



# FCC Test Report

Test report no.: EMC\_848FCC15.247\_2005\_GSM+BT

FCC Part 15.247 / CANADA RSS-210

EUT Tablet PC      Model: iX104C2  
With GSM module    Model: AC775  
With BT module      Model: TM60M665  
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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<b>1</b>	<b>General information</b>
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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**

**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  
Telephone : +1 512 336 7797  
Tele-fax : +1 512 336 7791  
e-mail : [dfowler@xploretech.com](mailto:dfowler@xploretech.com)

### 1.4 Application details

Date of receipt test item : 2005-02-15  
Date of test : 2005-02-15 to 2005-02-22

### 1.5 Test item

Manufacturer : Applicant  
Model No. : iX104C2  
Description : [Tablet PC with BT module and GSM module](#)  
FCC-ID : Q2GIX104-132, Q2GIX104-134  
IC ID : 4596A-IX104WBG

### Additional information

Test Sample ID : 03CW00a Troy  
Frequency : 2402MHz – 2480MHz for BT  
824.2MHz – 848.8MHz for GSM 850,  
1850.2MHz – 1909.8MHz for PCS 1900  
Type of modulation : FHSS, DSSS & OFDM, GFSK  
Antenna : Embedded  
Power supply : via host Tablet PC  
Extreme temp. Tolerance : -30°C to +50°C

1.6 Test standards: FCC Part 15 §15.247 (DA00-705) / RSS 210

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## SUMMARY OF TEST REPORT

**This test report is valid for collocation combination of different radios under following FCC ID's and model #'s**

FCC ID: Q2GIX104-132 EUT Model: iX104-C2 (BT+GSM)

FCC ID: Q2GIX104-134 EUT Model: iX104C2 \*(BT+WLAN+GSM)

**\*In this case both WLAN and GSM modules can not transmit simultaneously.**

**Testing is done against FCC15.247 limits. GSM mode was tested in both 850 & 1900 bands along with BT respectively. Test report carries only worst case plots.**

<u>Transmitter</u>	<u>Channel Freq.</u>
GSM 850	ch-251 848.8MHz
GSM 1900	ch-661 1880MHz
BT	ch-79 2480MHz

**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:**

2005-02-25 EMC & Radio Lothar Schmidt (Manager)



Date

Section

Name

Signature

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

2005-02-25 EMC & Radio Harpreet Sidhu (EMC Engineer)



Date

Section

Name

Signature

## 2.2 Test report

**TEST REPORT**

**Test report no.: EMC\_848FCC15.247\_2005\_GSM+BT**

**TEST REPORT REFERENCE**

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**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 26.5 GHz very short cable connections to the antenna was used to minimize the noise level.
2. Frequency resolution is not fine enough to show the exact frequency of the carrier, refer to plots under EIRP.
3. 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)

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

<b>Transmit at Lowest channel Frequency</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</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</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)**

