MET Laboratories, Inc. *Safety Certification - EMI - Telecom Environmental Simulation*

914 WEST PATAPSCO AVENUE ● BALTIMORE, MARYLAND 21230-3432 ● PHONE (410) 354-3300 ● FAX (410) 354-3313
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13301 MCCALLEN PASS ● AUSTIN, TX 78753 ● PHONE (512) 287-2500 ● FAX (512) 287-2513

February 22, 2017

Firetide, Inc.
2105 South Bascom Avenue
Suite 220
Campbell, CA 95008

Dear Sudhir Hirudayaraj,

Enclosed is the EMC Wireless test report for compliance testing of the Firetide, Inc., 7010(W), tested to the requirements of Title 47 of the Code of Federal Regulations (CFR), Part 90 Subpart Y for Land Mobile Radio Services and RSS-111, Issue 5, September 2014.

Thank you for using the services of MET Laboratories, Inc. If you have any questions regarding these results or if MET can be of further service to you, please feel free to contact me.

Sincerely yours,
MET LABORATORIES, INC.

Joel Huna
Documentation Department

Reference: (\Firetide, Inc.\EMCS92597-FCC90Y Rev. 1)

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Electromagnetic Compatibility Criteria Test Report

For the

Firetide, Inc.
7010(W)

Tested under

The FCC Verification Rules
Contained in Title 47 of the CFR, Part 90, Subpart Y
for Private Land Mobile Radio Services
and
RSS-111, Issue 5, September 2014

MET Report: EMCS92597-FCC90Y Rev. 1

February 22, 2017

Prepared For:
Firetide, Inc.
2105 South Bascom Avenue
Suite 220
Campbell, CA 95008

Prepared By:
MET Laboratories, Inc.
3162 Belick St.
Santa Clara, CA 95054

Electromagnetic Compatibility Criteria
Test Report

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for Private Land Mobile Radio Services
and
RSS-111, Issue 5, September 2014

MET Report: EMCS92597-FCC90Y Rev. 1

Jun Qi, Project Engineer
Electromagnetic Compatibility Lab

Joel Huna
Documentation Department

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of Part 90, Subpart Y of the FCC Rules and Industry Canada standard RSS-111, Issue 5, September 2014 under normal use and maintenance.

Asad Bajwa,
Director, Electromagnetic Compatibility Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
0	February 13, 2017	Initial issue.
1	February 22, 2017	Engineer corrections.

Table of Contents

All references to section numbers are taken directly from the standard/specification used. Only sections requiring testing or evaluation are included.

List of Tables

List of Figures

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List of Terms and Abbreviations

AC	**A**lternating **C**urrent
ACF	**A**ntenna **C**orrection **F**actor
Cal	**Cal**ibration
d	**M**easurement **D**istance
dB	**D**eci**b**els
dBµA	**D**eci**b**els above one **micro**amp
dBµV	**D**eci**b**els above one **micro**volt
dBµA/m	**D**eci**b**els above one **micro**amp **per m**eter
dBµV/m	**D**eci**b**els above one **micro**volt **per m**eter
DC	**D**irect **C**urrent
E	**E**lectric Field
DSL	**D**igital **S**ubscriber **L**ine
ESD	**E**lectro**s**tatic **D**ischarge
EUT	**E**quipment **U**nder **T**est
f	**F**requency
FCC	**F**ederal **C**ommunications **C**ommission
GRP	**G**round **R**eference **P**lane
H	Magnetic Field
HCP	**H**orizontal **C**oupling **P**lane
Hz	**H**ert**z**
IEC	**I**nternational **E**lectrotechnical **C**ommission
kHz	**k**ilo**h**ert**z**
kPa	**k**ilo**pa**scal
kV	**k**ilo**v**olt
LISN	**L**ine **I**mpedance **S**tabilization **N**etwork
MHz	**M**ega**h**ertz
µH	**microh**enry
µ	**microf**arad
µs	**micros**econds
NEBS	**N**etwork **E**quipment-**B**uilding **S**ystem
PRF	**P**ulse **R**epetition **F**requency
RF	**R**adio **F**requency
RMS	**R**oot-**M**ean-**S**quare
TWT	**T**raveling **W**ave **T**ube
V/m	**V**olts **per m**eter
VCP	**V**ertical **C**oupling **P**lane

Executive Summary

1. Testing Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 90, Subpart Y. All tests were conducted using measurement procedure ANSI TIA/EIA-603-D(2010).

Title 47 of the CFR, Part 90, Subpart Y, and FCC 04-265 Reference and Test Description	RSS-111, Issue 5, September 2014 Reference	Compliance / Comments
2.1046; 90.1215(a) Peak Power Output	RSS-111, Section 5.3	Compliant
2.1046; 90.1215(a) Peak Power Spectral Density	RSS-111, Section 4.2	Compliant
2.1047(a) Modulation Characteristics	N/A	Not Applicable
2.1049; 90.210(L) Occupied Bandwidth (Emission Mask)	RSS-111, Section 5.3	Compliant
2.1051; 90.210(L) Spurious Emissions at Antenna Terminals	RSS-111, Section 5.4	Compliant
2.1053; 90.210(L) Radiated Spurious Emissions	RSS-111, Section 5.4	Compliant
2.1055(a) (1); 90.213 Frequency Stability over Temperature Variations	RSS-111, Section 5.2	Compliant
2.1055(d) (2) Frequency Stability over Voltage Variations	RSS-111, Section 5.2	Compliant
90.214 Transient Frequency Behavior	RSS-111, Section 5.2	Not Applicable

Equipment Configuration

2. Equipment Configuration

2.1. Overview

MET Laboratories, Inc. was contracted by Firetide, Inc. to perform testing on the 7010(W) under purchase order number PO-3987.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Firetide, Inc., 7010(W).

An EMC evaluation to determine compliance of the TB 4.9 with the requirements of Part 90, Subpart Y, was conducted. (All references are to the most current version of Title 47 of the Code of Federal Regulations in effect). In accordance with §2.1033, the following data is presented in support of the Certification of the TB4.9. Firetide, Inc. should retain a copy of this document and it should be kept on file for at least five years after the manufacturing of the EUT has been **permanently** discontinued. The results obtained relate only to the item(s) tested.

Model(s) Tested:	7010(W)	
Model(s) Covered:	7010(W)	
EUT Specifications:	Primary Power Source: 115VAC	
	FCC ID:REP-7100-W IC: 4988A-7100W	
	Type of Modulations:	BPSK, DQPSK, CCK & QAM
	Max Peak and Output Power:	22.85 dBm@ 4980MHz
	Equipment Code:	TNB
	EUT Frequency Ranges:	Radio 1 and Radio 2: 4940MHz – 4990MHz
Analysis:	The results obtained relate only to the item(s) tested.	
Environmental Test Conditions:	Temperature (15-35º C):	
	Relative Humidity (30-60%):	
	Barometric Pressure (860-1060 mbar):	
Evaluated by:	Jun Qi	
Report Date(s):	February 22, 2017	

2.2. Test Site

All testing was performed at MET Laboratories, Inc., 3162 Belick St. Santa Clara, CA 95054. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a semi-anechoic chamber (equivalent to an Open Area Test Site). In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories.

2.3. Description of Test Sample

The Firetide, Inc. 7010(W), Equipment Under Test (EUT), is a Firetide Mesh Network, which is composed of two or more Mesh Nodes, and it gives you the convenience of a wired- Ethernet switch combined with the deployment flexibility of wireless technology. Each Mesh Node in the network can accept a wired Ethernet connection. That connection's Ethernet data is sent wirelessly to another Mesh Node. If the receiving Mesh Node is connected to the wired destination for the data packet, the Node routes that packet to its Ethernet connection. If it is not the final destination, the packet is forwarded wirelessly to the next Mesh Node and ultimately to its final destination. Depending on the network topology, a Mesh Node can be set up to operate as a point to point device (in which directional antennas would be used) or as a point to multipoint device (in which a combination of omnidirectional and directional antennas would be used). The Radio technology incorporated into the Mesh Node is based on the 802.11a/b/g/n standard. The Radio can be configured to operate in standard 802.11g mode or 802.11n mode, referred to as MIMO.
The HotPort Node is housed in a weatherized, cast aluminum enclosure. External antennas connect to the four type N connectors (two per radio 2x2), two on each side of the enclosure.

2.4. Equipment Configuration

The EUT was set up as outlined in Figure 1, Block Diagram of Test Setup. All cards, racks, etc., incorporated as part of the EUT is included in the following list.

Ref. ID	Slot #	Name / Description	Model Number	Part Number	Serial Number	Rev. #
1		HOTPORT Out Door Mesh Node	7010(W)	7010(W)		1.0

Table 1. Equipment Configuration

2.5. Support Equipment

Firetide, Inc. supplied support equipment necessary for the operation and testing of the 7010(W). All support equipment supplied is listed in the following Support Equipment List.

Ref. ID	Name / Description	Manufacturer	Model Number	*Customer Supplied Calibration Data
1	5.125 to 6.1G,3xN,19dBi Panel Antenna	Firetide	AP-20-050-MIMO-19	N/A
2	4.9 to 6.1 GHZ3xN,16dBi Sector	Firetide	AS90-050-MIMO-16T	N/A
3	4.9 to 5.875G,3 Port,9dBi Omini	Firetide	AO-050-MIMO-9	N/A
4	2.3 to 2.7G,2xN,13dBi Panel	Firetide	AS90-024-MIMO-13	N/A
5	2.4 to 2.5G,3 Port,9dBi,Omini	Firetide	AO-024-MIMO-8	N/A
6	5G,5dBi Omini (used for DFS)	WHA Yu	C812510010-A	N/A
7	5G,5dBi Omini(used for DFS)	WHA Yu	C812510012-A	N/A
The 'Customer Supplied Calibration Data' column will be marked as either not applicable, not available, or will contain the calibration date supplied by the customer.				

Table 2. Support Equipment

2.6. Ports and Cabling Information

Ref. ID	Port name on EUT	Cable Description or reason for no cable	Qty	Length as tested (m)	Shielded? (Y/N)	Termination Box ID & Port Name
1	Antenna Ports,Radio1: Ant1,Ant2 Radio2: Ant1,Ant2	CB-C-015-N(LMR400)	4	1.5Meter	Yes	Antenna Ports
2	Power Input Port: AC	Power cord, 3 conductor, 18 awg	1		Yes	AC: Power Input Port (115v/60hz)
3	Port1 … Port4 (P1...P4)	CAT 5E Ethernet cable	1	2 Meter	N	Port1 … Port4

Table 3. Ports and Cabling Information

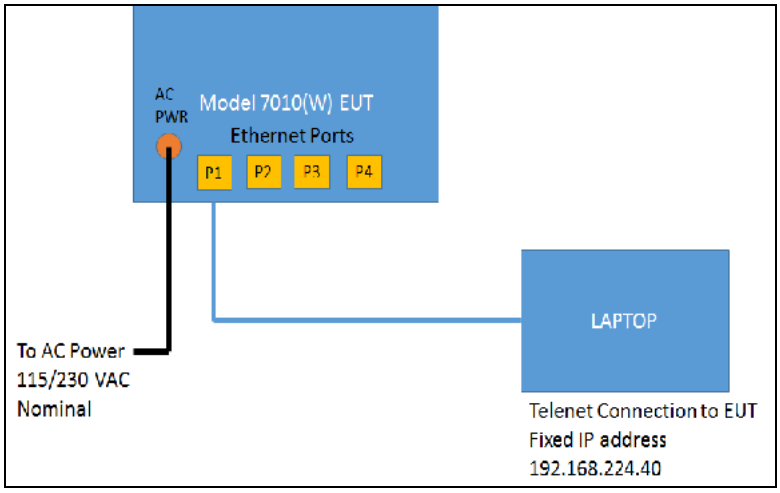


Figure 1. Block Diagram of Test Configuration

2.7. Mode of Operation

HotPort 7010(W)

Once the AC power/POE Power is applied LED indicates to mention that the 7010(W) unit is powered on properly. Proper IP address should be set in the PC prior to the Ethernet cable connection. The Ethernet connectivity needs to be made by connecting an Ethernet cable. Once the connection is established, you can verify this in the PC's LAN connectivity status. Proper IP address should be set in the PC prior to the Ethernet cable connection.

2.8. Method of Monitoring EUT Operation

HotPort 7010(W)
Mechanical Dimension: Dimensions: 13.4" X 9.3" X 4.7"Outdoor

Electrical Indication: Power and Status LED's on the front panel To verify whether the EUT is power ON , if the EUT is ON the Power LED will glow Green
Status LED Glows when the firmware is up. When the unit meshes with another unit using single radio configuration Radio1 LED will glow and when the unit meshes with another unit with dual radio configuration both Radio 1 and Radio 2 LED will glow.
With the Ethernet cable connected to PC or Laptop Ping the EUT with the IP address 192.168.224.xxx (150) for 7010(W).

2.9. Modifications

2.9.1. Modifications to EUT

No modifications were made to the EUT.

2.9.2. Modifications to Test Standard

No modifications were made to the test standard.

2.10. Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to Firetide, Inc. upon completion of testing.

III. Electromagnetic Compatibility Criteria for Intentional Radiators

3. Electromagnetic Compatibility RF Power Output Requirements

3.1. RF Power Output

Test Requirement(s): **§2.1046 and §90.1215(a) with FCC 04-265**

Test Procedures: As required by 47 CFR 2.1046, *RF power output measurements* were made at the RF output terminals using a Spectrum Analyzer.

A laptop was connected to EUT to control the RF power output and frequency channel. The EUT was connected to a Spectrum Analyzer via an attenuator to measure the Peak power. The EUT power was adjusted enough to produce maximum output power as specified in the owner's manual. The output power was then recorded with peak reading. Measurements were made at the low, mid and high channels.

Test Results: Equipment is compliant with 47CFR 2.1046 and 90.1215(a) with FCC 04-265.

All RF Power output measurements were direct connection to RF output Terminal of EUT from a Spectrum Analyzer.

Test Engineer(s): Jun Qi

Test Date(s): December 16, 2016

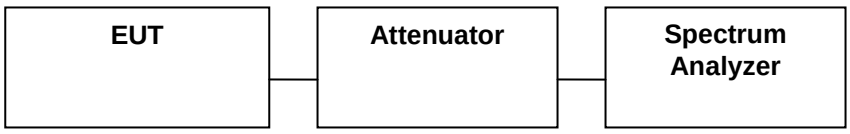


Figure 2. RF Power Output Test Setup

5MHz										
Center Frequency	**Bandwidth**	**Port R11 Data**	**Port R12 Data**	**Port R21 Data**	**Port R22 Data**	**Sum of 4 Ports**	**Limit**	**Antenna Gain**	**Final limit**	**Margin dB**
Ch 4942.5M	BW 5M	9.85	7.64	6.94	9.11	14.56	27	9	27	-12.44
Ch 4967.5M	BW 5M	9.04	9.85	9.63	8.41	15.29	27	9	27	-11.71
Ch 4987.5M	BW 5M	10.75	10.28	10.9	9.03	16.32	27	9	27	-10.68
10MHz										
Center Frequency	**Bandwidth**	**Port R11 Data**	**Port R12 Data**	**Port R21 Data**	**Port R22 Data**	**Sum of 4 Ports**	**Limit**	**Antenna Gain**	**Final limit**	**Margin dB**
Ch 4945M	BW 10M	14.7	12.65	10.08	11.84	18.66	30	9	30	-11.34
Ch 4965M	BW 10M	11.93	13	12.25	10.42	18.02	30	9	30	-11.98
Ch 4985M	BW 10M	12.16	13.02	13.57	9.76	18.37	30	9	30	-11.63
20MHz										
Center Frequency	**Bandwidth**	**Port R11 Data**	**Port R12 Data**	**Port R21 Data**	**Port R22 Data**	**Sum of 4 Ports**	**Limit**	**Antenna Gain**	**Final limit**	**Margin dB**
Ch 4950M	BW 20M	15.06	15.9	15.08	15.43	21.41	33	9	33	-11.59
Ch 4965M	BW 20M	17.84	16.37	15.64	15.04	22.38	33	9	33	-10.62
Ch 4980M	BW 20M	17.54	17.31	16.96	15.12	22.85	33	9	33	-10.15

Table 4. RF Output Power, 90Y Power 9 dBi, Test Results

5MHz										
Center Frequency	**Bandwidth**	**Port R11 Data**	**Port R12 Data**	**Port R21 Data**	**Port R22 Data**	**Sum of 4 Ports**	**Limit**	**Antenna Gain**	**Final limit**	**Margin dB**
Ch 4942.5M	BW 5M	0.52	0.41	1.6	1.35	7.03	27	16	20	-12.97
Ch 4967.5M	BW 5M	1.11	2.69	2.29	-0.22	7.63	27	16	20	-12.37
Ch 4987.5M	BW 5M	1.81	3.24	2.05	0.42	8.02	27	16	20	-11.98
10MHz										
Center Frequency	**Bandwidth**	**Port R11 Data**	**Port R12 Data**	**Port R21 Data**	**Port R22 Data**	**Sum of 4 Ports**	**Limit**	**Antenna Gain**	**Final limit**	**Margin dB**
Ch 4945M	BW 10M	4.73	4.61	4.86	3.94	10.57	30	16	23	-12.43
Ch 4965M	BW 10M	4.01	5.52	4.61	4.18	10.65	30	16	23	-12.35
Ch 4985M	BW 10M	5.76	3.72	6.22	3.02	10.91	30	16	23	-12.09
20MHz										
Center Frequency	**Bandwidth**	**Port R11 Data**	**Port R12 Data**	**Port R21 Data**	**Port R22 Data**	**Sum of 4 Ports**	**Limit**	**Antenna Gain**	**Final limit**	**Margin dB**
Ch 4950M	BW 20M	8.65	8.33	8.76	7.01	13.88	33	16	26	-12.12
Ch 4965M	BW 20M	7.9	8.59	8.83	7.58	14.28	33	16	26	-11.72
Ch 4980M	BW 20M	8.12	8.47	8.41	8.02	14.28	33	16	26	-11.72

Table 5. RF Output Power, 90Y Power 16 dBi

3.2. Peak Power Spectral Density

Test Requirement(s): **§90.1215(a) with FCC 04-265**

Test Procedures: As required by 47 CFR 2.1046, *RF power output measurements* were made at the RF output terminals using a Directional Coupler through a Spectrum Analyzer and Power Meter.

