



# FCC Test Report

Test report no.: EMC\_452\_FCC15.247-407\_2003

FCC Part 15.247 for DSSS systems / CANADA RSS-210 for DSSS systems  
FCC Part 15.407 for UNII Devices / CANADA RSS-210 Issue 5 for LELEAN Devices

EUT: WLAN                      Model: BCM94309MP  
HOST: Dell Laptop                Model: PPT

FCC ID: QDS-BRCM1007



**TTI-P-G 081/94-A0**

Accredited according to **ISO/IEC 17025**



FCC listed # 101450

IC recognized # 3925

## **CETECOM Inc.**

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Board of Directors: Dr. Harald Ansoerge, Dr. Klaus Matkey, Hans Peter May

**Table of Contents**

<b>1</b>	<b>General information</b>
<b>1.1</b>	<b>Notes</b>
<b>1.2</b>	<b>Testing laboratory</b>
<b>1.3</b>	<b>Details of applicant</b>
<b>1.4</b>	<b>Application details</b>
<b>1.5</b>	<b>Test item</b>
<b>1.6</b>	<b>Test standards</b>
<b>2</b>	<b>Technical test</b>
<b>2.1</b>	<b>Summary of test results</b>
<b>2.2</b>	<b>Test report</b>
<b>1</b>	<b>General information</b>
<b>1.1</b>	<b>Notes</b>

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@cetecomusa.com](mailto:lothar.schmidt@cetecomusa.com)****Internet: [www.cetecom.com](http://www.cetecom.com)**

### 1.3 Details of applicant

**Name** : **Broadcom corporation**  
**Street** : **190 Mathilda Place**  
**City / Zip Code** : **Sunnyvale, CA 94086**  
**Country** : **USA**  
**Contact** : **Chris McGough**  
**Telephone** : **408-922-5810**  
**Tele-fax** : **408-543-3399**  
**e-mail** : [cmcgough@broadcom.com](mailto:cmcgough@broadcom.com)

### 1.4 Application details

Date of receipt of application : 2003-04-01  
Date of receipt test item : 2003-04-03  
Date of test : 2003-04-03

### 1.5 Test item

**Manufacturer** : Applicant  
**Model No.(EUT)** : BCM94309MP  
**Model No.(Host)** : Dell Laptop PC Model No: PPT  
**Description** : [802.11a & 54g wireless LAN mini PCI card in Dell Laptop](#)  
**FCC ID** : QDS-BRCM1007

### Additional information

**Frequency** : 2412MHz – 2462MHz for 54g  
5180MHz – 5320MHz for 802.11a  
**Type of modulation** : DSSS / OFDM (orthogonal frequency division multiplexing)  
**Number of channels** : 11 for 54g / 8 for 802.11a  
**Power supply** : 3.3 VDC from Host  
**Antenna** : Dual band (2.45GHz & 5.0GHz) antenna by Wistron NeWeb  
**Output power** : 19.8dBm (95.50mW) conducted peak power for 54g  
21.8dBm (151.35mW) conducted peak power for 802.11a

### 1.6 Test standards: FCC Part 15 §15.247 & 15.407 / CANADA RSS-210

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

**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:**

2003-04-16 EMC & Radio Lothar Schmidt (Manager)



Date

Section

Name

Signature

**Responsible for test report and project leader:**

2003-04-16 EMC & Radio Harpreet Sidhu (EMC Engineer)



Date

Section

Name

Signature

## **2.2 Test report**

**TEST REPORT**

**Test report no.: EMC\_452\_FCC15.247-407\_2003**

**FCC ID: QDS-BRCM1007**

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**TEST REPORT REFERENCE**

<b>LIST OF MEASUREMENTS</b>		<b>PAGE</b>
<b>MAXIMUM PEAK OUTPUT POWER</b>	<b>§ 15.247 (b) (1)</b>	<b>7</b>
<b>BAND EDGE COMPLIANCE</b>	<b>§15.247 (c)</b>	<b>8</b>
<b>EMISSION LIMITATIONS</b>	<b>§ 15.247 (c) (1)</b>	<b>12</b>
<b>CONDUCTED EMISSIONS</b>	<b>§ 15.107/207</b>	<b>21</b>
<b>RECEIVER SPURIOUS RADIATION</b>	<b>§ 15.209</b>	<b>22</b>
<b>MAXIMUM PEAK OUTPUT POWER</b>	<b>§ 15.407(a)</b>	<b>27</b>
<b>BAND EDGE COMPLIANCE</b>	<b>§15.407</b>	<b>28</b>
<b>EMISSION LIMITATIONS</b>	<b>§ 15.407 (b)</b>	<b>32</b>
<b>RECEIVER SPURIOUS RADIATION</b>	<b>§ 15.209/§ 15.407</b>	<b>42</b>
<b>TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS</b>		<b>48</b>
<b>BLOCK DIAGRAMS</b>		<b>49</b>

**MAXIMUM PEAK OUTPUT POWER  
(Conducted)**

§ 15.247 (b) (1)

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
Frequency (MHz)		2412	2437	2462
T <sub>nom</sub> (23)°C	V <sub>nom</sub> (3.3)VDC	19.4	19.8	19.5
Measurement uncertainty		±0.5dBm		

RBW / VBW: 10 MHz

**LIMIT**

SUBCLAUSE § 15.247 (b) (1)

Frequency range	RF power output
2400-2483.5 MHz	1.0 Watt

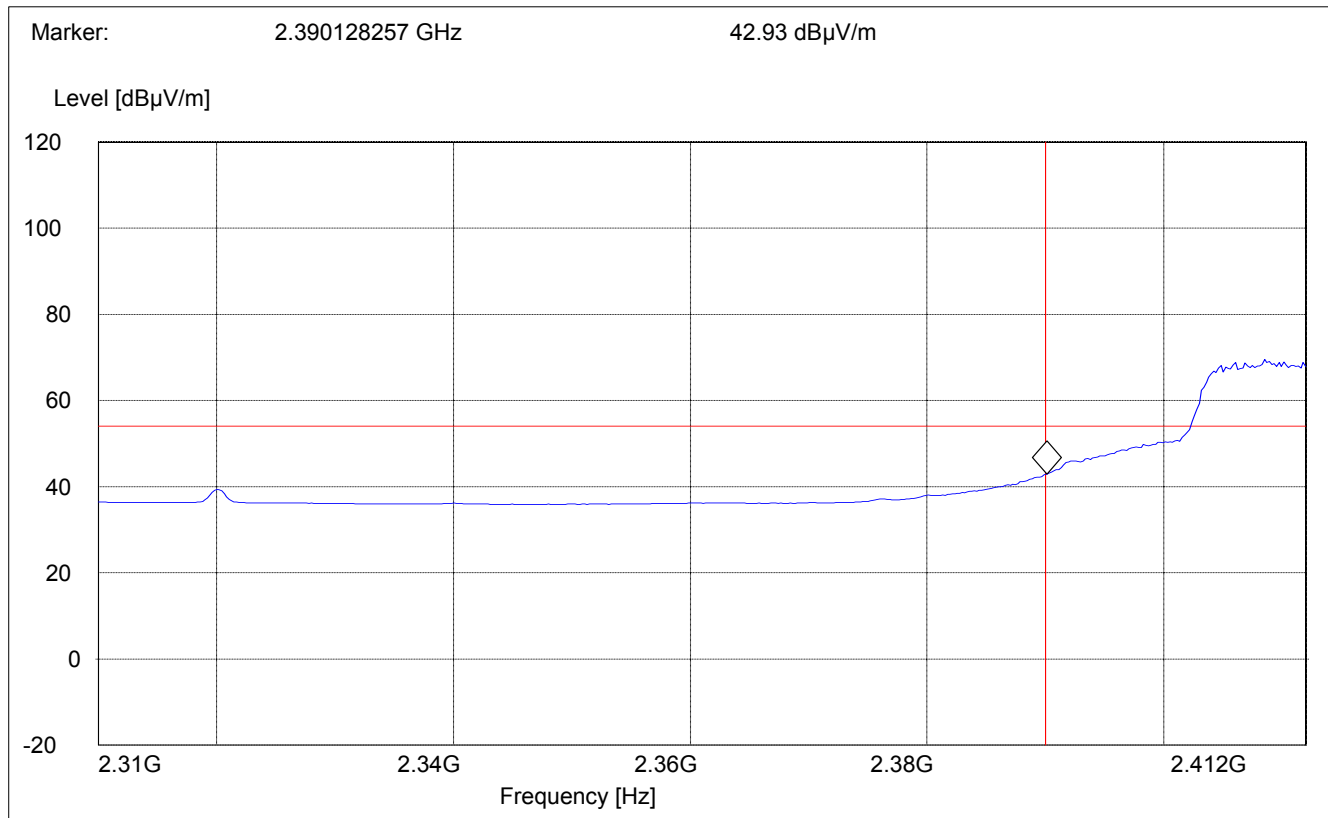
**BAND EDGE COMPLIANCE**

**§15.247 (c)**

**Low frequency section  
(Average measurement)**

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)





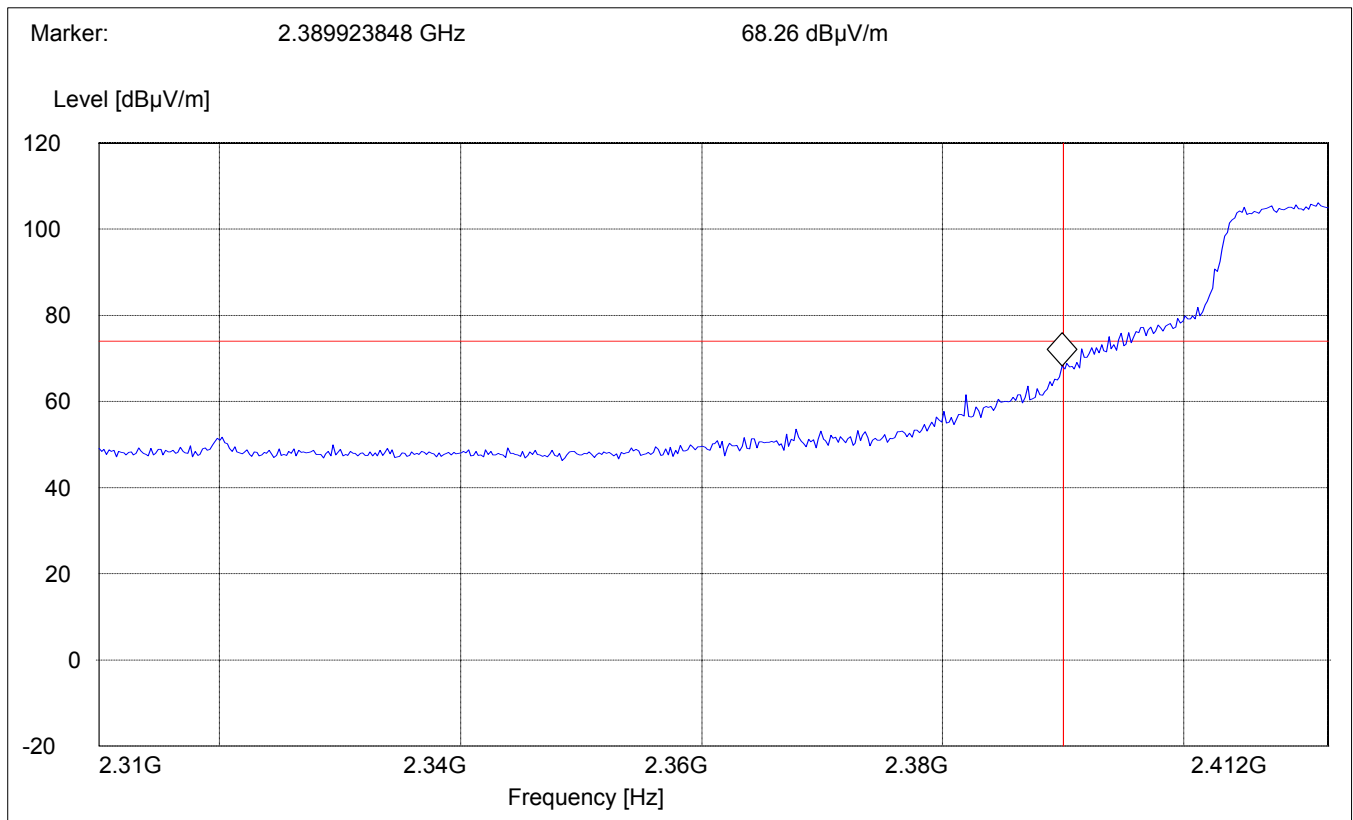
**BAND EDGE COMPLIANCE**

§15.247 (c)

**Low frequency section  
(Peak measurement)**

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)



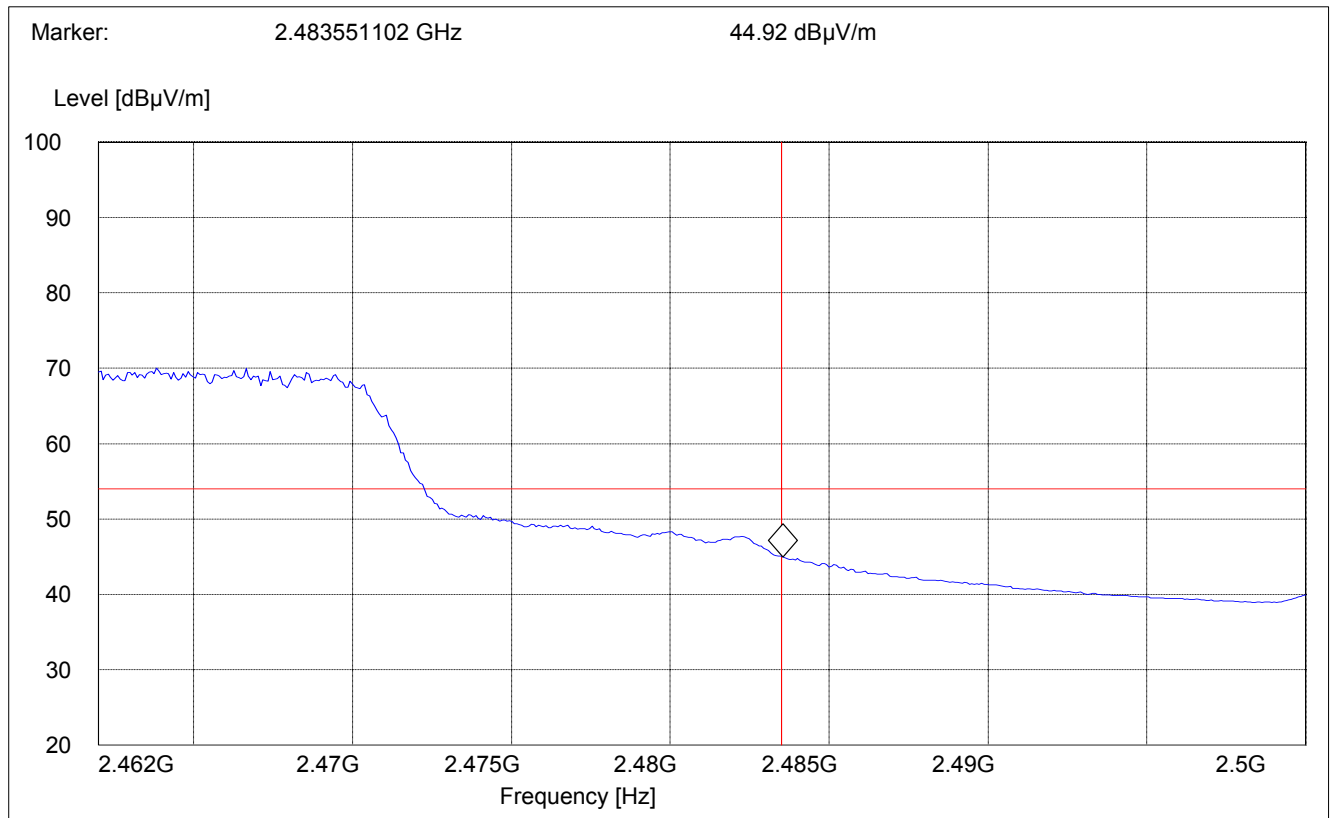
**BAND EDGE COMPLIANCE**

§15.247 (c)

**High frequency section  
(Average measurement)**

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)



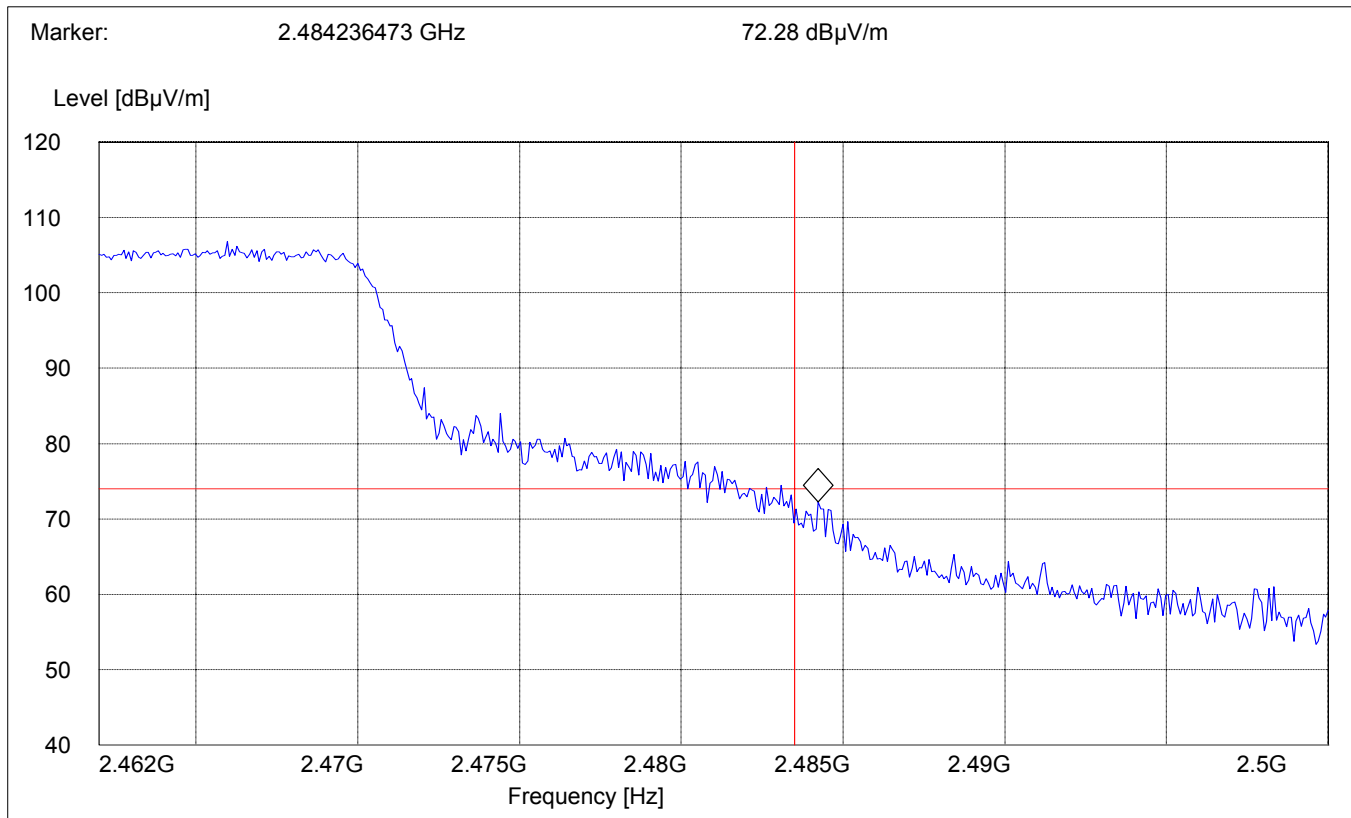
**BAND EDGE COMPLIANCE**

§15.247 (c)

**High frequency section  
(Peak measurement)**

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 that 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 plots.

