KTL Test Report:	0R02873
Applicant:	Nortel Networks 21 Richardson Side Road Kanata, Ontario K2K 2C1
Equipment Under Test: **(E.U.T.)**	BTR 28-08M NTVG14CB S/W Ver. 1.2
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 Group Manager
Date:	Sept 5,00
Total Number of Pages:	36
Authorized Copy:	CD

Table of Contents

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

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: Sept 4,00

Summary Of Test Data

Name Of Test	Para. No.	Result
RF Power Output	101.113	Complies
Audio Frequency Response	——	Not Applicable
Audio Low-Pass Filter Response	——	Not Applicable
Modulation Limiting	——	Not Applicable
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: This equipment does not have any provision for conventional analogue voice processing circuits.

* Equipment authorized to be operated in the 38000 to 40000 MHz band is exempt from the frequency tolerance requirement.

Test Conditions:

Indoor Temperature: 24 °C
Humidity: 46 %

Outdoor Temperature: 25 °C
Humidity: 44 %

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Section 2. General Equipment Specification

Manufacturer:	Nortel Networks
Model No.:	BTR 28-08M, NTVG14CB S/W Ver. 1.2
Serial No.:	NNTM532GPH4X
Date Received In Laboratory:	August 14, 2000
KTL Identification No.:	Item #1
Supply Voltage Input:	-48 Vdc
Frequency Range:	27.505 – 27.645 GHz
Tunable Bands:	1
Necessary Bandwidth:	(1 Carrier) OCC. BW = 7.83 MHz (4 Carrier) OCC. BW = 31.32 MHz
Types of Modulation:	4, 16 & 64 QAM @ 7.456 Msps FDMA
Data Rate(s):	7.456 Msps
Internal/External Data Source:	External
Emission Designator:	7M83D9W 15M7D9W 23M5D9W 31M3D9W
Output Impedance:	50Ω
RF Power Output (rated):	14.5 to 22 dBm
Channel Spacing(s):	10 MHz
Operator Selection of Operating Frequency:	None
Power Output Adjustment Capability:	Attenuation Adjust 31 – 0 dB

Section 3. RF Power Output

Para. No.: 1.1046

Test Performed By: Glen Westwell	**Date of Test:** August 24, 2000

Minimum Standard: 101.113 (a), 55 dBW

Test Results: Complies

Measurement Data:

Rated (dBm)	Measured (dBm)
22.0	22.1
22.0	22.0
20.0	20.1
20.0	20.1
18.0	17.9
18.0	18.0
20.5	20.4
20.5	20.8
17.5	17.5
17.5	17.8
14.5	14.8
14.5	15.3

Section 4. Occupied Bandwidth

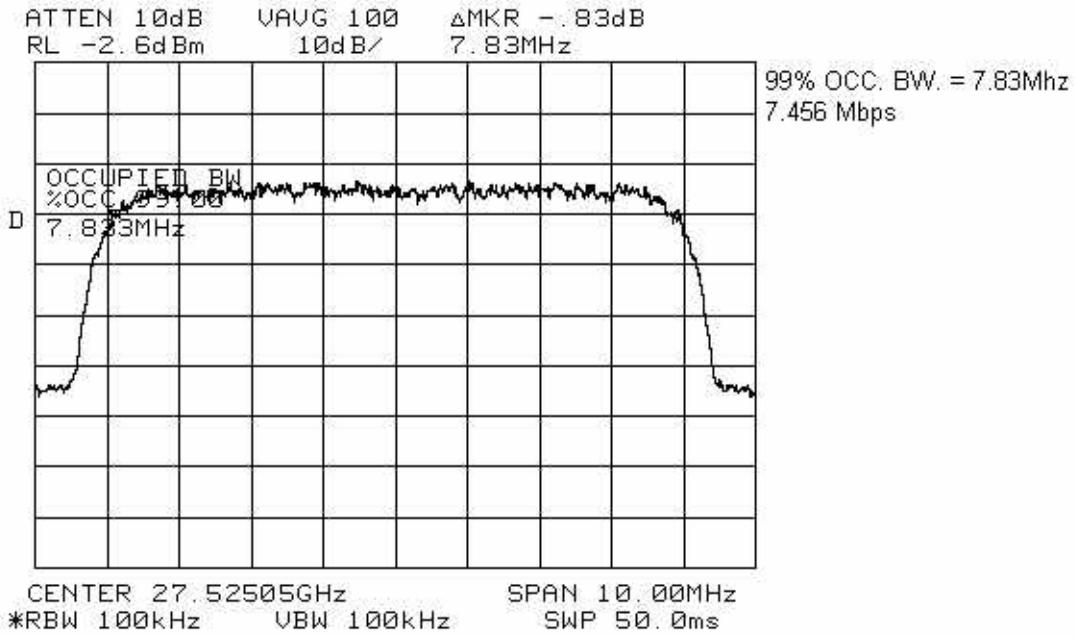
Para. No.: 2.1049

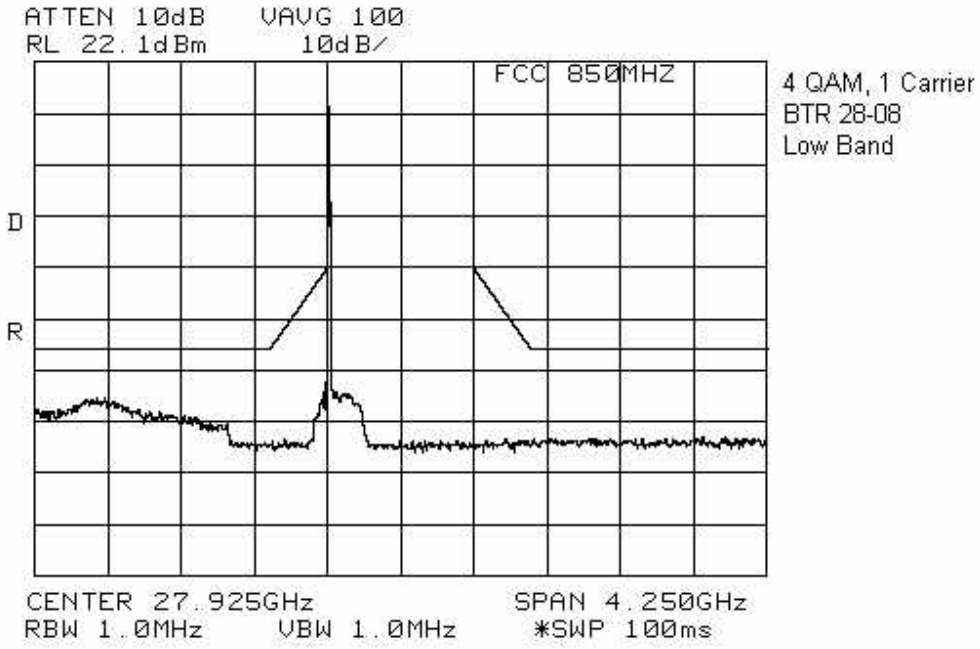
Test Performed By: Glen Westwell	**Date of Test:** August 25, 2000

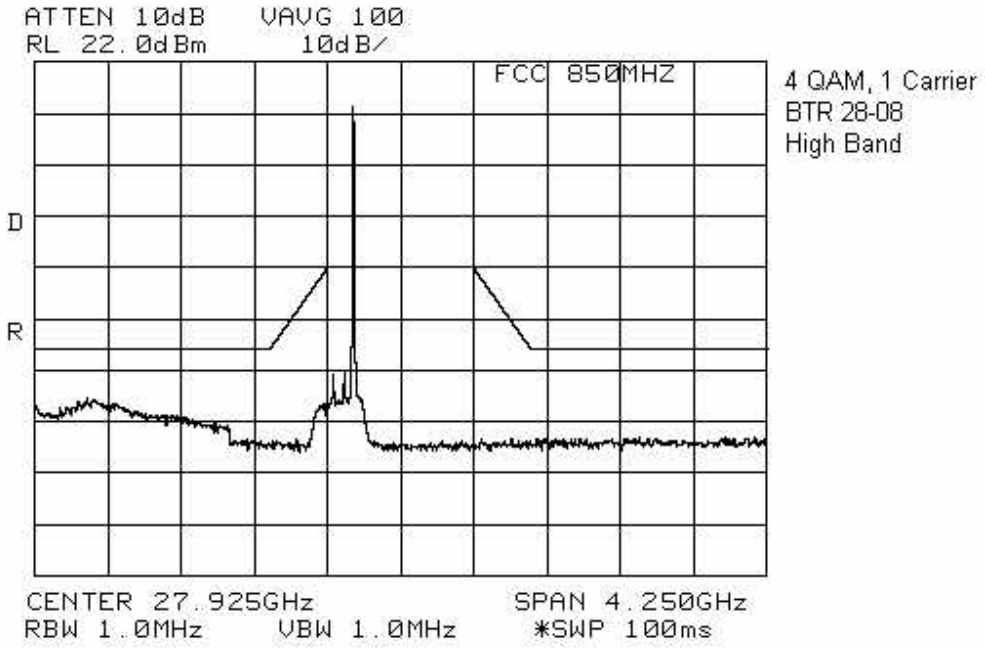
Minimum Standard: 101.111 (a)(2)(ii)

