



FCC Test Report

Test report no.: EMC_958FCC15.247_2005_WLAN_139

FCC Part 15.247 for DSSS systems / CANADA RSS-210

EUT Tablet PC Model: iX104C2
With WLAN Model: 2915ABG
With GSM module Model: MC75
With BT module Model: TM60M665
FCC ID: Q2GIX104-139
IC: 4596A-IX104WBG



TTI-P-G 081/94-A0

Accredited according to **ISO/IEC 17025**



**Bluetooth Qualification
Test Facility
(BQTF)**



FCC listed # 101450

IC recognized # 3925

CETECOM Inc.

411 Dixon Landing Road ♦ Milpitas, CA 95035 ♦ U.S.A.

Phone: + 1 (408) 586 6200 ♦ Fax: + 1 (408) 586 6299 ♦ E-mail: info@cetecomusa.com ♦ <http://www.cetecom.com>

CETECOM Inc. is a Delaware Corporation with Corporation number: 2113686
Board of Directors: Dr. Harald Ansorge, Dr. Klaus Matkey, Hans Peter May

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1	General information
1.1	Notes

The test results of this test report relate exclusively to the test item specified in 1.5. The CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM Inc USA.

TEST REPORT PREPARED BY:**EMC Engineer: Harpreet Sidhu**

1.2 Testing laboratory
CETECOM Inc.
411 Dixon Landing Road, Milpitas, CA-95035, USA
Phone: +1 408 586 6200 Fax: +1 408 586 6299
E-mail: lothar.schmidt@cetekomusa.com
Internet: www.cetekom.com

1.3 Details of applicant

Name : **Xplore Technologies**
Street : **14000 Summit Road, Suite 900**
City / Zip Code : **Austin, TX 78728**
Country : **USA**
Contact : **Douglas L. Fowler**
Telephone : **+1 512 336 7797**
Tele-fax : **+1 512 336 7791**
e-mail : dfowler@xploretech.com

1.4 Application details

Date of receipt test item : 2005-06-15
Date of test : 2005-06-15 to 2005-06-21

1.5 Test item

Manufacturer : Applicant
Marketing Name : iX104C2
Model No. : iX104C2
[Description](#) : [Tablet PC with 802.11b/g WLAN, GSM & BT modules](#)
FCC-ID : Q2GIX104-139
IC ID : 4596A-IX104WBG

Additional information

Frequency : 824.2MHz – 848.8MHz for GSM 850 (not covered under this report)
1850.2MHz – 1909.8MHz for PCS 1900 (not covered under this report)
2412MHz – 2462MHz for WLAN (covered under this report)
2402MHz – 2480MHz for BT (not covered under this report)
Type of modulation : DSSS / OFDM (orthogonal frequency division multiplexing)
Number of channels : 11
Power supply : via host Tablet PC
Output power : 251.19mW conducted peak power
Extreme temp. Tolerance : 0°C to +70°C

1.6 Test standards: **FCC Part 15 §15.247 / CANADA RSS-210 issue 5 2001
with amendments 1: 2002, 2: 2003, 3: 2004**

Note: All radiated measurements were made in all three orthogonal planes. The values reported are the maximum values.

The Tablet PC (model# iX104C2) carries pre-certified WLAN mini PCI card with FCC ID: PD9WM3B2915ABG

This test report covers full radiated testing as per FCC 15.247 on Tablet PC with WLAN. All conducted measurements are covered under *test report# INTEL-040412F*

EUT is tested in both “b” & “g” modes at 1,6,11 & 54Mbps. Test report shows only worst-case test results.

2 Technical test**2.1 Summary of test results**

No deviations from the technical specification(s) were ascertained in the course of the tests
Performed

Final Verdict:
(Only “passed” if all single measurements are “passed”)

Passed

Technical responsibility for area of testing:

2005-07-01 EMC & Radio Lothar Schmidt (Manager)



Date

Section

Name

Signature

Responsible for test report and project leader:

2005-07-01 EMC & Radio Harpreet Sidhu (EMC Engineer)



Date

Section

Name

Signature

2.2 Test report

TEST REPORT

Test report no.: EMC_958FCC15.247_2005_WLAN_139

FCC Part 15.247 for DSSS systems / CANADA RSS-210

TEST REPORT REFERENCE

LIST OF MEASUREMENTS		PAGE
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**MAXIMUM PEAK OUTPUT POWER
(RADIATED)**

§ 15.247 (b) (1)

EIRP:

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
Frequency (MHz)		2412	2437	2462
T _{nom} (23)°C	V _{nom}	21.69	21.77	21.59
Measurement uncertainty		±0.5dBm		

ANALYZER SETTINGS: RBW=VBW=10MHz

LIMIT

SUBCLAUSE § 15.247 (b) (1)

Frequency range	RF power output
2400-2483.5 MHz	30dBm on Conducted

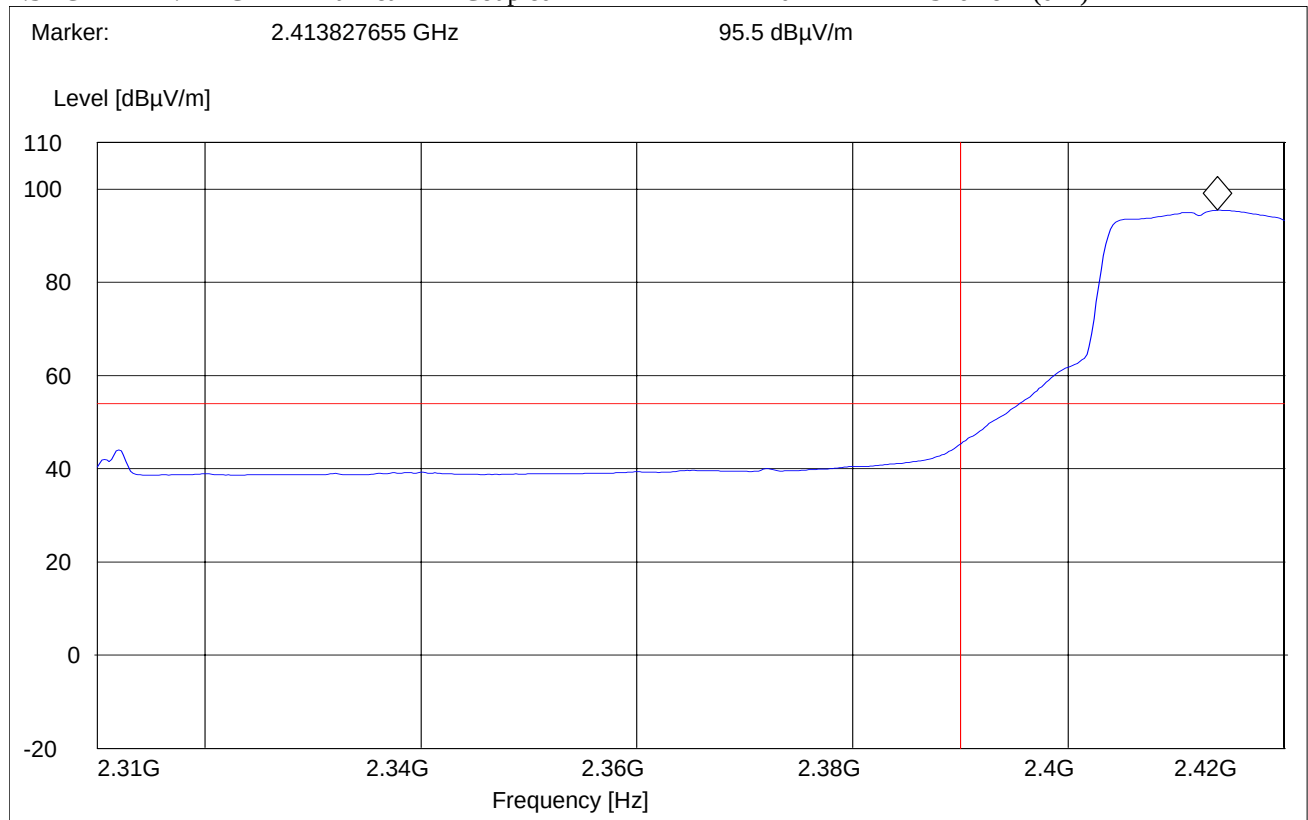
BAND EDGE COMPLIANCE

§15.247 (c)

Low frequency section (spurious in the restricted band 2310 – 2390 MHz) (Average measurement @ 6Mbps)

Operating condition : Tx at 2412MHz
SWEEP TABLE : "FCC15.247 LBE_AVG"
Limit Line : 54dBμV

Start Frequency	Stop Frequency	Detector	Meas. Bandw.	RBW	VBW	Transducer
2.31 GHz	2.412 GHz	MaxPeak	Coupled	1 MHz	10Hz	#326 horn (dBi)