**§ 15.247 (d)**

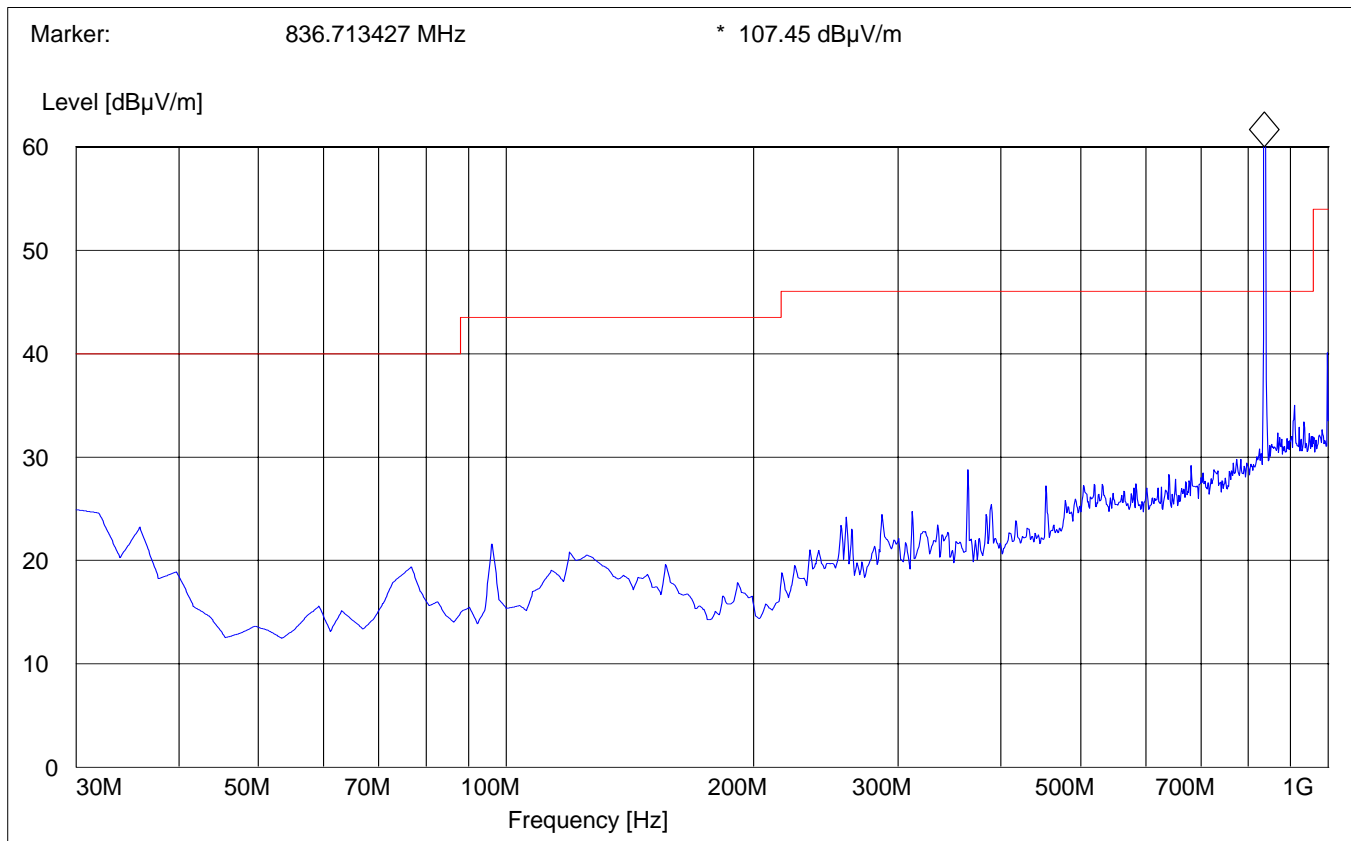
**30MHz – 1GHz**

**Antenna: vertical**

**GSM850+BT**

**Note: Peak above the limit line is the carrier freq. of GSM 850 @ ch-251**

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



**EMISSION LIMITATIONS - Radiated (Transmitter)**

**§ 15.247 (d)**

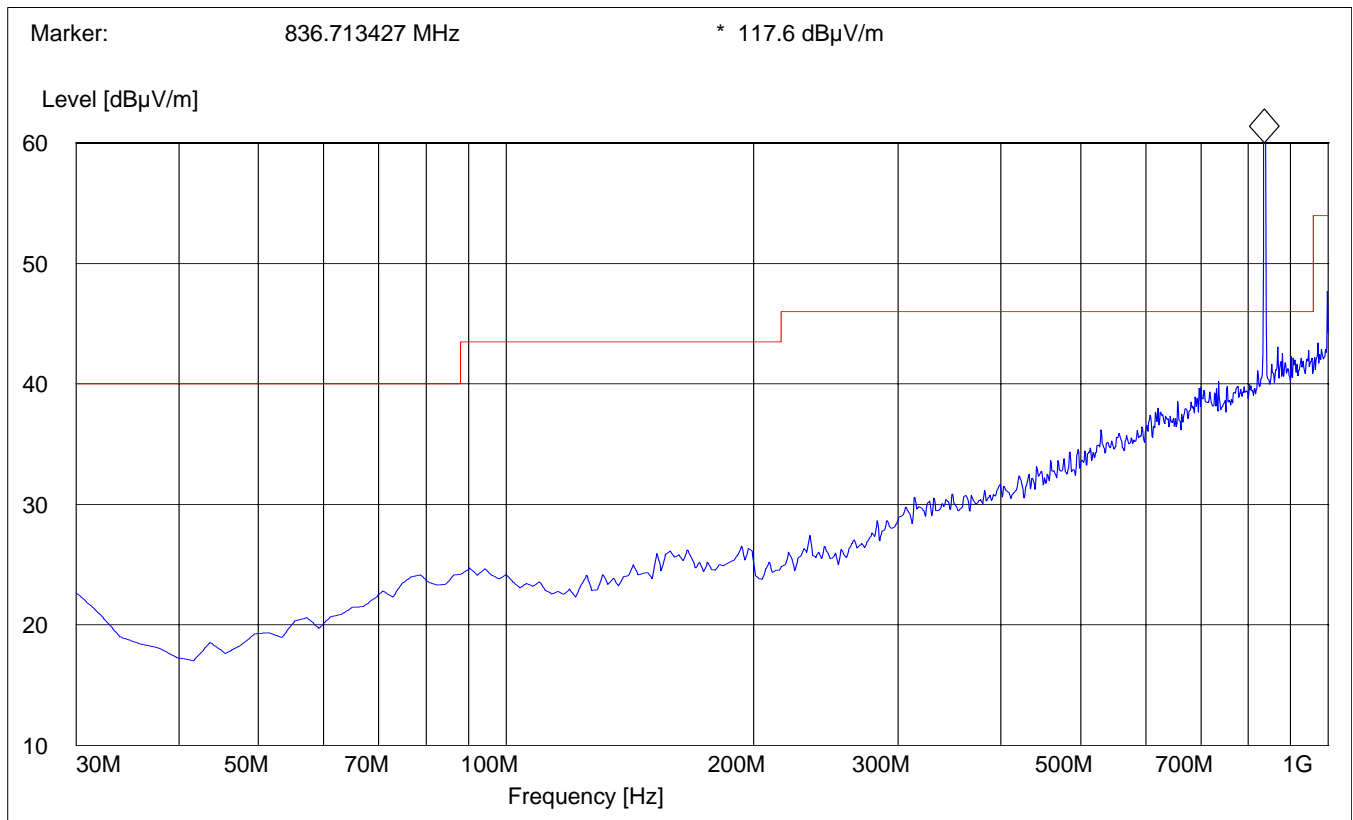
**30MHz – 1GHz**

**Antenna: horizontal**

**GSM850+BT**

**Note: Peak above the limit line is the carrier freq. of GSM 850 @ ch-251**

SWEEP TABLE:		"Spuri hi 30-1G"			
Short Description:		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 (d)

30MHz – 1GHz

Antenna: vertical

### GSM1900+BT

SWEEP TABLE:

"Spuri hi 30-1G"

Short Description:

30MHz-1GHz

Start Stop

Detector

Meas.

