Nemko Test Report:	10217451RUS3
Applicant:	AgileMesh, Inc. 1761 International ParkwaySuite 113 Richardson TX 75081 USA
Equipment Under Test: (E.U.T.)	DNMA92AM
FCC ID.: **IC:**	TTHDNMA92AM 10127A-DNMA92AM
In Accordance With:	**CFR 47 Part 90, Subpart I and Subpart Y** Regulations Governing Licensing and Use of Frequencies in the 4940–4990 MHz Band **RSS 111, Issue 4** Broadband Public Safety Equipment
Tested By:	Nemko USA Inc. 802 N. Kealy Lewisville, TX 75057-3136

TESTED BY: _____ **DATE:** **17 January 2012**
David Light, Senior Wireless Engineer

APPROVED BY: _____ **DATE:** **17-Jan-2012**
Michael Cantwell, GM

Total Number of Pages: 36

Table of Contents

Section 1. Summary of Test Results

Manufacturer: AgileMesh, Inc.

Model No.: DNMA92AM

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 RSS 111,Issue 4 and CFR 47, Part 90,Subparts I and Y.

☒ 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".

NVLAP LAB CODE: 100426-0

Summary Of Test Data

NAME OF TEST	CFR PARA. NO.	RSS PARA. NO.	RESULT
RF Power Output	90.1215(a)(1)	5.3	Complies
Peak Power Spectral Density	90.1215(a)(2)	5.3	Complies
Audio Frequency Response	TIA EIA-603.3.2.6	-	NA[1]
Audio Low-Pass Filter Response	TIA EIA-603.3.2.6	-	NA[1]
Modulation Limiting	TIA EIA-603.3.2.6	-	NA[1]
Occupied Bandwidth	90.210	5.4	Complies
Spurious Emissions at Antenna Terminals	90.210	5.4	Complies
Field Strength of Spurious Emissions	90.210	-	Complies
Frequency Stability	90.213	5.2	Complies
Transient Frequency Behavior	90.214	-	NA[2]
Receiver Spurious Emissions	-	5.5	Complies

Footnotes:

1) The radio has no audio components
2) The radio does not operate in the necessary bands for this test.

Section 2. General Equipment Specification

Frequency Range:	4940 to 4990 MHz
Tunable Bands:	4960 to 4980
Necessary Bandwidth:	20 MHz
Emission Designator:	17M1W7D
Output Impedance:	50 ohms
RF Power Output (rated):	21 dBm
Number of Channels:	2
Channel Spacing:	20 MHz
Operator Selection of Frequency:	Software Controlled
Power Output Adjustment Capability:	Software Controlled

System Description

Wireless data radio module

Section 3. RF Power Output

NAME OF TEST: RF Power Output	PARA. NO.: 90.1215(a)(1)
TESTED BY: David Light	DATE: 11 January 2012

Test Results: Complies.

Measurement Data:

Frequency (MHz)	Output Power (dBm)	Output Power (W)
4960	22.75	0.188
4980	21.61	0.145

Spectrum analyzer settings:
RBW: 100 kHz
VBW: 100 kHz
Detector: RMS
Sweep: Auto

RSS 111, Issue 4

Frequency (MHz)	Output Power (dBm)	Output Power (W)
4960	22.54	0.179
4980	22.36	0.172

