

# FCC Test Report

**Test report no.: EMC\_405FCC15.247\_2003\_PP07L**  
**FCC Part 15.247 for DSSS systems / CANADA RSS-210**

**EUT: WLAN Model: BCM94306MP**  
**HOST: Dell Laptop Model: PP07L**

**FCC ID: QDS-BRCM1005-D**

Accredited according to  
**ISO/IEC 17025** by:



FCC listed # 101450

IC recognized # 3925

**CETECOM Inc.**

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

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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

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**1.3 Details of applicant**

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

**1.4 Application details**

Date of receipt of application : 2003-02-28  
Date of receipt test item : 2003-03-03  
Date of test : 2003-03-03

**1.5 Test item**

**Manufacturer** : Applicant  
**Model No. (EUT)** : BCM94306MP  
**Model No. (Host)** : Dell Laptop PC Model No: PP07L  
**Description** : [54g wireless LAN mini PCI card in Dell Laptop](#)  
**FCC ID** : QDS-BRCM1005-D

**Additional information**

**Frequency** : 2412MHz – 2462MHz  
**Type of modulation** : DSSS / OFDM (orthogonal frequency division multiplexing)  
**Number of channels** : 11  
**Antenna** : 2.55dBi max. gain antenna  
**Power supply** : 3.3 VDC from Host  
**Output power** : 25.55dBm (359mW) conducted peak power  
(For EIRP and Source-based time-averaged output please see page no.11)  
**Extreme temp. Tolerance** : 0°C to +85°C


**1.6 Test standards:** **FCC Part 15 §15.247 / CANADA RSS-210**

**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")	<b>Passed</b>

**Technical responsibility for area of testing:**

2003-03-05	EMC & Radio	Lothar Schmidt (Manager)	
Date	Section	Name	Signature

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

2003-03-05	EMC & Radio	Harpreet Sidhu (EMC Engineer)	
Date	Section	Name	Signature

**2.2 Test report**

**TEST REPORT**

**Test report no.: EMC\_405FCC15.247\_2003\_PP07L**

**EUT: WLAN          Model: BCM94306MP**

**HOST: Dell Laptop   Model: PP07L**

**FCC ID: QDS-BRCM1005-D**

**TEST REPORT REFERENCE**

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**SPECTRUM BANDWIDTH OF DSSS SYSTEM  
6 dB bandwidth**

**§15.247(a) (2)**

<b>TEST CONDITIONS</b>		<b>6 dB BANDWIDTH (MHz)</b>		
<b>Frequency (MHz)</b>		<b>2412</b>	<b>2437</b>	<b>2462</b>
<b>T<sub>nom</sub>(23)°C</b>	<b>V<sub>nom</sub>(3.3) VDC</b>	<b>16.38</b>	<b>16.53</b>	<b>16.43</b>

**LIMIT**

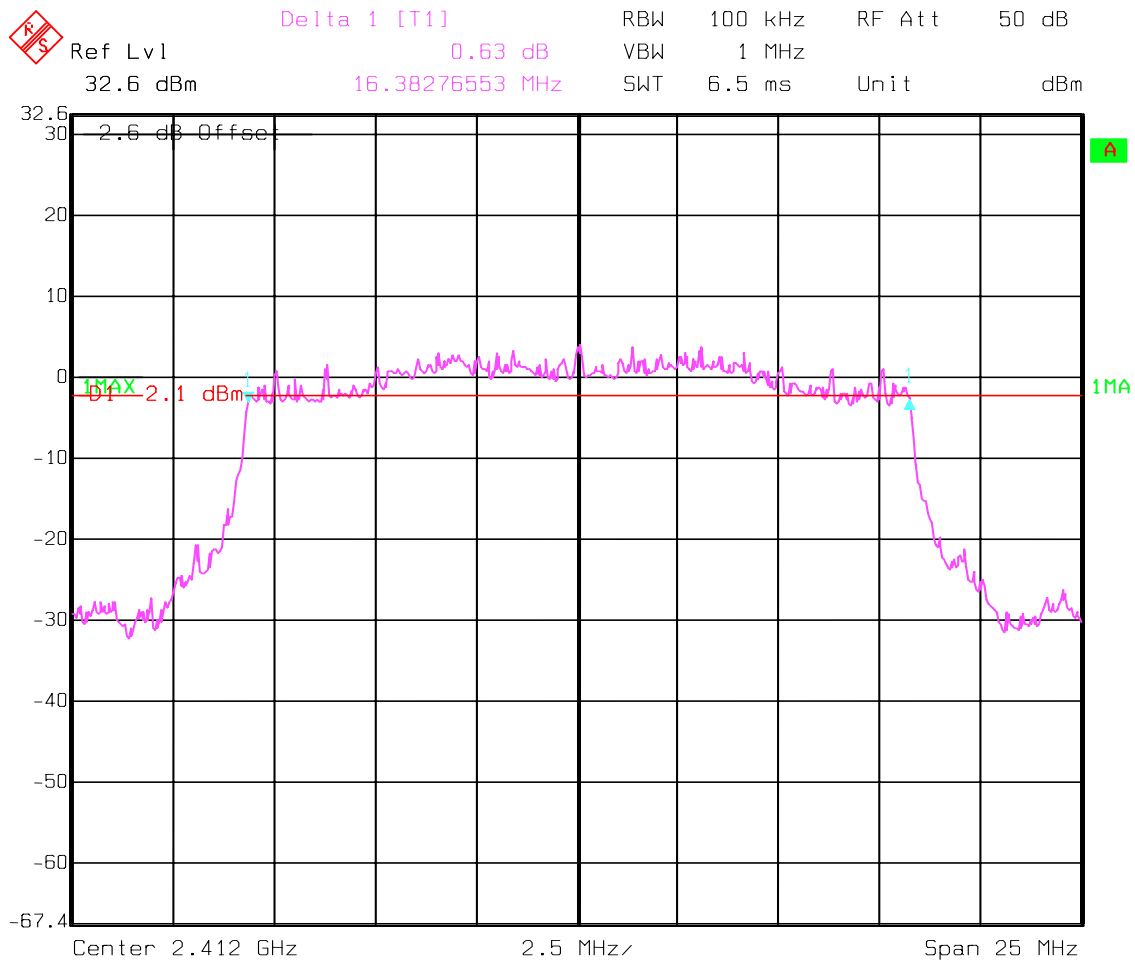
**SUBCLAUSE §15.247(a) (2)**

**The minimum 6dB bandwidth shall be at least 500 KHz**

**SPECTRUM BANDWIDTH OF DSSS SYSTEM  
6 dB bandwidth**

**§15.247(a) (2)**

**Lowest Channel: 2412MHz**



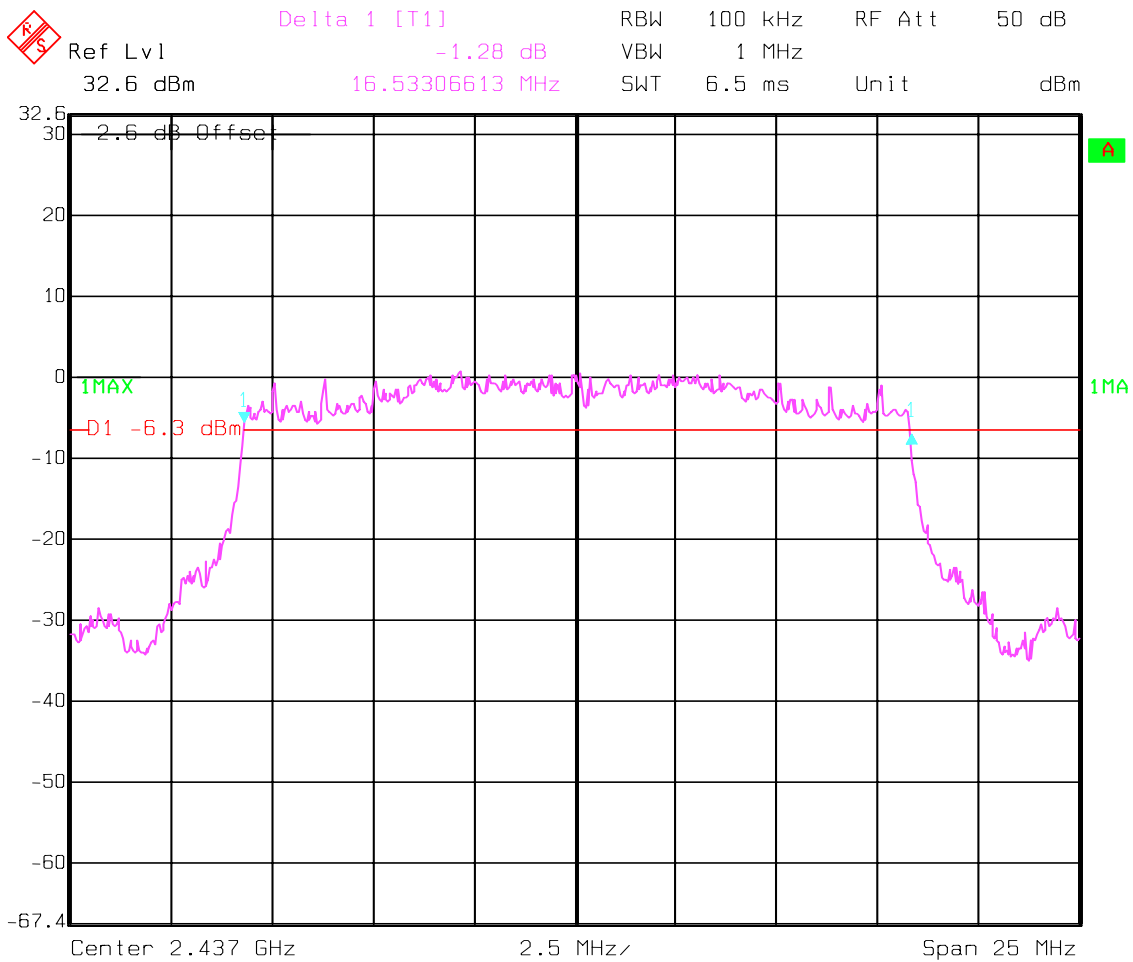
Date: 21.NOV.2002 10:46:29



**SPECTRUM BANDWIDTH OF DSSSS SYSTEM  
6 dB bandwidth**

§15.247(a) (2)

**Mid Channel: 2437MHz**

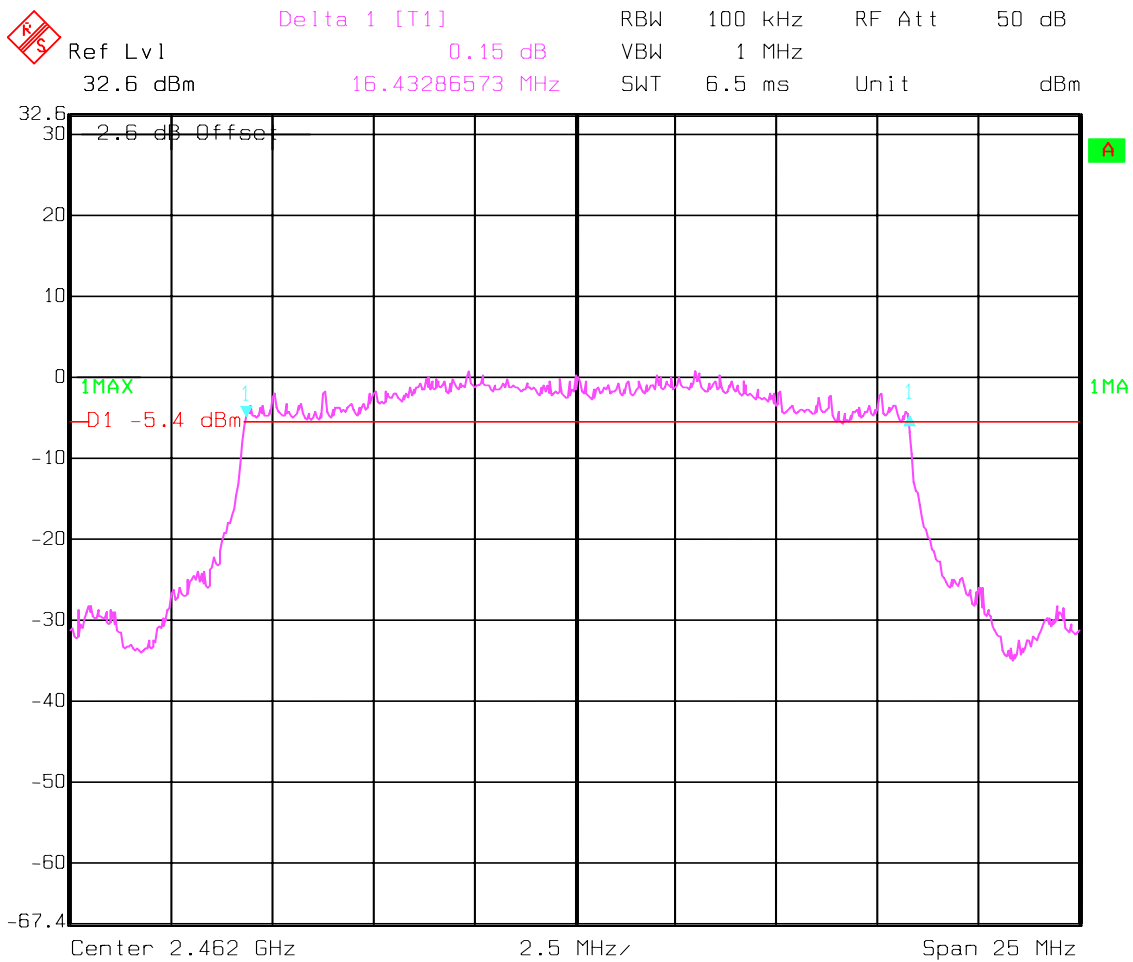


Date: 21.NOV.2002 10:29:55

**SPECTRUM BANDWIDTH OF DSSS SYSTEM  
6 dB bandwidth**

§15.247(a) (2)

**Highest Channel: 2462MHz**



Date: 21.NOV.2002 11:00:24

**OUTPUT POWER**

§ 15.247 (b) (1)

	Low channel	Mid channel	High channel
<b>*Conducted Peak Power</b>	<b>25.55dBm</b>	<b>24.48dBm</b>	<b>24.11dBm</b>
<b>*Radiated Power (EIRP)</b>	<b>28.10dBm</b>	<b>27.03dBm</b>	<b>26.66dBm</b>
<b>**Source-based time averaged output</b>	<b>21.33dBm</b>	<b>20.26dBm</b>	<b>19.89dBm</b>

**\*For details please refer to pages 12(Conducted output power results), 16(EIRP calculation) & 17(duty cycle measurements) respectively.**

**\*\*The source-based time-averaged output power is calculated using the duty cycle (measurement result see page 17-20, These values are used to determine if the TCB route can be used)**

**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	Pk	*25.55	*24.48	*24.11
Measurement uncertainty		±0.5dBm			

RBW / VBW: 10MHz

\*To comply with following;

RBW / VBW should be equal to or greater than the 6dB BW

All measured values are corrected by **10log 6dB BW / used BW**

(Therefore correction factor of 2.14, 2.18 & 2.15 is added to low, mid& high channel measurements respectively)

**LIMIT**

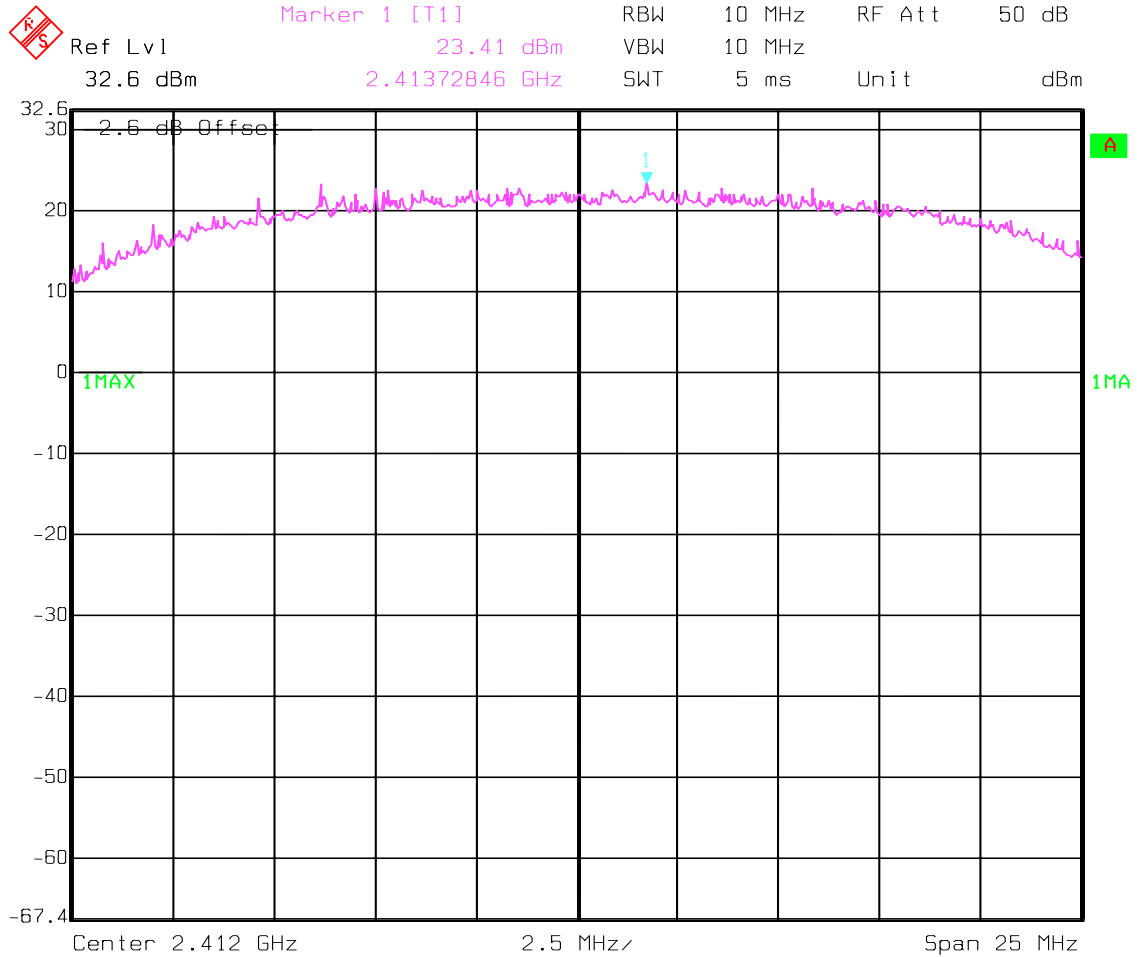
**SUBCLAUSE § 15.247 (b) (1)**

Frequency range	RF power output
2400-2483.5 MHz	1.0 Watt / 30dBm

PEAK OUTPUT POWER (CONDUCTED)

§15.247 (b) (1)