A laptop was connected to EUT to control the RF power output and frequency channel. The EUT was connected to a Spectrum Analyzer in order to measure the power level. The Spectrum Analyzer was set to a RBW = 1 & VBW = 3 MHz. The EUT power was adjusted at the maximum output power level. The max hold key from the Spectrum Analyzer was activated capturing the modulated envelope of the EUT. The Peak Power Spectral Density was then recorded. Measurements were made at the low, mid and high channels.

Test Results: Equipment is compliant with 47 CFR 2.1046 and 90.1215(a) with FCC 04-265.

The following pages show measurements of Peak Power Spectral Density plots which is recorded below:

Test Engineer(s): Jun Qi

Test Date(s): December 16, 2016

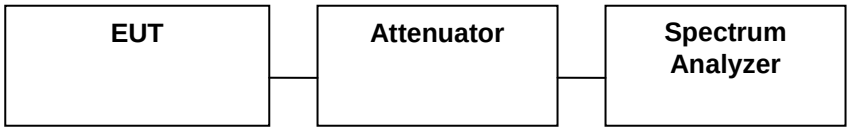


Figure 3. Peak Spectral Density Test Setup

5MHz										
Center Frequency	**Bandwidth**	**Port R11 Data**	**Port R12 Data**	**Port R21 Data**	**Port R22 Data**	**Sum of 4 Ports**	**Limit**	**Antenna Gain**	**Final limit**	**Margin dB**
Ch 4942.5M	BW 5M	15.219	13.977	14.777	15.622	20.97	21	9	21	-0.03
Ch 4967.5M	BW 5M	14.76	15.325	14.827	13.777	20.73	21	9	21	-0.27
Ch 4987.5M	BW 5M	14.893	15.214	15.575	12.782	20.77	21	9	21	-0.23
10MHz										
Center Frequency	**Bandwidth**	**Port R11 Data**	**Port R12 Data**	**Port R21 Data**	**Port R22 Data**	**Sum of 4 Ports**	**Limit**	**Antenna Gain**	**Final limit**	**Margin dB**
Ch 4945M	BW 10M	14.976	15.366	14.438	14.695	20.91	21	9	21	-0.09
Ch 4965M	BW 10M	14.865	15.355	14.914	12.698	20.6	21	9	21	-0.4
Ch 4985M	BW 10M	14.521	15.399	14.441	13.436	20.53	21	9	21	-0.47
20MHz										
Center Frequency	**Bandwidth**	**Port R11 Data**	**Port R12 Data**	**Port R21 Data**	**Port R22 Data**	**Sum of 4 Ports**	**Limit**	**Antenna Gain**	**Final limit**	**Margin dB**
Ch 4950M	BW 20M	15.101	14.198	14.798	14.637	20.72	21	9	21	-0.28
Ch 4965M	BW 20M	14.648	14.015	14.62	13.173	20.18	21	9	21	-0.82
Ch 4980M	BW 20M	14.85	13.898	14.937	13.145	20.29	21	9	21	-0.71

Table 6. Peak Power Spectral Density, 90Y, 9 dBi, Test Results

5MHz										
Center Frequency	**Bandwidth**	**Port R11 Data**	**Port R12 Data**	**Port R21 Data**	**Port R22 Data**	**Sum of 4 Ports**	**Limit**	**Antenna Gain**	**Final limit**	**Margin dB**
Ch 4942.5M	BW 5M	7.665	6.806	7.523	6.519	13.18	21	16	14	-0.82
Ch 4967.5M	BW 5M	7.089	8.07	8.18	6.226	13.49	21	16	14	-0.51
Ch 4987.5M	BW 5M	7.989	7.963	7.32	6.239	13.46	21	16	14	-0.54
10MHz										
Center Frequency	**Bandwidth**	**Port R11 Data**	**Port R12 Data**	**Port R21 Data**	**Port R22 Data**	**Sum of 4 Ports**	**Limit**	**Antenna Gain**	**Final limit**	**Margin dB**
Ch 4945M	BW 10M	8.63	7.158	8.04	6.589	13.7	21	16	14	-0.3
Ch 4965M	BW 10M	6.995	8.66	7.49	6.966	13.61	21	16	14	-0.39
Ch 4985M	BW 10M	7.724	6.651	8.42	6.218	13.37	21	16	14	-0.63
20MHz										
Center Frequency	**Bandwidth**	**Port R11 Data**	**Port R12 Data**	**Port R21 Data**	**Port R22 Data**	**Sum of 4 Ports**	**Limit**	**Antenna Gain**	**Final limit**	**Margin dB**
Ch 4950M	BW 20M	7.92	7.558	8.22	6.326	13.59	21	16	14	-0.41
Ch 4965M	BW 20M	7.703	7.897	7.77	6.728	13.57	21	16	14	-0.43
Ch 4980M	BW 20M	7.212	7.736	7.882	7.187	13.54	21	16	14	-0.46

Table 7. Power Spectral Density, 90Y, 16 dBi

4. Electromagnetic Compatibility Occupied Bandwidth Requirements

4.1. Occupied Bandwidth (Emission Mask)

Test Requirement(s): **§2.1049 and §90.210 (L) with FCC 04-265 (Emissions Mask L)**

Test Procedures: As required by 47 CFR 2.1049, *occupied bandwidth measurements* were made at the RF output terminals using a Spectrum Analyzer.

A laptop was connected to EUT to control the RF power output and frequency channel. The EUT was connected to a Spectrum Analyzer via attenuator. The measured highest Average Power was set relative to zero dB reference. The RBW of the Spectrum Analyzer was set to at least 1% of the channel bandwidth. The EUT power was adjusted at the maximum output power level. Measurements were carried out at the low, mid and high channels of the TX band.

Test Results: Equipment is compliant with Section 2.1049 and 90.210(M) with FCC 04-265 (Emission Mask M). The EUT does not exceed the Emission Masks limit.

The following pages show measurements of Emission Mask plots:

Test Engineer(s): Jun Qi

Test Date(s): December 16, 2016

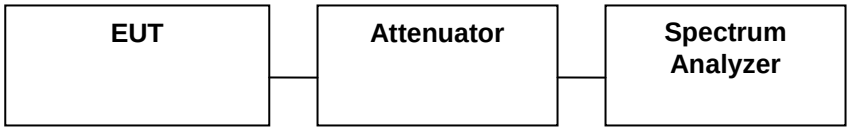


Figure 4. Occupied Bandwidth (Emission Mask) Test Setup

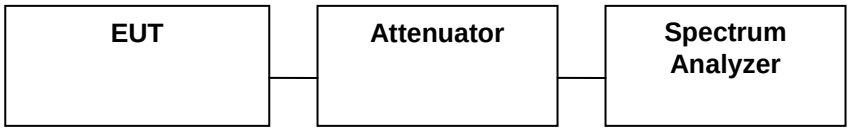
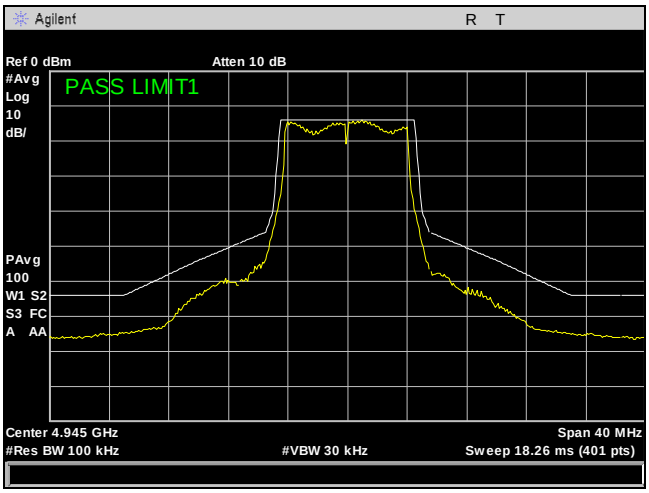
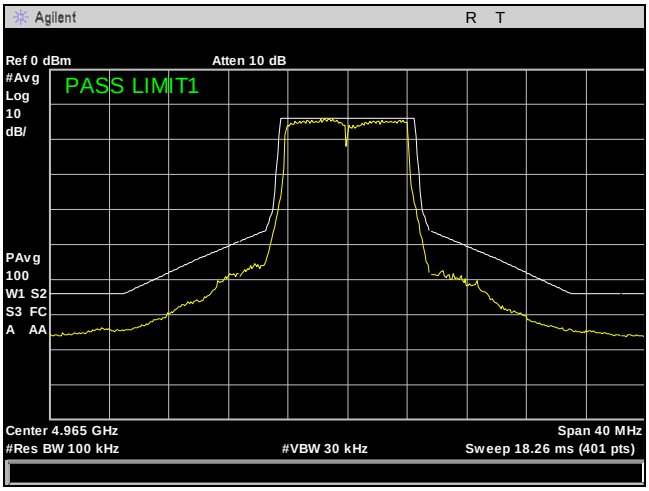


Figure 5. Occupied Bandwidth Test Setup

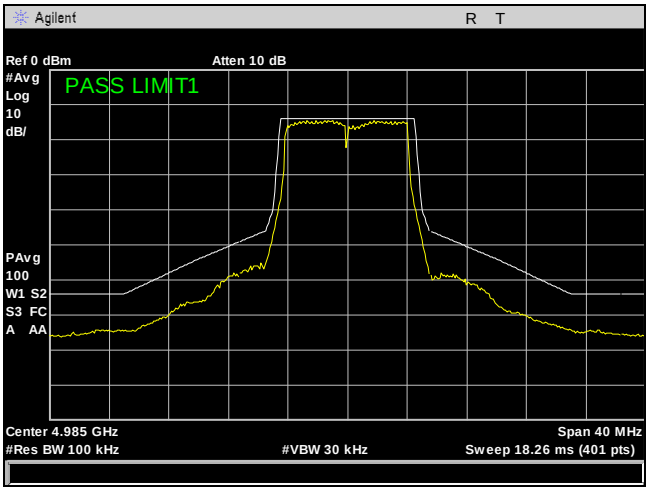
Emission Mask



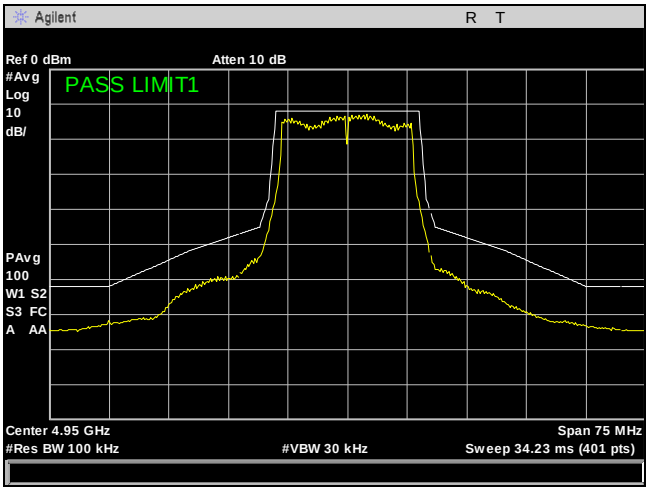
Plot 1. Emission Mask M, BW 10M, Ch. 4945M, Port R11, 16 dBi, TP9



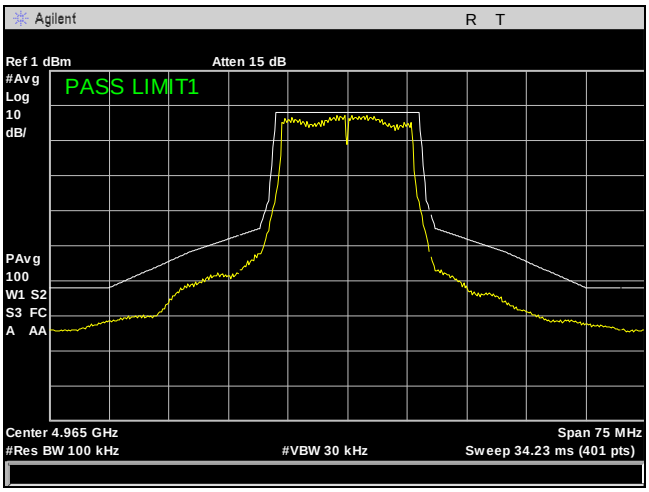
Plot 2. Emission Mask M, BW 10M, Ch. 4965M, Port R11, 16 dBi, TP9



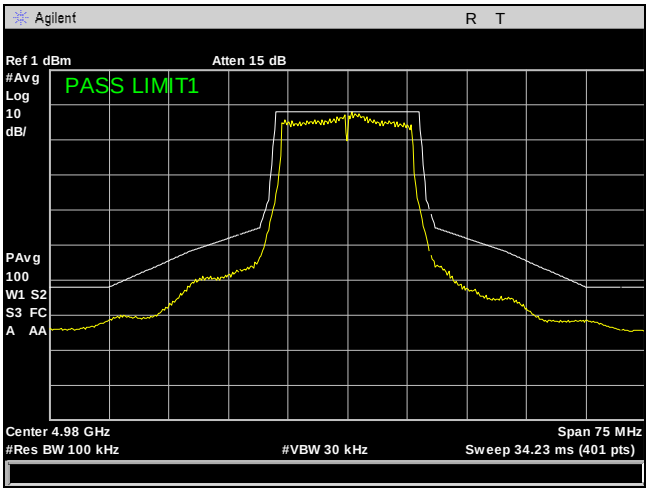
Plot 3. Emission Mask M, BW 10M, Ch. 4985M, Port R11, 16 dBi, TP9



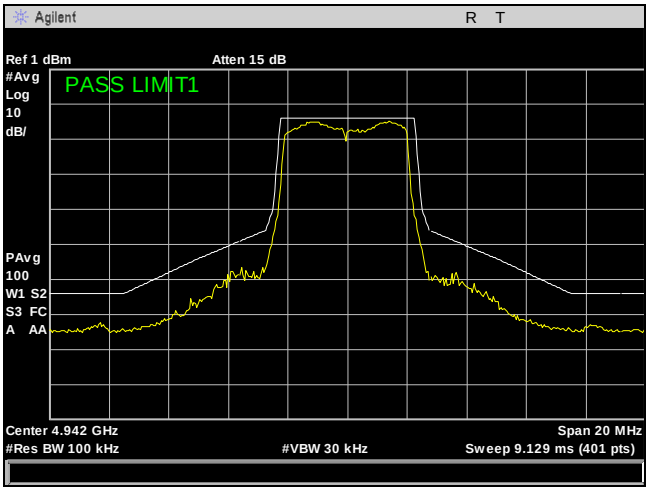
Plot 4. Emission Mask M, BW 20M, Ch. 4950M, Port R11, 16 dBi, TP14



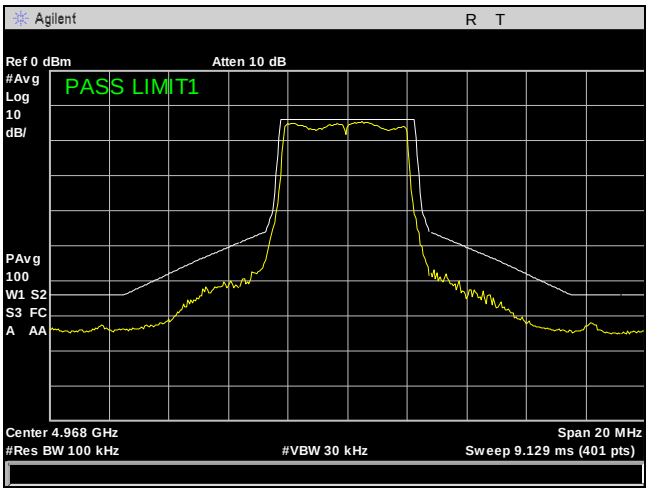
Plot 5. Emission Mask M, BW 20M, Ch. 4965M, Port R11, 16 dBi, TP14.5



