



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.

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TEST REPORT PREPARED BY:

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1.2 Testing laboratory
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1.3 Details of applicant

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Street : 14000 Summit Road, Suite 900
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Country : USA
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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)		
		2412	2437	2462
Frequency (MHz)				
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

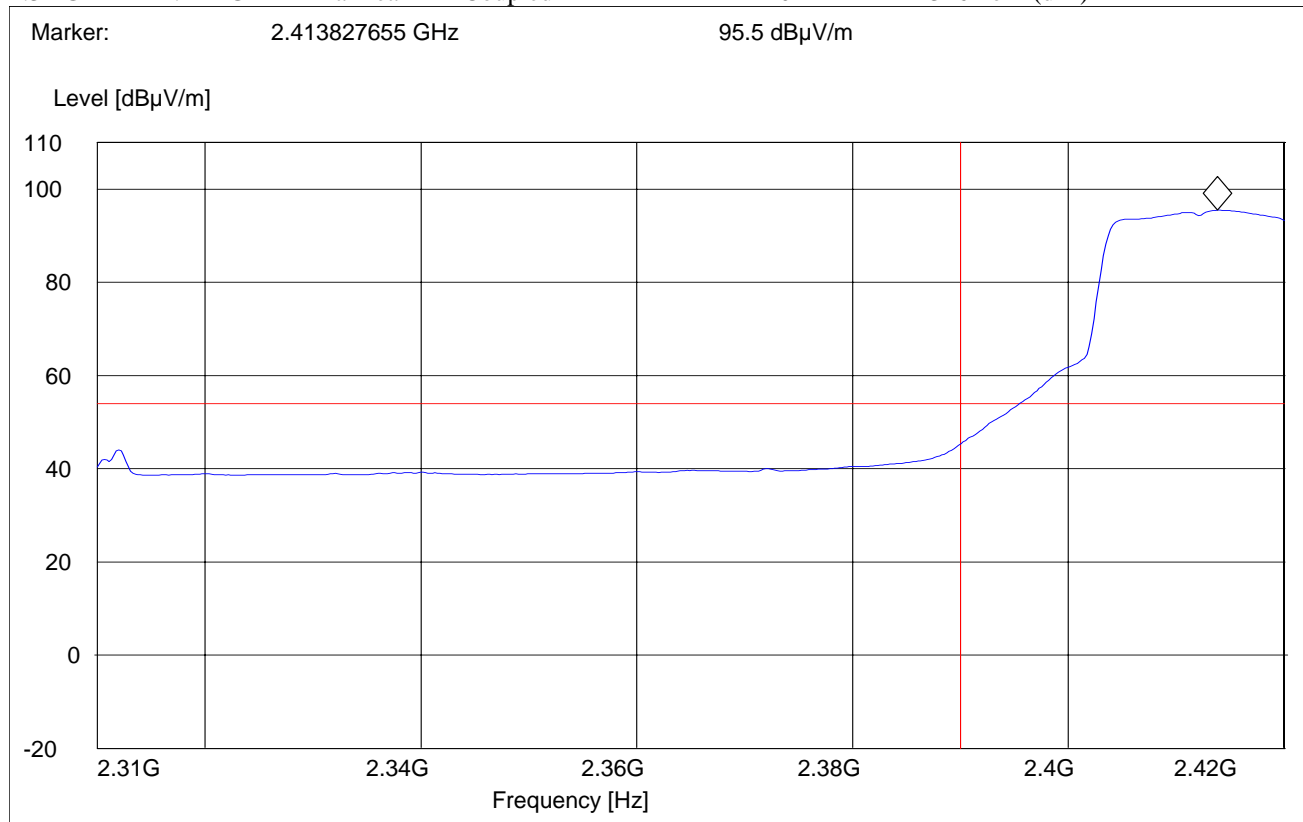
BAND EDGE COMPLIANCE

§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)



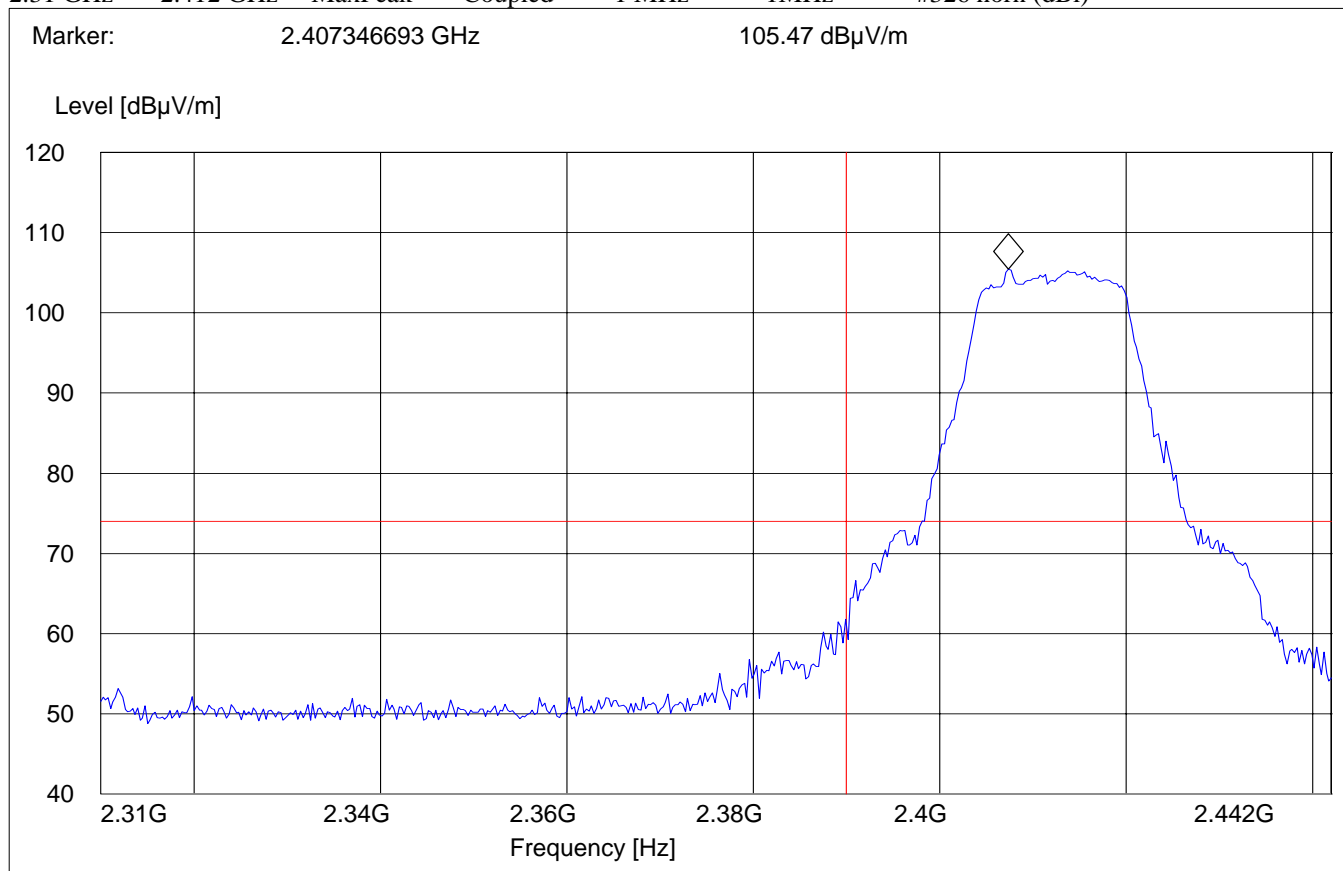
BAND EDGE COMPLIANCE

§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	Meas. Bandw.	RBW	VBW	Transducer
2.31 GHz	2.412 GHz	MaxPeak	Coupled	1 MHz	1MHz	#326 horn (dBi)