Lowest Channel: 2412MHz

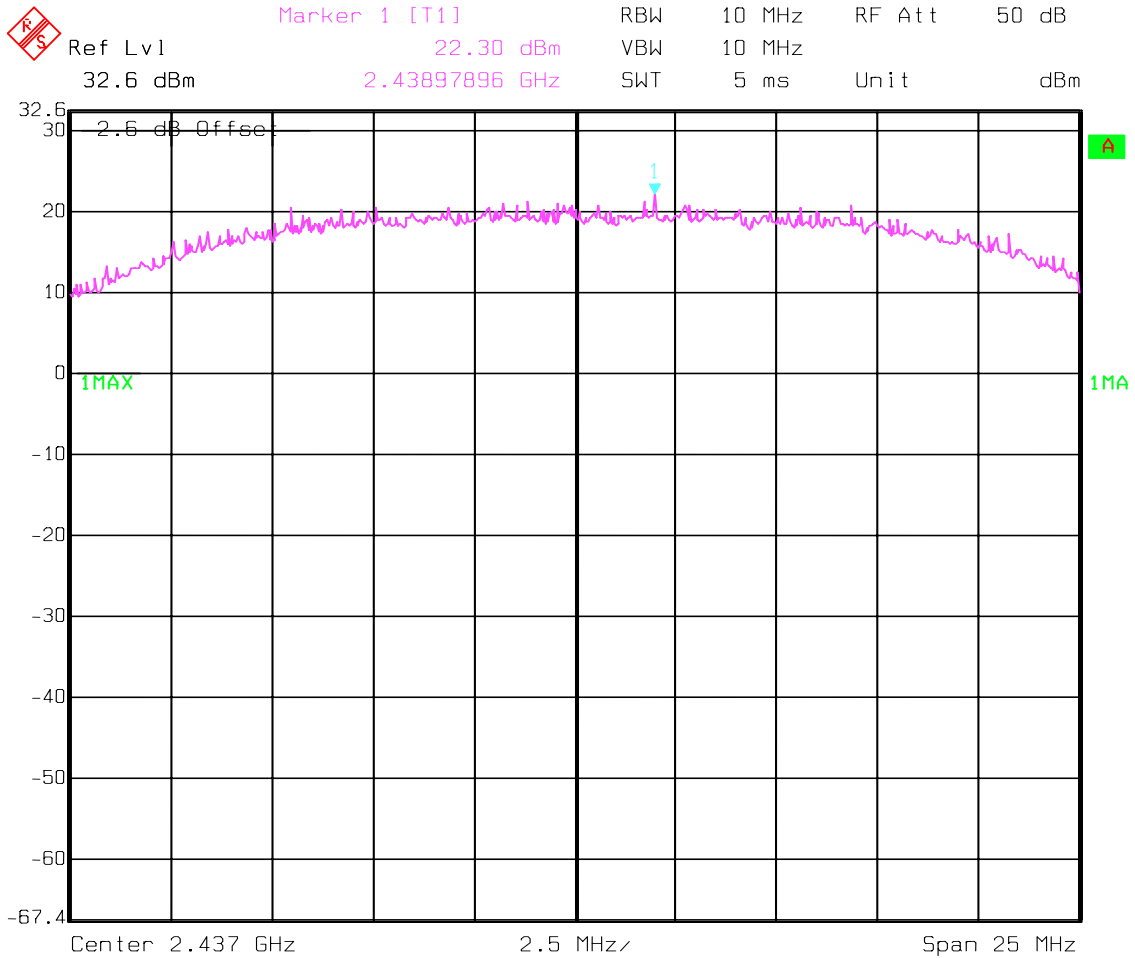


Date: 21.NOV.2002 09:15:39

PEAK OUTPUT POWER (CONDUCTED)

§15.247 (b)

Mid Channel: 2437MHz

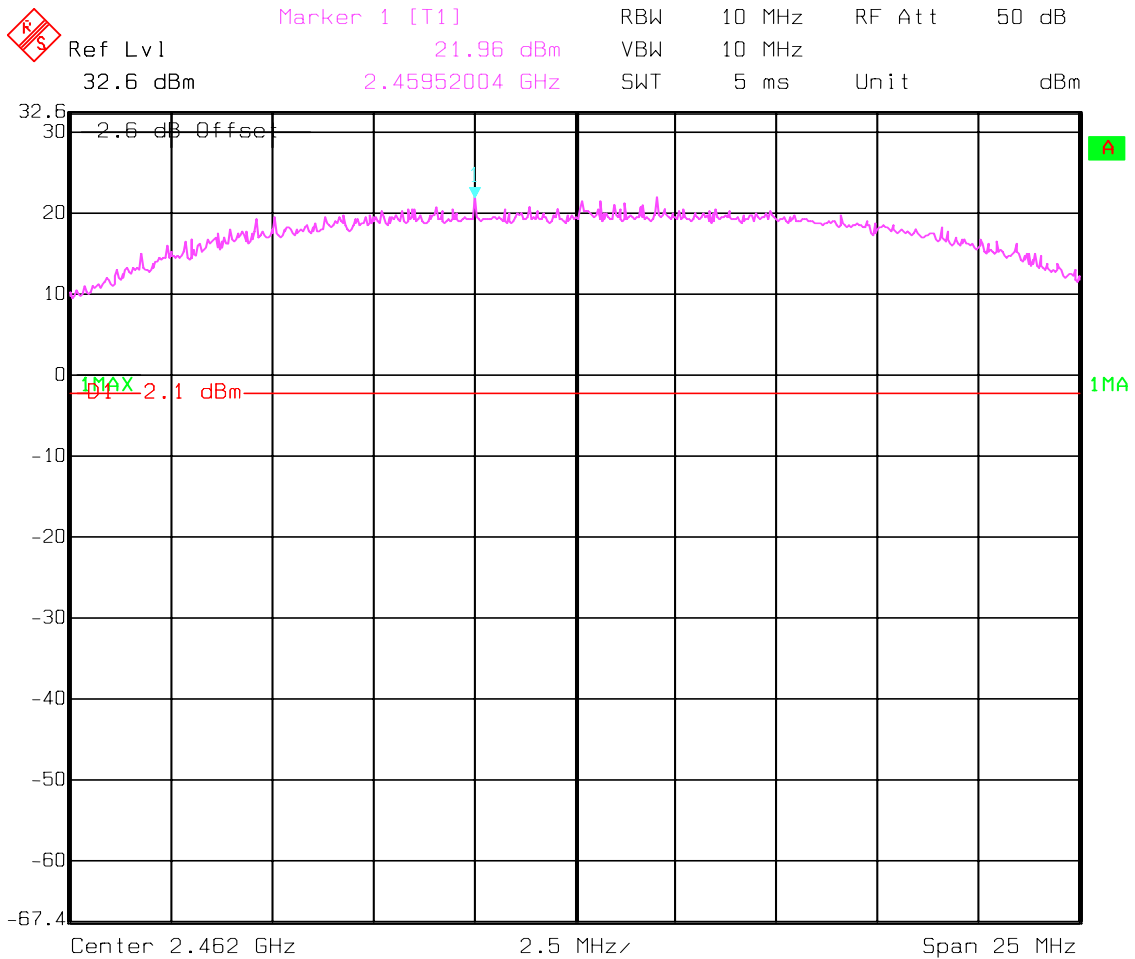


Date: 21.NOV.2002 09:49:43

PEAK OUTPUT POWER (CONDUCTED)

§15.247 (b)

Highest Channel: 2462MHz



Date: 21.NOV.2002 10:56:52

**MAXIMUM PEAK OUTPUT POWER  
(RADIATED)**

§ 15.247 (b) (1)

**EIRP:**

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
		2412	2437	2462
T <sub>nom</sub> (23)°C	V <sub>nom</sub> (3.3) VDC	*28.10	*27.03	*26.66
Measurement uncertainty		±0.5dBm		

\*Note: EIRP is calculated based on 2.55dBi antenna and conducted peak power measurements.

**LIMIT**

SUBCLAUSE § 15.247 (b) (1)

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



**SOURCE-BASED TIME-AVERAGED OUTPUT**

$$T_{x\ on} = 140.2\ \mu\text{s}$$

$$T_{x\ on} + T_{x\ off} = 661.32\ \mu\text{s}$$

$$\text{Duty factor} = T_{x\ on} / T_{x\ on} + T_{x\ off} = 140.2 / 661.32 = 0.21$$

Therefore;

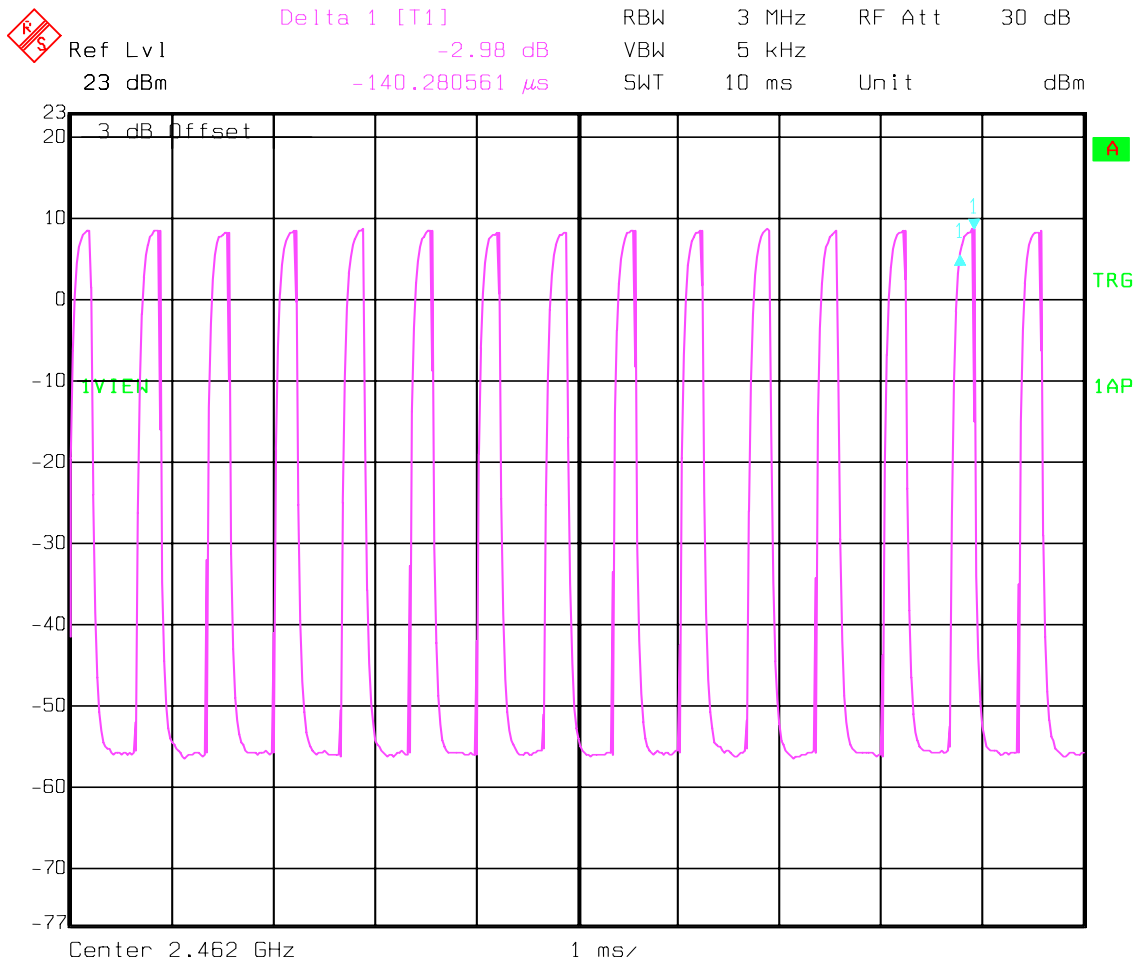
(Example for Low channel)

$$\begin{aligned} \text{Source-based time averaged output} &= \text{Max. EIRP} + 10\log(\text{duty factor}) \\ &= 28.10 - 6.77 = \mathbf{21.33\text{dBm}} \end{aligned}$$

TEST CONDITIONS		SOURCE-BASED TIME AVERAGED OUTPUT (dBm)		
		2412	2437	2462
$T_{nom}(23)^{\circ}\text{C}$	$V_{nom}(3.3)\ \text{VDC}$	21.33	20.26	19.89

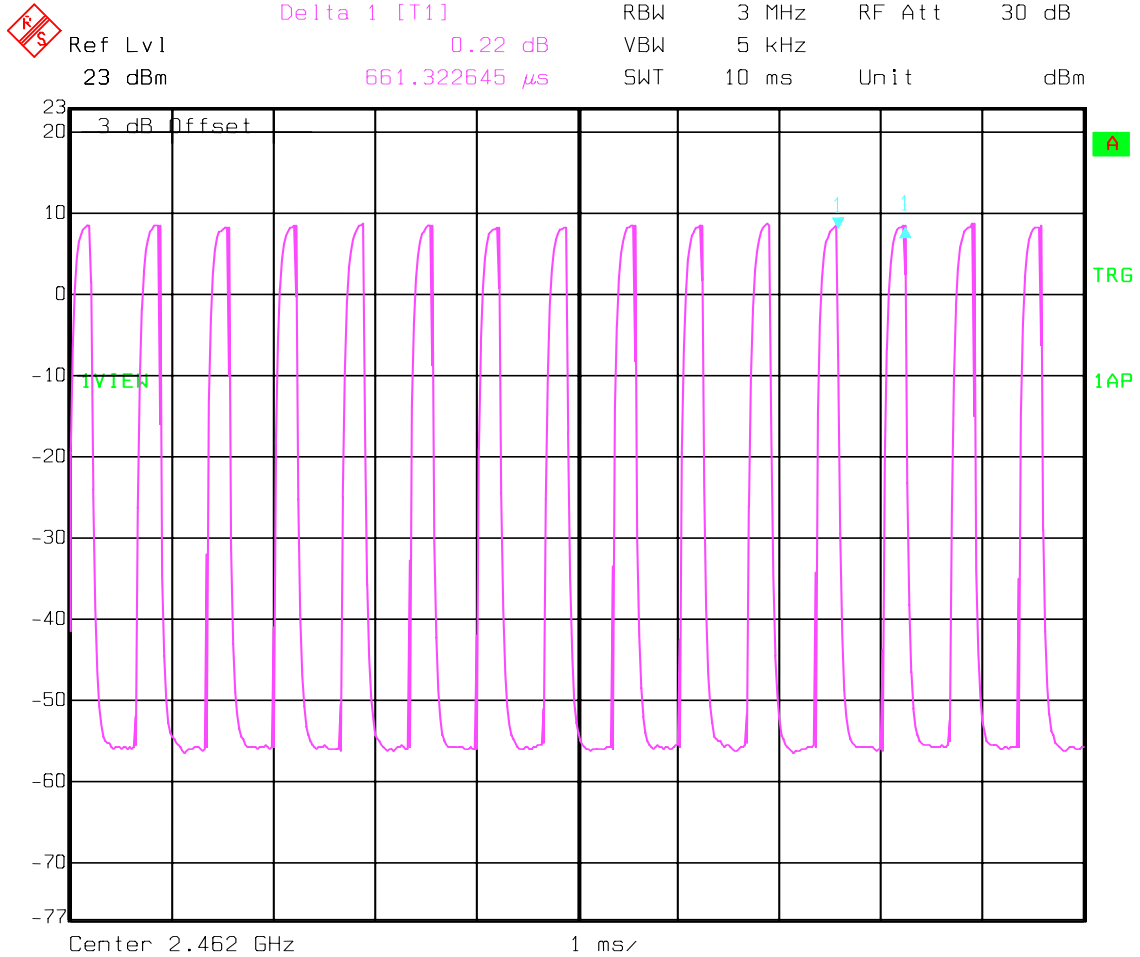
Please refer to the plots on next pages

Transmitter ON time – Tx<sub>on</sub>



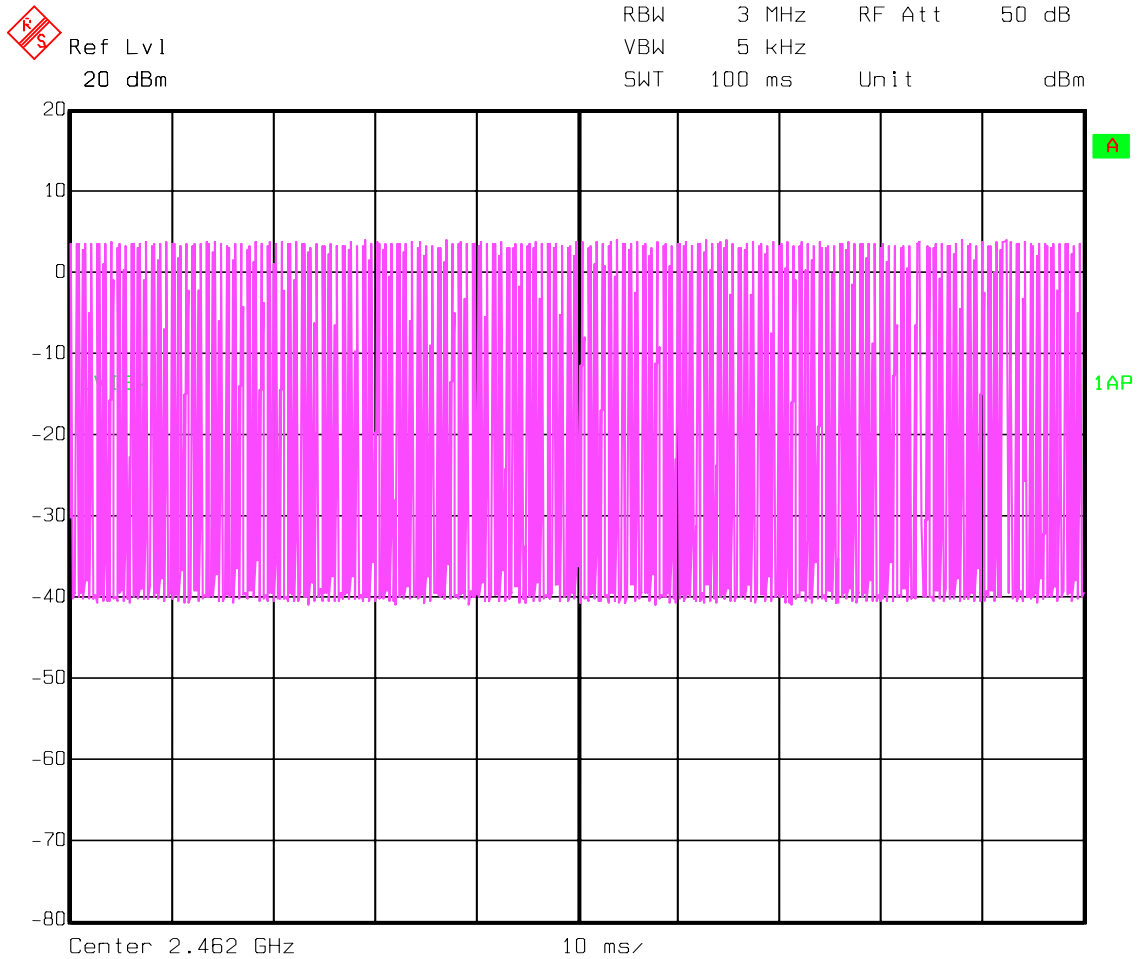
Date: 11.DEC.2002 03:43:11

Transmitter ON+OFF time –  $T_{x_{on}} + T_{x_{off}}$



Date: 11.DEC.2002 03:45:09

100ms plot – to show repetition of pattern



Date: 11.DEC.2002 04:22:23

**POWER SPECTRAL DENSITY**

**§15.247 (d)**

TEST CONDITIONS		POWER SPECTRAL DENSITY (dBm)		
		2412	2437	2462
Frequency (MHz)				
T <sub>nom</sub> (23)°C	V <sub>nom</sub> (3.3) VDC	-0.99	-5.15	-3.72