BAND EDGE COMPLIANCE

§15.247 (c)

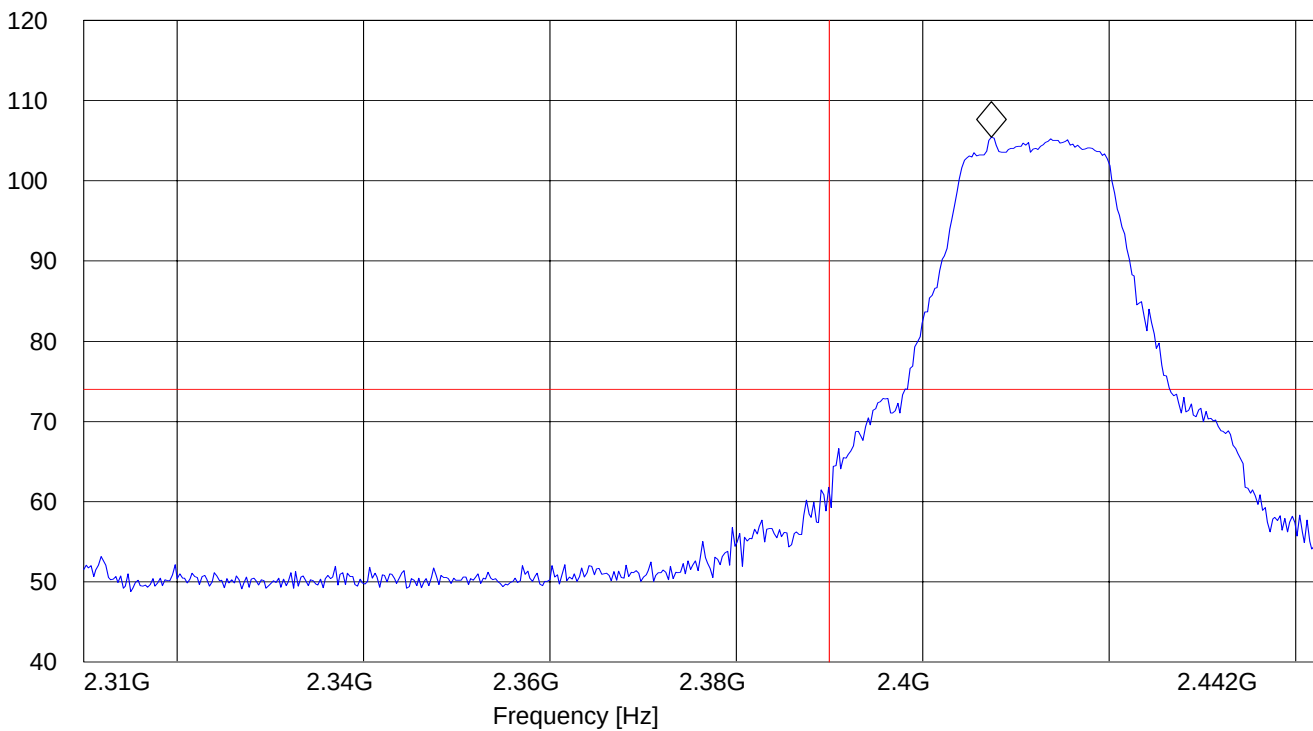
Low frequency section (spurious in the restricted band 2310 – 2390 MHz) (Peak measurement @ 54Mbps)

Operating condition : Tx at 2412MHz
SWEEP TABLE : "FCC15.247 LBE_Pk"
Limit Line : 74dBμV

Start Frequency	Stop Frequency	Detector Time	Meas. Bandw.	RBW	VBW	Transducer
2.31 GHz	2.412 GHz	MaxPeak	Coupled	1 MHz	1MHz	#326 horn (dBi)

Marker: 2.407346693 GHz 105.47 dBμV/m

Level [dBμV/m]



BAND EDGE COMPLIANCE

§15.247 (c)

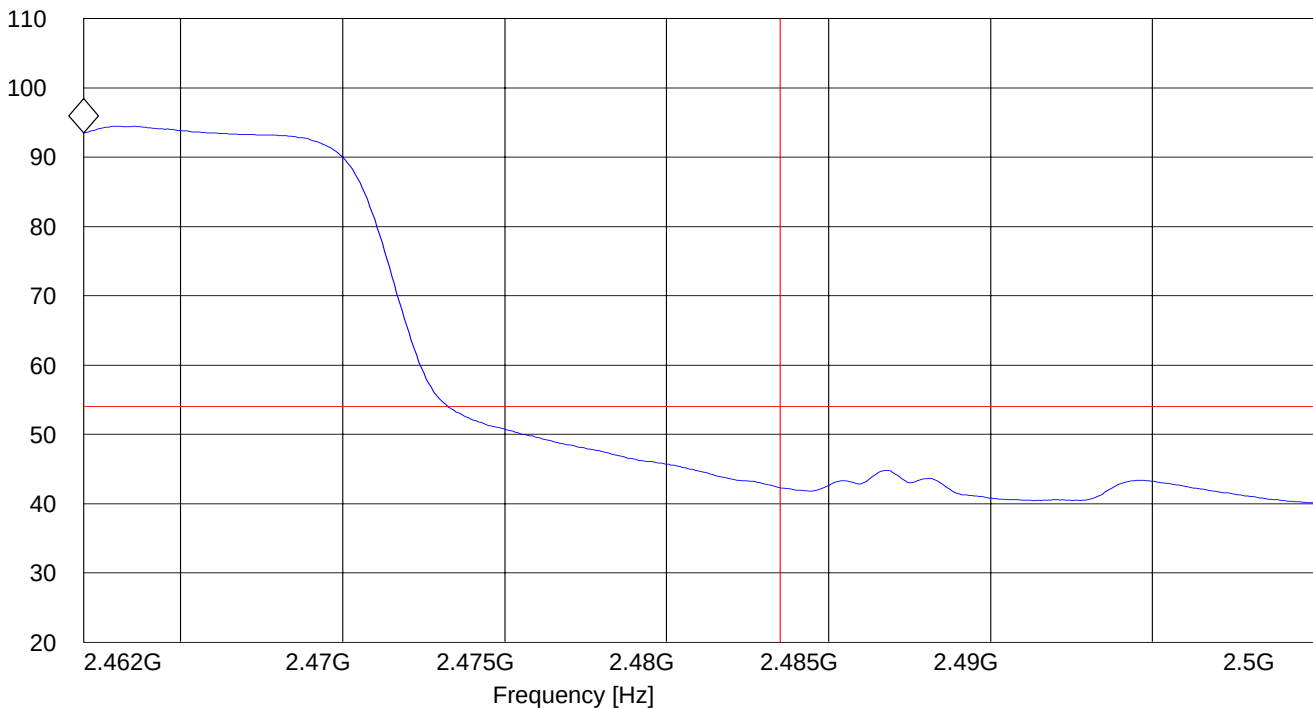
High frequency section (spurious in the restricted band 2483.5 – 2500 MHz) (Average measurement @ 6Mbps)

Operating condition : Tx at 2462MHz
SWEEP TABLE : "FCC15.247 HBE_AVG"
Limit Line : 54dBμV

Start Frequency	Stop Frequency	Detector Time	Meas. Bandw.	RBW	VBW	Transducer
2.462 GHz	2.5 GHz	MaxPeak	Coupled	1 MHz	10Hz	#326 horn (dBi)

Marker: 2.462 GHz 93.47 dBμV/m

Level [dBμV/m]