Spectrum analyzer settings:
RBW: 100 kHz
VBW: 100 kHz
Detector: Peak
Sweep: Auto

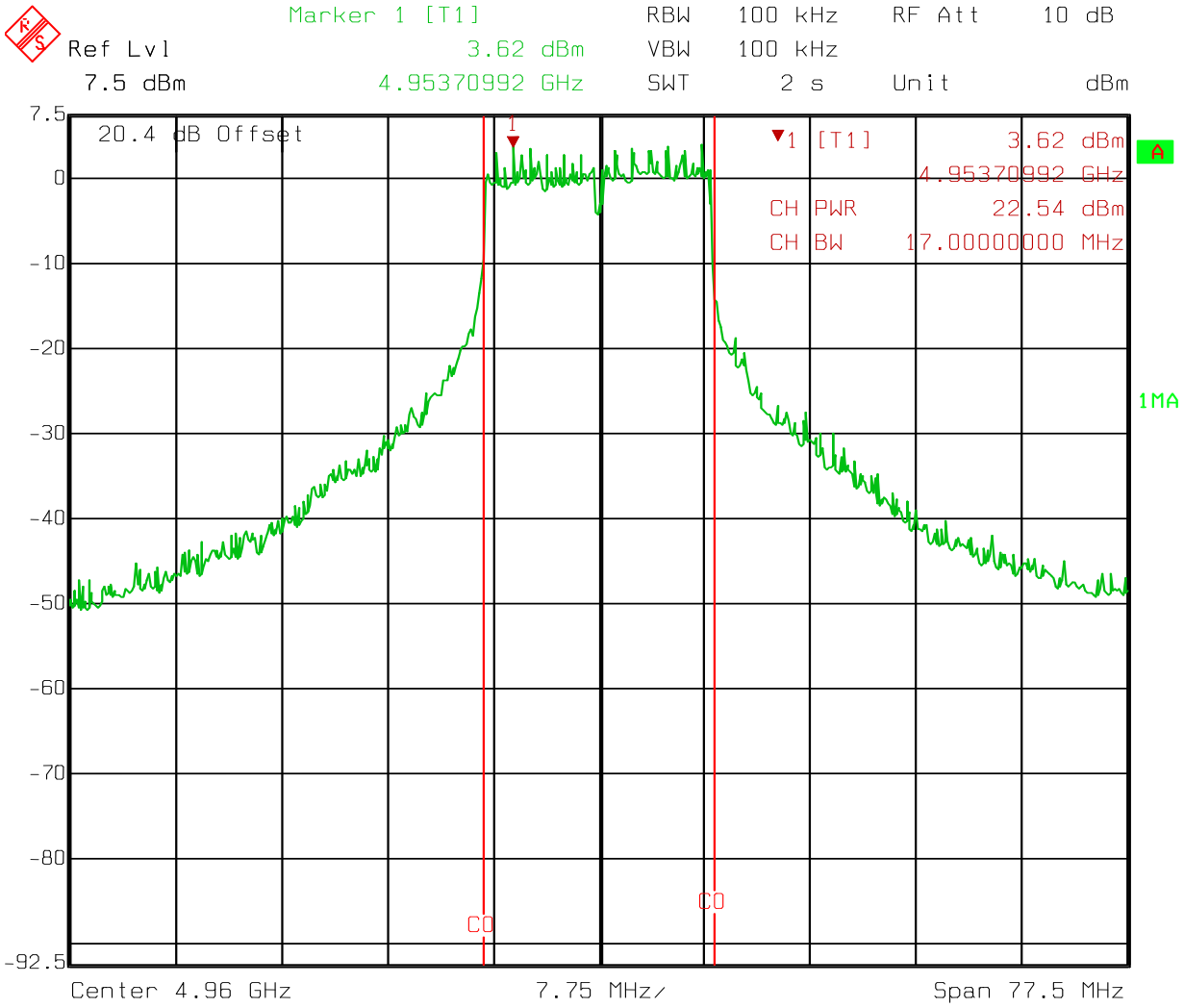
Equipment Used: 1036-1082-1472

Measurement Uncertainty: 1.7 dB

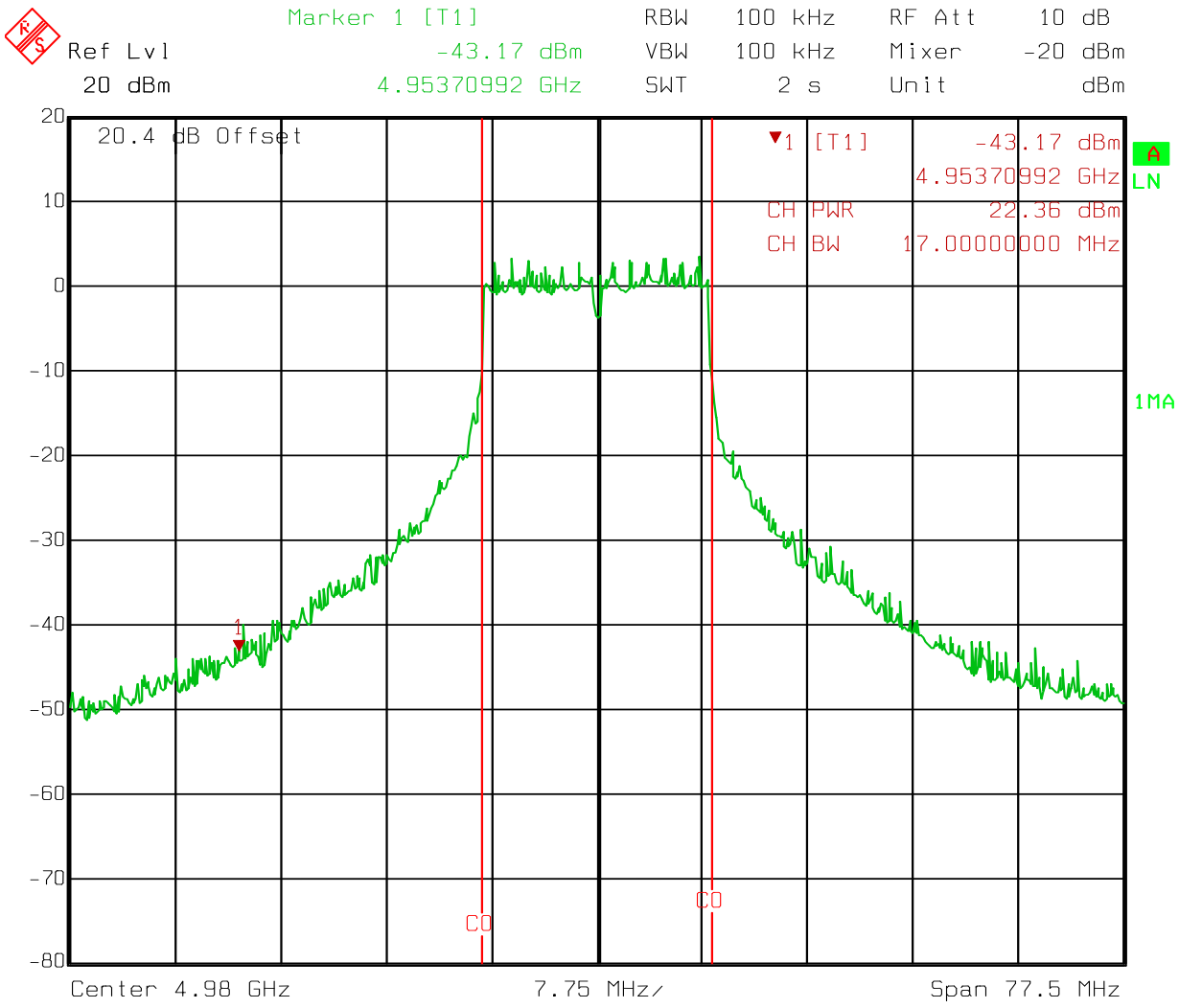
Temperature: 23 °C

Relative Humidity: 48 %

Peak Power – RSS 111



Peak Power – RSS 111



Section 4. Peak Power Spectral Density

NAME OF TEST: Peak Power Spectral Density	PARA. NO.: 90.1215(a)(2)
TESTED BY: David Light	DATE: 16 January 2012

Test Results: Complies.

Test Data: See attached plots.

Equipment Used: 1036-1082-1472

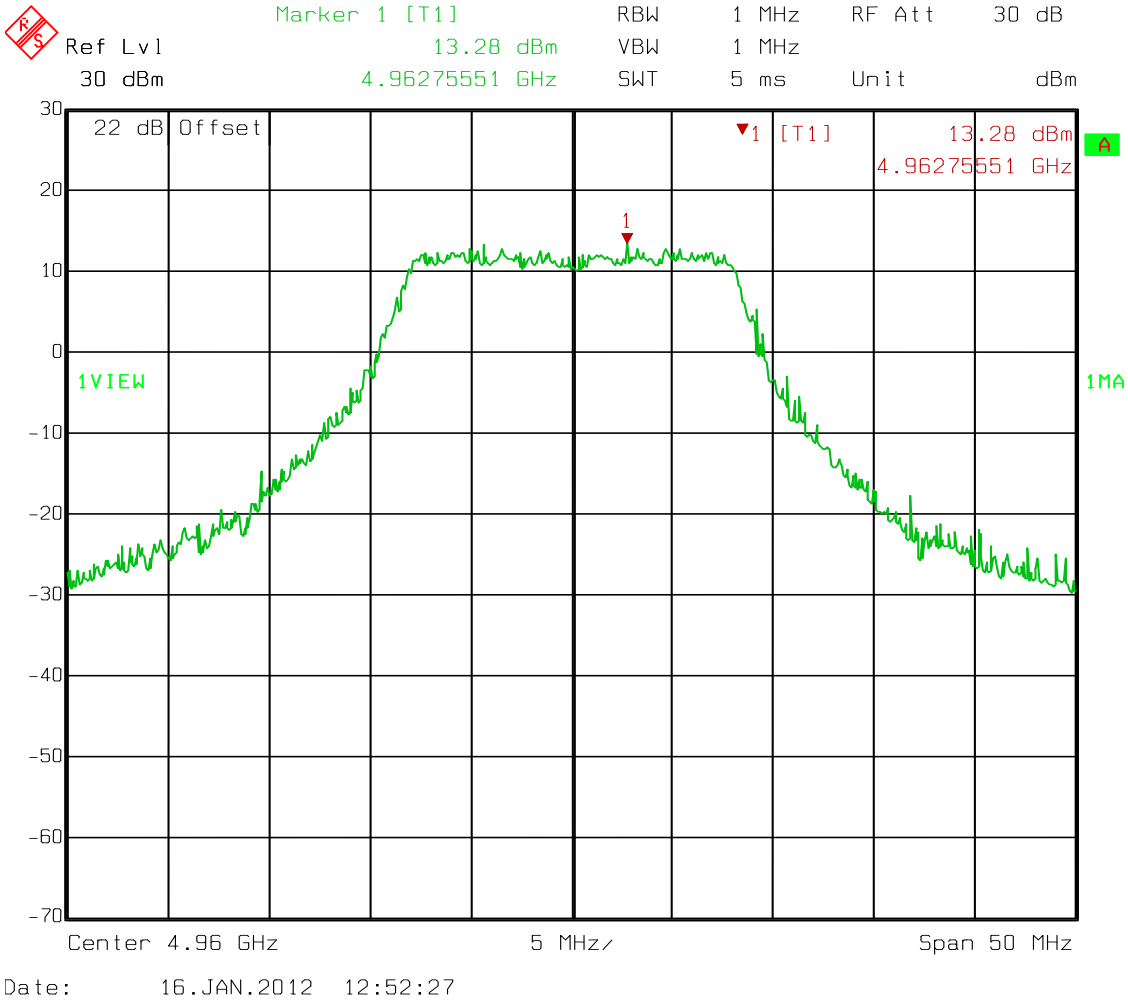
Measurement Uncertainty: $1x10^{-7}$ ppm

