Nemko Test Report:	2L0210RUS1
Applicant:	Navini Networks 2240 Campbell Creek Blvd. Suite 110 Richardson, TX 75082
Equipment Under Test: (E.U.T.)	2.6 GHz CPE
In Accordance With:	**FCC PART 21, Subpart K** Multipoint Distribution Service
Tested By:	Nemko Dallas Inc. 802 N. Kealy Lewisville, Texas 75057-3136
Authorized By:	 Tom Tidwell, Wireless Group Manager
Date:	7/8/02
Total Number of Pages:	72

Table of Contents

Table of Contents 2

Section 1. Summary of Test Results 3

Section 2. General Equipment Specification 5

Section 3. RF Power Output 7

Section 4. Occupied Bandwidth 10

Section 5. Spurious Emissions at Antenna Terminals 13

Section 6. Field Strength of Spurious 16

Section 7. Frequency Stability 19

Section 8 Powerline Conducted Emissions 56

Section 9. Test Equipment List 62

ANNEX A - TEST DETAILS 63

ANNEX B - TEST DIAGRAMS 69

Section 1. Summary of Test Results

Manufacturer: Navini Networks

Model No.: 2.6 GHz CPE

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 21, Subpart K.

☒ 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. LIMIT	RESULT
RF Power Output	2.1046	33dBW + 10 log (X/6) dBW EIRP (661 Watts)	Complies
Occupied Bandwidth	2.1049	21.908 (b) Mask	Complies
Spurious Emissions @ Antenna Terminals	2.1051	-60 dBc	Complies
Field Strength of Spurious Radiation	2.1053	-60 dBc	Complies
Frequency Stability	2.1055	± 1 kHz	Complies

Footnotes:

X = Signal Bandwidth

Signal bandwidth = 2 MHz therefore, 33 dBW + 10 log (2/6) = 661 Watts

Section 2. General Equipment Specification

Power Supply	115 Vac
Frequency Range (See note below):	2596 to 2644 MHz (E1 – F4)
Type(s) of Modulation:	**F3E (Voice)** ☐ **F1D** ☐ **F2D** ☐ **D7W (QAM)** ☐ **F9W** ☒
Emission Designator:	2M00F9W
Output Impedance:	50 ohms
RF Power Output: (Rated at antenna terminal)	25 dBm *or* 28 dBm (316.2 *or* 631 mW)
Duty Cycle:	50% TDD
Selection Of Operating Frequency:	Not selectable by operator
Power Output Adjustment Capability:	Not selectable by operator

Note:
If operating at 25 dBm output, the device operates at any frequency not removed from the center of the channel (E1 to F4) by more than +/- 1.5 MHz.
If operating at 28 dBm output, the device operates at any frequency not removed from the center of the channel (E1 to F4) by more than +/- 0.5 MHz.

Description of Operation

The EUT is a CPE (Customer Premise Equipment) transceiver operating in the MMDS band. The transceiver serves as a wireless link between a BTS and a customer site. The transceiver is not intended to be a mobile device. The EUT uses a multi-antenna system for improved coverage and diversity. **Only one antenna transmits at any time.** The transmitter is digitally modulated and produces a spread spectrum waveform.

System Diagram

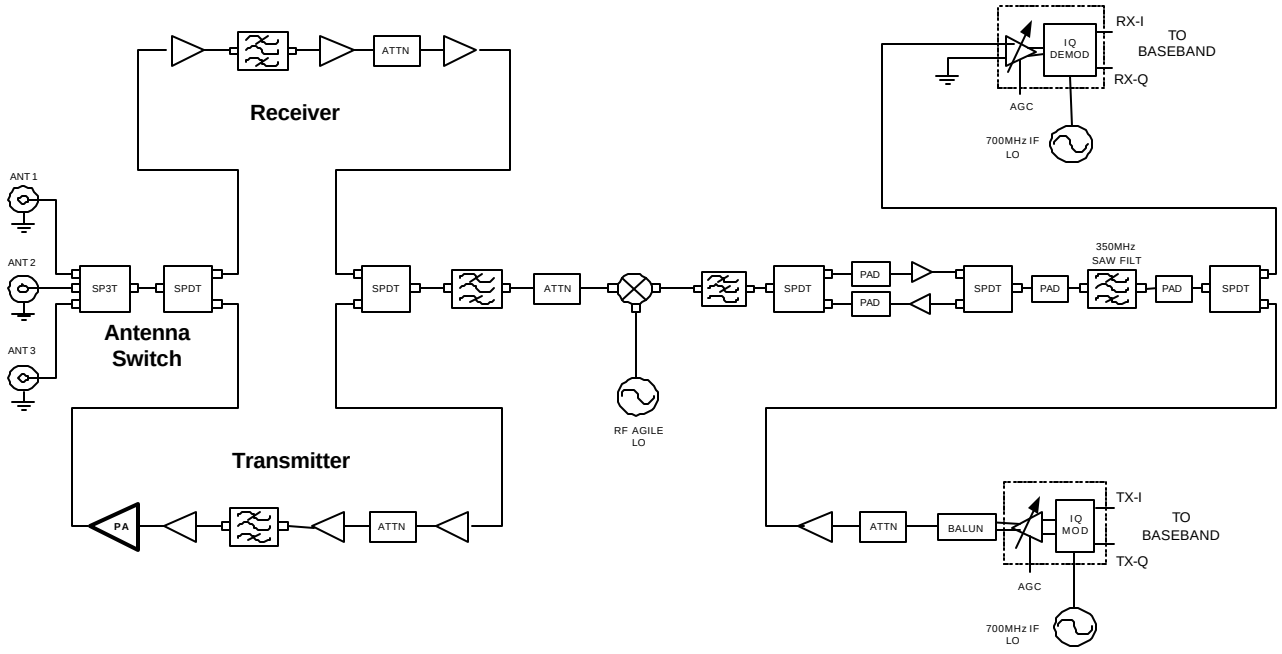


Figure 1 2.6GHz CPE BLOCK DIAGRAM

Section 3. RF Power Output

NAME OF TEST: RF Power Output	PARA. NO.: 2.1046
TESTED BY: David Light	DATE: 4/12/2002

Test Results: Complies

Measurement Data: See attached power plots.

Test Data – RF Power Output

Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Nemko Dallas, Inc.

Data Plot **RF Power Output**

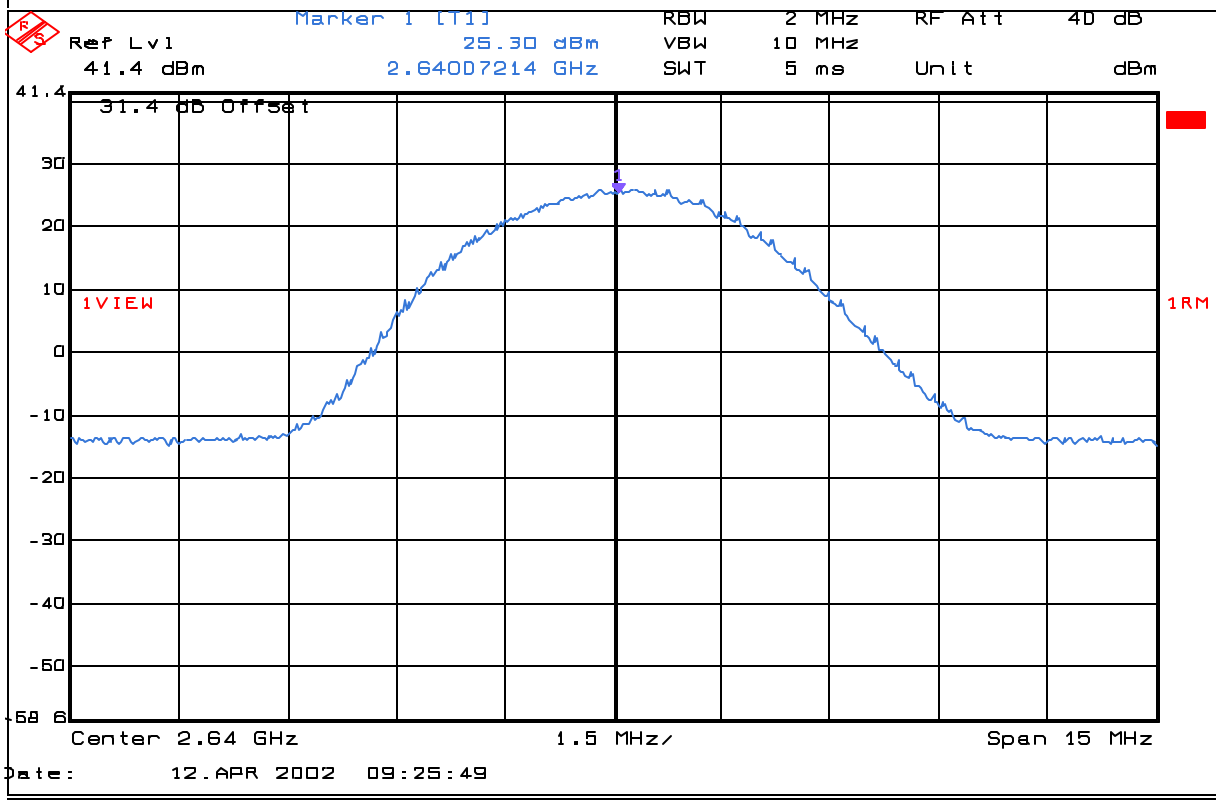
Page 1 of 2

Complete X
Preliminary: _____

Job No.: 2L0210 Date: 4/12/2002
Specification: PT 21 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: 2.6 GHz CPE
Configuration: TX FULL POWER IN TEST FIXTURE
Sample Number: 1
Location: Lab 2 RBW: 2 MHz
Detector Type: Rms VBW: 2 MHz

Test Equipment Used

Antenna: _____ Directional Coupler: Anaren 20 dB Coupler Model 1C0870-20 (0.5-4.0 GHz)
Pre-Amp: _____ Cable #1: 1629
Filter: _____ Cable #2: _____
Receiver: 1036 Cable #3: _____
Attenuator #1 1469 Cable #4: _____
Attenuator #2: Mixer: _____
Additional equipment used: _____
Measurement Uncertainty: +/-1.7 dB



Notes: **25.3 dBm output**

Test Data – RF Power Output

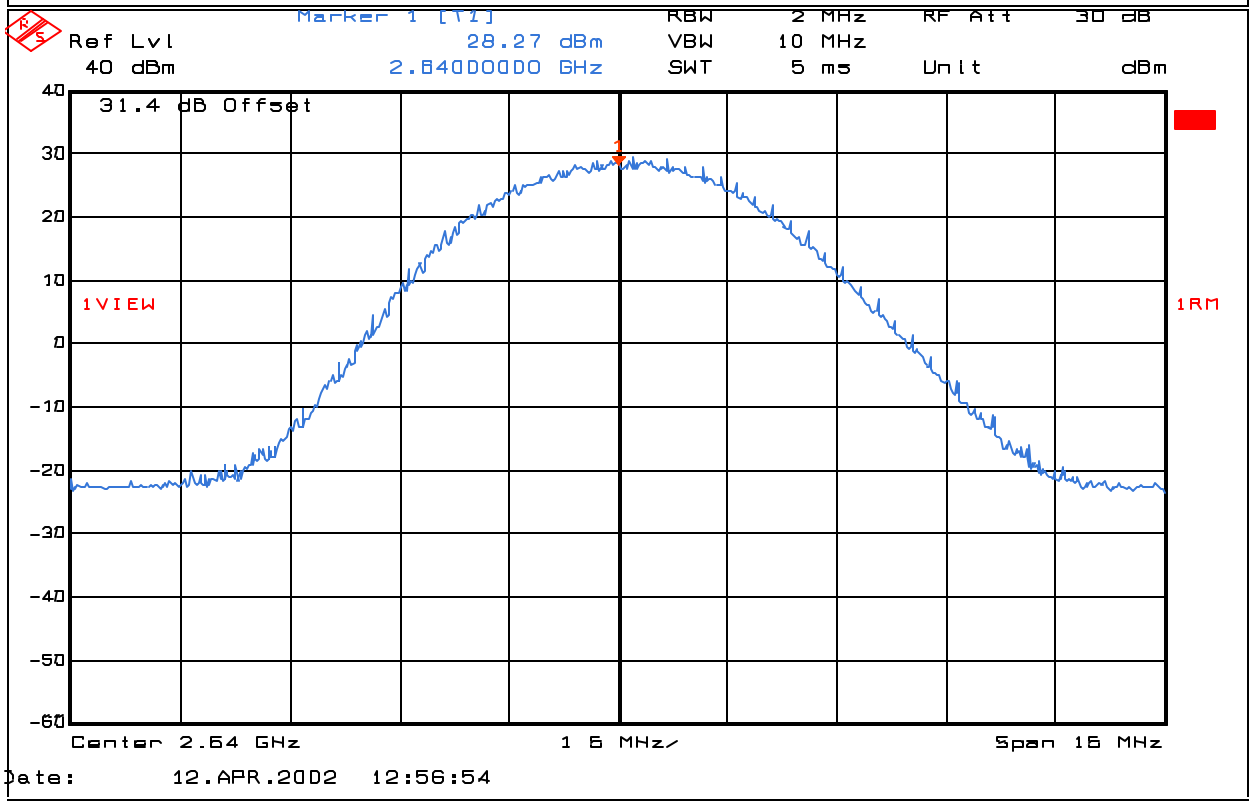
Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Nemko Dallas, Inc.

Data Plot **RF Power Output**

Page ~~2~~ of 2

Job No.: 2L0210 Date: 4/12/2002
Specification: PT 21 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: 2.6 GHz CPE
Configuration: TX FULL POWER IN TEST FIXTURE



Notes: 28.3 dBm output

Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 2.1049
TESTED BY: David Light	DATE:4/12/2002

Test Results: Complies

Measurement Data: See attached plots.

Test Data – Occupied Bandwidth

Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Nemko Dallas, Inc.

Data Plot **Occupied Bandwidth**

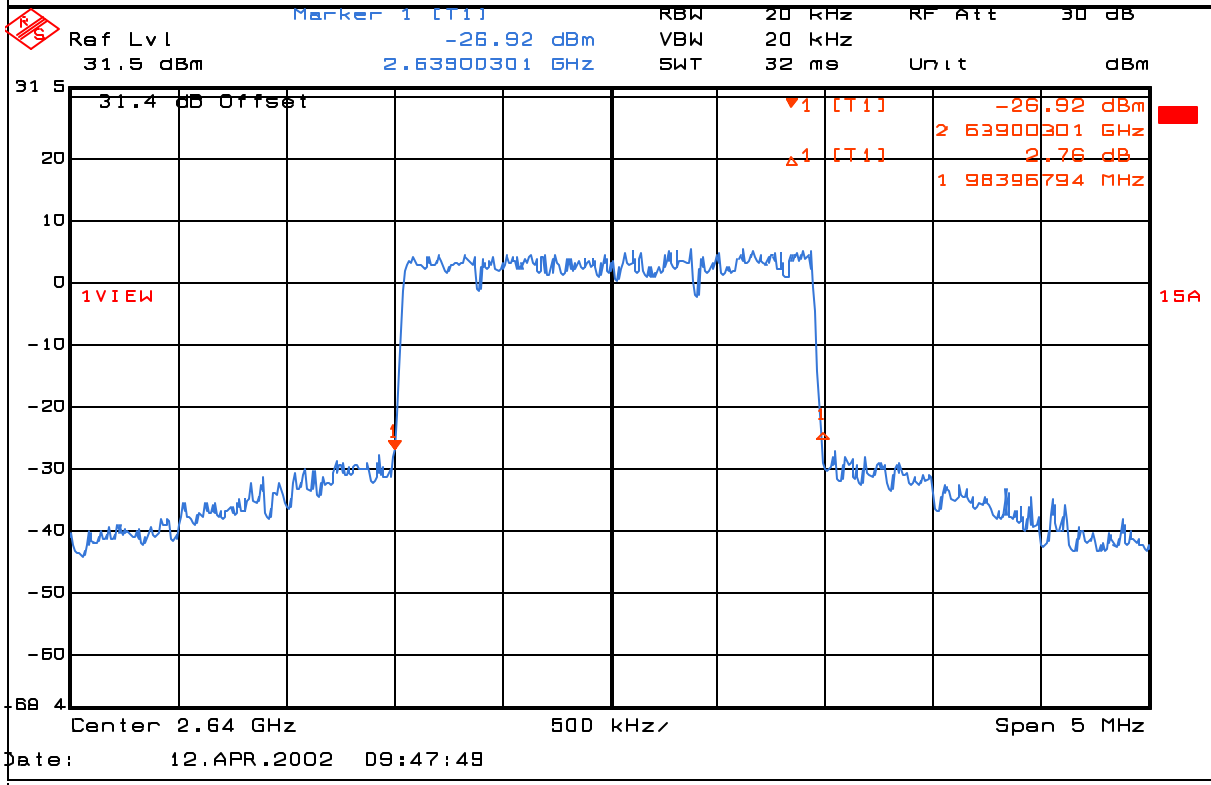
Page 1 of 2

Complete X
Preliminary:

Job No.: 2L0210 Date: 4/12/2002
Specification: PT 21 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: 2.6 GHz CPE
Configuration: TX FULL POWER IN TEST FIXTURE
Sample Number: 1
Location: Lab 2 RBW: 2 MHz
Detector Type: Rms VBW: 2 MHz

Test Equipment Used

Antenna:
Pre-Amp:
Filter:
Receiver: 1036
Attenuator #1 1469
Attenuator #2:
Directional Coupler: Anaren 20 dB Coupler Model 1C0870-20 (0.5-4.0 GHz)
Cable #1: 1629
Cable #2:
Cable #3:
Cable #4:
Mixer:
Additional equipment used:
Measurement Uncertainty: +/-1.7 dB



Notes: 25 dBm output

Test Data – Occupied Bandwidth

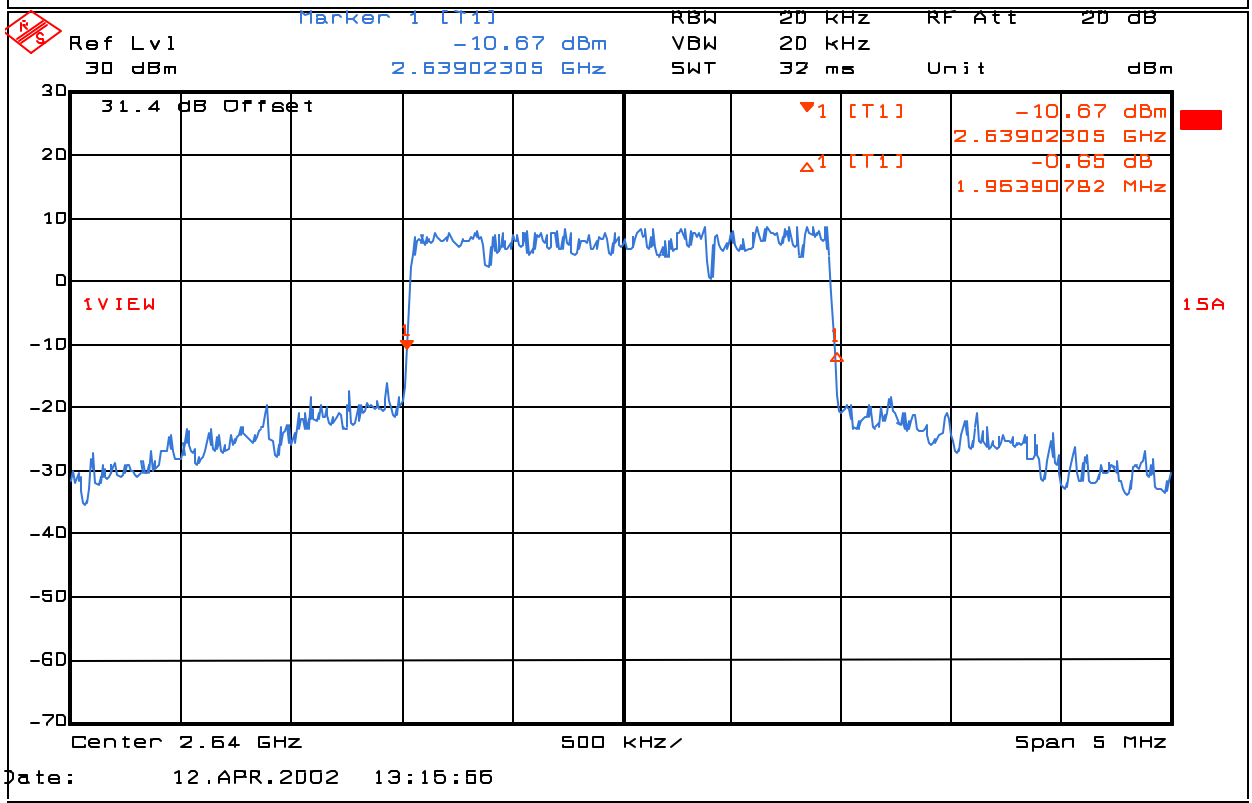
Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Nemko Dallas, Inc.

Data Plot **Occupied Bandwidth**

Page ~~2~~ of 2

Job No.: 2L0210 Date: 4/12/2002
Specification: PT 21 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: 2.6 GHz CPE
Configuration: TX FULL POWER IN TEST FIXTURE



Notes: **28 dBm output**

Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 2.1051
TESTED BY: David Light	DATE:4/12/2002

Test Results: Complies

Measurement Data: See attached plots.

Test Data – Spurious Emissions at Antenna Terminals

Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Nemko Dallas, Inc.