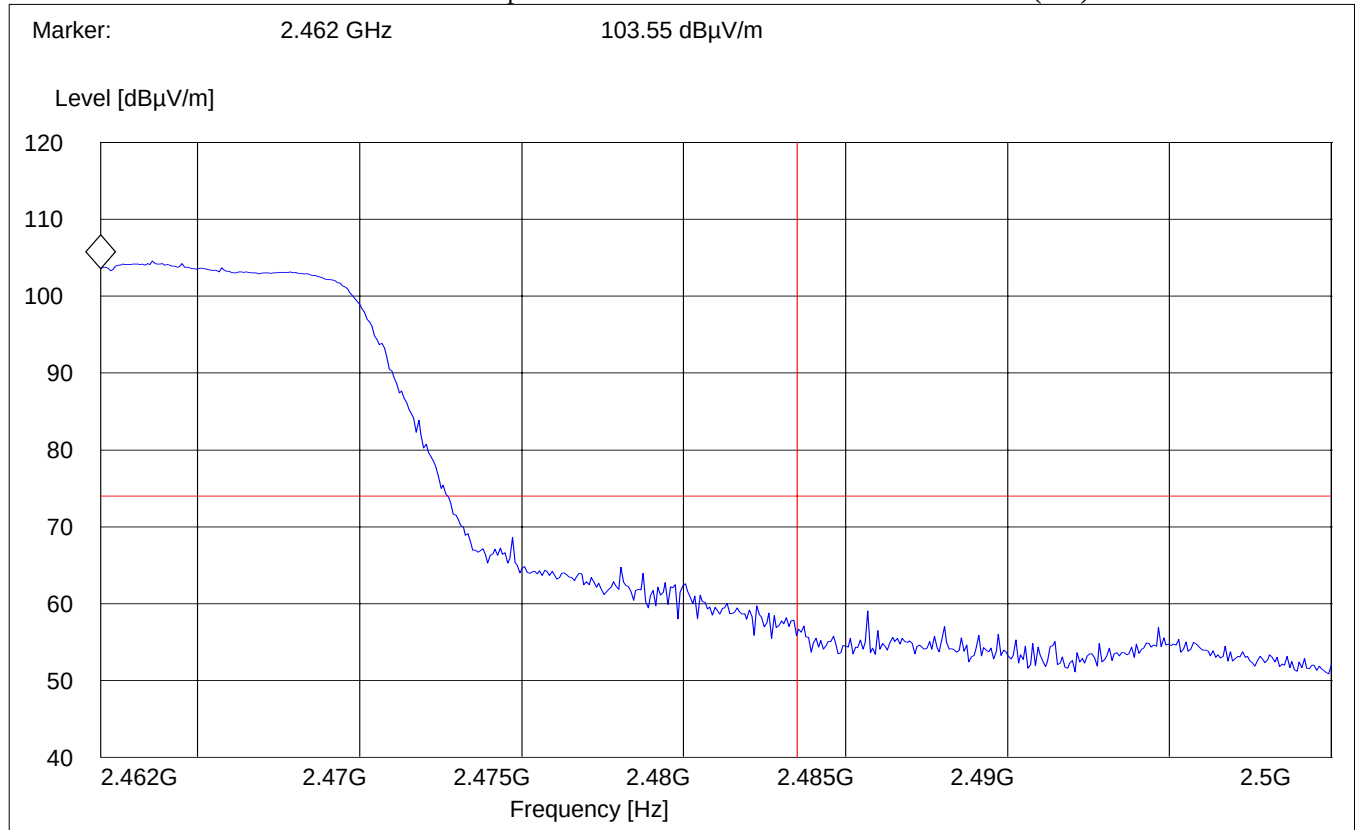
BAND EDGE COMPLIANCE

§15.247 (c)

High frequency section (spurious in the restricted band 2483.5 – 2500 MHz) (Peak measurement @ 54Mbps)

Operating condition : Tx at 2462MHz
SWEEP TABLE : "FCC15.247 HBE_PK"
Limit Line : 74dBμV

Start Frequency	Stop Frequency	Detector Time	Meas. Bandw.	RBW	VBW	Transducer
2.462 GHz	2.5 GHz	MaxPeak	Coupled	1 MHz	1MHz	#326 horn (dBi)



EMISSION LIMITATIONS
Transmitter (Radiated)

§ 15.247 (c) (1)

LIMITS

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions, which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

NOTE:

1. The radiated emissions were done with different settings, using the relevant pre-amplifiers for the relevant frequency ranges. This is the reason that the graphs show different noise levels. In the range between 3 and 25 GHz very short cable connections to the antenna was used to minimize the noise level.

2. All measurements are done in peak mode unless specified with the plots.

Results for the radiated measurements below 30MHz according § 15.33

Frequency	Measured values	Remarks
9KHz – 30MHz	No emissions found, caused by the EUT	This is valid for all the tested channels

EMISSION LIMITATIONS - Radiated (Transmitter)

§ 15.247 (c) (1)

Transmit at Lowest channel Frequency 2412MHz			
Frequency (MHz)	Level (dBµV/m)		
	Peak	Quasi-Peak	Average
See plots			
Transmit at Middle channel Frequency 2437MHz			
Frequency (MHz)	Level (dBµV/m)		
	Peak	Quasi-Peak	Average
See plots			
Transmit at Highest channel Frequency 2462MHz			
Frequency (MHz)	Level (dBµV/m)		
	Peak	Quasi-Peak	Average
See plots			

EMISSION LIMITATIONS - Radiated (Transmitter)

§ 15.247 (c) (1)

Lowest Channel (2412MHz): 30MHz – 1GHz

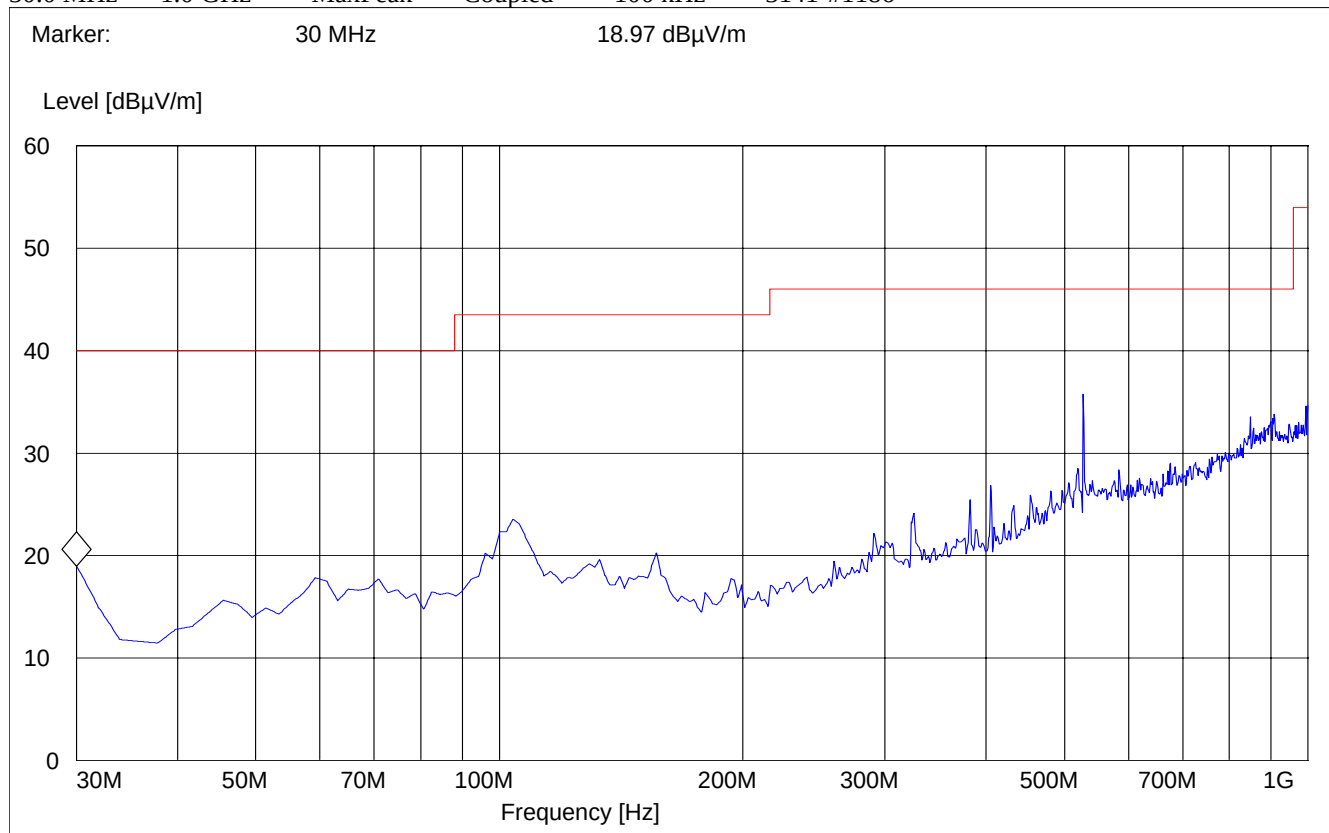
@ 54Mbps

Note: This plot is valid for low, mid, high channels (worst-case plot)

SWEEP TABLE:

"Spuri hi 30-1G"

Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency		Time	VBW	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186



EMISSION LIMITATIONS - Radiated (Transmitter)

§ 15.247 (c) (1)

Lowest Channel (2412MHz): 1GHz – 3GHz

@ 54Mbps

Note: The peak above the limit line is the carrier freq.