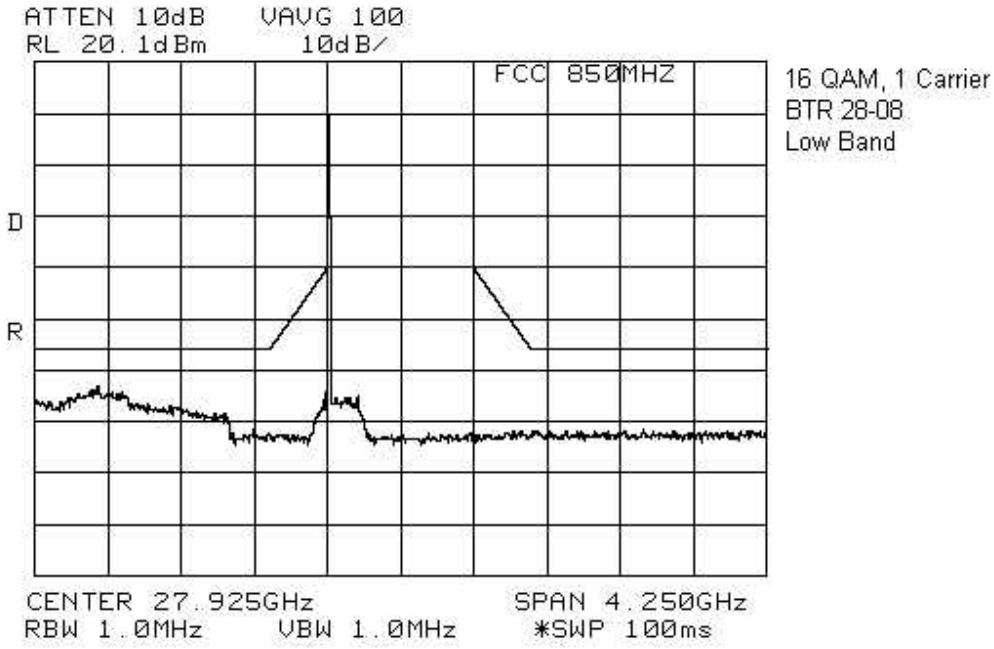
Test Results: Complies

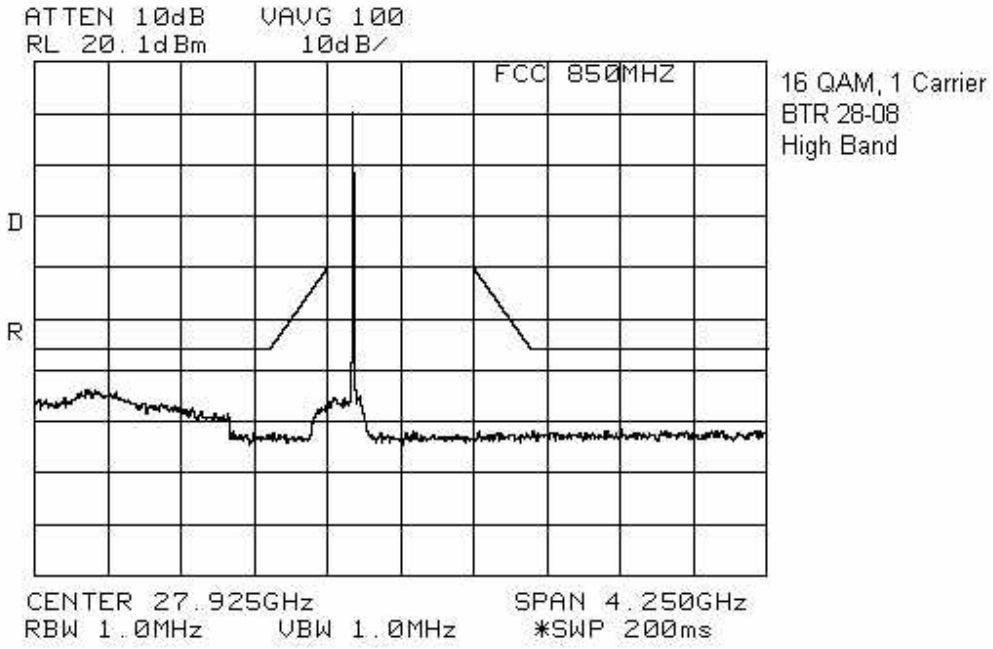
Test Data: See attached graph(s).

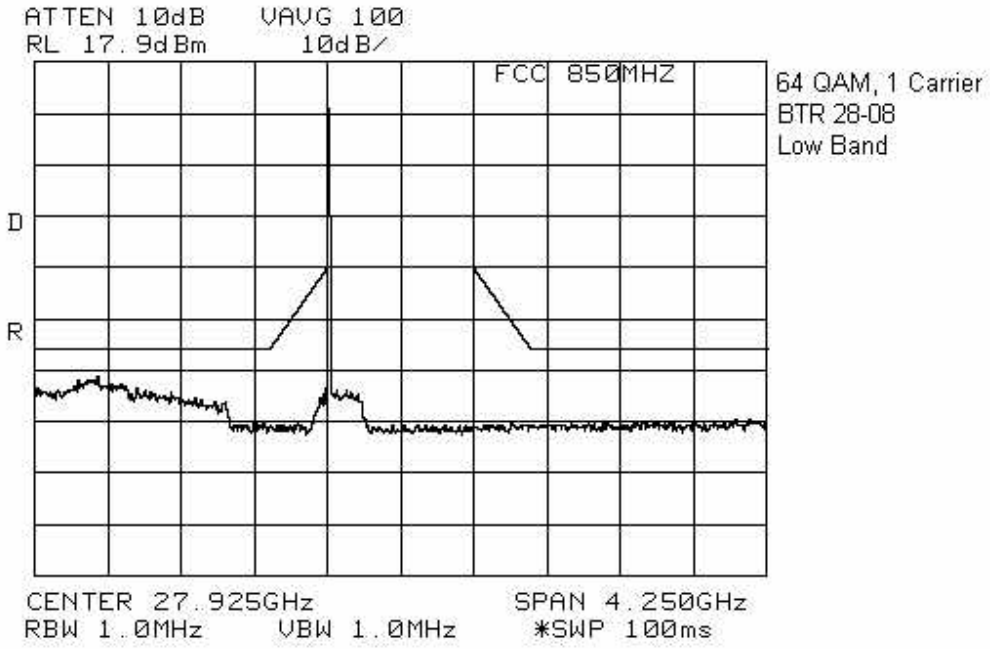

ATTEN 10dB
RL -2.6dBm
VAVG 100
10dB/
ΔMKR -.83dB
7.83MHz
99% OCC. BW. = 7.83Mhz
7.456 Mbps
OCCUPIED BW
%OCC.99.00
D
7.823MHz
CENTER 27.52505GHz
SPAN 10.00MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms

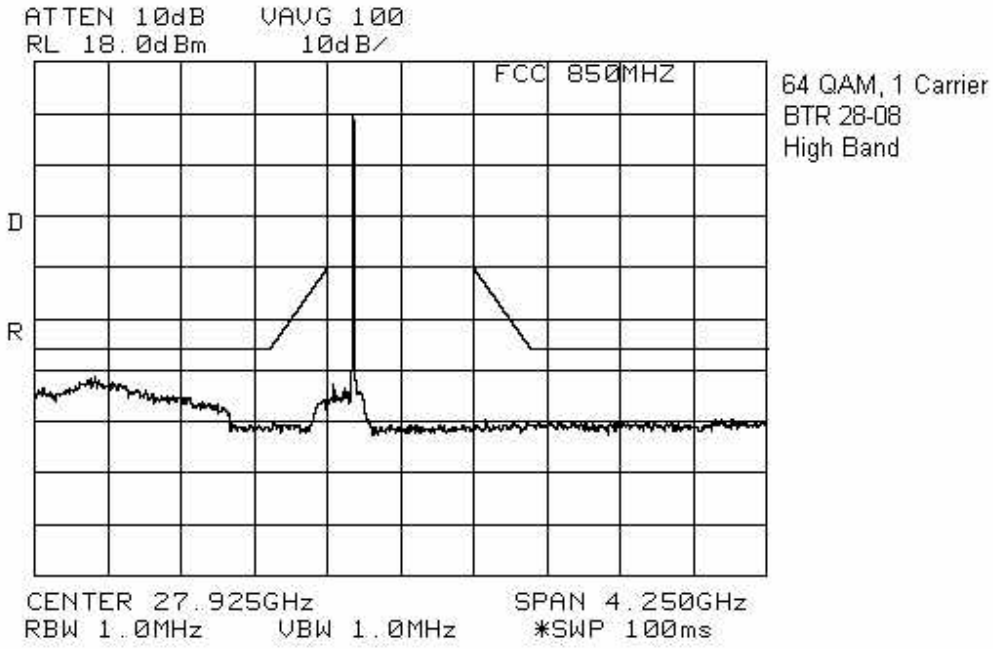

ATTEN 10dB
RL 22.1dBm
VAVG 100
10dB/
FCC 850MHZ
4 QAM, 1 Carrier
BTR 28-08
Low Band
D
R
CENTER 27.925GHz
SPAN 4.250GHz
RBW 1.0MHz
VBW 1.0MHz
*SWP 100ms