Data Plot **Spurious Emissions at Antenna Terminal**

Page 1 of 2

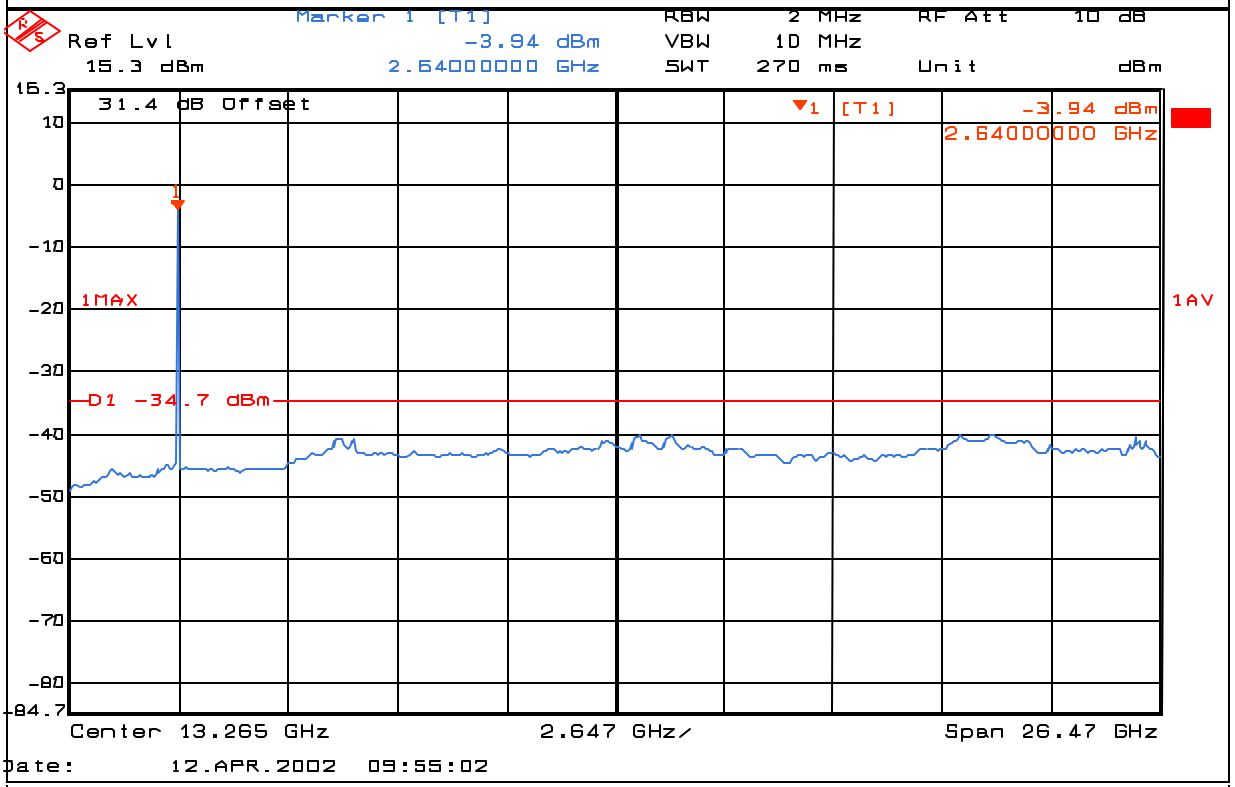
Complete X
Preliminary:

Job No.: 2L0210 Date: 4/12/2002
Specification: PT 21 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: 2.6 GHz CPE
Configuration: TX FULL POWER IN TEST FIXTURE
Sample Number: 1
Location: Lab 2 RBW: 2 MHz
Detector Type: Rms VBW: 2 MHz

Test Equipment Used

Antenna:
Pre-Amp:
Filter:
Receiver: 1036
Attenuator #1 1469
Attenuator #2:
Additional equipment used:
Measurement Uncertainty: +/-1.7 dB

Directional Coupler: Anaren 20 dB Coupler Model 1C0870-20 (0.5-4.0 GHz)
Cable #1: 1629
Cable #2:
Cable #3:
Cable #4:
Mixer:



Notes: Display line indicates -60 dBc
25.3 dBm output
Marker indicates carrier

Test Data – Spurious Emissions at Antenna Terminals

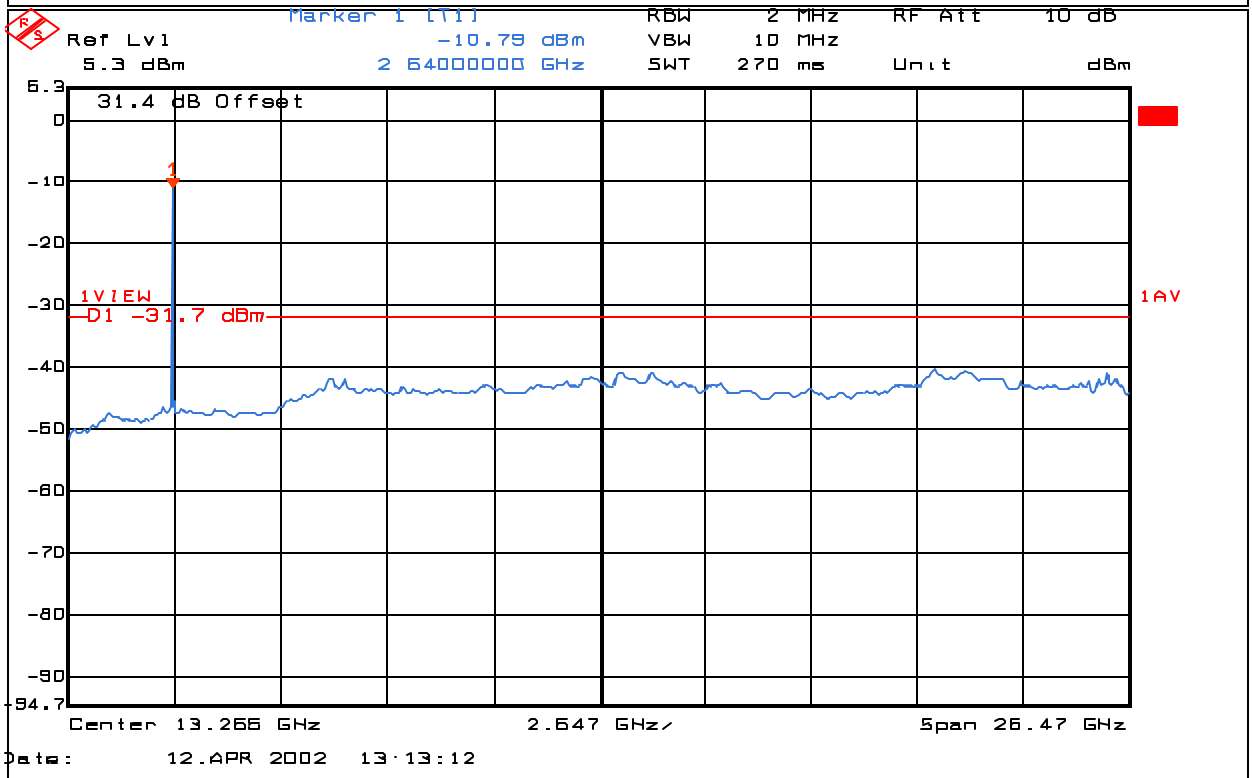
Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Nemko Dallas, Inc.

Data Plot **Spurious Emissions at Antenna Terminal**

Page ~~2~~ of 2

Job No.: 2L0210 Date: 4/12/2002
Specification: PT 21 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: 2.6 GHz CPE
Configuration: TX FULL POWER IN TEST FIXTURE



Notes: Display line indicates -60 dBc
28.3 dBm output
Marker indicates carrier

Section 6. Field Strength of Spurious

NAME OF TEST: Field Strength of Spurious Emissions	PARA. NO.: 2.1053
TESTED BY: David Light	DATE: 4/12/2002

Test Results: Complies

Measurement Data: See attached table.

Test Data - Radiated Emissions

Nemko Dallas, Inc.

Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

ERP Substitution Method

Page 1 of 1 — Complete X

Job No.: 2L0210 — Date: 4/12/2002 — Preliminary

Specification: PT 21 — Temperature(°C): 22

Tested By: David Light — Relative Humidity(%) 50

E.U.T.: 2.6 GHz CPE

Configuration: TX FULL POWER IN TEST FIXTURE - ANTENNA PORTS LOADED

Sample No: 1

Location: AC 3 — RBW: 2 MHz — Measurement

Detector Type: Peak — VBW: 3 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)	RF Output (dBm)	Pre-Amp Gain (dB)	Substitution Antenna Gain (dBd)	Limit (dBm)	ERP (dBm)	ERP (mW)	Polarity	Comments
5280	-56.5	41.3	25.3	33.3	8.2	-34.7	-40.3	0.0001	V	
7920	-58.7	41.8	25.3	33.7	9.2	-34.7	-41.4	0.0001	V	Noise Floor
10560	-60.2	42.8	25.3	35.7	10.3	-34.7	-42.8	0.0001	V	Noise Floor
13200	-62.7	45.8	25.3	33.8	9.8	-34.7	-40.9	0.0001	V	Noise Floor
15840	-62.5	44.3	25.3	33.2	12.9	-34.7	-38.5	0.0001	V	Noise Floor
5280	-52.7	38.3	25.3	33.3	8.2	-34.7	-39.5	0.0001	H	
7920	-58.7	41.5	25.3	33.7	9.2	-34.7	-41.8	0.0001	H	Noise Floor
10560	-60.2	46.2	25.3	35.7	10.3	-34.7	-39.5	0.0001	H	Noise Floor
13200	-62.7	47.8	25.3	33.8	9.8	-34.7	-38.9	0.0001	H	Noise Floor
15840	-62.5	45.5	25.3	33.2	12.9	-34.7	-37.3	0.0002	H	Noise Floor
5280	-56.0	41.3	28.3	33.3	8.2	-31.7	-39.8	0.0001	V	
7920	-58.7	41.8	28.3	33.7	9.2	-31.7	-41.4	0.0001	V	Noise Floor
10560	-55.0	42.8	28.3	35.7	10.3	-31.7	-37.6	0.0002	V	Noise Floor
13200	-62.7	45.8	28.3	33.8	9.8	-31.7	-40.9	0.0001	V	Noise Floor
15840	-62.5	44.3	28.3	33.2	12.9	-31.7	-38.5	0.0001	V	Noise Floor
5280	-52.0	38.3	28.3	33.3	8.2	-31.7	-38.8	0.0001	H	
7920	-58.7	41.5	28.3	33.7	9.2	-31.7	-41.8	0.0001	H	Noise Floor
10560	-54.7	46.2	28.3	35.7	10.3	-31.7	-34.0	0.0004	H	
13200	-62.7	47.8	28.3	33.8	9.8	-31.7	-38.9	0.0001	H	Noise Floor
15840	-62.5	45.5	28.3	33.2	12.9	-31.7	-37.3	0.0002	H	Noise Floor

Notes: **Spectrum searched to the 10th harmonic.**
No emissions detected above 5280 MHz

Photos – Radiated Emissions

Section 7. Frequency Stability

NAME OF TEST: Frequency Stability	PARA. NO.: 2.1055
TESTED BY: David Light	DATE: 4/22/2002

Test Results: Complies

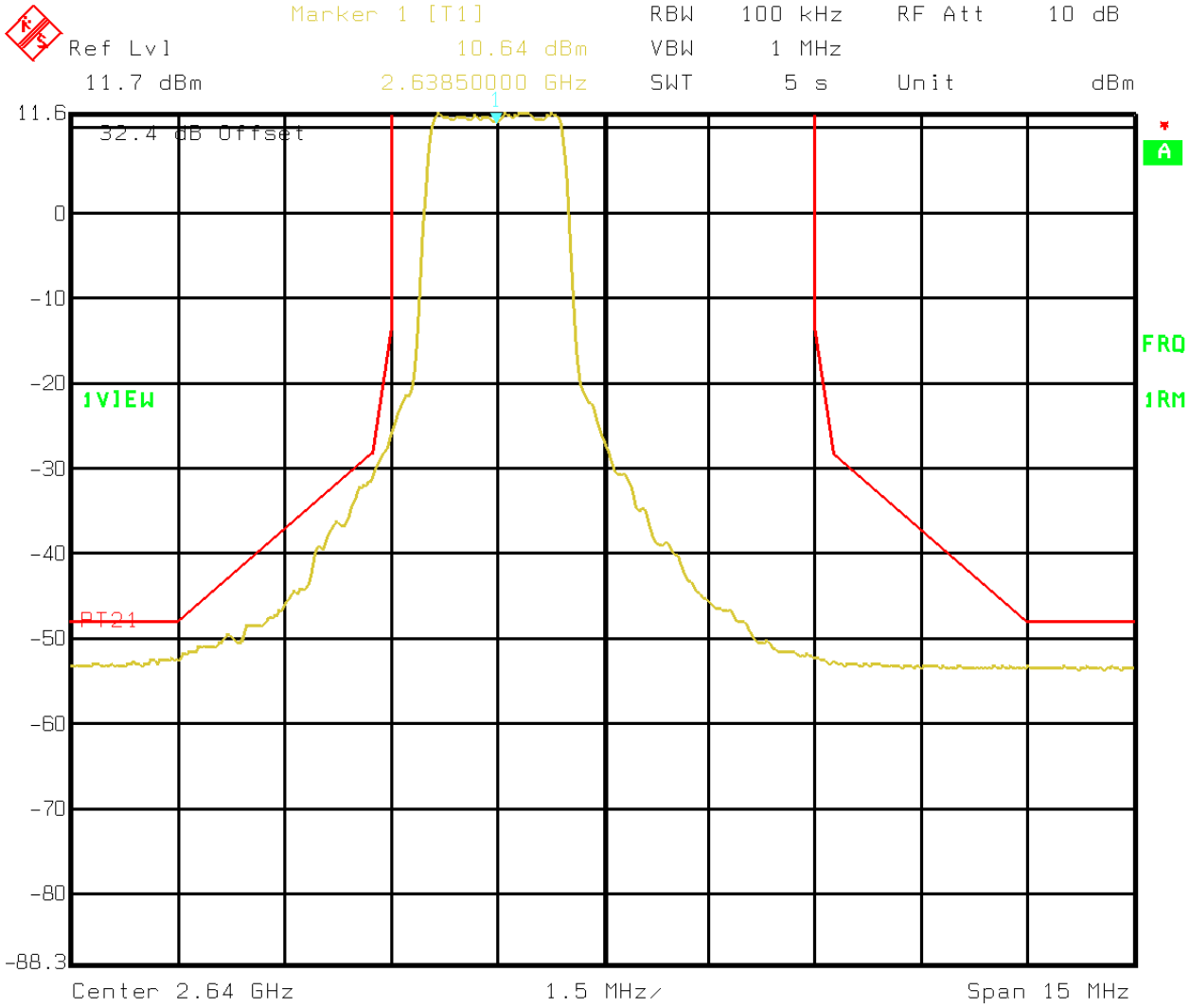
Measurement Data: See attached plots.

Test Equipment Used: 1036-1469-1629-283

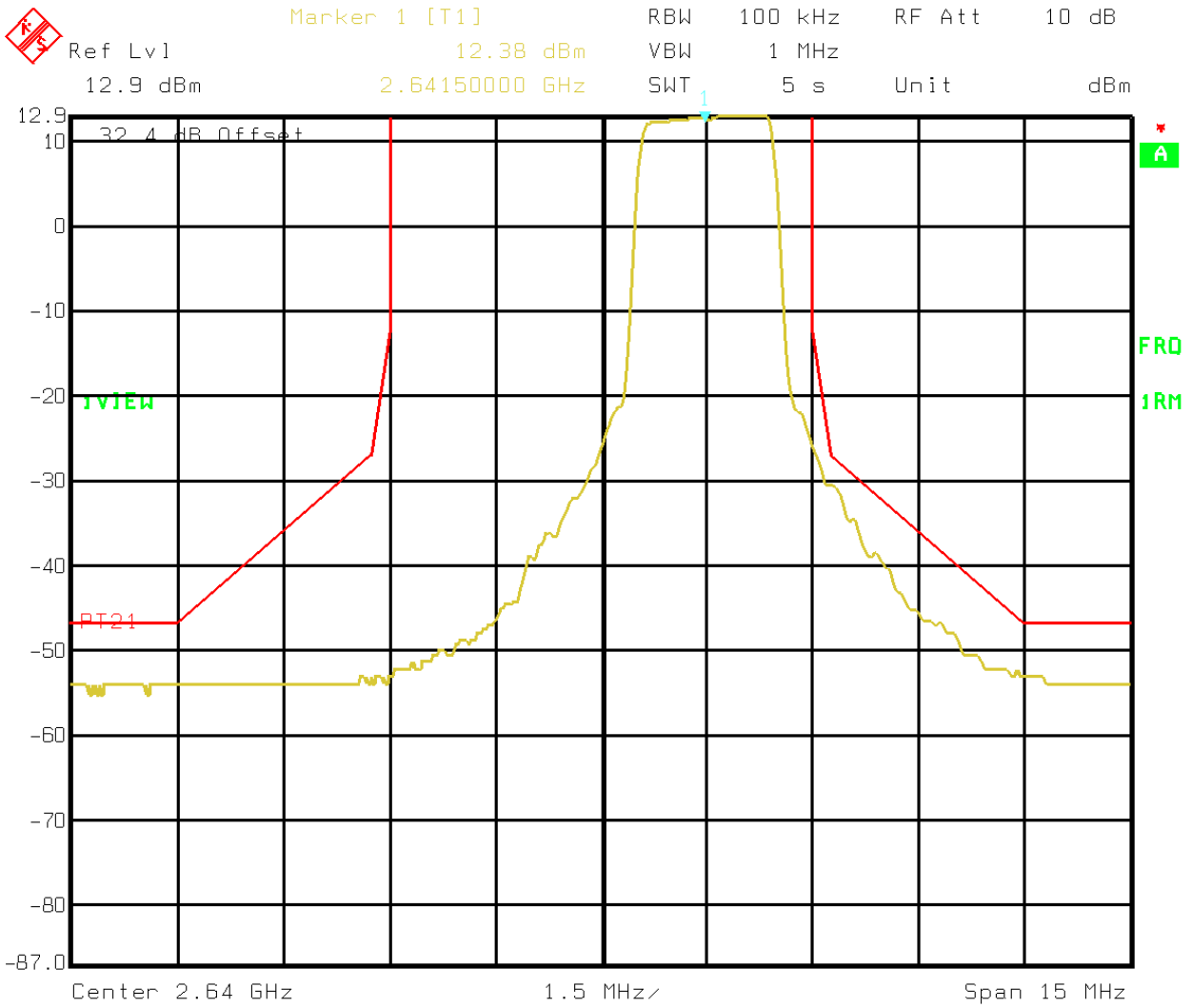
Standard Supply Voltage: 115 Vac

Environmental Conditions: 20 °Celsius
50 % RH

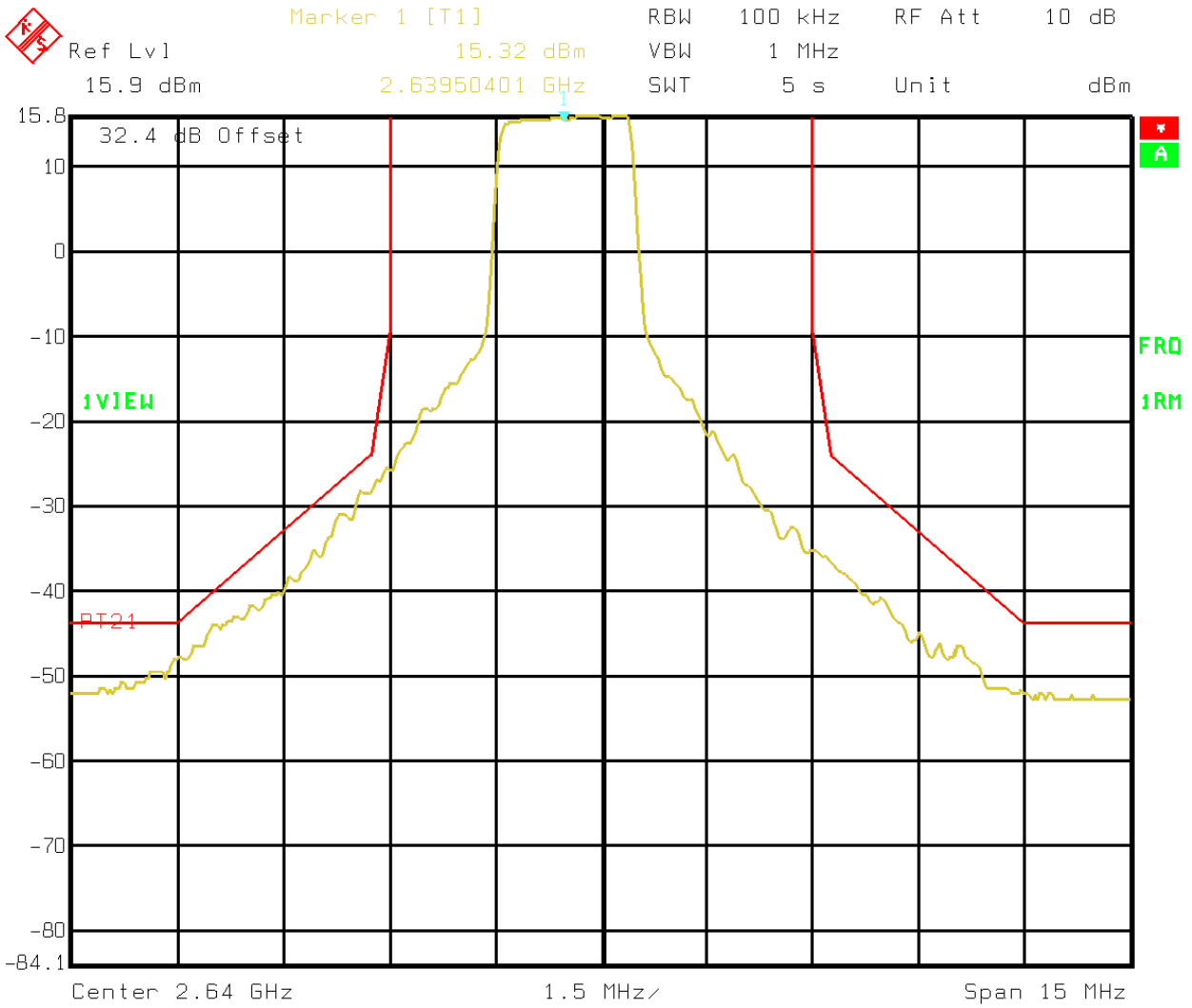
Test Data – Frequency Stability



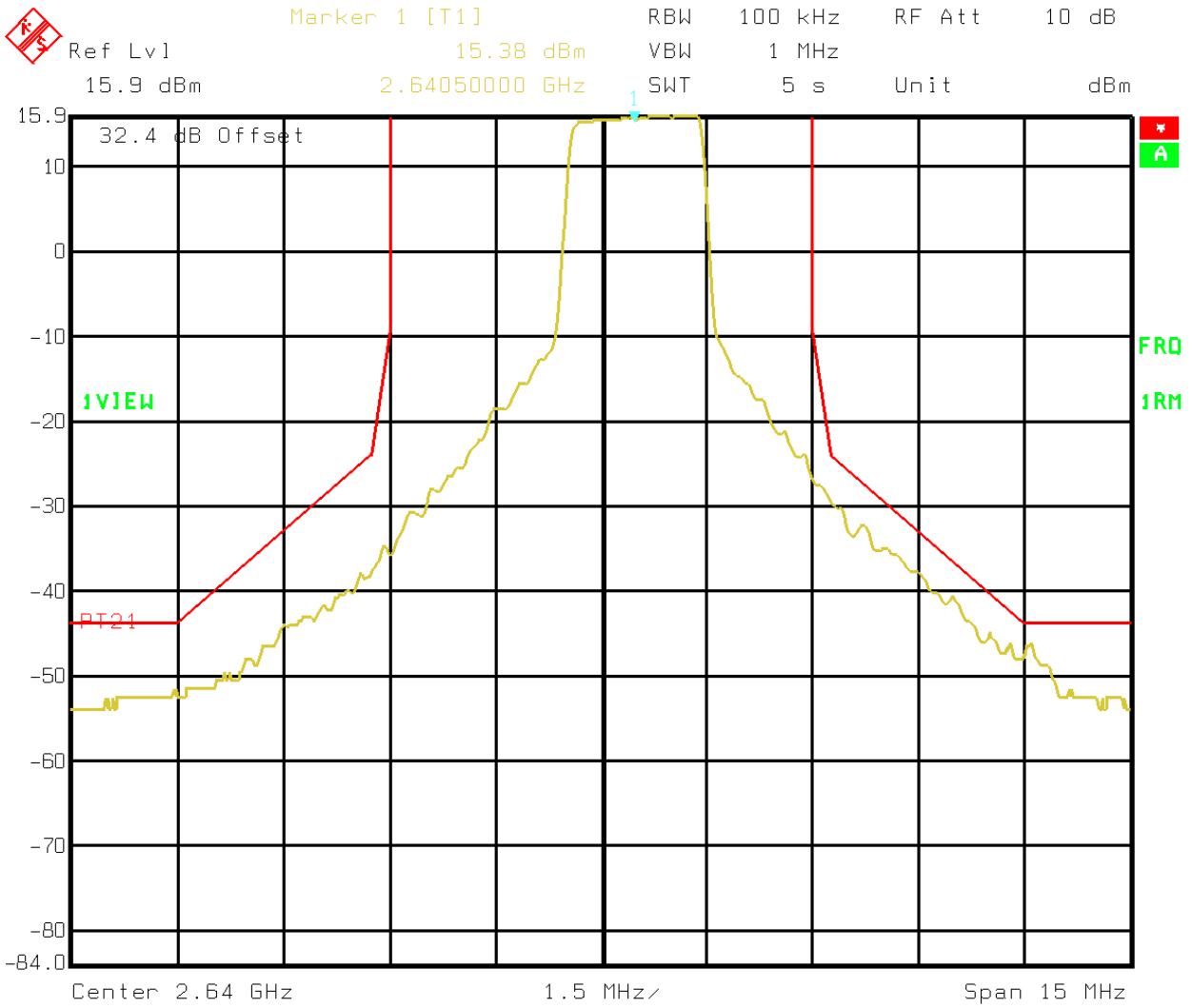
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
25dBm +50C
Date: 23.APR.2002 09:59:11



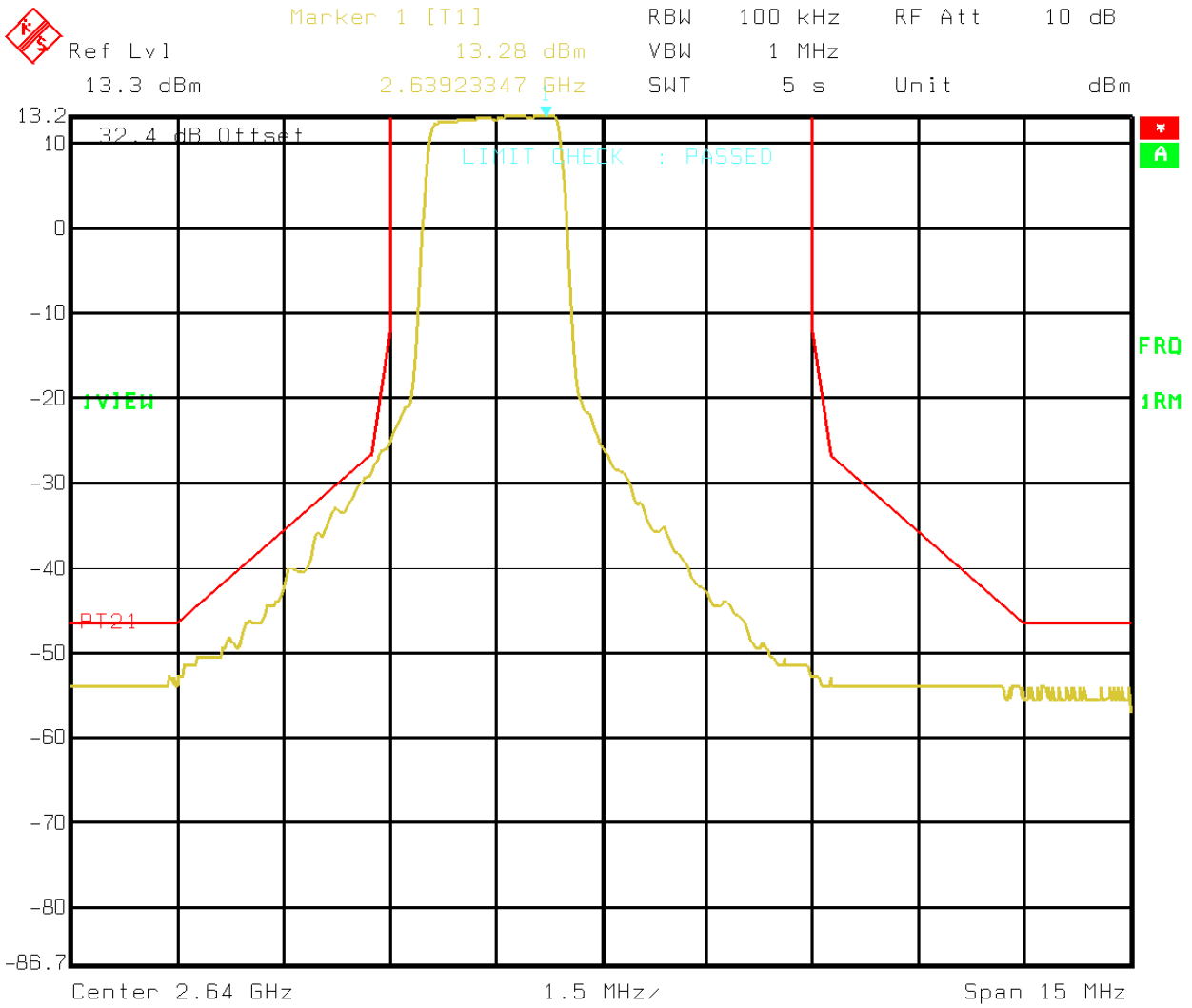
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
25dBm +50C
Date: 23.APR.2002 09:57:51