**Results for the radiated measurements below 30MHz according § 15.33**

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

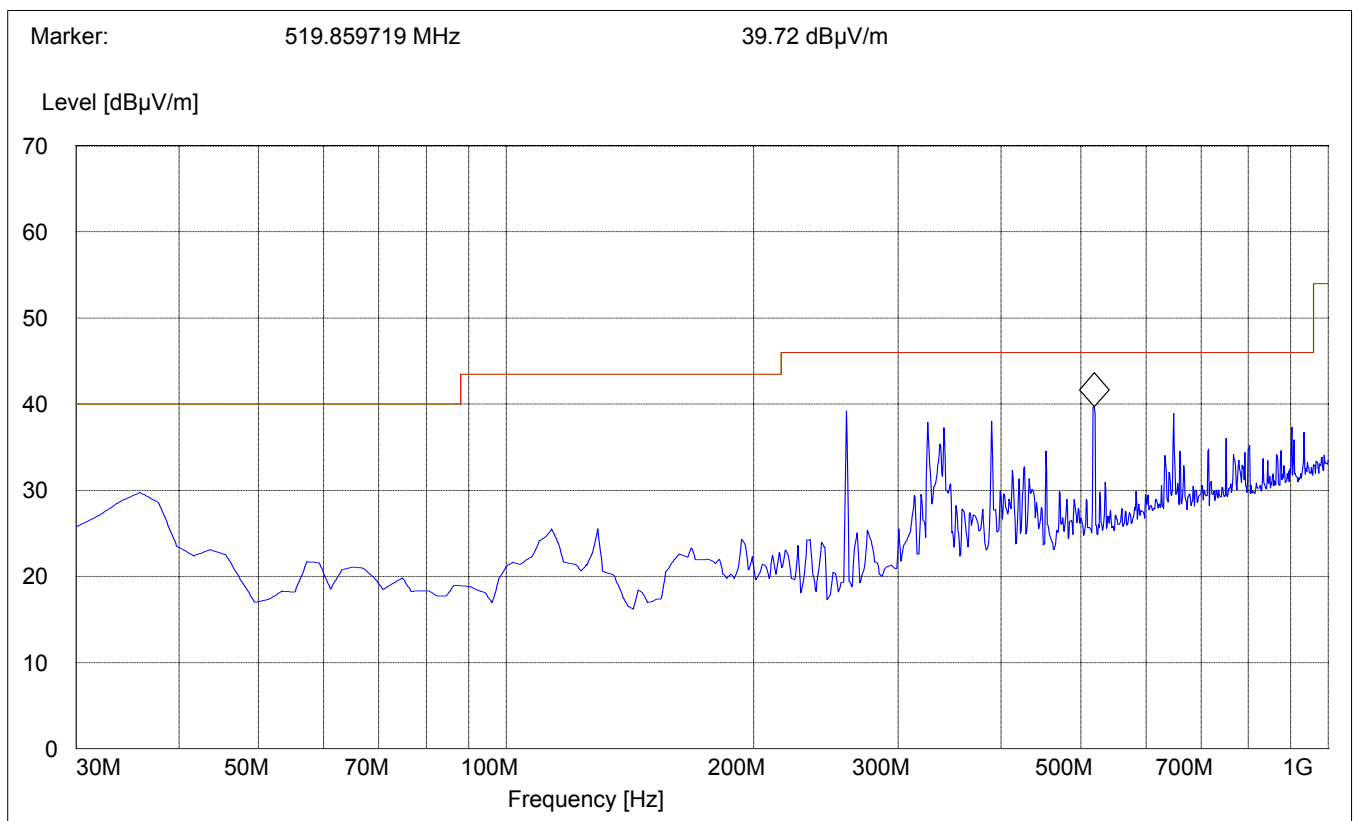
## EMISSION LIMITATIONS - Radiated (Transmitter)

§ 15.247 (c) (1)

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

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

SWEEP TABLE:		"BT Spuri hi 30-1G"			
Short Description:		Bluetooth 30MHz-1GHz			
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)**

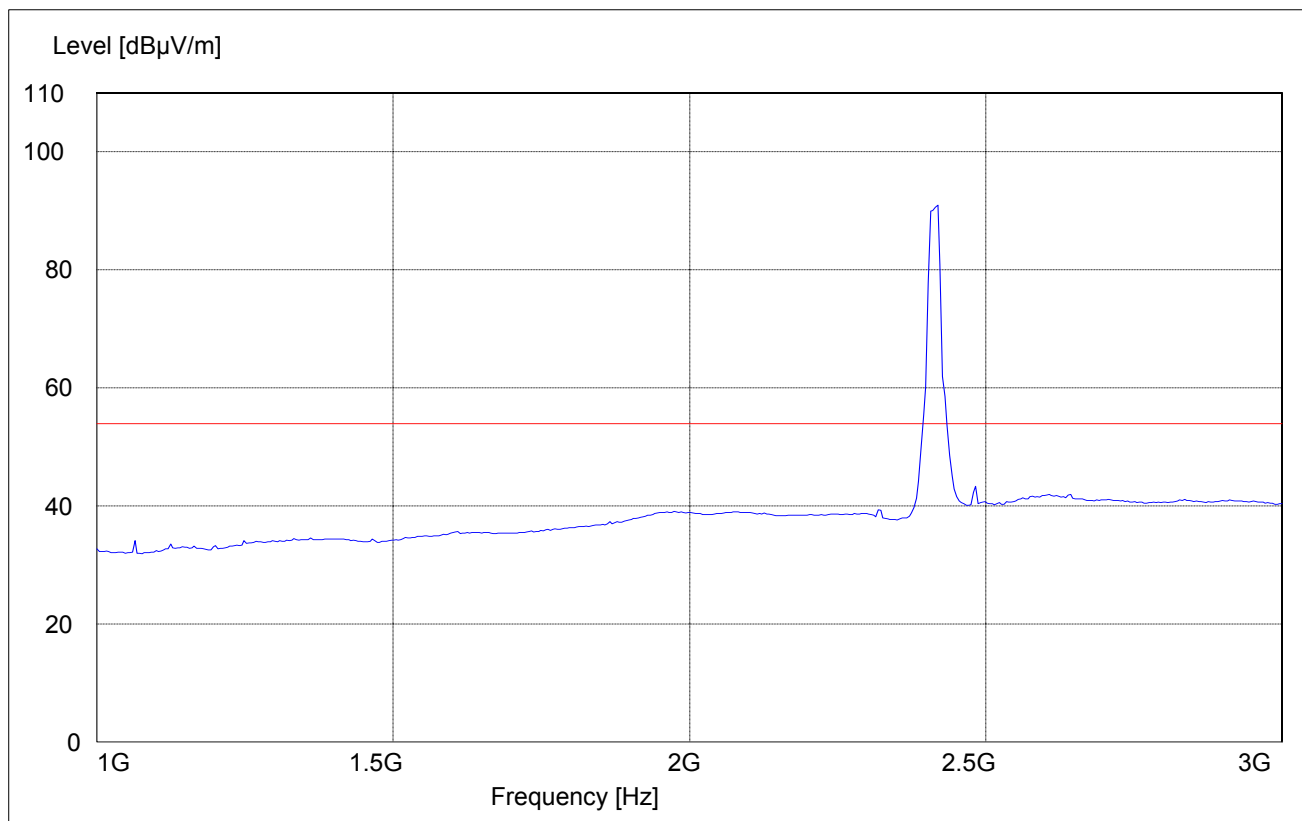
**§ 15.247 (c) (1)**

**Lowest Channel (2412GHz): 1GHz – 3GHz**

**(Average measurement)**

**NOTE: The peak above the limit is the carrier frequency.**

SWEEP TABLE:		"BT Spuri hi 1-3G"				
Short Description:		Bluetooth Spurious 1-3 GHz				
Start	Stop	Detector	Meas.	RBW		Transducer
Frequency	Frequency	Time	Bandw.		VBW	
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	10Hz	#326 horn (dBi)

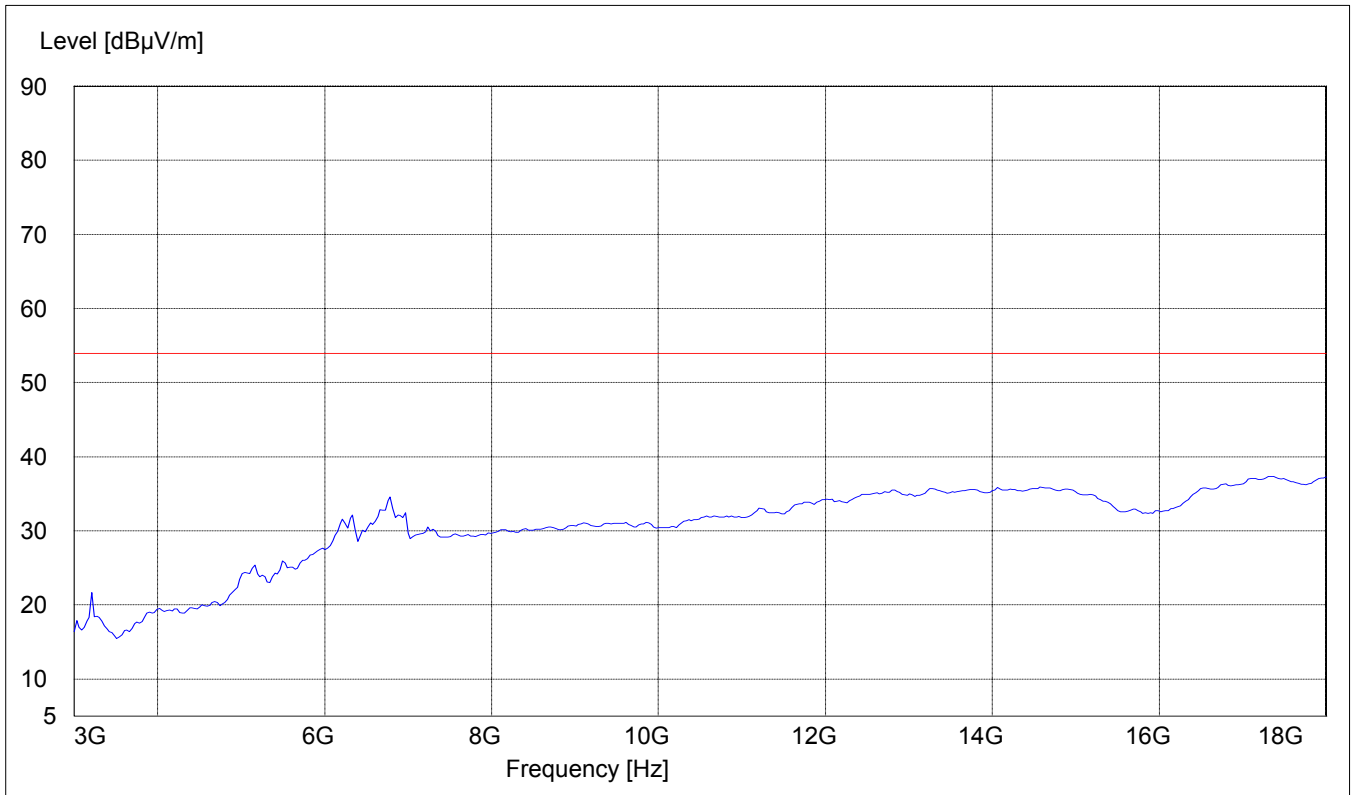


**EMISSION LIMITATIONS - Radiated (Transmitter)**

**§ 15.247 (c) (1)**

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

SWEEP TABLE:		"BT Spuri hi 3-18G"			
Short Description:		Bluetooth Spurious 3-8 GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)



**EMISSION LIMITATIONS - Radiated (Transmitter)**  
**Middle Channel (2437MHz): 1GHz – 3GHz**

§ 15.247 (c) (1)

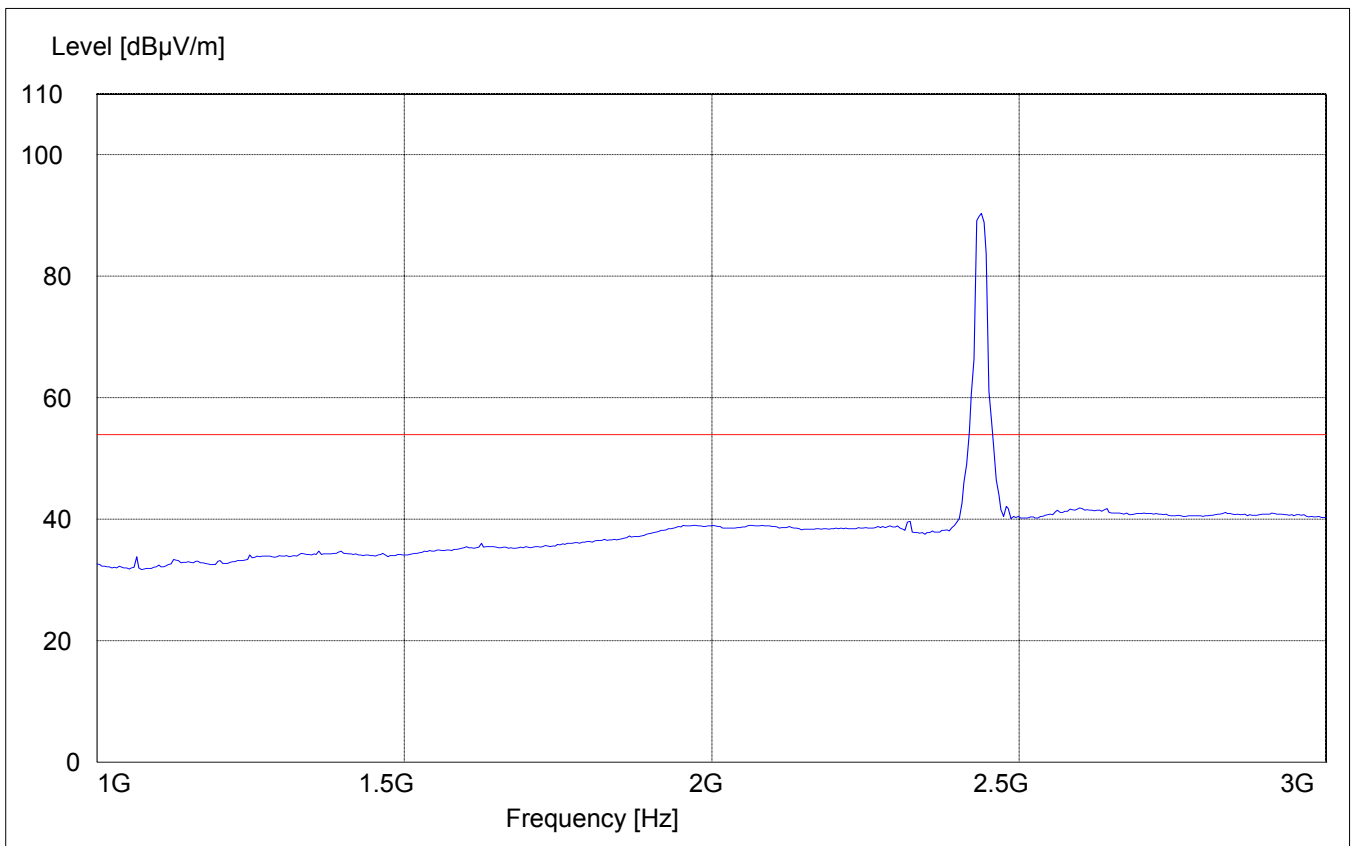
**(Average measurement)**

**NOTE: The peak above the limit is the carrier frequency.**

SWEEP TABLE: "BT Spuri hi 1-3G"