RBW

Transducer

Frequency Frequency

Time

VBW

30.0 MHz

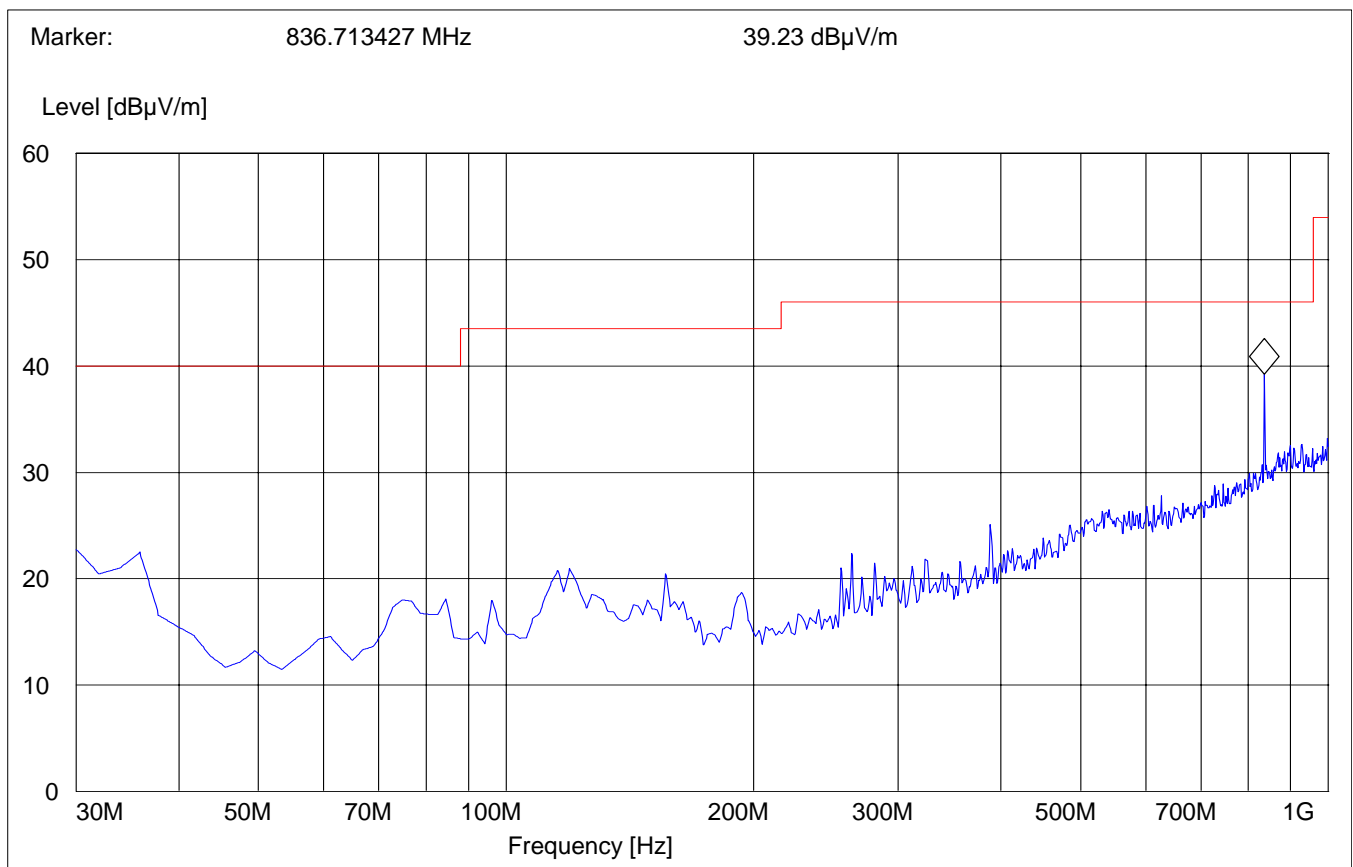
1.0 GHz

MaxPeak

Coupled

100 kHz

3141-#1186



## EMISSION LIMITATIONS - Radiated (Transmitter)

§ 15.247 (d)

30MHz – 1GHz

Antenna: horizontal

### GSM1900+BT

SWEEP TABLE:

"Spuri hi 30-1G"

Short Description:

30MHz-1GHz

Start Stop

Detector

Meas.

