

KTL Test Report: 1R03491


Applicant: Nortel Networks
21 Richardson Side Road
Kanata, Ontario
K2K 2C1

**Equipment Under Test:
(E.U.T.)** BTR 24-01M
NTVG11BA 66
NNTM532H45HD

In Accordance With: **FCC Part 101, Subpart C**

Tested By: KTL Ottawa Inc.
3325 River Road, R.R. 5
Ottawa, Ontario K1V 1H2

Authorized By:



R. Grant, Wireless Manager

Date: January 24, 2001

Total Number of Pages: 43

Authorized Copy: Soft Copy

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EQUIPMENT: BTR 24-01M

Section 1. Summary of Test Results

General

All measurements are traceable to national standards.

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 101, Subpart C.

New Submission
Class II Permissive Change

Production Unit
Pre-Production Unit

T	N	B
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Equipment Code

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

See " Summary of Test Data".



NVLAP LAB CODE: 100351-0

TESTED BY:
Glen Westwell, Technologist

DATE: January 24, 2001

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This report applies only to the items tested.

EQUIPMENT: BTR 24-01M

Summary Of Test Data

Name Of Test	Para. No.	Result
RF Power Output	101.113	Complies
Occupied Bandwidth	101.111	Complies
Spurious Emissions at Antenna Terminals	101.111	Complies
Field Strength of Spurious Emissions	101.111	Complies
Frequency Stability	101.107	Complies

Footnotes For N/A's:

Test Conditions:

Indoor Temperature: 24 °C
 Humidity: 42 %

Outdoor Temperature: N/A
 Humidity: N/A

EQUIPMENT: BTR 24-01M

Section 2. General Equipment Specification

Manufacturer: Nortel Networks

Model No.: BTR 24-01M, SW Version 1.2
NTVG11BA 66

Serial No.: NNTM532H45HD

Date Received In Laboratory: October 23, 2000

KTL Identification No.: Item #2

Transmitter

Supply Voltage Input: -48 Vdc

Frequency Range: Tx 24.255 GHz to 24.445 GHz

Tunable Bands: Item #1

Types of Modulation: 4, 16, 64 QAM @ 7.488 Msps FDMA

Data Rate(s): 7.488 Msps

Internal/External Data Source: External

Emission Designator: 7M92D9W
37M9D9W

Output Impedance: 50Ω

RF Power Output (rated): 14.75dBm to 24.4dBm

Channel Spacing(s): 10 MHz

Operator Selection of Operating Frequency: None

Power Output Adjustment Capability: 0-31 dBm Attenuation

EQUIPMENT: BTR 24-01M

Equipment Under Test

- | | |
|---|---|
| (1) BTR 24-01M
NTVG11BA 66
NNTM532H45HD | (6) SMM 5010C x QTY 04
NTVH06AA – NNTM5337THA2
NTVH06AB19 – NNTM5353P C9P
NTVH06AB03 – NNTM5334XA7R
NTVH06AB03 – NNTM532NV8B7 |
| (2) RPE 9000 (Telemetry Box)
NTVH24AA 25
NNTM532GD728 | (7) CIM5000C
NTVH25AA 15
NNTM5324MWH9 |
| (3) RSM 9016
NTVH13BA 62
NNTM532G9F7H | (8) AWM5010B
NTVH04AA AD
NNTM535L30ML |
| (4) RSM 9116
NTVH20BA 16
NNTM53219QEJ | (9) SDM5002C
NTV07AB27
NNTM83004BRE |
| (5) PSM5148 x QTY 05
NTVH10AC 03 | |

EQUIPMENT: BTR 24-01M

Section 3. RF Power Output

Para. No.: 1.1046

Test Performed By: Glen Westwell	Date of Test: November 3, 2000
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Minimum Standard: 101.113 (a)

Test Results: Complies.

The RF output power is within 1 dBm of the rated power.

Measurement Data:

	Rated (dBm)	Measured (dBm)
1 Carrier	24.4	24.7
	21.4	21.5
	18.4	18.4
4 Carriers	20.74	20.8
	17.74	18.7
	14.74	15.2

EQUIPMENT: BTR 24-01M

Section 4. Occupied Bandwidth

Para. No.: 2.1049

Test Performed By: Glen Westwell	Date of Test: November 7, 2000
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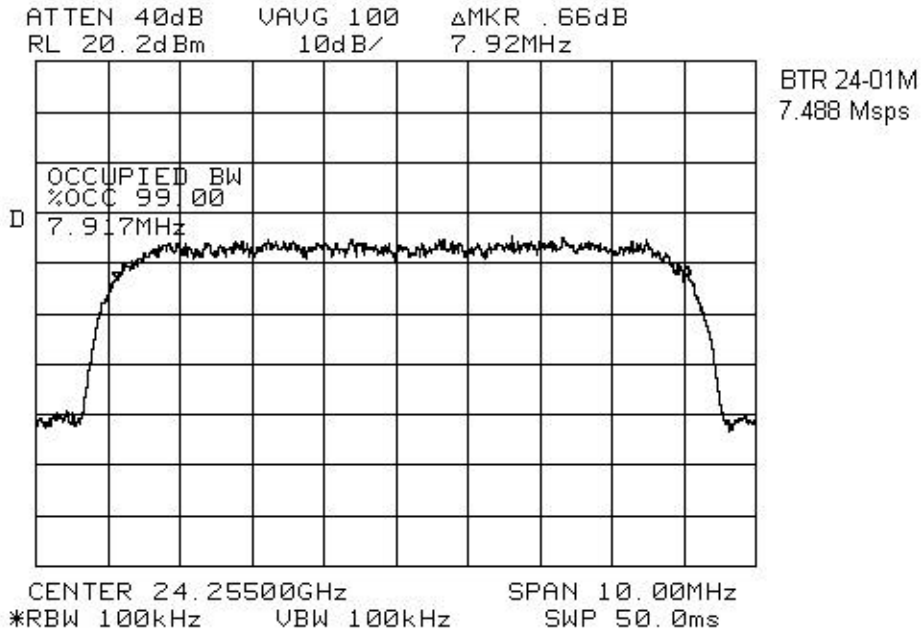
Minimum Standard: 101.111 (a)(2)(ii)

Test Results: Complies.

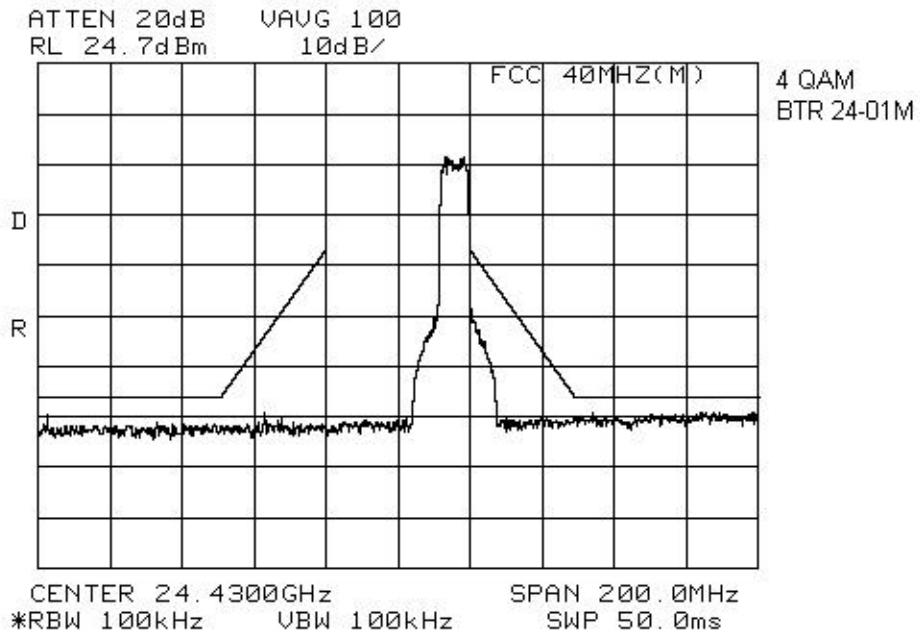
Test Data: See attached graph(s).

