



Nemko USA, Inc.
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Test Report: 2004 080531 FCC

Applicant: VITELCOM MOBILE TECHNOLOGY U.S.A.
2480 Irvine Boulevard #172
Tustin, California 92782
714.389.1169
714.865.4608- fax

Equipment Under Test: Model TSM1 / VTL101

FCC ID: SELTSM1

In Accordance With: FCC Part 22, Subpart H
800 MHz Cellular Subscriber Units

Tested By: Nemko USA Inc.
11696 Sorrento Valley Road
San Diego, CA 92121-1024

Date: August 12, 2004

Total Number of Pages: 39

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EQUIPMENT: MODEL TSM1-VTL101

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 22, Subpart H.

DOCUMENT HISTORY

REVISION	DATE	COMMENTS
-	August 12, 2004	Prepared By: Chip Fleury
-	August 12, 2004	Initial Release: R. L. Hill
1	October 1, 2004	Revision Release: R. L. Hill

NOTE: Nemko USA, Inc. hereby makes the following statements so as to conform to Chapter 10 (Test Reports) Requirements of ANSI C63.4 (1992) "Methods and Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz":

- The unit described in this report was received at Nemko USA, Inc.'s facilities on August 6, 2004. Testing was performed on the unit described in this report on August 6, 2004 to August 11, 2004 .
- The Test Results reported herein apply only to the Unit actually tested, and to substantially identical Units.
- This report does not imply the endorsement of the Federal Communications Commission (FCC), NVLAP or any other government agency.

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EQUIPMENT: MODEL TSM1-VTL101

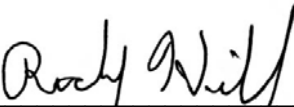
CERTIFICATION

Nemko USA, Inc., an independent Electromagnetic Compatibility (EMC) Test Laboratory, produced this Test Report and performed the Radio Frequency Interference (RFI) testing and data evaluation contained herein.

Nemko USA, Inc.'s measurement facility is currently registered with the United States Federal Communications Commission (FCC) in accordance with the provisions of 47 United States Code (CFR) Part 2, Subpart I, Section 2.948(a). A current description of Nemko USA, Inc.'s measurement facility is on file with the FCC. Nemko USA Inc. has additionally satisfied the FCC that it complies with the requirements set forth in 47 CFR Part 2, Subpart I, Section 2.948(d) regarding the accreditation of EMC laboratories. As a result, the FCC has placed Nemko USA Inc. on its list of EMC laboratories approved to perform Declaration of Conformity (DOC) procedure testing.

The RFI testing, test data collection and test data evaluation were accomplished in accordance with the ANSI C63.4-1992 Standard, and in accordance with the applicable sections of the FCC rules (47 CFR Parts 2 and 18)." digital devices. The testing was also accomplished in accordance with Industry Canada's ICES-003 standard for unintentional radiating device per EMCAB-3, Issue 3 (May 1998). The administrative summary of this test report provides a description of the test sample

I hereby certify that the test data, test data evaluation, and equipment configurations used to compile this test report are a true and accurate representation of the test sample's radio frequency interference characteristics as of the test date(s), and, for the design of the test sample.



Ricky L. Hill, EMC Supervisor

EQUIPMENT: MODEL TSM1-VTL101

Summary Of Test Data

Name Of Test	Para. No.	Result
RF Power Output	2.1046	Complies
Audio Frequency Response	2.1047	N/A ¹
Audio Low Pass Filter Response	2.1047	N/A ²
Modulation Limiting	2.1047	N/A ³
Occupied Bandwidth (WB Data)	2.1049	Complies
Spurious Emissions at Antenna Terminals	2.1051	Complies
Field Strength of Spurious Emissions	2.1053	Complies
Frequency Stability	2.1055	Complies

Footnotes For N/A's:

1,2 & 3: Modulation is Digital, CDMA

Test Conditions:

Indoor Temperature: 22 °C
 Humidity: 50 %

Outdoor Temperature: 27 °C
 Humidity: 45 %

EQUIPMENT: MODEL TSM1-VTL101

Section 2. General Equipment Specification

Manufacturer: VITELCOM MOBILE TECHNOLOGY U.S.A.
Model No.: TSM1 / VTL101
Serial No.: 43
Date Received In Laboratory: August 6, 2004
Nemko Identification No.: 24-531-EMC

There are no user accessible adjustments or tuning in this portable cellular transceiver. All necessary adjustments and tuning are performed during manufacture of the product. Any adjustments or tuning after service or repair are done as part of that process as special equipment is required to perform such adjustments.

Accessories to be provided with this device are:
Standard Lithium Ion Battery, Battery Charger, Holster clip (20mm from body)

DC voltages and DC currents per 2.1033(c)(8)

The input supply to the transmitter was set at 3.6 Volts. The RF power output was measured with the indicated voltage and current applied into the final RF amplifying device(s).

800 MHz Digital CDMA

RF Output, DC Current and RF Input Power are all average values.

Measured Maximum RF output: 23.9dBm (0.245W)

Measured DC voltage: 3.6V

Measured DC current: 606mA.

Measured Minimum RF output: -56.2dBm

Measured DC voltage: 3.6V

Measured DC current: 268mA

EQUIPMENT: MODEL TSM1-VTL101

Section 3. RF Power Output

Para. No.: 2.1046

Test Performed By: Alan Laudani	Date of Test: 8/9/04
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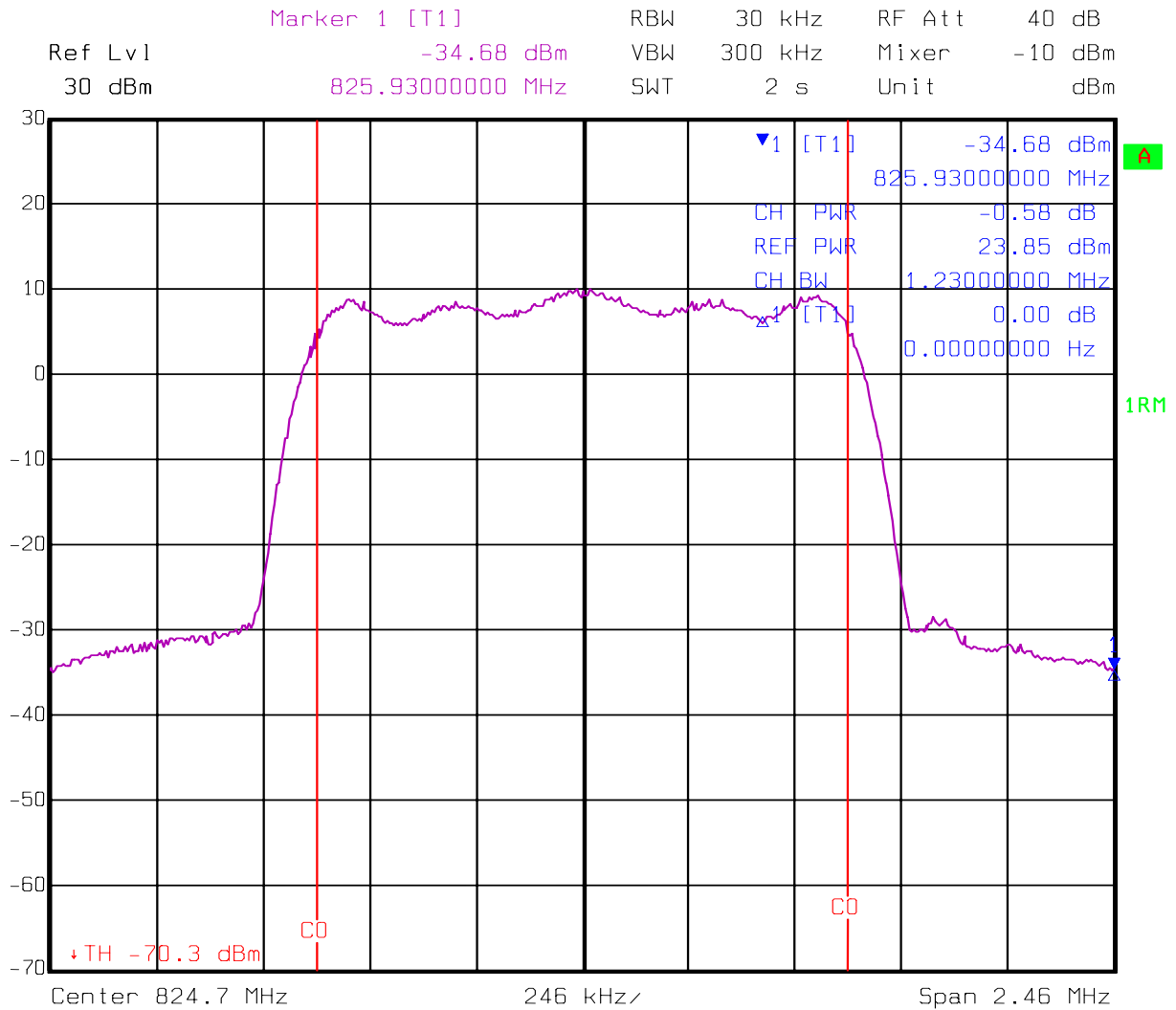
Minimum Standard: Para. No. 22.913(a). The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

Test Results: Complies:
ERP = Measured Output Power + **Antenna Gain**

Measurement Data:

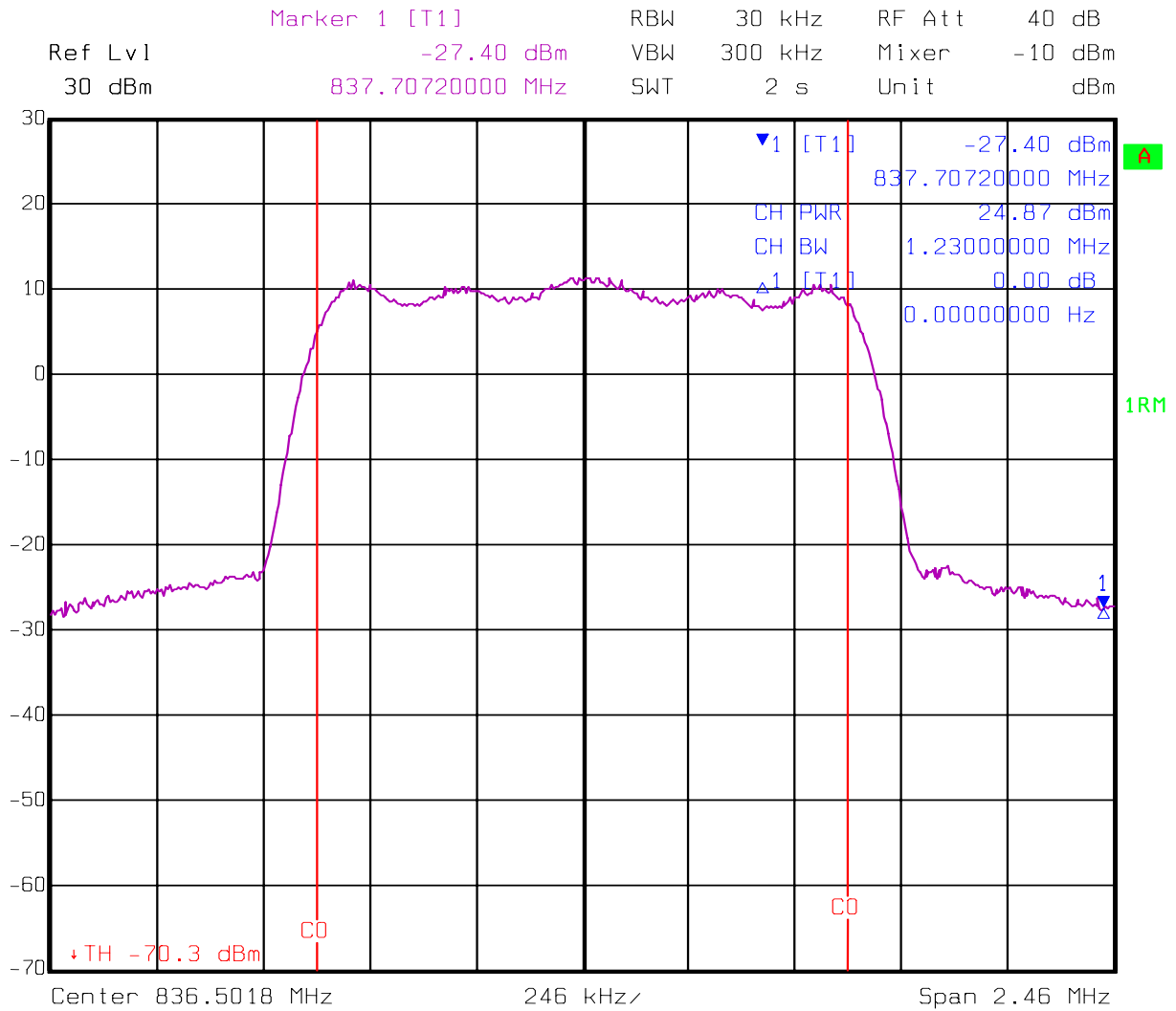
Channel/Frequency MHz	Measured / Rated Output Power (dBm)	Antenna Gain	ERP (dBm)	Limit (dBm)
824.70	23.85	-1.9	21.95	38.45
836.49	24.87	-1.65	23.22	38.45
848.31	24.55	-1.6	22.95	38.45