RBW

Transducer

Frequency Frequency

Time

VBW

30.0 MHz

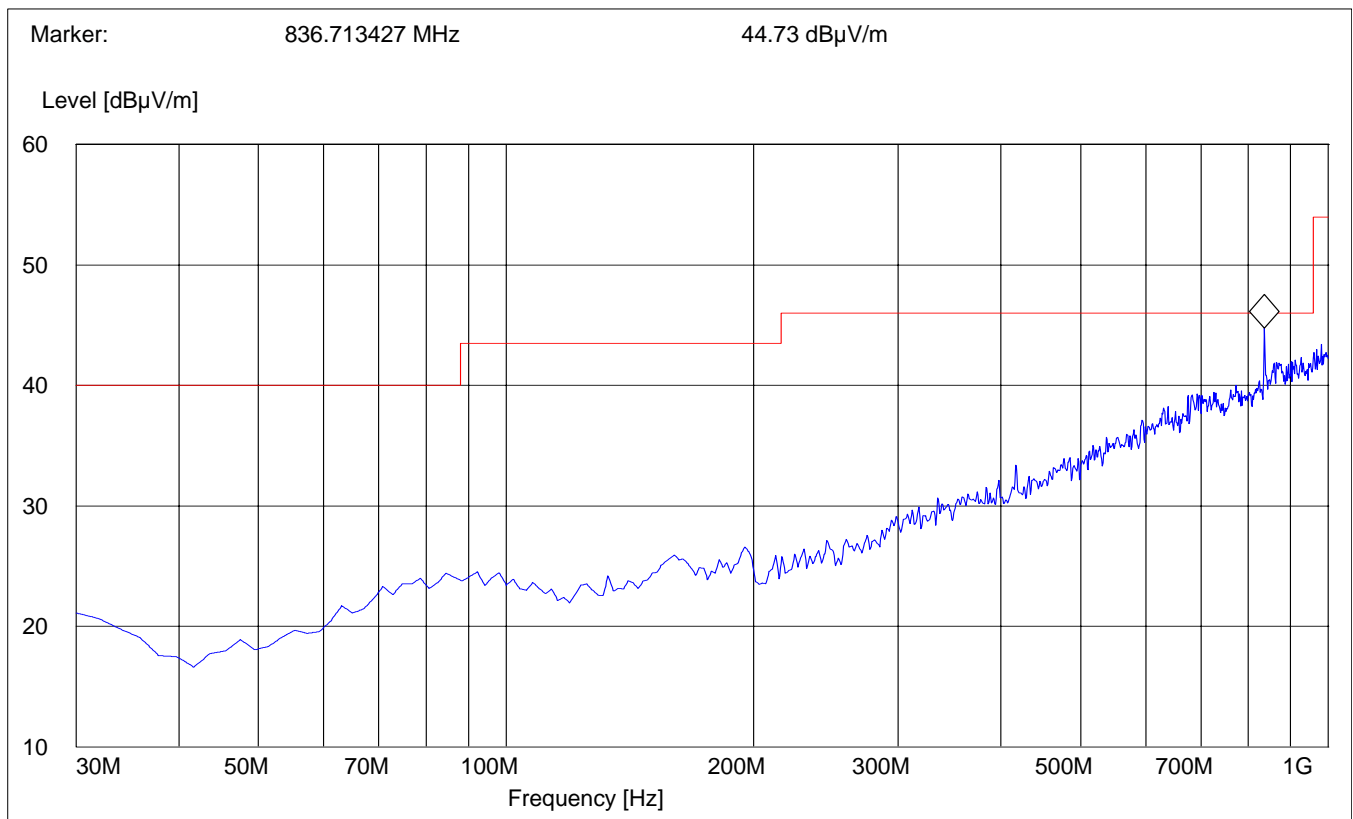
1.0 GHz

MaxPeak

Coupled

100 kHz

3141-#1186



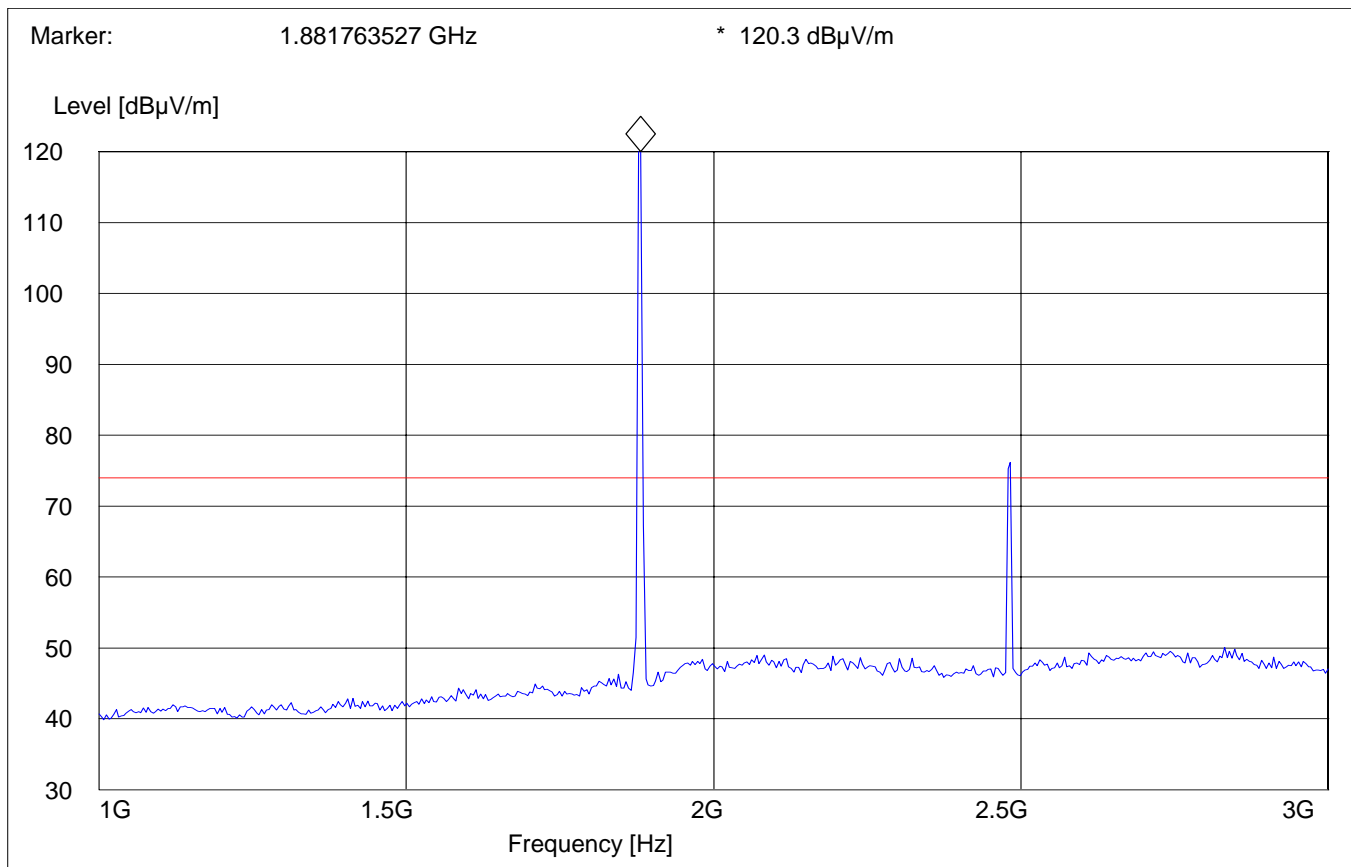
## EMISSION LIMITATIONS - Radiated (Transmitter) 1GHz – 3GHz

§ 15.247 (d)

### GSM1900+BT

**NOTE: The marked peak is GSM 1900 carrier freq. @ 1880MHz and other two lower and higher peaks above the limit line are BT @ 2480MHz**