Note: In plots where the RBW has been reduced to 100 kHz, the limit has been decreased by another 10 dB.

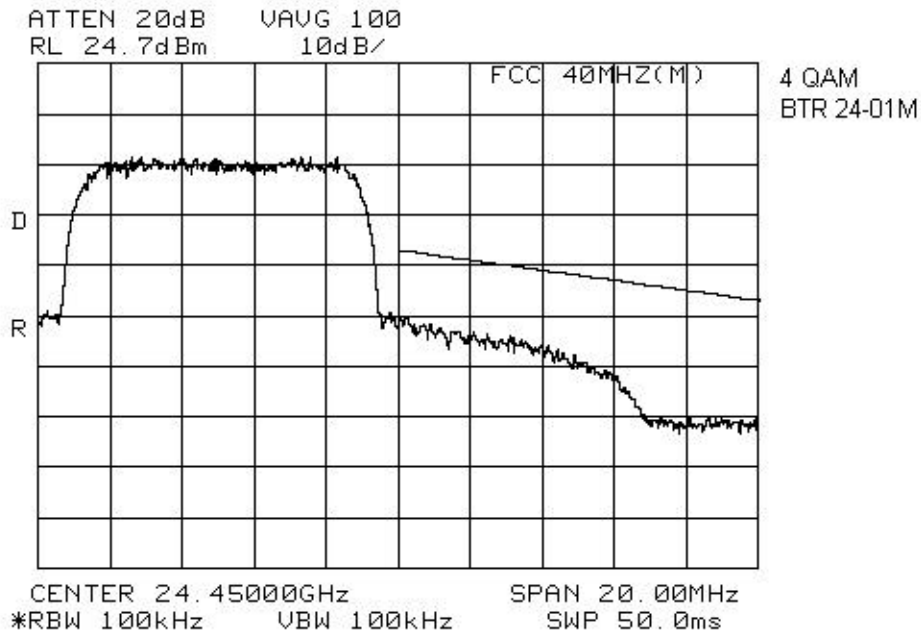
EQUIPMENT: BTR 24-01M



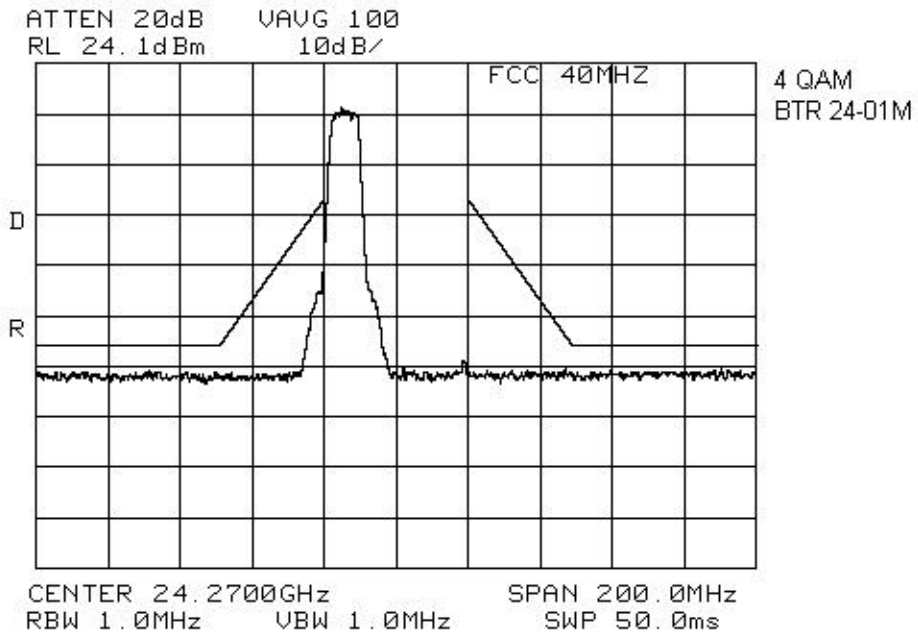
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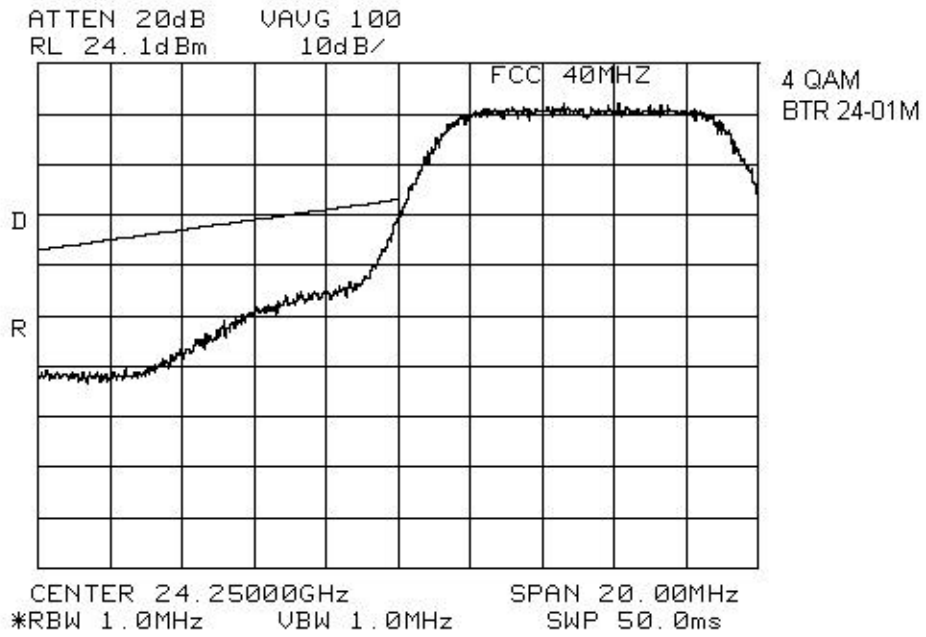
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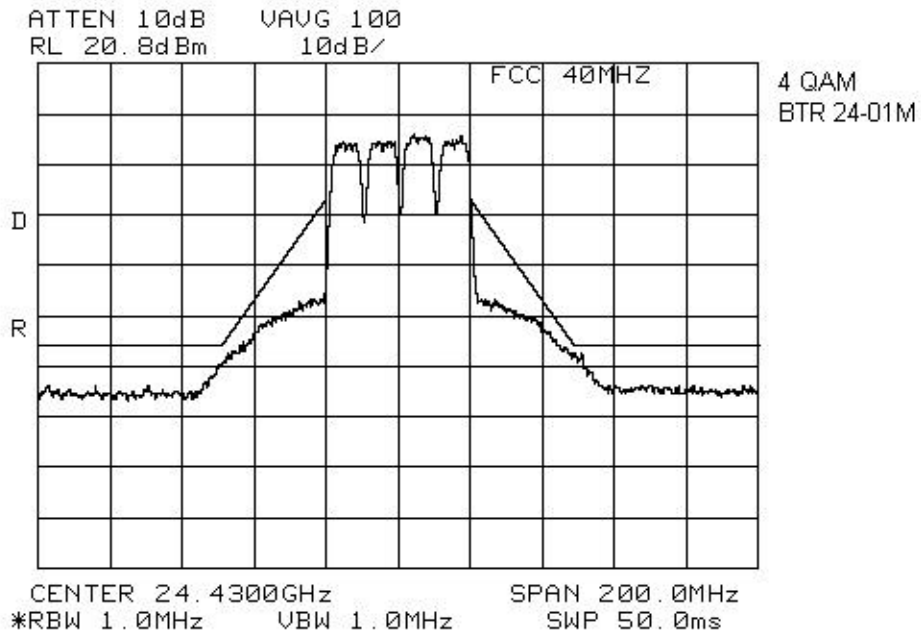
