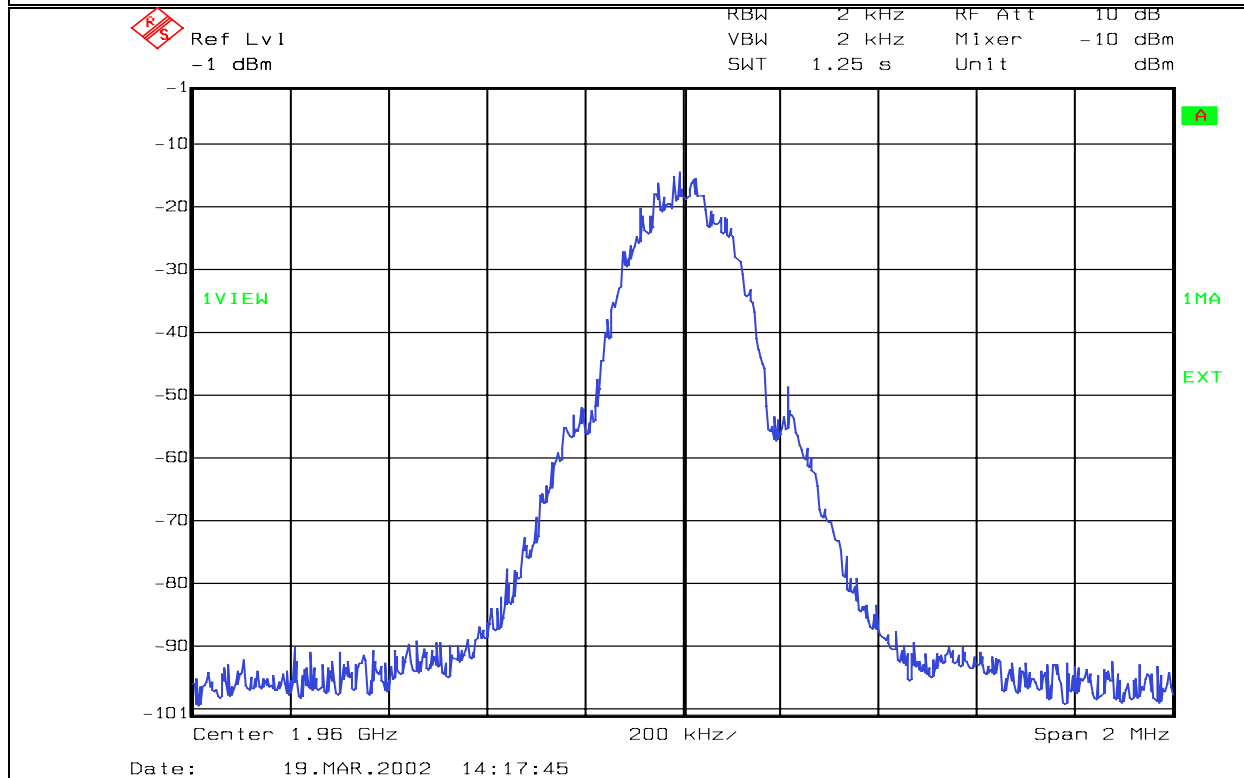
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Test Plot:

OCCUPIED BANDWIDTH

Page 4 of 6

Job No.: 2L0027R Date: 3/19/2002
Specification: PT 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 60
E.U.T.: DUAL BAND REPEATER
Configuration: TX FULL POWER



Notes: GSM INPUT

EQUIPMENT: Enhanced Remote Antenna Unit
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Test Data – Occupied Bandwidth



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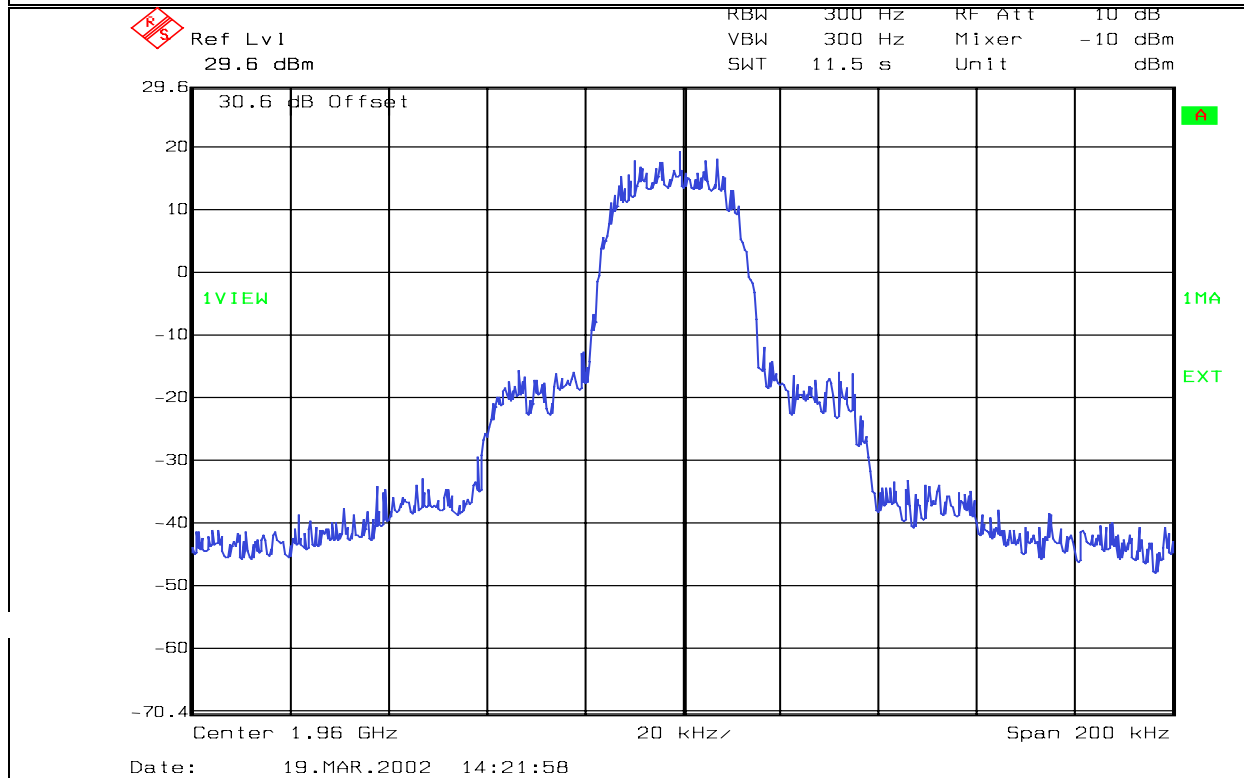
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Fax: (972) 436-2667

Test Plot:

OCCUPIED BANDWIDTH

Page 5 of 6

Job No.: 2L0027R Date: 3/19/2002
Specification: PT 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 60
E.U.T.: DUAL BAND REPEATER
Configuration: TX FULL POWER



Notes: TDMA OUTPUT

EQUIPMENT: Enhanced Remote Antenna Unit
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PROJECT NO: 2L0027RUS2

Test Data – Occupied Bandwidth



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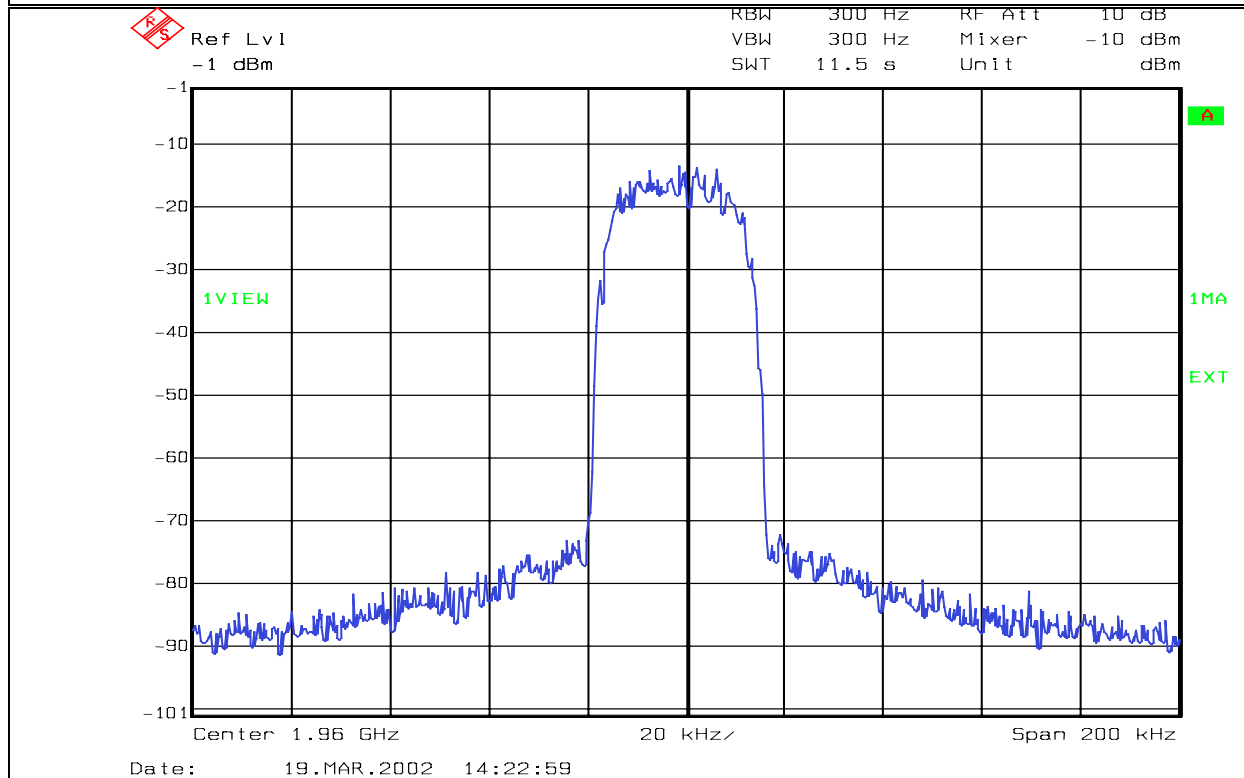
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Test Plot:

OCCUPIED BANDWIDTH

Page 6 of 6

Job No.: 2L0027R Date: 3/19/2002
Specification: PT 24 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 60
E.U.T.: DUAL BAND REPEATER
Configuration: TX FULL POWER



Notes: TDMA INPUT

EQUIPMENT: **Enhanced Remote Antenna Unit
(ERAU)**

PROJECT NO: **2L0027RUS2**

Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 2.1051
TESTED BY: David Light	DATE: 3/19/2002

Test Results: Complies.