EQUIPMENT: MODEL TSM1-VTL101



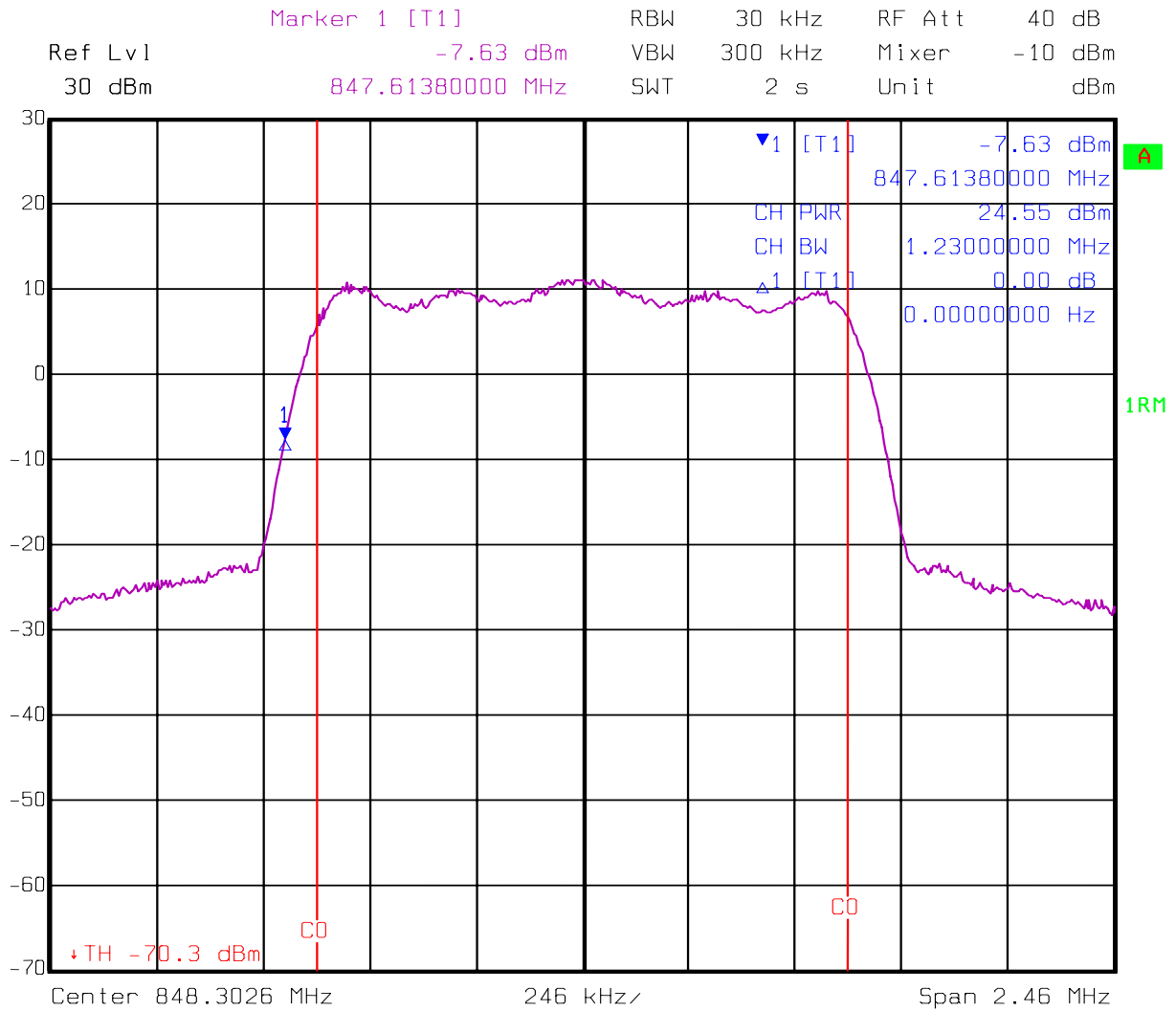
Date: 09.AUG.2004 08:56:17

EQUIPMENT: MODEL TSM1-VTL101



Date: 09.AUG.2004 08:54:29

EQUIPMENT: MODEL TSM1-VTL101



Date: 09.AUG.2004 08:57:08

EQUIPMENT: MODEL TSM1-VTL101

Section 4. Audio Frequency Response

Para. No.: 2.1047

Test Performed By:	Date of Test:
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Minimum Standard: Para. No. 2.1047.

Test Results: N/A Digital modulation

Measurement Data: N/A

EQUIPMENT: MODEL TSM1-VTL101

Section 5. Audio Low-Pass Filter Response

Para. No.: 2.1047

Test Performed By:	Date of Test:
---------------------------	----------------------

Minimum Standard: Para. No. 22.915 (d).

Test Results: N/A Digital modulation

Measurement Data: N/A

EQUIPMENT: MODEL TSM1-VTL101

Section 6. Modulation Limiting

Para. No.: 2.1047

Test Performed By:	Date of Test:
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Minimum Standard: 22.915(b)

Test Results: N/A Digital modulation

Measurement Data: .N/A

EQUIPMENT: MODEL TSM1-VTL101

Section 7. Occupied Bandwidth

Para. No.: 2.1049

(i) Transmitters designed for other types of modulation--when modulated by an appropriate signal of sufficient amplitude to be representative of the type of service in which used. A description of the input signal should be supplied

Test Performed By: Alan Laudani	Date of Test: 8/9/04
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Minimum Standard: 22.917(b)

Emission Designator: 1M6F9W.

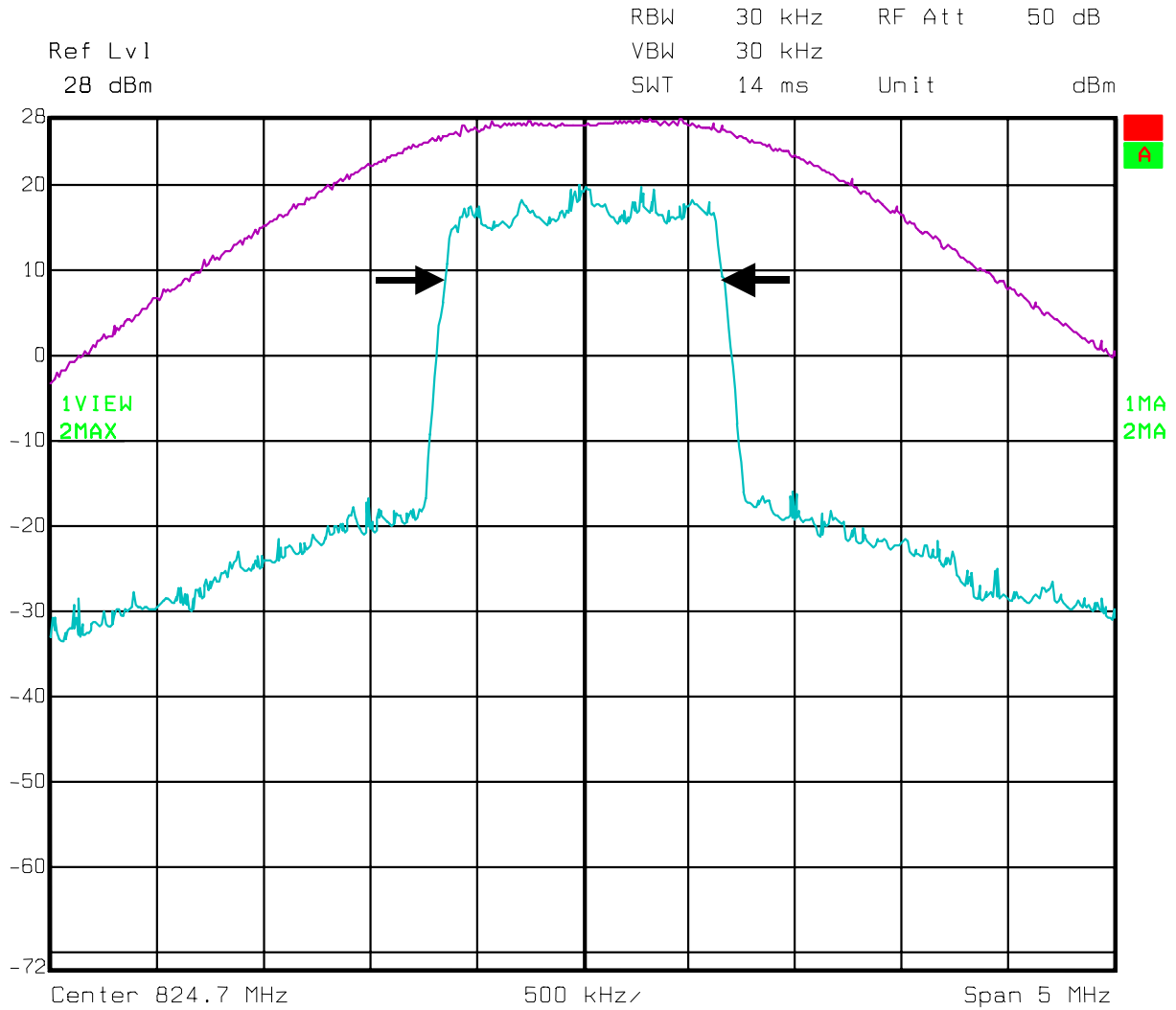
Input signal for test digitally inserted via test program and support computer.