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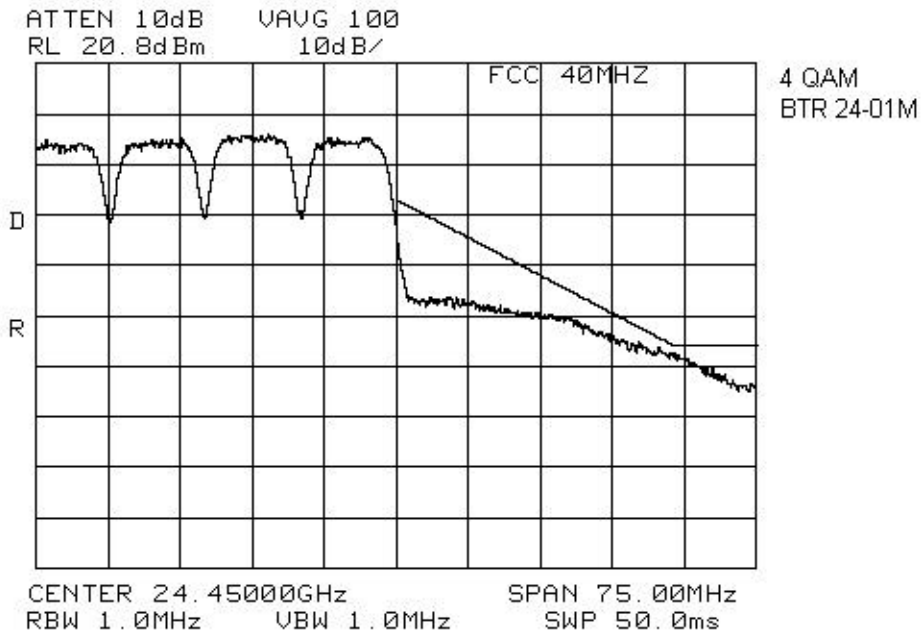
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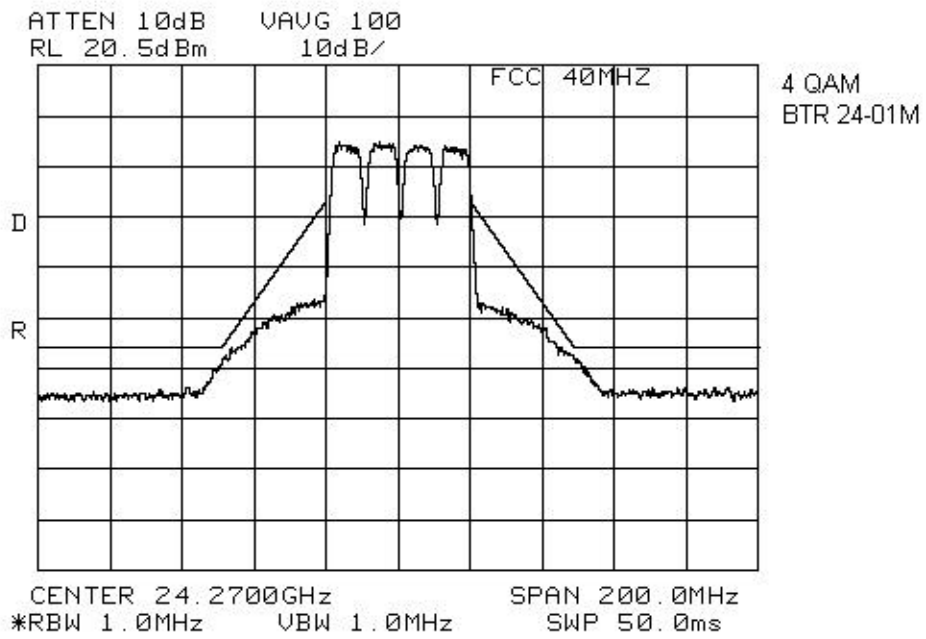
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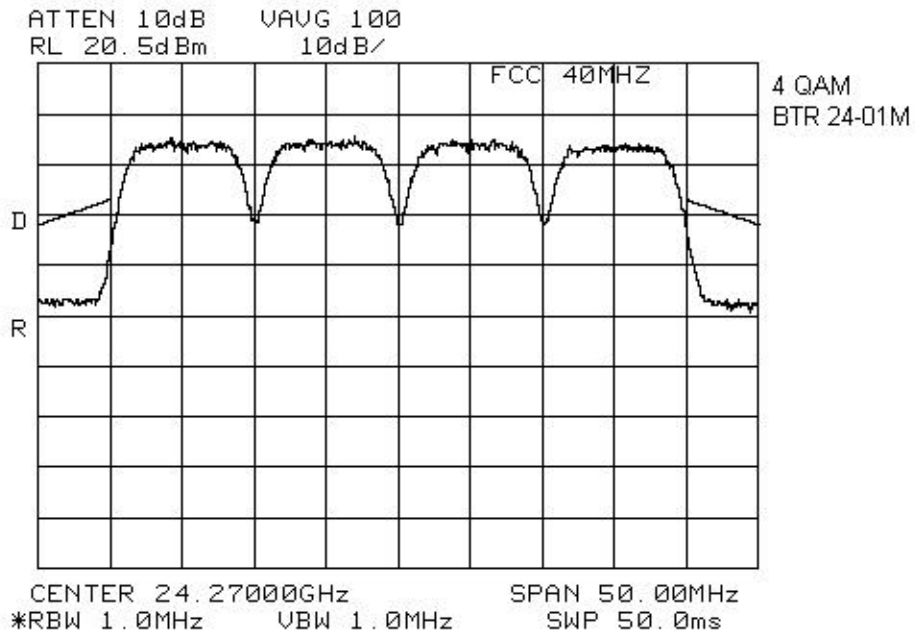
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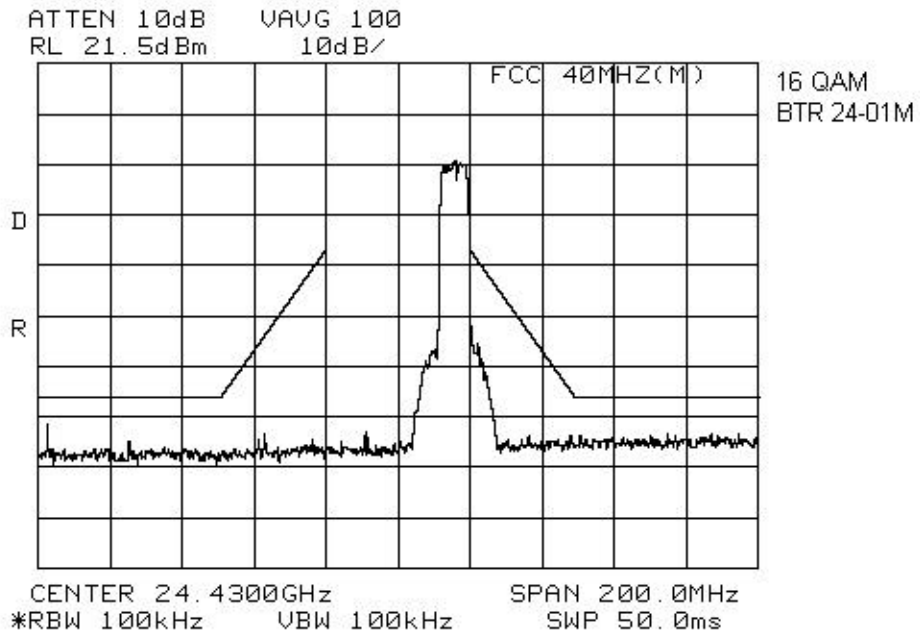
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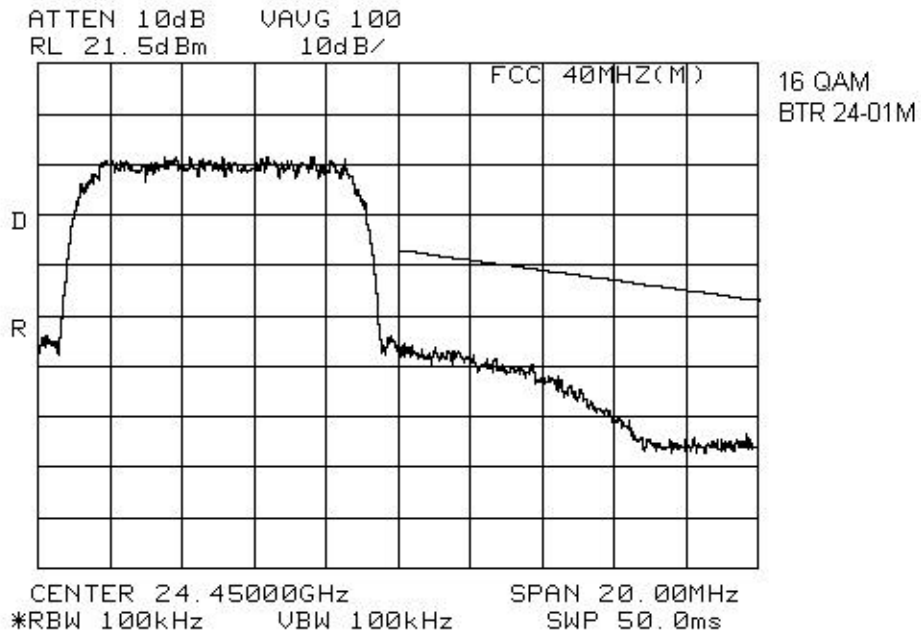