Test Data: See attached plot(s).

**Measurement
Uncertainty:** +/- 1.6 dB

EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

Test Data – Spurious Emissions at Antenna Terminals



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Data Plot

SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Page 1 of 3

Job No.: 2L0027R Date: 3/19/2002 Complete: X

Specification: PT 24 Temperature(°C): 22 Preliminary: _____

Tested By: David Light Relative Humidity(%): 60

E.U.T.: DUAL BAND REPEATER

Configuration: TX FULL POWER

Sample Number: 1

Location: Lab 1 RBW: Refer to plots Measurement

Detector Type: Peak VBW: Refer to plots Distance: N/A m

Test Equipment Used

Antenna: _____ Directional Coupler: _____

Pre-Amp: _____ Cable #1: 1627

Filter: _____ Cable #2: 1628

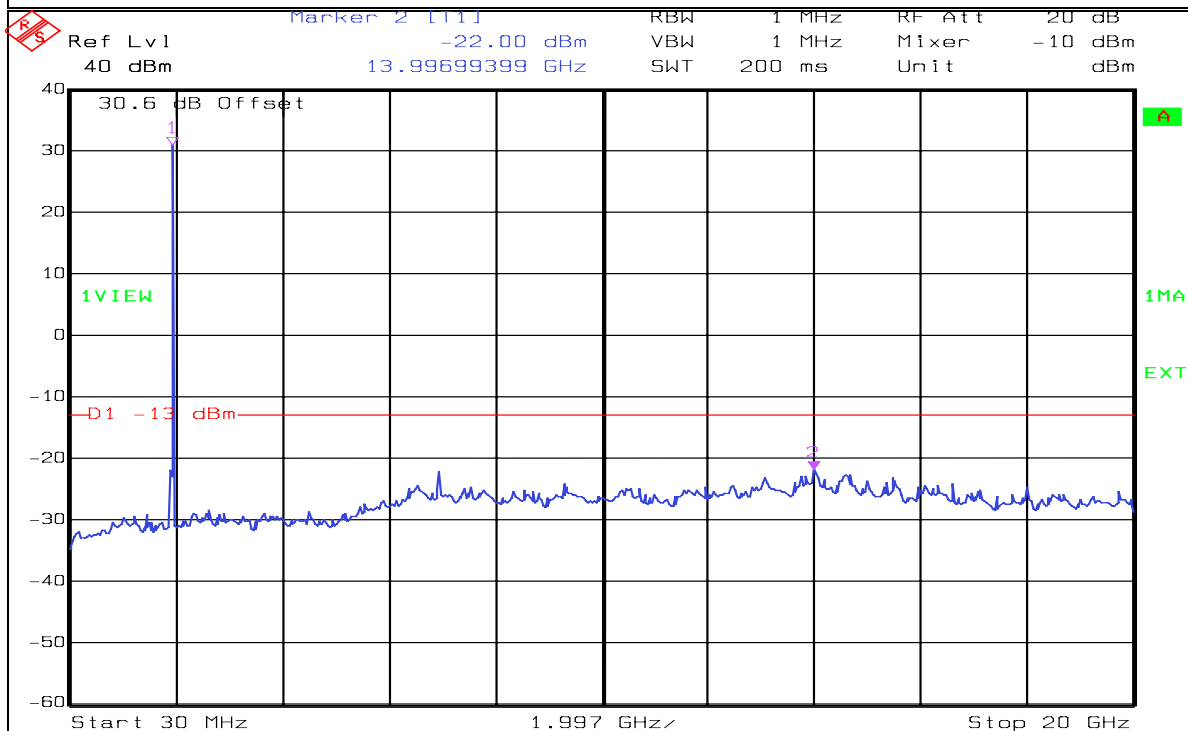
Receiver: 1036 Cable #3: 1629

Attenuator #1: 1478 Cable #4: _____

Attenuator #2: 1471 Mixer: _____

Additional equipment used: 1051 1052 1092 1053

Measurement Uncertainty: +/-1.7 dB



Date: 19.MAR.2002 14:29:08

Notes: TDMA

EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

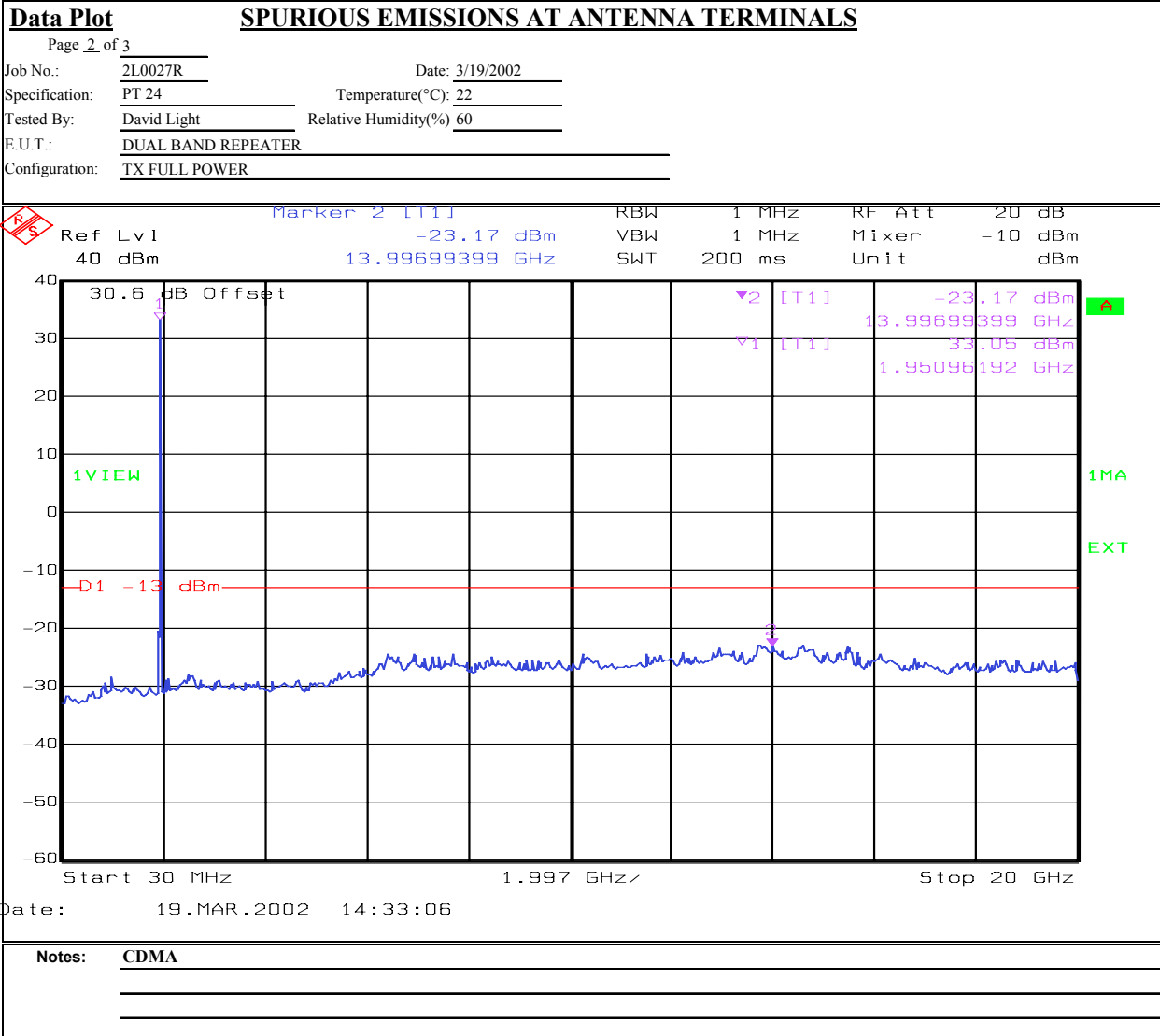
Test Data – Spurious Emissions at Antenna Terminals