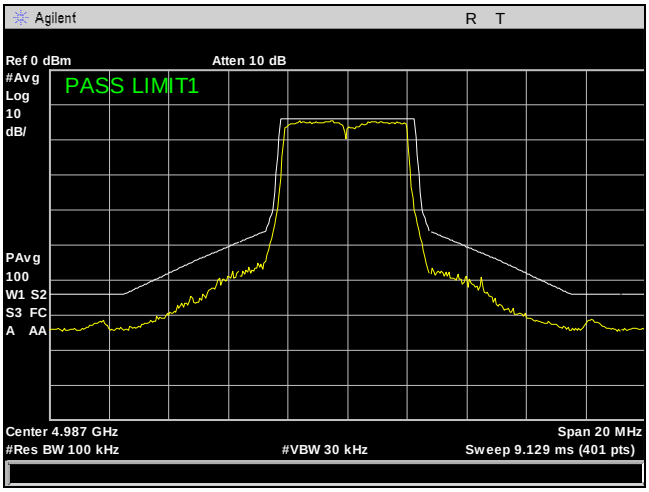
Plot 6. Emission Mask M, BW 20M, Ch. 4980M, Port R11, 16 dBi, TP14



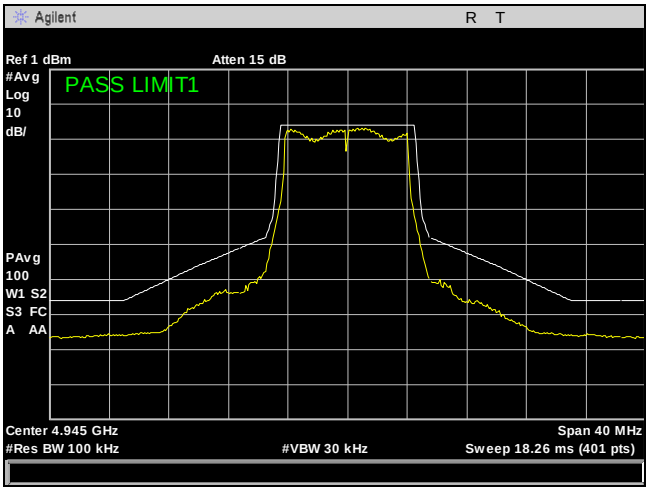
Plot 7. Emission Mask M, BW 5M, Ch. 4942.5M, Port R11, 16 dBi, TP5.5



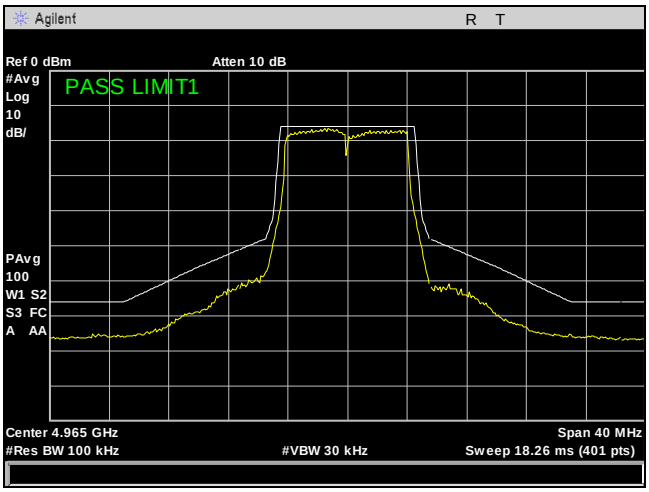
Plot 8. Emission Mask M, BW 5M, Ch. 4967.5M, Port R11, 16 dBi, TP6



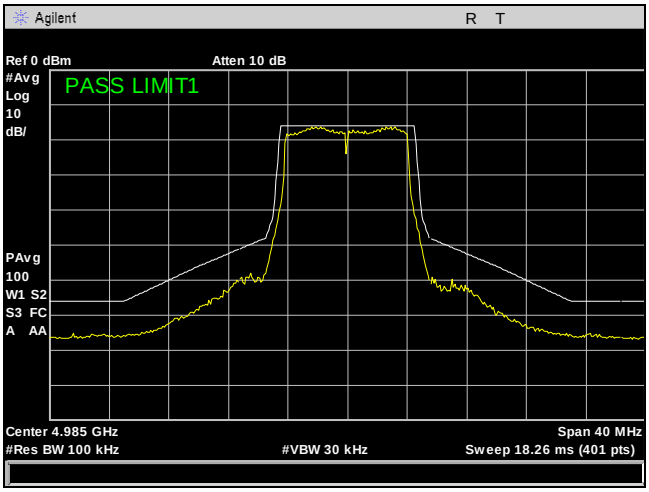
Plot 9. Emission Mask M, BW 5M, Ch. 4987.5M, Port R11, 16 dBi, TP6



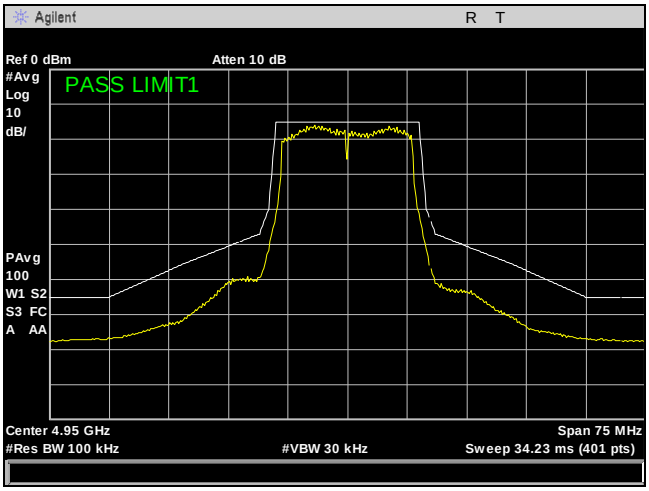
Plot 10. Emission Mask M, BW 10M, Ch. 4945M, Port R11, 9 dBi, TP5



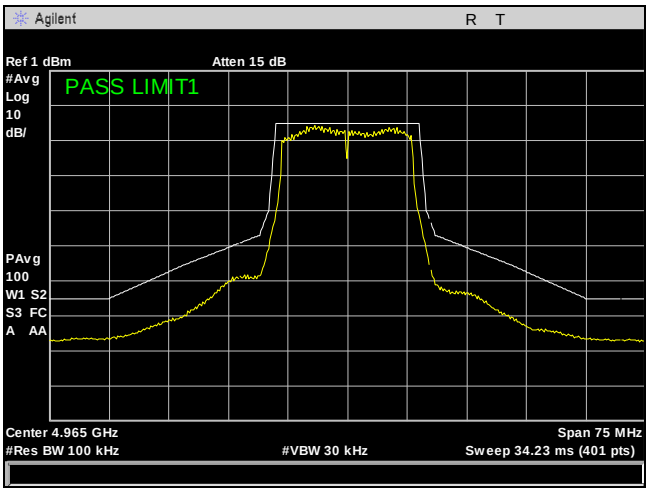
Plot 11. Emission Mask M, BW 10M, Ch. 4965M, Port R11, 9 dBi, TP4.5



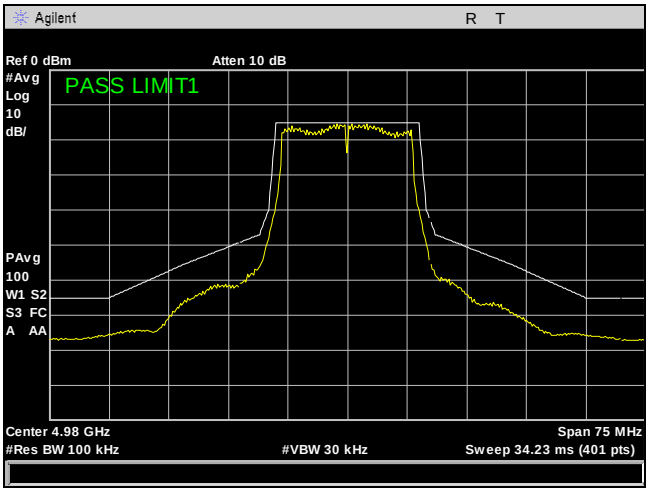
Plot 12. Emission Mask M, BW 10M, Ch. 4985M, Port R11, 9 dBi, TP4.5



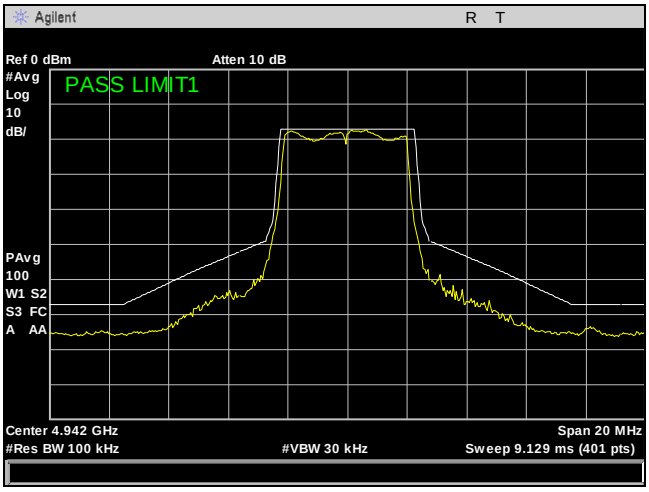
Plot 13. Emission Mask M, BW 20M, Ch. 4950M, Port R11, 9 dBi, TP8.5



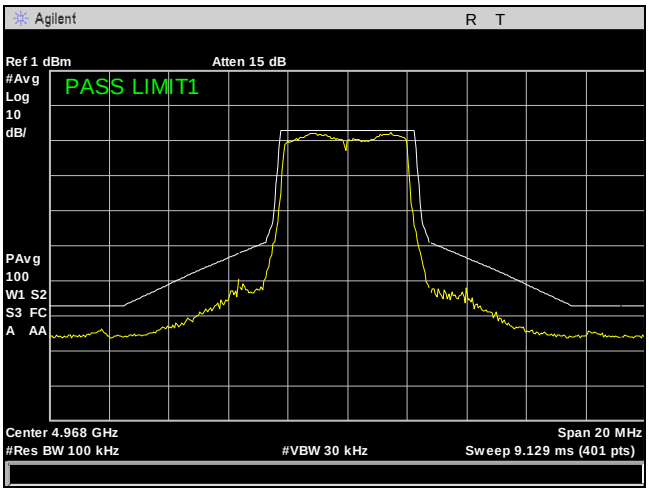
Plot 14. Emission Mask M, BW 20M, Ch. 4965M, Port R11, 9 dBi, TP8.5



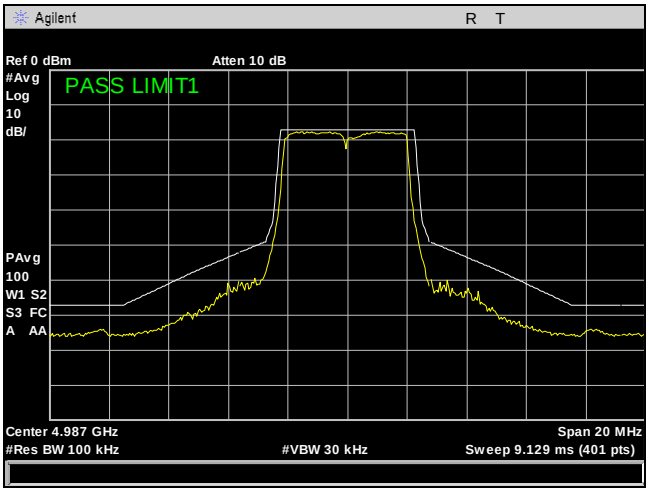
Plot 15. Emission Mask M, BW 20M, Ch. 4980M, Port R11, 9 dBi, TP8.5



Plot 16. Emission Mask M, BW 5M, Ch. 4942.5M, Port R11, 9 dBi, TP0.5

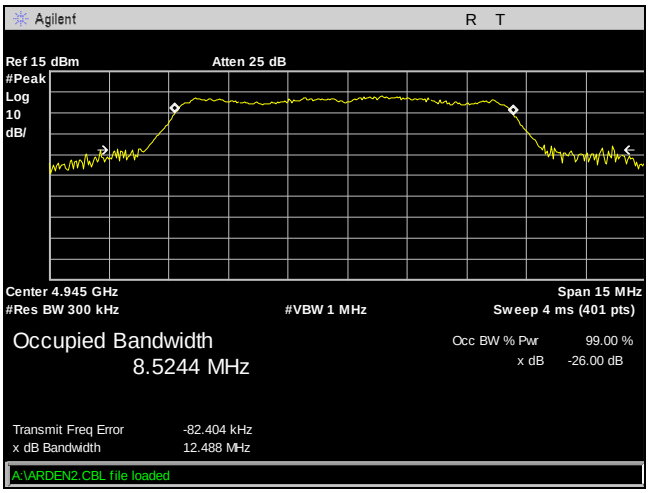


Plot 17. Emission Mask M, BW 5M, Ch. 4967.5M, Port R11, 9 dBi, TP1.5

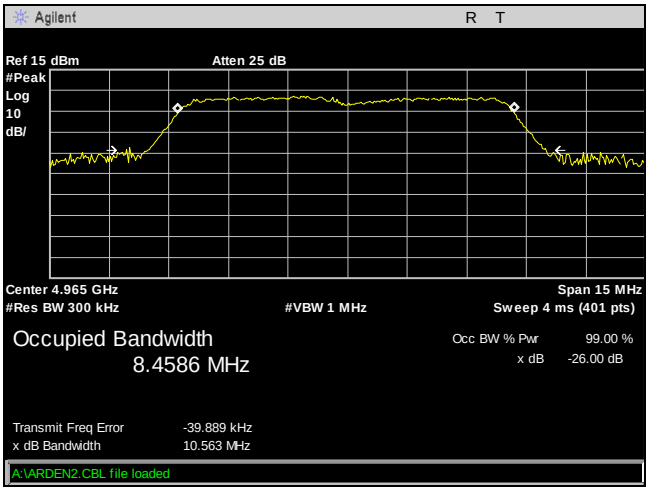


Plot 18. Emission Mask M, BW 5M, Ch. 4987.5M, Port R11, 9 dBi, TP1

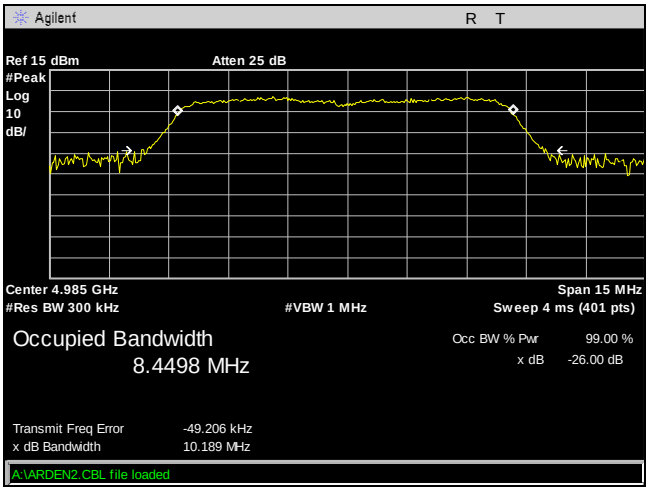
99% Occupied Bandwidth



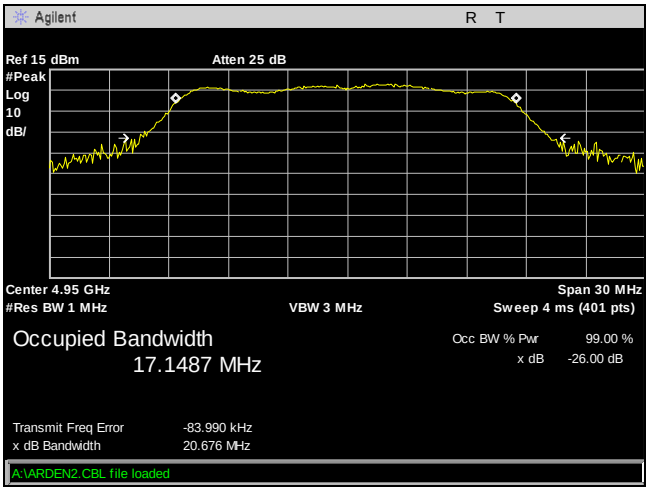
Plot 19. Occupied Bandwidth, Power, BW 10M, Ch. 4945M, 16 dBi, TP9