BAND EDGE COMPLIANCE

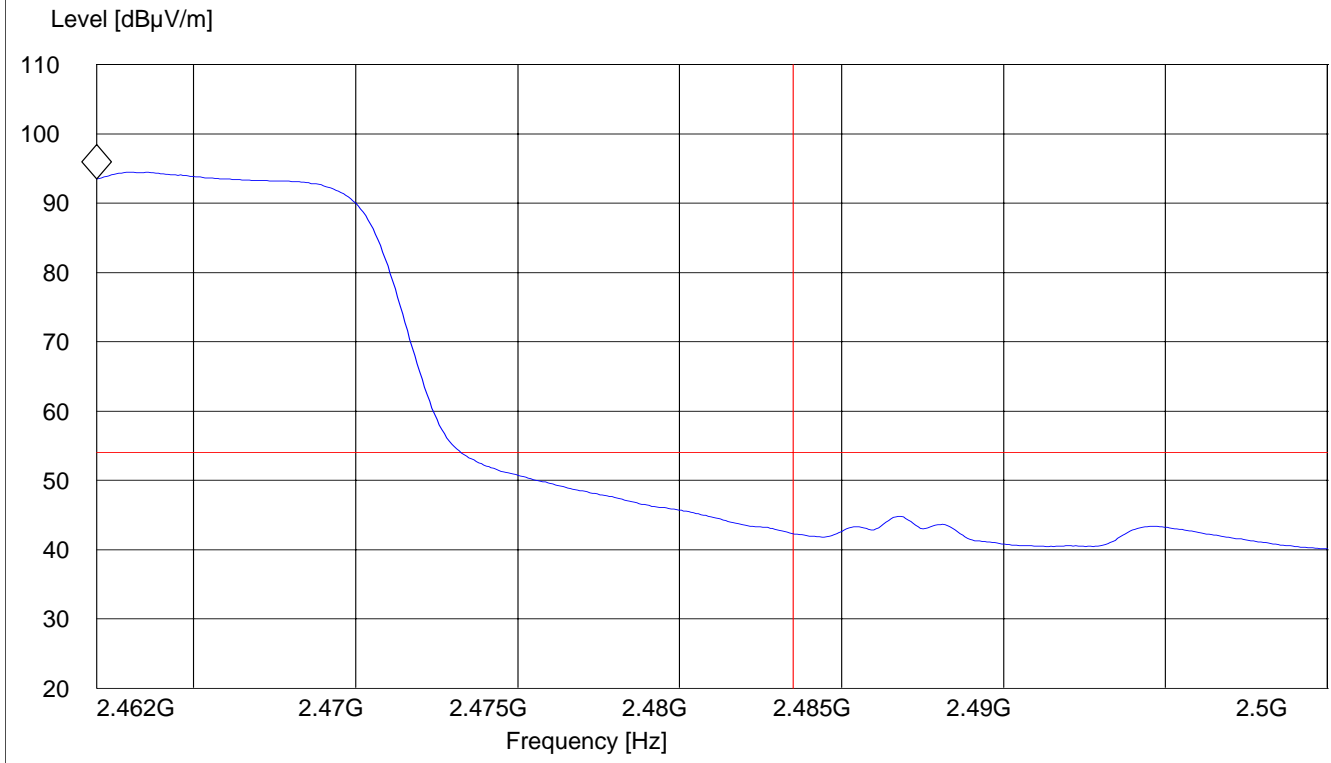
§15.247 (c)

**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	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



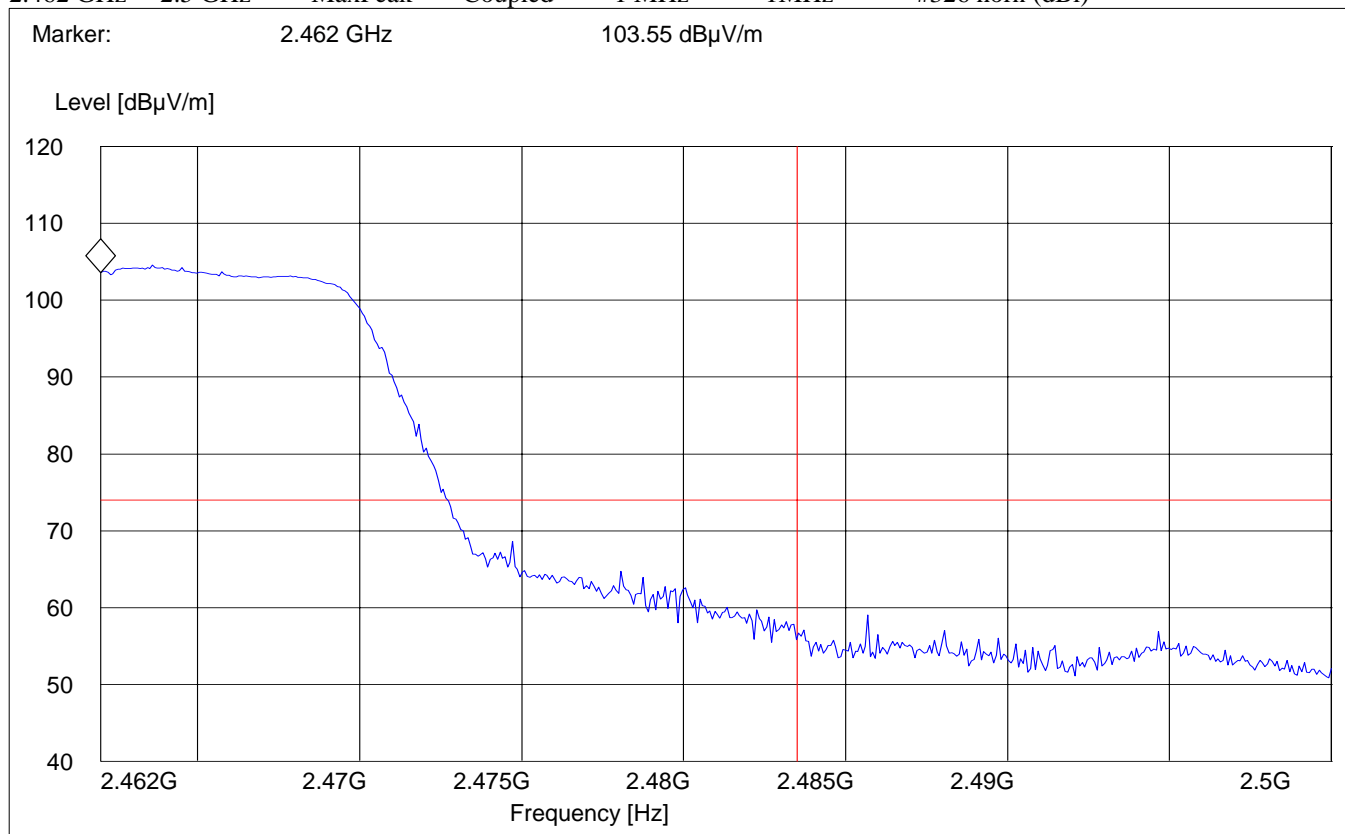
BAND EDGE COMPLIANCE

§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	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			