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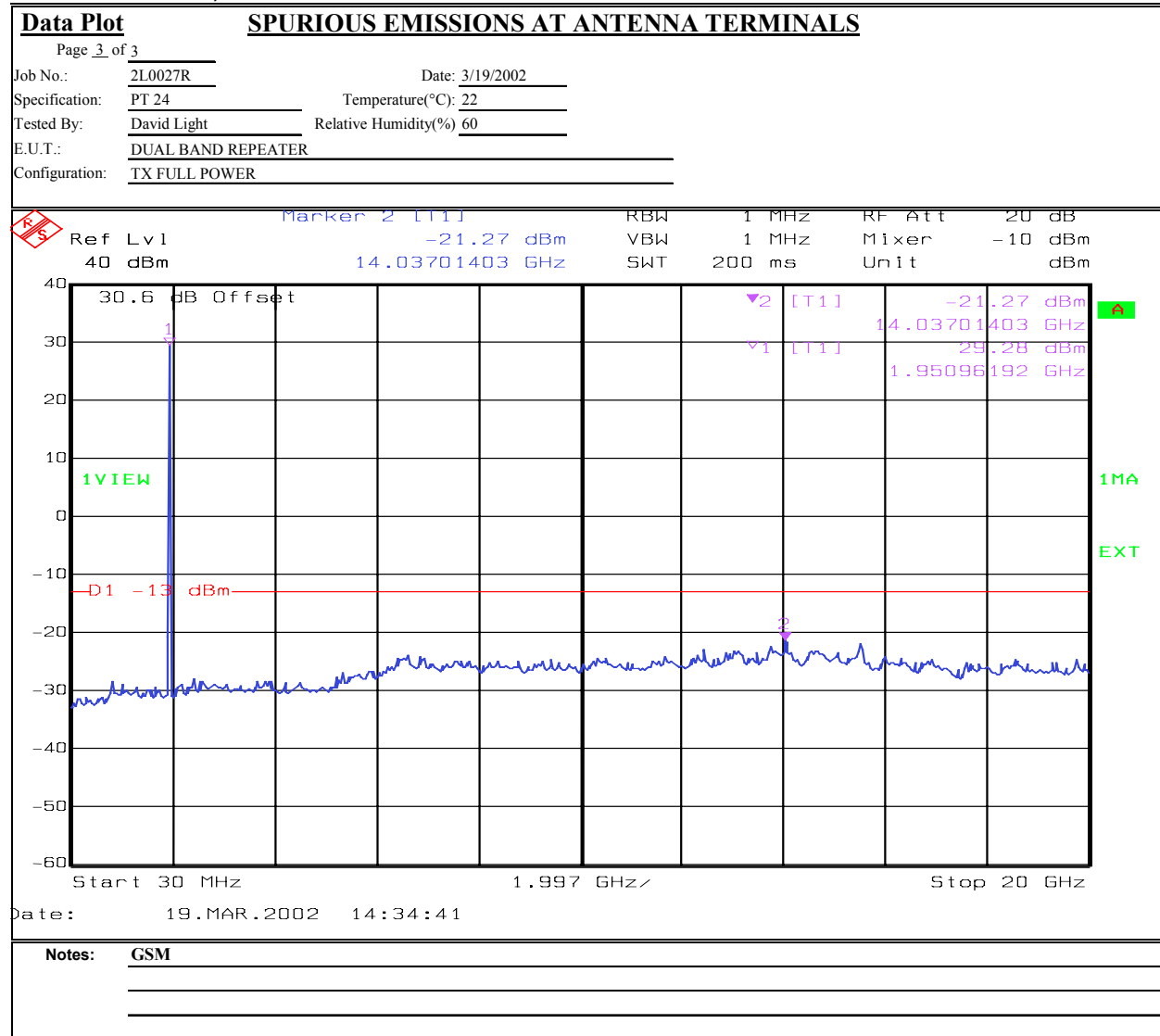
PROJECT NO: 2L0027RUS2

Test Data – Spurious Emissions at Antenna Terminals



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Test Data – Spurious Emissions at Antenna Terminals



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Data Plot		BANDEDGE PLOTS	
Page 1 of 6			
Job No.: 2L0027R	Date: 3/19/2002	Complete: <u>X</u>	
Specification: PT 24	Temperature(°C): 22	Preliminary: _____	
Tested By: David Light	Relative Humidity(%): 60		
E.U.T.: DUAL BAND REPEATER			
Configuration: TX FULL POWER			
Sample Number: 1			
Location: Lab 1	RBW: Refer to plots	Measurement	
Detector Type: Refer to plots	VBW: Refer to plots	Distance: N/A m	
Test Equipment Used			
Antenna: _____	Directional Coupler: _____		
Pre-Amp: _____	Cable #1: 1627		
Filter: _____	Cable #2: 1628		
Receiver: 1036	Cable #3: 1629		
Attenuator #1: 1478	Cable #4: _____		
Attenuator #2: 1471	Mixer: _____		
Additional equipment used: 1051 1052 1092 1053			
Measurement Uncertainty: +/-1.7 dB			
Ref Lvl 39.6 dBm 30.6 dB Offset 1VIEW LOBNEDGE RBW 30 KHz VBW 300 KHz SWT 7 ms RF Att 20 dB Mixer -10 dBm Unit dBm Center 1.93 GHz 246 kHz Span 2.46 MHz Date: 19.MAR.2002 12:54:58			
Notes: CDMA			

EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

Test Data – Spurious Emissions at Antenna Terminals



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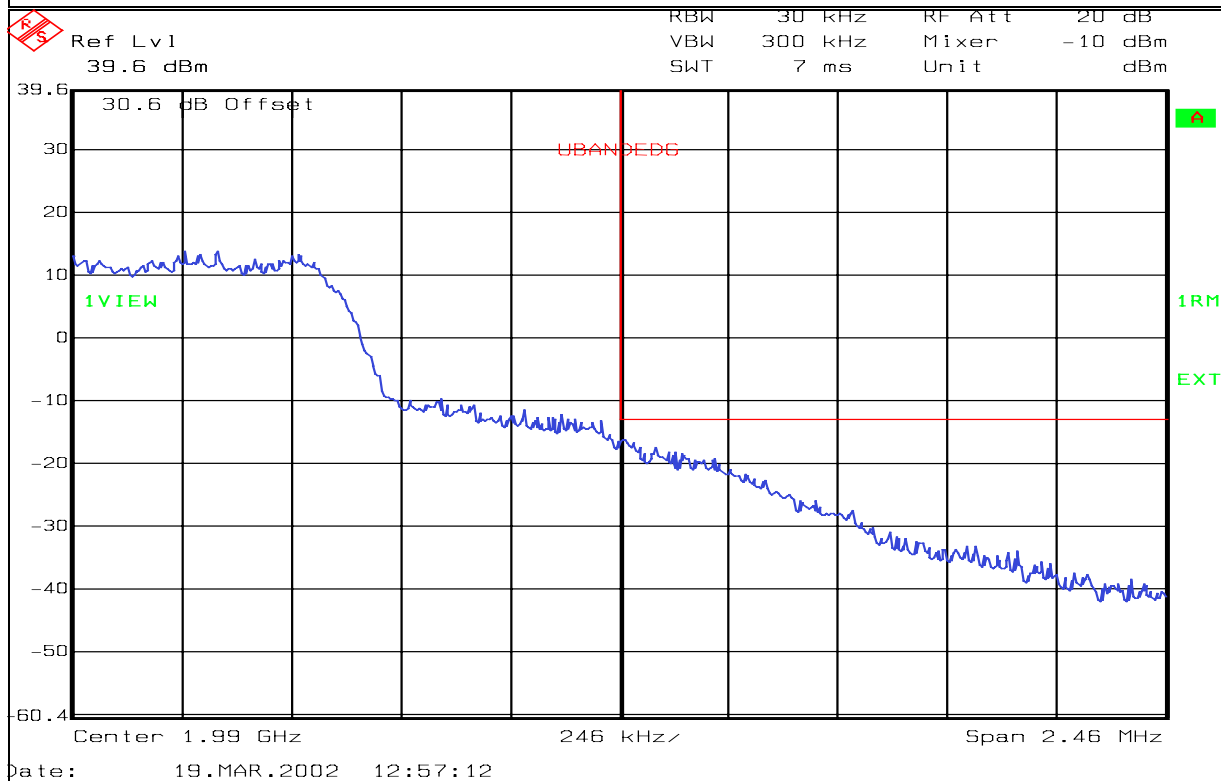
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Data Plot

BANDEDGE PLOTS

Page 2 of 6

Job No.: 2L0027R Date: 3/19/2002
 Specification: PT 24 Temperature(°C): 22
 Tested By: David Light Relative Humidity(%) 60
 E.U.T.: DUAL BAND REPEATER
 Configuration: TX FULL POWER



Notes: CDMA

EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

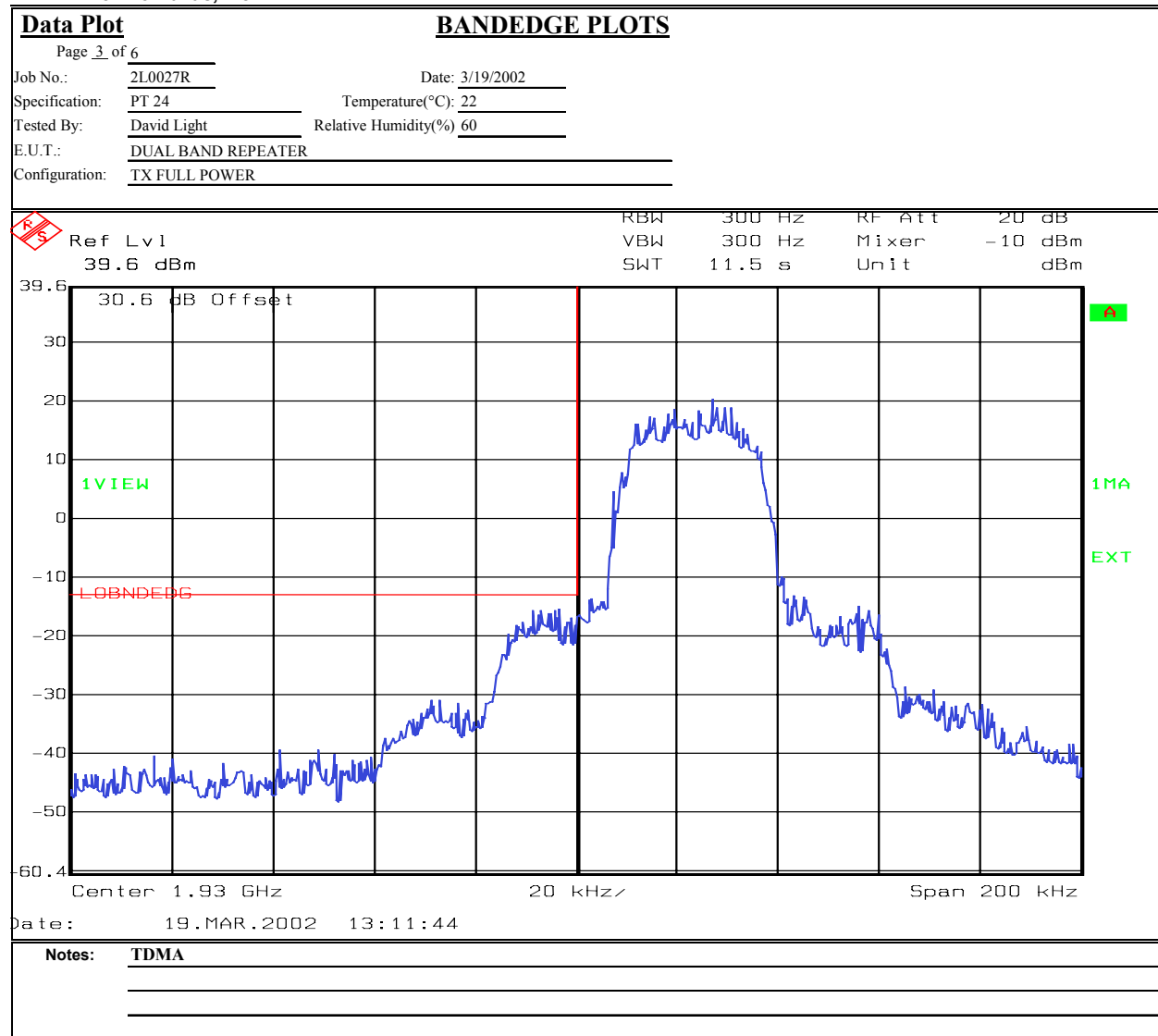
PROJECT NO: 2L0027RUS2

Test Data – Spurious Emissions at Antenna Terminals



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EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