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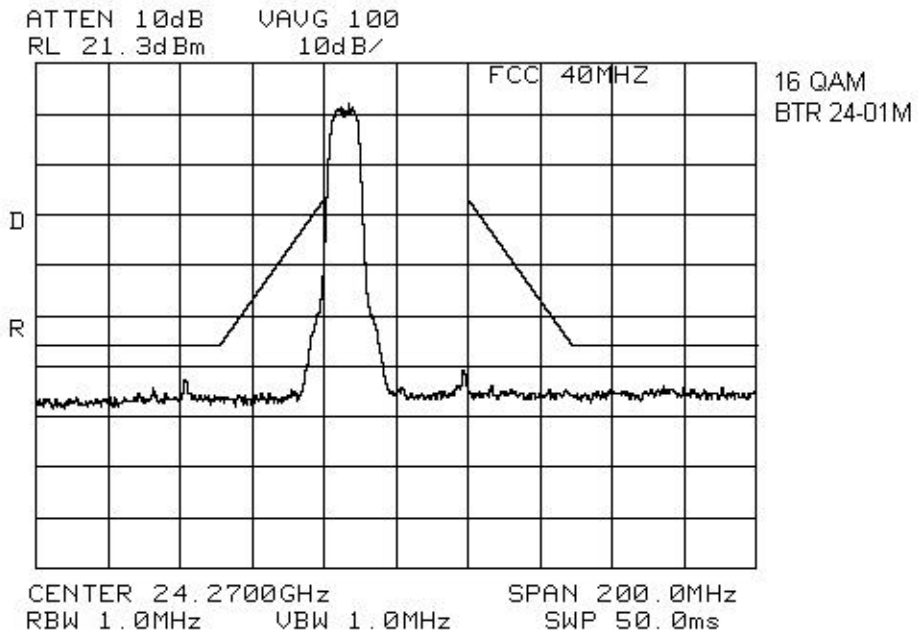
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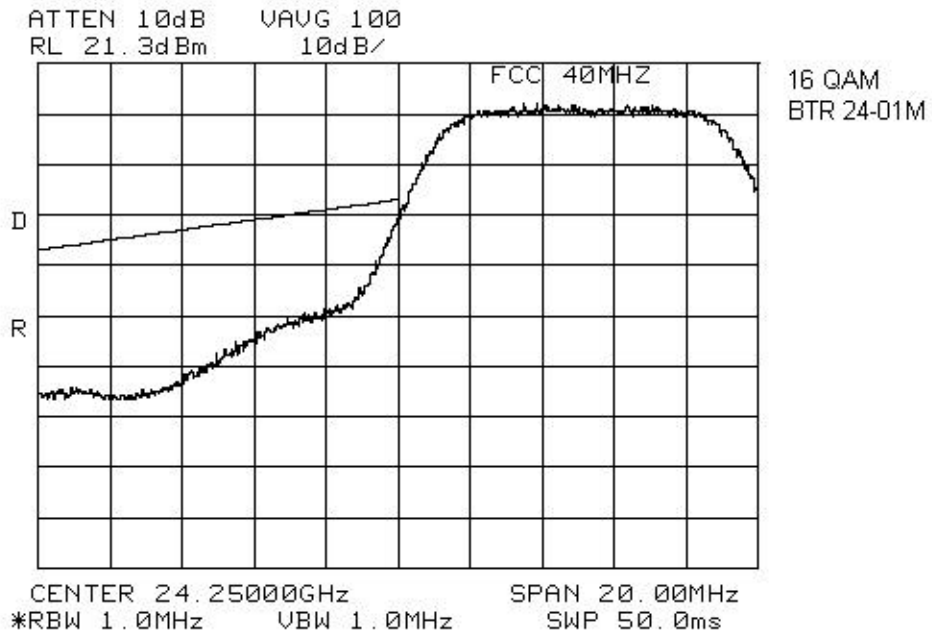
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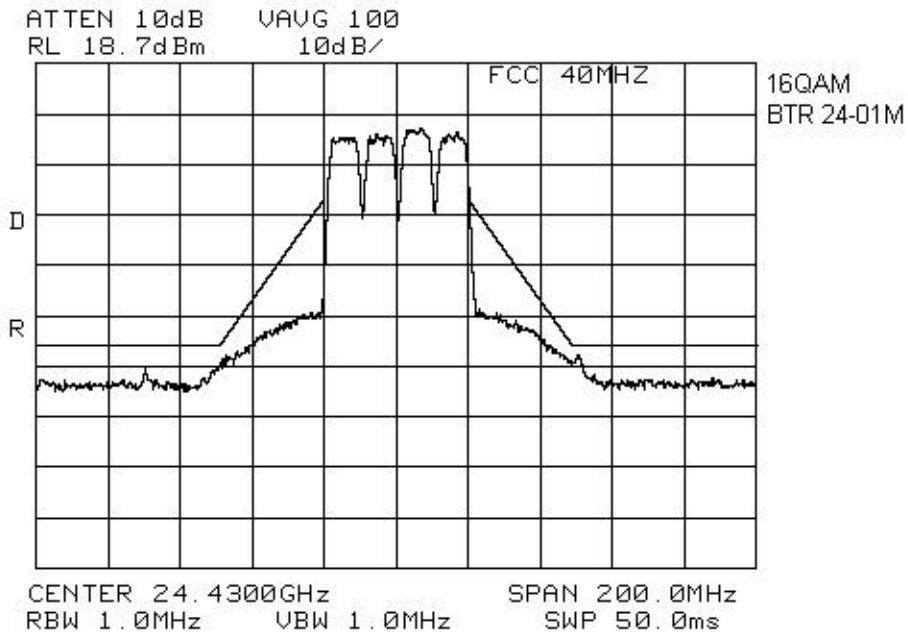
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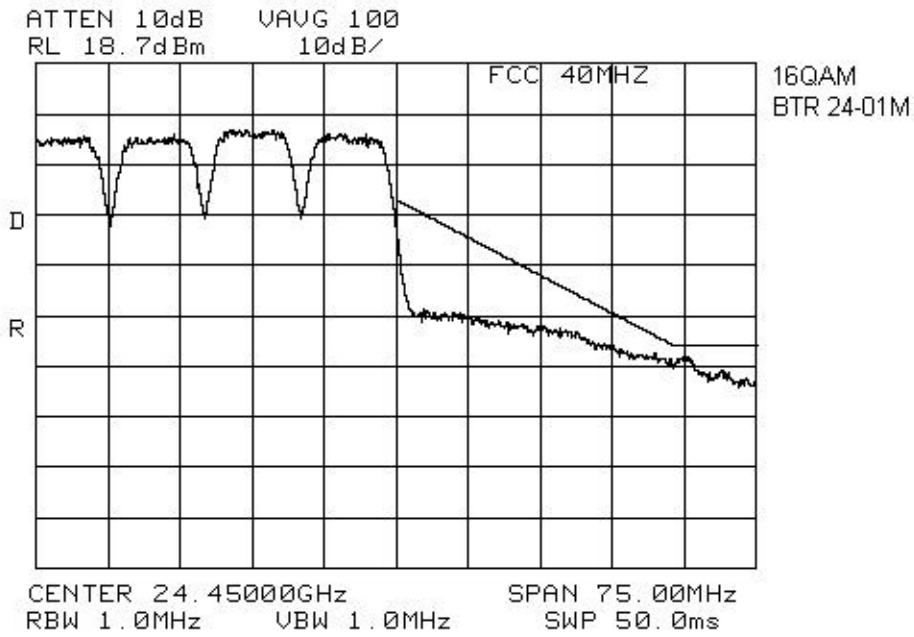
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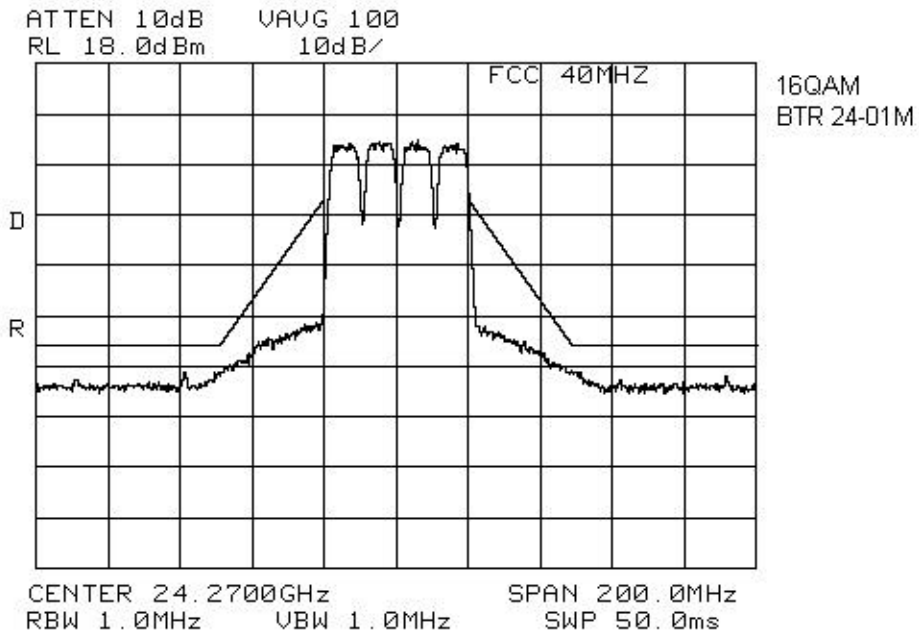
