



# FCC Test Report

Test report no.: EMC\_544FCC15.247\_2003\_KM8

FCC Part 15.247 for DSSS systems / CANADA RSS-210

EUT: Tablet PC      Model: iX104-CDMA  
with WLAN          Model: KM8  
FCC ID: Q2GIX104-114  
IC ID: 4596A-iX104-CDMA



Accredited according to ISO/IEC 17025



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  
City / Zip Code : Austin, TX 78728  
Country : USA  
Contact : Douglas L. Fowler  
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Tele-fax : +1 512 336 7791  
e-mail : [dfowler@xploretech.com](mailto:dfowler@xploretech.com)

**1.4 Application details**

Date of receipt test item : 2003-09-02  
Date of test : 2002-09-03/04

**1.5 Test item**

EUT Manufacturer : Applicant  
WLAN Manufacturer : Wistron Neweb Corporation  
Street : No. 10-1, Li-hsin Road I, Science-based Industrial Park  
City / Zip Code : Hsinchu 300  
Country : Taiwan, R.O.C  
Model No. (EUT) : [iX104-CDMA](#)  
Model No. (WLAN) : [KM8](#)  
Description : 802.11b wireless LAN mini PCI card in Tablet PC  
FCC ID : Q2GIX104-114  
IC ID : 4596A-iX104-CDMA

**Additional information**

Frequency : 2412MHz – 2462MHz  
Type of modulation : DSSS  
Number of channels : 11  
Antenna : Embedded  
Output power : 0.083W conducted peak power  
Extreme temp. Tolerance : -20°C to +60°C

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


**NOTE: This test report covers only radiated testing done on Tablet PC model# iX104 with WLAN model# KM8. For all RF Conducted measurements on WLAN please refer to test report# ISL-03LR007FC**

**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:**

2003-10-07	EMC & Radio	Siegfried Lehmann (Technical Manager)	
Date	Section	Name	Signature

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

2003-10-07	EMC & Radio	Harpreet Sidhu (EMC Engineer)	
Date	Section	Name	Signature

**2.2 Test report**

**TEST REPORT**

**Test report no.: EMC\_544FCC15.247\_2003\_KM8**

**EUT: Tablet PC  
with WLAN:**

**Model: iX104-CDMA  
Model: KM8**

**TEST REPORT REFERENCE**

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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 <sub>nom</sub> (23)°C	V <sub>nom</sub>	19.07	18.94	18.66
Measurement uncertainty		±0.5dBm		

**LIMIT**

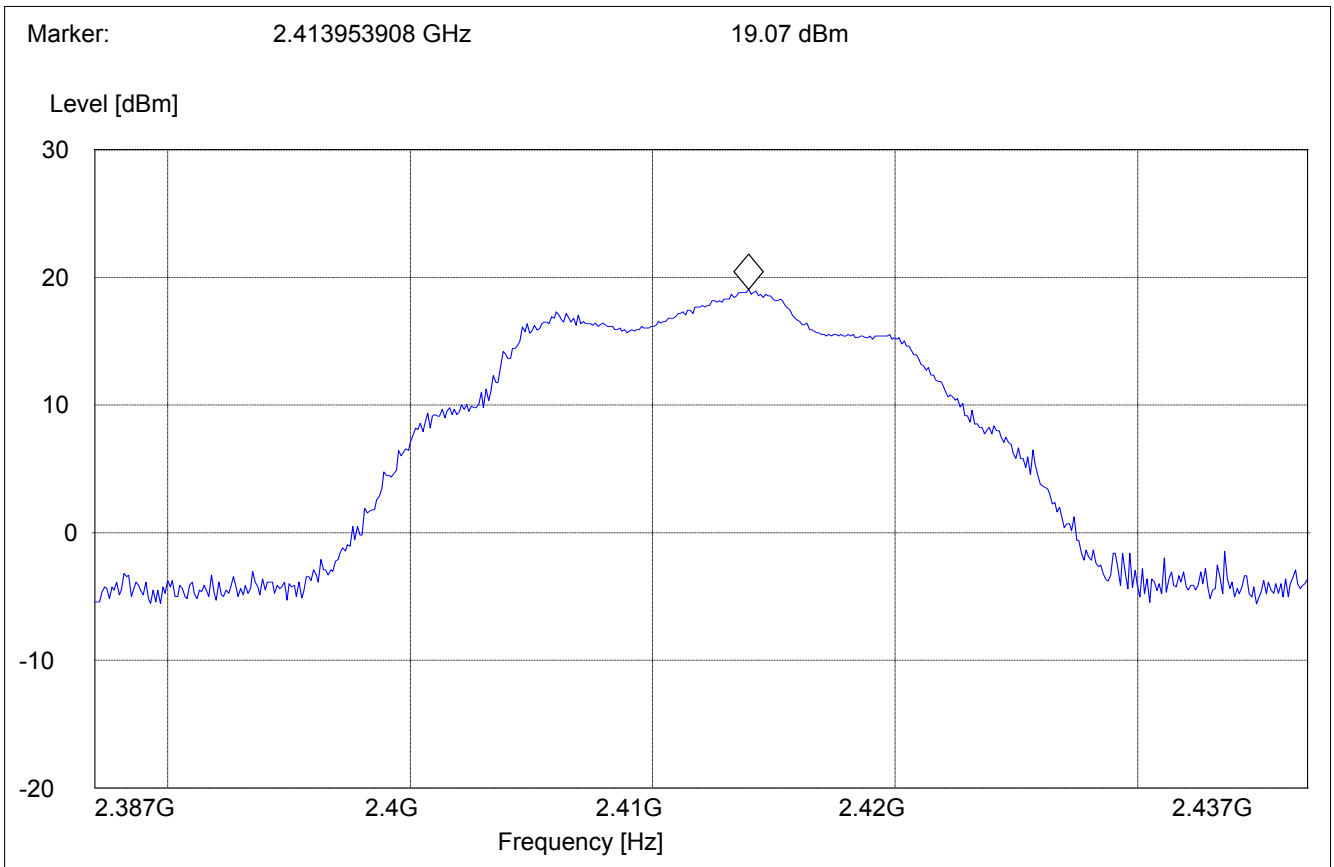
SUBCLAUSE § 15.247 (b) (1)

Frequency range	RF power output
2400-2483.5 MHz	≤30dBm Conducted ≤36dBm Radiated (EIRP)

**ANALYZER SETTINGS: RBW=VBW=10MHz**

**MAXIMUM PEAK OUTPUT POWER  
(RADIATED)  
Low Channel (2412MHz)**

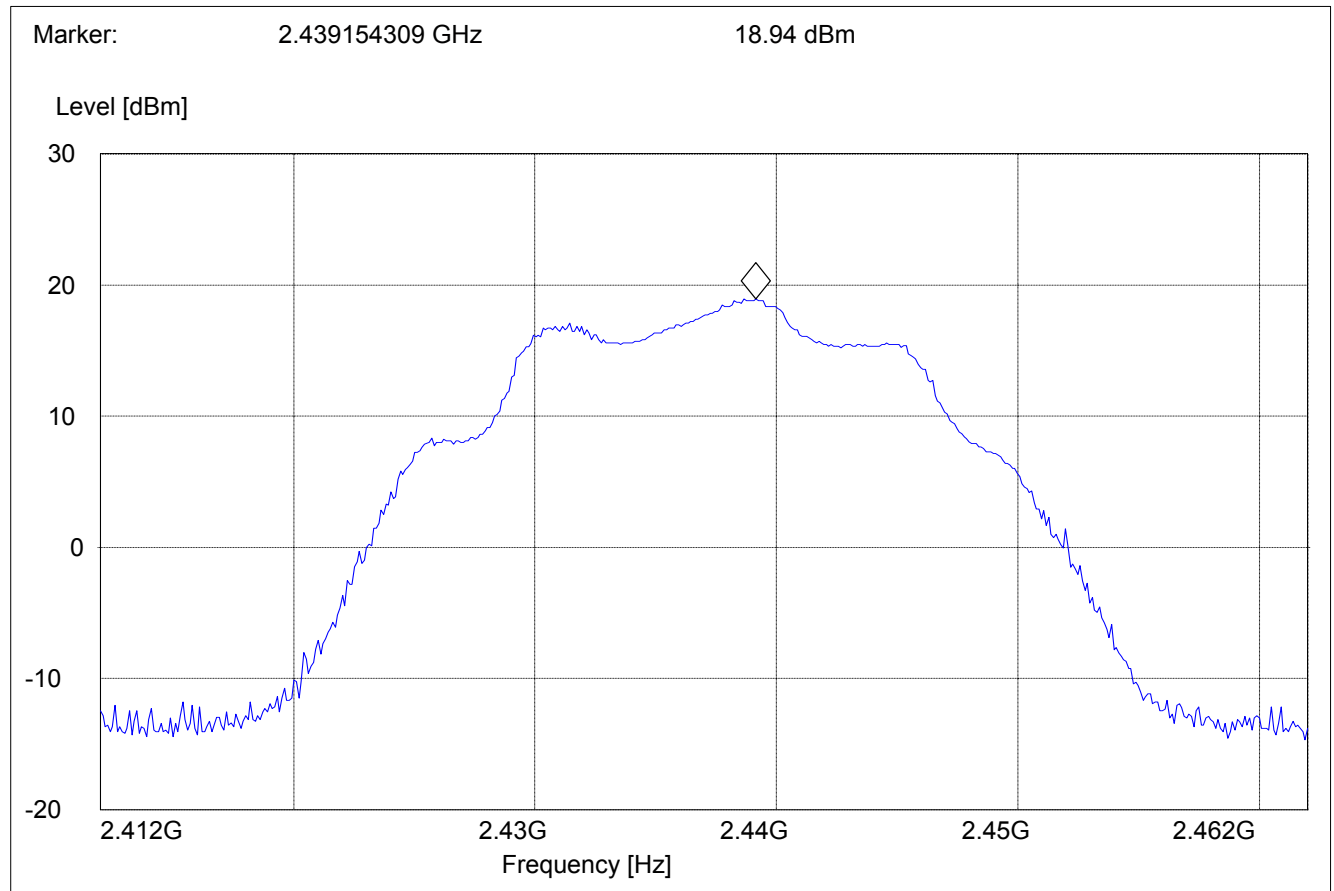
§ 15.247 (b) (1)