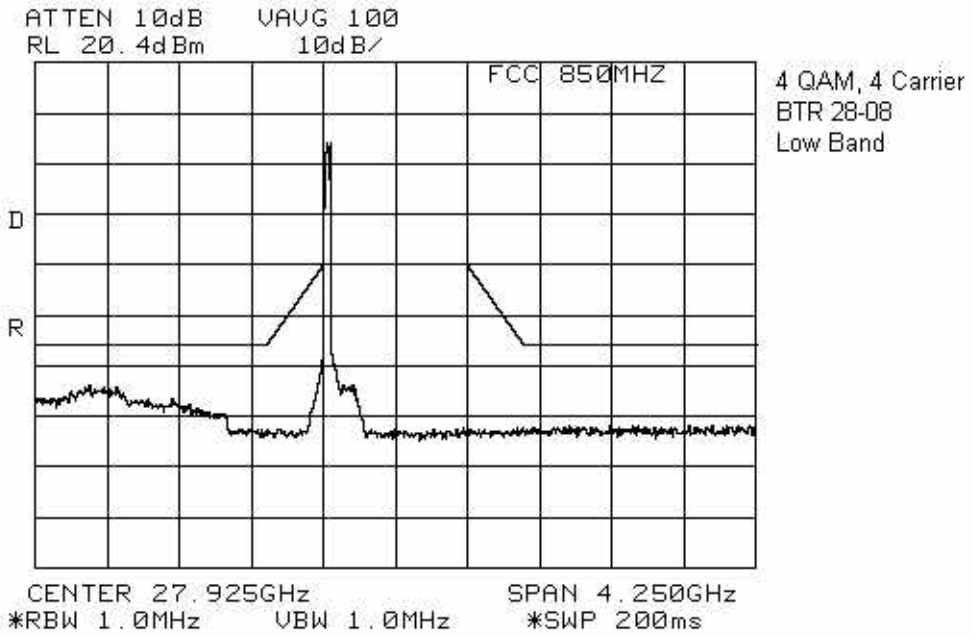

ATTEN 10dB
RL 22.0dBm
VAVG 100
10dB/
FCC 850MHZ
4 QAM, 1 Carrier
BTR 28-08
High Band
D
R
CENTER 27.925GHz
SPAN 4.250GHz
RBW 1.0MHz
VBW 1.0MHz
*SWP 100ms

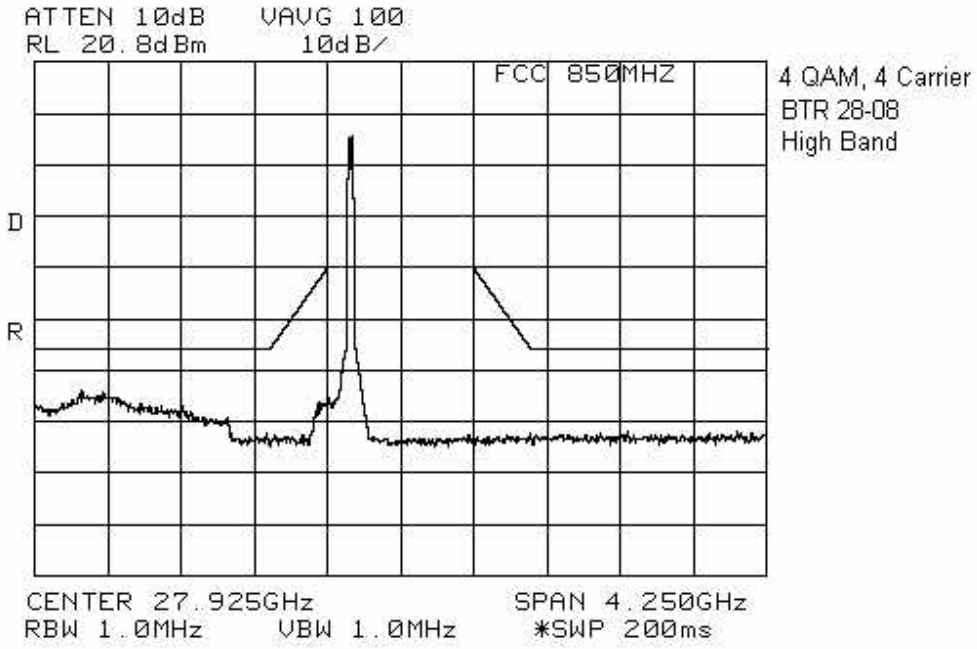

ATTEN 10dB
RL 20.1dBm
VAVG 100
10dB/
FCC 850MHZ
16 QAM, 1 Carrier
BTR 28-08
Low Band
D
R
CENTER 27.925GHz
SPAN 4.250GHz
RBW 1.0MHz
VBW 1.0MHz
*SWP 100ms

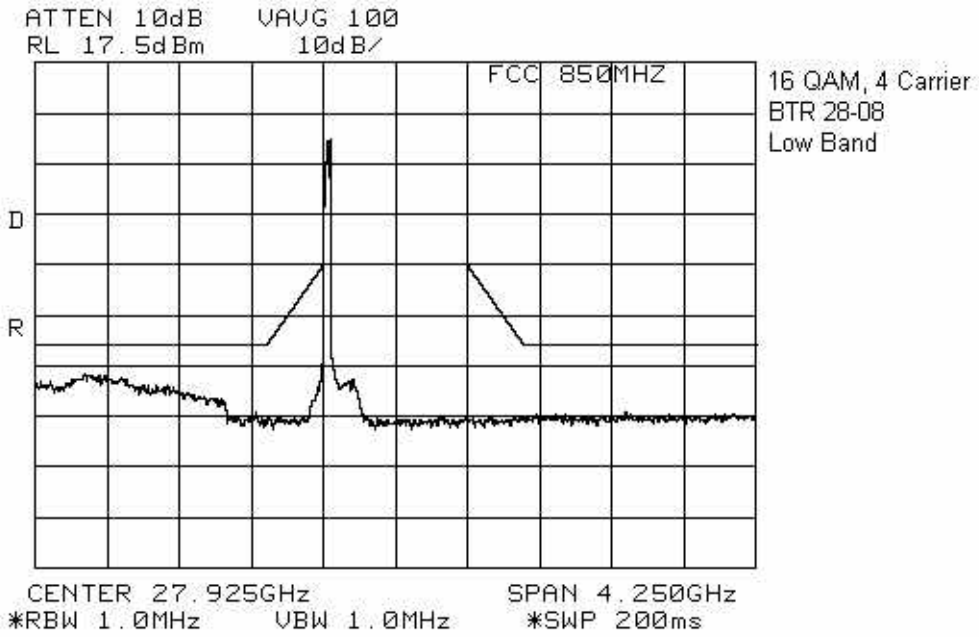

ATTEN 10dB
RL 20.1dBm
VAVG 100
10dB/
FCC 850MHZ
16 QAM, 1 Carrier
BTR 28-08
High Band
D
R
CENTER 27.925GHz
SPAN 4.250GHz
RBW 1.0MHz
VBW 1.0MHz
*SWP 200ms

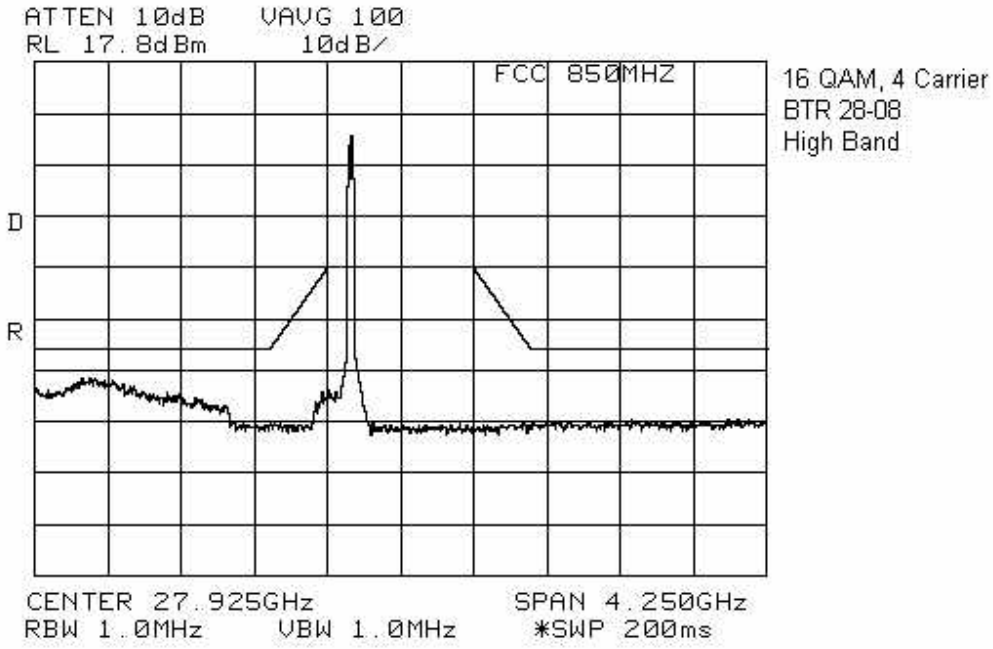

ATTEN 10dB
RL 17.9dBm
VAVG 100
10dB/
FCC 850MHZ
64 QAM, 1 Carrier
BTR 28-08
Low Band
D
R
CENTER 27.925GHz
SPAN 4.250GHz
RBW 1.0MHz
VBW 1.0MHz
*SWP 100ms