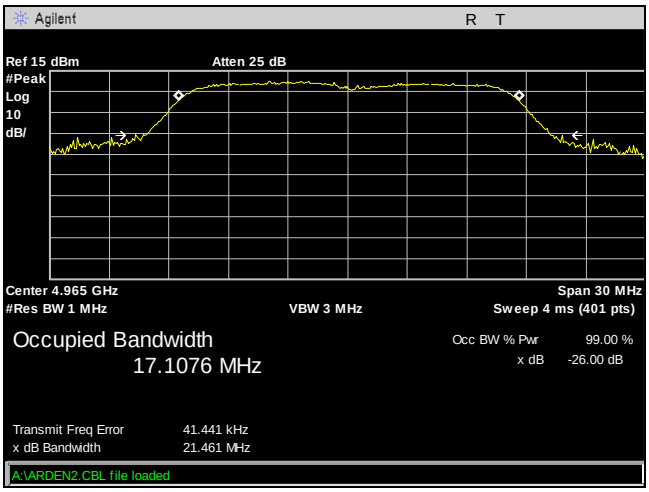
Plot 20. Occupied Bandwidth, Power, BW 10M, Ch. 4965M, 16 dBi, TP9



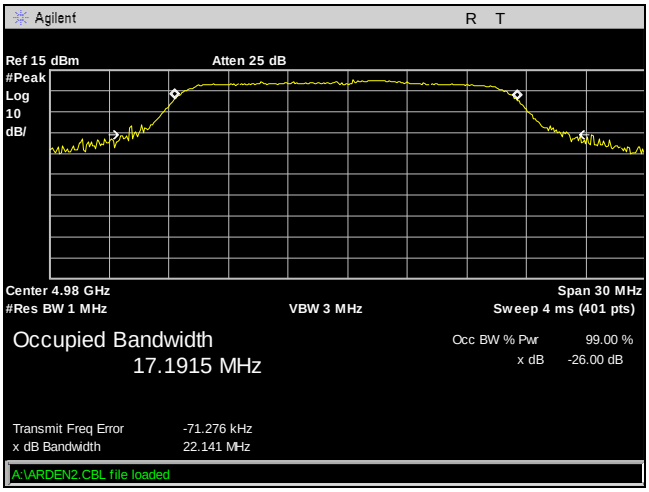
Plot 21. Occupied Bandwidth, Power, BW 10M, Ch. 4985M, 16 dBi, TP9



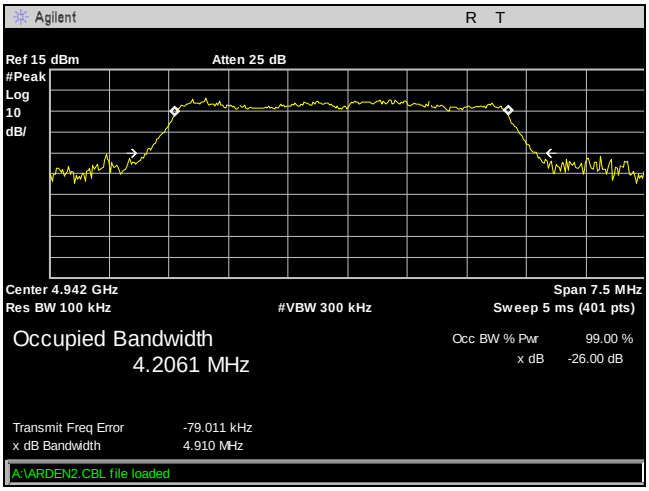
Plot 22. Occupied Bandwidth, Power, BW 20M, Ch. 4950M, 16 dBi, TP14



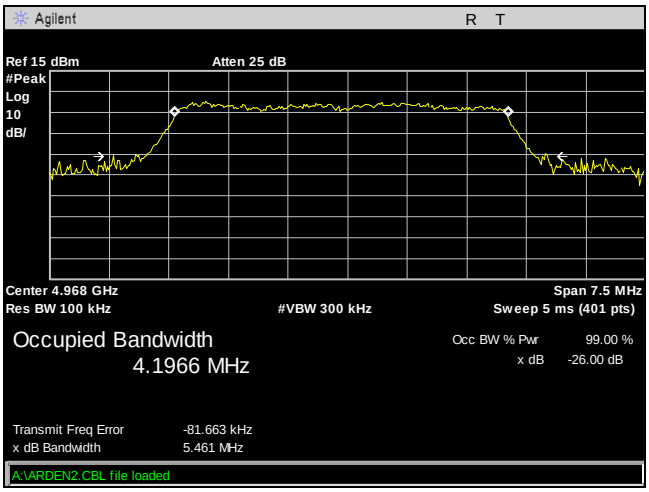
Plot 23. Occupied Bandwidth, Power, BW 20M, Ch. 4965M, 16 dBi, TP14.5



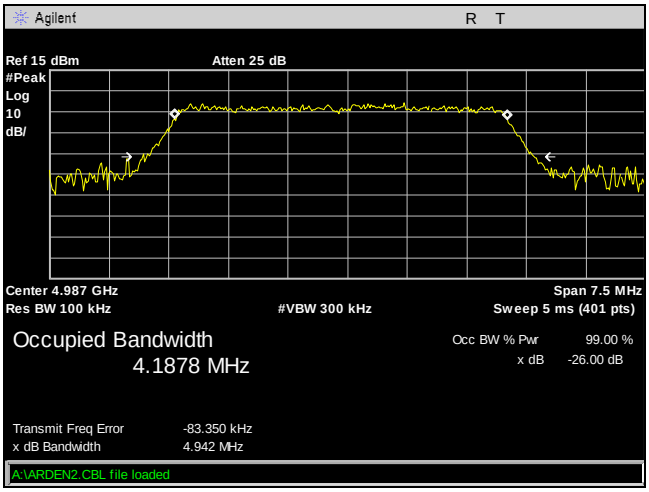
Plot 24. Occupied Bandwidth, Power, BW 20M, Ch. 4980M, 16 dBi, TP14



Plot 25. Occupied Bandwidth, Power, BW 5M, Ch. 4942.5M, 16 dBi, TP5.5



Plot 26. Occupied Bandwidth, Power, BW 5M, Ch. 4967.5M, 16 dBi, TP6



Plot 27. Occupied Bandwidth, Power, BW 5M, Ch. 4987.5M, 16 dBi, TP6

5. Electromagnetic Compatibility Spurious Emissions at Antenna Terminal Requirements

5.1. Spurious Emissions at Antenna Terminals

Test Requirement(s): **§2.1051 and §90.210(L) with FCC 04-265**

Test Procedures: As required by 47 CFR 2.1051, *spurious emissions at antenna terminal measurements* were made at the RF output terminals using a Spectrum Analyzer.

A laptop was connected to EUT to control the RF power output and frequency channel. The EUT was connected to a Spectrum Analyzer and a Power Meter to monitor the output power level. The Spectrum Analyzer was set to sweep 30 MHz and up to 10th harmonic of the fundamental or 40GHz whichever is the lesser. Measurements were made at the low, mid and high channels.

The Conducted Spurious Emissions *Limit* is obtained by the following plots. Note: only noise floor was measurable above 18GHz.

Test Results: Equipment is compliant with Section 2.1051 and 90.210(M) with FCC 04-265.

Test Engineer(s): Jun Qi

Test Date(s): December 16, 2016

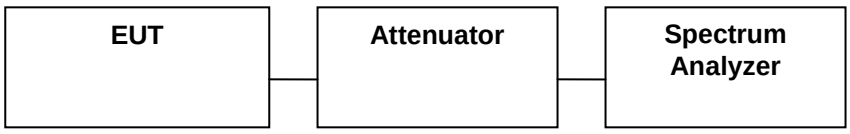
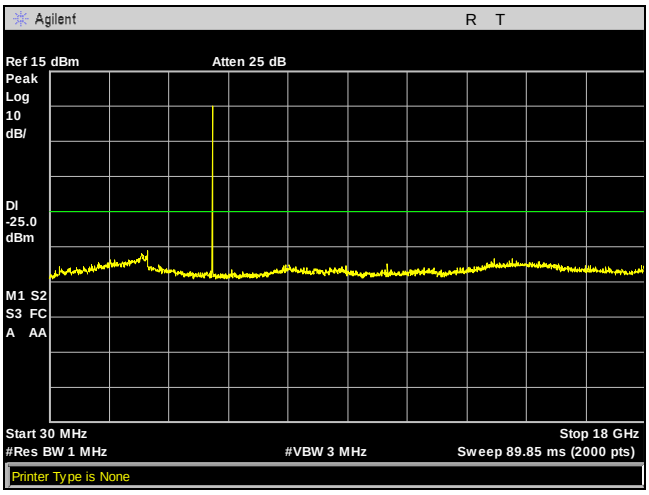
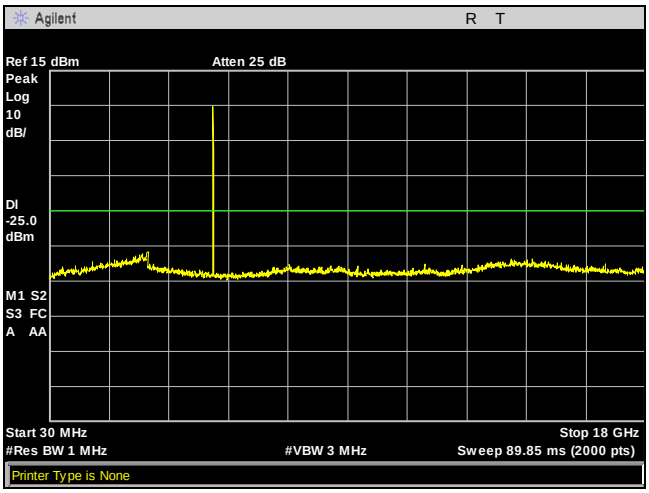


Figure 6. Spurious Emissions at Antenna Terminals Test Setup

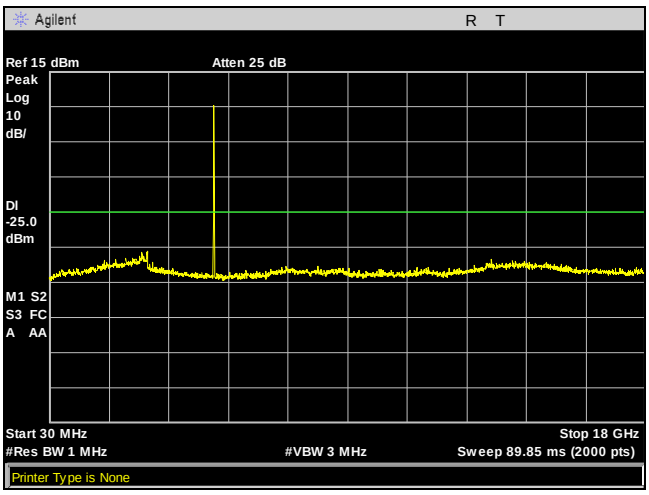
Conducted Spurious Emissions



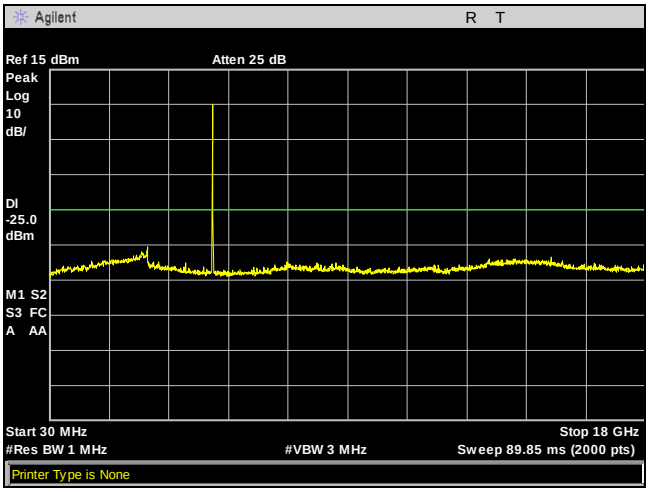
Plot 28. Conducted Spurious Emission 30MHz - 18GHz -25dBm, BW 10M, Ch. 4945M, 16 dBi, TP9



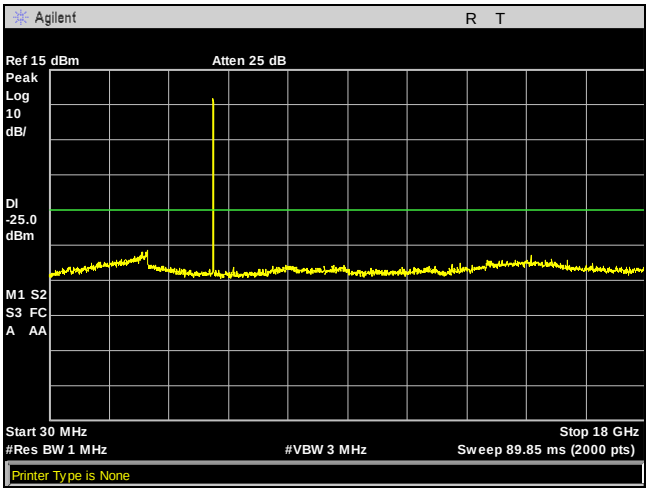
Plot 29. Conducted Spurious Emission 30MHz - 18GHz -25dBm, BW 10M, Ch. 4965M, 16 dBi, TP9



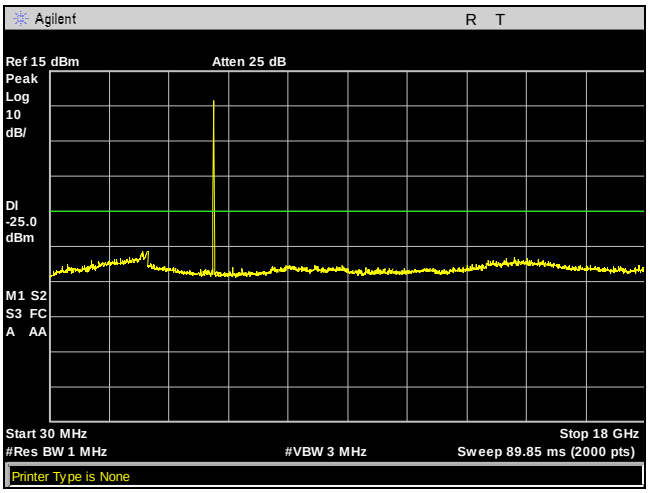
Plot 30. Conducted Spurious Emission 30MHz - 18GHz -25dBm, BW 10M, Ch. 4985M, 16 dBi, TP9



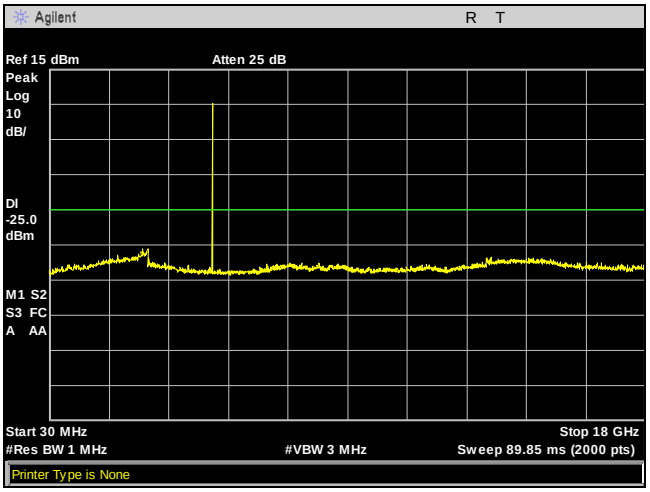
Plot 31. Conducted Spurious Emission 30MHz - 18GHz -25dBm, BW 20M, Ch. 4950M, 16 dBi, TP14



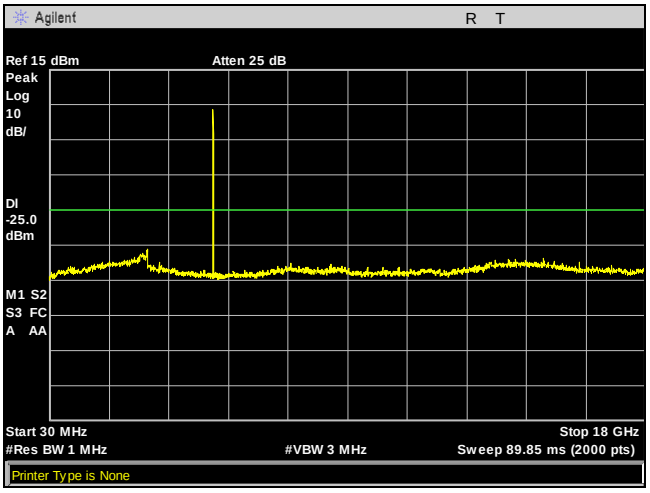
Plot 32. Conducted Spurious Emission 30MHz - 18GHz -25dBm, BW 20M, Ch. 4965M, 16 dBi, TP14