Temperature: 23 °C

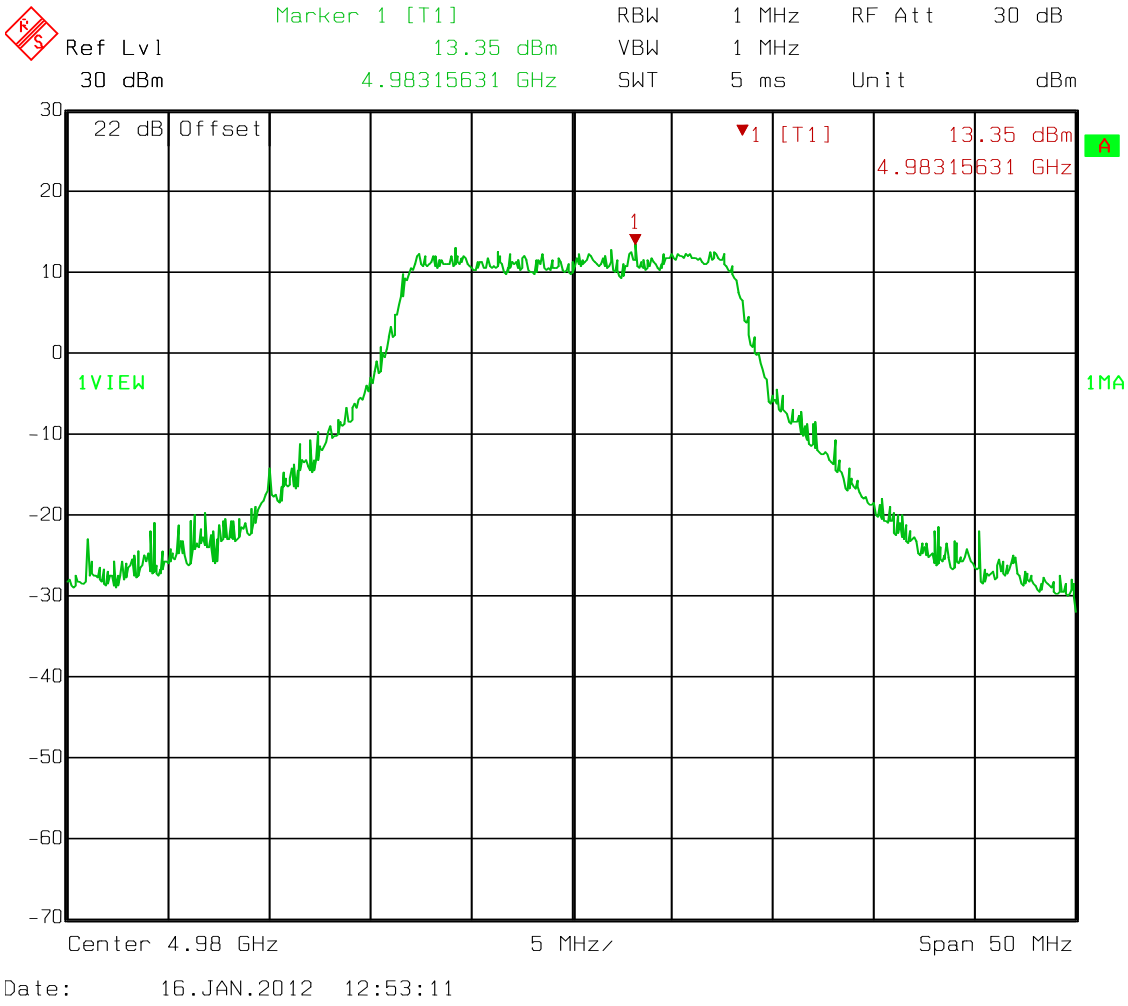
Relative Humidity: 48 %

Detector: Max. Peak

Test Data – Peak Power Spectral Density



Test Data – Peak Power Spectral Density



Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 90.210
TESTED BY: David Light	DATE: 11 January 2012

Test Results: Complies.

Test Data: Refer to plots on following pages

Equipment Used:

Measurement Uncertainty: 1.7 dB

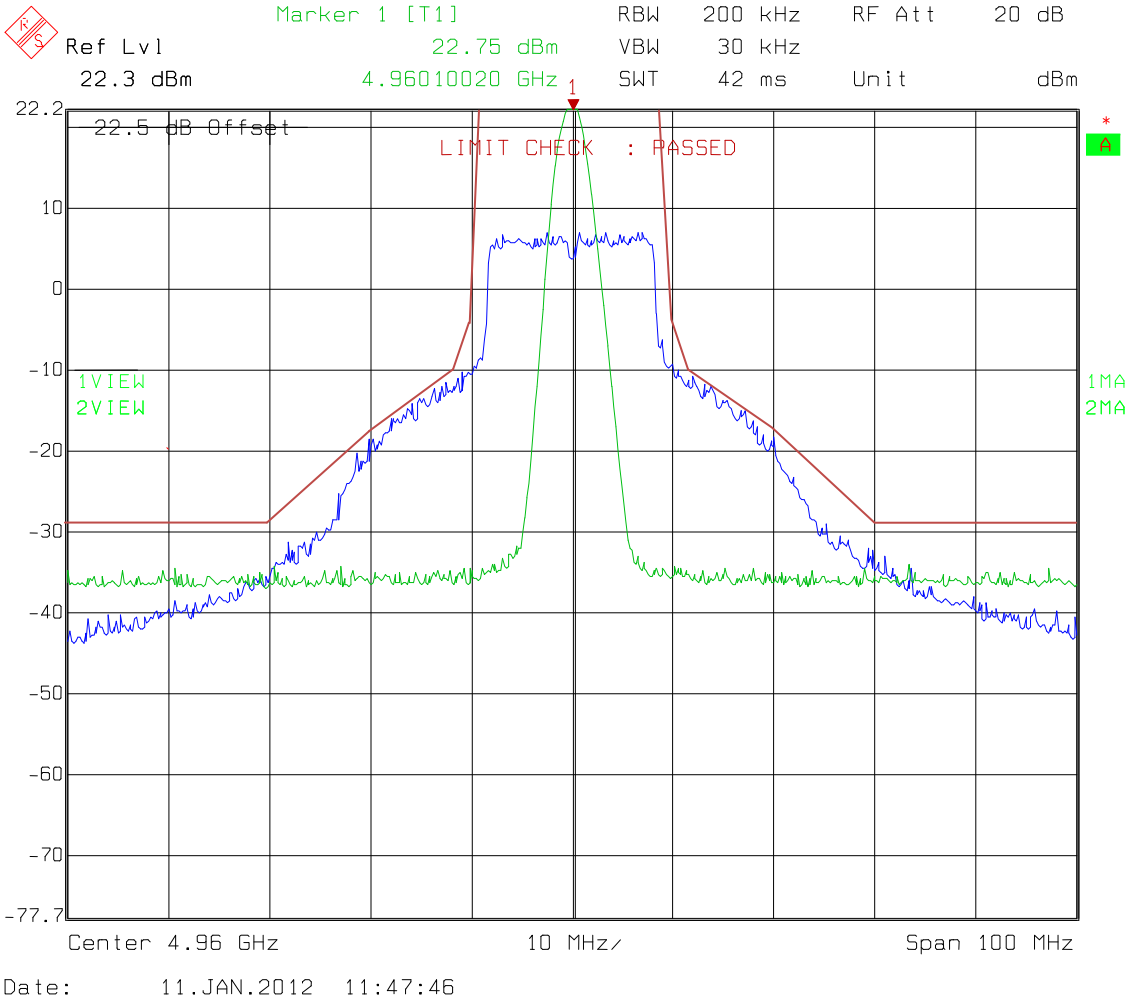
Temperature: 22 °C

Relative Humidity: 51 %

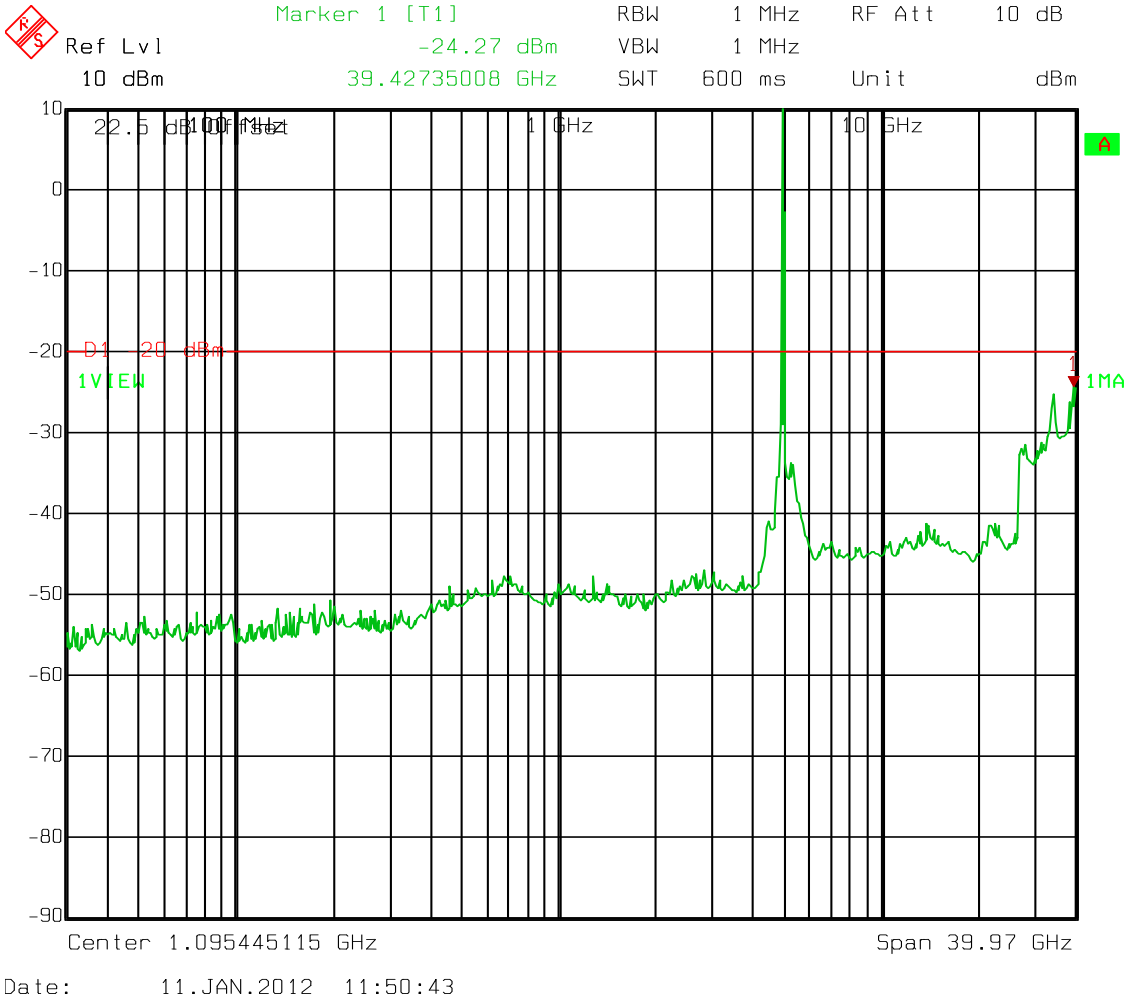
Detector: Max. Peak

Test Data – Spurious Emissions at Antenna Terminals

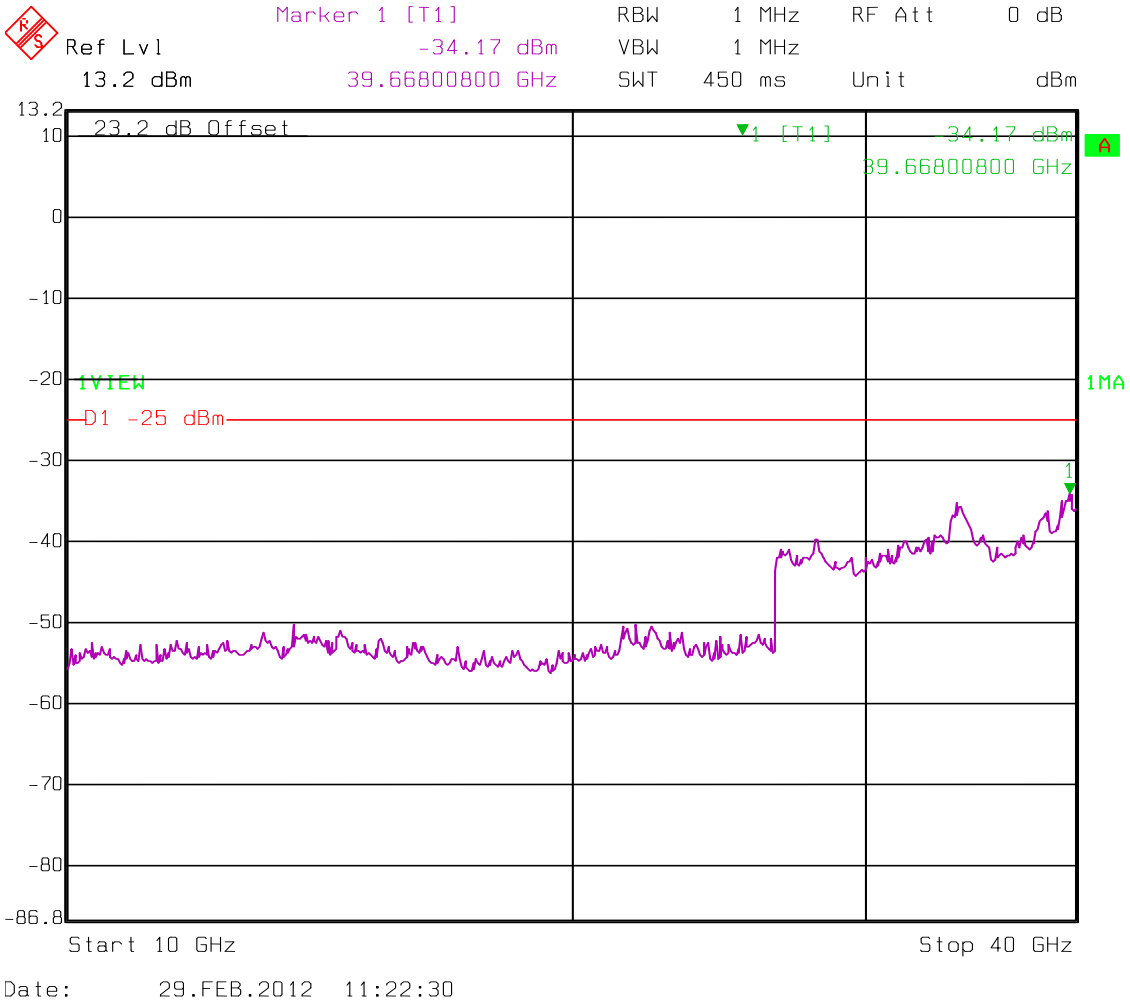
Mask M
Low channel



Spurious Emissions
30 MHz to 40 GHz
Low Channel

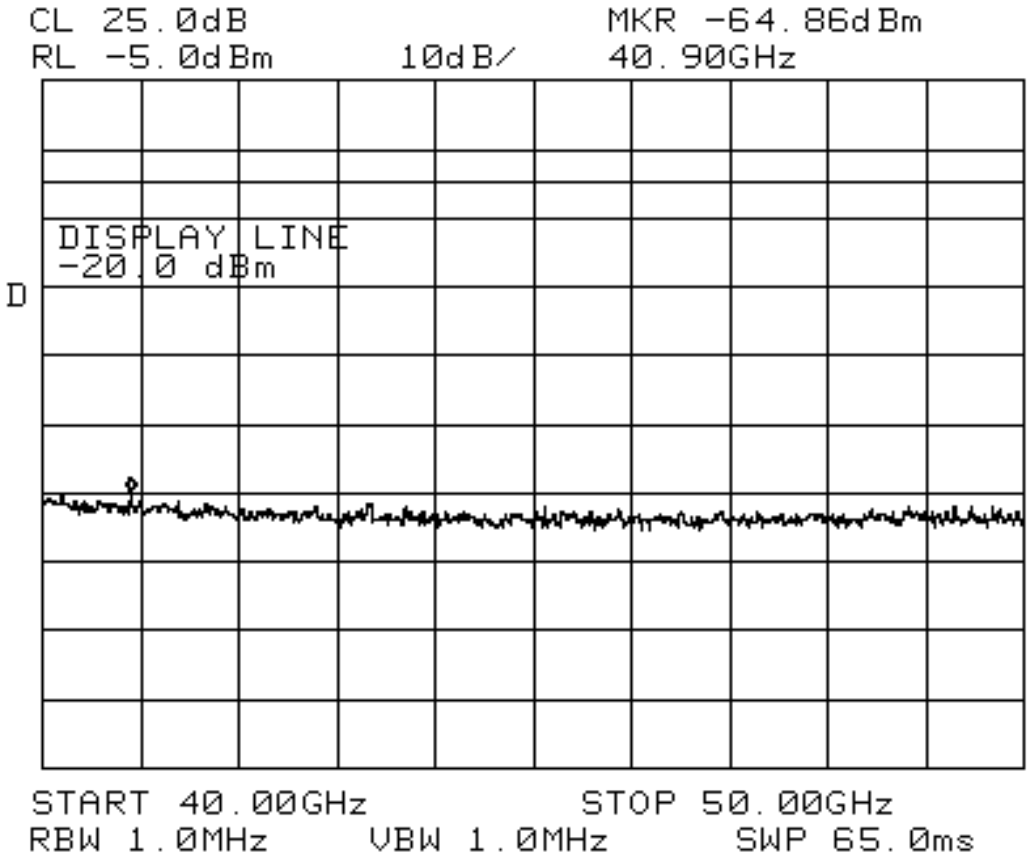


NOTE: Emissions marked on the graph above is the ambient noise floor of this plot. A plot of the ambient noise floor with reduced external attenuation is shown below to demonstrate compliance with the -25 dBm limit.

