

AIRAYA, CORP

Wireless Bridge Model: WirelessGRID-300

28 January 2009

Report No.: SL09010501-AIR-001 (15.247)(MIMO) Rev 3.0
(This report supersedes SL09010501-AIR-001 (15.247)(MIMO))



Modifications made to the product : None

This Test Report is Issued Under the Authority of:

	
Choon Sian Ooi Test Engineer	Leslie Bai Engineering Reviewer

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Test result presented in this test report is applicable to the representative sample only.

EMC Test Report

To: FCC Part 15.247 & RSS210 Issue7: 2007

SIEMIC, INC.
Accessing global markets



SIEMIC ACREDITATION DETAILS: A2LA Lab Code: 2742.01



THE AMERICAN ASSOCIATION FOR
LABORATORY ACCREDITATION

ACCREDITED LABORATORY

A2LA has accredited

SIEMIC LABORATORIES

San Jose, CA

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 18 June 2005).

Presented this 11th day of July 2008.

President

For the Accreditation Council

Certificate Number 2742.01

Valid to September 30, 2010



For the tests or types of tests to which this accreditation applies,
please refer to the laboratory's Electrical Scope of Accreditation.

SIEMIC ACREDITATION DETAILS: ISO Guide 65 for US TCB



THE AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION

ACCREDITED PRODUCT CERTIFICATION BODY

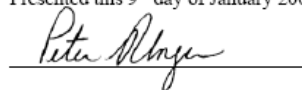
A2LA has accredited
SIEMIC INC.
San Jose, CA

for technical competence as a
Product Certification Body

This product certification body is accredited in accordance with the recognized International Standard ISO/IEC Guide 65:1996 *General requirements for bodies operating product certification systems*. This accreditation demonstrates technical competence for a defined scope and the operation of a quality management system for a Telecommunications Certification Body (TCB) meeting FCC (U.S.), IDA (Singapore) and IC (Canada) requirements.



Presented this 9th day of January 2009.



President
For the Accreditation Council
Certificate Number: 2742.02
Valid to: September 30, 2010

For the product certification schemes to which this accreditation applies,
please refer to the certification body's Scope of Accreditation.

SCOPE OF ACCREDITATION TO ISO/IEC GUIDE 65:1996

SIEMIC INC.
 2206 Ringwood Ave.
 San Jose, CA 95131
 Mr. Snell Leong (Authorized Representative) Phone: 408 526 1188
www.siemic.com

PRODUCT CERTIFICATION CONFORMITY ASSESSMENT BODY (CAB)

Valid to: September 30, 2010

Certificate Number: 2742.02

In recognition of the successful completion of the A2LA Certification Body Accreditation Program evaluation, including the US Federal Communications Commission (FCC), Industry Canada (IC) and Singapore (IDA) requirements for the indicated types of product certifications, accreditation is granted to this organization to perform the following product certification schemes:

Economy

Scope

Federal Communication Commission - (FCC)

Unlicensed Radio Frequency Devices	A1, A2, A3, A4
Licensed Radio Frequency Devices	B1, B2, B3, B4
Telephone Terminal Equipment	C

**Please refer to FCC TCB Program Roles and Responsibilities, v04, released February 14, 2008 detailing scopes, roles and responsibilities. <http://www.fcc.gov/oet/ea/FCC-Overview-TCB-Program.pdf>*

Industry Canada - (IC)

Radio	All Radio Standards Specifications (RSS) in Category I Equipment Standards List Radio
-------	--

**Please refer to Industry Canada (IC) website at: http://www.ic.gc.ca/epic/site/smt-gst.nsf/en/h_sf01342e.html*

IDA – Singapore

Line Terminal Equipment	All Technical Specifications for Line Terminal Equipment – Table 1 of IDA MRA Recognition Scheme: 2008, Annex 2
Radio-Communication Equipment	All Technical Specifications for Radio-Communication Equipment – Table 2 of IDA MRA Recognition Scheme: 2008, Annex 2

**Please refer to Info-Communication Development Authority (IDA) Singapore website at:
http://www.ida.gov.sg/doc/Policies%20and%20Regulation/Policies_and_Regulation_Level2/20060609145118/MRARecScheme.pdf*



Title: RF Test Report AIRAYA, CORP , model : WirelessGRID-300
To: FCC 15.247 2009, RSS 210 Issue 7: 2007

Serial# SL09010501-AIR-001 (15.247)(MIMO) Rev 3.0
Issue Date 28 January 2009
Page 5 of 134
www.sieminc.com

SIEMIC ACREDITATION DETAILS: FCC Registration No. 783147

FEDERAL COMMUNICATIONS COMMISSION

**Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046**

December 20, 2007

Registration Number: 783147

SIEMIC Laboratories
2206 Ringwood Avenue,
San Jose, CA 95131

Attention: Leslie Bai

Re: Measurement facility located at San Jose
3 & 10 meter site
Date of Renewal: December 20, 2007

Dear Sir or Madam:

Your request for renewal of the registration of the subject measurement facility has been received. The information submitted has been placed in your file and the registration has been renewed. The name of your organization will remain on the list of facilities whose measurement data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Please note that the file must be updated for any changes made to the facility and the registration must be renewed at least every three years.

Measurement facilities that have indicated that they are available to the public to perform measurement services on a fee basis may be found on the FCC website www.fcc.gov under E-Filing, OET Equipment Authorization Electronic Filing, Test Firms.

Sincerely,

Phyllis Parrish
Industry Analyst



May 23rd, 2008

OUR FILE: 46405-4842

Submission No: 126429

Siemic Inc.
2206 Ringwood Ave.
San Jose CA 95131
USA

Attention: Leslie Bai

Dear Sir/Madame:

The Bureau has received your application for the registration / renewal of a 3/10m OATS. Be advised that the information received was satisfactory to Industry Canada. The following number(s) is now associated to the site(s) for which registration / renewal was sought (**4842A-1**). Please reference the appropriate site number in the body of test reports containing measurements performed on the site. In addition, please be informed that the Bureau is now utilizing a **new site numbering scheme** in order to simplify the electronic filing process. Our goal is to reduce the number of secondary codes associated to one particular company. The following changes have been made to your record.

- Your primary code is: **4842**
- The company number associated to the site(s) located at the above address is: **4842A**
- The table below is a summary of the changes made to the unique site registration number(s):

New Site Number	Obsolete Site Number	Description of Site	Expiry Date (YYYY-MM-DD)
4842A-1	4842-1	3m Chamber	2010-05-23

Furthermore, to obtain or renew a unique site number, the applicant shall demonstrate that the site has been accredited to ANSI C63.4-2003 or later. A scope of accreditation indicating the accreditation by a recognized accreditation body to ANSI C63.4-2003 shall be accepted. Please indicate in a letter the previous assigned site number if applicable and the type of site (example: 3 meter OATS or 3 meter chamber). If the test facility is not accredited to ANSI C63.4-2003 or later, the test facility shall submit test data demonstrating full compliance with the ANSI standard. The Bureau will evaluate the filing to determine if recognition shall be granted.

The frequency for re-validation of the test site and the information that is required to be filed or retained by the testing party shall comply with the requirements established by the accrediting organization. However, in all cases, test site re-validation shall occur on an interval not to exceed two years. There is no fee or form associated with an OATS filing. OATS submissions are encouraged to be submitted electronically to the Bureau using the following URL;
http://strategis.ic.gc.ca/epic/internet/inceb-bhst.nsf/en/h_tt00052c.html.

If you have any questions, you may contact the Bureau by e-mail at certification_bureau@ic.gc.ca
Please reference our file and submission number above for all correspondence.

Yours sincerely,

S. Proulx
Test & Measurement Specialist
Certification and Engineering Bureau
3701 Carling Ave., Building 94
Ottawa, Ontario K2H 8S2

SIEMIC ACREDITATION DETAILS: Australia CAB ID : US0160

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899

November 20, 2008

Mr. Leslie Bai
SIEMIC, Inc.
2206 Ringwood Avenue
San Jose, CA 95131

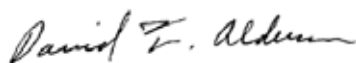
Dear Mr. Bai:

NIST is pleased to inform you that your laboratory has been recognized by the Australian Communications and Media Authority (ACMA) under the Asia Pacific Economic Cooperation for Telecommunications Equipment Mutual Recognition Arrangement (APEC Tel MRA). Your laboratory is now designated to act as a Conformity Assessment Body (CAB) under Appendix B, **Phase I** Procedures, of the APEC Tel MRA. The pertinent information about your laboratory's designation is as follows:

CAB Name:	Siemic, Inc.
Physical Location:	2206 Ringwood Avenue, San Jose, CA 95131
Identification No.:	US0160
Recognized Scope:	<u>EMC</u> : AS/NZS 4251.1 (until 5/31/2009), AS/NZS 4251.2 (until 5/31/2009), AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR 22, AS/NZS 61000.6.3, AS/NZS 61000.6.4 <u>Radiocommunications</u> : AS/NZS 4281, AS/NZS 4268, AS/NZS 4280.1, AS/NZS 4280.2, AS/NZS 4295, AS/NZS 4582, AS/NZS 4583, AS/NZS 4769.1, AS/NZS 4769.2, AS/NZS 4770, AS/NZS 4771 <u>Telecommunications</u> : AS/ACIF S002:05, AS/ACIF S003:06, AS/ACIF S004:06, AS/ACIF S006:01, AS/ACIF S016:01, AS/ACIF S031:01, AS/ACIF S038:01, AS/ACIF S040:01, AS/ACIF S041:05, AS/ACIF S043.2:06, AS/NZS 60950.1

You may submit test data to ACMA to verify that the equipment to be imported into Australia satisfies the applicable requirements. The designation of your organization will remain in force as long as its accreditation for the designated scope remains valid and comply with the designation requirements. Recognized CABs are listed on the NIST website at <http://ts.nist.gov/mra>. Please contact Ms. Ramona Saar, at (301) 975-5521 or ramona.saar@nist.gov if you have questions.

Sincerely,



David F. Alderman
Group Leader, Standards Coordination and Conformity Group
Standards Services Division

Enclosure

cc: Snell Leong, Siemic, Inc.; Ramona Saar, NIST



SIEMIC ACREDITATION DETAILS: Korea CAB ID: US0160



UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899

October 1, 2008

Mr. Leslie Bai
SIEMIC, Inc.
2206 Ringwood Avenue
San Jose, CA 95131

Dear Mr. Bai:

NIST is pleased to inform you that your laboratory has been recognized by the Radio Research Agency (RRA) Korea Communications Commission (KCC) under the Asia Pacific Economic Cooperation for Telecommunications Equipment Mutual Recognition Arrangement (APEC Tel MRA). Your laboratory is now designated to act as a Conformity Assessment Body (CAB) under Appendix B, **Phase I** Procedures, of the APEC Tel MRA. The pertinent information about your laboratory's designation is as follows:

CAB Name: SIEMIC, Inc.
Physical Location: 2206 Ringwood Avenue, San Jose, CA 95131
Identification No.: US0160
Recognized Scope: **EMI:** KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI
KN22: Test Method for EMI
EMS: KCC Notice 2008-38, RRL Notice 2008-4: CA Procedures for EMS
KN24, KN-61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11: Test Method for EMS
Wireless: RRL Notice 2008-26, RRL Notice 2008-2, RRL Notice 2008-10,
RRL Notice 2007-49, RRL Notice 2007-20, RRL Notice 2007-21,
RRL Notice 2007-80, RRL Notice 2004-68
Wired: President Notice 20664, RRL Notice 2007-30,
RRL Notice 2008-7 with attachments 1, 3, 5, 6
President Notice 20664, RRL Notice 2008-7 with attachment 4

You may submit test data to RRA/KCC to verify that the equipment to be imported into Korea satisfies the applicable requirements. The designation of your organization will remain in force as long as its accreditation for the designated scope remains valid and comply with the designation requirements.

Recognized CABs are listed on the NIST website at <http://ts.nist.gov/mra>. If you have any questions please contact Ramona Saar at (301) 975-5521 or ramona.saar@nist.gov.

Sincerely,



David F. Alderman
Group Leader, Standards Coordination and Conformity Group
Standards Services Division

Enclosure

cc: Ramona Saar

NIST

SIEMIC ACREDITATION DETAILS: Taiwan BSMI Accreditation No. SL2-IN-E-1130R



UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899

May 3, 2006

Mr. Leslie Bai
SIEMIC Laboratories
2206 Ringwood Avenue
San Jose, CA 95131

Dear Mr. Bai:

I am pleased to inform you that your laboratory has been recognized by the Chinese Taipei's Bureau of Standards, Metrology, and Inspection (BSMI) under the Asia Pacific Economic Cooperation (APEC) Mutual Recognition Arrangement (MRA). Your laboratory is now designated to act as a Conformity Assessment Body (CAB) under Appendix B, **Phase I** Procedures, of the APEC Tel MRA. You may submit test data to BSMI to verify that the equipment to be imported into Chinese Taipei satisfies the applicable requirements. The designation of your organization will remain in force as long as its accreditation for the designated scope remains valid and comply with the designation requirements. The pertinent designation information is as follows:

- BSMI number: **SL2-IN-E-1130R** (Must be applied to the test reports)
- U.S. Identification No: **US0160**
- Scope of Designation: **CNS 13438**
- Authorized signatory: **Mr. Leslie Bai**

The names of all recognized CABs will be posted on the NIST website at <http://ts.nist.gov/mra>. If you have any questions, please contact Mr. Dhillon at 301-975-5521. We appreciate your continued interest in our international conformity assessment activities.

Sincerely,

David F. Alderman
Group Leader, Standards Coordination and Conformity Group

cc: Jogindar Dhillon

NIST

SIEMIC ACREDITATION DETAILS: Taiwan NCC CAB ID: US0160



UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899

November 25, 2008

Mr. Leslie Bai
SIEMIC, Inc.
2206 Ringwood Avenue
San Jose, CA 95131

Dear Mr. Bai:

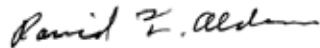
NIST is pleased to inform you that your laboratory has been recognized by the National Communications Commission (NCC) for the requested scope expansion under the Asia Pacific Economic Cooperation for Telecommunications Equipment Mutual Recognition Arrangement (APEC Tel MRA). Your laboratory is designated to act as a Conformity Assessment Body (CAB) under Appendix B, **Phase I** Procedures, of the APEC Tel MRA. The pertinent information about your laboratory's designation is as follows:

CAB Name: SIEMIC, Inc.
Physical Location: 2206 Ringwood Avenue, San Jose, CA 95131
Identification No.: US0160
Current Scope: LP0002
Additional Scope: PSTN01, ADSL01, ID0002, IS6100 and CNS 14336

You may submit test data to NCC to verify that the equipment to be imported into China satisfies the applicable requirements. The designation of your organization will remain in force as long as its accreditation for the designated scope remains valid and comply with the designation requirements.

Recognized CABs are listed on the NIST website at <http://ts.nist.gov/mra>. If you have any questions please contact Ramona Saar at (301) 975-5521 or ramona.saar@nist.gov.

Sincerely,



David F. Alderman
Group Leader, Standards Coordination and Conformity Group
Standards Services Division

Enclosure

cc: Ramona Saar

NIST

SIEMIC ACREDITATION DETAILS: Mexico NOM Recognition

 CAMARA NACIONAL DE LA INDUSTRIA ELECTRONICA, DE TELECOMUNICACIONES E INFORMATICA	Laboratorio Valentin V. Rivero	México D.F. a 18 de octubre de 2009.
LESLIE BAI DIRECTOR OF CERTIFICATION SIEMIC LABORATORIES, INC. ACCESSING GLOBAL MARKETS P R E S E N T E		
En contestación a su escrito de fecha 5 de septiembre del año en curso, le comento que estamos muy interesados en su intención de firmar un Acuerdo de Reconocimiento Mutuo, para lo cual adjunto a este escrito encontrara el Acuerdo en idioma ingles y español prellenado de los cuales le pido sea revisado y en su caso corregido, para que si este de acuerdo poder firmarlo para mandarlo con las autoridades Mexicanas para su visto bueno y así poder ejercer dicho acuerdo.		
Aprovecho este escrito para mencionarle que nuestro intermediario gestor será la empresa Isabel de México, S. A. de C. V., empresa que ha colaborado durante mucho tiempo con nosotros en lo relacionado a la evaluación de la conformidad y que cuenta con amplia experiencia en la gestión de la certificación de cumplimiento con Normas Oficiales Mexicanas de producto en México.		
Me despido de usted enviándole un cordial saludo y esperando sus comentarios al Acuerdo que nos ocupa.		
Atentamente:		
 Ing. Faustino Gomez Gonzalez Gerente Técnico del Laboratorio de CANIETI		
Culiacán 71 Hacienda Códoba 04100 México, D.F. Tel: 5264 0000 con 12 líneas Fax: 5264 0000 www.canietit.org		



UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899

December 8, 2008

Mr. Leslie Bai
SIEMIC, Inc.
2206 Ringwood Avenue
San Jose, CA 95131

Dear Mr. Bai:

NIST is pleased to inform you that your laboratory has been recognized by the Office of the Telecommunications Authority (OFTA) under the Asia Pacific Economic Cooperation for Telecommunications Equipment Mutual Recognition Arrangement (APEC Tel MRA). Your laboratory is now designated to act as a Conformity Assessment Body (CAB) under Appendix B, **Phase I** Procedures, of the APEC Tel MRA. The pertinent information about your laboratory's designation is as follows:

CAB Name:	SIEMIC, Inc.
Physical Location:	2206 Ringwood Avenue, San Jose, California 95131 USA
Identification No.:	US0160
Recognized Scope:	Radio: HKTA 1002, 1007, 1008, 1010, 1015, 1016, 1020, 1022, 1026, 1027, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1039, 1041, 1042, 1043, 1044, 1046, 1047, 1048, 1049, 1051 Telecom: HKTA 2011, 2012, 2013, 2014, 2017, 2018, 2022, 2024, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033

You may submit test data to OFTA to verify that the equipment to be imported into Hong Kong satisfies the applicable requirements. The designation of your organization will remain in force as long as its accreditation for the designated scope remains valid and comply with the designation requirements.

Recognized CABs are listed on the NIST website at <http://ts.nist.gov/mra>. If you have any questions please contact Ramona Saar at (301) 975-5521 or ramona.saar@nist.gov.

Sincerely,

David F. Alderman
Group Leader, Standards Coordination and Conformity Group
Standards Services Division

Enclosure

cc: Ramona Saar

NIST

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1 Executive Summary & EUT information

The purpose of this test programme was to demonstrate compliance of the AIRAYA, CORP , Wireless Bridge, and Model: WirelessGRID-300 against the current Stipulated Standards. The Wireless Bridge have demonstrated compliance with the FCC 15.247 2009.

EUT Information

EUT Description	: The WirelessGRID is a point-to-point and point-to-multipoint radio device. The WirelessGRID transfers all Ethernet packets received by the bridge to any other bridge that's been successfully associated with the sending bridge. These packets can include T1, voice, video, and data. When a bridge receives the RF packet, it translates the packet back into an Ethernet packet frame and sends it out over the physical Ethernet connection. The Ethernet packets can be sent in any of 3 different data rates, depending on the device at the other end of Ethernet cable. These data rates include 10, 100, or 1000 mbps. The device is operating as a MAC layer bridge. The WirelessGRID uses an OFDM radio section with a digital interface. The system receives Ethernet packets over the PCI bus and sends packets out over the radio interface via the PCI bus. Data being sent out over the radio interface comes in from the Ethernet interface or is sourced from inside the bridge via the user management functions. A Link requires at least two of an Indoor Unit (IU) or Outdoor Unit (OU) used to establish communications between locations. The IU consists of a radio, antenna cable, antenna, enclosure, AC power supply or DC power source. The IU uses a long antenna cable between the antenna and the radio. The OU consists of a radio, antenna cable, antenna, Power Over Ethernet, enclosure, and AC power supply. The Power Over Ethernet includes an injector, which is located near the AC power source and a splitter mounted inside the outdoor enclosure. The short antenna cable is connected between the radio board and the integrated antenna. A version of the Outdoor Unit allows the user to connect a non-integrated antenna via an N-connector. The IU is installed inside the OU enclosures. The communications between the units is for outdoor use only. Versions of the product that include an external connector will require professional installation. Versions of the product that are provided with the attached antenna to the enclosure using Torx head screws, will not require professional installation. If the following table, the GI defines the Guard Interval between symbols. This helps the receiver overcome the effects of any multipath delays. The MCS Index value represents the Modulation and Coding Scheme that determines the number of spatial streams, the modulation, the coding rate and data rate.
Model No	: WirelessGRID-300
Serial No	: 601461-00T
Input Power	: 120 Vac
Classification Per Stipulated Test Standard	: Spread Spectrum System / Device

2 TECHNICAL DETAILS

Purpose	Compliance testing of MIMO RADIO Module with stipulated standard
Applicant / Client	AIRAYA, CORP
Manufacturer	AIRAYA, CORP 637 Adair Court Morgan Hill, CA 95037
Laboratory performing the tests	SIEMIC Laboratories
Test report reference number	SL09010501-AIR-001 (15.247)(MIMO) Rev 3.0
Date EUT received	09 January 2009
Standard applied	47 CFR §15.247 (2009)
Dates of test (from – to)	January 12-23 2009
No of Units:	1
Equipment Category:	DTS
Trade Name:	AIRAYA, CORP
Model :	WirelessGRID-300
RF Operating Frequency (ies)	5745 to 5825 MHz
Number of Channels :	20MHz Channel Bandwidth: 5 channels, 40MHz Channel Bandwidth: 2 channels
Modulation :	OFDM
FCC ID :	QDE-GRID-3X3
IC ID :	4433A-GRID3X3

3 MODIFICATION

NONE

4 TEST SUMMARY

The product was tested in accordance with the following specifications. All Testing has been performed according to below product classification:

Spread Spectrum System / Device

Test Results Summary

Test Standard		Description	Pass / Fail
CFR 47 Part 15.247: 2009	RSS 210 Issue 7: 2007		
15.203		Antenna Requirement	Pass
15.205	RSS210(A8.5)	Restricted Band of Operation	Pass
15.207(a)	RSSGen(7.2.2)	Conducted Emissions Voltage	Pass
15.247(a)(1)	RSS210(A8.1)	Channel Separation	N/A
15.247(a)(1)	RSS210(A8.1)	Occupied Bandwidth	Pass
15.247(a)(2)	RSS210 (A8.2)	Bandwidth	Pass
15.247(a)(1)	RSS210(A8.1)	Number of Hopping Channels	N/A
15.247(a)(1)	RSS210(A8.1)	Time of Occupancy	N/A
15.247(b)	RSS210(A8.4)	Output Power	Pass
15.247(c)	RSS210(A8.4)	Antenna Gain > 6 dBi	Pass
15.247(d)	RSS210(A8.5)	Conducted Spurious Emissions	Pass
15.209; 15.247(d)	RSS210(A8.5)	Radiated Spurious Emissions	Pass
15.247(e)	RSS210(A8.3)	Power Spectral Density	Pass
15.247(f)	RSS210(A8.3)	Hybrid System Requirement	N/A
15.247(g)	RSS210(A8.1)	Hopping Capability	N/A
15.247(h)	RSS210(A8.1)	Hopping Coordination Requirement	N/A
15.247(i)	RSSGen(5.5)	RF Exposure requirement	Pass
	RSSGen(4.8)	Receiver Spurious Emissions	Pass
ANSI C63.4: 2003/ RSS-Gen Issue 2: 2007			
PS: All measurement uncertainties are not taken into consideration for all presented test result.			

5 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

5.1 Antenna Requirement

Requirement(s): 47 CFR §15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna requirement must meet at least one of the following:

- a) Antenna must be permanently attached to the device.
- b) Antenna must use a unique type of connector to attach to the device.
- c) Device must be professionally installed. Installer shall be responsible for ensuring that the correct antenna is employed with the device.

The device must be professionally installed. Installer shall be responsible for ensuring that the correct antenna is employed with the device.

Antenna type for point to point link

- 1) 4.9-5.875GHz Dual Polarized Antenna, Model: AI108-2-24, 23.5dBi antenna gain.
- 2) 4.9-5.875GHz Sector Antenna, Model: AI108-2-MP-90, 17dBi antenna gain.
- 3) 5.15-5.85GHz Grid Antenna, Model: AI108-2-28, 28dBi antenna gain.
- 4) 4.9-5.875GHz Broadband Antenna Model: AI108-2-23, 23dBi antenna gain.

Antenna type for point to multi point link

- 1) 4.9-5.875GHz Omni directional Antenna, Model: AI108-MP-OMNI, 10dBi antenna gain.

Note: This is a Spatial Multiplexing "MIMO" system and the elements are always driven incoherently at each frequency.
Direction gain = gain of each antenna.

5.2 Conducted Emissions Voltage

Requirement :

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

*Decreases with the logarithm of the frequency.

Procedures:

1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR and Average detectors, are reported. All other emissions were relatively insignificant.
 2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
 3. Conducted Emissions Measurement Uncertainty
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 9kHz – 30MHz (Average & Quasi-peak) is ±3.5dB.
 4. Environmental Conditions

Temperature	23°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar
- Test Date : January 12-23 2009
Tested By :Choon Sian Ooi

Results:

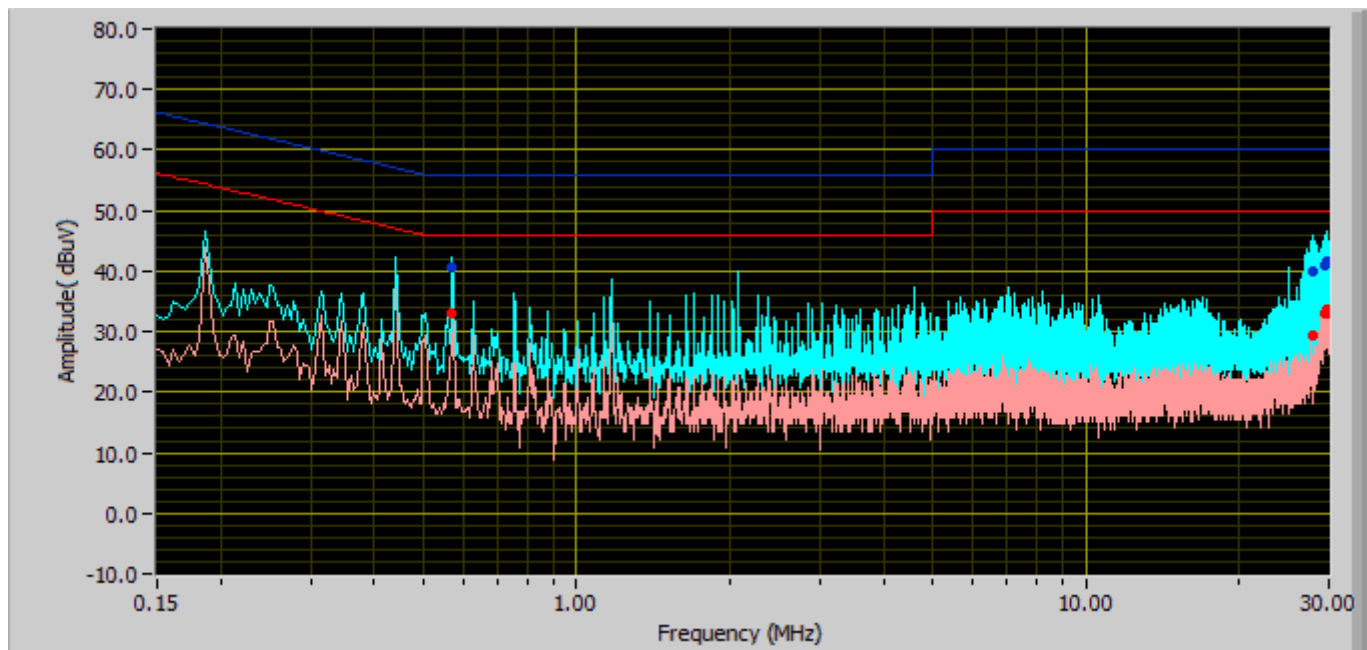


(Transmit Mode) with AF1805-A AC/DC Power supply

Results: Note –

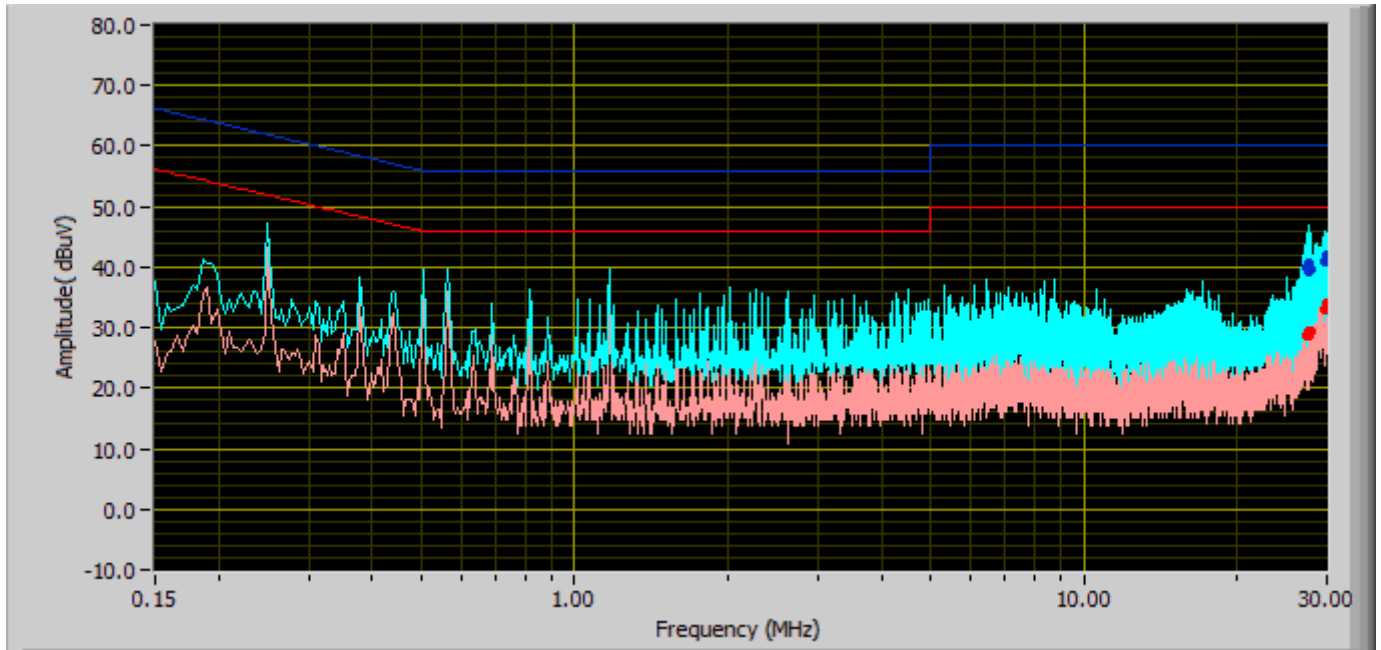
Average Limit

Quasi-Peak Limit



Phase Line Plot at 120Vac, 60Hz

Line Under Test	Freq. (MHz)	Corrected Amplitude (dBuV)	Limit (dBuV) QP	Margin (dB) QP	Corrected Amplitude (dBuV)	Limit (dBuV) AVG	Margin (dB) AVG
Neutral	29.71	41.17	60.00	-18.83	33.13	50.00	-16.87
Neutral	0.57	40.70	56.00	-15.30	33.01	46.00	-12.99
Neutral	27.88	39.98	60.00	-20.02	29.26	50.00	-20.74
Neutral	29.57	41.07	60.00	-18.93	33.00	50.00	-17.00
Neutral	29.48	40.90	60.00	-19.10	32.86	50.00	-17.14
Neutral	29.78	41.61	60.00	-18.39	33.54	50.00	-16.46



Neutral Line Plot at 120Vac, 60Hz

Line Under Test	Freq. (MHz)	Corrected Amplitude (dBuV) QP	Limit (dBuV) QP	Margin (dB) QP	Corrected Amplitude (dBuV) AVG	Limit (dBuV) AVG	Margin (dB) AVG
Line	27.74	39.26	60.00	-20.74	28.59	50.00	-21.41
Line	29.60	40.86	60.00	-19.14	33.10	50.00	-16.90
Line	29.97	41.98	60.00	-18.02	33.89	50.00	-16.11
Line	27.49	40.08	60.00	-19.92	28.83	50.00	-21.17
Line	28.03	39.67	60.00	-20.33	29.50	50.00	-20.50
Line	27.67	40.63	60.00	-19.37	29.51	50.00	-20.49

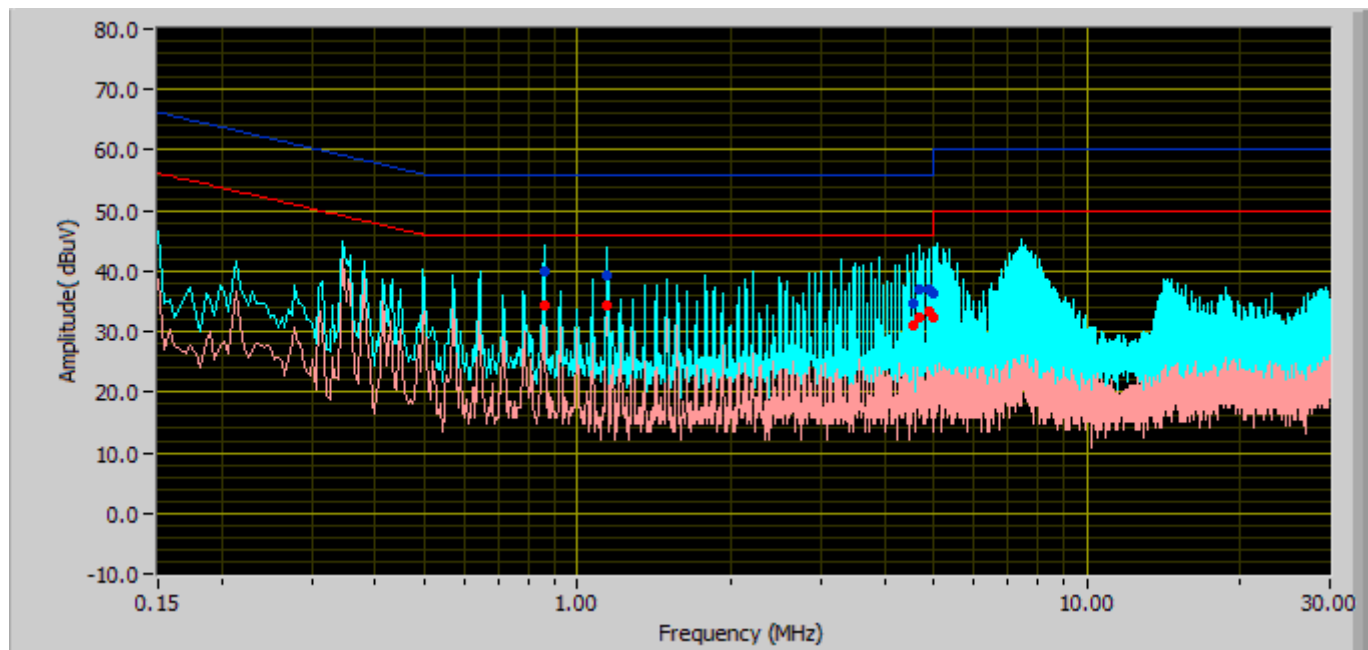


(Transmit Mode) with SA06L48-V POE Power Supply

Results: Note –

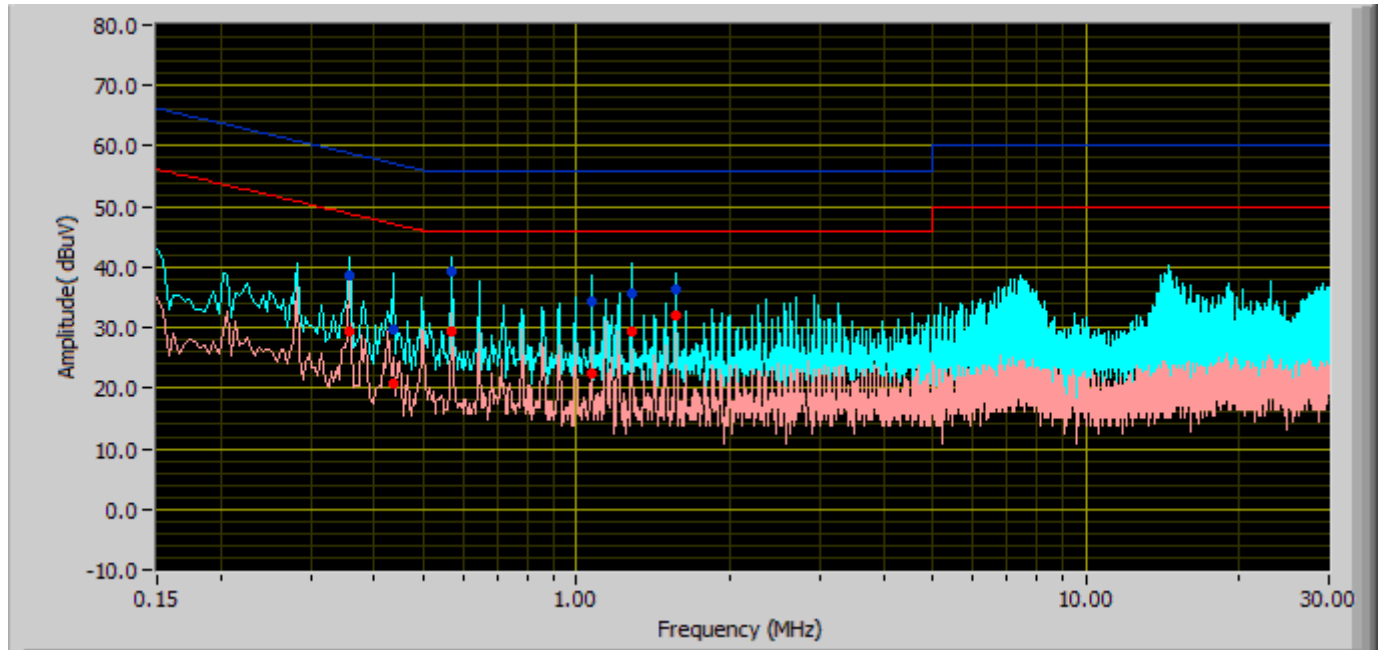
Average Limit

Quasi-Peak Limit



Phase Line Plot at 120Vac, 60Hz

Line Under Test	Freq. (MHz)	Corrected Amplitude (dBuV)	Limit (dBuV) QP	Margin (dB) QP	Corrected Amplitude (dBuV)	Limit (dBuV) AVG	Margin (dB) AVG
Neutral	4.71	37.08	56.00	-18.92	32.22	46.00	-13.78
Neutral	0.86	39.85	56.00	-16.15	34.36	46.00	-11.64
Neutral	1.14	39.17	56.00	-16.83	34.31	46.00	-11.69
Neutral	4.99	36.48	56.00	-19.52	32.36	46.00	-13.64
Neutral	4.92	37.08	56.00	-18.92	33.43	46.00	-12.57
Neutral	4.56	34.62	56.00	-21.38	30.99	46.00	-15.01



Neutral Line Plot at 120Vac, 60Hz

Line Under Test	Freq. (MHz)	Corrected Amplitude (dBuV) QP	Limit (dBuV) QP	Margin (dB) QP	Corrected Amplitude (dBuV) AVG	Limit (dBuV) AVG	Margin (dB) AVG
Line	0.57	39.24	56.00	-16.76	29.50	46.00	-16.50
Line	1.28	35.79	56.00	-20.21	29.36	46.00	-16.64
Line	1.57	36.47	56.00	-19.53	32.03	46.00	-13.97
Line	0.36	38.76	58.82	-20.06	29.35	48.82	-19.47
Line	1.07	34.50	56.00	-21.50	22.46	46.00	-23.54
Line	0.44	29.78	57.12	-27.33	20.61	47.12	-26.51

5.3 6dB & 99% Occupied Bandwidth

1. Conducted Measurement
EUT was set for low , mid, high channel with modulated mode and highest RF output power.
The spectrum analyzer was connected to the antenna terminal.
2. Environmental Conditions

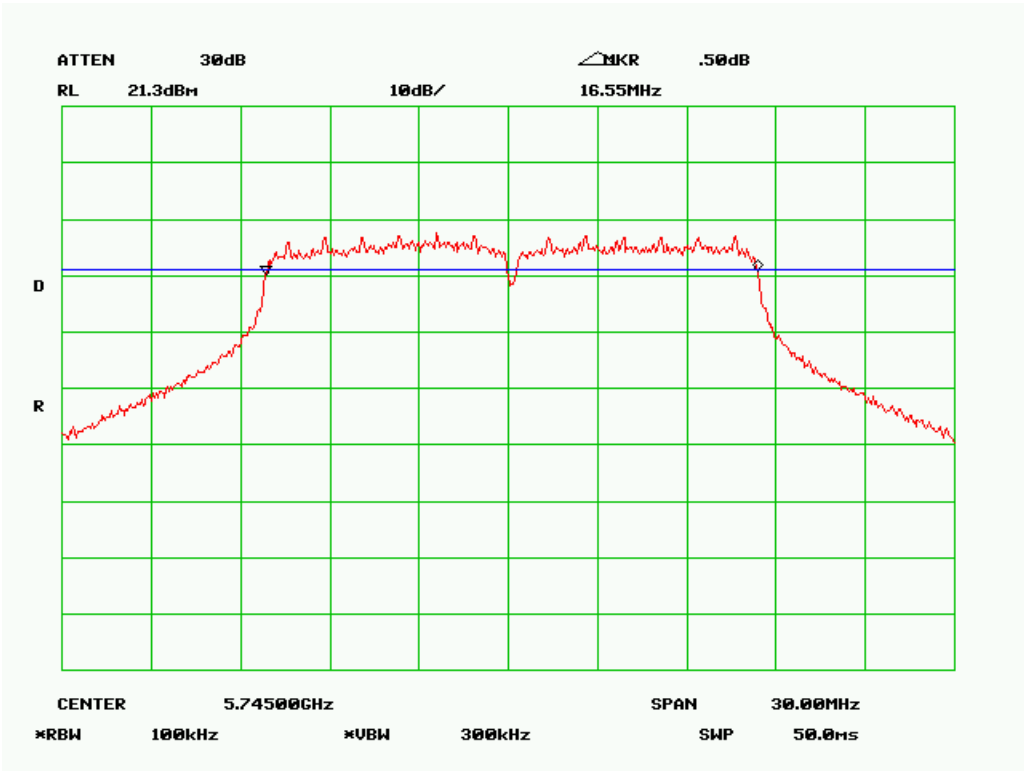
Temperature	23°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar
3. Conducted Emissions Measurement Uncertainty
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ± 1.5 dB.
4. Test Date : January 12-23 2009
Tested By :Choon Sian Ooi

Requirement(s): 47 CFR §15.247(a)(1) ; RSS210(A8.1)

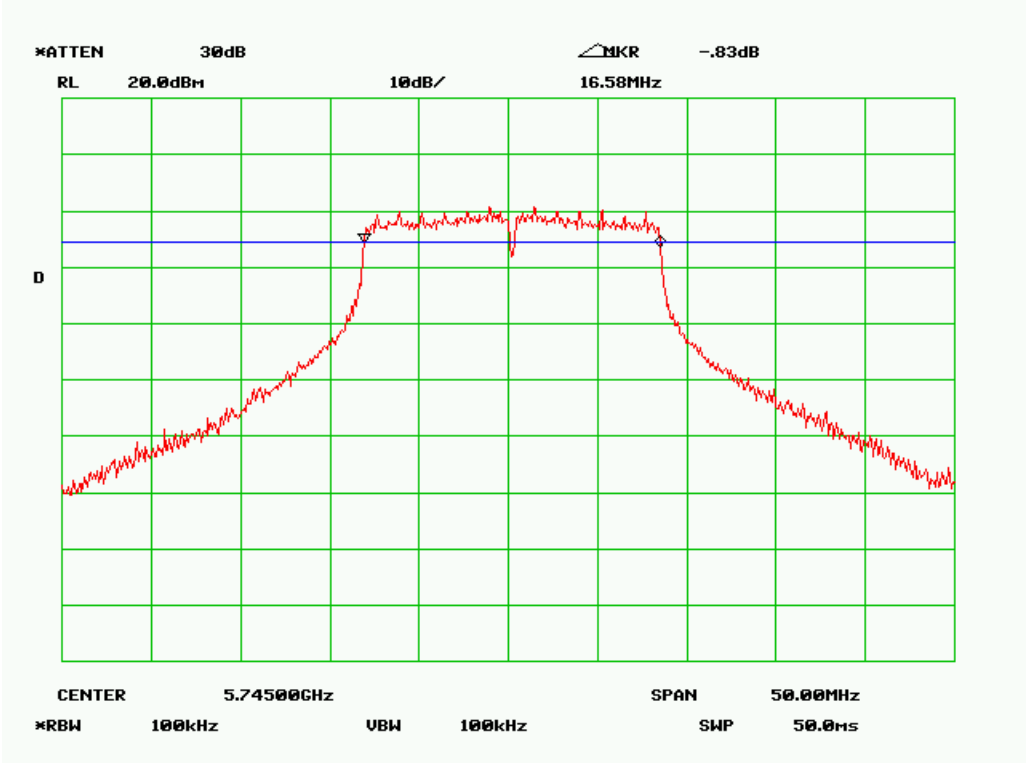
Procedures: The 6dB bandwidths were measured conducted using a spectrum analyzer at low, mid, and hi channels. 6 dB Bandwidth Limit: > 500 kHz.

Channel	Channel Bandwidth	Chain	6 dB Channel Bandwidth (MHz)	99% Channel Bandwidth (MHz)	6 dB Occupied Bandwidth Limit (KHz)
Low Channel (5745 MHz)	20MHz	0	16.55	16.50	500
	20MHz	1	16.58	16.50	500
	20MHz	2	16.50	16.50	500
Mid Channel (5785 MHz)	20MHz	0	16.45	16.55	500
	20MHz	1	16.50	16.55	500
	20MHz	2	16.45	16.50	500
High Channel (5825 MHz)	20MHz	0	16.45	16.55	500
	20MHz	1	16.45	16.50	500
	20MHz	2	16.25	16.50	500
Low Channel (5755 MHz)	40MHz	0	36.30	36.20	500
	40MHz	1	36.50	36.50	500
	40MHz	2	36.25	36.33	500
High Channel (5795 MHz)	40MHz	0	36.17	36.17	500
	40MHz	1	36.50	36.50	500
	40MHz	2	36.00	36.17	500

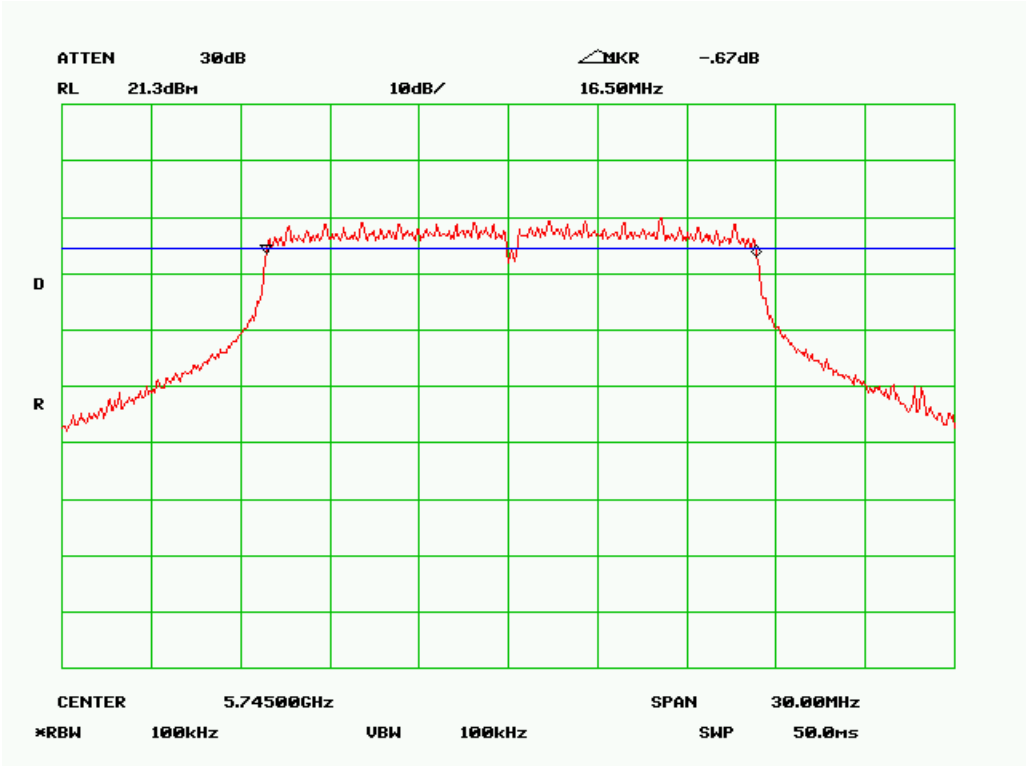
Refer to the attached plots.