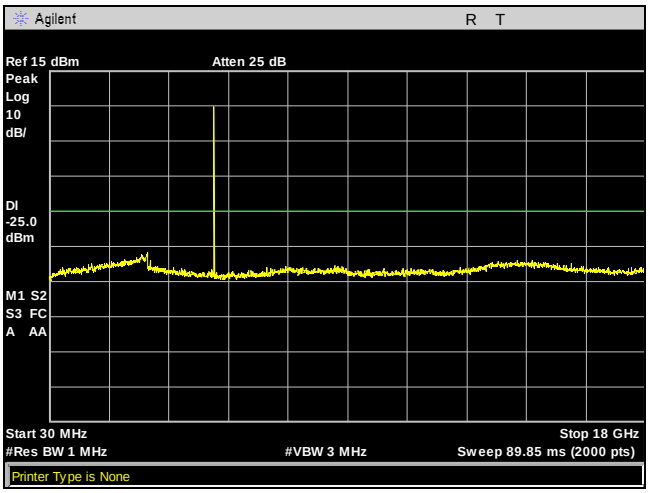
Plot 33. Conducted Spurious Emission 30MHz - 18GHz -25dBm, BW 20M, Ch. 4980M, 16 dBi, TP14



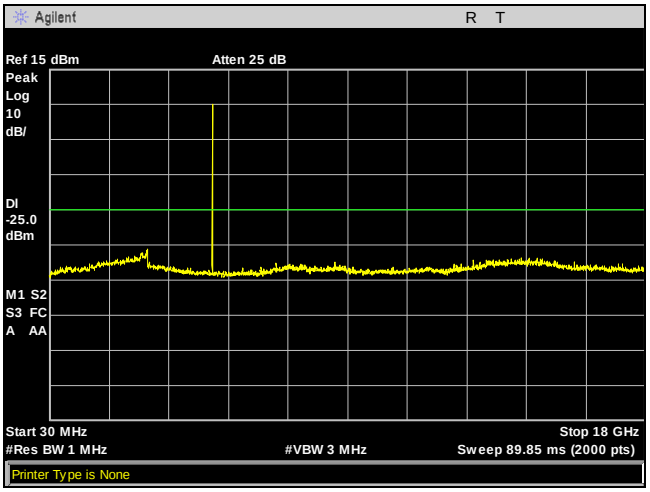
Plot 34. Conducted Spurious Emission 30MHz - 18GHz -25dBm, BW 5M, Ch. 4942.5M, 16 dBi, TP5.5



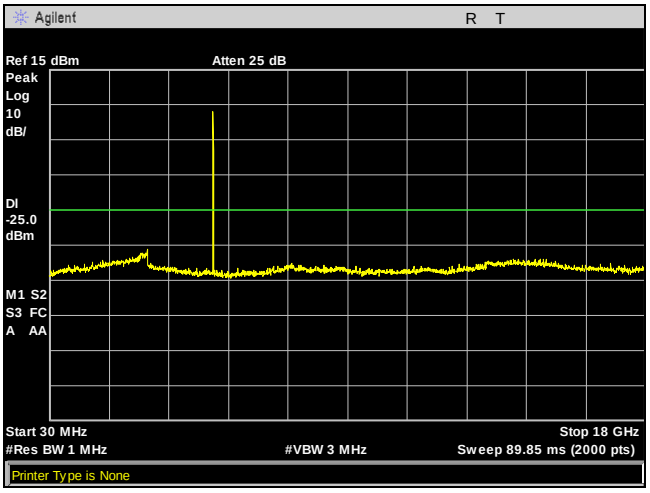
Plot 35. Conducted Spurious Emission 30MHz - 18GHz -25dBm, BW 5M, Ch. 4967.5M, 16 dBi, TP6



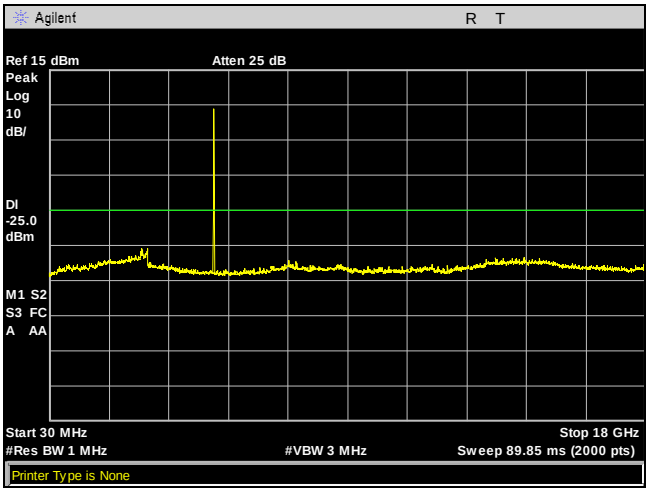
Plot 36. Conducted Spurious Emission 30MHz - 18GHz -25dBm, BW 5M, Ch. 4987.5M, 16 dBi, TP6



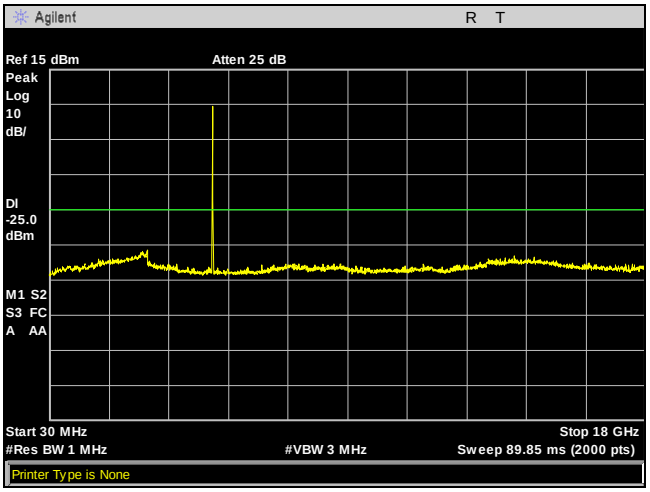
Plot 37. Conducted Spurious Emission 30MHz - 18GHz -25dBm, BW 10M, Ch. 4945M, 9 dBi, TP5



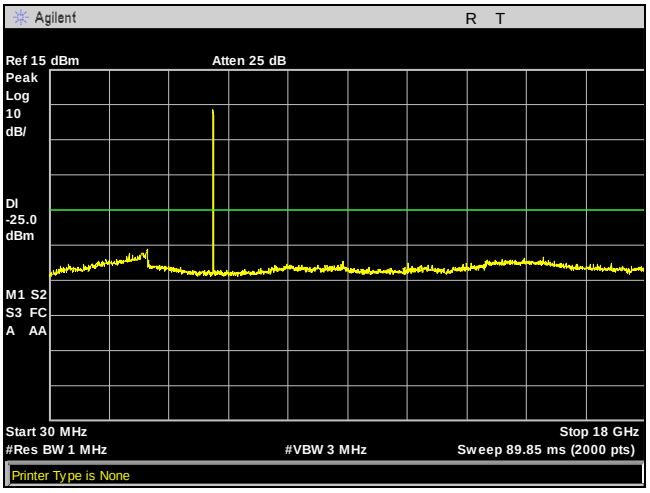
Plot 38. Conducted Spurious Emission 30MHz - 18GHz -25dBm, BW 10M, Ch. 4965M, 9 dBi, TP4.5



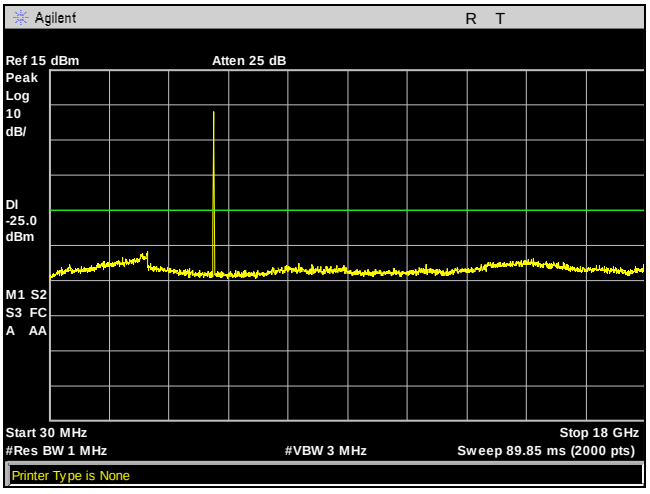
Plot 39. Conducted Spurious Emission 30MHz - 18GHz -25dBm, BW 10M, Ch. 4985M, 9 dBi, TP4.5



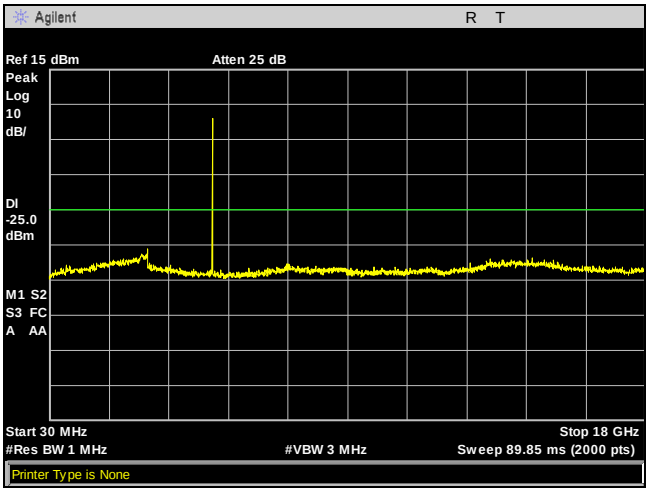
Plot 40. Conducted Spurious Emission 30MHz - 18GHz -25dBm, BW 20M, Ch. 4950M, 9 dBi, TP8.5



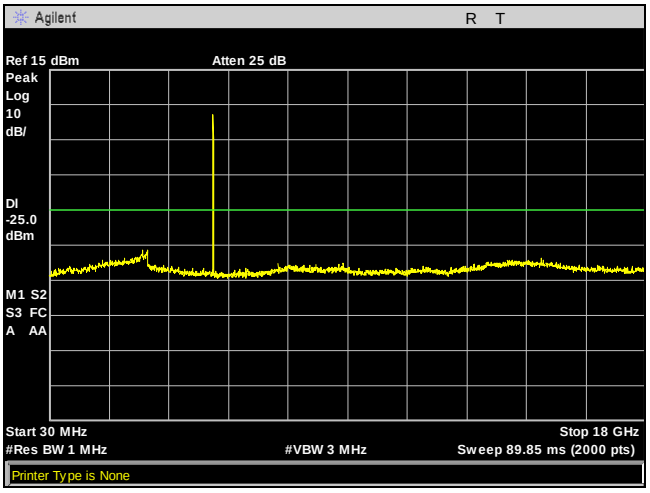
Plot 41. Conducted Spurious Emission 30MHz - 18GHz -25dBm, BW 20M, Ch. 4965M, 9 dBi, TP8.5



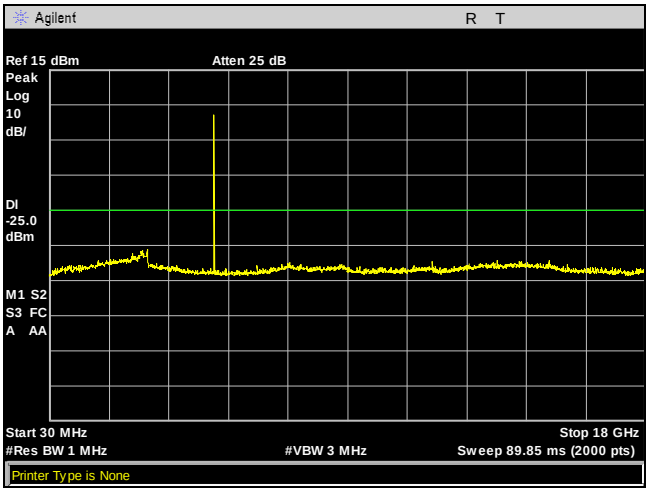
Plot 42. Conducted Spurious Emission 30MHz - 18GHz -25dBm, BW 20M, Ch. 4980M, 9 dBi, TP8



Plot 43. Conducted Spurious Emission 30MHz - 18GHz -25dBm, BW 5M, Ch. 4942.5M, 9 dBi, TP0.5



Plot 44. Conducted Spurious Emission 30MHz - 18GHz -25dBm, BW 5M, Ch. 4967.5M, 9 dBi, TP1.5



Plot 45. Conducted Spurious Emission 30MHz - 18GHz -25dBm, BW 5M, Ch. 4987.5M, 9 dBi, TP1

Electromagnetic Compatibility Radiated Emissions Requirements

5.2. Radiated Emissions

Test Requirement(s): **§2.1053 and §90.210**

Test Procedures: As required by 47 CFR 2.1053, *field strength of radiated spurious measurements* were made in accordance with the procedures of TIA/EIA-603-A-2001 "Land Mobile FM or PM Communications Equipment Measurement and Performance Standards".

Radiated emission measurements were performed inside a 5 meter semi-anechoic chamber. The EUT was set at a distance of 3m from the receiving antenna. The EUT's RF ports were terminated to 50ohm load. The EUT was set to transmit at the low, mid and high channels of the transmitter frequency range at its maximum power level. The EUT was rotated about 360^0 and the receiving antenna scanned from 1-4m in order to capture the maximum emission. A calibrated antenna source was positioned in place of the EUT and the previously recorded signal was duplicated. The maximum EIRP of the emission was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried out with the receiving antenna in both vertical and horizontal polarization. Harmonic emissions up to the 10^{th} or 40GHz, which ever was the lesser, were investigated.

No peaks were found above 18 GHz.

Note: Signal substitution was not performed due to the fact that only noise floor was detected from 30 MHz – 40 GHz.

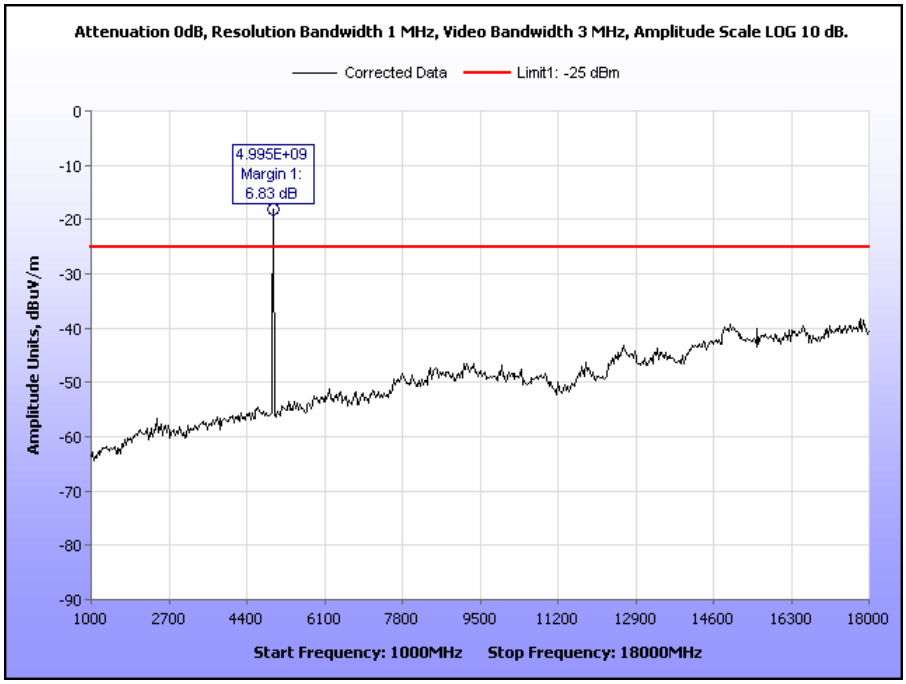
Note: only noise floor was measurable above 18GHz.

Test Results: Equipment is compliant with Section 2.1053 and 90.210.