**LIMIT**

**SUBCLAUSE §15.247(d)**

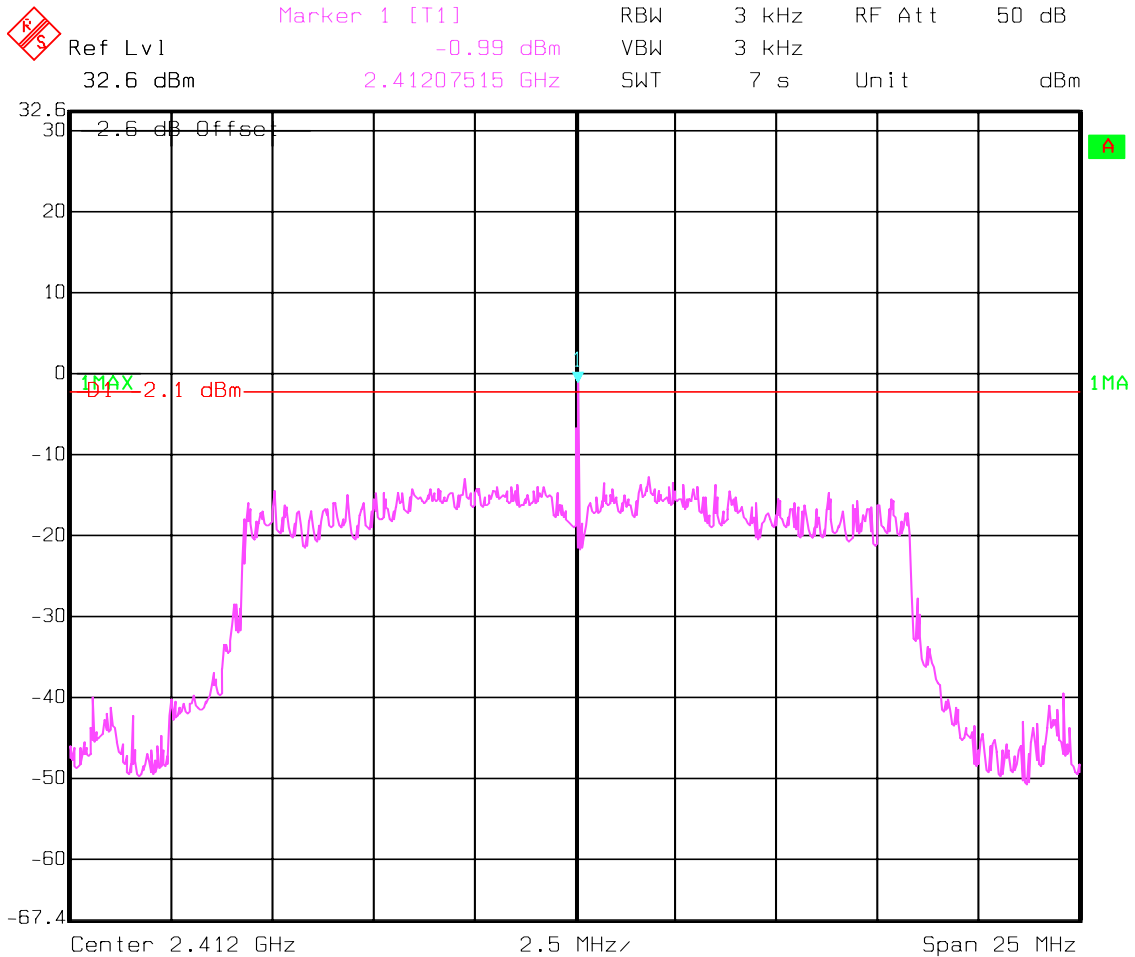
**The peak power spectral density shall not be greater than 8dBm in any 3 kHz band**

**ANALYZER SETTINGS: RBW=3KHz, VBW=3KHz**

POWER SPECTRAL DENSITY

§15.247(d)

Lowest Channel: 2412MHz

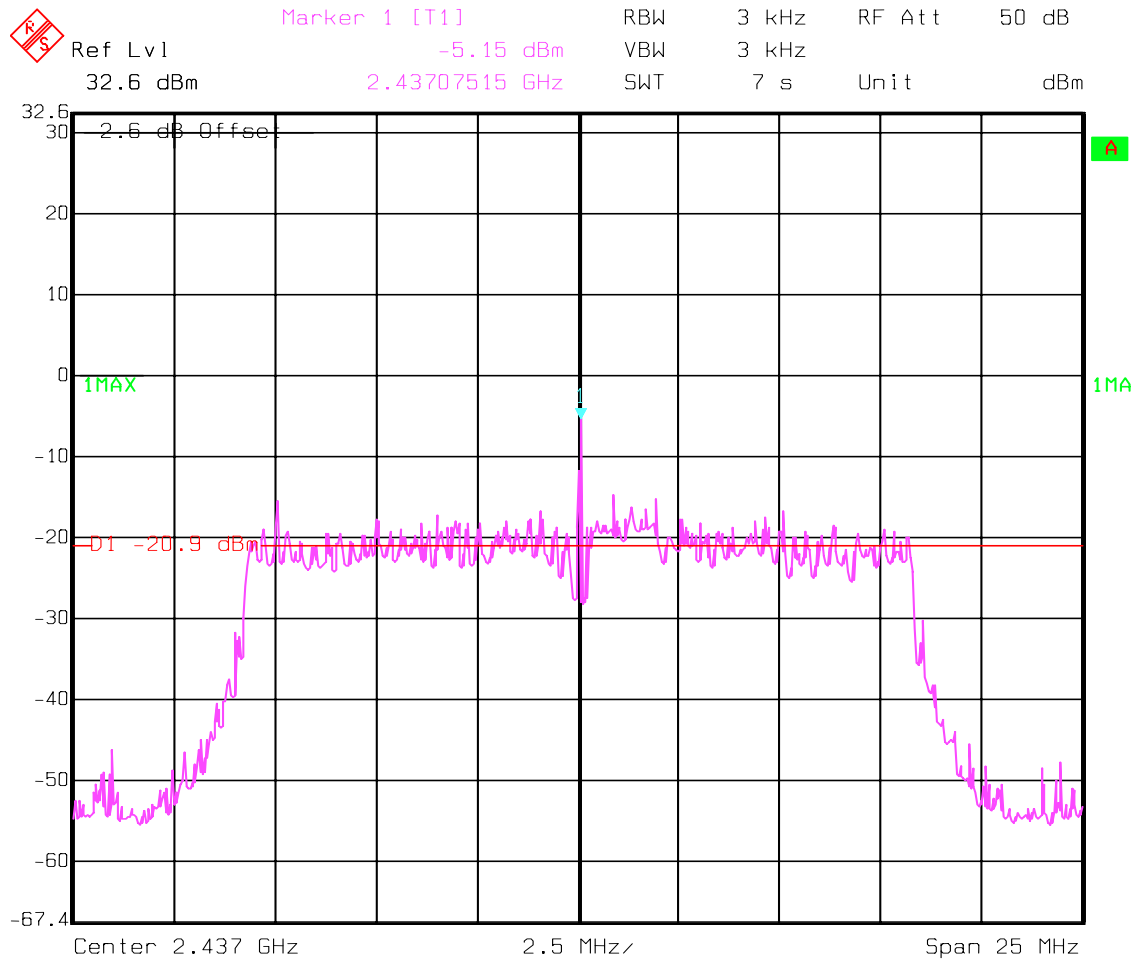


Date: 21.NOV.2002 10:48:55

POWER SPECTRAL DENSITY

§15.247(d)

Mid Channel: 2437MHz

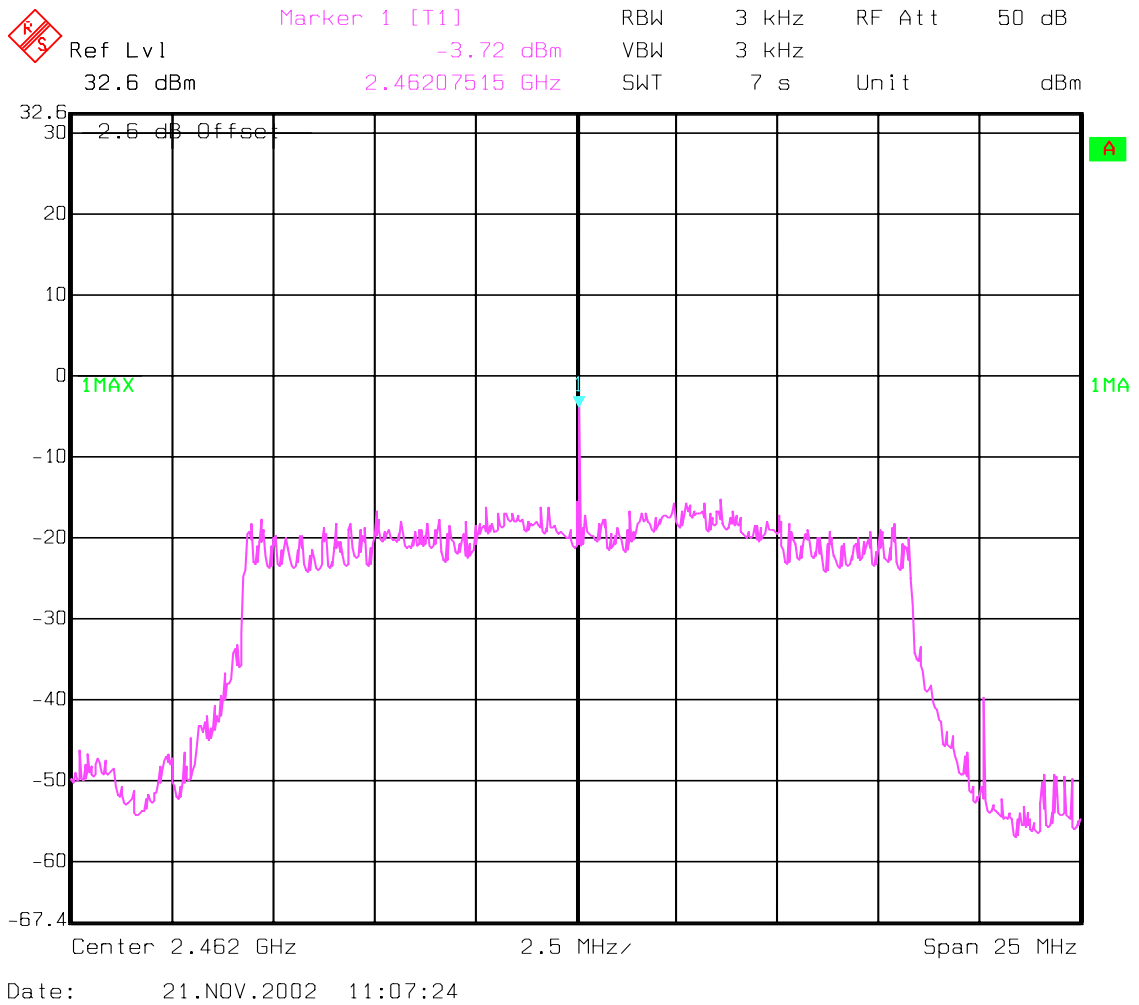


Date: 21.NOV.2002 10:37:09

POWER SPECTRAL DENSITY

§15.247(d)

Highest Channel: 2462MHz





**POWER SPECTRAL DENSITY**

**RSS-210**

TEST CONDITIONS		POWER SPECTRAL DENSITY (dBm/MHz)		
		2412	2437	2462
T <sub>nom</sub> (23)°C	V <sub>nom</sub> (3.3) VDC	*11.77	*8.91	*8.57

\*Correction factor of 60dBm is added to convert measured values from dBm/Hz to dBm/MHz

**LIMIT**

**RSS-210**

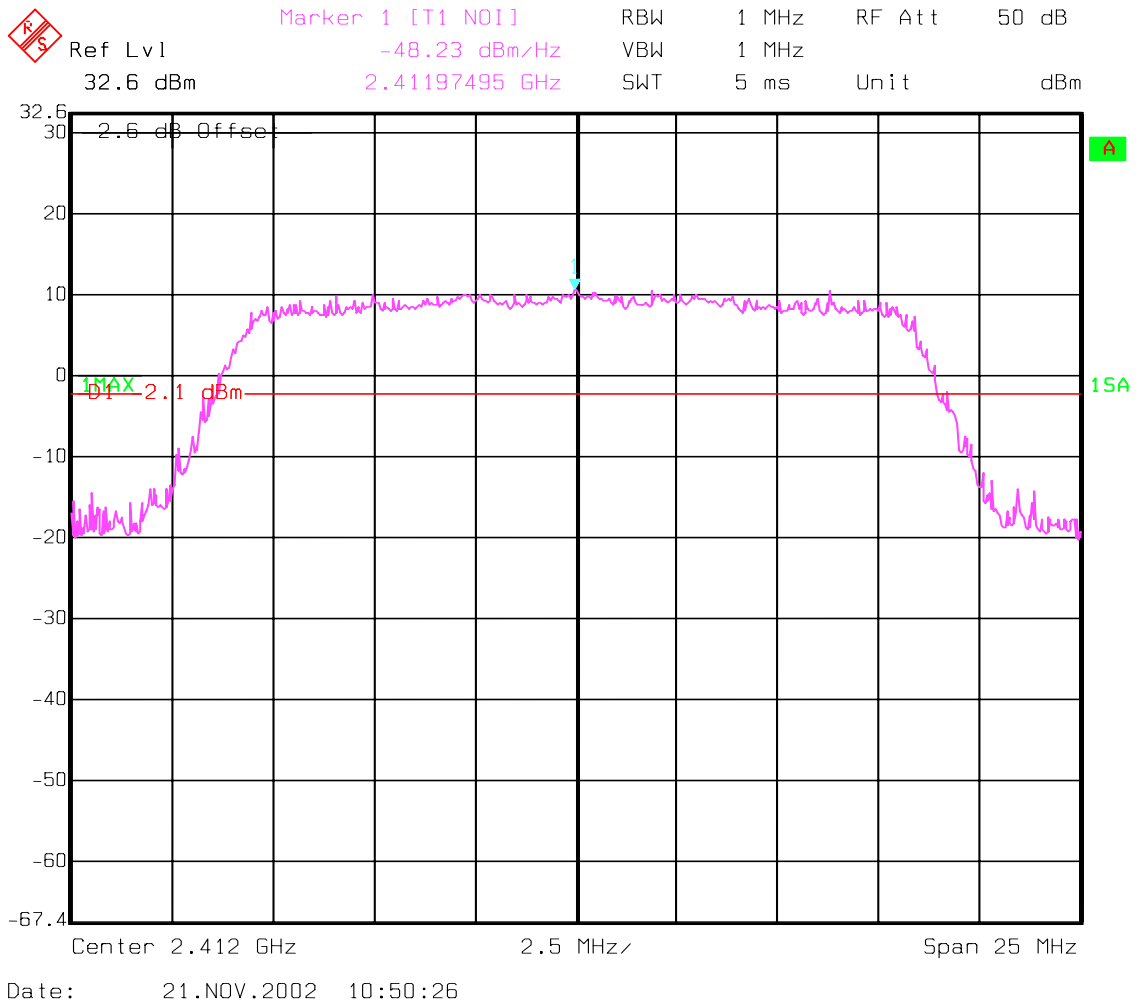
**The peak power spectral density shall be  $\leq 50\text{mW/MHz}$  (17dBm/MHz)**