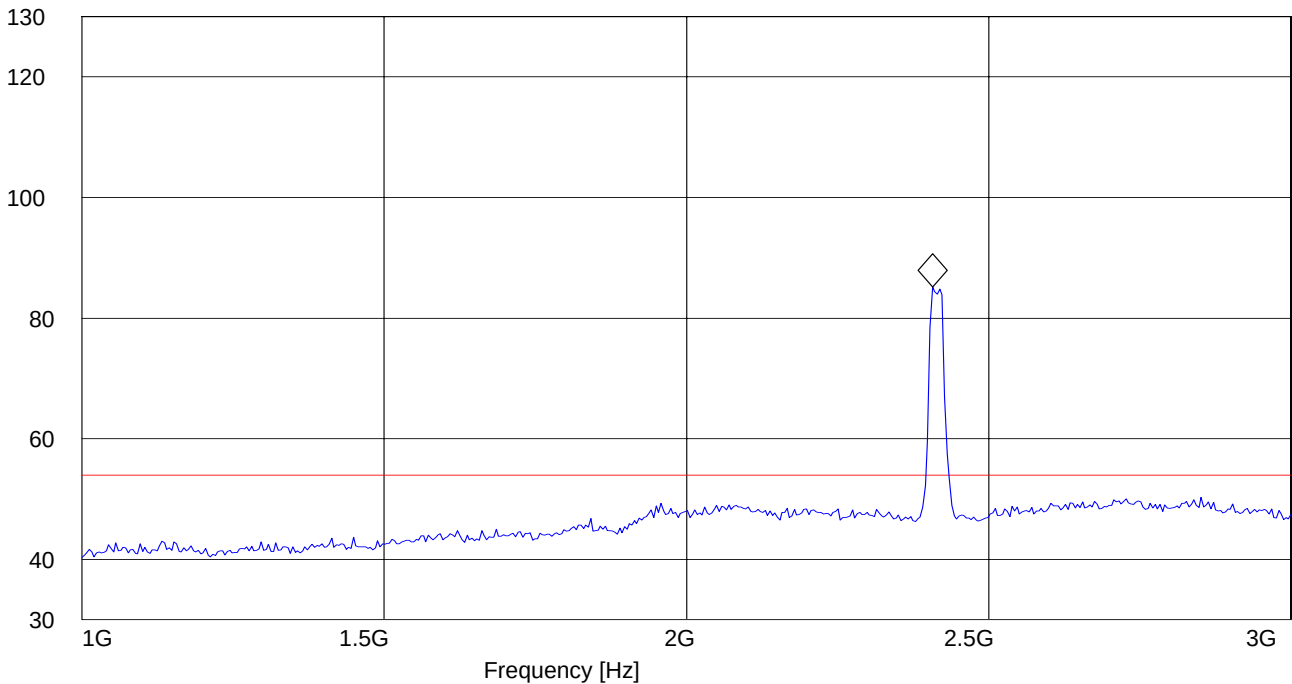
SWEEP TABLE:

"Spuri hi 1-3G"

Start	Stop	Detector	Meas.	RBW	VBW	Transducer
Frequency	Frequency	Time	Bandw.			
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	1MHz	#326 horn (dBi)

Marker: 2.406813627 GHz 85.12 dBμV/m

Level [dBμV/m]



EMISSION LIMITATIONS - Radiated (Transmitter)

§ 15.247 (c) (1)

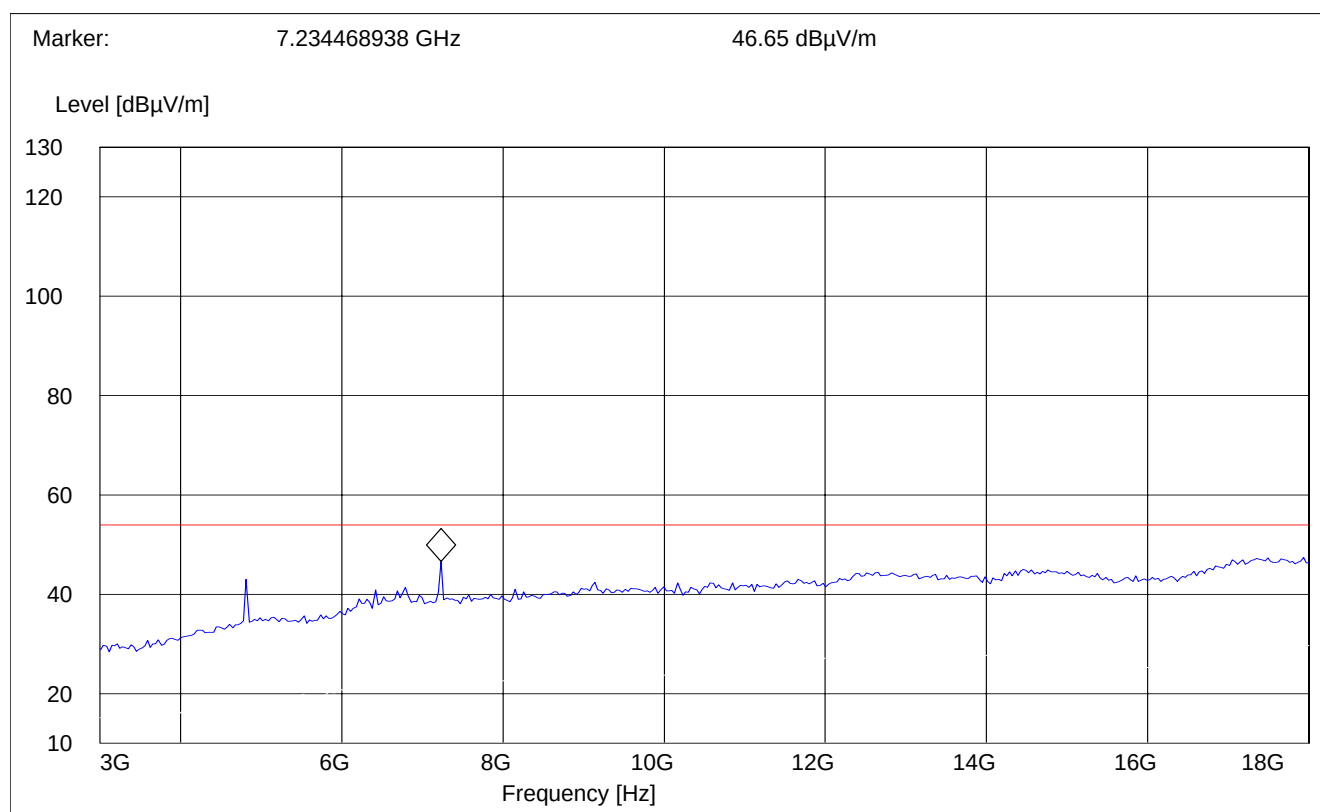
Lowest Channel (2412MHz): 3GHz – 18GHz

@ 54Mbps

SWEEP TABLE:

"Spuri hi 3-18G"

Start	Stop	Detector	Meas.	RBW	VBW	Transducer
Frequency	Frequency	Time	Bandw.			
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	1MHz	#326 horn (dBi)



EMISSION LIMITATIONS - Radiated (Transmitter)

§ 15.247 (c) (1)

Mid Channel (2437MHz): 1GHz – 3GHz

@ 54Mbps

Note: The peak above the limit line is the carrier freq.

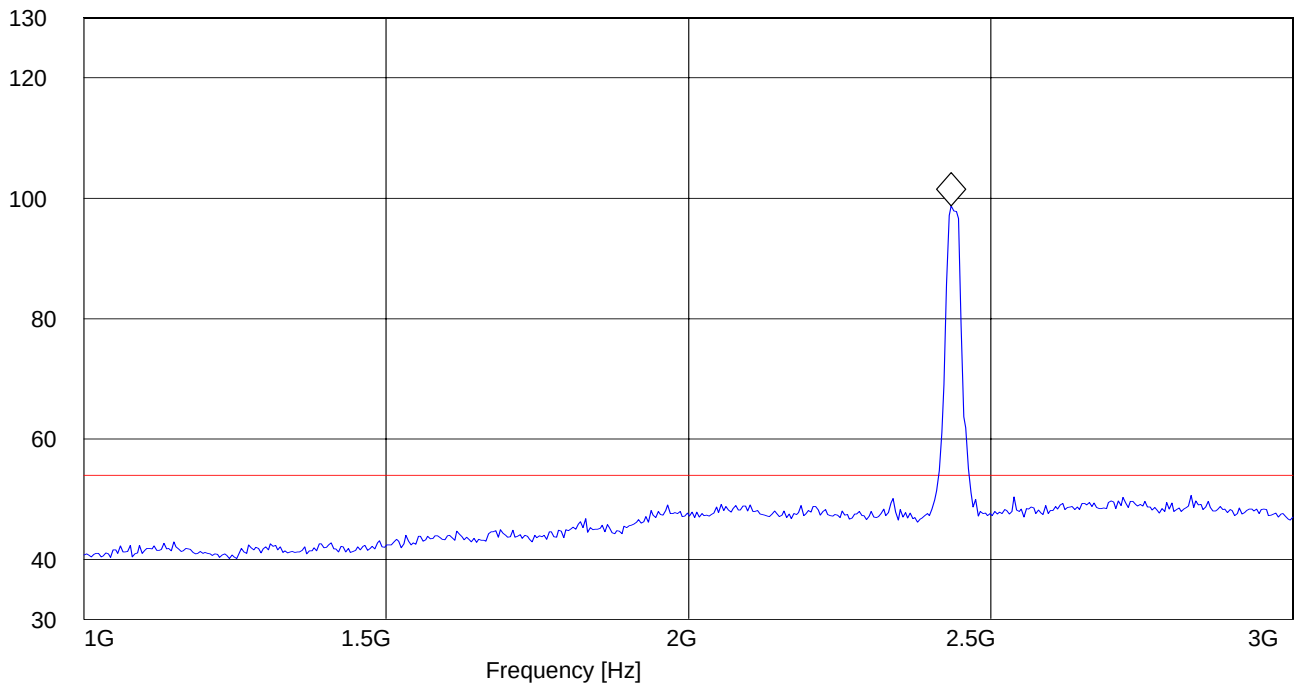
SWEEP TABLE:

"Spuri hi 1-3G"

Start	Stop	Detector	Meas.	RBW	VBW	Transducer
Frequency	Frequency	Time	Bandw.			
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	1MHz	#326 horn (dBi)

Marker: 2.434869739 GHz 98.76 dBμV/m

Level [dBμV/m]



EMISSION LIMITATIONS - Radiated (Transmitter)

§ 15.247 (c) (1)

Mid Channel (2437MHz): 3GHz – 18GHz

@ 54Mbps (Average measurement)

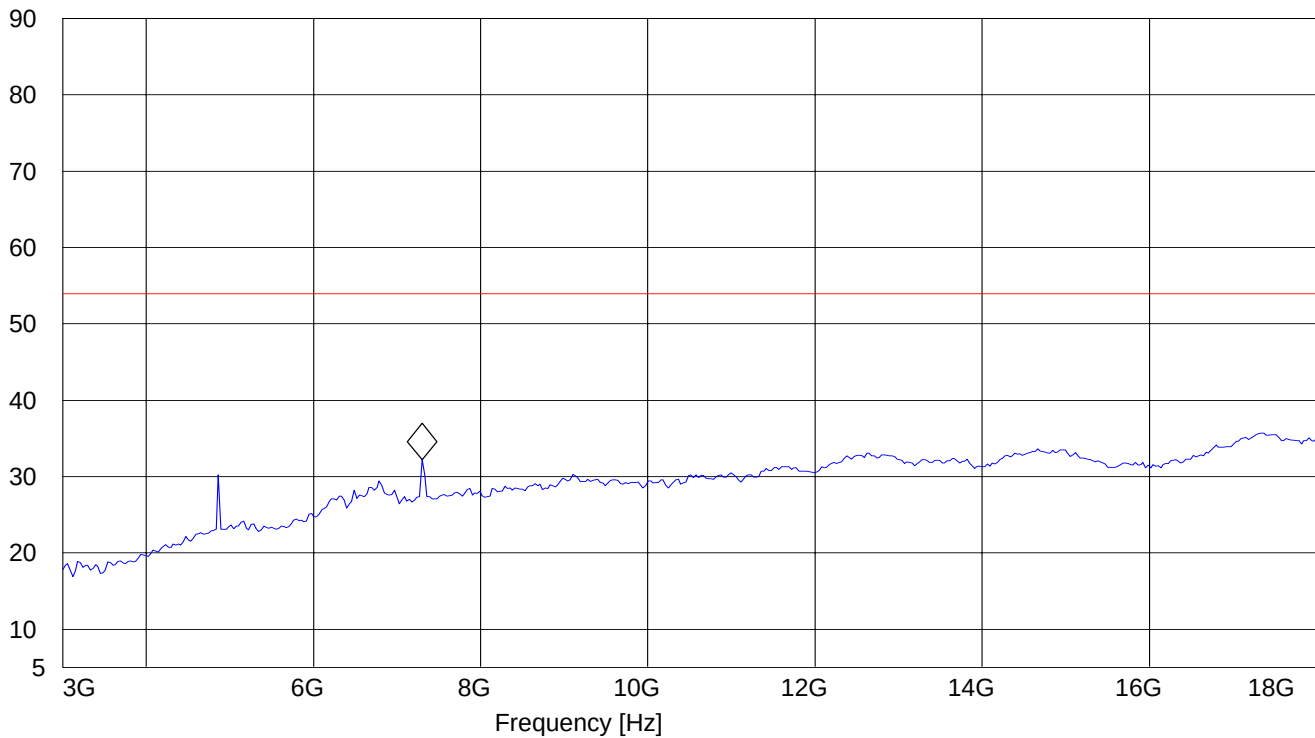
SWEEP TABLE:

"Spuri hi 3-18G"

Start	Stop	Detector	Meas.	RBW	VBW	Transducer
Frequency	Frequency	Time	Bandw.			
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	10Hz	#326 horn (dBi)

Marker: 7.298597194 GHz 32.22 dBμV/m

Level [dBμV/m]



EMISSION LIMITATIONS - Radiated (Transmitter)

§ 15.247 (c) (1)

Highest Channel (2462MHz): 1GHz – 3GHz

@ 54Mbps

Note: The peak above the limit line is the carrier freq.

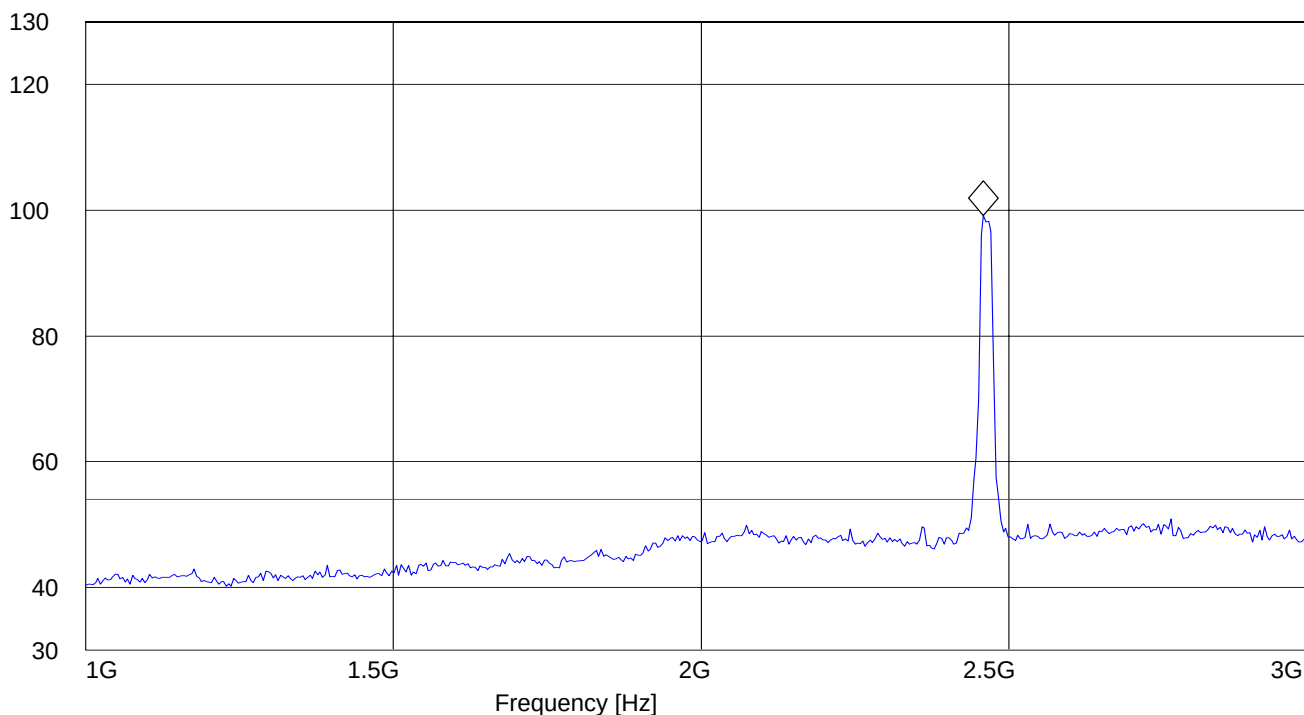
SWEEP TABLE:

"Spuri hi 1-3G"

Start	Stop	Detector	Meas.	RBW	VBW	Transducer
Frequency	Frequency	Time	Bandw.			
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	1MHz	#326 horn (dBi)

Marker: 2.458917836 GHz 99.18 dBμV/m

Level [dBμV/m]



EMISSION LIMITATIONS - Radiated (Transmitter)