Test Results: Complies

Frequency (MHz)	Bandwidth
824.70	1.6 MHz
836.49	1.6 MHz
848.31	1.6 MHz

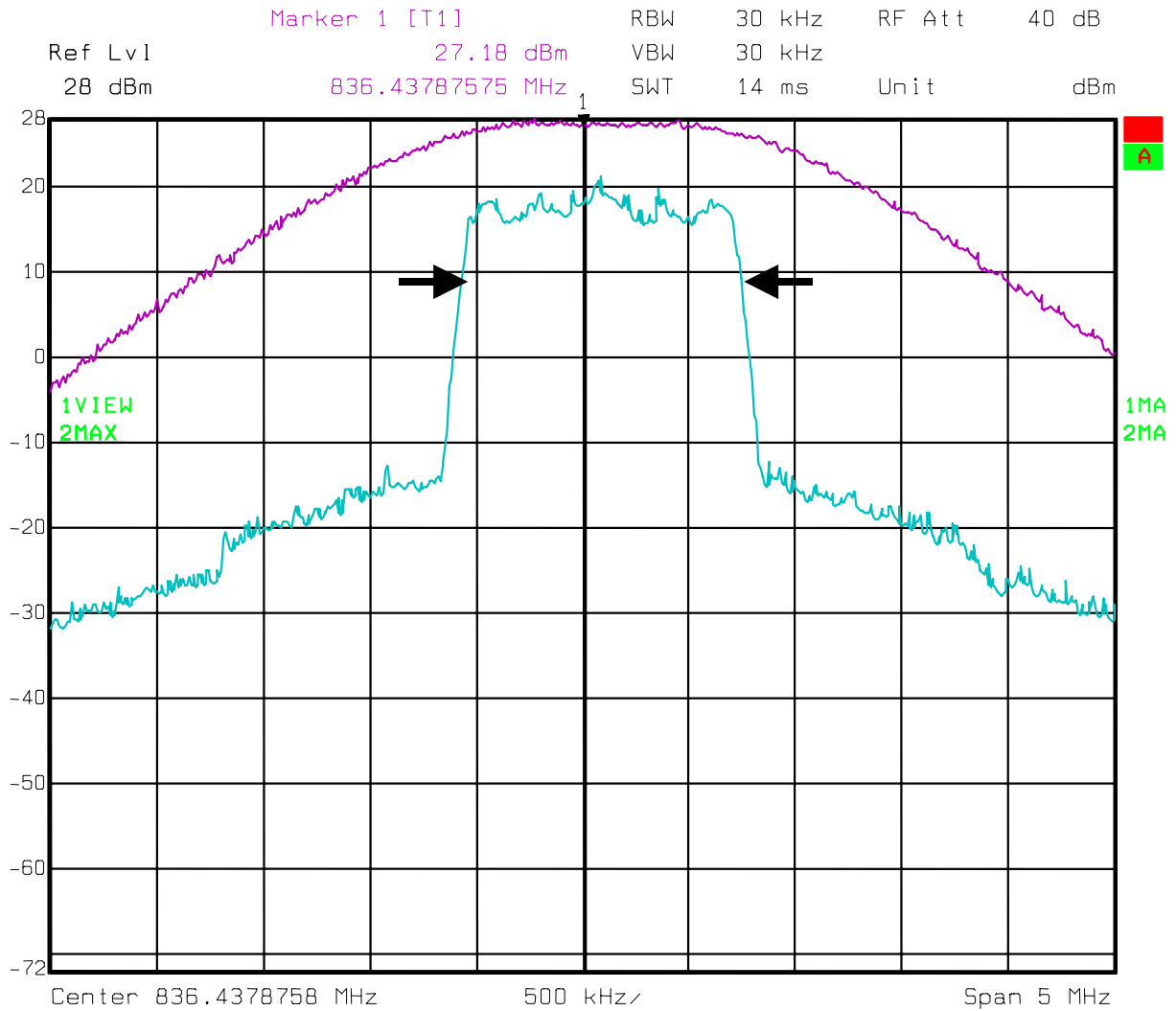
Test Data: See attached graphs.

EQUIPMENT: MODEL TSM1-VTL101



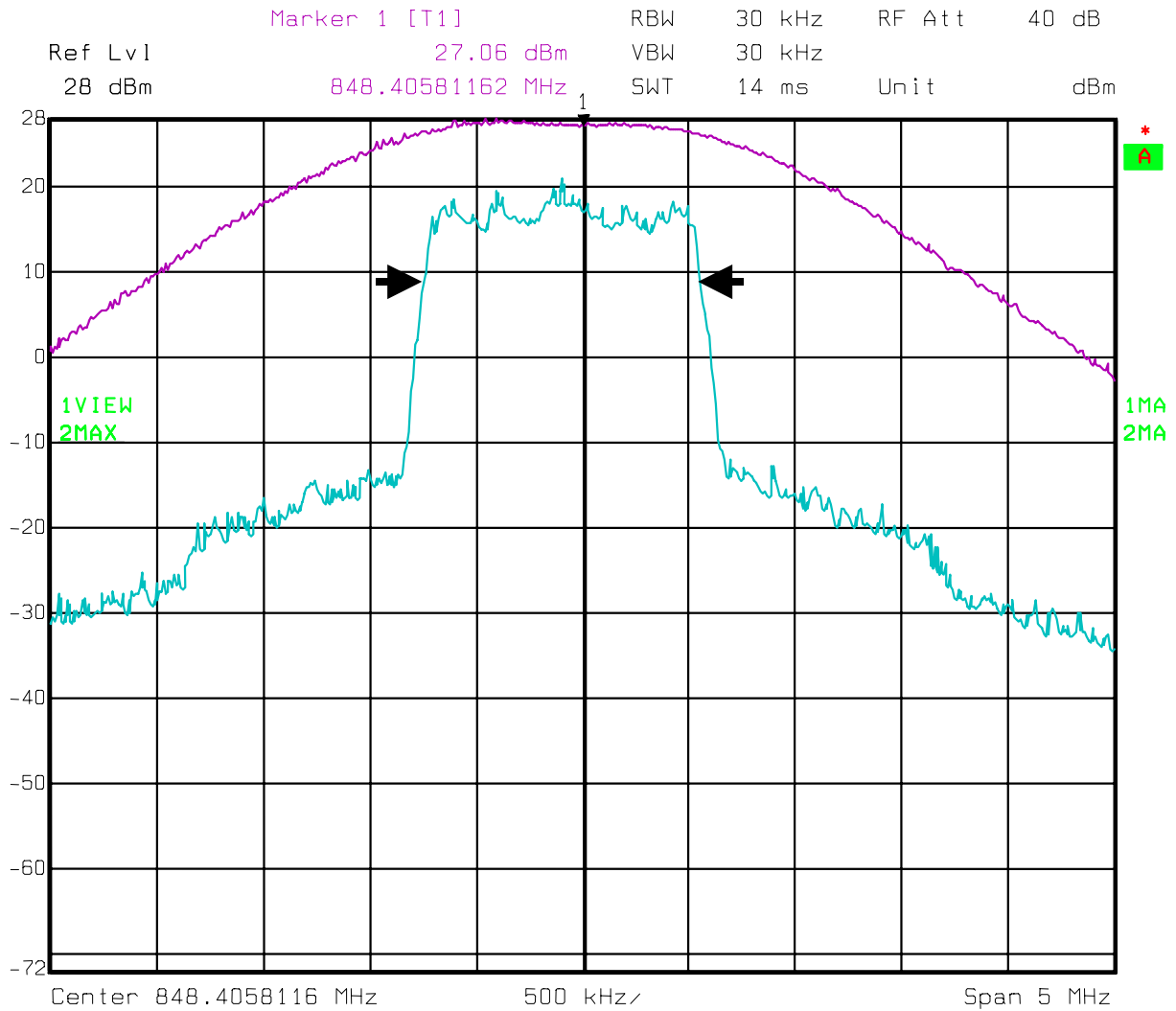
Date: 09.AUG.2004 14:19:33

EQUIPMENT: MODEL TSM1-VTL101



Date: 09.AUG.2004 14:36:28

EQUIPMENT: MODEL TSM1-VTL101



Date: 09.AUG.2004 14:44:08

EQUIPMENT: MODEL TSM1-VTL101

Section 8. Spurious Emissions At Antenna Terminals

Para. No.: 2.1051

Test Performed By: Alan Laudani	Date of Test: 8/9/04
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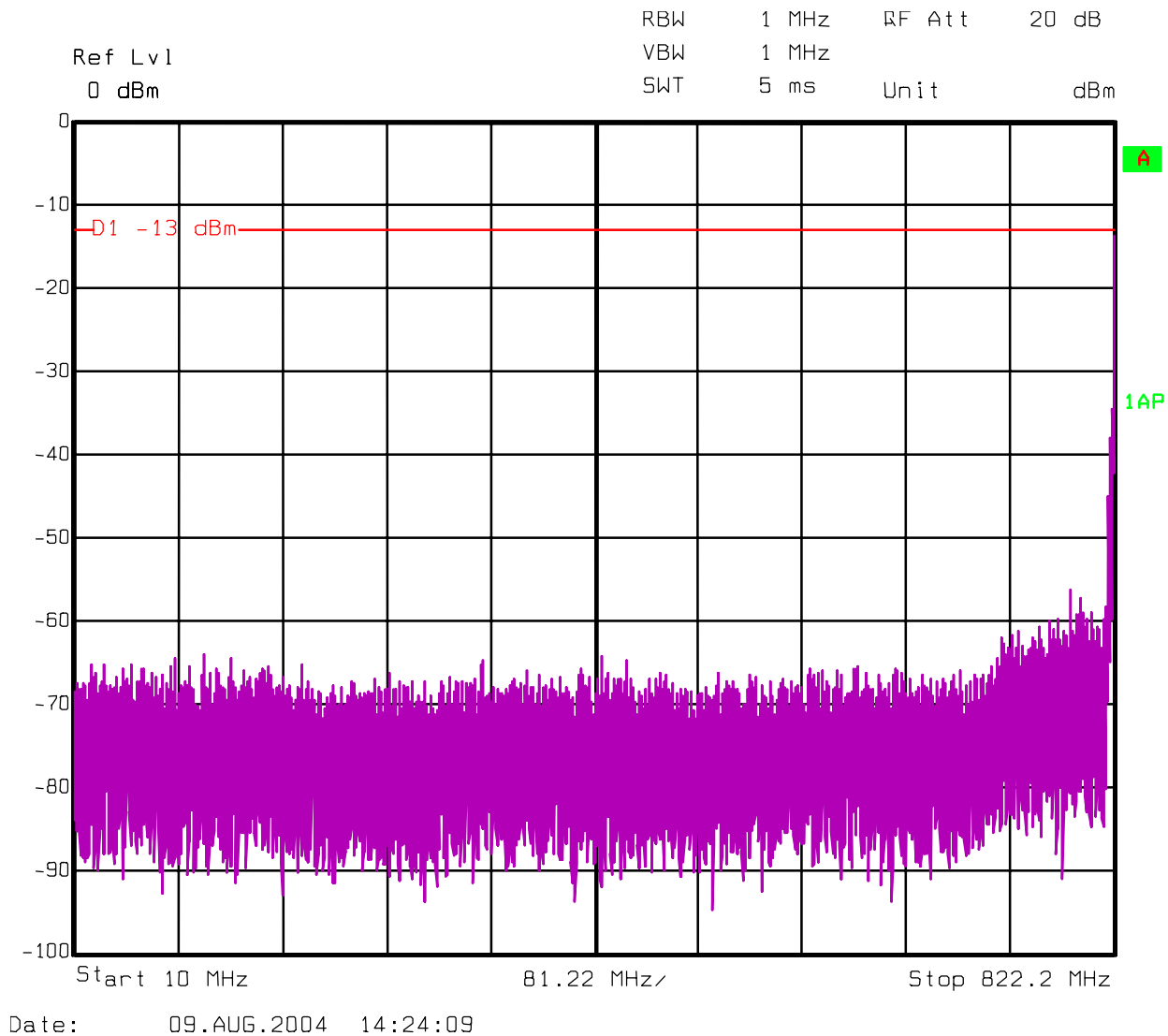
Minimum Standard: Para. No. 22.917(b).

Test Results: Complies

Test Data: See attached graphs.