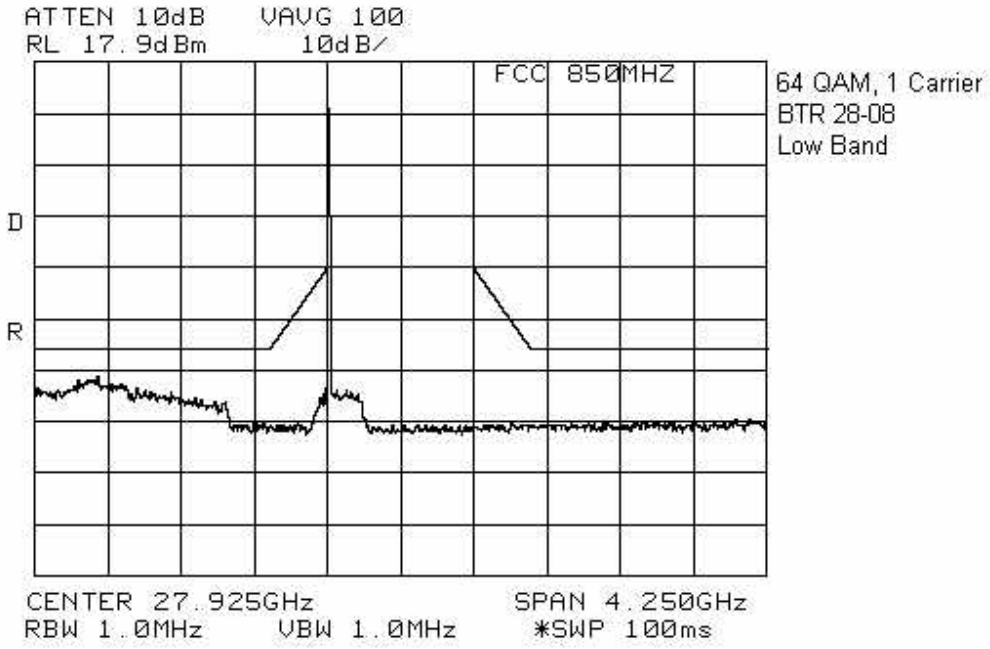

ATTEN 10dB
RL 18.0dBm
VAVG 100
10dB/
FCC 850MHZ
64 QAM, 1 Carrier
BTR 28-08
High Band
D
R
CENTER 27.925GHz
SPAN 4.250GHz
RBW 1.0MHz
VBW 1.0MHz
*SWP 100ms

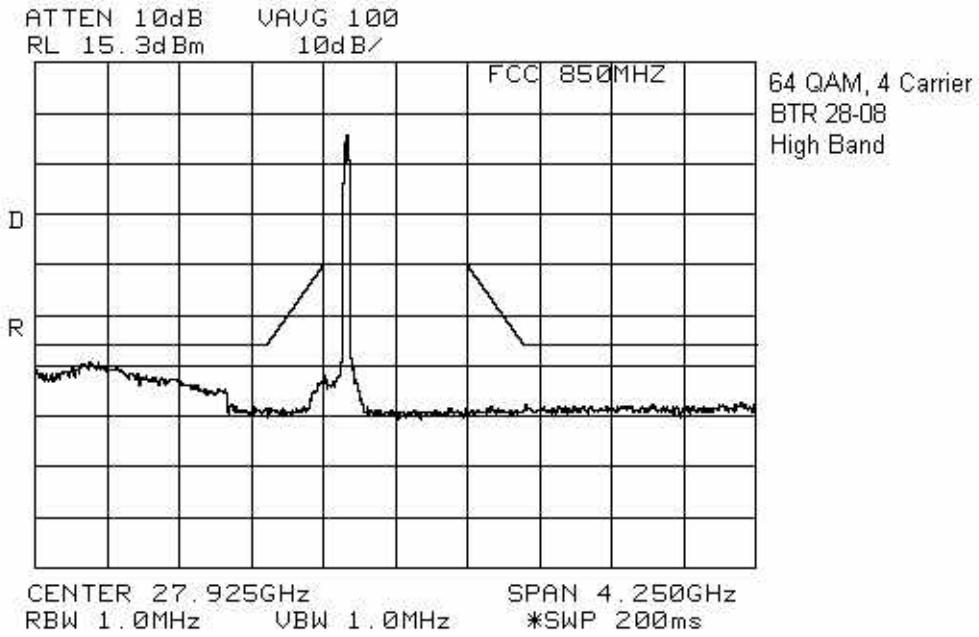

ATTEN 10dB
RL 20.4dBm
VAVG 100
10dB/
FCC 850MHZ
4 QAM, 4 Carrier
BTR 28-08
Low Band
D
R
CENTER 27.925GHz
SPAN 4.250GHz
*RBW 1.0MHz
VBW 1.0MHz
*SWP 200ms


ATTEN 10dB
RL 20.8dBm
VAVG 100
10dB/
FCC 850MHZ
4 QAM, 4 Carrier
BTR 28-08
High Band
D
R
CENTER 27.925GHz
SPAN 4.250GHz
RBW 1.0MHz
VBW 1.0MHz
*SWP 200ms


ATTEN 10dB
RL 17.5dBm
VAVG 100
10dB/
FCC 850MHZ
16 QAM, 4 Carrier
BTR 28-08
Low Band
D
R
CENTER 27.925GHz
SPAN 4.250GHz
*RBW 1.0MHz
VBW 1.0MHz
*SWP 200ms


ATTEN 10dB
RL 17.8dBm
VAVG 100
10dB/
FCC 850MHZ
16 QAM, 4 Carrier
BTR 28-08
High Band
D
R
CENTER 27.925GHz
SPAN 4.250GHz
RBW 1.0MHz
VBW 1.0MHz
*SWP 200ms


ATTEN 10dB
RL 17.9dBm
VAVG 100
10dB/
FCC 850MHZ
64 QAM, 1 Carrier
BTR 28-08
Low Band
D
R
CENTER 27.925GHz
SPAN 4.250GHz
RBW 1.0MHz
VBW 1.0MHz
*SWP 100ms


ATTEN 10dB
VAVG 100
RL 15.3dBm
10dB/
FCC 850MHZ
64 QAM, 4 Carrier
BTR 28-08
High Band
D
R
CENTER 27.925GHz
SPAN 4.250GHz
RBW 1.0MHz
VBW 1.0MHz
*SWP 200ms

Section 5. Spurious Emissions at Antenna Terminals

Para. No.: 2.1051

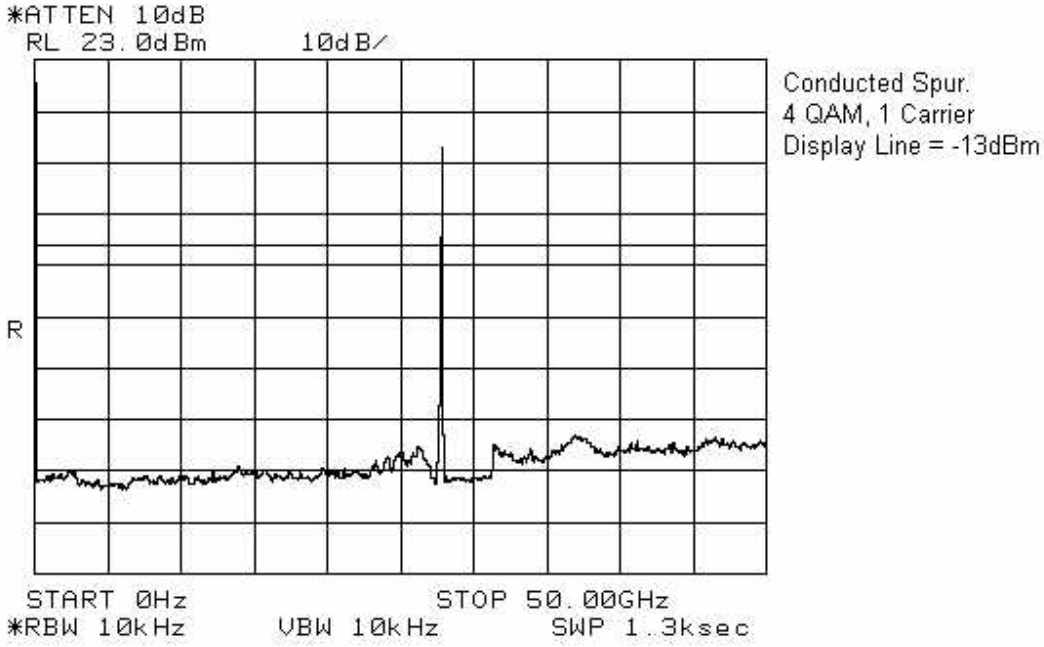
Test Performed By: Glen Westwell	**Date of Test:** August 23, 2000