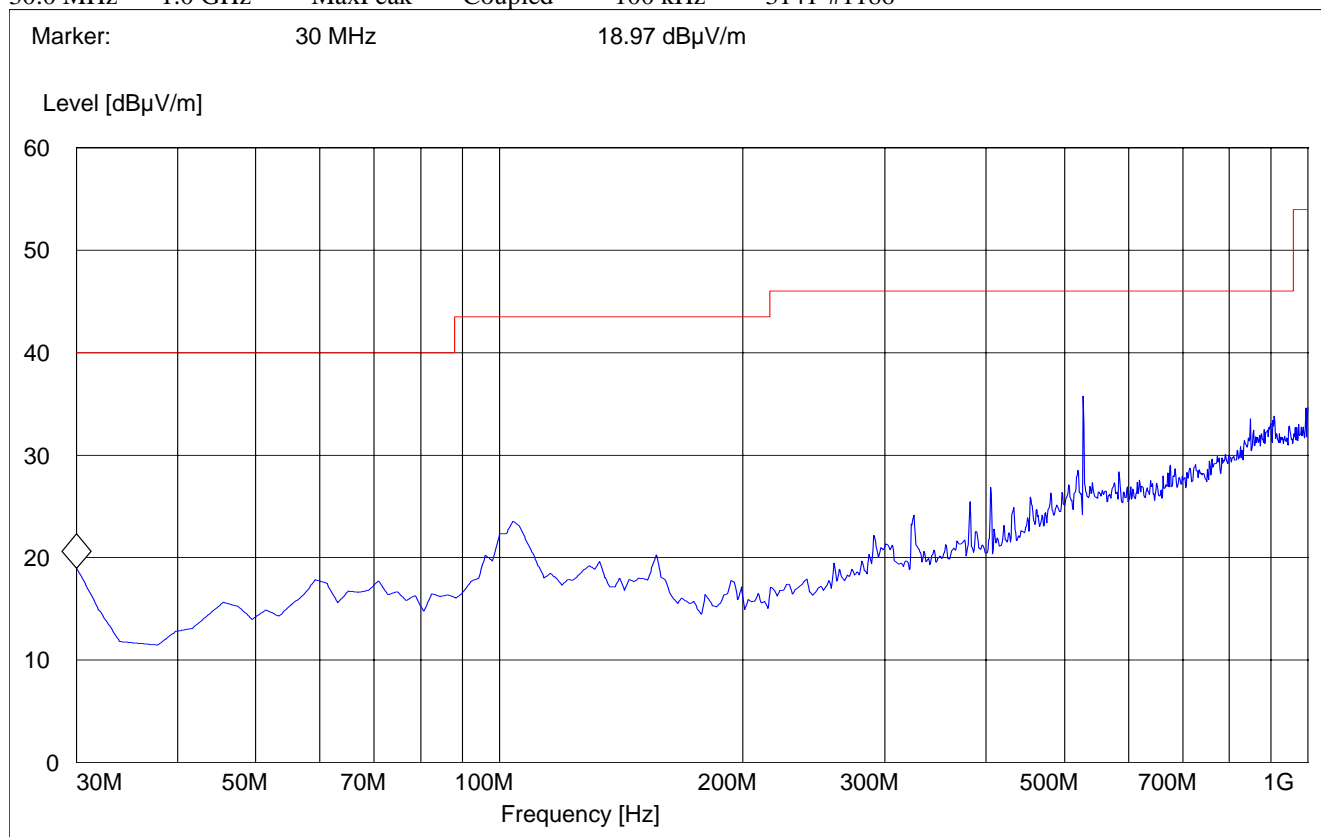
EMISSION LIMITATIONS - Radiated (Transmitter) § 15.247 (c) (1)

**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 Frequency	Stop Frequency	Detector	Meas. Time	RBW VBW	Transducer
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**

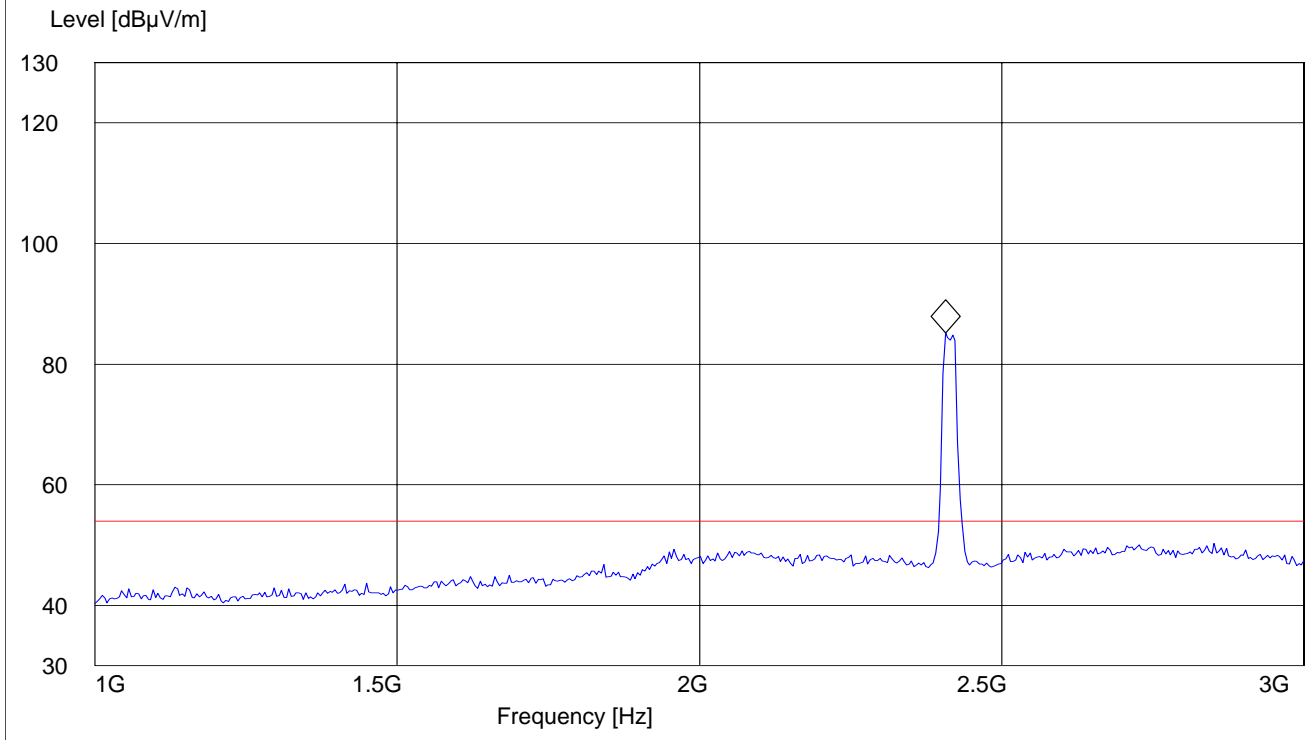
Note: The peak above the limit line is the carrier freq.

SWEEP TABLE:

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

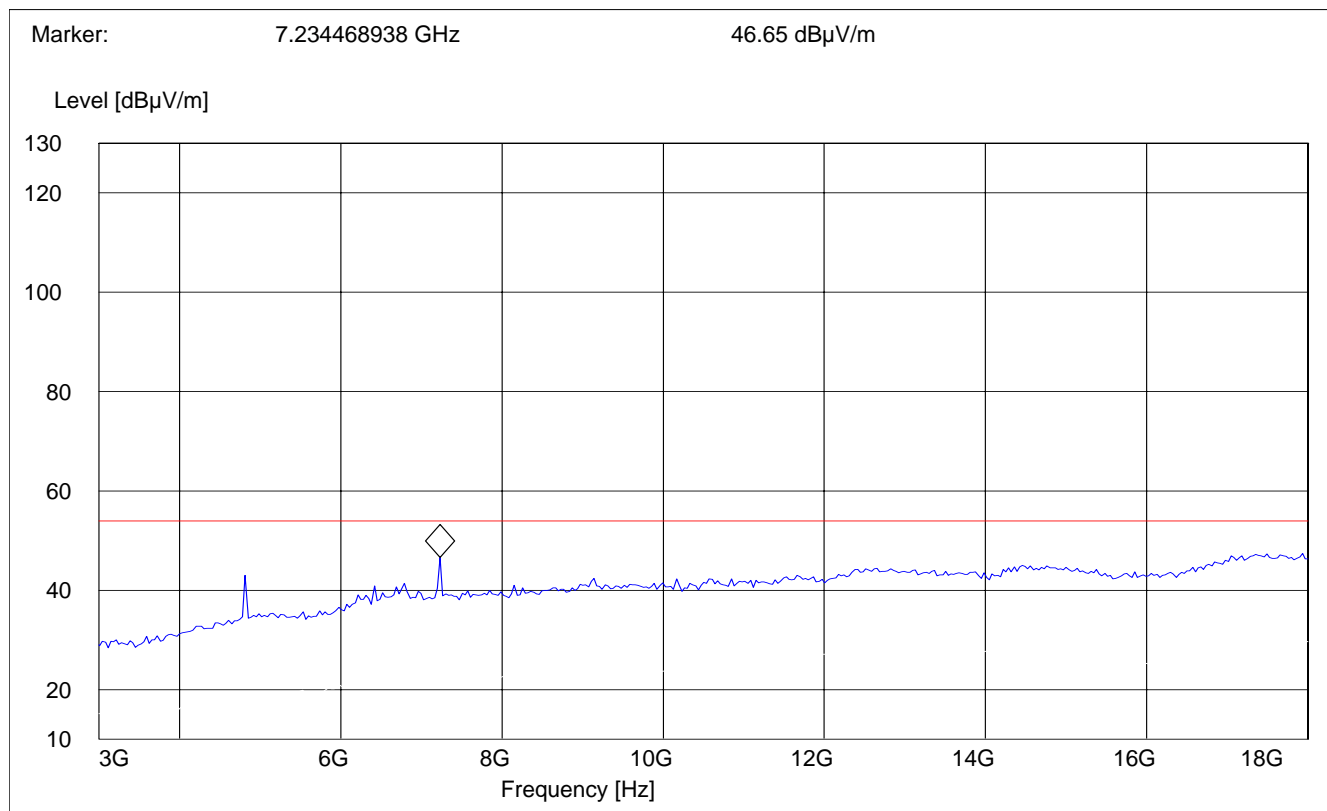
"Spuri hi 1-3G"

Marker: 2.406813627 GHz 85.12 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)

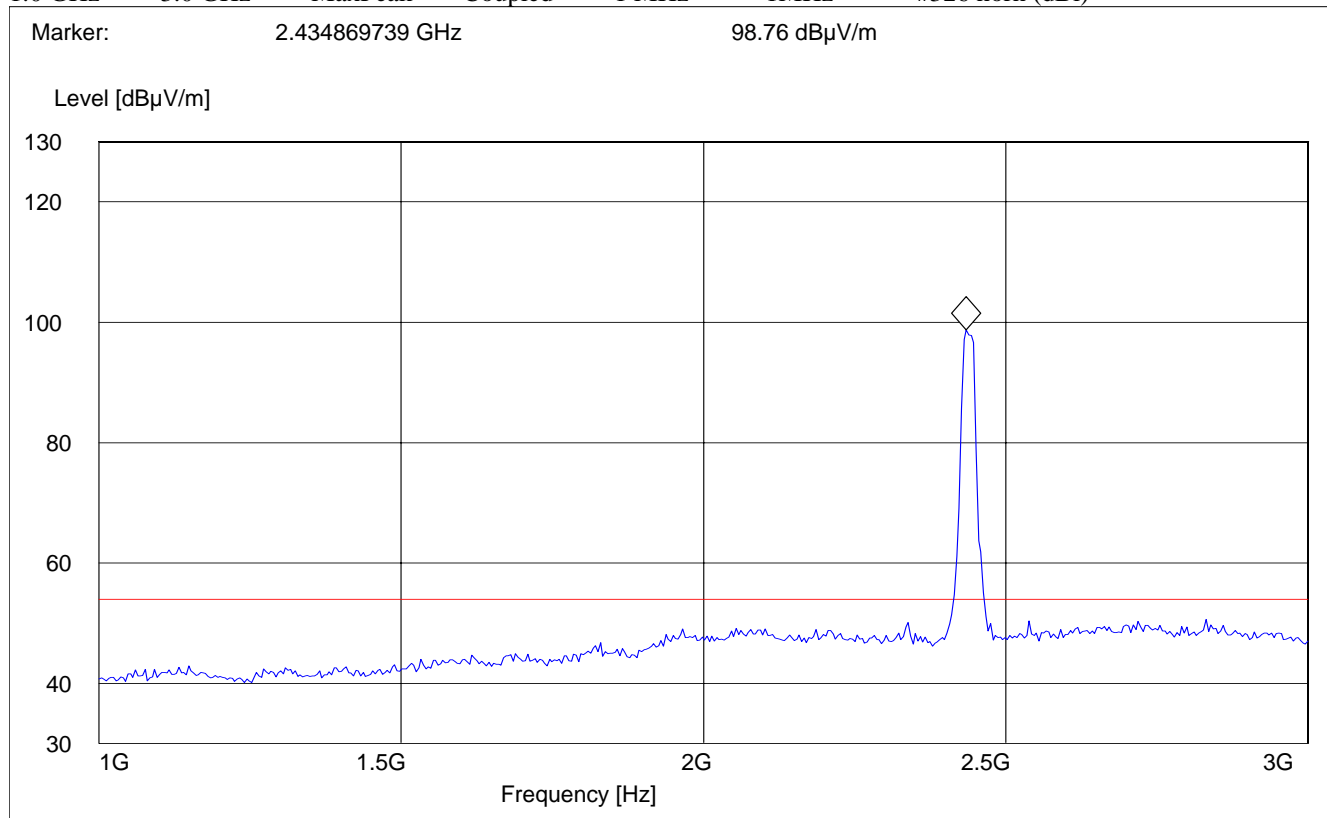


EMISSION LIMITATIONS - Radiated (Transmitter) § 15.247 (c) (1)
Mid Channel (2437MHz): 1GHz – 3GHz
@ 54Mbps

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

SWEEP TABLE: "Spuri hi 1-3G"

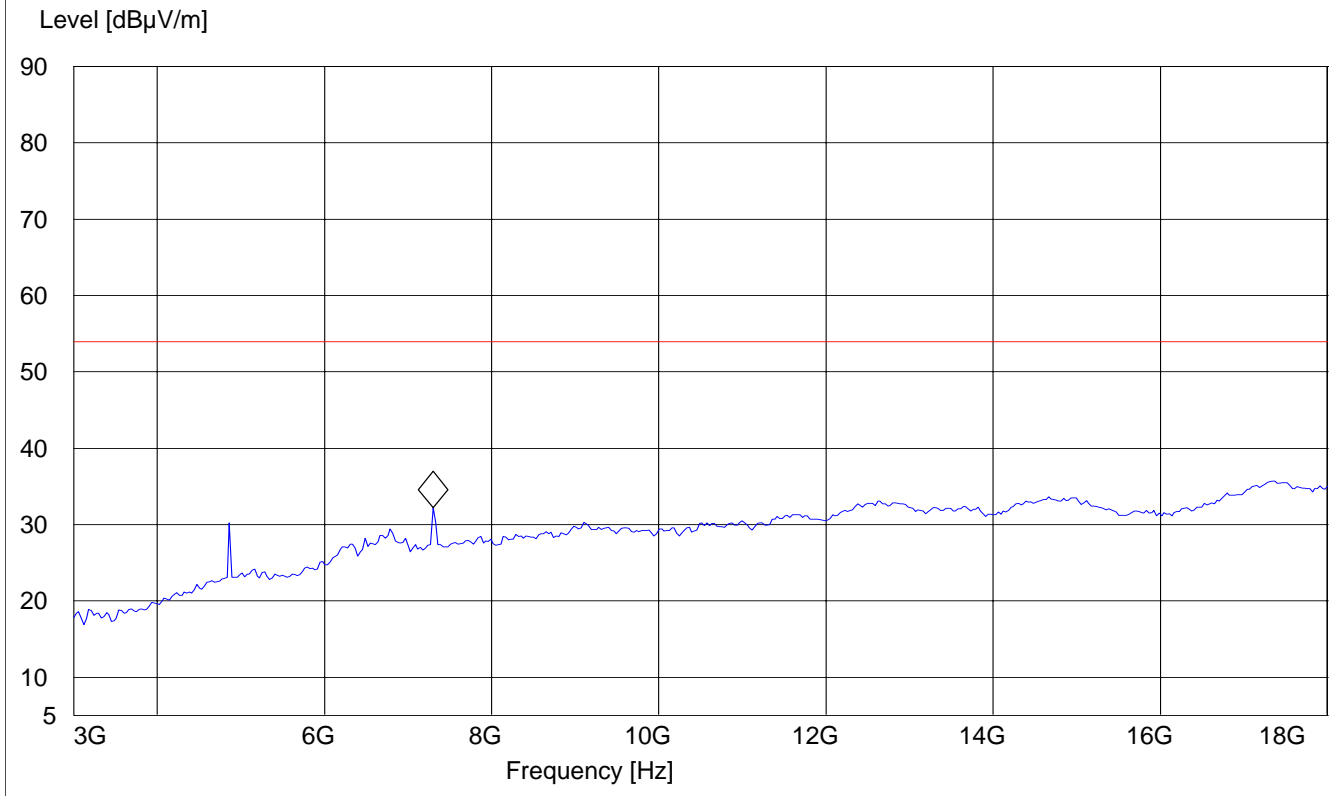
Start Frequency	Stop Frequency	Detector	Meas. Time	Meas. Bandw.	RBW	VBW	Transducer
1.0 GHz	3.0 GHz	MaxPeak		Coupled	1 MHz	1MHz	#326 horn (dBi)