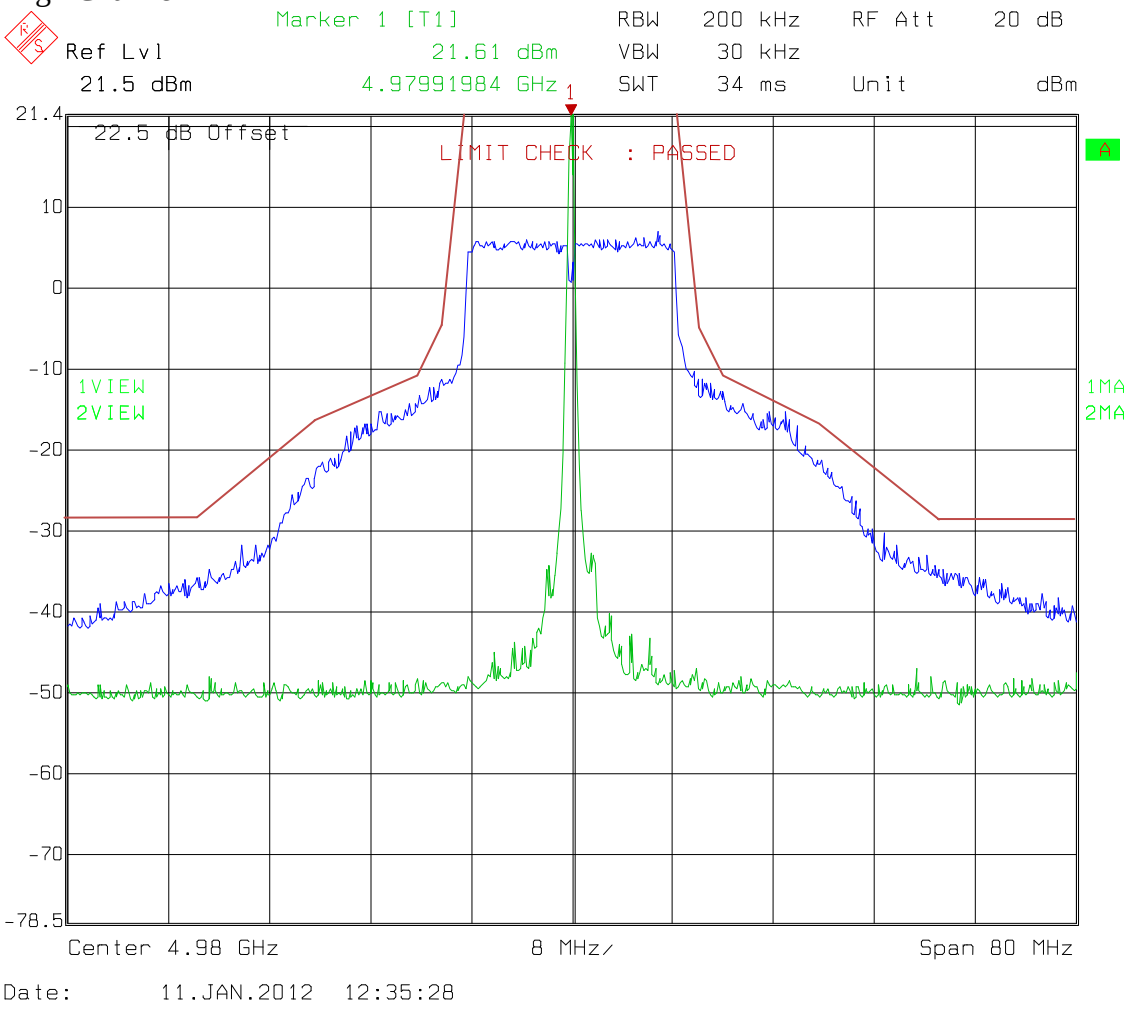


Above is the ambient emission scan with reduced external attenuation showing compliance.

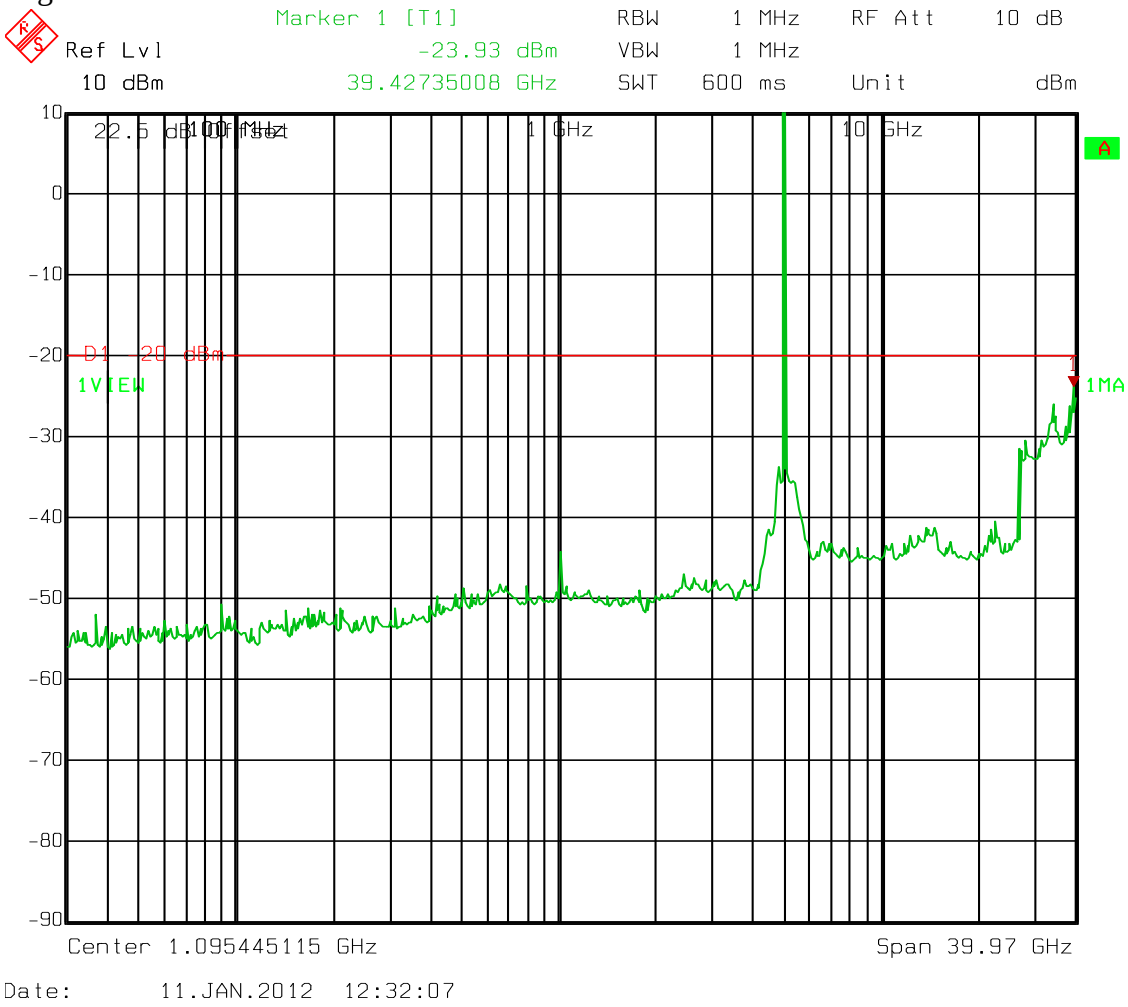
Spurious Emissions
40 to 50 GHz
Low Channel