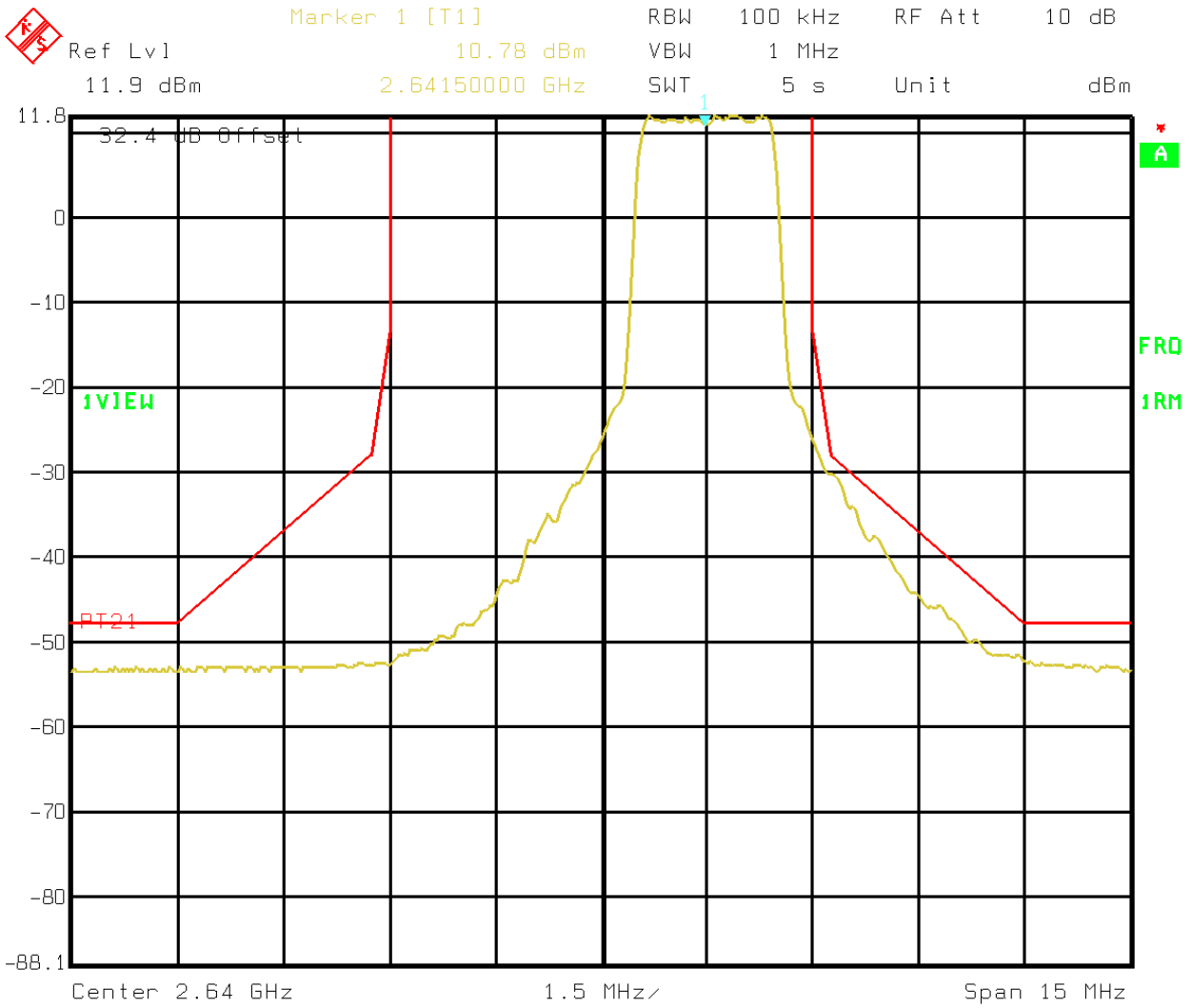
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
28 dBm +50C
Date: 23.APR.2002 10:02:10



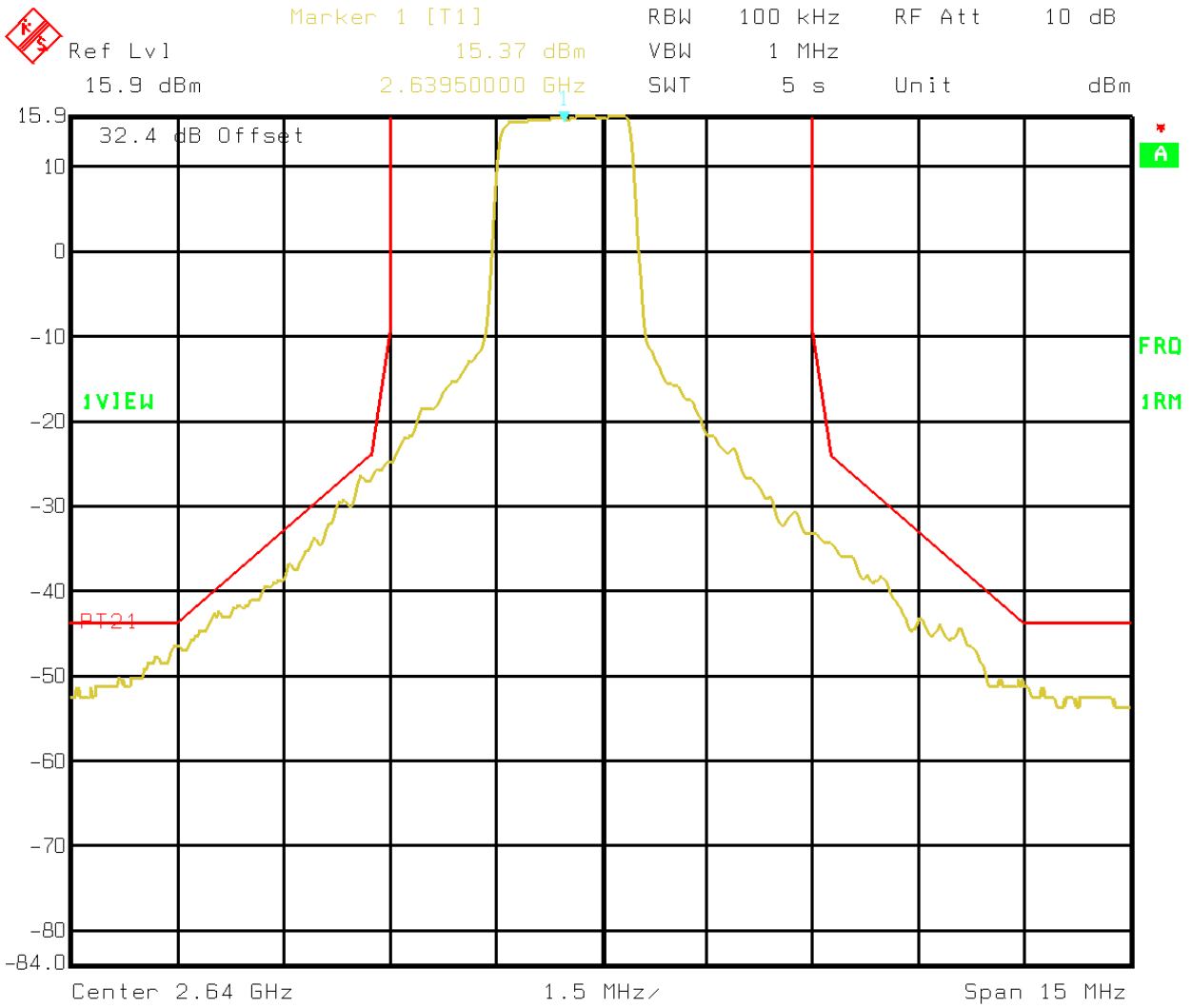
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
28 dBm +50C
Date: 23.APR.2002 10:03:32



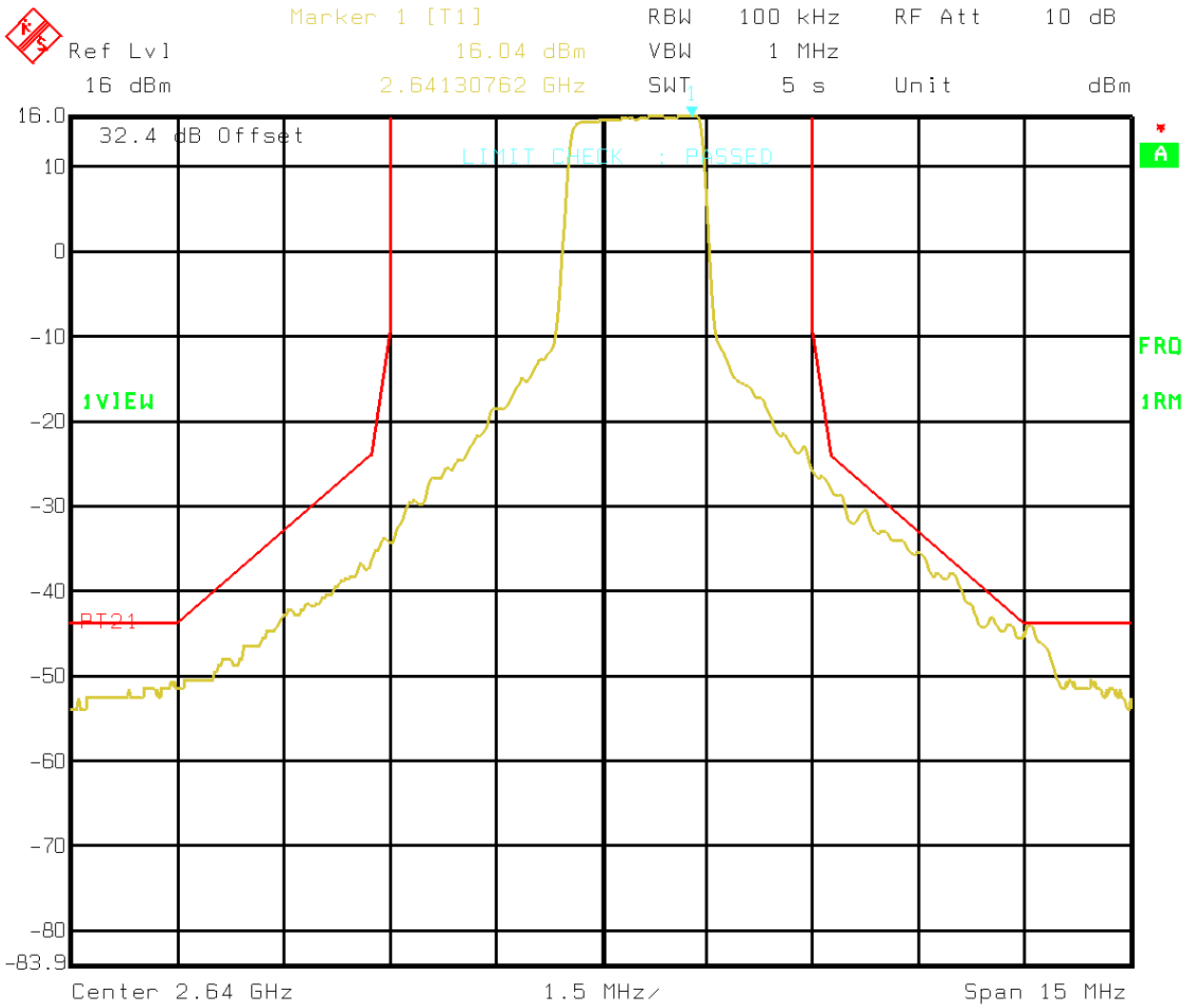
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
25 dBm +40C
Date: 23.APR.2002 10:49:58



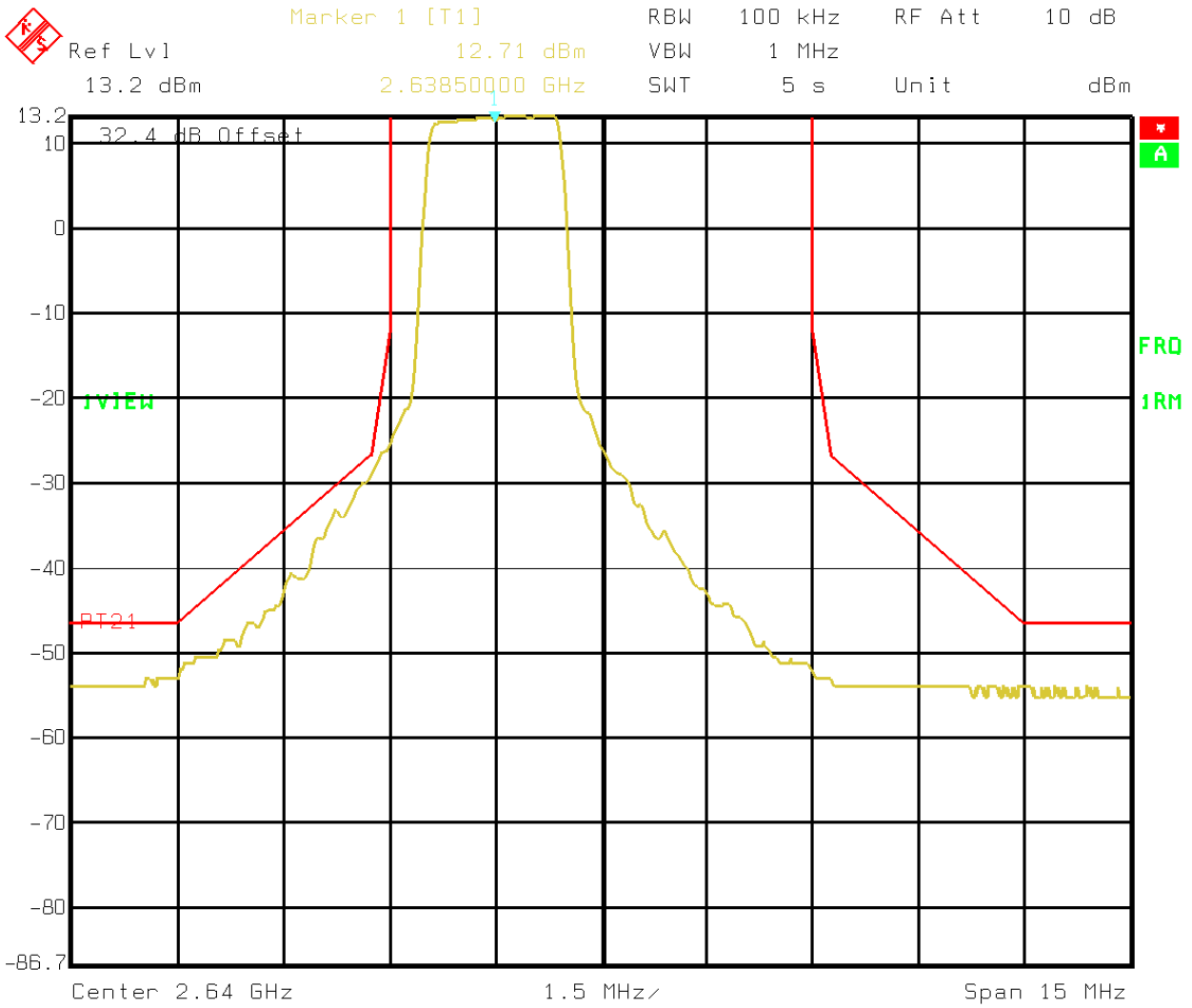
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
25 dBm +40C
Date: 23.APR.2002 10:52:06



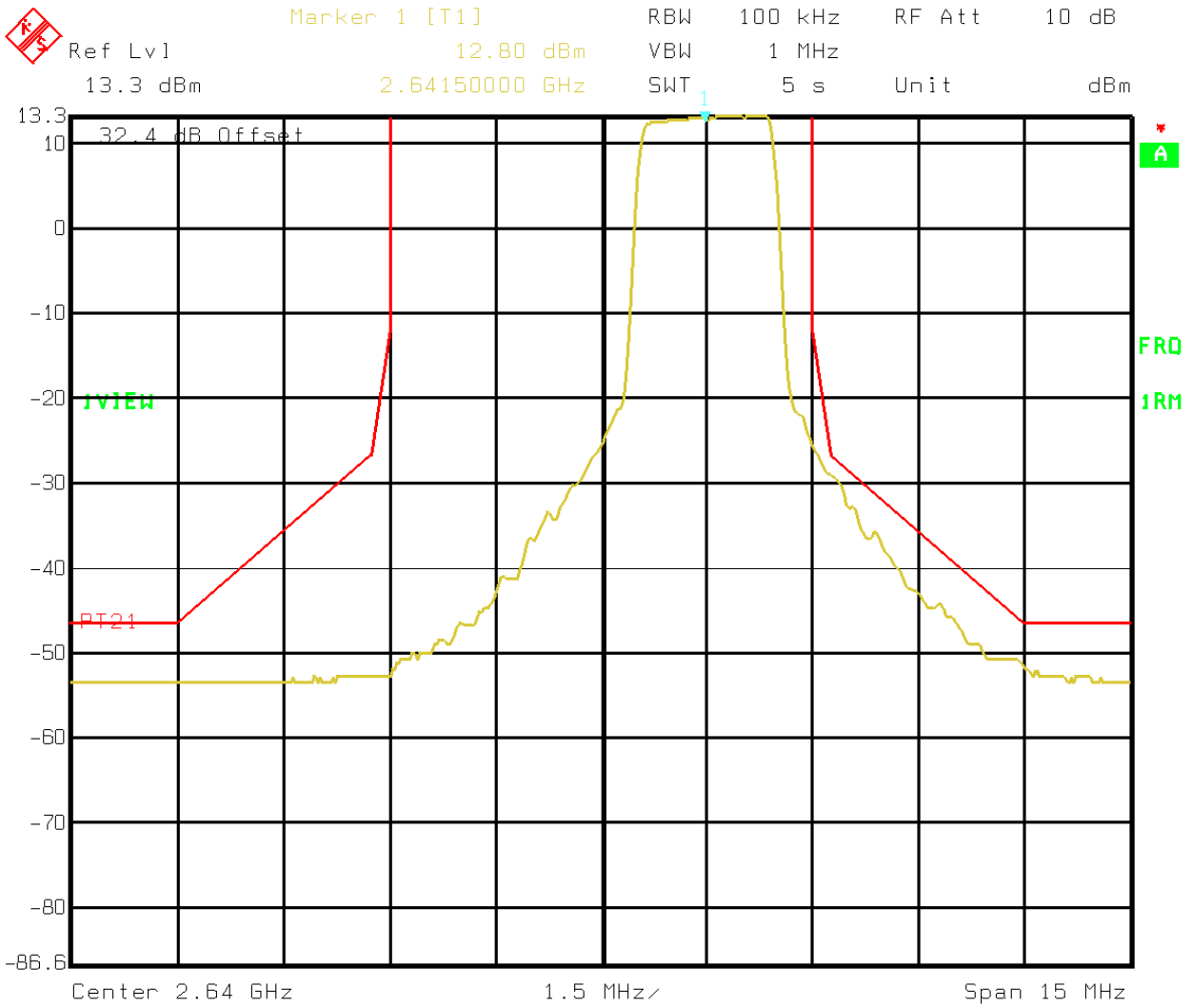
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
28 dBm +40C
Date: 23.APR.2002 10:48:00



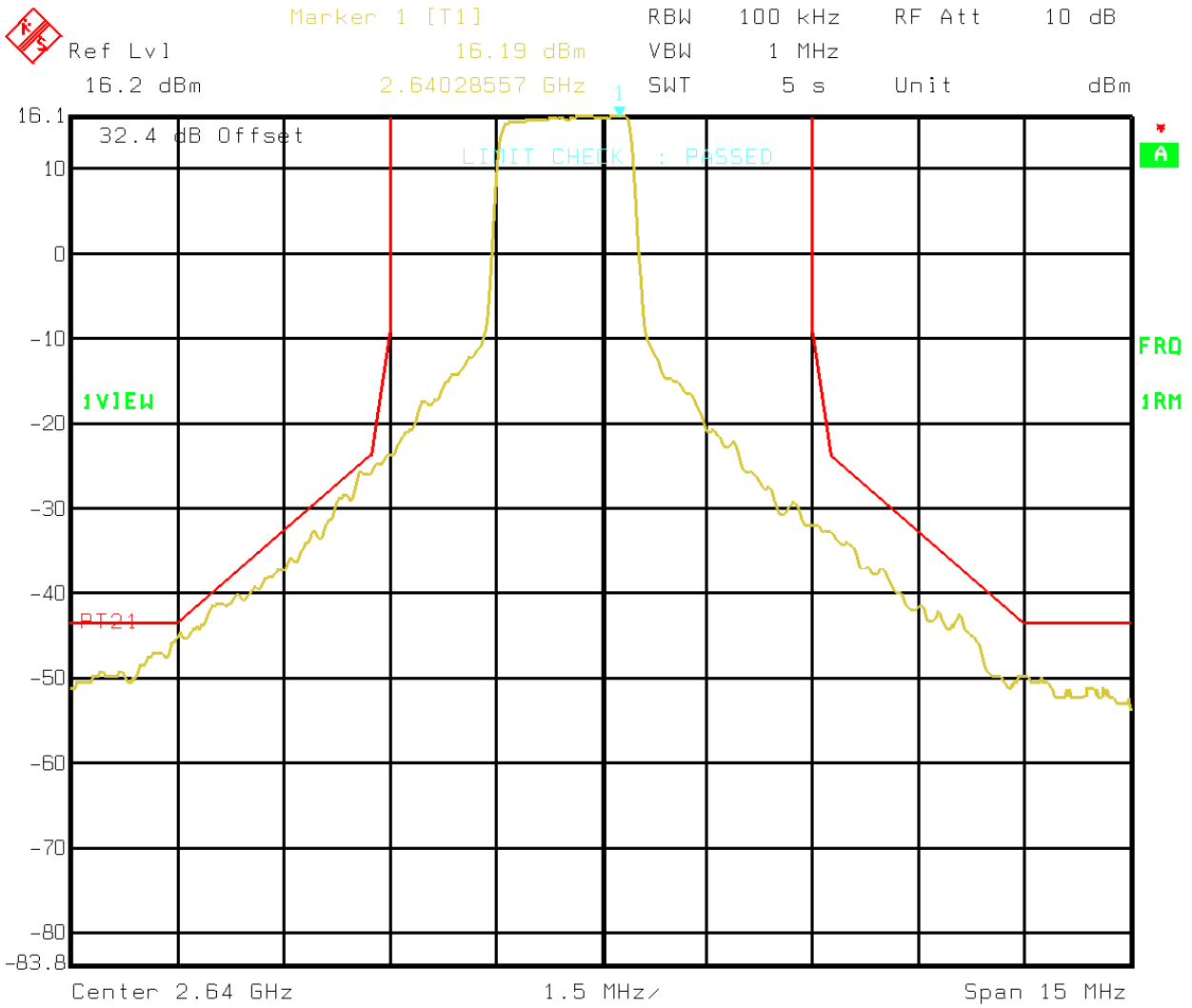
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
28 dBm +40C
Date: 23.APR.2002 10:45:59