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



EMISSION LIMITATIONS - Radiated (Transmitter) § 15.247 (c) (1)
Highest Channel (2462MHz): 1GHz – 3GHz
@ 54Mbps

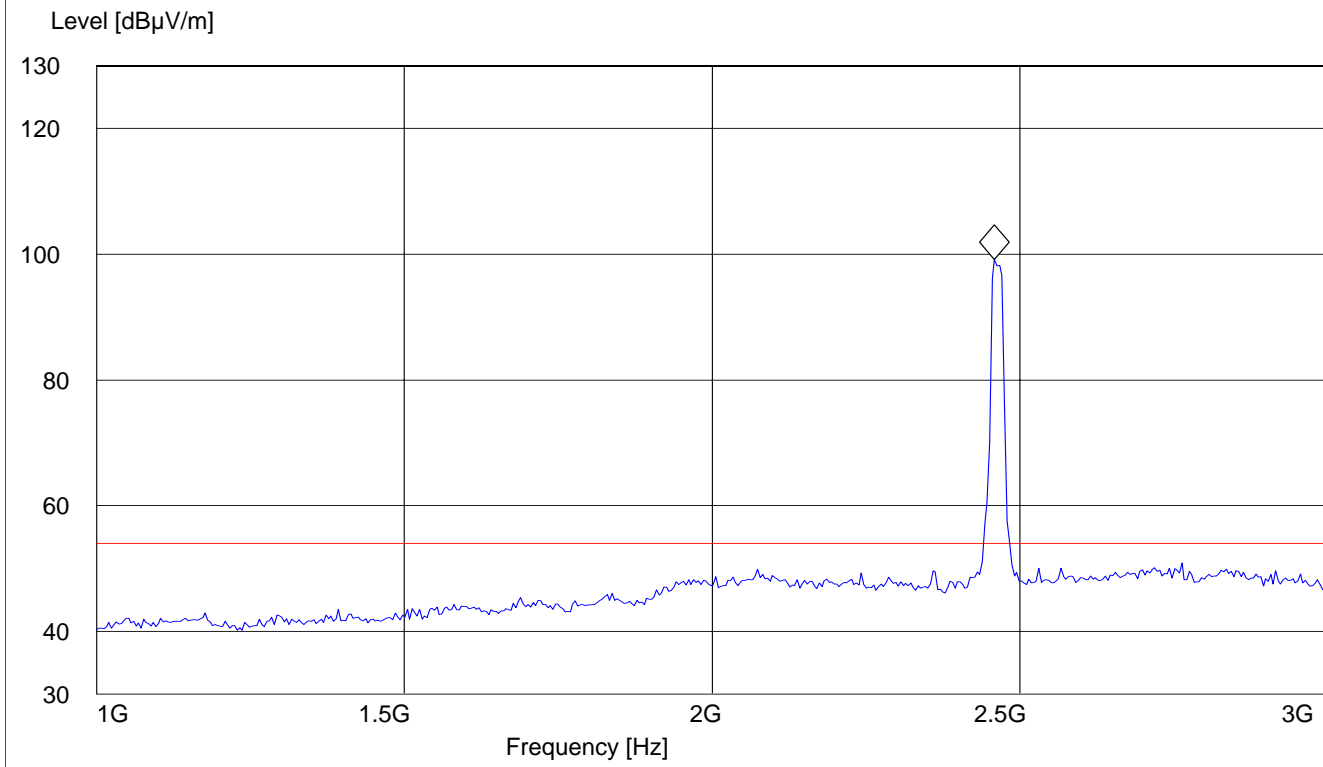
Note: The peak above the limit line is the carrier freq.

SWEEP TABLE:

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

"Spuri hi 1-3G"

Marker: 2.458917836 GHz 99.18 dBµV/m



EMISSION LIMITATIONS - Radiated (Transmitter) § 15.247 (c) (1)

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

@ 54Mbps

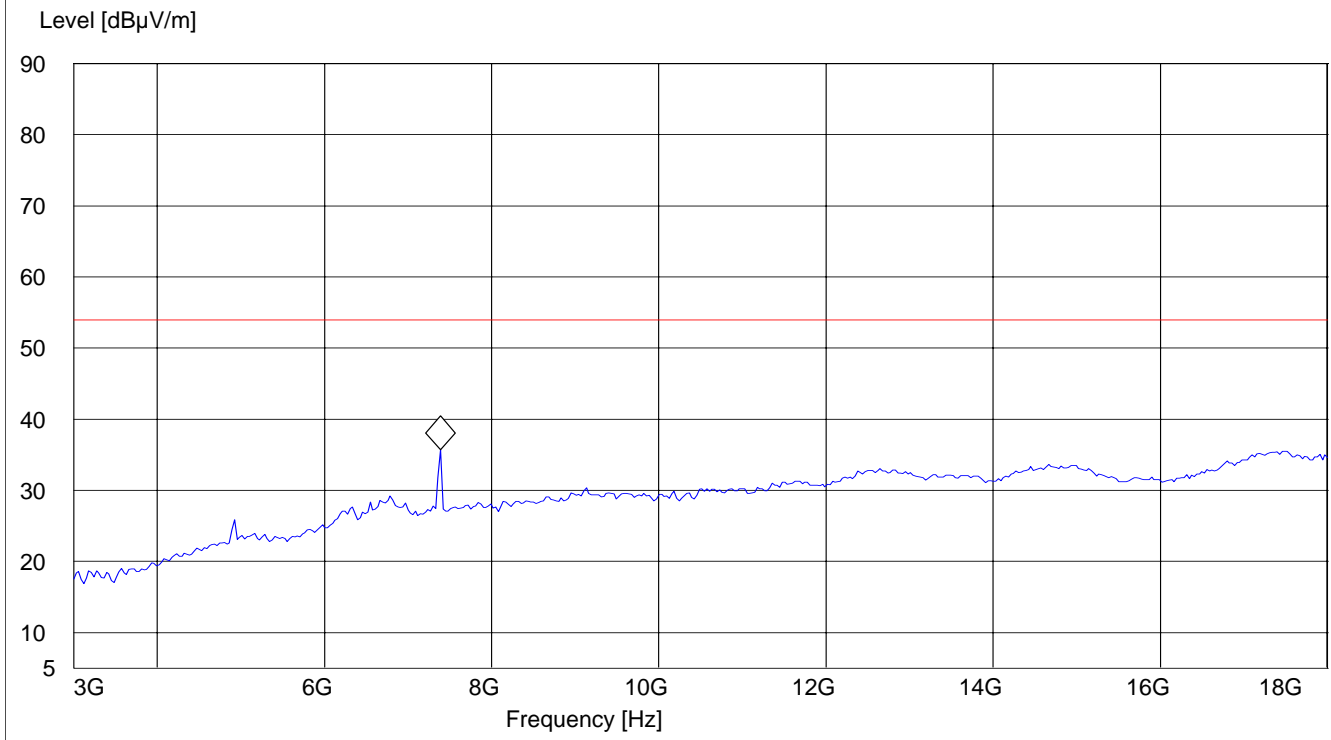
Average measurement

SWEEP TABLE:

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)

"Spuri hi 3-18G"

Marker: 7.388777555 GHz 35.73 dBµV/m

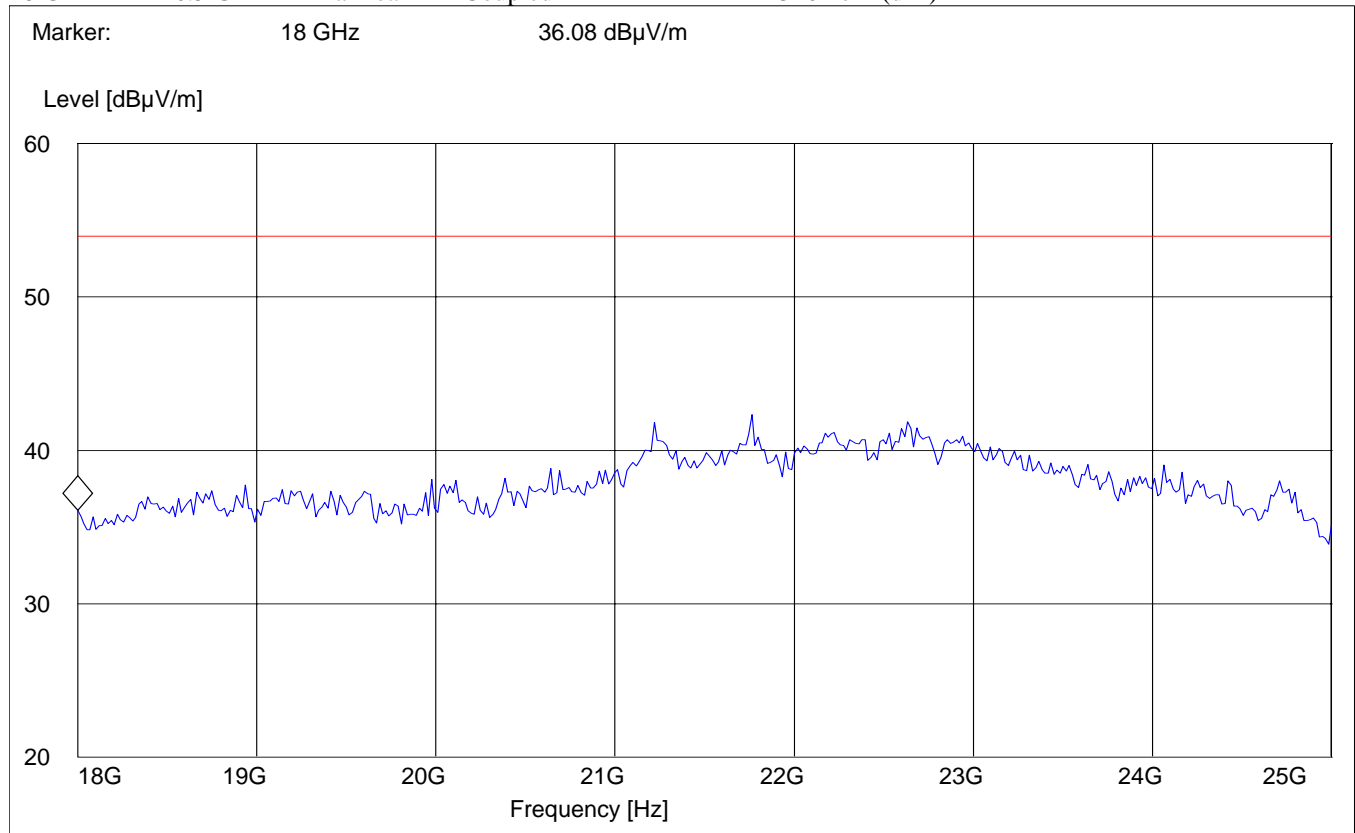


EMISSION LIMITATIONS - Radiated (Transmitter) § 15.247 (c) (1)

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)



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

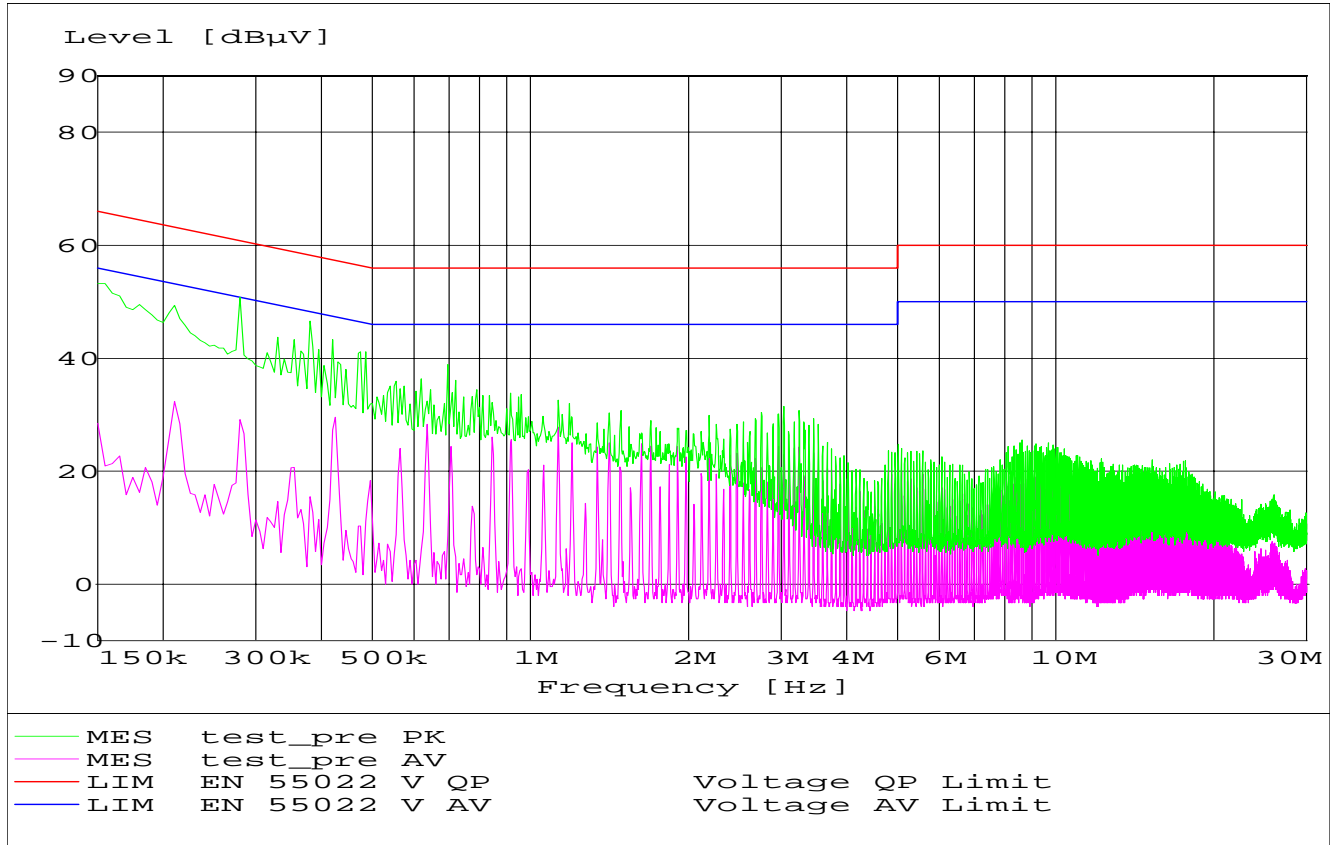
Technical specification: 15.107 / 15.207 (Revised as of August 20, 2002)