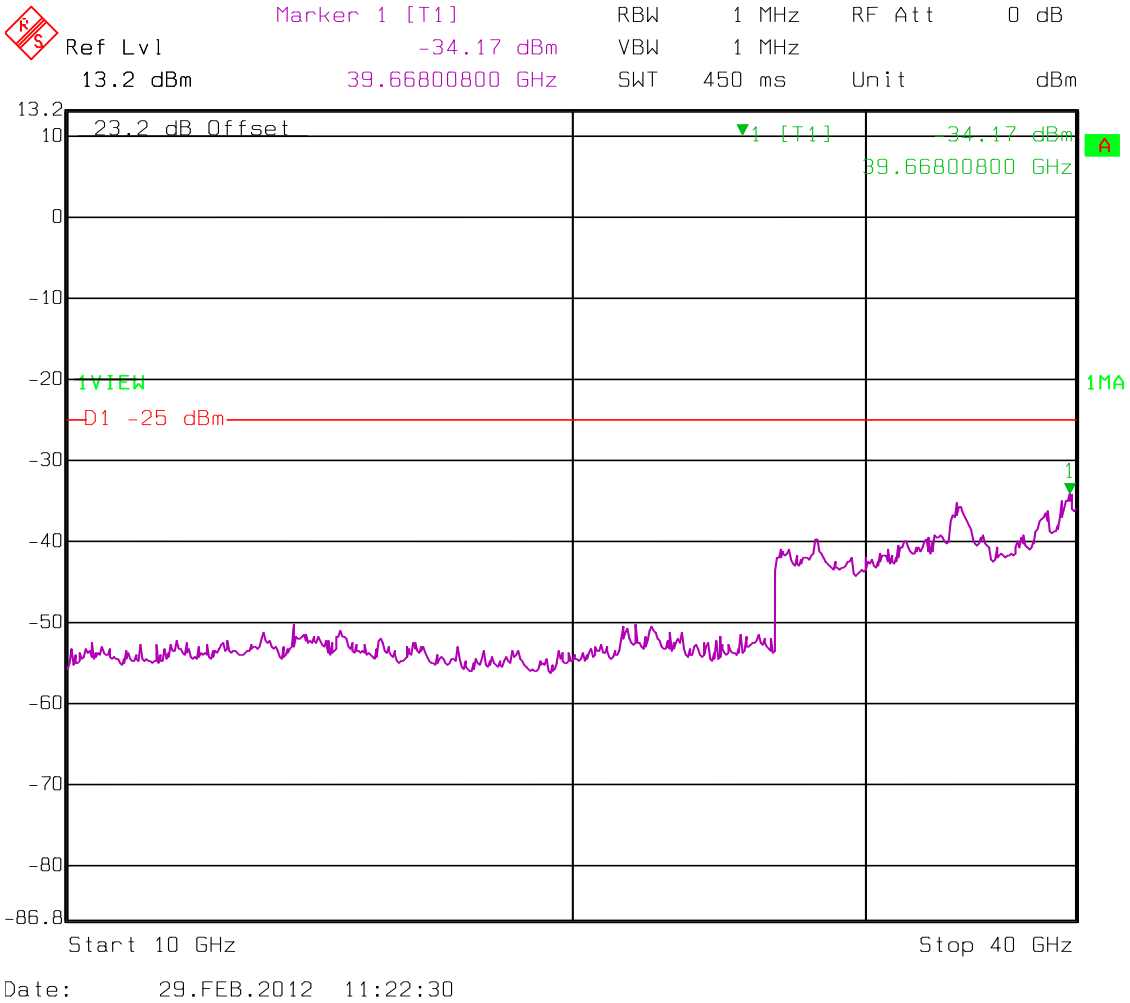
Mask M
High Channel



Spurious Emissions
30 MHz to 40 GHz
High Channel

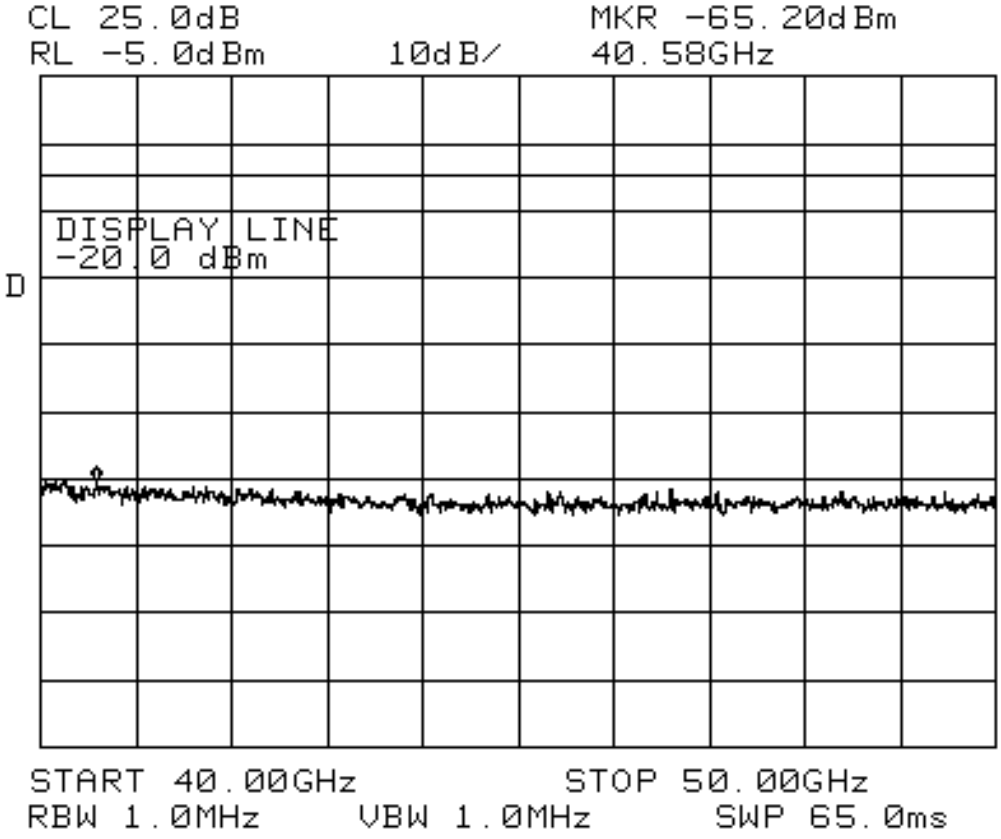


NOTE: Emissions marked on the graph above is the ambient noise floor of this plot. A plot of the ambient noise floor with reduced external attenuation is shown below to demonstrate compliance with the -25 dBm limit.



Above is the ambient emission scan with reduced external attenuation showing compliance.

Spurious Emissions
40 to 50 GHz
High Channel



Section 6. Field Strength of Spurious

NAME OF TEST: Field Strength of Spurious	PARA. NO.: 90.210
TESTED BY: David Light	DATE: 11 January 2012

Test Results: Complies.

Test Data: There were no emissions detected within 20 dB of the specification limit. The spectrum was searched from 30 MHz to 50 GHz.

Analyzer Settings: RBW/VBW = 1 MHz Peak detector

Equipment Used: 1464-993-1016-1480-791-1783

Measurement Uncertainty: 1.7 dB

Temperature: 23 °C

Relative Humidity: 51 %

Section 7. Frequency Stability

NAME OF TEST: Frequency Stability	PARA. NO.: 90.213
TESTED BY: David Light	DATE: 12 January 2012

Test Results: Complies.

Measurement Data: See data below.

Equipment Used: 1036-1082-1472

Measurement Uncertainty: $1x10^{-7}$ ppm

Temperature: 21 °C

Relative Humidity: 49 %

Test Data – Frequency Stability

Measurement Uncertainty:	$1x10^{-7}$ppm		Standard Test Frequency		4960.000000	MHz
Temp (^{o}C)	**Measured Frequency (MHz)**		**Test Voltage**	**Freqeuncy Error (Hz)**	**Limit (+/-Hz)**	**Error (ppm)**	**Comment**
20	4959.970583		120.0	-29417	NA	-5.9	
20	4959.970583		102.0	-29417	NA	-5.9	
20	4959.970583		138.0	-29417	NA	-5.9	
50	4959.970876		120.0	-29124	NA	-5.9	
40	4959.976038		120.0	-23962	NA	-4.8	
30	4959.985816		120.0	-14184	NA	-2.9	
10	4960.002317		120.0	2317	NA	0.5	
0	4960.012993		120.0	12993	NA	2.6	
-10	4960.012292		120.0	12292	NA	2.5	
-20	4960.008830		120.0	8830	NA	1.8	
-30	4959.992025		120.0	-7975	NA	-1.6	
Notes:							

Except for DSRCS equipment in the 5850–5925 MHz band, frequency stability is to be specified in the station authorization.

Section 8. Occupied Bandwidth

NAME OF TEST: Frequency Stability	PARA. NO.: 2.1049
TESTED BY: David LightTom Tidwell & Debbie Jensen	DATE: 17 January 2012

Test Results: Complies.

Measurement Data: See data below.