§ 15.247 (c) (1)

Highest Channel (2462MHz): 3GHz – 18GHz

@ 54Mbps

Average measurement

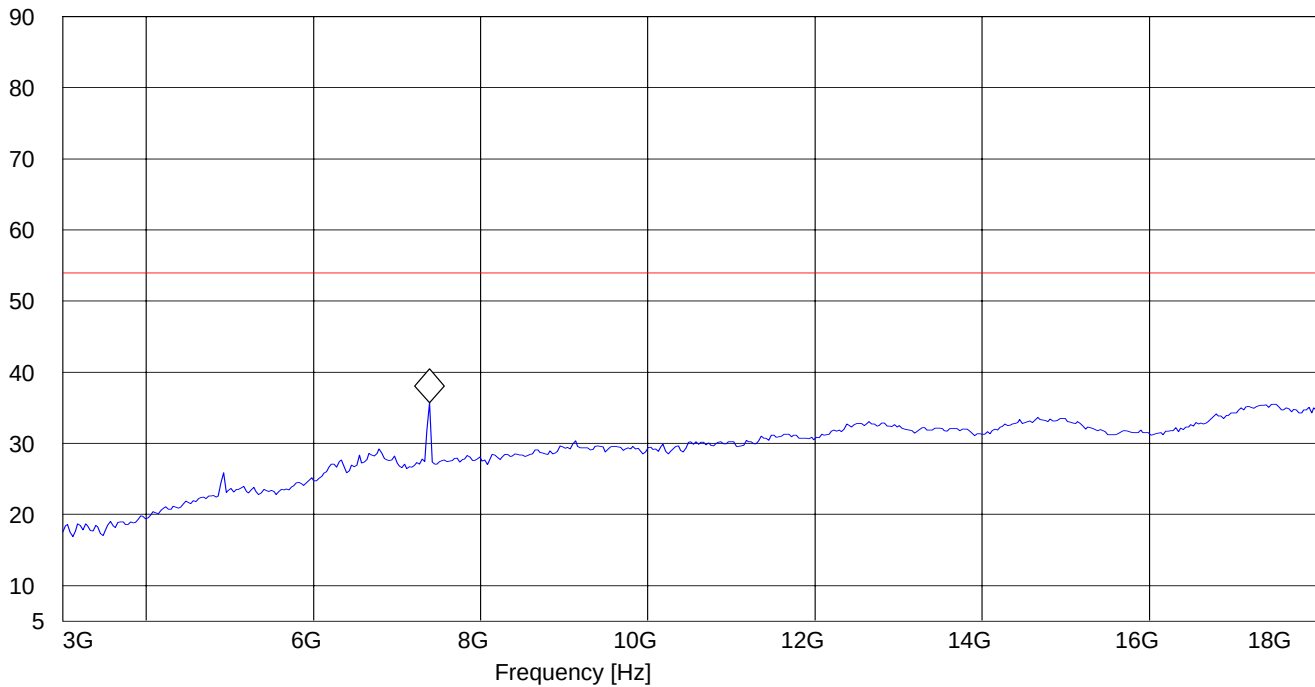
SWEEP TABLE:

"Spuri hi 3-18G"

Start	Stop	Detector	Meas.	RBW	VBW	Transducer
Frequency	Frequency	Time	Bandw.			
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	10Hz	#326 horn (dBi)

Marker: 7.388777555 GHz 35.73 dBμV/m

Level [dBμV/m]



EMISSION LIMITATIONS - Radiated (Transmitter)

§ 15.247 (c) (1)

18GHz – 26.5GHz

Note: This plot is valid for low, mid, high channels (worst-case plot)

@ 54Mbps

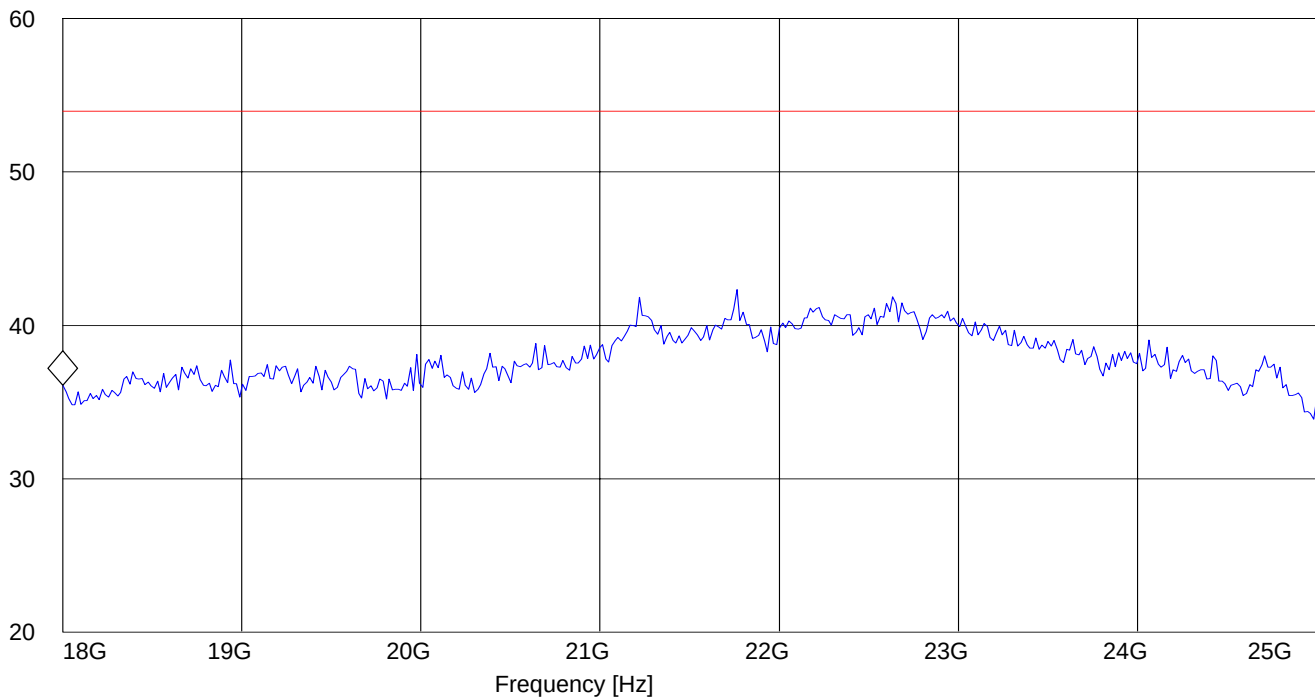
SWEEP TABLE:

"Spuri hi 18-26.5G"

Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
18 GHz	26.5 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)

Marker: 18 GHz 36.08 dBμV/m

Level [dBμV/m]



CONDUCTED EMISSIONS

§ 15.107/207

Measured with AC/DC power adapter

SWEEP TABLE: "55022 cond"

Short Description:		EN 55022 for 150KHz-30MHz			
Start	Stop	Detector	Meas	IF	Transducer
Frequency	Frequency		Time	Bandw.	
150.0 kHz	30.0 MHz	MaxPeak	Coupled	10 kHz	None

Technical specification: 15.107 / 15.207 (Revised as of August 20, 2002)