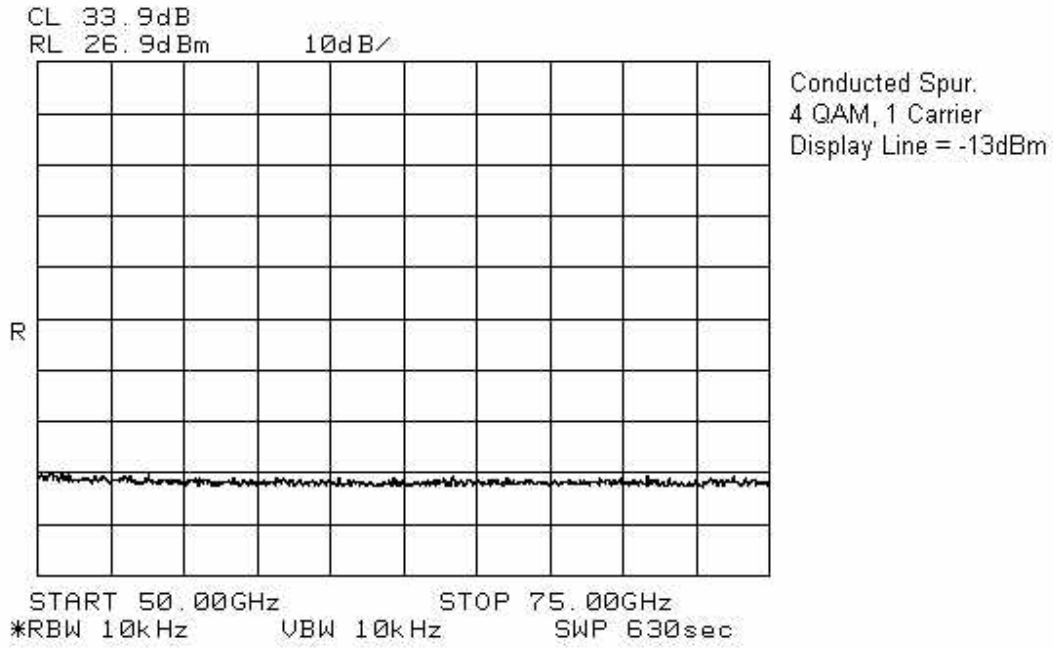
Minimum Standard: 101.111 (a)(2)(iii), -13 dBm

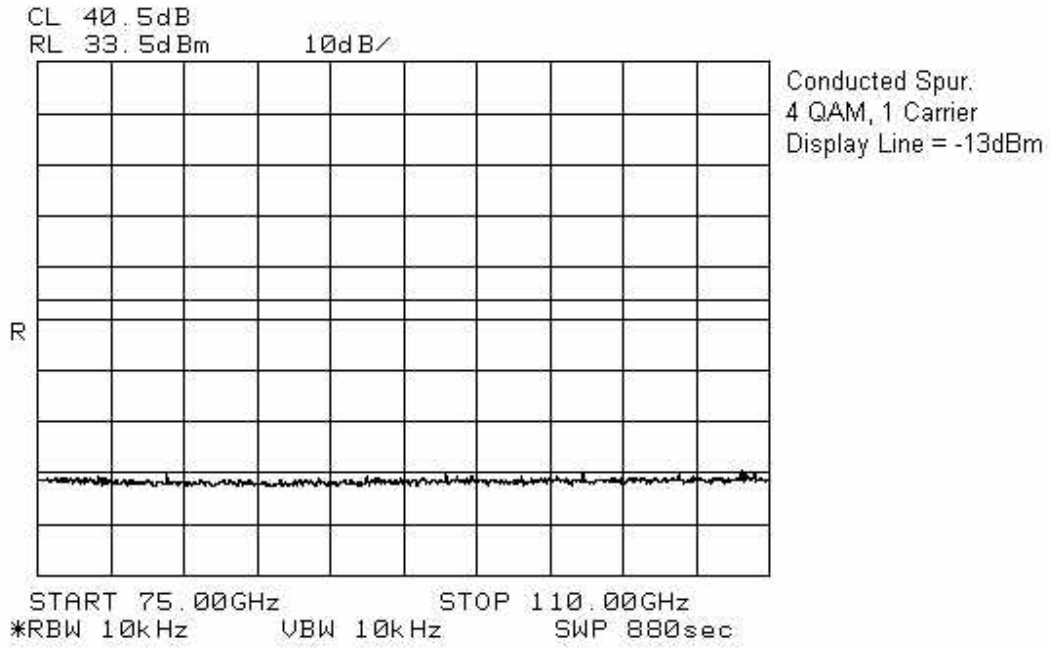
Test Results: Complies

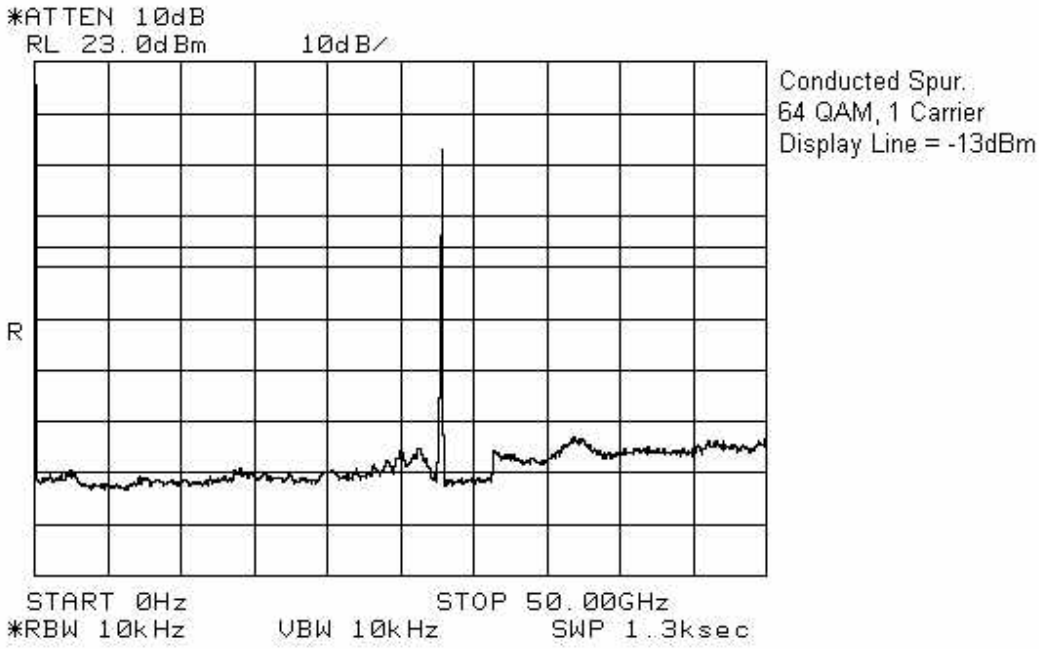
No emissions were detected within 20 dB of the specification limit.

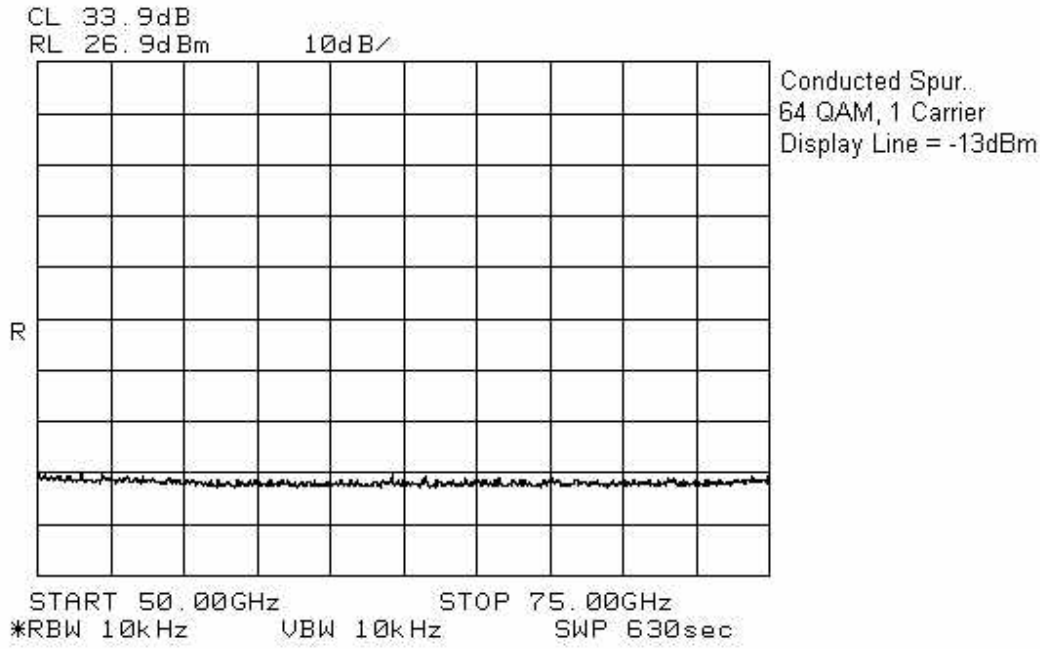
Test Data: See attached graph(s).

