

CETECOM Inc.



CETECOM Inc.

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Issued test report consists of 50 Pages

Page 1 (38)

**FCC LISTED, REG. NO.: 101450
&
RECOGNIZED BY INDUSTRY CANADA
IC – 3925**

**Test report no.:184FCC/2001
FCC Part 15.247
WL-305**

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

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 generalisations 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 & Radio Engineer: Harpreet Sidhu****1.2 Testing laboratory****CETECOM Inc.**

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E-mail: lothar.schmidt@cetecomusa.comInternet: www.cetecom.com

1.3 Details of applicant

Name : 3COM Corporation
Street : 5400 Bayfront Plaza
City : Santa Clara, CA 95051
Country : USA
Contact : David Boldy
Telephone : 408 326 2878
Telefax : 408 326 5854
e-mail : david_boldy@3com.com

1.4 Application details

Date of receipt of application : 2001-08-25
Date of receipt of test item : 2001-09-11
Date of test : 2001-09-11/12

1.5 Test item

Manufacturer : applicant
Name of EUT : 3COM Model WL-305
Description : [Wireless LAN PC Card](#)
Model No. : WL-305
Serial No. : N/A
FCC ID :

Additional informations

Frequency : 2400 – 2483.5 MHz
Type of modulation : DSSS
Number of channels : 13
Antenna : External Antenna
Power supply : PC Card
Output power : 16dBm
Extreme Vol. Limits : 3.3V ±10%
Extreme Temp. Limits : -20°C - +55°C

1.6 Test standards : **FCC Part 15 §15.247**

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.

Technical responsibility for area of testing :

2001-10-29

EMC & Radio

Lothar Schmidt



Date

Section

Name

Signature

2.2 Testreport

TEST REPORT

**Testreport no. : 187FCC/2001
WL-305**

TEST REPORT REFERENCE**LIST OF MEASUREMENTS**

Paragraph	PARAMETER TO BE MEASURED	PAGE
	Transmitter parameters	
§ 15.247 (a)(2)	Spectrum Bandwith of a DSSS System	7
§ 15.247 (b)(1)	Maximum peak output power	11
§ 15.247 (c)(1)	Emission limitations	19
§ 15.247 (d)	Power Spectral Density	28
§ 15.247 (e)	Processing Gain of DSSS System	32
§ 15.107	Conducted emissions	33
	Receiver parameters	
§ 15.209	Receiver Spurious Radiation	34
	Test equipment listing	38

SPECTRUM BANDWITH OF DSSS-SYSTEM

SUBCLAUSE § 15.247 (a)(2)

TEST CONDITIONS		6 dB BANDWIDTH (kHz)		
		2412	2442	2472
Frequency (MHz)				
$T_{nom}(23)^{\circ}C$	$V_{nom}(3.3)V$	9719	9719	10000
Measurement uncertainty		±3dB		

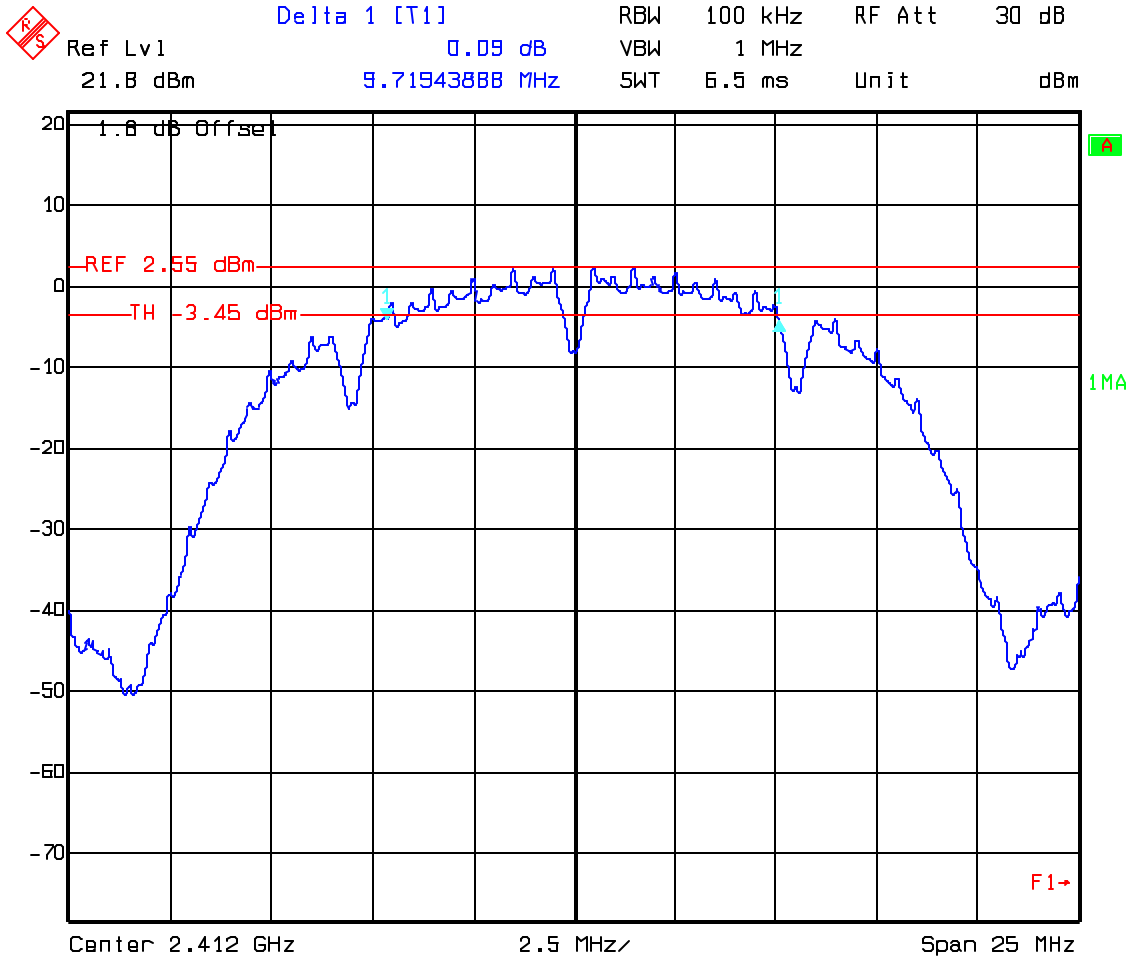
LIMIT

SUBCLAUSE §15.247(a) (2)

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

SPECTRUM BANDWIDTH OF DSSS-SYSTEM
Low Channel: 2412 MHz

SUBCLAUSE § 15.247 (a)(2)



Date: 12.SEP.01 20:03:20

LIMIT

SUBCLAUSE §15.247(a) (2)

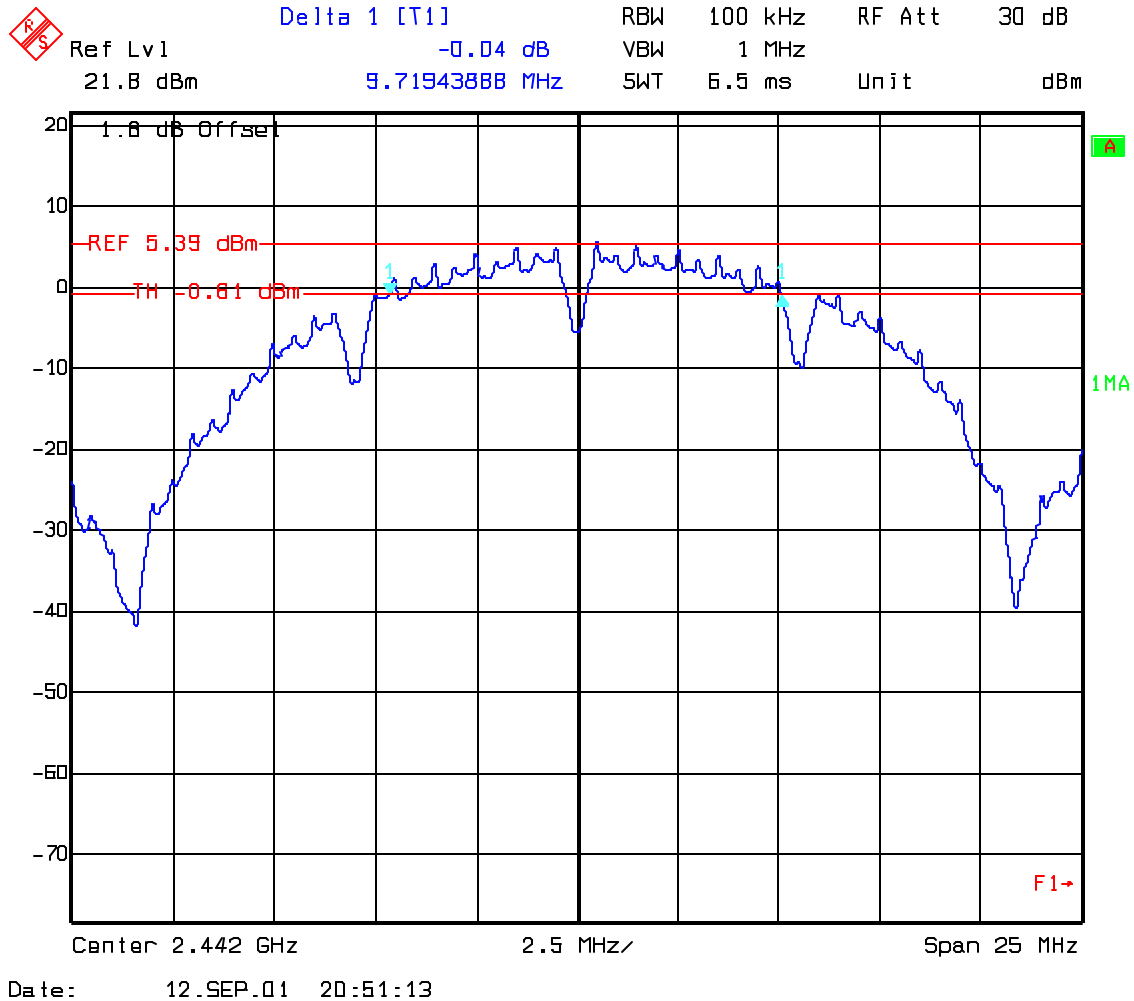
<p>The minimum 6dB bandwidth shall be at least 500 KHz</p>
--