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

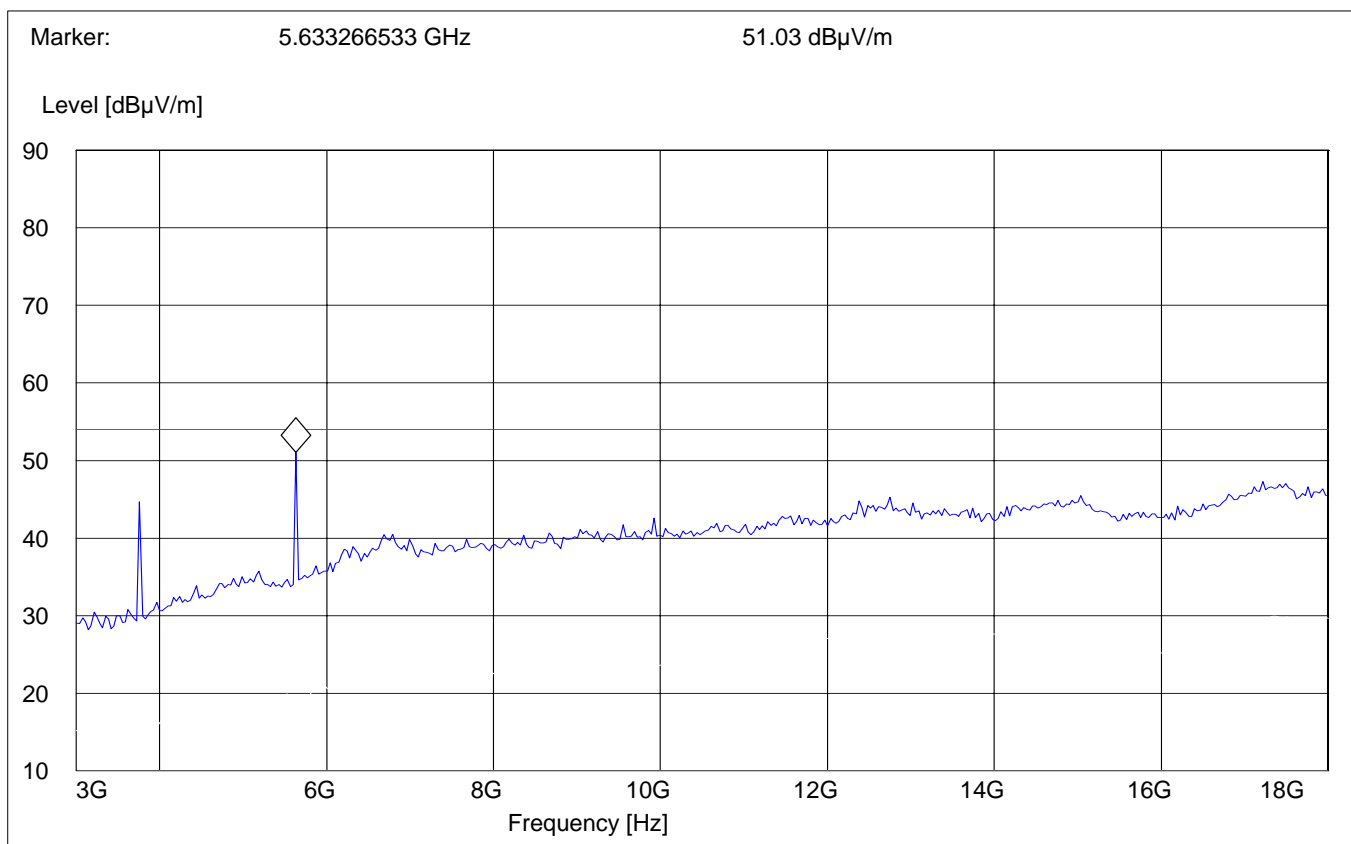


## EMISSION LIMITATIONS - Radiated (Transmitter) 3GHz – 18GHz

§ 15.247 (d)

### GSM1900+BT

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



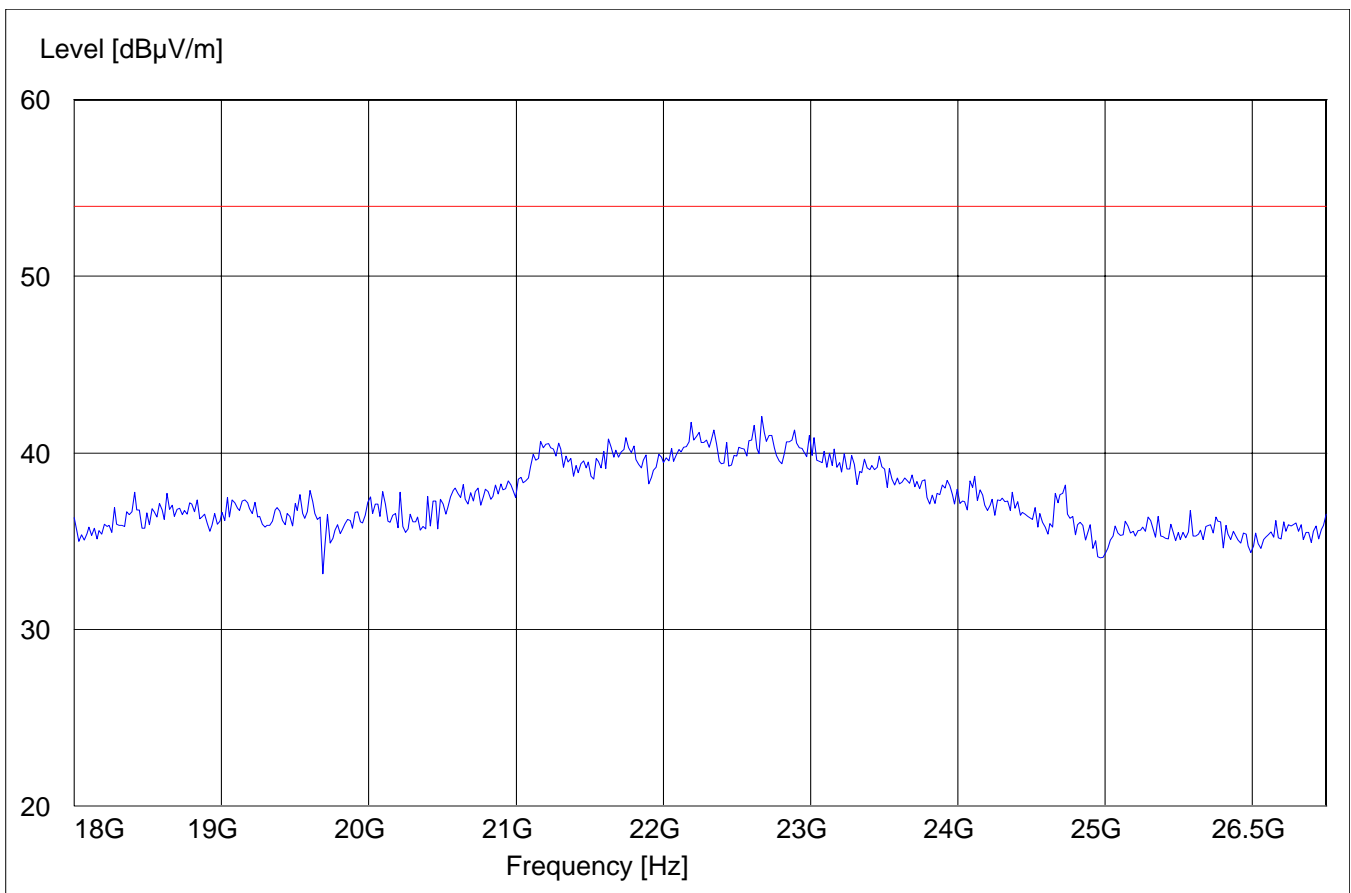
**EMISSION LIMITATIONS - Radiated (Transmitter)**

**§ 15.247 (d)**

**18GHz – 26.5GHz**

**GSM1900+BT**

SWEEP TABLE:		"Spuri hi 18-26.5G"			
Short Description:		Spurious 18-26.5GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
18 GHz	26.5 GHz	MaxPeak	Coupled	1 MHz	#141 horn (dBi)