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 ($\mu\text{V/m}$)	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:

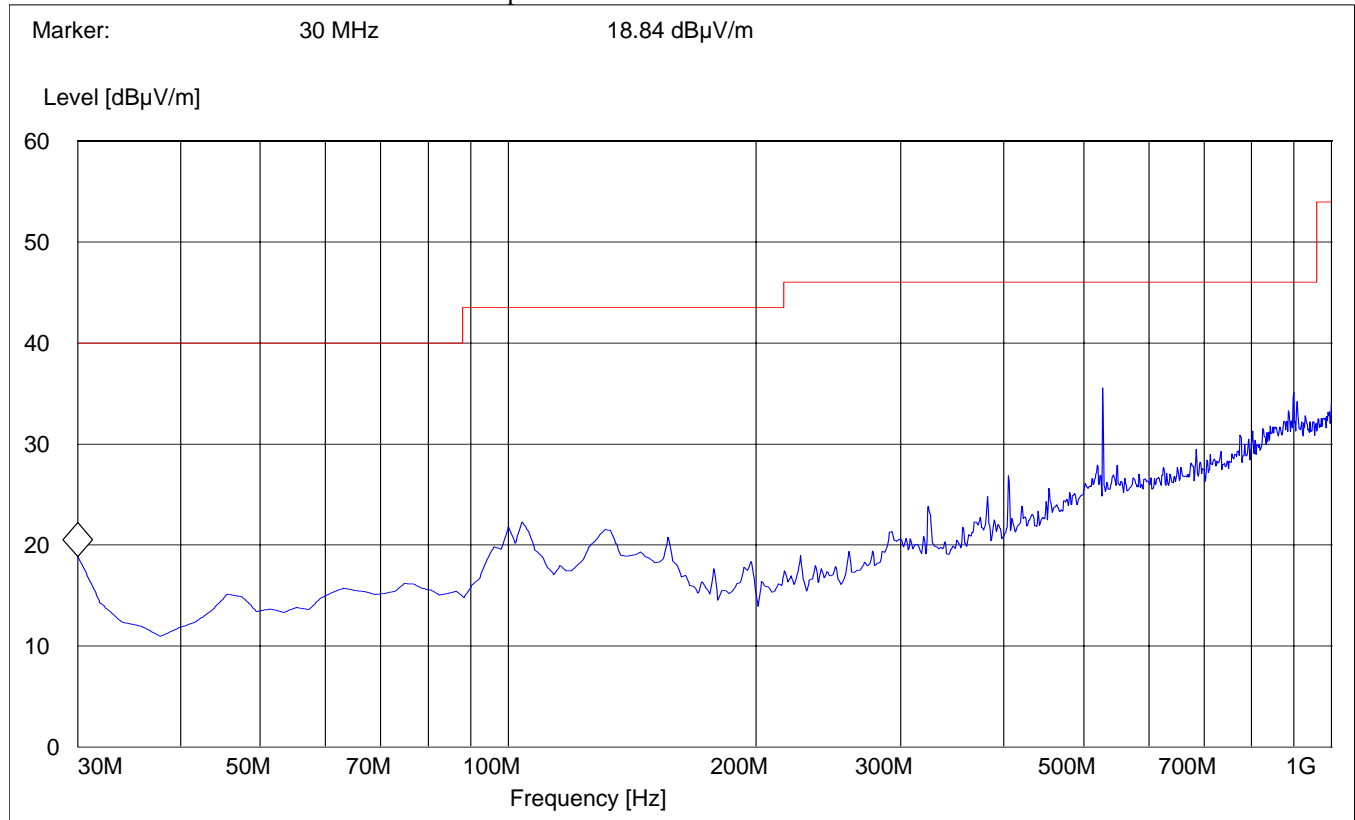
The radiated emissions were done with different settings, using the relevant pre-amplifiers for the relevant frequency ranges. This is the reason that the graphs show different noise levels. In the range between 3 and 26.5 GHz very short cable connections to the antenna was used to minimize the noise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

RECEIVER SPURIOUS RADIATION
30MHz – 1GHz

§ 15.209

SWEEP TABLE: " Spuri hi 30-1G"

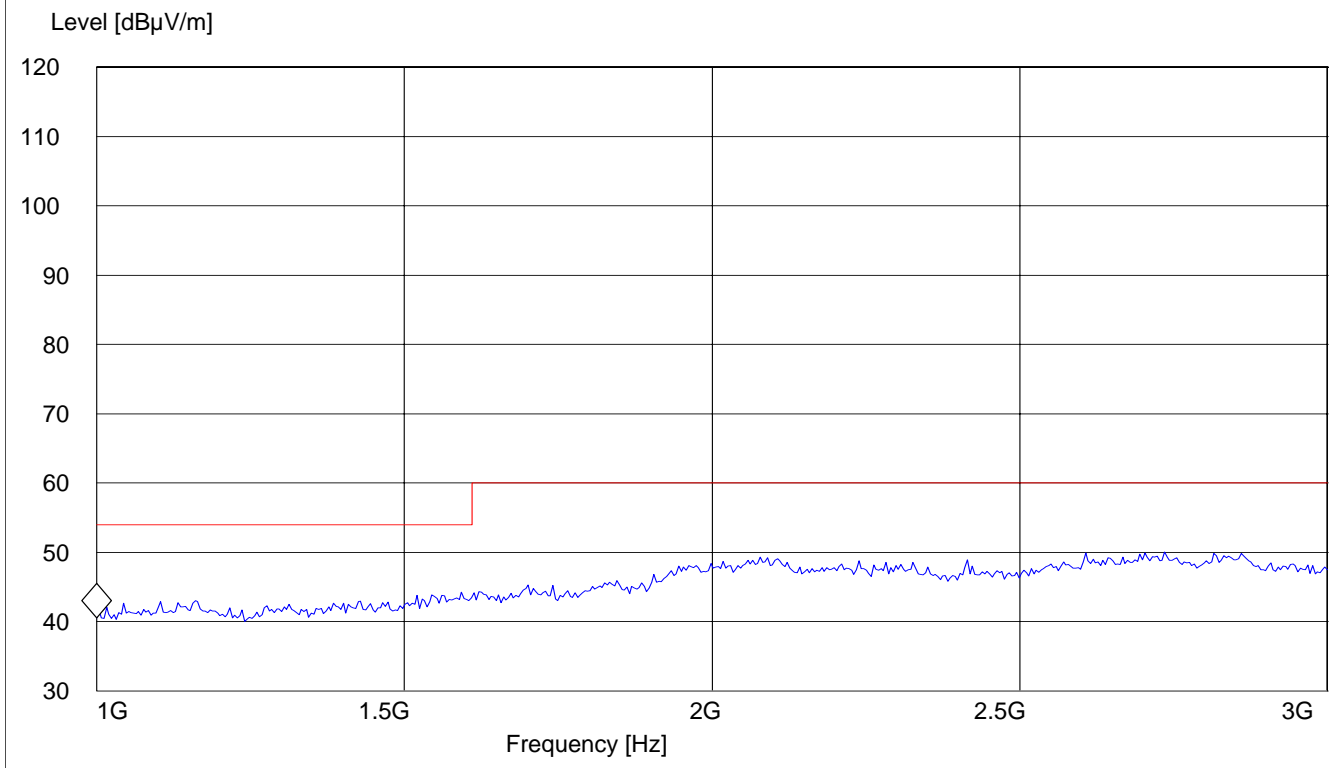
Start	Stop	Detector	Meas. Time	RBW	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186