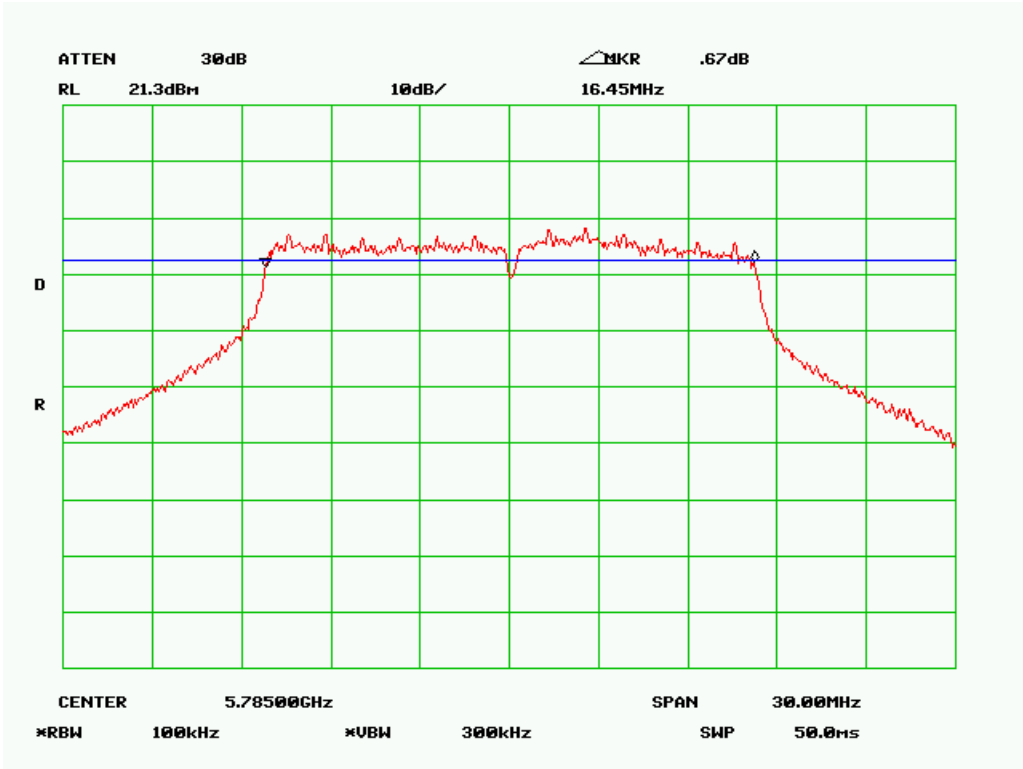
6 dB Bandwidth - Low Channel (20MHz Chain 0)



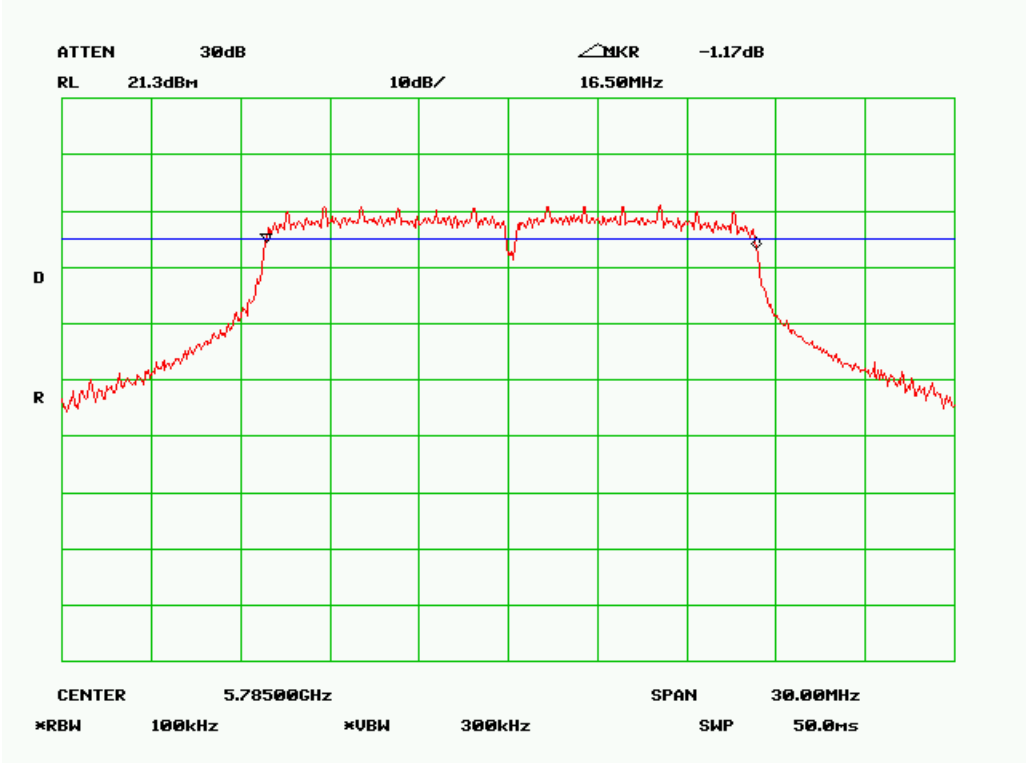
6 dB Bandwidth – Low Channel (20MHz Chain 1)



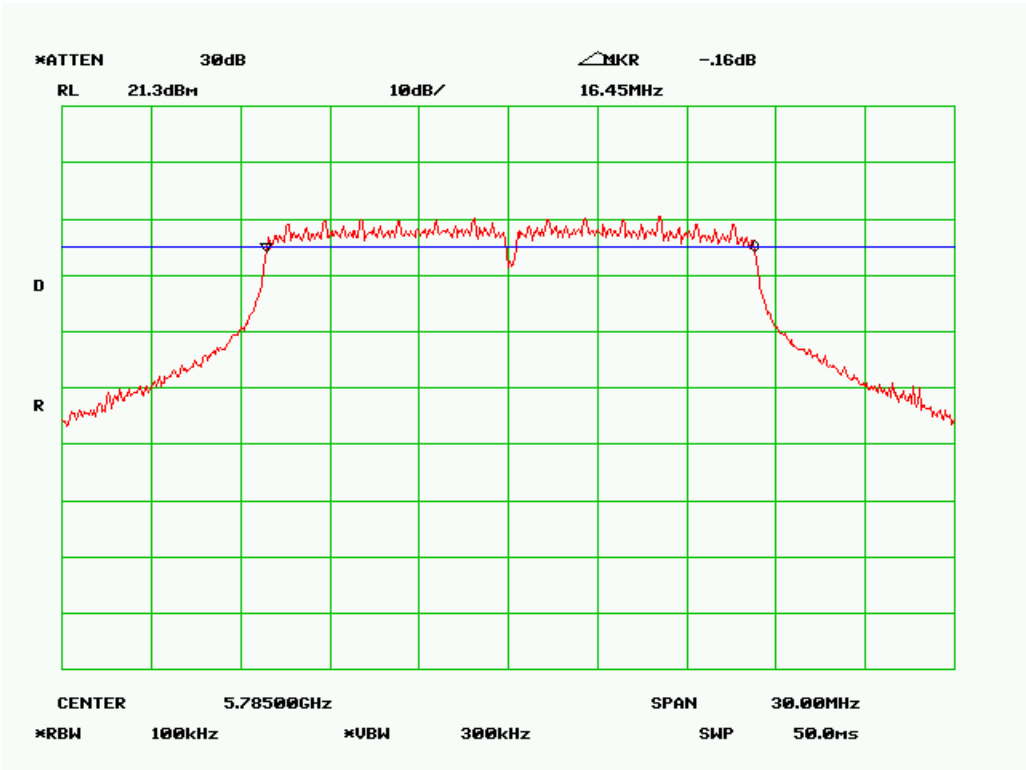
6 dB Bandwidth - Low Channel (20MHz Chain 2)



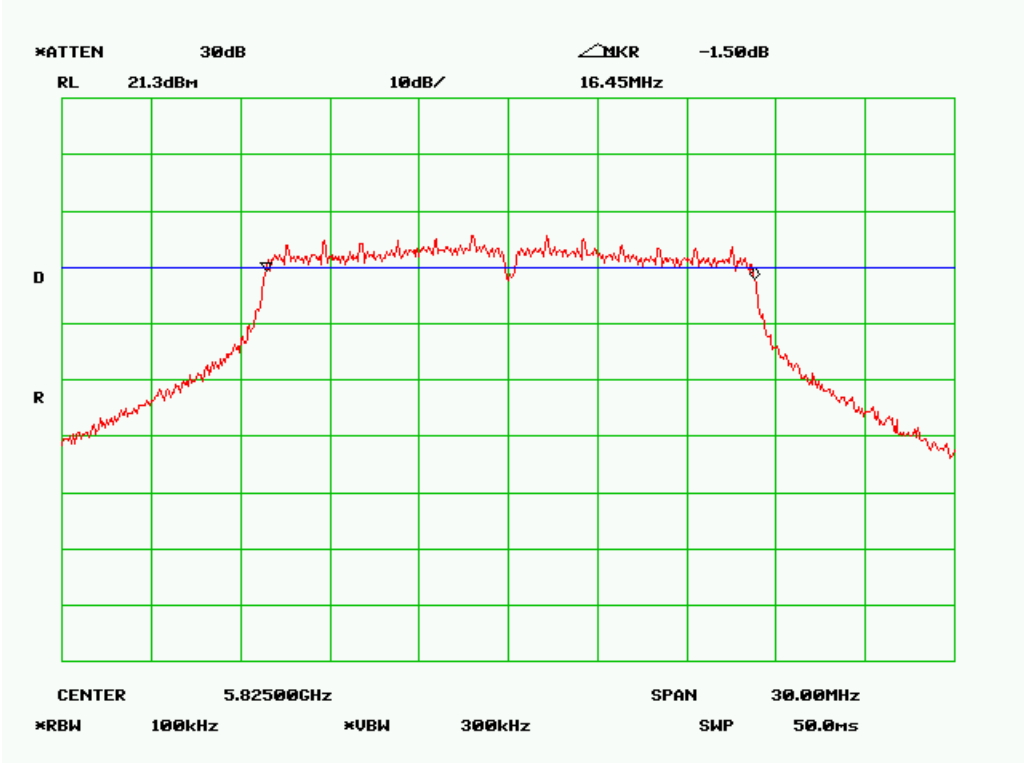
6 dB Bandwidth - Mid Channel (20MHz Chain 0)



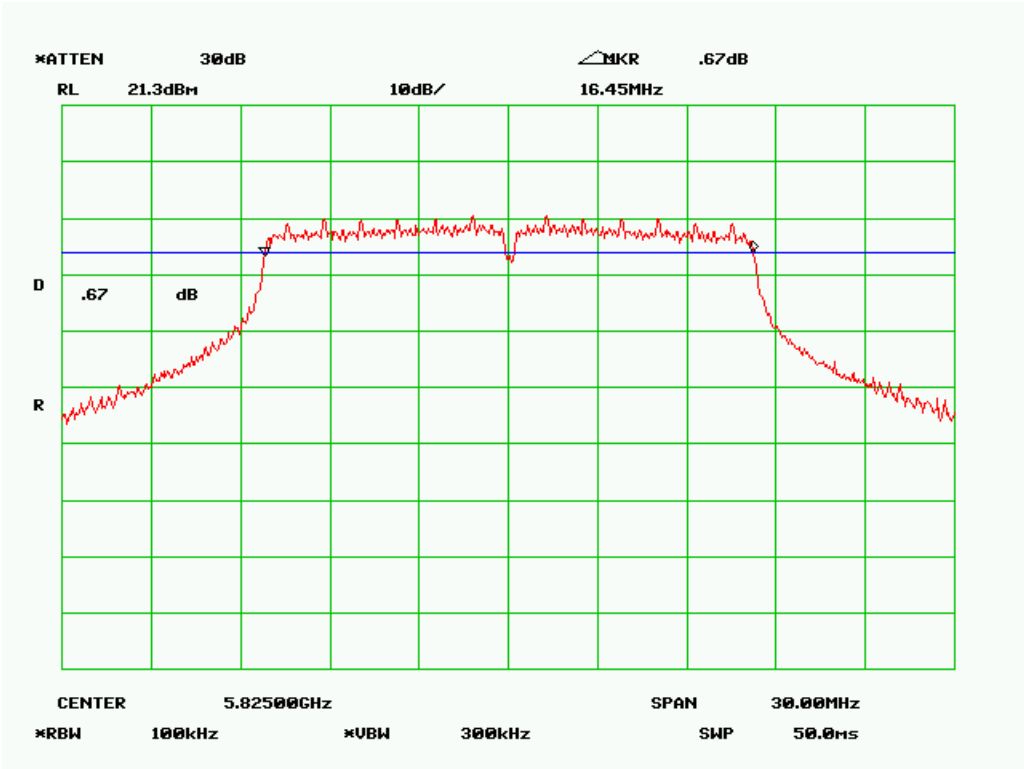
6 dB Bandwidth - Mid Channel (20MHz Chain 1)



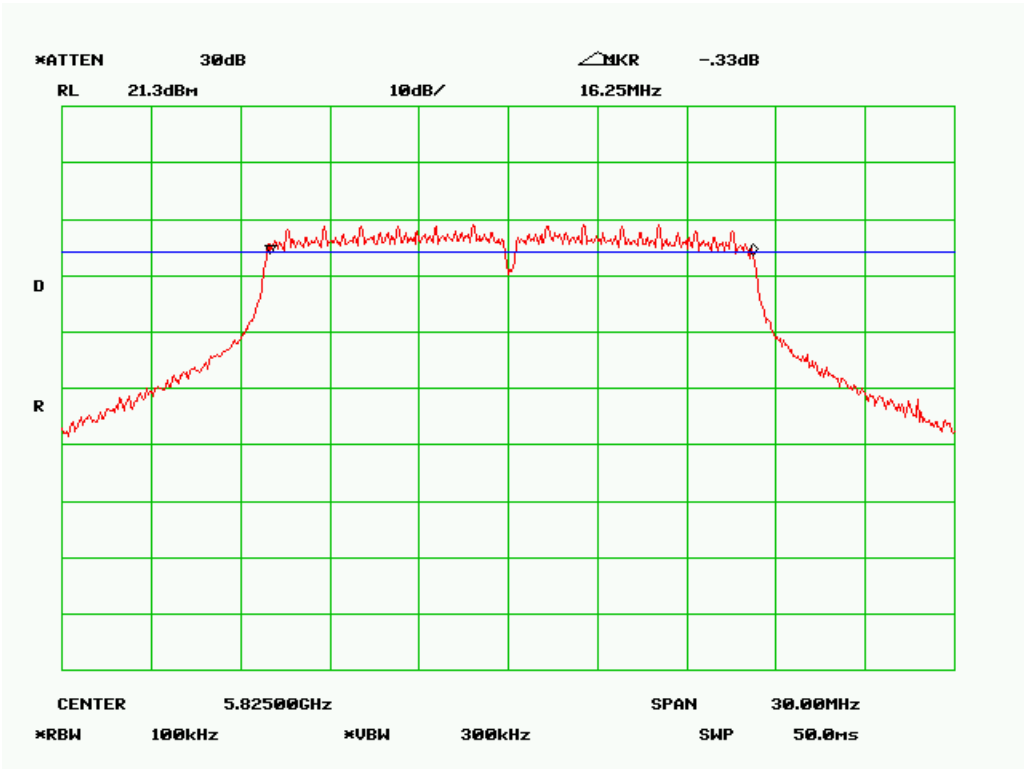
6 dB Bandwidth - Mid Channel (20MHz Chain 2)



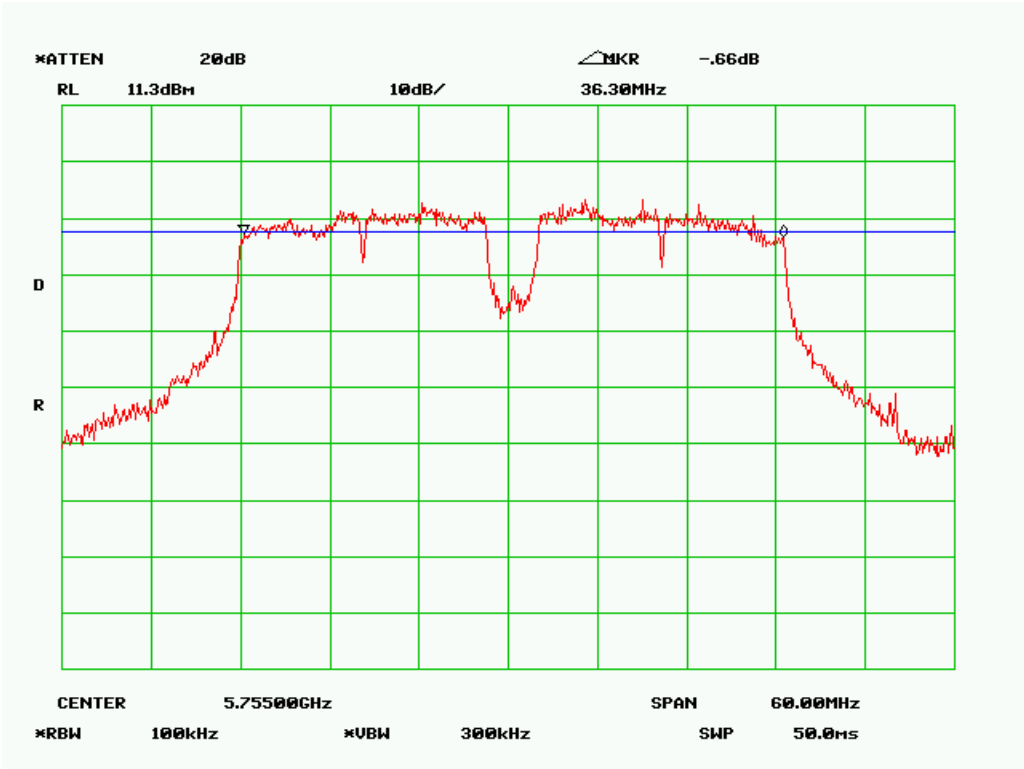
6 dB Bandwidth - High Channel (20MHz Chain 0)



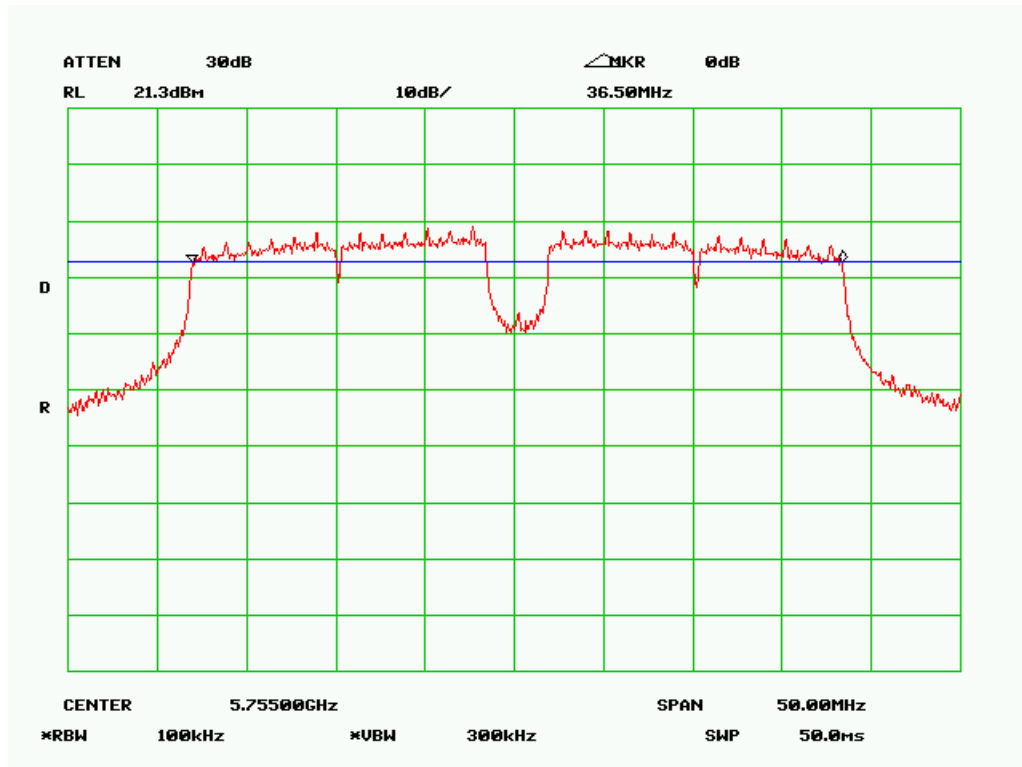
6 dB Bandwidth - High Channel (20MHz Chain 1)



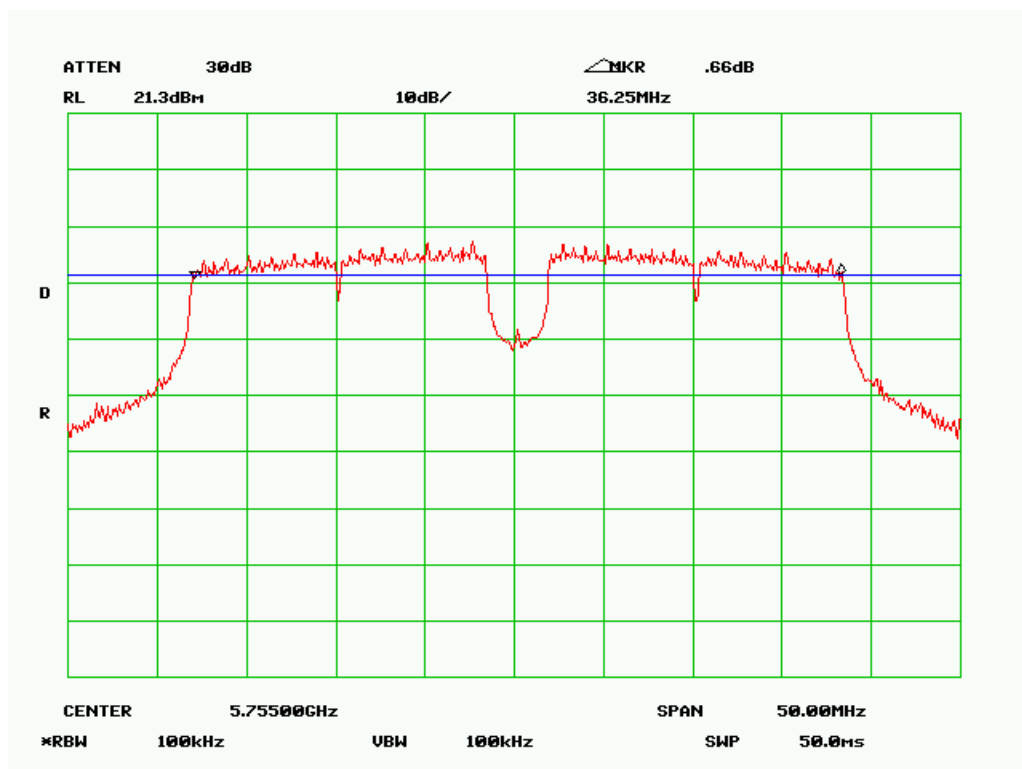
6 dB Bandwidth - High Channel (20MHz Chain 2)



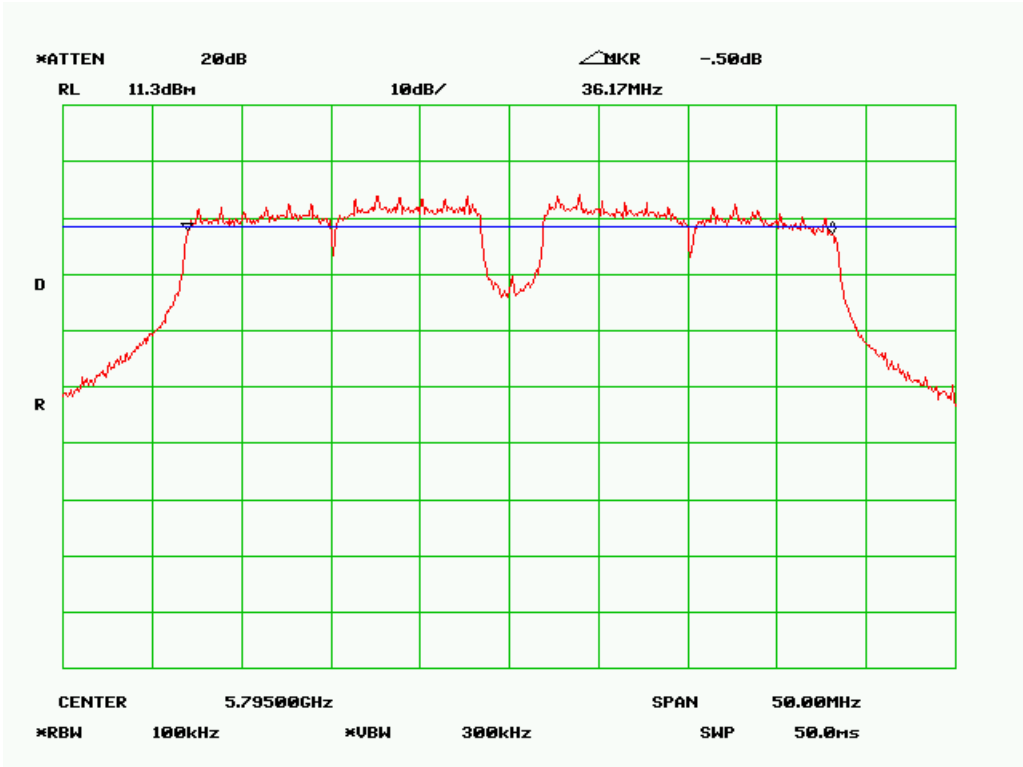
6 dB Bandwidth - Low Channel (40MHz Chain 0)



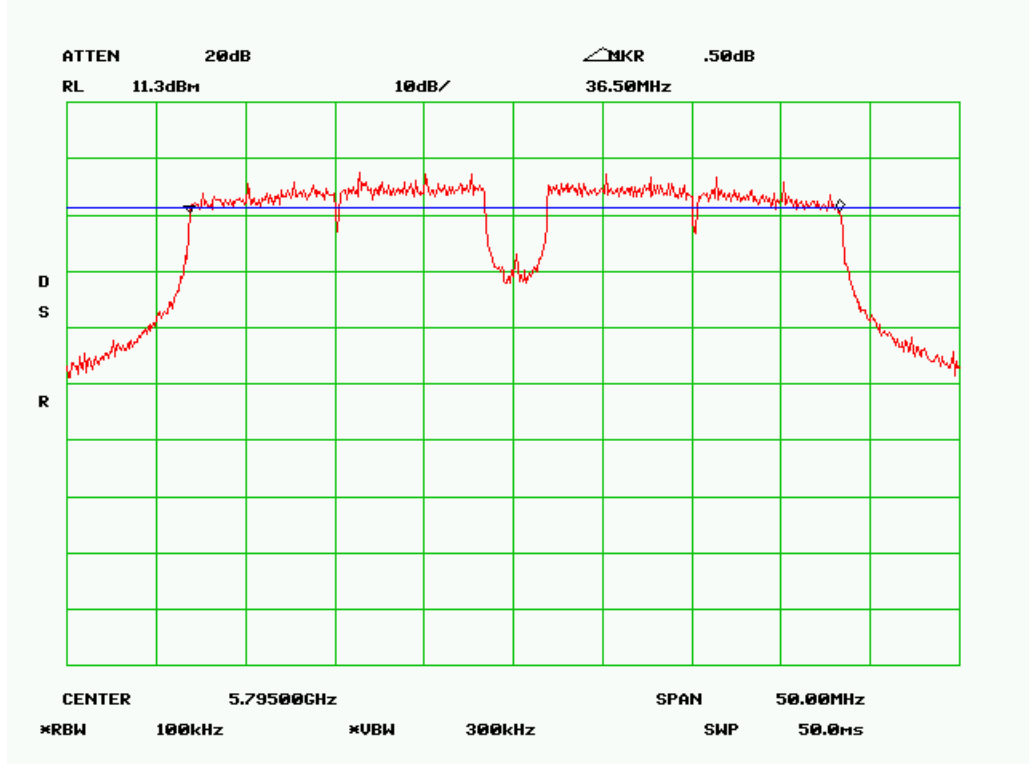
6 dB Bandwidth – Low Channel (40MHz Chain 1)



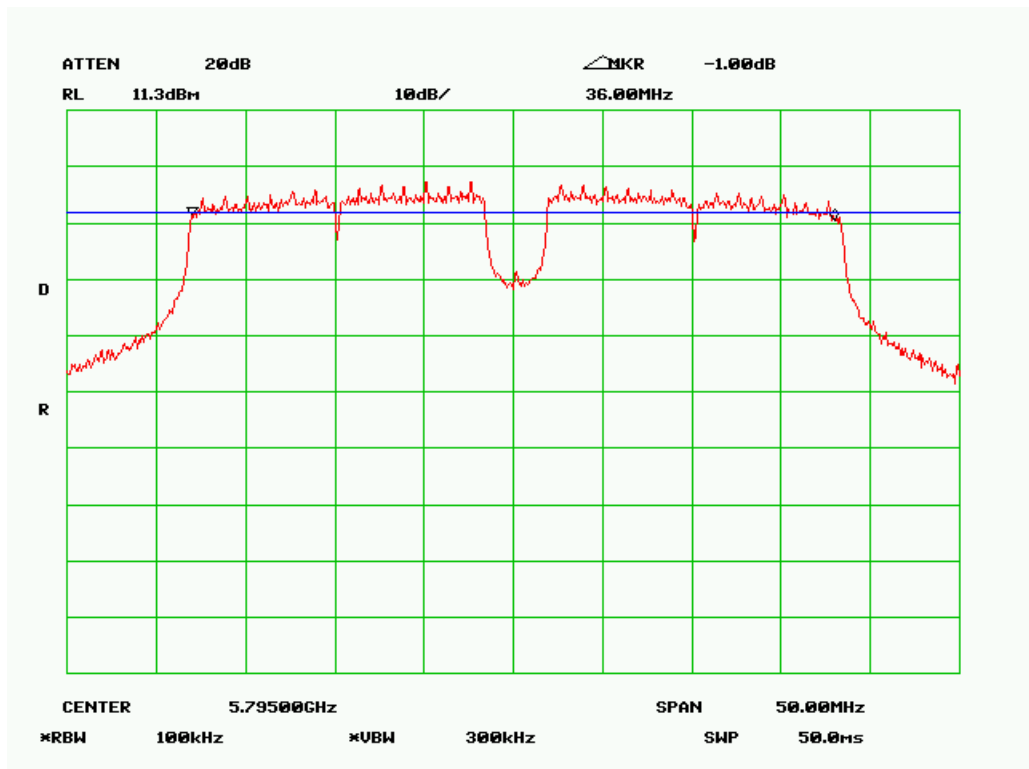
6 dB Bandwidth - Low Channel (40MHz Chain 2)



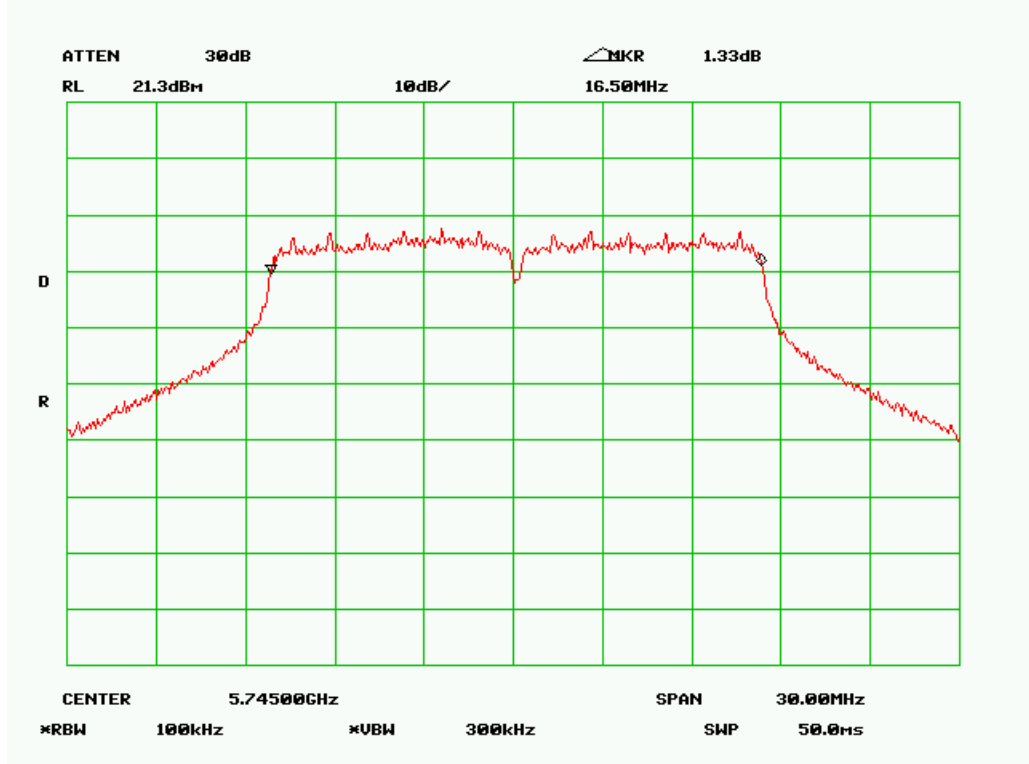
6 dB Bandwidth - High Channel (40MHz Chain 0)



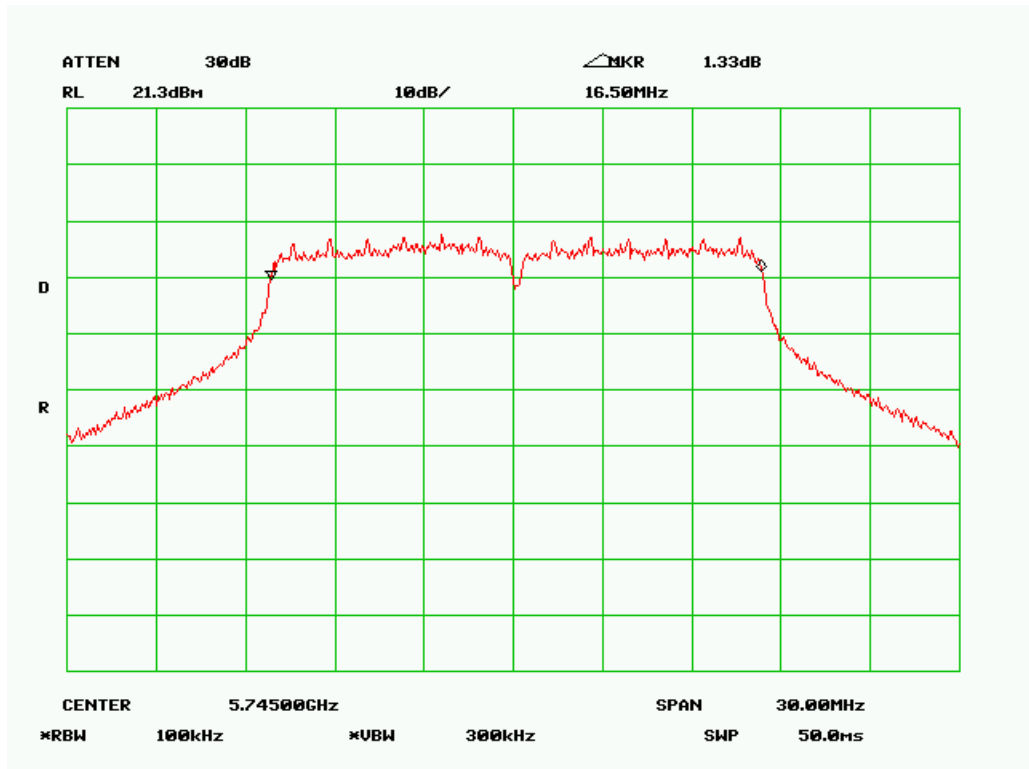
6 dB Bandwidth - High Channel (40MHz Chain 1)



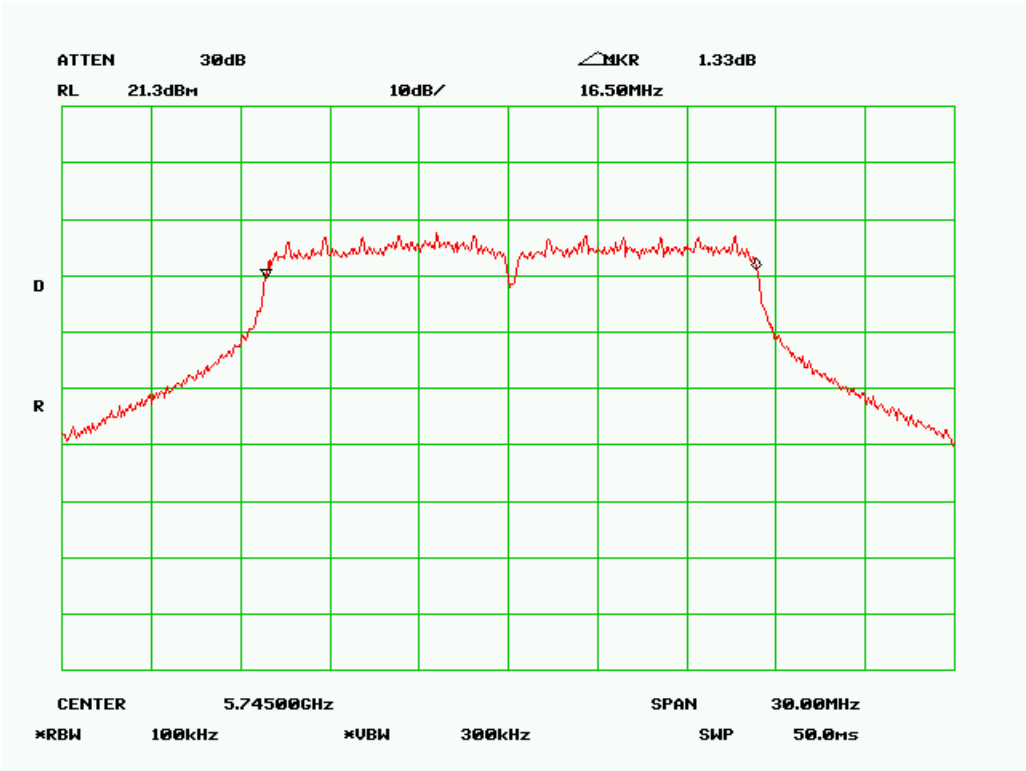
6 dB Bandwidth - High Channel (40MHz Chain 2)



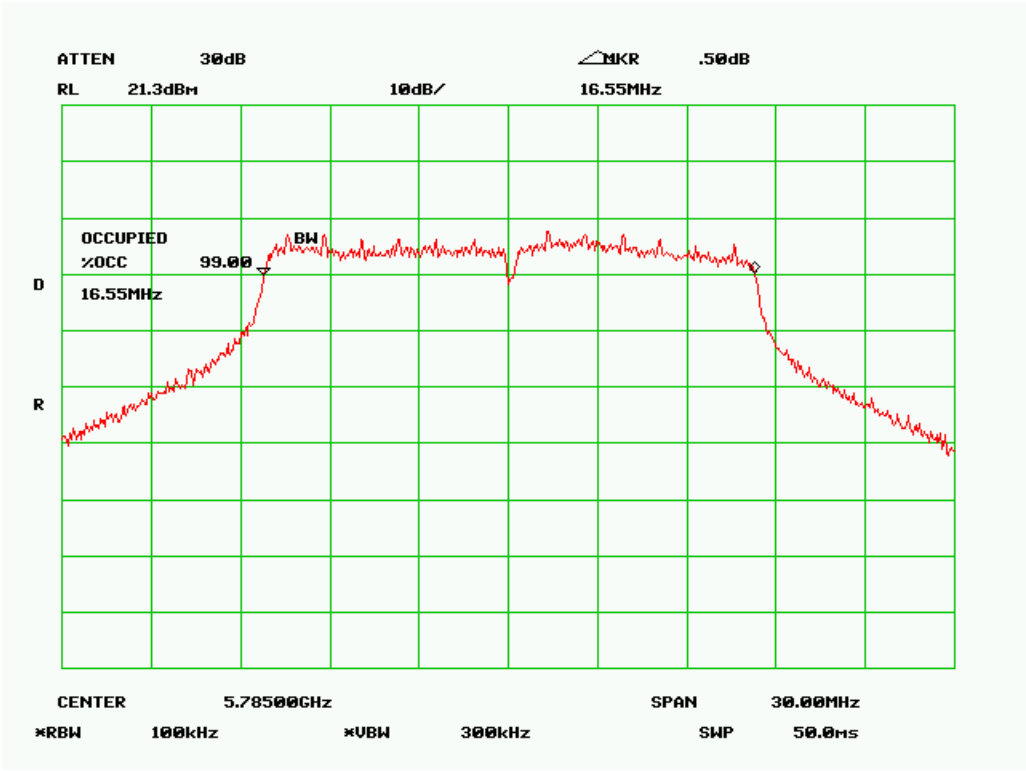
99% Bandwidth - Low Channel (20MHz Chain 0)



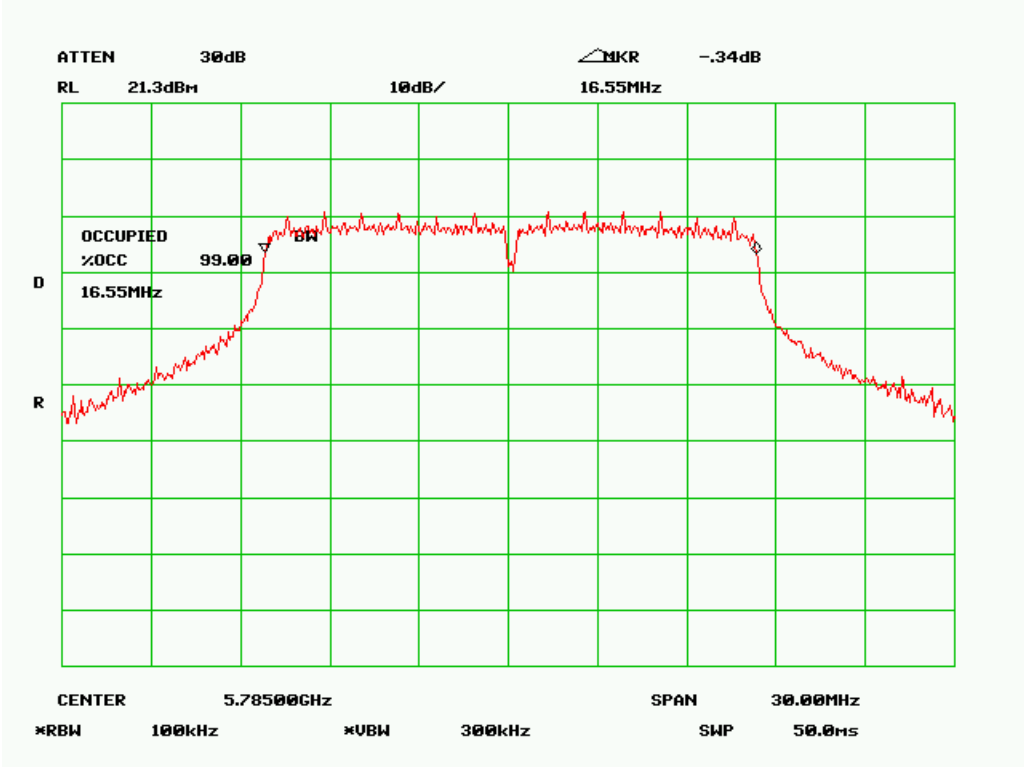
99% Bandwidth - Low Channel (20MHz Chain 1)



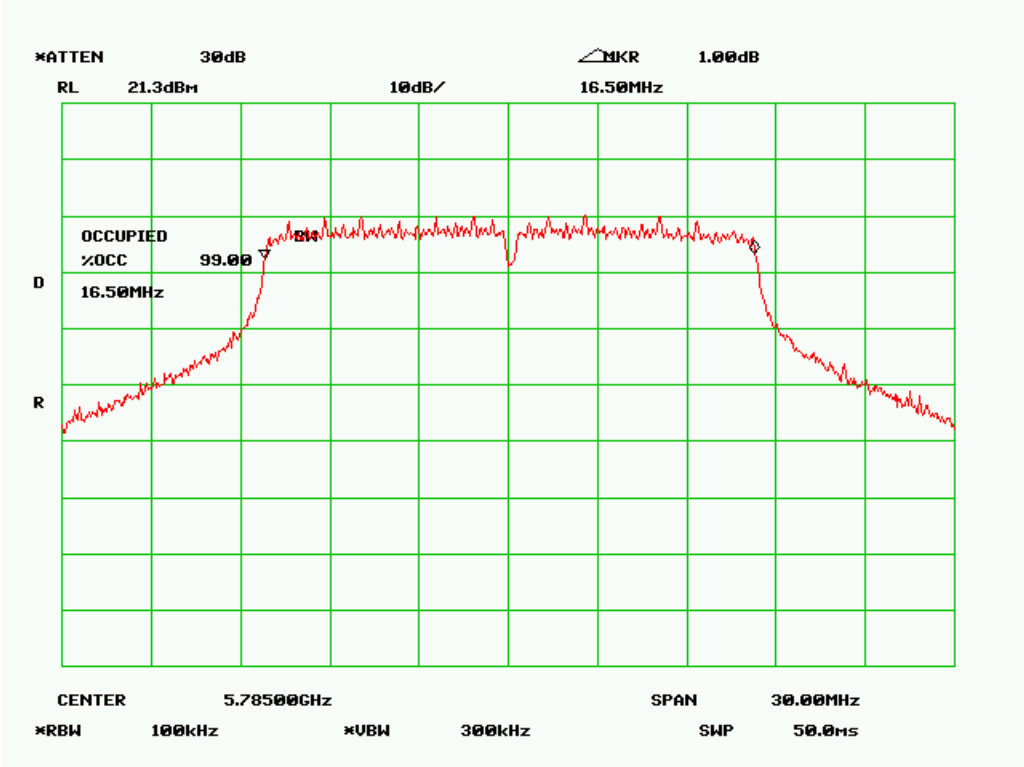
99% Bandwidth - Low Channel (20MHz Chain 2)



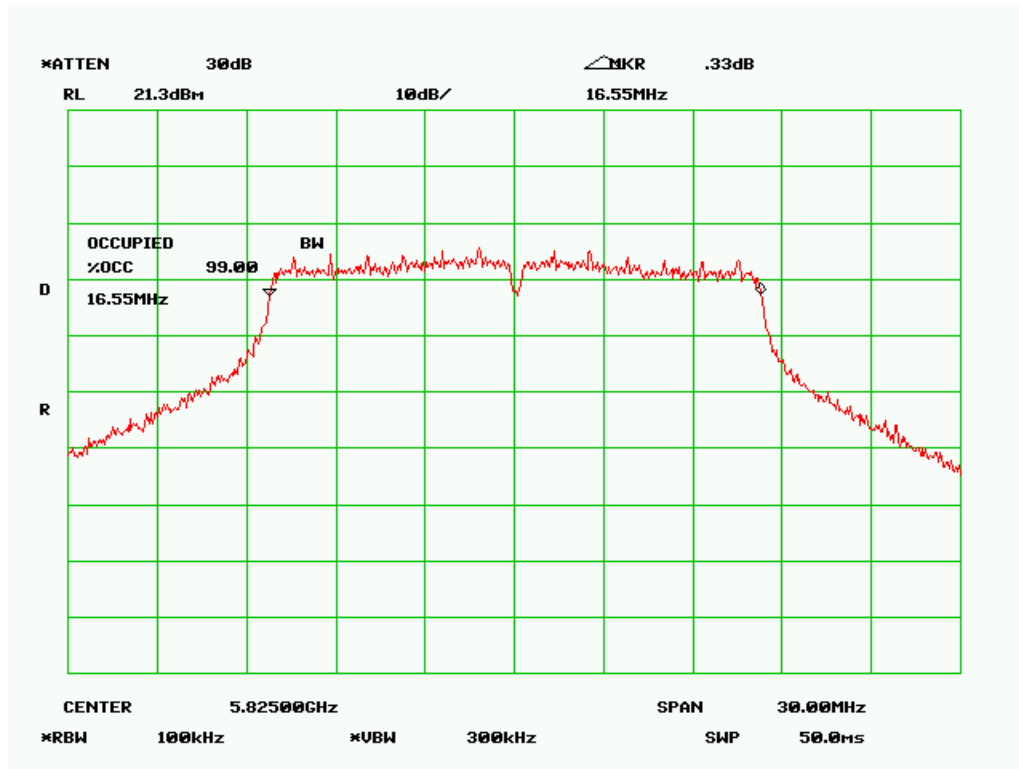
99% Bandwidth - Mid Channel (20MHz Chain 0)



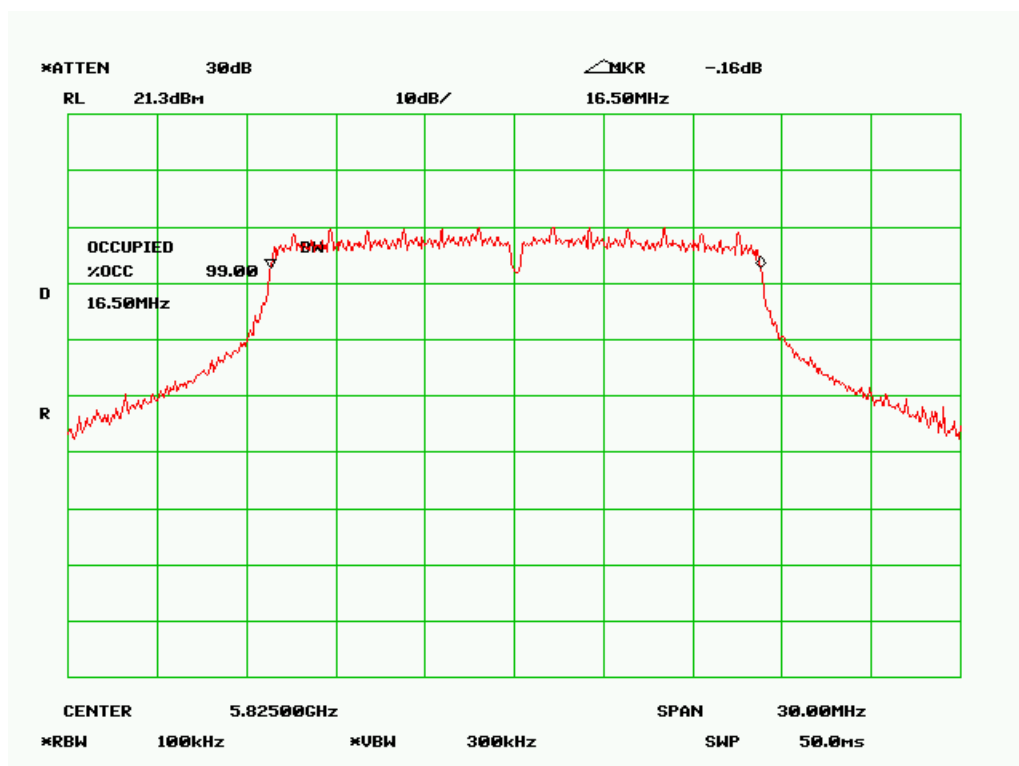
99% Bandwidth - Mid Channel (20MHz Chain 1)