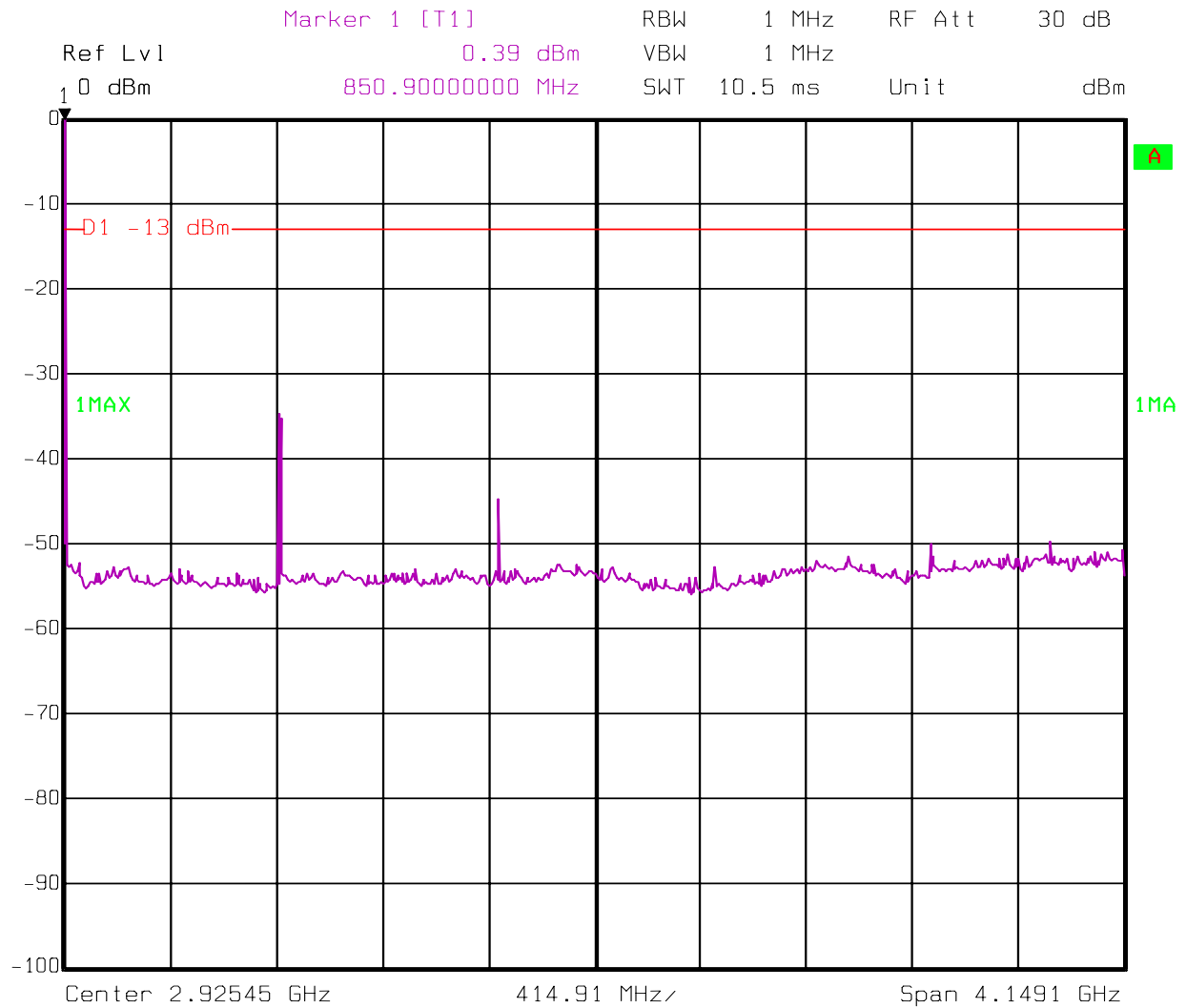
EQUIPMENT: MODEL TSM1-VTL101

Low Channel – Conductive Spurious



EQUIPMENT: MODEL TSM1-VTL101

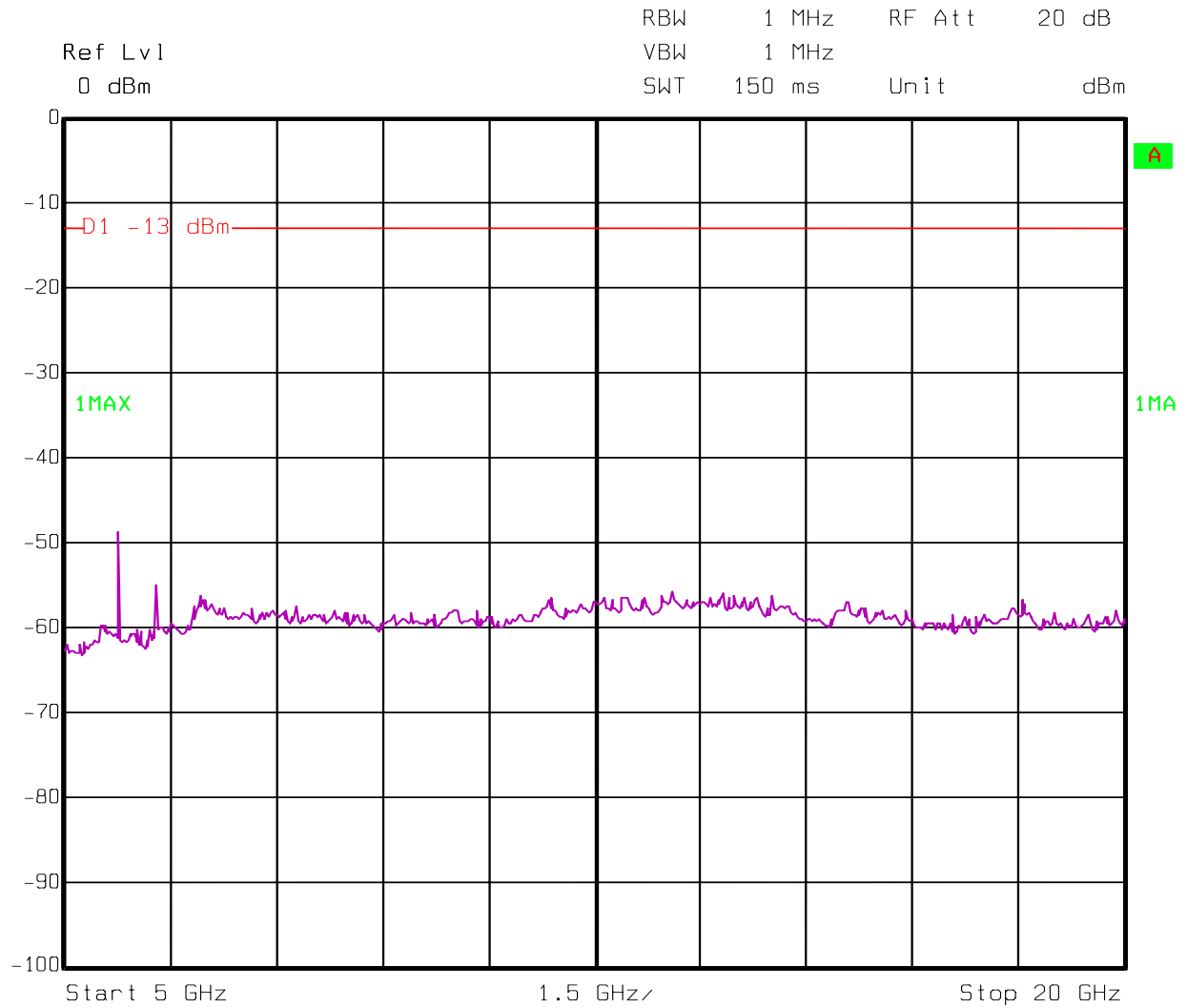
Low Channel – Conductive Spurious



Date: 09.AUG.2004 14:49:02

EQUIPMENT: MODEL TSM1-VTL101

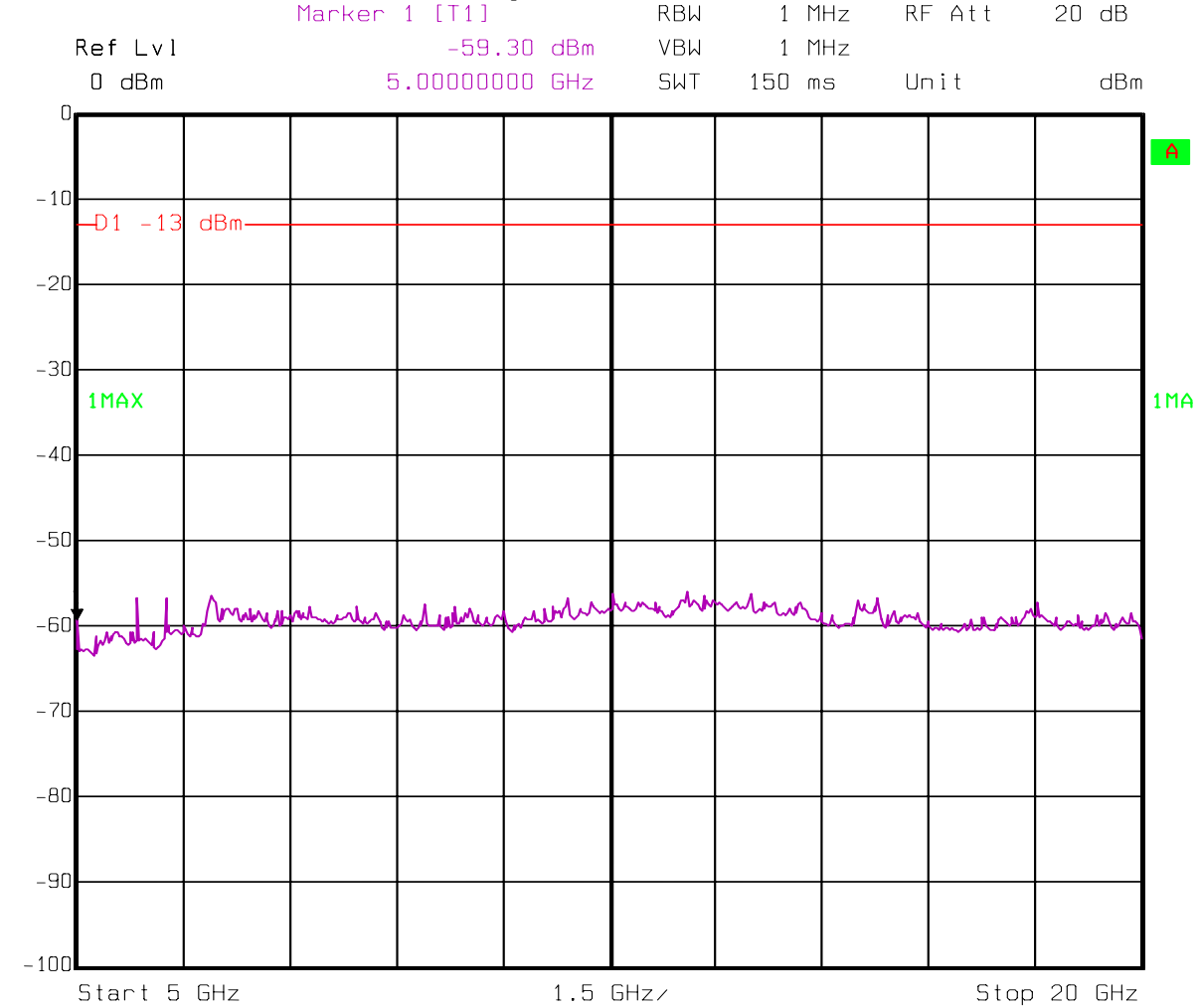
Low Channel – Conductive Spurious



Date: 09.AUG.2004 14:26:34

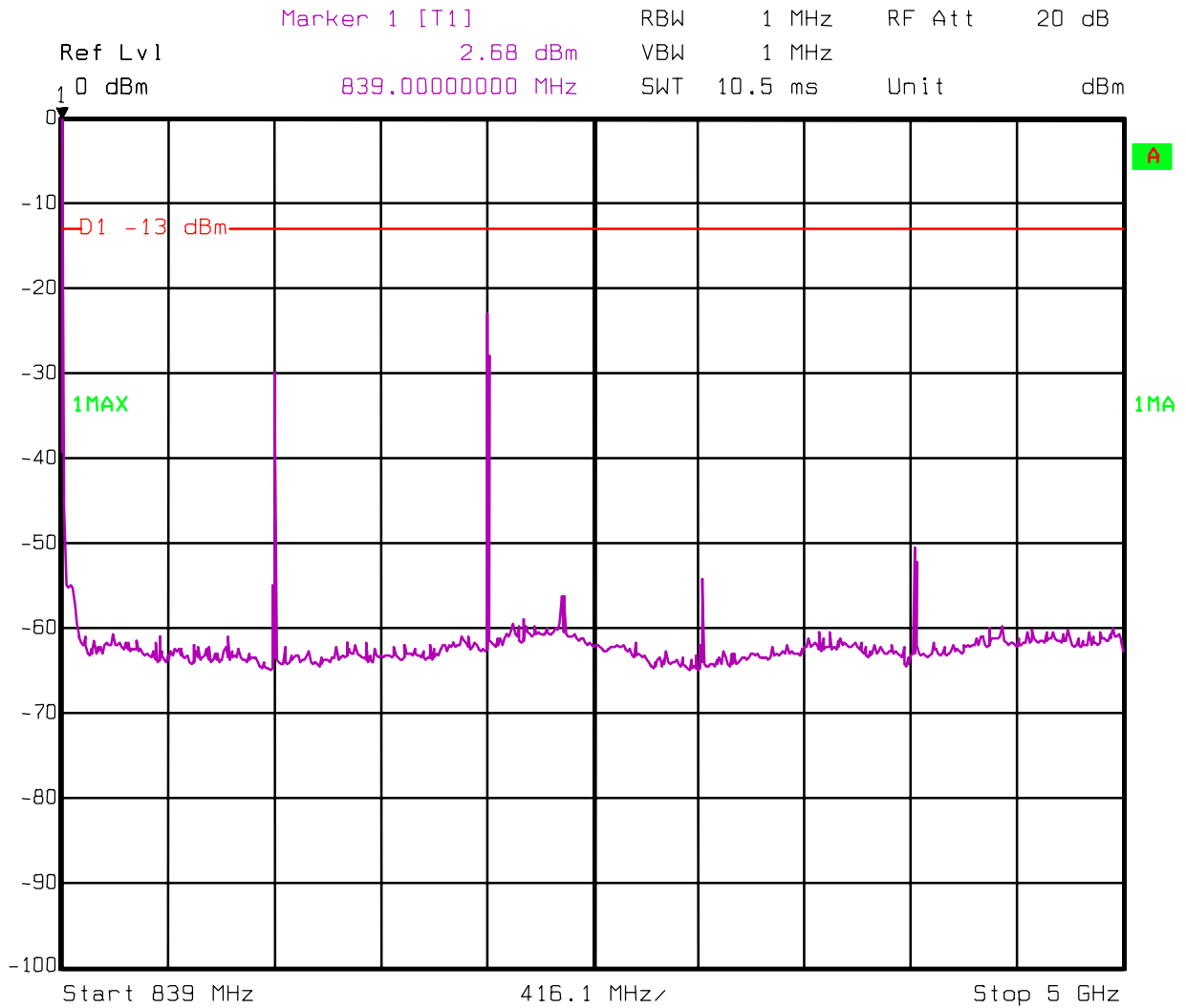