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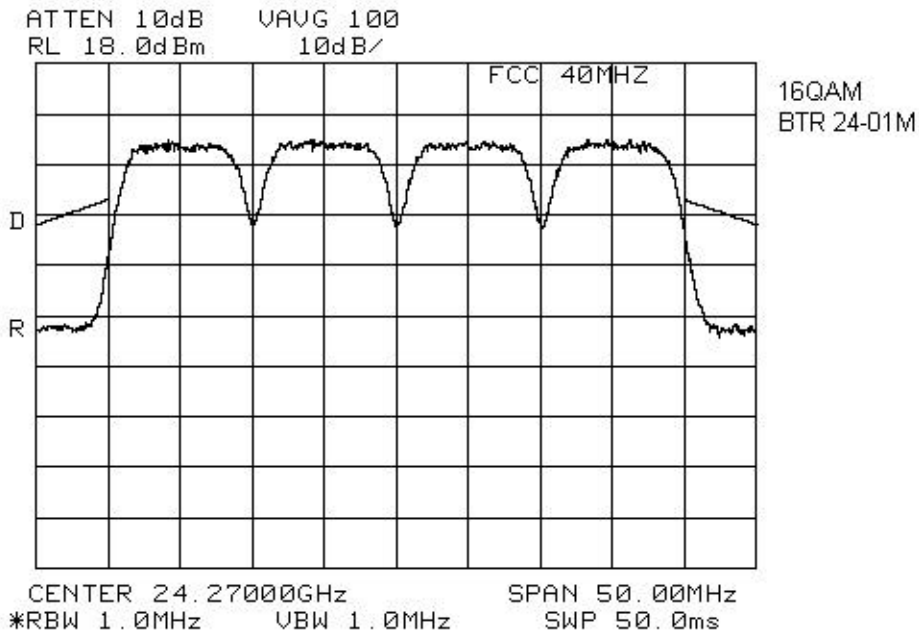
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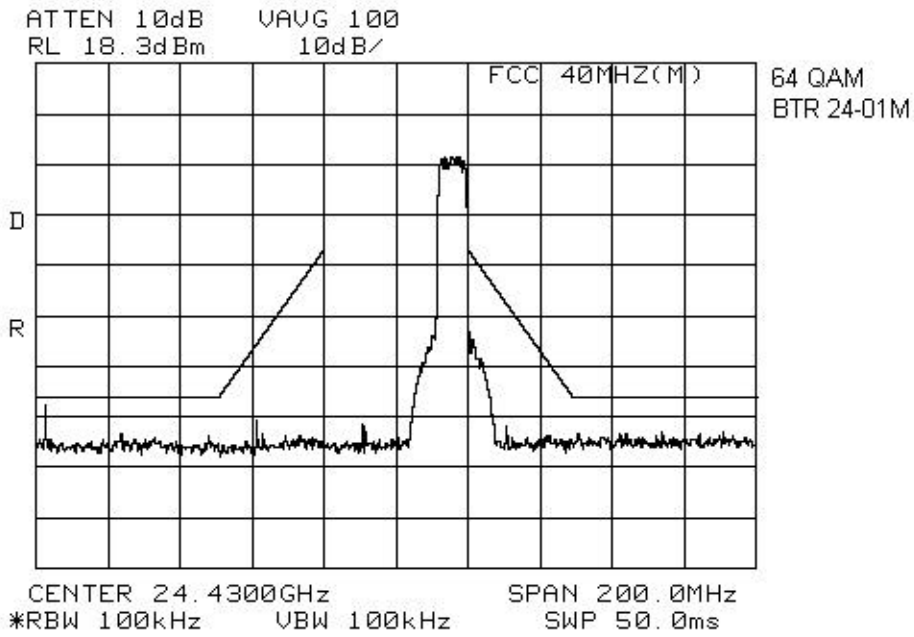
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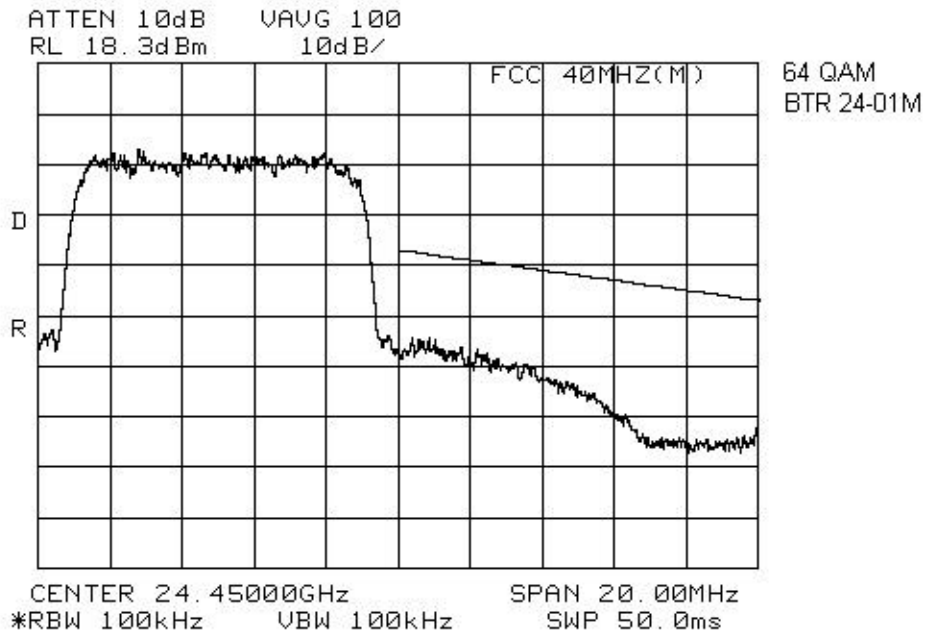
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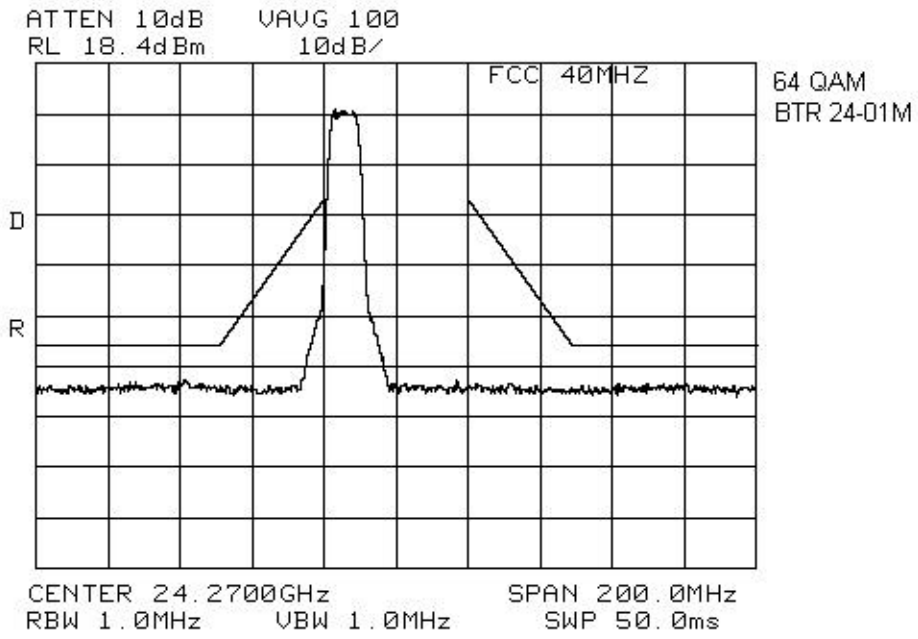
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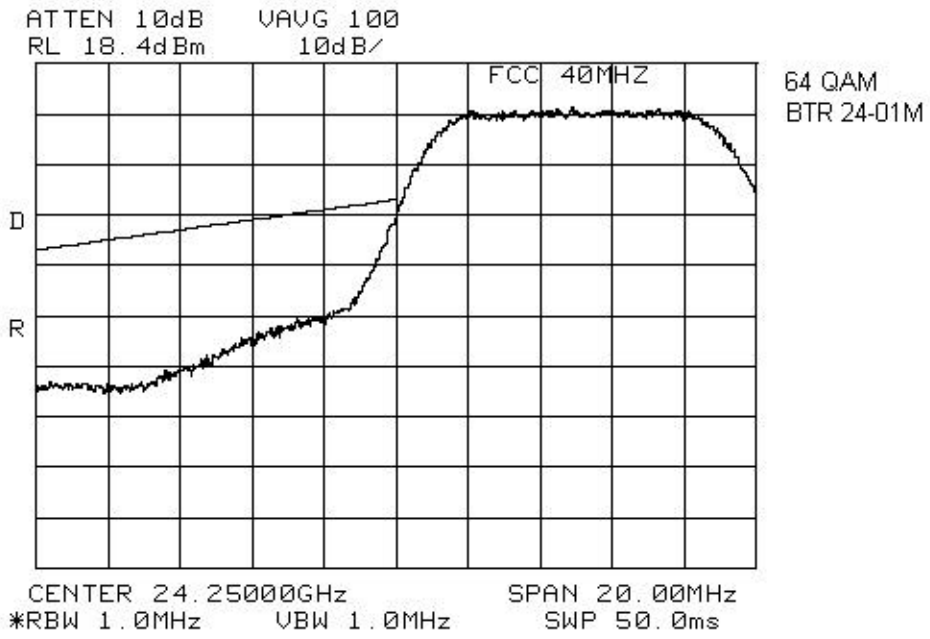