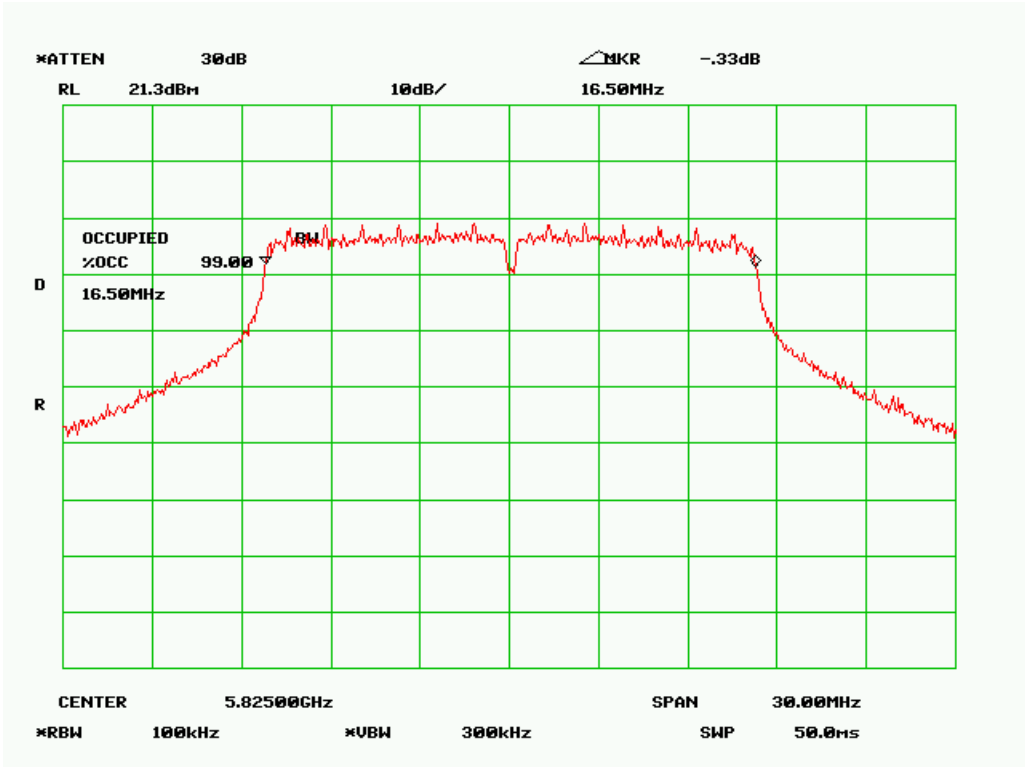
99% Bandwidth - Mid Channel (20MHz Chain 2)



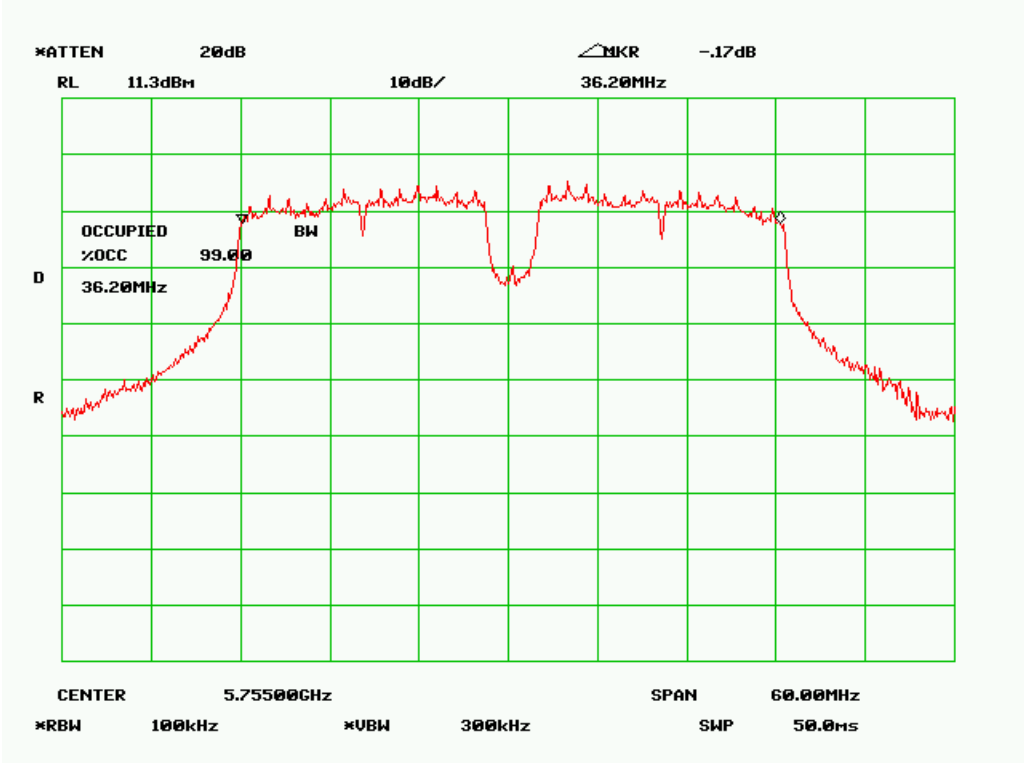
99% Bandwidth - High Channel (20MHz Chain 0)



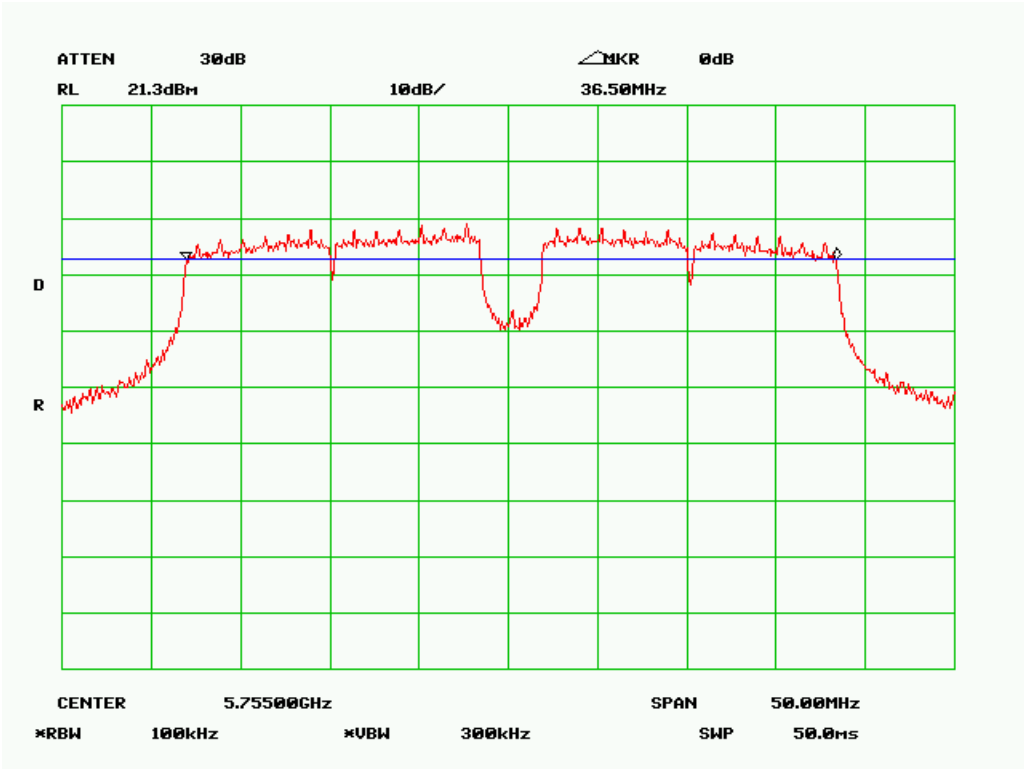
99% Bandwidth - High Channel (20MHz Chain 1)



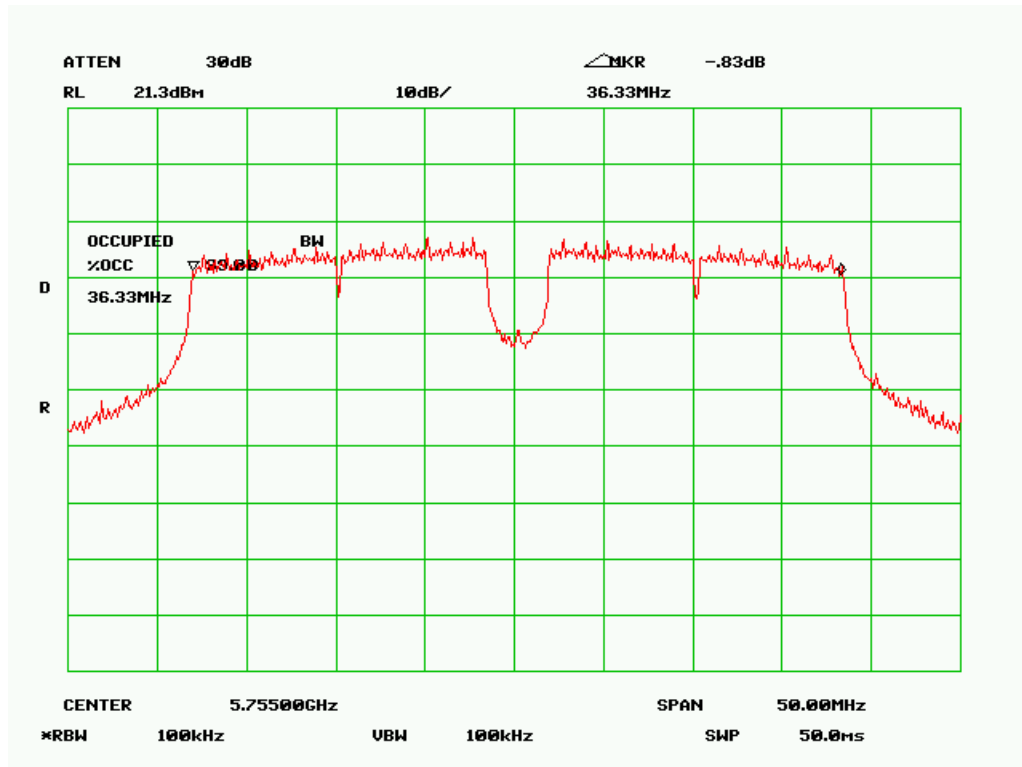
99% Bandwidth - High Channel (20MHz Chain 2)



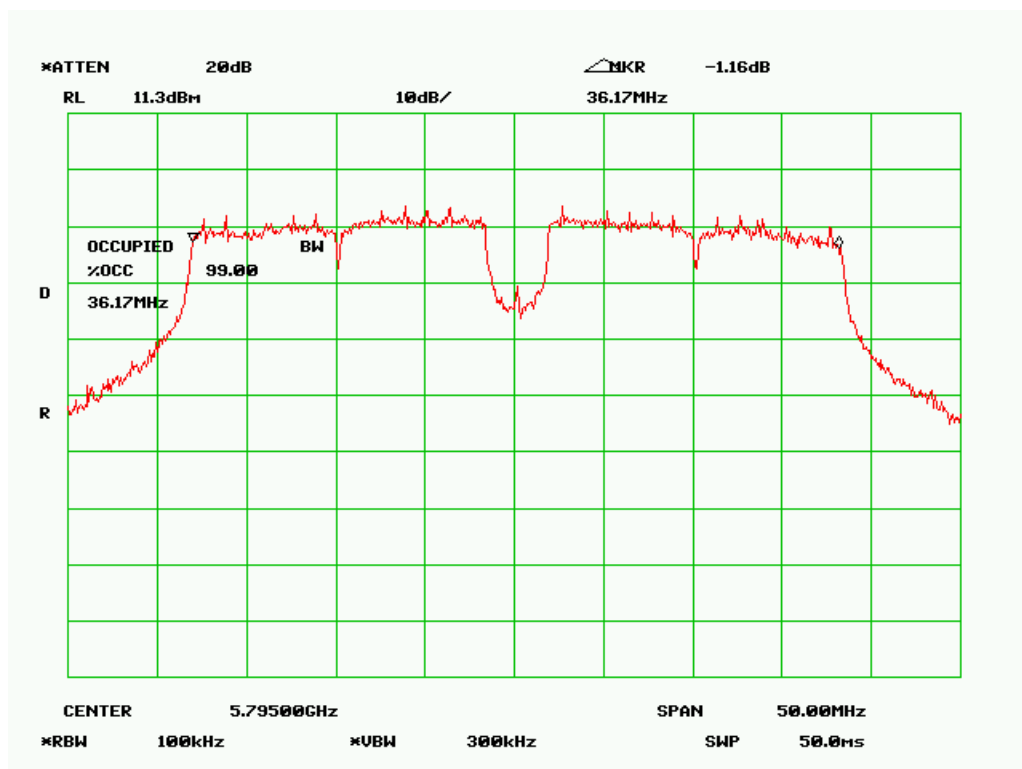
99% Bandwidth - Low Channel (40MHz Chain 0)



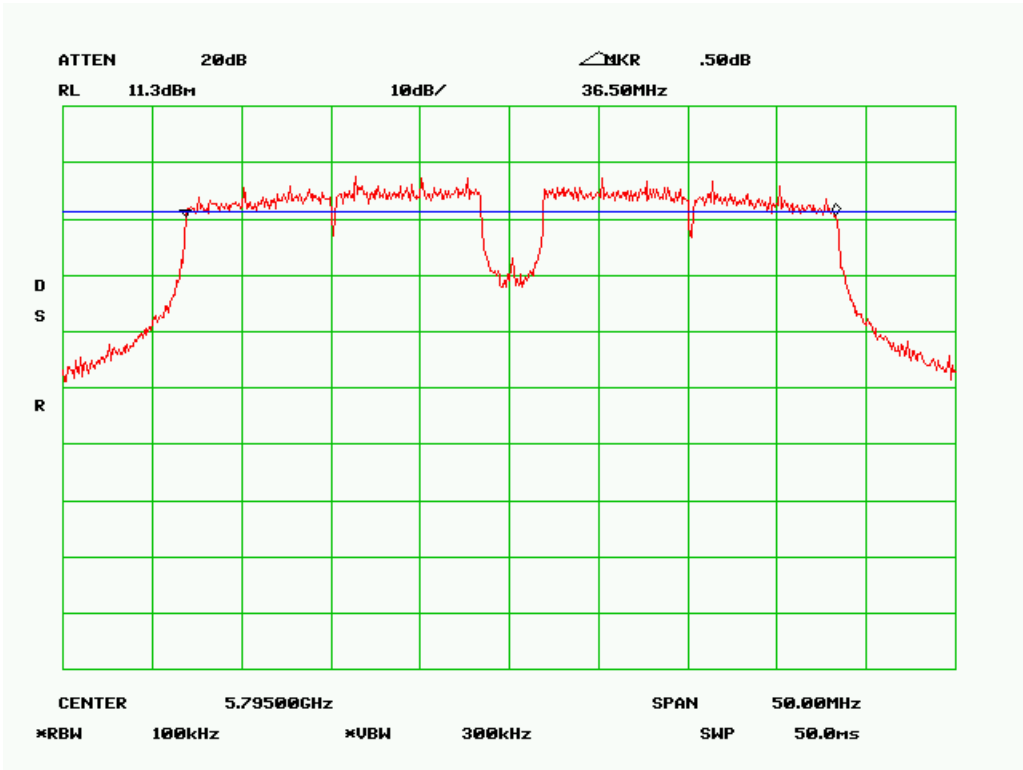
99% Bandwidth – Low Channel (40MHz Chain 1)



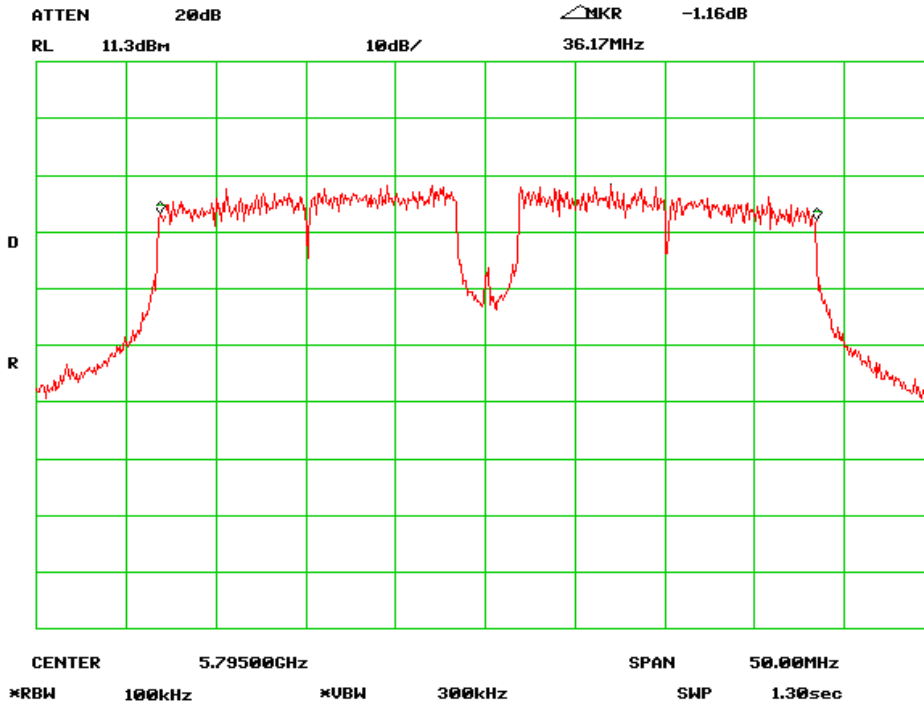
99% Bandwidth - Low Channel (40MHz Chain 2)



99% Bandwidth - High Channel (40MHz Chain 0)



99% Bandwidth - High Channel (40MHz Chain 1)



99% Bandwidth - High Channel (40MHz Chain 2)

5.4 Peak Spectral Density

- | | | | |
|----|---|--|-------------------------|
| 1. | Conducted Measurement
EUT was set for low , mid, high channel with modulated mode and highest RF output power.
The spectrum analyzer was connected to the antenna terminal. | | |
| 2 | Conducted Emissions Measurement Uncertainty
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is $\pm 1.5\text{dB}$. | | |
| 3 | Environmental Conditions | Temperature
Relative Humidity
Atmospheric Pressure | 23°C
50%
1019mbar |
| 4 | Test Date : January 12-23 2009
Tested By :Choon Sian Ooi | | |

Standard Requirement : 47 CFR §15.247(e); RSS210(A8.3)

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission

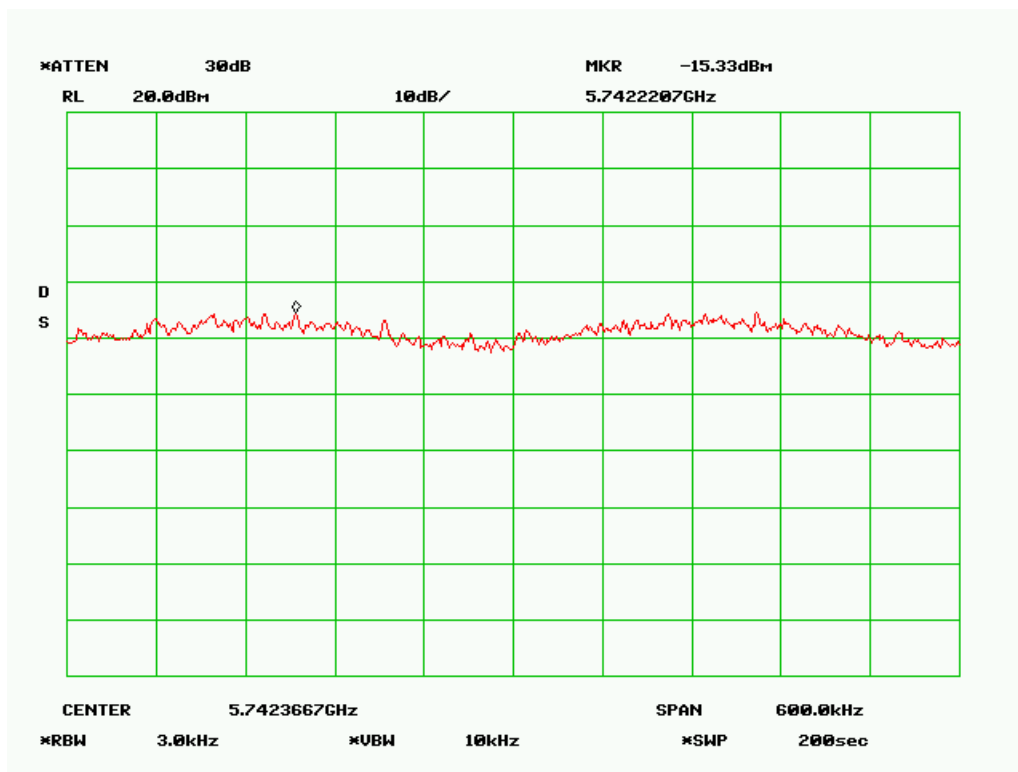
Procedures: The Peak Spectral density measurement was taken conducted using a spectrum analyzer.

RBW=3KHz, VBW > RBW , Sweep time to SPAN/RBW (sec)

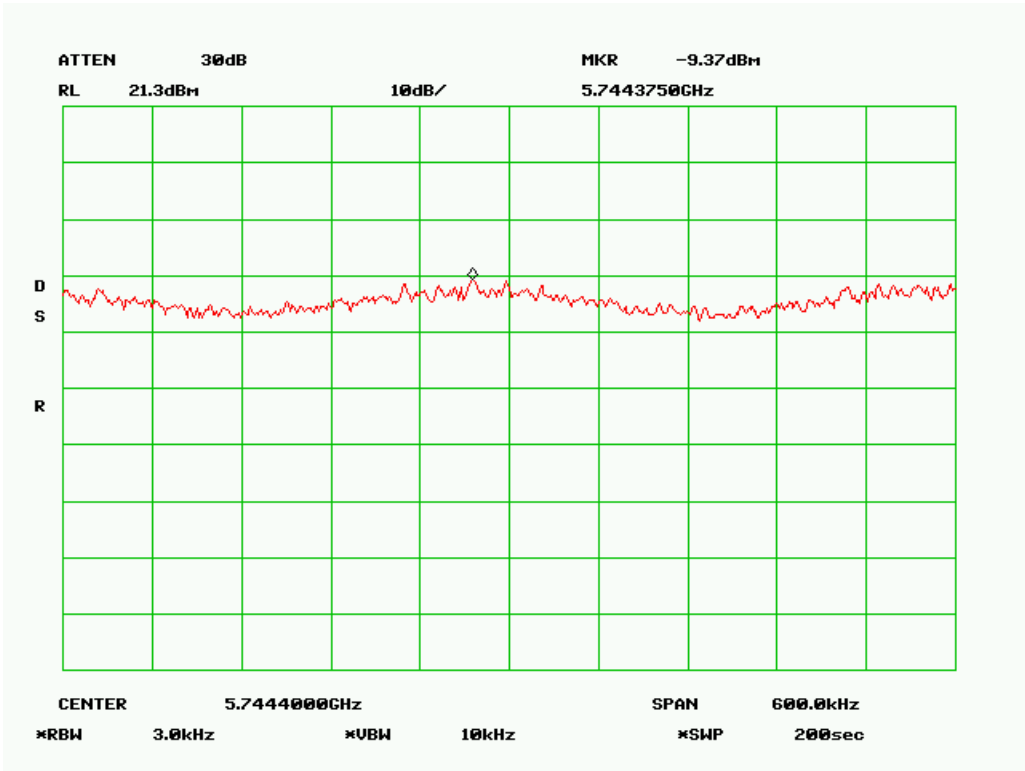
Test Result :

Channel	Channel Bandwidth	Chain	PSD (dBm)	Total PSD (dBm)	PSD Limit (dBm)
Low Channel (5745 MHz)	20MHz	0	-15.33	-1.91	4
	20MHz	1	-9.37		4
	20MHz	2	-10.70		4
Mid Channel (5785 MHz)	20MHz	0	-14.70	-2.17	4
	20MHz	1	-10.37		4
	20MHz	2	-10.70		4
High Channel (5825 MHz)	20MHz	0	-15.70	-3.47	4
	20MHz	1	-10.70		4
	20MHz	2	-13.37		4
Low Channel (5755 MHz)	40MHz	0	-17.37	-4.90	4
	40MHz	1	-12.87		4
	40MHz	2	-13.70		4
High Channel (5795 MHz)	40MHz	0	-18.53	-5.55	4
	40MHz	1	-13.53		4
	40MHz	2	-14.03		4

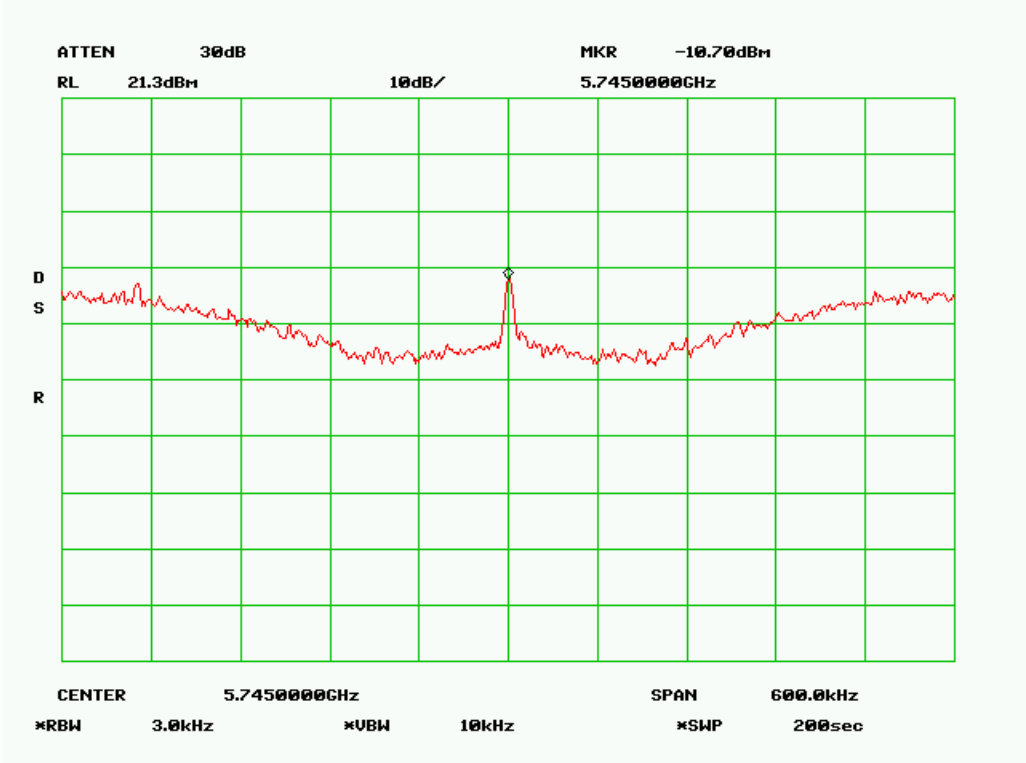
PS: No limit reduction due to PTP operation for all antenna over 10 dBi
Refer to the attached plots.



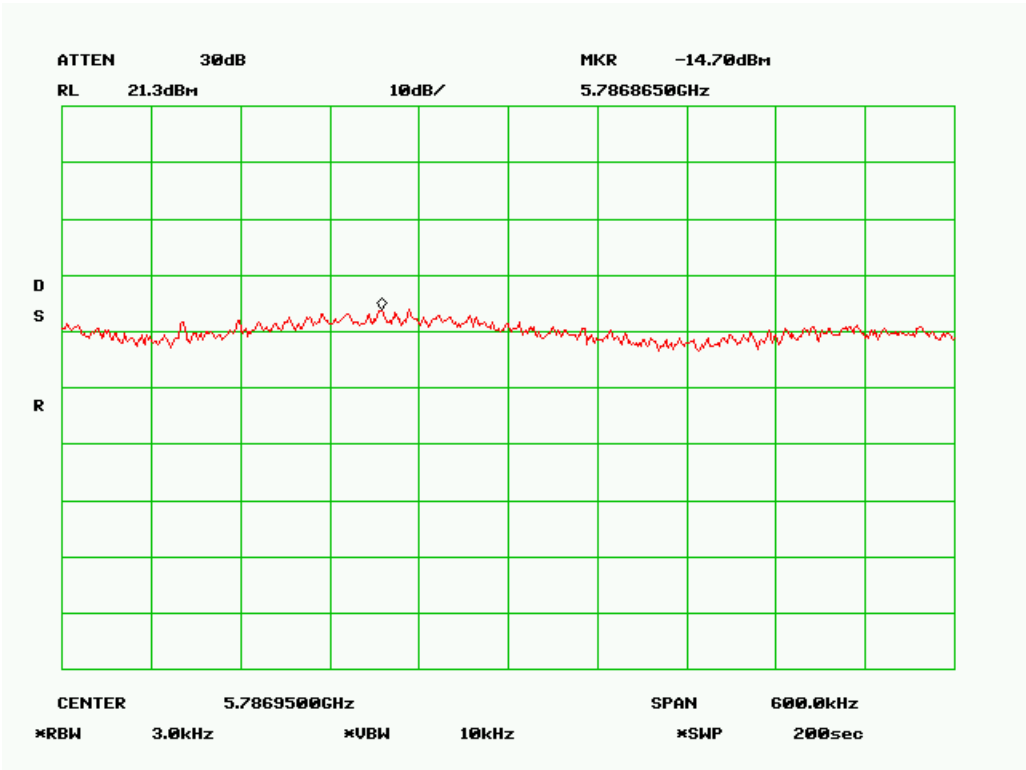
Low Channel (20MHz Chain 0)



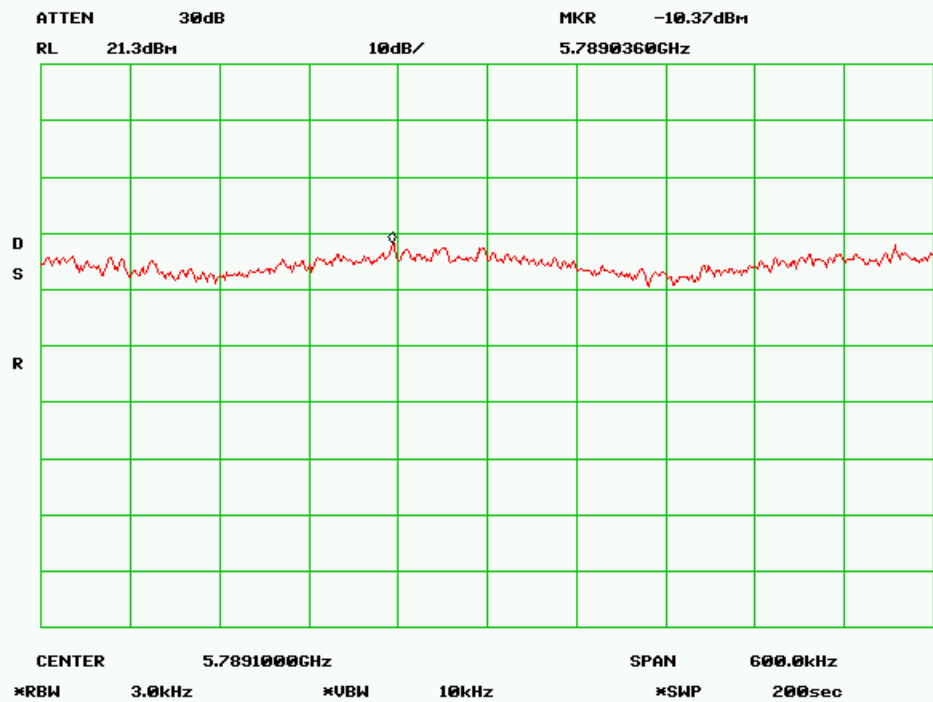
Low Channel (20MHz Chain 1)



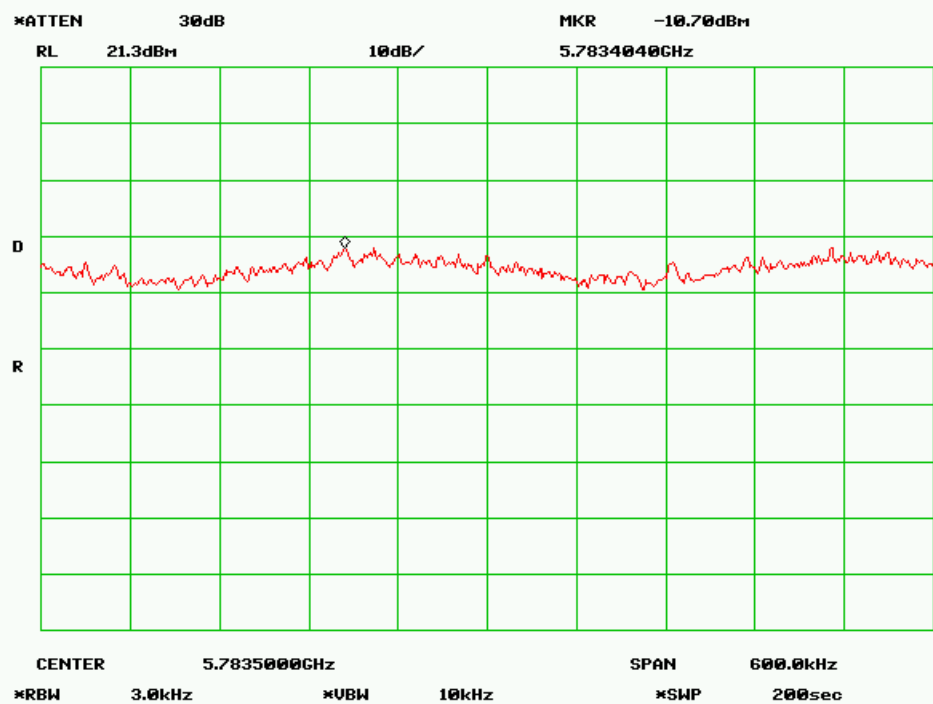
Low Channel (20MHz Chain 2)



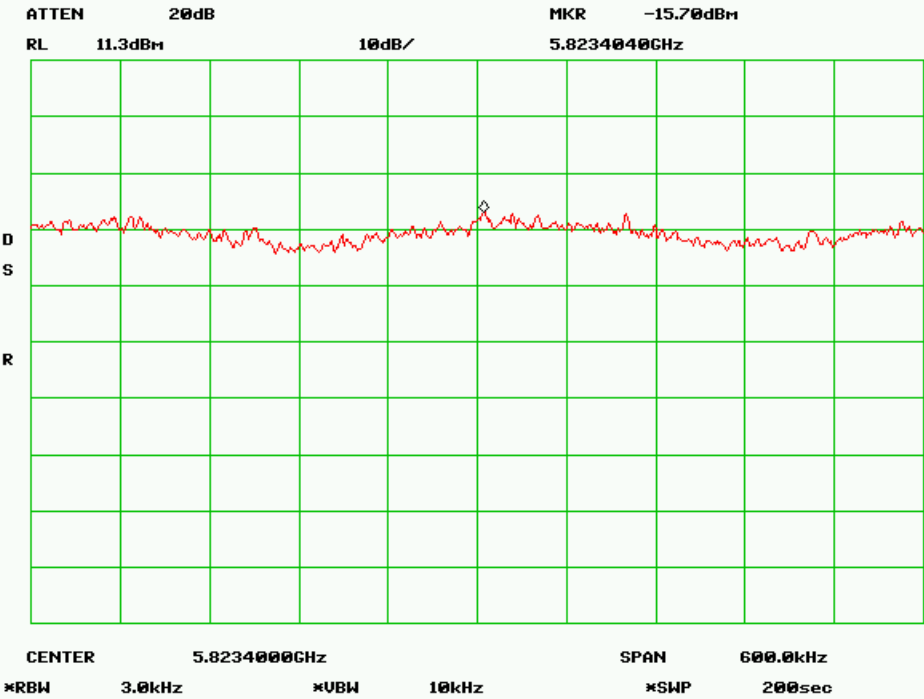
Mid Channel (20MHz Chain 0)



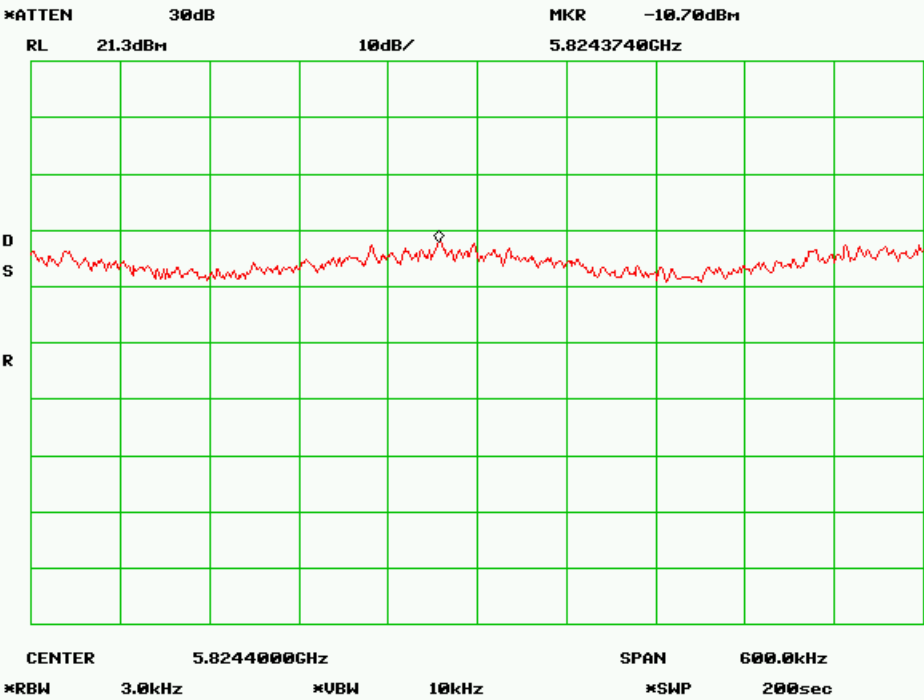
Mid Channel (20MHz Chain 1)



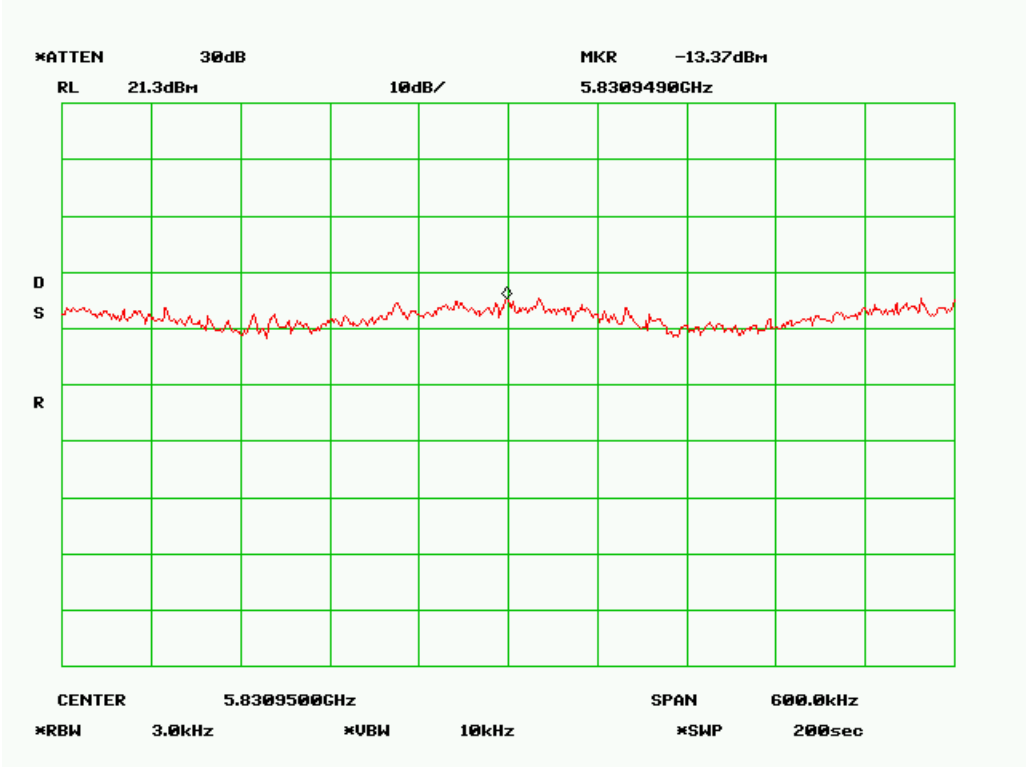
Mid Channel (20MHz Chain 2)



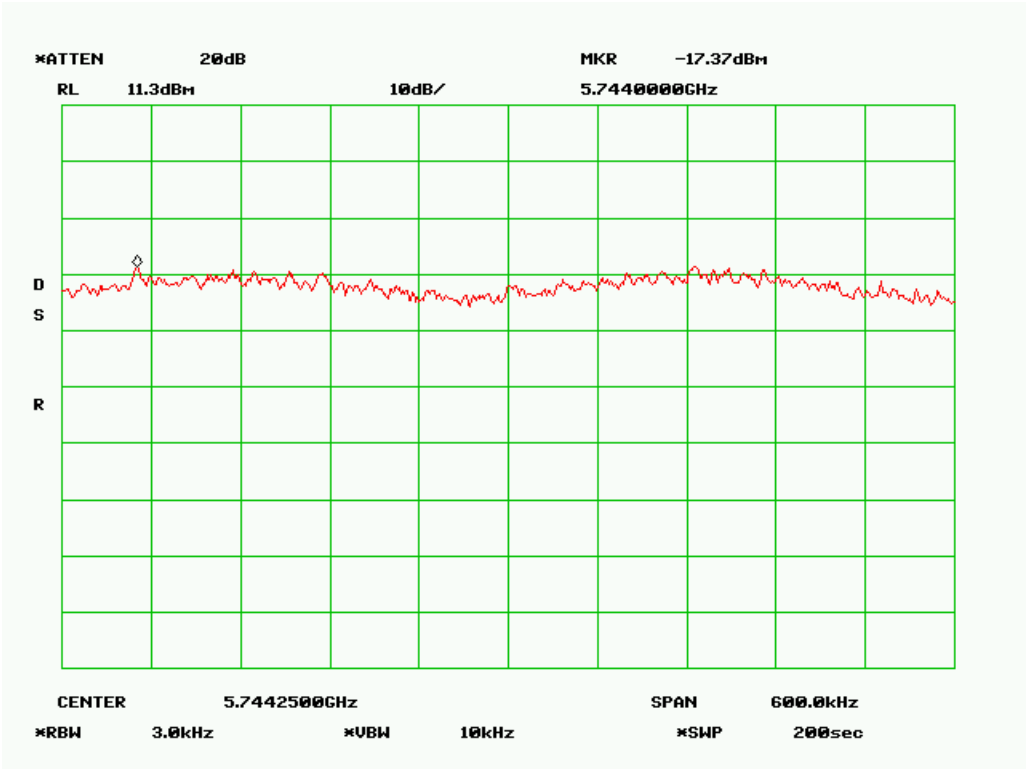
High Channel (20MHz Chain 0)



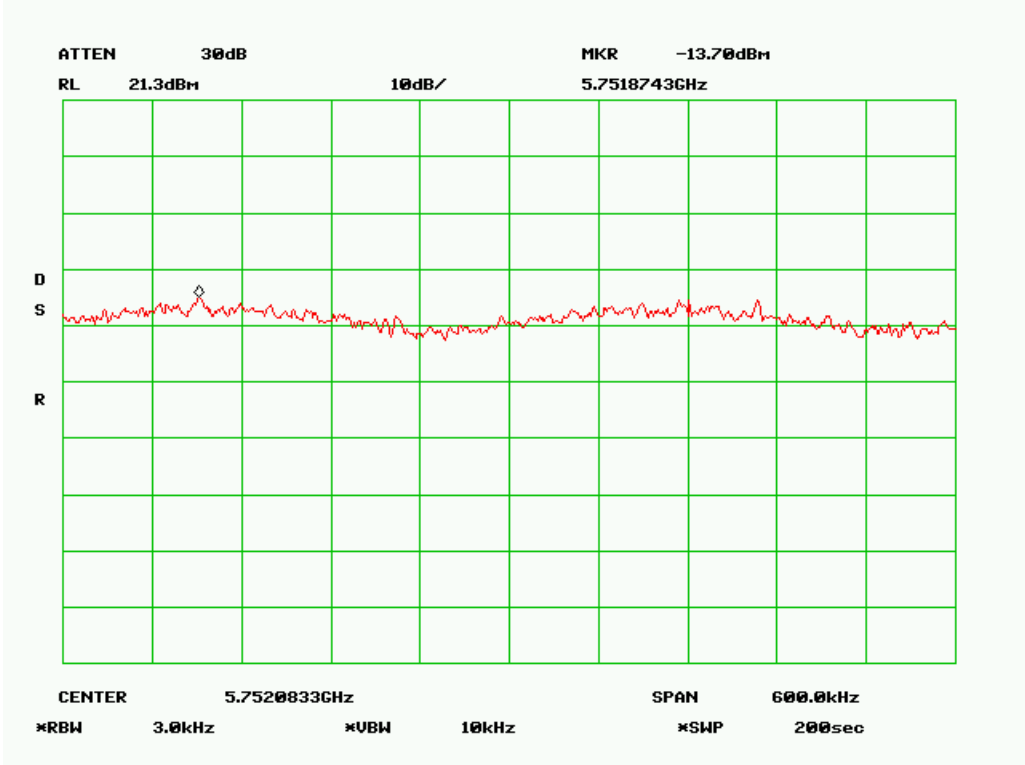
High Channel (20MHz Chain 1)



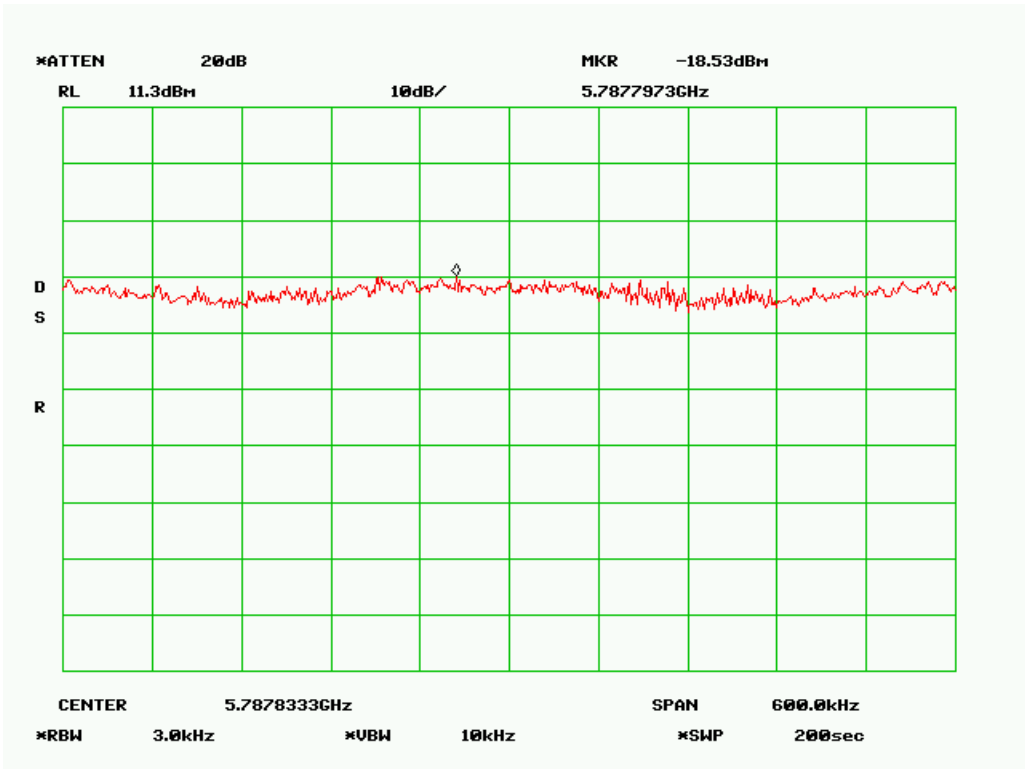
High Channel (20MHz Chain 2)



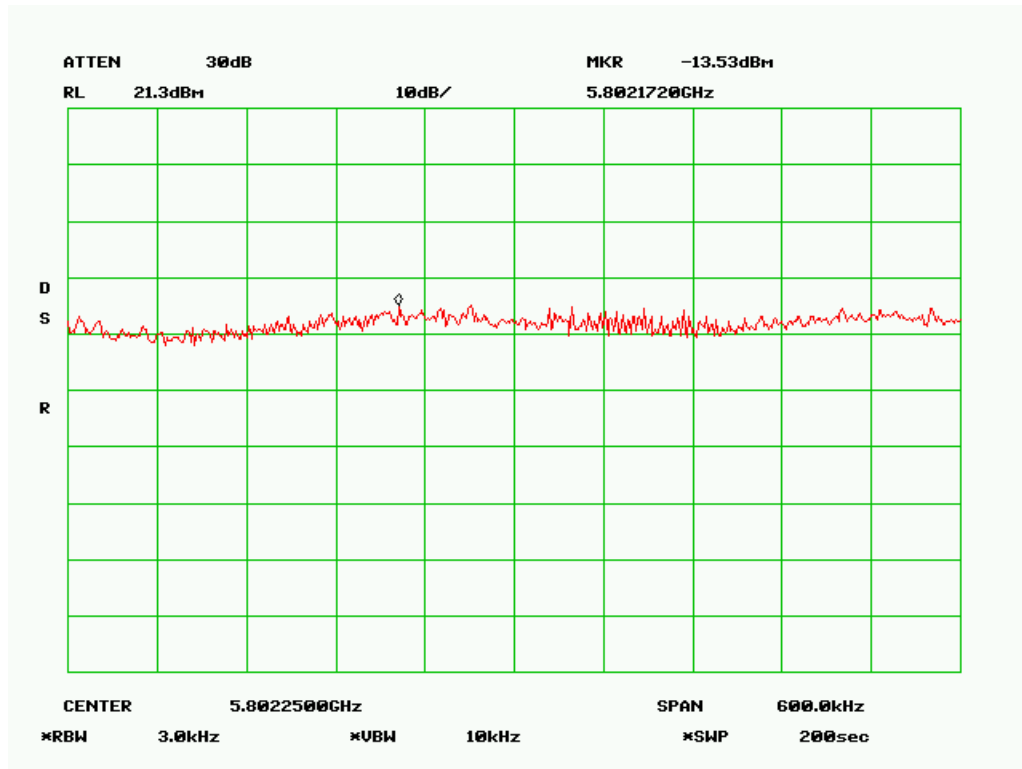
Low Channel (40MHz Chain 0)



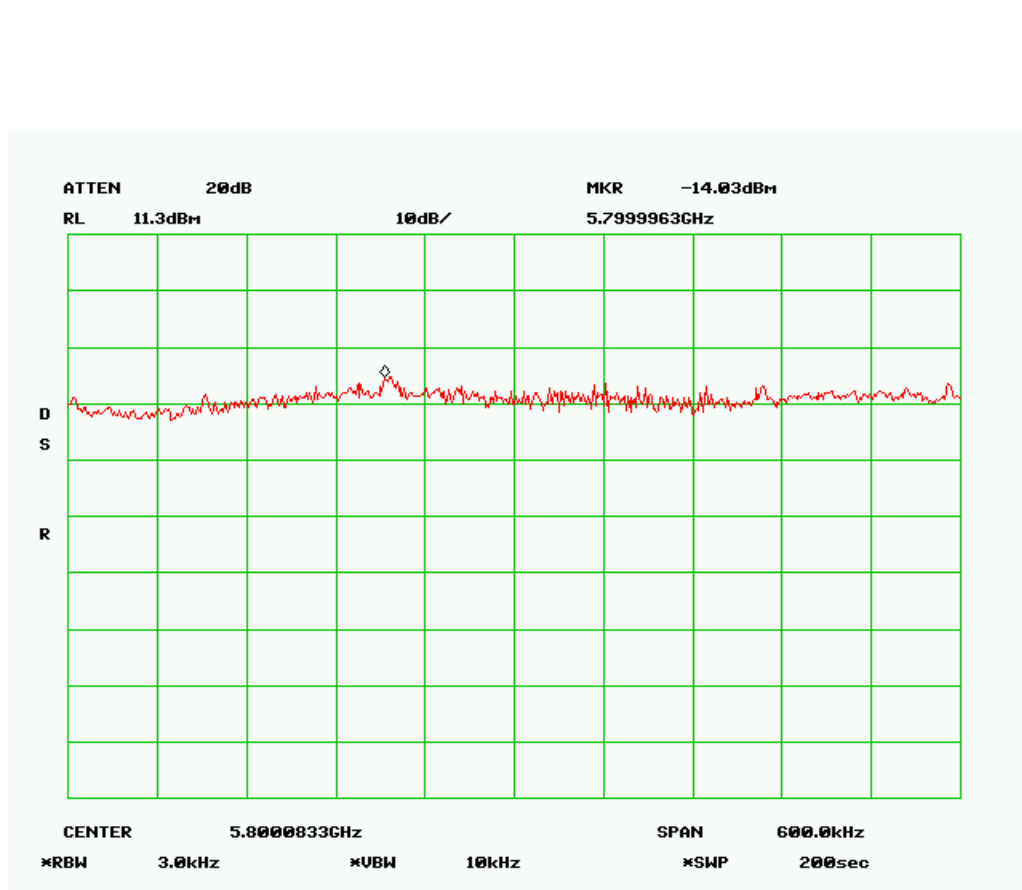
Low Channel (40MHz Chain 2)



High Channel (40MHz Chain 0)



High Channel (40MHz Chain 1)



High Channel (40MHz Chain 2)

5.10 Peak Output Power

1. Conducted Measurement
EUT was set for low , mid, high channel with modulated mode and highest RF output power.
The spectrum analyzer was connected to the antenna terminal.
2. Conducted Emissions Measurement Uncertainty
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is $\pm 1.5\text{dB}$.
3. Environmental Conditions

Temperature	23°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar
4. Test Date : January 12-23 2009
Tested By :Choon Sian Ooi

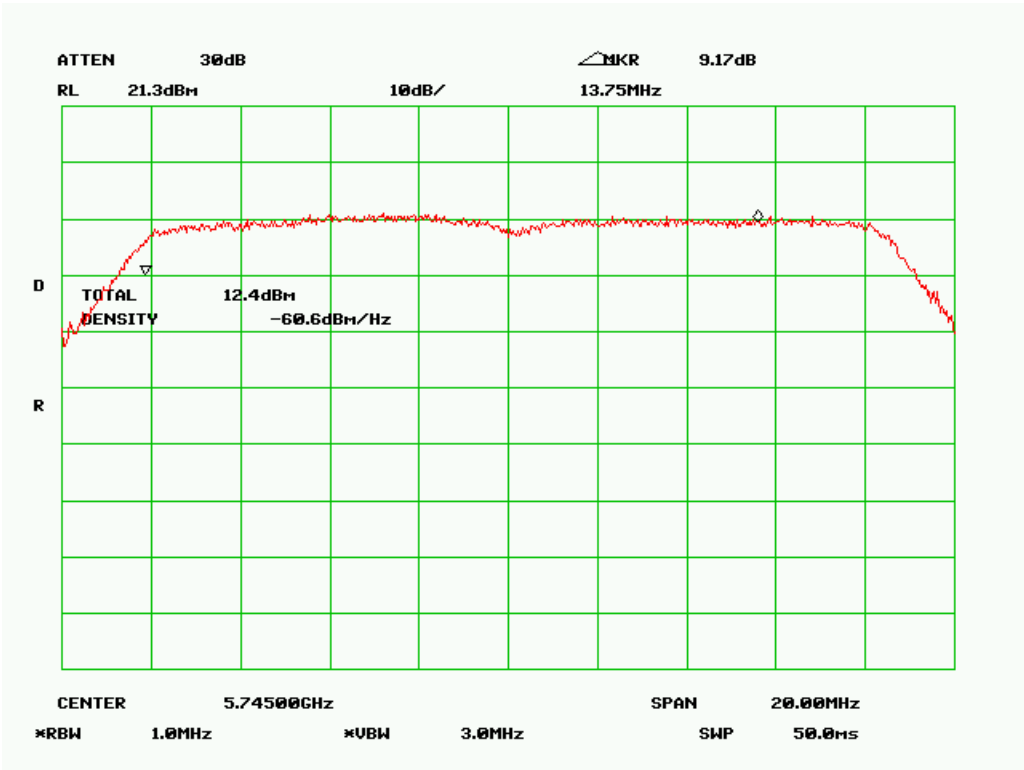
Standard Requirement: 47 CFR §15.247(b); RSS210 (A8.4)

Procedures: The peak output power was measured conducted using a spectrum analyzer at low, mid, and hi channels. Sample detector was set to measure the power output.