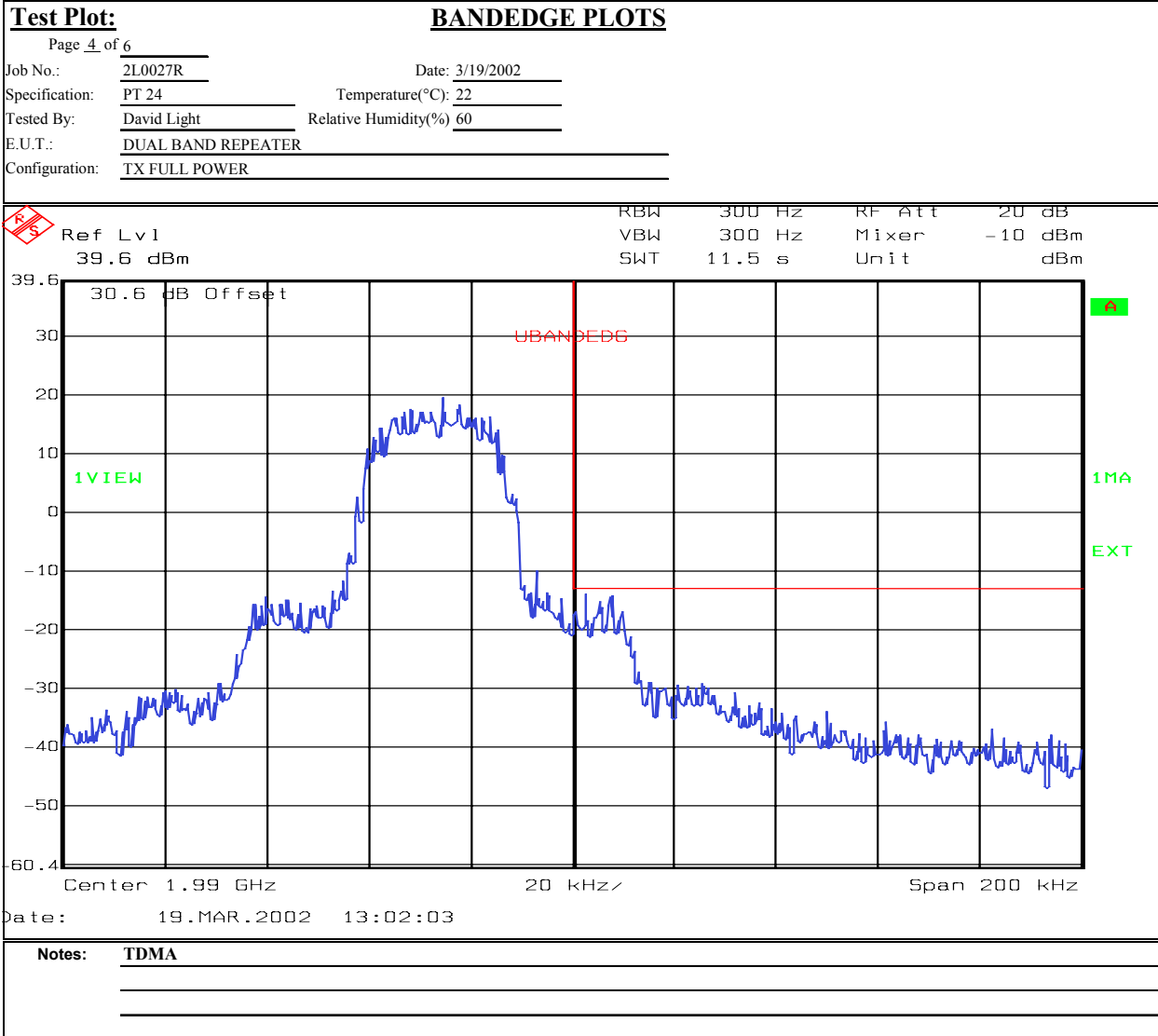
Test Data – Spurious Emissions at Antenna Terminals



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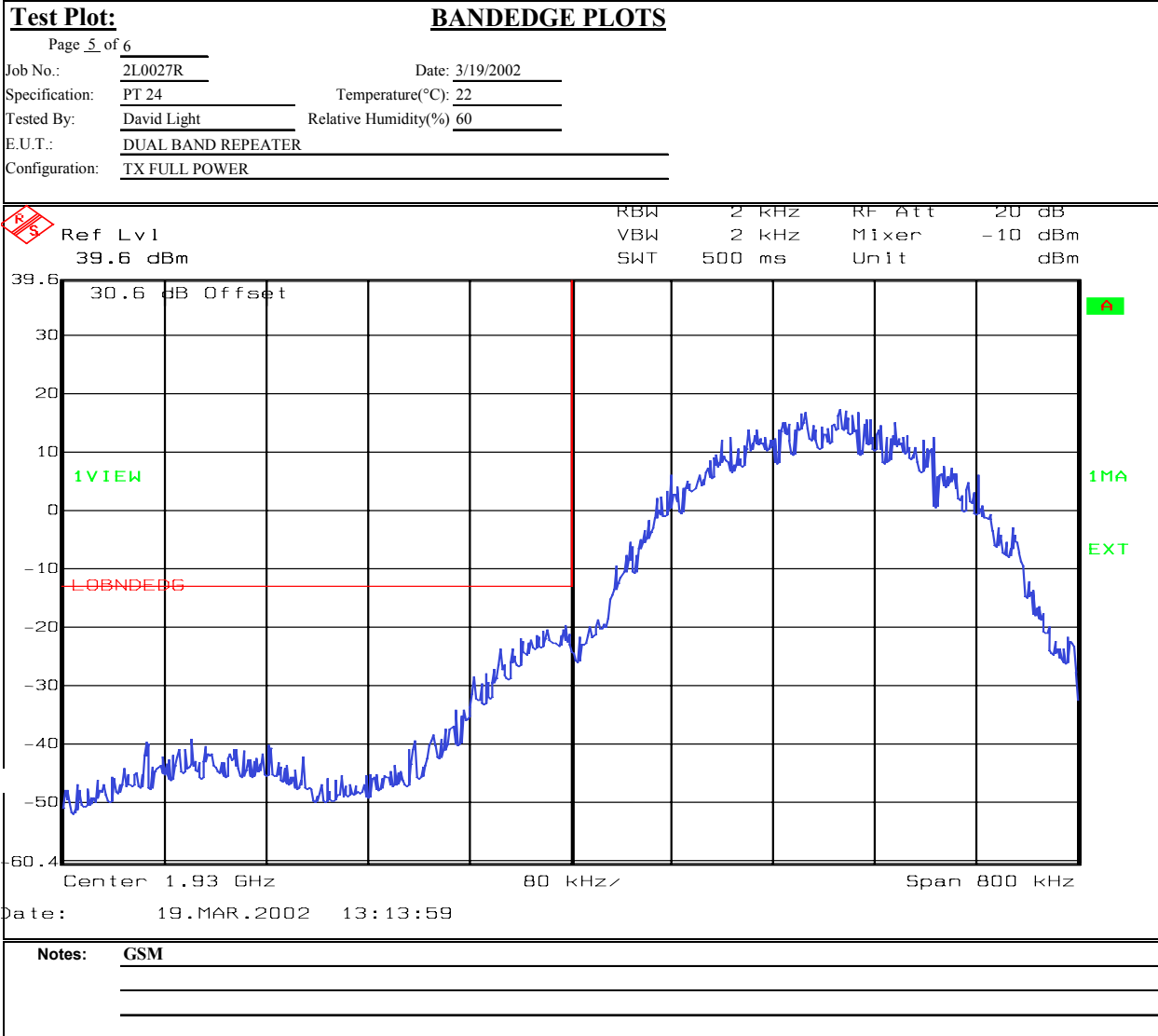
PROJECT NO: 2L0027RUS2