Short Description: Bluetooth Spurious 1-3 GHz

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

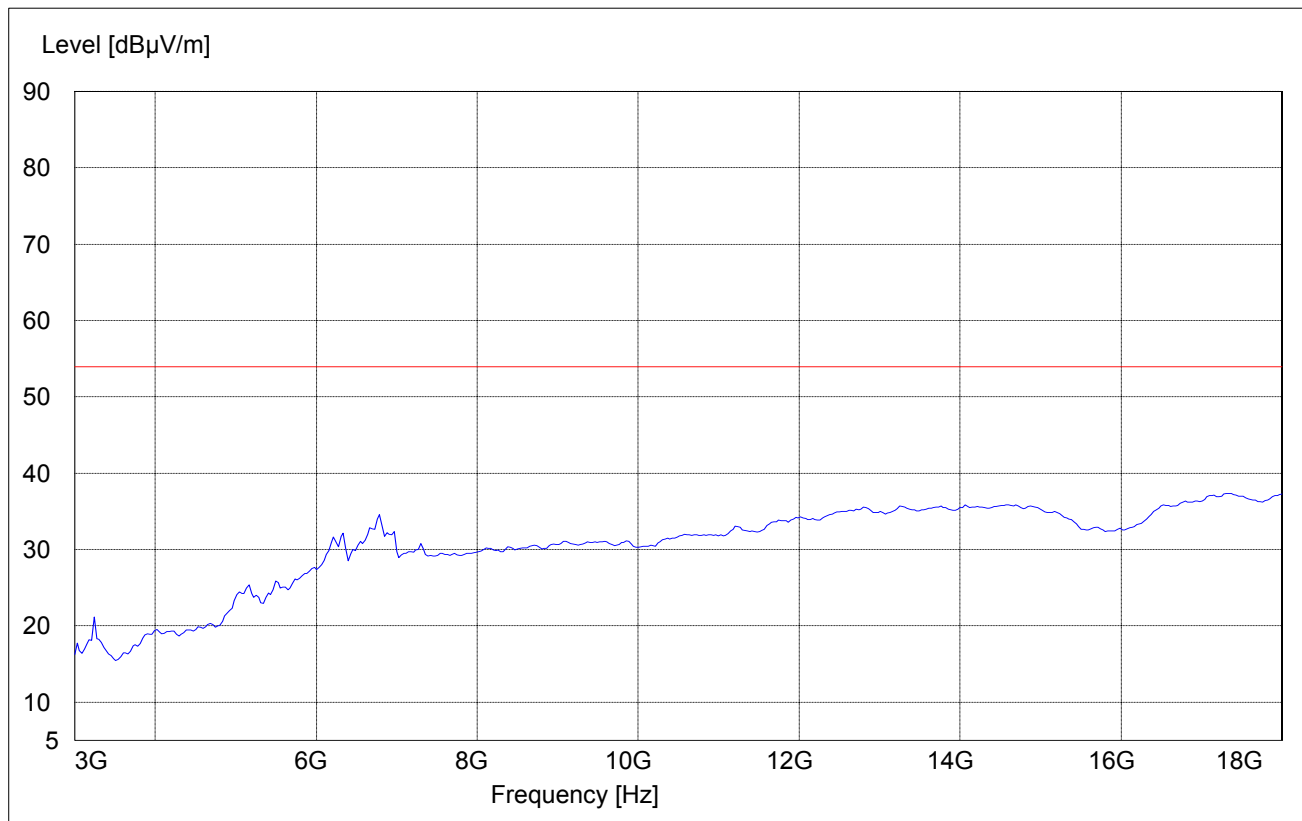




**EMISSION LIMITATIONS - Radiated (Transmitter)**  
**Middle Channel (2437MHz): 3GHz – 18GHz**

§ 15.247 (c) (1)

SWEEP TABLE:		"BT Spuri hi 3-18G"			
Short Description:		Bluetooth Spurious 3-8 GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)



**EMISSION LIMITATIONS - Radiated (Transmitter)**

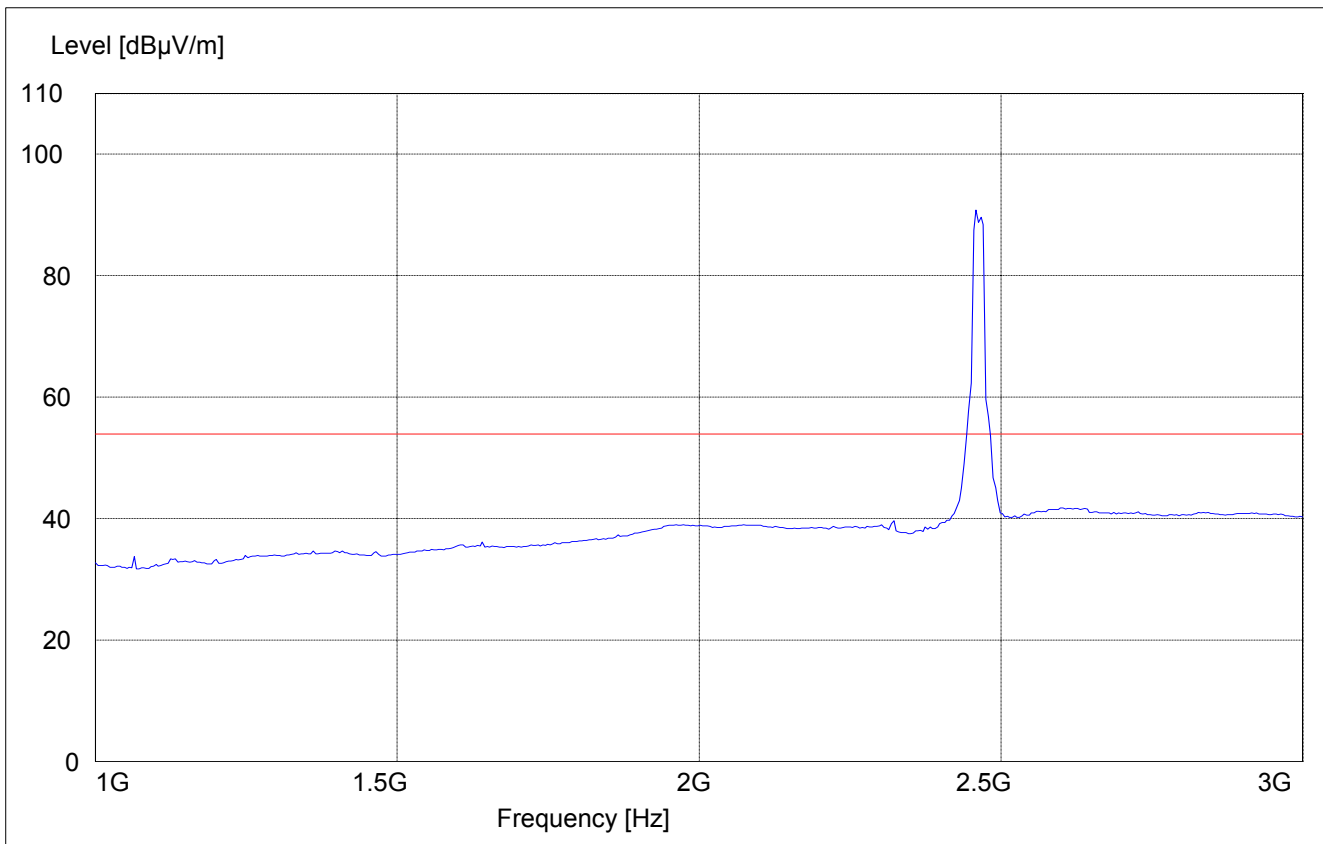
**§ 15.247 (c) (1)**

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

**(Average measurement)**

**NOTE: The peak above the limit is the carrier frequency.**

SWEEP TABLE:		"BT Spuri hi 1-3G"				
Short Description:		Bluetooth Spurious 1-3 GHz				
Start	Stop	Detector	Meas.	RBW	Transducer	
Frequency	Frequency	Time	Bandw.	VBW		
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	10Hz	#326 horn (dBi)

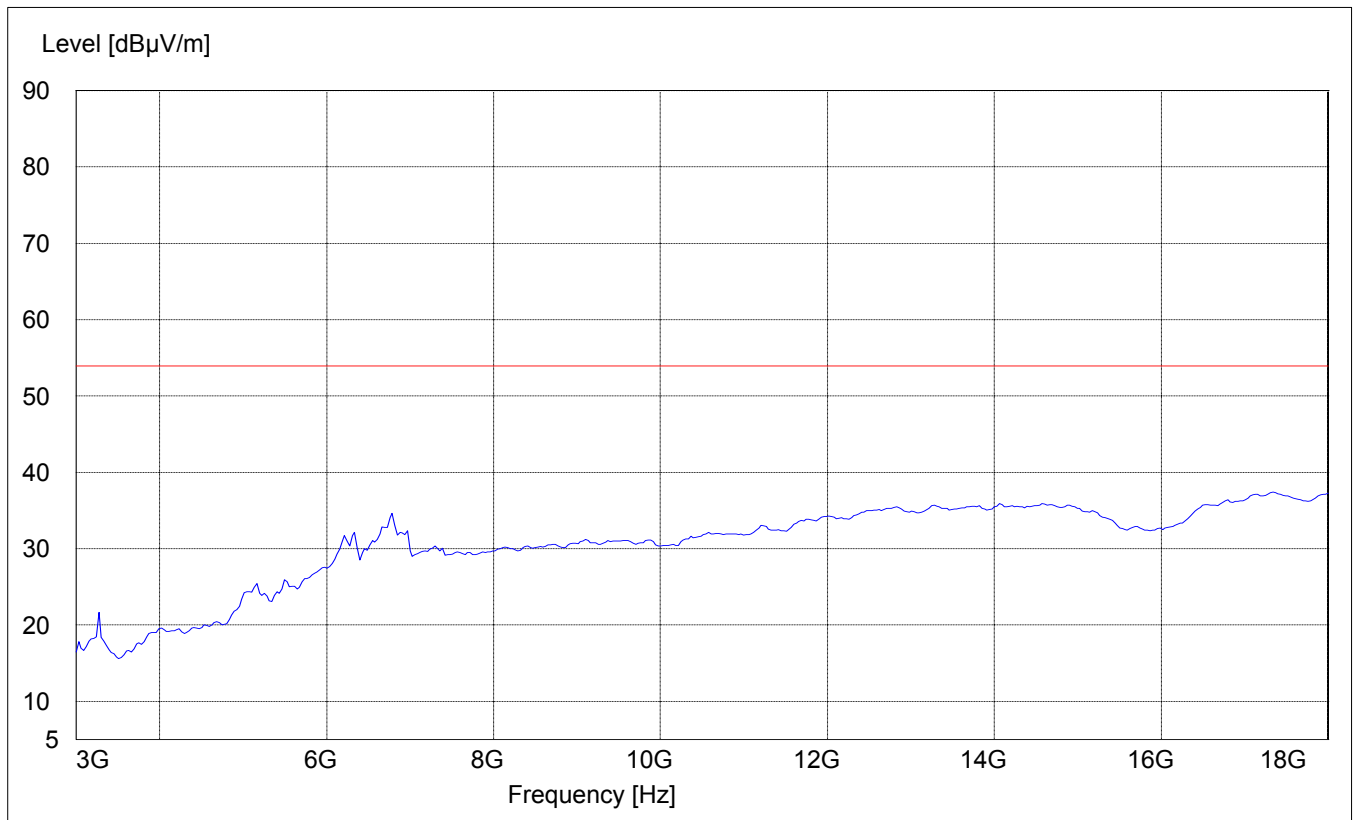


**EMISSION LIMITATIONS - Radiated (Transmitter)**

**§ 15.247 (c) (1)**

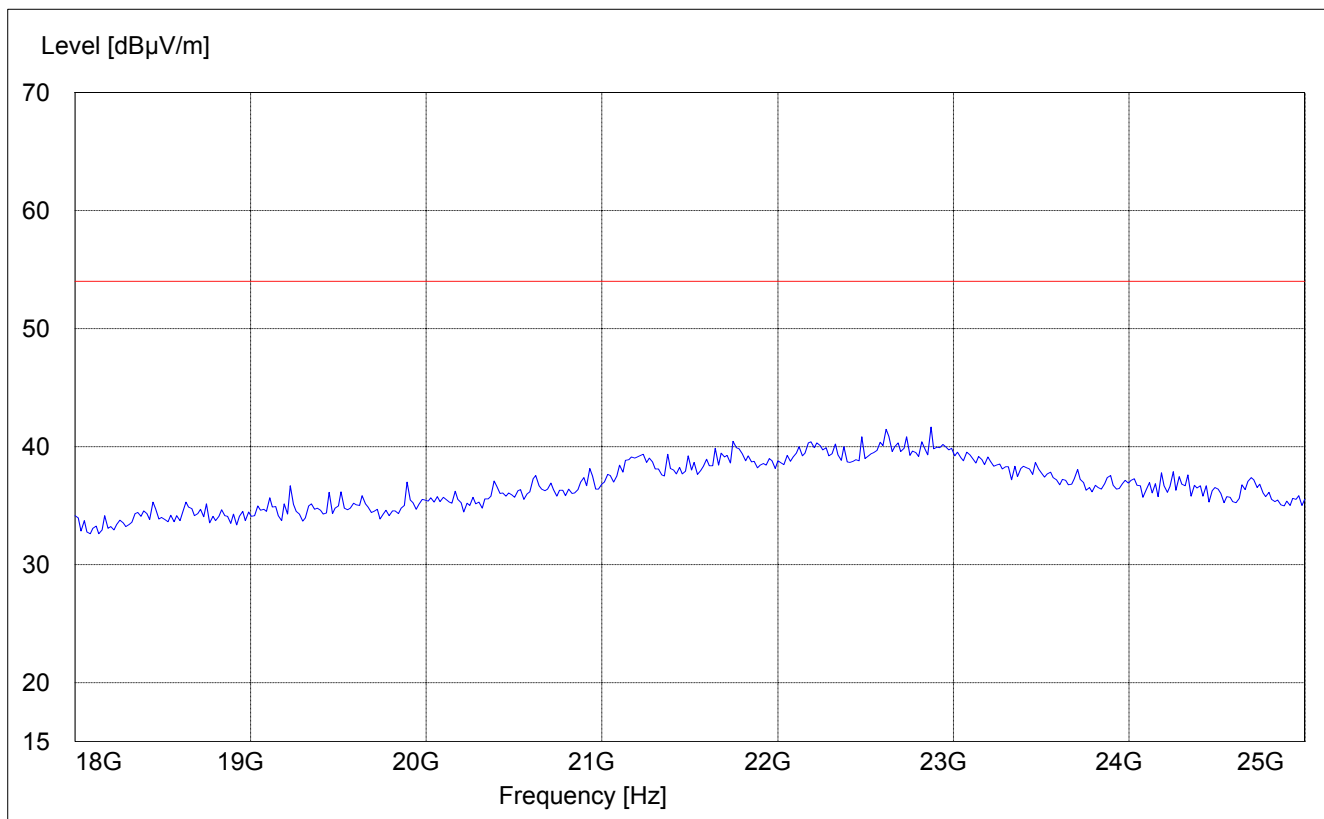
**Highest Channel (2462MHz): 3GHz – 18GHz**

SWEEP TABLE:		"BT Spuri hi 3-18G"			
Short Description:		Bluetooth Spurious 3-8 GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)



**EMISSION LIMITATIONS - Radiated (Transmitter)****§ 15.247 (c) (1)****18GHz – 25GHz****Note: This plot is valid for low, mid & high channels (worst-case plot)**

SWEEP TABLE:		"BT Spuri hi 18-25G"			
Short Description:		Bluetooth Spurious 18-25GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
18 GHz	25 GHz	MaxPeak	Coupled	1 MHz	#141 horn (dBi)



**CONDUCTED EMISSIONS**

§ 15.107/207

Measured with AC/DC power adapter

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

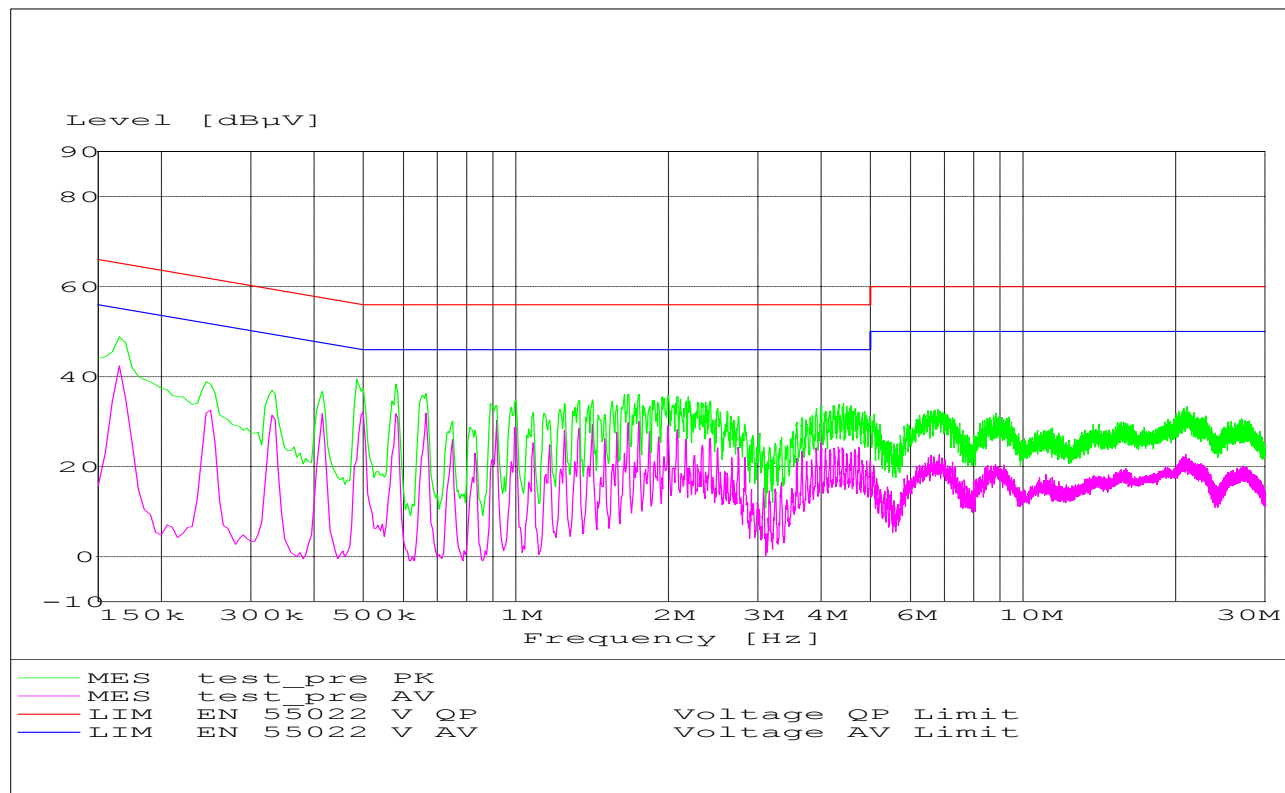
**Limit**

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**

<b>Frequency (MHz)</b>	<b>Field strength (<math>\mu\text{V/m}</math>)</b>	<b>Measurement distance (m)</b>
<b>0.009 - 0.490</b>	<b>2400/F(kHz)</b>	<b>300</b>
<b>0.490 - 1.705</b>	<b>24000/F(kHz)</b>	<b>30</b>
<b>1.705 - 30.0</b>	<b>30</b>	<b>30</b>
<b>30 - 88</b>	<b>100</b>	<b>3</b>
<b>88 - 216</b>	<b>150</b>	<b>3</b>
<b>216 - 960</b>	<b>200</b>	<b>3</b>
<b>above 960</b>	<b>500</b>	<b>3</b>