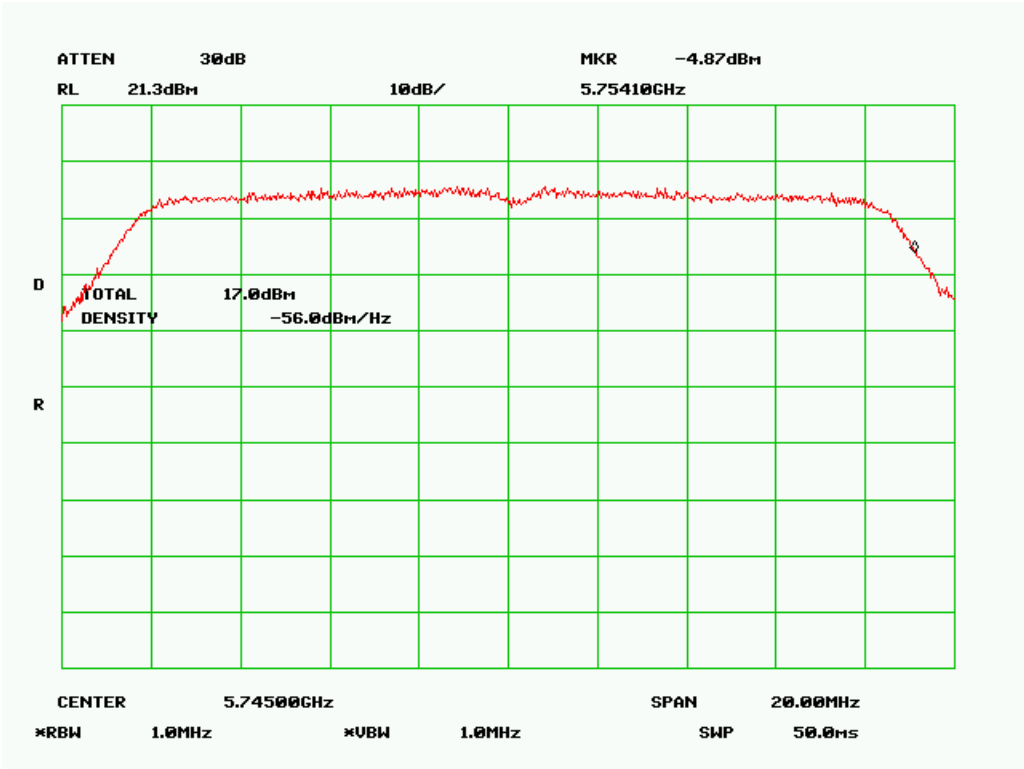
Test Result:

Channel	Channel Bandwidth	Chain	Output Power (dBm)	Total Power (dBm)	Limit (dBm)
Low Channel (5745 MHz)	20MHz	0	12.40	24.96	26
	20MHz	1	17.00		
	20MHz	2	16.20		
Mid Channel (5785 MHz)	20MHz	0	12.30	24.67	26
	20MHz	1	16.60		
	20MHz	2	15.90		
High Channel (5825 MHz)	20MHz	0	10.30	23.40	26
	20MHz	1	15.60		
	20MHz	2	14.80		
Low Channel (5755 MHz)	40MHz	0	11.60	24.24	26
	40MHz	1	16.30		
	40MHz	2	15.50		
High Channel (5795 MHz)	40MHz	0	11.30	23.57	26
	40MHz	1	15.80		
	40MHz	2	14.40		

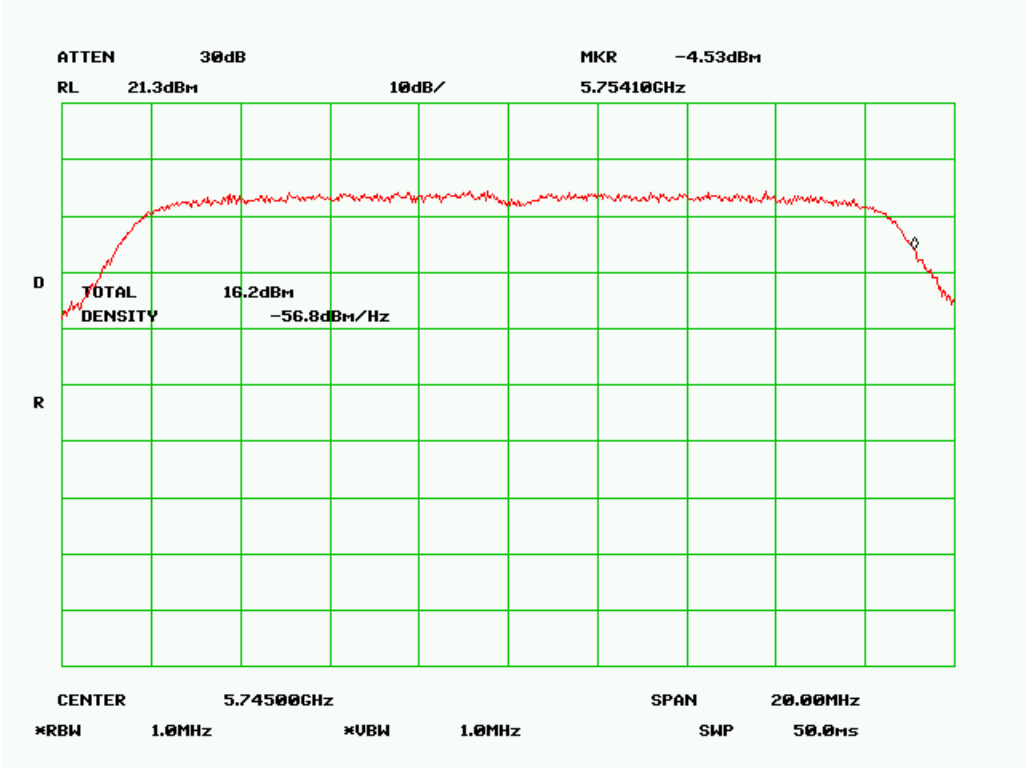
Note: The above power limit is for point to multi point transmit mode. The higher antenna gain for point to multi point transmit mode is 10dbi so 4dB which had exceeded the maximum antenna gain 6dBi will be deducted from the normal power limit 30dBm.



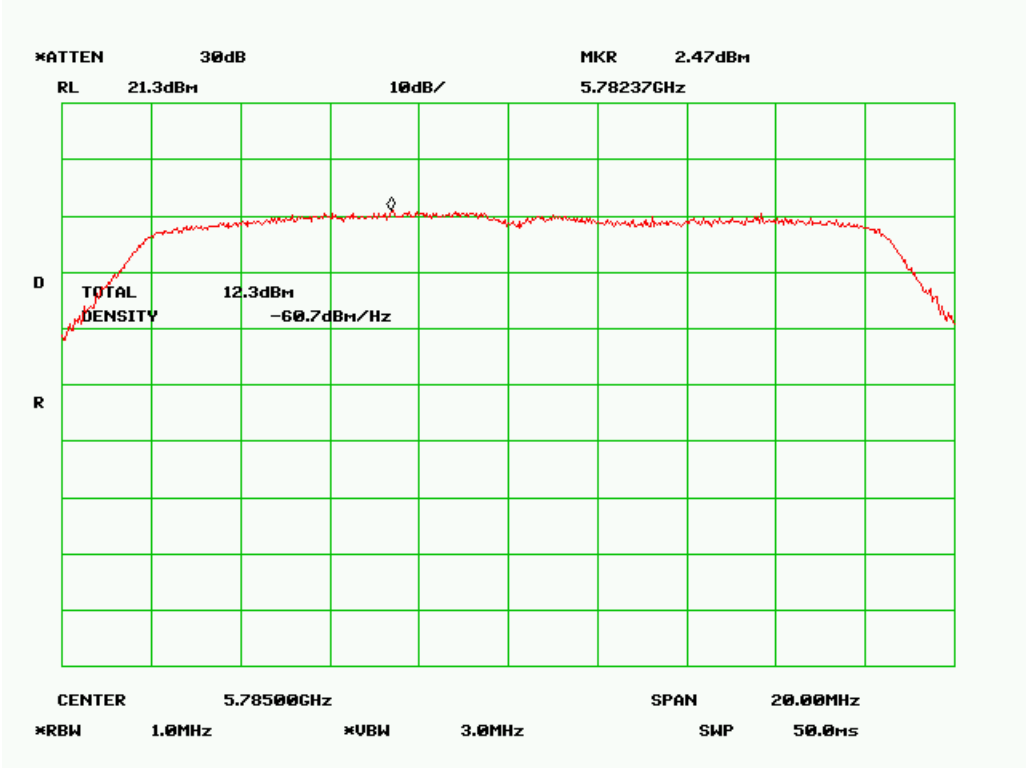
Low Channel (20MHz Chain 0)



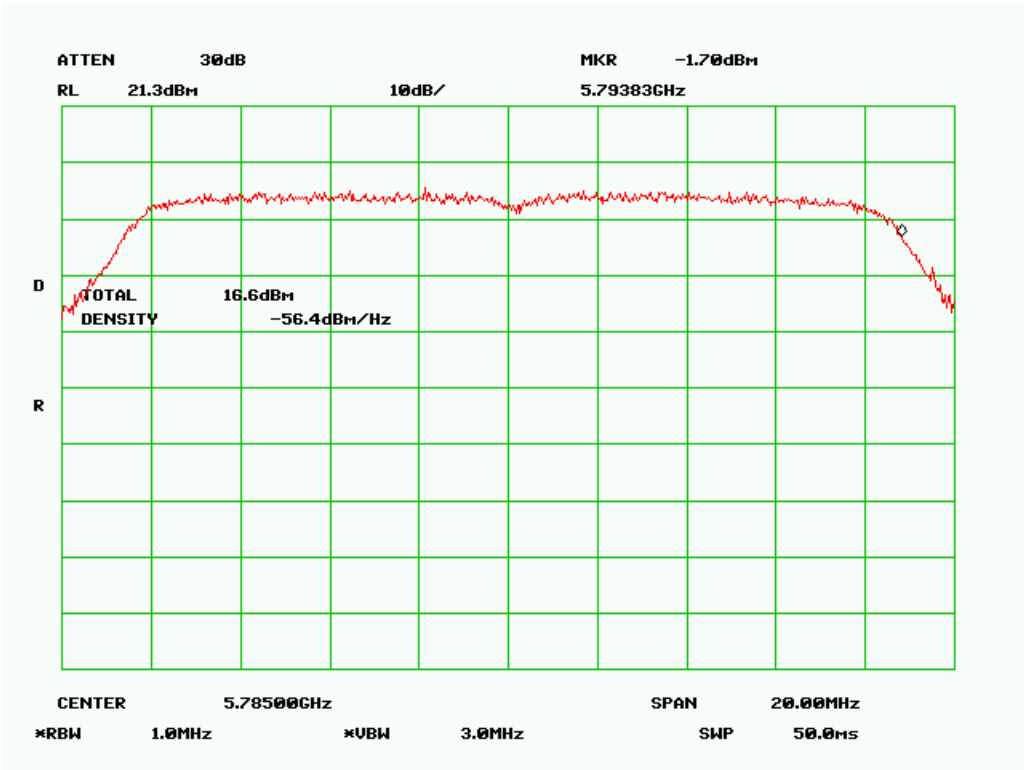
Low Channel (20MHz Chain 1)



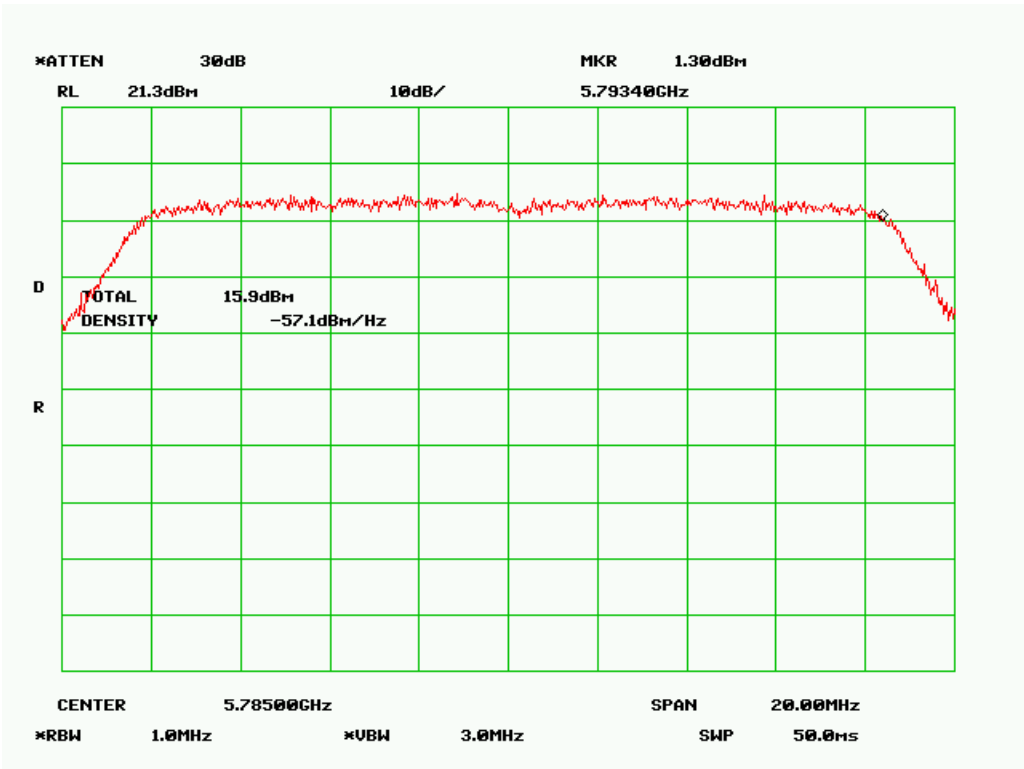
Low Channel (20MHz Chain 2)



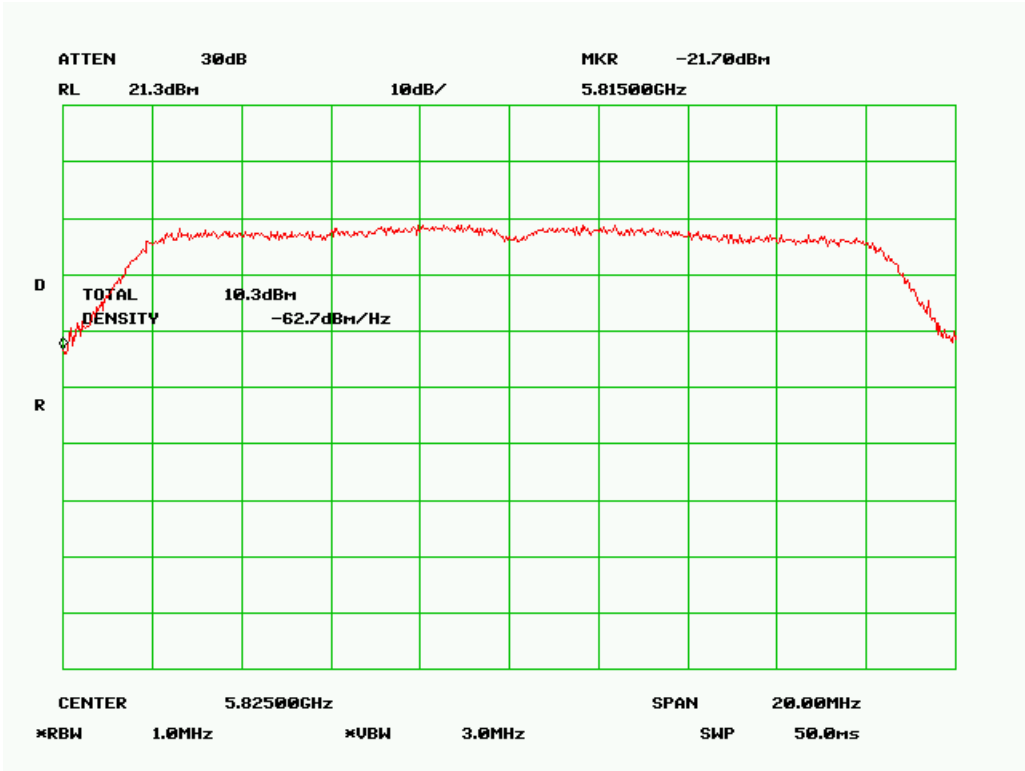
Mid Channel (20MHz Chain 0)



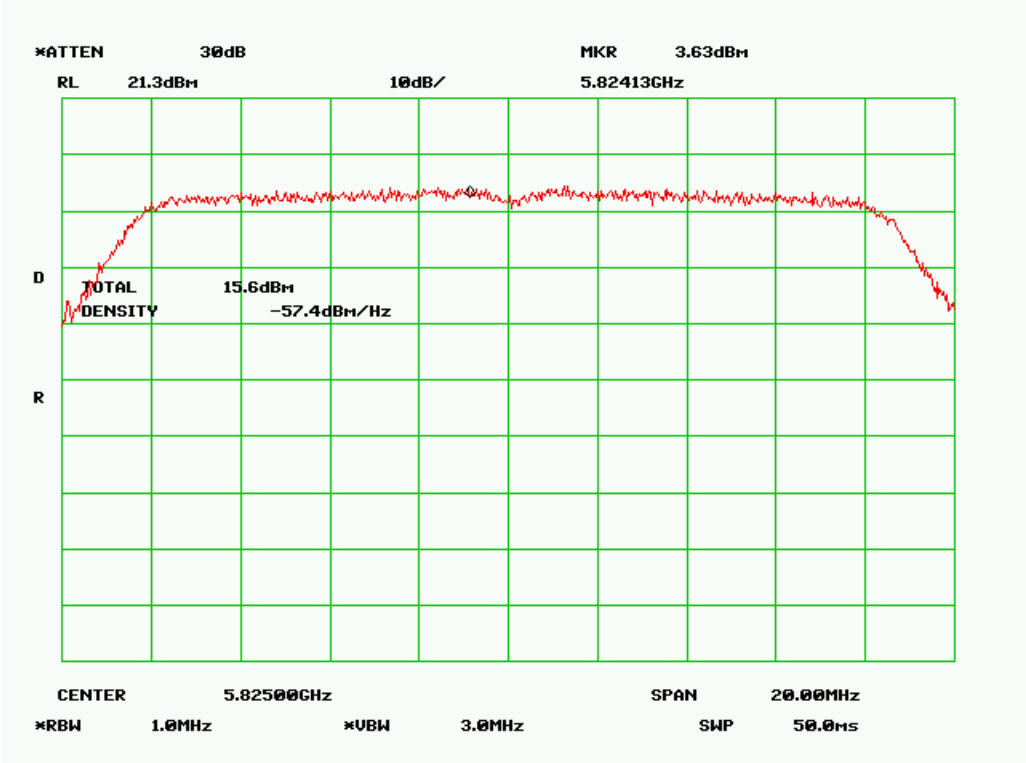
Mid Channel (20MHz Chain 1)



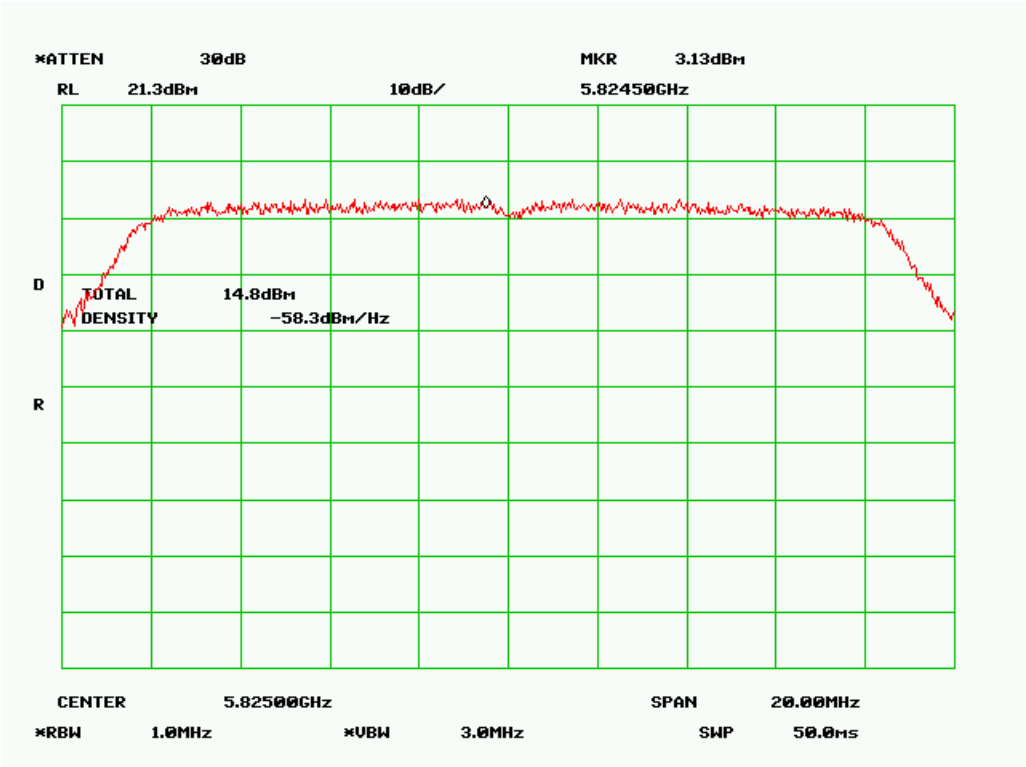
Mid Channel (20MHz Chain 2)



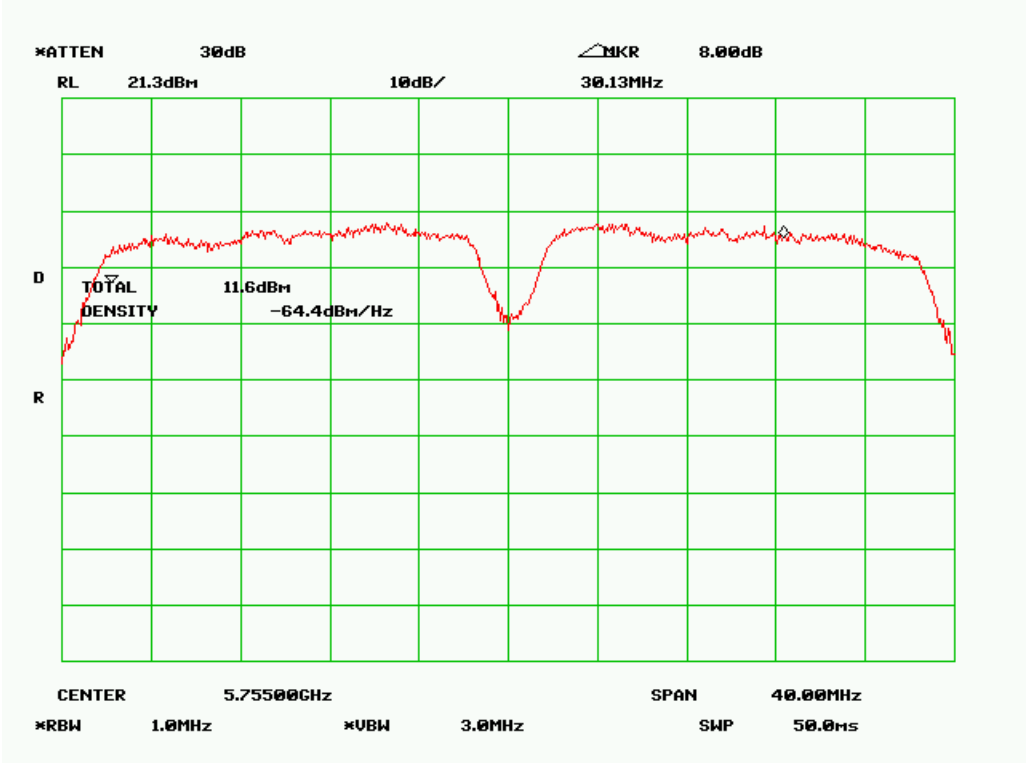
High Channel (20MHz Chain 0)



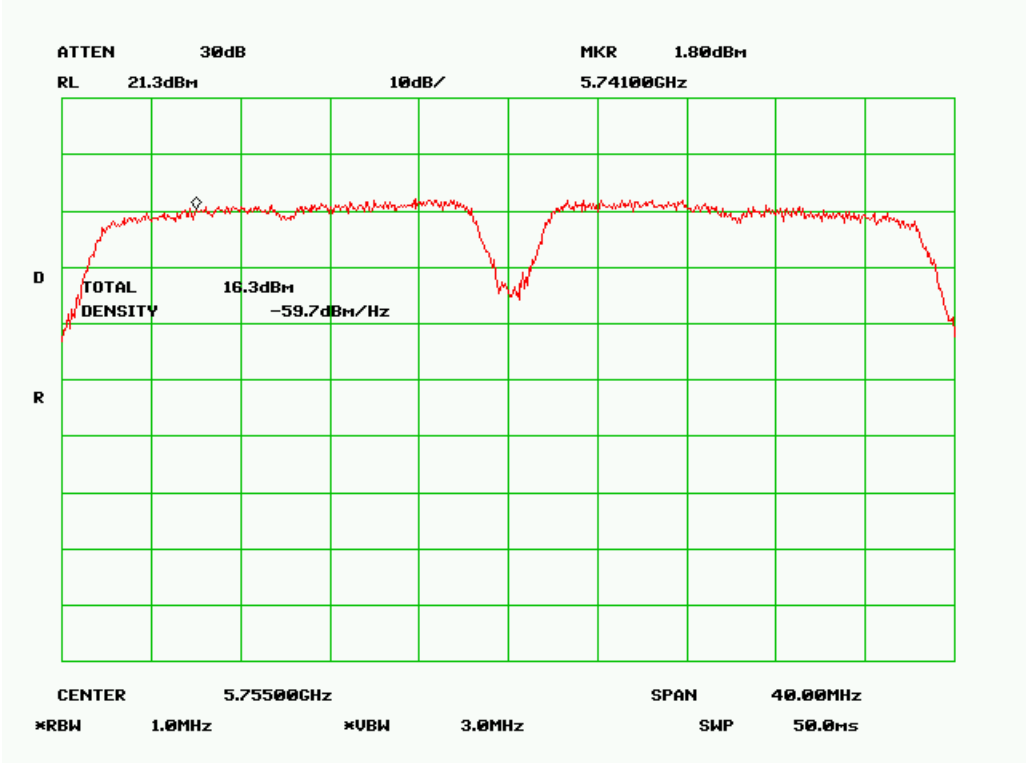
High Channel (20MHz Chain 1)



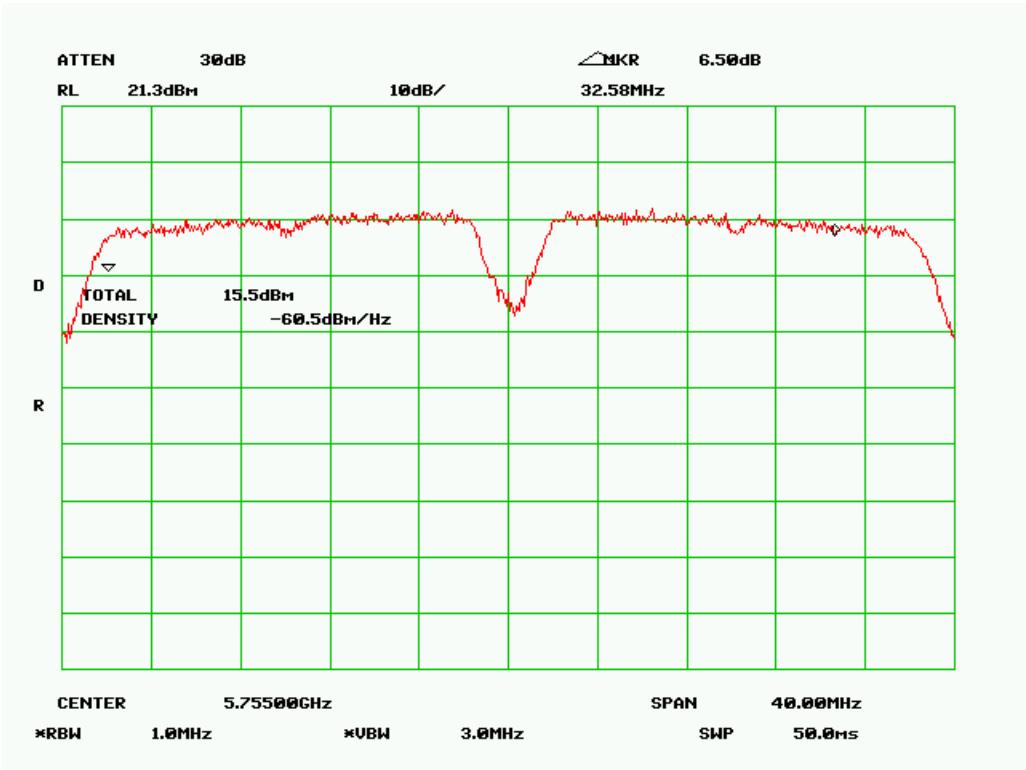
High Channel (20MHz Chain 2)



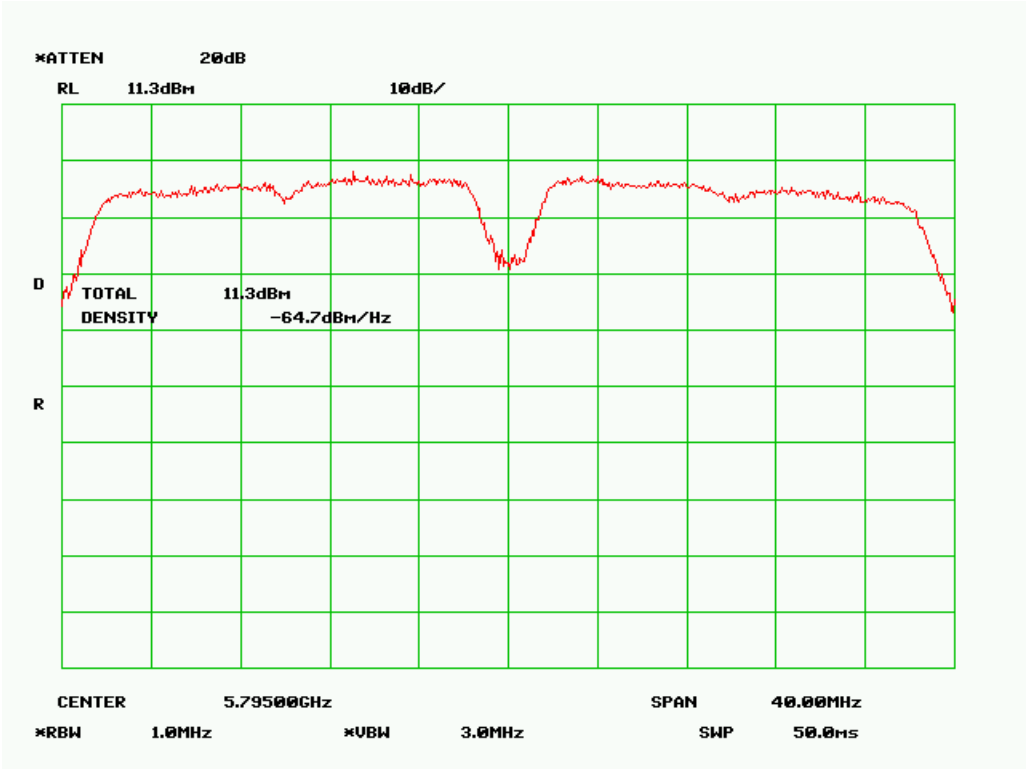
Low Channel (40MHz Chain 0)



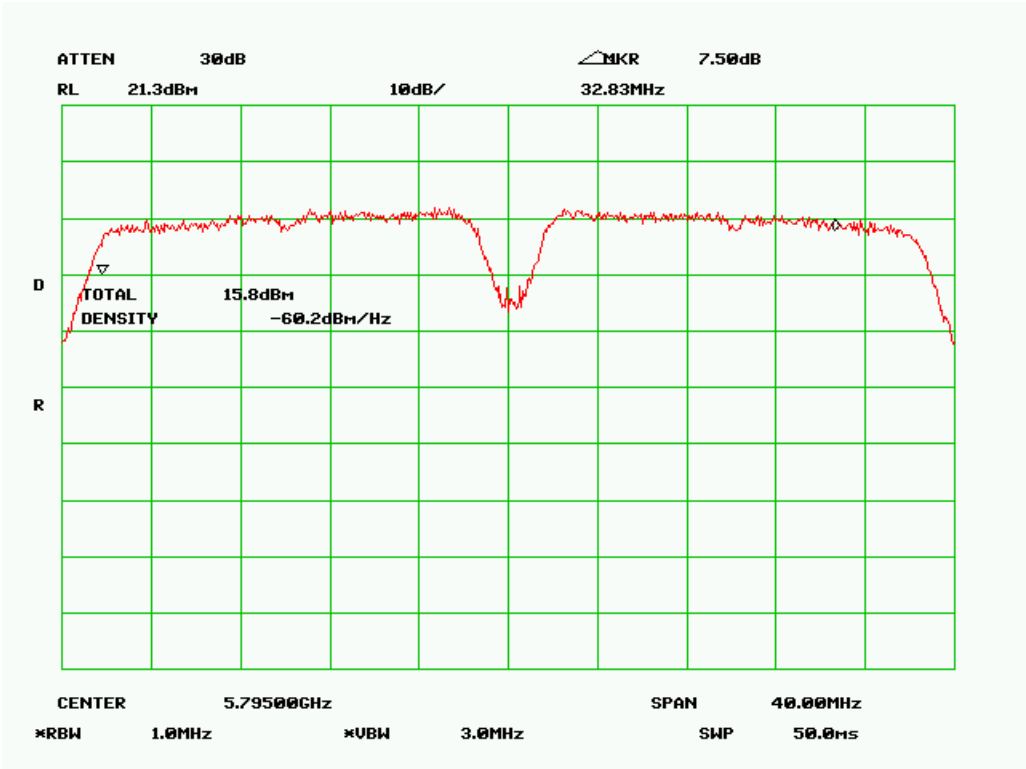
Low Channel (40MHz Chain 1)



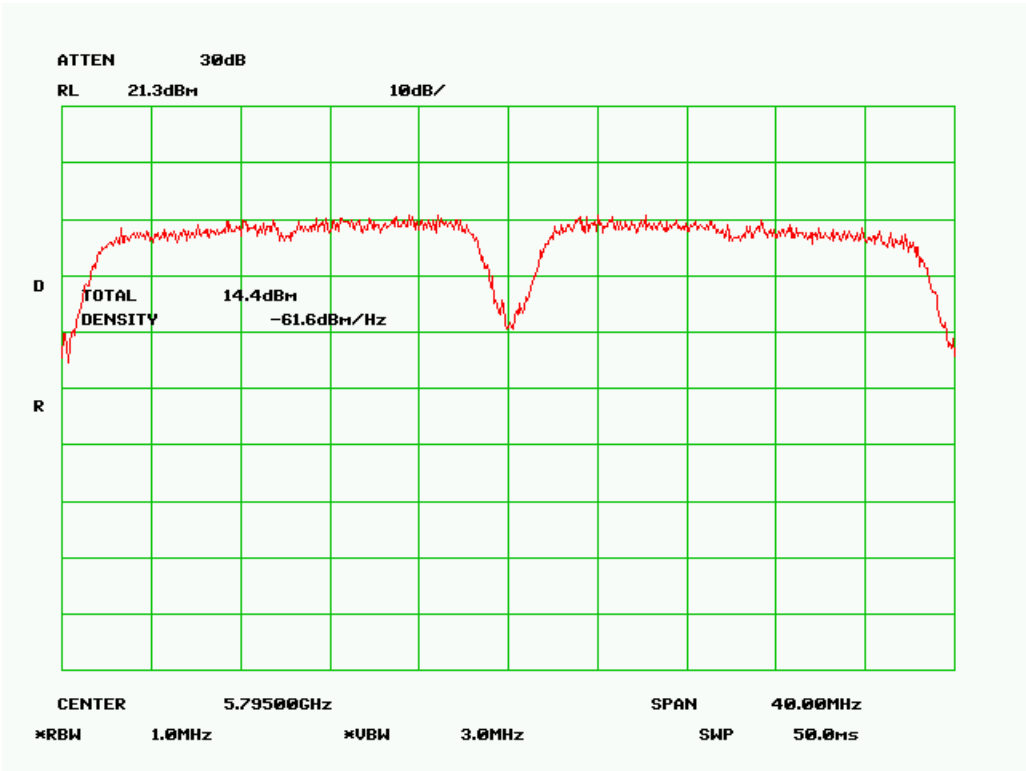
Low Channel (40MHz Chain 2)



High Channel (40MHz Chain 0)



High Channel (40MHz Chain 1)



High Channel (40MHz Chain 2)

5.10 Antenna Port Emission

- Conducted Measurement
EUT was set for low , mid, high channel with modulated mode and highest RF output power.
The spectrum analyzer was connected to the antenna terminal.
- Conducted Emissions Measurement Uncertainty
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ± 1.5 dB.
- Environmental Conditions

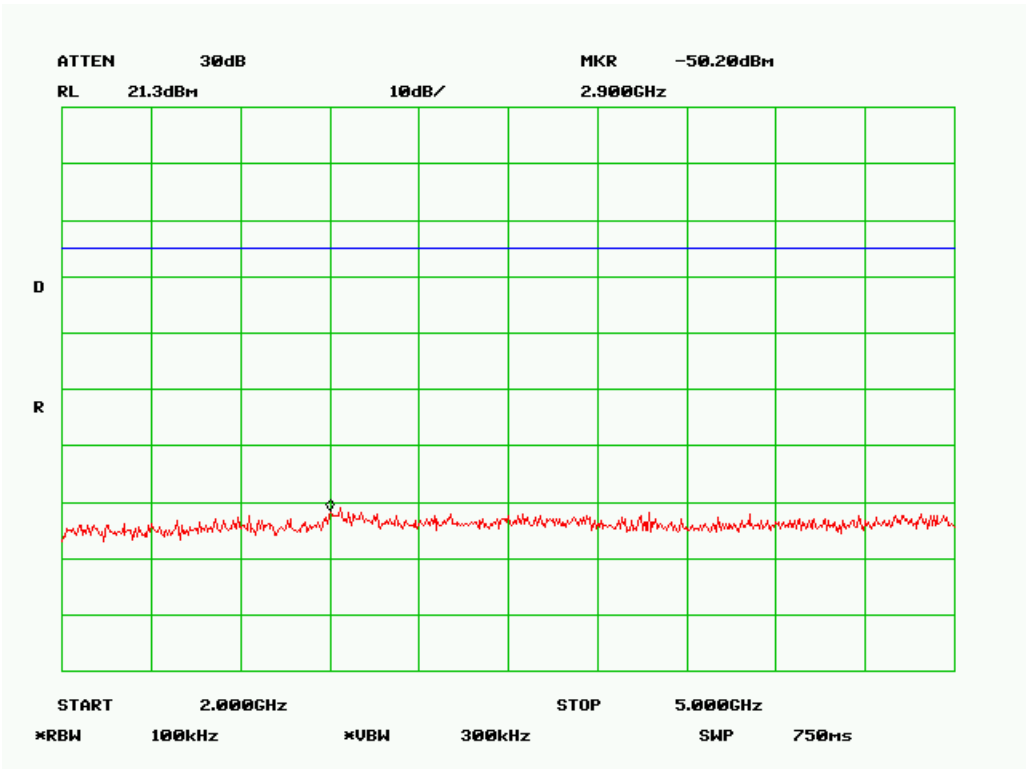
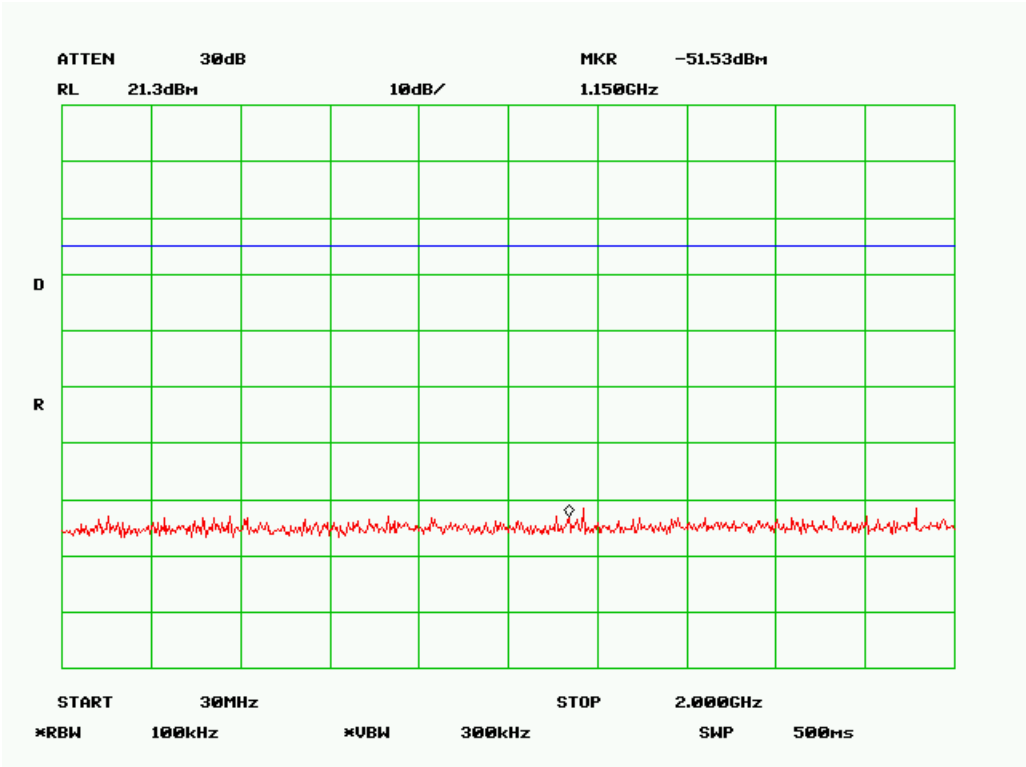
Temperature	23°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar
- Test Date : January 12-23 2009
Tested By :Choon Sian Ooi

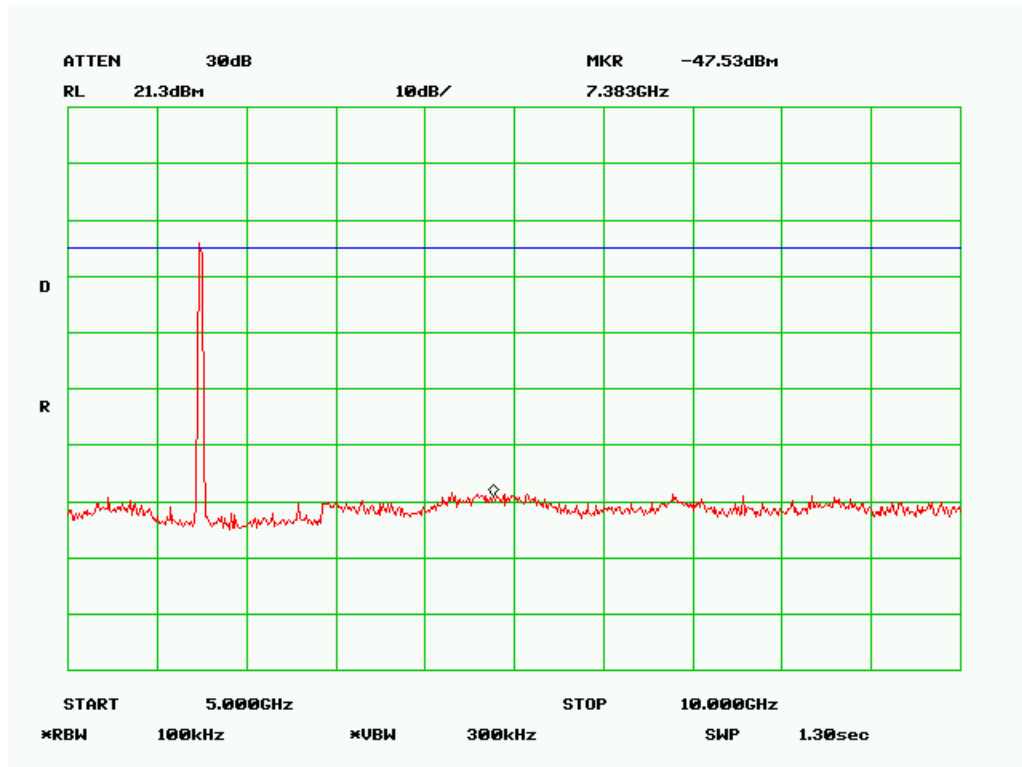
Standard Requirement : 47 CFR §15.247(d); RSS210(A8.5)

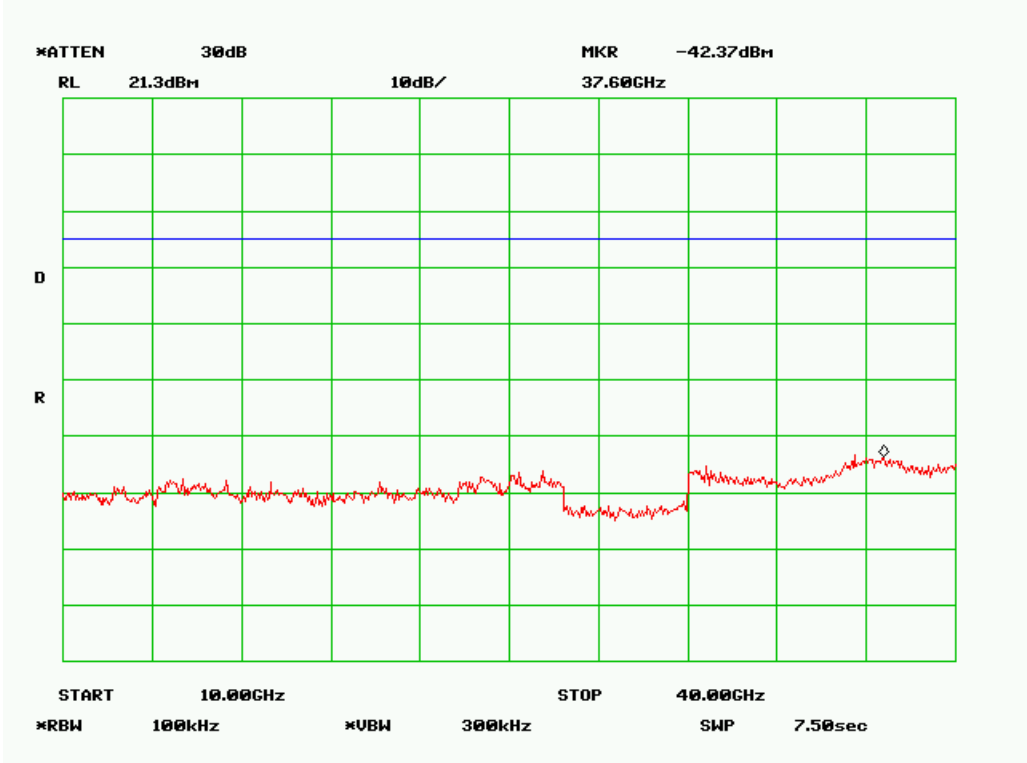
Procedures: The conducted spurious emissions were measured conducted using a spectrum analyzer at low, mid, and hi channels. The limit was determined by attenuating 20 dB of the RF peak power output