ANALYZER SETTINGS: RBW=100KHz , VBW=1MHz

SPECTRUM BANDWIDTH OF DSSS-SYSTEM

SUBCLAUSE § 15.247 (a)(2)

Mid Channel: 2442 MHz



LIMIT

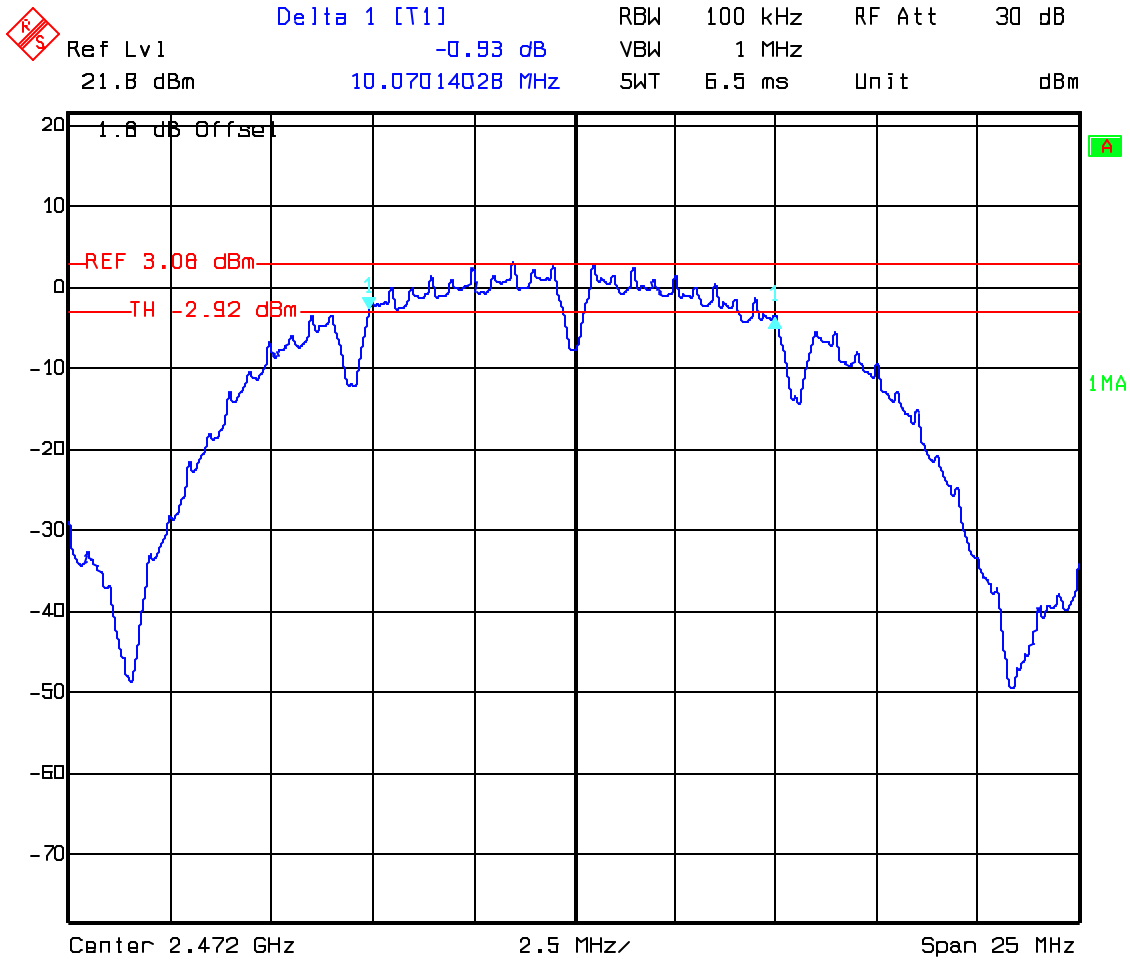
SUBCLAUSE §15.247(a) (2)

The minimum 6dB bandwidth shall be at least 500 KHz

ANALYZER SETTINGS: RBW=100KHz , VBW=1MHz

SPECTRUM BANDWITH OF DSSS-SYSTEM
High Channel: 2472 MHz

SUBCLAUSE § 15.247 (a)(2)



Date: 12.SEP.01 20:53:46

LIMIT

SUBCLAUSE §15.247(a) (2)

The minimum 6dB bandwidth shall be at least 500 KHz

ANALYZER SETTINGS: RBW=100KHz, VBW=1MHz

**MAXIMUM PEAK OUTPUT POWER
(CONDUCTED)**

SUBCLAUSE § 15.247 (b) (1)

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)					
		2412		2442		2472	
Frequency (MHz)		Pk	19.37	Pk	19.77	Pk	18.54
$T_{nom}(23)^{\circ}C$	$V_{nom}(3.3)V$	Av	11.96	Av	12.52	Av	11.34
Measurement uncertainty		$\pm 3dB$					

LIMIT

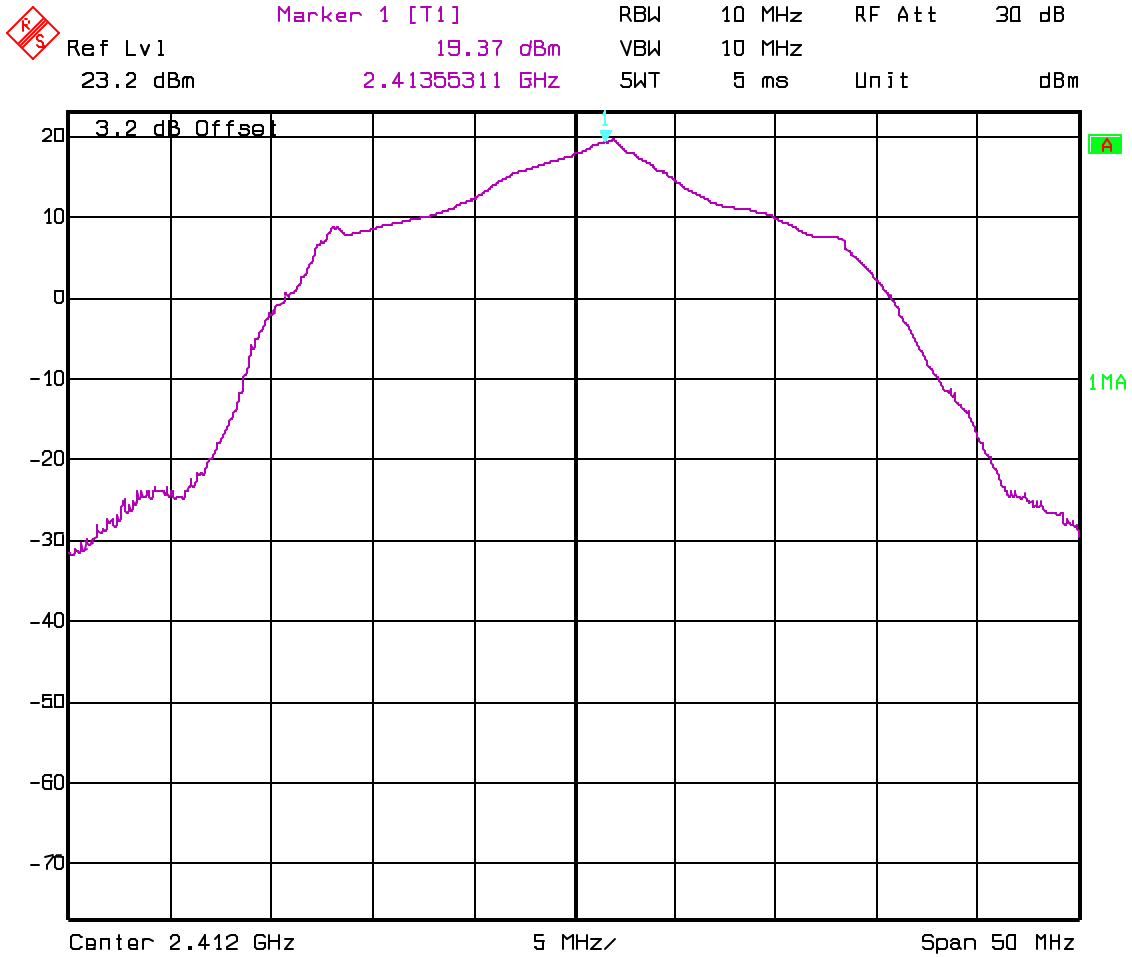
SUBCLAUSE § 15.247 (b) (1)