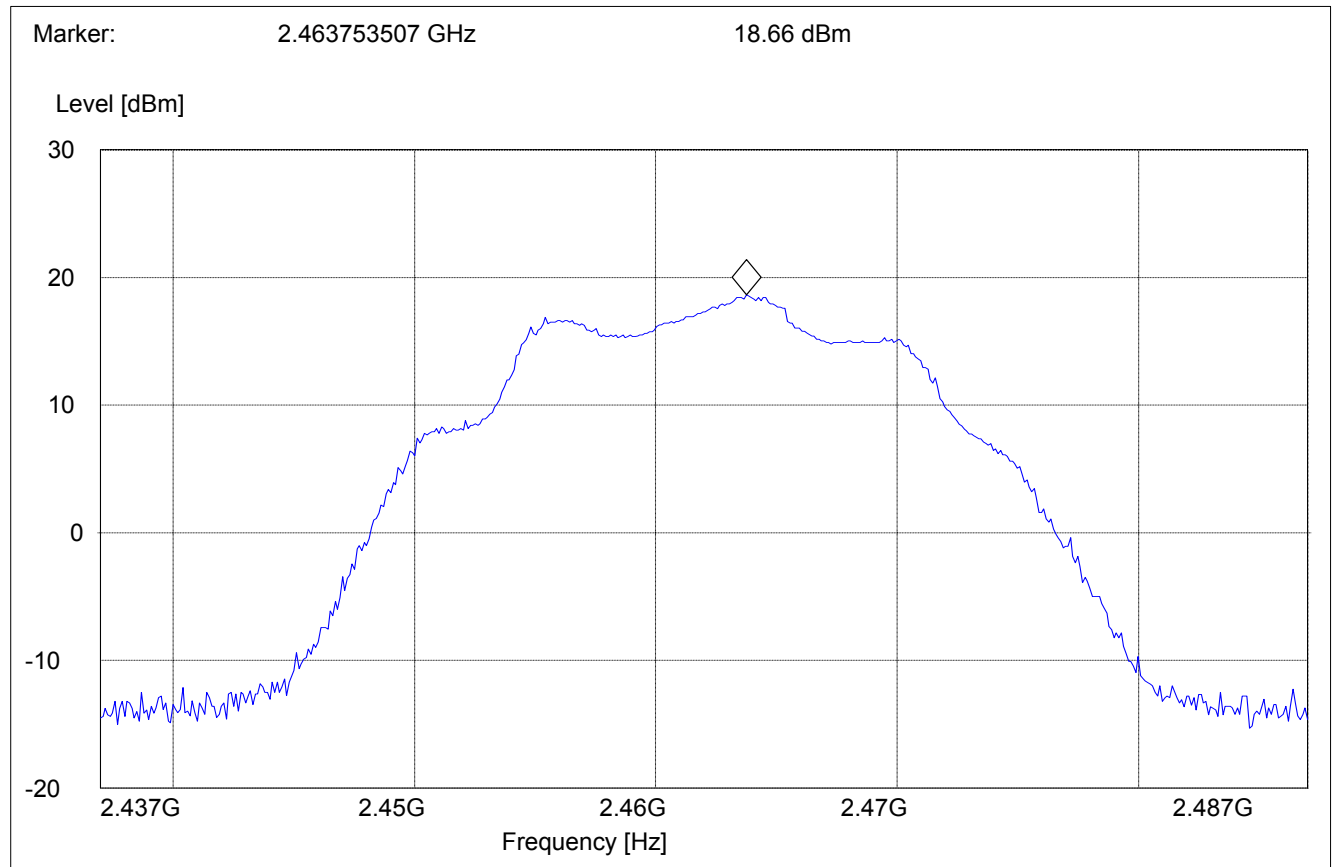
**MAXIMUM PEAK OUTPUT POWER  
(RADIATED)  
Mid Channel (2437MHz)**

§ 15.247 (b) (1)



**MAXIMUM PEAK OUTPUT POWER  
(RADIATED)  
High Channel (2462MHz)**

§ 15.247 (b) (1)



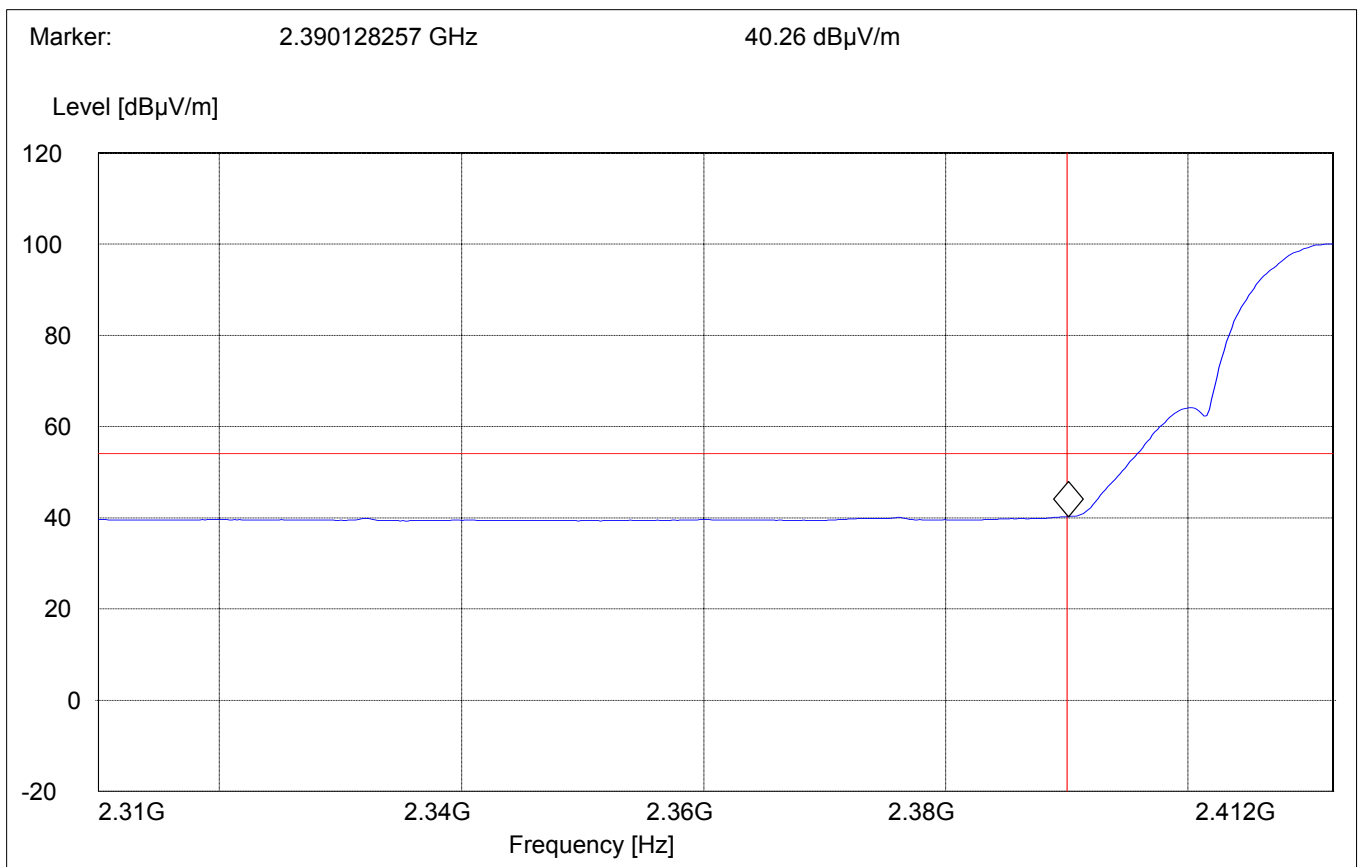
**BAND EDGE COMPLIANCE**

§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)