Test Result:

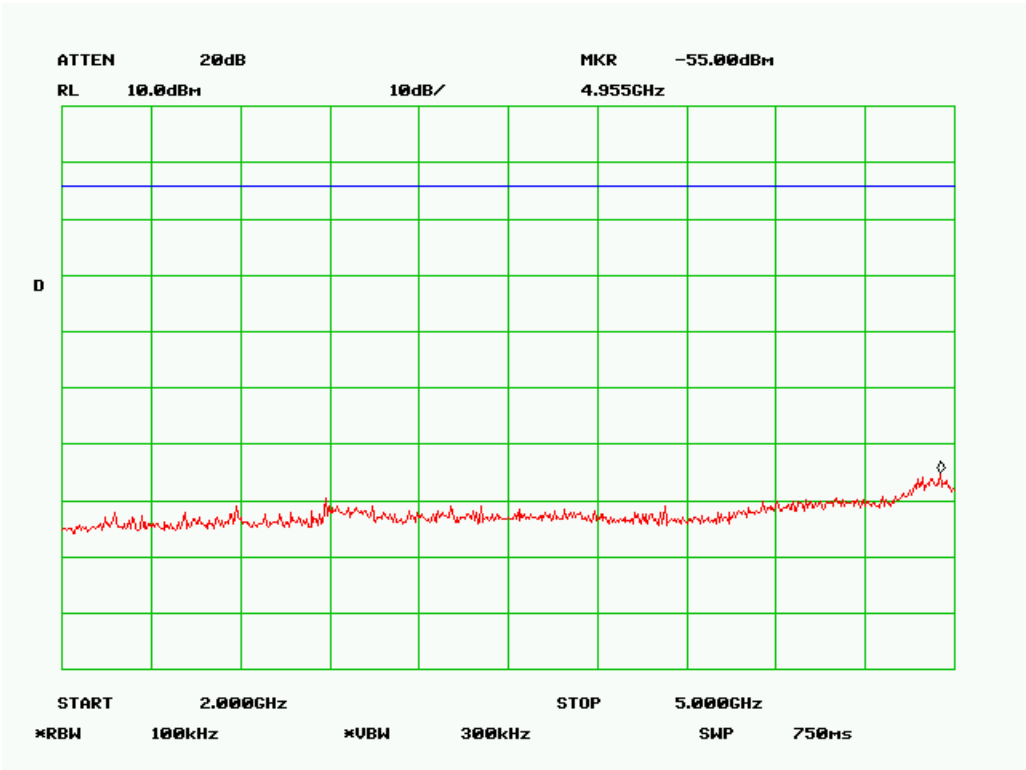
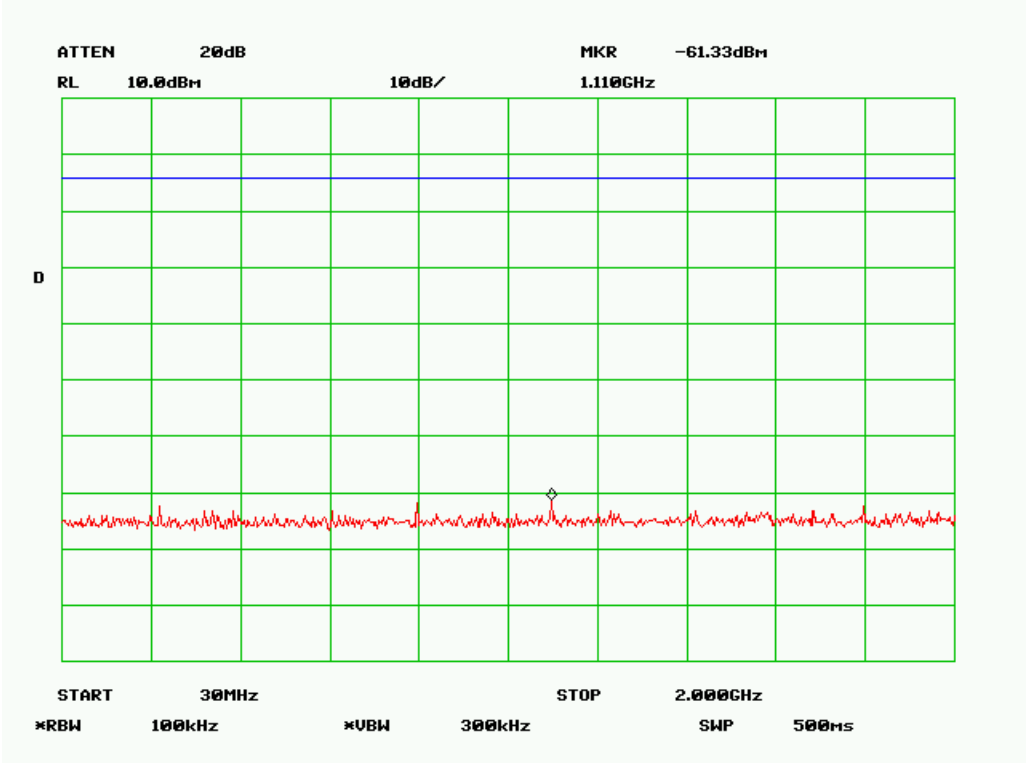
Low Channel (20MHz Chain 0)

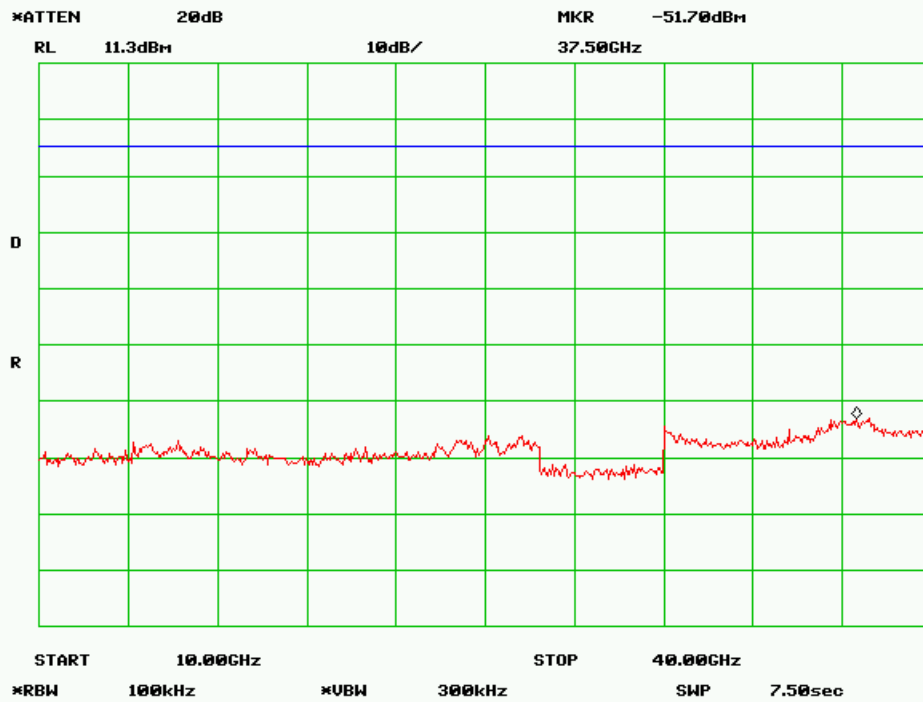
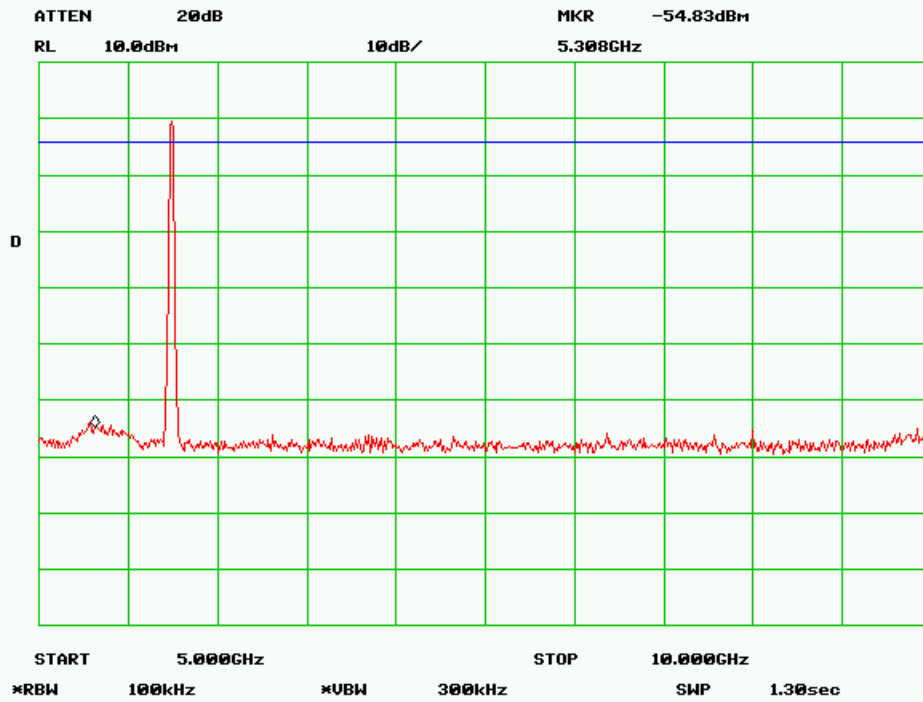




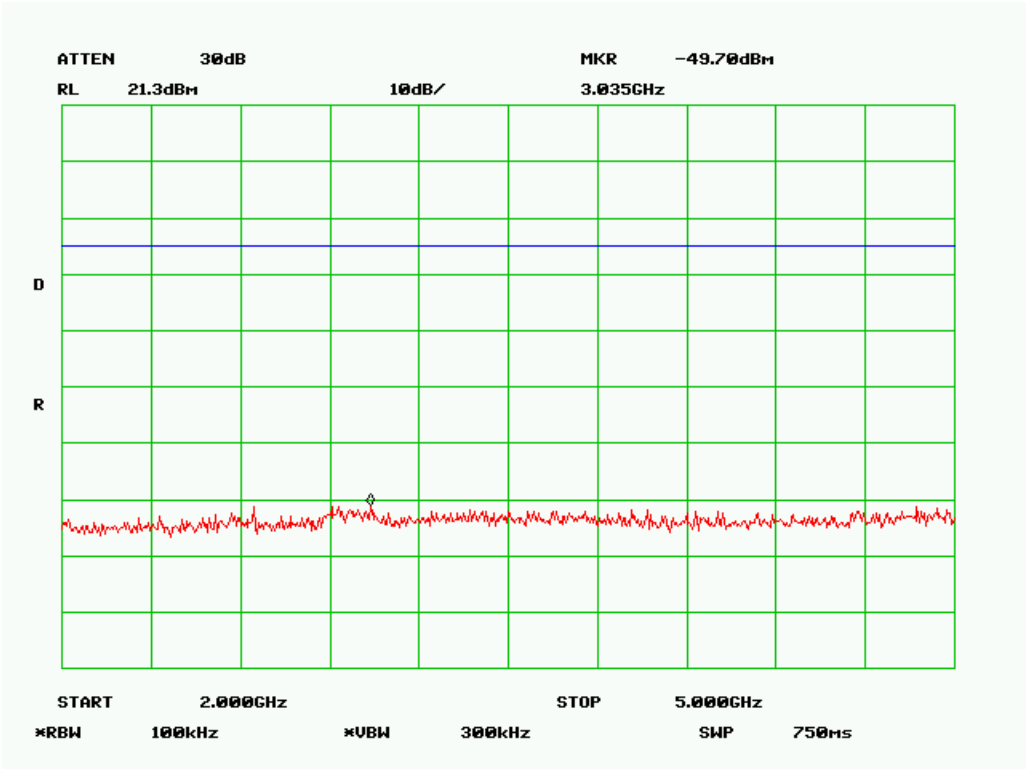
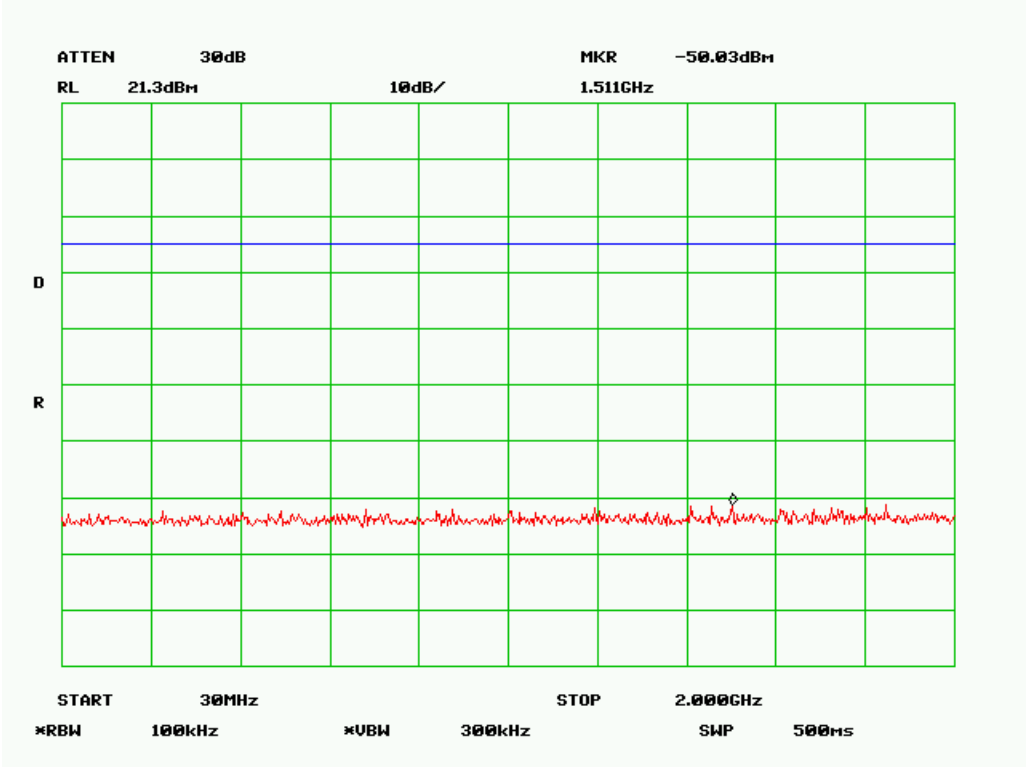


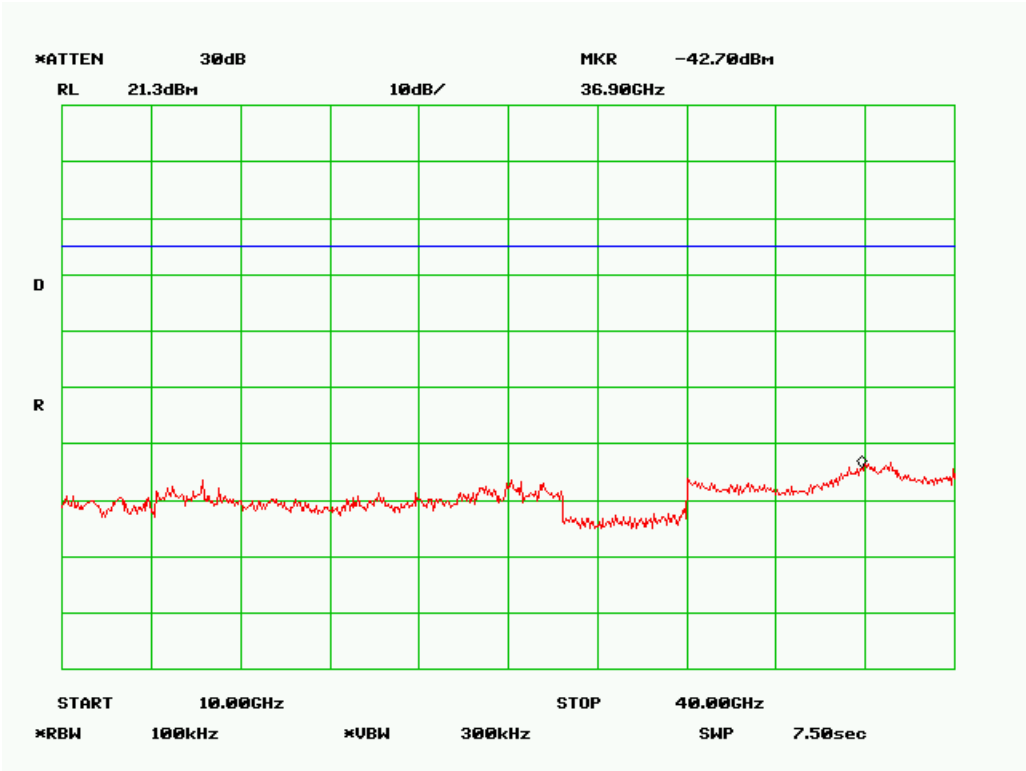
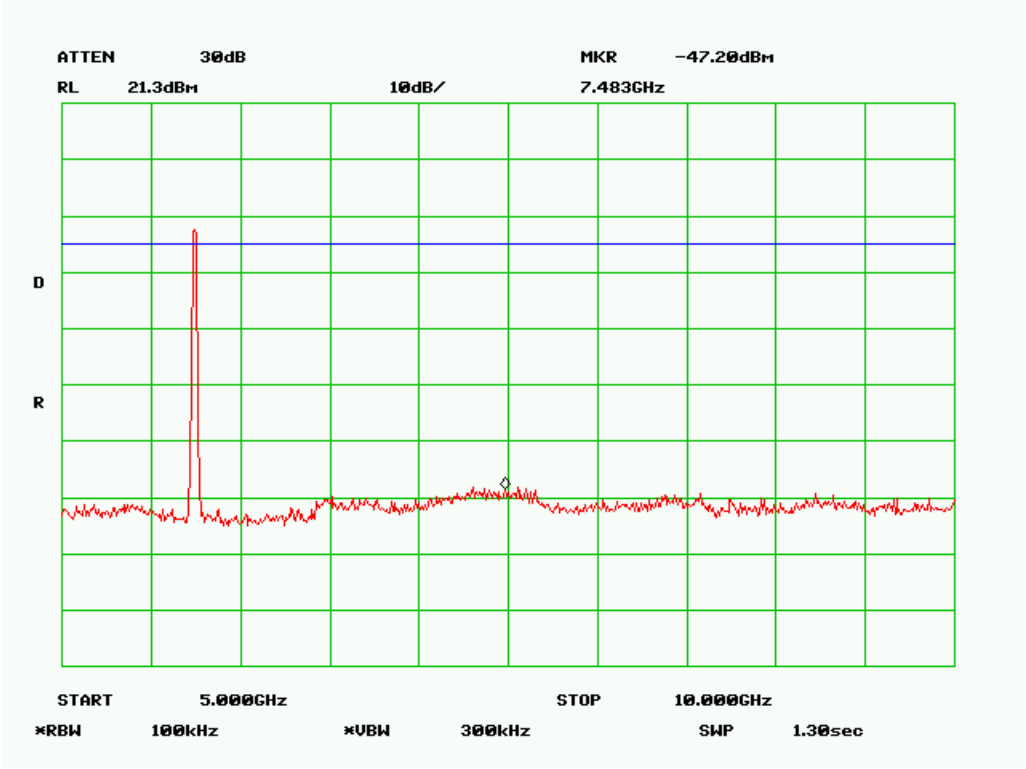
Low Channel (20MHz Chain 1)



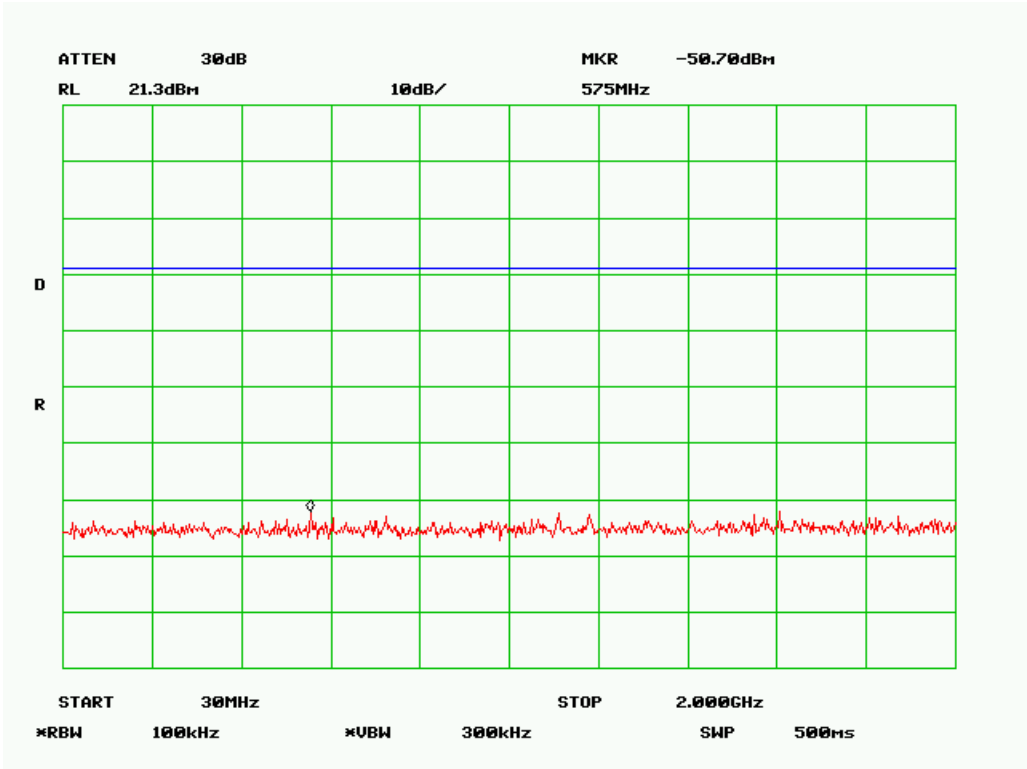


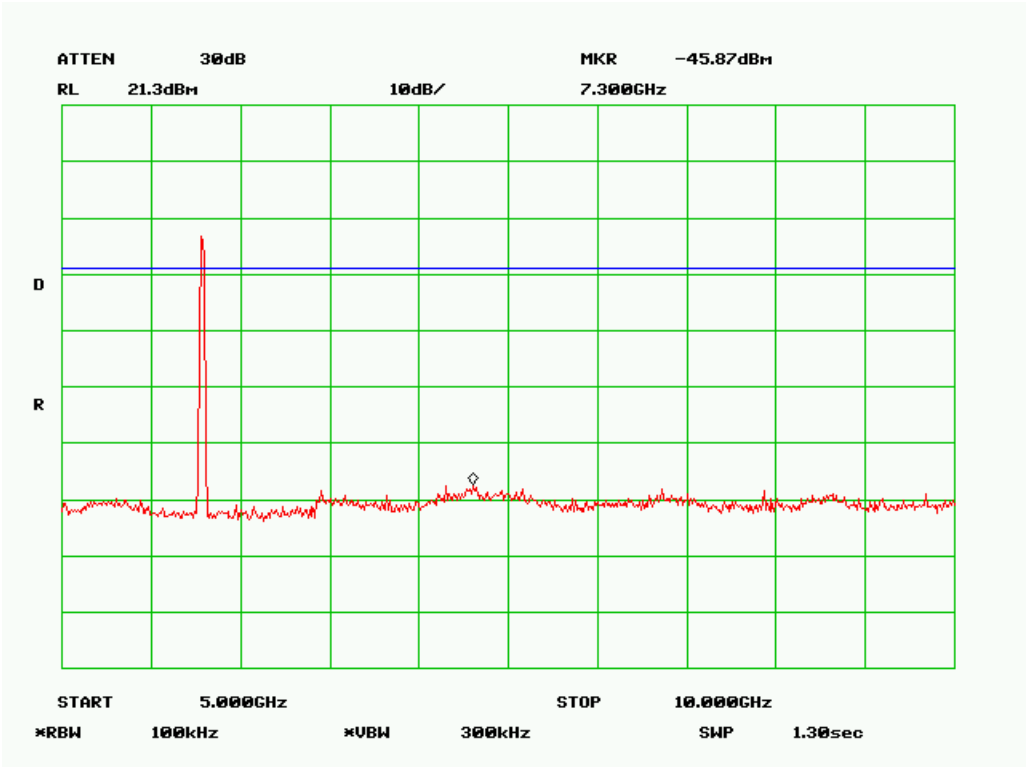
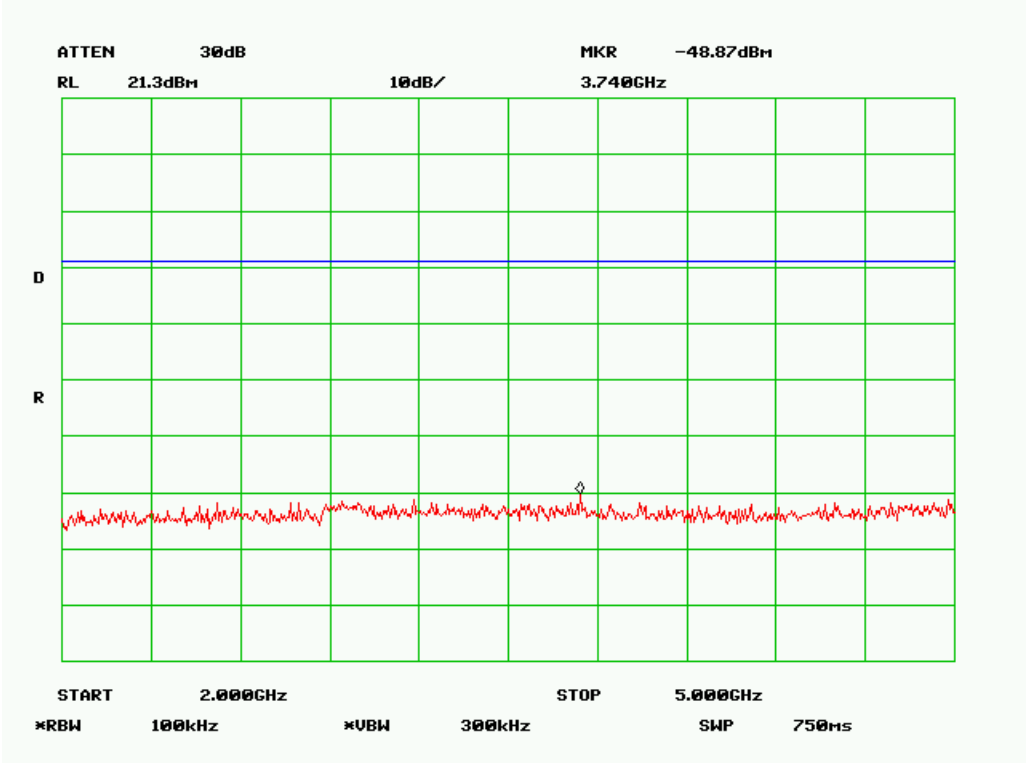
Low Channel (20MHz Chain 2)

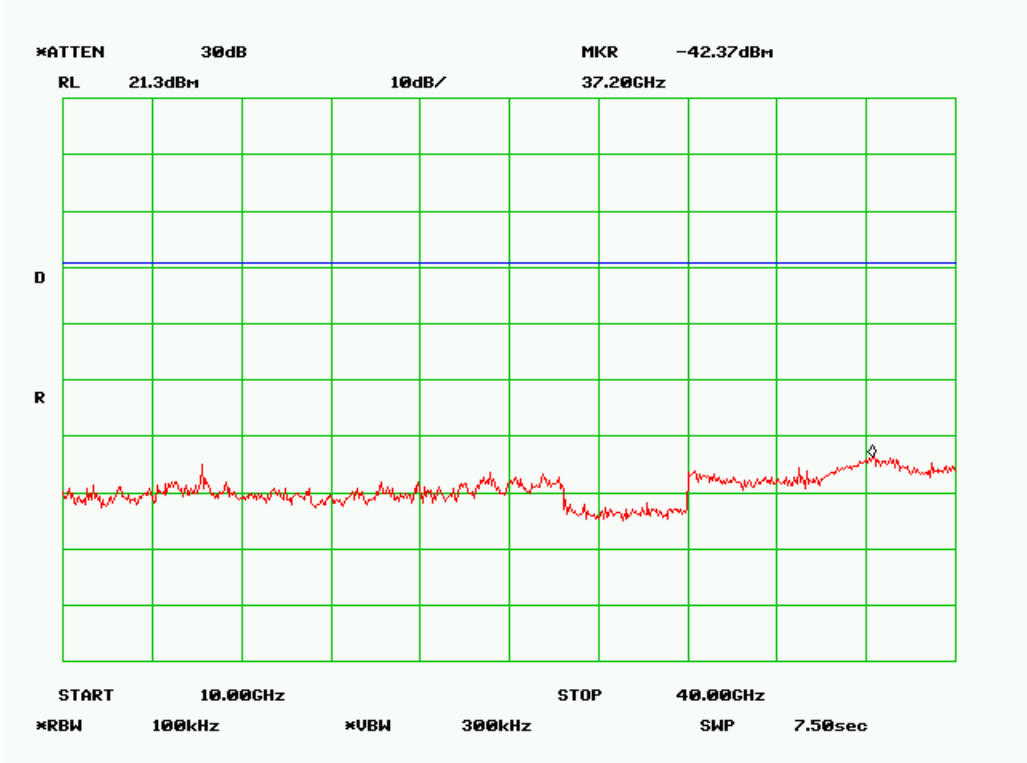




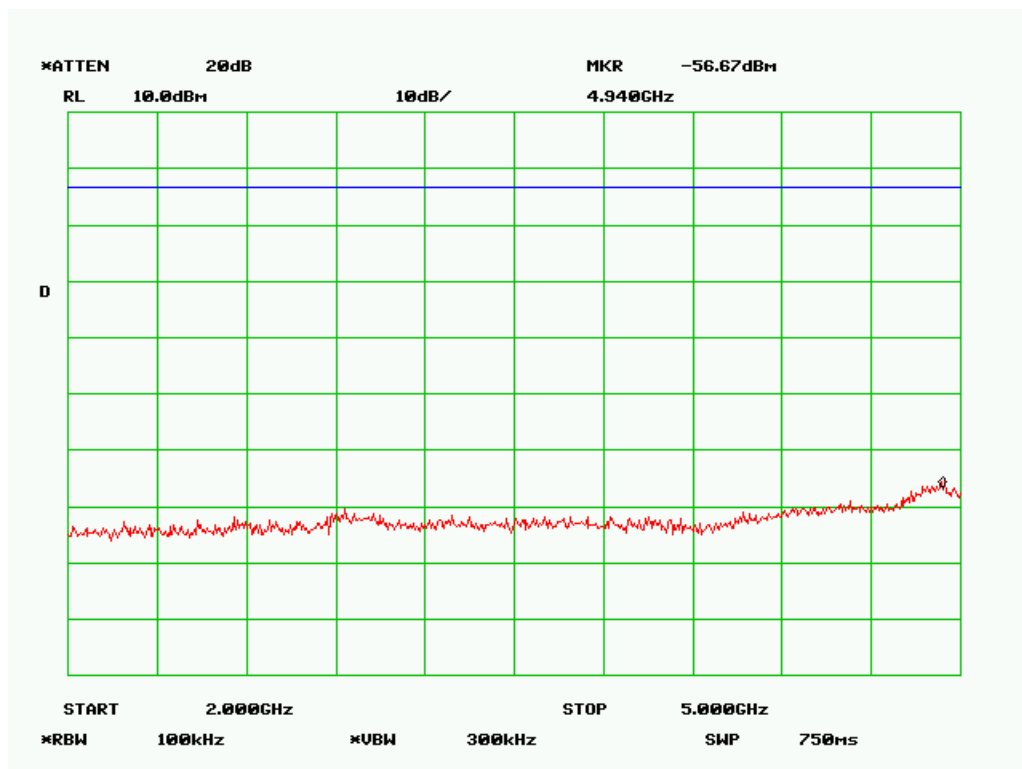
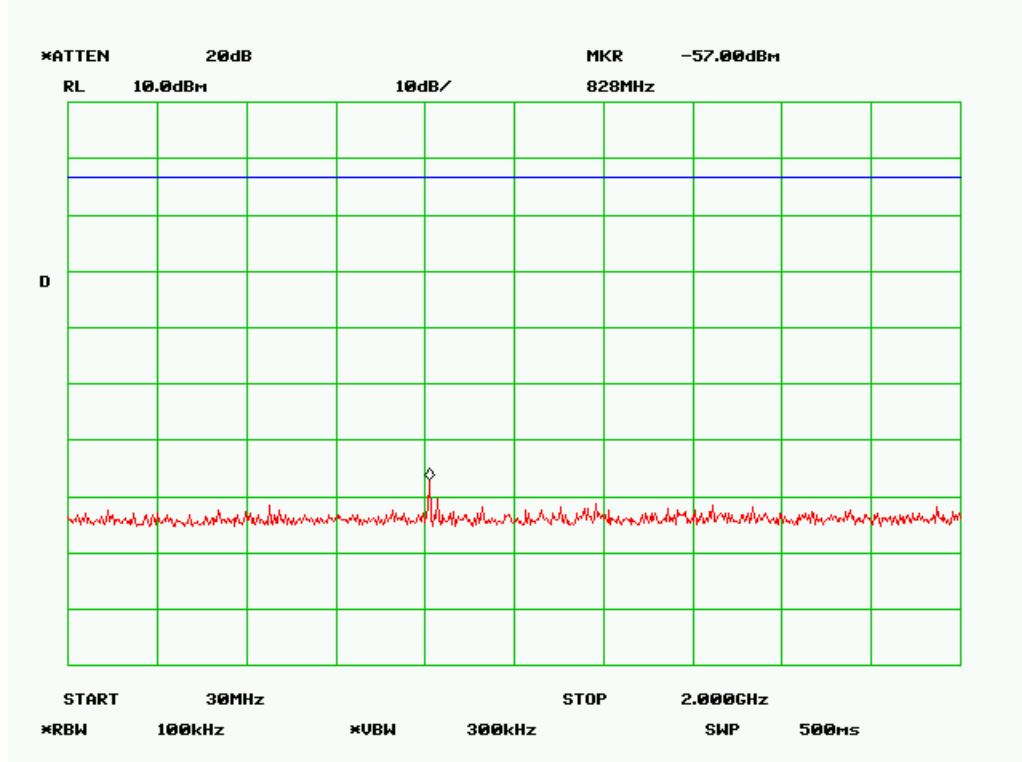
Mid Channel (20MHz Chain 0)

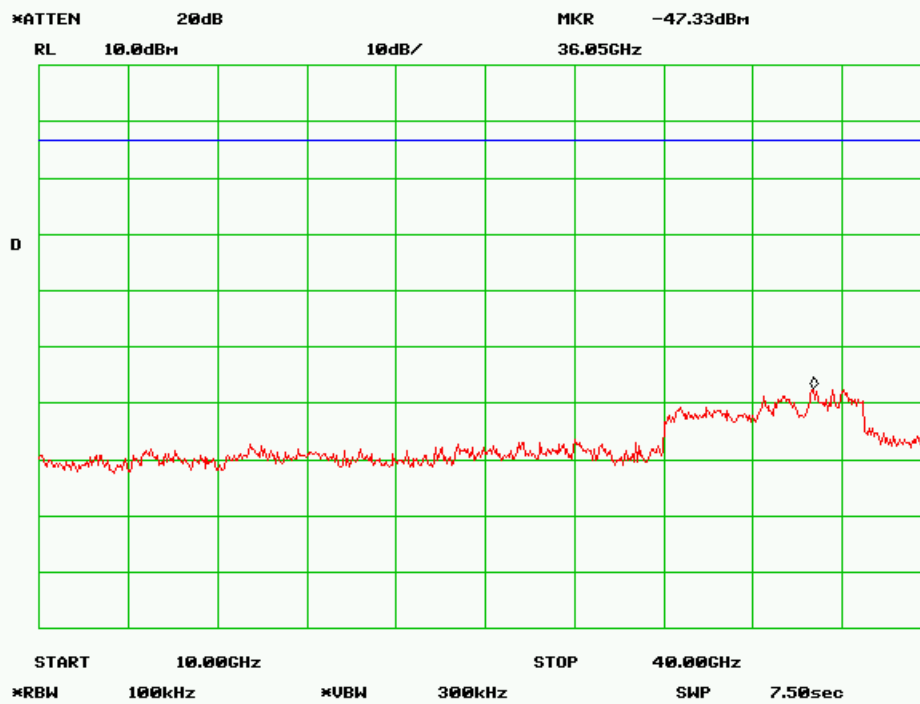
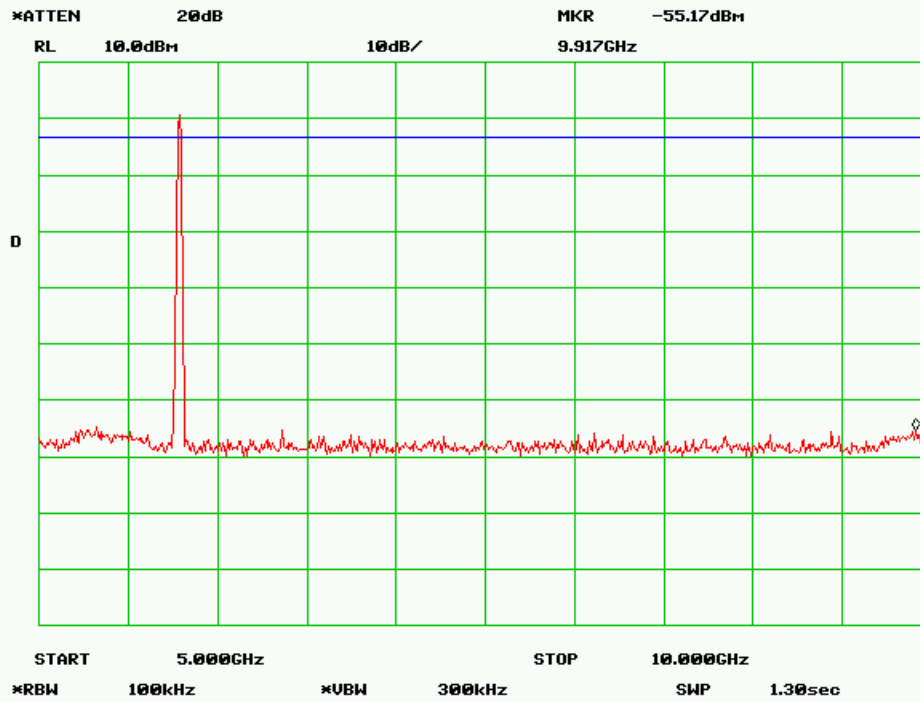




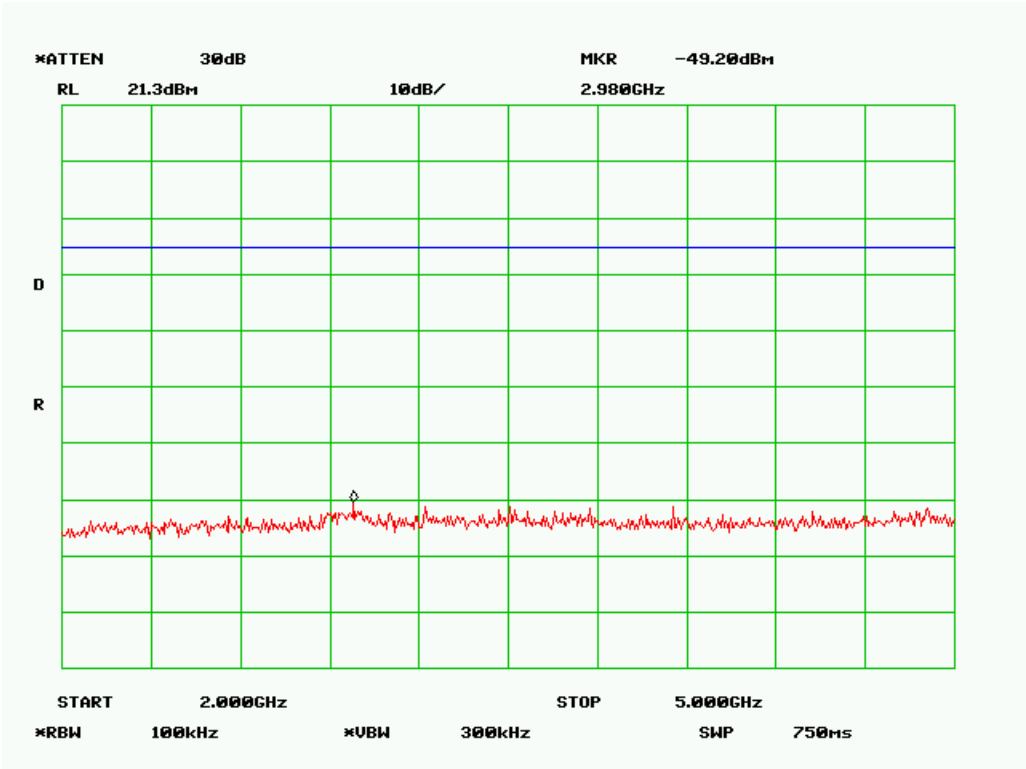
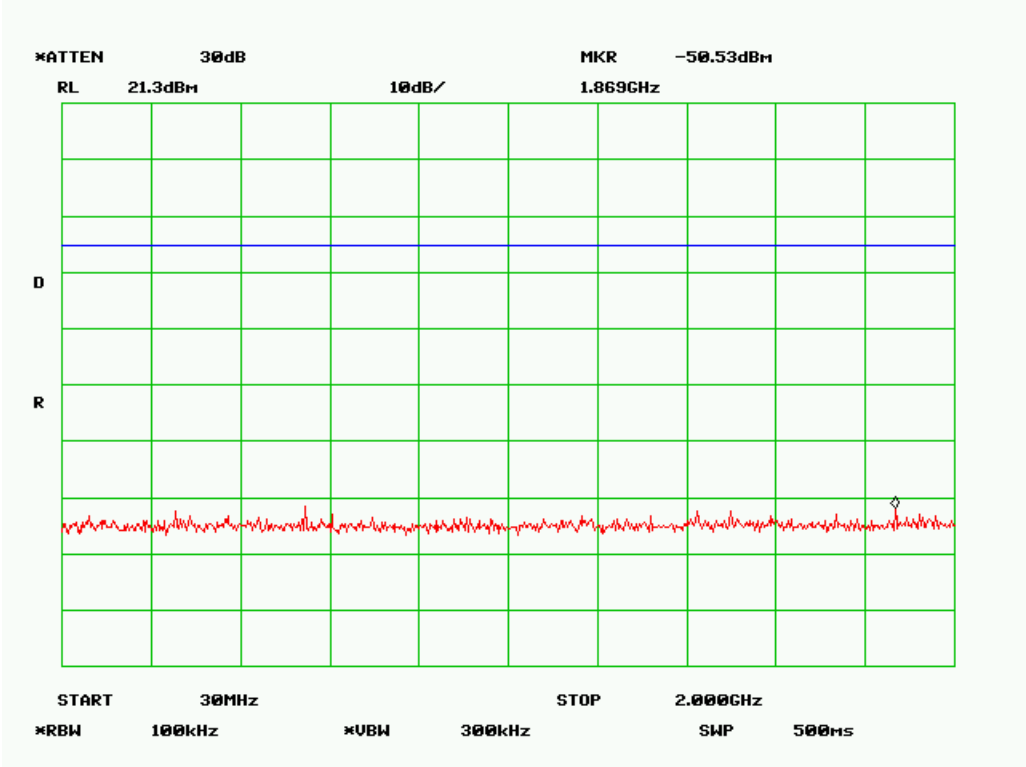


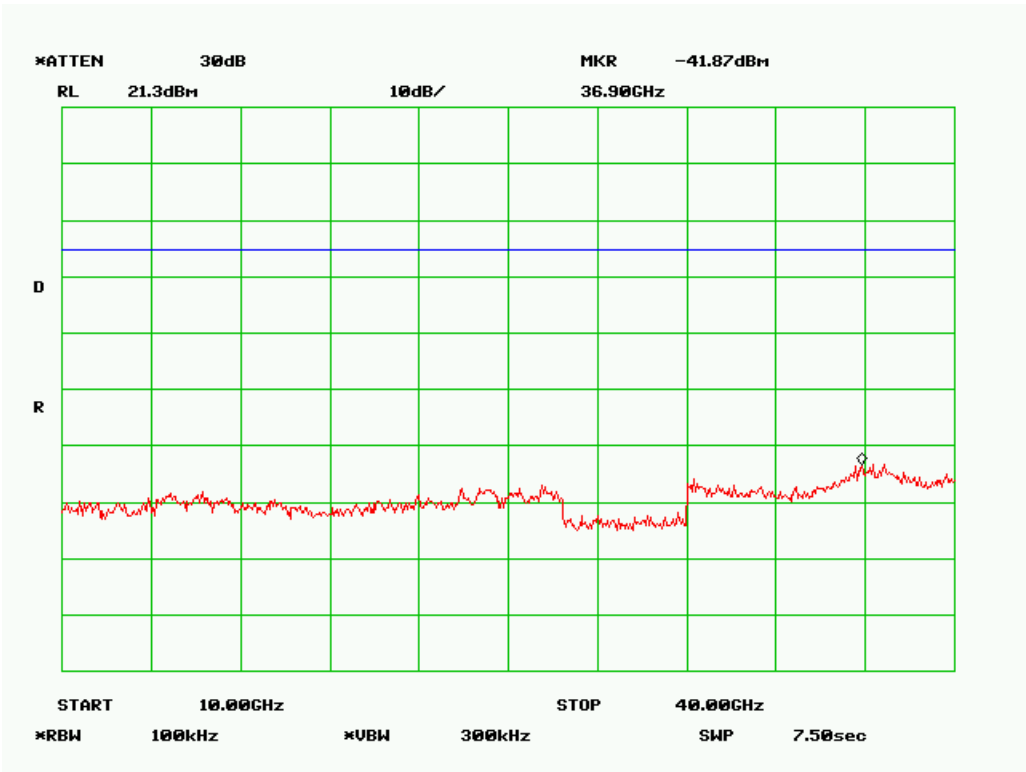
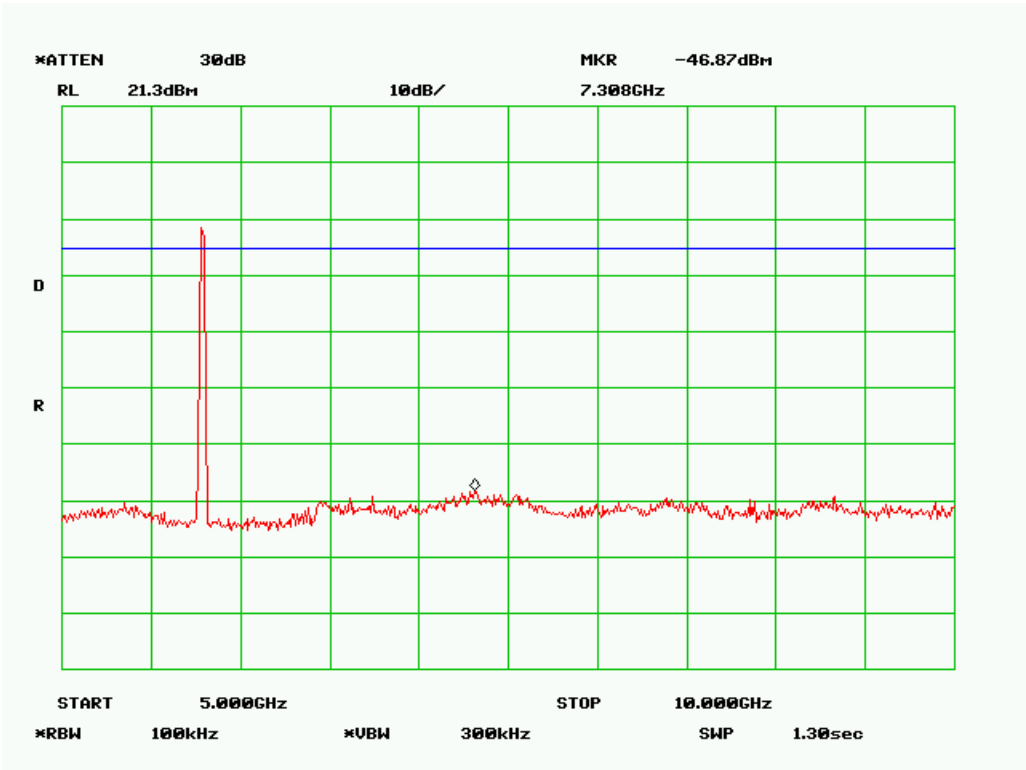
Mid Channel (20MHz Chain 1)