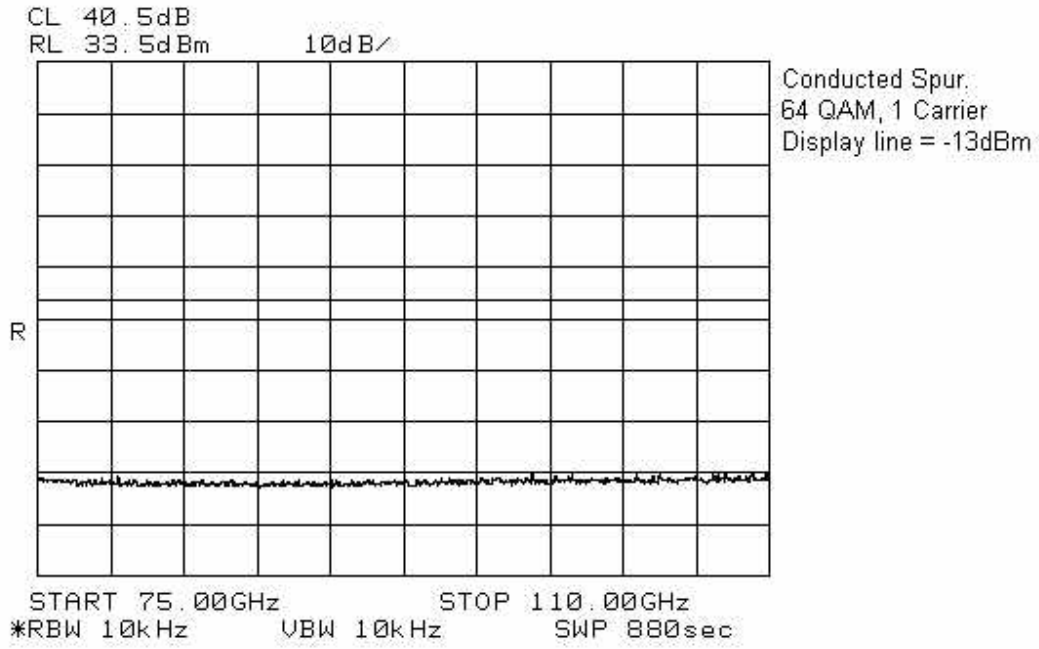

*ATTEN 10dB
RL 23.0dBm
10dB/
R
START 0Hz
STOP 50.00GHz
*RBW 10kHz
VBW 10kHz
SWP 1.3ksec
Conducted Spur.
4 QAM, 1 Carrier
Display Line = -13dBm

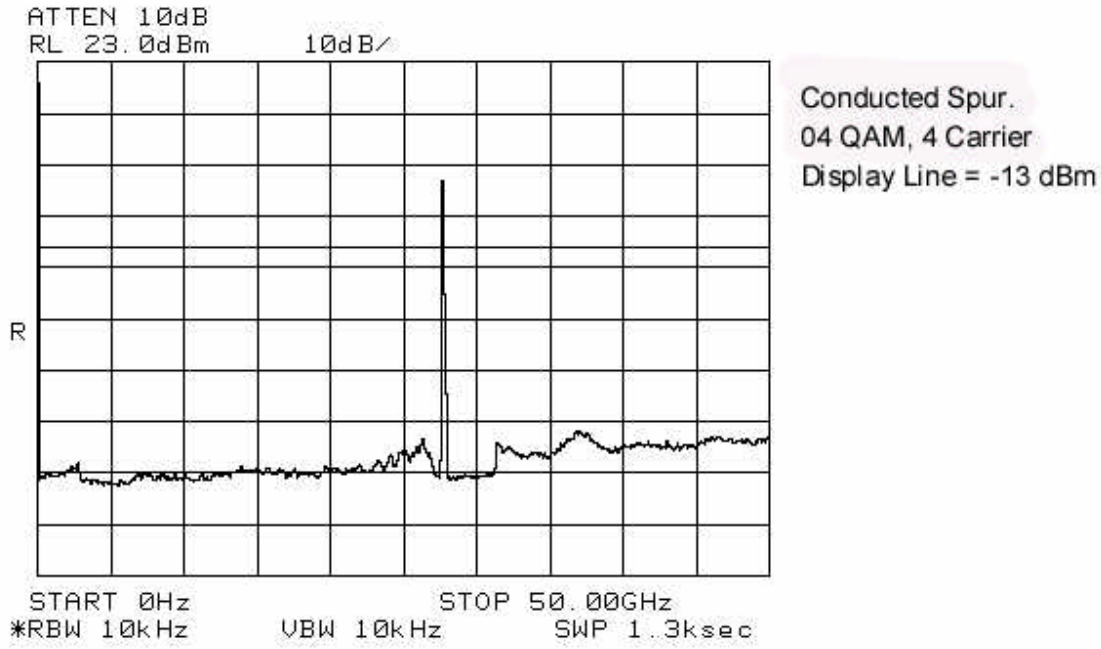

CL 33.9dB
RL 26.9dBm
10dB/
R
Conducted Spur.
4 QAM, 1 Carrier
Display Line = -13dBm
START 50.00GHz
STOP 75.00GHz
*RBW 10kHz
VBW 10kHz
SWP 630sec

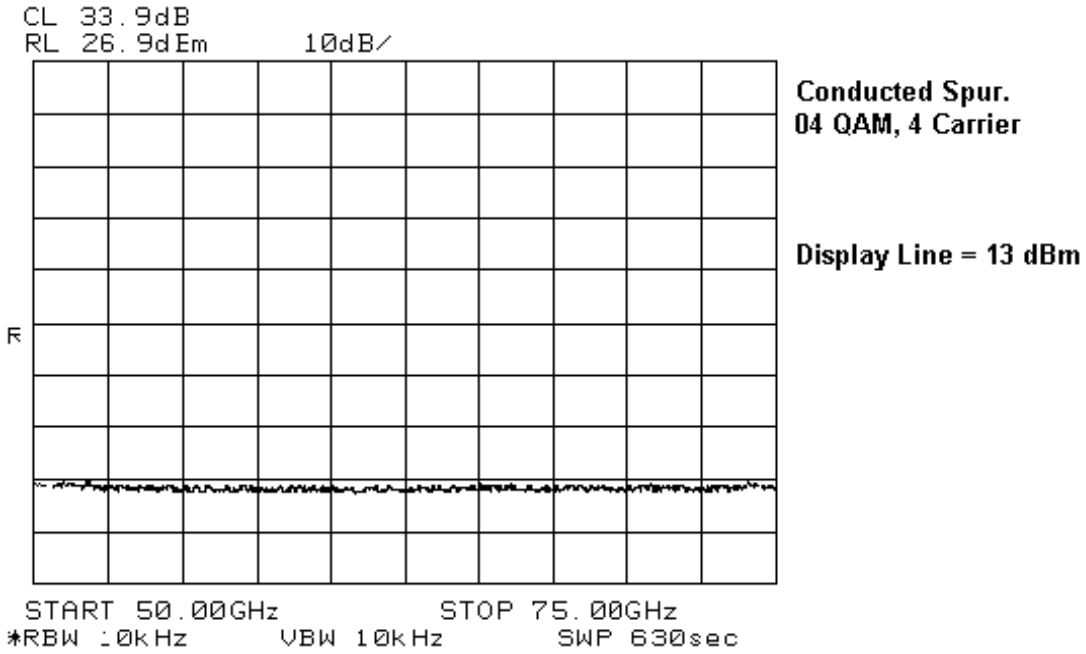

CL 40.5dB
RL 33.5dBm
10dB/
R
Conducted Spur.
4 QAM, 1 Carrier
Display Line = -13dBm
START 75.00GHz
STOP 110.00GHz
*RBW 10kHz
VBW 10kHz
SWP 880sec