**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 plots.

**RECEIVER SPURIOUS RADIATION**

§ 15.209

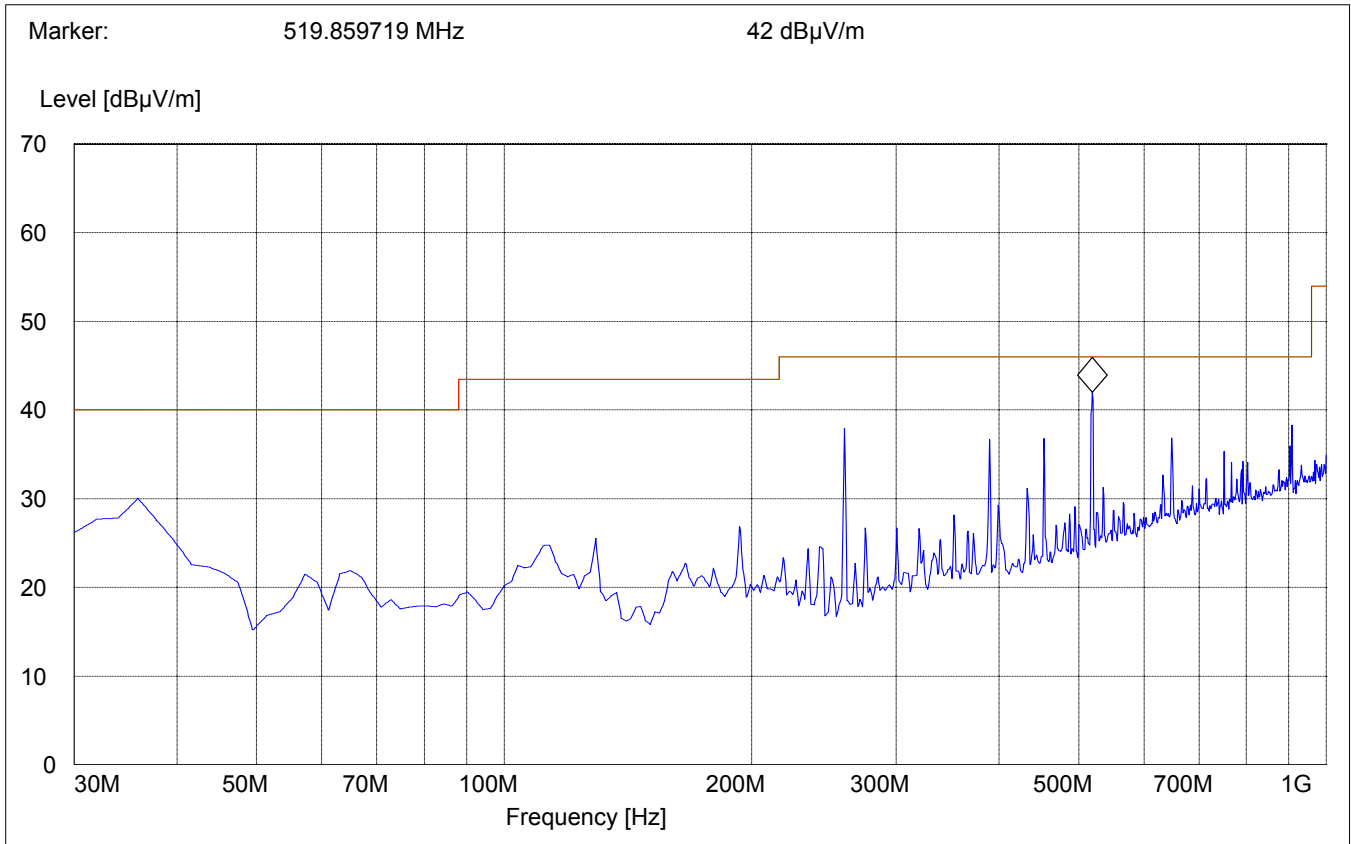
**30MHz – 1GHz**

SWEEP TABLE:

"BT Spuri hi 30-1G"

Short Description: Bluetooth 30MHz-1GHz

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**

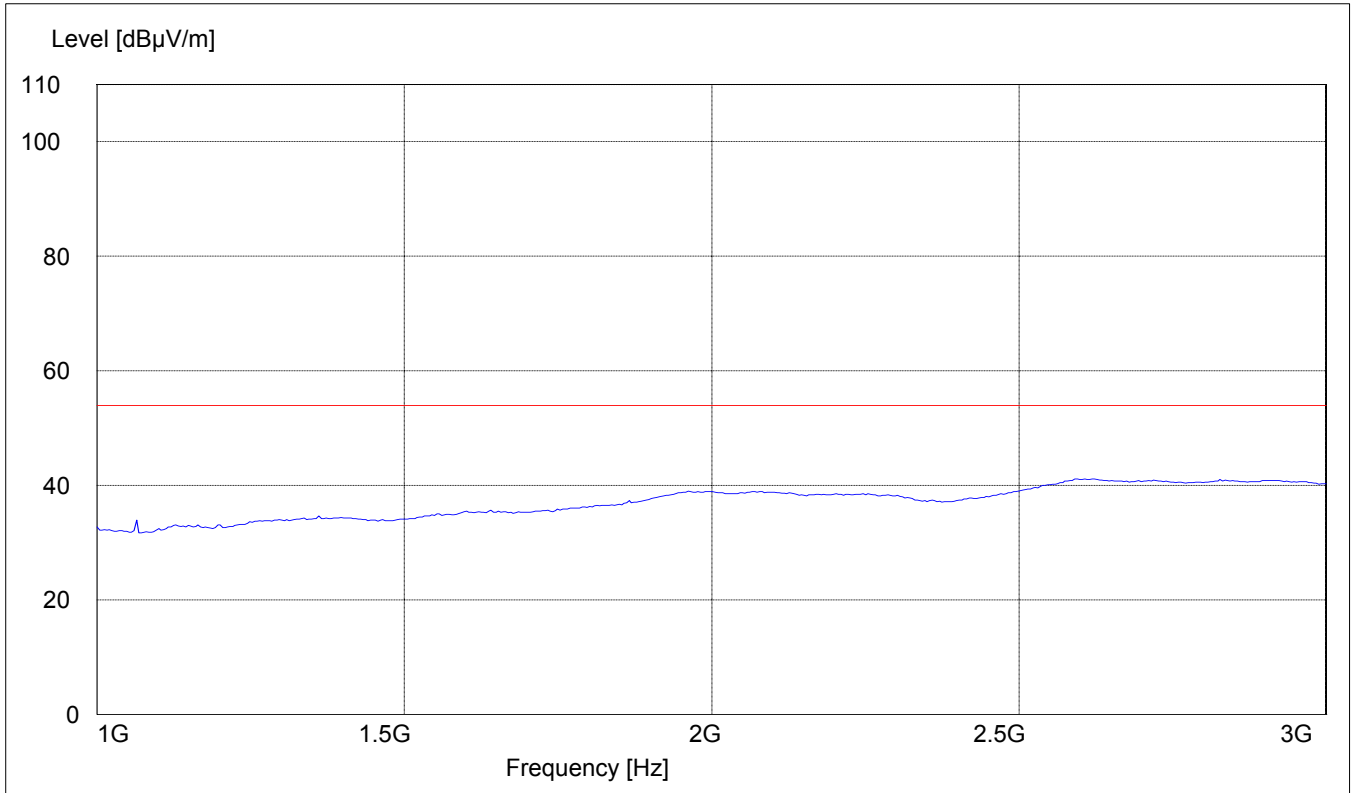
SWEEP TABLE:

"BT Spuri hi 1-3G"

Short Description:

Bluetooth Spurious 1-3 GHz

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





**RECEIVER SPURIOUS RADIATION**

§ 15.209

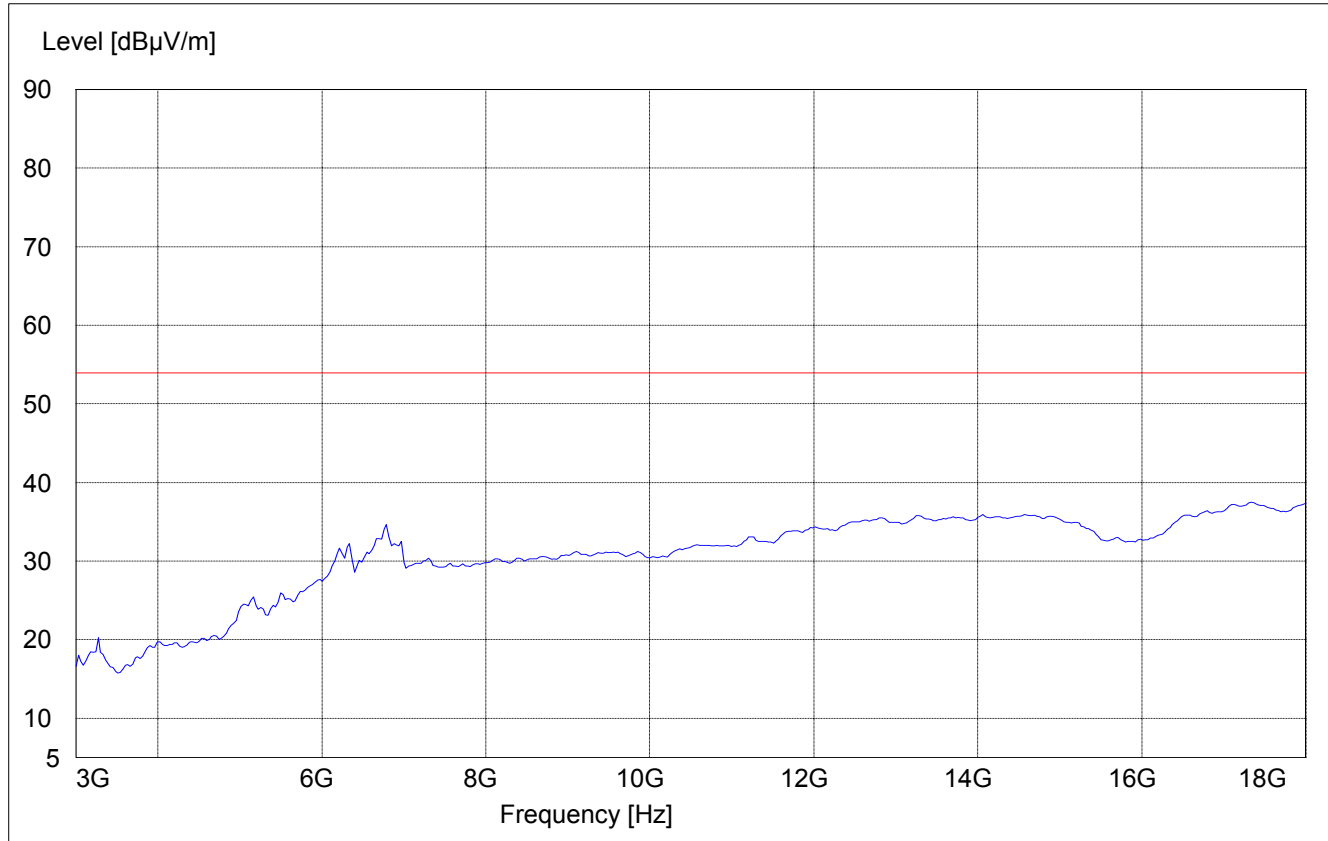
**3GHz – 18GHz**

SWEEP TABLE:

"BT Spuri hi 3-18G"

Short Description: Bluetooth Spurious 3-18 GHz

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



**RECEIVER SPURIOUS RADIATION**

§ 15.209

**18GHz – 25GHz**

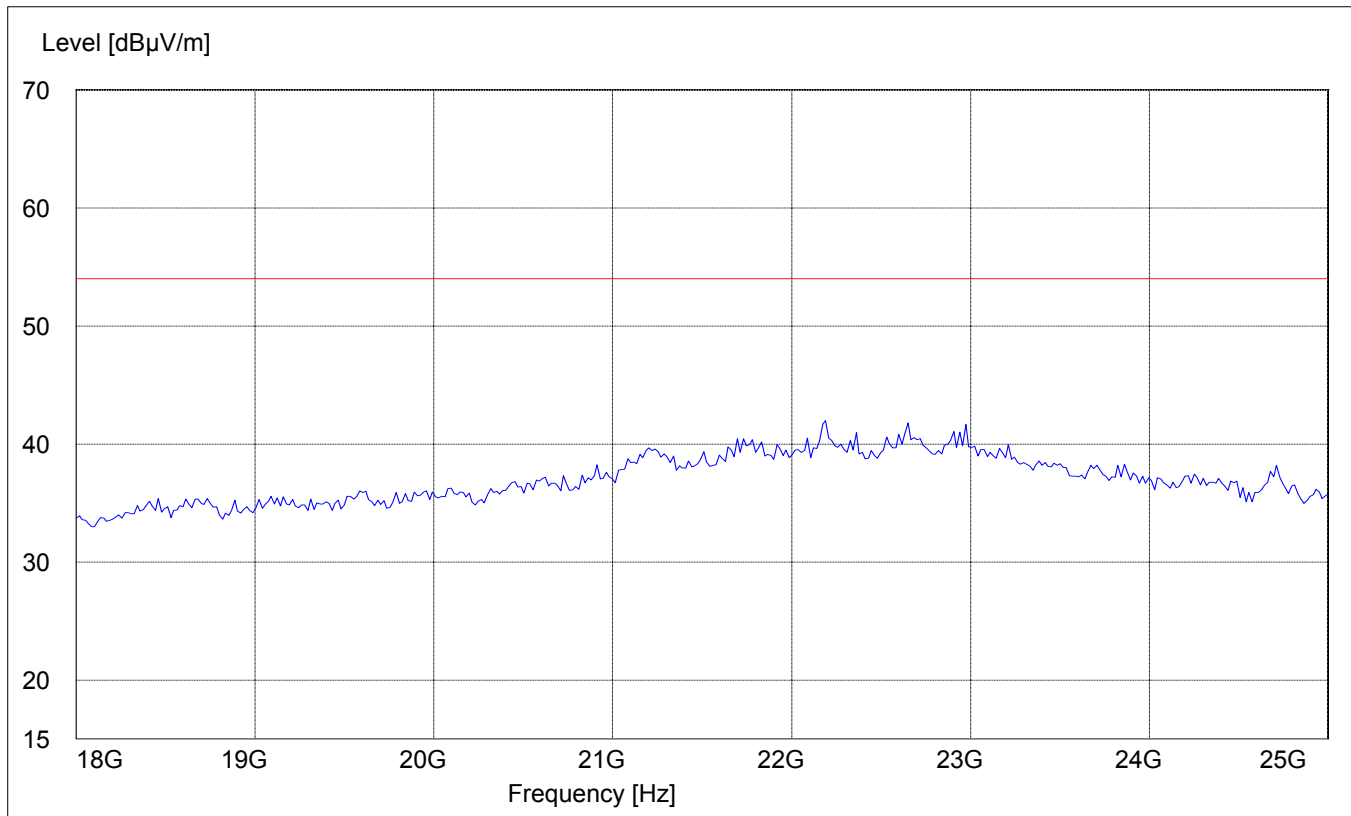
SWEEP TABLE:

"BT Spuri hi 18-25G"

Short Description:

Bluetooth Spurious 18-25GHz

Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
18.0 GHz	25 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)



**MAXIMUM PEAK OUTPUT POWER  
(Conducted)**

§ 15.407(a)

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
Frequency (MHz)		5180	5260	5320
T <sub>nom</sub> (23)°C	V <sub>nom</sub> (3.3)VDC	15.0	21.5	21.8
FCC 15.407(a) Limit (dBm)		17.0	24.0	24.0
Measurement uncertainty		±0.5dBm		

**Note:** The minimum VBW required for power measurements using a spectrum analyzer is 1/T, where T is the pulse transmission rate.