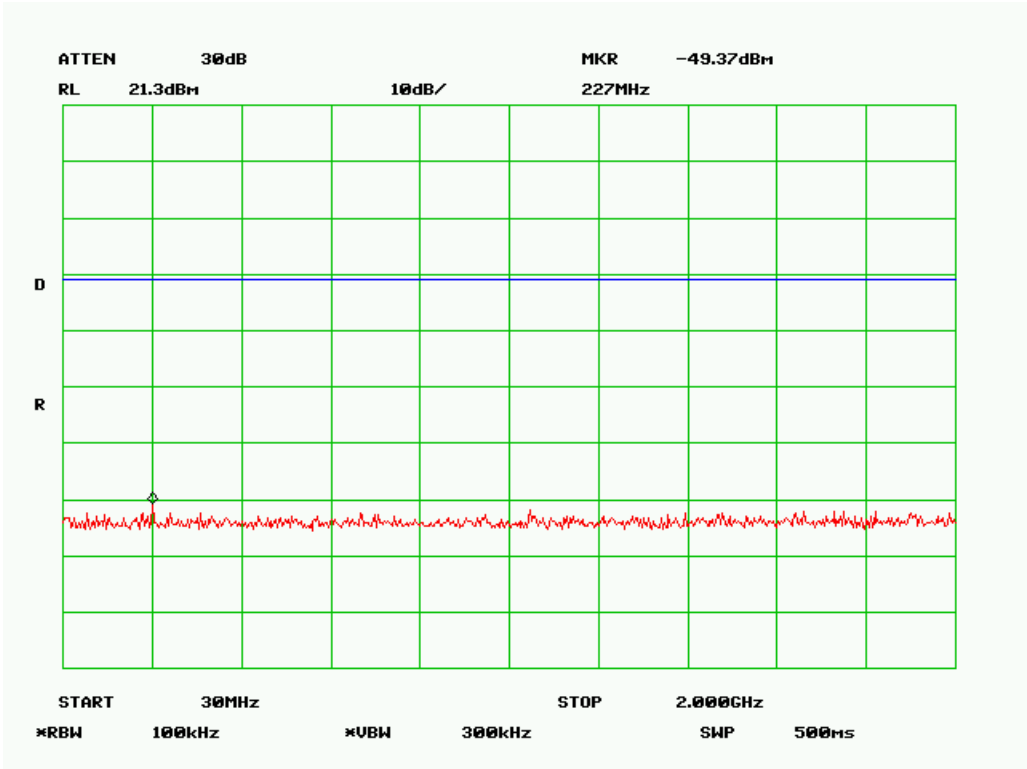


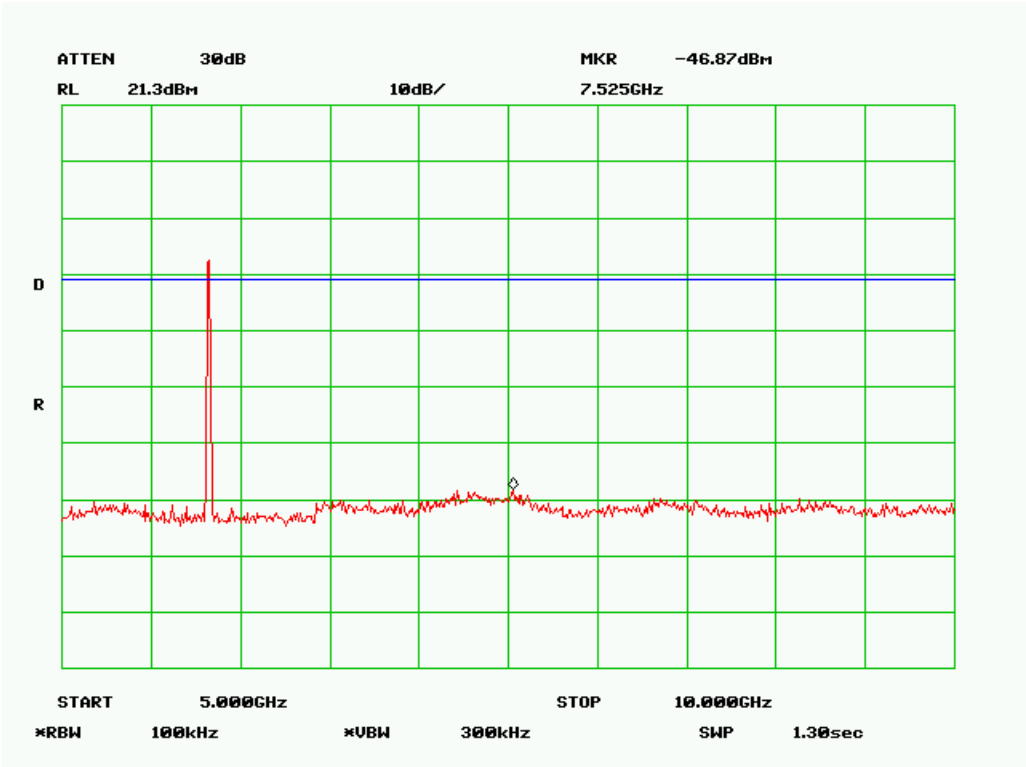
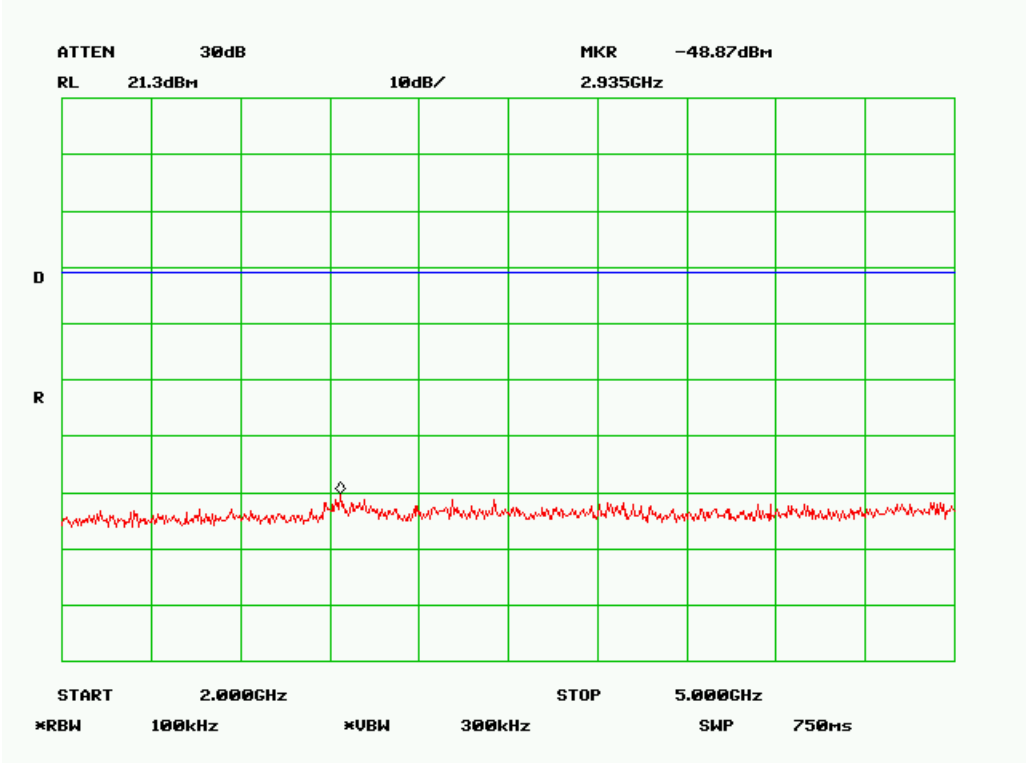
Mid Channel (20MHz Chain 2)

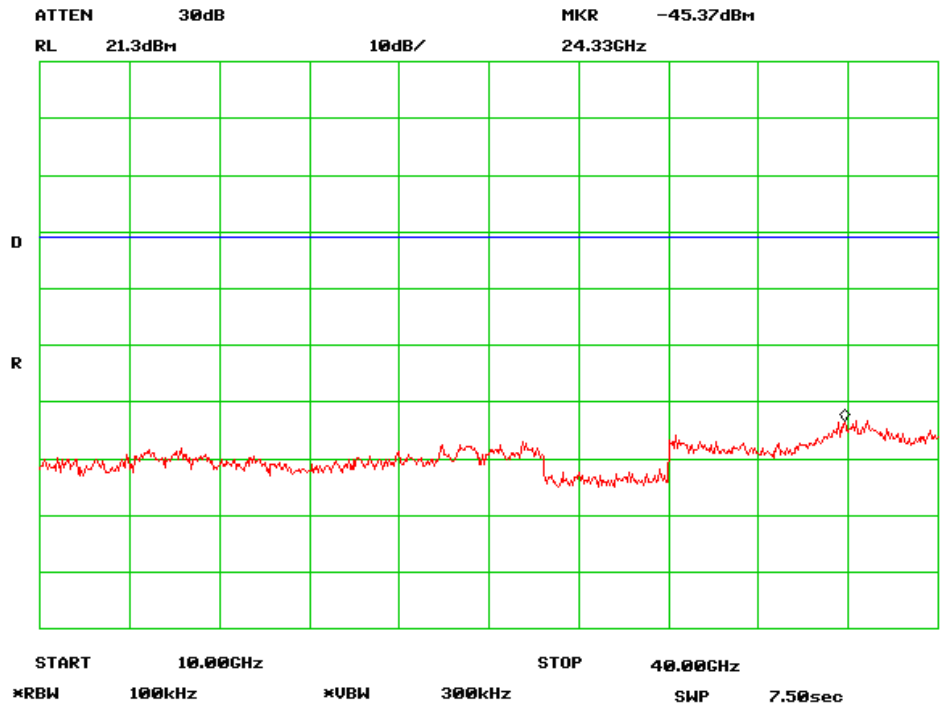




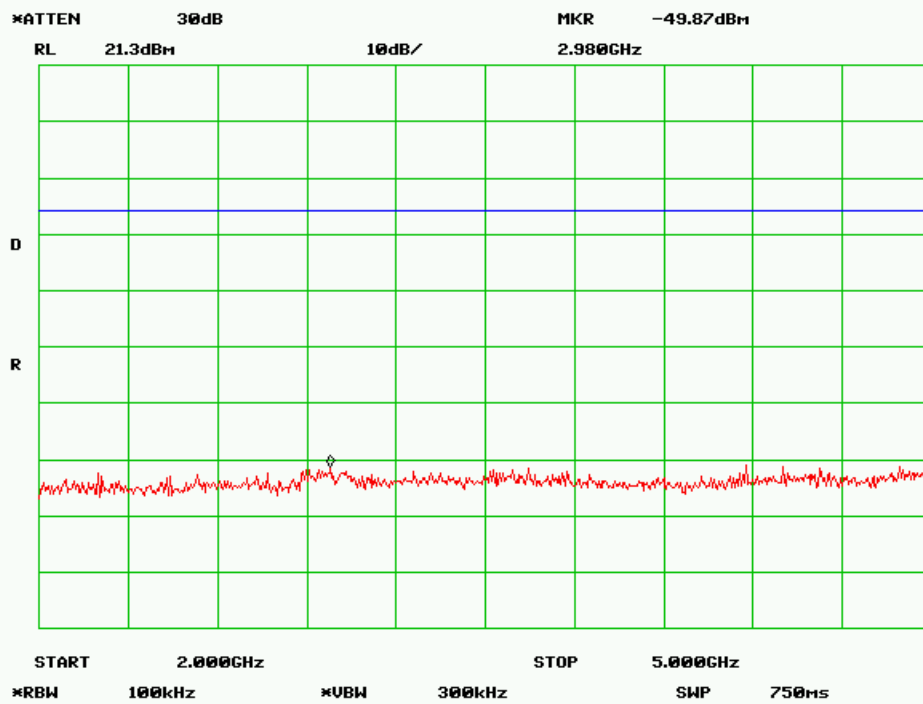
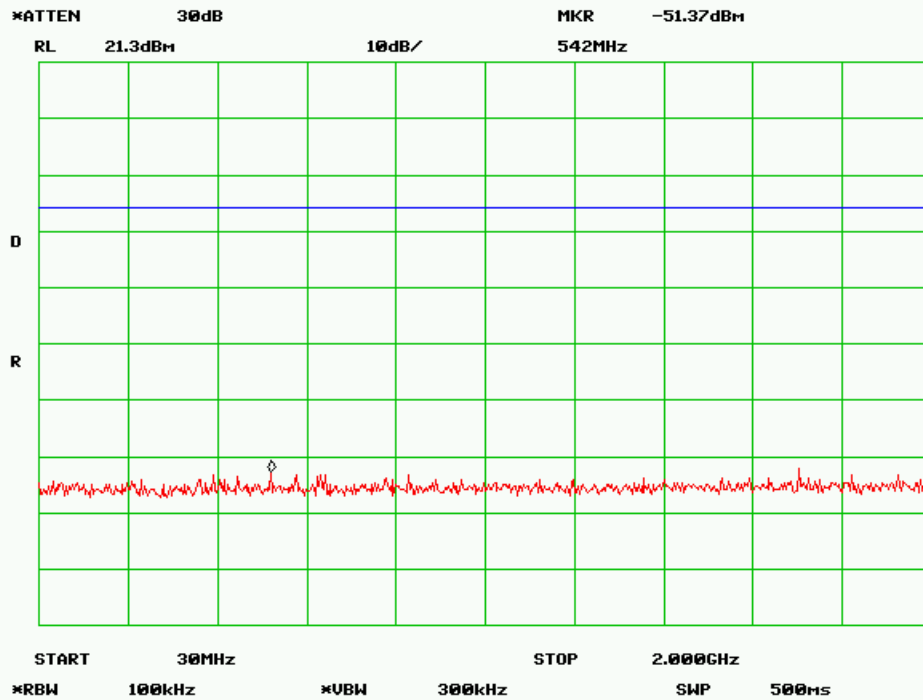
High Channel (20MHz Chain 0)

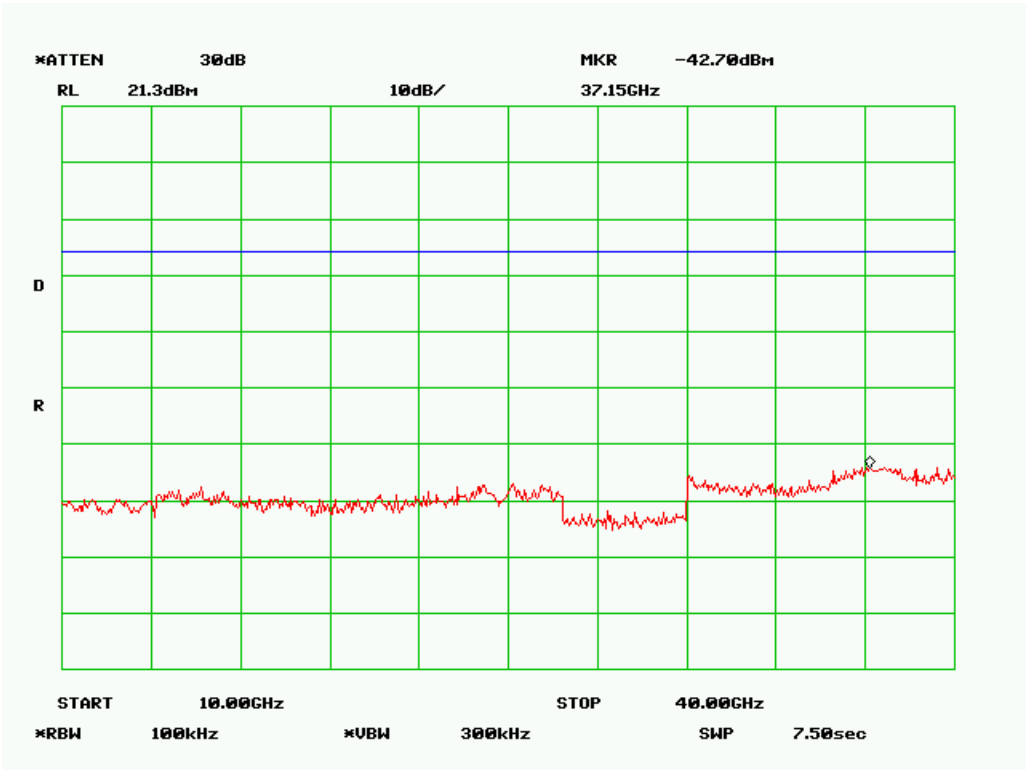
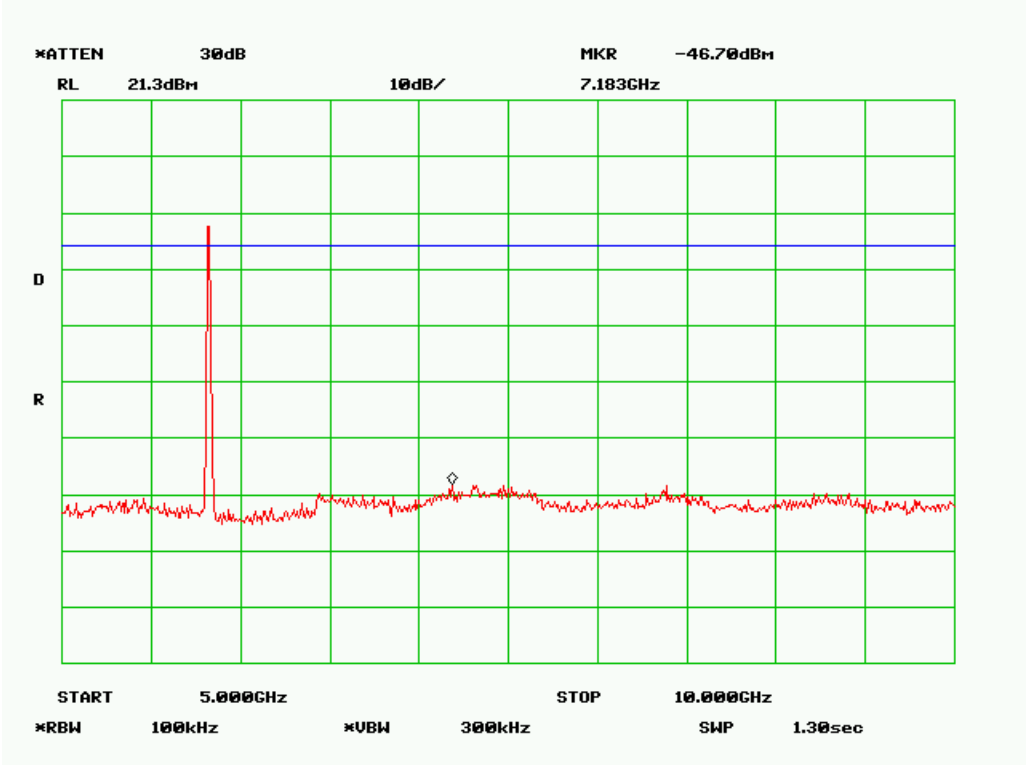




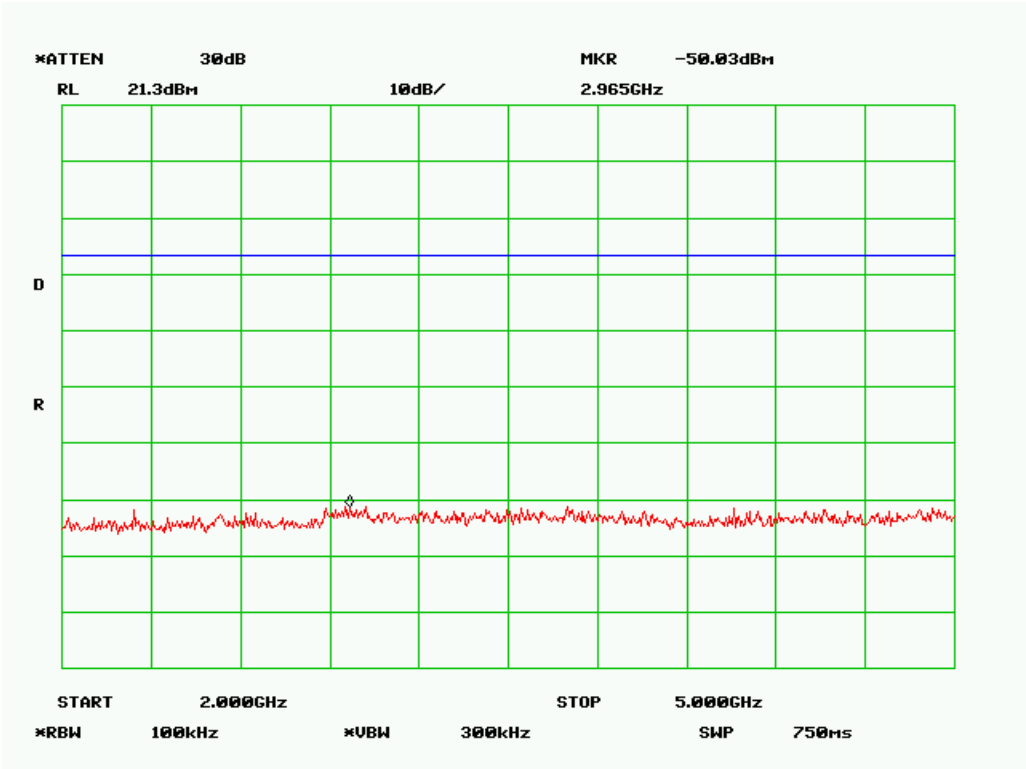
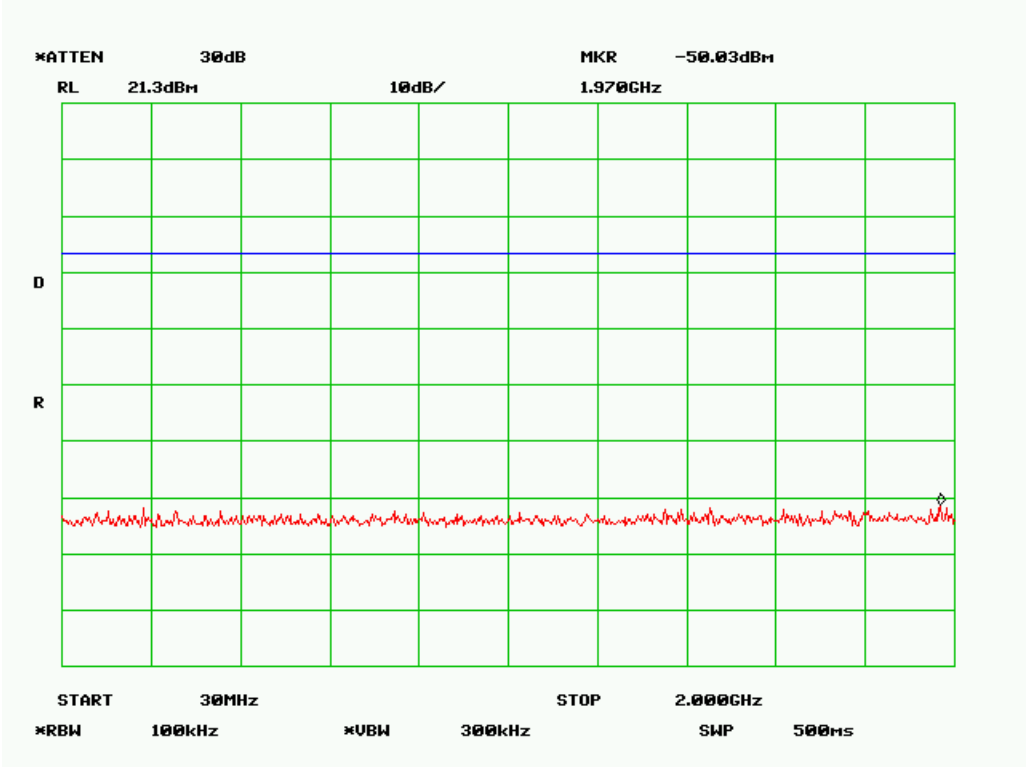


High Channel (20MHz Chain 1)





High Channel (20MHz Chain 2)

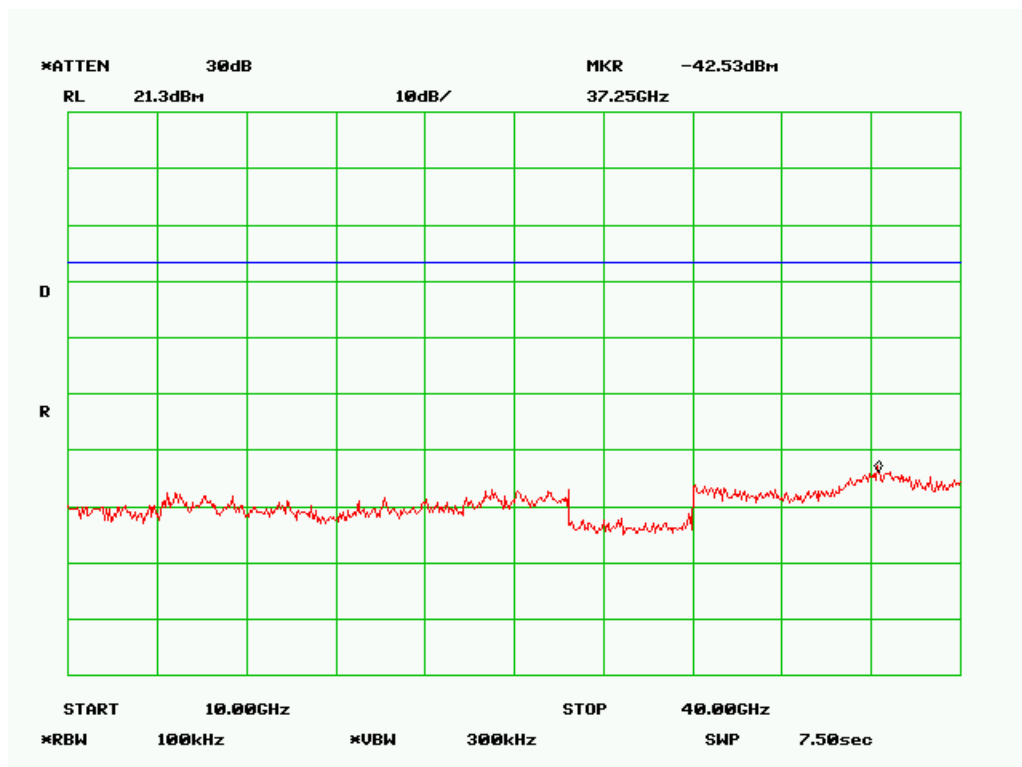
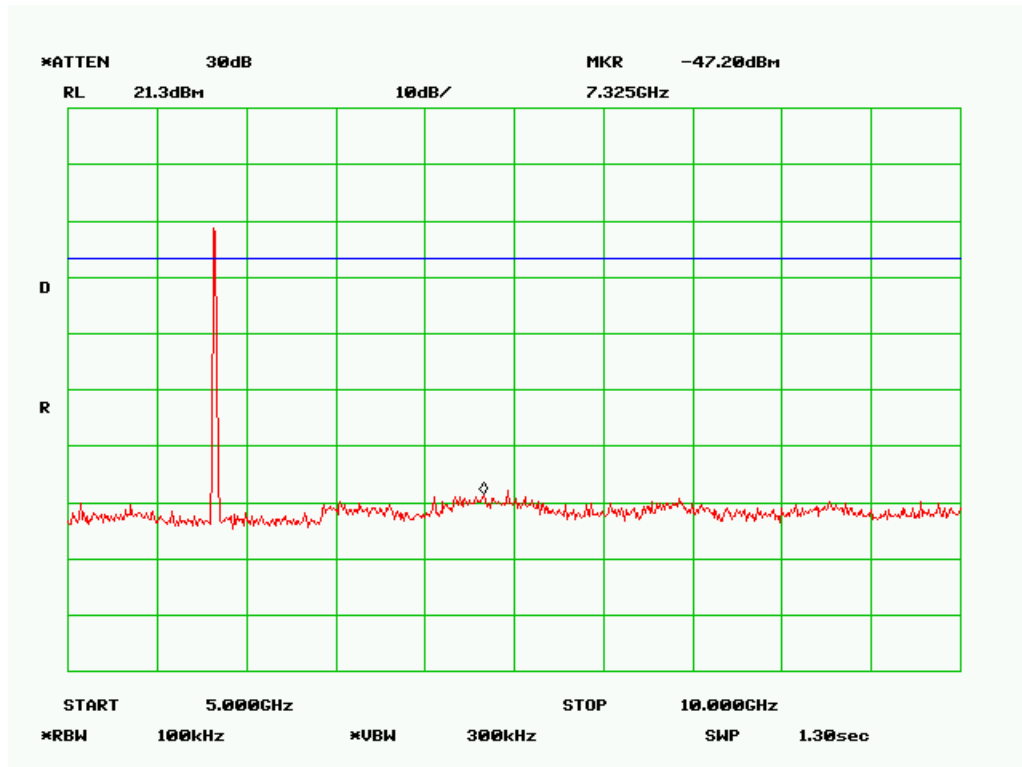




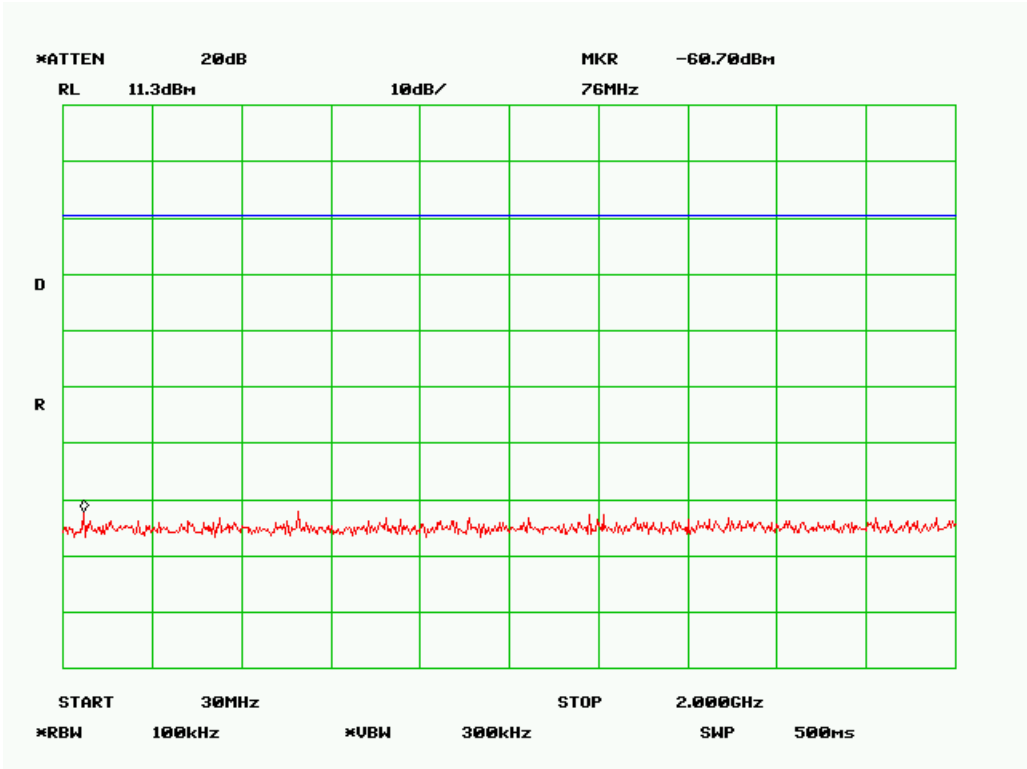
SIEMIC, INC.
Accessing global markets

Title: RF Test Report AIRAYA, CORP , model : WirelessGRID-300
To: FCC 15.247 2009, RSS 210 Issue 7: 2007

Serial# SL09010501-AIR-001 (15.247)(MIMO) Rev 3.0
Issue Date 28 January 2009
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Low Channel (40MHz Chain 0)

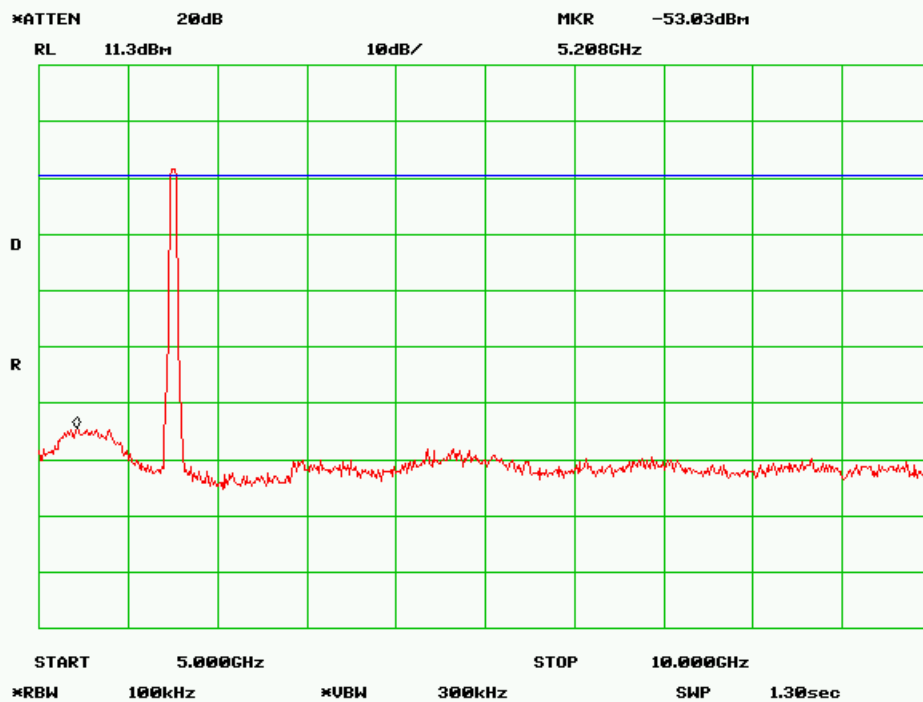
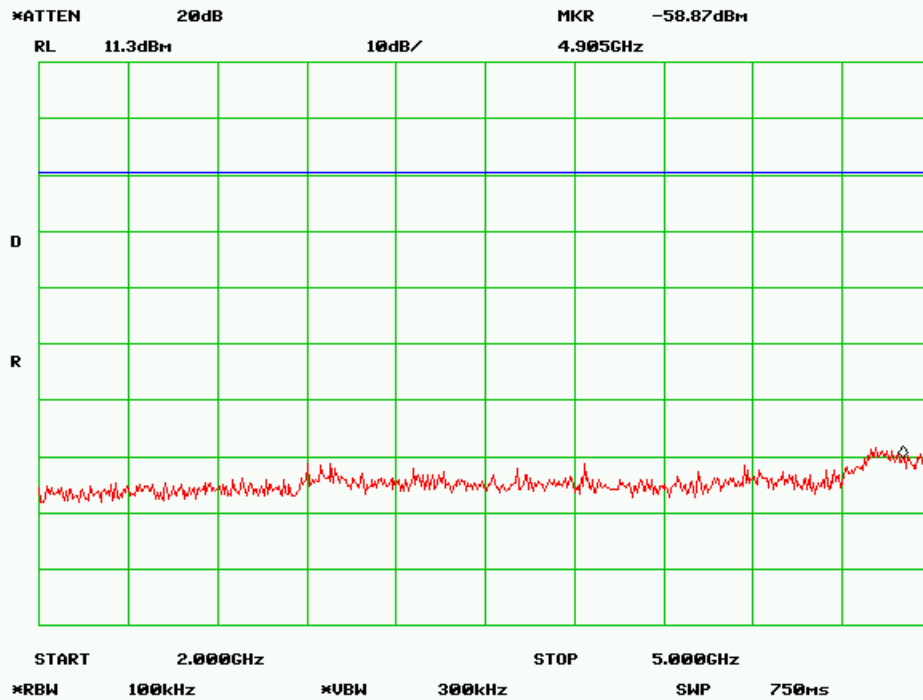


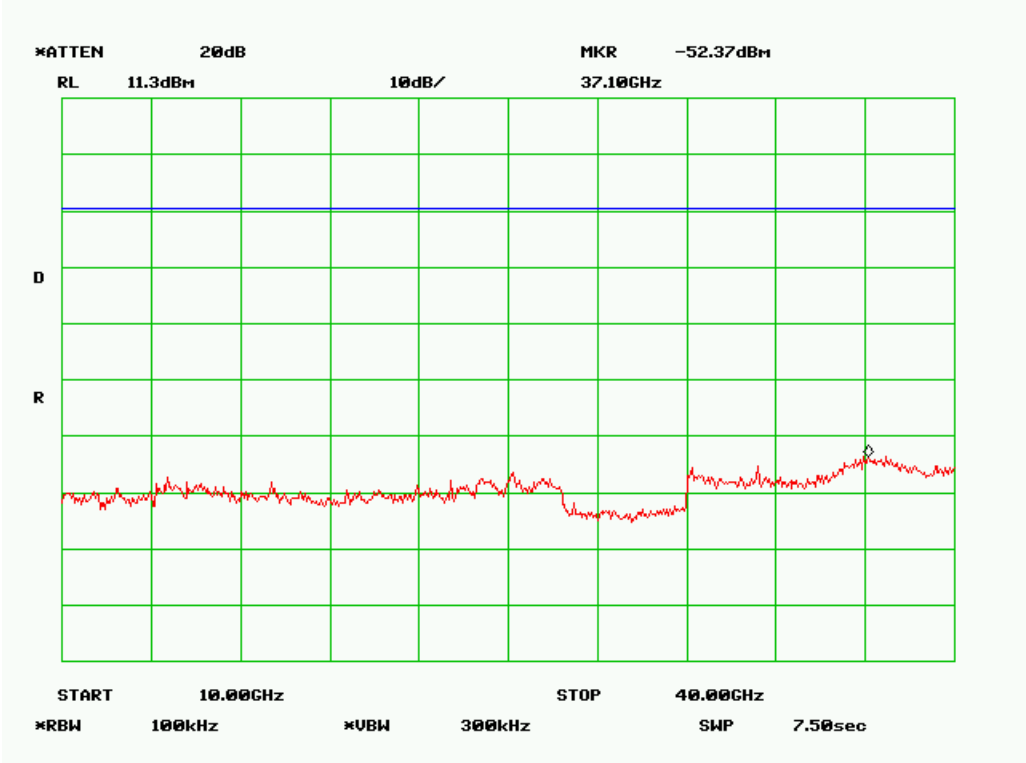


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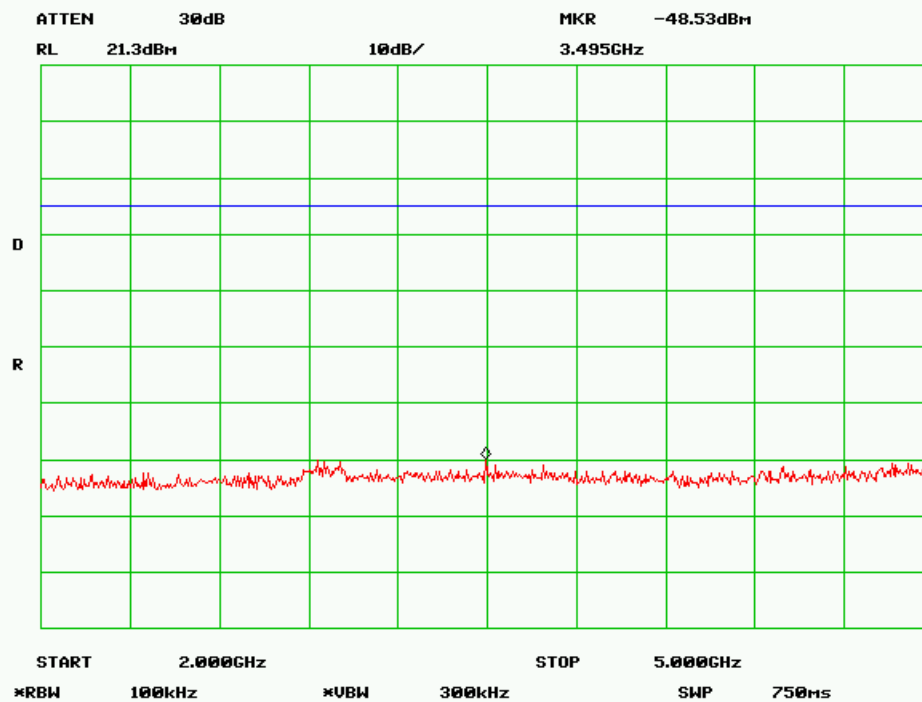
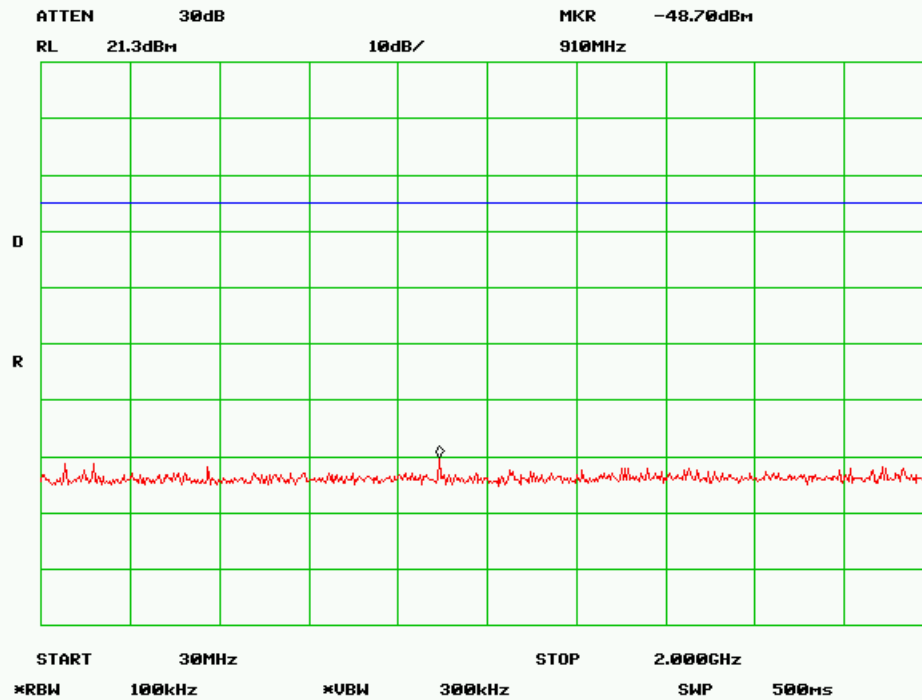
Title: RF Test Report AIRAYA, CORP , model : WirelessGRID-300
To: FCC 15.247 2009, RSS 210 Issue 7: 2007

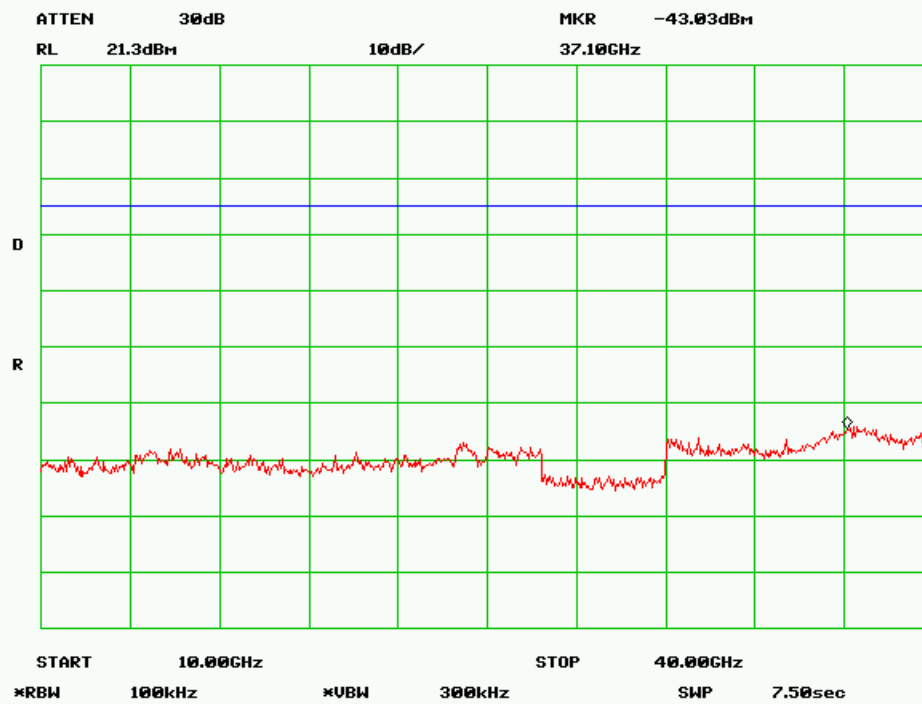
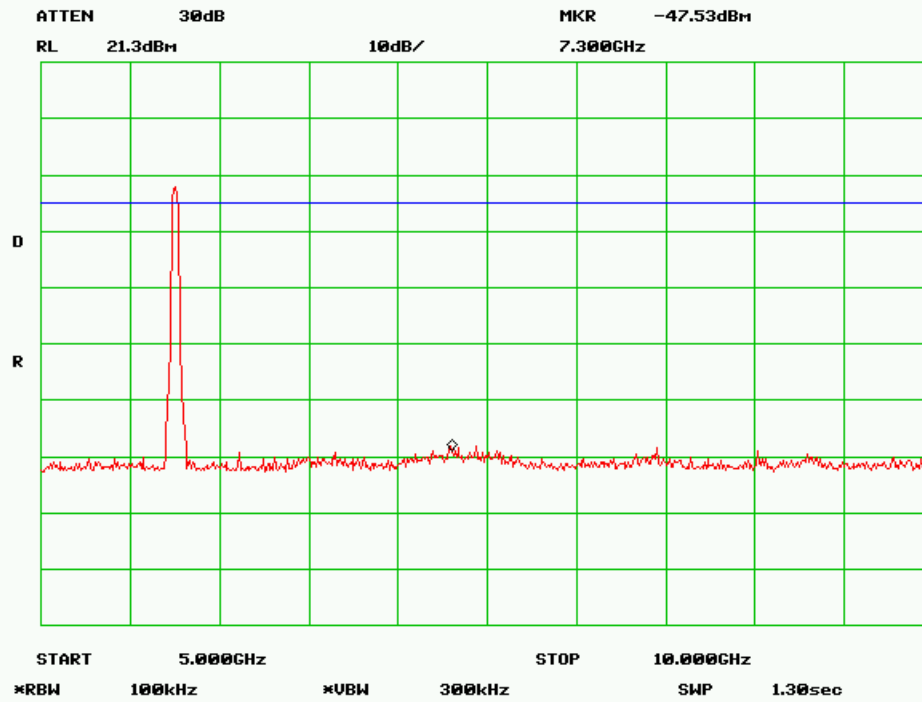
Serial# SL09010501-AIR-001 (15.247)(MIMO) Rev 3.0
Issue Date 28 January 2009
Page 92 of 134
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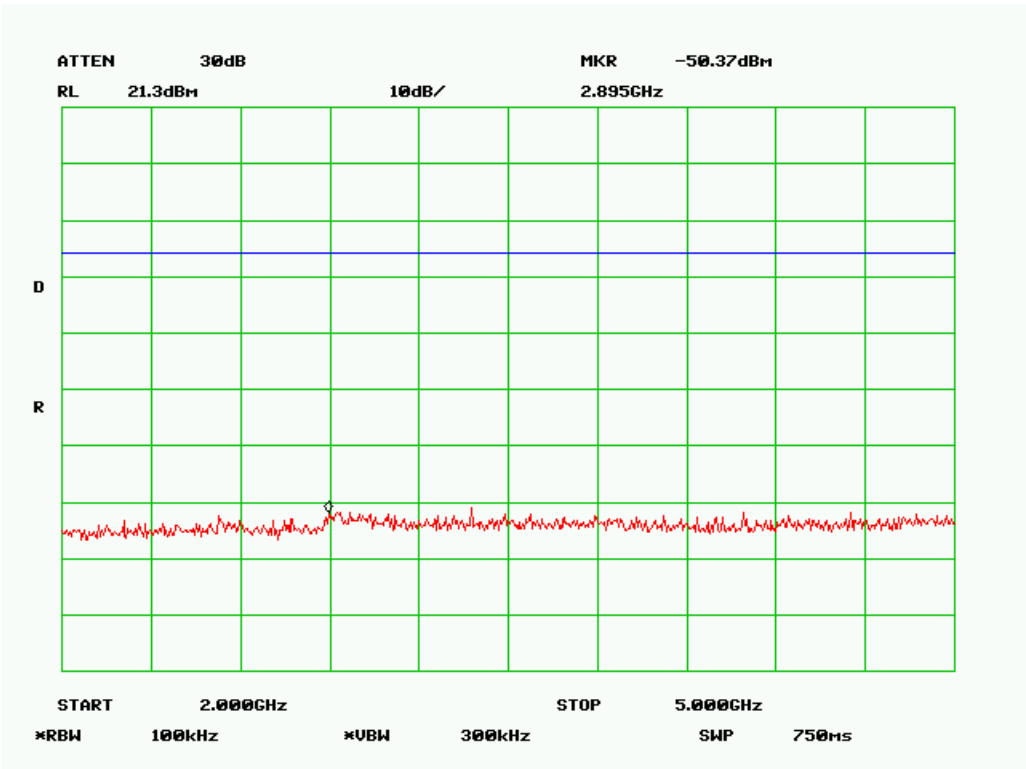
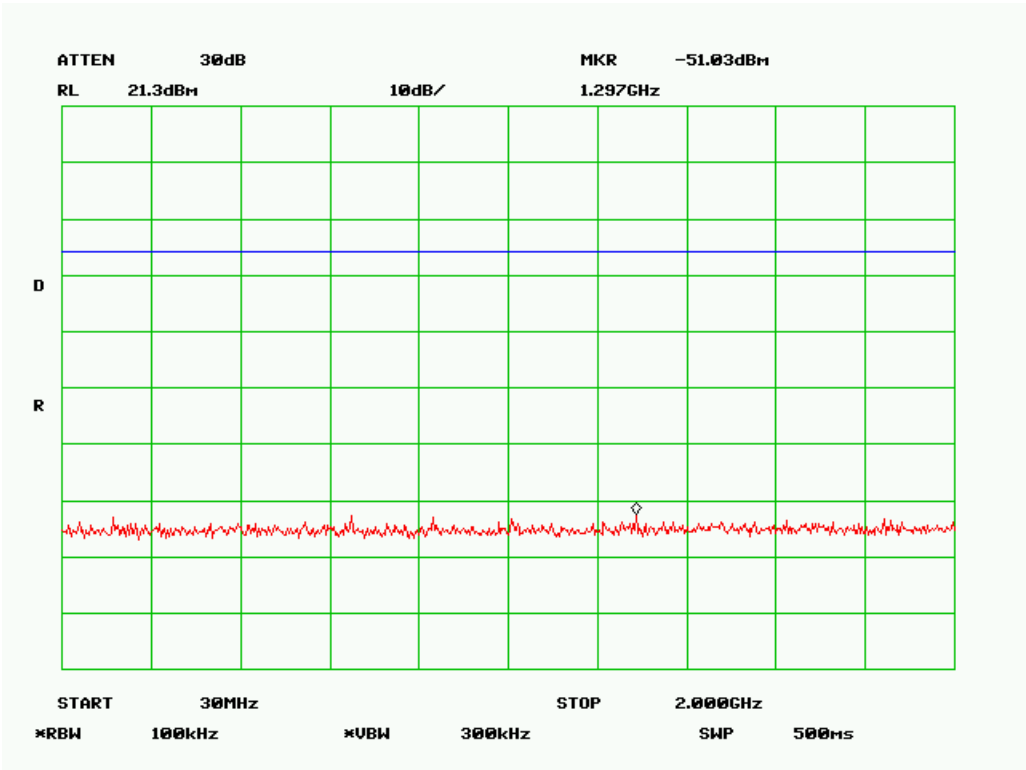