Test Data – Spurious Emissions at Antenna Terminals



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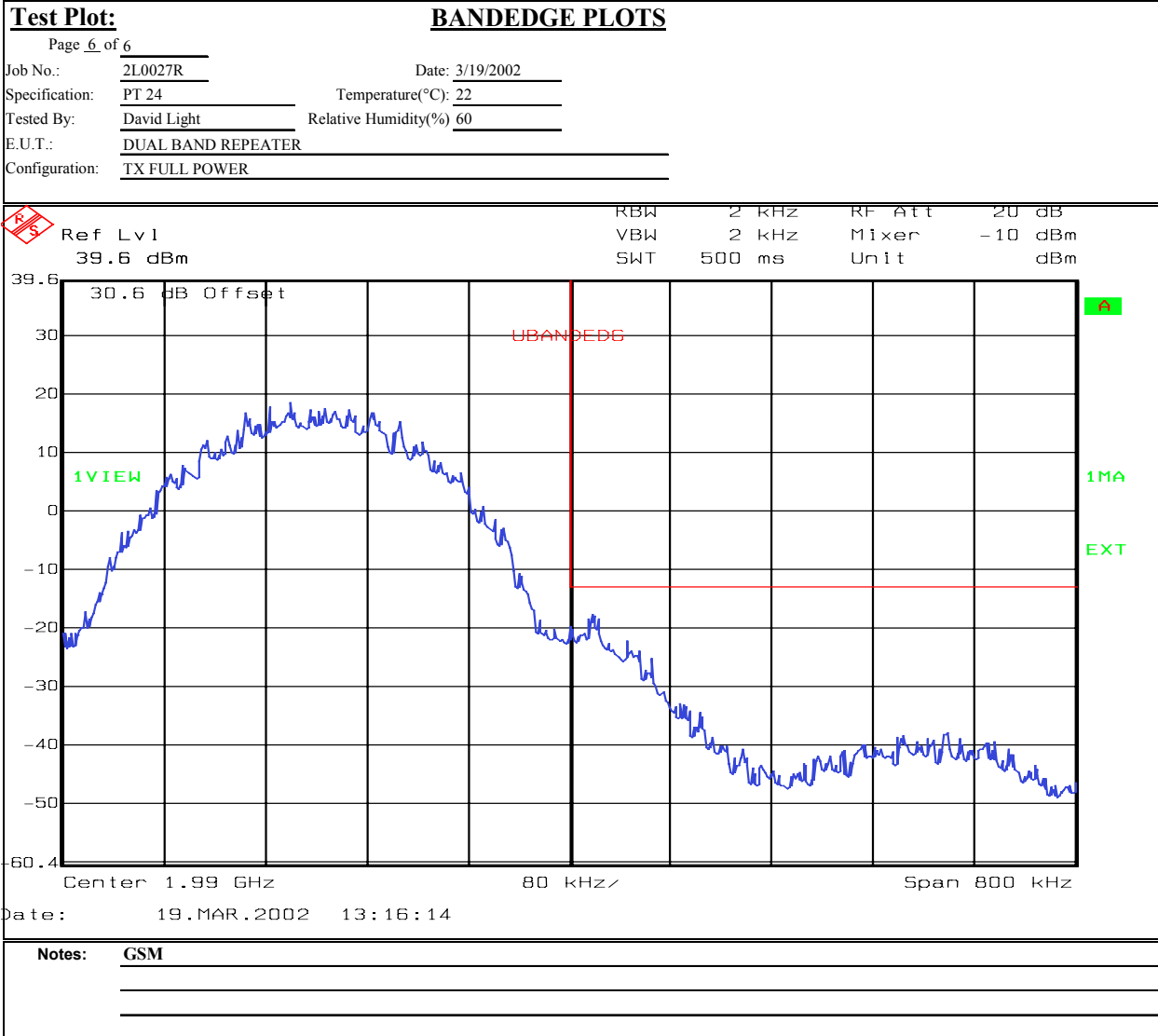
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Test Data – Spurious Emissions at Antenna Terminals



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Test Data – Spurious Emissions at Antenna Terminals



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Data Plot

INTERMODULATION CHARACTERISTICS

Page 1 of 6

Job No.: 2L0027R Date: 3/19/2002 Complete X

Specification: PT24 Temperature(°C): 22 Preliminary:

Tested By: David Light Relative Humidity(%): 60

E.U.T.: DUAL BAND REPEATER

Configuration: TX 2 CARRIERS

Sample Number: 1

Location: Lab 1 RBW: Refer to plots Measurement

Detector Type: Refer to plot VBW: Refer to plots Distance: N/A m

Test Equipment Used

Antenna: Directional Coupler:

Pre-Amp: Cable #1: 1627

Filter: Cable #2: 1628

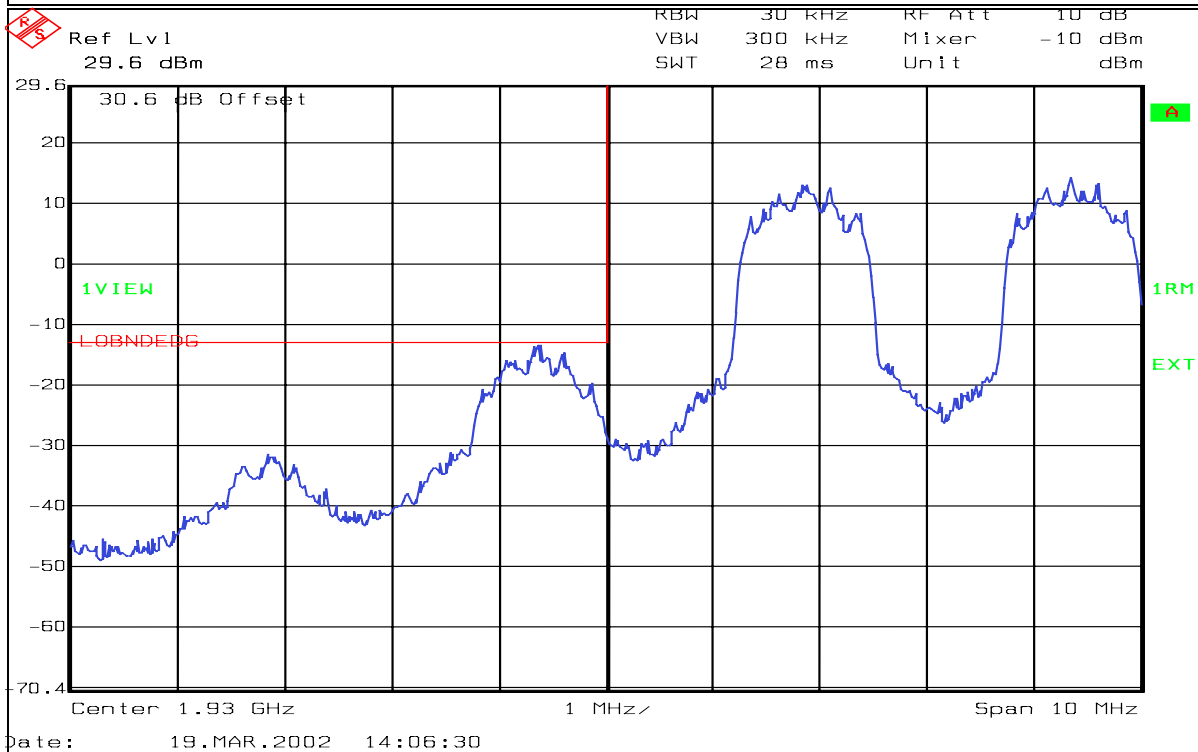
Receiver: 1036 Cable #3: 1629

Attenuator #1: 1478 Cable #4:

Attenuator #2: 1471 Mixer:

Additional equipment used: 1051 1052 1092 1053

Measurement Uncertainty: +/-1.7 dB



Notes: CDMA

EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

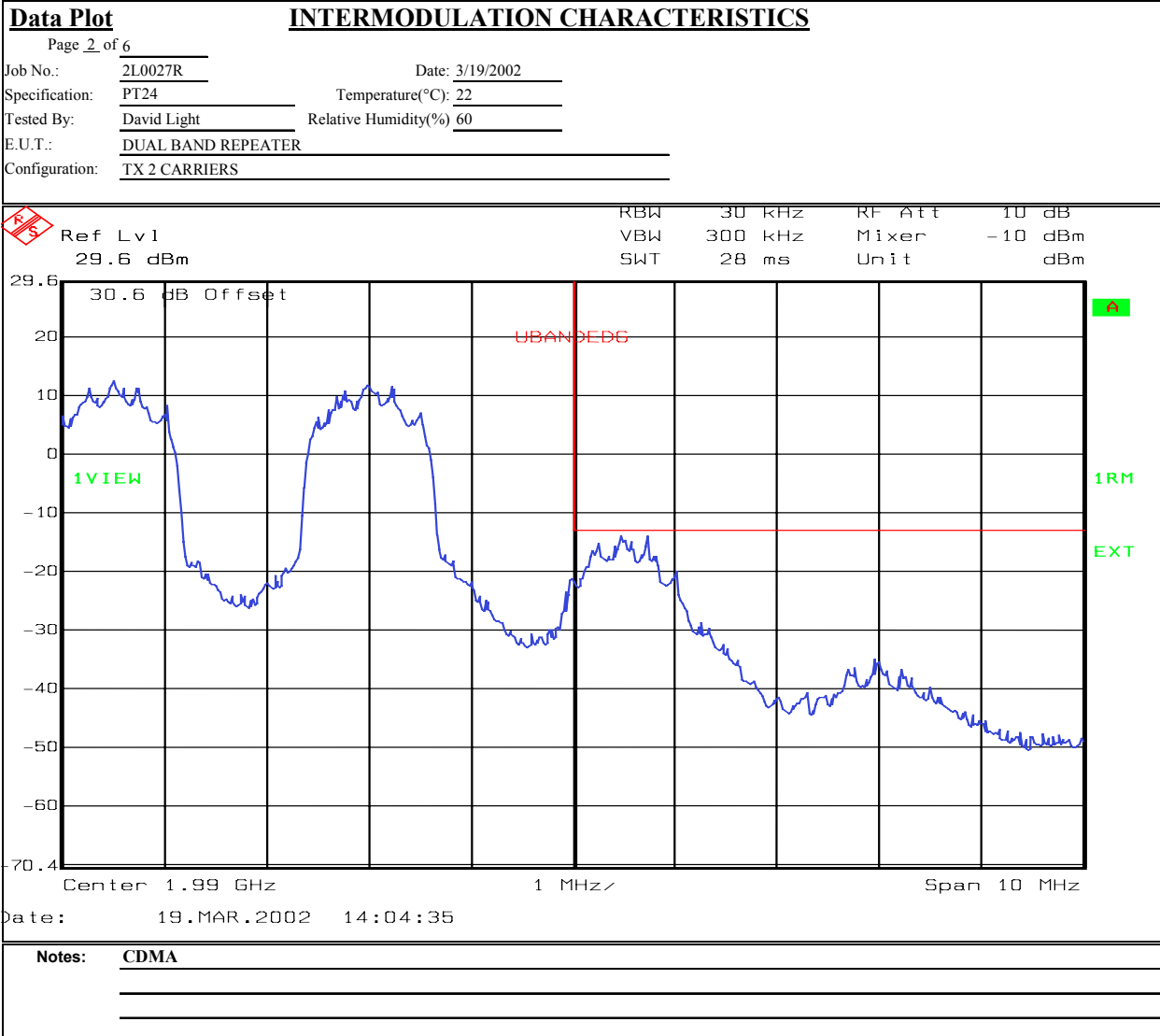
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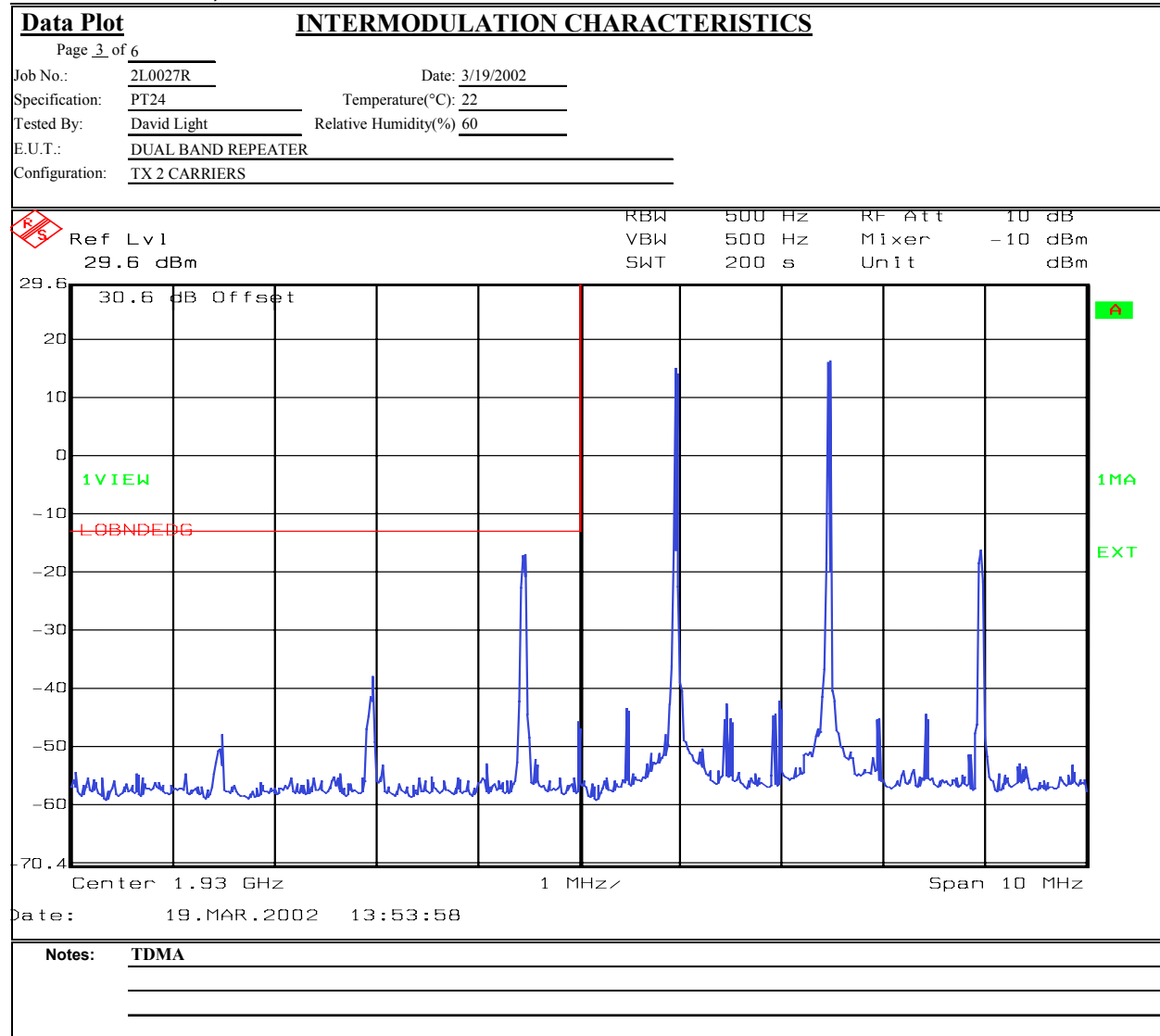
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EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

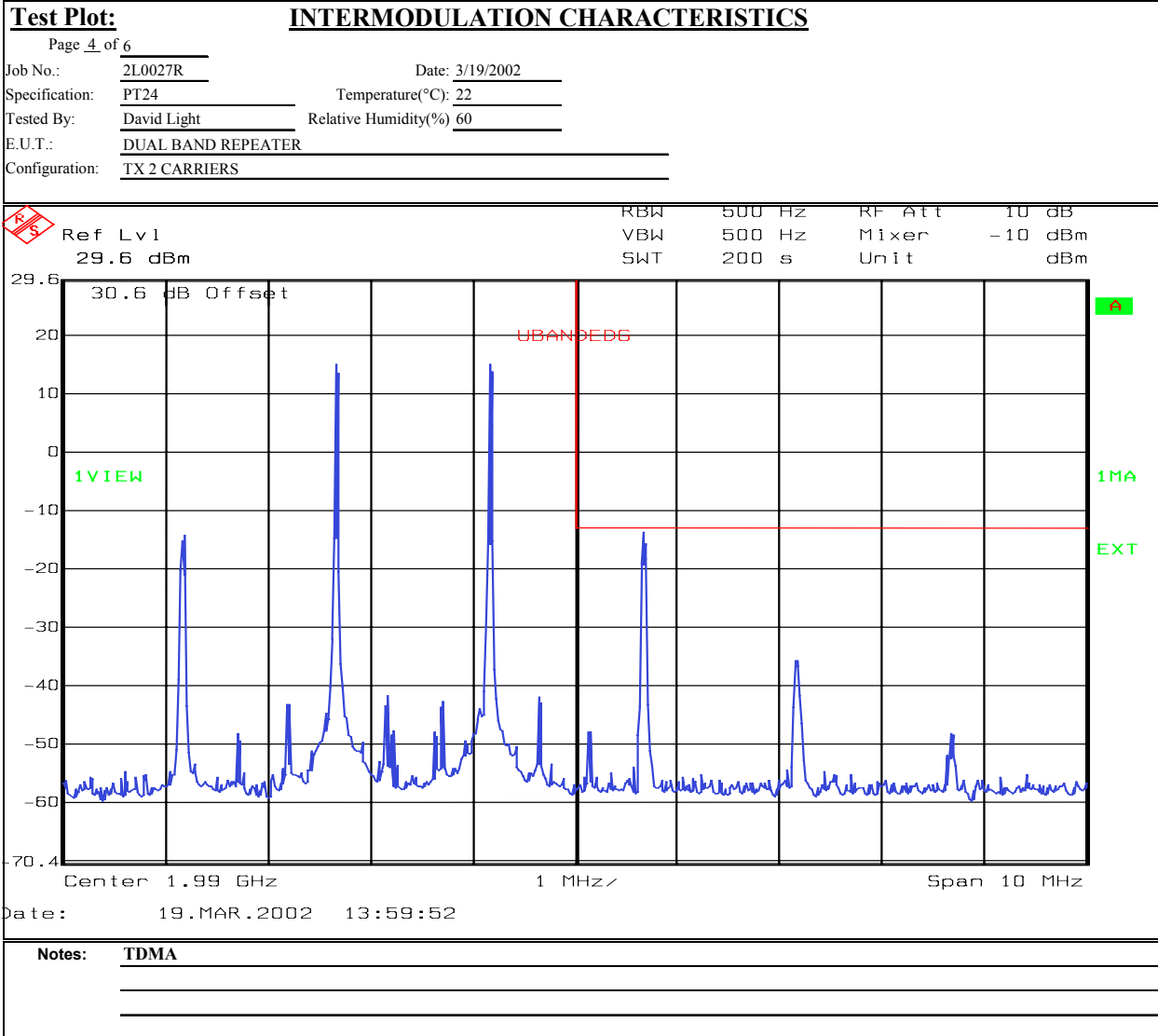
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EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