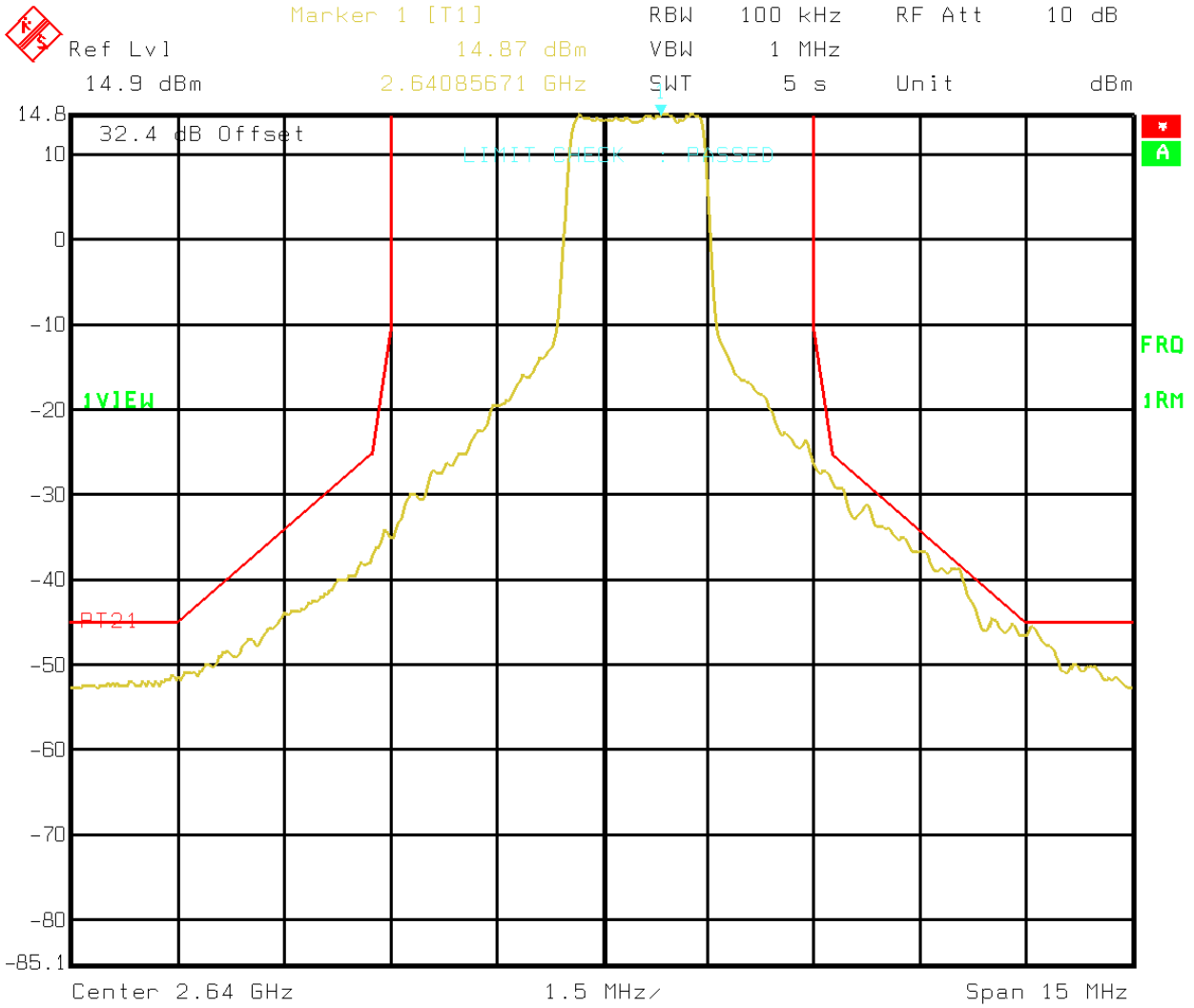
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
25 dBm +30C
Date: 23.APR.2002 11:26:16



Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
25 dBm +30C
Date: 23.APR.2002 11:24:55



Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
28 dBm +30C
Date: 23.APR.2002 11:28:29



Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
28 dBm +30C
Date: 23.APR.2002 11:31:09

Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Nemko Dallas, Inc.

Data Plot — Bandedge Plots

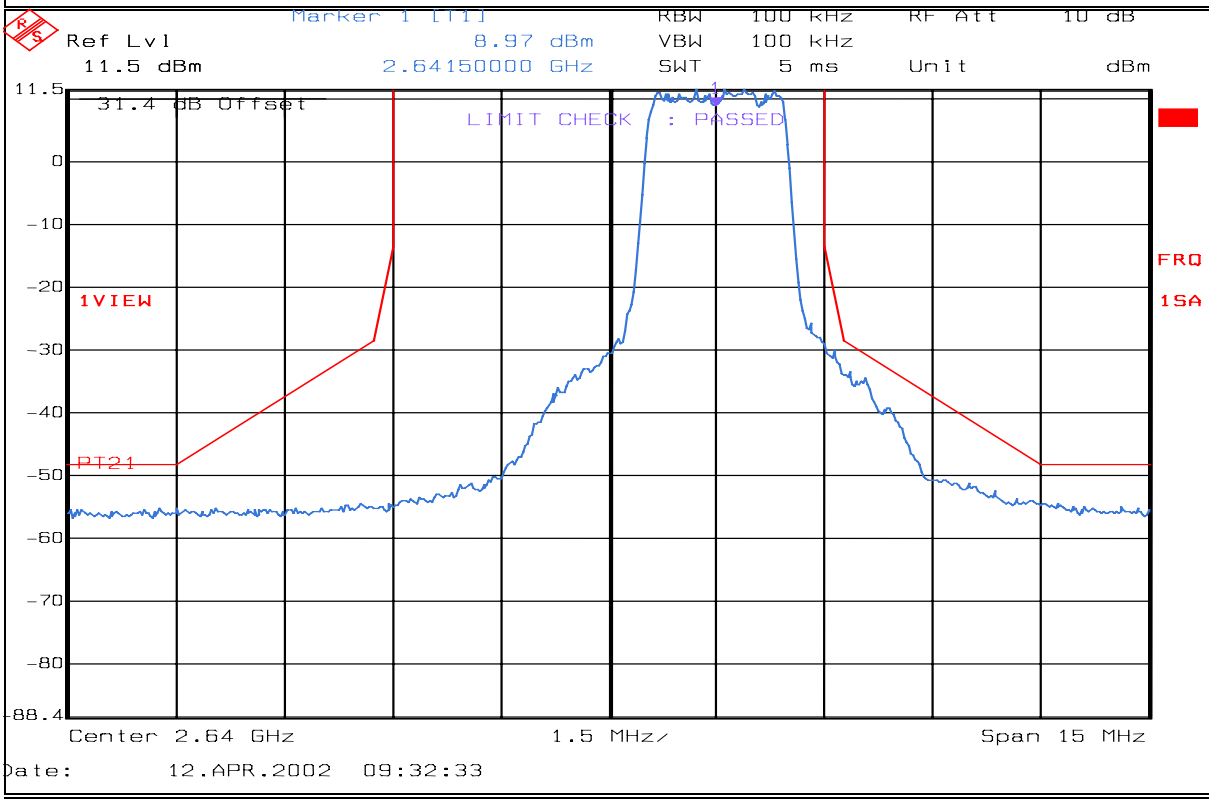
Page 1 of 1

Complete X
Preliminary:

Job No.: 2L0210 Date: 4/12/2002
Specification: PT 21 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: 2.6 GHz CPE
Configuration: TX FULL POWER IN TEST FIXTURE
Sample Number: 1
Location: Lab 2 RBW: 2 MHz
Detector Type: Rms VBW: 2 MHz

Test Equipment Used

Antenna:
Pre-Amp:
Filter:
Receiver: 1036
Attenuator #1 1469
Attenuator #2:
Directional Coupler: Anaren 20 dB Coupler Model 1C0870-20 (0.5-4.0 GHz)
Cable #1: 1629
Cable #2:
Cable #3:
Cable #4:
Mixer:
Additional equipment used:
Measurement Uncertainty: +/-1.7 dB



Notes: **Highest channel available in block at 25 dBm output**
Supply voltage was varied from 98 Vac to 132 Vac with no effect on frequency

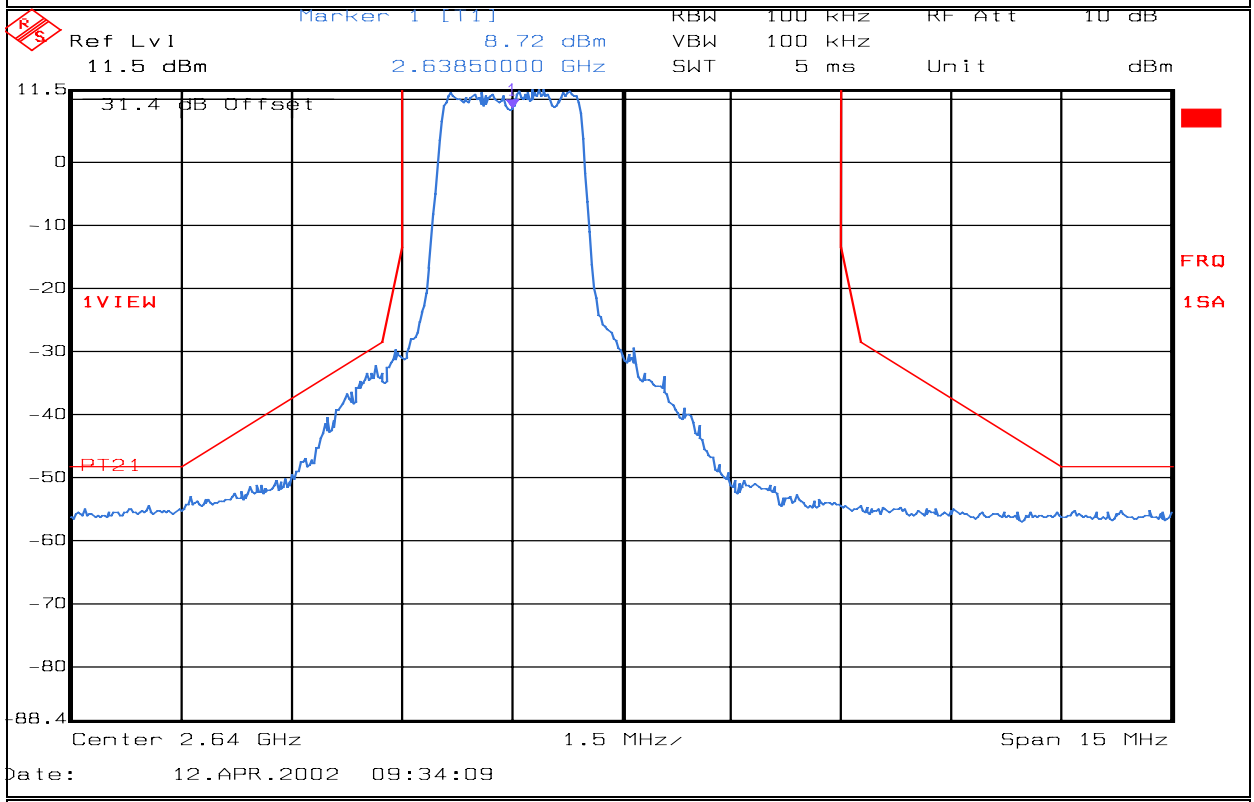
Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Nemko Dallas, Inc.

Data Plot — Bandedge Plots

Page 2 of 1

Job No.:	2L0210	Date:	4/12/2002
Specification:	PT 21	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	2.6 GHz CPE		
Configuration:	TX FULL POWER IN TEST FIXTURE		



Notes: **Lowest channel available in block at 25 dBm output**

Supply voltage was varied from 98 Vac to 132 Vac with no effect on frequency

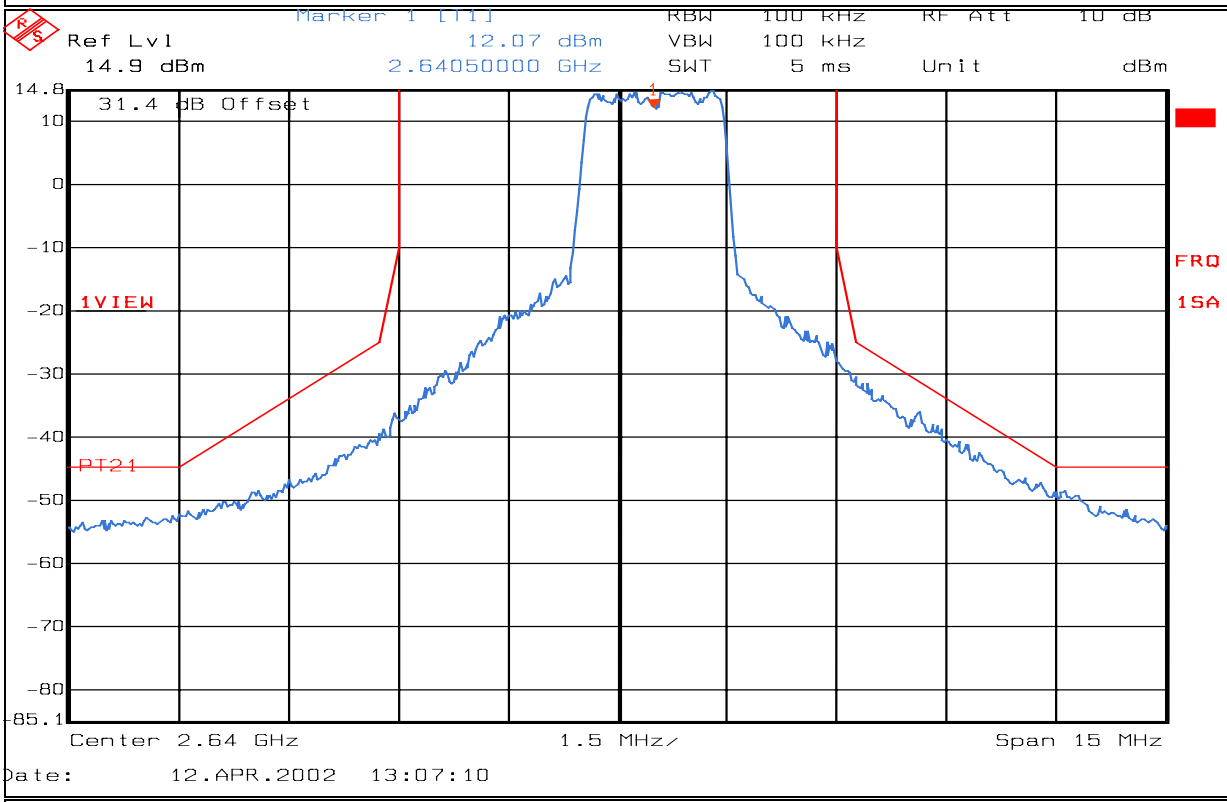
Nemko Dallas, Inc.

Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Data Plot — Bandedge Plots

Page 3 of 1

Job No.:	2L0210	Date:	4/12/2002
Specification:	PT 21	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	2.6 GHz CPE		
Configuration:	TX FULL POWER IN TEST FIXTURE		



Notes: **Highest channel available in block at 28 dBm output**

Supply voltage was varied from 98 Vac to 132 Vac with no effect on frequency

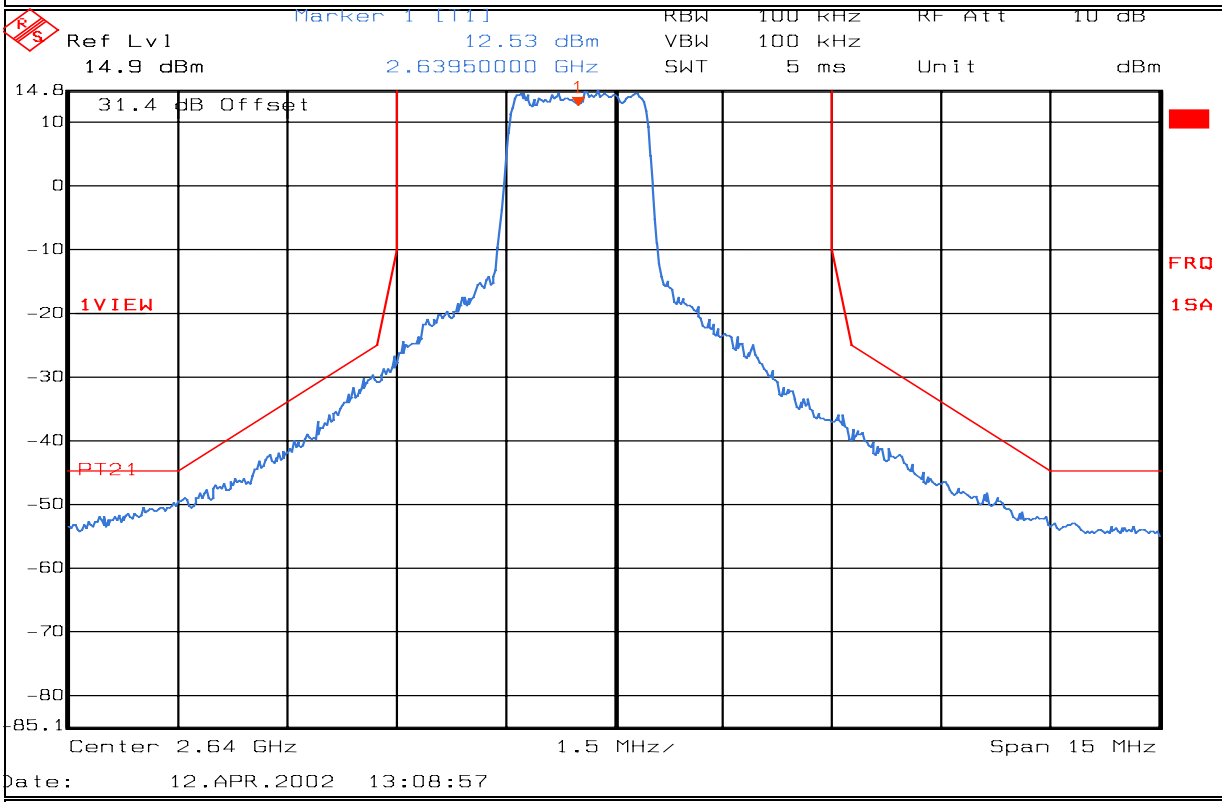
Nemko Dallas, Inc.

Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

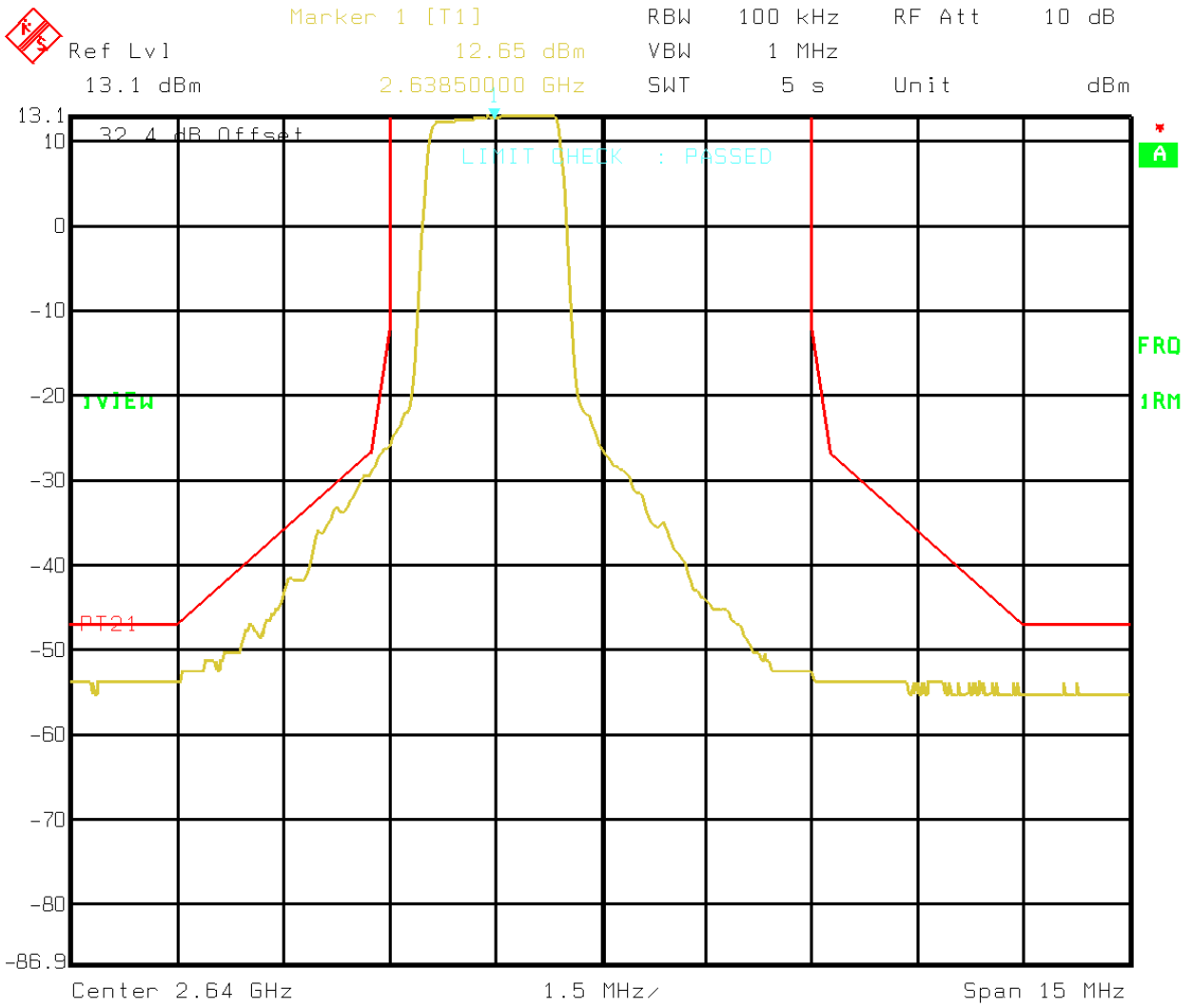
Test Plot: Bandedge Plots

Page 4 of 1

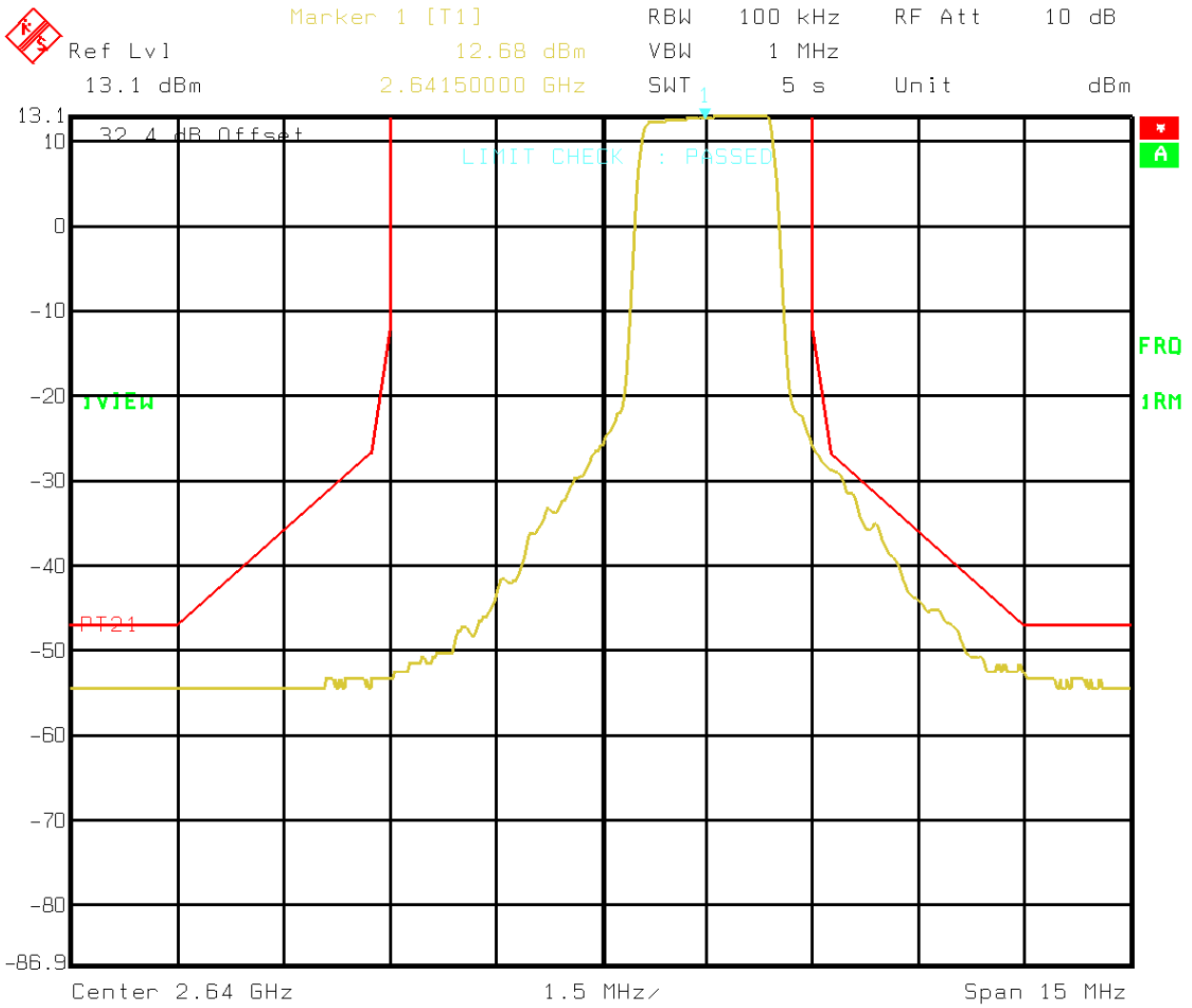
Job No.:	2L0210	Date:	4/12/2002
Specification:	PT 21	Temperature(°C):	22
Tested By:	David Light	Relative Humidity(%)	40
E.U.T.:	2.6 GHz CPE		
Configuration:	TX FULL POWER IN TEST FIXTURE		