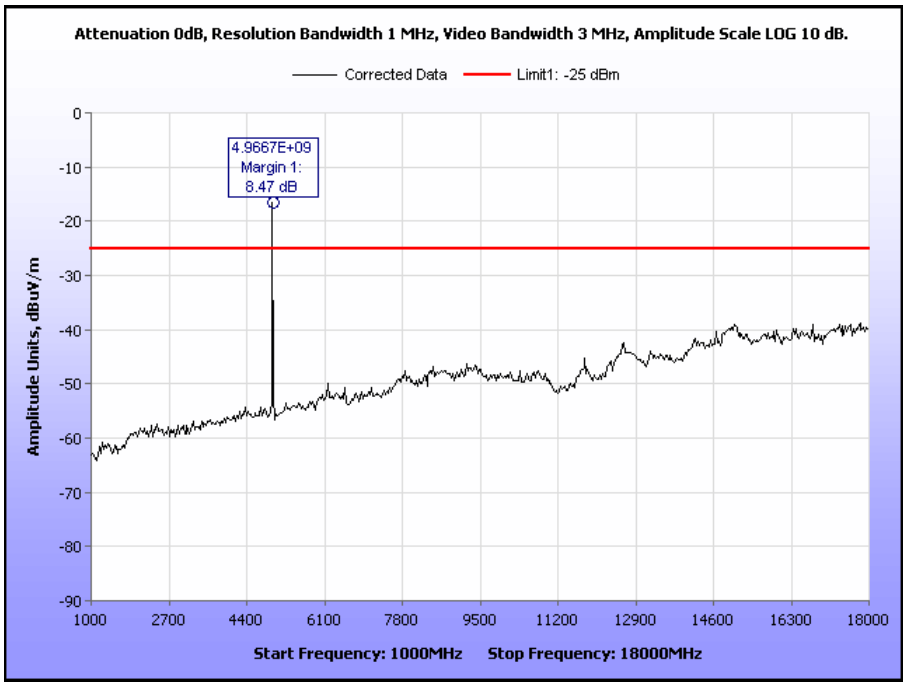
Test Engineer(s): Jun Qi

Test Date(s): December 16, 2016

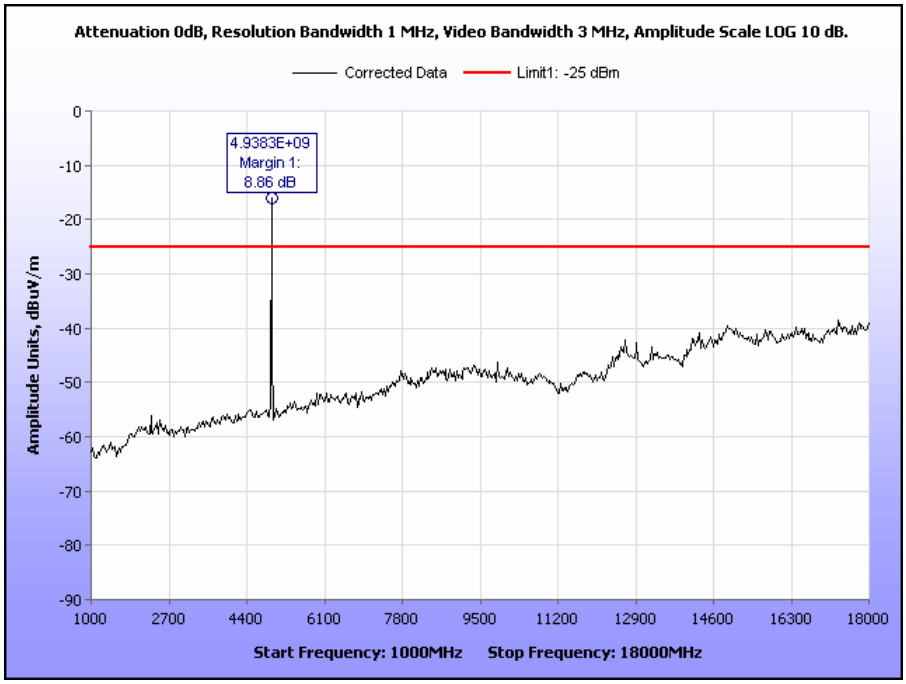
Radiated Spurious Emissions



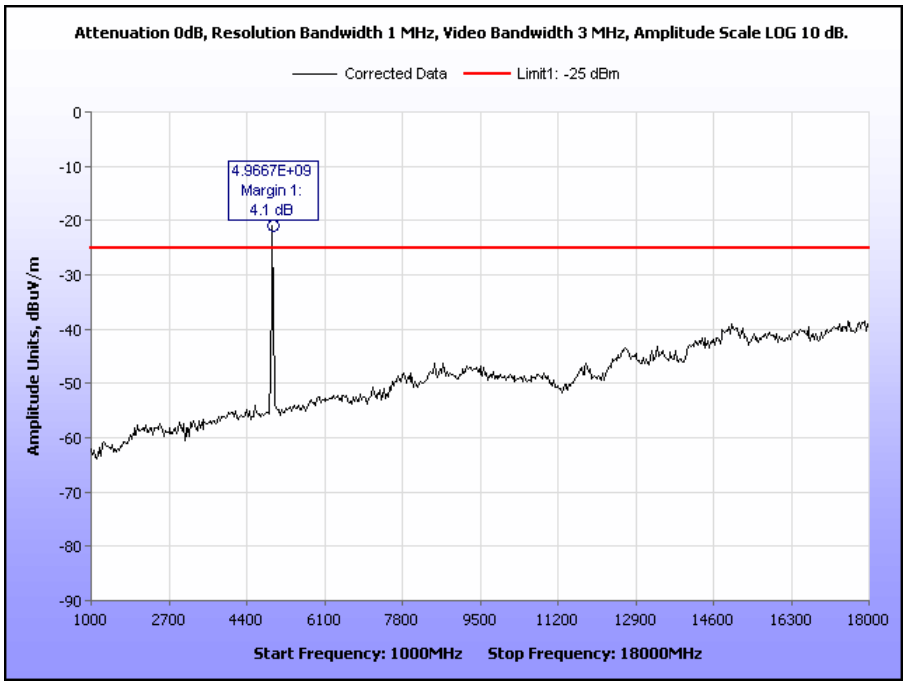
Plot 46. Radio Spurious Emission 1GHz - 18GHz -25dBm, BW 5M, Ch 4987.5M, TP25



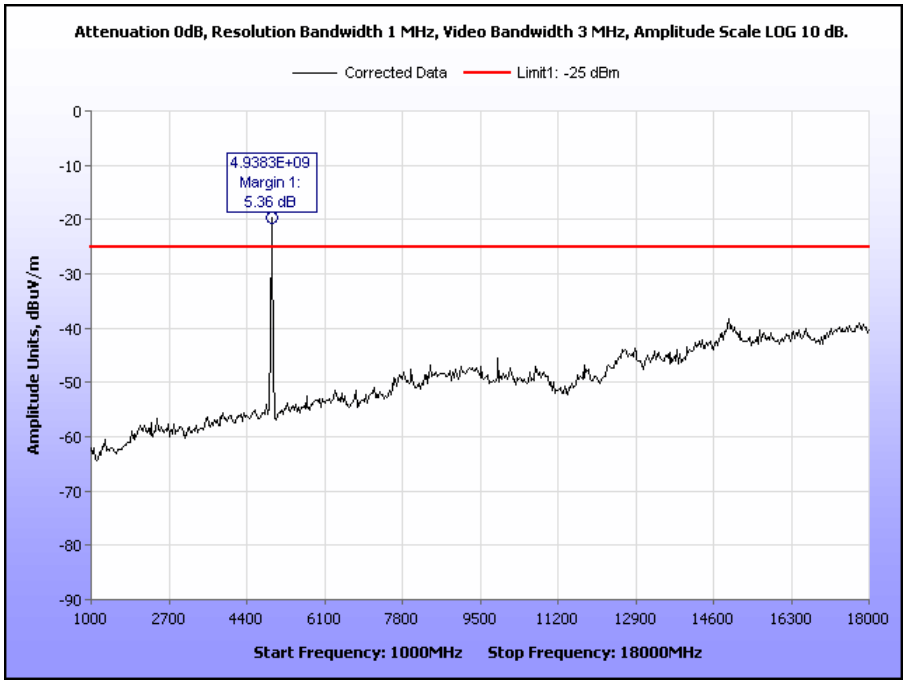
Plot 47. Radio Spurious Emission 1GHz - 18GHz -25dBm, BW 5M, Ch 4967.5M, TP25



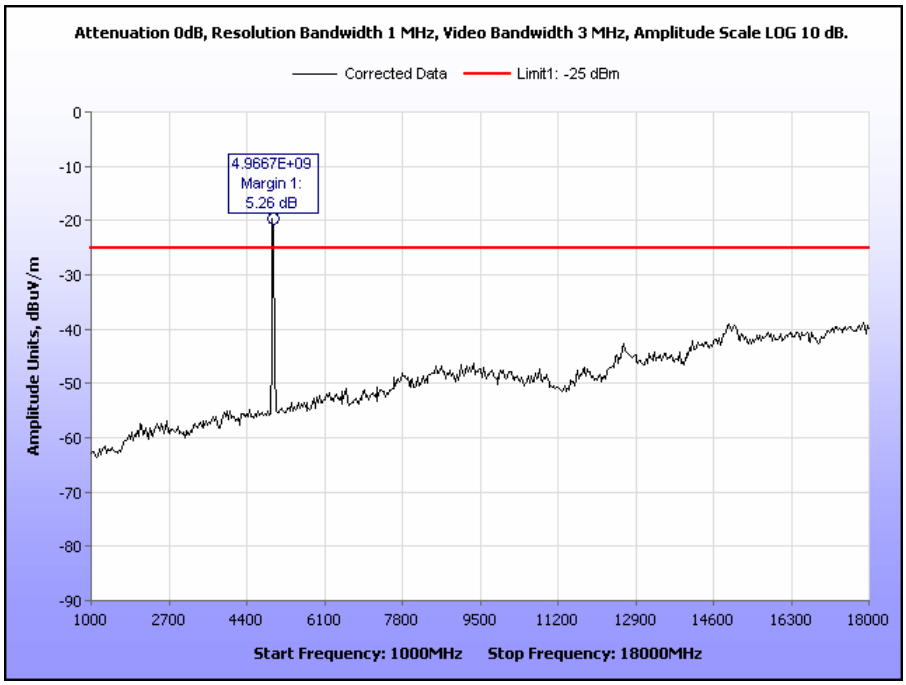
Plot 48. Radio Spurious Emission 1GHz - 18GHz -25dBm, BW 5M, Ch 4942.5M, TP25



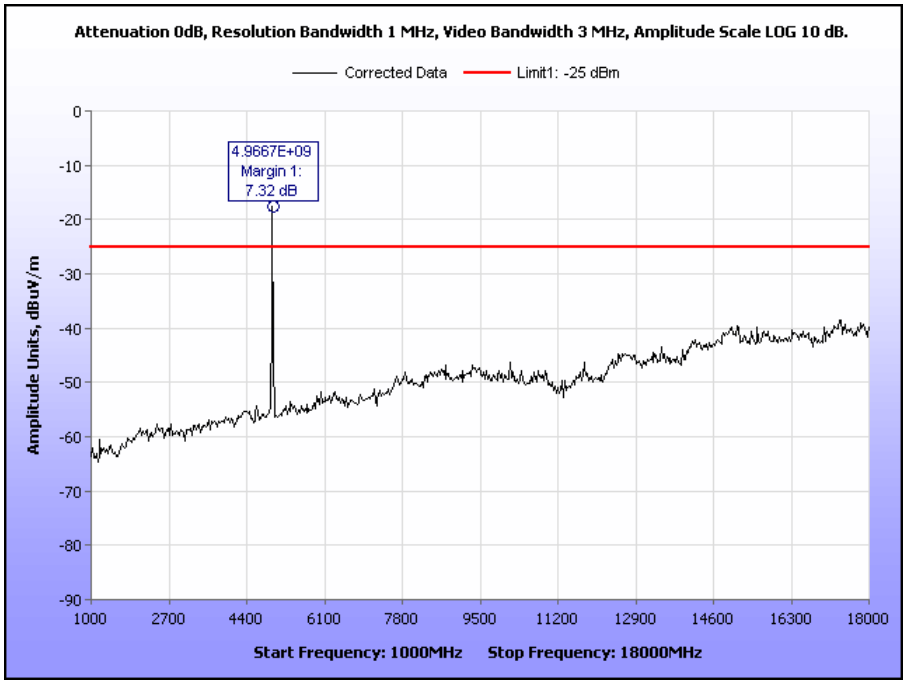
Plot 49. Radio Spurious Emission 1GHz - 18GHz -25dBm, BW 20M, Ch 4965M, TP25



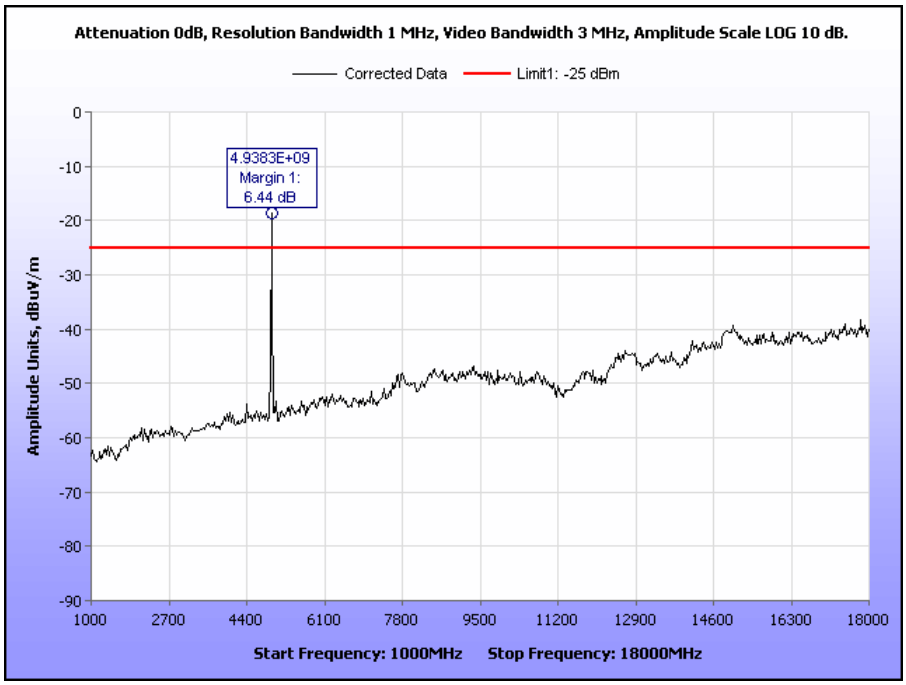
Plot 50. Radio Spurious Emission 1GHz - 18GHz -25dBm, BW 20M, Ch 4950M, TP25



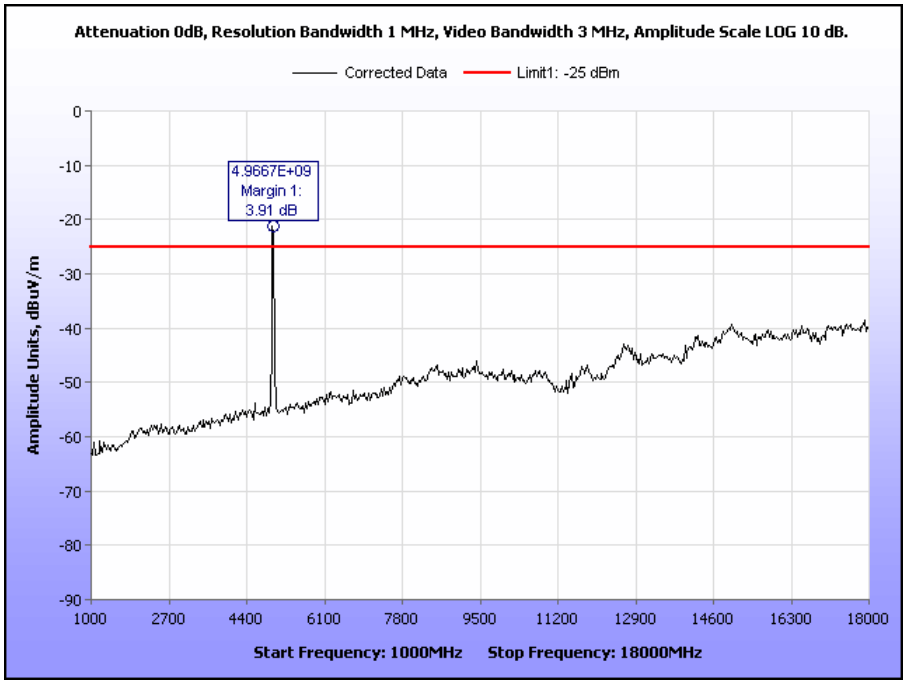
Plot 51. Radio Spurious Emission 1GHz - 18GHz -25dBm, BW 20M, Ch 4980M, TP25