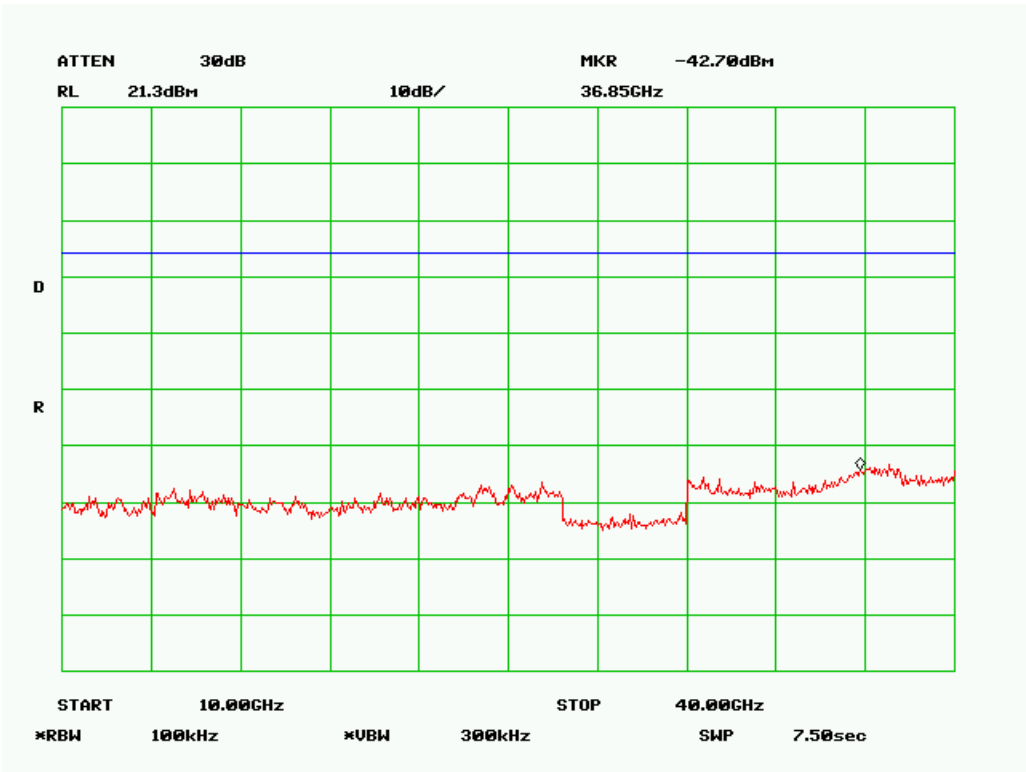
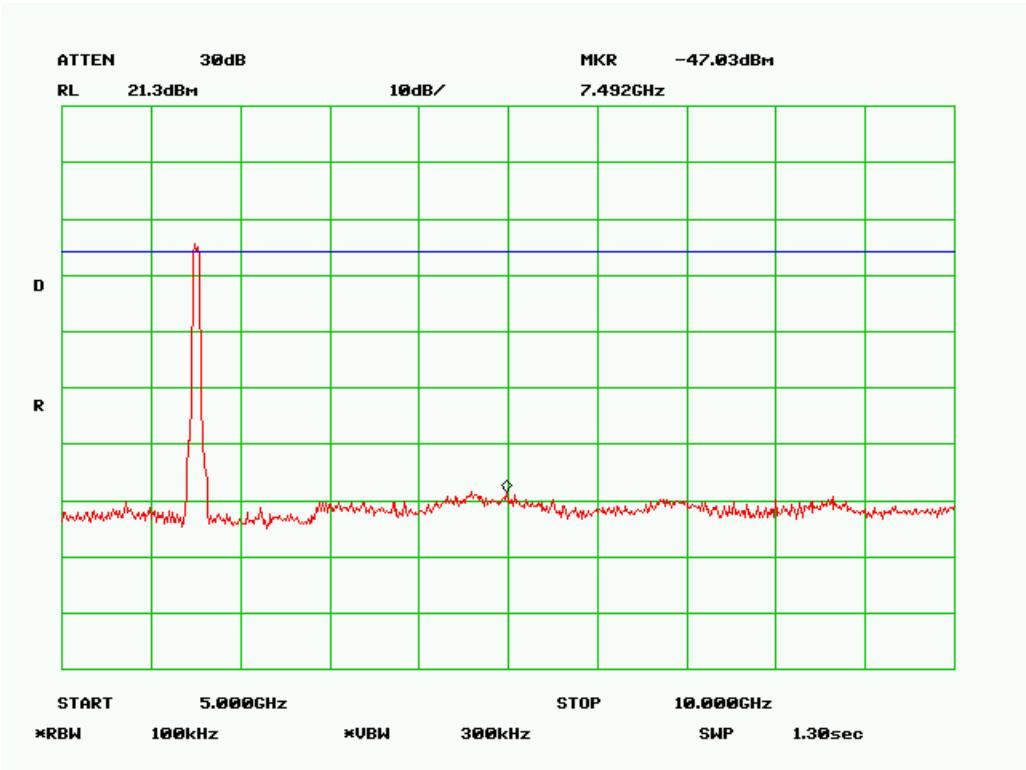
Low Channel (40MHz Chain 1)



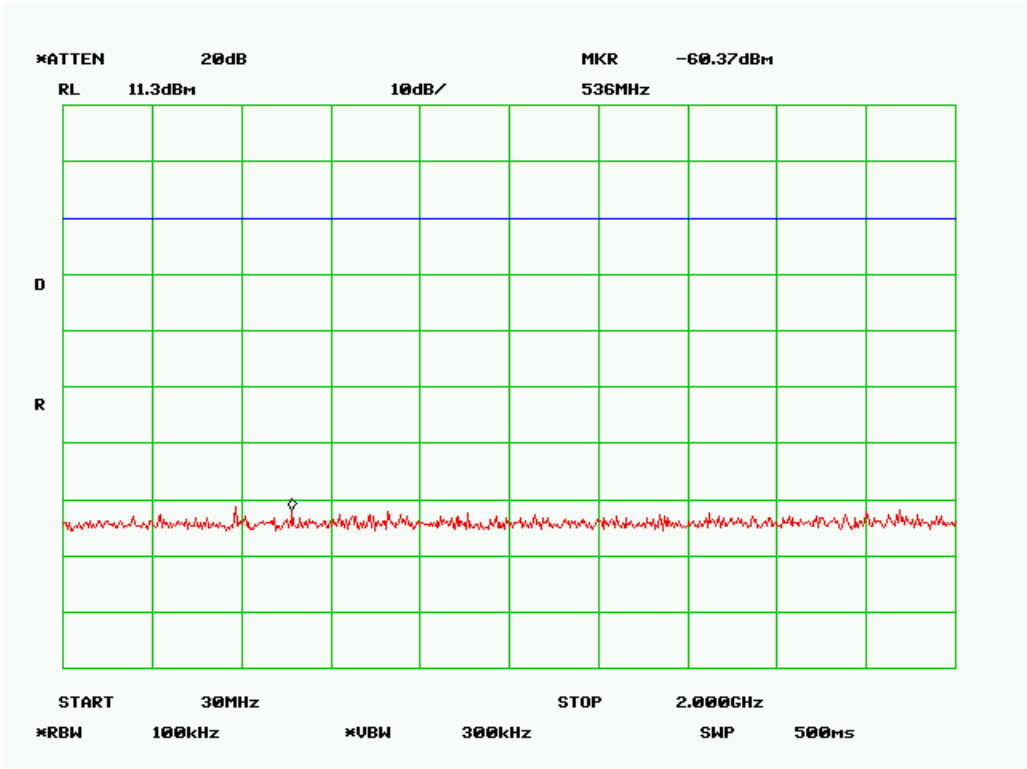


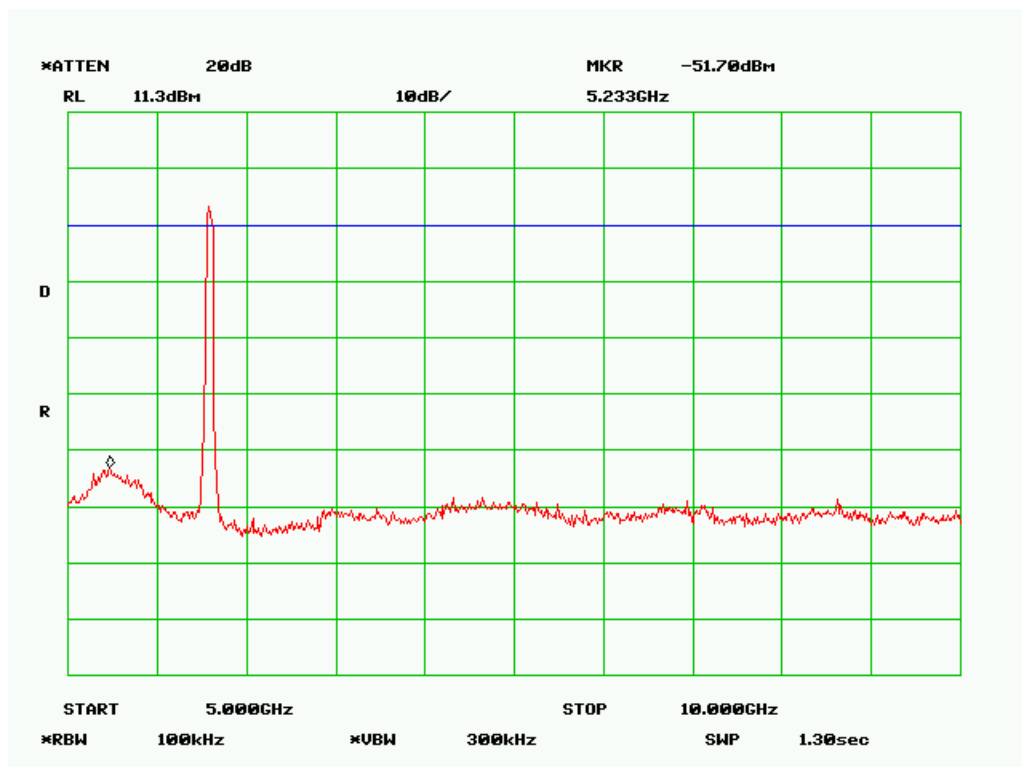
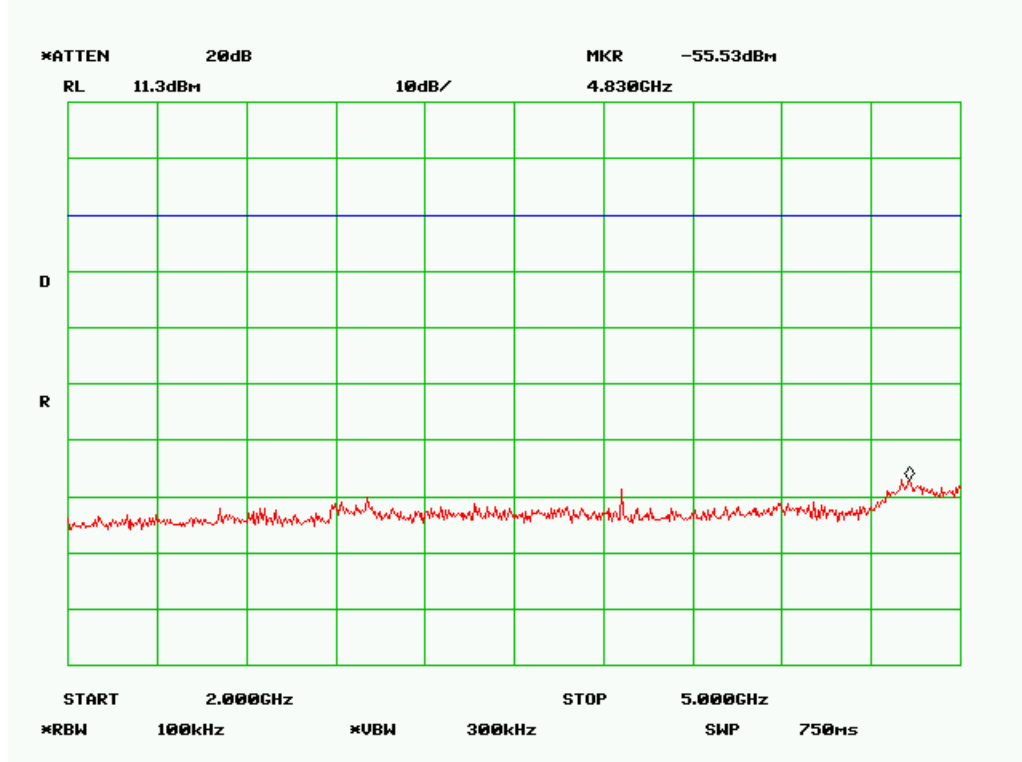
Low Channel (40MHz Chain 2)

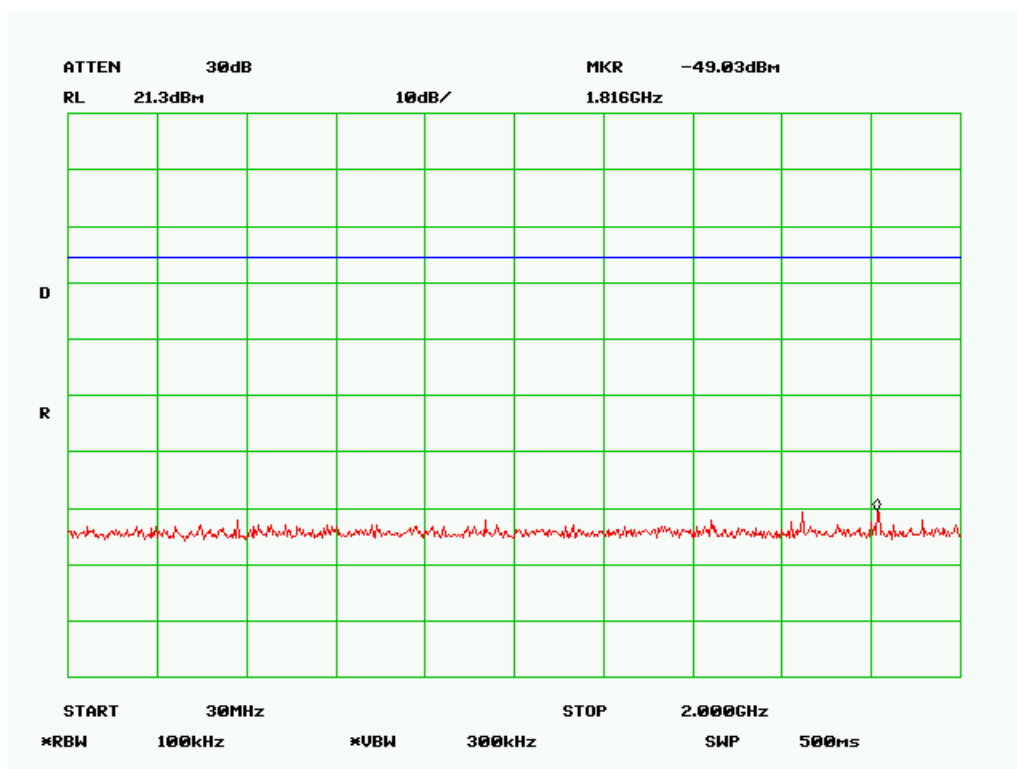


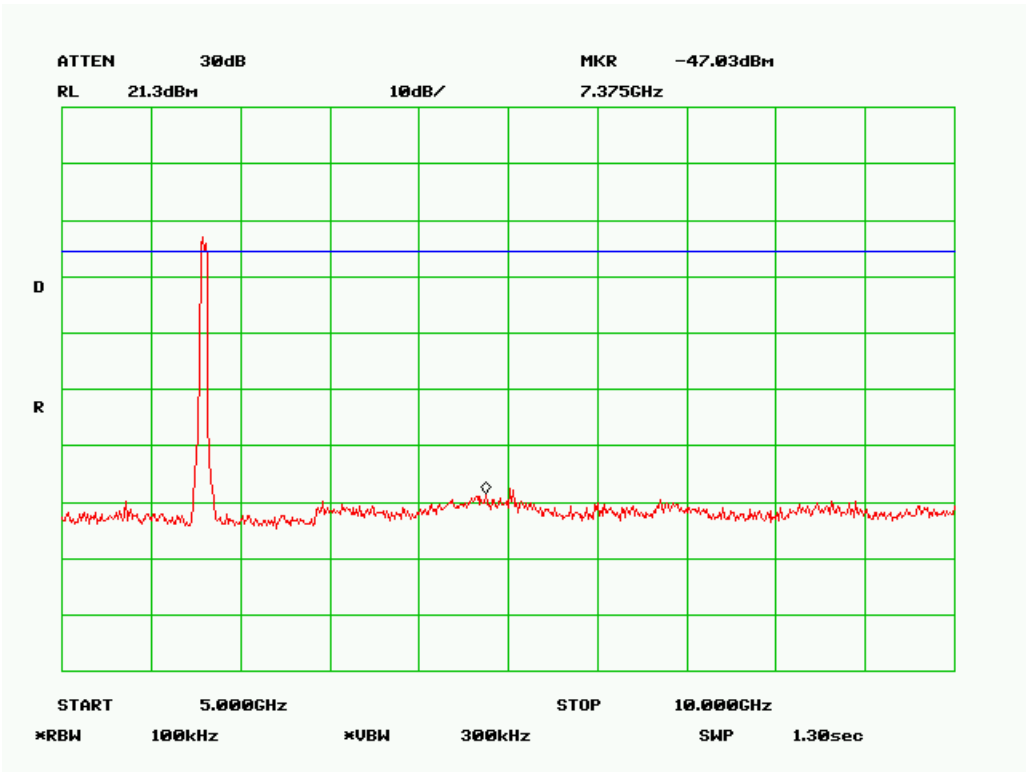
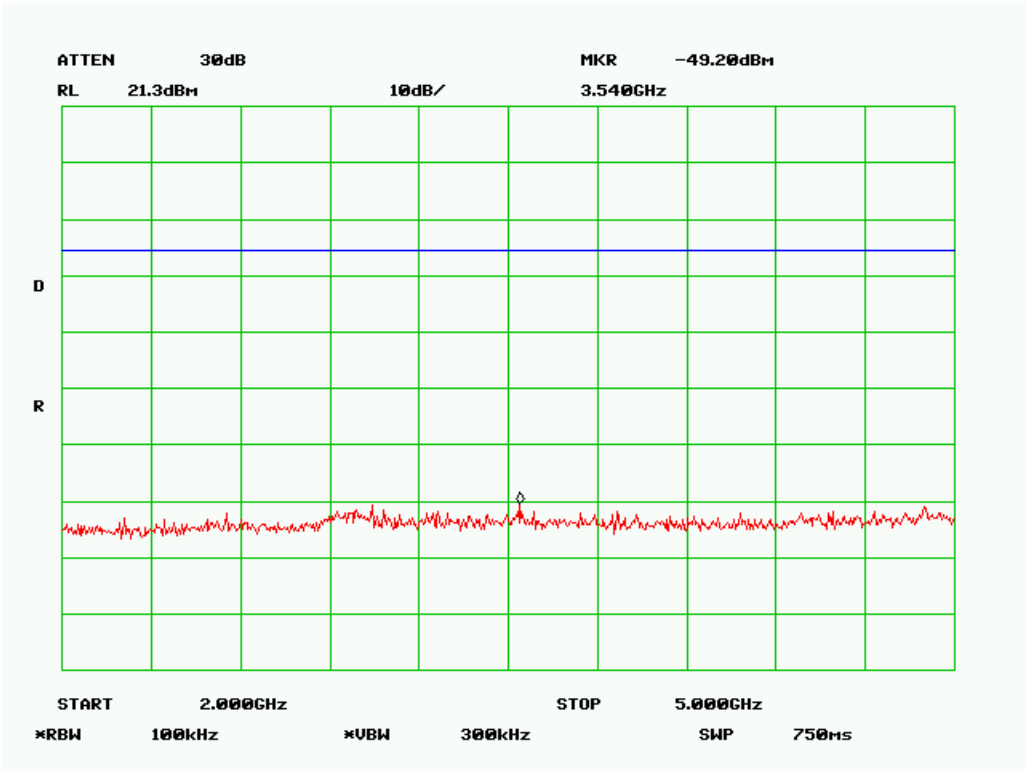


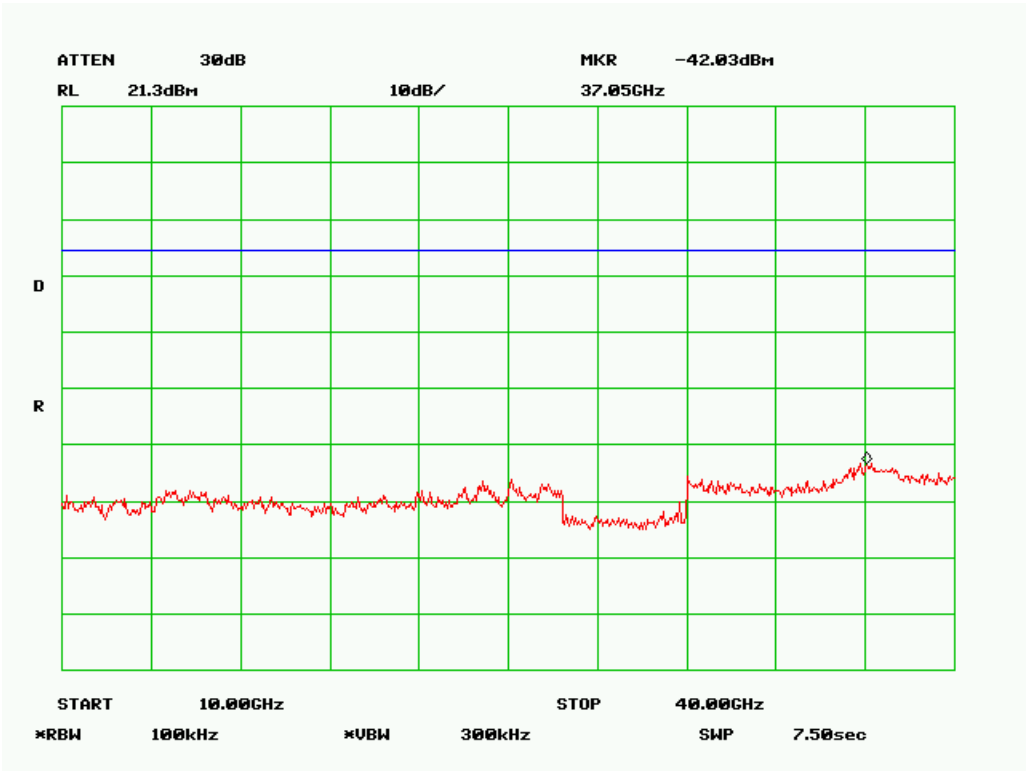
High Channel (40MHz Chain 0)

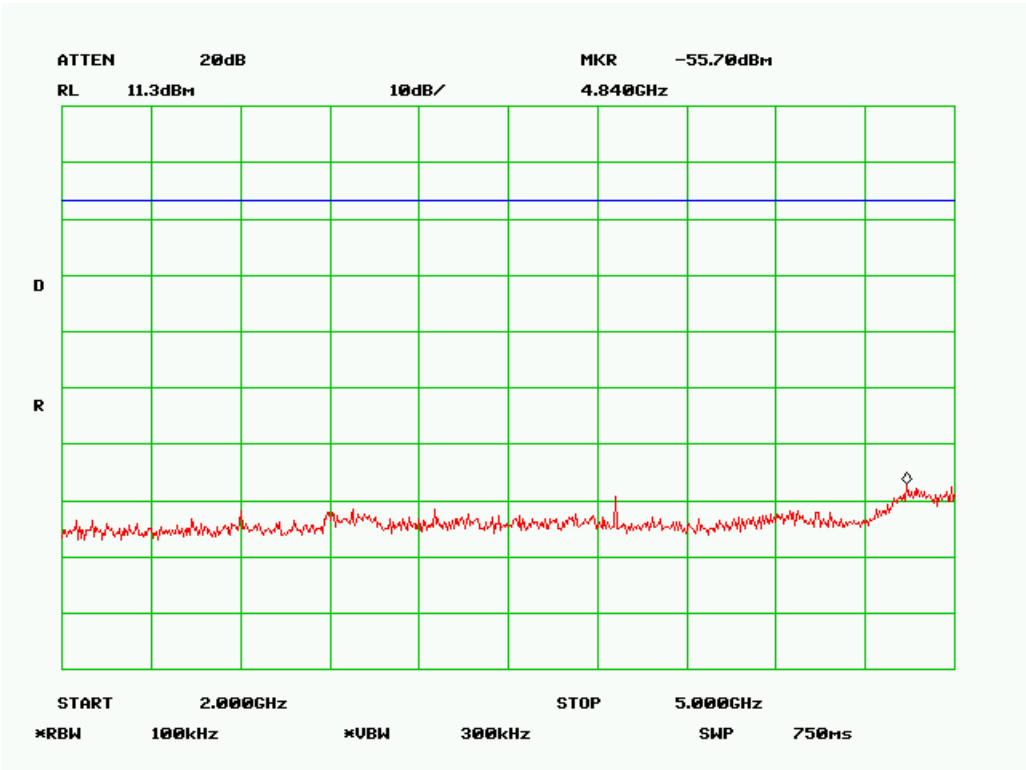
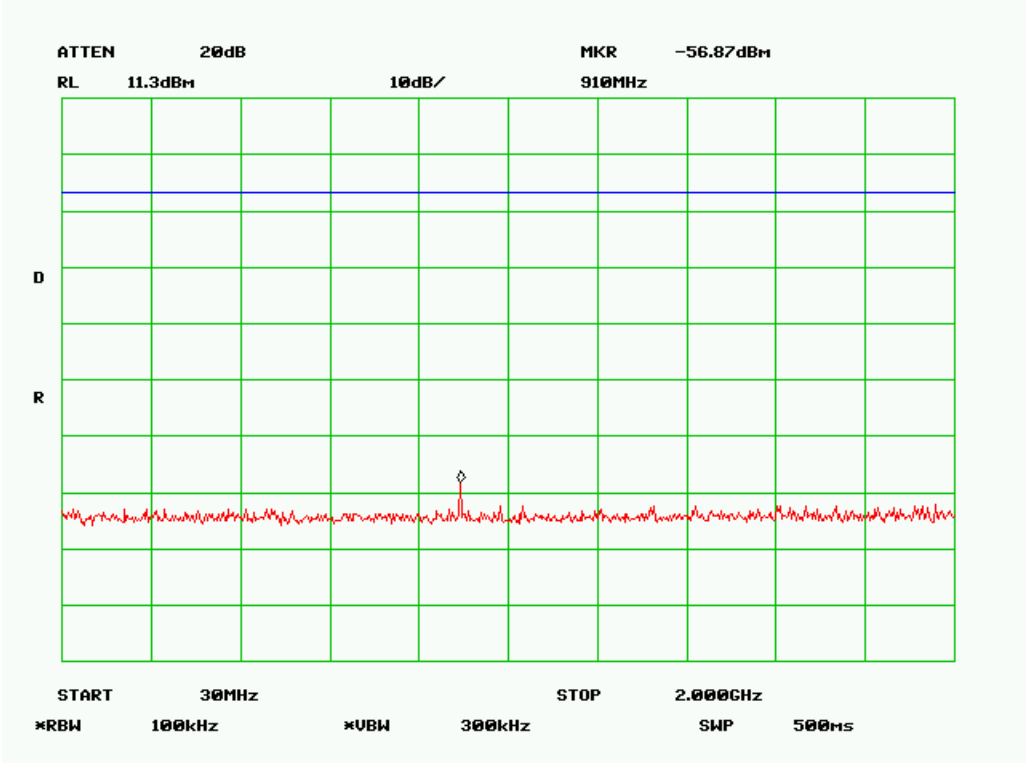




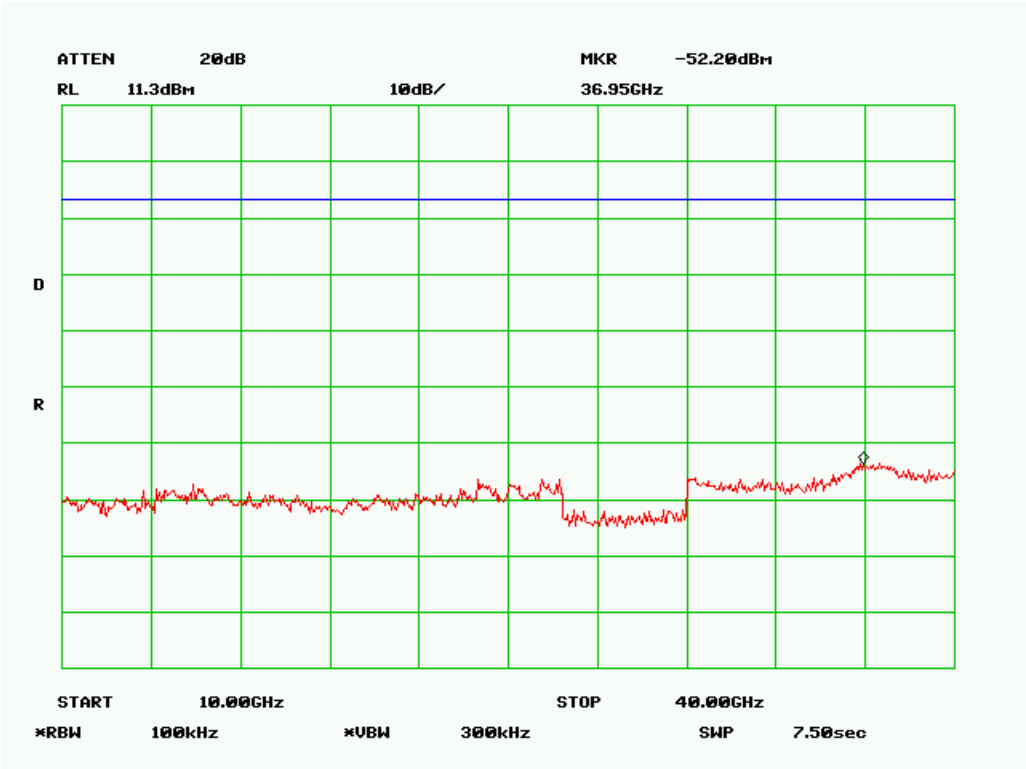
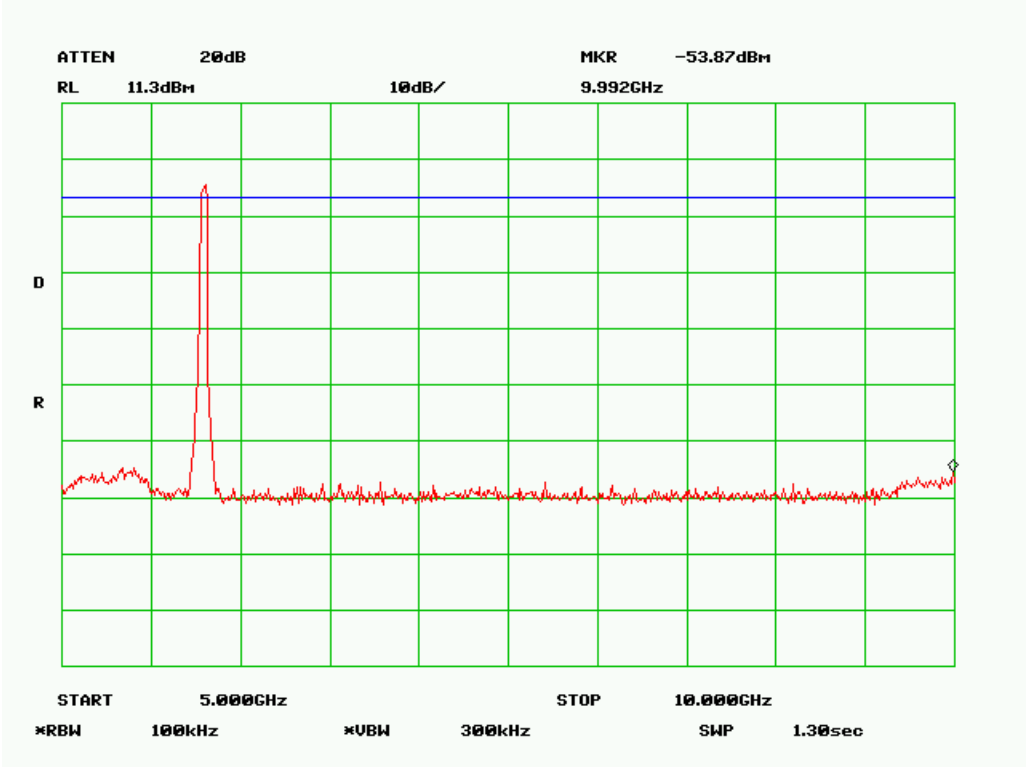








High Channel (40MHz Chain 2)



5.10 Radiated Spurious Emission < 1GHz

1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
 2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
 3. Radiated Emissions Measurement Uncertainty
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 1GHz (QP only @ 3m & 10m) is +5.6dB/-4.5dB (for EUTs < 0.5m X 0.5m X 0.5m).
 4. Environmental Conditions

Temperature	23°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar
- Test Date : January 12-23 2009
 Tested By :Choon Sian Ooi

Standard Requirement : 47 CFR §15.247(d); RSS210(A8.5)

Procedures: Radiated emissions were measured according to ANSI C63.4. The EUT was set to transmit at the highest output power. The EUT was set to transmit at mid channel. Note that setting the channel other than mid, the spurious emissions are the same.

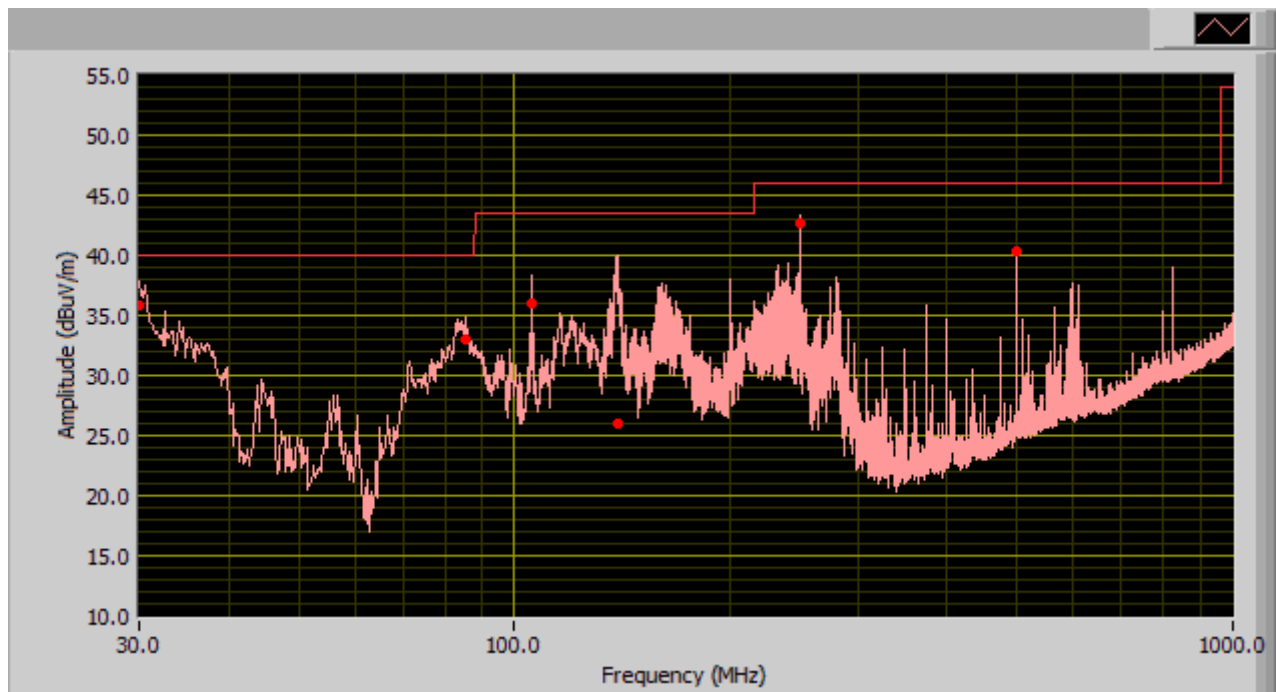
The limit is converted from microvolts/meter to decibel microvolts/meter.

Sample Calculation: Corrected Amplitude = Raw Amplitude(dBμV/m) + ACF(dB) + Cable Loss(dB)

Test Result:



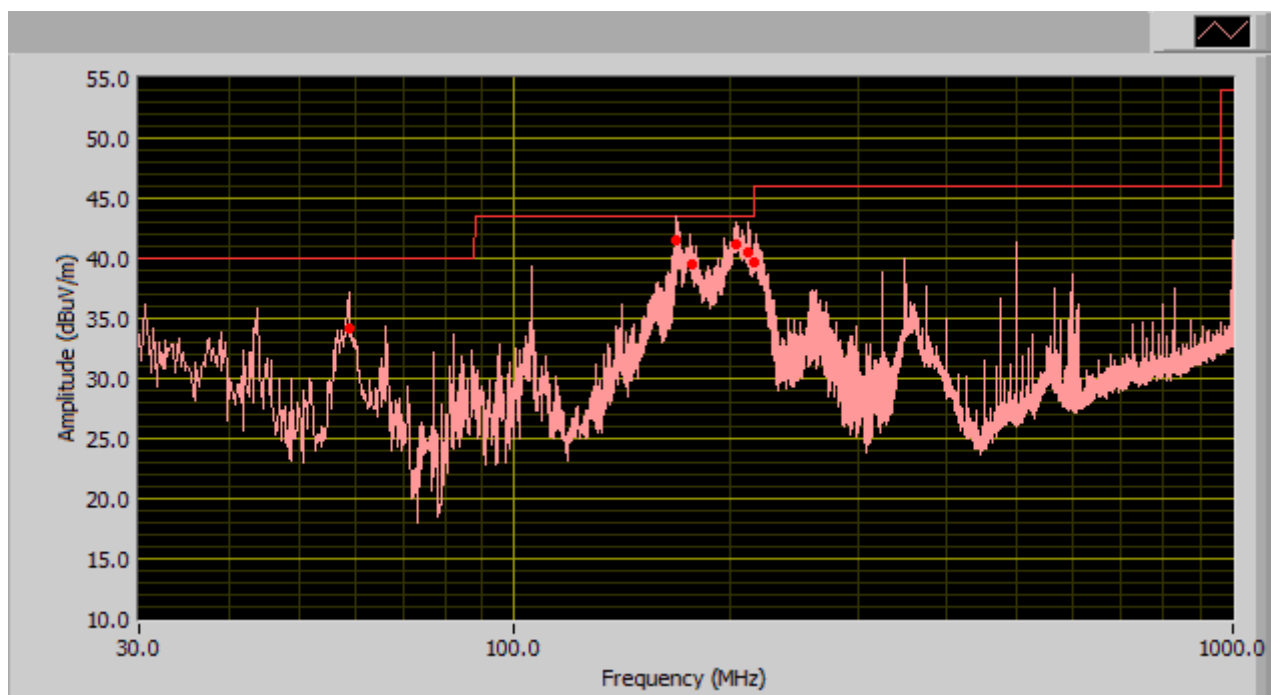
Radiated Emission Plot (Transmit Mode) with AF1805-A AC/DC Power supply



Test Data

Frequency (MHz)	Quasi-Peak (dBμV/m)	Antenna height (cm)	Polarity	Turntable position (deg)	Limit (dBμV/m)	Margin (dB)
29.94	35.79	43.00	V	101.00	40.00	-4.21
250.03	42.68	270.00	H	120.00	46.00	-3.32
139.29	25.98	270.00	V	102.00	43.50	-17.52
105.70	35.96	1.00	V	104.00	43.50	-7.54
85.51	32.94	3.00	V	182.00	40.00	-7.06
500.01	40.38	270.00	H	101.00	46.00	-5.62

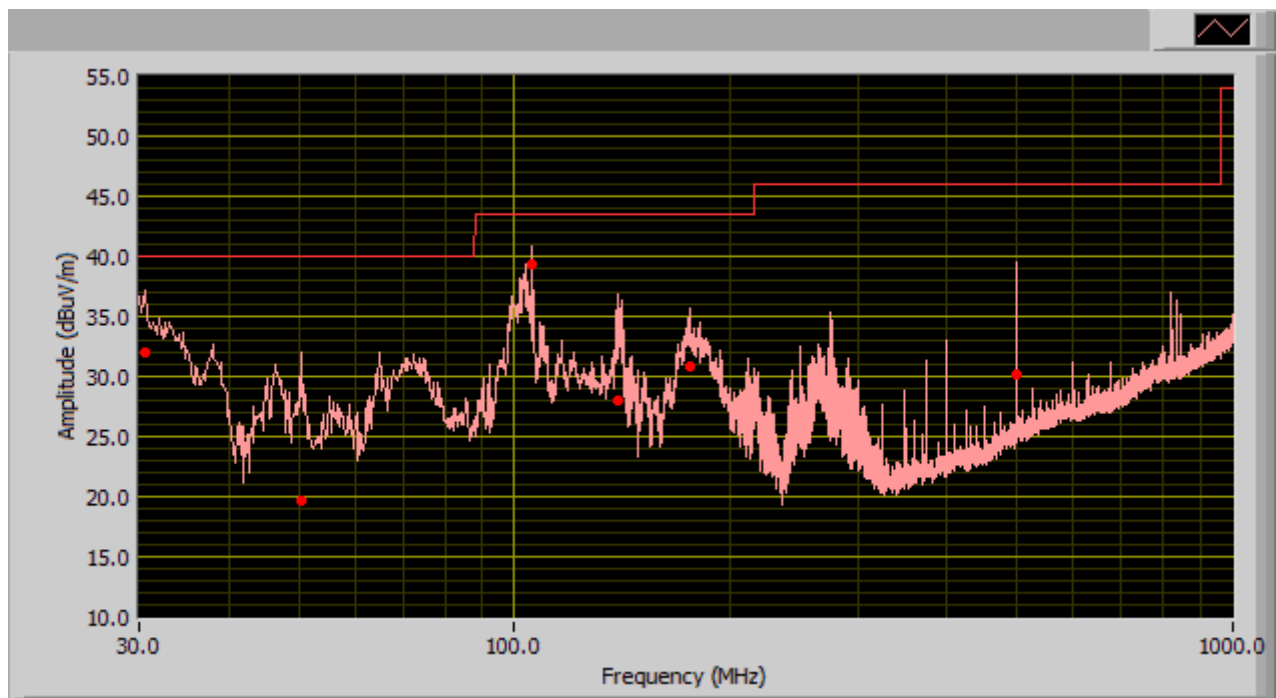
Radiated Emission Plot (Transmit Mode) with SA06L48-V POE Power Supply



Test Data

Frequency (MHz)	Quasi-Peak (dBμV/m)	Antenna height (cm)	Polarity	Turntable position (deg)	Limit (dBμV/m)	Margin (dB)
168.26	41.55	222.00	H	113.00	43.50	-1.95
203.89	41.25	99.00	H	107.00	43.50	-2.25
211.34	40.43	102.00	H	129.00	43.50	-3.07
215.59	39.60	82.00	H	123.00	43.50	-3.90
176.15	39.43	105.00	H	115.00	43.50	-4.07
58.72	34.15	6.00	V	154.00	40.00	-5.85

Radiated Emission Plot (Receive Mode)



Test Data

Frequency (MHz)	Quasi-Peak (dBμV/m)	Antenna height (cm)	Polarity	Turntable position (deg)	Limit (dBμV/m)	Margin (dB)
105.69	39.37	264.00	V	108.00	43.50	-4.13
30.59	32.07	14.00	V	100.00	40.00	-7.93
499.98	30.23	8.00	V	104.00	46.00	-15.77
139.64	27.97	274.00	V	100.00	43.50	-15.53
174.88	30.77	139.00	H	176.00	43.50	-12.73
50.37	19.74	177.00	V	112.00	40.00	-20.26

5.10 Radiated Spurious Emissions > 1GHz & Band Edge

1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. Radiated Emissions Measurement Uncertainty
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 1GHz – 40GH is +5.6dB/-4.5dB (for EUTs < 0.5m X 0.5m X 0.5m).
4. Environmental Conditions

Temperature	23°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

Test Date : January 12-23 2009
 Tested By :Choon Sian Ooi

Standard Requirement: 47 CFR §15.247(d); RSS210(A8.5)

Procedures: Equipment was setup in a semi-anechoic chamber. For measurements above 1 GHz an average measurement was taken with a 10Hz video bandwidth. The EUT was tested at low, mid and high with the highest output power. Investigated up to 10th harmonic of the operating frequency.