**CONDUCTED EMISSIONS**  
**GSM1900+BT**

§ 15.107/207

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

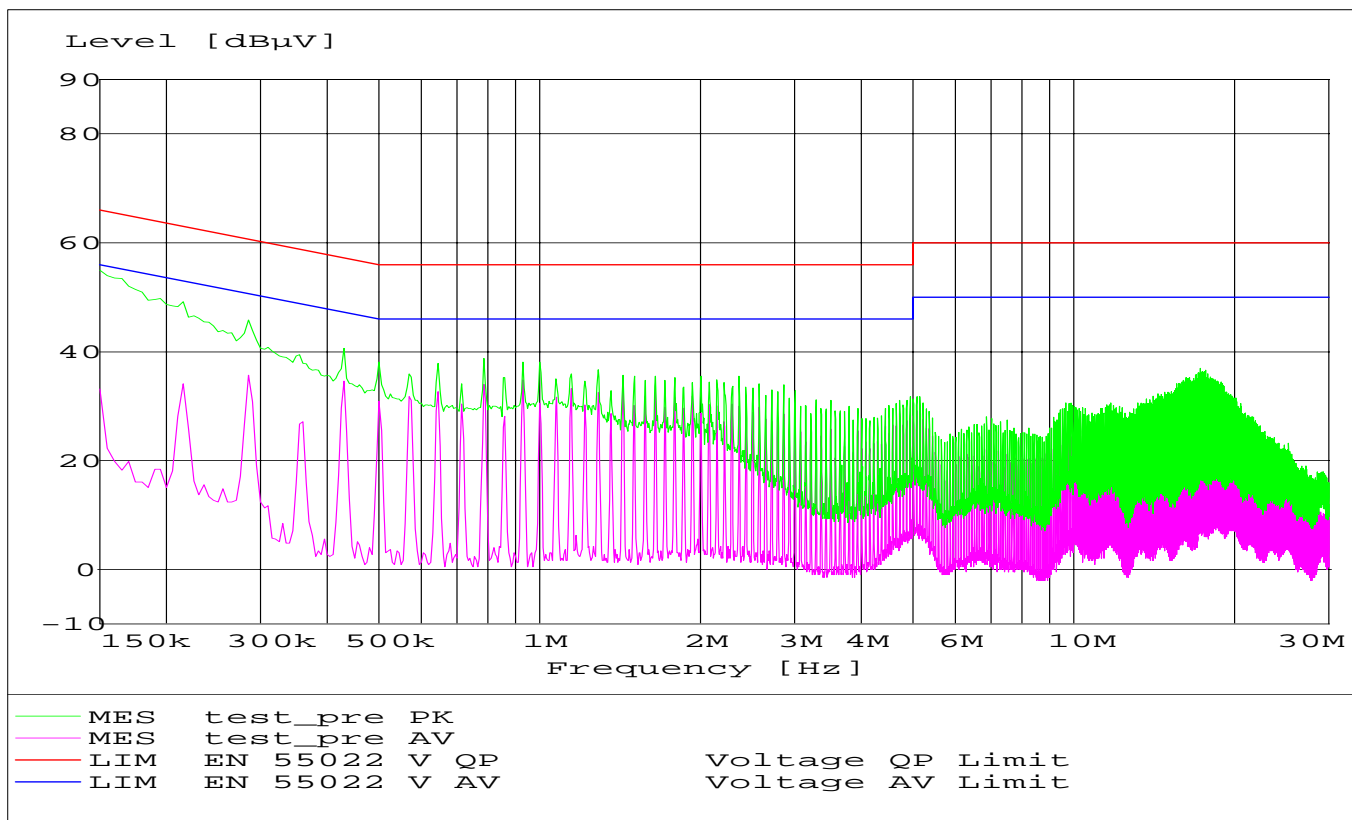
**Limit**

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 26.5 GHz very short cable connections to the antenna was used to minimize the noise level.
2. All radios (BT, WLAN & GSM) are set to idle/receive mode.
3. All measurements are done in peak mode unless specified with the plots.