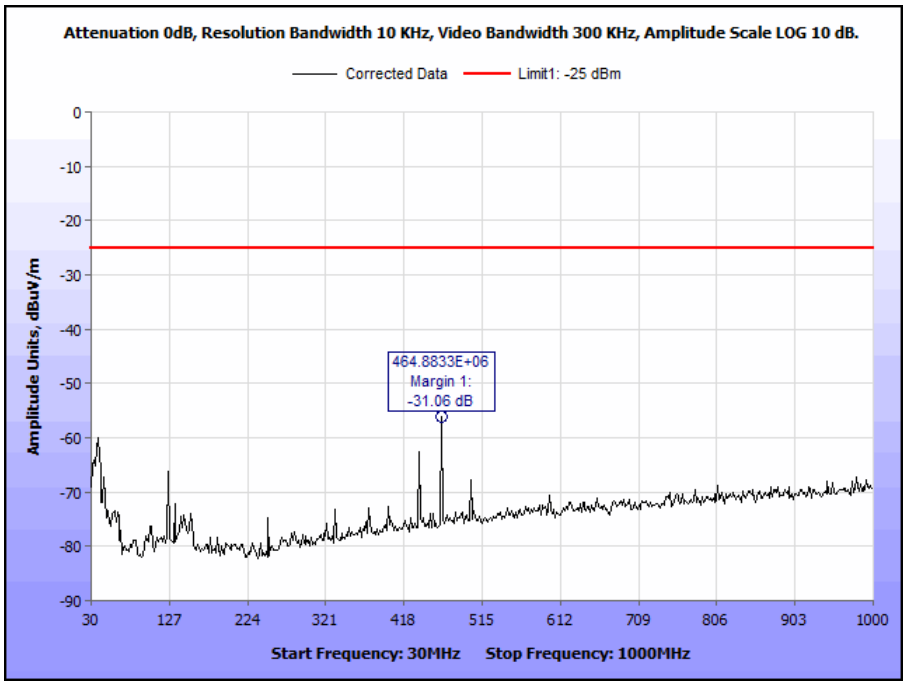
Plot 52. Radio Spurious Emission 1GHz - 18GHz -25dBm, BW 10M, Ch 4965M, TP25



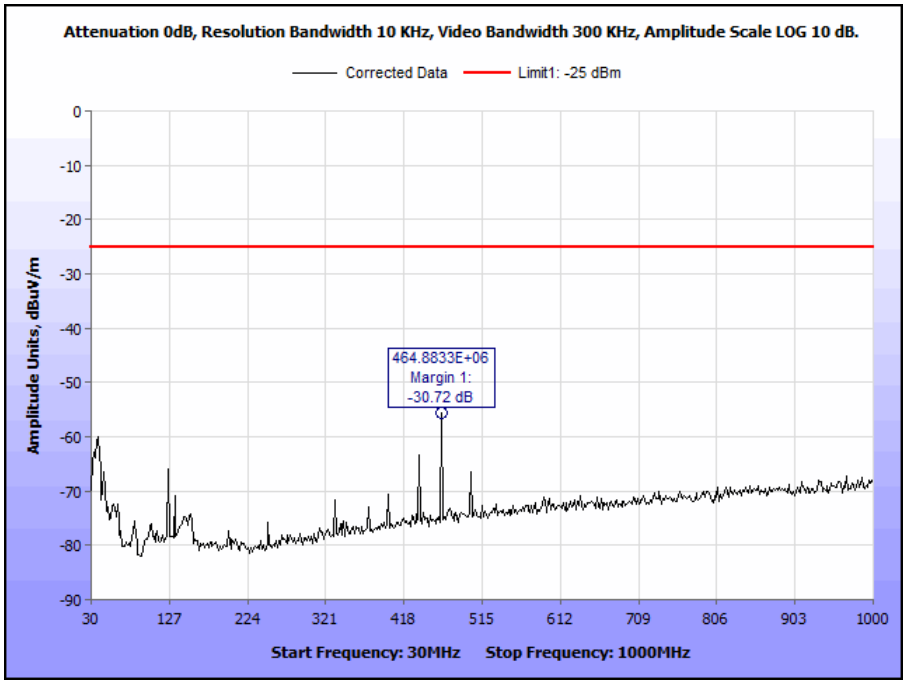
Plot 53. Radio Spurious Emission 1GHz - 18GHz -25dBm, BW 10M, Ch 4945M, TP25



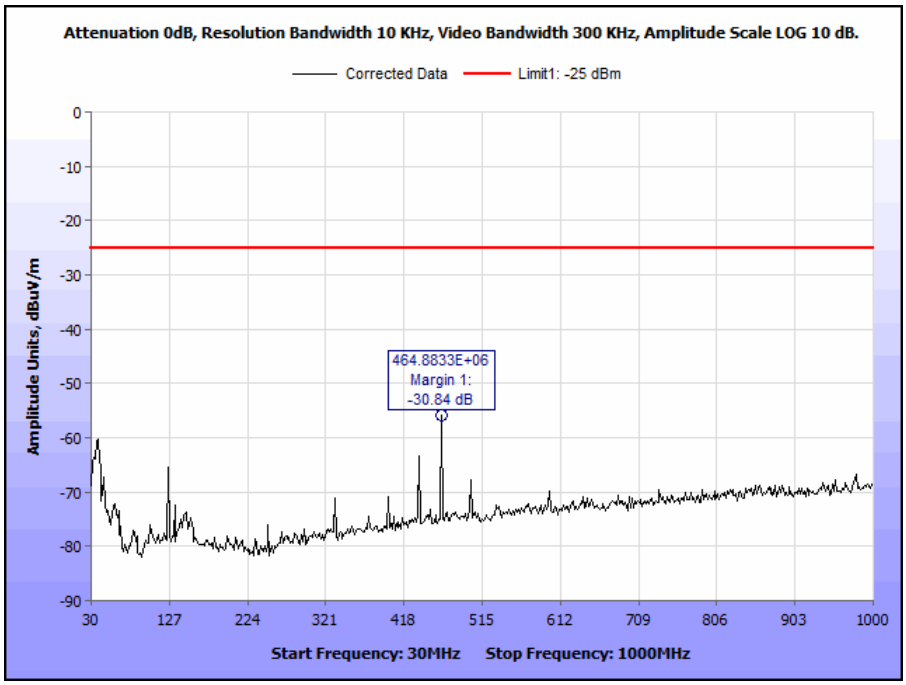
Plot 54. Radio Spurious Emission 1GHz - 18GHz -25dBm, BW 10M, Ch 4985M, TP25



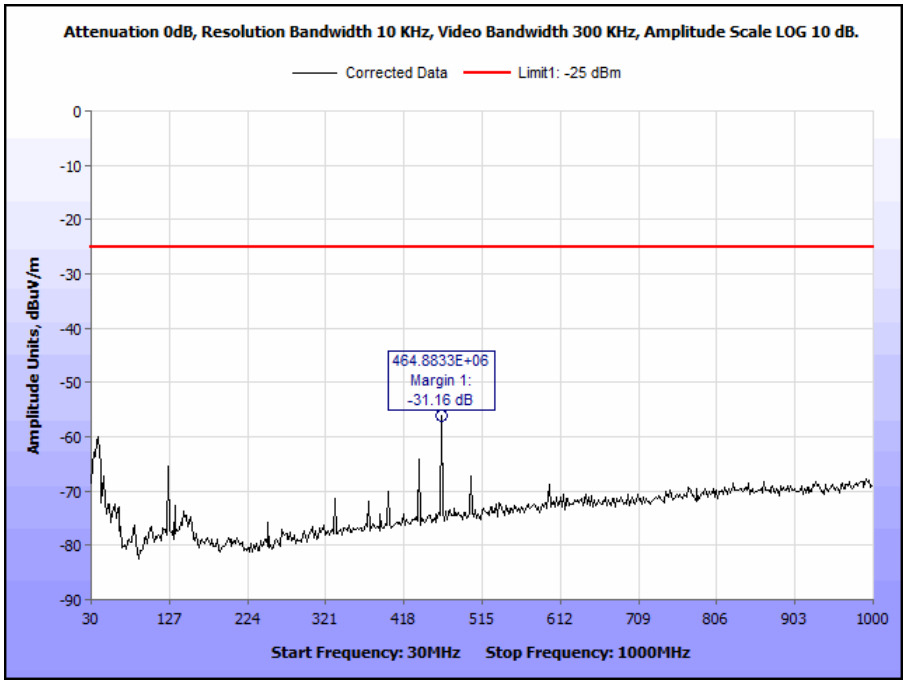
Plot 55. Radio Spurious Emission 30MHz - 1GHz -25dBm, BW 10M, Ch 4945M, TP25



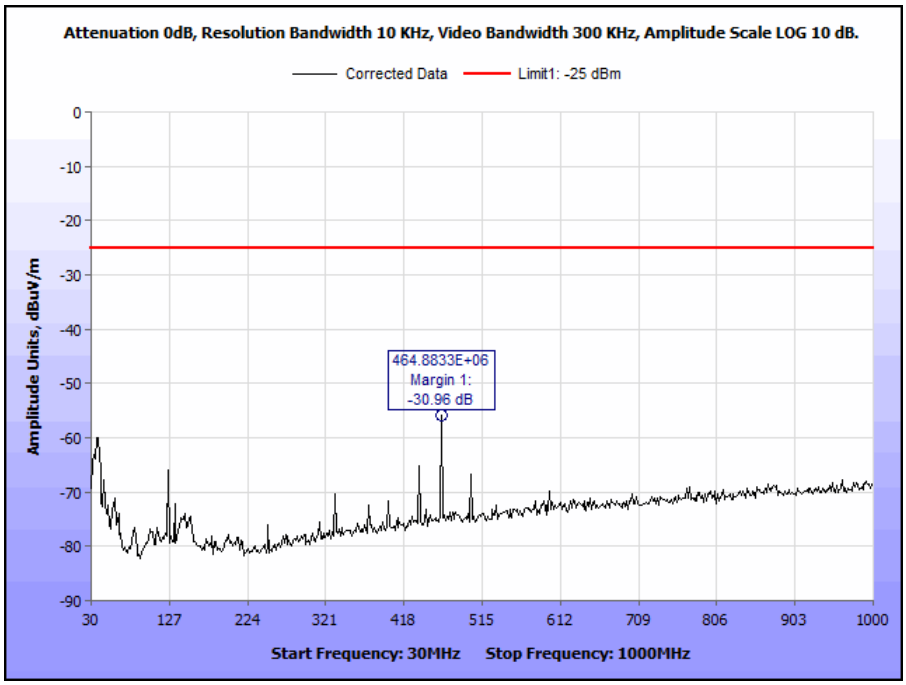
Plot 56. Radio Spurious Emission 30MHz - 1GHz -25dBm, BW 10M, Ch 4965M, TP25



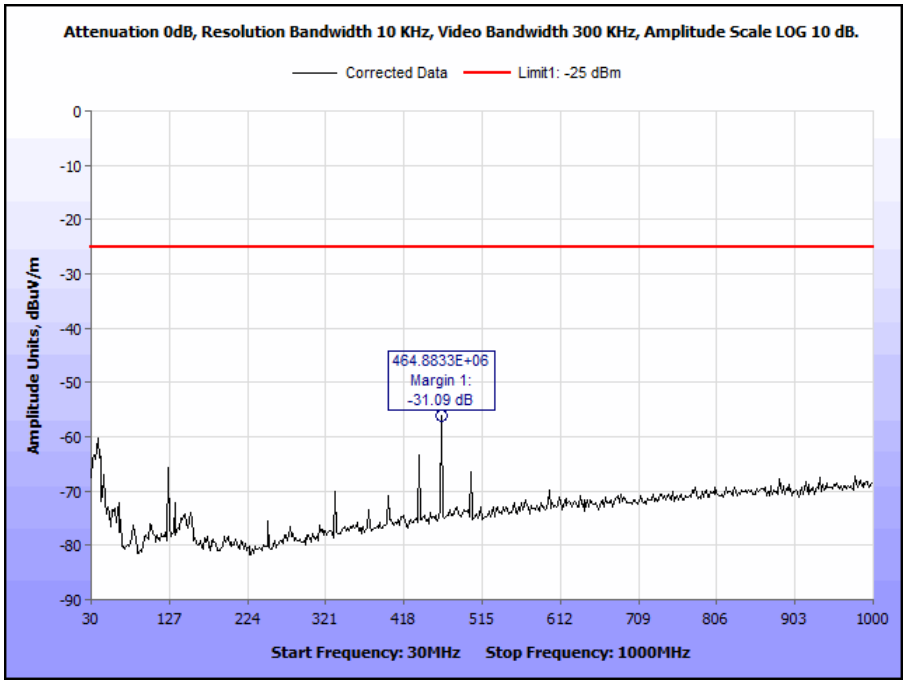
Plot 57. Radio Spurious Emission 30MHz - 1GHz -25dBm, BW 10M, Ch 4985M, TP25



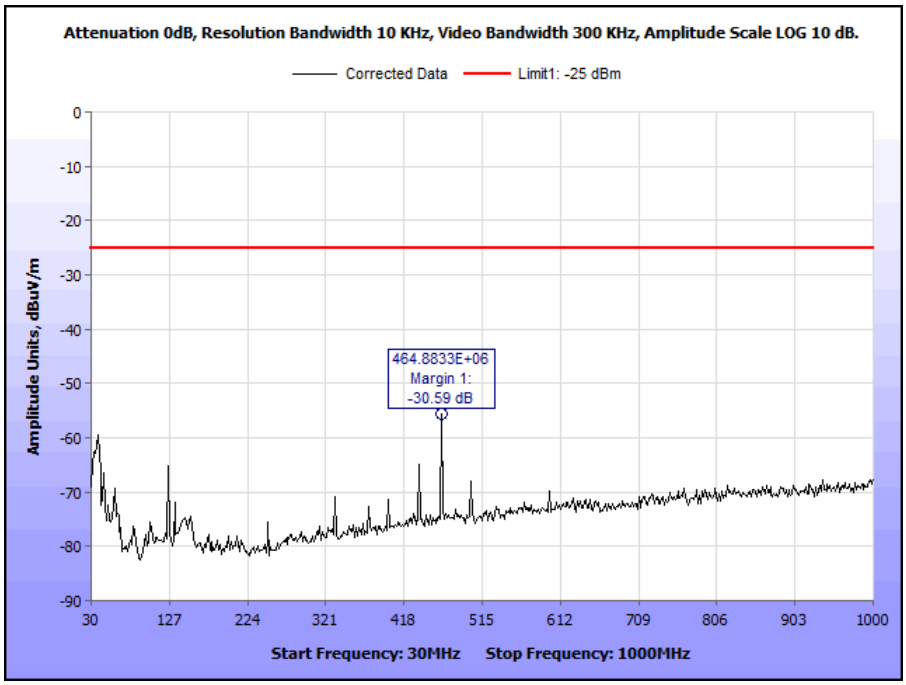
Plot 58. Radio Spurious Emission 30MHz - 1GHz -25dBm, BW 20M, Ch 4950M, TP25



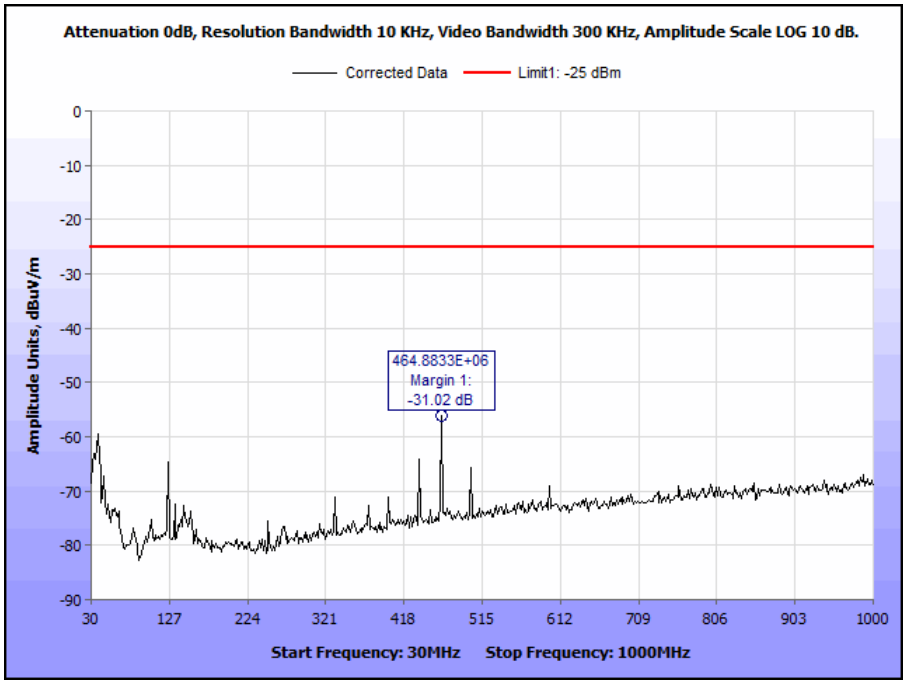
Plot 59. Radio Spurious Emission 30MHz - 1GHz -25dBm, BW 20M, Ch 4965M, TP25