Frequency range	RF power output
2400-2483.5 MHz / 5725 – 5850 MHz	1.0 Watt

**MAXIMUM PEAK OUTPUT POWER
(CONDUCTED)**

SUBCLAUSE § 15.247 (b) (1)

Low Channel: 2412 MHz

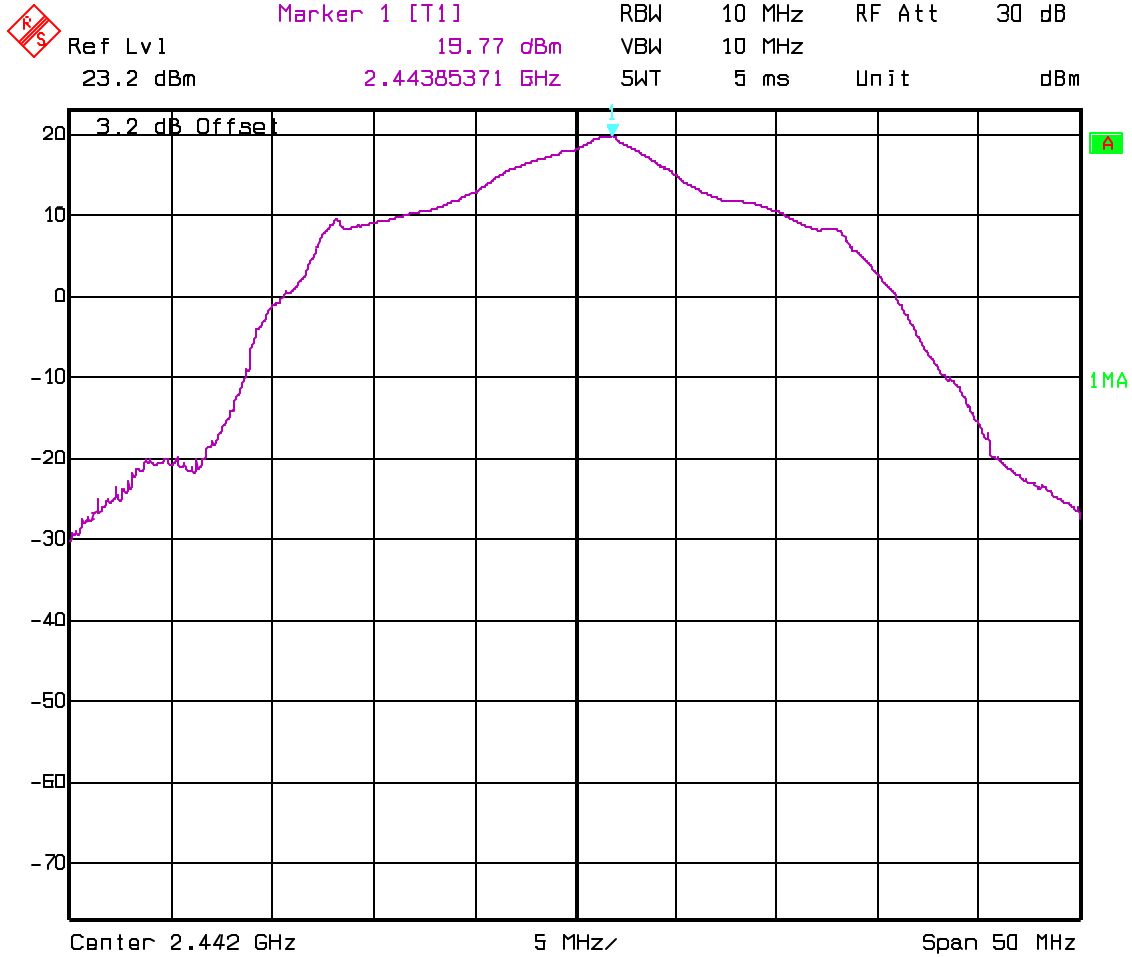


Date: 17.OCT.01 21:58:55

**MAXIMUM PEAK OUTPUT POWER
(CONDUCTED)**

SUBCLAUSE § 15.247 (b) (1)

Mid Channel: 2442 MHz

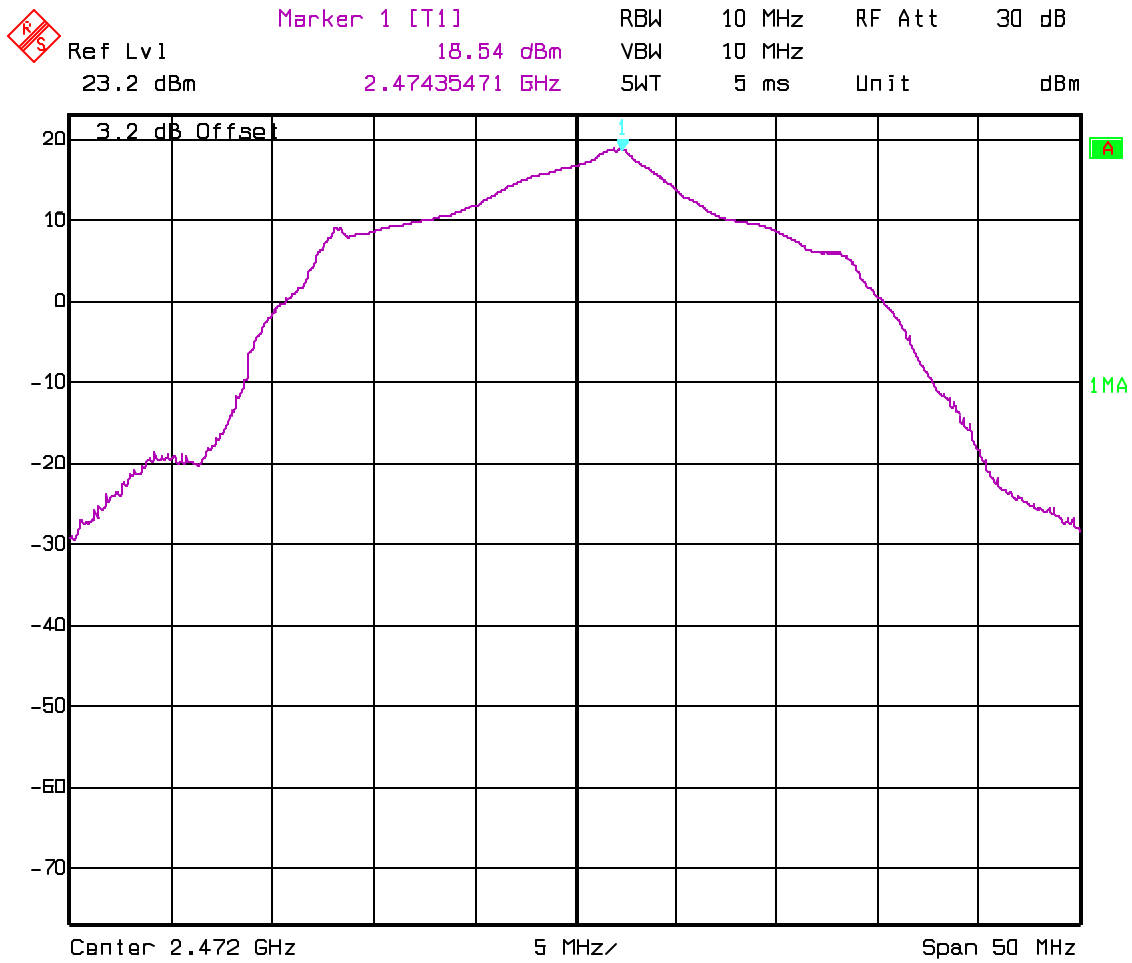


Date: 17.OCT.01 22:00:32

**MAXIMUM PEAK OUTPUT POWER
(CONDUCTED)**

SUBCLAUSE § 15.247 (b) (1)