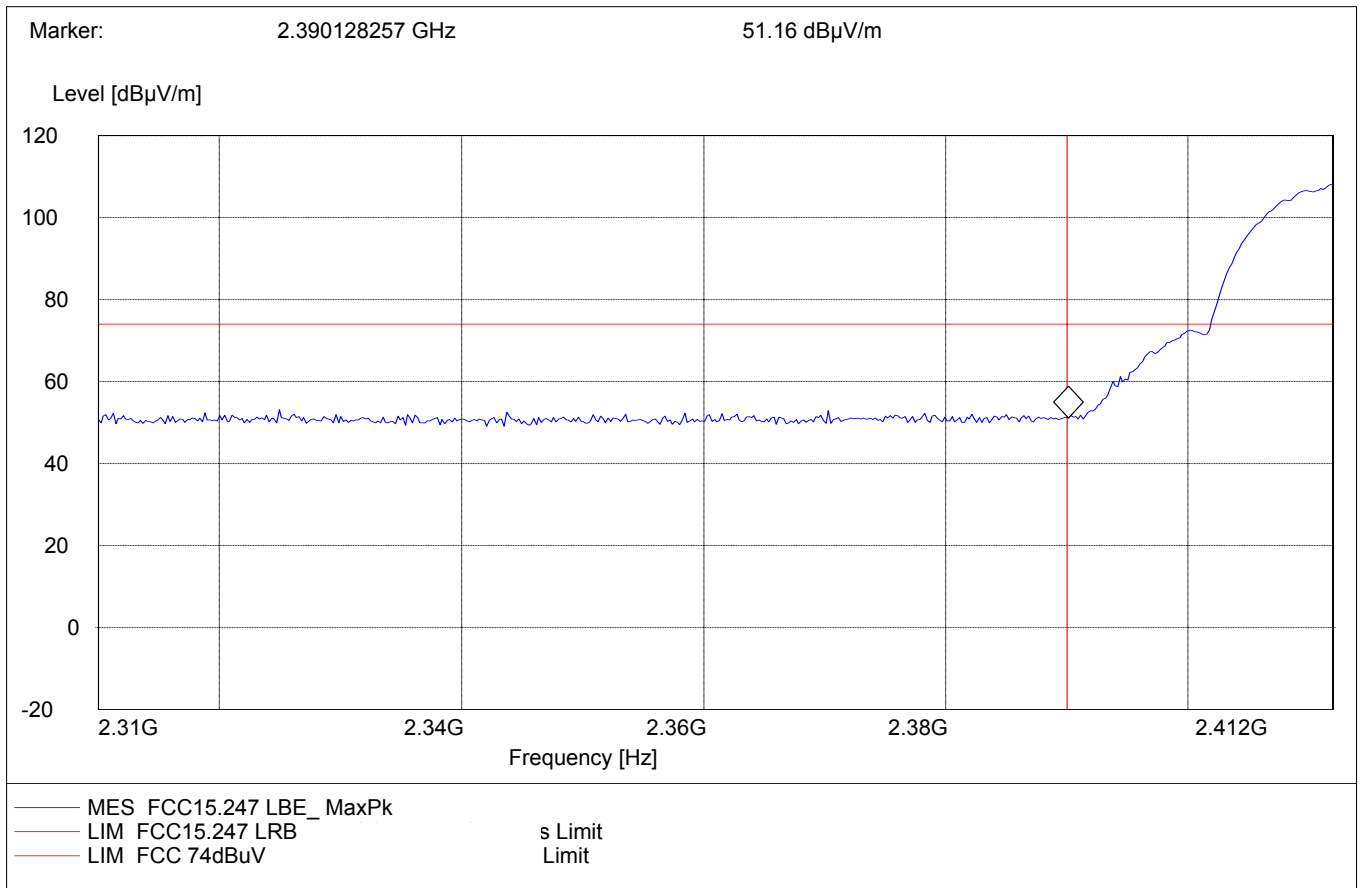
**BAND EDGE COMPLIANCE**

**§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 : 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)



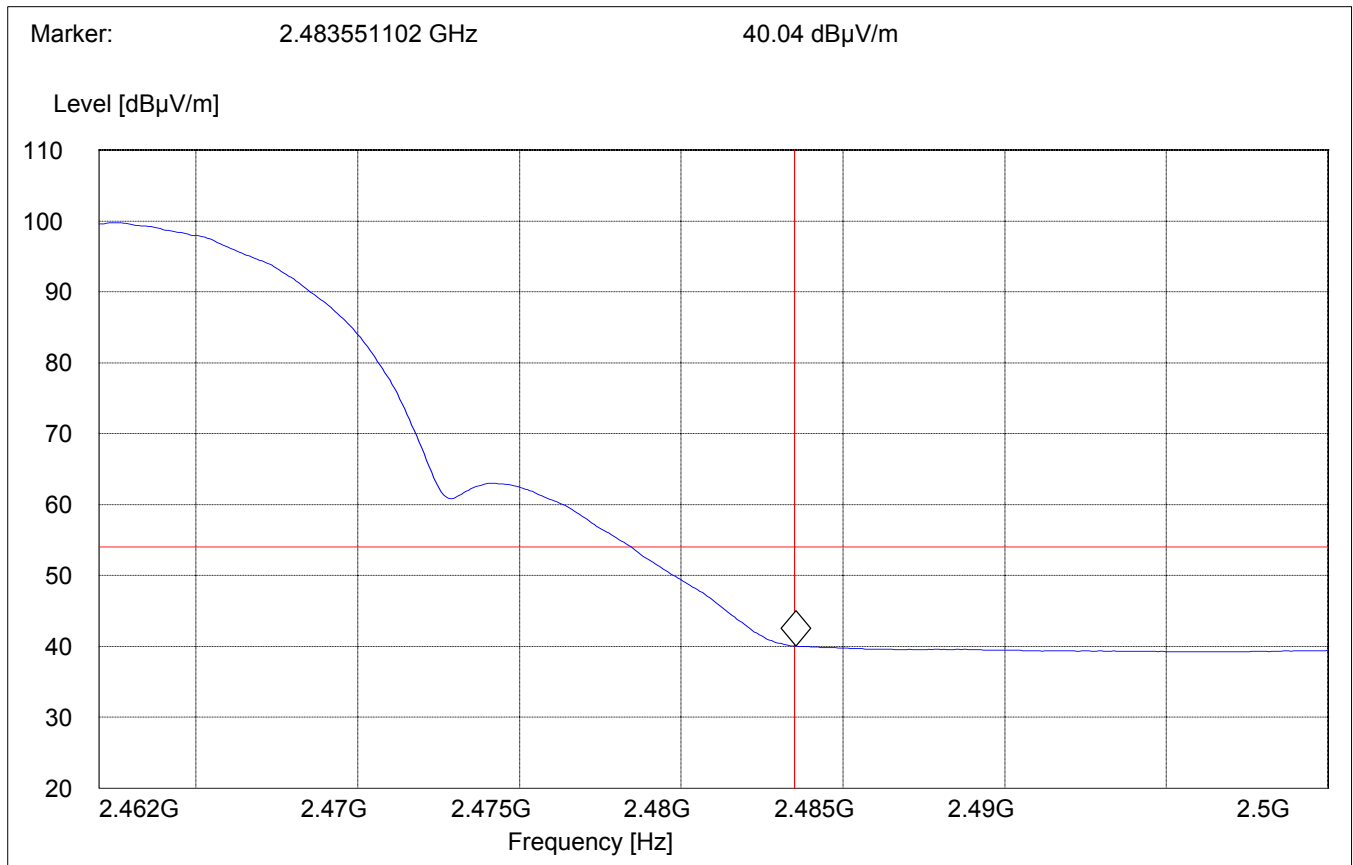
**BAND EDGE COMPLIANCE**

**§15.247 (c)**

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

Operating condition : Tx at 2472MHz  
 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)



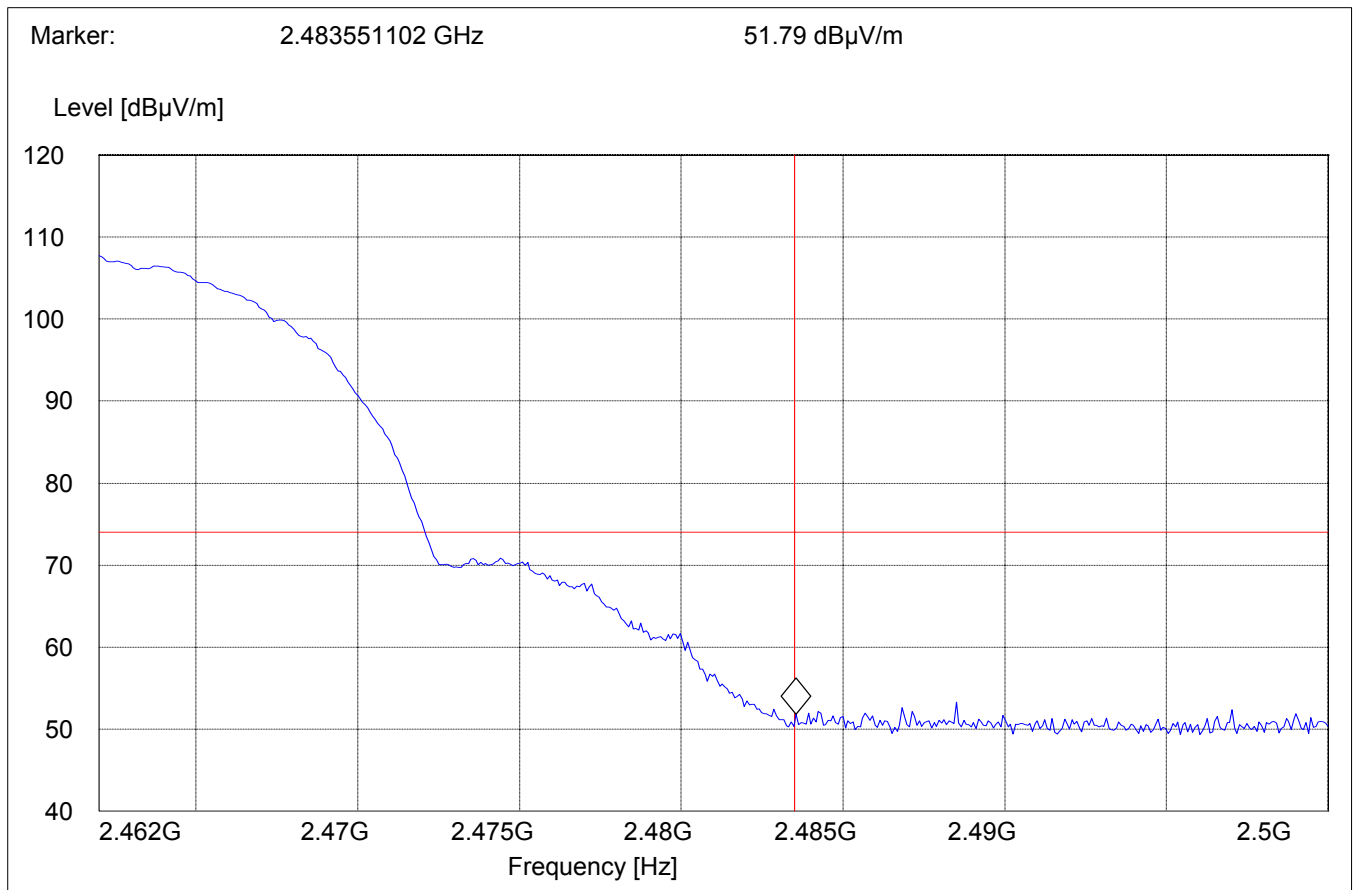
**BAND EDGE COMPLIANCE**

**§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 : 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**

<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)**

<b>Transmit at Lowest channel Frequency 2412MHz</b>			
<b>Frequency (MHz)</b>	<b>Level (dBµV/m)</b>		
	<b>Peak</b>	<b>Quasi-Peak</b>	<b>Average</b>
SEE PLOTS			
<b>Transmit at Middle channel Frequency 2437MHz</b>			
<b>Frequency (MHz)</b>	<b>Level (dBµV/m)</b>		
	<b>Peak</b>	<b>Quasi-Peak</b>	<b>Average</b>
SEE PLOTS			
<b>Transmit at Highest channel Frequency 2462MHz</b>			
<b>Frequency (MHz)</b>	<b>Level (dBµV/m)</b>		
	<b>Peak</b>	<b>Quasi-Peak</b>	<b>Average</b>
SEE PLOTS			