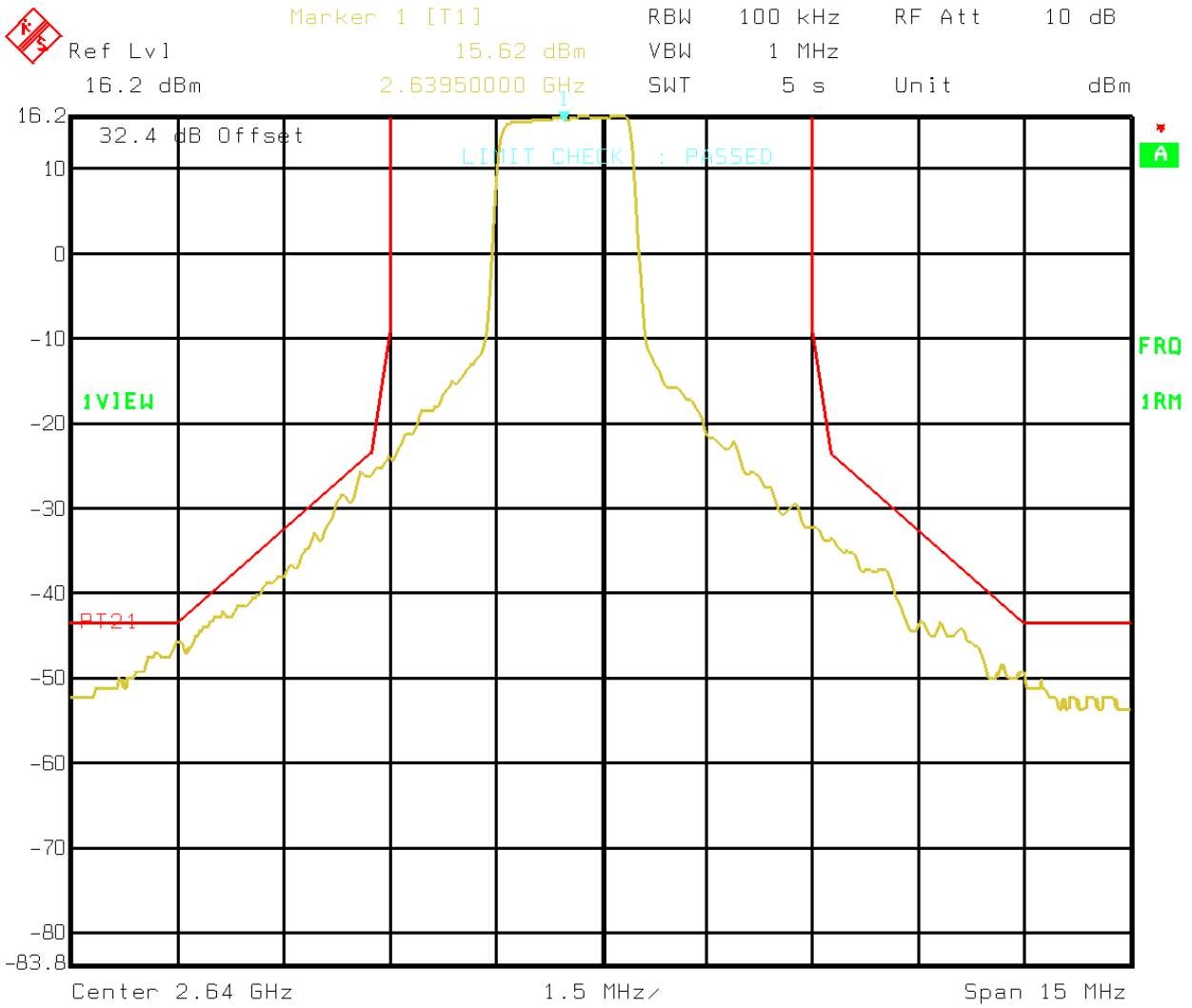
Notes: **Lowest channel available in block at 28 dBm output**
Supply voltage was varied from 98 Vac to 132 Vac with no effect on frequency



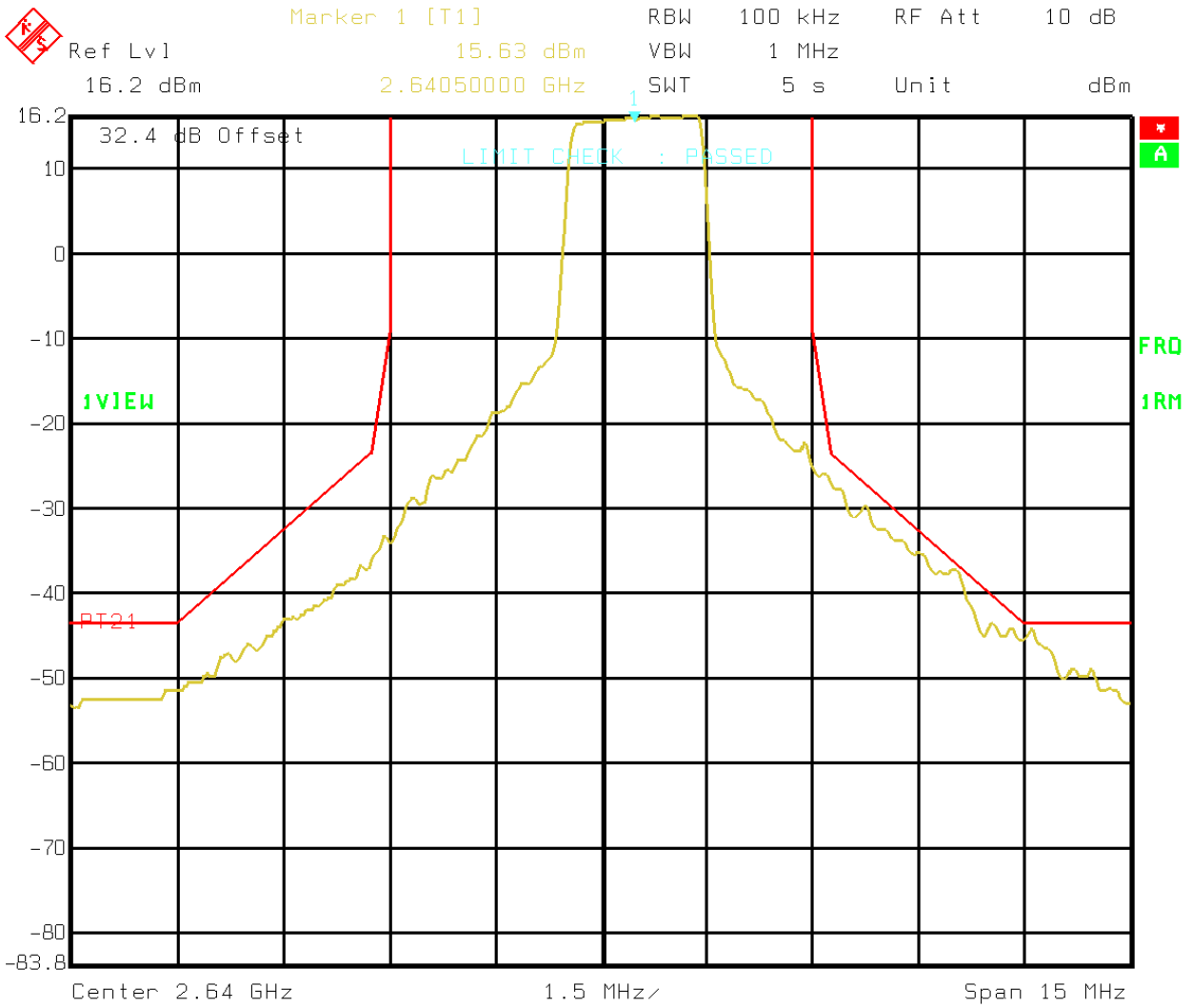
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
25 dBm +10C
Date: 23.APR.2002 12:39:15



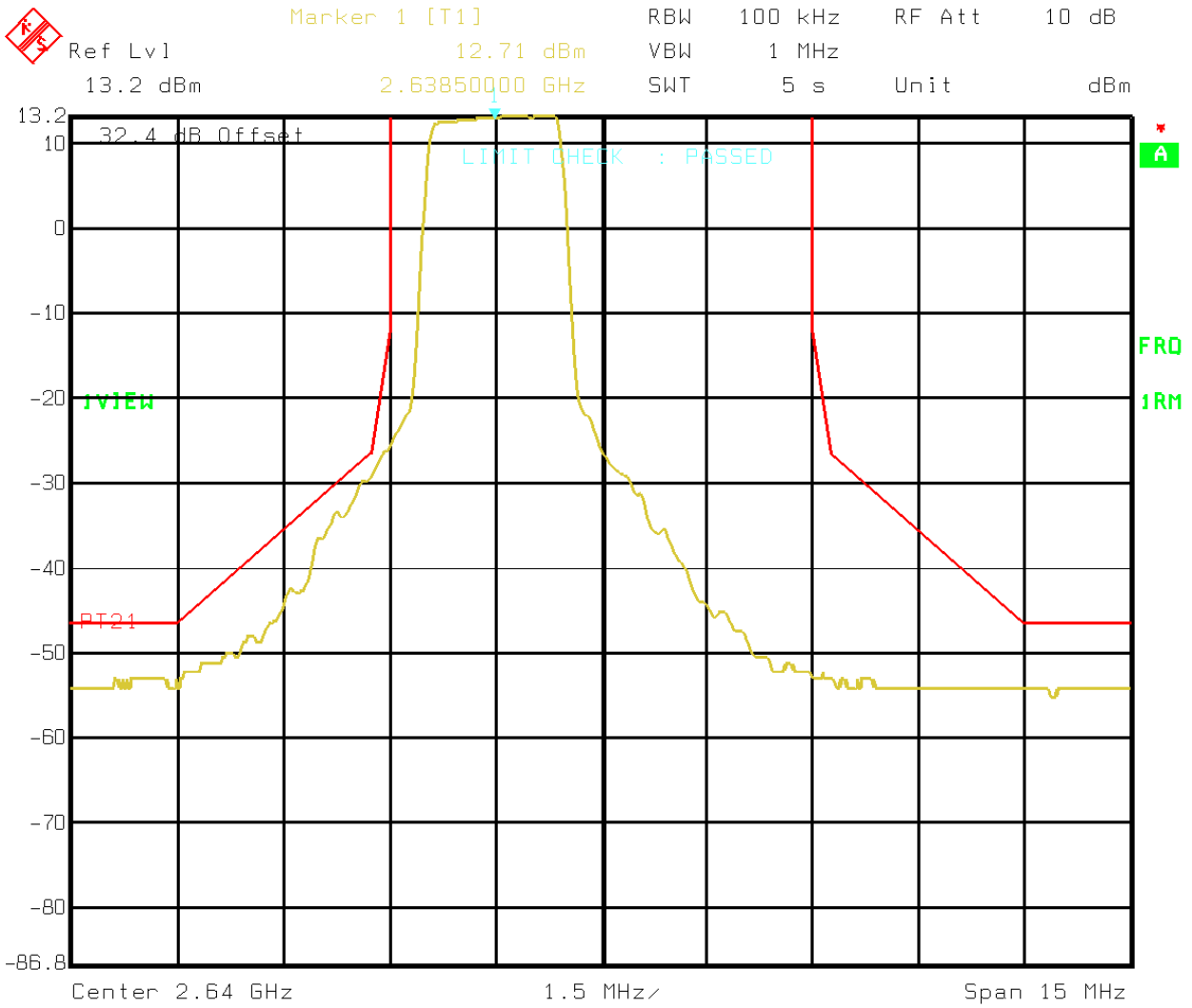
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
25 dBm +10C
Date: 23.APR.2002 12:40:17



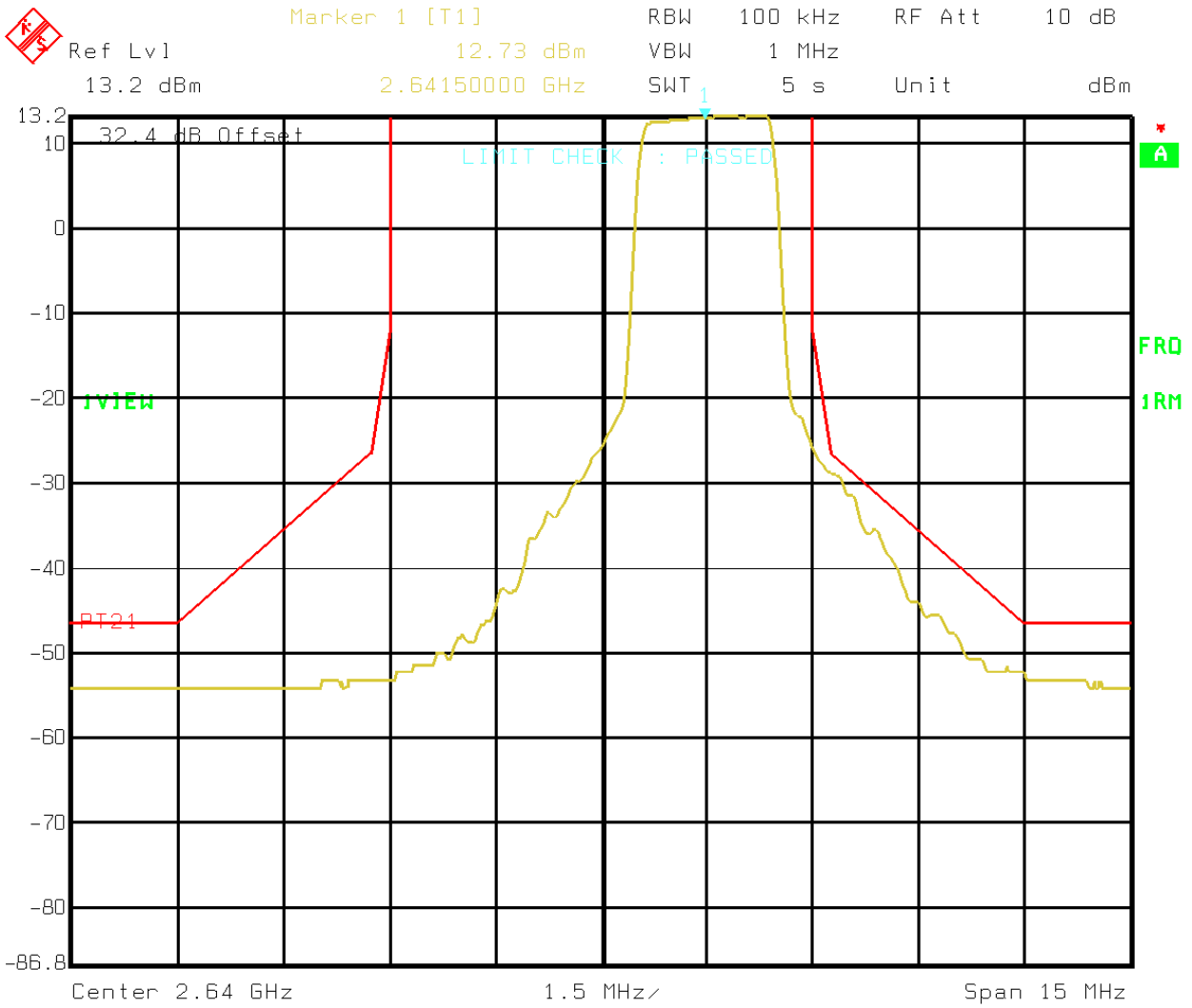
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
28 dBm +10C
Date: 23.APR.2002 12:37:10



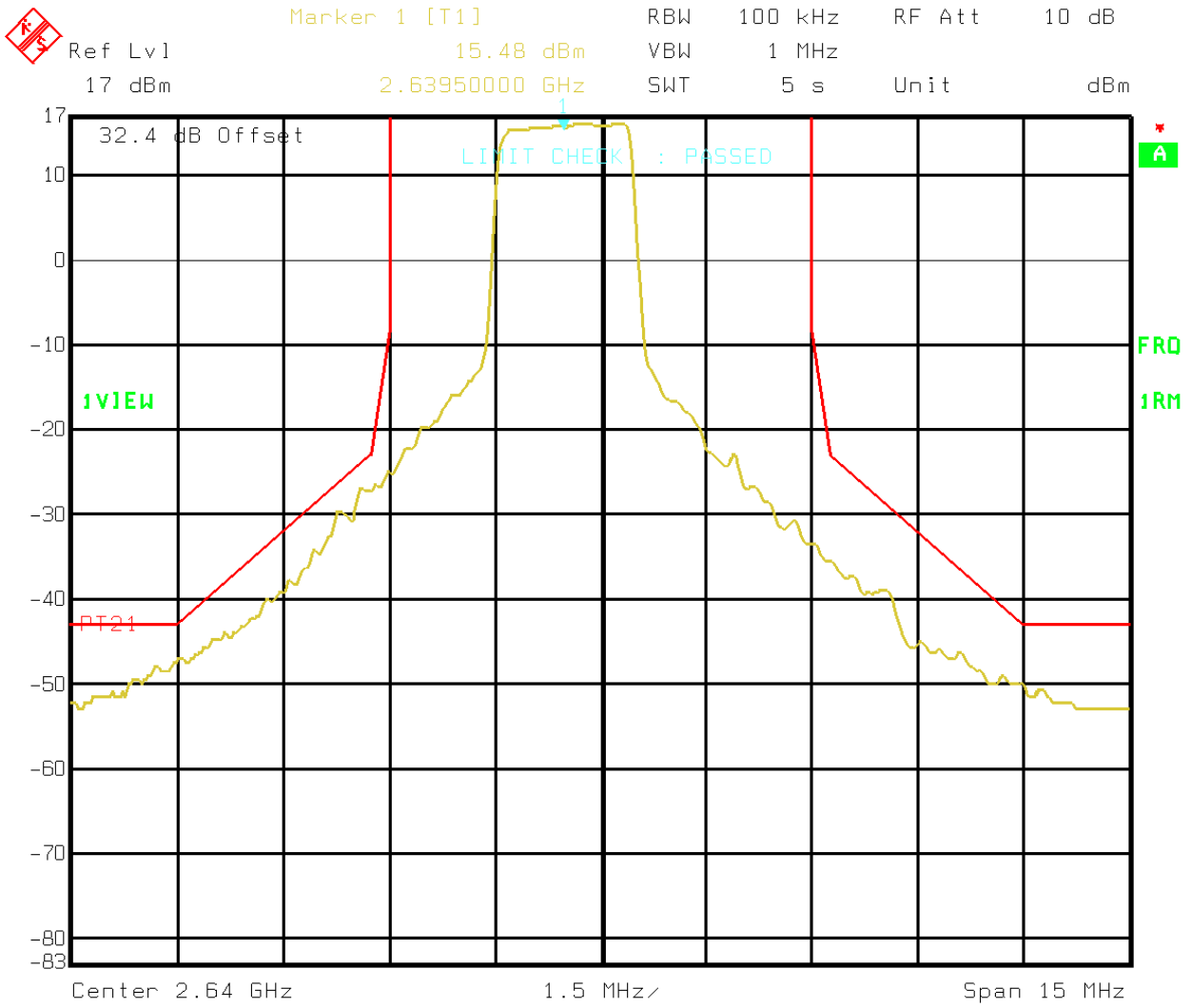
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
28 dBm +10C
Date: 23.APR.2002 12:34:16



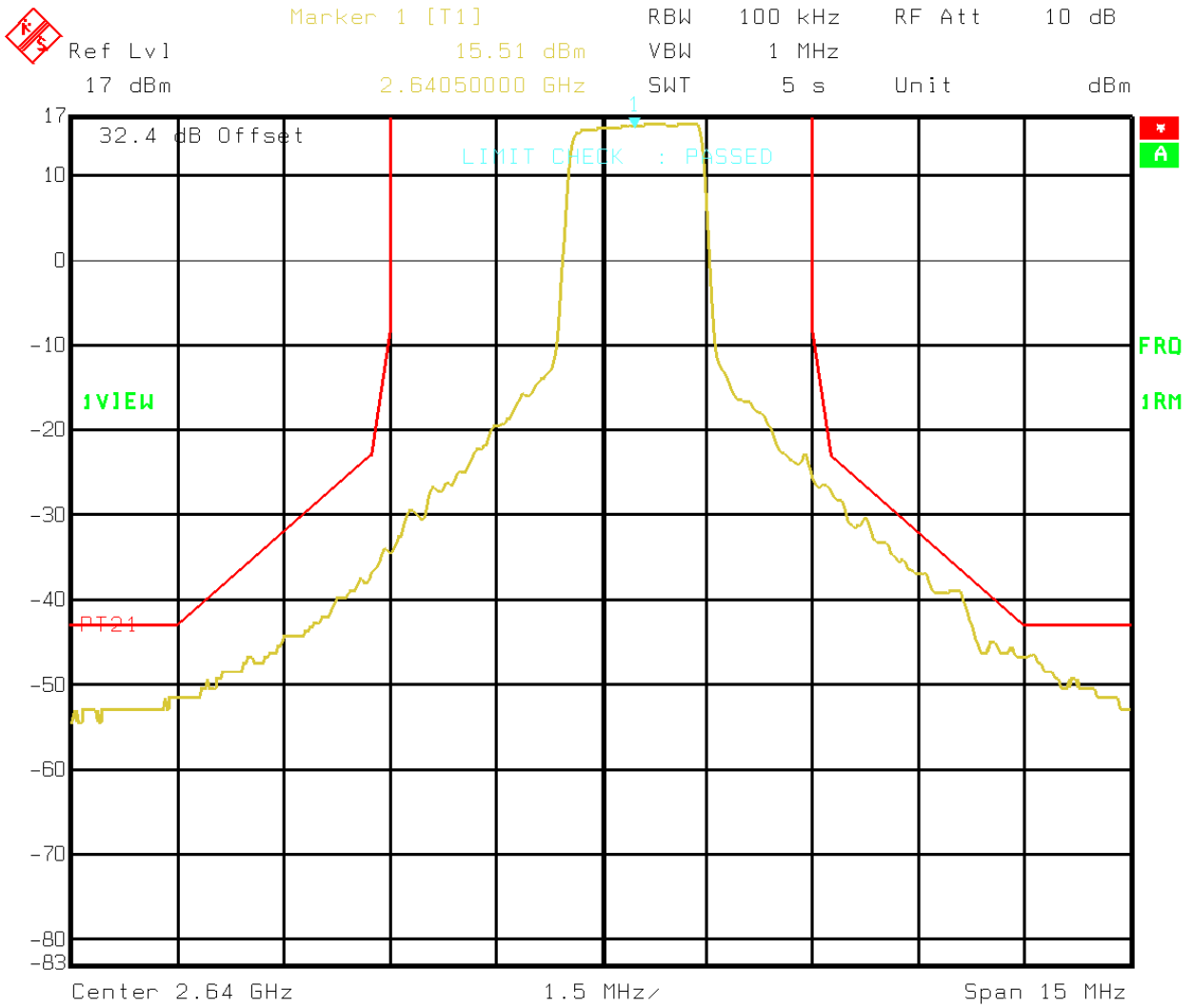
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
25 dBm OC
Date: 23.APR.2002 13:31:02