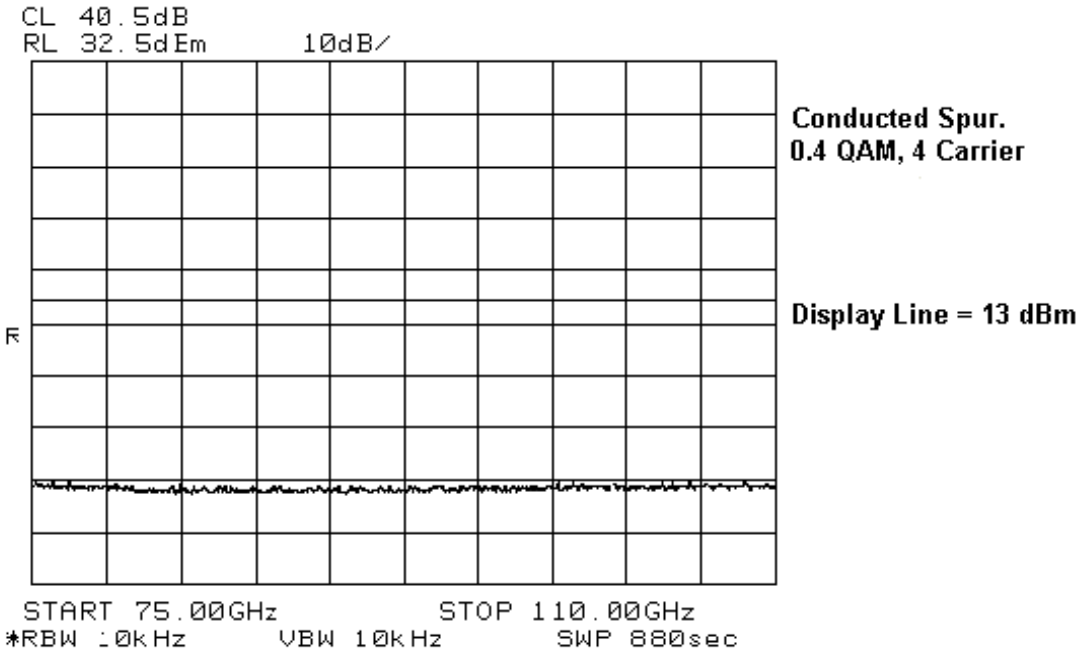

*ATTEN 10dB
RL 23.0dBm
10dB/
R
START 0Hz
STOP 50.00GHz
*RBW 10kHz
VBW 10kHz
SWP 1.3ksec
Conducted Spur.
64 QAM, 1 Carrier
Display Line = -13dBm


CL 33.9dB
RL 26.9dBm
10dB/
R
Conducted Spur.
64 QAM, 1 Carrier
Display Line = -13dBm
START 50.00GHz
STOP 75.00GHz
*RBW 10kHz
VBW 10kHz
SWP 630sec


CL 40.5dB
RL 33.5dBm
10dB/
R
Conducted Spur.
64 QAM, 1 Carrier
Display line = -13dBm
START 75.00GHz
STOP 110.00GHz
*RBW 10kHz
VBW 10kHz
SWP 880sec


ATTEN 10dB
RL 23.0dBm
10dB/
R
START 0Hz
STOP 50.00GHz
*RBW 10kHz
VBW 10kHz
SWP 1.3ksec
Conducted Spur.
04 QAM, 4 Carrier
Display Line = -13 dBm


CL 33.9dB
RL 26.9dEm
10dB/
R
START 50.00GHz
STOP 75.00GHz
*RBW 10kHz
VBW 10kHz
SWP 630sec
Conducted Spur.
04 QAM, 4 Carrier
Display Line = 13 dBm


CL 40.5dB
RL 32.5dBm
10dB/
R
START 75.00GHz
STOP 110.00GHz
*RBW 10kHz
VBW 10kHz
SWP 880sec
Conducted Spur.
0.4 QAM, 4 Carrier
Display Line = 13 dBm

Section 6. Field Strength of Spurious Emissions

Para. No.: 2.1053

Test Performed By: Glen Westwell	**Date of Test:** August 22, 2000

Minimum Standard: 101.111 (a)(2)(iii), -13 dBm

84.4 dBµV/m @ 3m < 1 GHz
82.2 dBµV/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.

Section 7. Frequency Stability

Para. No.: 2.1055

Test Performed By: Glen Westwell	**Date of Test:** August 22, 2000

Minimum Standard: 101.107, 0.001% (276 kHz)

Test Results: Complies

The maximum frequency drift is 15 kHz.
This is 0.0000543%

Test Data: Standard Test Voltage: STV -48 VDC
Standard Test Frequency: 27575 MHz

Test Condition	Frequency (MHz)	Frequency Drift (kHz)
STV	27 574.987	13
115% STV	27 574.988	12
85% STV	27 574.988	12
-30 °C	27 574.994	6
-20 °C	27 574.993	7
-10 °C	27 574.993	7
0 °C	27 574.994	6
+10 °C	27 574.994	6
+30 °C	27 574.993	7
+40 °C	27 574.988	12
+50 °C	27 574.985	15

Section 8. Test Equipment List

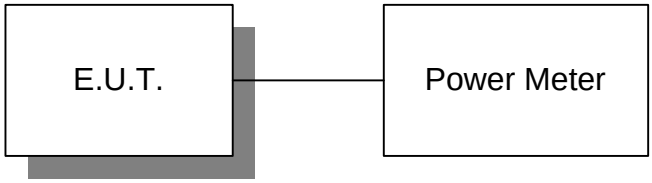
CAL CYCLE	EQUIPMENT	MANUFACTURER	MODEL	SERIAL	LAST CAL.	NEXT CAL.
1 Year	Spectrum Analyzer	Hewlett Packard	8565E	FA000981	June 16/00	June 16/01
1 Year	Climate Chamber	Thermotron	SM-16C	15649-S	COU	COU
1 Year	Horn Antenna	EMCO #2	3115	4336	Nov. 11/99	Nov. 11/00
3 Year	Waveguide Attenuator	Millitech	FXA-28-S20TG0	FA001295	Oct. 13/98	Oct. 13/01
1 Year	Power Meter	Hewlett Packard	E4418B	FA001413	Nov. 8/99	Dec. 7/00
3 Year	Harmonic Mixer	Hewlett Packard	50-75 GHz	FA001027	Mar. 9/00	Mar. 9/03
3 Year	Harmonic Mixer	Hewlett Packard	75-110 GHz	FA001302	Oct. 13/00	Oct. 13/01
3 Year	Diplexer	Olsen-OML	DPL.20(HP)	——	Mar. 15/00	Mar. 15/03
3 Year	Mixer Antenna 90-140 GHz	Olsen-OML	M05HWA(HP)	——	Mar. 15/00	Mar. 15/03
3 Year	Mixer Antenna 140-220 GHz	Olsen-OML	M05HWA(HP)	——	Mar. 15/00	Mar. 15/03

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

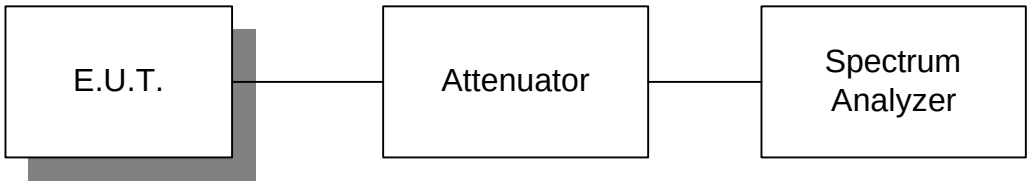
Annex A

Test Diagrams

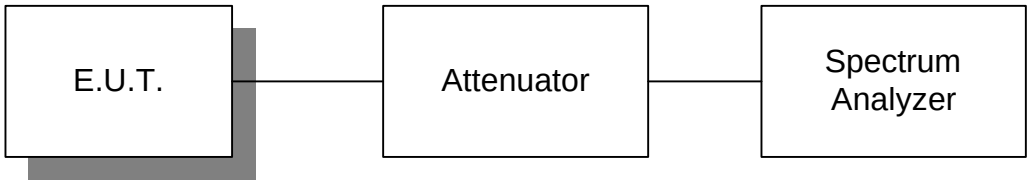
Para. No. 2.1046 - R.F. Power Output



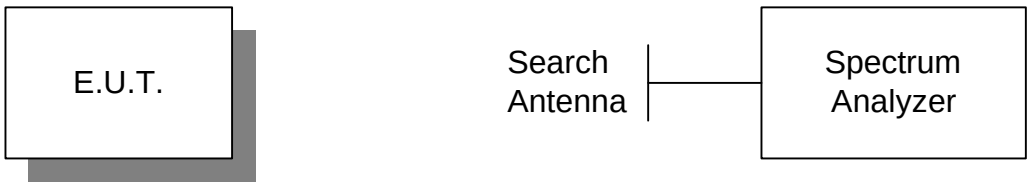
Para. No. 2.1049 - Occupied Bandwidth



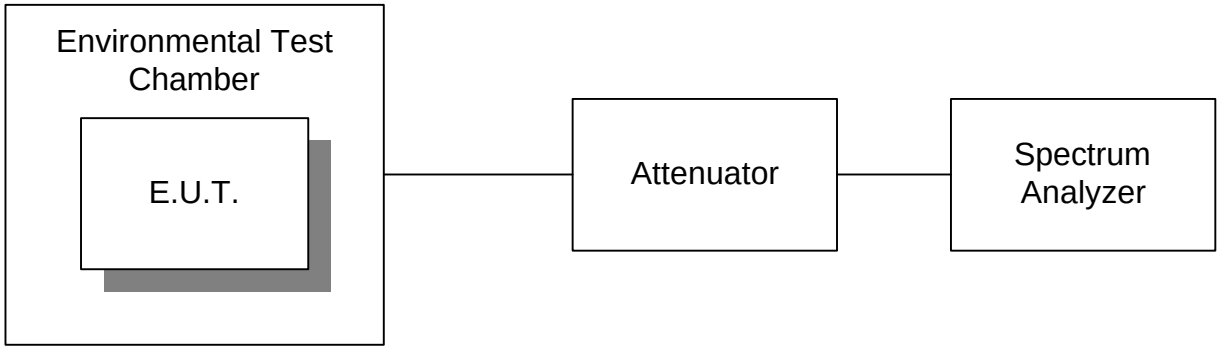
Para. No. 2.1051 - Spurious Emissions at Antenna Terminals