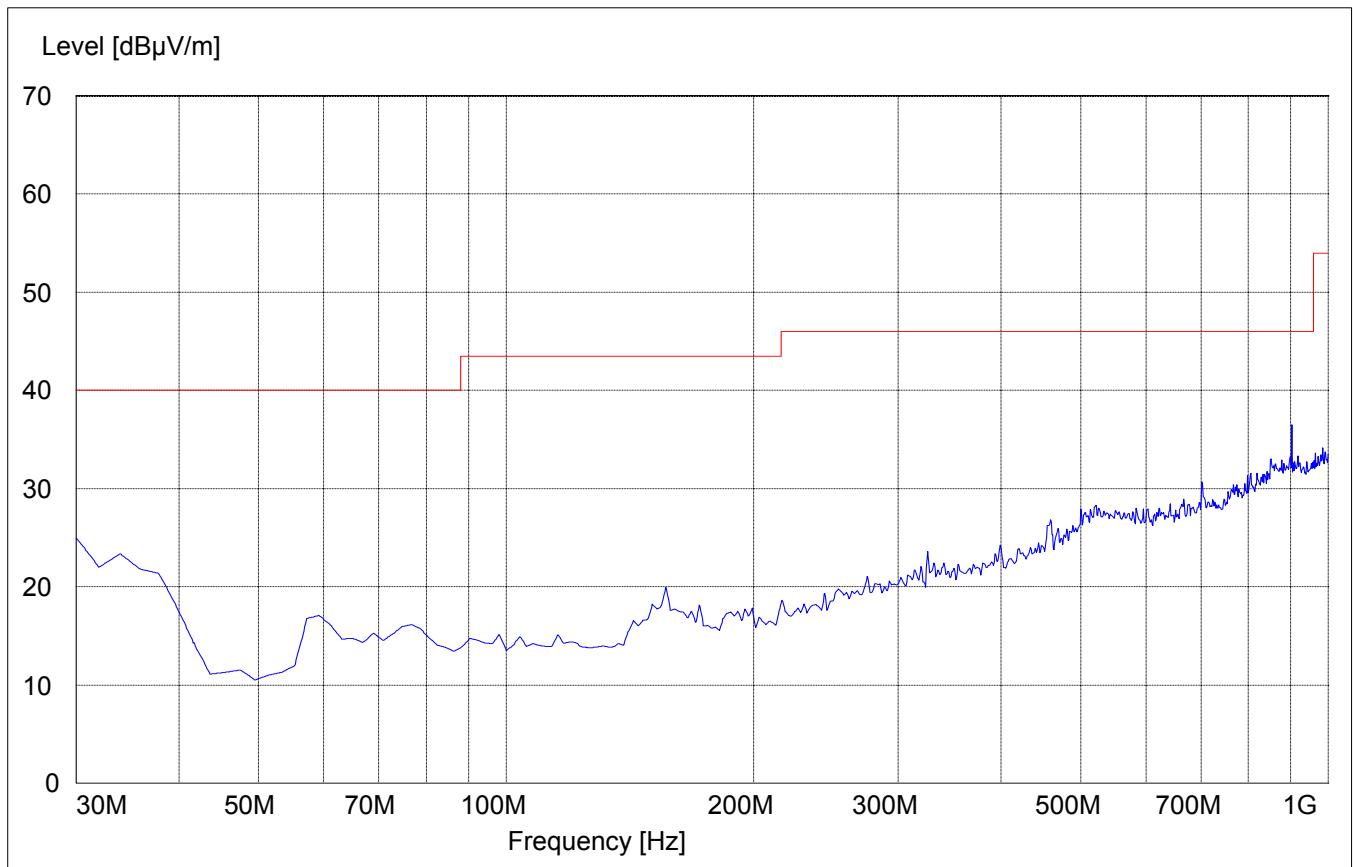


**EMISSION LIMITATIONS - Radiated (Transmitter)**  
**Lowest Channel (2412MHz): 30MHz – 1GHz**

§ 15.247 (c) (1)

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

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

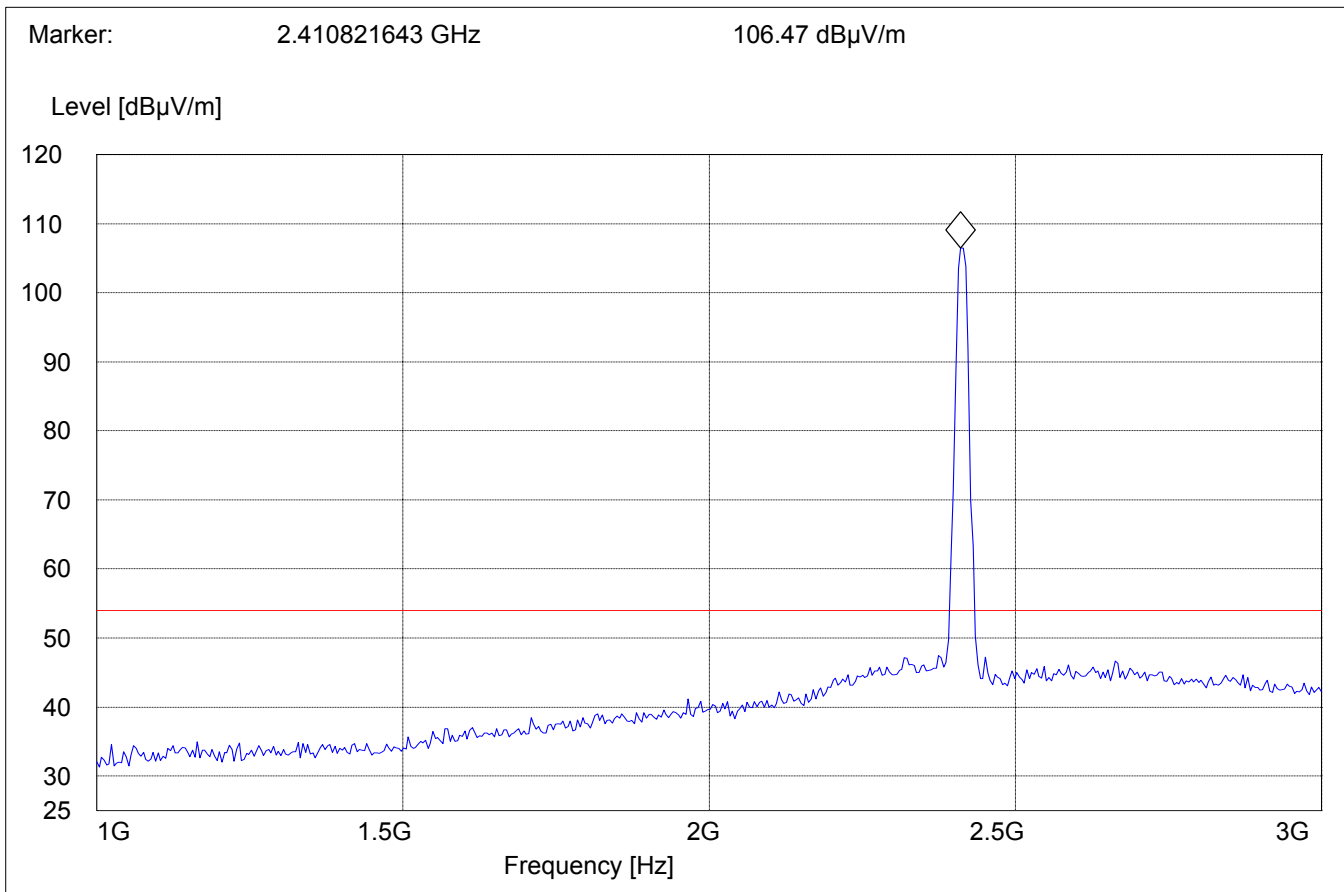


**EMISSION LIMITATIONS - Radiated (Transmitter)**  
**Lowest Channel (2412MHz): 1GHz – 3GHz**

§ 15.247 (c) (1)

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

SWEEP TABLE:		"BT 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)

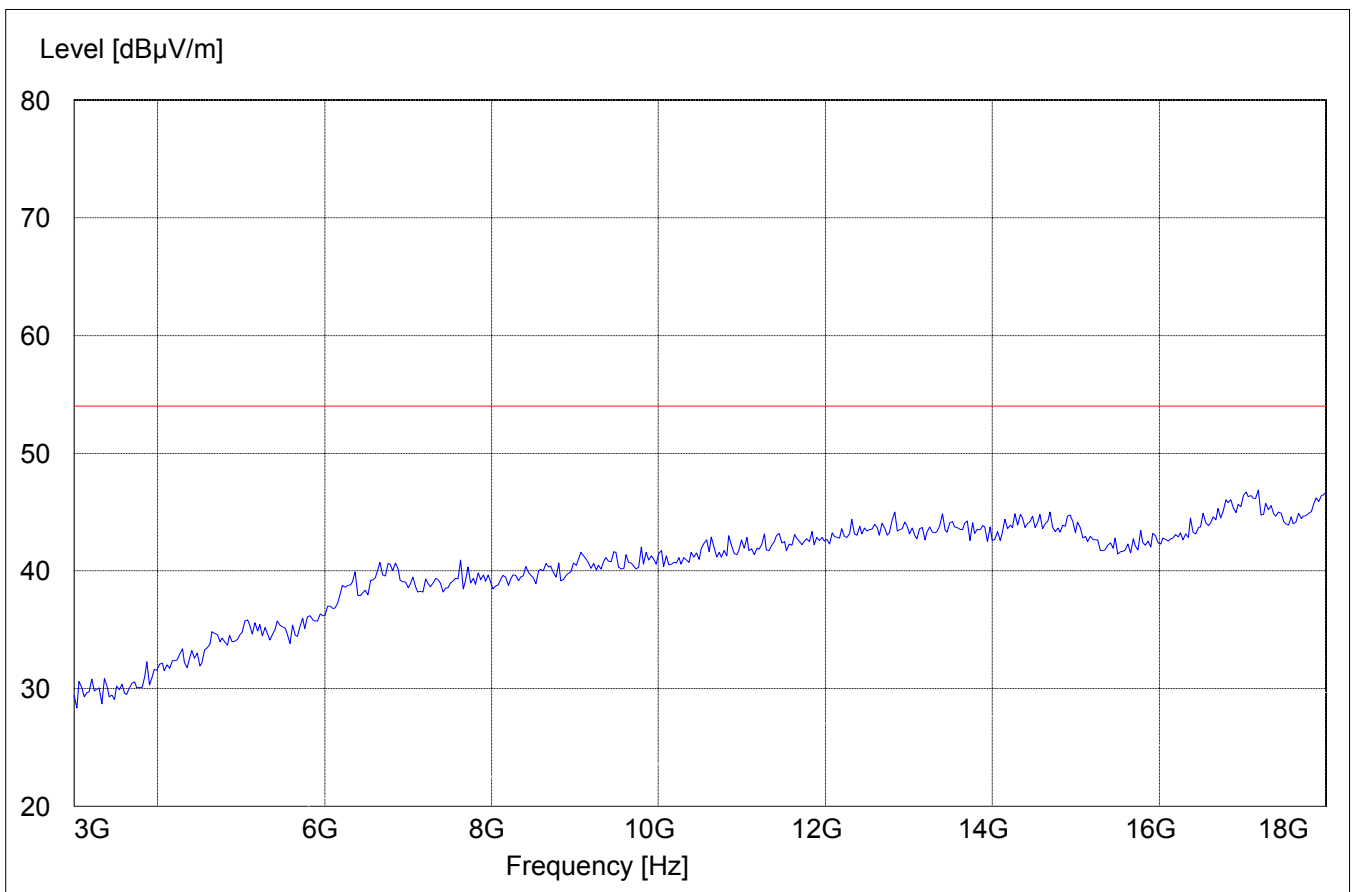


**EMISSION LIMITATIONS - Radiated (Transmitter)**  
**Lowest Channel (2412MHz): 3GHz – 18GHz**

§ 15.247 (c) (1)