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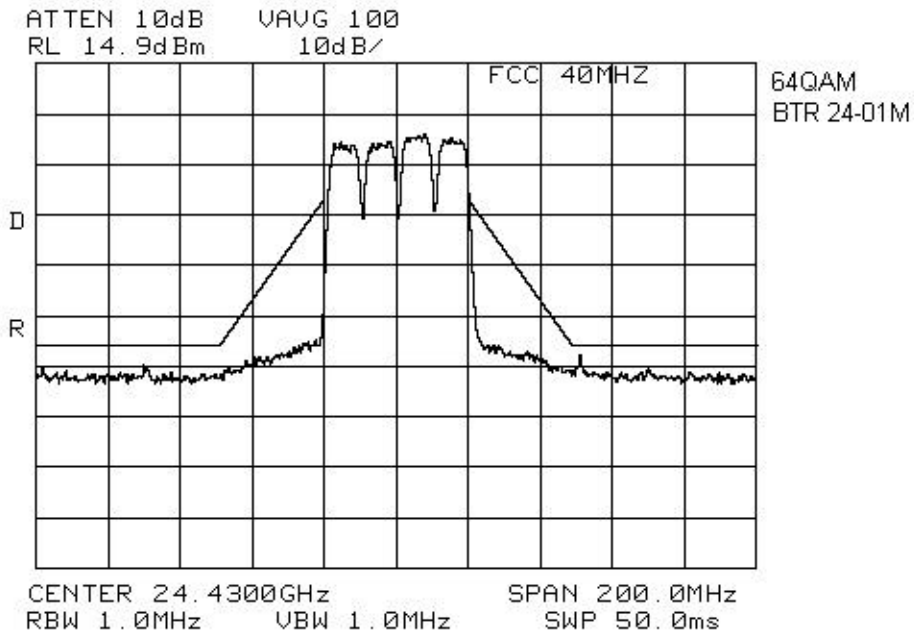
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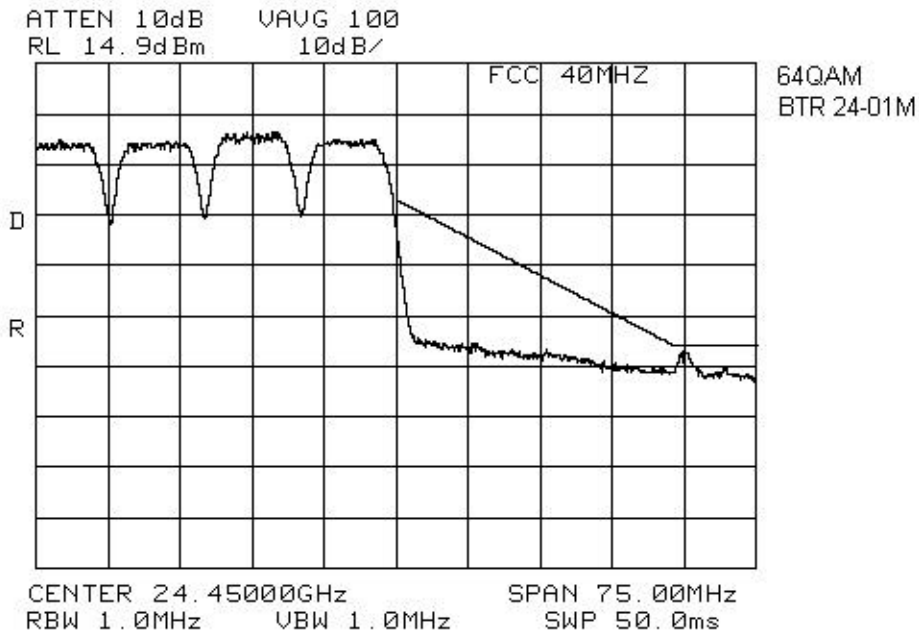
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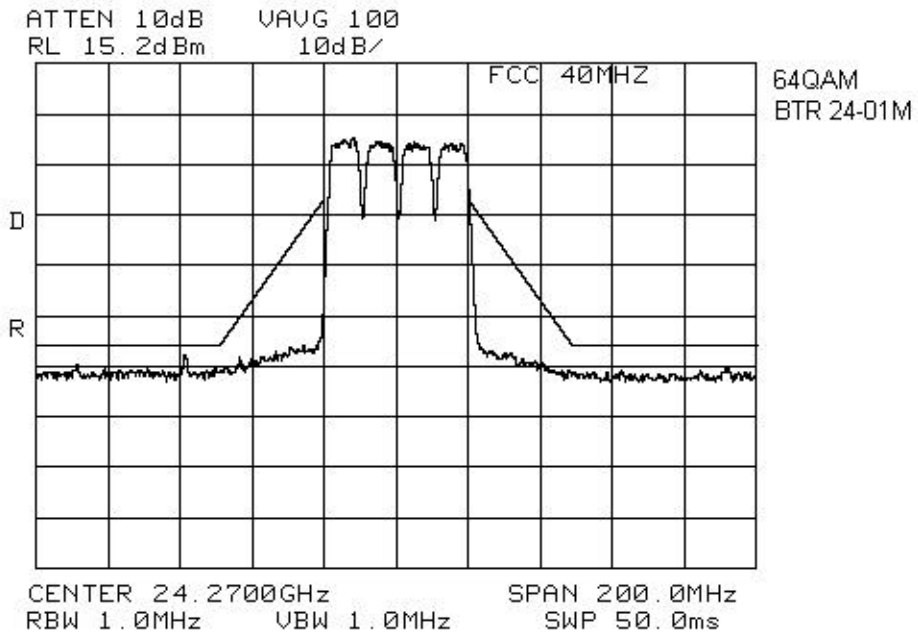
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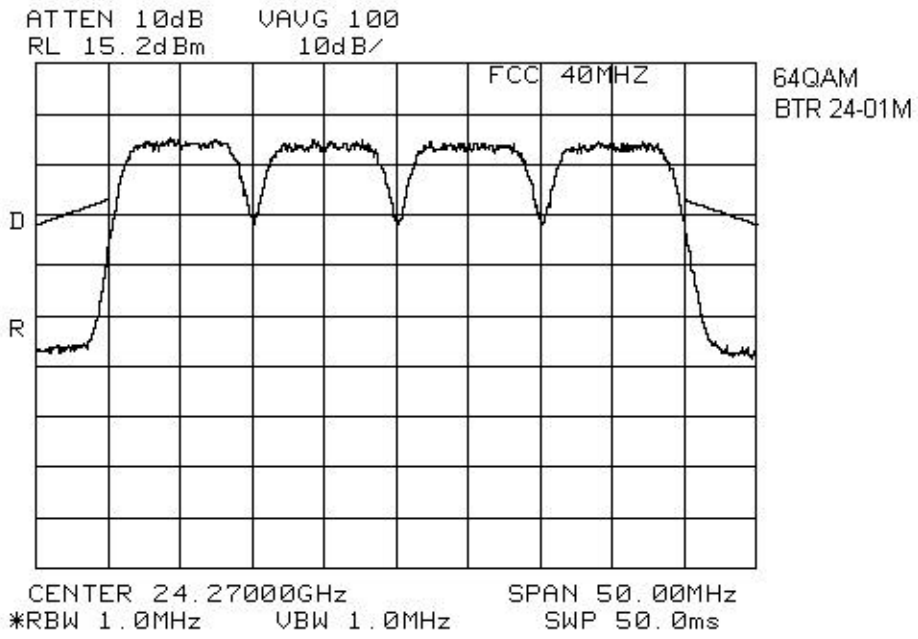
EQUIPMENT: BTR 24-01M