Pulse transmission rate: 4.0µs  
Minimum VBW: 250kHz  
VBW used: 300kHz

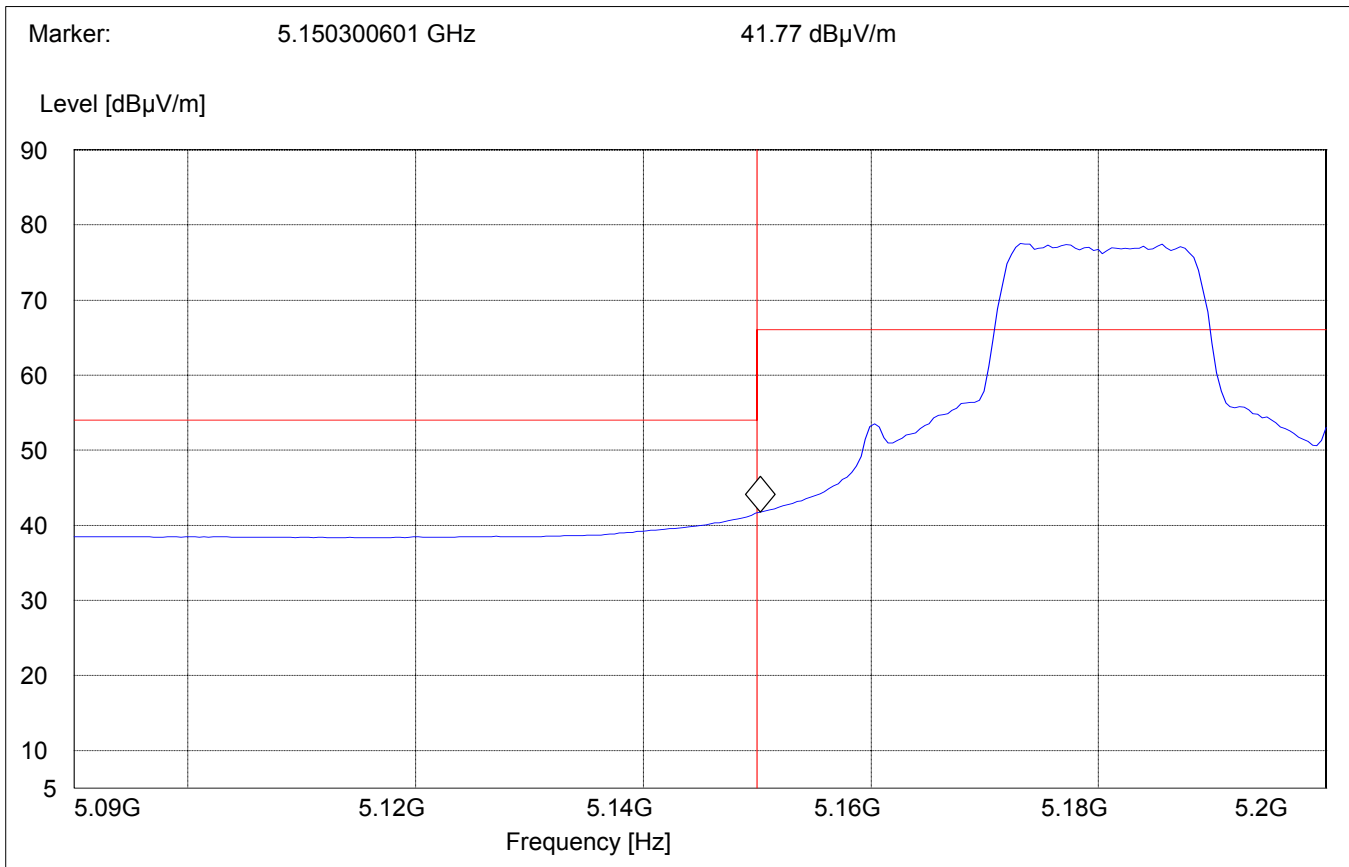
**BAND EDGE COMPLIANCE**

**§15.407**

**Low frequency section (Average measurement)**

Operating condition : Tx at 5180MHz  
 SWEEP TABLE : "FCC15.407LBE\_AVG"  
 Limit Line : 54dBμV

Start Frequency	Stop Frequency	Detector Time	Meas. Bandw.	RBW	VBW	Transducer
5.09 GHz	5.2GHz	MaxPeak	Coupled	1 MHz	10Hz	#326 horn (dBi)



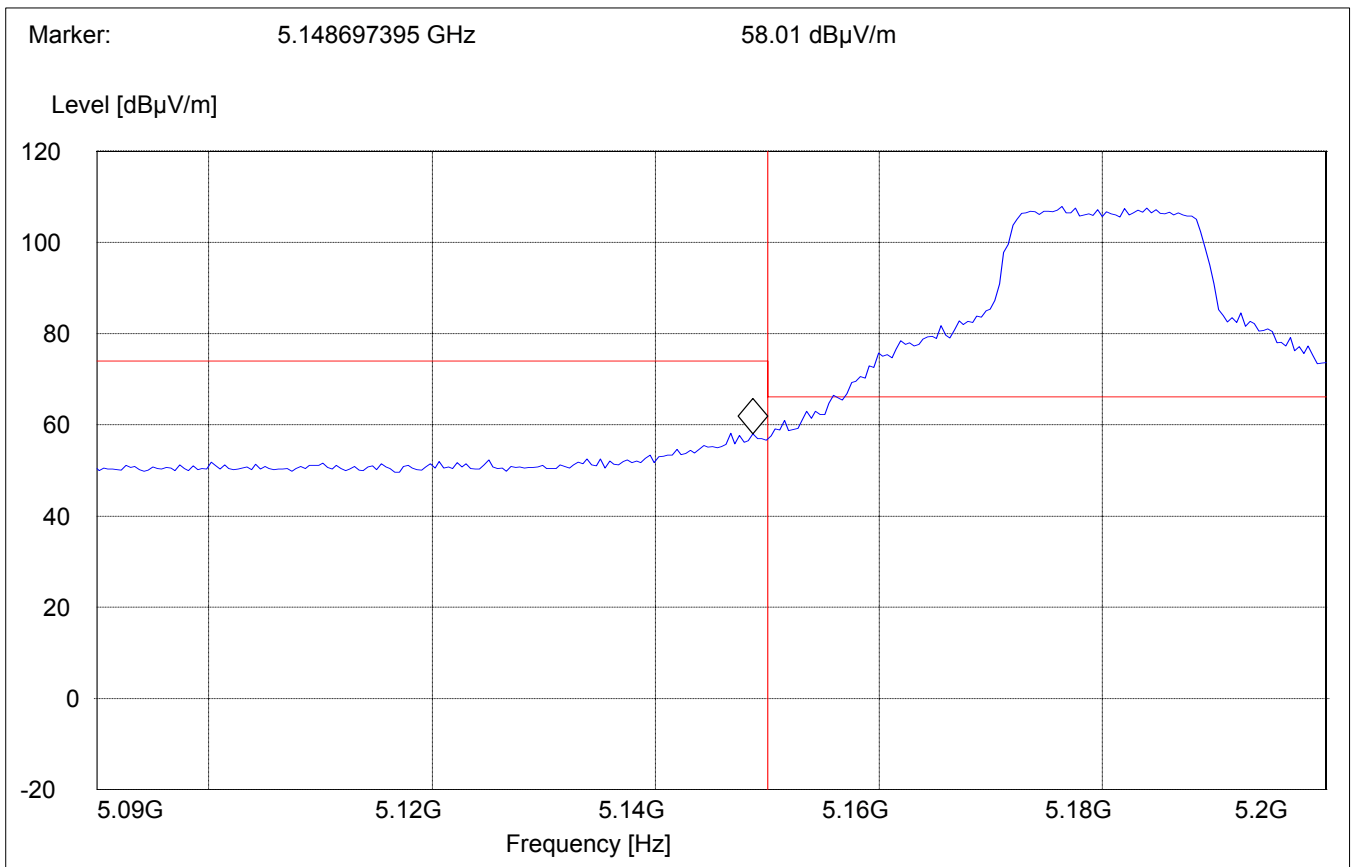
**BAND EDGE COMPLIANCE**

**§15.407**

**Low frequency section (Peak measurement)**

Operating condition : Tx at 5180MHz  
 SWEEP TABLE : "FCC15.407LBE\_AVG"  
 Limit Line : 74dBμV

Start Frequency	Stop Frequency	Detector	Meas. Bandw.	RBW	VBW	Transducer
5.09 GHz	5.2GHz	MaxPeak	Coupled	1 MHz	1MHz	#326 horn (dBi)



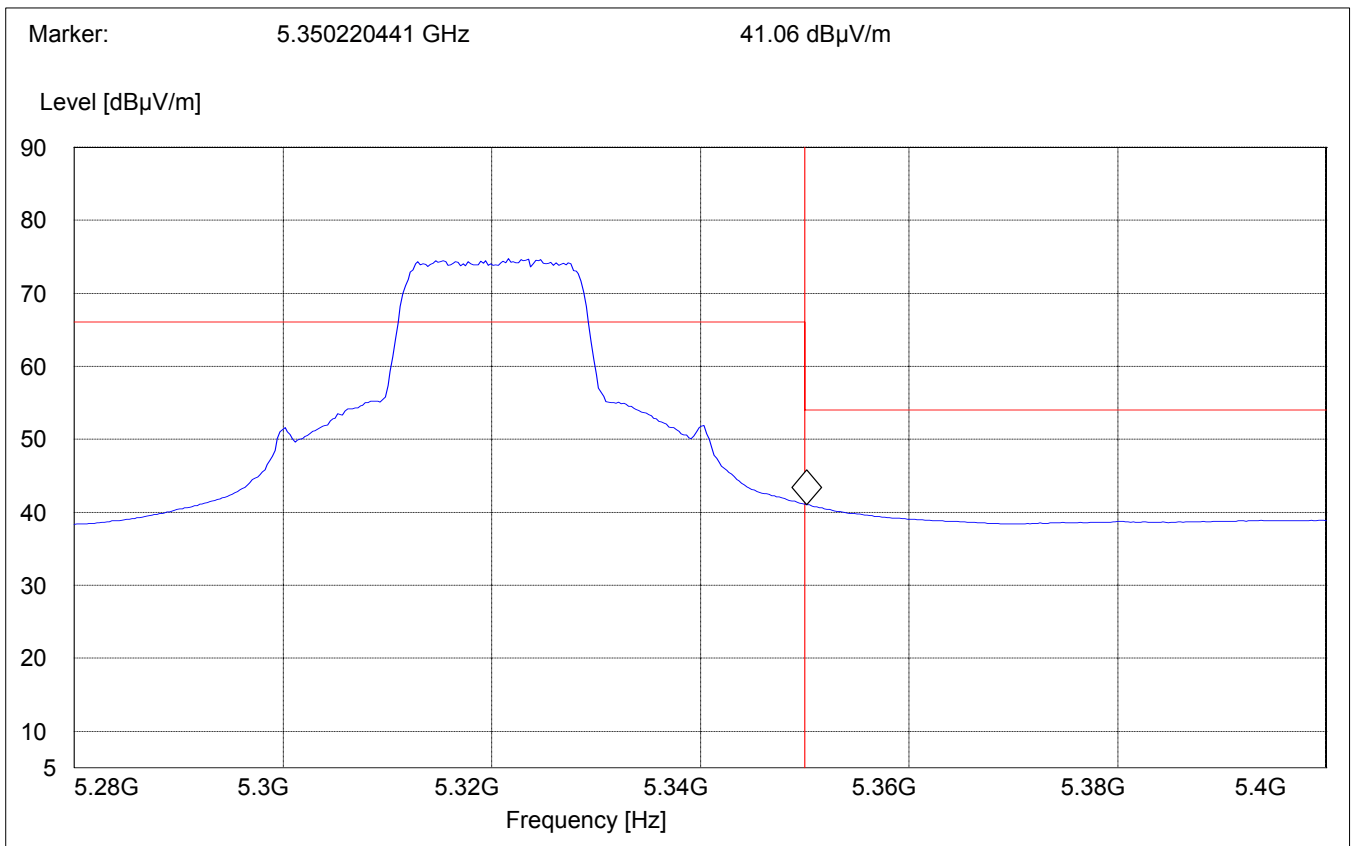
**BAND EDGE COMPLIANCE**

**§15.407**

**High frequency section (Average measurement)**

Operating condition : Tx at 5320MHz  
 SWEEP TABLE : "FCC15.407LBE\_AVG"  
 Limit Line : 54dB $\mu$ V

Start Frequency	Stop Frequency	Detector Time	Meas. Bandw.	RBW	VBW	Transducer
5.28 GHz	5.4GHz	MaxPeak	Coupled	1 MHz	10Hz	#326 horn (dBi)



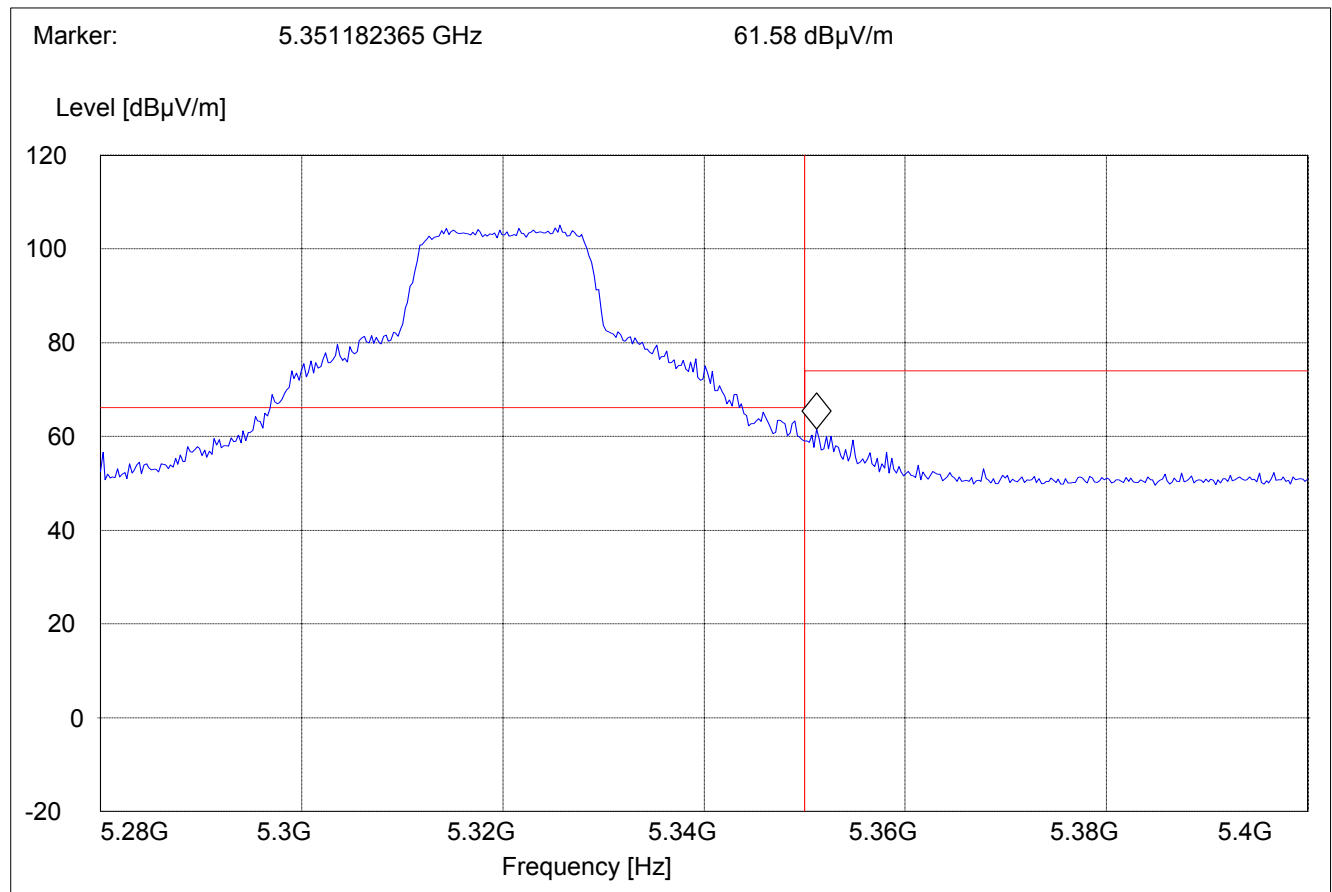
**BAND EDGE COMPLIANCE**

**§15.407**

**High frequency section (Peak measurement)**

Operating condition : Tx at 5320MHz  
 SWEEP TABLE : "FCC15.407LBE\_AVG"  
 Limit Line : 74dBμV

Start Frequency	Stop Frequency	Detector	Meas. Bandw.	RBW	VBW	Transducer
5.28 GHz	5.4GHz	MaxPeak	Coupled	1 MHz	1MHz	#326 horn (dBi)



**EMISSION LIMITATIONS  
Transmitter (Radiated)**

§ 15.407 (b)

**Limits**

§ 15.209 / § 15.407 (b)

Frequency (MHz)	Field strength ( $\mu\text{V/m}$ )	Field strength ( $\text{dB}\mu\text{V/m}$ )
0.009 - 0.490	2400/F (kHz)	
0.490 - 1.705	24000/F (kHz)	
1.705 - 30.0	30	29.54
30 - 88	100	40.00
88 - 216	150	43.52
216 - 960	200	46.02
above 960*	500	53.97
1000-40000**	2013.8	66.08

\*) Limit in restricted bands

\*\*) Limit outside restricted bands

**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 40 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 plots.



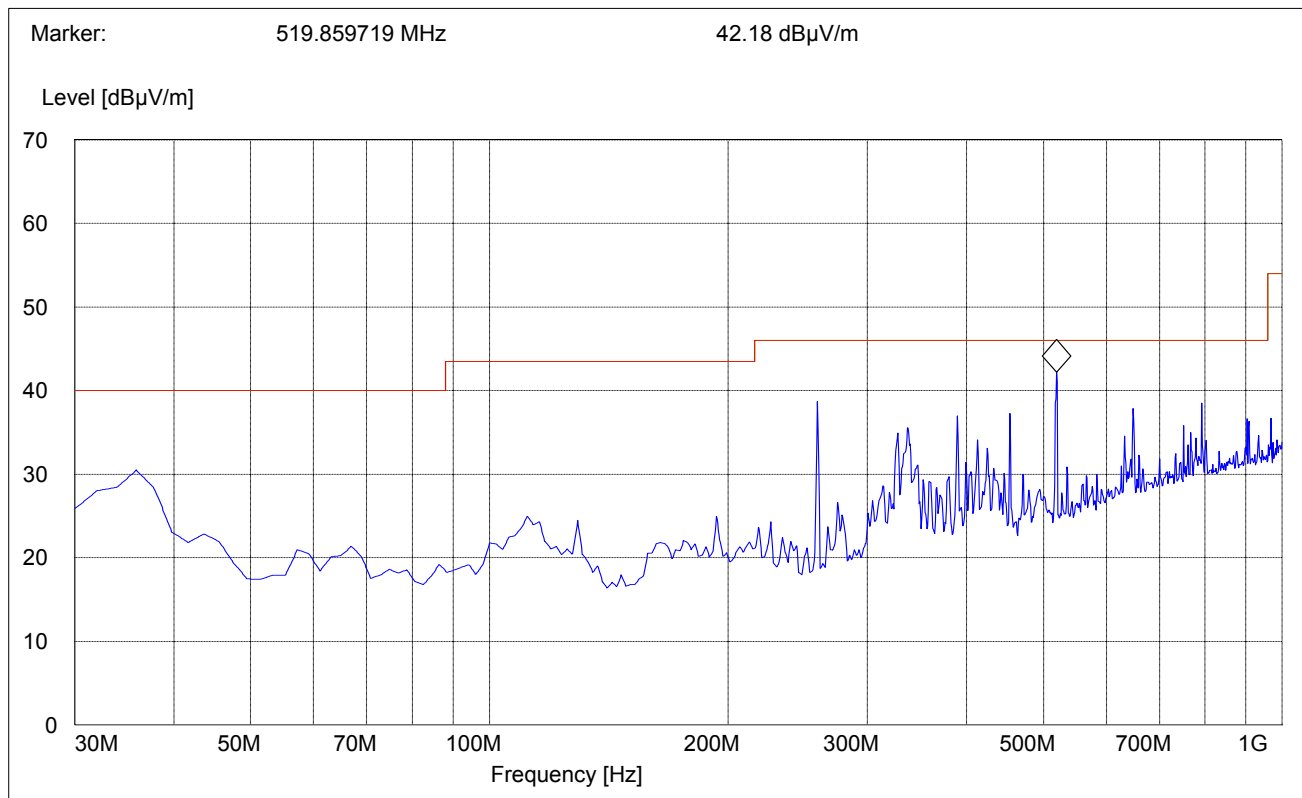
**EMISSION LIMITATIONS - Radiated (Transmitter)**