EQUIPMENT: MODEL TSM1-VTL101

Mid Channel – Conductive Spurious



Date: 09.AUG.2004 14:41:04

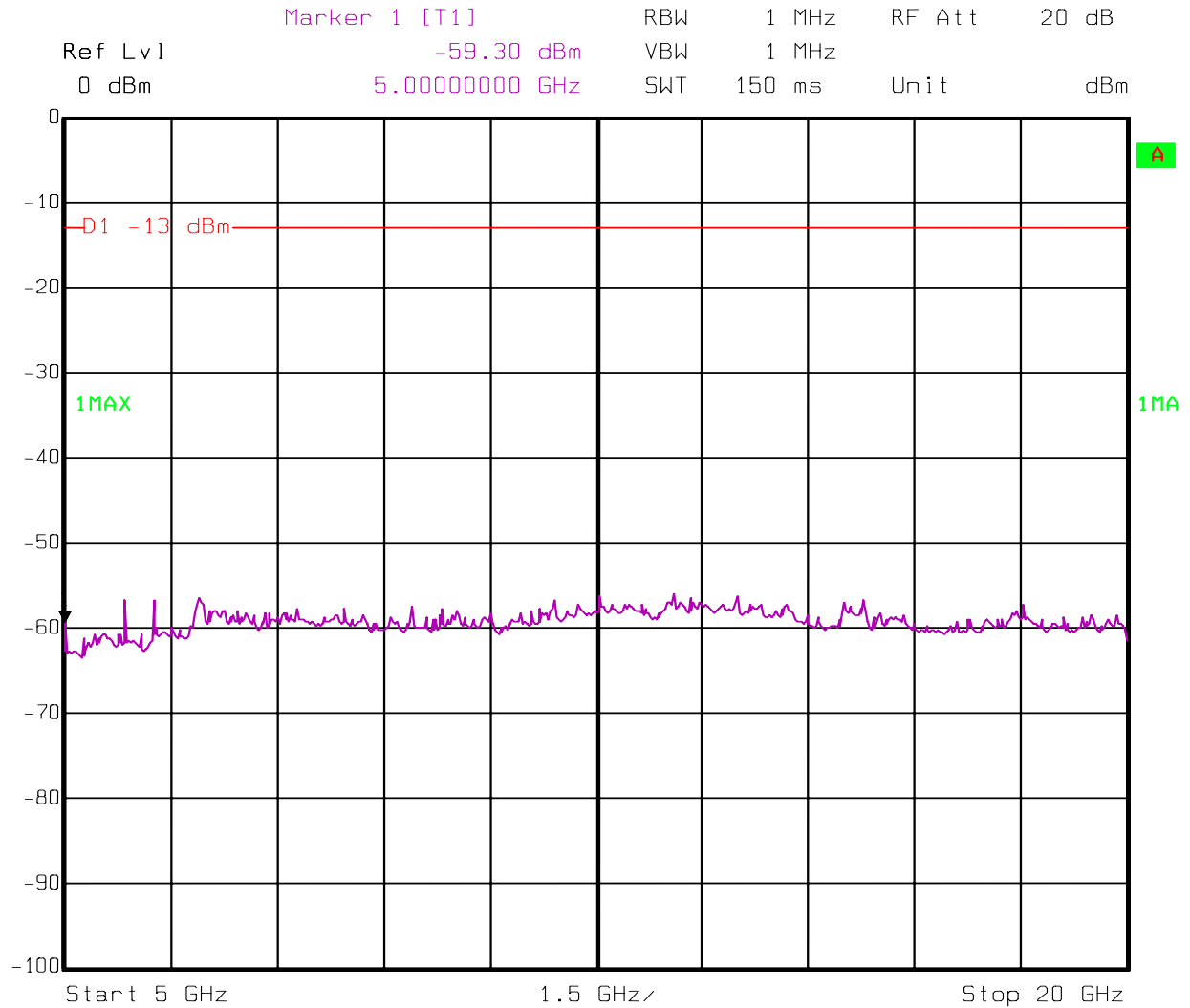
EQUIPMENT: MODEL TSM1-VTL101



Date: 09.AUG.2004 14:40:18

EQUIPMENT: MODEL TSM1-VTL101

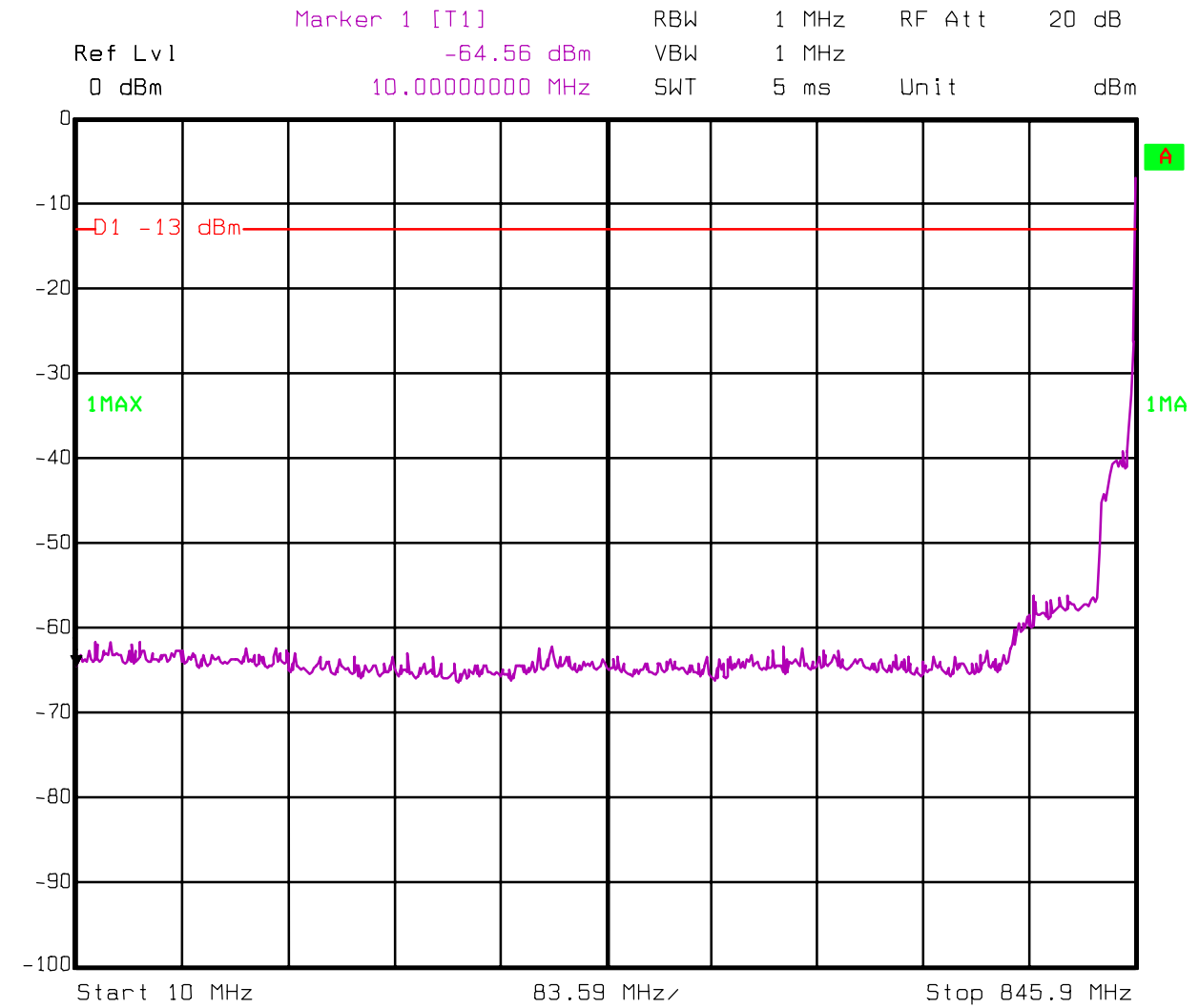
High Channel – Conductive Spurious



Date: 09.AUG.2004 14:41:04

EQUIPMENT: MODEL TSM1-VTL101

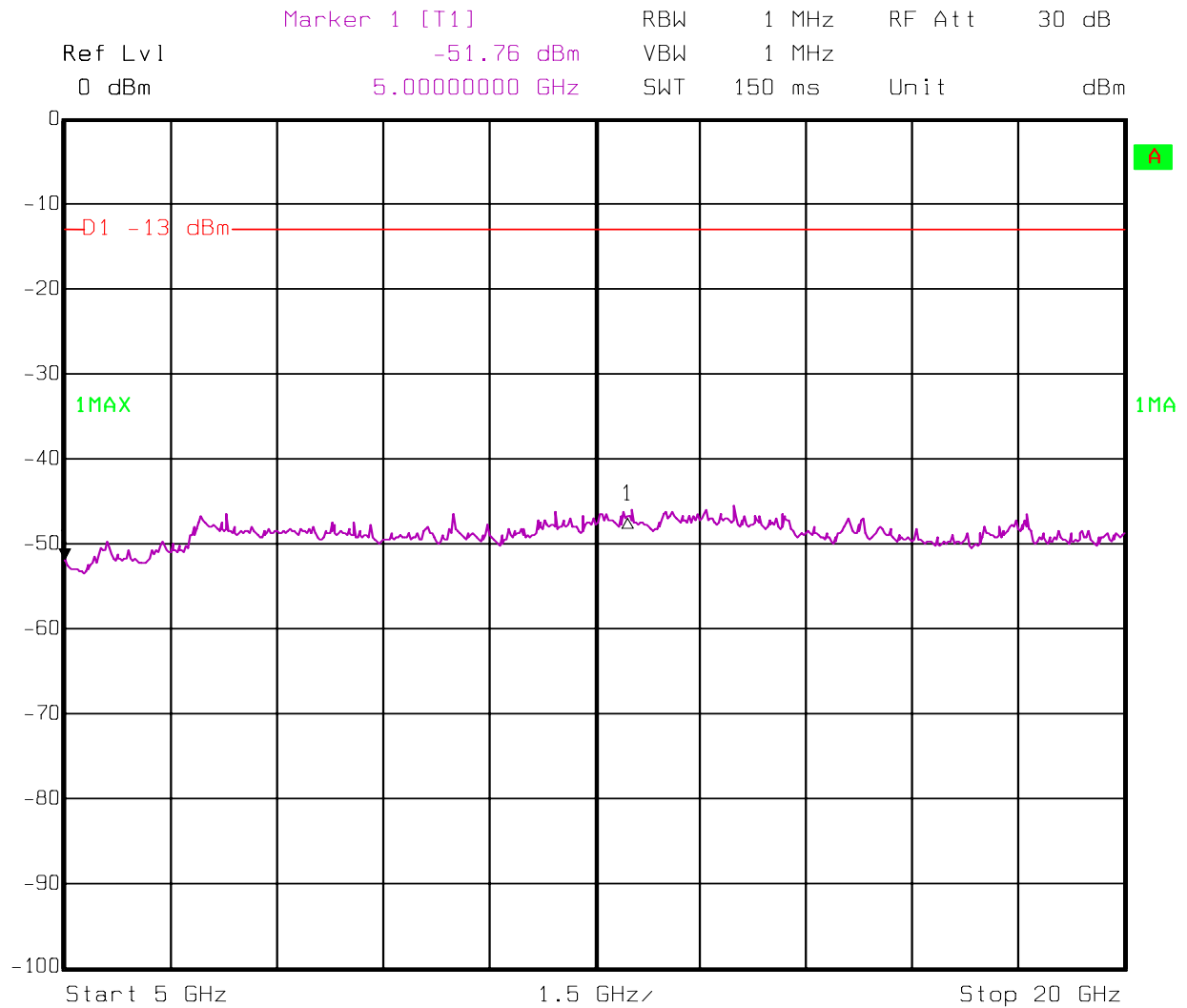