**ANALYZER SETTINGS: RBW=1MHz, VBW=1MHz**

POWER SPECTRAL DENSITY

RSS-210

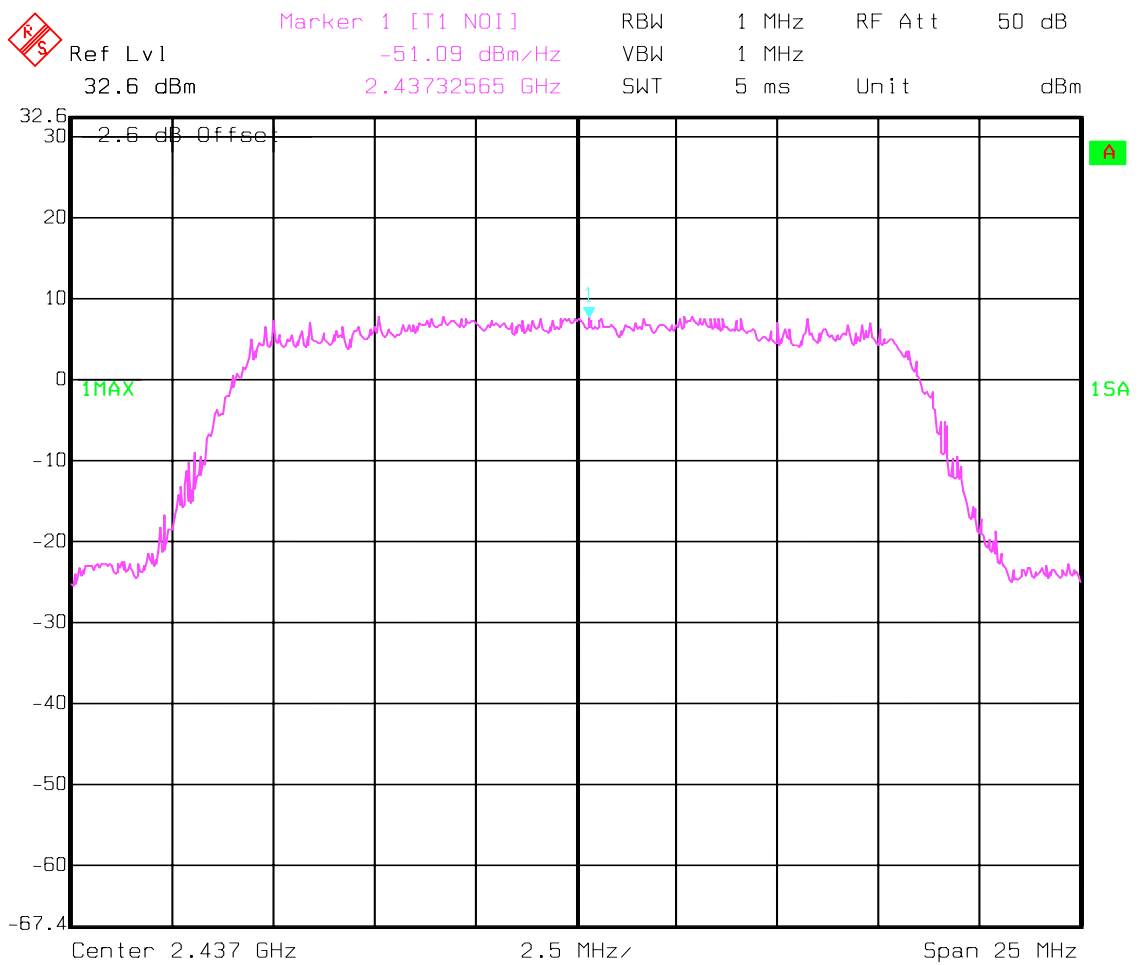
Lowest Channel: 2412MHz



POWER SPECTRAL DENSITY

RSS-210

Mid Channel: 2437MHz

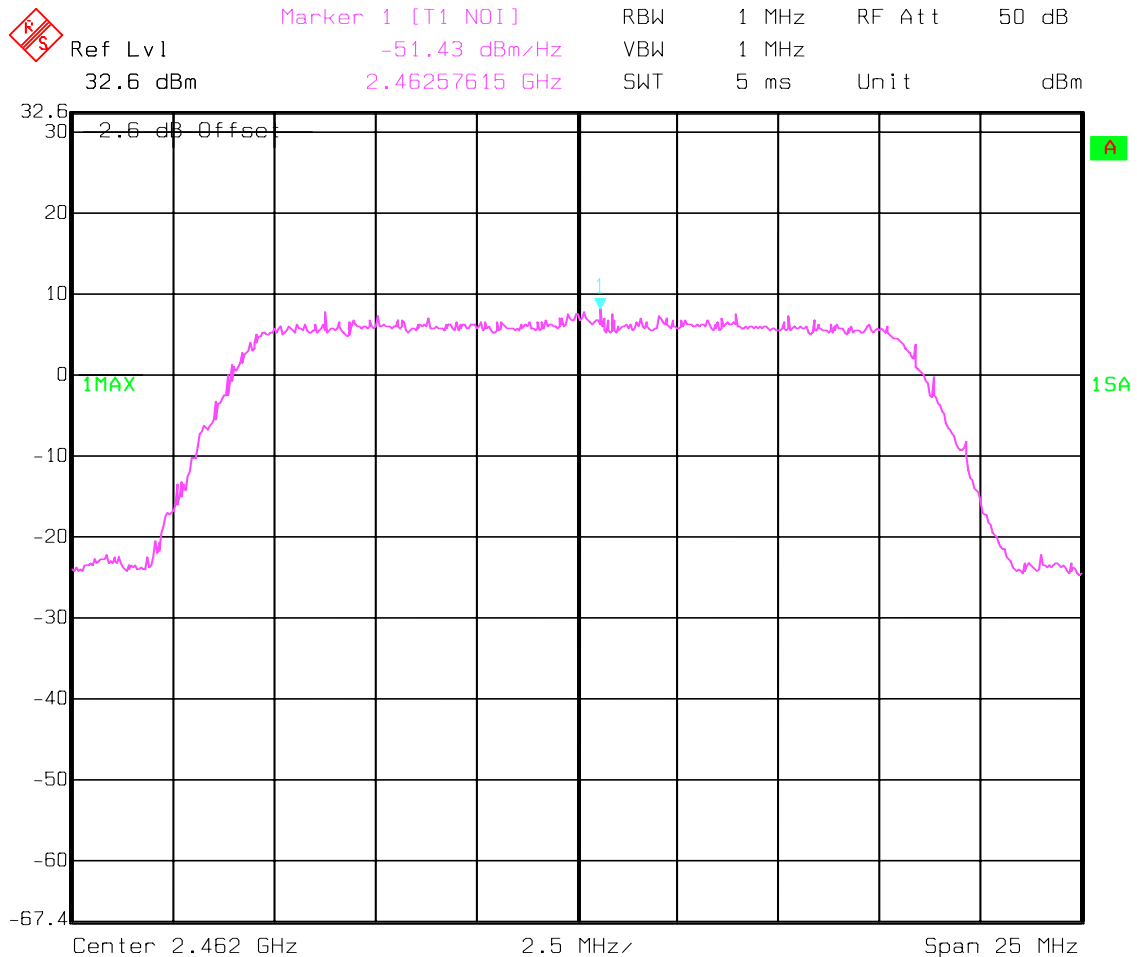


Date: 21.NOV.2002 10:38:53

POWER SPECTRAL DENSITY

RSS-210

Highest Channel: 2462MHz



Date: 21.NOV.2002 11:09:43

**BAND EDGE COMPLIANCE**

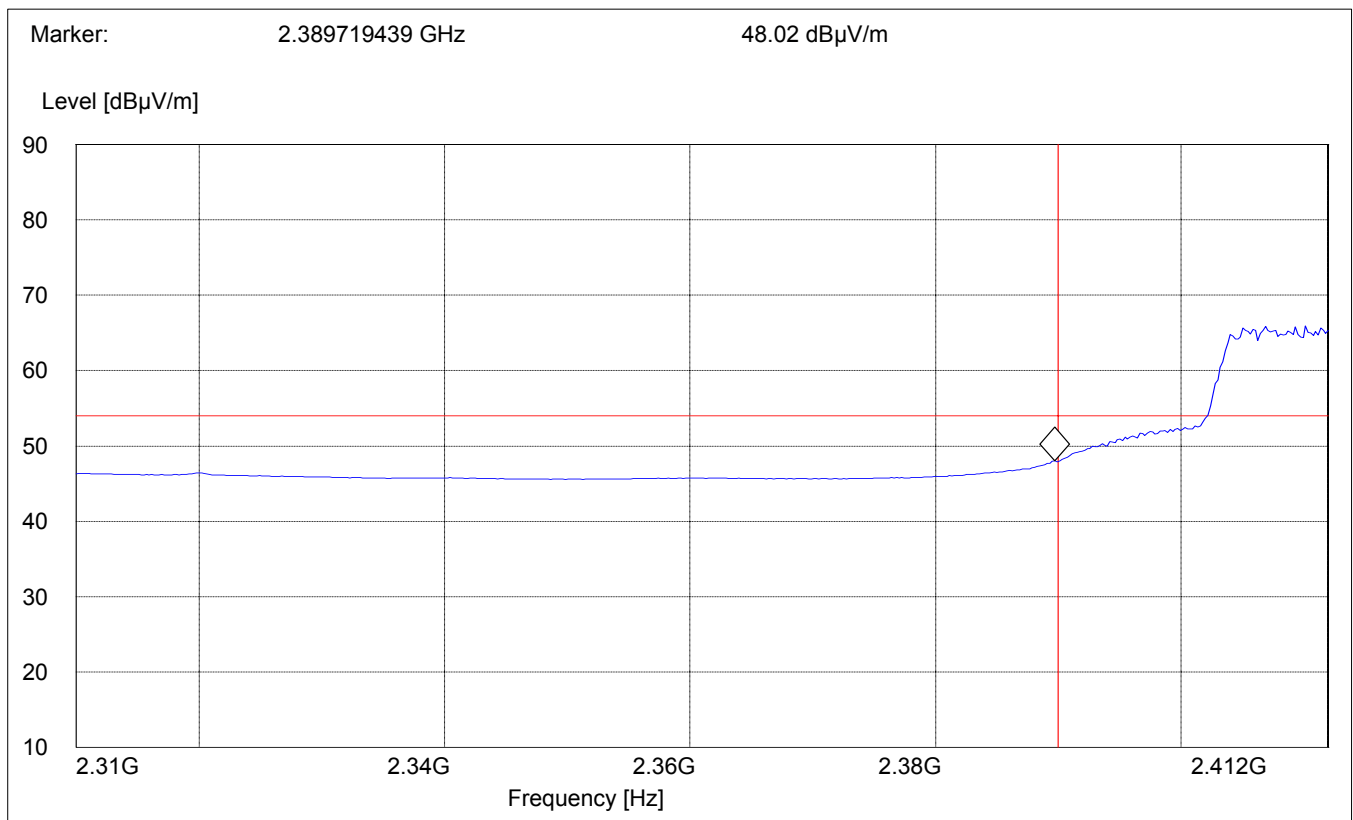
§15.247 (c)

Low frequency section (spurious in the restricted band 2310 – 2390 MHz)

(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)



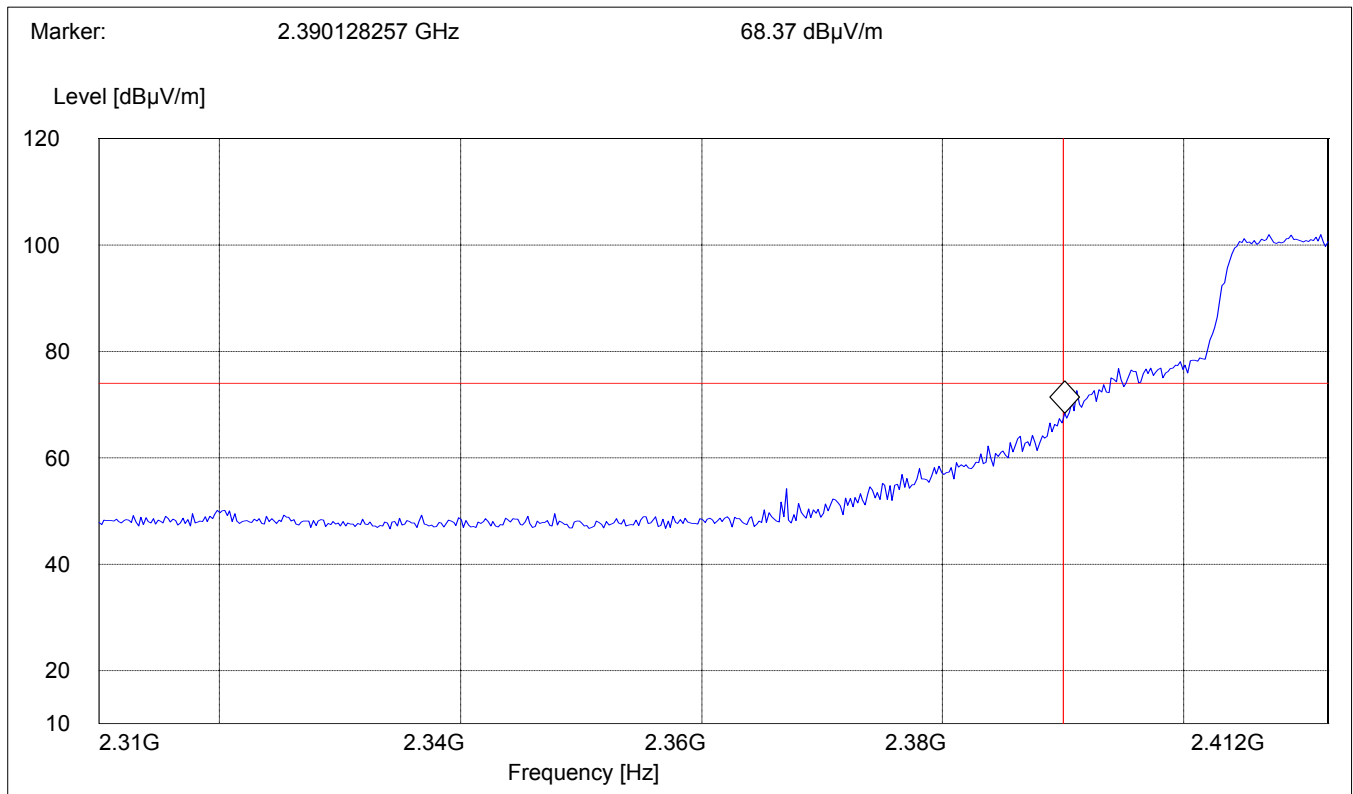
**BAND EDGE COMPLIANCE**

§15.247 (c)

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

Operating condition : Tx at 2412MHz  
 SWEEP TABLE : "FCC15.247 LBE\_Pk"  
 Limit Line : 74dB $\mu$ V

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**

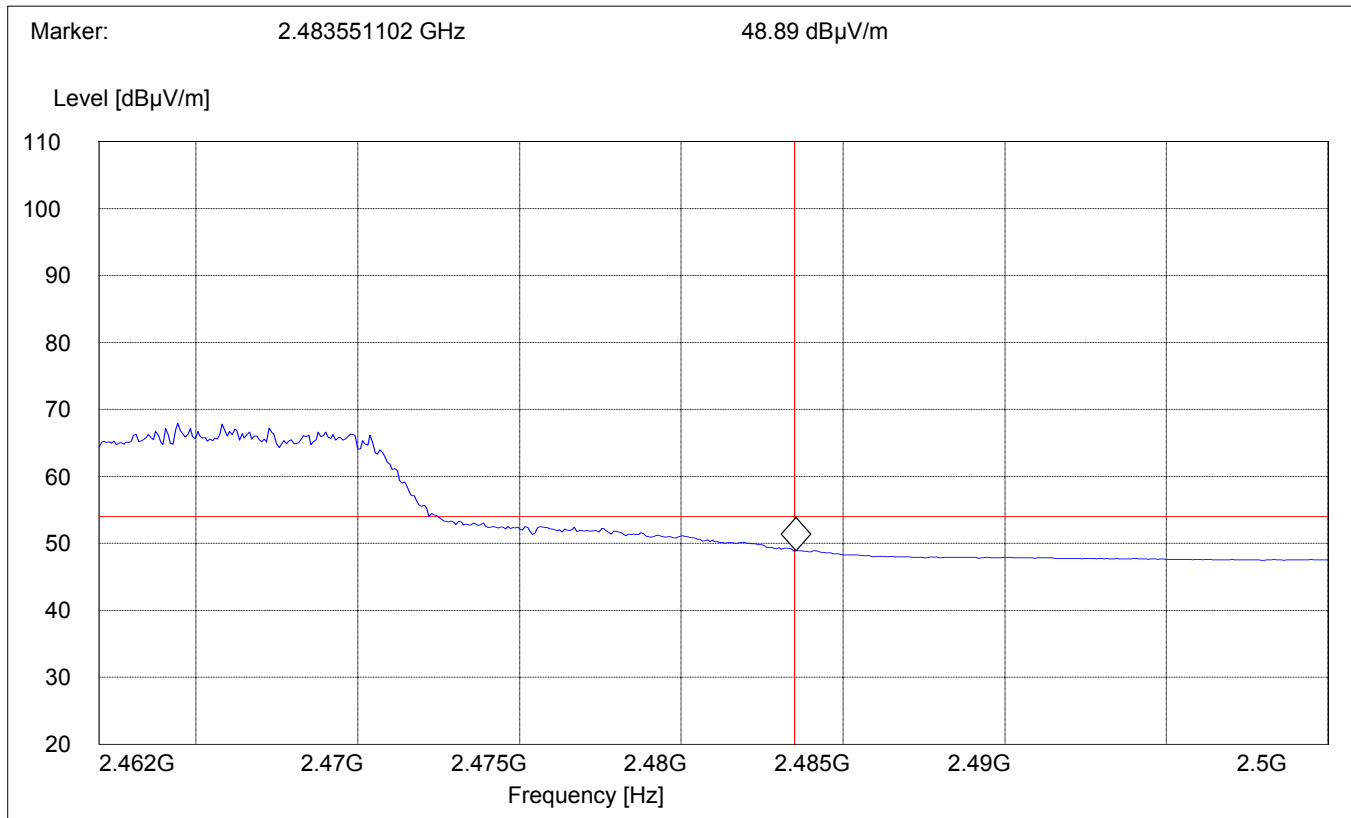
§15.247 (c)

**High frequency section (spurious in the restricted band 2483.5 – 2500 MHz)**

(Average measurement)

Operating condition : Tx at 2472MHz  
 SWEEP TABLE : "FCC15.247 HBE\_AVG"  
 Limit Line : 54dB $\mu$ V

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**

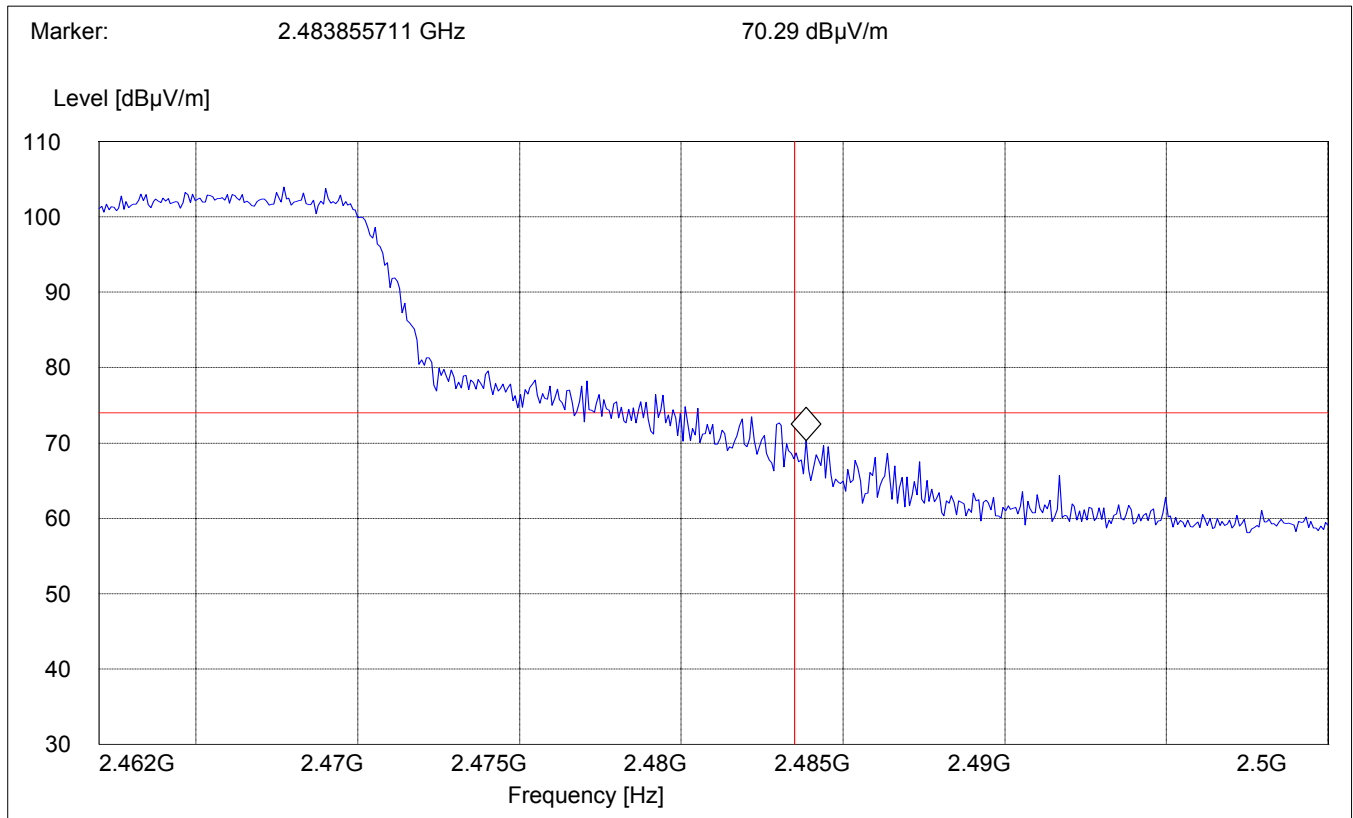
§15.247 (c)

**High frequency section (spurious in the restricted band 2483.5 – 2500 MHz)**

**(Peak measurement)**

Operating condition : Tx at 2472MHz  
 SWEEP TABLE : "FCC15.247 HBE\_PK"  
 Limit Line : 74dB $\mu$ V

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 (Conducted)  
LIMITS**

**§ 15.247 (c) (1)**

**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).**

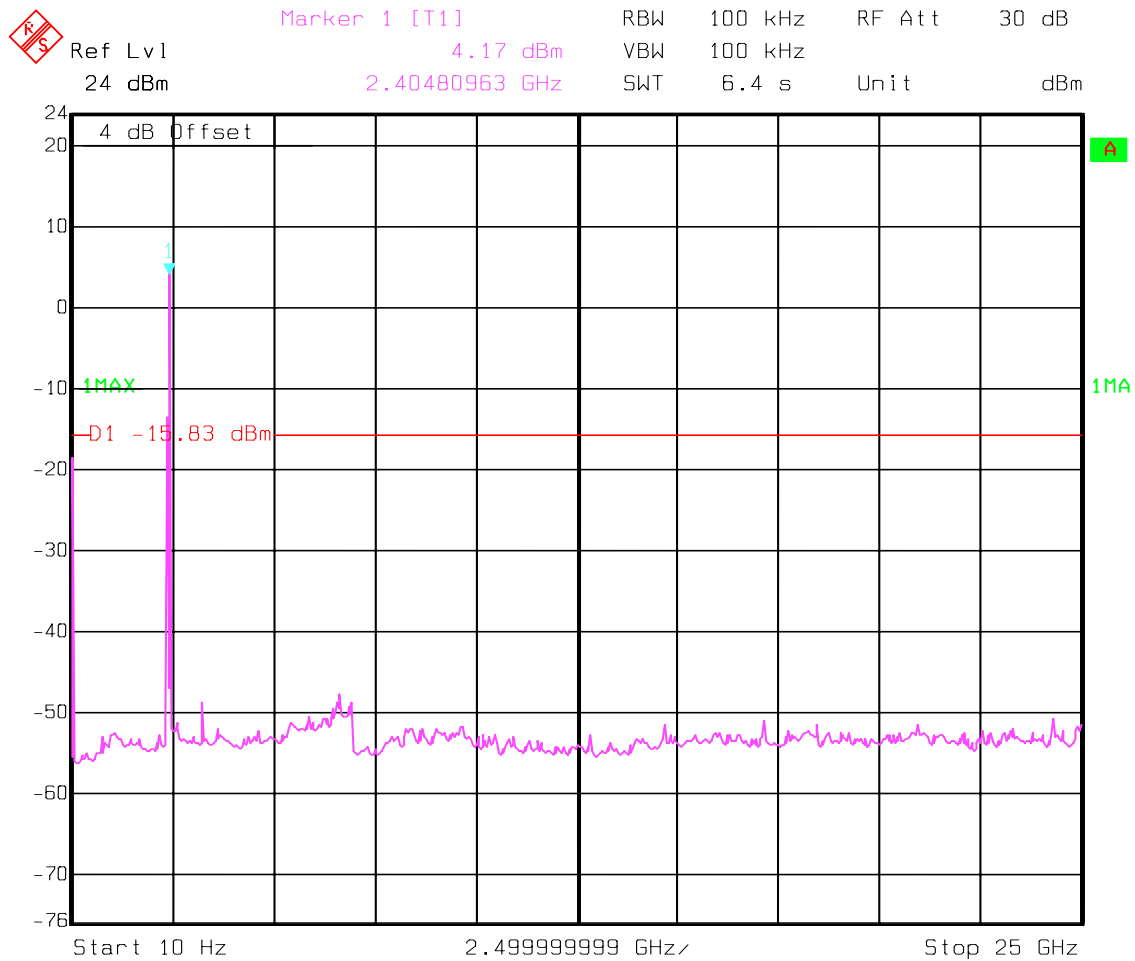
**NOTE: Frequency resolution is not fine enough to show the exact frequency of the carrier.**