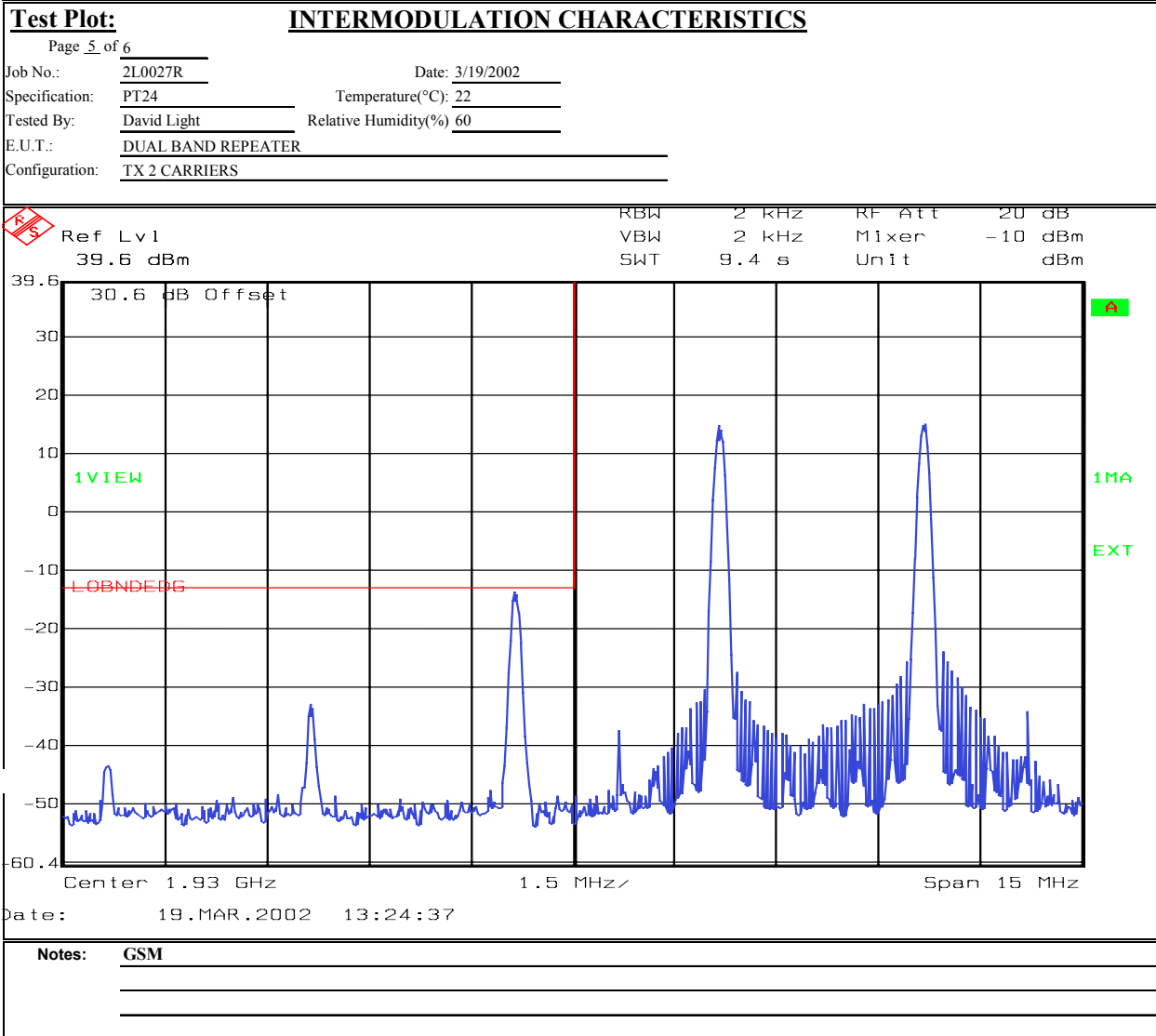
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Test Data – Spurious Emissions at Antenna Terminals



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(ERAU)

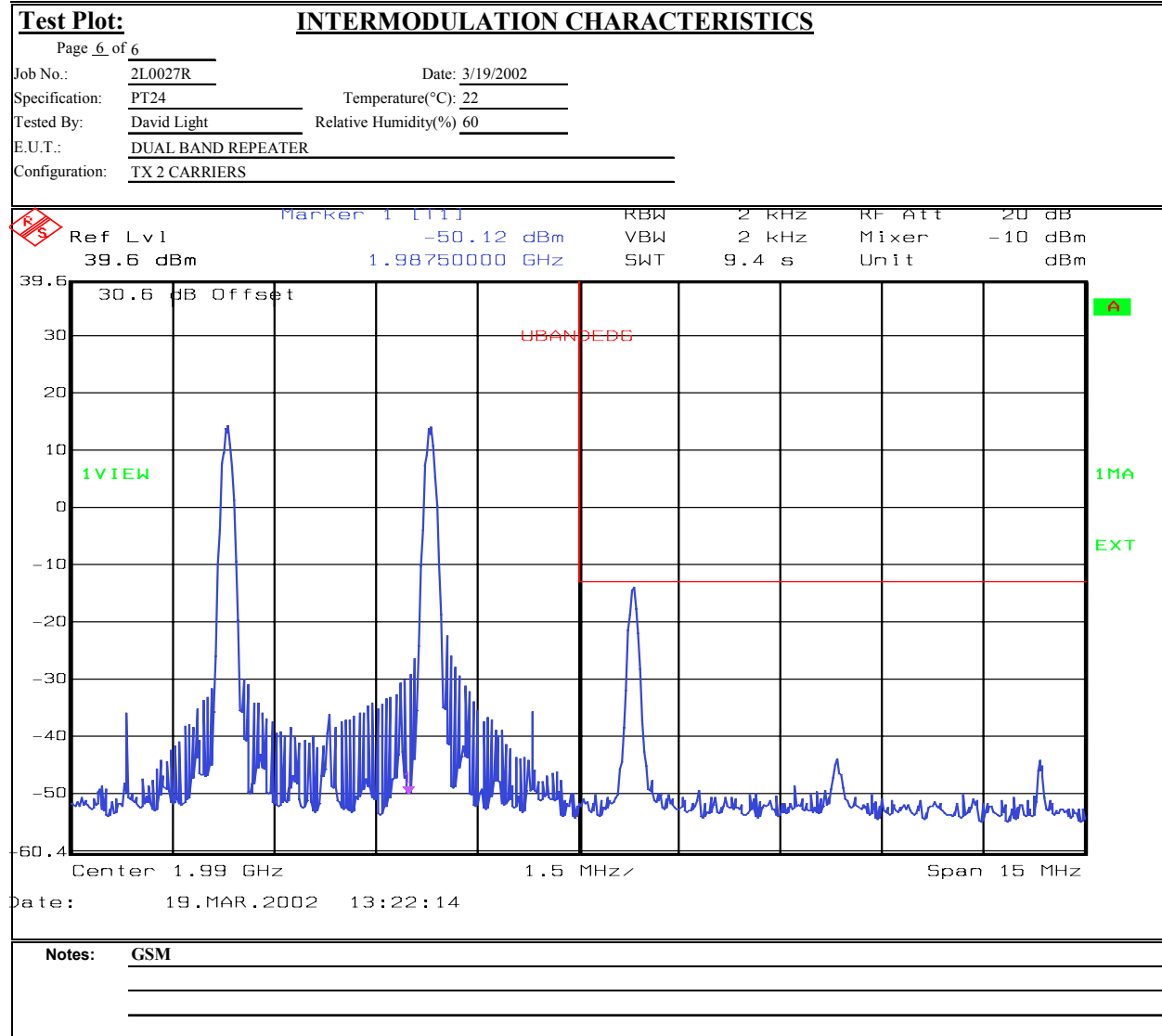
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Test Data – Spurious Emissions at Antenna Terminals



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EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

Section 6. Field Strength of Spurious

NAME OF TEST: Field Strength of Spurious Emissions	PARA. NO.: 2.1051
TESTED BY: David Light	DATE:3/19/2002

Test Results: Complies.

Test Data: See attached table.

Measurement Uncertainty: +/- 3.6 dB

EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

Test Data - Radiated Emissions - Downlink



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Tel: (972) 436-9600
Fax: (972) 436-2667**FIELD STRENGTH OF SPURIOUS EMISSIONS**

Page 1 of 1

Job No.: 2L0027R Date: 3/19/2002 Complete X
Preliminary _____

Specification: PT24 Temperature(°C): 20

Tested By: David Light Relative Humidity(%) 60

E.U.T.: DUAL BAND REPEATER

Configuration: TX @ 1960 MHz

Sample No: 1

Location: AC 3 RBW: 1 MHz Measurement

Detector Type: Peak VBW: 1 MHz Distance: 3 m

Test Equipment Used

Antenna: 1304 Directional Coupler: _____

Pre-Amp: 1016 Cable #1: 1484

Filter: Cable #2: 1485

Receiver: 1464 Cable #3: _____

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
3920	-63.0	35.5		33.3	8.6		-52.3	0.0000	H	NOISE FLOOR
5880	-64.0	37.8		33.3	9.3		-50.2	0.0000	H	NOISE FLOOR
7840	-65.3	41.5		33.3	9.2		-48.0	0.0000	H	NOISE FLOOR
9800	-64.3	43.3		36	10.3		-46.7	0.0000	H	NOISE FLOOR
3920	-60.7	43.3		33.3	8.6		-42.1	0.0001	V	
5880	-64.0	39.8		33.3	9.3		-48.2	0.0000	V	NOISE FLOOR
7840	-65.3	41.8		33.3	9.2		-47.6	0.0000	V	NOISE FLOOR
9800	-64.3	41.8		36	10.3		-48.2	0.0000	V	NOISE FLOOR

Notes: Scanned spectrum to the tenth harmonic

EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

Photographs of Test Setup

FRONT VIEW



REAR VIEW



EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

Section 7. Test Equipment List

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date
1304	HORN ANTENNA	ELECTRO METRICS RGA-60	6151	07/30/01
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	01/02/01
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	06/01/01
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	06/01/01
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	12/18/01
1052	I/Q MODULATION GENERATOR	Rhode & Schwarz AMIQ	DE30619	09/25/00
1051	Radio Communication Analyzer	Rhode & Schwarz CMTA-54	835875/002	CBU
1478	20db Attenuator DC 18 Ghz	MCL Inc. BW-S20W6	NONE	CBU
1471	10 db Attenuator DC 18 Ghz	MCL Inc. BW-S10W2 10db-2WDC	NONE	CBU
1628	CABLE, 6 ft	MEGAPHASE TM26 S1S5 72	N/A	CBU
1627	CABLE, 5 ft	MEGAPHASE 10312 1GVT4	N/A	CBU
1629	CABLE, 6 ft	MEGAPHASE 10311 1GVT4	N/A	CBU
1092	COMBINER	MINI-CIRCUITS ZA3PD-1.5	NONE	CBU
1053	SIGNAL GENERATOR	ROHDE & SCHWARZ SMIQ 03	DE22081	08/09/01

Nemko Dallas

FCC PART 24, SUBPART E
BROADBAND PCS REPEATERS

EQUIPMENT: **Enhanced Remote Antenna Unit
(ERAU)**

PROJECT NO: **2L0027RUS2**

ANNEX A - TEST DETAILS

EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

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: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

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: Enhanced Remote Antenna Unit
(ERAU)PROJECT NO: **2L0027RUS2****NAME OF TEST:** Spurious Emission at Antenna
Terminals**PARA. NO.:** 2.1051**Minimum Standard:**
licensee'sPara. No.24.238(a). On any frequency outside a
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:

CDMARBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 30 kHz (< 1MHz from Band Edge)
VBW: $\geq$ RBW
Sweep: Auto
Video Avg: 6 SweepsGSMRBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 3 kHz (< 1 MHz from Band Edge)
VBW: $\geq$ RBW
Sweep: Auto
Video Avg: DisabledNADCRBW: 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: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

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

Test Method:

TIA/EIA-603-1992, Section 2.2.12

The antenna substitution method was used to determine the equivalent radiated power at spurious frequencies. The spurious emissions were measured at a distance of 3 meters. The EUT was then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna was fed with a signal at the spurious frequency. The level of the signal was adjusted to repeat the previously measured level. The resulting erp is the signal level fed to the reference antenna corrected for gain referenced to a dipole.