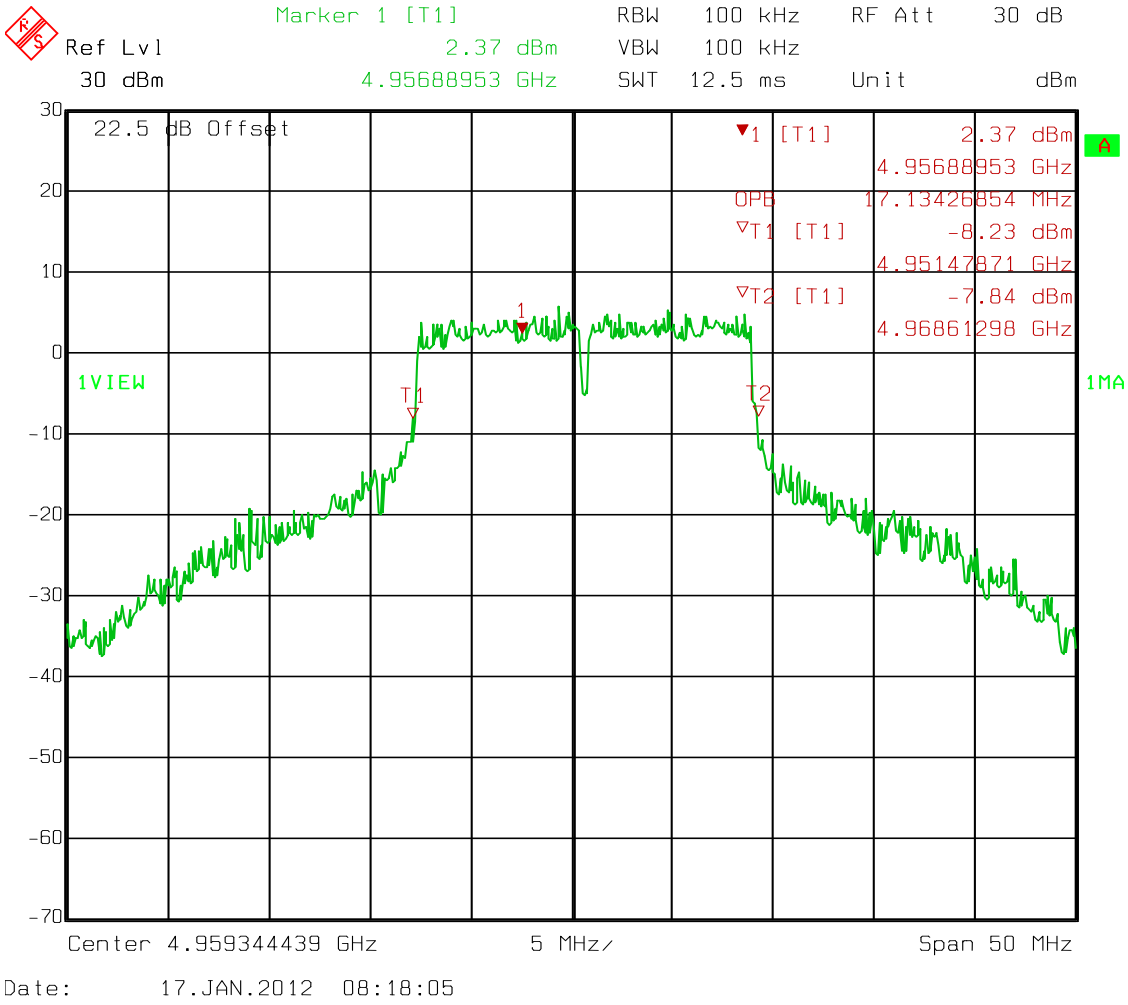
Equipment Used: 1036-1082-1472

Measurement Uncertainty: $1x10^{-7}$ ppm

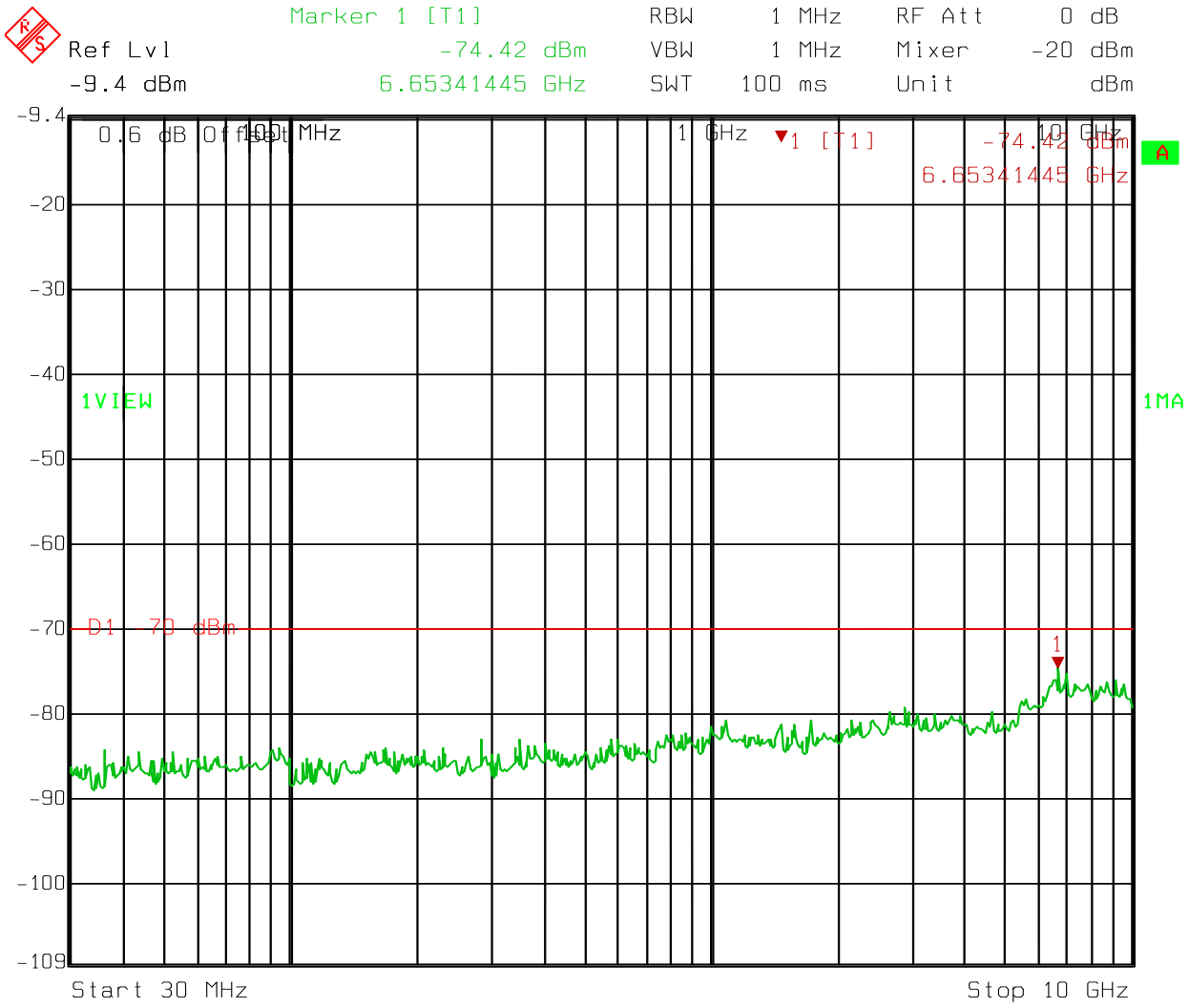
Temperature: 21 °C

Relative Humidity: 49 %

Test Data – 99% Occupied Bandwidth



Section 9. Receiver Spurious Emissions



Section 10. Test Equipment List

Asset Tag	Description	Manufacturer	Model	Serial #	Last Cal	Next Cal
993	Antenna, Horn	A.H. Systems	SAS-200/571	162	22-Sep-2011	22-Sep-2013
1016	Preamplifier	Hewlett Packard	8449A	2749A00159	20-Jul-2011	20-Jul-2012
1025	Preamplifier, 25dB	Nemko USA, Inc.	LNA25	399	23-Feb-2011	23-Feb-2012
1036	Spectrum Analyzer	Rohde & Schwartz	FSEK30	830844/006	06-Jan-2012	06-Jan-2014
1082	Cable	Astrolab	32027-2-29094-72TC		N/R	
1464	Spectrum Analyzer	Hewlett Packard	8563E	3551A04428	16-May-2011	16-May-2013
1472	Attenuator,	Omni Spectra	20600-20db		N/R	
1480	Antenna, Bilog	Schaffner-Chase	CBL6111C	2572	19-Jan-2011	19-Jan-2012
1783	Cable Assy, r	Nemko	Chamber		26-Sep-2011	26-Sep-2012

ANNEX A - TEST METHODOLOGIES

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

Minimum Standard: §90.1215 The transmitting power of stations operating in the 4940–4990 MHz band must not exceed the maximum limits in this section.

(a)(1) The maximum conducted output power should not exceed:

Channel bandwidth (MHz)	Low power maximum conducted output power (dBm)	High power maximum conducted output power (dBm)
1	7	20
5	14	27
10	17	30
15	18.8	31.8
20	20	33

NAME OF TEST: Peak Power Spectral Density	**PARA. NO.: 90.1215**

Minimum Standard: §90.1215 The transmitting power of stations operating in the 4940–4990 MHz band must not exceed the maximum limits in this section.