EMISSION LIMITATIONS - Conducted (Transmitter)

§ 15.247 (c) (1)

Lowest Channel (2412MHz): 10MHz - 25GHz

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



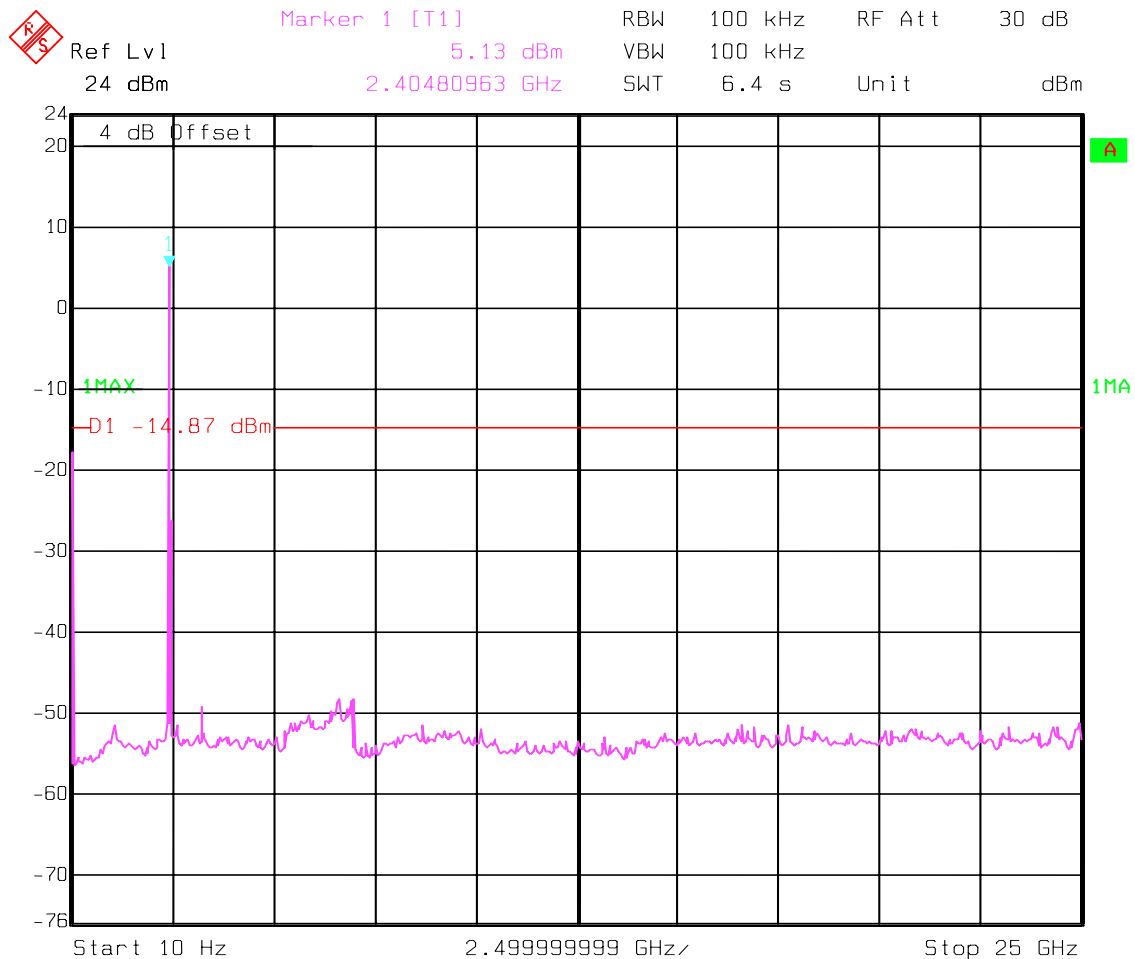
Date: 02.JAN.2003 12:12:48

## EMISSION LIMITATIONS - Conducted (Transmitter)

§ 15.247 (c) (1)

### Mid Channel (2437MHz): 10MHz - 25GHz

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



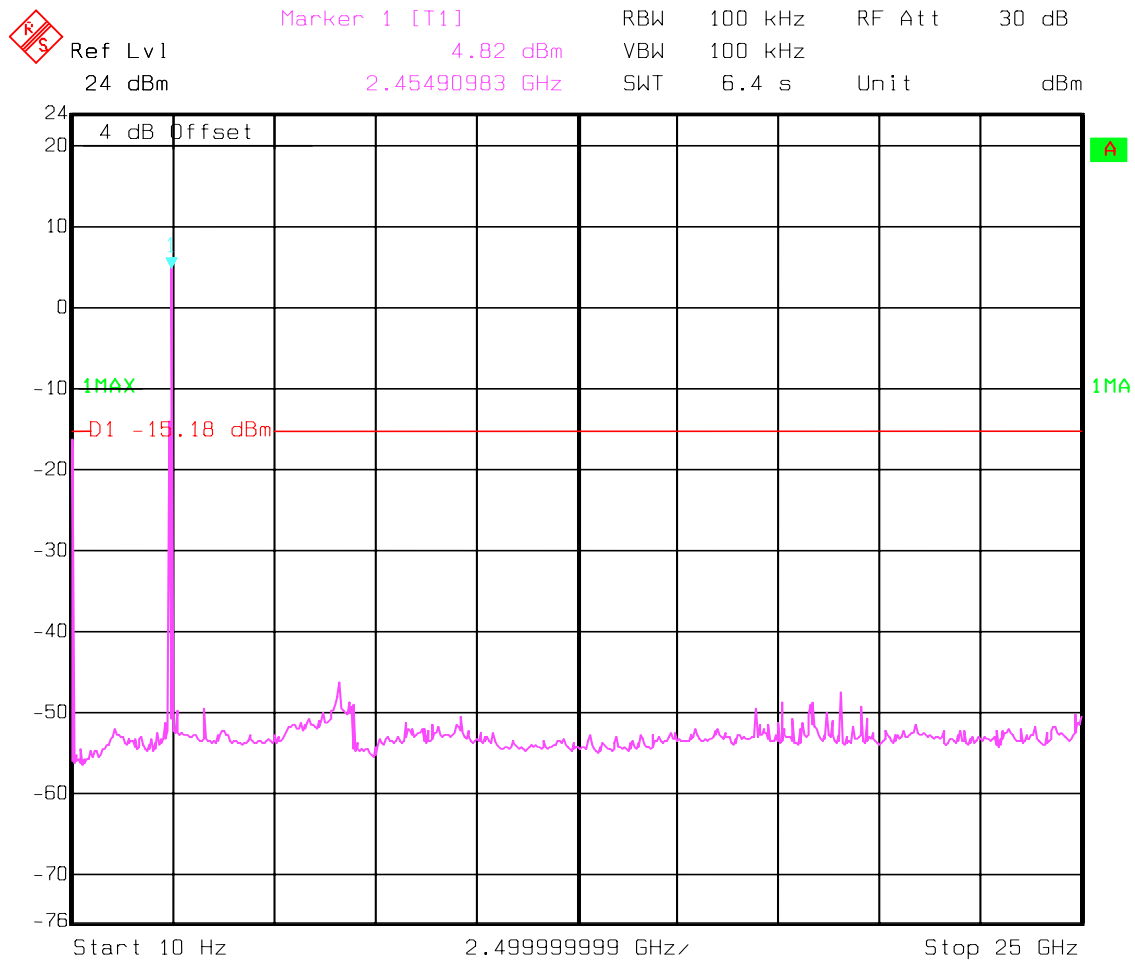
Date: 02.JAN.2003 12:11:18

EMISSION LIMITATIONS - Conducted (Transmitter)

§ 15.247 (c) (1)

Highest Channel (2462MHz): 10MHz - 25GHz

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



Date: 02.JAN.2003 12:09:39

**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**

<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)**

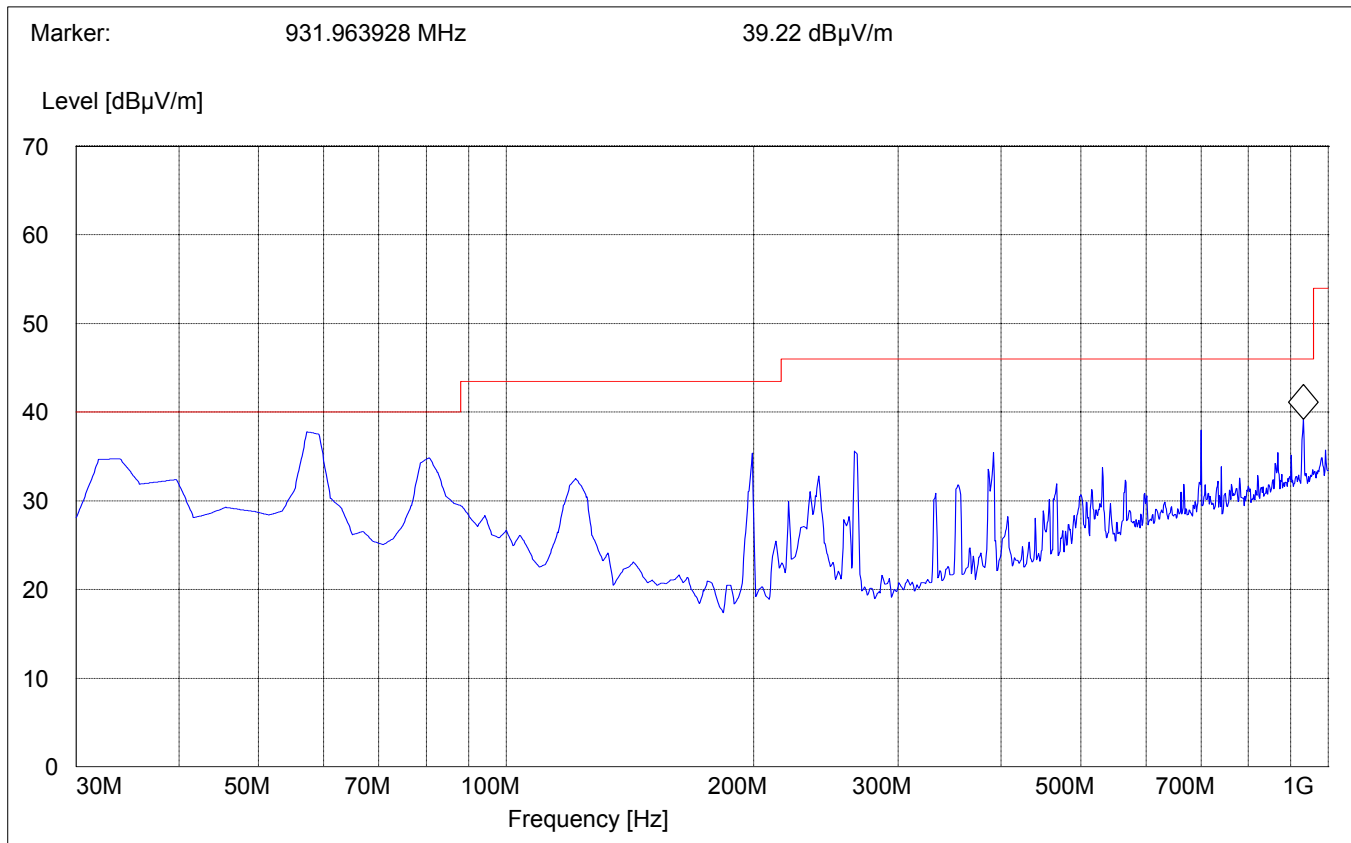
**Note: All radiated measurements were made in all three orthogonal planes. The values reported are the maximum values.**

<b>Transmit at Lowest channel Frequency 2402MHz</b>			
<b>Frequency (MHz)</b>	<b>Level (dBµV/m)</b>		
	<b>Peak</b>	<b>Quasi-Peak</b>	<b>Average</b>
<i>See plots</i>			
<b>Transmit at Middle channel Frequency 2440MHz</b>			
<b>Frequency (MHz)</b>	<b>Level (dBµV/m)</b>		
	<b>Peak</b>	<b>Quasi-Peak</b>	<b>Average</b>
<i>See plots</i>			
<b>Transmit at Highest channel Frequency 2480MHz</b>			
<b>Frequency (MHz)</b>	<b>Level (dBµV/m)</b>		
	<b>Peak</b>	<b>Quasi-Peak</b>	<b>Average</b>
<i>See plots</i>			

**EMISSION LIMITATIONS - Radiated (Transmitter)**  
**Lowest Channel (2412MHz): 30MHz – 1GHz**

§ 15.247 (c) (1)

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)**

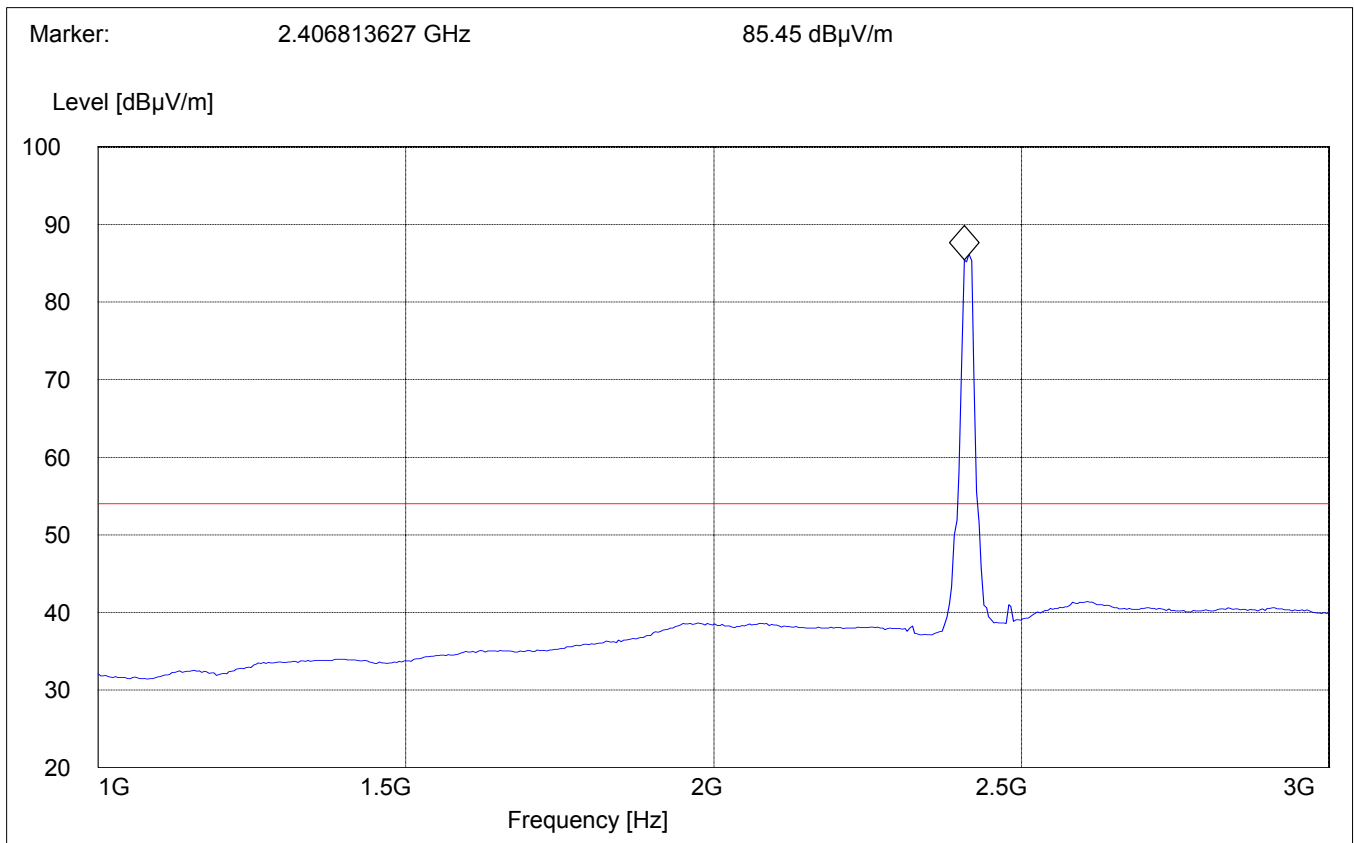
**§ 15.247 (c) (1)**

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

**Average Measurement with VBW=10Hz**

SWEEP TABLE:		"BT Spuri hi 1-3G"				
Short Description:		Bluetooth Spurious 1-3GHz				
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)

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





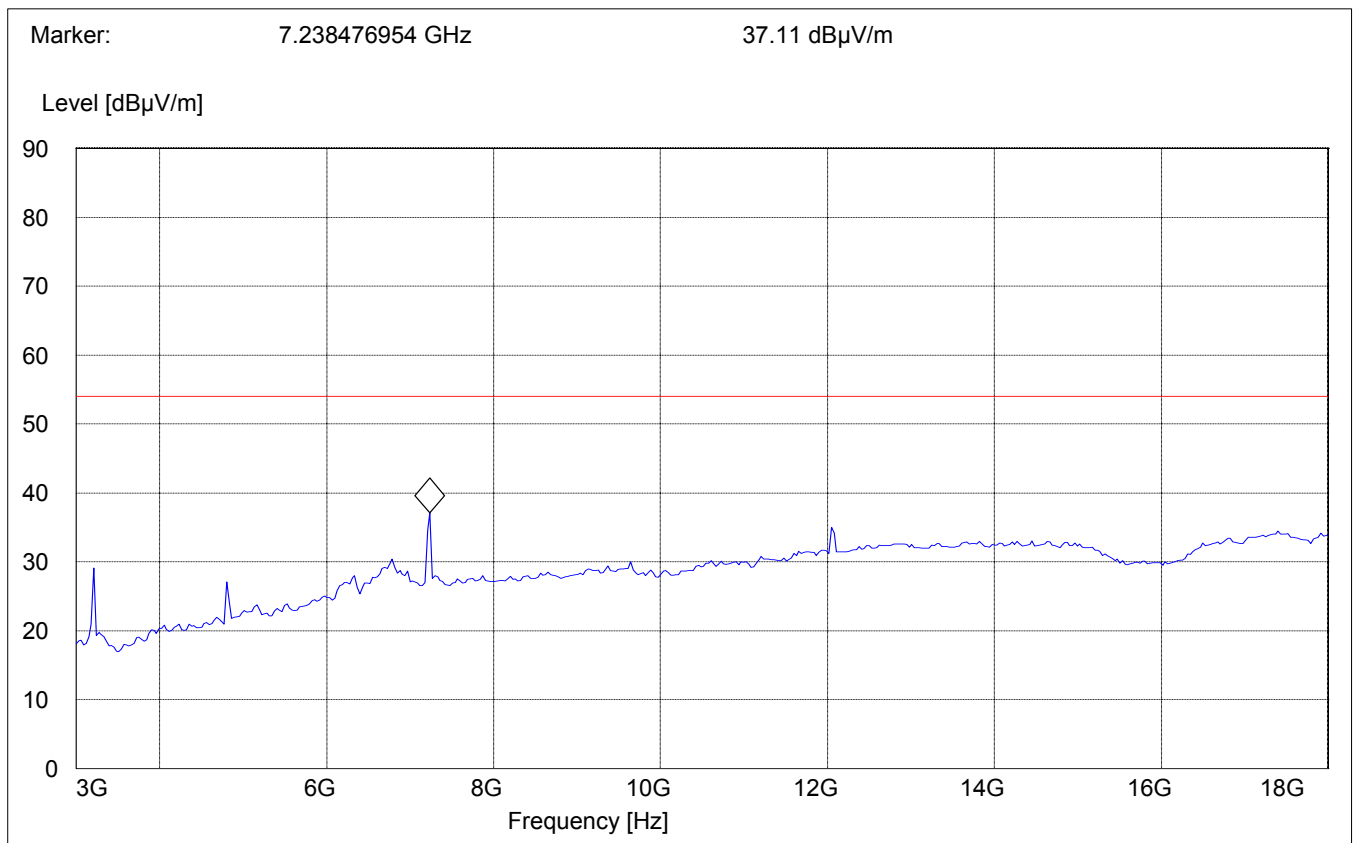
**EMISSION LIMITATIONS - Radiated (Transmitter)**