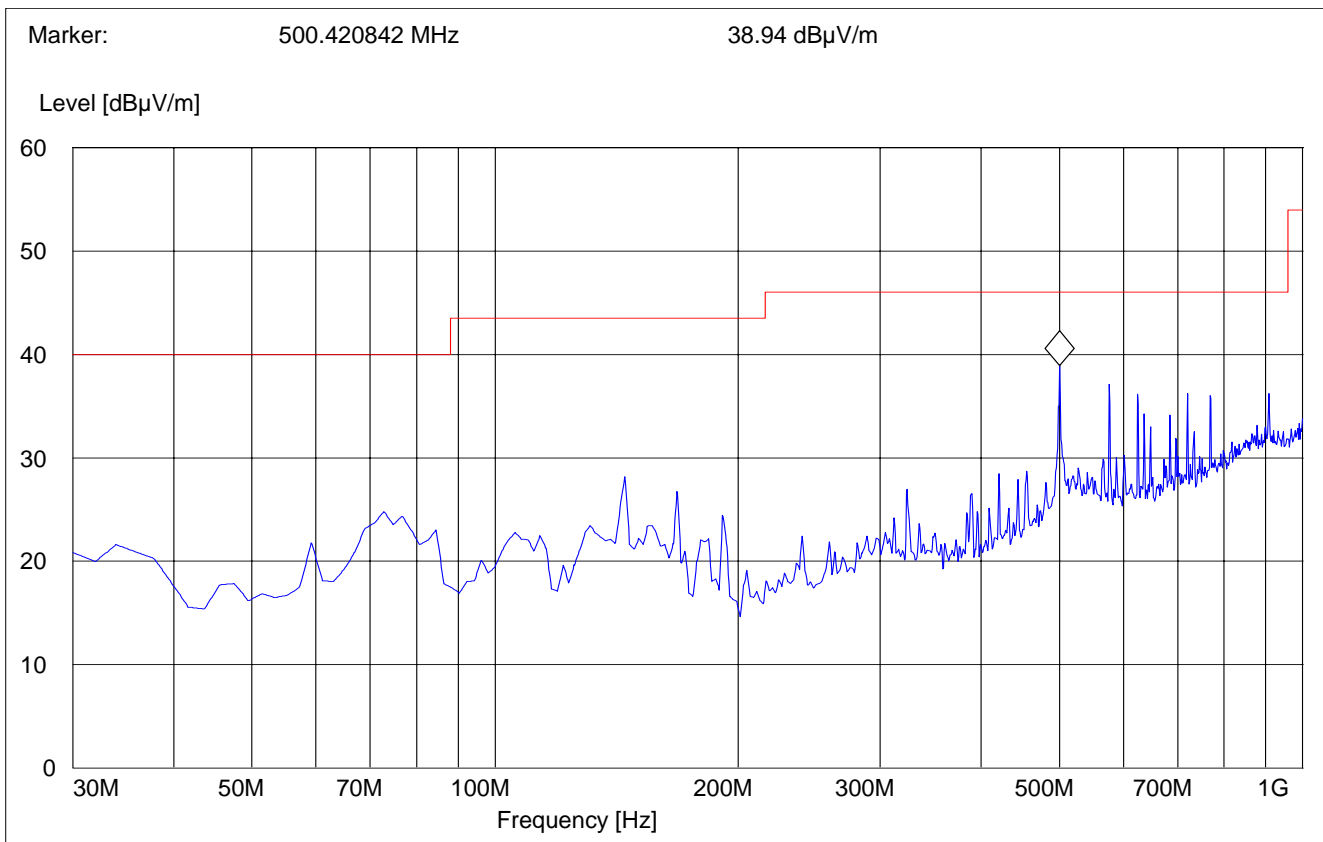
## RECEIVER SPURIOUS RADIATION

§ 15.209

30MHz – 1GHz

Antenna: vertical

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



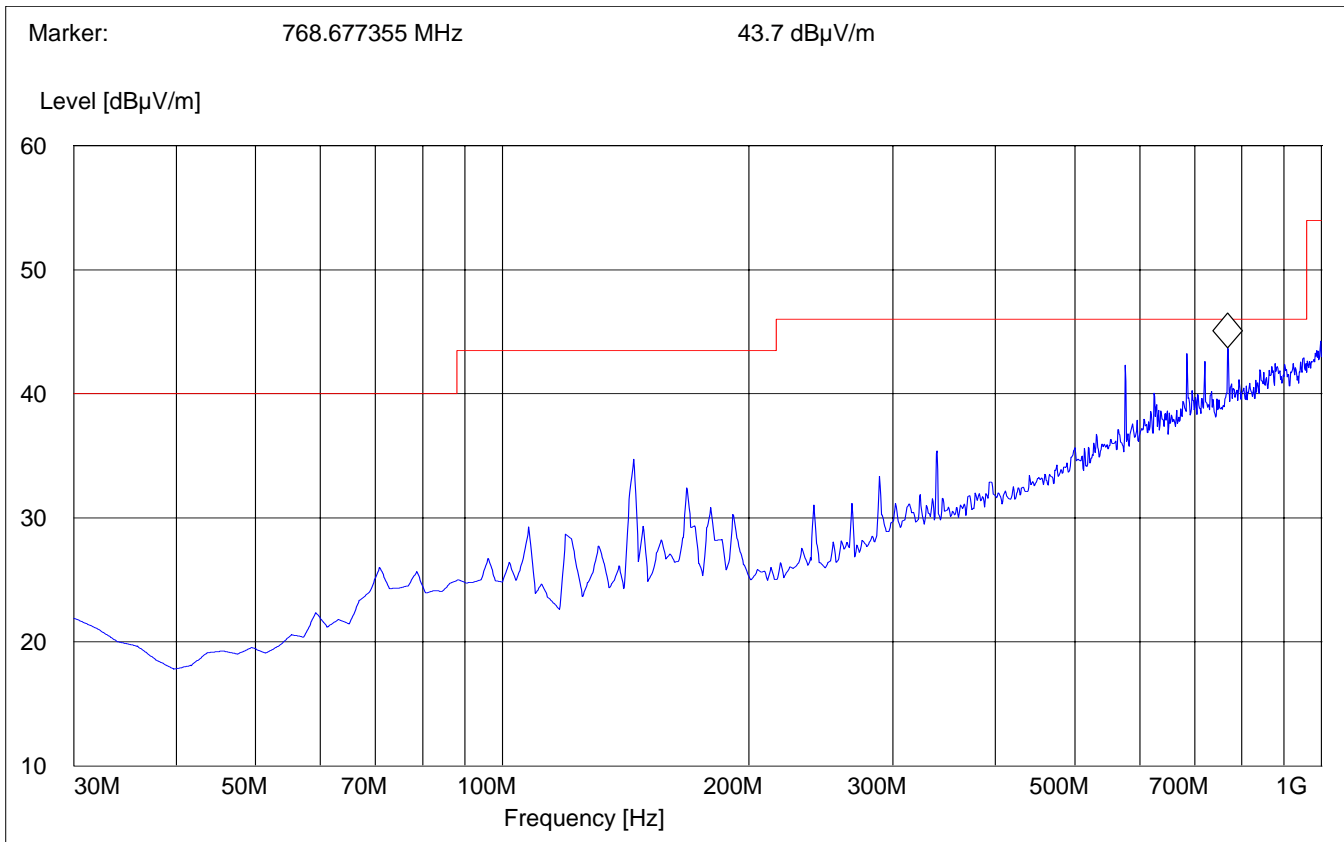
**RECEIVER SPURIOUS RADIATION**

§ 15.209

**30MHz – 1GHz**

**Antenna: Horizontal**

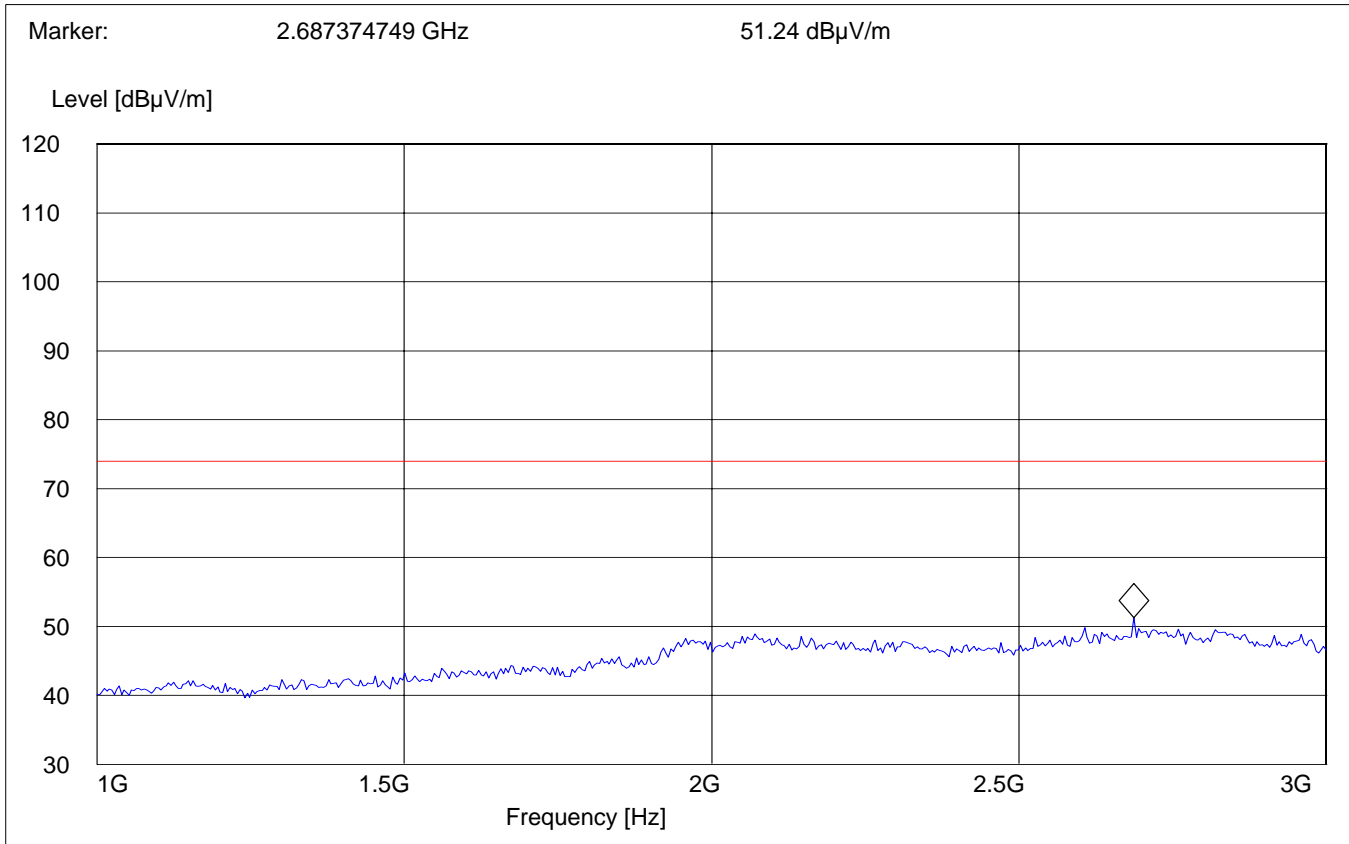
SWEEP TABLE:		" Spuri hi 30-1G"			
Short Description:		30MHz-1GHz			
Start	Stop	Detector	Meas. Time	RBW	Transducer
Frequency	Frequency			VBW	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	3141-#1186