Para. No. 2.1053 - Field Strength of Spurious Radiation

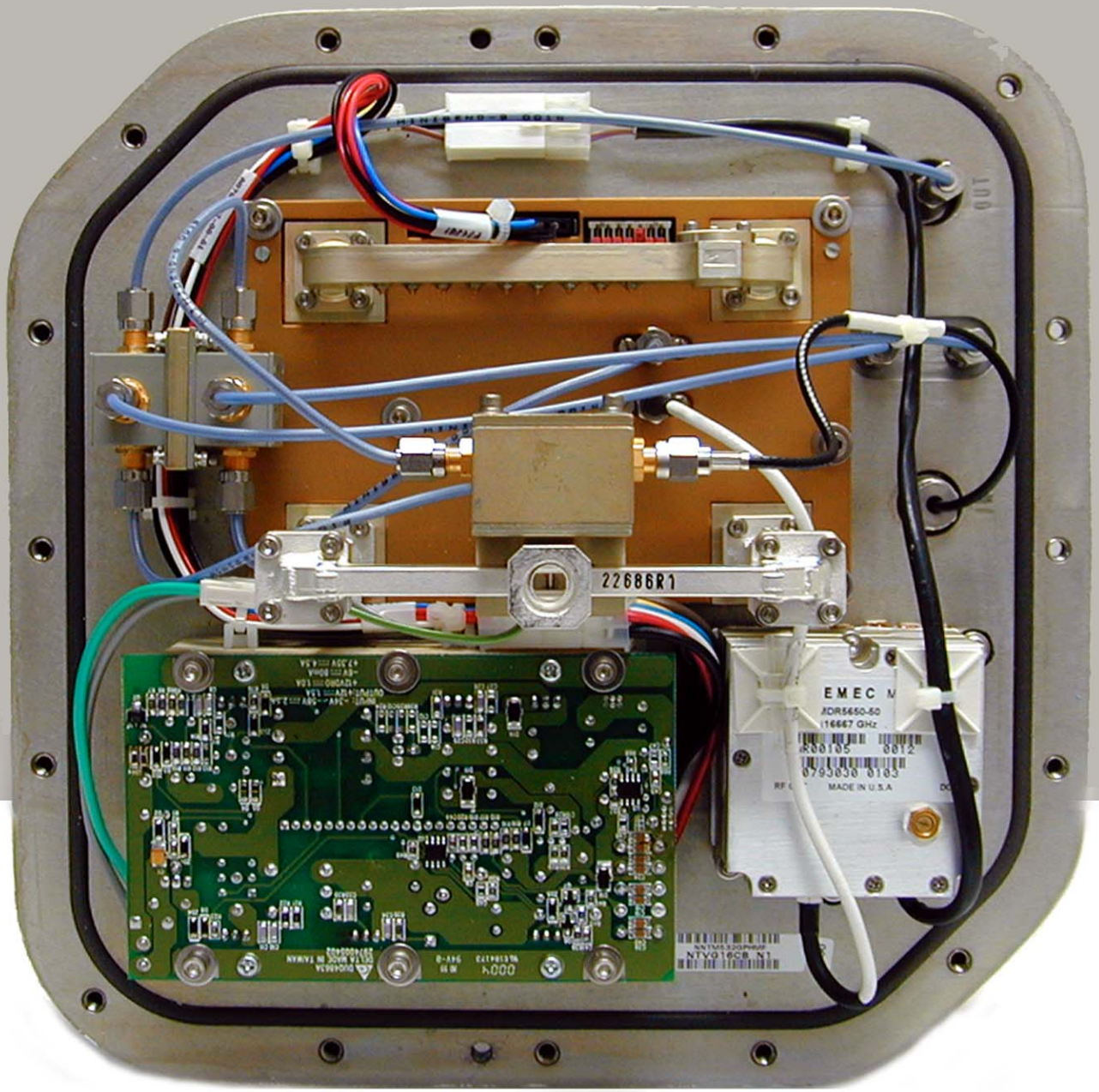


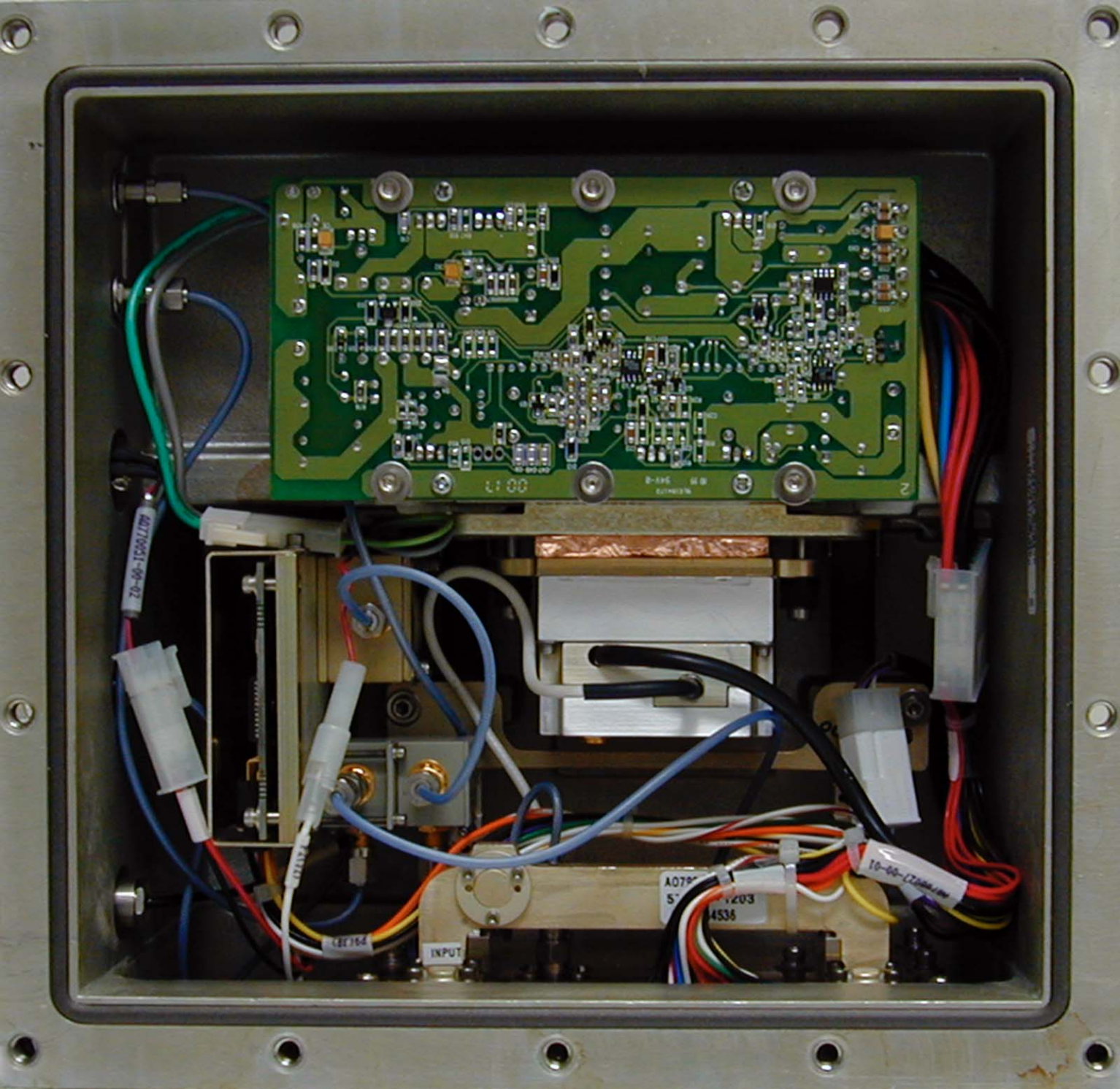
Para. No. 2.1055 - Frequency Stability




NTVG KCCB,
28-08M


Rx IF
TP2
Tx IF
TP1
IF OUT
IF IN
-48 VDC


22686R1
EMEC
MADE IN U.S.A


INPUT

NNTM532GPH4X
NTVG14CB N2
2800
ITEM No. 1
08 / 08 /2000
IF IN
-48 VDC
IF OUT
MONITOR
RX/ IF OUT
TP2
TX/IF IN
TP1