**§ 15.247 (c) (1)**

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

**Average Measurement with VBW=10Hz**

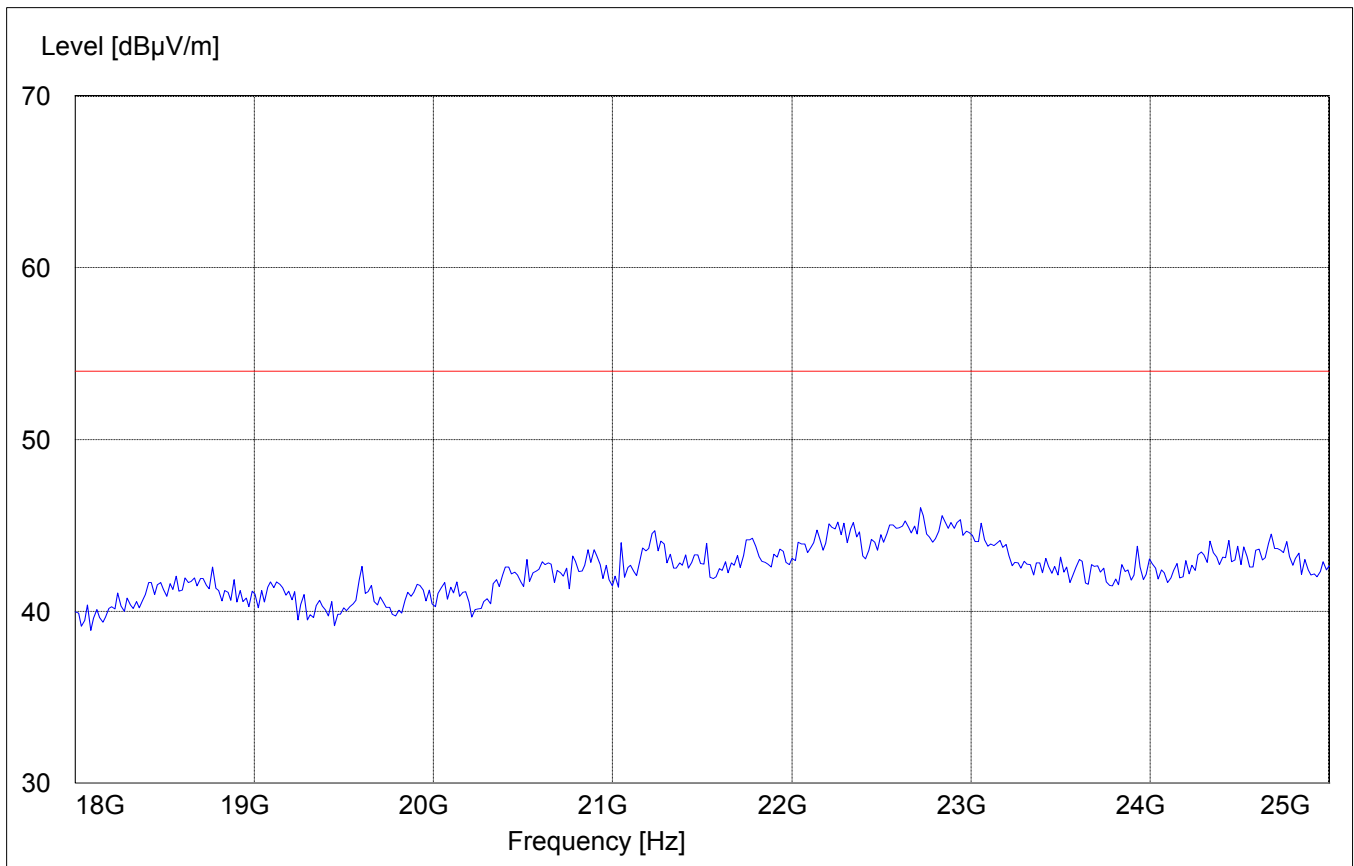
SWEEP TABLE:		"BT Spuri hi 3-18G"				
Short Description:		Bluetooth Spurious 3-18GHz				
Start	Stop	Detector	Meas.	RBW		Transducer
Frequency	Frequency	Time	Bandw.		VBW	
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	10Hz	#326 horn (dBi)



**EMISSION LIMITATIONS - Radiated (Transmitter)**  
**Lowest Channel (2412MHz): 18GHz – 25GHz**

§ 15.247 (c) (1)

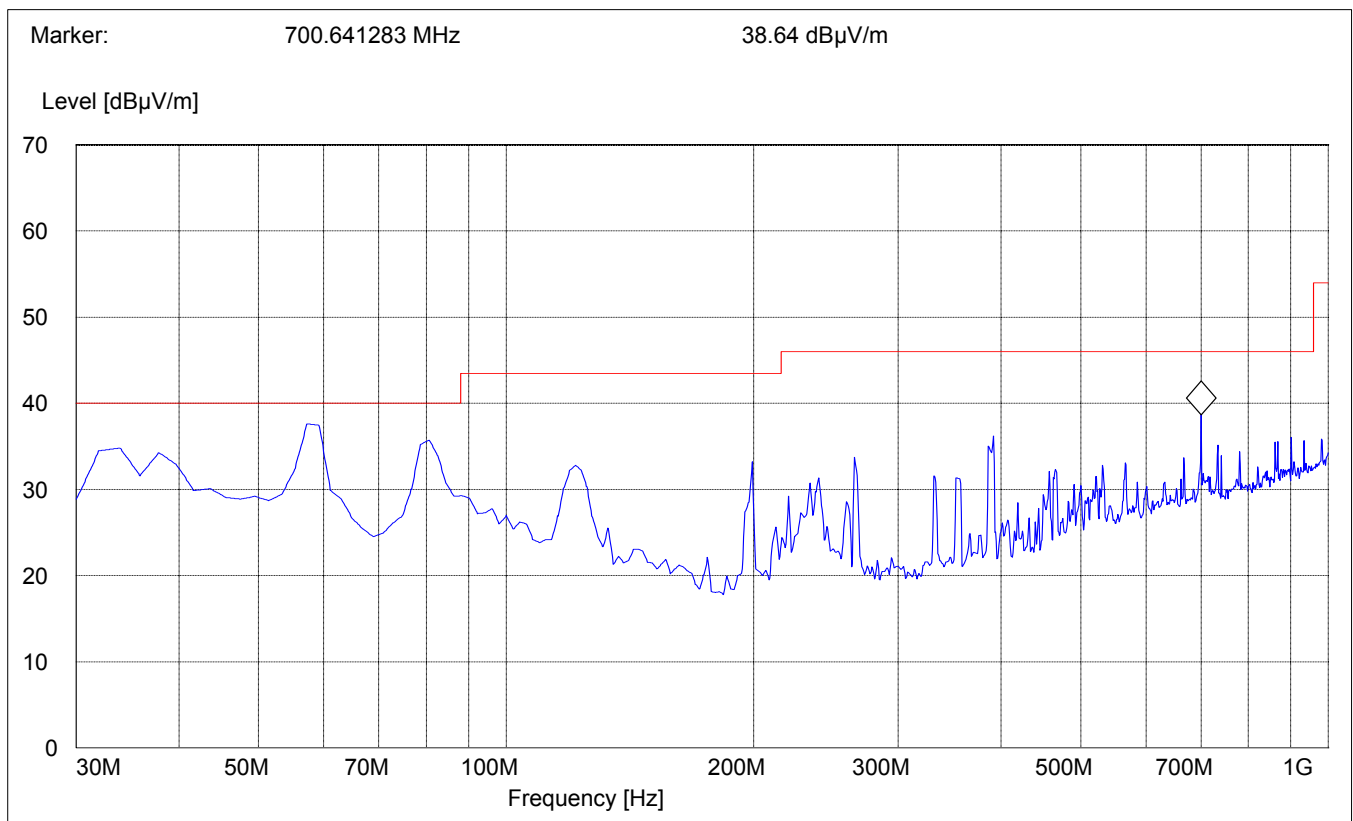
SWEEP TABLE:		"BT Spuri hi 18-25G"			
Short Description:		Bluetooth Spurious 18-25GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
18 GHz	25 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)



**EMISSION LIMITATIONS - Radiated (Transmitter)**  
**Mid Channel (2437MHz): 30MHz – 1GHz**

§ 15.247 (c) (1)

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)**

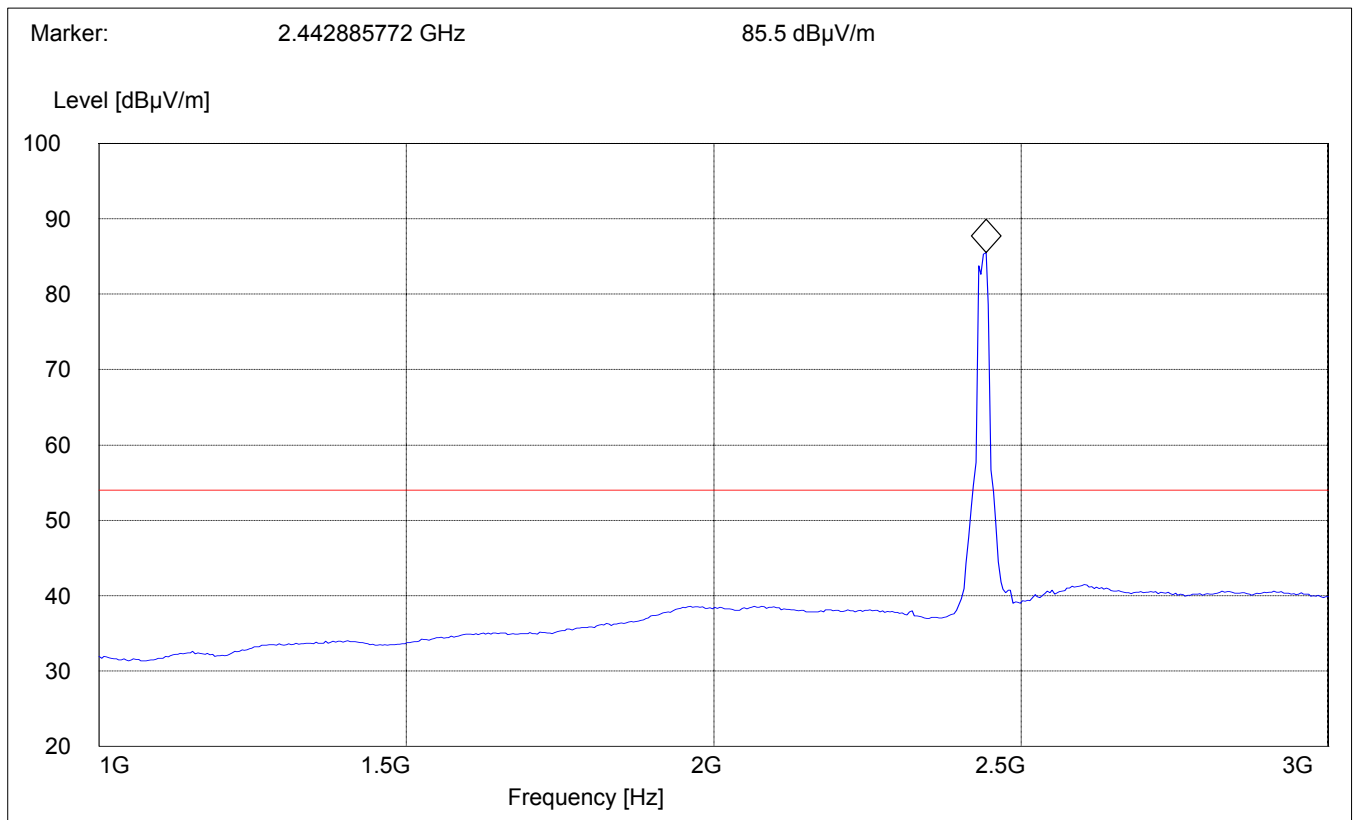
**§ 15.247 (c) (1)**

**Mid Channel (2437MHz): 1GHz – 3GHz**

**Average Measurement with VBW=10Hz**

SWEEP TABLE:		"BT Spuri hi 1-3G"				
Short Description:		Bluetooth Spurious 1-3GHz				
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)

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



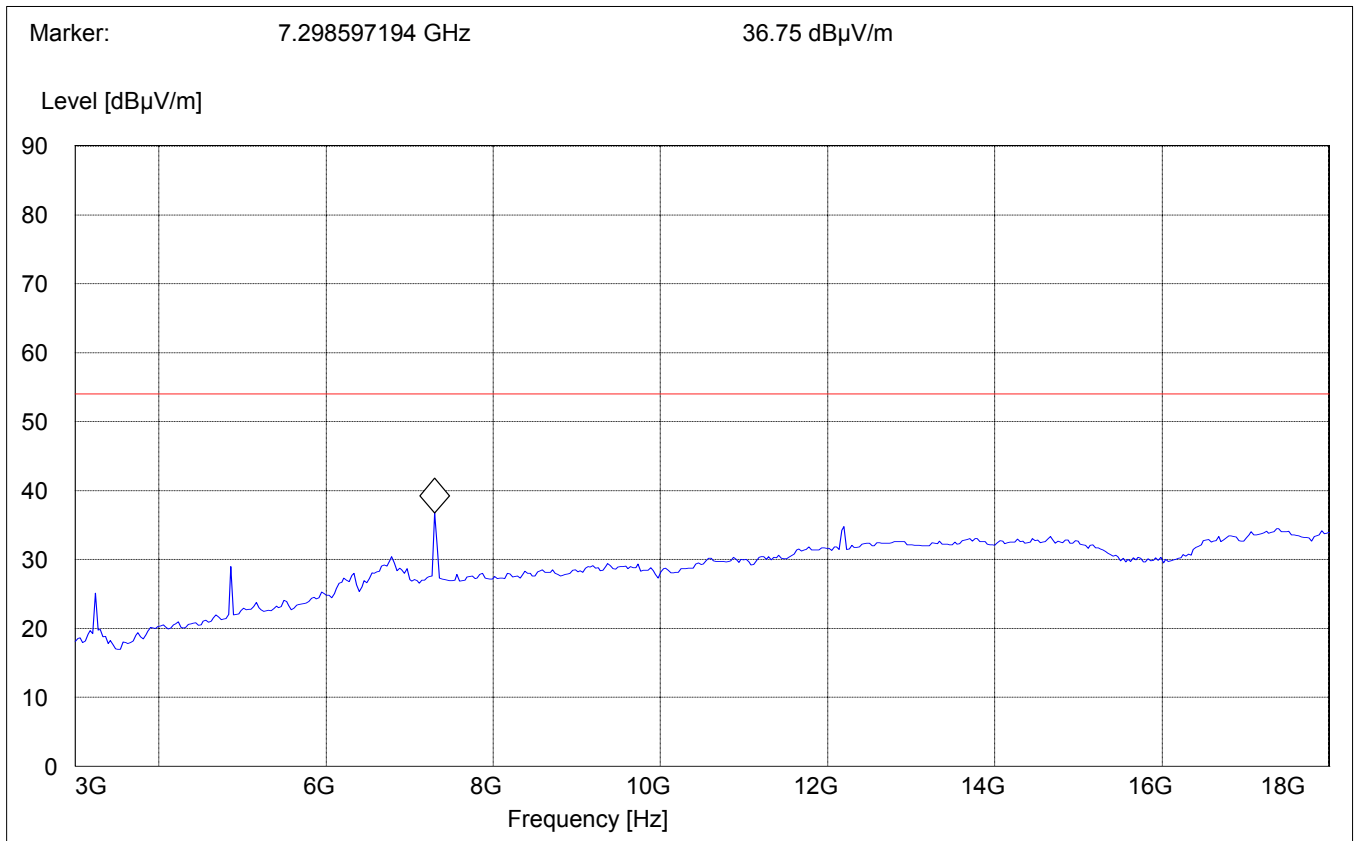
**EMISSION LIMITATIONS - Radiated (Transmitter)**

**§ 15.247 (c) (1)**

**Mid Channel (2437MHz): 3GHz – 18GHz**

**Average Measurement with VBW=10Hz**

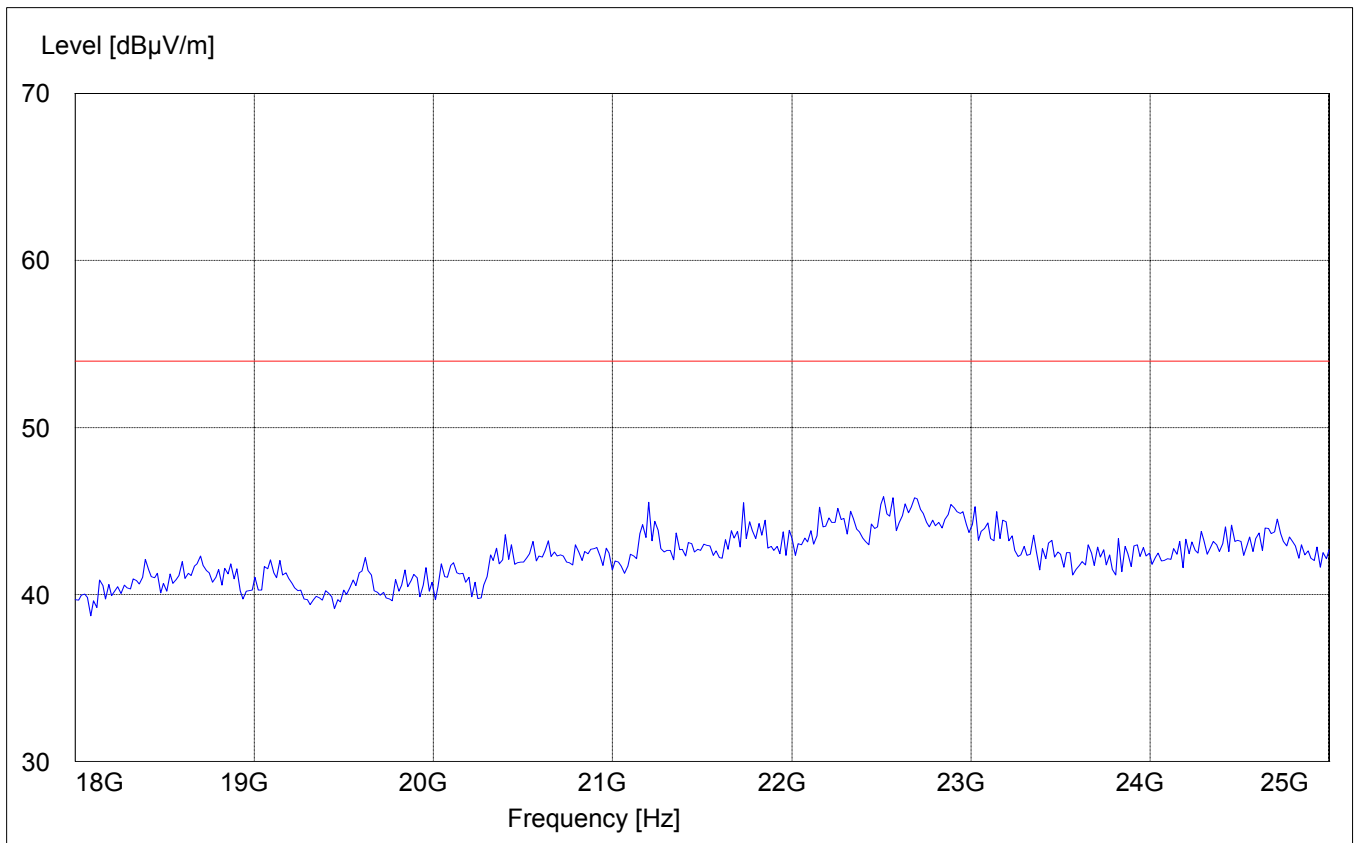
SWEEP TABLE:		"BT Spuri hi 3-18G"				
Short Description:		Bluetooth Spurious 3-18GHz				
Start	Stop	Detector	Meas.	RBW	Transducer	
Frequency	Frequency	Time	Bandw.			
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	10Hz	#326 horn (dBi)