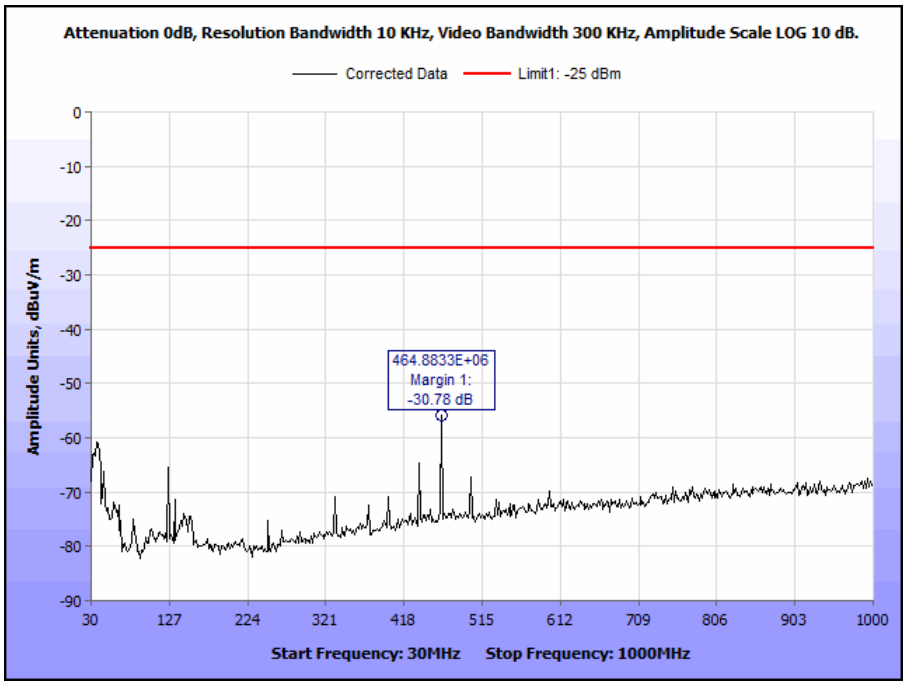
Plot 60. Radio Spurious Emission 30MHz - 1GHz -25dBm, BW 20M, Ch 4980M, TP25



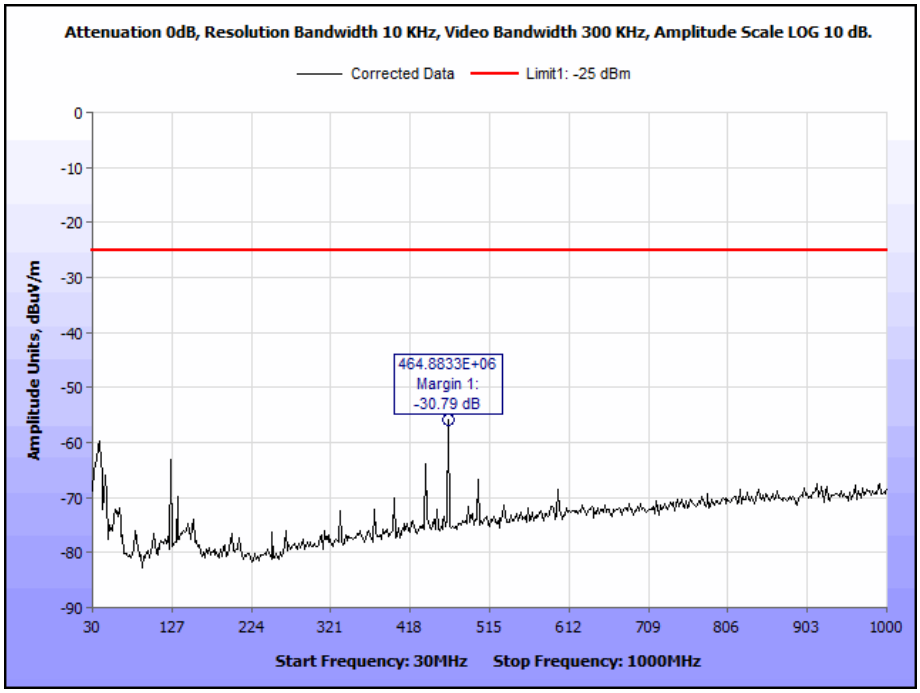
Plot 61. Radio Spurious Emission 30MHz - 1GHz -25dBm, BW 5M, Ch 4942.5M, TP25



Plot 62. Radio Spurious Emission 30MHz - 1GHz -25dBm, BW 5M, Ch 4967.5M, TP25



Plot 63. Radio Spurious Emission 30MHz - 1GHz -25dBm, BW 5M, Ch 4987.5.5M, TP25



Plot 64. Radio Spurious Emission 30MHz - 1GHz -25dBm, Radio off

6. Electromagnetic Compatibility Frequency Stability Requirements

6.1. Frequency Stability

Test Requirement(s): **§2.1055 and §90.213**

Test Procedures: As required by 47 CFR 2.1055, *Frequency Stability measurements* were made at the RF output terminals using a Directional Coupler through a Spectrum Analyzer.

The EUT was placed in the Environmental Chamber and support equipments are outside the chamber on a table. The EUT was set to transmit a CW signal corresponding to the low, mid and high Channels for 5, 10, & 20MHz Bandwidths. The frequency counter option on the Spectrum Analyzer was used to measure frequency deviations. The frequency drift was investigated for every 10^{C} increment until the unit is stabilized then recorded the reading in tabular format with the temperature range of -40 to 60^{C}.

Voltage supplied to EUT is 120 VAC reference temperature was done at 20 ^{C}. The voltage was varied by ± 15 % of nominal.

Test Results: Equipment is compliant with Section 2.1055 and 90.213.

Test Engineer(s): Jun Qi

Test Date(s): December 16, 2016

(Low Channel)				
Reference Frequency	Voltage (AC)	Temperature (C)	Frequency (MHz)	PPM
	93.5	50	4942.507503	12.146
	110.0	50	4942.447473	0.000
	126.5	50	4942.522511	15.182
	93.5	20	4942.427463	4.049
	110.0	20	4942.447473	0.000
4942.447473	126.5	20	4942.462481	3.037
	93.5	-30	4942.457478	2.024
	110.0	-30	4942.462481	3.037
	126.5	-30	4942.472486	5.061
(Mid Channel)				
Reference Frequency	Voltage (AC)	Temperature (C)	Frequency (MHz)	PPM
	93.5	50	4967.482491	8.056
	110.0	50	4967.432466	2.014
	126.5	50	4967.512506	14.099
	93.5	20	4967.437468	1.007
	110.0	20	4967.442471	0.000
4967.442471	126.5	20	4967.417458	5.035
	93.5	-30	4967.452476	2.014
	110.0	-30	4967.457478	3.021
	126.5	-30	4967.472486	6.042
(High Channel)				
Reference Frequency	Voltage (AC)	Temperature (C)	Frequency (MHz)	PPM
	93.5	50	4987.482491	11.033
	110.0	50	4987.467483	8.024
	126.5	50	4987.507503	16.048
	93.5	20	4987.447473	4.012
	110.0	20	4987.427463	0.000
4987.427463	126.5	20	4987.432466	1.003
	93.5	-30	4987.447473	4.012
	110.0	-30	4987.457478	6.018
	126.5	-30	4987.472486	9.027

Table 8. Exalt Frequency Stability Calculation 90Y, Test Results

7. Electromagnetic Compatibility Frequency Stability Requirements

7.1. Peak Excursion

Test Requirements: **§90.1215(e):** The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

Test Results: Equipment was not applicable with the peak excursion ratio limits of this section**.**

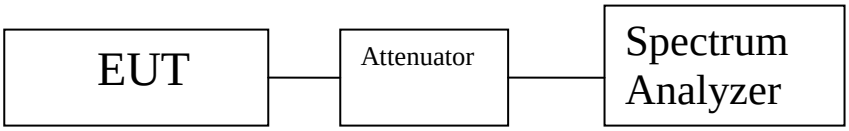


Figure 7. Peak Excursion Ration Test Setup

8. RF Exposure Requirements

RF Exposure Requirements: **§1.1307(b)(1) and §1.1307(b)(2):** Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.

RF Radiation Exposure Limit: **§1.1310:** As specified in this section, the Maximum Permissible Exposure (MPE) Limit shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in Sec. 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of Sec. 2.1093 of this chapter.

FCC									
Frequency (MHz)	**Con. Pwr. (dBm)**	**Con. Pwr. (mW)**	**Ant. Gain (dBi)**	**Ant. Gain numeric**	**Pwr. Density (mW/cm^2)**	**Limit (mW/cm^2)**	**Margin**	**Distance (cm)**	**Result**
4980	22.85	192.752	9	7.943	0.3046	1	0.6954	20	Pass

9. Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2005.

MET Asset #	Equipment	Manufacturer	Model	Last Cal Date	Cal Due Date
1S2746	Bilog Antenna	Sunol Science	JB3	9/29/2015	3/29/2017
1S2482	5 Meter Chamber (NSA)	Panashield	5 Meter Semi-Anechoic Chamber	See Note	
1S2603	Double Ridged Waveguide Horn	ETS-Lindgren	3117	08/09/2016	08/09/18
1S3962	Spectrum Analyzer (PSA)	Keysight/Agilent	E4448A	02/26/16	02/26/2018
1S2121	Pre-Amplifier	Hewlett Packard	8449B	See Note	
1U0258	Spectrum Analyzer	Agilent Technologies	E4407B	2/2/2016	2/2/2017
1S2229	Temperature Chamber	Tenny Engineering	T63C	17/11/2016	17/5/2018

Note: Functionally tested equipment is verified using calibrated instrumentation at the time of testing.

Certification & User's Manual Information

10. Certification Label & User's Manual Information

10.1. Certification Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart I — Marketing of Radio frequency devices:

§ 2.801 Radio-frequency device defined.

As used in this part, a radio-frequency device is any device which in its operation is capable of Emitting radio-frequency energy by radiation, conduction, or other means. Radio- frequency devices include, but are not limited to:

(a) The various types of radio communication transmitting devices described throughout this chapter.

(b) The incidental, unintentional and intentional radiators defined in Part 15 of this chapter.

(c) The industrial, scientific, and medical equipment described in Part 18 of this chapter.

(d) Any part or component thereof which in use emits radio-frequency energy by radiation, conduction, or other means.

§ 2.803 Marketing of radio frequency devices prior to equipment authorization.

(a) Except as provided elsewhere in this chapter, no person shall sell or lease, or offer for sale or lease (including advertising for sale or lease), or import, ship or distribute for the purpose of selling or leasing or offering for sale or lease, any radio frequency device unless:

(1) In the case of a device subject to certification, such device has been authorized by the Commission in accordance with the rules in this chapter and is properly identified and labeled as required by §2.925 and other relevant sections in this chapter; or

(2) In the case of a device that is not required to have a grant of equipment authorization issued by the Commission, but which must comply with the specified technical standards prior to use, such device also complies with all applicable administrative (including verification of the equipment or authorization under a Declaration of Conformity, where required), technical, labeling and identification requirements specified in this chapter.

(d) Notwithstanding the provisions of paragraph (a) of this section, the offer for sale solely to business, commercial, industrial, scientific or medical users (but not an offer for sale to other parties or to end users located in a residential environment) of a radio frequency device that is in the conceptual, developmental, design or pre-production stage is permitted prior to equipment authorization or, for devices not subject to the equipment authorization requirements, prior to a determination of compliance with the applicable technical requirements *provided* that the prospective buyer is advised in writing at the time of the offer for sale that the equipment is subject to the FCC rules and that the equipment will comply with the appropriate rules before delivery to the buyer or to centers of distribution.

(e)(1) Notwithstanding the provisions of paragraph (a) of this section, prior to equipment authorization or determination of compliance with the applicable technical requirements any radio frequency device may be operated, but not marketed, for the following purposes and under the following conditions:

(i) Compliance testing;

(ii) Demonstrations at a trade show provided the notice contained in paragraph (c) of this section is displayed in a conspicuous location on, or immediately adjacent to, the device;

(iii) Demonstrations at an exhibition conducted at a business, commercial, industrial, scientific or medical location, but excluding locations in a residential environment, provided the notice contained in paragraphs (c) or (d) of this section, as appropriate, is displayed in a conspicuous location on, or immediately adjacent to, the device;

(iv) Evaluation of product performance and determination of customer acceptability, provided such operation takes place at the manufacturer's facilities during developmental, design or pre-production states; or

(v) Evaluation of product performance and determination of customer acceptability where customer acceptability of a radio frequency device cannot be determined at the manufacturer's facilities because of size or unique capability of the device, provided the device is operated at a business, commercial, industrial, scientific or medical user's site, but not at a residential site, during the development, design or pre-production stages.

(e)(2) For the purpose of paragraphs (e)(1)(iv) and (e)(1)(v) of this section, the term *manufacturer's facilities* includes the facilities of the party responsible for compliance with the regulations and the manufacturer's premises, as well as the facilities of other entities working under the authorization of the responsible party in connection with the development and manufacture, but not the marketing, of the equipment.

(f) For radio frequency devices subject to verification and sold solely to business, commercial, industrial, scientific and medical users (excluding products sold to other parties or for operation in a residential environment), parties responsible for verification of the devices shall have the option of ensuring compliance with the applicable technical specifications of this chapter at each end user's location after installation, provided that the purchase or lease agreement includes a provision that such a determination of compliance be made and is the responsibility of the party responsible for verification of the equipment.

The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart Y — Equipment Authorization Procedures:

§ 2.901 Basis and Purpose

(a) In order to carry out its responsibilities under the Communications Act and the various treaties and international regulations, and in order to promote efficient use of the radio spectrum, the Commission has developed technical standards for radio frequency equipment and parts or components thereof. The technical standards applicable to individual types of equipment are found in that part of the rules governing the service wherein the equipment is to be operated.[1] *In addition to the technical standards provided, the rules governing the service may require that such equipment be verified by the manufacturer or importer*, be authorized under a Declaration of Conformity, or receive an equipment authorization from the Commission by one of the following procedures: certification or registration.

(b) The following sections describe the verification procedure, the procedure for a Declaration of Conformity, and the procedures to be followed in obtaining certification from the Commission and the conditions attendant to such a grant, whichever is applicable.

§ 2.902 Certification.

(a) Certification is an equipment authorization issued by the Commission, based on representation and test data submitted by the applicant.

(b) Certification attaches to all units subsequently marketed by the grantee which are identical (see Section 2.908) to the sample tested except for permissive changes or other variations authorized by the Commission pursuant to Section 2.1043.

[1] In this case, the equipment is subject to the rules of Part 15. More specifically, the equipment falls under Subpart B (of Part 15), which deals with unintentional radiators.

§ 2.948 Description of measurement facilities.

(a) Each party making measurements of equipment that is subject to an equipment authorization under Part 15 or Part 18 of this chapter, regardless of whether the measurements are filed with the Commission or kept on file by the party responsible for compliance of equipment marketed within the U.S. or its possessions, shall compile a description of the measurement facilities employed.

(1) If the measured equipment is subject to the verification procedure, the description of the measurement facilities shall be retained by the party responsible for verification of the equipment.

(i) If the equipment is verified through measurements performed by an independent laboratory, it is acceptable for the party responsible for verification of the equipment to rely upon the description of the measurement facilities retained by or placed on file with the Commission by that laboratory. In this situation, the party responsible for the verification of the equipment is not required to retain a duplicate copy of the description of the measurement facilities.

(ii) If the equipment is verified based on measurements performed at the installation site of the equipment, no specific site calibration data is required. It is acceptable to retain the description of the measurement facilities at the site at which the measurements were performed.

(2) If the equipment is to be authorized by the Commission under the certification procedure, the description of the measurement facilities shall be filed with the Commission's Laboratory in Columbia, Maryland. The data describing the measurement facilities need only be filed once but must be updated as changes are made to the measurement facilities or as otherwise described in this section. At least every three years, the organization responsible for filing the data with the Commission shall certify that the data on file is current.

10.2. Label and User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart A — General:

§ 15.19 Labeling requirements.

(a) In addition to the requirements in Part 2 of this chapter, a device subject to certification or verification shall be labeled as follows:

(1) Receivers associated with the operation of a licensed radio service, e.g., FM broadcast under Part 73 of this chapter, land mobile operation under Part 90, etc., shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

(2) A stand-alone cable input selector switch, shall bear the following statement in a conspicuous location on the device:

This device is verified to comply with Part 15 of the FCC Rules for use with cable television service.

(3) All other devices shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

(4) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified under paragraph (a) of this section is required to be affixed only to the main control unit.

(5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

§ 15.21 Information to user.

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart B — Unintentional Radiators:

§ 15.105 Information to the user.

(a) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

– Reorient or relocate the receiving antenna.
– Increase the separation between the equipment and receiver.
– Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
– Consult the dealer or an experienced radio/TV technician for help.

End of Report