Sample Calculation:

EUT Field Strength = Raw Amplitude(dBμV/m) – Amplifier Gain(dB) + Antenna Factor(dB) + Cable Loss(dB) + Filter Attenuation(dB, if used)

Test Result:

GRID Antenna

@ Low Channel 20MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.745	117.51	180.00	155.00	v	34.30	4.56	32.48	123.89	\	\	Fund/Peak
5.745	102.99	78.00	105.00	h	34.30	4.56	32.48	109.37	\	\	Fund/Peak
5.745	104.62	180.00	155.00	v	34.30	4.56	32.48	111.00	\	\	Fund/Ave
5.745	91.63	78.00	105.00	h	34.30	4.56	32.48	98.01	\	\	Fund/Ave
11.490	53.88	160.00	1.00	v	42.20	7.17	32.70	70.55	74.00	-3.45	Peak
11.490	41.84	178.00	1.30	h	42.20	7.17	32.70	58.51	74.00	-15.49	Peak
11.490	37.06	160.00	1.00	v	42.20	7.17	32.70	53.73	54.00	-0.27	Ave
11.490	28.57	178.00	1.30	h	42.20	7.17	32.70	45.24	54.00	-8.76	Ave
17.225	42.09	190.00	1.10	v	43.40	10.58	31.56	64.51	103.89	-39.38	Peak *
17.225	42.82	271.00	1.70	h	43.40	10.58	31.56	65.24	89.37	-24.13	Peak *
17.225	28.36	190.00	1.10	v	43.40	10.58	31.56	50.78	91.00	-40.22	Ave *
17.225	26.12	271.00	1.70	h	43.40	10.58	31.56	48.54	78.01	-29.47	Ave *
5.725	86.94	190.00	1.10	v	34.30	4.56	32.48	93.32	103.89	-10.57	Peak *
5.725	67.25	271.00	1.70	h	34.30	4.56	32.48	73.63	89.37	-15.74	Peak *
5.725	66.41	190.00	1.10	v	34.30	4.56	32.48	72.79	91.00	-18.21	Ave *
5.725	55.48	271.00	1.70	h	34.30	4.56	32.48	61.86	78.01	-16.15	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

@ Mid Channel 20MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.785	114.18	180.00	155.00	v	34.30	4.56	32.48	120.56	\	\	Fund/Peak
5.785	100.50	78.00	105.00	h	34.30	4.56	32.48	106.88	\	\	Fund/Peak
5.785	103.12	180.00	155.00	v	34.30	4.56	32.48	109.50	\	\	Fund/Ave
5.785	90.42	78.00	105.00	h	34.30	4.56	32.48	96.80	\	\	Fund/Ave
11.570	52.51	200.00	1.00	v	43.20	7.42	32.51	70.62	74.00	-3.38	Peak
11.570	42.63	187.00	1.20	h	43.20	7.42	32.51	60.74	74.00	-13.27	Peak
11.570	35.34	200.00	1.00	v	43.20	7.42	32.51	53.45	54.00	-0.55	Ave
11.570	28.87	187.00	1.20	h	43.20	7.42	32.51	46.98	54.00	-7.02	Ave
17.355	39.50	271.00	1.00	v	43.40	10.58	31.56	61.92	74.00	-12.08	Peak *
17.355	38.49	159.00	1.00	h	43.40	10.58	31.56	60.91	74.00	-13.09	Peak *
17.355	25.89	271.00	1.30	v	43.40	10.58	31.56	48.31	54.00	-5.69	Ave *
17.355	25.95	159.00	1.40	h	43.40	10.58	31.56	48.37	54.00	-5.63	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

@ High Channel 20MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.825	114.16	180.00	155.00	v	34.30	4.56	32.48	120.54	\	\	Fund/Peak
5.825	99.66	78.00	105.00	h	34.30	4.56	32.48	106.04	\	\	Fund/Peak
5.825	103.86	180.00	155.00	v	34.30	4.56	32.48	110.24	\	\	Fund/Ave
5.825	89.02	78.00	105.00	h	34.30	4.56	32.48	95.40	\	\	Fund/Ave
11.650	47.56	24.00	1.00	v	43.20	7.42	32.51	65.67	74.00	-8.33	Peak
11.650	41.19	102.00	1.00	h	43.20	7.42	32.51	59.30	74.00	-14.71	Peak
11.650	34.02	24.00	1.00	v	43.20	7.42	32.51	52.13	54.00	-1.87	Ave
11.650	28.14	180.00	1.30	h	43.20	7.42	32.51	46.25	54.00	-7.75	Ave
5.850	69.12	115.00	1.10	v	34.30	4.56	32.48	75.50	100.54	-25.04	Peak *
5.850	68.87	235.00	1.70	h	34.30	4.56	32.48	75.25	86.04	-10.79	Peak *
5.850	56.04	115.00	1.10	v	34.30	4.56	32.48	62.42	90.24	-27.82	Ave *
5.850	55.95	235.00	1.70	h	34.30	4.56	32.48	62.33	75.40	-13.07	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

@ Low Channel 40MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.755	114.41	180.00	155.00	v	34.30	4.56	32.48	120.79	\	\	Fund/Peak
5.755	100.52	78.00	105.00	h	34.30	4.56	32.48	106.90	\	\	Fund/Peak
5.755	103.82	180.00	155.00	v	34.30	4.56	32.48	110.20	\	\	Fund/Ave
5.755	89.14	78.00	105.00	h	34.30	4.56	32.48	95.52	\	\	Fund/Ave
11.510	50.07	360.00	1.20	v	43.20	7.42	32.51	68.18	74.00	-5.82	Peak
11.510	40.25	280.00	1.20	h	43.20	7.42	32.51	58.36	74.00	-15.65	Peak
11.510	35.81	360.00	1.00	v	43.20	7.42	32.51	53.92	54.00	-0.08	Ave
11.510	26.16	280.00	1.20	h	43.20	7.42	32.51	44.27	54.00	-9.73	Ave
17.265	38.77	62.00	1.30	v	43.40	10.58	31.56	61.19	100.79	-39.60	Peak *
17.265	40.42	78.00	1.40	h	43.40	10.58	31.56	62.84	86.90	-24.06	Peak *
17.265	26.65	62.00	1.30	v	43.40	10.58	31.56	49.07	90.20	-41.13	Ave *
17.265	26.15	78.00	1.40	h	43.40	10.58	31.56	48.57	75.52	-26.95	Ave *
5.725	68.86	190.00	1.10	v	34.30	4.56	32.48	75.24	100.79	-25.55	Peak *
5.725	68.06	271.00	1.70	h	34.30	4.56	32.48	74.44	86.90	-12.46	Peak *
5.725	55.59	190.00	1.10	v	34.30	4.56	32.48	61.97	90.20	-28.23	Ave *
5.725	55.47	271.00	1.70	h	34.30	4.56	32.48	61.85	75.52	-13.67	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

@ High Channel 40MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.795	114.41	180.00	155.00	v	34.30	4.56	32.48	120.79	\	\	Fund/Peak
5.795	100.52	78.00	105.00	h	34.30	4.56	32.48	106.90	\	\	Fund/Peak
5.795	103.82	180.00	155.00	v	34.30	4.56	32.48	110.20	\	\	Fund/Ave
5.795	89.14	78.00	105.00	h	34.30	4.56	32.48	95.52	\	\	Fund/Ave
11.590	49.29	360.00	1.20	v	43.20	7.42	32.51	67.40	74.00	-6.60	Peak
11.590	43.12	280.00	1.20	h	43.20	7.42	32.51	61.23	74.00	-12.78	Peak
11.590	33.45	360.00	1.00	v	43.20	7.42	32.51	51.56	54.00	-2.44	Ave
11.590	28.42	280.00	1.20	h	43.20	7.42	32.51	46.53	54.00	-7.47	Ave
17.385	40.36	62.00	1.30	v	43.40	10.58	31.56	62.78	74.00	-11.22	Peak *
17.385	40.03	78.00	1.40	h	43.40	10.58	31.56	62.45	74.00	-11.55	Peak *
17.385	26.07	62.00	1.30	v	43.40	10.58	31.56	48.49	54.00	-5.51	Ave *
17.385	25.95	78.00	1.40	h	43.40	10.58	31.56	48.37	54.00	-5.63	Ave *
5.850	69.23	190.00	1.10	v	34.30	4.56	32.48	75.61	100.79	-25.18	Peak *
5.850	68.88	271.00	1.70	h	34.30	4.56	32.48	75.26	86.90	-11.64	Peak *
5.850	55.93	190.00	1.10	v	34.30	4.56	32.48	62.31	90.20	-27.89	Ave *
5.850	55.90	271.00	1.70	h	34.30	4.56	32.48	62.28	75.52	-13.24	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

Sector Antenna

@ Low Channel 20MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.725	117.62	180.00	155.00	v	34.30	4.56	32.48	124.00	\	\	Fund/Peak
5.725	100.94	78.00	105.00	h	34.30	4.56	32.48	107.32	\	\	Fund/Peak
5.725	107.60	180.00	155.00	v	34.30	4.56	32.48	113.98	\	\	Fund/Ave
5.725	90.37	78.00	105.00	h	34.30	4.56	32.48	96.75	\	\	Fund/Ave
11.490	51.38	140.00	1.00	v	42.20	7.17	32.70	68.05	74.00	-5.95	Peak
11.490	43.51	143.00	1.00	h	42.20	7.17	32.70	60.18	74.00	-13.82	Peak
11.490	36.90	140.00	1.00	v	42.20	7.17	32.70	53.57	54.00	-0.43	Ave
11.490	30.30	143.00	1.30	h	42.20	7.17	32.70	46.97	54.00	-7.03	Ave
17.225	42.17	190.00	1.10	v	43.40	10.58	31.56	64.59	104.00	-39.41	Peak *
17.225	42.13	271.00	1.70	h	43.40	10.58	31.56	64.55	87.32	-22.77	Peak *
17.225	28.34	190.00	1.10	v	43.40	10.58	31.56	50.76	93.98	-43.22	Ave *
17.225	28.27	271.00	1.70	h	43.40	10.58	31.56	50.69	76.75	-26.06	Ave *
5.725	87.26	190.00	1.10	v	34.30	4.56	32.48	93.64	104.00	-10.36	Peak *
5.725	72.23	271.00	1.70	h	34.30	4.56	32.48	78.61	87.32	-8.71	Peak *
5.725	58.61	190.00	1.10	v	34.30	4.56	32.48	64.99	93.98	-28.99	Ave *
5.725	68.39	271.00	1.70	h	34.30	4.56	32.48	74.77	76.75	-1.98	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

@ Mid Channel 20MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.785	117.89	180.00	155.00	v	34.30	4.56	32.48	124.27	\	\	Fund/Peak
5.785	100.48	78.00	105.00	h	34.30	4.56	32.48	106.86	\	\	Fund/Peak
5.785	107.36	180.00	155.00	v	34.30	4.56	32.48	113.74	\	\	Fund/Ave
5.785	89.25	78.00	105.00	h	34.30	4.56	32.48	95.63	\	\	Fund/Ave
11.570	50.25	200.00	1.00	v	43.20	7.42	32.51	68.36	74.00	-5.64	Peak
11.570	42.38	187.00	1.20	h	43.20	7.42	32.51	60.49	74.00	-13.52	Peak
11.570	35.37	200.00	1.00	v	43.20	7.42	32.51	53.48	54.00	-0.52	Ave
11.570	29.30	187.00	1.20	h	43.20	7.42	32.51	47.41	54.00	-6.59	Ave
17.355	40.69	271.00	1.00	v	43.40	10.58	31.56	63.11	104.27	-41.16	Peak *
17.355	39.80	159.00	1.00	h	43.40	10.58	31.56	62.22	86.86	-24.64	Peak *
17.355	26.38	271.00	1.30	v	43.40	10.58	31.56	48.80	93.74	-44.94	Ave *
17.355	26.22	159.00	1.40	h	43.40	10.58	31.56	48.64	75.63	-26.99	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

@ High Channel 20MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.825	114.87	180.00	155.00	v	34.30	4.56	32.48	121.25	\	\	Fund/Peak
5.825	99.19	78.00	105.00	h	34.30	4.56	32.48	105.57	\	\	Fund/Peak
5.825	104.19	180.00	155.00	v	34.30	4.56	32.48	110.57	\	\	Fund/Ave
5.825	88.13	78.00	105.00	h	34.30	4.56	32.48	94.51	\	\	Fund/Ave
11.650	42.28	24.00	1.00	v	43.20	7.42	32.51	60.39	74.00	-13.62	Peak
11.650	42.62	102.00	1.00	h	43.20	7.42	32.51	60.73	74.00	-13.28	Peak
11.650	28.71	24.00	1.00	v	43.20	7.42	32.51	46.82	54.00	-7.19	Ave
11.650	29.05	180.00	1.30	h	43.20	7.42	32.51	47.16	54.00	-6.84	Ave
5.850	67.07	115.00	1.10	v	34.30	4.56	32.48	73.45	101.25	-27.80	Peak *
5.850	68.03	235.00	1.70	h	34.30	4.56	32.48	74.41	85.57	-11.16	Peak *
5.850	56.07	115.00	1.10	v	34.30	4.56	32.48	62.45	90.57	-28.12	Ave *
5.850	56.13	235.00	1.70	h	34.30	4.56	32.48	62.51	74.51	-12.00	Ave *
17.475	40.03	190.00	1.10	v	43.40	10.58	31.56	62.45	101.25	-38.80	Peak *
17.475	39.38	271.00	1.70	h	43.40	10.58	31.56	61.80	85.57	-23.77	Peak *
17.475	26.27	190.00	1.10	v	43.40	10.58	31.56	48.69	90.57	-41.88	Ave *
17.475	26.28	271.00	1.70	h	43.40	10.58	31.56	48.70	74.51	-25.81	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

@ Low Channel 40MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.755	113.12	180.00	155.00	v	34.30	4.56	32.48	119.50	\	\	Fund/Peak
5.755	97.91	78.00	105.00	h	34.30	4.56	32.48	104.29	\	\	Fund/Peak
5.755	100.60	180.00	155.00	v	34.30	4.56	32.48	106.98	\	\	Fund/Ave
5.755	86.59	78.00	105.00	h	34.30	4.56	32.48	92.97	\	\	Fund/Ave
11.510	45.66	360.00	1.20	v	43.20	7.42	32.51	63.77	74.00	-10.24	Peak
11.510	42.93	280.00	1.20	h	43.20	7.42	32.51	61.04	74.00	-12.97	Peak
11.510	32.84	360.00	1.00	v	43.20	7.42	32.51	50.95	54.00	-3.05	Ave
11.510	28.45	280.00	1.20	h	43.20	7.42	32.51	46.56	54.00	-7.44	Ave
17.265	26.15	62.00	1.30	v	43.40	10.58	31.56	48.57	99.50	-50.93	Peak *
17.265	39.67	78.00	1.40	h	43.40	10.58	31.56	62.09	84.29	-22.20	Peak *
17.265	25.99	62.00	1.30	v	43.40	10.58	31.56	48.41	86.98	-38.57	Ave *
17.265	26.16	78.00	1.40	h	43.40	10.58	31.56	48.58	72.97	-24.39	Ave *
5.725	86.13	190.00	1.10	v	34.30	4.56	32.48	92.51	99.50	-6.99	Peak *
5.725	75.39	271.00	1.70	h	34.30	4.56	32.48	81.77	84.29	-2.52	Peak *
5.725	71.56	190.00	1.10	v	34.30	4.56	32.48	77.94	86.98	-9.04	Ave *
5.725	65.48	271.00	1.70	h	34.30	4.56	32.48	71.86	72.97	-1.11	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

@ High Channel 40MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.795	113.07	180.00	155.00	v	34.30	4.56	32.48	119.45	\	\	Fund/Peak
5.795	97.08	78.00	105.00	h	34.30	4.56	32.48	103.46	\	\	Fund/Peak
5.795	101.83	180.00	155.00	v	34.30	4.56	32.48	108.21	\	\	Fund/Ave
5.795	85.36	78.00	105.00	h	34.30	4.56	32.48	91.74	\	\	Fund/Ave
11.590	43.06	360.00	1.20	v	43.20	7.42	32.51	61.17	74.00	-12.84	Peak
11.590	41.38	280.00	1.20	h	43.20	7.42	32.51	59.49	74.00	-14.52	Peak
11.590	29.31	360.00	1.00	v	43.20	7.42	32.51	47.42	54.00	-6.58	Ave
11.590	28.68	280.00	1.20	h	43.20	7.42	32.51	46.79	54.00	-7.22	Ave
17.385	40.61	62.00	1.30	v	43.40	10.58	31.56	63.03	74.00	-10.97	Peak *
17.385	39.25	78.00	1.40	h	43.40	10.58	31.56	61.67	74.00	-12.33	Peak *
17.385	26.14	62.00	1.30	v	43.40	10.58	31.56	48.56	54.00	-5.44	Ave *
17.385	26.18	78.00	1.40	h	43.40	10.58	31.56	48.60	54.00	-5.40	Ave *
5.850	67.33	190.00	1.10	v	34.30	4.56	32.48	73.71	99.45	-25.74	Peak *
5.850	67.99	271.00	1.70	h	34.30	4.56	32.48	74.37	83.46	-9.09	Peak *
5.850	53.70	190.00	1.10	v	34.30	4.56	32.48	60.08	88.21	-28.13	Ave *
5.850	53.80	271.00	1.70	h	34.30	4.56	32.48	60.18	71.74	-11.56	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

Dual Polarity- Antenna

@ Low Channel 20MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.745	118.83	180.00	155.00	v	34.30	4.56	32.48	125.21	\	\	Fund/Peak
5.745	108.00	78.00	105.00	h	34.30	4.56	32.48	114.38	\	\	Fund/Peak
5.745	107.00	180.00	155.00	v	34.30	4.56	32.48	113.38	\	\	Fund/Ave
5.745	98.17	78.00	105.00	h	34.30	4.56	32.48	104.55	\	\	Fund/Ave
11.490	47.17	140.00	1.00	v	42.20	7.17	32.70	63.84	74.00	-10.16	Peak
11.490	42.17	143.00	1.00	h	42.20	7.17	32.70	58.84	74.00	-15.16	Peak
11.490	33.17	140.00	1.00	v	42.20	7.17	32.70	49.84	54.00	-4.16	Ave
11.490	27.50	143.00	1.30	h	42.20	7.17	32.70	44.17	54.00	-9.83	Ave
17.225	38.80	190.00	1.10	v	43.40	10.58	31.56	61.22	105.21	-43.99	Peak *
17.225	39.17	271.00	1.70	h	43.40	10.58	31.56	61.59	94.38	-32.79	Peak *
17.225	25.17	190.00	1.10	v	43.40	10.58	31.56	47.59	93.38	-45.79	Ave *
17.225	25.33	271.00	1.70	h	43.40	10.58	31.56	47.75	84.55	-36.80	Ave *
5.725	97.17	190.00	1.10	v	34.30	4.56	32.48	103.55	105.21	-1.66	Peak *
5.725	72.00	271.00	1.70	h	34.30	4.56	32.48	78.38	94.38	-16.00	Peak *
5.725	79.17	190.00	1.10	v	34.30	4.56	32.48	85.55	93.38	-7.83	Ave *
5.725	60.17	271.00	1.70	h	34.30	4.56	32.48	66.55	84.55	-18.00	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

@ Mid Channel 20MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.785	119.33	180.00	155.00	v	34.30	4.56	32.48	125.71	\	\	Fund/Peak
5.785	106.17	78.00	105.00	h	34.30	4.56	32.48	112.55	\	\	Fund/Peak
5.785	107.33	180.00	155.00	v	34.30	4.56	32.48	113.71	\	\	Fund/Ave
5.785	96.33	78.00	105.00	h	34.30	4.56	32.48	102.71	\	\	Fund/Ave
11.570	47.83	200.00	1.00	v	43.20	7.42	32.51	65.94	74.00	-8.07	Peak
11.570	43.17	187.00	1.20	h	43.20	7.42	32.51	61.28	74.00	-12.73	Peak
11.570	33.33	200.00	1.00	v	43.20	7.42	32.51	51.44	54.00	-2.56	Ave
11.570	29.17	187.00	1.20	h	43.20	7.42	32.51	47.28	54.00	-6.72	Ave
17.355	38.67	271.00	1.00	v	43.40	10.58	31.56	61.09	105.21	-44.12	Peak *
17.355	38.17	159.00	1.00	h	43.40	10.58	31.56	60.59	94.38	-33.79	Peak *
17.355	24.94	271.00	1.30	v	43.40	10.58	31.56	47.36	93.38	-46.02	Ave *
17.355	24.83	159.00	1.40	h	43.40	10.58	31.56	47.25	84.55	-37.30	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

@ High Channel 20MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.825	117.67	180.00	155.00	v	34.30	4.56	32.48	124.05	\	\	Fund/Peak
5.825	107.33	78.00	105.00	h	34.30	4.56	32.48	113.71	\	\	Fund/Peak
5.825	105.50	180.00	155.00	v	34.30	4.56	32.48	111.88	\	\	Fund/Ave
5.825	97.17	78.00	105.00	h	34.30	4.56	32.48	103.55	\	\	Fund/Ave
11.650	46.50	24.00	1.00	v	43.20	7.42	32.51	64.61	74.00	-9.39	Peak
11.650	40.67	102.00	1.00	h	43.20	7.42	32.51	58.78	74.00	-15.23	Peak
11.650	32.60	24.00	1.00	v	43.20	7.42	32.51	50.71	54.00	-3.29	Ave
11.650	27.00	180.00	1.30	h	43.20	7.42	32.51	45.11	54.00	-8.89	Ave
5.850	89.67	115.00	1.10	v	34.30	4.56	32.48	96.05	104.05	-8.00	Peak *
5.850	54.83	235.00	1.70	h	34.30	4.56	32.48	61.21	93.71	-32.50	Peak *
5.850	67.00	115.00	1.10	v	34.30	4.56	32.48	73.38	91.88	-18.50	Ave *
5.850	36.17	235.00	1.70	h	34.30	4.56	32.48	42.55	83.55	-41.00	Ave *
17.475	38.67	190.00	1.10	v	43.40	10.58	31.56	61.09	104.05	-42.96	Peak *
17.475	38.17	271.00	1.70	h	43.40	10.58	31.56	60.59	93.71	-33.12	Peak *
17.475	25.17	190.00	1.10	v	43.40	10.58	31.56	47.59	91.88	-44.29	Ave *
17.475	25.00	271.00	1.70	h	43.40	10.58	31.56	47.42	83.55	-36.13	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

@ Low Channel 40MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.755	116.70	180.00	155.00	v	34.30	4.56	32.48	123.08	\	\	Fund/Peak
5.755	106.50	78.00	105.00	h	34.30	4.56	32.48	112.88	\	\	Fund/Peak
5.755	104.00	180.00	155.00	v	34.30	4.56	32.48	110.38	\	\	Fund/Ave
5.755	96.50	78.00	105.00	h	34.30	4.56	32.48	102.88	\	\	Fund/Ave
11.510	47.33	360.00	1.20	v	43.20	7.42	32.51	65.44	74.00	-8.57	Peak
11.510	40.67	280.00	1.20	h	43.20	7.42	32.51	58.78	74.00	-15.23	Peak
11.510	32.67	360.00	1.00	v	43.20	7.42	32.51	50.78	54.00	-3.22	Ave
11.510	26.33	280.00	1.20	h	43.20	7.42	32.51	44.44	54.00	-9.56	Ave
17.265	38.33	62.00	1.30	v	43.40	10.58	31.56	60.75	74.00	-13.25	Peak *
17.265	39.33	78.00	1.40	h	43.40	10.58	31.56	61.75	74.00	-12.25	Peak *
17.265	25.83	62.00	1.30	v	5.00	10.58	31.56	9.85	54.00	-44.15	Ave *
17.265	25.83	78.00	1.40	h	43.40	10.58	31.56	48.25	54.00	-5.75	Ave *
5.725	96.33	190.00	1.10	v	34.30	4.56	32.48	102.71	103.08	-0.37	Peak *
5.725	72.33	271.00	1.70	h	34.30	4.56	32.48	78.71	92.88	-14.17	Peak *
5.725	83.17	190.00	1.10	v	34.30	4.56	32.48	89.55	90.38	-0.83	Ave *
5.725	61.00	271.00	1.70	h	34.30	4.56	32.48	67.38	82.88	-15.50	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

@ High Channel 40MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.795	115.67	180.00	155.00	v	34.30	4.56	32.48	122.05	\	\	Fund/Peak
5.795	104.00	78.00	105.00	h	34.30	4.56	32.48	110.38	\	\	Fund/Peak
5.795	104.00	180.00	155.00	v	34.30	4.56	32.48	110.38	\	\	Fund/Ave
5.795	94.00	78.00	105.00	h	34.30	4.56	32.48	100.38	\	\	Fund/Ave
11.590	46.33	360.00	1.20	v	43.20	7.42	32.51	64.44	74.00	-9.57	Peak
11.590	47.83	280.00	1.20	h	43.20	7.42	32.51	65.94	74.00	-8.07	Peak
11.590	32.67	360.00	1.00	v	43.20	7.42	32.51	50.78	54.00	-3.22	Ave
11.590	33.33	280.00	1.20	h	43.20	7.42	32.51	51.44	54.00	-2.56	Ave
17.385	39.17	62.00	1.30	v	43.40	10.58	31.56	61.59	102.05	-40.46	Peak *
17.385	39.02	78.00	1.40	h	43.40	10.58	31.56	61.44	90.38	-28.94	Peak *
17.385	25.17	62.00	1.30	v	43.40	10.58	31.56	47.59	90.38	-42.79	Ave *
17.385	25.10	78.00	1.40	h	43.40	10.58	31.56	47.52	80.38	-32.86	Ave *
5.850	76.00	190.00	1.10	v	34.30	4.56	32.48	82.38	102.05	-19.67	Peak *
5.850	52.50	271.00	1.70	h	34.30	4.56	32.48	58.88	90.38	-31.50	Peak *
5.850	56.17	190.00	1.10	v	34.30	4.56	32.48	62.55	90.38	-27.83	Ave *
5.850	41.67	271.00	1.70	h	34.30	4.56	32.48	48.05	80.38	-32.33	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

Omni Directional Antenna - Antenna

@ Low Channel 20MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.745	112.33	180.00	155.00	v	34.30	4.56	32.48	118.71	\	\	Fund/Peak
5.745	97.00	78.00	105.00	h	34.30	4.56	32.48	103.38	\	\	Fund/Peak
5.745	102.00	180.00	155.00	v	34.30	4.56	32.48	108.38	\	\	Fund/Ave
5.745	85.50	78.00	105.00	h	34.30	4.56	32.48	91.88	\	\	Fund/Ave
11.490	52.50	160.00	1.00	v	42.20	7.17	32.70	69.17	74.00	-4.83	Peak
11.490	43.17	178.00	1.30	h	42.20	7.17	32.70	59.84	74.00	-14.16	Peak
11.490	36.50	160.00	1.00	v	42.20	7.17	32.70	53.17	54.00	-0.83	Ave
11.490	29.00	178.00	1.30	h	42.20	7.17	32.70	45.67	54.00	-8.33	Ave
17.225	39.83	190.00	1.10	v	43.40	10.58	31.56	62.25	98.71	-36.46	Peak *
17.225	39.56	271.00	1.70	h	43.40	10.58	31.56	61.98	83.38	-21.40	Peak *
17.225	25.67	190.00	1.10	v	43.40	10.58	31.56	48.09	88.38	-40.29	Ave *
17.225	25.50	271.00	1.70	h	43.40	10.58	31.56	47.92	71.88	-23.96	Ave *
5.725	74.17	190.00	1.10	v	34.30	4.56	32.48	80.55	98.71	-18.16	Peak *
5.725	72.00	271.00	1.70	h	34.30	4.56	32.48	78.38	83.38	-5.00	Peak *
5.725	61.83	190.00	1.10	v	34.30	4.56	32.48	68.21	88.38	-20.17	Ave *
5.725	60.83	271.00	1.70	h	34.30	4.56	32.48	67.21	71.88	-4.67	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

@ Mid Channel 20MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.785	113.33	180.00	155.00	v	34.30	4.56	32.48	119.71	\	\	Fund/Peak
5.785	96.33	78.00	105.00	h	34.30	4.56	32.48	102.71	\	\	Fund/Peak
5.785	102.00	180.00	155.00	v	34.30	4.56	32.48	108.38	\	\	Fund/Ave
5.785	85.00	78.00	105.00	h	34.30	4.56	32.48	91.38	\	\	Fund/Ave
11.570	51.17	200.00	1.00	v	43.20	7.42	32.51	69.28	74.00	-4.72	Peak
11.570	42.00	187.00	1.20	h	43.20	7.42	32.51	60.11	74.00	-13.90	Peak
11.570	35.82	200.00	1.00	v	43.20	7.42	32.51	53.93	54.00	-0.07	Ave
11.570	27.50	187.00	1.20	h	43.20	7.42	32.51	45.61	54.00	-8.39	Ave
17.355	38.17	271.00	1.00	v	43.40	10.58	31.56	60.59	74.00	-13.41	Peak *
17.355	38.67	159.00	1.00	h	43.40	10.58	31.56	61.09	74.00	-12.91	Peak *
17.355	25.40	271.00	1.30	v	43.40	10.58	31.56	47.82	54.00	-6.18	Ave *
17.355	25.33	159.00	1.40	h	43.40	10.58	31.56	47.75	54.00	-6.25	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

@ High Channel 20MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.825	112.33	180.00	155.00	v	34.30	4.56	32.48	118.71	\	\	Fund/Peak
5.825	93.83	78.00	105.00	h	34.30	4.56	32.48	100.21	\	\	Fund/Peak
5.825	101.67	180.00	155.00	v	34.30	4.56	32.48	108.05	\	\	Fund/Ave
5.825	83.67	78.00	105.00	h	34.30	4.56	32.48	90.05	\	\	Fund/Ave
11.650	49.50	24.00	1.00	v	43.20	7.42	32.51	67.61	74.00	-6.39	Peak
11.650	42.83	102.00	1.00	h	43.20	7.42	32.51	60.94	74.00	-13.07	Peak
11.650	35.33	24.00	1.00	v	43.20	7.42	32.51	53.44	54.00	-0.56	Ave
11.650	28.67	180.00	1.30	h	43.20	7.42	32.51	46.78	54.00	-7.22	Ave
5.850	60.83	115.00	1.10	v	34.30	4.56	32.48	67.21	98.71	-31.50	Peak *
5.850	44.33	235.00	1.70	h	34.30	4.56	32.48	50.71	80.21	-29.50	Peak *
5.850	39.33	115.00	1.10	v	34.30	4.56	32.48	45.71	88.05	-42.34	Ave *
5.850	32.33	235.00	1.70	h	34.30	4.56	32.48	38.71	70.05	-31.34	Ave *
17.475	38.67	190.00	1.10	v	43.40	10.58	31.56	61.09	98.71	-37.62	Peak *
17.475	39.50	271.00	1.70	h	43.40	10.58	31.56	61.92	80.21	-18.29	Peak *
17.475	25.34	190.00	1.10	v	43.40	10.58	31.56	47.76	88.05	-40.29	Ave *
17.475	25.17	271.00	1.70	h	43.40	10.58	31.56	47.59	70.05	-22.46	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

@ Low Channel 40MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.755	110.83	180.00	155.00	v	34.30	4.56	32.48	117.21	\	\	Fund/Peak
5.755	93.33	78.00	105.00	h	34.30	4.56	32.48	99.71	\	\	Fund/Peak
5.755	101.45	180.00	155.00	v	34.30	4.56	32.48	107.83	\	\	Fund/Ave
5.755	82.00	78.00	105.00	h	34.30	4.56	32.48	88.38	\	\	Fund/Ave
11.510	45.34	360.00	1.20	v	43.20	7.42	32.51	63.45	74.00	-10.56	Peak
11.510	45.17	280.00	1.20	h	43.20	7.42	32.51	63.28	74.00	-10.73	Peak
11.510	30.15	360.00	1.00	v	43.20	7.42	32.51	48.26	54.00	-5.75	Ave
11.510	31.17	280.00	1.20	h	43.20	7.42	32.51	49.28	54.00	-4.72	Ave
17.265	39.53	62.00	1.30	v	43.40	10.58	31.56	61.95	74.00	-12.05	Peak *
17.265	39.33	78.00	1.40	h	43.40	10.58	31.56	61.75	74.00	-12.25	Peak *
17.265	25.83	62.00	1.30	v	5.00	10.58	31.56	9.85	54.00	-44.15	Ave *
17.265	25.67	78.00	1.40	h	43.40	10.58	31.56	48.09	54.00	-5.91	Ave *
5.725	82.67	190.00	1.10	v	34.30	4.56	32.48	89.05	97.21	-8.16	Peak *
5.725	60.17	271.00	1.70	h	34.30	4.56	32.48	66.55	79.71	-13.16	Peak *
5.725	60.83	190.00	1.10	v	34.30	4.56	32.48	67.21	87.83	-20.62	Ave *
5.725	44.17	271.00	1.70	h	34.30	4.56	32.48	50.55	68.38	-17.83	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

@ High Channel 40MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.795	111.33	180.00	155.00	v	34.30	4.56	32.48	117.71	\	\	Fund/Peak
5.795	94.33	78.00	105.00	h	34.30	4.56	32.48	100.71	\	\	Fund/Peak
5.795	101.00	180.00	155.00	v	34.30	4.56	32.48	107.38	\	\	Fund/Ave
5.795	83.33	78.00	105.00	h	34.30	4.56	32.48	89.71	\	\	Fund/Ave
11.590	49.50	360.00	1.20	v	43.20	7.42	32.51	67.61	74.00	-6.39	Peak
11.590	42.83	280.00	1.20	h	43.20	7.42	32.51	60.94	74.00	-13.07	Peak
11.590	34.67	360.00	1.00	v	43.20	7.42	32.51	52.78	54.00	-1.22	Ave
11.590	27.50	280.00	1.20	h	43.20	7.42	32.51	45.61	54.00	-8.39	Ave
17.385	39.00	62.00	1.30	v	43.40	10.58	31.56	61.42	97.71	-36.29	Peak *
17.385	38.33	78.00	1.40	h	43.40	10.58	31.56	60.75	80.71	-19.96	Peak *
17.385	25.89	62.00	1.30	v	43.40	10.58	31.56	48.31	87.38	-39.07	Ave *
17.385	25.33	78.00	1.40	h	43.40	10.58	31.56	47.75	69.71	-21.96	Ave *
5.850	62.00	190.00	1.10	v	34.30	4.56	32.48	68.38	97.71	-29.33	Peak *
5.850	47.83	271.00	1.70	h	34.30	4.56	32.48	54.21	80.71	-26.50	Peak *
5.850	42.00	190.00	1.10	v	34.30	4.56	32.48	48.38	87.38	-39.00	Ave *
5.850	32.83	271.00	1.70	h	34.30	4.56	32.48	39.21	69.71	-30.50	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

5GHz Broadband Antenna (23dBi Patch Antenna)

@ Low Channel 20MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.75	119.08	180.00	155.00	v	34.30	4.56	32.48	125.46	\	\	Fund/Peak
5.75	114.57	78.00	105.00	h	34.30	4.56	32.48	120.95	\	\	Fund/Peak
5.75	107.61	180.00	155.00	v	34.30	4.56	32.48	113.99	\	\	Fund/Ave
5.75	103.01	78.00	105.00	h	34.30	4.56	32.48	109.39	\	\	Fund/Ave
5.73	67.27	160.00	1.00	v	34.30	4.56	32.48	73.65	105.46	-31.81	Peak *
5.73	76.46	178.00	1.30	h	34.30	4.56	32.48	82.84	100.95	-18.11	Peak *
5.73	53.88	160.00	1.00	v	34.30	4.56	32.48	60.26	93.99	-33.73	Ave *
5.73	62.08	178.00	1.30	h	34.30	4.56	32.48	68.46	89.39	-20.93	Ave *
11.49	51.09	140.00	1.00	v	42.20	7.17	32.70	67.76	74.00	-6.24	Peak
11.49	45.11	143.00	1.00	h	42.20	7.17	32.70	61.78	74.00	-12.22	Peak
11.49	36.19	140.00	1.00	v	42.20	7.17	32.70	52.86	54.00	-1.14	Ave
11.49	31.44	143.00	1.30	h	42.20	7.17	32.70	48.11	54.00	-5.89	Ave
17.23	42.62	190.00	1.10	v	43.40	10.58	31.56	65.04	105.46	-40.42	Peak *
17.23	42.54	271.00	1.70	h	43.40	10.58	31.56	64.96	100.95	-35.99	Peak *
17.23	28.66	190.00	1.10	v	43.40	10.58	31.56	51.08	93.99	-42.91	Ave *
17.23	28.64	271.00	1.70	h	43.40	10.58	31.56	51.06	89.39	-38.33	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

@ Mid Channel 20MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.79	116.16	180.00	155.00	v	34.30	4.56	32.48	122.54	\	\	Fund/Peak
5.79	112.05	78.00	105.00	h	34.30	4.56	32.48	118.43	\	\	Fund/Peak
5.79	104.60	180.00	155.00	v	34.30	4.56	32.48	110.98	\	\	Fund/Ave
5.79	102.30	78.00	105.00	h	34.30	4.56	32.48	108.68	\	\	Fund/Ave
11.57	47.46	200.00	1.00	v	43.20	7.42	32.51	65.57	74.00	-8.44	Peak
11.57	42.95	187.00	1.20	h	43.20	7.42	32.51	61.06	74.00	-12.95	Peak
11.57	31.78	200.00	1.00	v	43.20	7.42	32.51	49.89	54.00	-4.11	Ave
11.57	28.09	187.00	1.20	h	43.20	7.42	32.51	46.20	54.00	-7.80	Ave
17.35	39.75	271.00	1.00	v	43.40	10.58	31.56	62.17	102.54	-40.37	Peak *
17.35	40.23	159.00	1.00	h	43.40	10.58	31.56	62.65	98.43	-35.78	Peak *
17.35	25.80	271.00	1.30	v	43.40	10.58	31.56	48.22	90.98	-42.76	Ave *
17.35	25.79	159.00	1.40	h	43.40	10.58	31.56	48.21	88.68	-40.47	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

@ High Channel 20MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.83	115.40	180.00	155.00	v	34.30	4.56	32.48	121.78	\	\	Fund/Peak
5.83	111.12	78.00	105.00	h	34.30	4.56	32.48	117.50	\	\	Fund/Peak
5.83	103.51	180.00	155.00	v	34.30	4.56	32.48	109.89	\	\	Fund/Ave
5.83	101.15	78.00	105.00	h	34.30	4.56	32.48	107.53	\	\	Fund/Ave
11.65	46.42	24.00	1.00	v	43.20	7.42	32.51	64.53	74.00	-9.47	Peak
11.65	41.29	102.00	1.00	h	43.20	7.42	32.51	59.40	74.00	-14.61	Peak
11.65	30.78	24.00	1.00	v	43.20	7.42	32.51	48.89	54.00	-5.11	Ave
11.65	27.75	180.00	1.30	h	43.20	7.42	32.51	45.86	54.00	-8.14	Ave
17.48	48.74	115.00	1.10	v	43.40	10.58	31.56	71.16	101.78	-30.62	Peak *
17.48	46.92	235.00	1.70	h	43.40	10.58	31.56	69.34	97.50	-28.16	Peak *
17.48	36.53	115.00	1.10	v	43.40	10.58	31.56	58.95	89.89	-30.94	Ave *
17.48	35.23	235.00	1.70	h	43.40	10.58	31.56	57.65	87.53	-29.88	Ave *
5.85	74.38	190.00	1.10	v	34.30	4.56	32.48	80.76	101.78	-21.02	Peak *
5.85	66.83	271.00	1.70	h	34.30	4.56	32.48	73.21	97.50	-24.29	Peak *
5.85	59.69	190.00	1.10	v	34.30	4.56	32.48	66.07	89.89	-23.82	Ave *
5.85	66.62	271.00	1.70	h	34.30	4.56	32.48	73.00	87.53	-14.53	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

@ Low Channel 40MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.83	115.40	180.00	155.00	v	34.30	4.56	32.48	121.78	\	\	Fund/Peak
5.83	111.12	78.00	105.00	h	34.30	4.56	32.48	117.50	\	\	Fund/Peak
5.83	103.51	180.00	155.00	v	34.30	4.56	32.48	109.89	\	\	Fund/Ave
5.83	101.15	78.00	105.00	h	34.30	4.56	32.48	107.53	\	\	Fund/Ave
11.65	46.42	24.00	1.00	v	43.20	7.42	32.51	64.53	74.00	-9.47	Peak
11.65	41.29	102.00	1.00	h	43.20	7.42	32.51	59.40	74.00	-14.61	Peak
11.65	30.78	24.00	1.00	v	43.20	7.42	32.51	48.89	54.00	-5.11	Ave
11.65	27.75	180.00	1.30	h	43.20	7.42	32.51	45.86	54.00	-8.14	Ave
17.48	48.74	115.00	1.10	v	43.40	10.58	31.56	71.16	101.78	-30.62	Peak *
17.48	46.92	235.00	1.70	h	43.40	10.58	31.56	69.34	97.50	-28.16	Peak *
17.48	36.53	115.00	1.10	v	43.40	10.58	31.56	58.95	89.89	-30.94	Ave *
17.48	35.23	235.00	1.70	h	43.40	10.58	31.56	57.65	87.53	-29.88	Ave *
5.85	74.38	190.00	1.10	v	34.30	4.56	32.48	80.76	101.78	-21.02	Peak *
5.85	66.83	271.00	1.70	h	34.30	4.56	32.48	73.21	97.50	-24.29	Peak *
5.85	59.69	190.00	1.10	v	34.30	4.56	32.48	66.07	89.89	-23.82	Ave *
5.85	66.62	271.00	1.70	h	34.30	4.56	32.48	73.00	87.53	-14.53	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

@ High Channel 40MHz Channel Bandwidth @ 3 Meter

Frequency	Reading	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier	Corrected Reading	15.247/15.209	15.247/15.209	
GHz	(dBuV/m)	Degree	Meter	H / V	(dB)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin	Comments
5.755	116.14	180	155	v	34.3	4.56	32.48	122.52	\	\	Fund/Peak
5.755	112	78	105	h	34.3	4.56	32.48	118.38	\	\	Fund/Peak
5.755	104.4	180	155	v	34.3	4.56	32.48	110.78	\	\	Fund/Ave
5.755	101.5	78	105	h	34.3	4.56	32.48	107.88	\	\	Fund/Ave
11.510	49.07	360	1.2	v	43.2	7.415	32.51	67.175	74	-6.825	Peak
11.510	44.42	280	1.2	h	43.2	7.415	32.51	62.525	74	-11.475	Peak
11.510	33.5	360	1	v	43.2	7.415	32.51	51.605	54	-2.395	Ave
11.510	31.32	280	1.2	h	43.2	7.415	32.51	49.425	54	-4.575	Ave
17.265	42.51	62	1.3	v	43.4	10.58	31.56	64.93	102.52	-37.59	Peak *
17.265	42.5	78	1.4	h	43.4	10.58	31.56	64.92	98.38	-33.46	Peak *
17.265	28.51	62	1.3	v	43.4	10.58	31.56	50.93	90.78	-39.85	Ave *
17.265	28.52	78	1.4	h	43.4	10.58	31.56	50.94	87.88	-36.94	Ave *
5.725	95.9	190	1.1	v	34.3	4.56	32.48	102.28	102.52	-0.24	Peak *
5.725	78.5	271	1.7	h	34.3	4.56	32.48	84.88	98.38	-13.5	Peak *
5.725	83.5	190	1.1	v	34.3	4.56	32.48	89.88	90.78	-0.9	Ave *
5.725	65.75	271	1.7	h	34.3	4.56	32.48	72.13	87.88	-15.75	Ave *

Note: * is Limit is using 20dB down form the fundamental signal measurement result

Emission was scanned up to 40GHz.

Annex A. TEST INSTRUMENT & METHOD

Annex A.i. TEST INSTRUMENTATION & GENERAL PROCEDURES

Instrument	Manufacturer	Model	CAL Due Date
Spectrum Analyzer	HP	8564E	04/26/2009
EMI Receiver	Rohde & Schwarz	ESIB 40	4/25/2009
R&S LISN	R&S	ESH2-Z5	04/24/2009
CHASE LISN	Chase	MN2050B	04/24/2009
Antenna(1 ~18GHz)	Emco	3115	01/04/2009
Antenna (30MHz~2GHz)	Sunol Sciences	JB1	01/04/2009
Chamber	Lingren	3m	04/18/2009
Pre-Amplifier(1 ~ 26GHz)	HP	8449	04/24/2009
Horn Antenna (18~40GHz)	Com Power	AH-840	5/21/2009
Microwave Pre-Amp (18~40GHz)	Com Power	PA-840	5/21/2009

Note: No calibration required.

Annex A.ii. CONDUCTED EMISSIONS TEST DESCRIPTION

Test Set-up

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table, as shown in Annex B.
2. The power supply for the EUT was fed through a 50 Ω /50 μ H EUT LISN, connected to filtered mains.
3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.
4. All other supporting equipments were powered separately from another main supply.

Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver.
3. High peaks, relative to the limit line, were then selected.
4. The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 KHz. For FCC tests, only Quasi-peak measurements were made; while for CISPR/EN tests, both Quasi-peak and Average measurements were made.
5. Steps 2 to 4 were then repeated for the LIVE line (for AC mains) or DC line (for DC power).

Sample Calculation Example

At 20 MHz

limit = 250 μ V = 47.96 dB μ V

Transducer factor of LISN, pulse limiter & cable loss at 20 MHz = 11.20 dB

Q-P reading obtained directly from EMI Receiver = 40.00 dB μ V
(Calibrated for system losses)

Therefore, Q-P margin = 47.96 – 40.00 = 7.96

i.e. **7.96 dB below limit**

Annex A. iii RADIATED EMISSIONS TEST DESCRIPTION

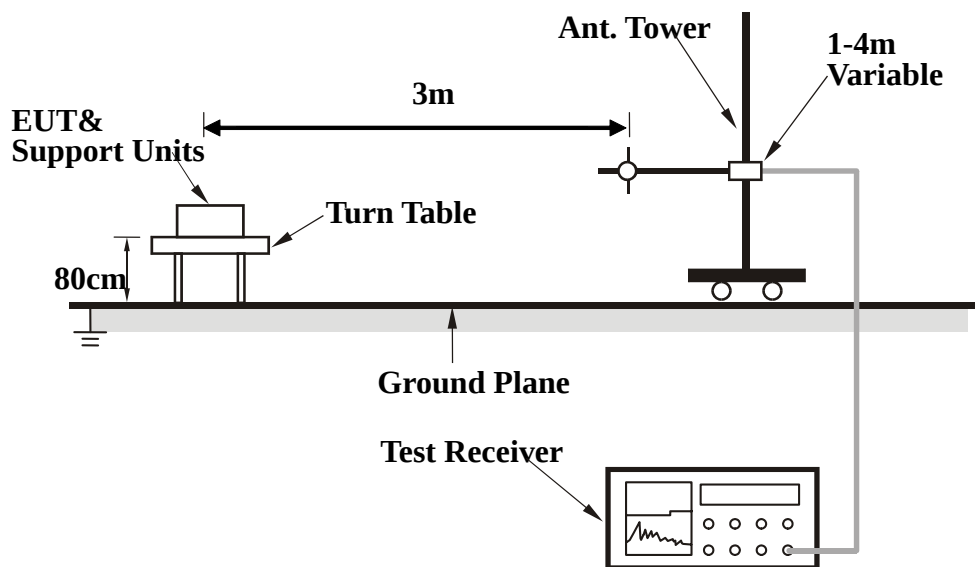
EUT Characterisation

EUT characterisation, over the frequency range from 30MHz to 10th Harmonic , was done in order to minimise radiated emissions testing time while still maintaining high confidence in the test results.

The EUT was placed in the chamber, at a height of about 0.8m on a turntable. Its radiated emissions frequency profile was observed, using a spectrum analyzer /receiver with the appropriate broadband antenna placed 3m away from the EUT. Radiated emissions from the EUT were maximised by rotating the turntable manually, changing the antenna polarisation and manipulating the EUT cables while observing the frequency profile on the spectrum analyzer / receiver. Frequency points at which maximum emissions occurred, clock frequencies and operating frequencies were then noted for the formal radiated emissions test at the Open Area Test Site (OATS).

Test Set-up

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table.
2. The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.
3. The relevant broadband antenna was set at the required test distance away from the EUT and supporting equipment boundary.



Test Method

The following procedure was performed to determine the maximum emission axis of EUT:

1. With the receiving antenna is H polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
2. With the receiving antenna is V polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
3. Compare the results derived from above two steps. So, the axis of maximum emission from EUT was determined and the configuration was used to perform the final measurement.

Final Radiated Emission Measurement

1. Setup the configuration according to figure 1. Turn on EUT and make sure that it is in normal function.
2. For emission frequencies measured below 1 GHz, a pre-scan is performed in a shielded chamber to determine the accurate frequencies of higher emissions will be checked on a open test site. As the same purpose, for emission frequencies measured above 1 GHz, a pre-scan also be performed with a 1 meter measuring distance before final test.
3. For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 100 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.
4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0° to 360° with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading.
5. Repeat step 4 until all frequencies need to be measured were complete.
6. Repeat step 5 with search antenna in vertical polarized orientations.

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	Peak	100 kHz	100 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

Sample Calculation Example

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. For the limit is employed average value, therefore the peak value can be transferred to average value by subtracting the duty factor. The basic equation with a sample calculation is as follows:

$$\text{Peak} = \text{Reading} + \text{Corrected Factor}$$

where

Corr. Factor = Antenna Factor + Cable Factor - Amplifier Gain (if any)

And the average value is

$$\text{Average} = \text{Peak Value} + \text{Duty Factor or}$$

$$\text{Set RBW} = 1\text{MHz, VBW} = 10\text{Hz.}$$

Note :

If the measured frequencies are fall in the restricted frequency band, the limit employed must be quasi peak value when frequencies are below or equal to 1 GHz. And the measuring instrument is set to quasi peak detector function.

Annex B EUT AND TEST SETUP PHOTOGRAPHS

Please see the attachment

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

EUT TEST CONDITIONS

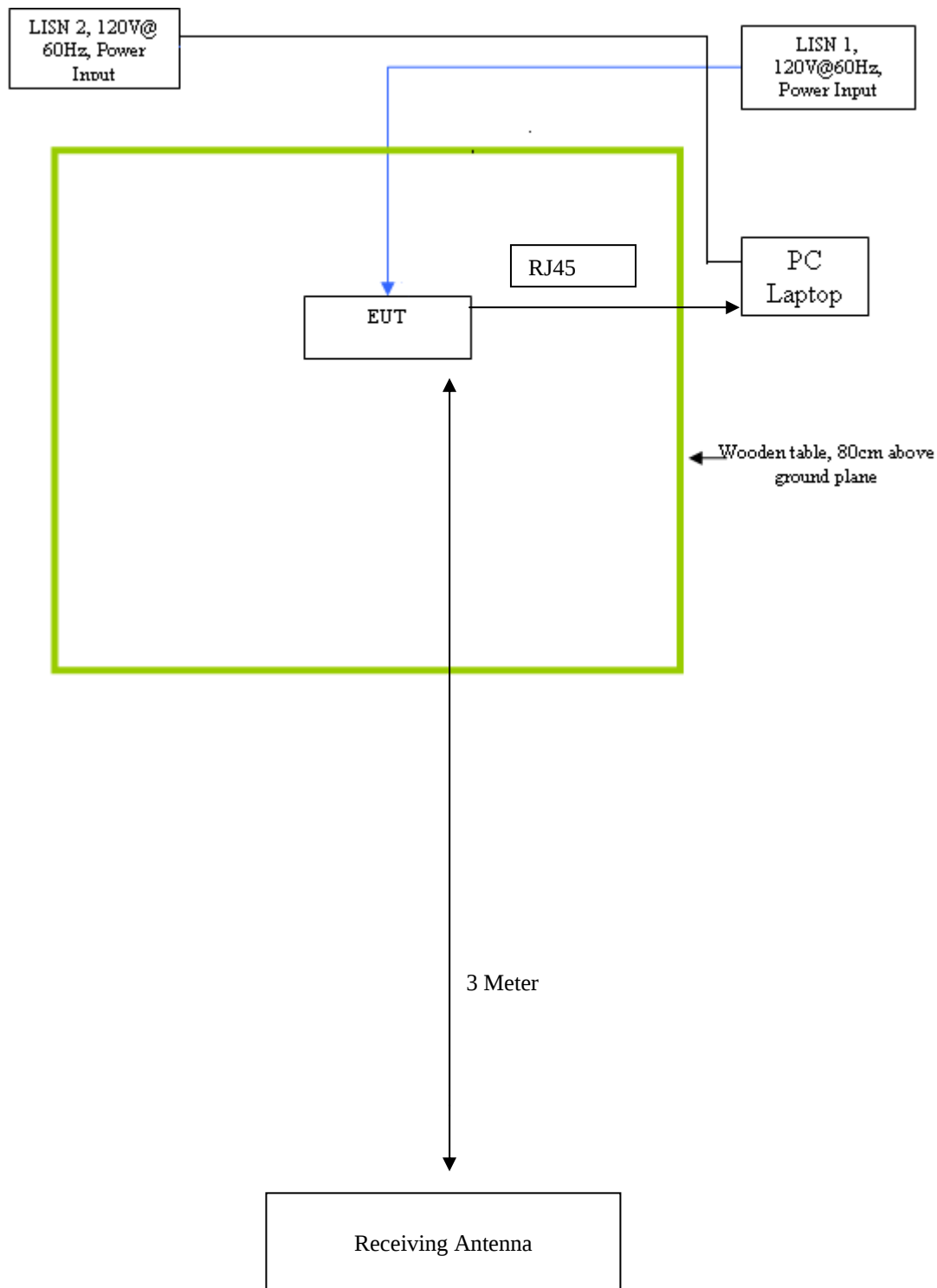
Annex C. i. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

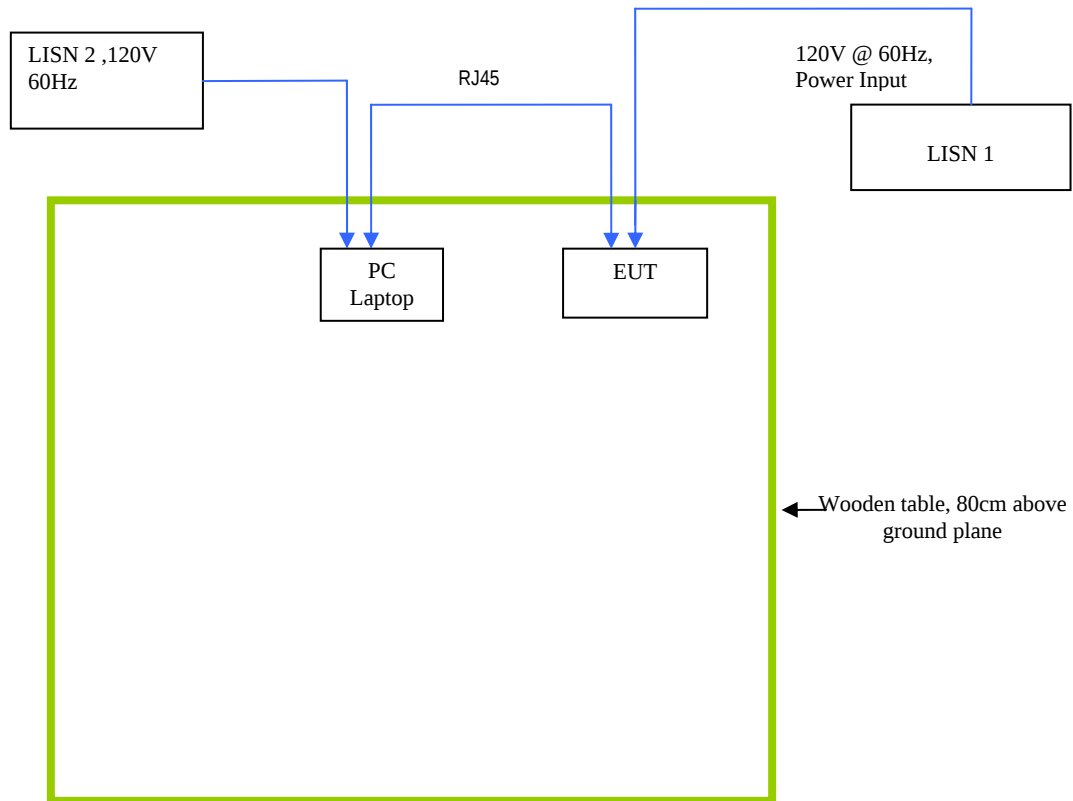
Equipment Description (Including Brand Name)	Model & Serial Number	Cable Description (List Length, Type & Purpose)
N/A	N/A	N/A

Remarks: The device does not have any supporting equipment, but it is controlled by itself when performing the compliance evaluations.

Block Configuration Diagram for Radiated Emission



Block Configuration Diagram for Conducted Emission



Annex C.ii. EUT OPERATING CONDITIONS

The following is the description of how the EUT is exercised during testing.

Test	Description Of Operation
Emissions Testing	The EUT was controlled by itself Using manufacturer's program.
Others Testing	TX mode is normal mode with full power.

Annex D USER MANUAL, BLOCK & CIRCUIT DIAGRAM

Please see attachment