High Channel: 2472 MHz



Date: 17.OCT.01 22:01:40

**MAXIMUM PEAK OUTPUT POWER (EIRP)
(RADIATED)**

SUBCLAUSE § 15.247 (b) (1)

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (dBm)		
		2412	2442	2472
Frequency (MHz)				
T _{nom} (23)°C	V _{nom} (3.3)V	22.47	22.32	19.95
Measurement uncertainty		±3dB		

LIMIT

SUBCLAUSE § 15.247 (b) (1)

Frequency range	RF power output
2400-2483.5 MHz / 5725 – 5850 MHz	1.0 Watt

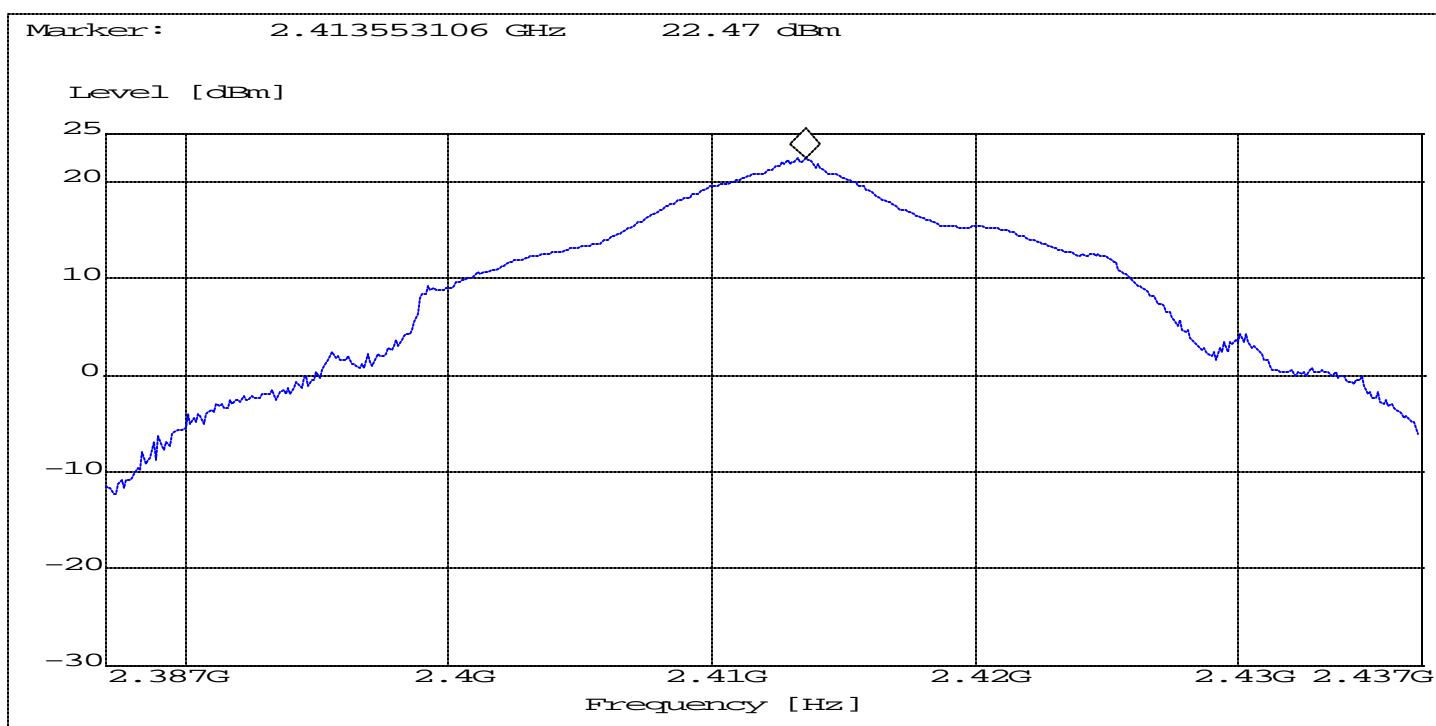
ANALYZER SETTINGS: RBW=10MHz , VBW=10MHz

**MAXIMUM PEAK OUTPUT POWER (EIRP)
(RADIATED)**

SUBCLAUSE § 15.247 (b) (1)

Low Channel: 2412 MHz

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

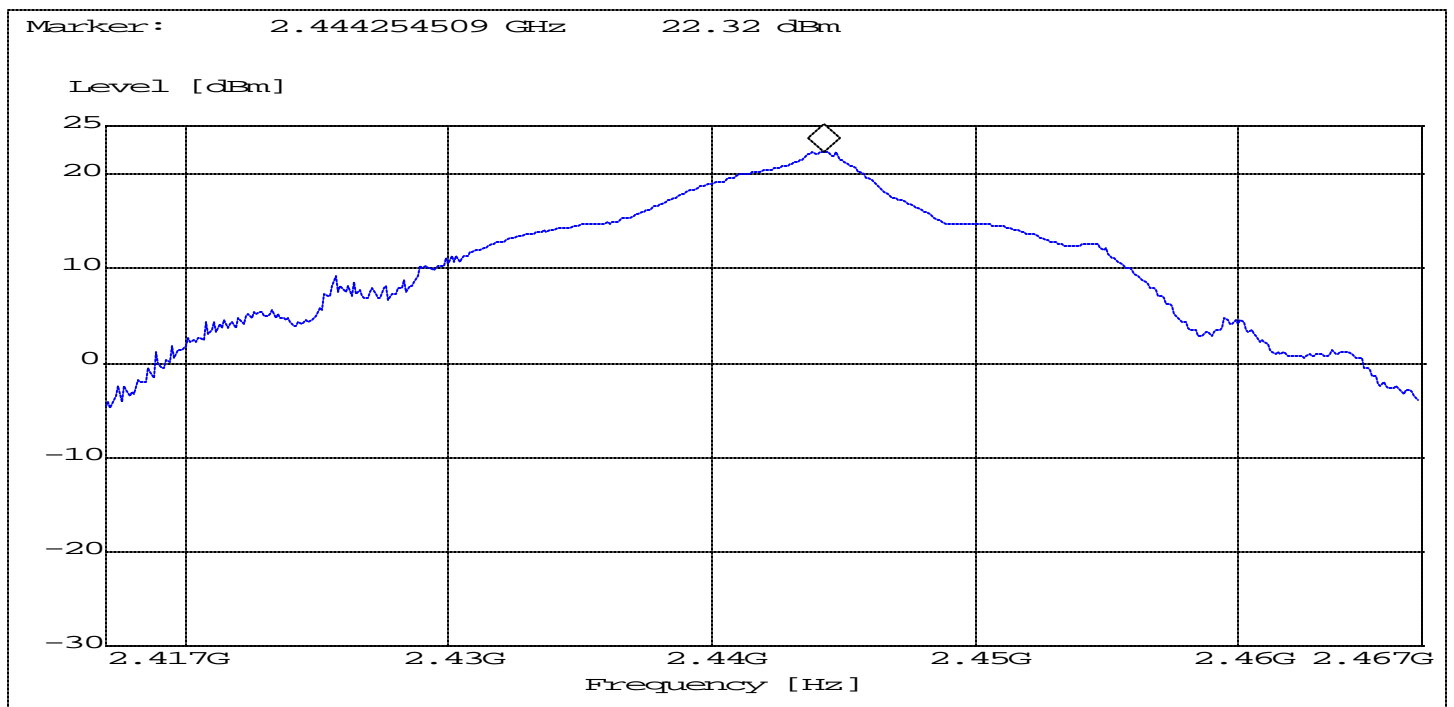


**MAXIMUM PEAK OUTPUT POWER (EIRP)
(RADIATED)**

SUBCLAUSE § 15.247 (b) (1)