SWEEP TABLE: "BT Spuri hi 3-18G"

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

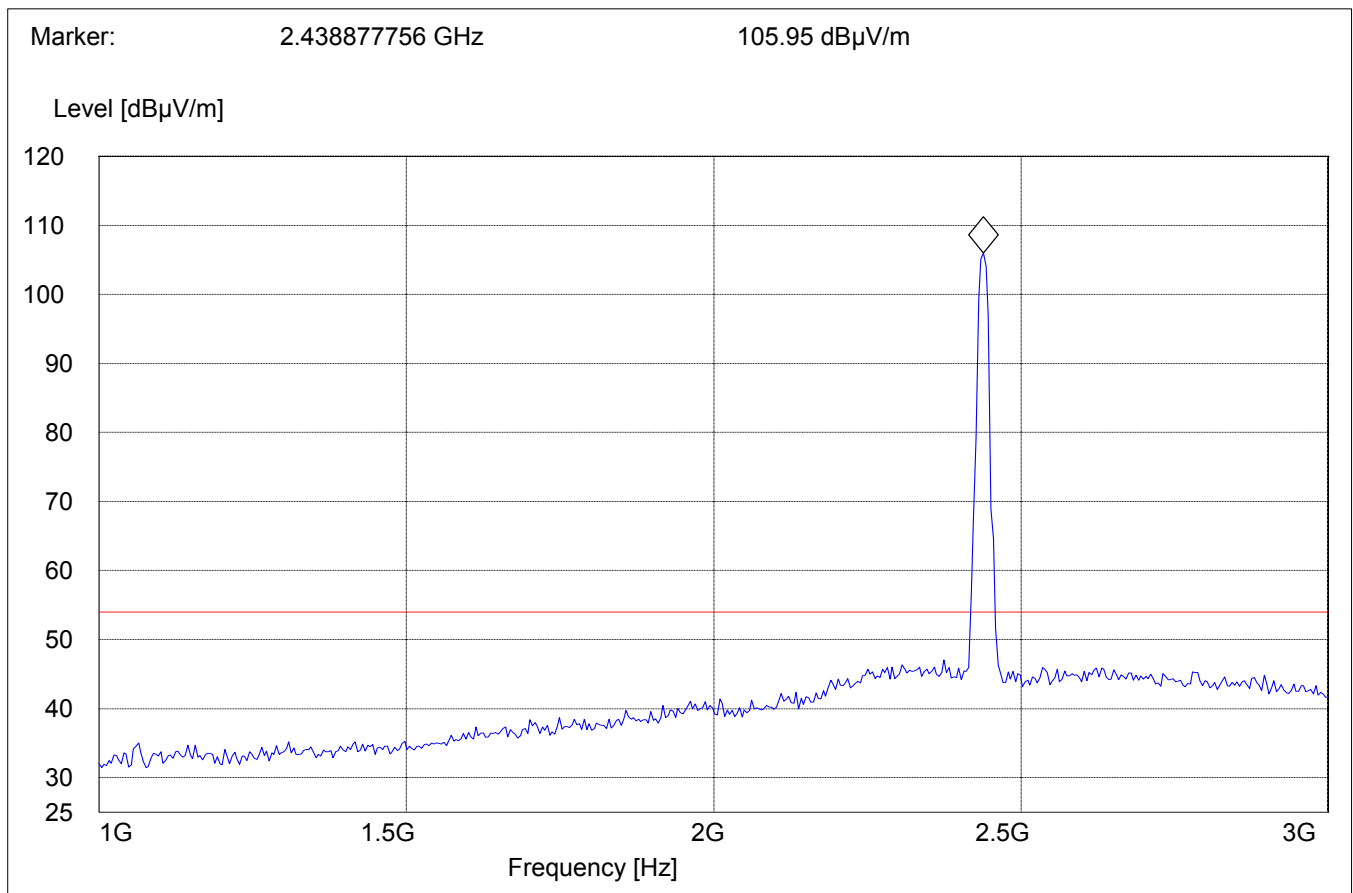


**EMISSION LIMITATIONS - Radiated (Transmitter)**  
**Mid Channel (2437MHz): 1GHz – 3GHz**

§ 15.247 (c) (1)

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

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

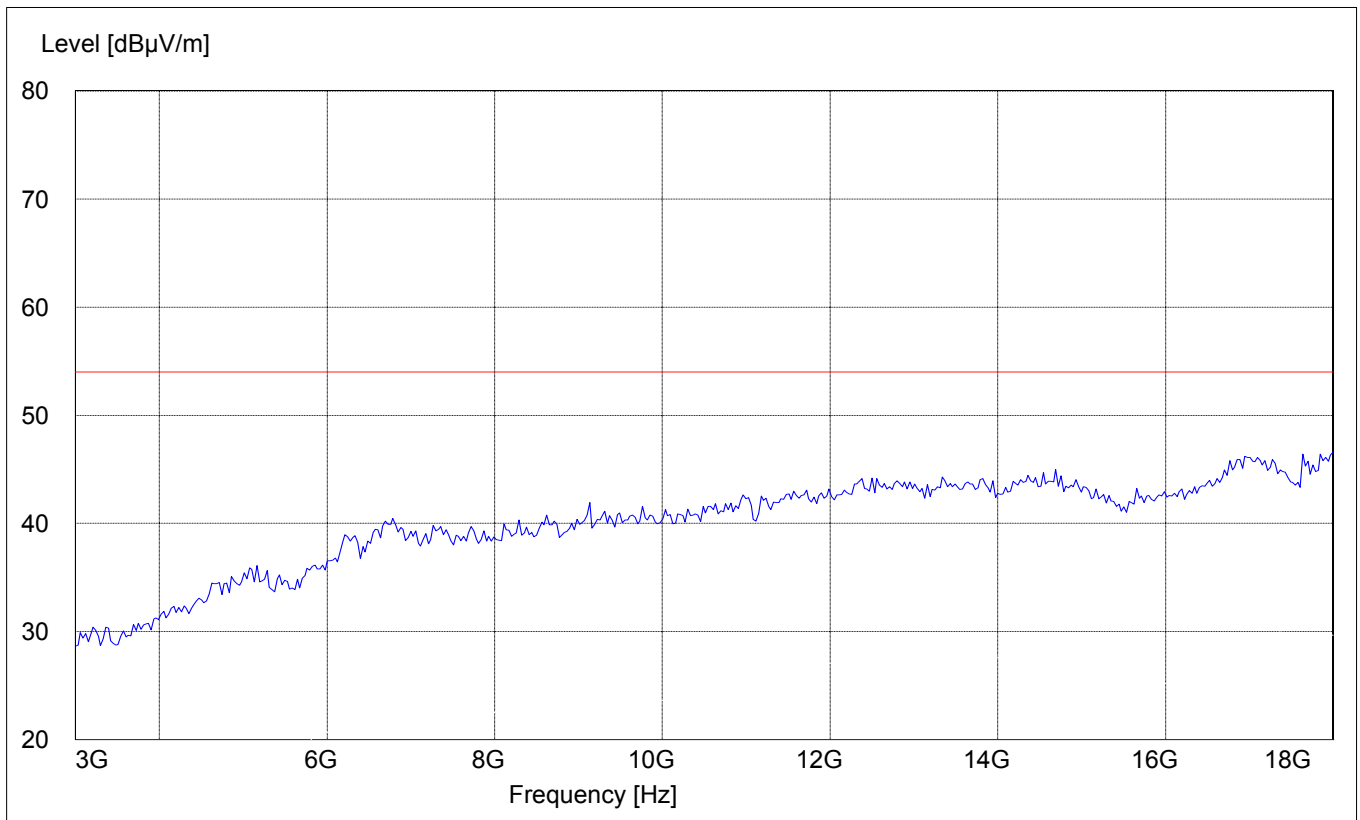


**EMISSION LIMITATIONS - Radiated (Transmitter)**  
**Mid Channel (2437MHz): 3GHz – 18GHz**

§ 15.247 (c) (1)

SWEEP TABLE: "BT Spuri hi 3-18G"