High power devices are also limited to a peak power spectral density of 21 dBm per one MHz. High power devices using channel bandwidths other than those listed above are permitted; however, they are limited to peak power spectral density of 21 dBm/MHz. If transmitting antennas of directional gain greater than 9 dBi are used, both the maximum conducted output power and the peak power spectral density should be reduced by the amount in decibels that the directional gain of the antenna exceeds 9 dBi. However, high power point-to-point and point-to-multipoint operations (both fixed and temporary-fixed rapid deployment) may employ transmitting antennas with directional gain up to 26 dBi without any corresponding reduction in the maximum conducted output power or spectral density. Corresponding reduction in the maximum conducted output power and peak power spectral density should be the amount in decibels that the directional gain of the antenna exceeds 26 dBi.

NAME OF TEST: Spurious Emissions **PARA. NO.: 2.1051**

Minimum Standard: §90.210 Except as indicated elsewhere in this part, transmitters used in the radio services governed by this part must comply with the emission masks outlined in this section.

Table 1

Frequency Band (MHz)	Mask for equipment with Low Pass Filter	Mask for equipment without Low Pass Filter
Below 25	A or B	A or C
25 – 50	B	C
72 – 76	B	C
150 - 174	B, D or E	C, D or E
150 Paging only	B	C
220 - 222	F	F
421 - 512	B, D or E	C, D or E
450 paging only	B	H
806 - 821/ 851 – 854	B	G
809 - 824/ 854 - 869	B	H
896 - 901/ 935 - 940	I	J
902 – 928	K	K
929 - 930	B	G
4940 - 4990	L or M	L or M
5850 – 5924		
All other bands	B	C

MASK	Spurious Limit
A,B,C,G,H,I	-13dBm
D,J,L,M	-20dBm
E,F,K	-25dBm

NAME OF TEST: Frequency Stability **PARA. NO.: 2.1053**

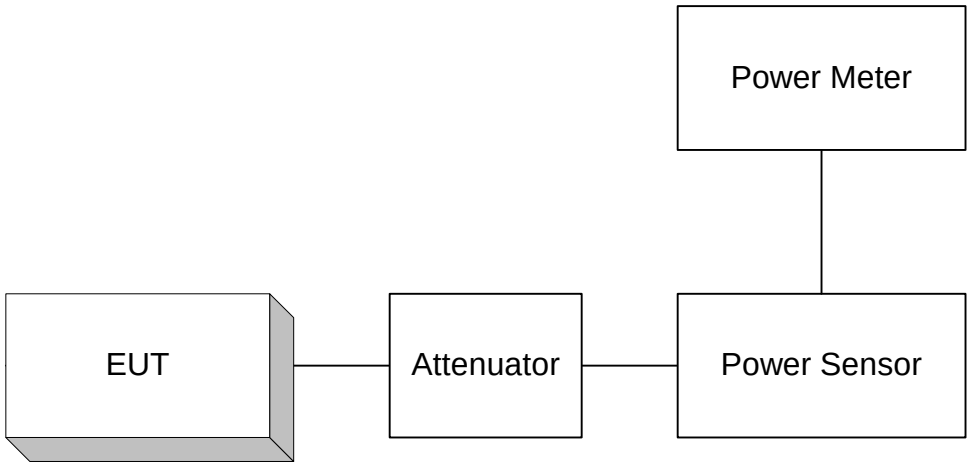
Minimum Standard: 90.213(a) Unless noted elsewhere, transmitters used in the services governed by this part must have a minimum frequency stability as specified in the following table.

Frequency Band (MHz)	Fixed And Base Stations	Mobile Stations	
		> 2 Watts o/p pwr	< 2 Watts o/p pwr
Below 25	100	100	200
25 - 50	20	20	50
72 - 76	5	-	50
150 - 174	5	5	5
220 - 222	0.1	1.5	1.5
421 - 512	2.5	5	5
806 - 809	1.5	2.5	2.5
809 – 824	1.0	1.5	15
851 – 854	1.5	2.5	2.5
854 - 869	1.0	1.5	1.5
896 - 901	0.1	1.5	1.5
902 - 928	2.5	2.5	2.5
929 - 930	1.5	-	-
935 - 940	0.1	1.5	1.5
1427 - 1435	300	300	300
Above 2450	-Note	Note	Note

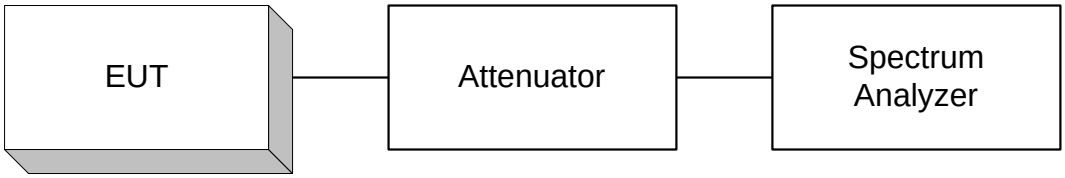
Note - Except for DSRCS equipment in the 5850–5925 MHz band, frequency stability is to be specified in the station authorization. Frequency stability for DSRCS equipment in the 5850–5925 MHz band is specified in subpart M of this part.

ANNEX B - TEST DIAGRAMS

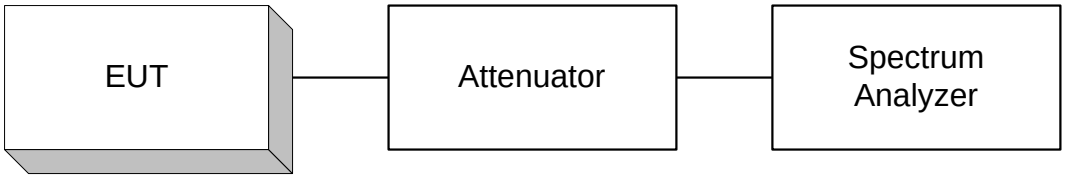
Para. No. 2.985 - R.F. Power Output



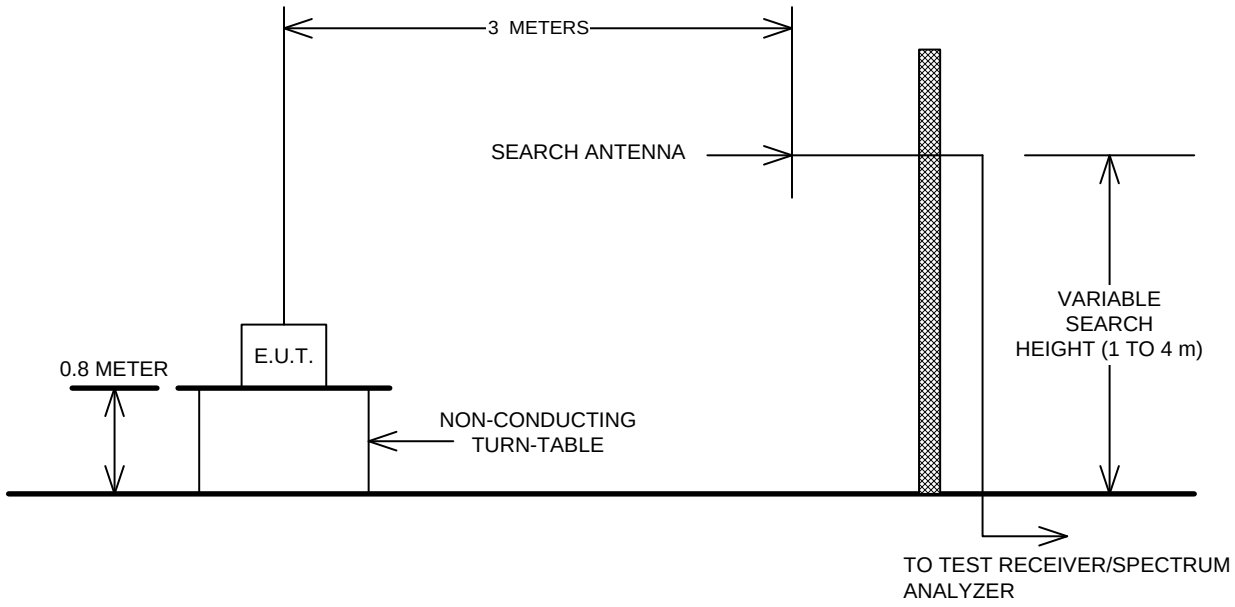
Para. No. 2.989 - Occupied Bandwidth



Para. No. 2.991 Spurious Emissions at Antenna Terminals



Para. No. 2.993 - Field Strength of Spurious Radiation



Para. No. 2.995 - Frequency Stability