EQUIPMENT: BTR 24-01M



EQUIPMENT: BTR 24-01M



EQUIPMENT: BTR 24-01M

Section 5. Spurious Emissions at Antenna Terminals

Para. No.: 2.1051

Test Performed By: Glen Westwell	Date of Test: November 6, 2000
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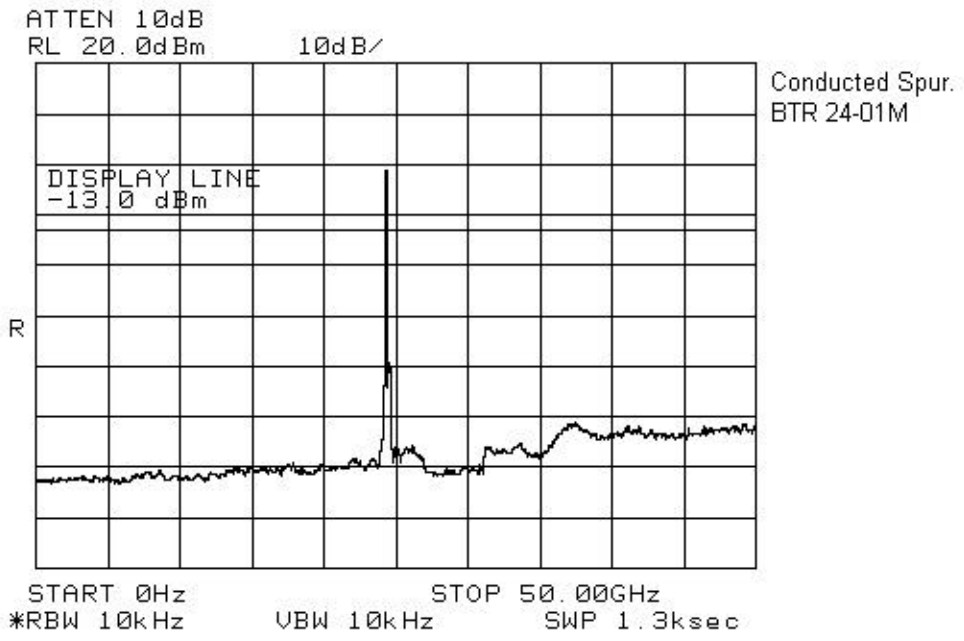
Minimum Standard: 101.111 (a)(2)(iii), -13 dBm

Test Results: Complies.

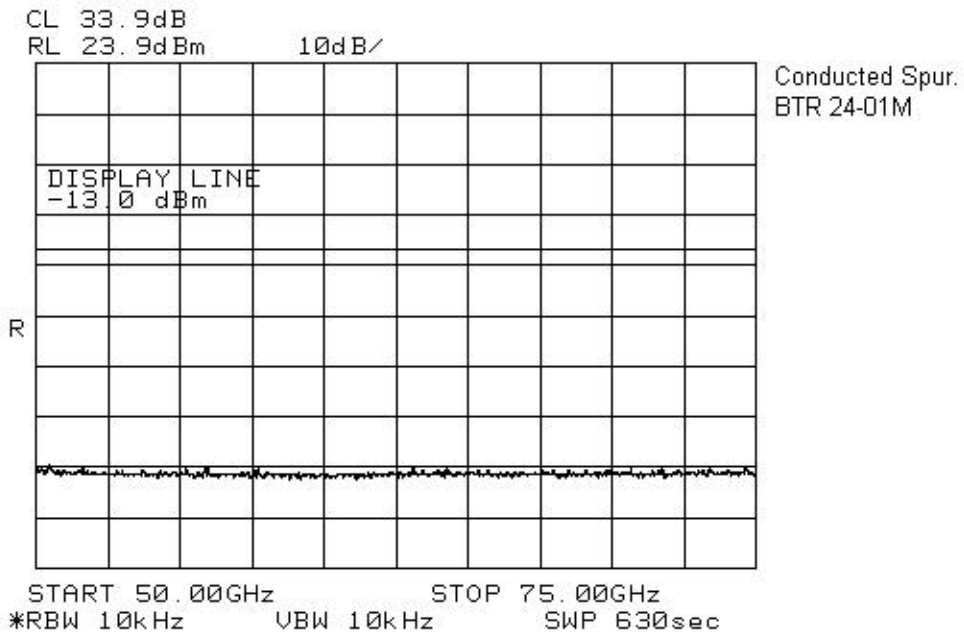
No emissions were detected within 20 dB of the specification limit.

Test Data: See attached graph(s).