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



**EMISSION LIMITATIONS - Radiated (Transmitter)**  
**Highest Channel (2462MHz): 1GHz – 3GHz**

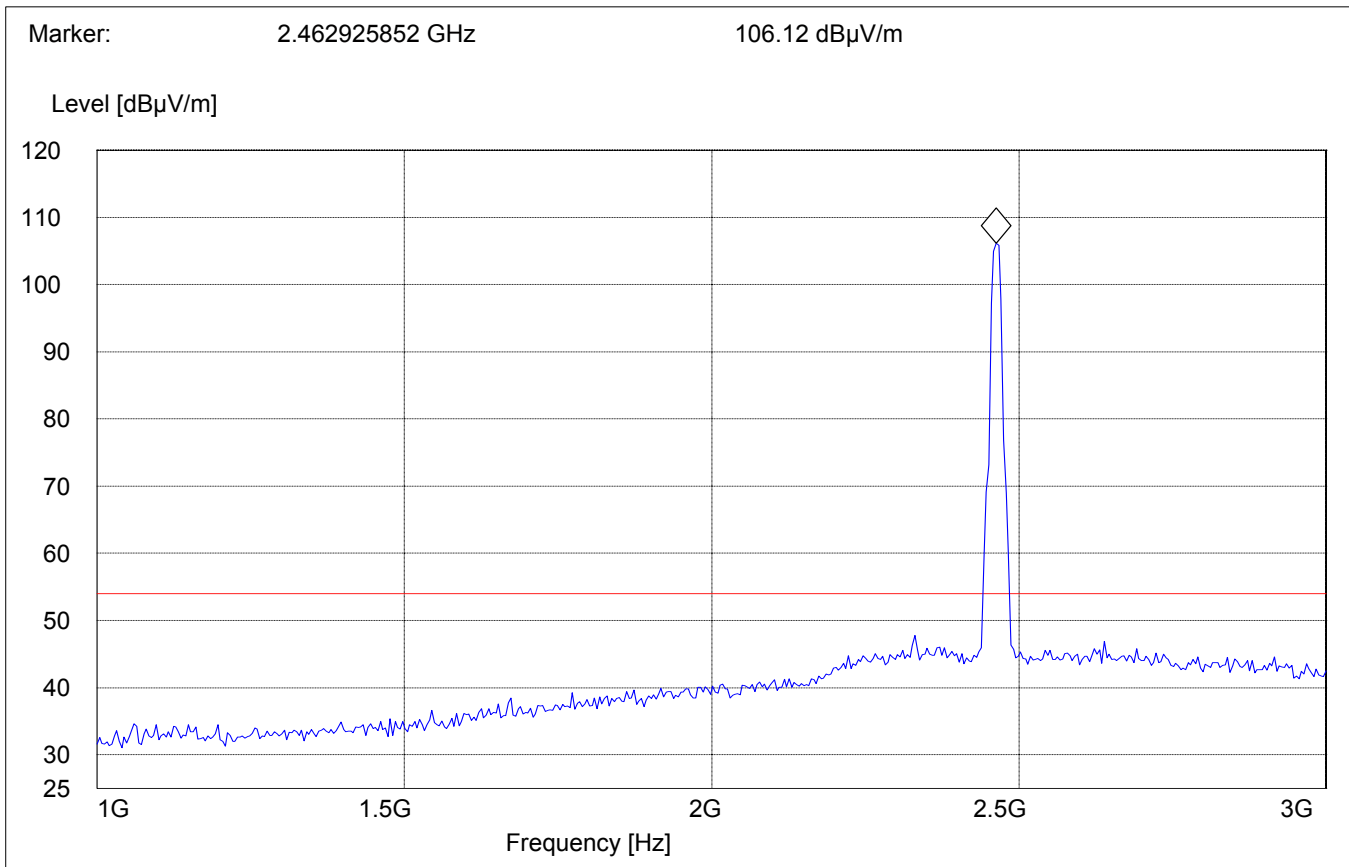
§ 15.247 (c) (1)

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

**SWEEP TABLE:**

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

"BT Spuri hi 1-3G"

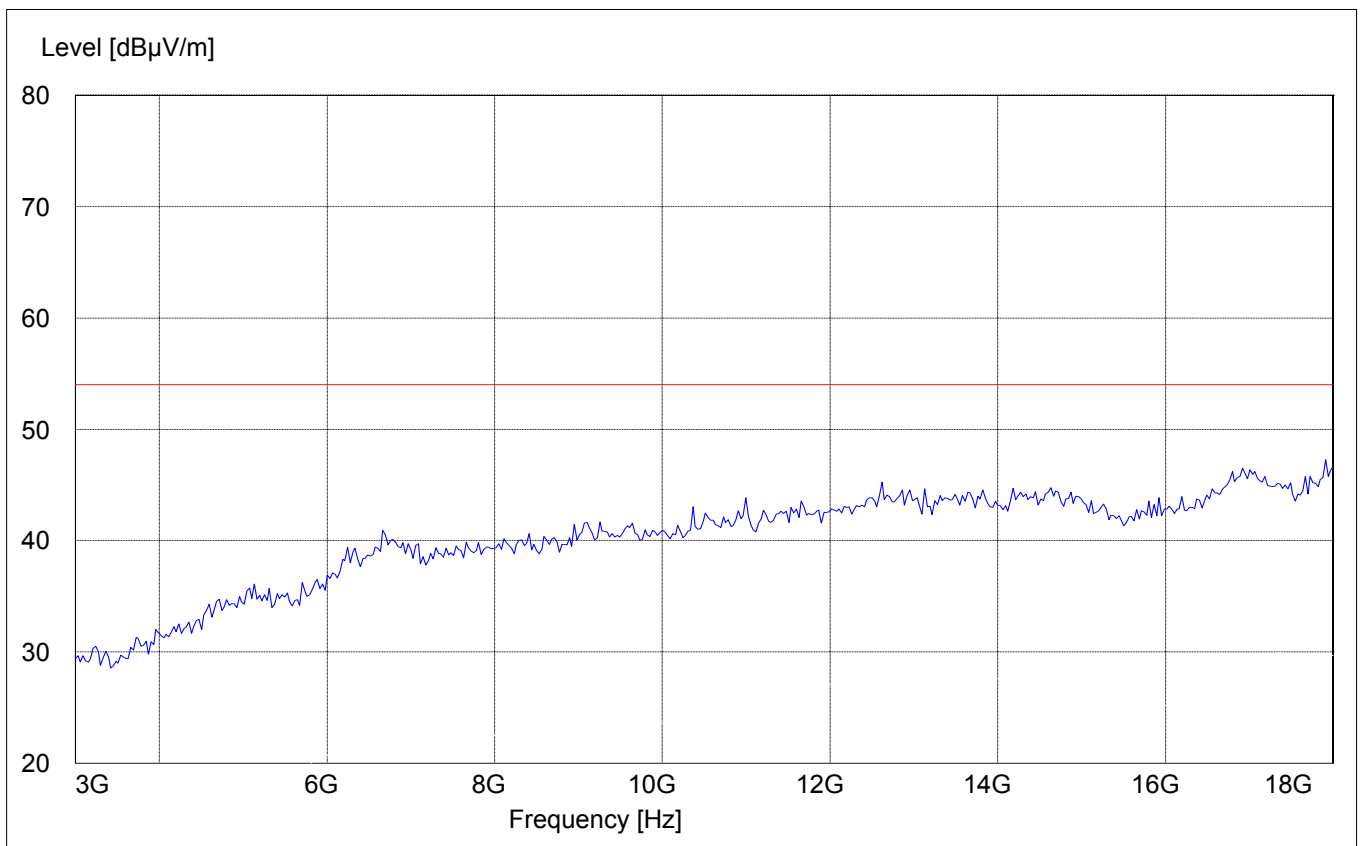


**EMISSION LIMITATIONS - Radiated (Transmitter)**  
**Highest Channel (2462MHz): 3GHz – 18GHz**

§ 15.247 (c) (1)

SWEEP TABLE: "BT 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)



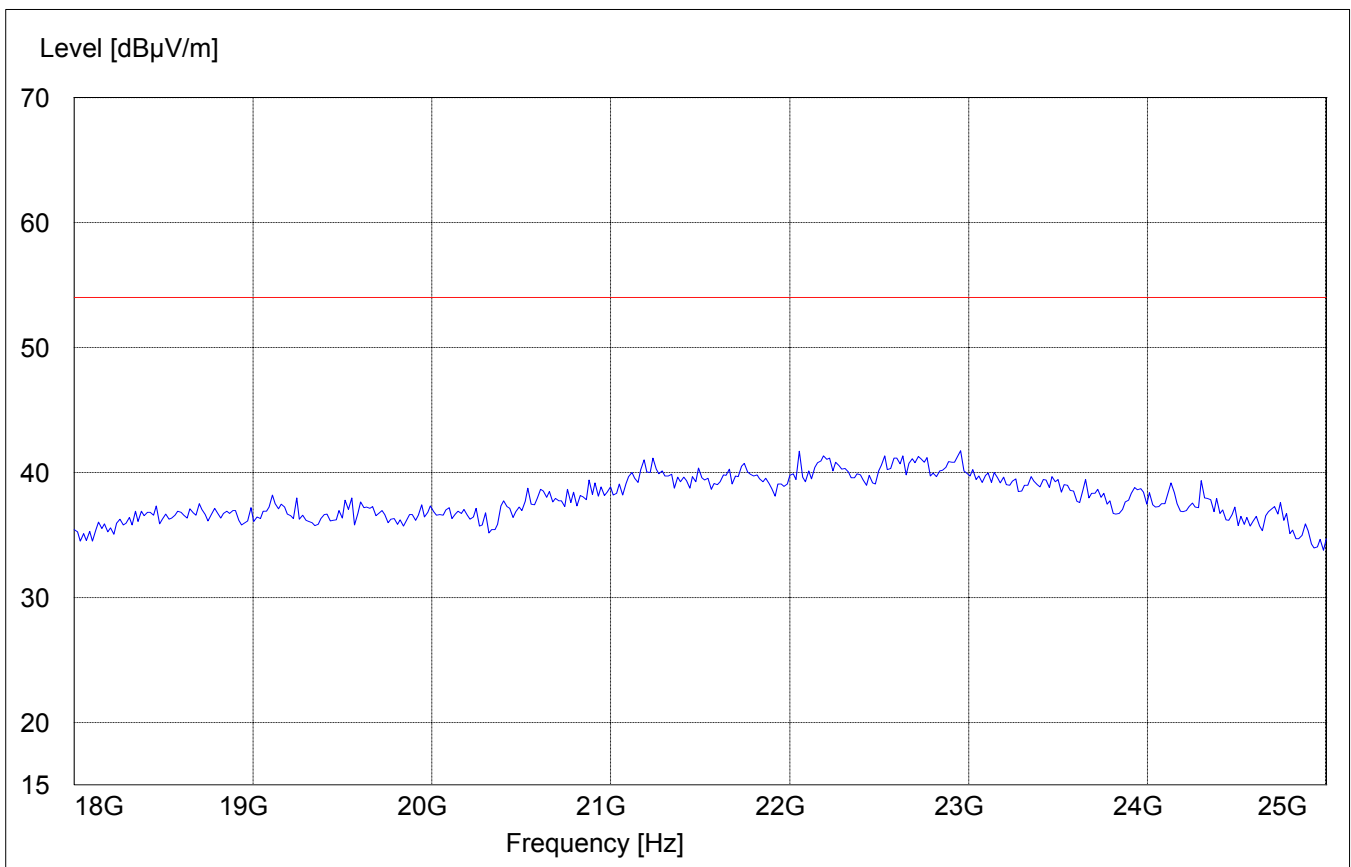
**EMISSION LIMITATIONS - Radiated (Transmitter)**