High Channel – Conductive Spurious



Date: 09.AUG.2004 14:46:37

EQUIPMENT: MODEL TSM1-VTL101

High Channel – Conductive Spurious



Date: 09.AUG.2004 14:51:53

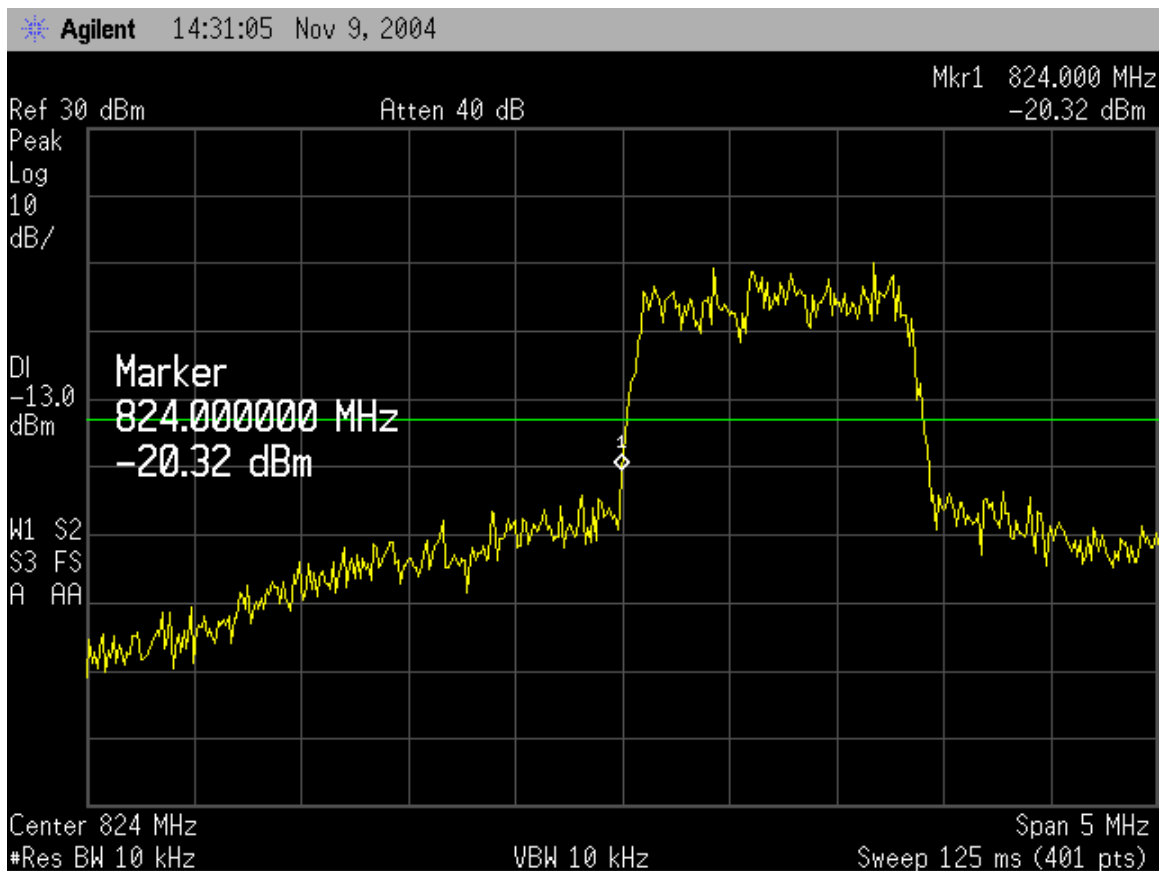
EQUIPMENT: MODEL TSM1-VTL101

Bandedge Plots

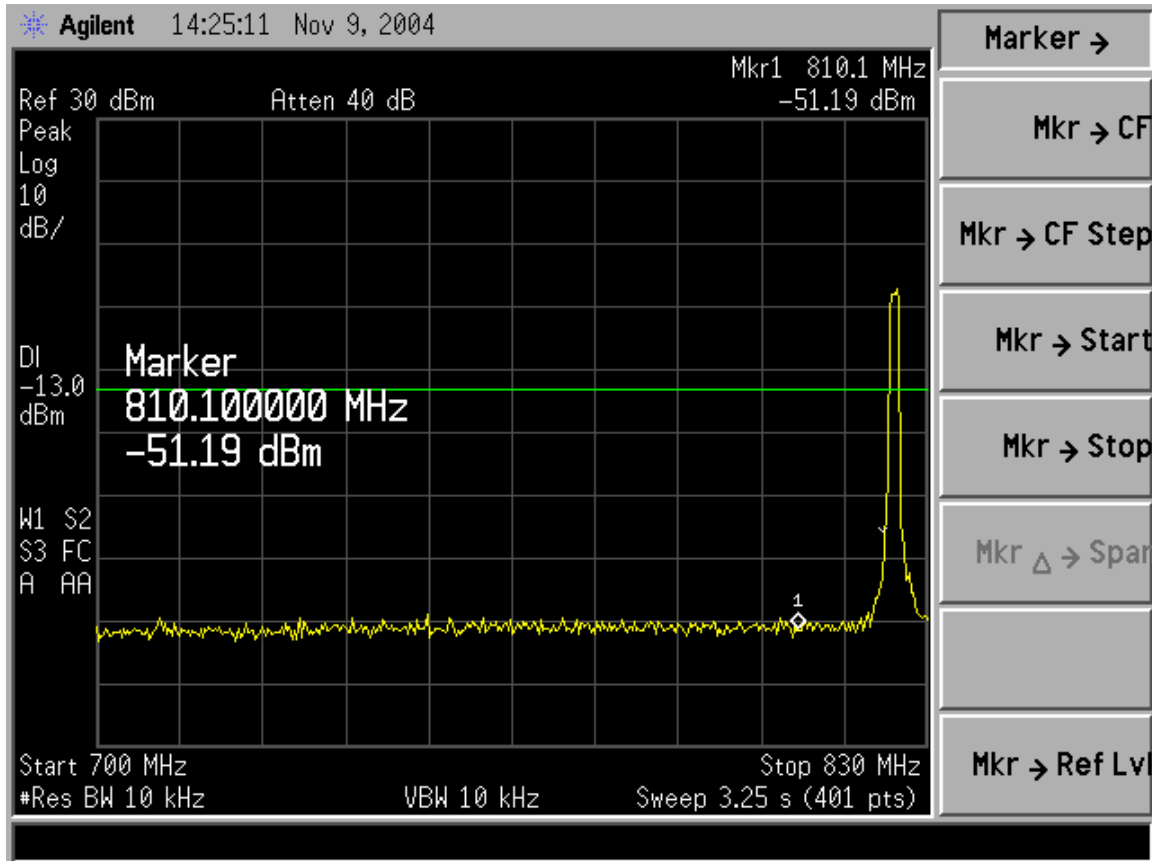
Agilent E4405B ESA-E series Spectrum Analyzer
Measurements are done at 25C by Vitelcom.

Lower bandedge:

Channel 1013 (824.7MHz)