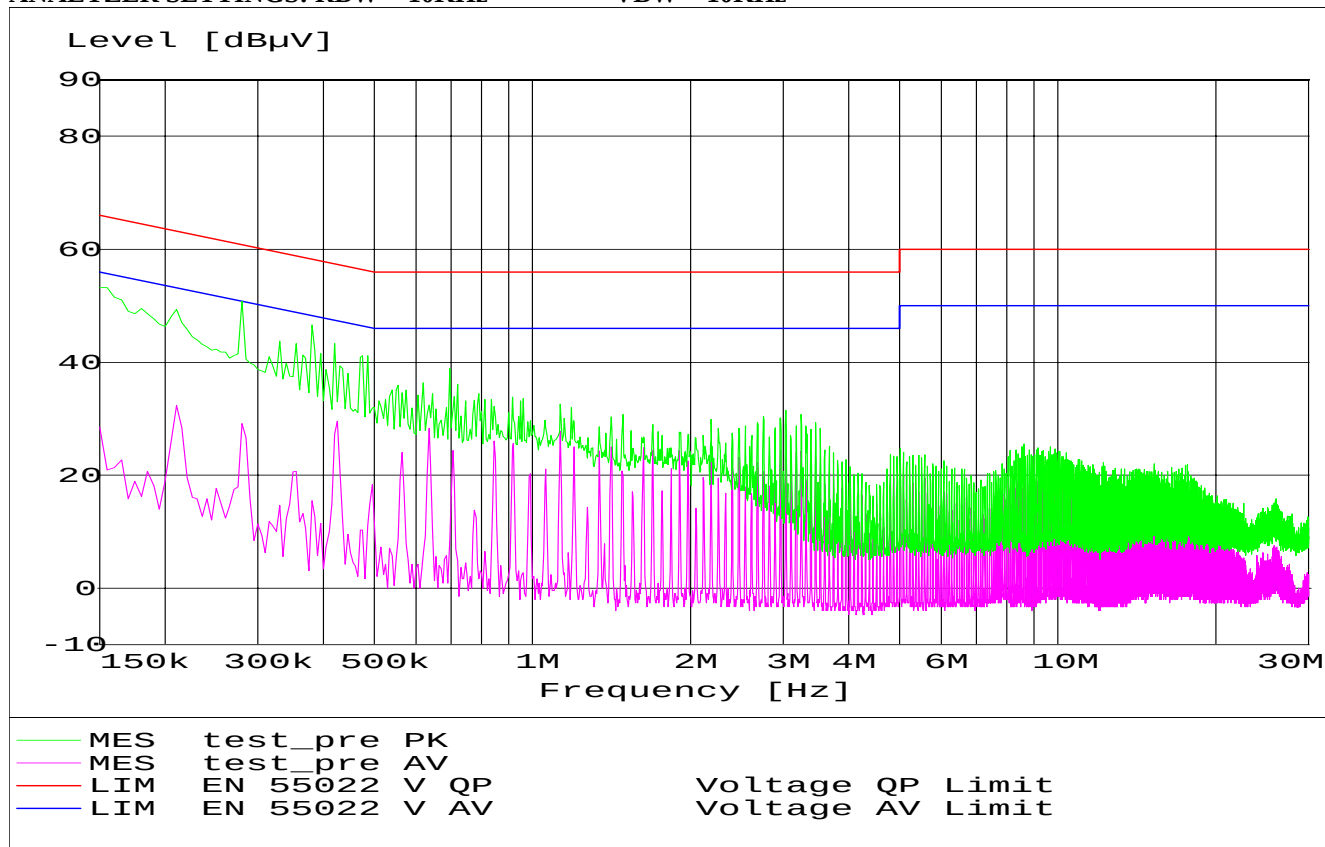
Limit

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 logarithm of the frequency

ANALYZER SETTINGS: RBW = 10KHz

VBW = 10KHz



RECEIVER SPURIOUS RADIATION**§ 15.209****Limits**

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

NOTE:

The radiated emissions were done with different settings, using the relevant pre-amplifiers for the relevant frequency ranges. This is the reason that the graphs show different noise levels. In the range between 3 and 26.5 GHz very short cable connections to the antenna was used to minimize the noise level.

RECEIVER SPURIOUS RADIATION 30MHz – 1GHz

§ 15.209

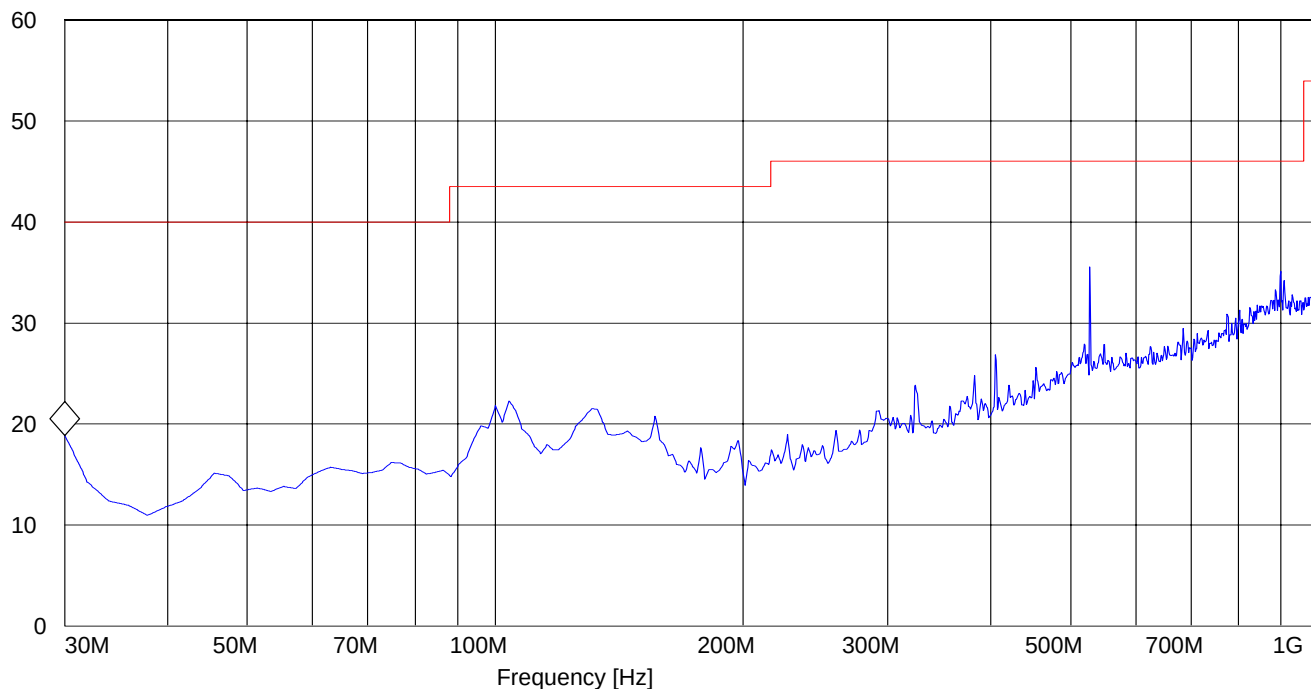
SWEEP TABLE:

Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency		Time	VBW	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186

"Spuri hi 30-1G"

Marker: 30 MHz 18.84 dB μ V/m

Level [dB μ V/m]



RECEIVER SPURIOUS RADIATION
1GHz – 3GHz

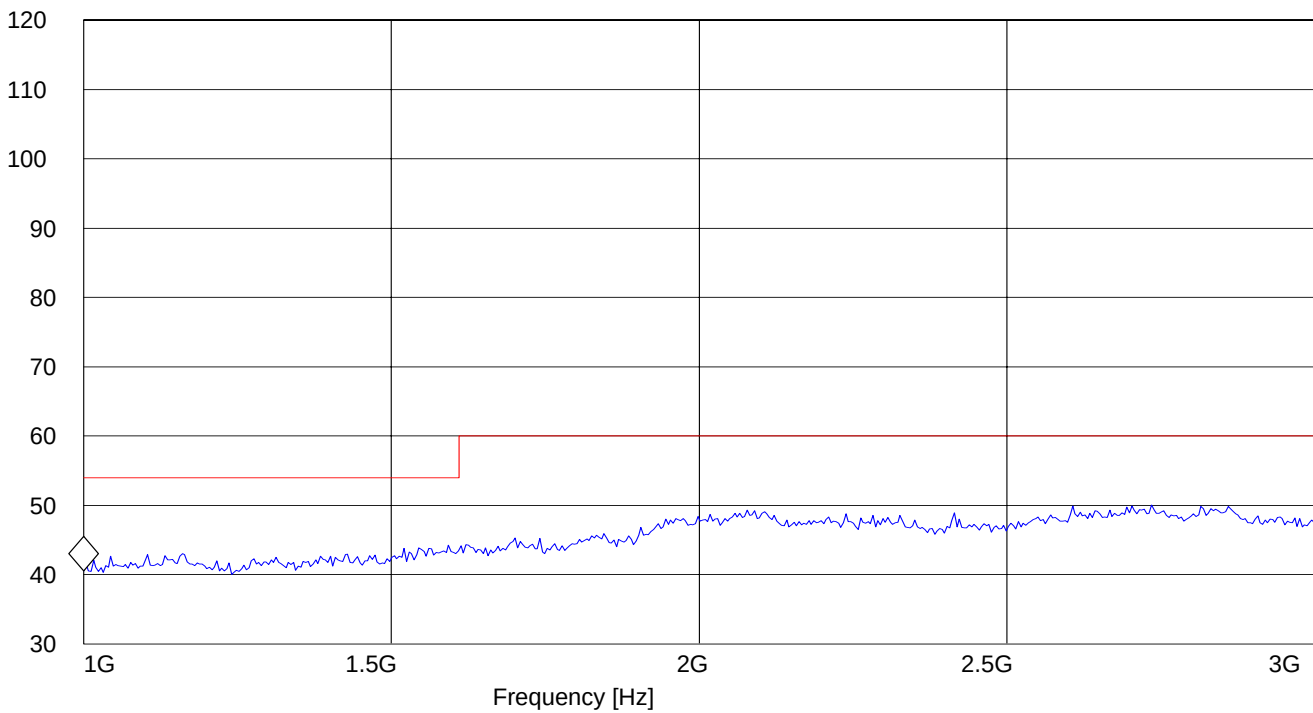
§ 15.209

SWEEP TABLE:

SWEEP TABLE:		"Spuri hi 1-3G"				
Start	Stop	Detector	Meas.	RBW		Transducer
Frequency	Frequency	Time	Bandw.		VBW	
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	1MHz	#326 horn (dBi)

Marker: 1 GHz 40.56 dBµV/m

Level [dBµV/m]



RECEIVER SPURIOUS RADIATION 3GHz – 18GHz

§ 15.209

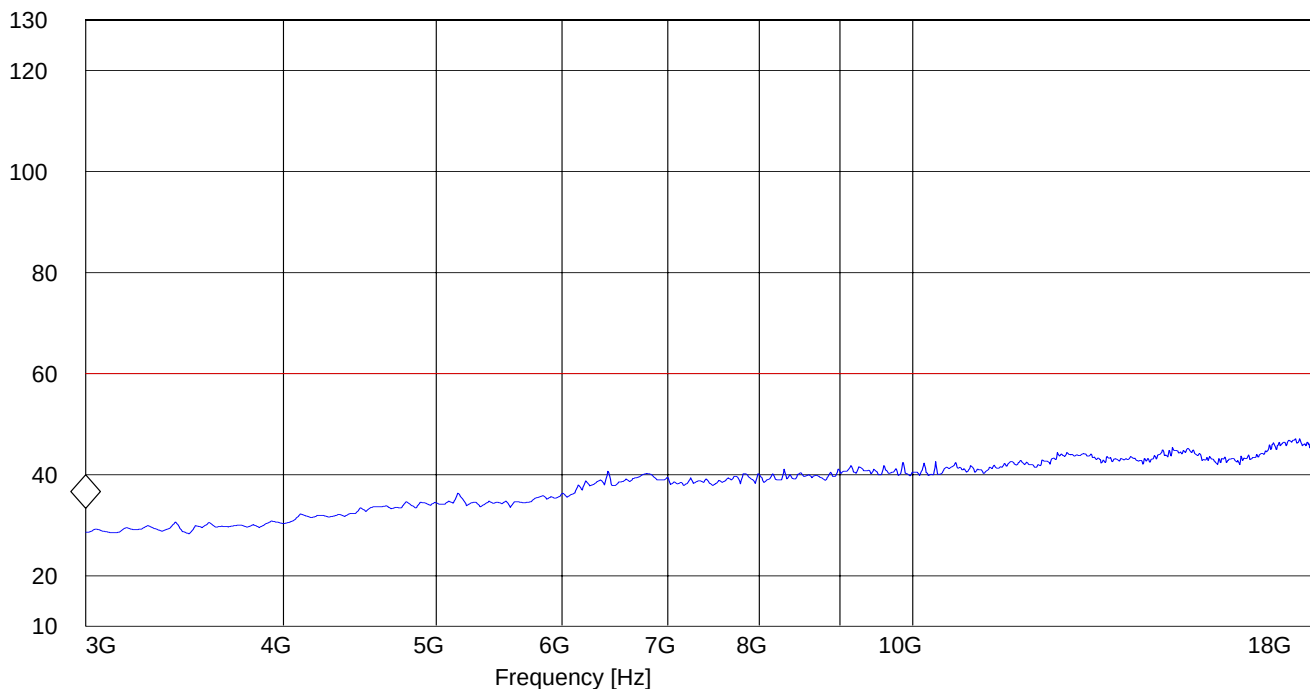
SWEEP TABLE:

Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
3.0 GHz	18 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)

"Spuri hi 3-18G"

Marker: * 1 GHz 33.34 dB μ V/m

Level [dB μ V/m]



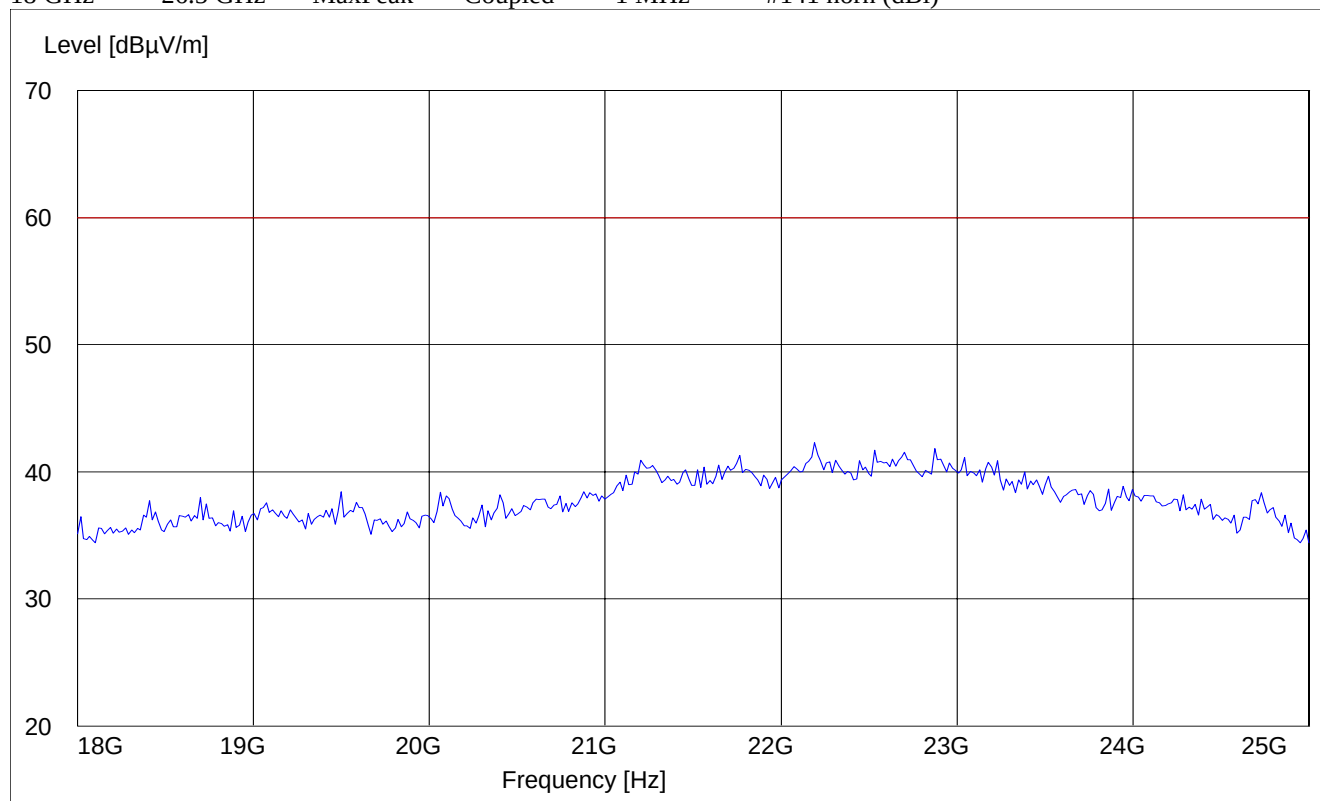
RECEIVER SPURIOUS RADIATION 18GHz – 26.5GHz

§ 15.209

SWEEP TABLE:

"Spuri hi 18-26.5G"

Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
18 GHz	26.5 GHz	MaxPeak	Coupled	1 MHz	#141 horn (dBi)



TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

No	Instrument/Ancillary	Type	Manufacturer	Serial No.	Cal. Due
01	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107	May 2006
02	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	826880/010	May 2006
03	Signal Generator	SMY02	Rohde & Schwarz	836878/011	May 2006
04	Power-Meter	NRVD	Rohde & Schwarz	0857.8008. 02	May 2006
05	Biconilog Antenna	3141	EMCO	0005-1186	May 2006
06	Horn Antenna (1-18GHz)	SAS-200/571	AH Systems	325	May 2006
07	Horn Antenna (18-26.5GHz)	3160-09	EMCO	1240	May 2006
08	Power Splitter	11667B	Hewlett Packard	645348	n/a
09	Climatic Chamber	VT4004	Voltsch	G1115	n/a
10	High Pass Filter	5HC2700	Trilithic Inc.	9926013	n/a
11	High Pass Filter	4HC1600	Trilithic Inc.	9922307	n/a
12	Pre-Amplifier	JS4-00102600	Miteq	00616	May 2006
13	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807	May 2006
14	Digital Radio Comm. Tester	CMD-55	Rohde & Schwarz	847958/008	May 2006
15	Universal Radio Comm. Tester	CMU 200	Rohde & Schwarz	832221/06	May 2006

BLOCK DIAGRAMS
Radiated Testing

ANECHOIC CHAMBER