RECEIVER SPURIOUS RADIATION § 15.209
1GHz – 3GHz

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: 1 GHz 40.56 dBµV/m

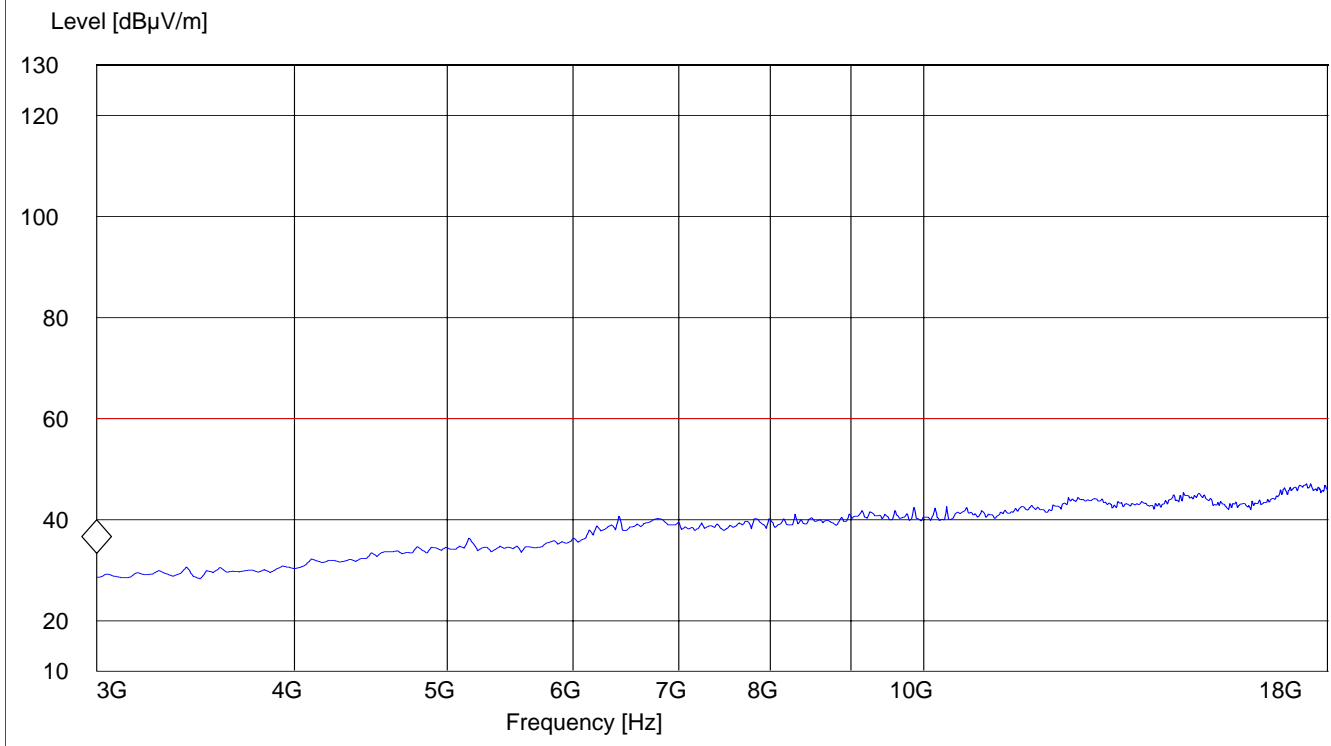


**RECEIVER SPURIOUS RADIATION
3GHz – 18GHz**

§ 15.209

SWEEP TABLE:		"Spuri hi 3-18G"			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
3.0 GHz	18 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)

Marker: * 1 GHz 33.34 dBµV/m

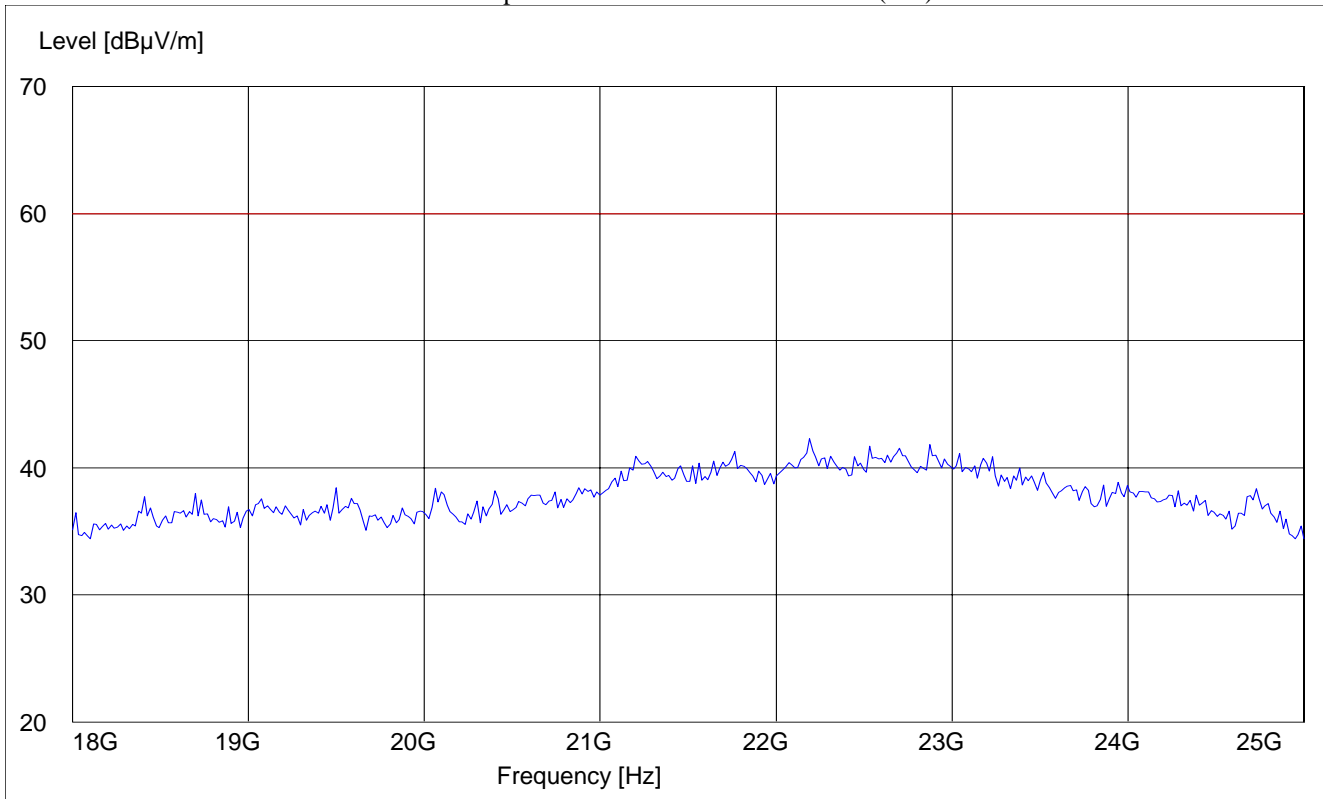


RECEIVER SPURIOUS RADIATION
18GHz – 26.5GHz

§ 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