**§ 15.407 (b)**

**Lowest Channel (5180MHz): 30MHz – 1GHz**

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

SWEEP TABLE:		" FCC 15.407 30-1G"			
Short Description:		FCC 15.407 30MHz-1GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency		Time	VBW	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186

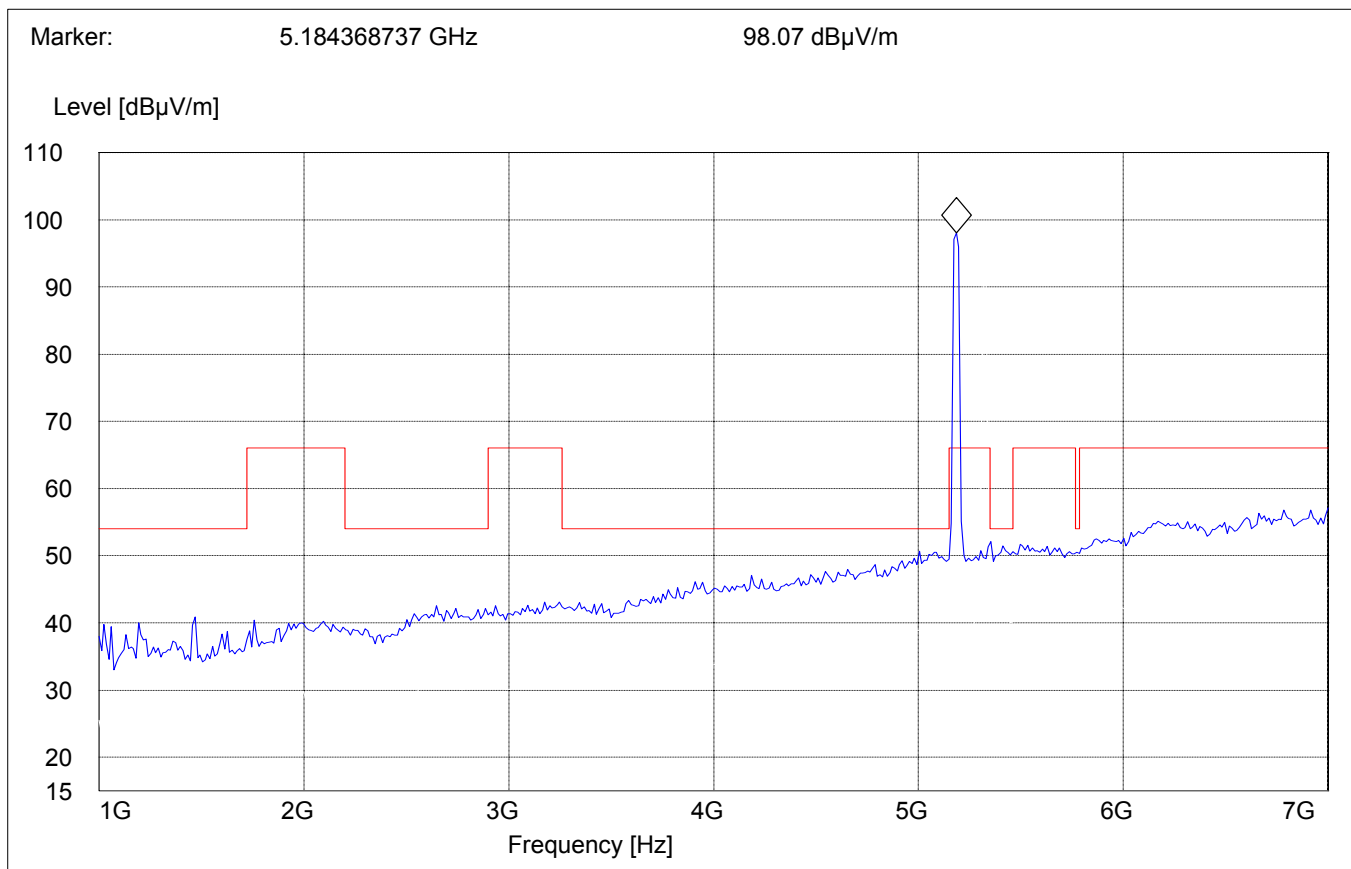


**EMISSION LIMITATIONS - Radiated (Transmitter)**  
**Lowest Channel (5180MHz): 1GHz – 7GHz**

**§ 15.407 (b)**

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

SWEEP TABLE:		"FCC 15.407 1-7G"			
Short Description:		Bluetooth Spurious 1-7 GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
1.0 GHz	7.0 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)

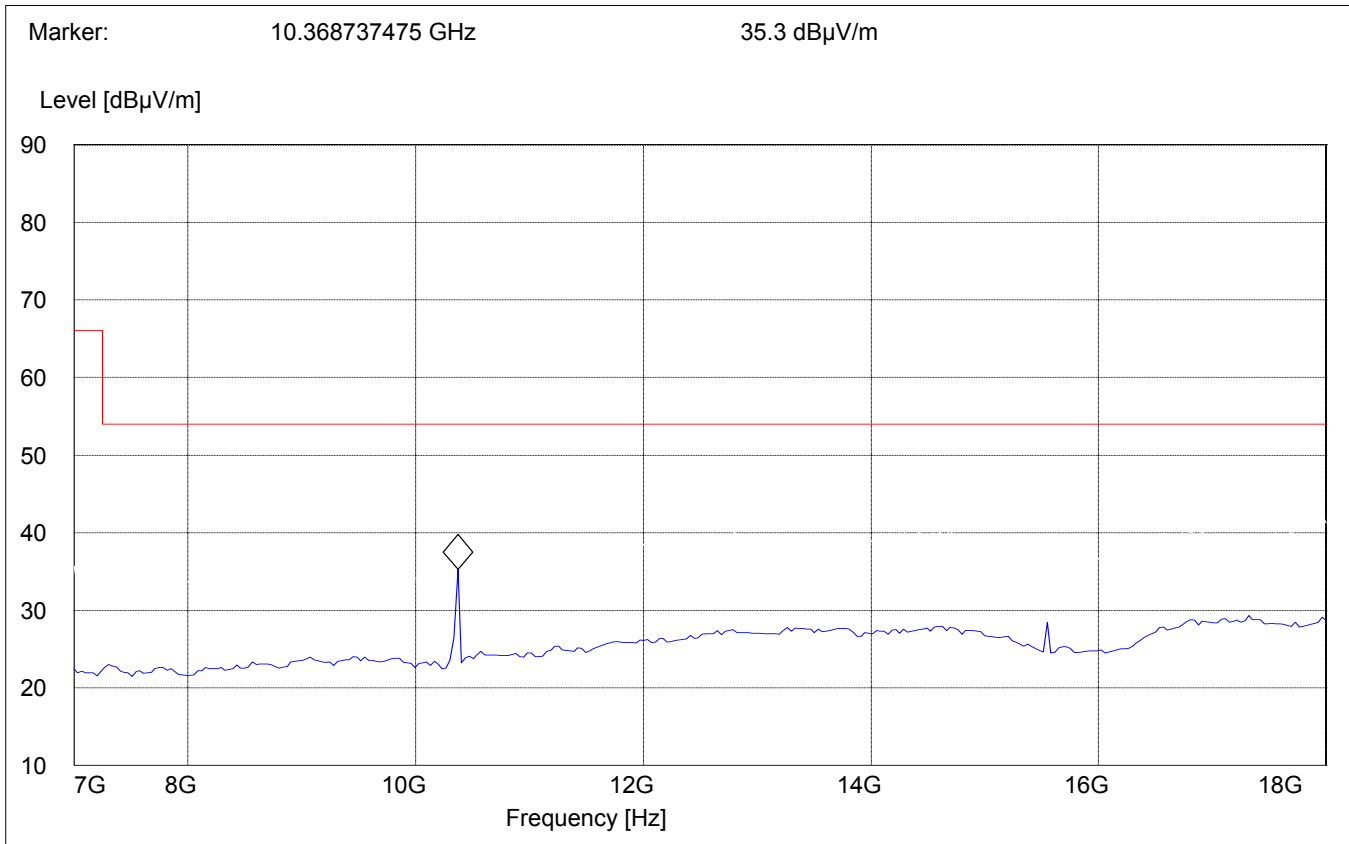


**EMISSION LIMITATIONS - Radiated (Transmitter)**

**§ 15.407 (b)**

**Lowest Channel (5180MHz): 7GHz – 18GHz**

SWEEP TABLE:		"FCC 15.407 7-18G"			
Short Description:		Bluetooth Spurious 7-18 GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
7.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#325 horn (dBi)

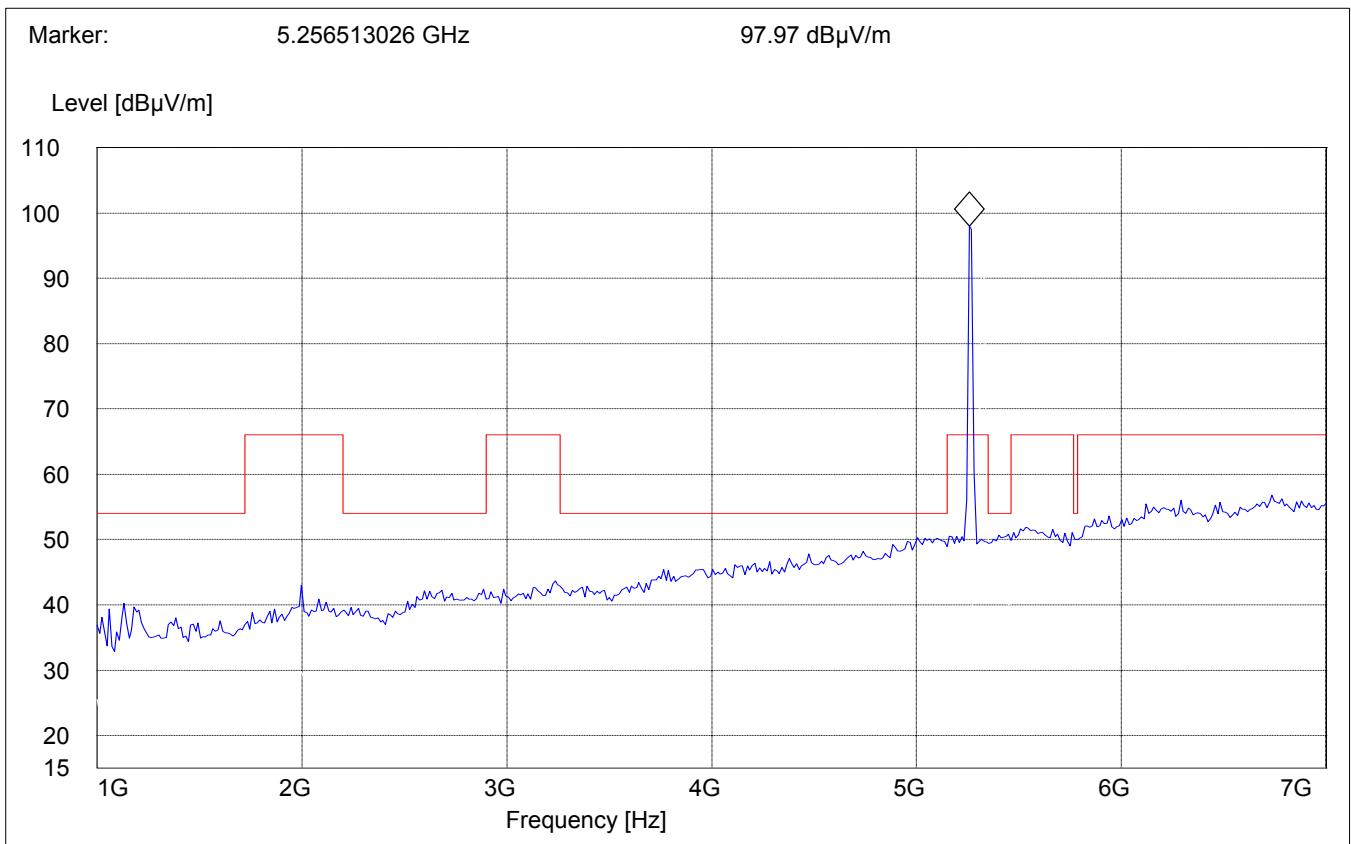


**EMISSION LIMITATIONS - Radiated (Transmitter)**  
**Middle Channel (5260MHz): 1GHz – 7GHz**

**§ 15.407 (b)**

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

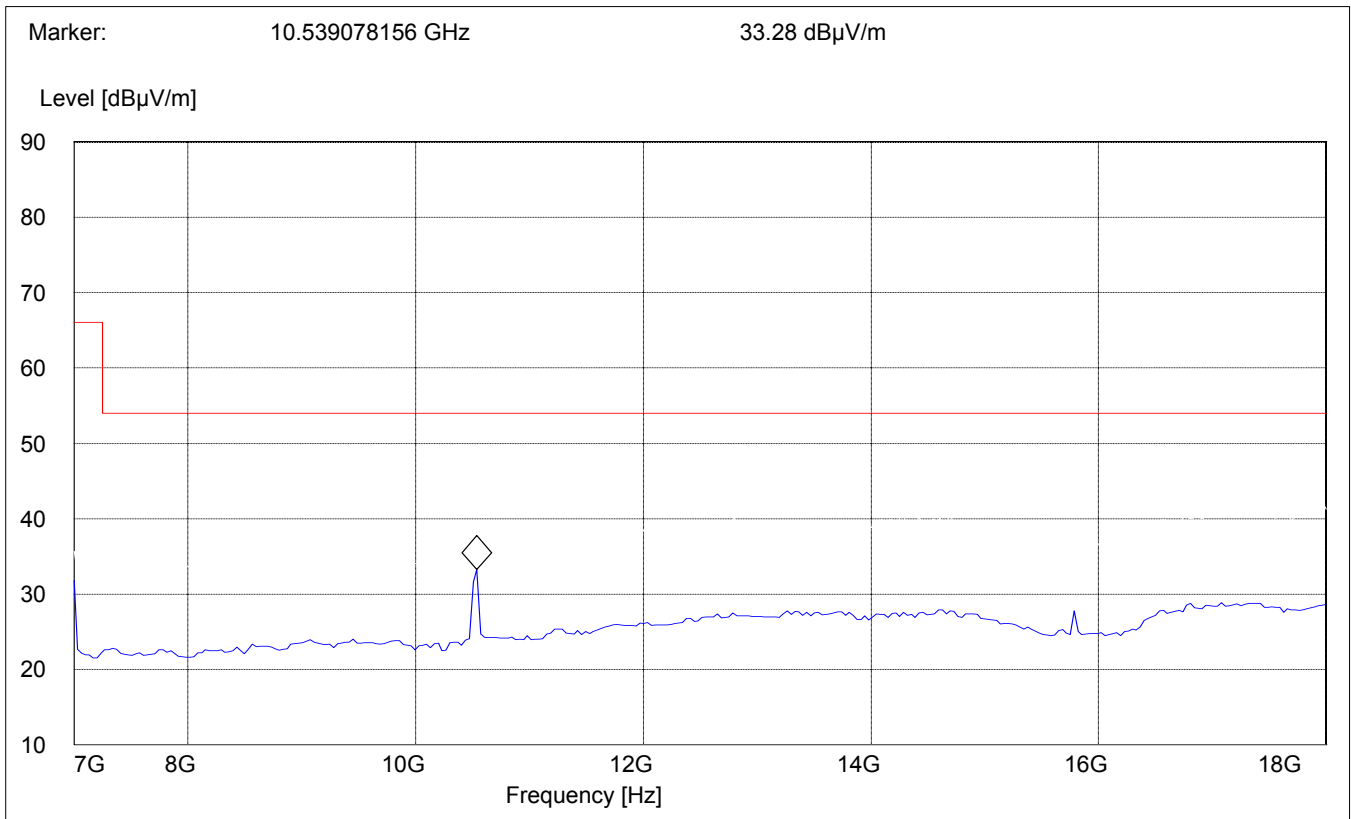
SWEEP TABLE:		"FCC 15.407 1-7G"			
Short Description:		Bluetooth Spurious 1-7 GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
1.0 GHz	7.0 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)



**EMISSION LIMITATIONS - Radiated (Transmitter)**  
**Middle Channel (5260MHz): 7GHz – 18GHz**

**§ 15.407 (b)**

SWEEP TABLE:		"FCC 15.407 7-18G"			
Short Description:		Bluetooth Spurious 7-18 GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
7.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#325 horn (dBi)