The spectrum is searched up to the 10th harmonic of the fundamental emission.

EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

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.

Nemko Dallas

FCC PART 24, SUBPART E
BROADBAND PCS REPEATERS

EQUIPMENT: **Enhanced Remote Antenna Unit
(ERAU)**

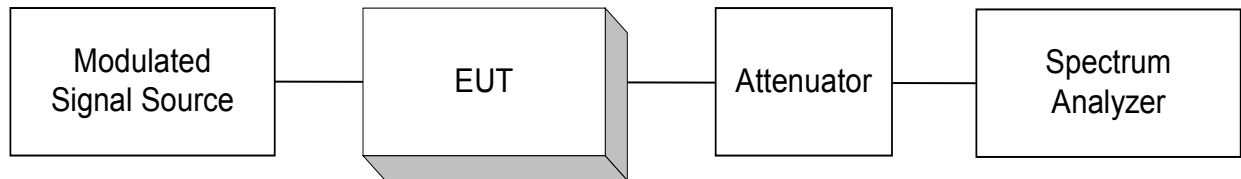
PROJECT NO: **2L0027RUS2**

ANNEX B - TEST DIAGRAMS

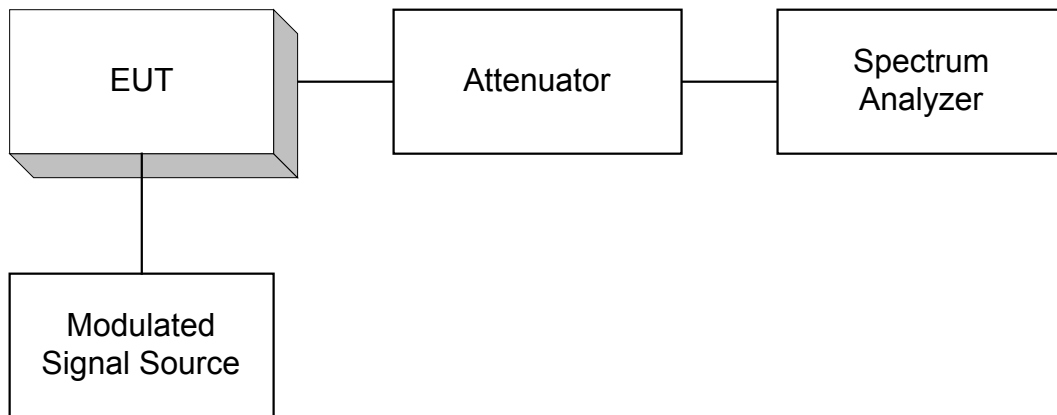
EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: **2L0027RUS2**

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



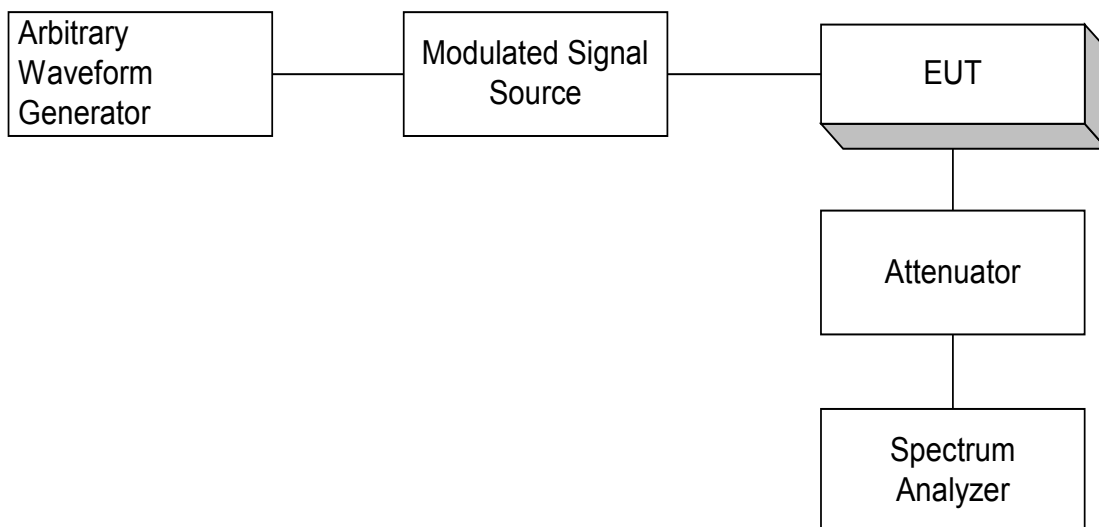
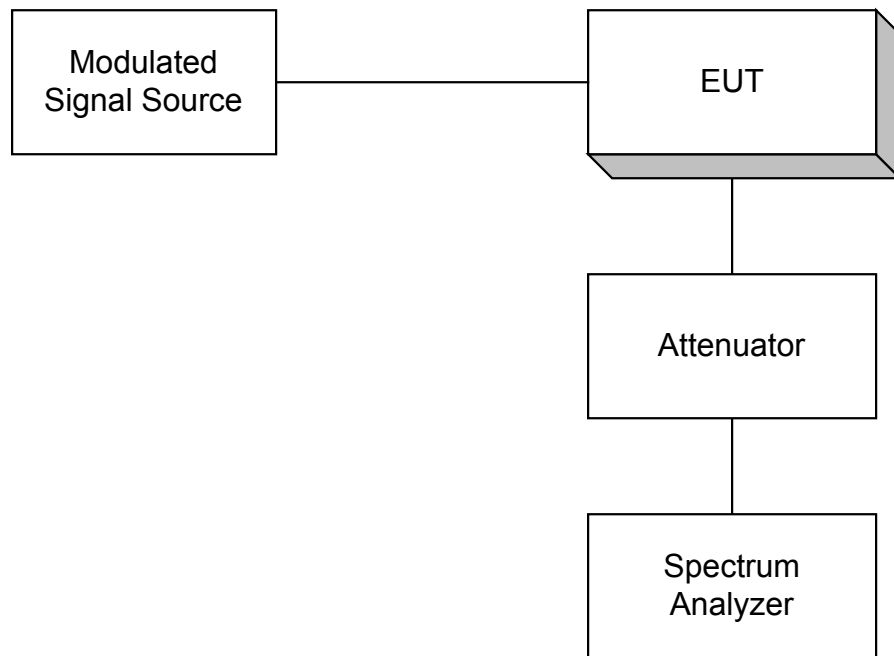
Para. No. 2.989 - Occupied Bandwidth



EQUIPMENT: **Enhanced Remote Antenna Unit
(ERAU)**

PROJECT NO: **2L0027RUS2**

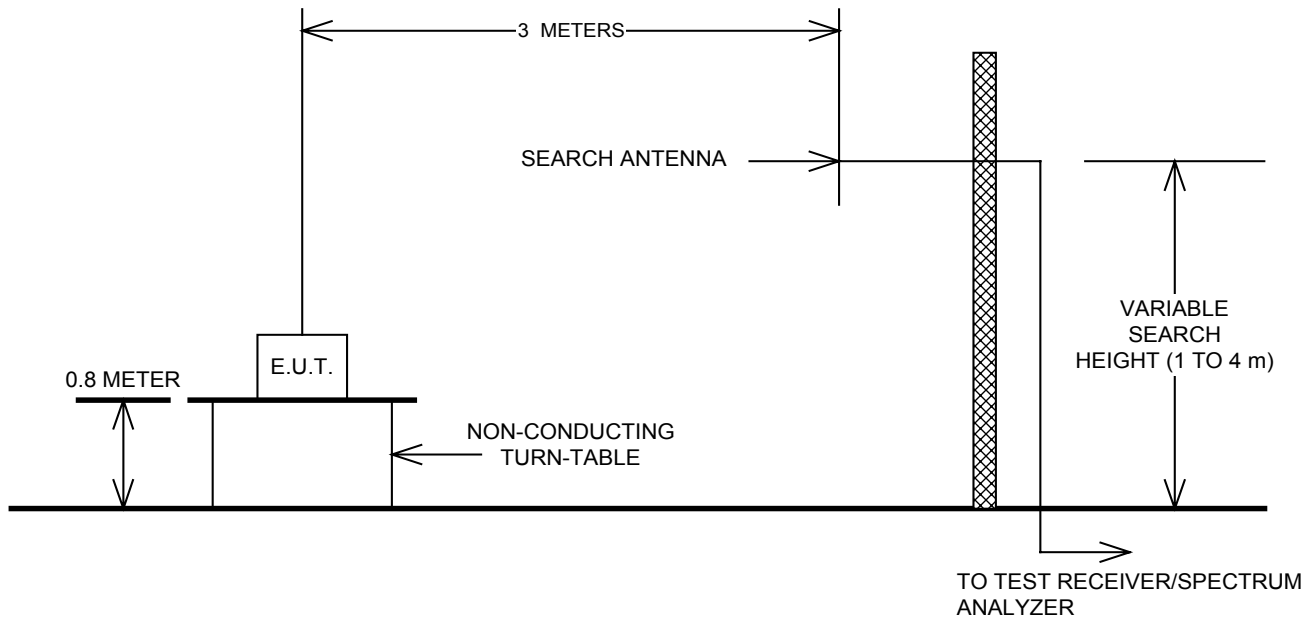
Para. No. 2.991 Spurious Emissions at Antenna Terminals



EQUIPMENT: Enhanced Remote Antenna Unit
(ERAU)

PROJECT NO: 2L0027RUS2

Para. No. 2.993 - Field Strength of Spurious Radiation



Para. No. 2.995 - Frequency Stability