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

§ 15.209

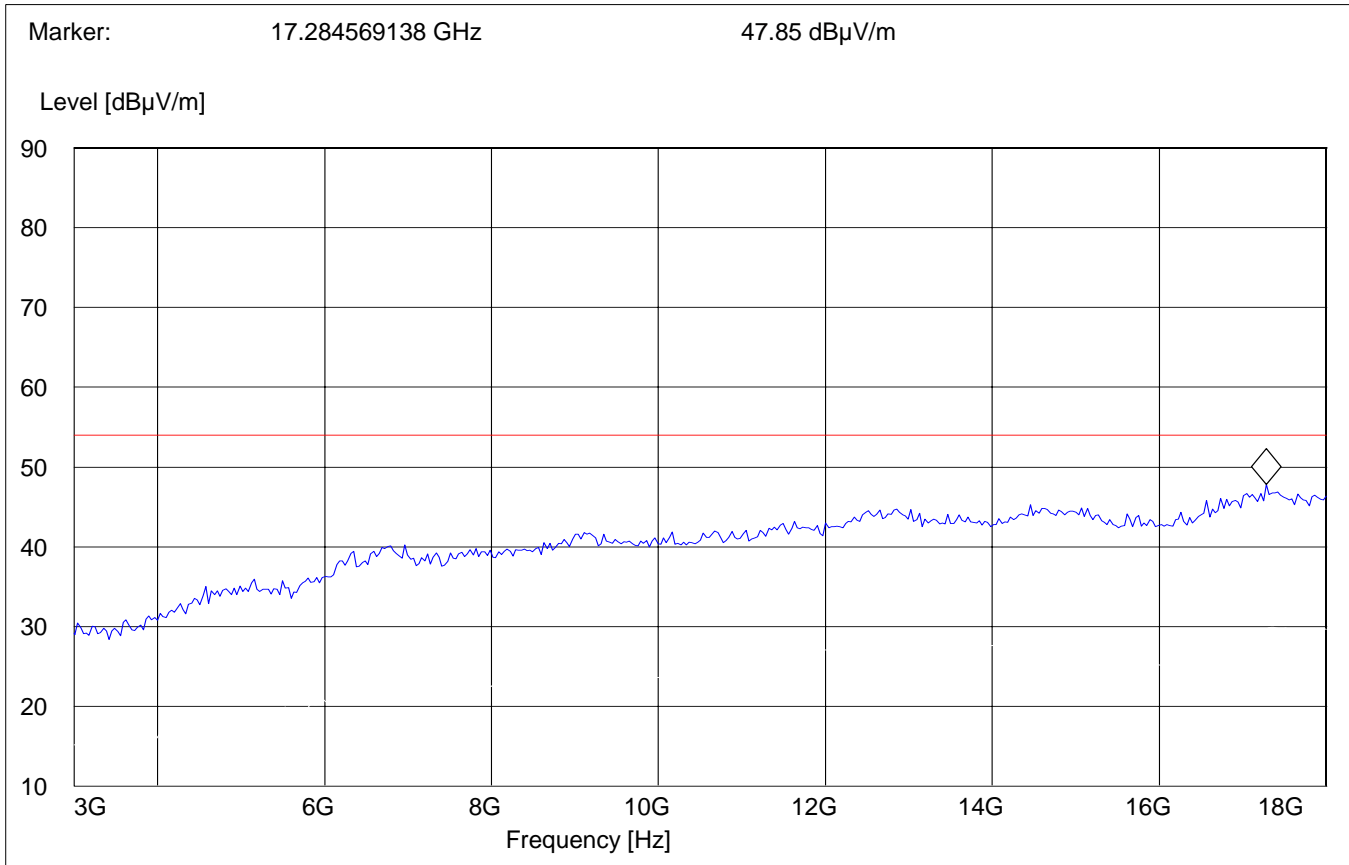
SWEEP TABLE:		" Spuri hi 1-3G"			
Short Description:		Spurious 1-3GHz			
Start	Stop	Detector	Meas.	RBW	Transducer
Frequency	Frequency	Time	Bandw.	VBW	
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	#326 horn (dBi)



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

§ 15.209

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



**TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS**

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
01	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107
02	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	826880/010
03	Biconilog Antenna	3141	EMCO	0005-1186
04	Horn Antenna (700M-18GHz)	SAS-200/571	AH Systems	325
05	Horn Antenna (18-26.5GHz)	3160-09	EMCO	1240
06	2-3GHz Band reject filter	BRM50701	Microtronics	6
07	Pre-Amplifier	TS-ANA	Rohde & Schwarz	--
08	Pre-Amplifier	JS4-00102600	Miteq	00616

**BLOCK DIAGRAMS**  
**Radiated Testing**

**ANECHOIC CHAMBER**