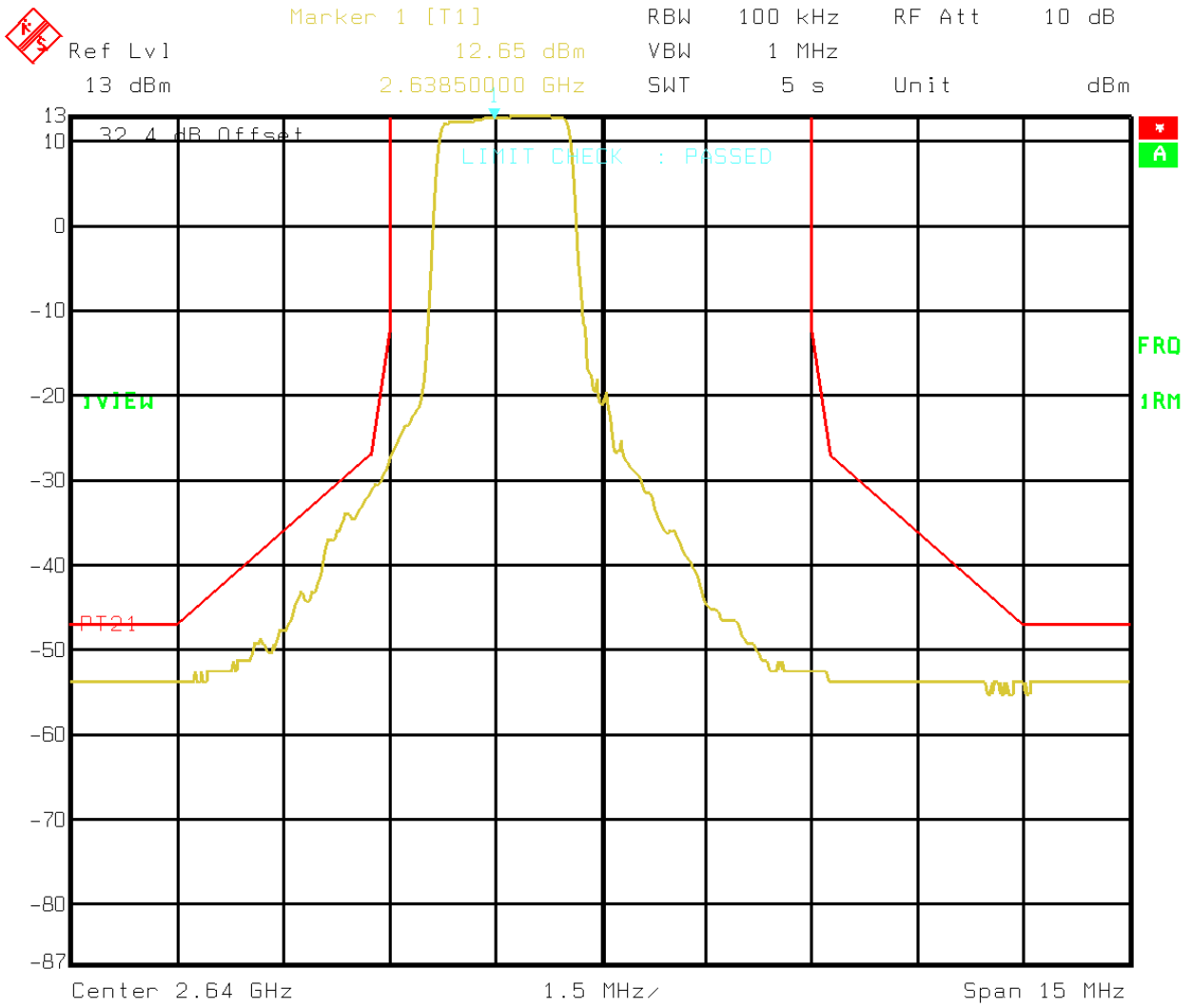
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
25 dBm OC
Date: 23.APR.2002 13:29:57



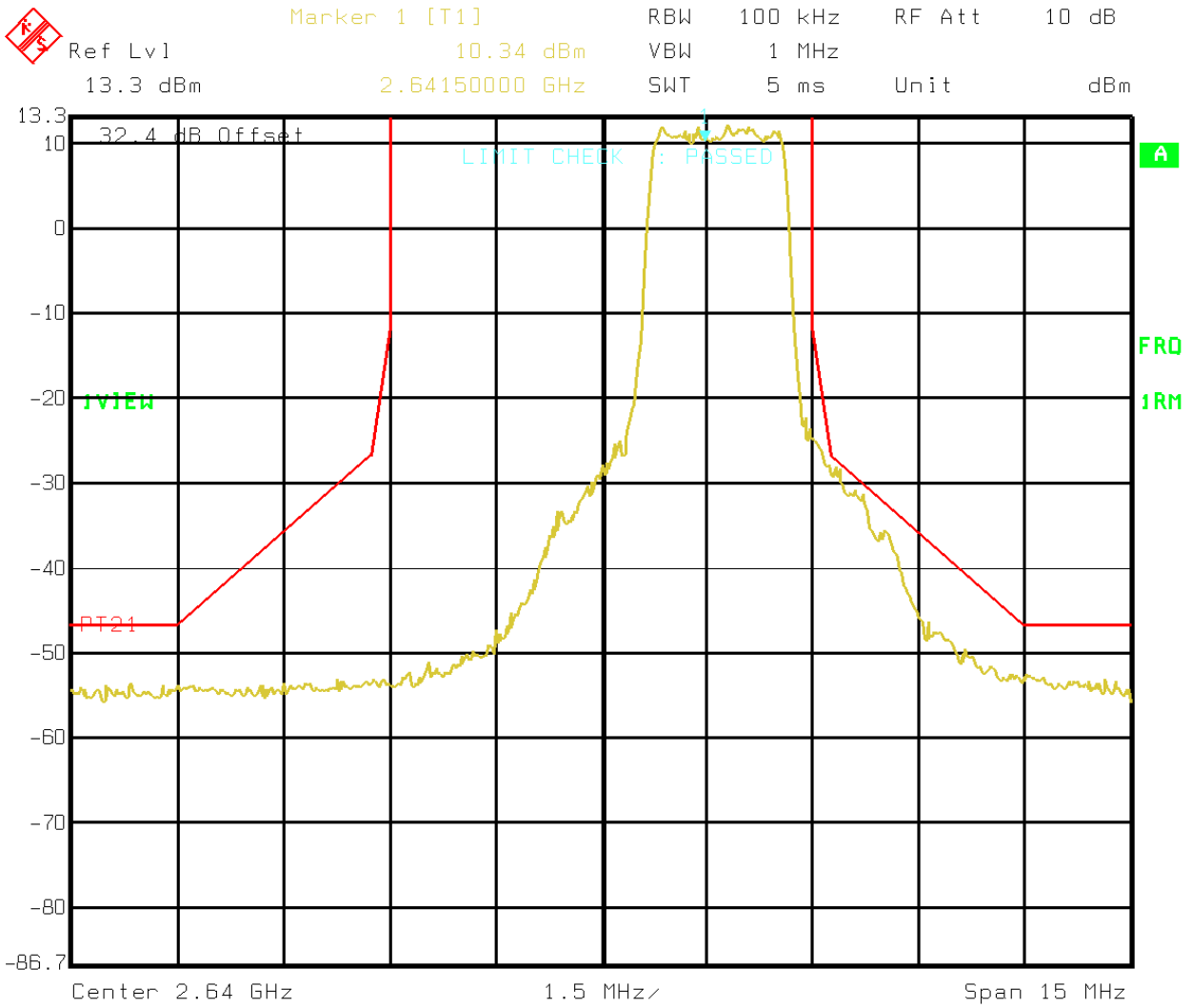
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
25 dBm OC
Date: 23.APR.2002 13:33:43



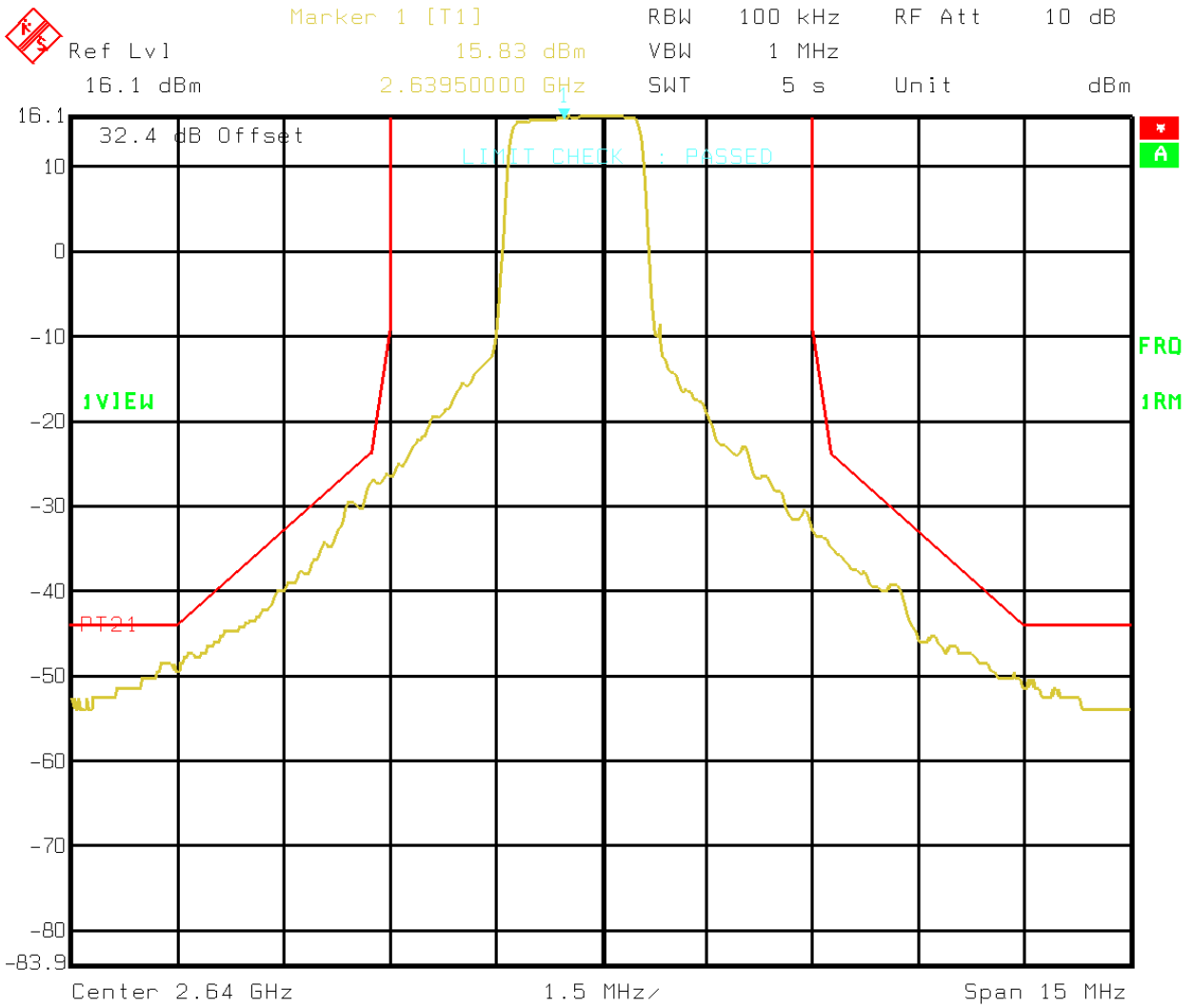
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
28 dBm OC
Date: 23.APR.2002 13:35:16



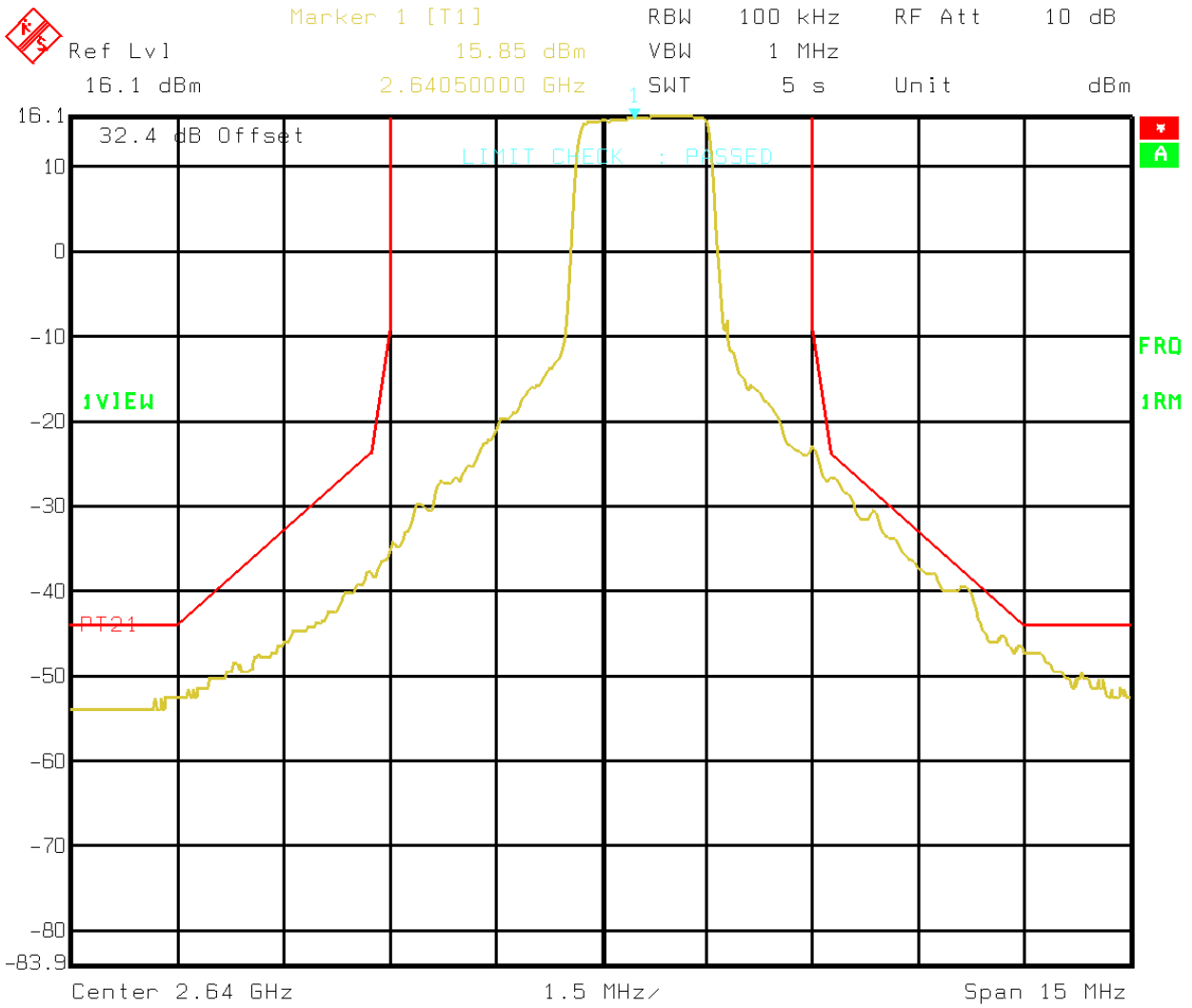
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
25 dBm -10C
Date: 23.APR.2002 14:16:54



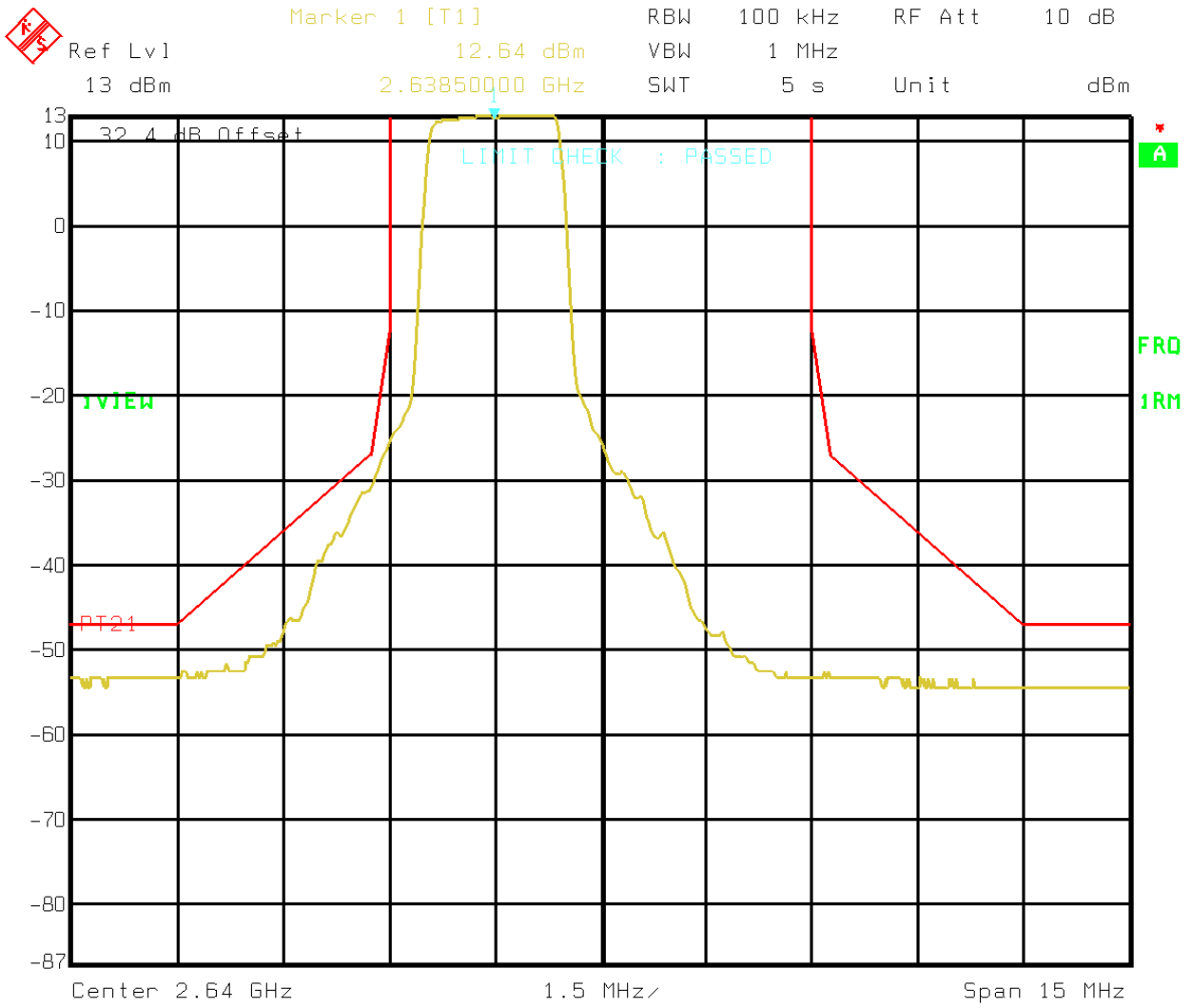
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
25 dBm -10C
Date: 23.APR.2002 15:00:40



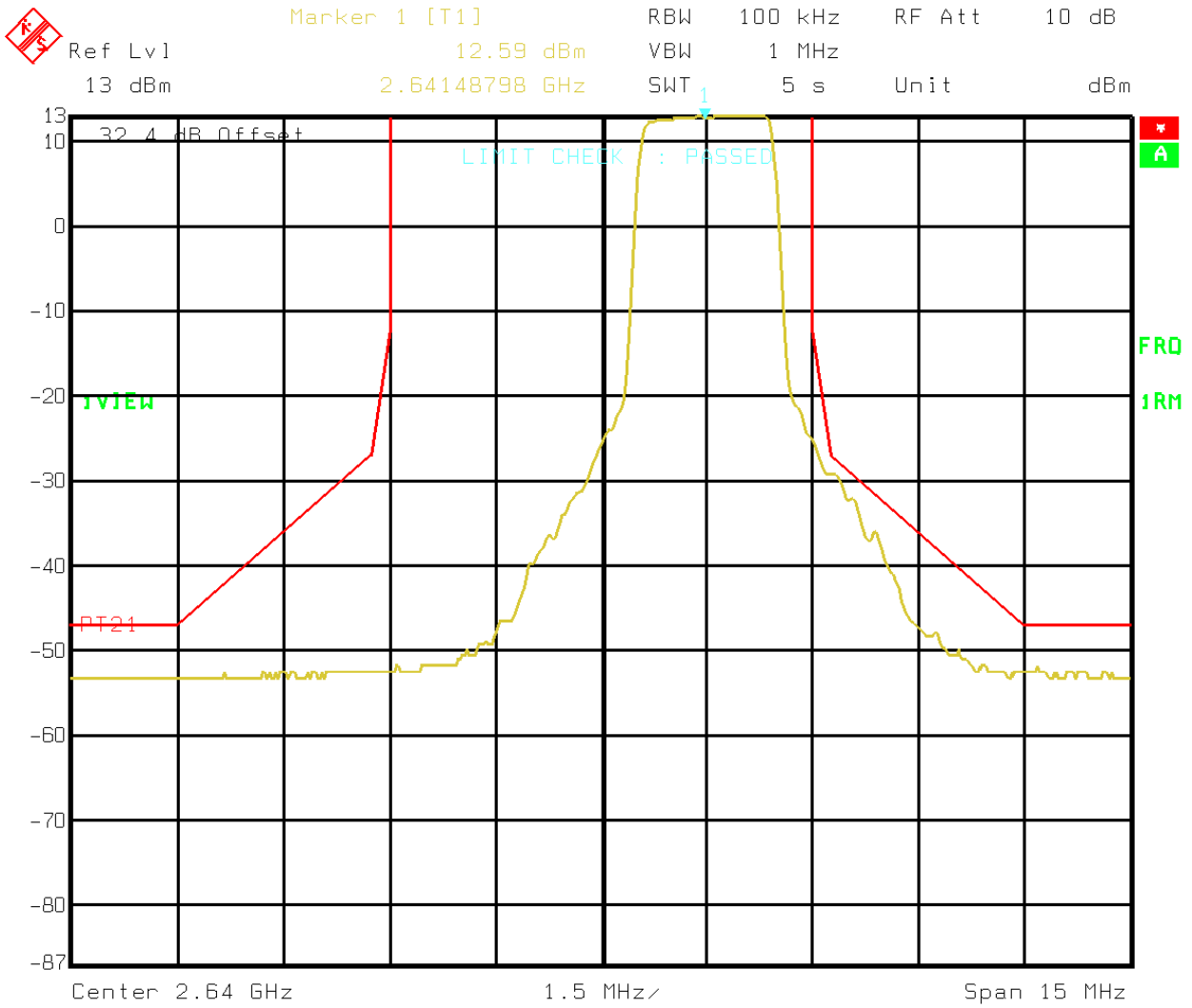
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
28 dBm -10C
Date: 23.APR.2002 14:13:44



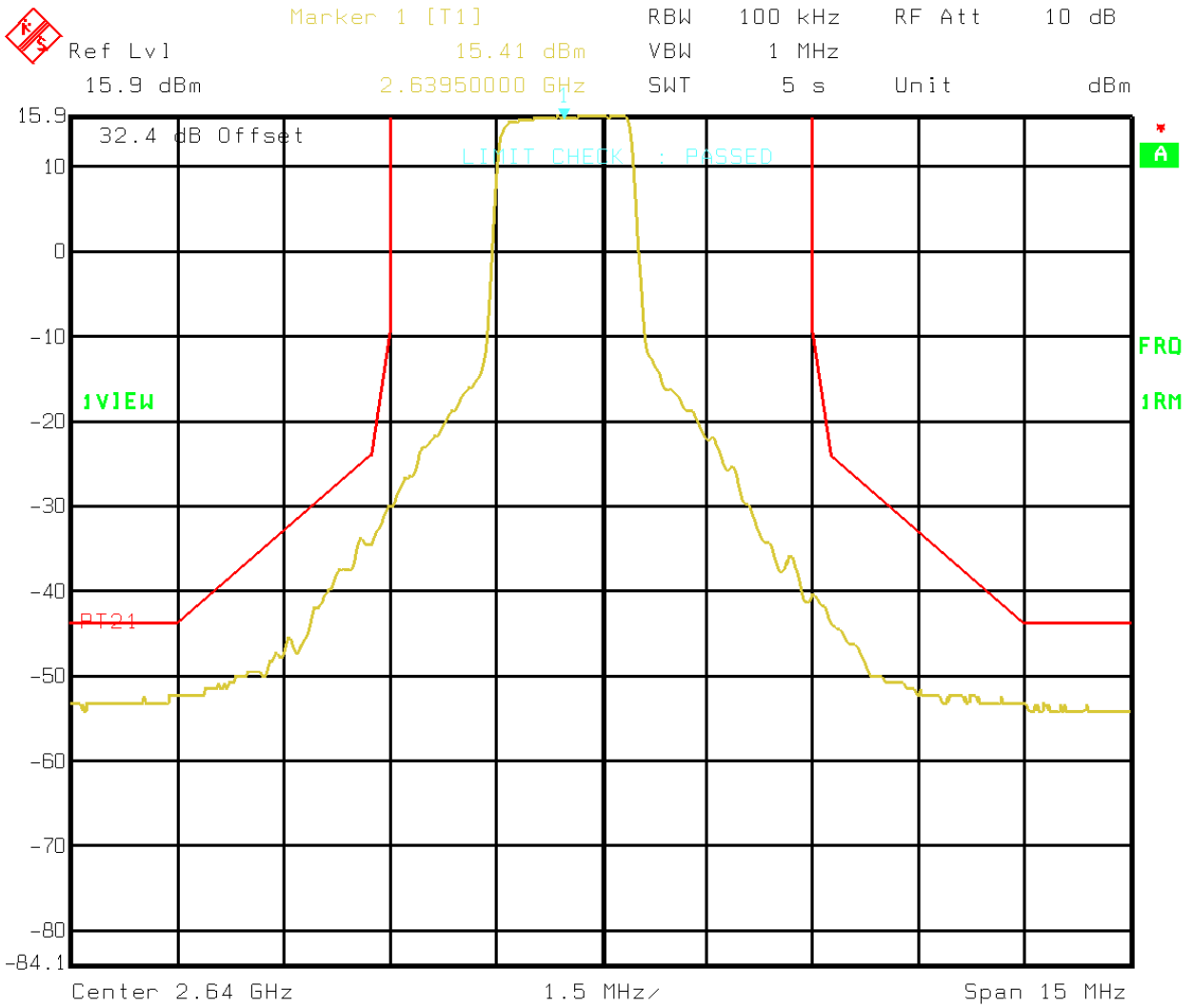
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
28 dBm -10C
Date: 23.APR.2002 14:12:42