**§ 15.247 (c) (1)**

**18GHz – 25GHz**

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

SWEEP TABLE:		"BT Spuri hi 18-25G"			
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)

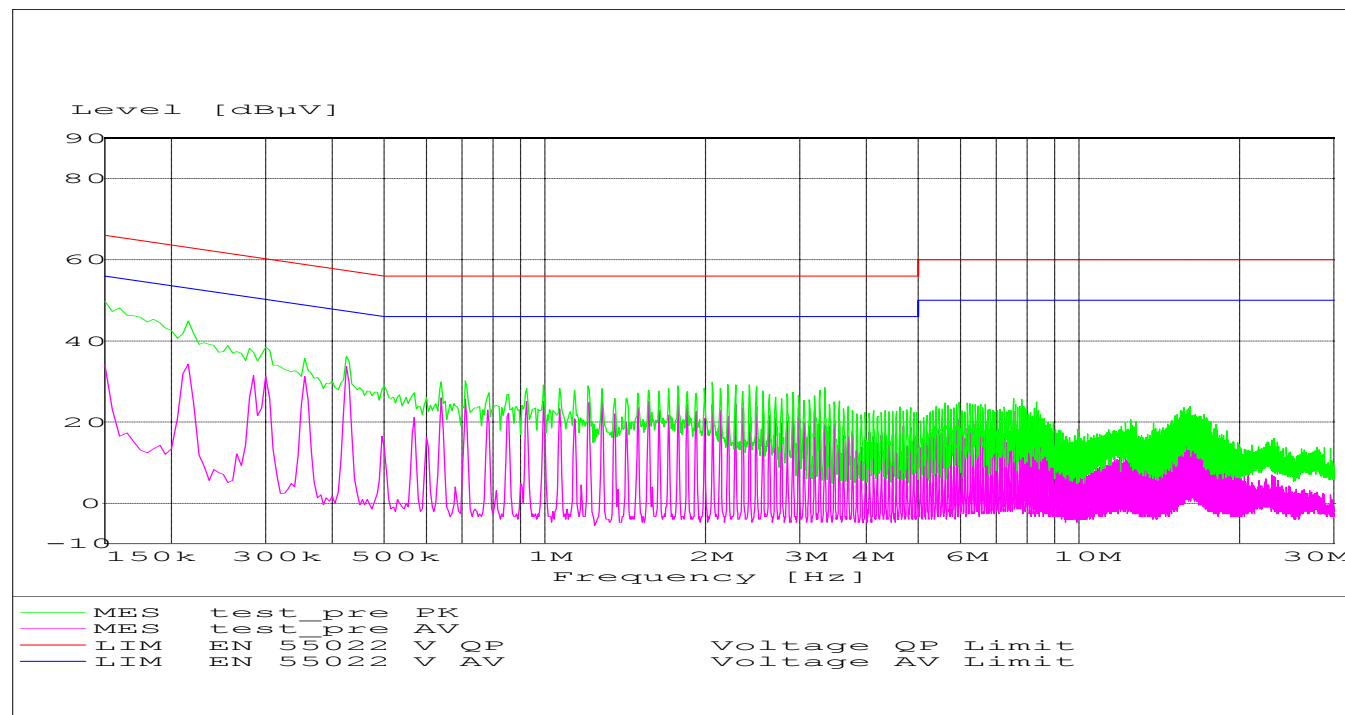
**Limit**

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



**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:**

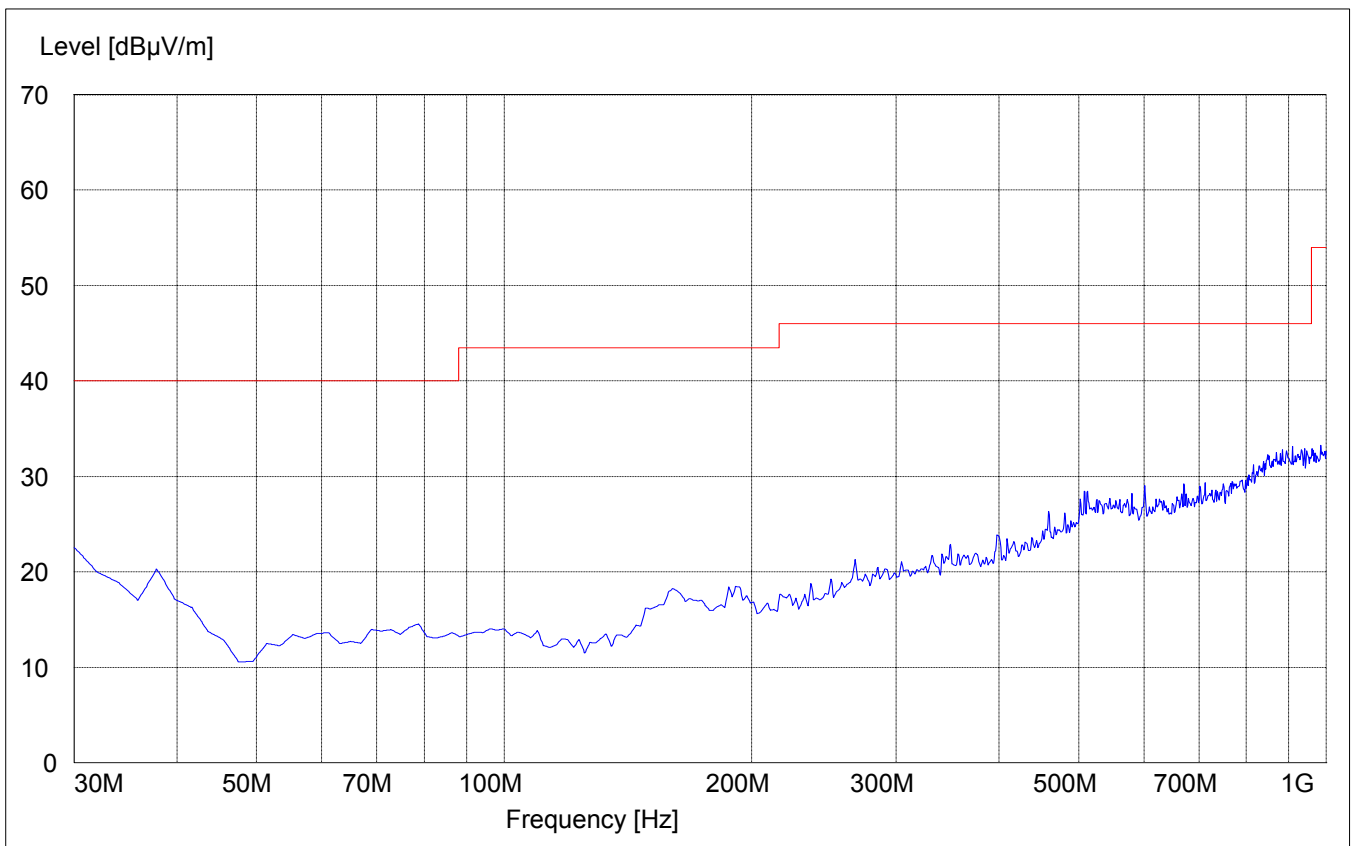
The radiated emissions were done with different settings, using the relevant pre-amplifiers for the relevant frequency ranges. This is the reason that the graphs show different noise levels. In the range between 3 and 25 GHz very short cable connections to the antenna was used to minimize the noise level.

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

§ 15.209

SWEEP TABLE: "BT Spuri hi 30-1G"

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



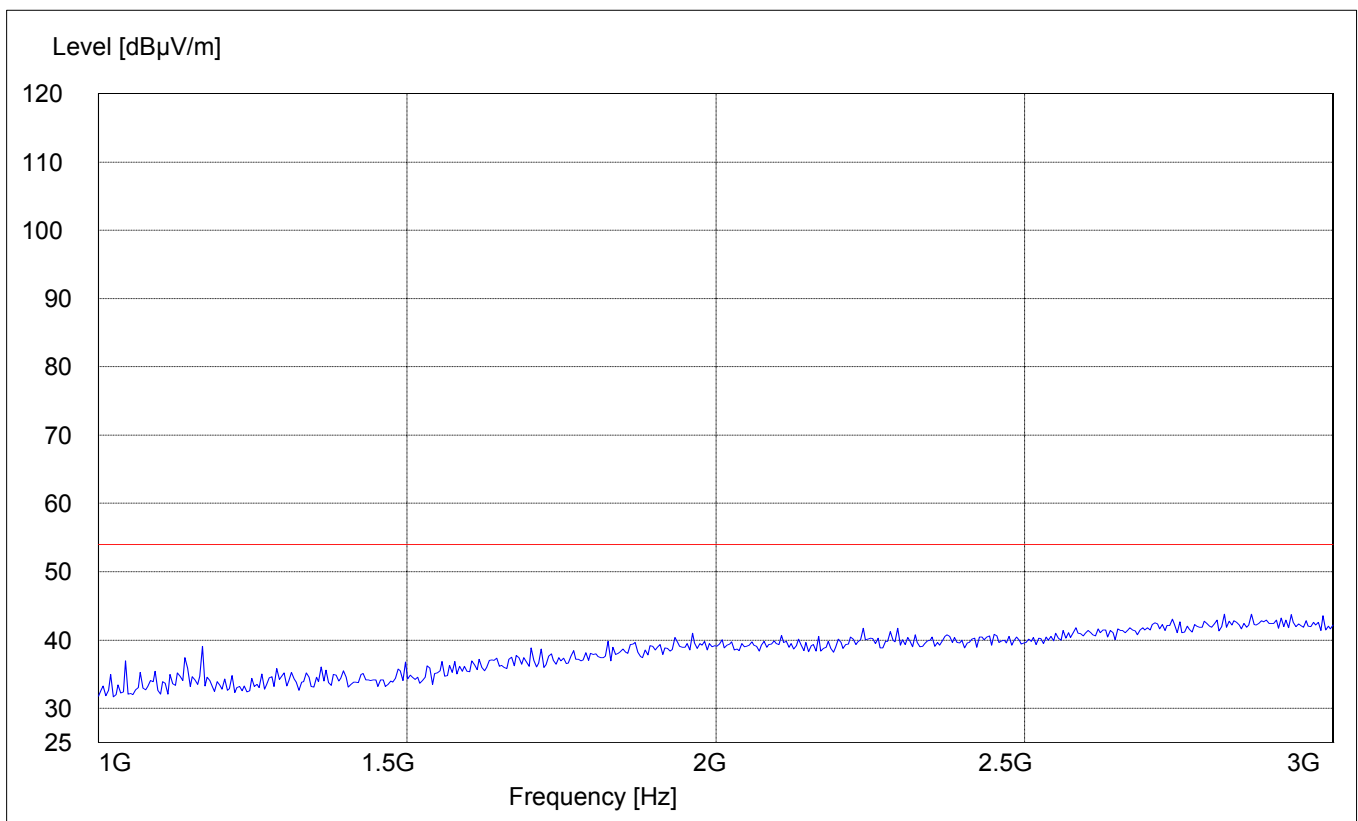
**RECEIVER SPURIOUS RADIATION**  
**1GHz – 3GHz**