**EMISSION LIMITATIONS - Radiated (Transmitter)**  
**Mid Channel (2437MHz): 18GHz – 25GHz**

§ 15.247 (c) (1)

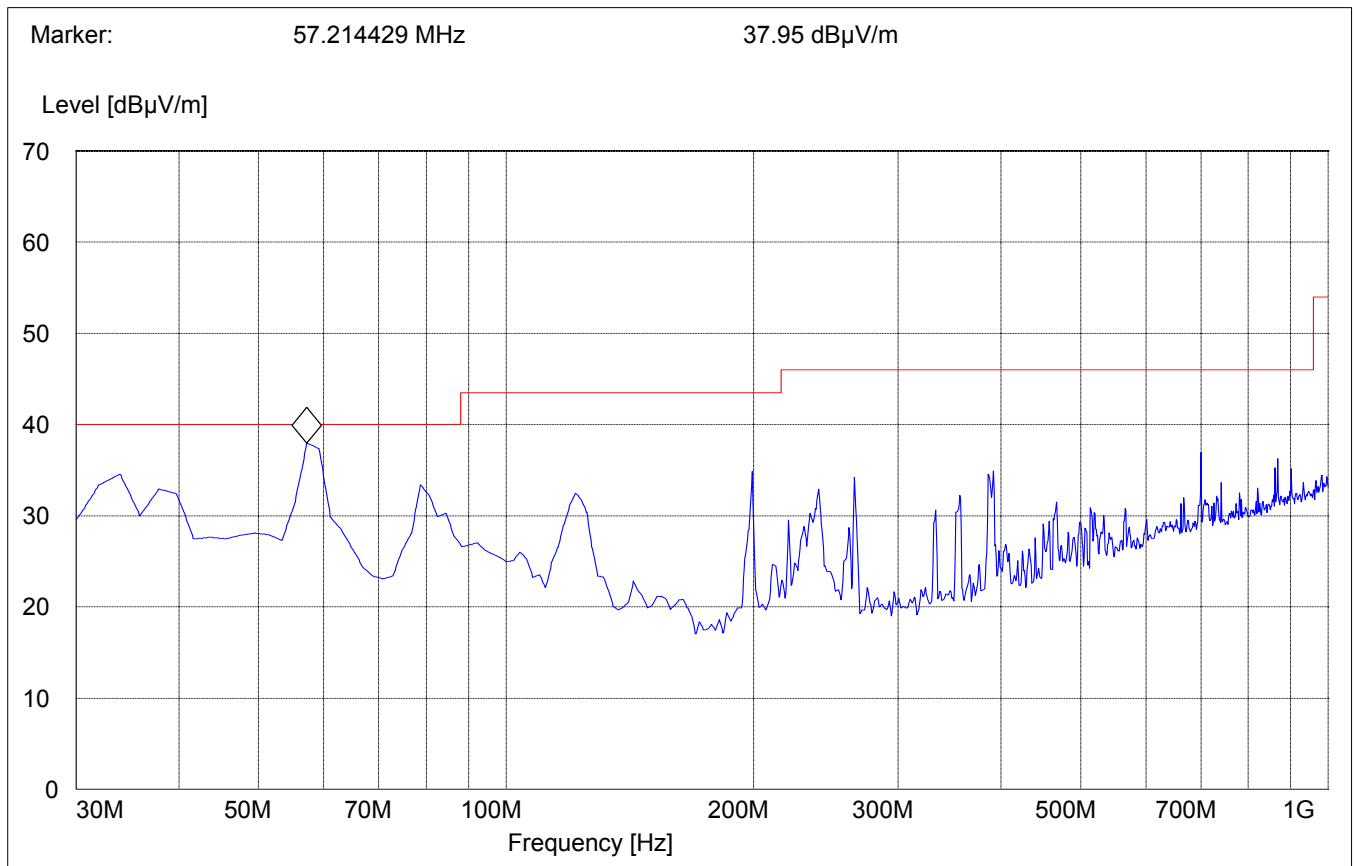
SWEEP TABLE:		"BT Spuri hi 18-25G"			
Short Description:		Bluetooth Spurious 18-25GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
18 GHz	25 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)



**EMISSION LIMITATIONS - Radiated (Transmitter)**  
**Highest Channel (2462MHz): 30MHz – 1GHz**

§ 15.247 (c) (1)

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)**

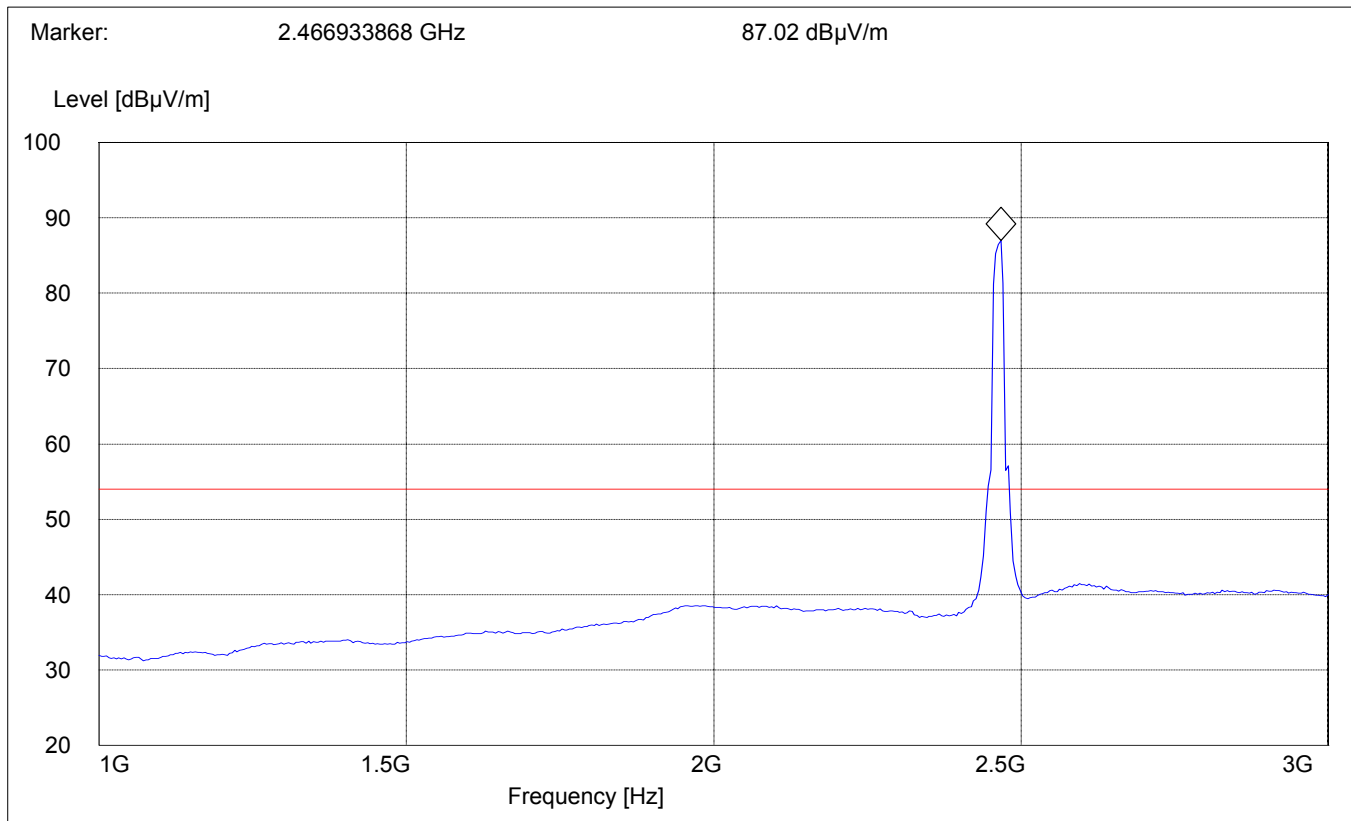
**§ 15.247 (c) (1)**

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

**Average Measurement with VBW=10Hz**

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

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





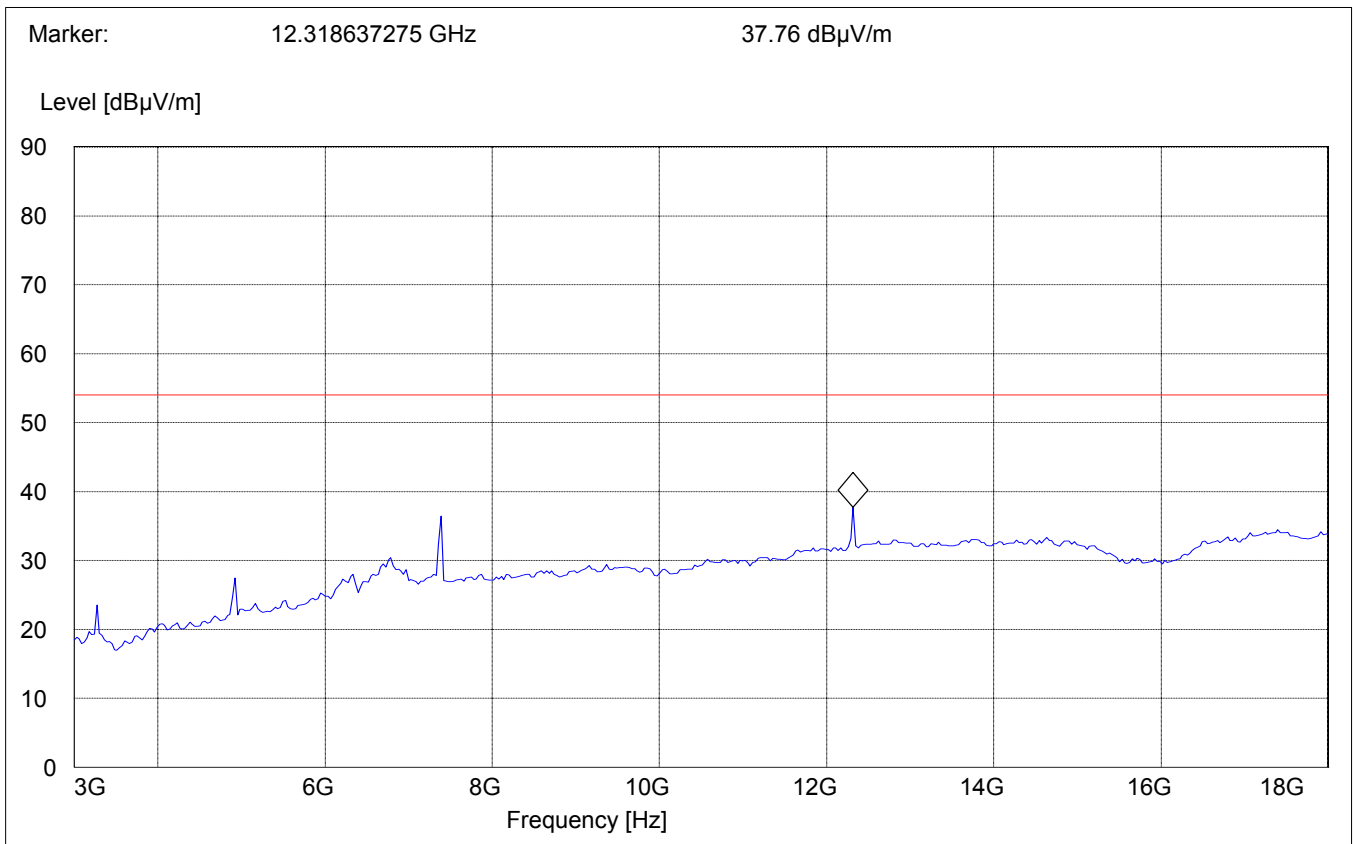
**EMISSION LIMITATIONS - Radiated (Transmitter)**

**§ 15.247 (c) (1)**

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

**Average Measurement with VBW=10Hz**

SWEEP TABLE:		"BT Spuri hi 3-18G"				
Short Description:		Bluetooth Spurious 3-18GHz				
Start	Stop	Detector	Meas.	RBW		Transducer
Frequency	Frequency	Time	Bandw.		VBW	
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	10Hz	#326 horn (dBi)

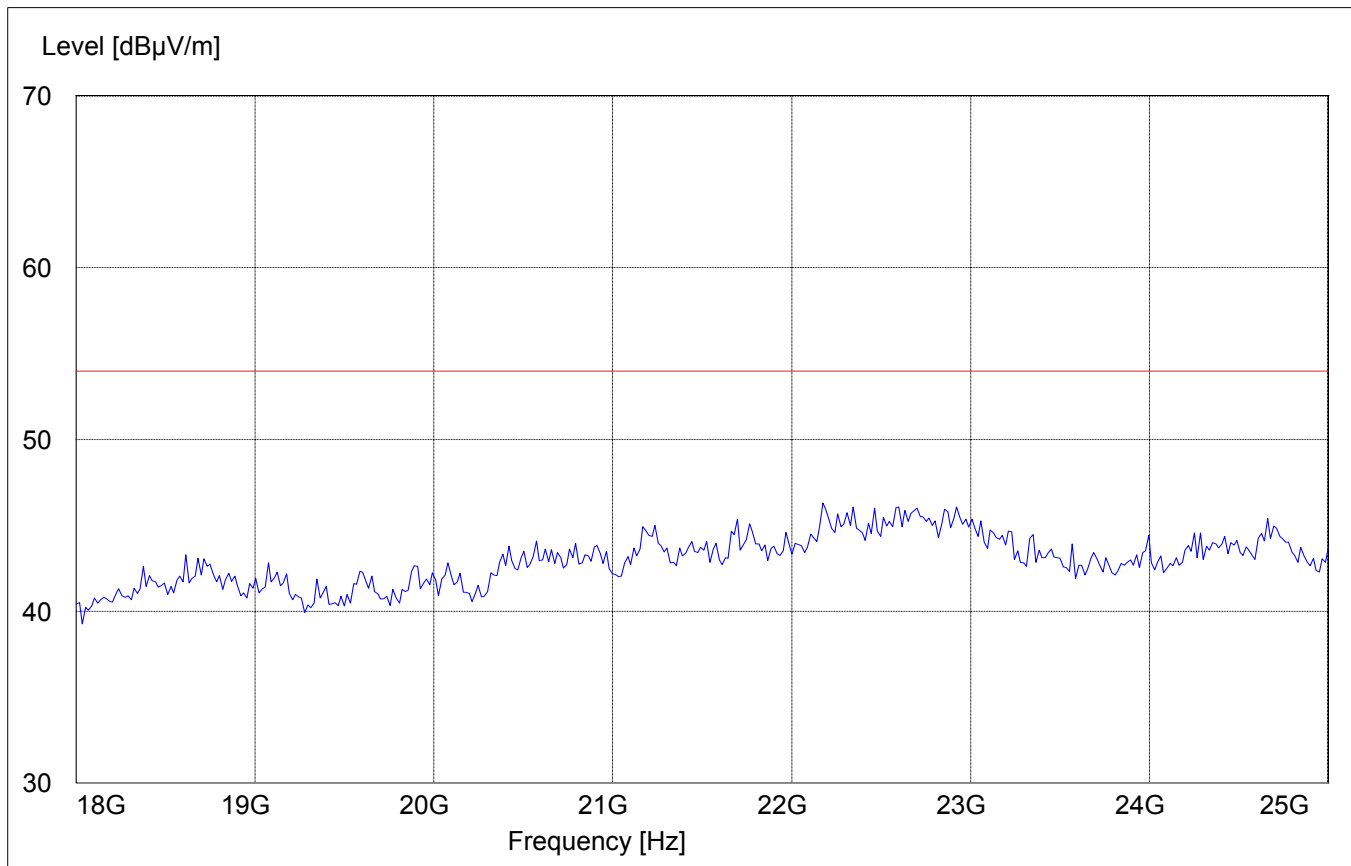


**EMISSION LIMITATIONS - Radiated (Transmitter)**

**§ 15.247 (c) (1)**

**Highest Channel (2462MHz): 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 GHz	25 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)

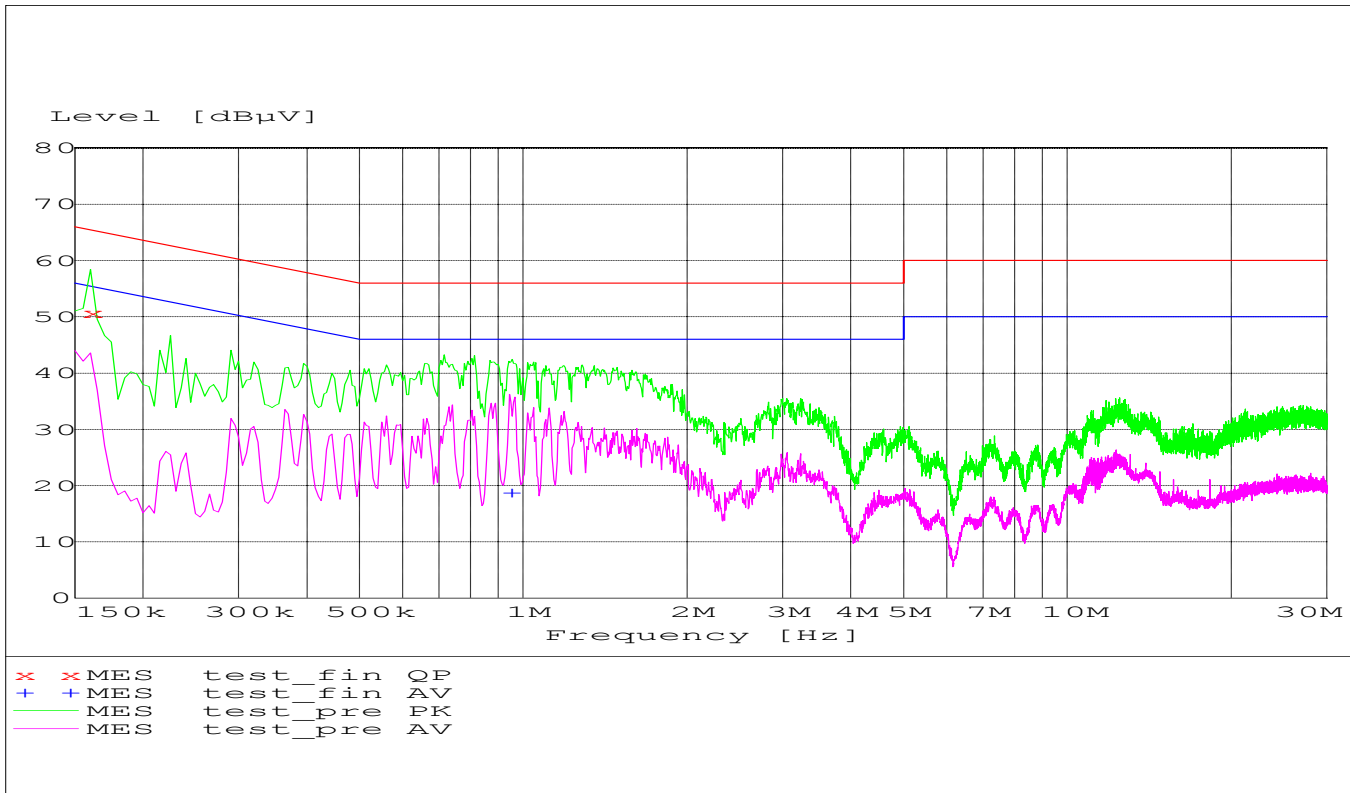
**Limit**

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



**MEASUREMENT RESULT: "test\_fin QP"**

3/3/03 3:00PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.160000	50.60	0.0	66	14.9	N	FLO