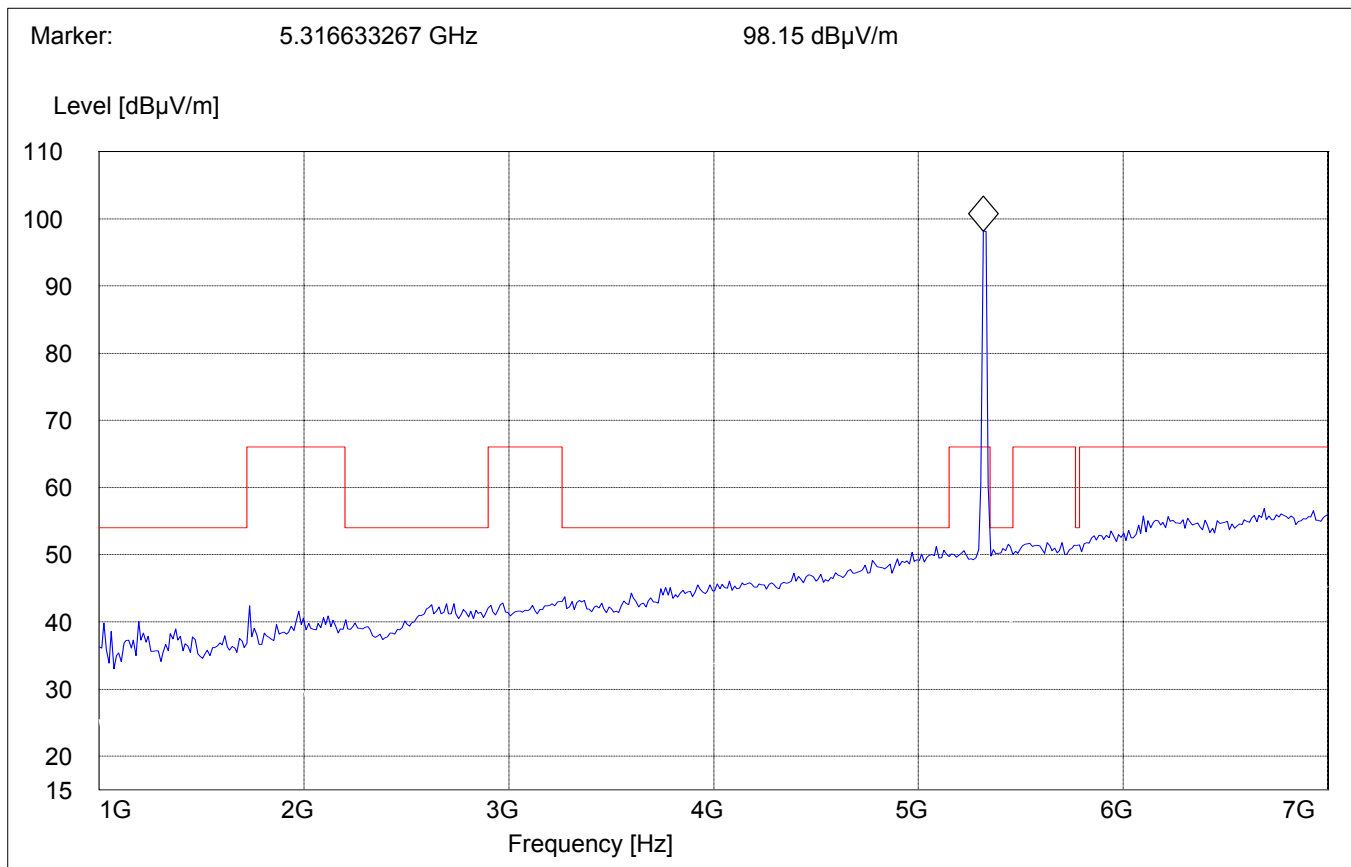
**EMISSION LIMITATIONS - Radiated (Transmitter)**

**§ 15.407 (b)**

**Highest Channel (5320MHz): 1GHz – 7GHz**

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

SWEEP TABLE:		"FCC 15.407 1-7G"			
Short Description:		Bluetooth Spurious 1-7 GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
1.0 GHz	7.0 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)

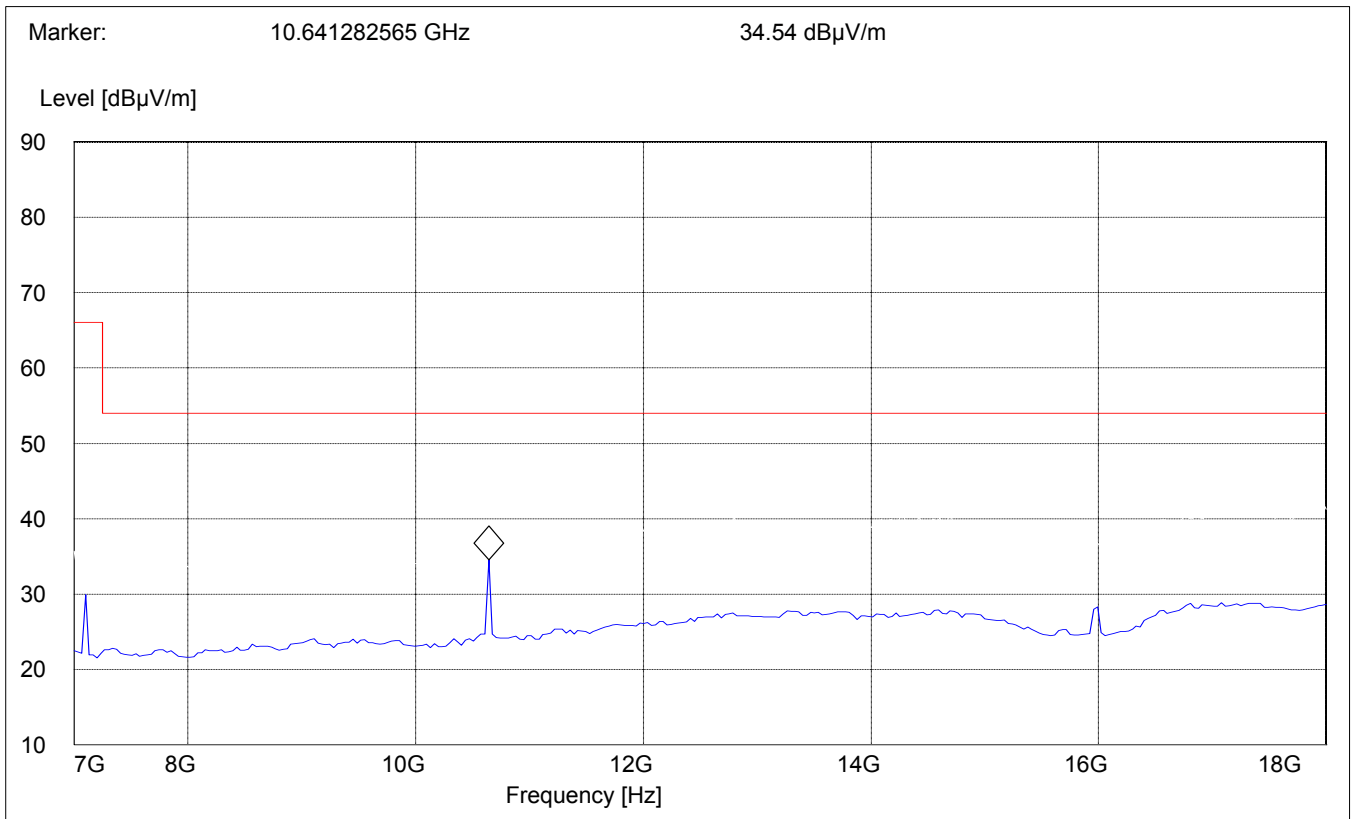


**EMISSION LIMITATIONS - Radiated (Transmitter)**

**§ 15.407 (b)**

**Highest Channel (5320MHz): 7GHz – 18GHz**

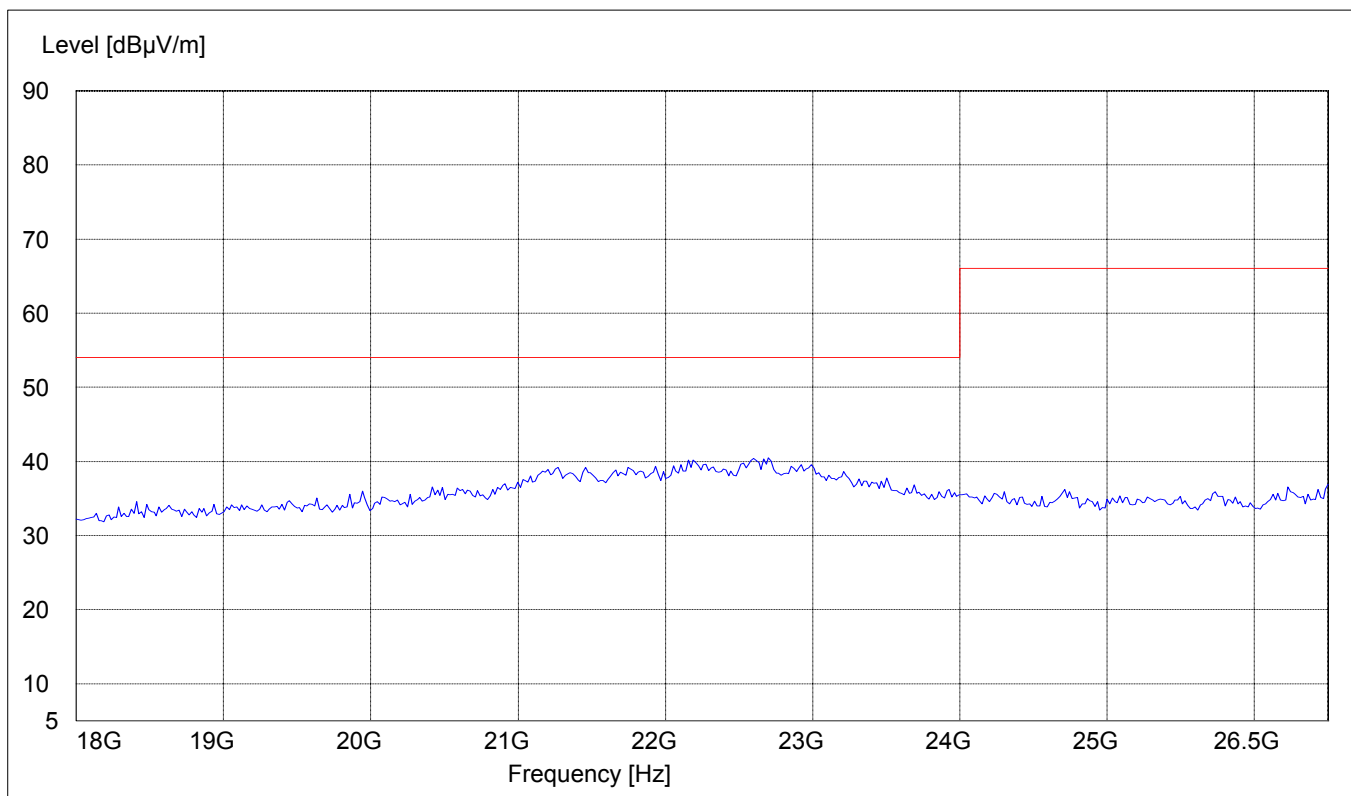
SWEEP TABLE:		"FCC 15.407 7-18G"			
Short Description:		Bluetooth Spurious 7-18 GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
7.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	#325 horn (dBi)



**EMISSION LIMITATIONS - Radiated (Transmitter)**  
**18GHz – 26.5GHz****§ 15.407 (b)****Note: This plot is valid for low, mid & high channels (worst-case plot)**

SWEEP TABLE: "FCC 15.407 18-26.5G"  
Short Description: Bluetooth Spurious 18-26.5 GHz

Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
18GHz	26.5GHz	MaxPeak	Coupled	1 MHz	#3160-09 horn



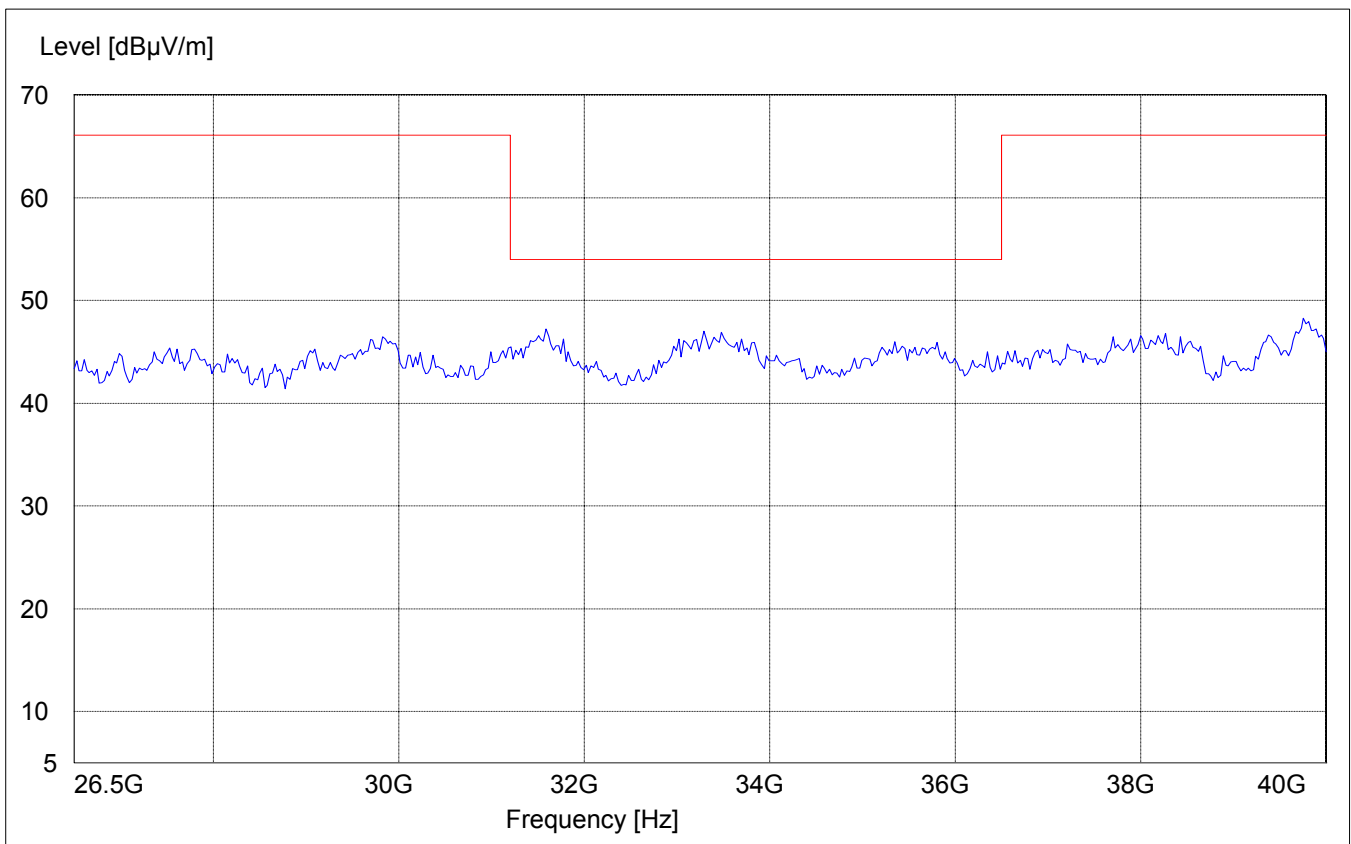


**EMISSION LIMITATIONS - Radiated (Transmitter)**  
**26.5GHz – 40.0GHz**

**§ 15.407 (b)**

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

SWEEP TABLE:		"FCC 15.407 26.5-40G"			
Short Description:		Bluetooth Spurious 26.5-40 GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
26.5GHz	40.0GHz	MaxPeak	Coupled	1 MHz	#3160-10 horn



**RECEIVER SPURIOUS RADIATION**

§ 15.209/§ 15.407

**Limits**

§ 15.209

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:**

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 plots.

3. All plots above 1GHz show FCC 15.407 Limits, which are more stringent than FCC 15.209 Limits.

**RECEIVER SPURIOUS RADIATION**

§ 15.209

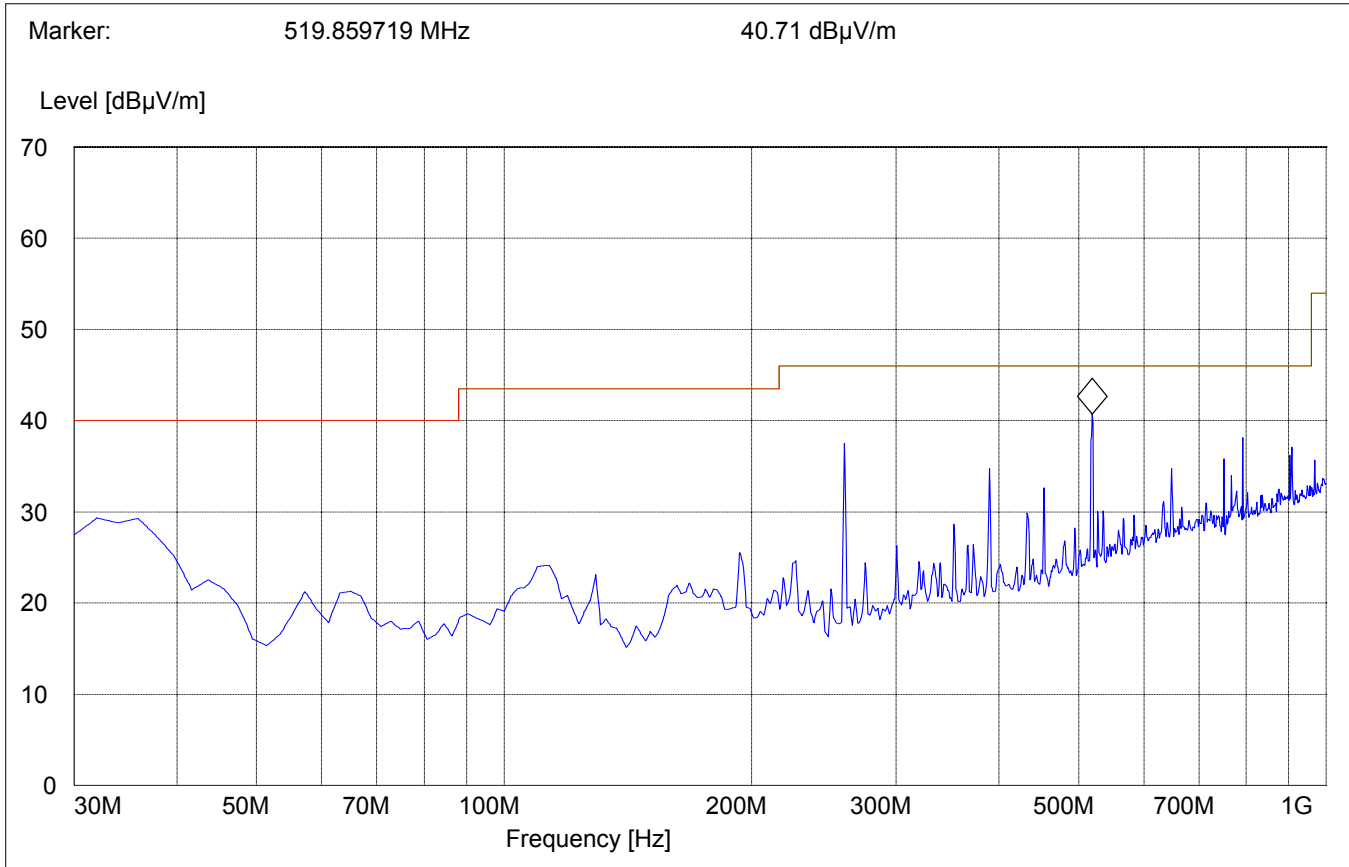
**30MHz – 1GHz**

SWEEP TABLE:

"BT Spuri hi 30-1G"