Mid Channel: 2442 MHz

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

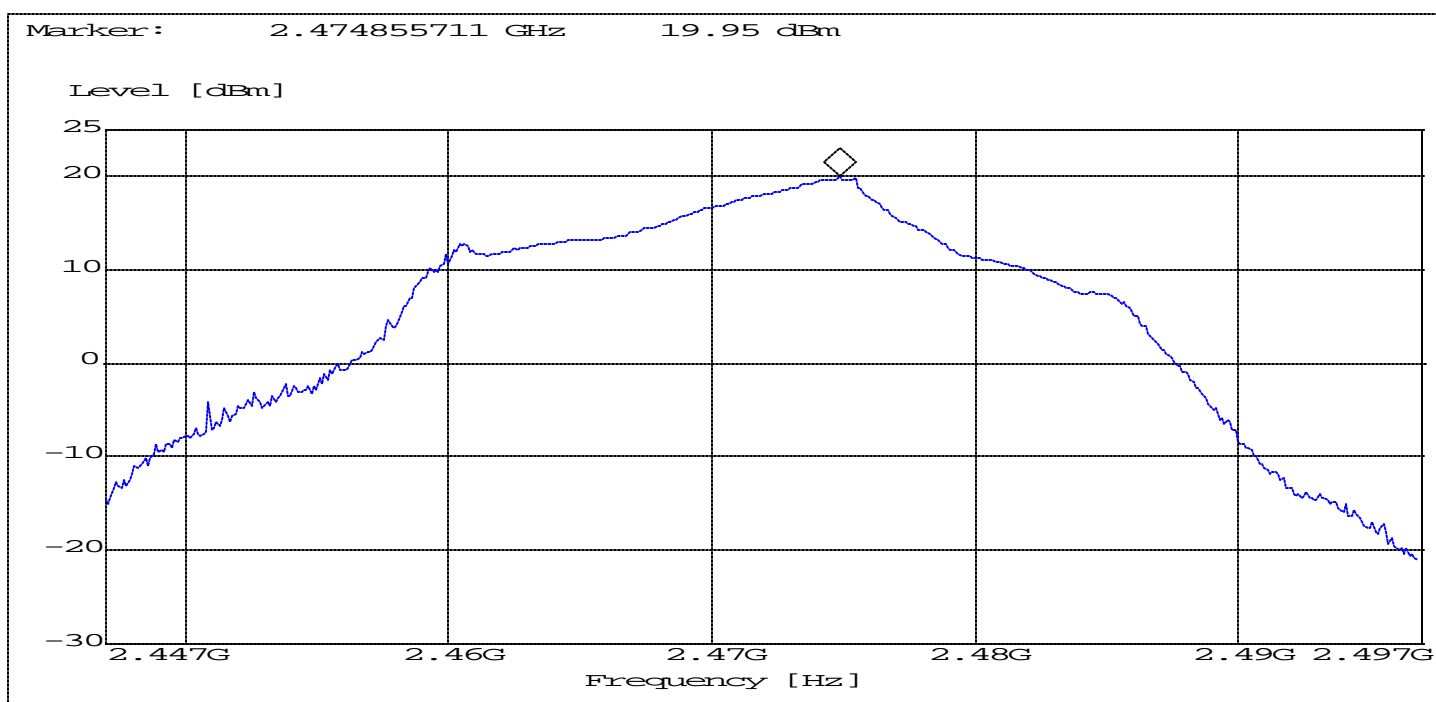


**MAXIMUM PEAK OUTPUT POWER (EIRP)
(RADIATED)**

SUBCLAUSE § 15.247 (b) (1)

High Channel: 2472 MHz

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



EMISSION LIMITATIONS (Transmitter)

SUBCLAUSE § 15.247 (c) (1)

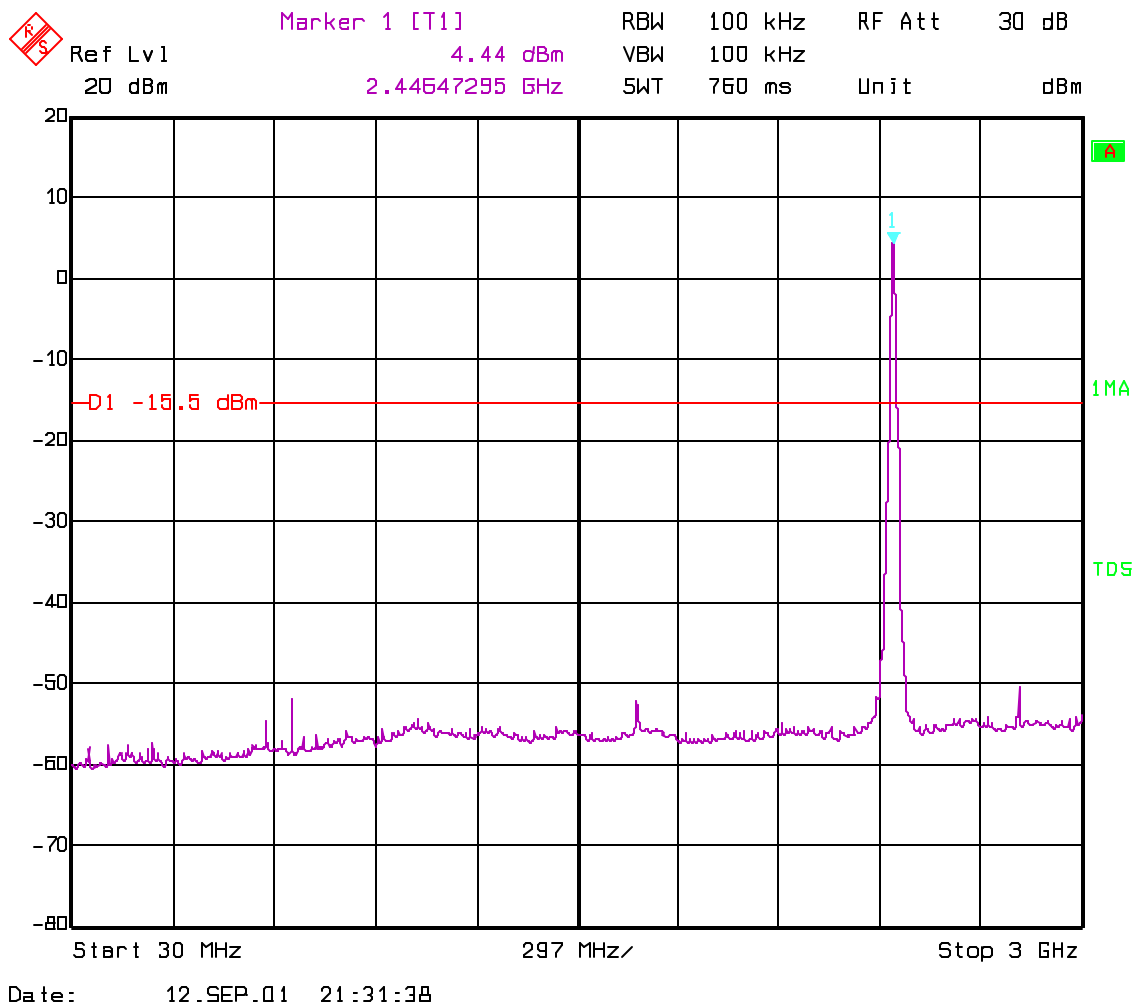
NOTE: Since this product was originally tested at CETECOM ICT Services GmbH, Saarbrücken, Germany as per test report No. 2_2203-C/00, the Conducted & Radiated Emissions are carried out only on middle channel (2442MHz)

Please refer to Test report No. 2_2203-C/00 of the original submission

EMISSION LIMITATIONS (Transmitter)
conducted

SUBCLAUSE § 15.247 (c) (1)

Mid Channel (2442 MHz): 30MHz – 3GHz



LIMITS

SUBCLAUSE § 15.247 (c)

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)).