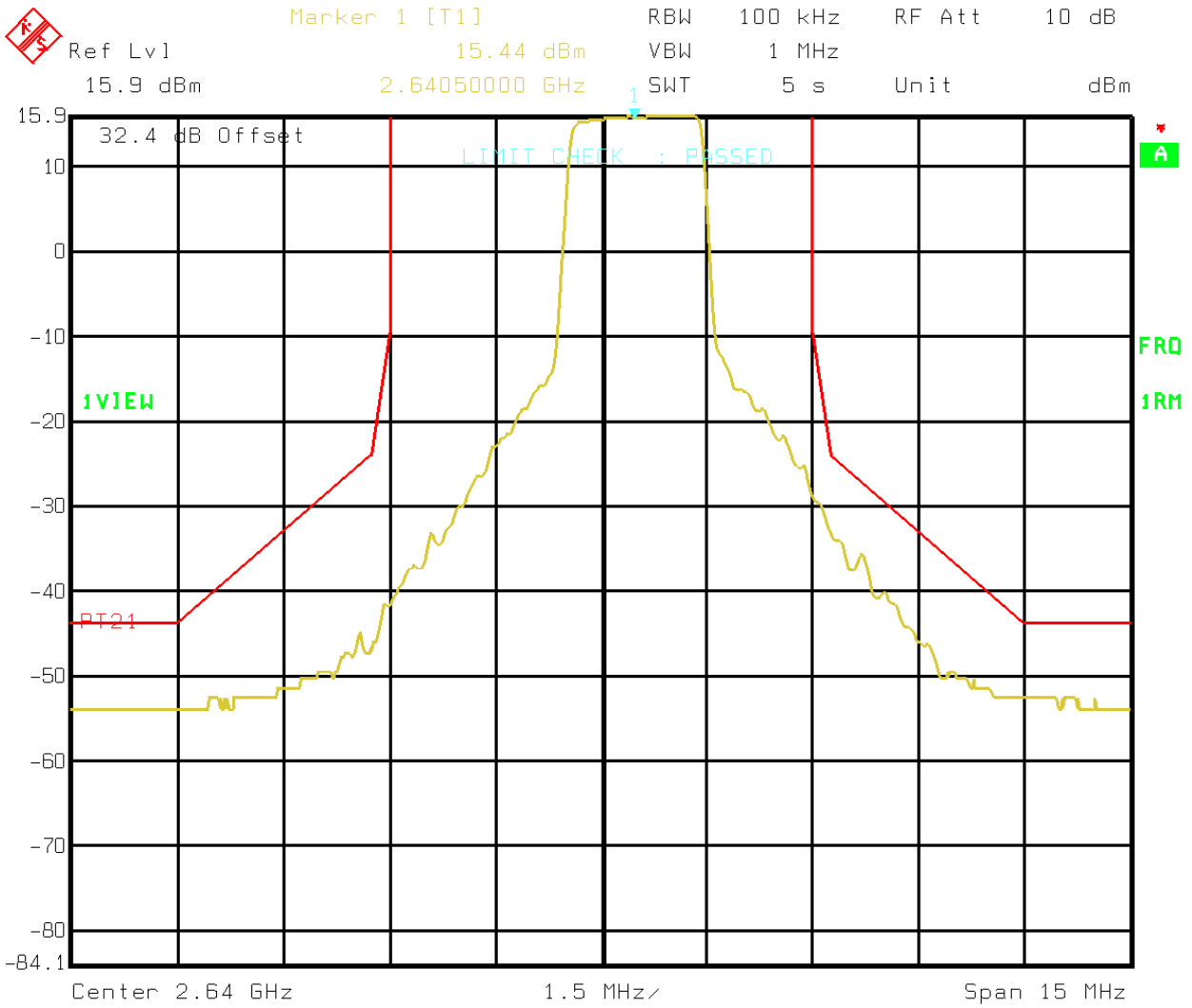
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
25 dBm -20C
Date: 24.APR.2002 11:42:37



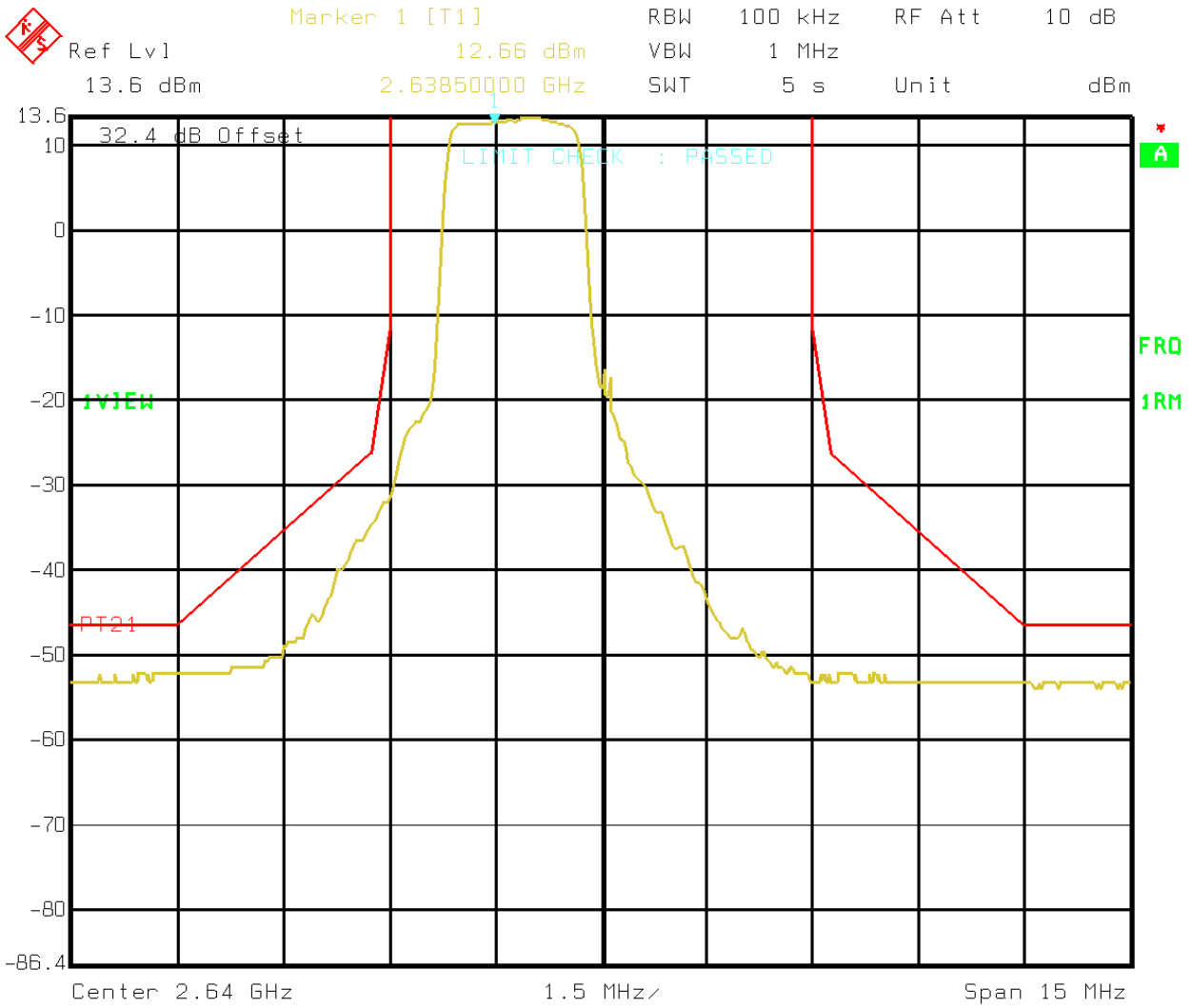
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
25 dBm -20C
Date: 24.APR.2002 11:41:23



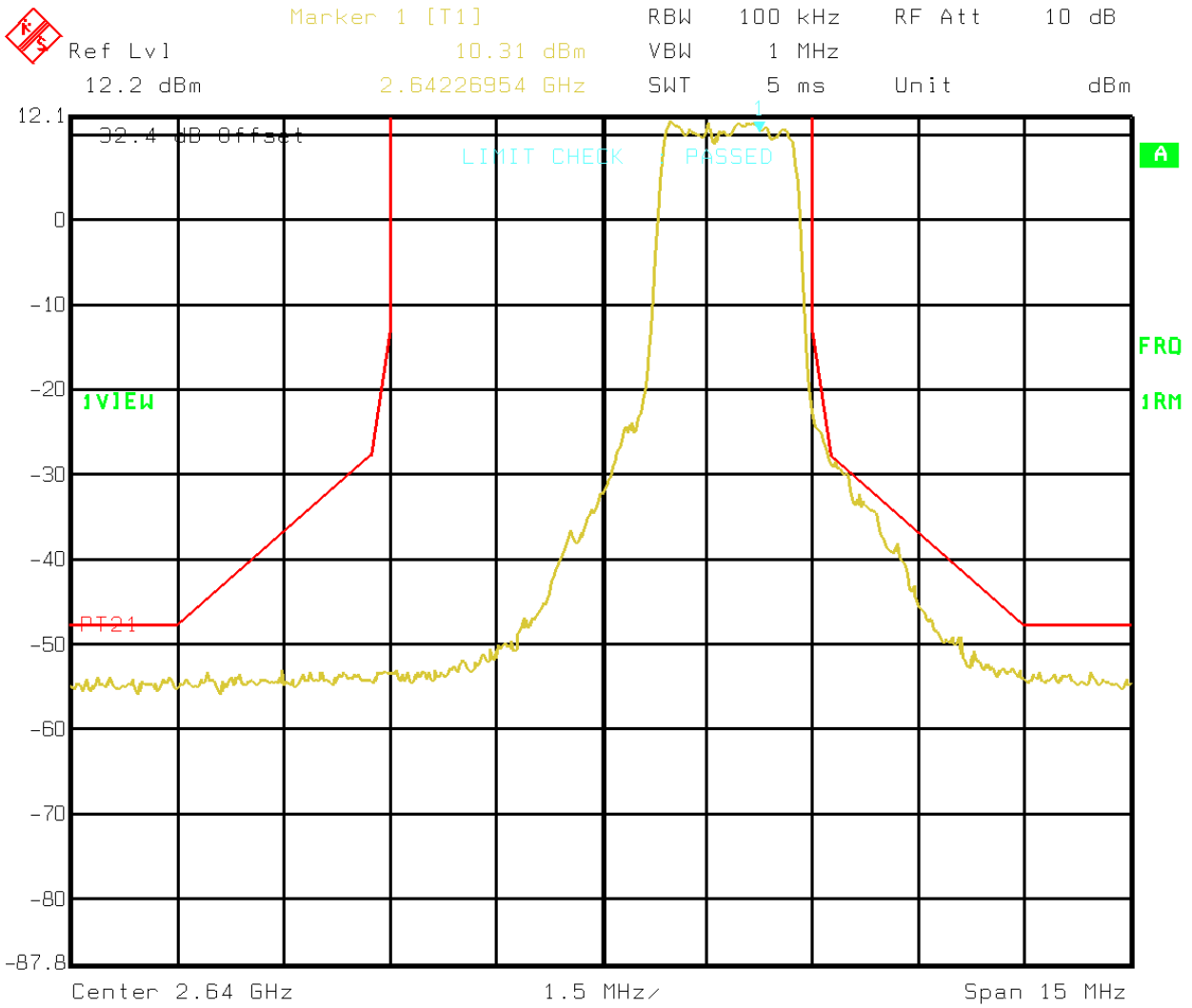
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
28 dBm -20C
Date: 24.APR.2002 11:45:01



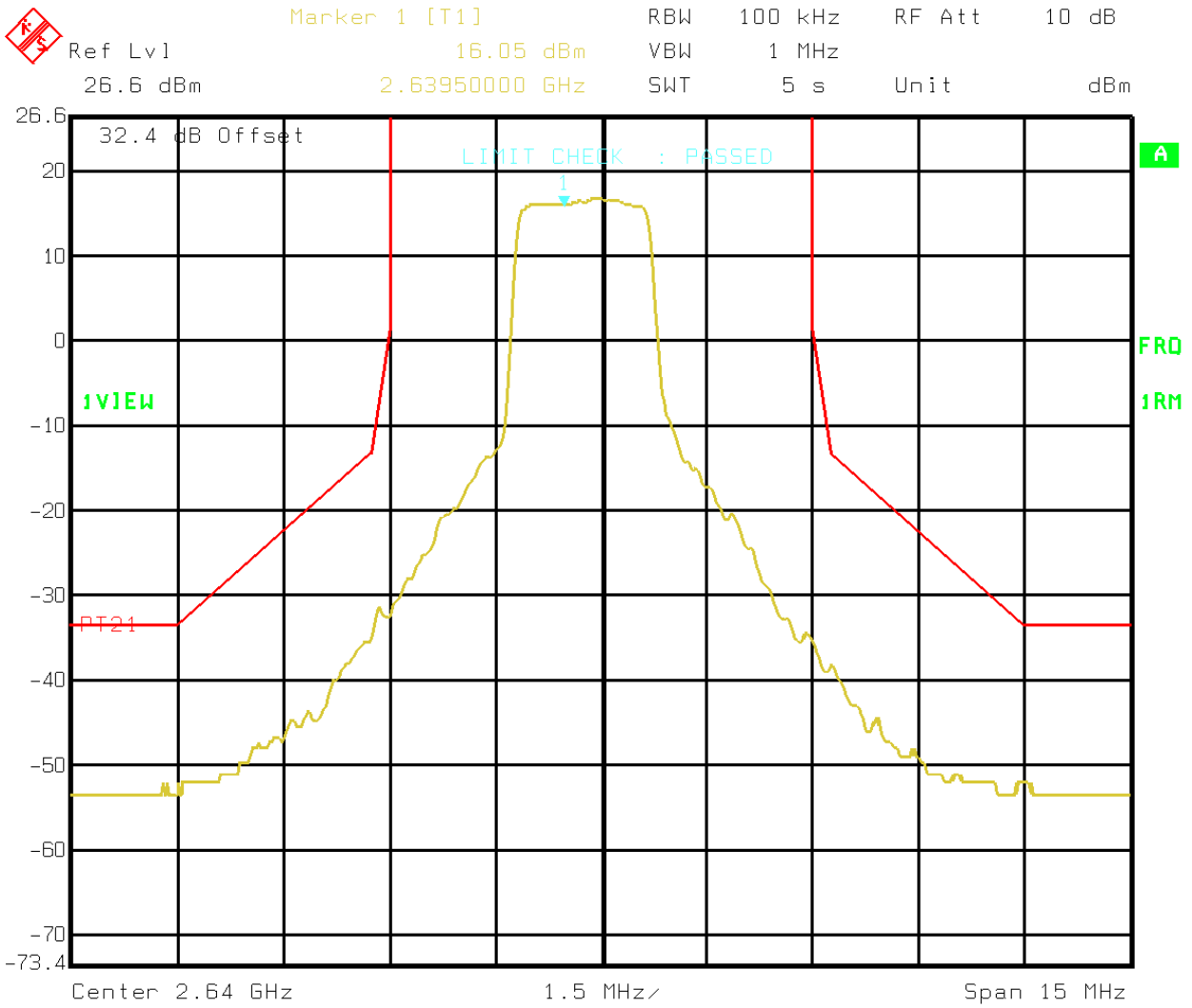
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
28 dBm -20C
Date: 24.APR.2002 11:46:05



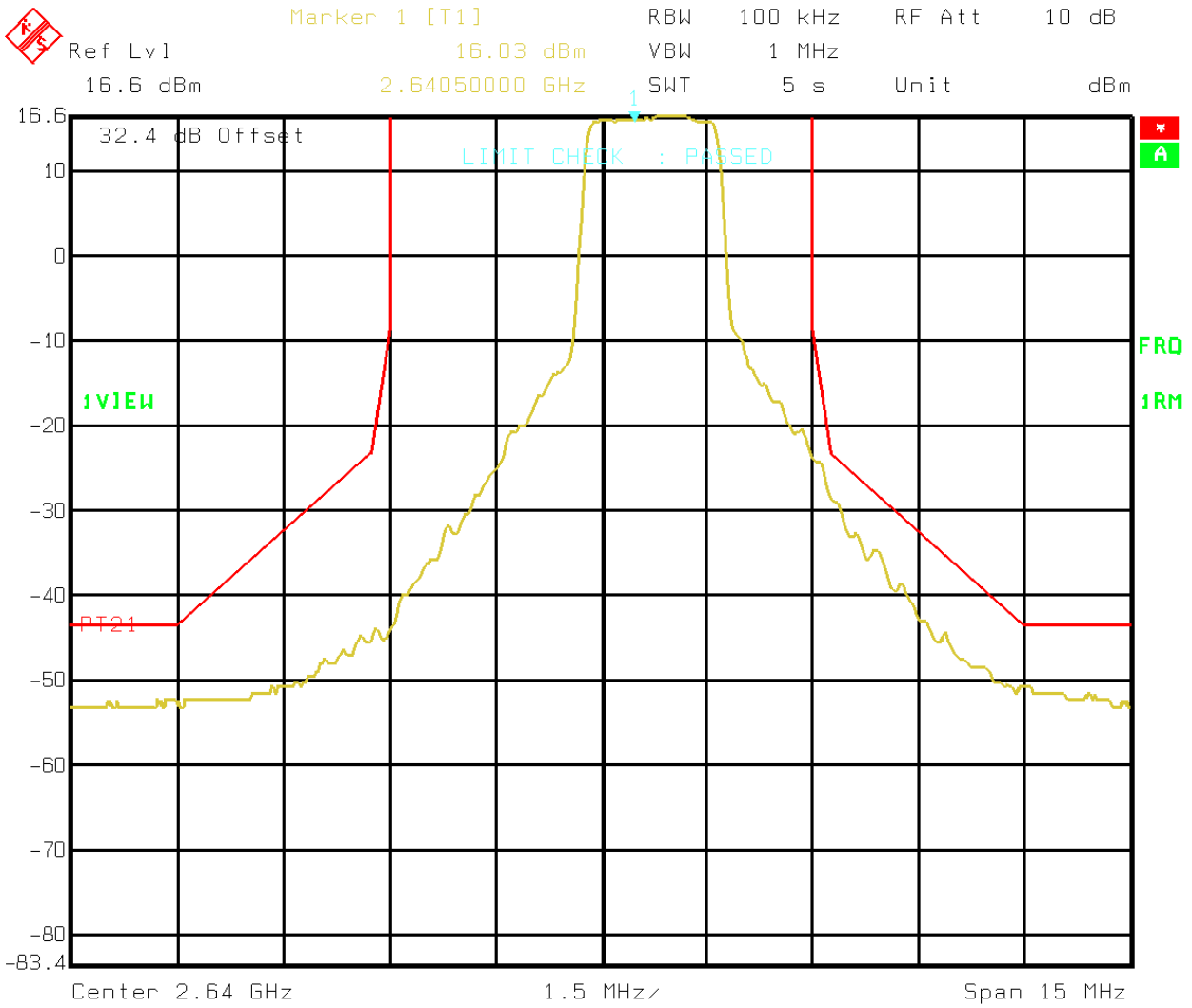
Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
25 dBm -30C
Date: 24.APR.2002 12:20:06



Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
25 dBm -30C
Date: 24.APR.2002 12:22:52



Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
28 dBm -30C
Date: 24.APR.2002 12:17:46



Title: FREQUENCY ERROR
Comment A: NOMINAL VOLTAGE
28 dBm -30C
Date: 24.APR.2002 12:16:41

Section 8 Powerline Conducted Emissions

NAME OF TEST: Powerline Conducted Emissions	PARA. NO.: 15.107
TESTED BY: David Light	DATE: 4/12/2002

Test Results: Complies

Measurement Data: See attached table.

Test Data – Powerline Conducted Emissions

Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Nemko Dallas, Inc.

Data Plot **Powerline Conducted Emissions**

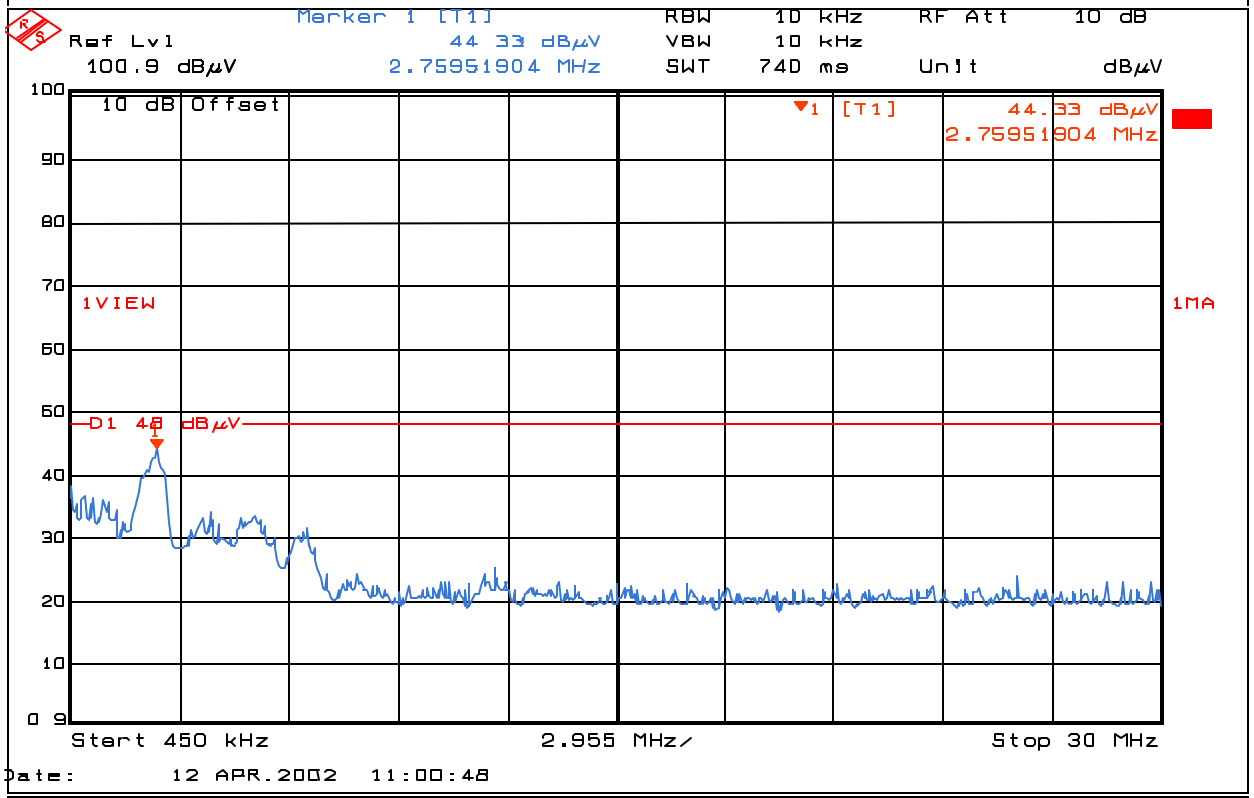
Page 1 of 4

Complete X
Preliminary: ____

Job No.: 2L0210 Date: 4/12/2002
Specification: PT 21 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: 2.6 GHz CPE
Configuration: Tx FULL POWER IN TEST FIXTURE
Sample Number: 1
Location: Lab 4 RBW: 10 kHz Measurement
Detector Type: Peak VBW: 10 kHz Distance: N/A m

Test Equipment Used

Antenna: ____ L.I.S.N. 1258
Pre-Amp: ____ Cable #1: 1266
Filter: 1555 Cable #2: 1038
Receiver: 1036 Limiter 674
Attenuator #1 ____ ____
Attenuator #2: Mixer: ____
Additional equipment used: ____
Measurement Uncertainty: +/-1.7 dB



Notes: L2
25 dBm Output

Test Data – Powerline Conducted Emissions

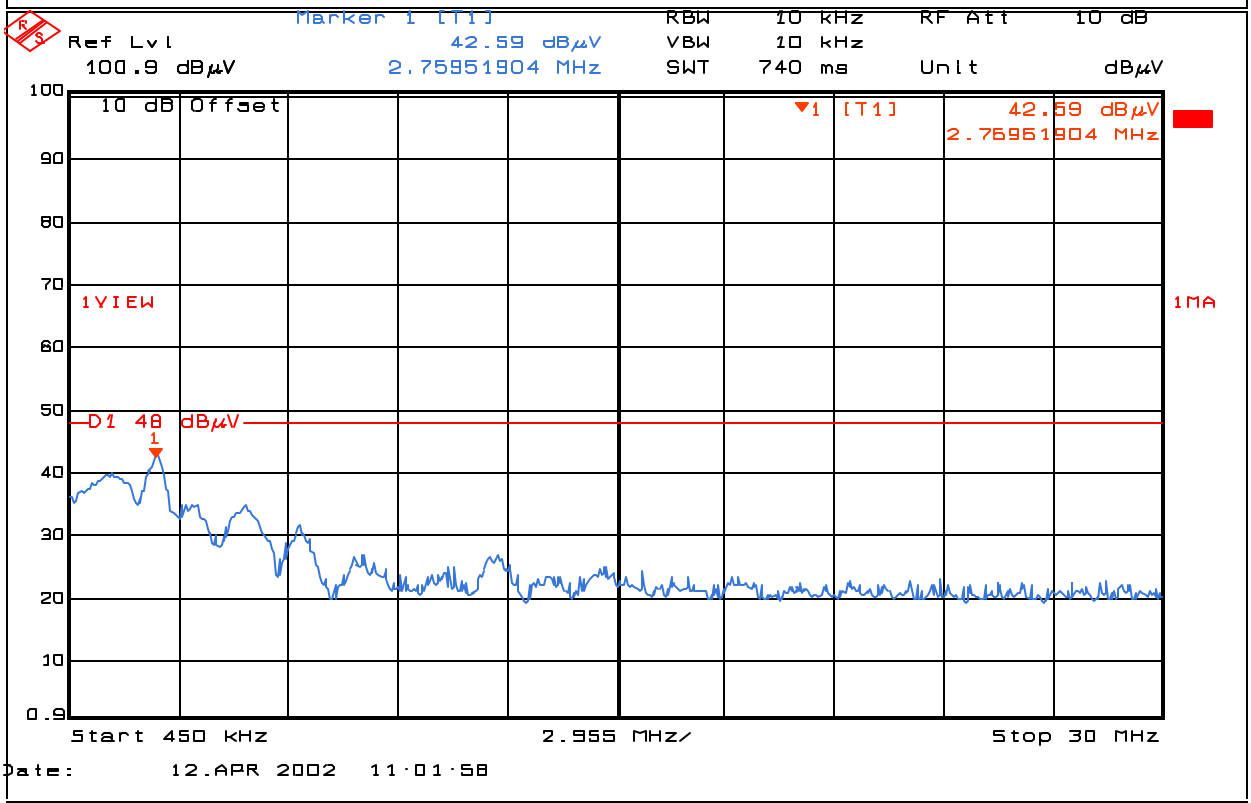
Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Nemko Dallas, Inc.