Short Description: Bluetooth 30MHz-1GHz

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



**RECEIVER SPURIOUS RADIATION**

**§ 15.209**

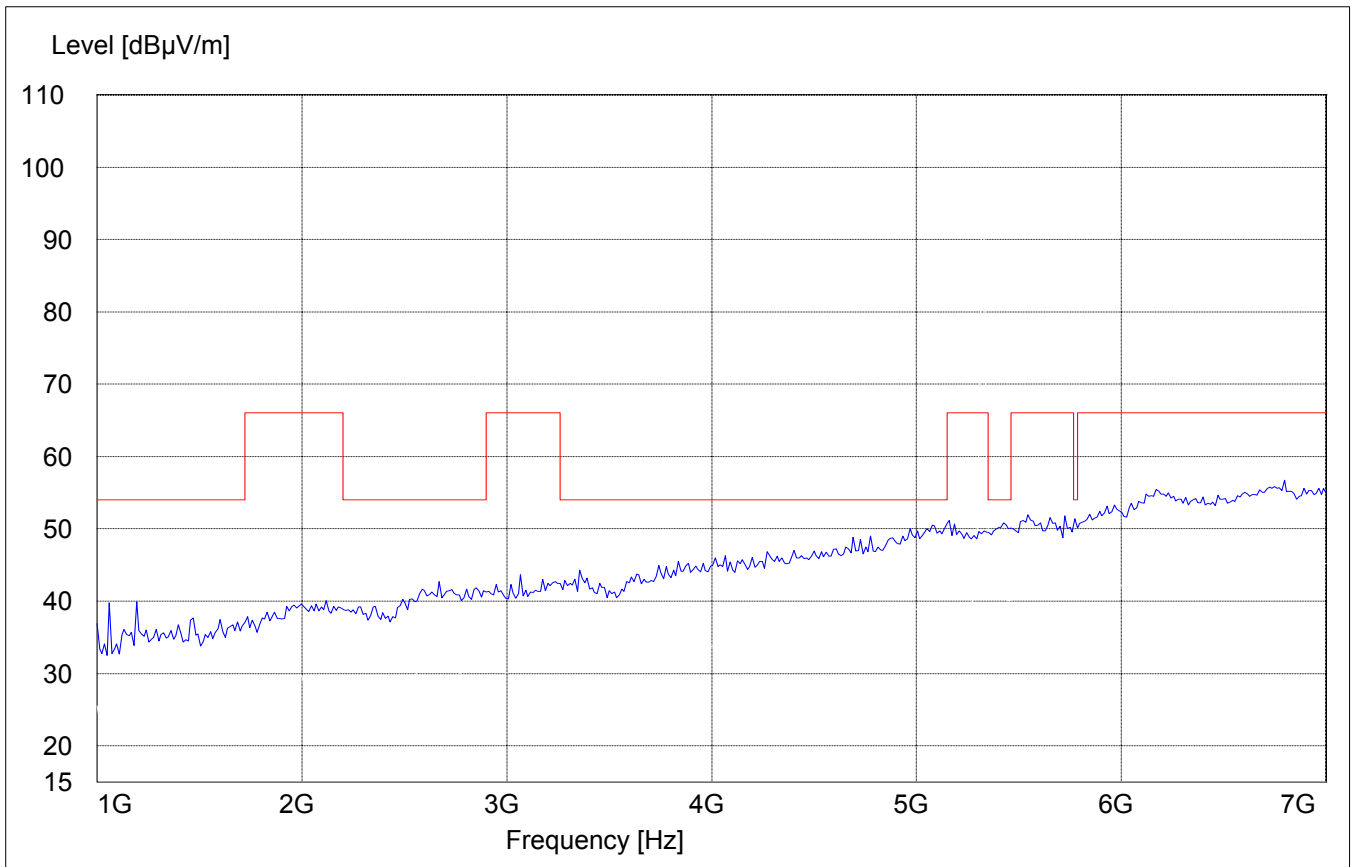
**1GHz – 7GHz**

SWEEP TABLE:

"BT Spuri hi 1-7G"

Short Description: Bluetooth Spurious 1-7 GHz

Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
1.0 GHz	7.0 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)



**RECEIVER SPURIOUS RADIATION**  
**7GHz – 18GHz**

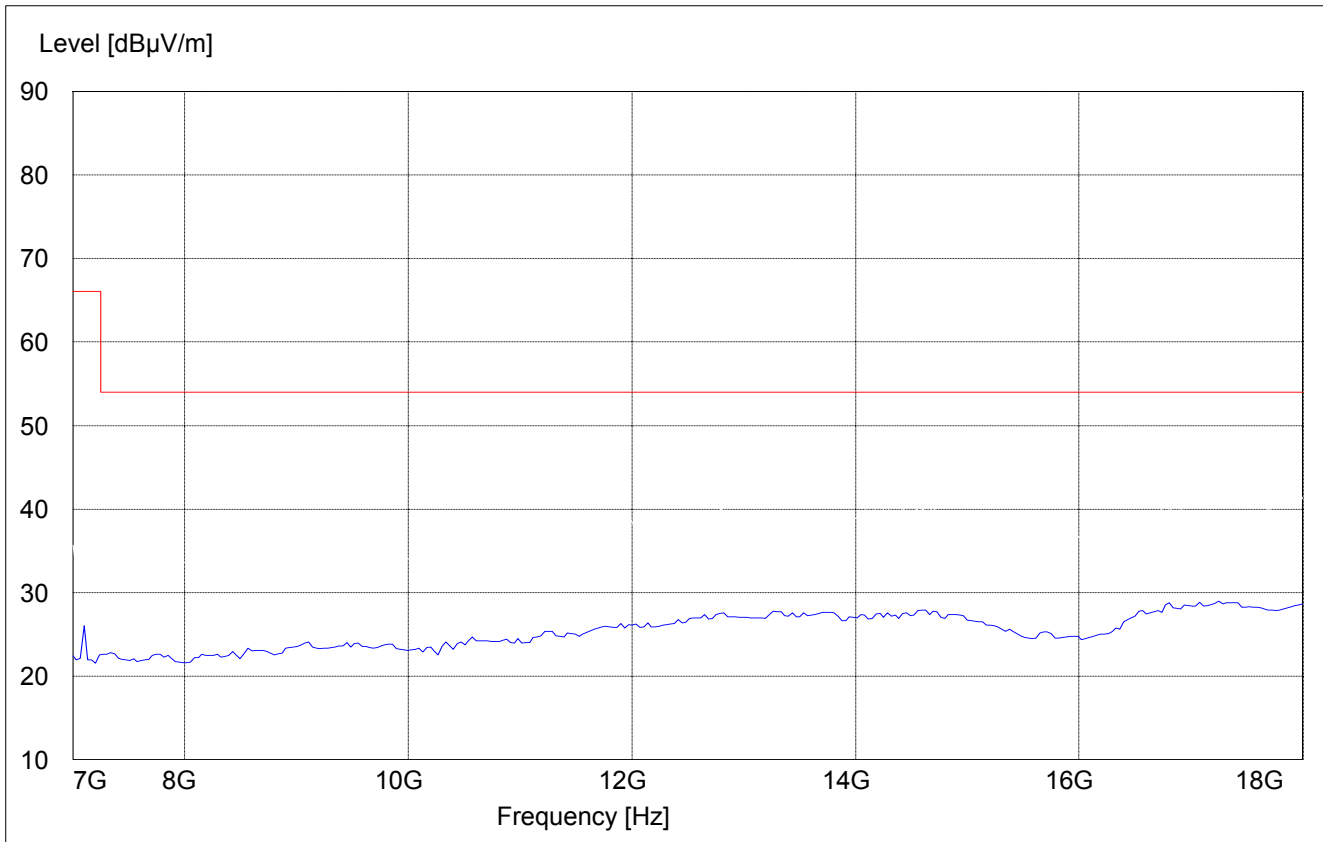
§ 15.209

**SWEEP TABLE:**

"BT Spuri hi 7-18G"

Short Description: Bluetooth Spurious 7-18 GHz

Start Frequency	Stop Frequency	Detector	Meas. Time	RBW	VBW	Transducer
7.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz		#325 horn (dBi)



**RECEIVER SPURIOUS RADIATION**  
**18GHz – 26.5GHz**

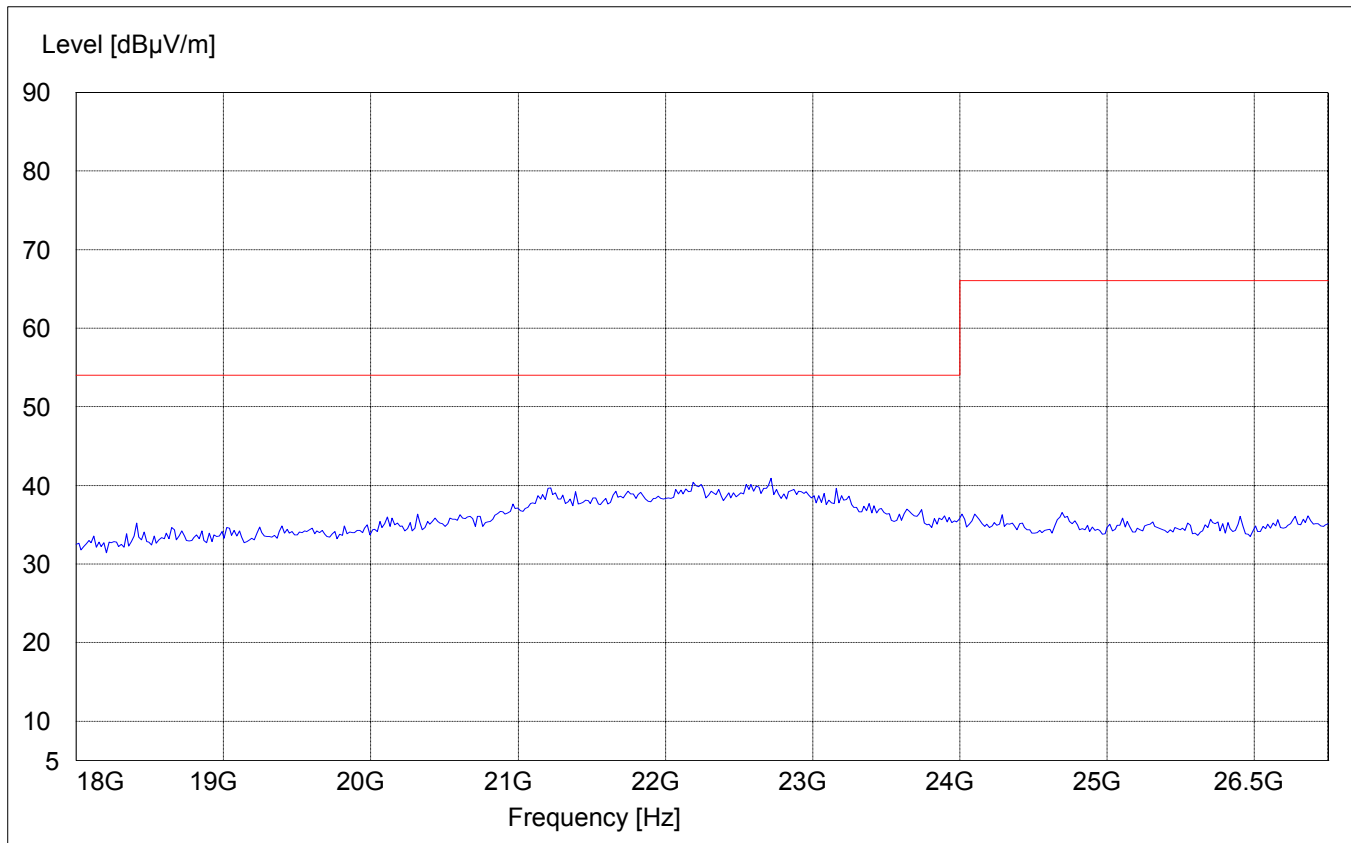
§ 15.209

SWEEP TABLE:

"BT Spuri hi 18-26.5G"

Short Description: Bluetooth Spurious 18-26.5GHz

Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
18.0 GHz	26.5 GHz	MaxPeak	Coupled	1 MHz	#3160-09 horn (dBi)



**RECEIVER SPURIOUS RADIATION**

**§ 15.209**

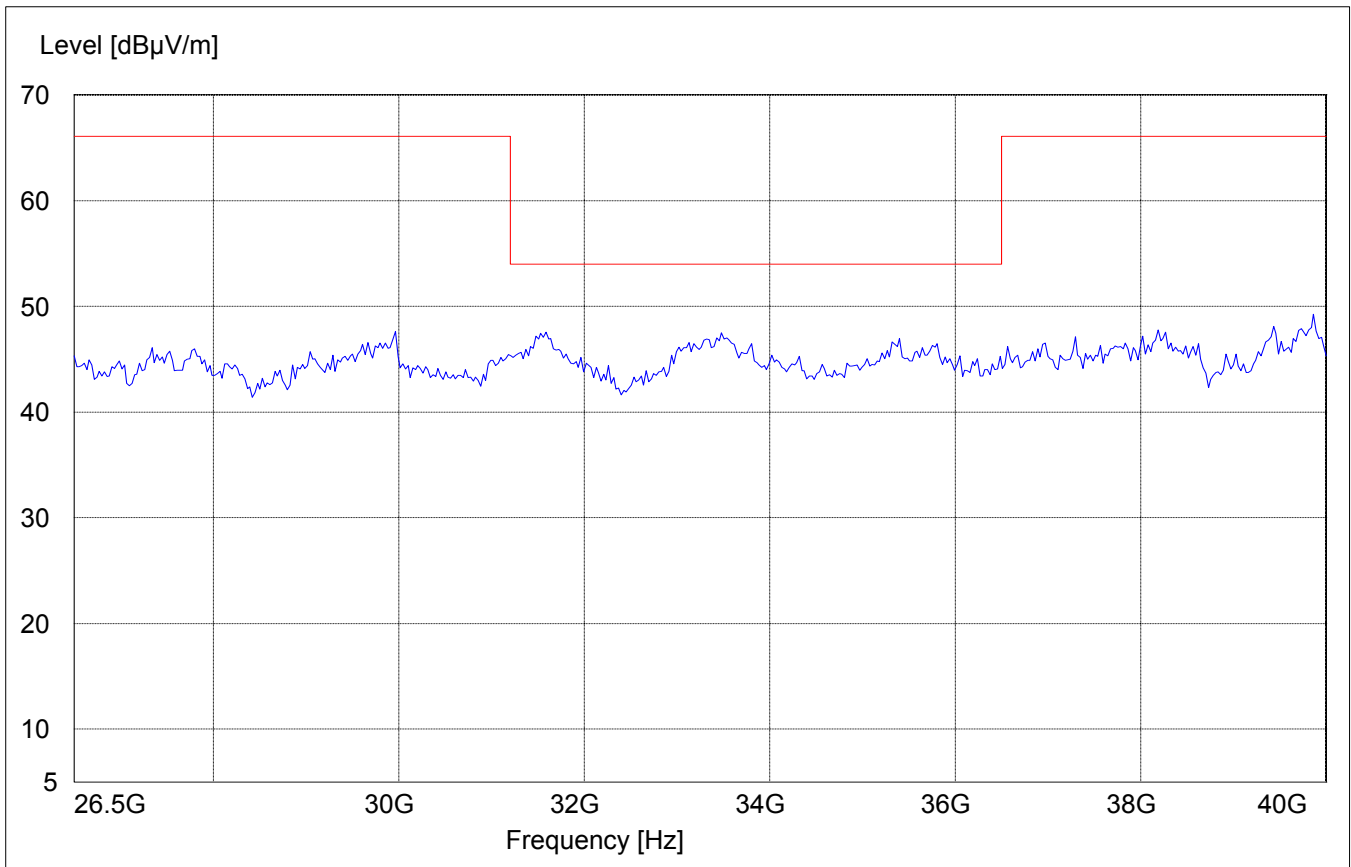
**26.5GHz – 40GHz**

SWEEP TABLE:

"BT Spuri hi 26.5-40G"

Short Description: Bluetooth Spurious 26.5-40GHz

Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
26.5 GHz	40GHz	MaxPeak	Coupled	1 MHz	#3160-10 horn (dBi)

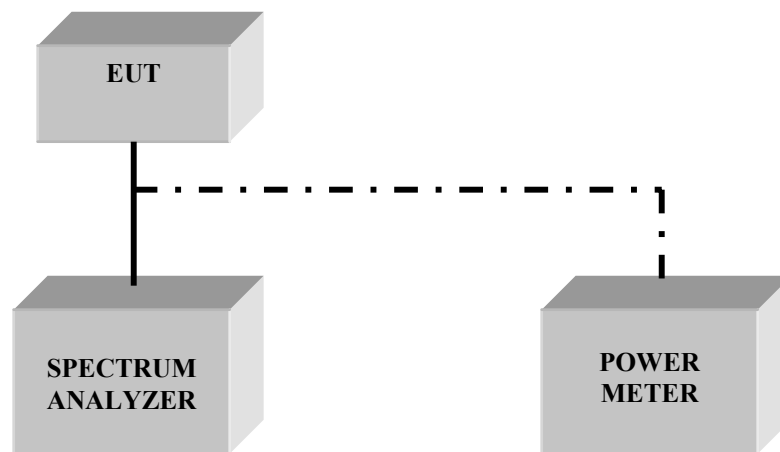


**TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS**

<b>No</b>	<b>Instrument/Ancillary</b>	<b>Type</b>	<b>Manufacturer</b>	<b>Serial No.</b>
<b>01</b>	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107
<b>02</b>	Biconilog Antenna	3141	EMCO	0005-1186
<b>03</b>	Horn Antenna (700M-18GHz)	SAS-200/571	AH Systems	325
<b>04</b>	Horn Antenna (18-26.5GHz)	3160-09	EMCO	1240
<b>05</b>	Horn Antenna (26.5-40GHz)	3160-10	EMCO	1156
<b>06</b>	2-3GHz Band reject filter	BRM50701	Microtronics	6
<b>07</b>	7-18GHz High Pass Filter	HPM50106	Microtronics	1
<b>08</b>	Pre-Amplifier	TS-ANA	Rohde & Schwarz	--
<b>09</b>	Pre-Amplifier	JS4-00102600	Miteq	00616



**BLOCK DIAGRAMS**  
**Conducted Testing**



**Radiated Testing**

**ANECHOIC CHAMBER**