ANALYZER SETTINGS: RBW=100kHz , VBW=100kHz

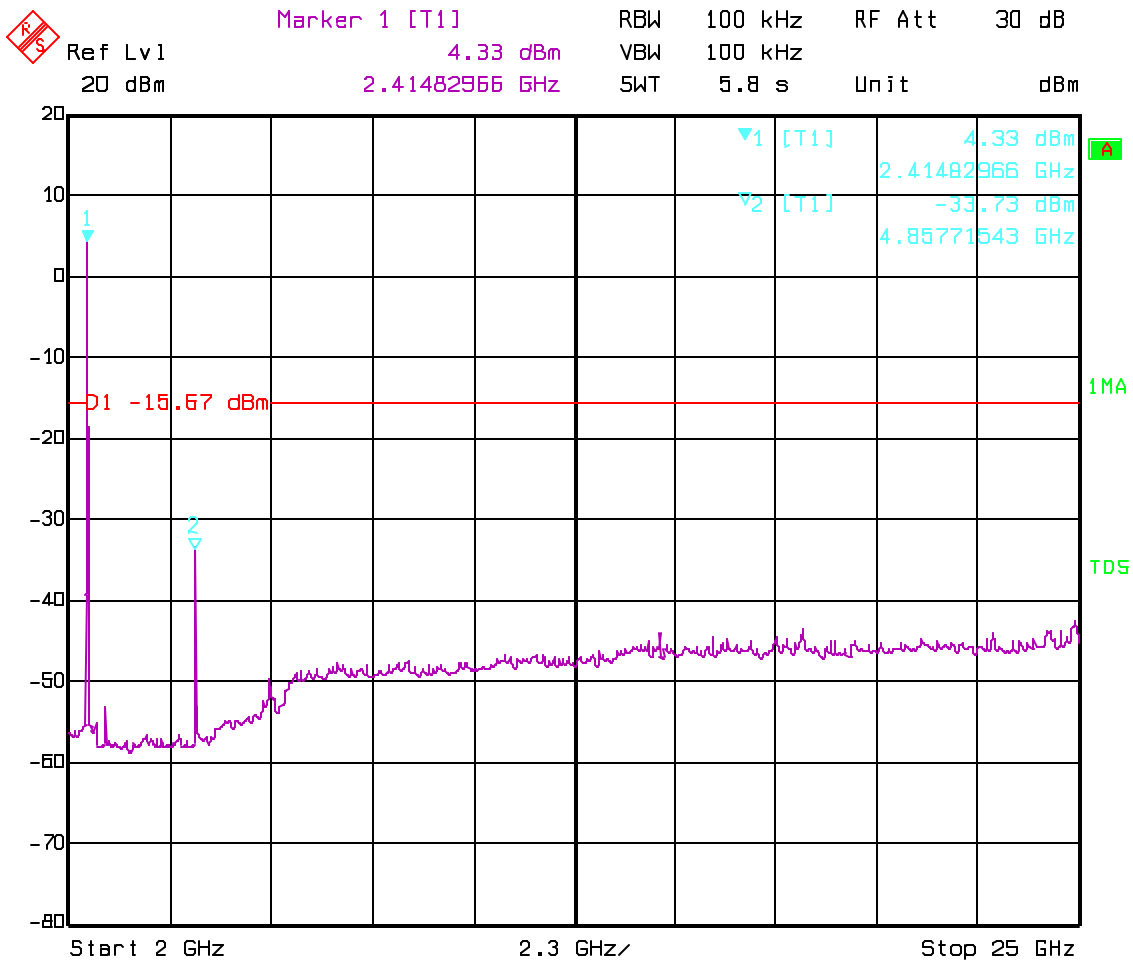
NOTE: The peak above the limit line is the carrier frequency. Frequency resolution is not fine enough to show the exact frequency of the carrier, refer to plots under EIRP.

EMISSION LIMITATIONS (Transmitter)

SUBCLAUSE § 15.247 (c) (1)

Conducted

Mid Channel (2442 MHz): 2GHz – 25GHz



Date: 12.SEP.01 21:36:00

LIMITS

SUBCLAUSE § 15.247 (c)

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)).

ANALYZER SETTINGS: RBW=100KHz, VBW=100KHz

NOTE: The peak above the limit line is the carrier frequency. Frequency resolution is not fine enough to show the exact frequency of the carrier, refer to plots under EIRP.

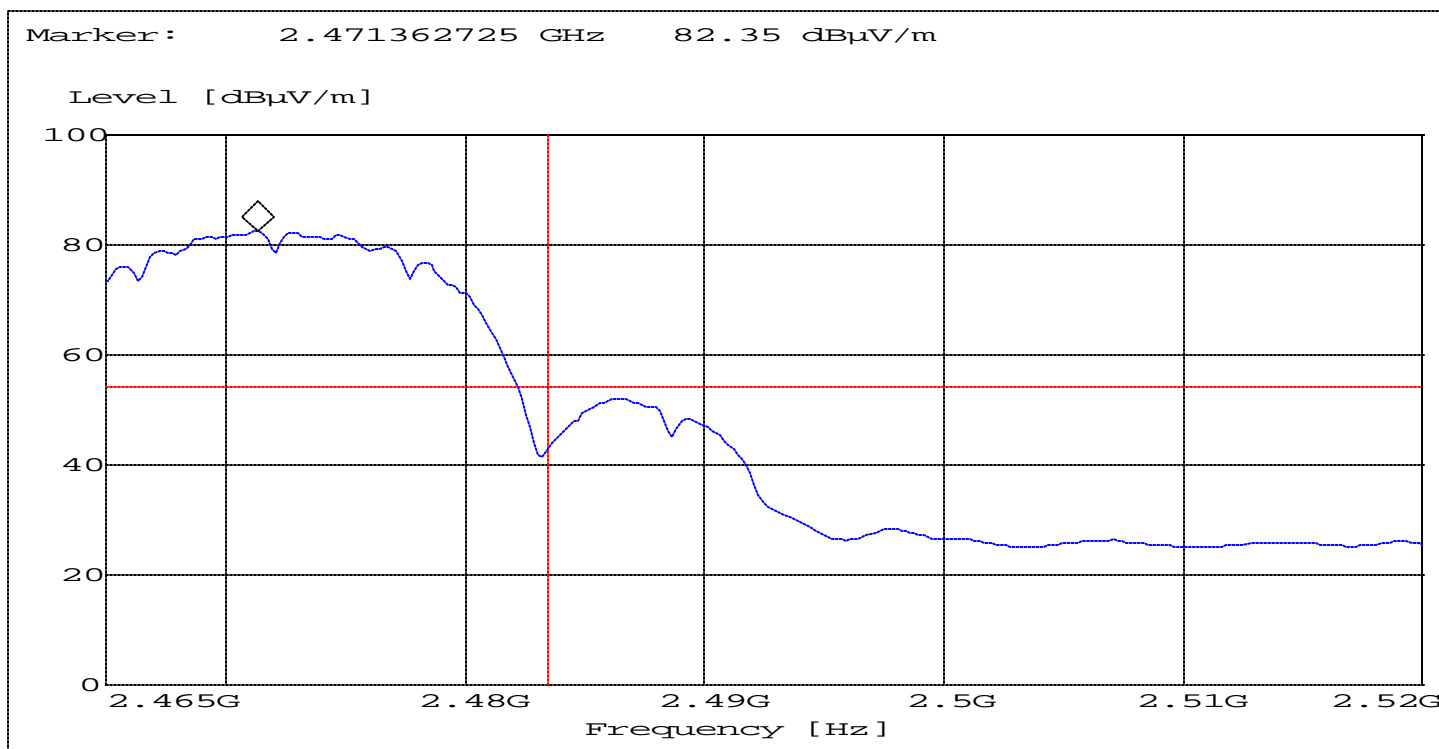
EMISSION LIMITATIONS (Transmitter)

SUBCLAUSE § 15.247 (c) (2)