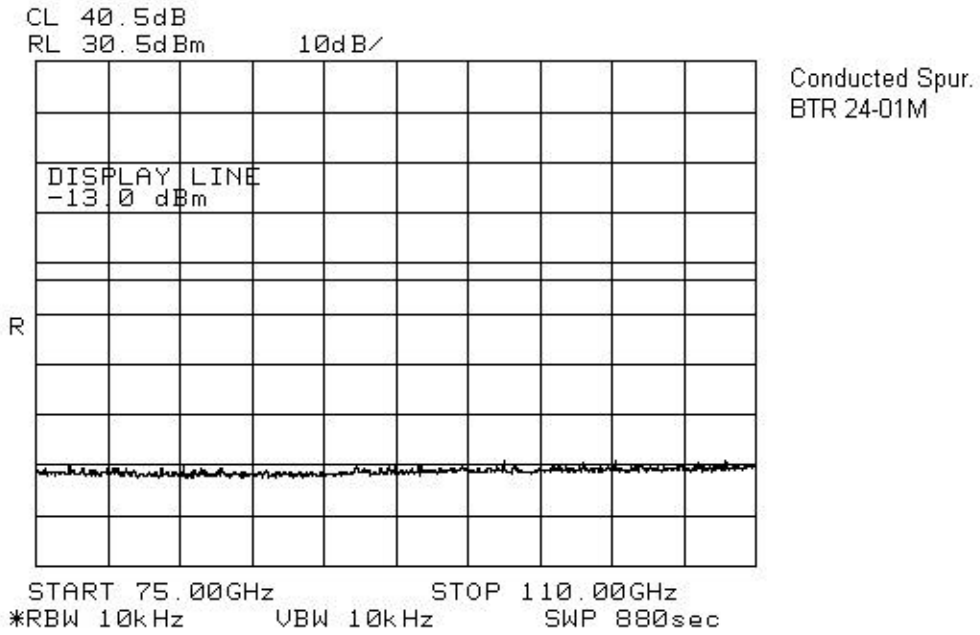
EQUIPMENT: BTR 24-01M



EQUIPMENT: BTR 24-01M



EQUIPMENT: BTR 24-01M



EQUIPMENT: BTR 24-01M

Section 6. Field Strength of Spurious Emissions

Para. No.: 2.1053

Test Performed By: Glen Westwell	Date of Test: November 2, 2000
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Minimum Standard: 101.111(a)(2)(iii), -13 dBm
84.4 dB μ V/m @ 3m < 1 GHz
82.2 dB μ V/m @ 3m > 1 GHz

Test Results: Complies

No emissions were detected within 20 dB of the specification limit.

Test Data: The spectrum was searched from 400 MHz to 140 GHz.

No emissions were detected.

EQUIPMENT: BTR 24-01M

Section 7. Frequency Stability

Para. No.: 2.1055

Test Performed By: Glen Westwell	Date of Test: November 1, 2000
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Minimum Standard: ± 0.03 %, 7306 kHz

Test Results: Complies

The maximum frequency drift is 4,000 Hz.
This is 0.0000164%

Measurement Data: Standard Test Voltage: STV -48 VDC
Standard Test Voltage: 24355.000 MHz

Test Condition	Frequency (kHz)	Frequency Drift (kHz)
STV	24 355 001	1
115% STV	24 355 002	2
85% STV	24 355 002	2
-30°C	24 355 996	4
-20°C	24 355 997	3
-10°C	24 355 997	3
0°C	24 355 999	1
+10°C	24 355 000	0
+30°C	24 355 002	2
+40°C	24 355 002	2
+50°C	24 355 003	3

EQUIPMENT: BTR 24-01M

Section 8. Test Equipment List

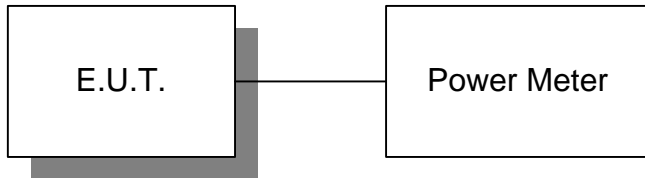
CAL CYCLE	EQUIPMENT	MANUFACTURER	MODEL	SERIAL	LAST CAL.	NEXT CAL.
1 Year	Spectrum Analyzer	Hewlett Packard	8565E	FA000981	June 16/00	June 16/01
1 Year	Climate Chamber	Thermotron	SM-16C	15649-S	COU	COU
2 Year	RF Power Meter	Hewlett Packard	E4418B	FA001413	Nov. 8/99	Dec. 7/00
1 Year	Horn Antenna	EMCO #2	3115	4336	Nov. 11/99	Nov. 11/00
1 Year	Log Periodic Antenna 1	EMCO	LPA-25	1141	Aug. 4/99	Aug. 4/00
3 Year	Standard Gain Horn	Electro-Metrics	SH-50/60-1	FA000479	July 7/00	July 7/01
3 Year	Standard Gain Horn	Electro-Metrics	SH-50/60-2	FA000485	July 7/00	July 7/01
3 year	Harmonic Mixer	H.P.	50-75Ghz	FA001027	Mar. 9/00	Mar. 9/03
3 year	Harmonic Mixer	H.P.	75-110Ghz	FA001302	Oct. 13/98	Oct. 13/01
3 year	Diplexer	Olsen - OML	DPL.26 (H.P)		Mar. 15/00	Mar 15/03
3 year	Mixer/Antenna 40-60Ghz	Olsen – OML	M19HWA (H.P.)		Mar. 15/00	Mar. 15/03
3 year	Mixer /Antenna 60-90Ghz	Olsen – OML	M12HWA (H.P.)		Mar. 15/00	Mar. 15/03
3 year	Mixer / Antenna 90-140Ghz	Olsen – OML	M08HWA (H.P.)		Mar. 15/00	Mar. 15/03
1 Year	RF Power Meter	Anritsu	ML2438A	98290019	Dec. /00	Dec. /01

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

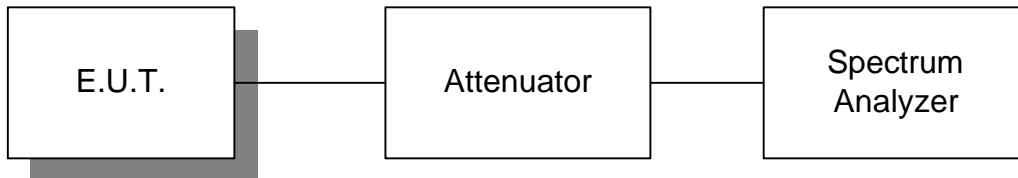
Annex A
Test Diagrams

EQUIPMENT: BTR 24-01M

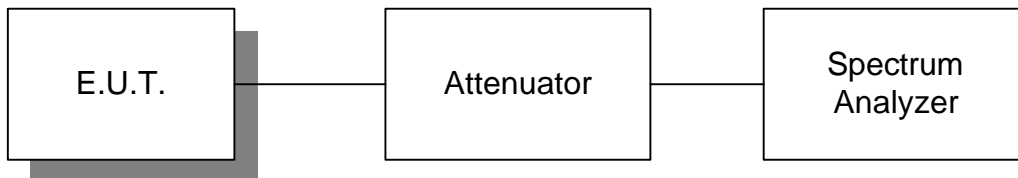
Para. No. 2.1046 - R.F. Power Output



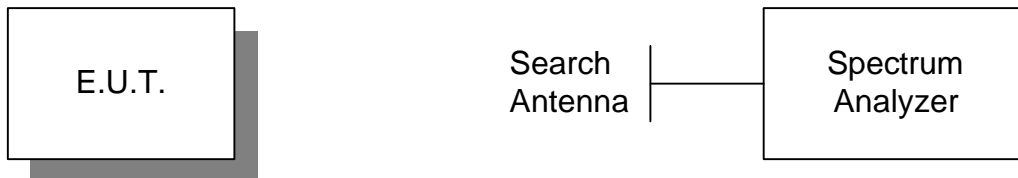
Para. No. 2.1049 - Occupied Bandwidth



Para. No. 2.1051 - Spurious Emissions at Antenna Terminals



Para. No. 2.1053 - Field Strength of Spurious Radiation



EQUIPMENT: BTR 24-01M

Para. No. 2.1055 - Frequency Stability