**MEASUREMENT RESULT: "test\_fin AV"**

3/3/03 3:00PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.945000	18.80	0.0	46	27.2	N	FLO

**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>

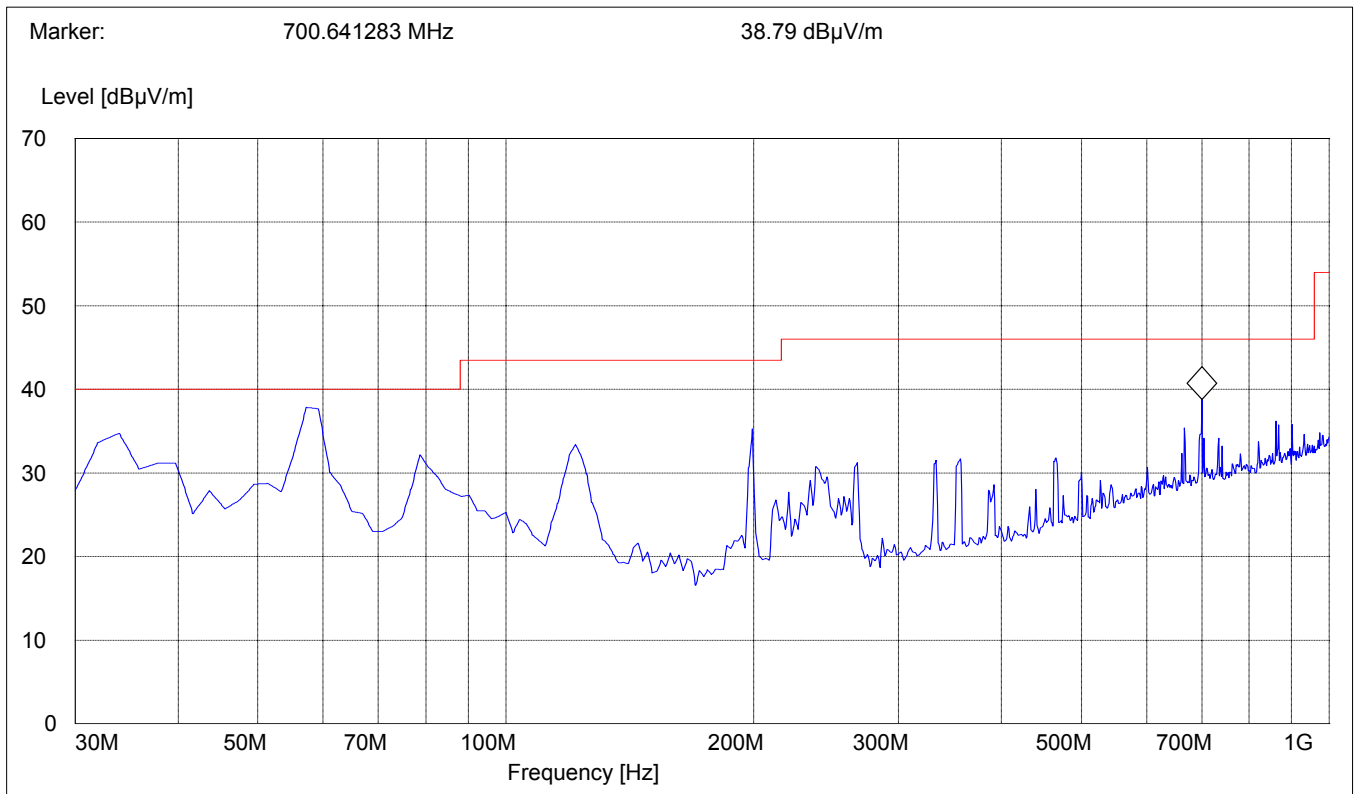
**NOTE:**

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.

**RECEIVER SPURIOUS RADIATION**  
**30MHz – 1GHz**

§ 15.209

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



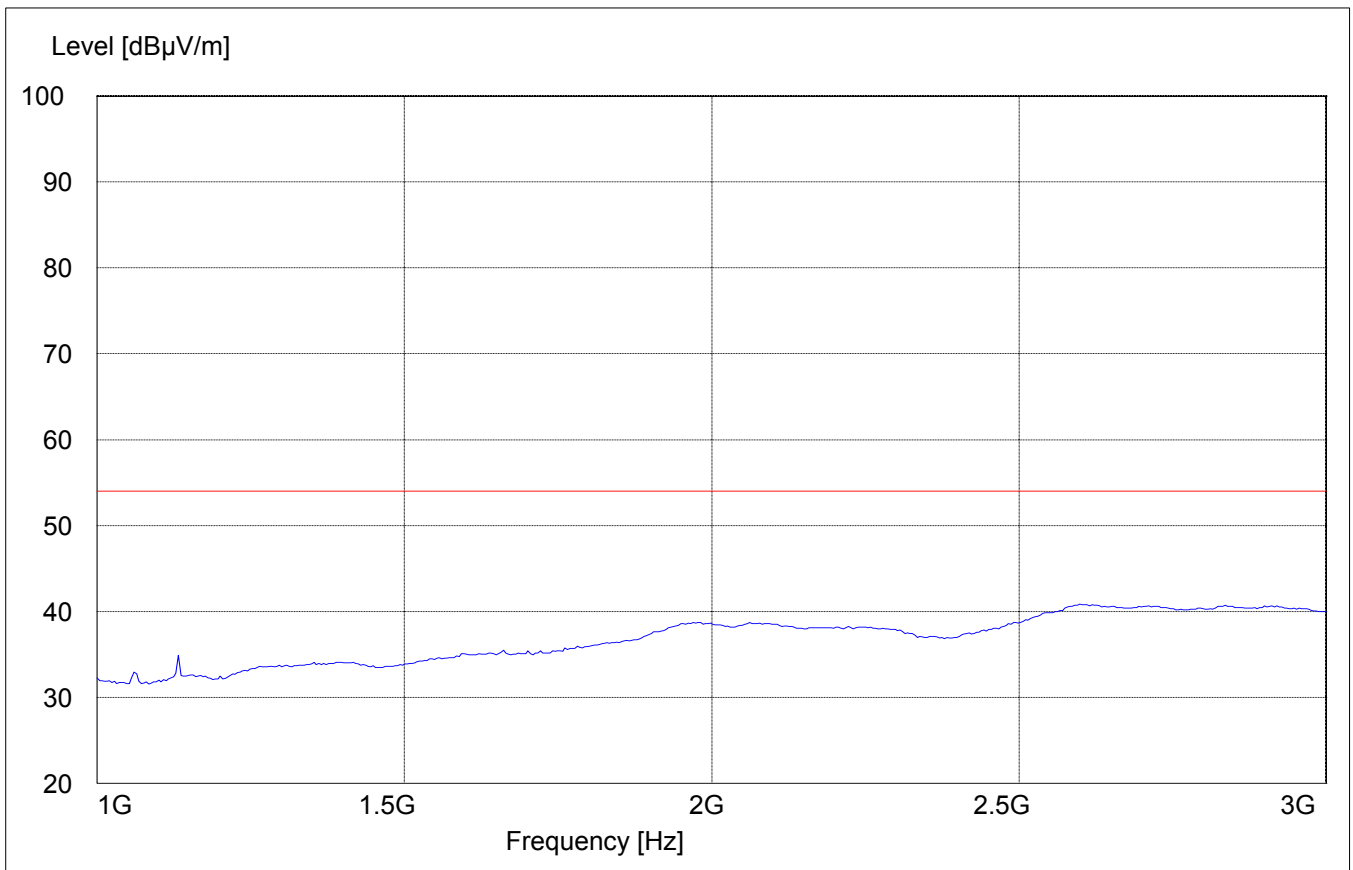
**RECEIVER SPURIOUS RADIATION**

**§ 15.209**

**1GHz – 3GHz**

**Average Measurement with VBW=10Hz**

SWEEP TABLE:		"BT Spuri hi 1-3G"				
Short Description:		Bluetooth Spurious 1-3GHz				
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)



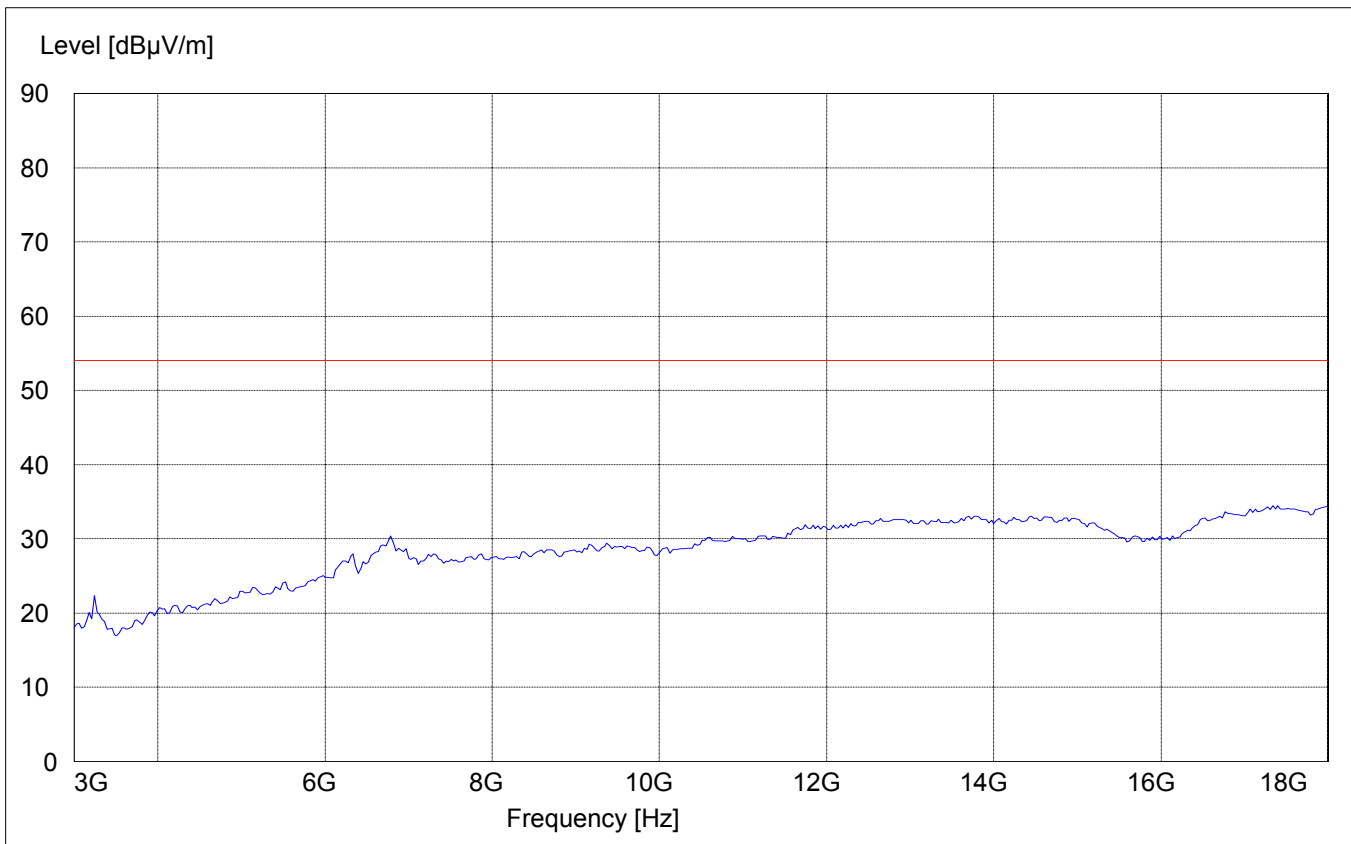
RECEIVER SPURIOUS RADIATION

§ 15.209

3GHz – 18GHz

Average Measurement with VBW=10Hz

SWEEP TABLE:		"BT Spuri hi 3-18G"				
Short Description:		Bluetooth Spurious 3-18GHz				
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)

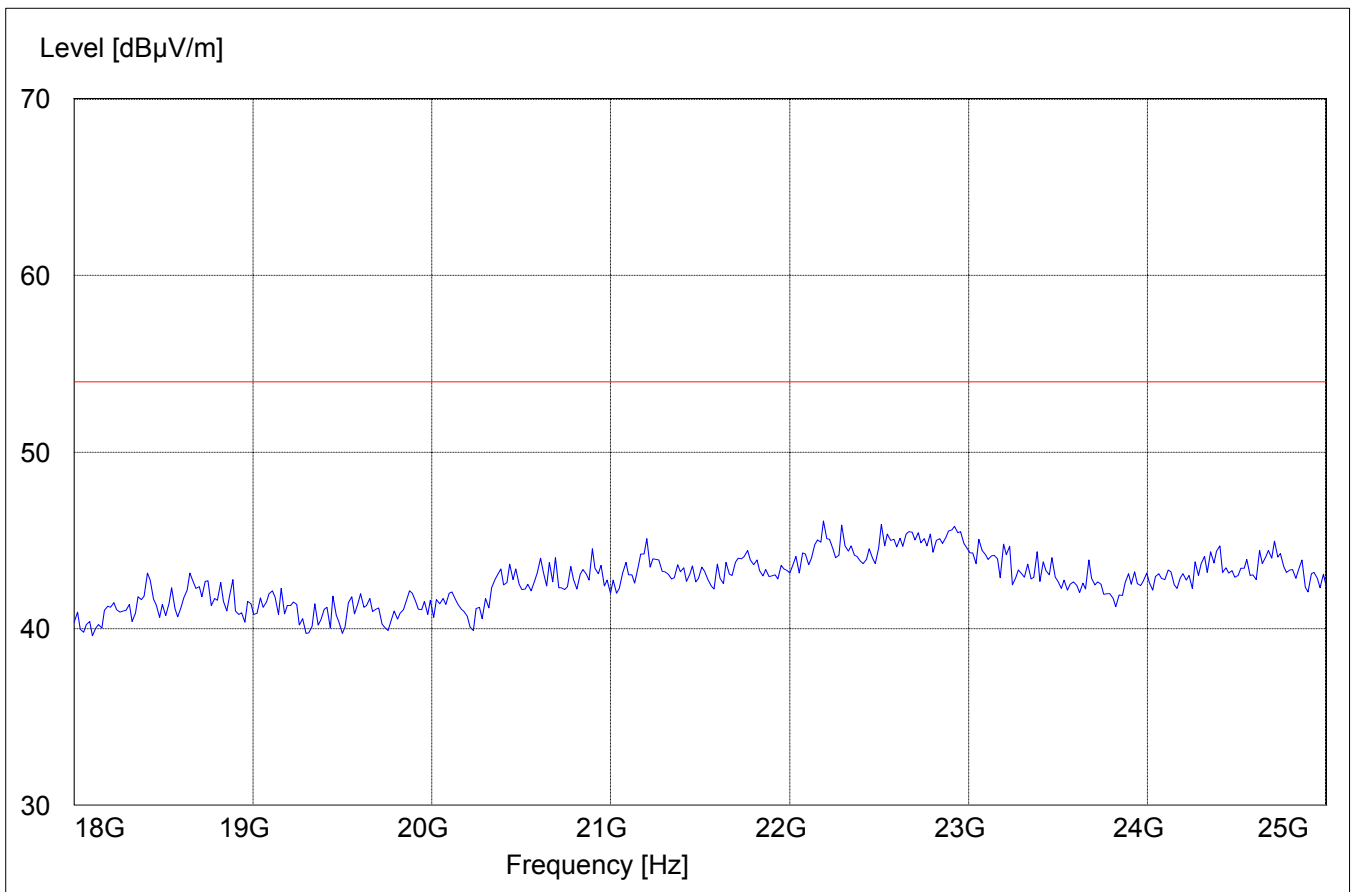




**RECEIVER SPURIOUS RADIATION**  
**18GHz – 25GHz**

§ 15.209

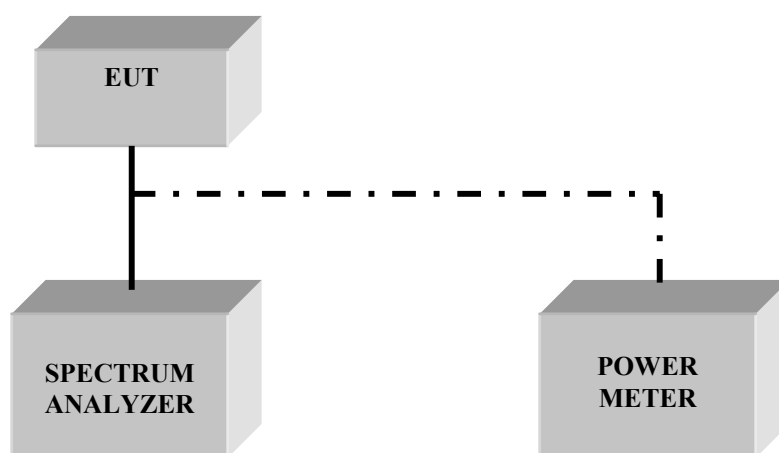
SWEEP TABLE:		"BT Spuri hi 18-25G"			
Short Description:		Bluetooth Spurious 18-25GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
18 GHz	25 GHz	MaxPeak	Coupled	1 MHz	#141 horn (dBi)



**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>	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	826880/010
<b>03</b>	Signal Generator	SMY02	Rohde & Schwarz	836878/011
<b>04</b>	Power-Meter	EPM-442A	Hewlett Packard	GB37170232
<b>05</b>	Power Amplifier	250W1000	Amplifier Research	300031
<b>06</b>	Biconilog Antenna	3141	EMCO	0005-1186
<b>07</b>	Horn Antenna	SAS-200/571	AH Systems	325
<b>08</b>	Power Splitter	11667B	Hewlett Packard	645348
<b>09</b>	Climatic Chamber	VT4004	Votch	G1115
<b>10</b>	Pre-Amplifier	JS4-00102600	Miteq	00616
<b>11</b>	2-3GHz band reject filter	BRM50701	Microtronics	NA
<b>12</b>	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807

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



**Radiated Testing**

**ANECHOIC CHAMBER**