conducted

spurious in the restricted band 2483.5 – 2500 MHz

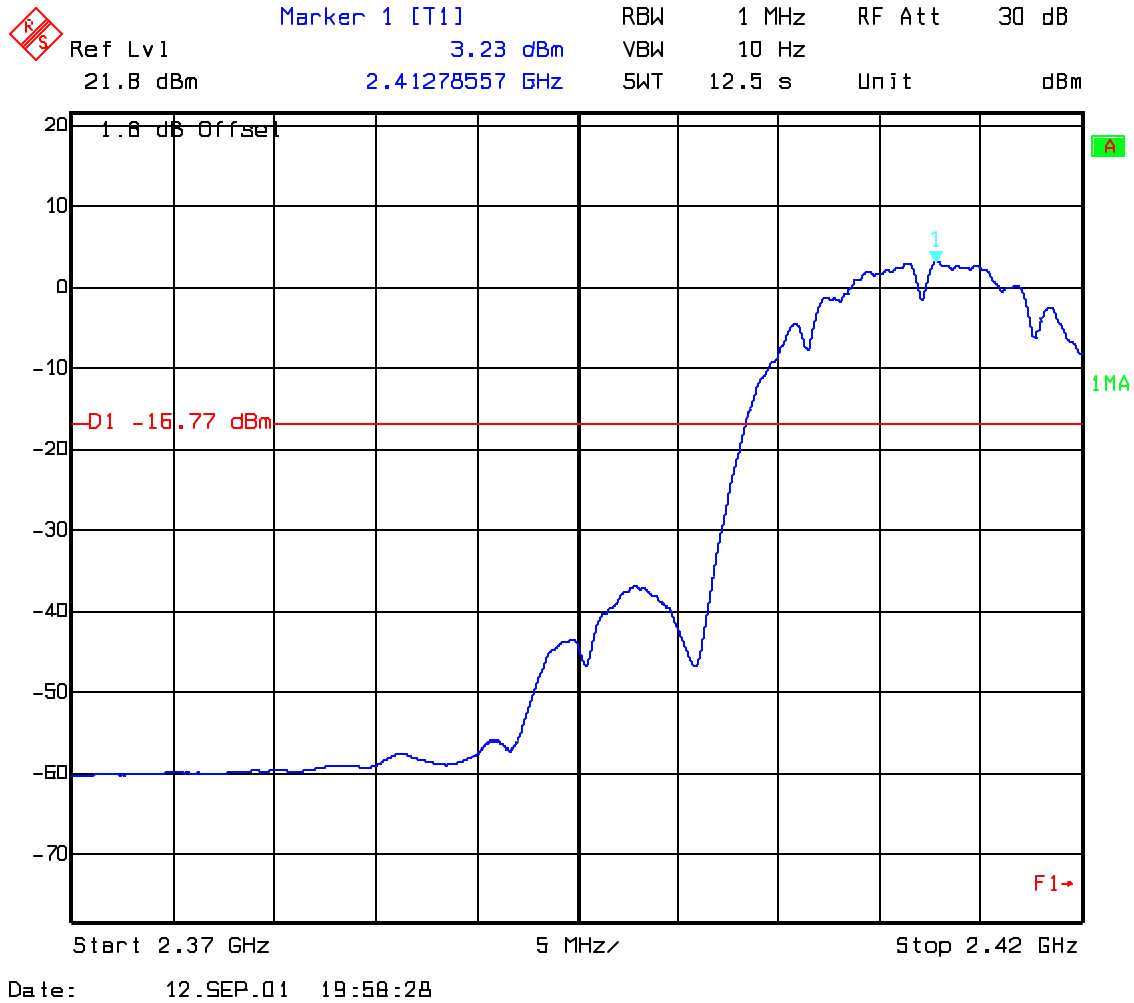
(Higher Band Edge)



ANALYZER SETTINGS: RBW=1MHz VBW=10Hz

Lower Band Edge

conducted



EMISSION LIMITATIONS (Transmitter)
Radiated

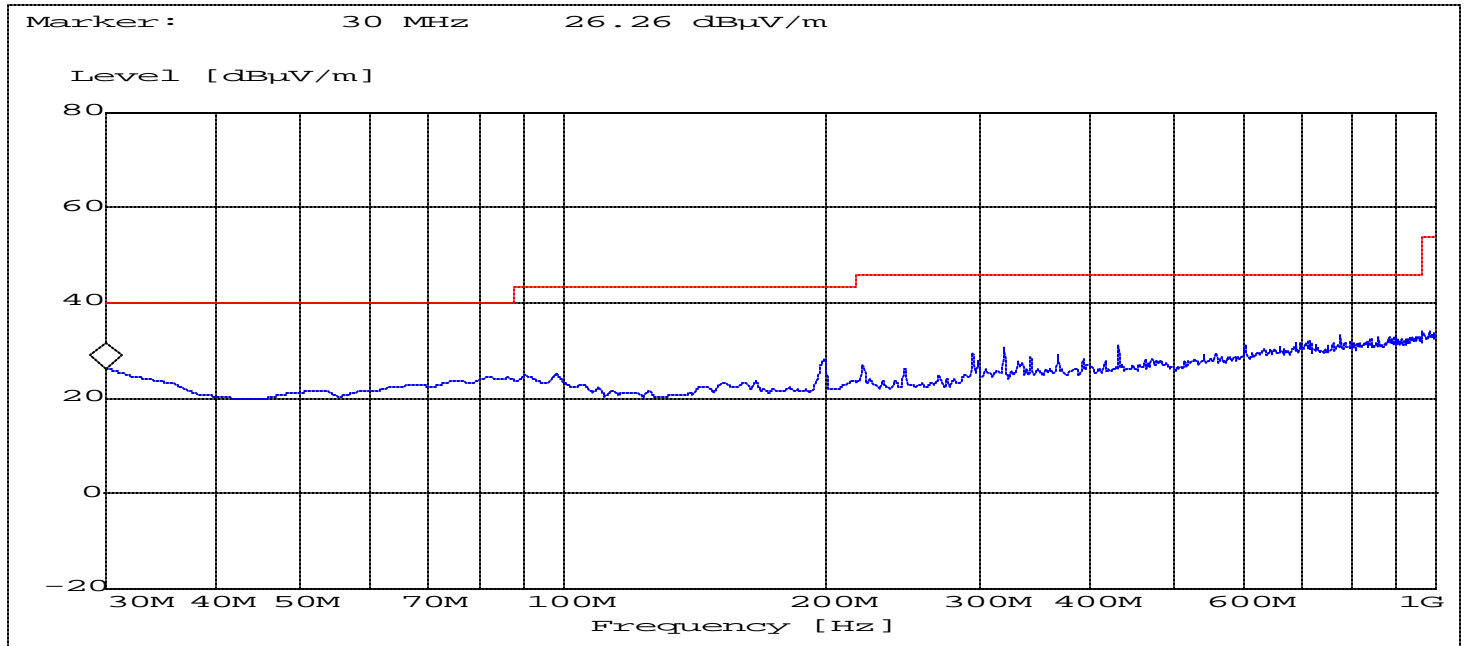
SUBCLAUSE § 15.247 (c) (1)

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 18 and 25 GHz very short cable connections to the antenna was used to minimize the noise level.

2. All emission measurements were done in Peak mode. In case limits are exceeded the measurements will be repeated and documented in the test report either with Quasi Peak or average detector depending on the frequency range specified in FCC 15 and/or DA00-705. Bandwidth, sweptime etc. were set according DA00-705 and recorded

Mid Channel(2442MHz): 30MHz-1GHz



LIMITS

SUBCLAUSE § 15.247 (c)

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)).

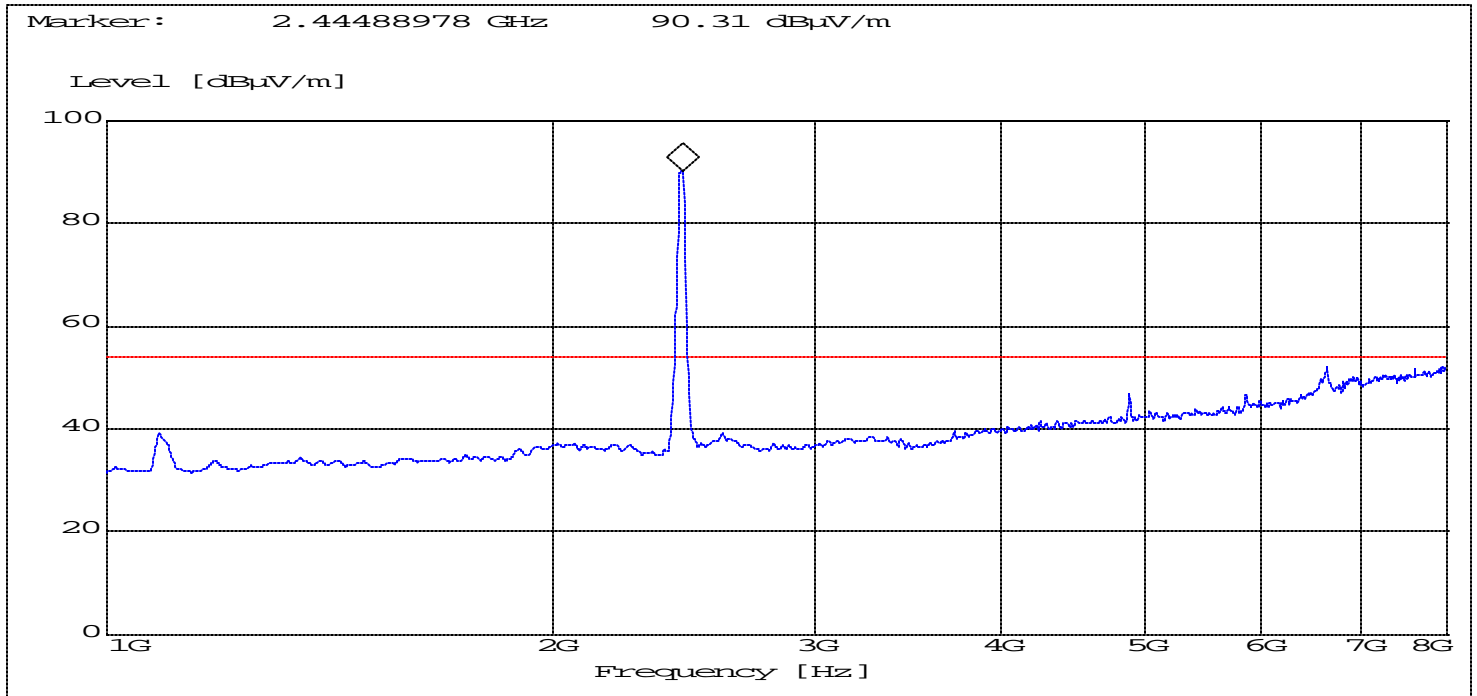
ANALYZER SETTINGS: f < 1 GHz : RBW/VBW: 100 kHz

f ≥ 1GHz : RBW/VBW: 1 MHz

EMISSION LIMITATIONS (Transmitter) SUBCLAUSE § 15.247 (c) (1)

Radiated

Mid Channel(2442MHz): 1GHz-8GHz



NOTE: The peak above the limit line is the carrier frequency. Frequency resolution is not fine enough to show the exact frequency of the carrier, refer to plots under EIRP.