Data Plot **Powerline Conducted Emissions**

Page ~~2~~ of 4

Job No.: 2L0210 Date: 4/12/2002
Specification: PT 21 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: 2.6 GHz CPE
Configuration: Tx FULL POWER IN TEST FIXTURE



Notes: L1
25 dBm Output

Test Data – Powerline Conducted Emissions

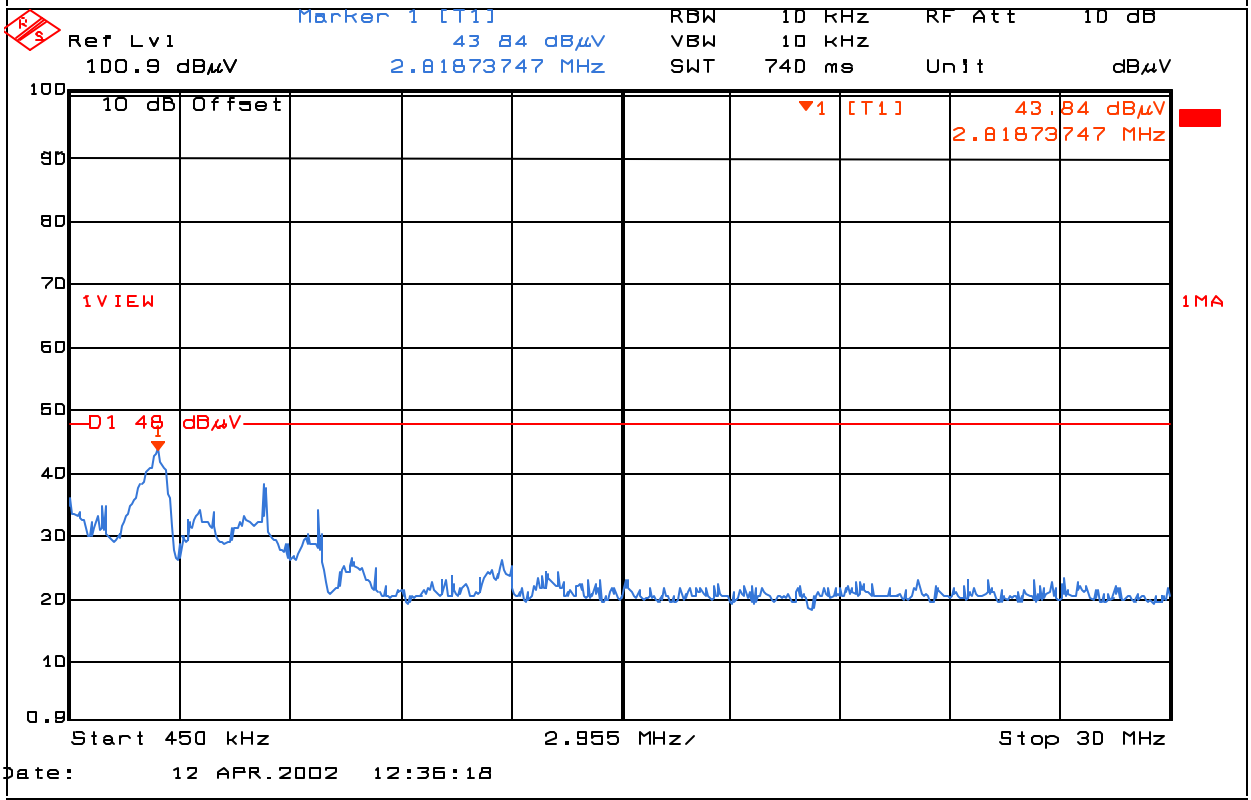
Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Nemko Dallas, Inc.

Data Plot **Powerline Conducted Emissions**

Page 3 of 4

Job No.: 2L0210 Date: 4/12/2002
Specification: PT 21 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: 2.6 GHz CPE
Configuration: Tx FULL POWER IN TEST FIXTURE



Notes: L2
28 dBm output

Test Data – Powerline Conducted Emissions

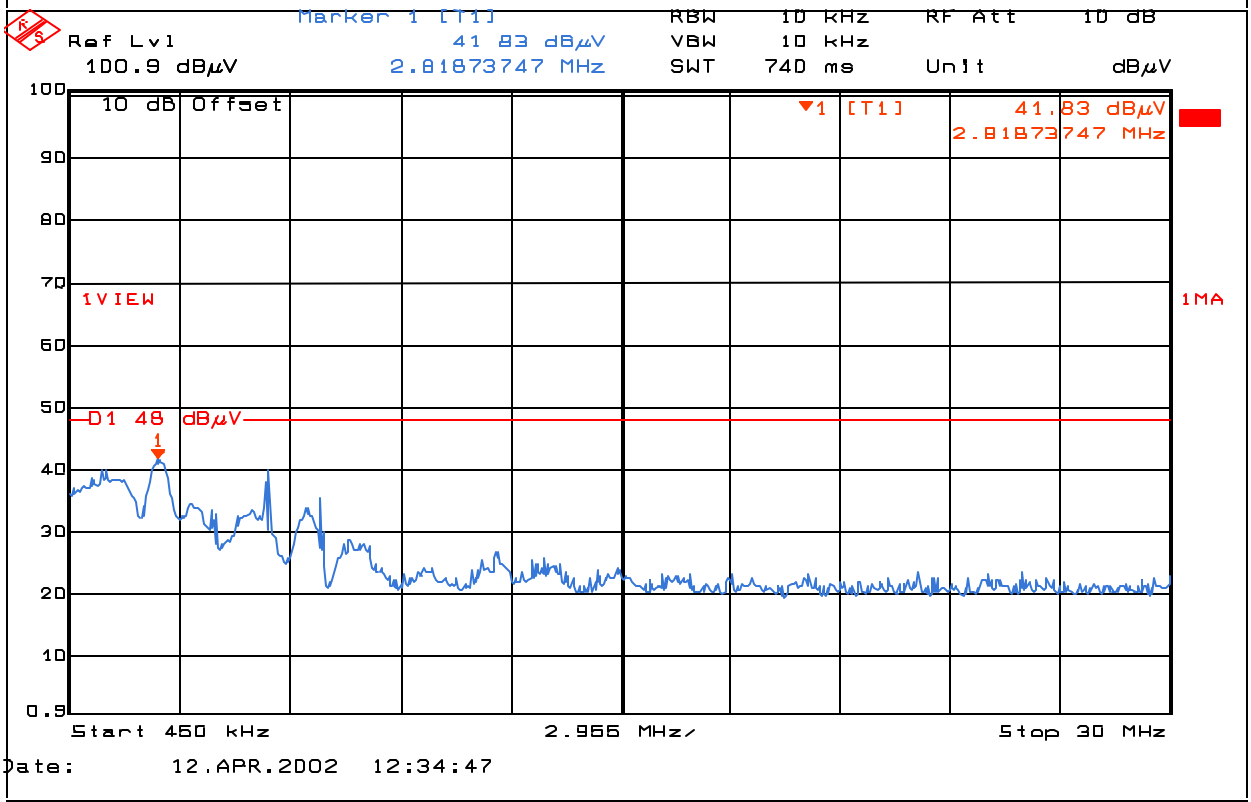
Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Nemko Dallas, Inc.

Test Plot: **Powerline Conducted Emissions**

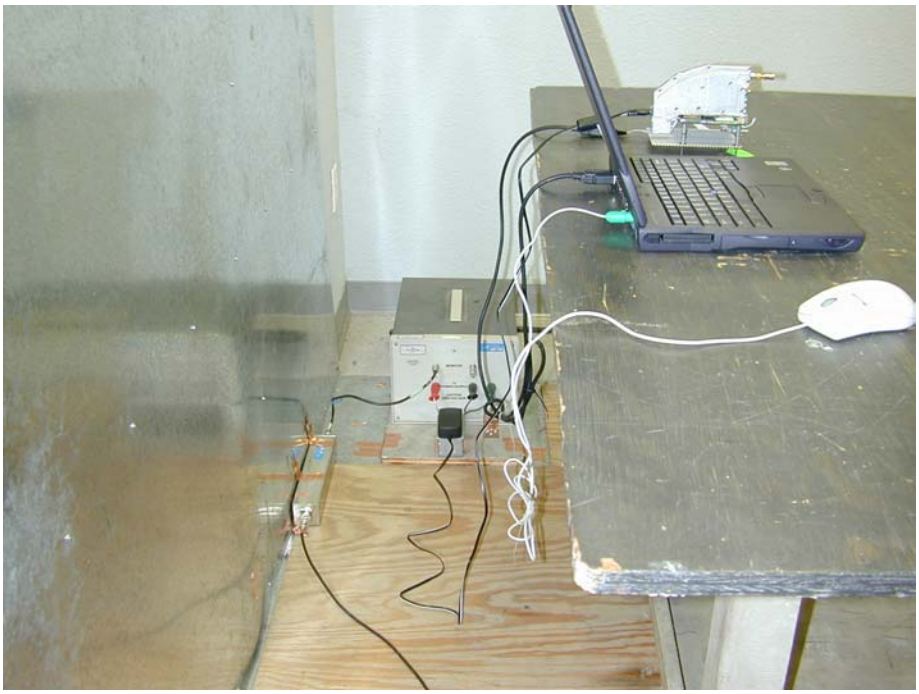
Page 4 of 4

Job No.: 2L0210 Date: 4/12/2002
Specification: PT 21 Temperature(°C): 22
Tested By: David Light Relative Humidity(%) 40
E.U.T.: 2.6 GHz CPE
Configuration: Tx FULL POWER IN TEST FIXTURE



Notes: L1
28 dBm output

Photos – Powerline Conducted Emissions



Section 9. Test Equipment List

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	12/18/01
1469	10 db Attenuator DC 18 Ghz	MCL Inc. BW-S10W2 10db-2WDC	NONE	CBU
1629	CABLE, 6 ft	MEGAPHASE 10311 1GVT4	N/A	CBU
1304	HORN ANTENNA	ELECTRO METRICS RGA-60	6151	07/30/01
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	05/30/01
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	01/02/01
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	06/01/01
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	06/01/01
Navini Asset	Directiona Coupler 0.5-4.0 GHz	Aneren 1C0870-20	None	CBU
283	Environmental Chamber with controller # 1189006	ENVIROTRONICS SH27 & 2030-22844	129010083	01/10/02
1555	Filter high pass 5KHz	Solar Electronics 7930-5.0	933125	05/29/01
1258	LISN .15mhz-30mhz	EMCO 0	1305	04/04/01
1266	CABLE, 10m	KTL RG223	N/A	05/29/01
1038	CABLE, .5m	KTL RG223	N/A	05/29/01
674	LIMITER	HP 11947A	3107A02200	CBU

ANNEX A - TEST DETAILS

NAME OF TEST: RF Power Output	**PARA. NO.: 2.1046**

Method Of Measurement:

Antenna Conducted:

The peak power at antenna terminals is measured using a Spectrum Analyzer or Power Meter. Power output is measured with the maximum rated input level.

E.I.R.P.:

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.: 2.1049**

Method Of Measurement:

A portion of the transmitted signal is coupled to a Spectrum Analyzer with a resolution bandwidth of at least 1% of the bandwidth of the transmitted signal. The resolution bandwidth is chosen so as not to reduce the peak level of the measured waveform.

The appropriate bandwidth mask is applied to the output waveform to verify compliance.

NAME OF TEST: Spurious Emission at Antenna Terminals PARA. NO.: 2.1051

Antenna Conducted:

A portion of the transmitted signal is coupled to a Spectrum Analyzer with a resolution bandwidth of 1 MHz for emissions above 1 GHz. Below 1 GHz the resolution bandwidth is chosen so as not to reduce the peak level of the measured waveform.

The appropriate limit line is applied to the output waveform to verify compliance.

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

If the antenna is detachable from the transmitter, it is removed and replaced with a 50 ohm load. Emissions are measured up to the 10^{th} harmonic of the highest transmit frequency that the transmitter is capable of producing.

If the antenna is not detachable from the transmitter, emissions are measured radiated only at a distance of 3 meters.

Calculation of E.I.R.P.:

NAME OF TEST: Frequency Stability 2.1055

Method Of Measurement:

Frequency Stability With Voltage Variation:

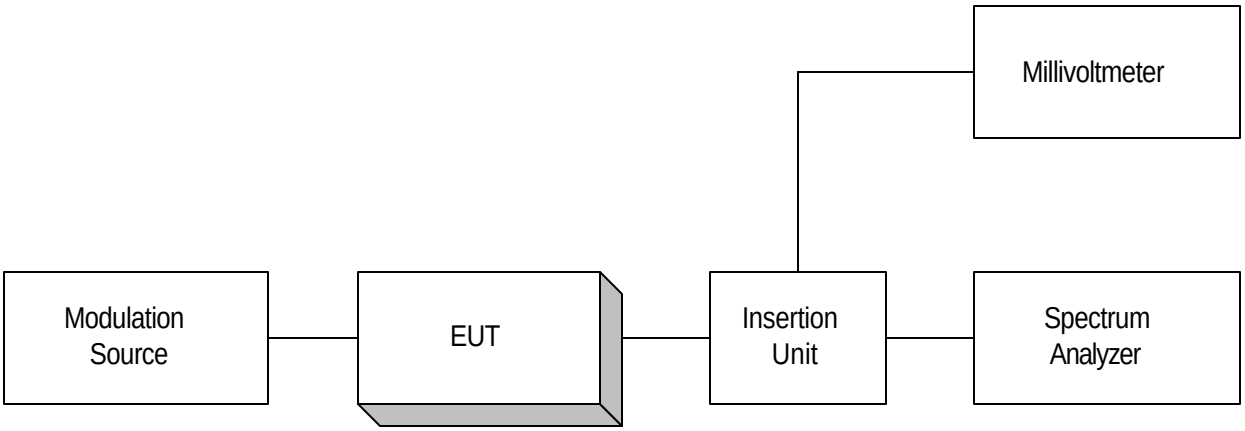
The E.U.T. is placed in an environmental chamber and allowed to stabilize at +20 degrees Celsius for at least 15 minutes. The frequency counter and signal generator are phase locked with the same 10 MHz reference frequency by connecting the 10 MHz ref. out of the counter to the 10 MHz ref, in of the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

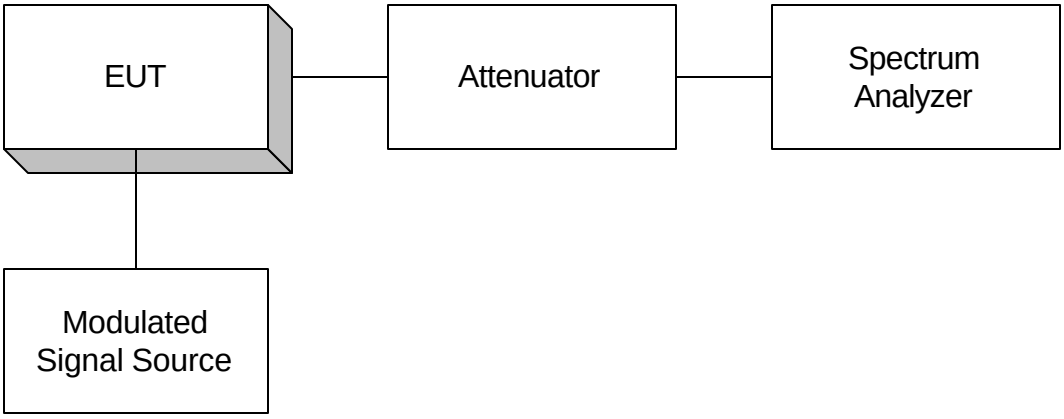
The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the frequency is measured in 30 second intervals for a period of 5 minutes.

ANNEX B - TEST DIAGRAMS

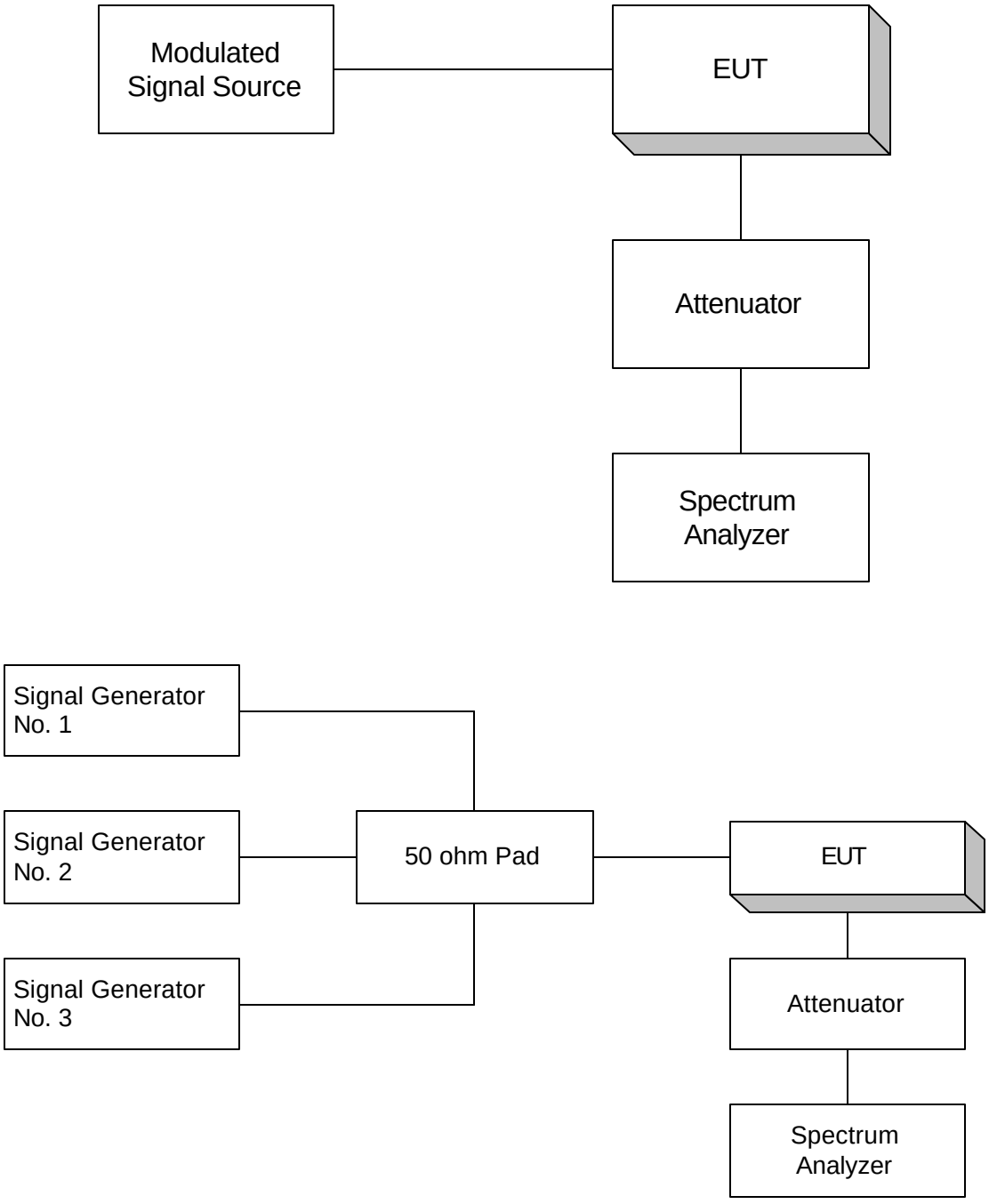
Para. No. 2.1046 - R.F. Power Output



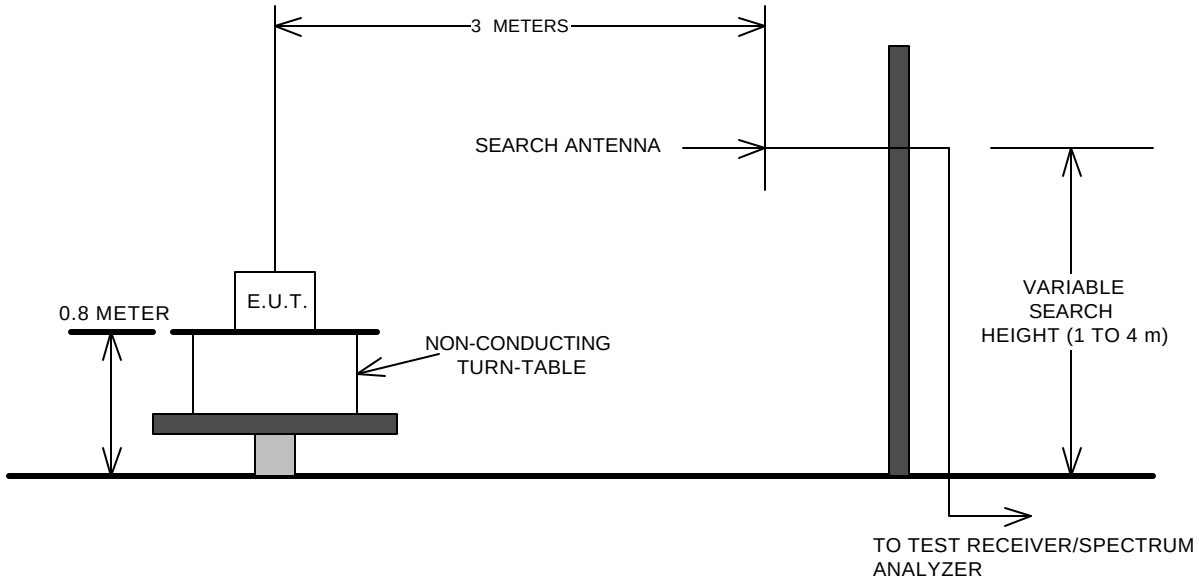
Para. No. 2.1049 - Occupied Bandwidth



Para. No. 2.1051 - Spurious Emissions at Antenna Terminals



Para. No. 2.1053 - Field Strength of Radiation



Para. No. 2.1055 - Frequency Stability