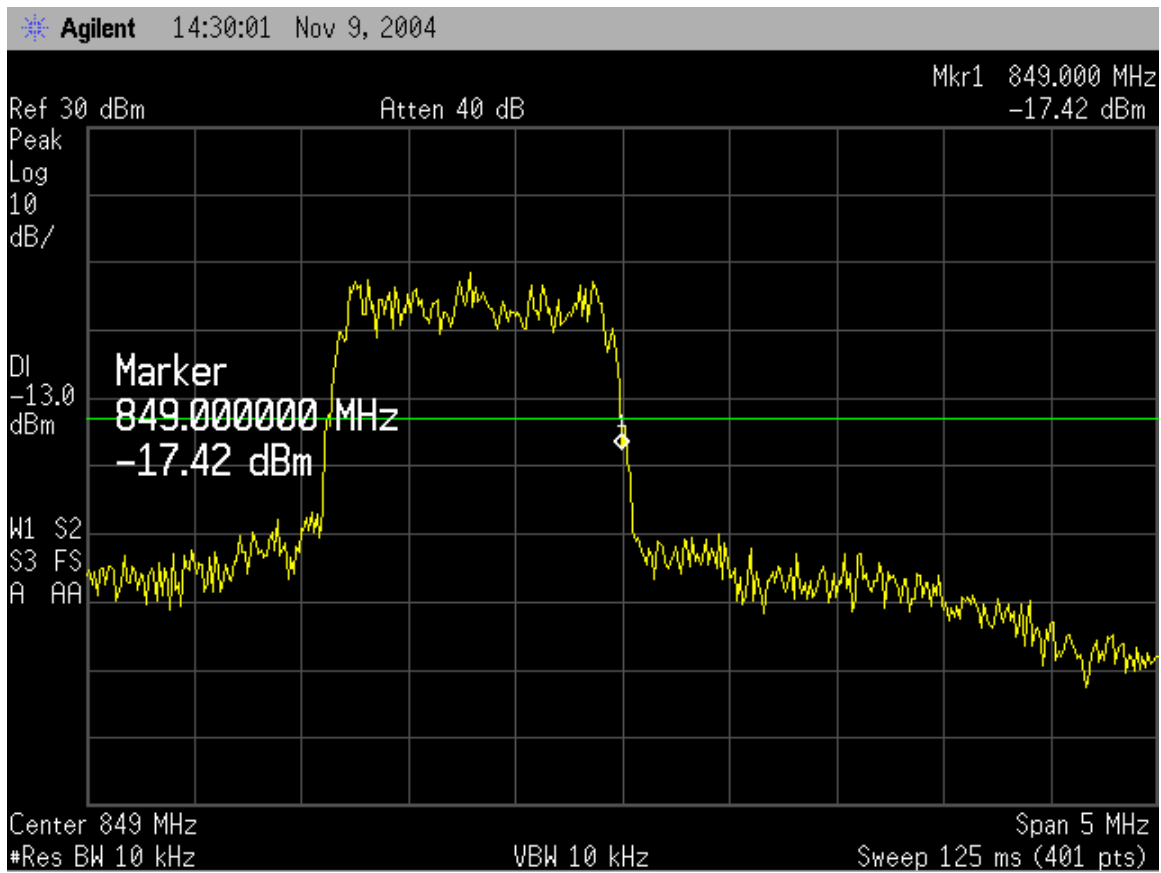
EQUIPMENT: MODEL TSM1-VTL101



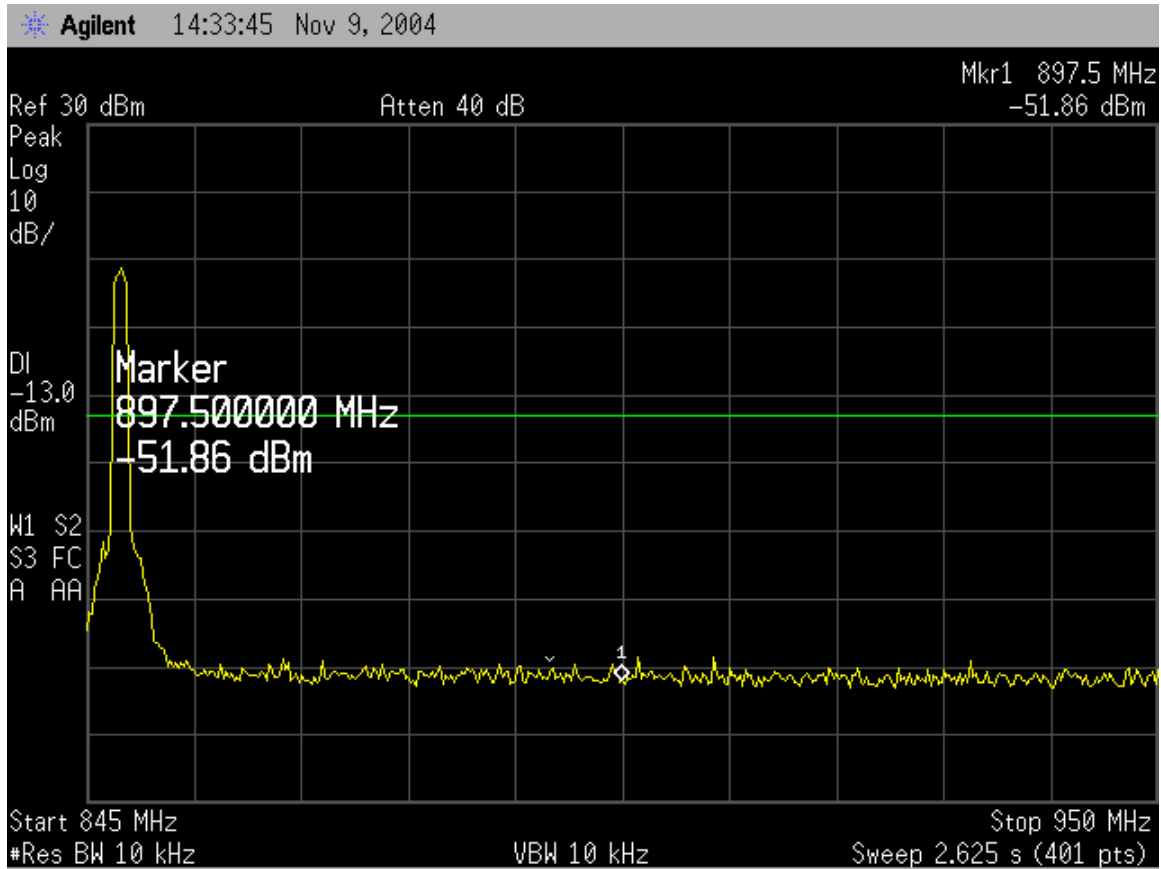
EQUIPMENT: MODEL TSM1-VTL101

Upper bandedge:

Channel 777 (848.31MHz)



EQUIPMENT: MODEL TSM1-VTL101



EQUIPMENT: MODEL TSM1-VTL101

Section 9. Field Strength of Spurious

Para. No.: 2.1053

Test Performed By: Chip Fleury	Date of Test: August 6, 2004
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Minimum Standard: Para. No. 22.917(b).
(e) Out of band emissions. The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency twice or more than twice the fundamental frequency by:
At least 43+10 log P dB

Test Results: Spurious emissions were searched for between 30 MHz to 10 GHz.
The maximum field strength is 63.5 dBµV/m @ 1696.2MHz @ 3m.
Which is 20.7 below the limit.

Test Data: See attached tables.



NEMKO USA, Inc.

San Diego Headquarters:
11696 Sorrento Valley Rd.
San Diego, CA 92121
Tel: (858) 755-5525
Fax: (858) 452-1810

Radiated Emissions Data

Page 1 of 3

Preliminary
Client Name : Vitelcom
EUT Name : Cellphone
EUT Model # : TSM1 / VTL101
EUT Part # :
EUT Serial # : 43
EUT Config. : Transmit mode CDMA - 800 RX Harmonis

Specification :	FCC Part 22 - Mid,Low,High channels	Reference :	
Rod. Ant. #:	NA	Temp. (deg. C) :	27
Bicon Ant.#:	NA	Humidity (%) :	45
Log Ant.#:	NA	EUT Voltage :	NA
DRG Ant. #	529	EUT Frequency :	NA
Dipole Ant.#:	NA	Phase:	NA
Cable#:	60ft	Location:	RN# 90579
Preamp#:	40db	Distance:	3m
Spec An.#:	711		
QP #:	NA		
PreSelect#:	NA		
		Date :	8/6/2004
		Time :	NA
		Staff :	cf
		Photo ID :	NA
		Peak Bandwidth:	1 MHz
		Video Bandwidth	1 MHz

Meas. Freq. (MHz)	Vertical (dBuV) pk	Horizontal (dBuV) pk	CF (db)	Max Level (dBm) pk	Spec. Limit (dBm) pk	Margin dB pk	EUT Rotation	Ant. Height	Pass Fail Unc.	Comment
2106.56	66	61	-5.9	-35.13	-13.0	-22.1	180.0	1.0	Pass	
4213.12	61	57	2.2	-32.03	-13.0	-19.0	180.0	1.0	Pass	
6319.68	54	54	7.5	-33.73	-13.0	-20.7	190	1.2	Pass	
8426.24	49	49	12.5	-33.73	-13.0	-20.7	160.0	1.0	Pass	
10532.80	43	43	16.5	-35.73	-13.0	-22.7			Pass	NF
12639.36	41	41	21.7	-32.53	-13.0	-19.5			Pass	NF
2130.24	60	53	-5.9	-41.13	-13.0	-28.1	270.0	2.0	Pass	
4260.47	62	58	2.2	-31.03	-13.0	-18.0	160.0	1.5	Pass	
6390.71	53	53	7.5	-34.73	-13.0	-21.7	200	1.4	Pass	
8533.15	45	45	12.5	-33.73	-13.0	-20.7	160.0	1.0	Pass	

Nemko USA Inc.

FCC PART 22, SUBPART H
800 MHz CELLULAR SUBSCRIBER UNITS
PROJECT NO. 2004-080531FCC:

EQUIPMENT: MODEL TSM1-VTL101

EQUIPMENT: MODEL TSM1-VTL101

Section 10. Frequency Stability

Para. No.: 2.1055

Test Performed By: Alan Laudani	Date of Test: 8/9/04
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Minimum Standard: Para. No. 22.355.

Test Results: EUT complies.

Frequency stability measurements were made over the temperature range of -30°C to +60°C. The frequency error was measured with a HP8960. Climatic control was accomplished using a temperature chamber. The temperature was first lowered to -30°C and then raised hourly in 10°C increments. The unit remained in the chamber during temperature transitions and during the measurement process.

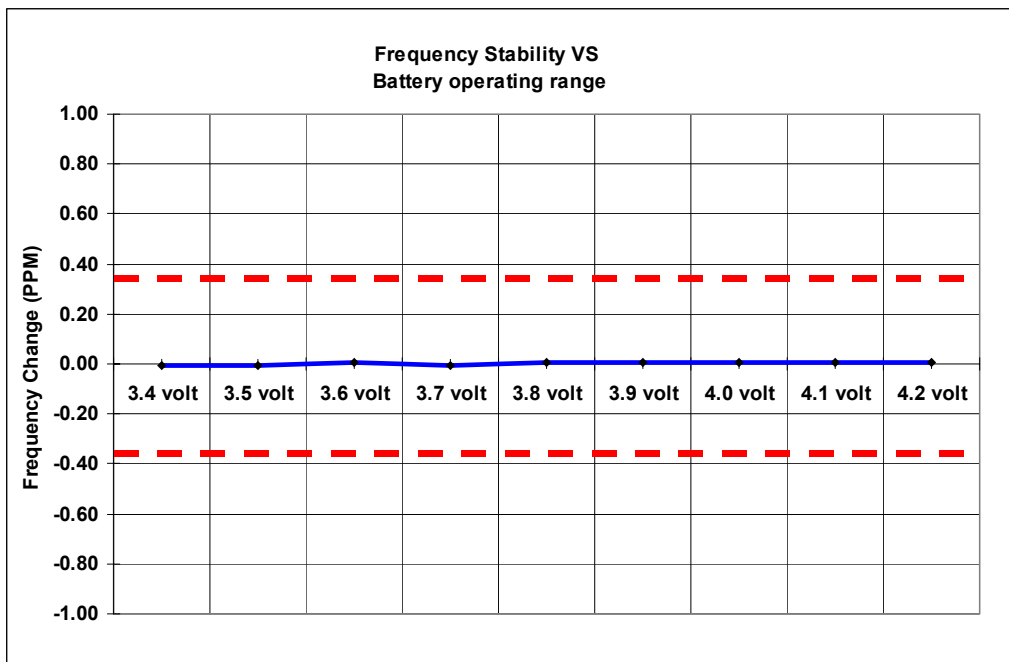
Measurement Data: Limit 2.5 ppm = **2061- 2121 Hz**

EQUIPMENT: MODEL TSM1-VTL101

Measurement Data:

Frequency Stability

Date:	27-Oct-04	
Mode:	CDMA 800	
Channel:	384	
Voltage	Frequency Error	Frequency Error
Volt	HZ	(PPM)
3.4 volt	-9.20	-0.005
3.5 volt	-8.10	-0.004
3.6 volt	11.80	0.006
3.7 volt	-10.10	-0.005
3.8 volt	7.90	0.004
3.9 volt	8.40	0.005
4.0 volt	7.90	0.004
4.1 volt	8.70	0.005
4.2 volt	8.90	0.005