**§ 15.209**

SWEEP TABLE:

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

"BT Spuri hi 1-3G"

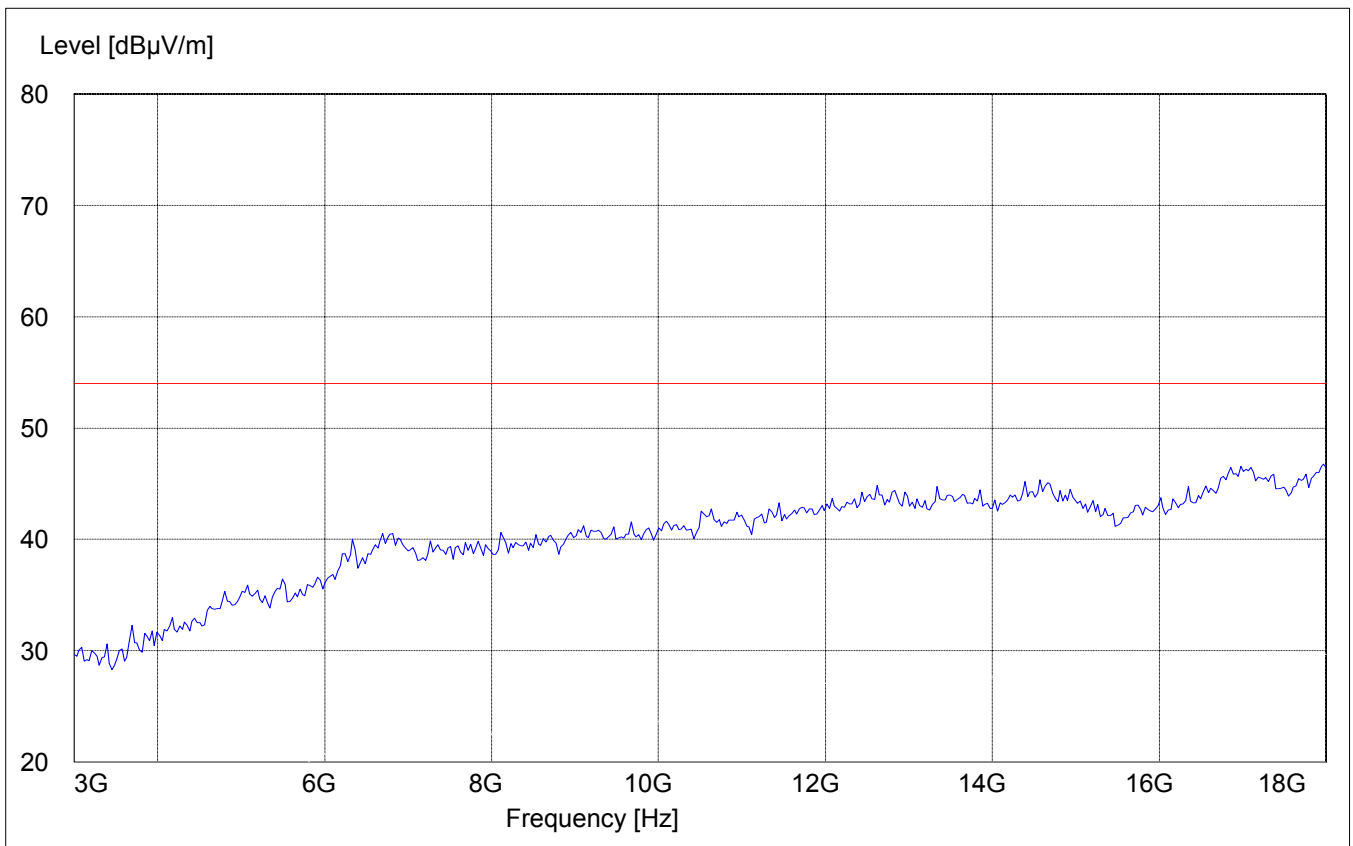


**RECEIVER SPURIOUS RADIATION  
3GHz – 18GHz**

**§ 15.209**

SWEEP TABLE: "BT 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)

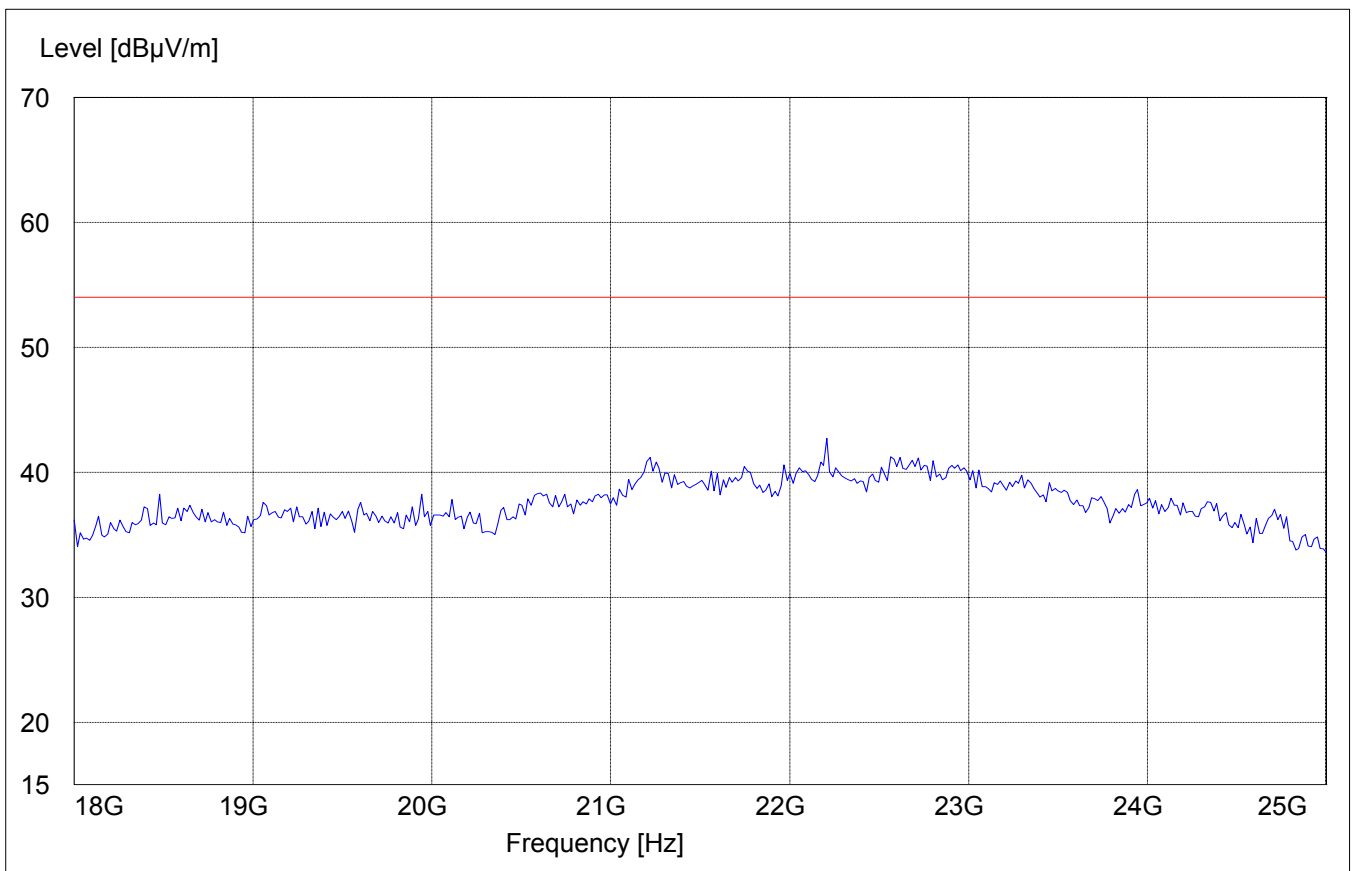


**RECEIVER SPURIOUS RADIATION**  
**18GHz – 25GHz**

§ 15.209

SWEEP TABLE: "BT Spuri hi 18-25G"

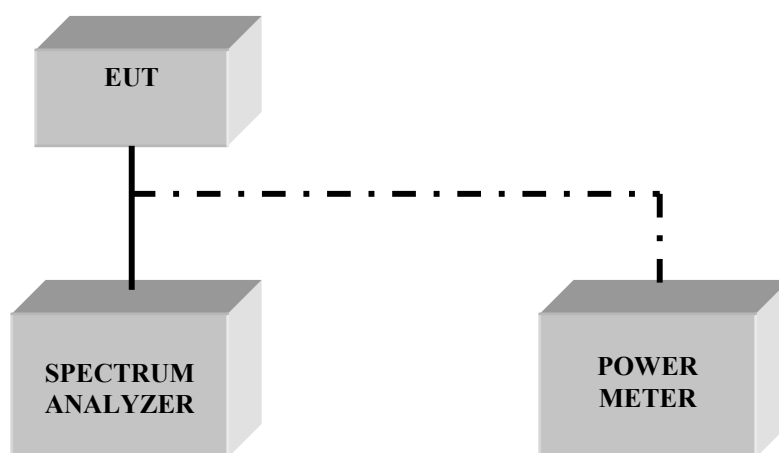
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
18 GHz	25 GHz	MaxPeak	Coupled	1 MHz	#141 horn (dBi)



**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>	Biconilog Antenna	3141	EMCO	0005-1186
<b>04</b>	Horn Antenna (700M-18GHz)	SAS-200/571	AH Systems	325
<b>05</b>	Horn Antenna (18-26.5GHz)	3160-09	EMCO	1240
<b>06</b>	2-3GHz Band reject filter	BRM50701	Microtronics	6
<b>07</b>	Power-Meter	NRVD	Rohde & Schwarz	0857.8008.02
<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**