EQUIPMENT: MODEL TSM1-VTL101

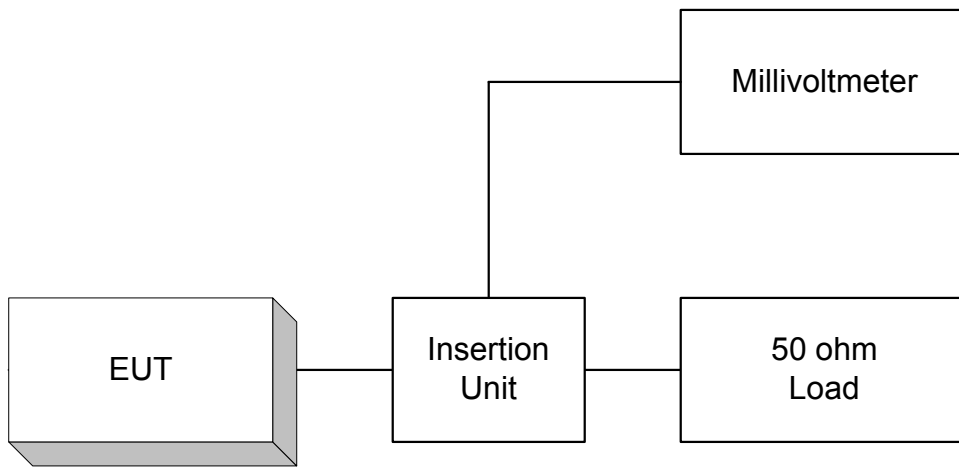
Frequency Stability over Temperature Variation

Temperature(°C)	Freq Error(Hz)			Ppm
	Ch1011	Ch384	Ch779	
-30	6.2	6.4	6	0.003
-20	5.8	6.1	7.1	0.003
-10	-4.6	6.6	-4.4	0.003
0	4.5	-5.6	5.3	0.003
10	4.3	-5.5	4.5	0.003
20	-5.5	6.1	7.5	0.004
30	-7.7	-8.1	-8.5	0.004
40	8.7	-7.5	7.5	0.004
50	-7.1	-7.7	7.5	0.004
60	8.7	-8.1	7.8	0.004

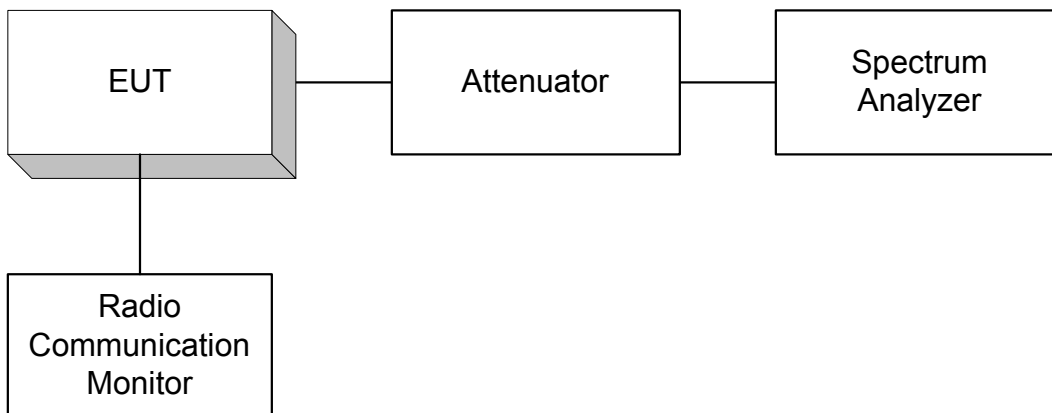
EQUIPMENT: MODEL TSM1-VTL101

Section 11. Block Diagrams

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

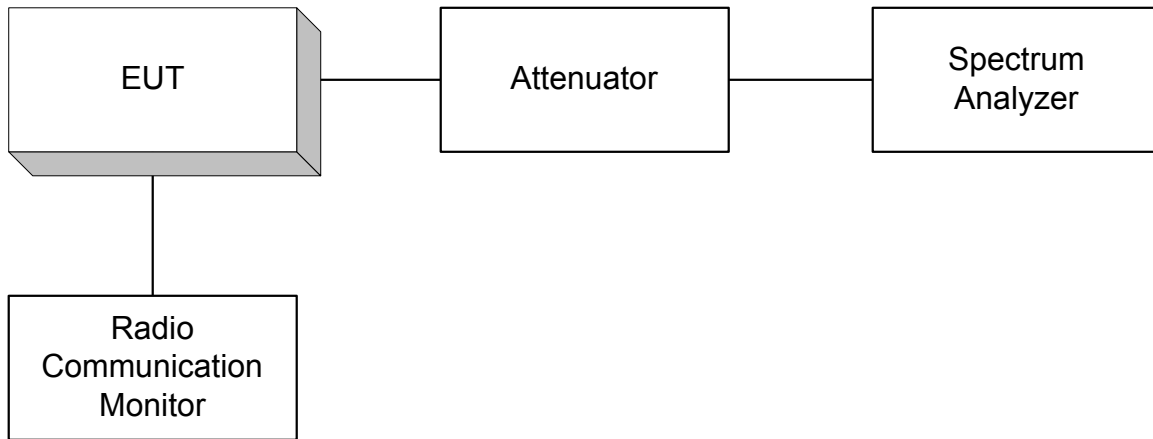


Para. No. 2.1049 - Occupied Bandwidth

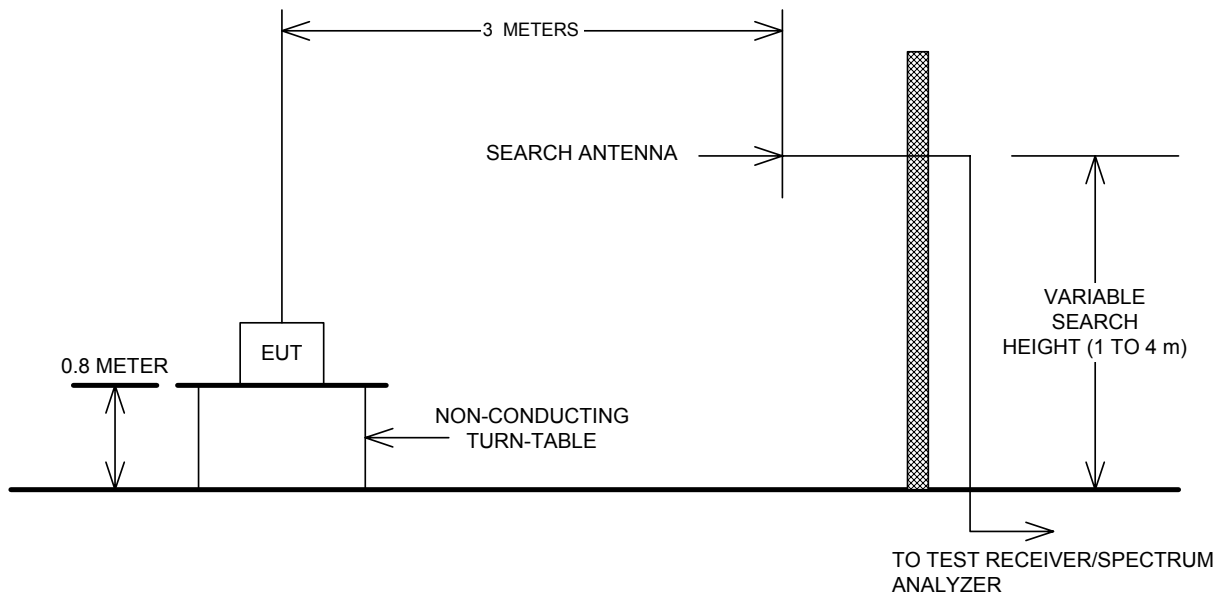


EQUIPMENT: MODEL TSM1-VTL101

Para. No. 2.1051 Spurious Emissions at Antenna Terminals

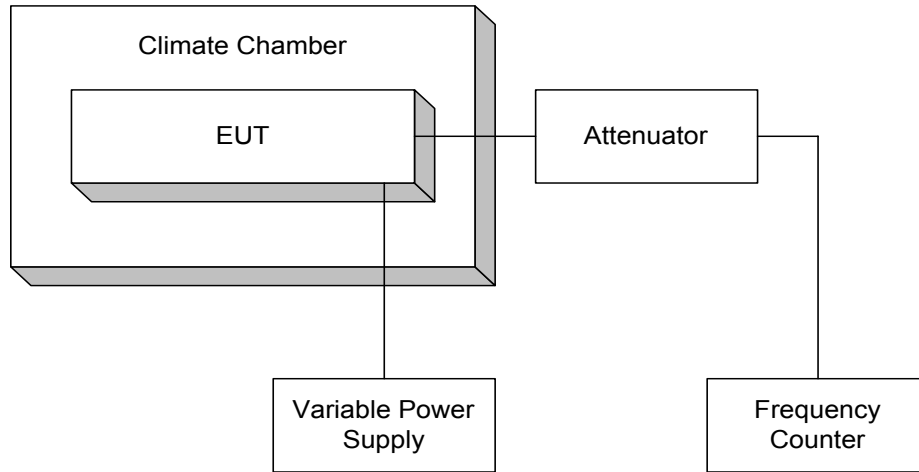


Para. No. 2.1053 - Field Strength of Spurious Radiation

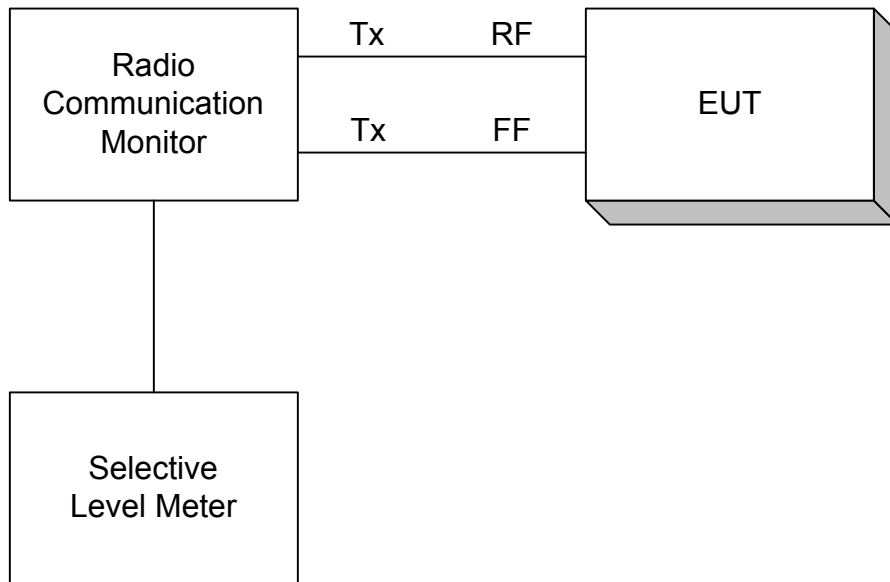


EQUIPMENT: MODEL TSM1-VTL101

Para. No. 2.1055 - Frequency Stability



Para. No. 2.1045 – Audio Frequency Response, Audio Low Pass Filter Response And Modulation Limiting



EQUIPMENT: MODEL TSM1-VTL101

Section 12. Test Equipment List

Radiated Emissions Test Equipment					
Client	Trapeze Networks, Inc.		EUT Name	MP-341 & MP-352	
PAN #	24-446-TRA		EUT Model	Trapeze Networks	
<i>Device Type</i>	<i>Model #</i>	<i>MFG</i>	<i>Asset #</i>	<i>SN</i>	<i>Cal Due</i>
OATS #1 (North)					
Spectrum Analyzer	1088.3494.30	R & S	835	830320/002	12/11/04
Antenna, Ridged Guide	3115	EMCO	529	2505	3/30/04
Antenna, Ridged Guide	3116	EMCO	625	9611-2325	1/12/05
Preamplifier	40 dB	Miteq	171	NA	NCR
4 GHz High Pass Filter	9SH10-4000	K&L	NA	55	NCR
Antenna, Ridged Guide	3115	EMCO	752	9609-4943	12/19/04
Signal Generator	E8254A	Agilent	836	US41140229	11/6/04

√A: Not Applicable
 √CR: No Cal Required
 √OU: CAL On Use