LIMITS

SUBCLAUSE § 15.247 (c)

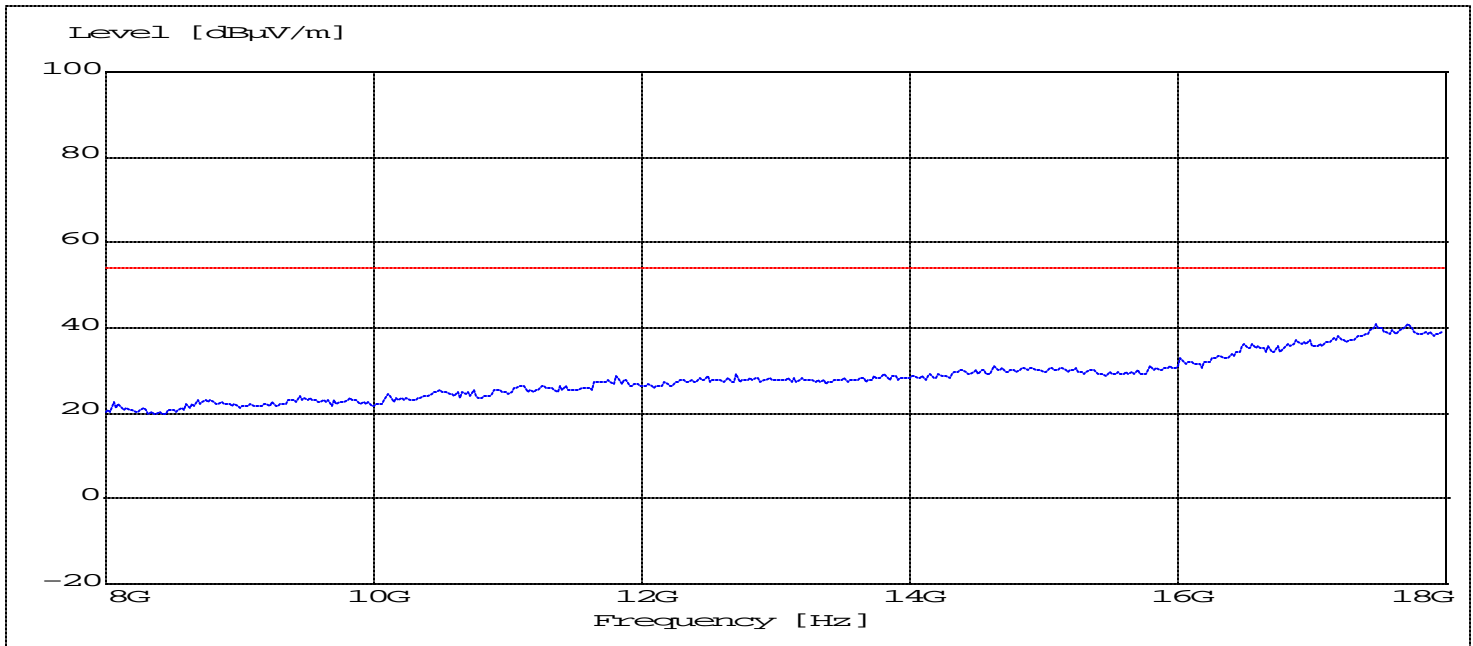
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

ANALYZER SETTINGS: f < 1 GHz : RBW/VBW: 100 kHz

f \geq 1GHz : RBW/VBW: 1 MHz

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

Mid Channel(2442MHz): 8GHz-18GHz



LIMITS

SUBCLAUSE § 15.247 (c)

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)).

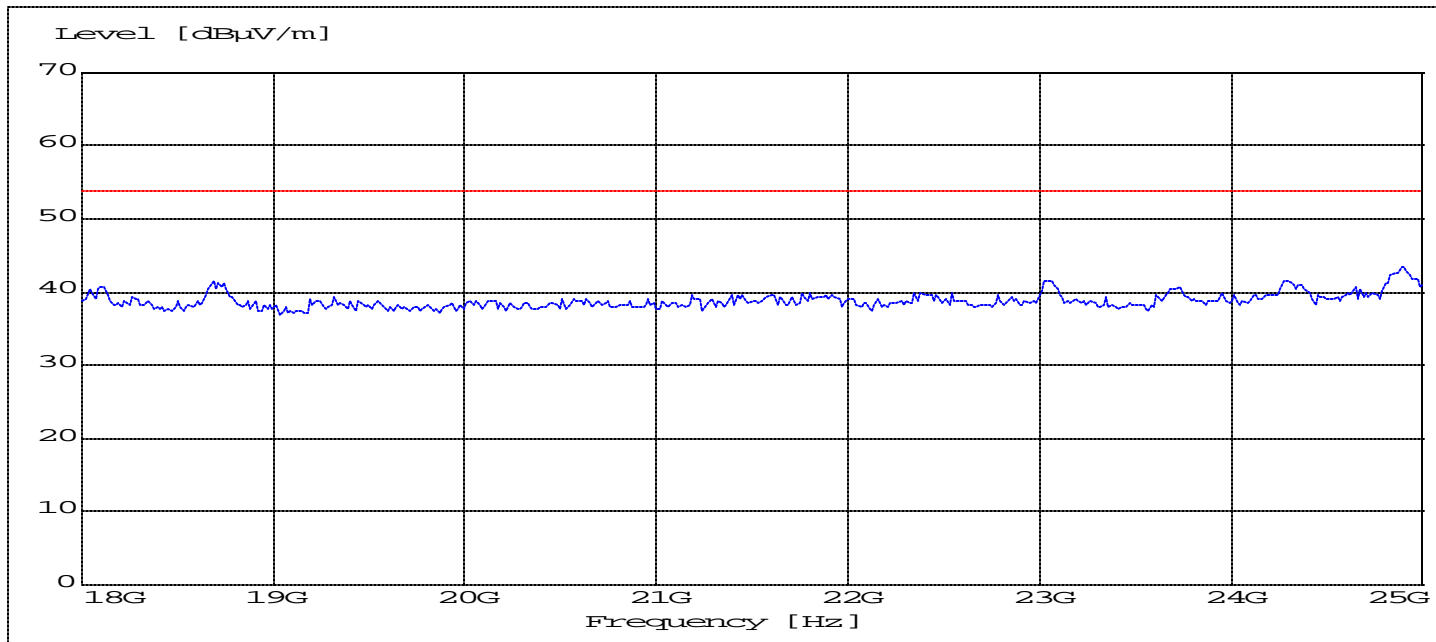
ANALYZER SETTINGS: f < 1 GHz : RBW/VBW: 100 kHz

f ≥ 1GHz : RBW/VBW: 1 MHz

EMISSION LIMITATIONS (Transmitter) SUBCLAUSE § 15.247 (c) (1)

Radiated

Mid Channel(2442MHz): 18GHz-25GHz



LIMITS

SUBCLAUSE § 15.247 (c)

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)).

ANALYZER SETTINGS: f < 1 GHz : RBW/VBW: 100 kHz

f ≥ 1GHz : RBW/VBW: 1 MHz

POWER SPECTRAL DENSITY

SUBCLAUSE § 15.247 (d)

TEST CONDITIONS		RF POWER LEVEL IN 3 kHz BW		
		2412	2442	2472
Frequency (MHz)				
T _{nom} (23)°C	V _{nom} (3.3)V	-16.26 dBm	-13.35dBm	-15.87 dBm
Measurement uncertainty		±3dB		

LIMIT

SUBCLAUSE §15.247(d)

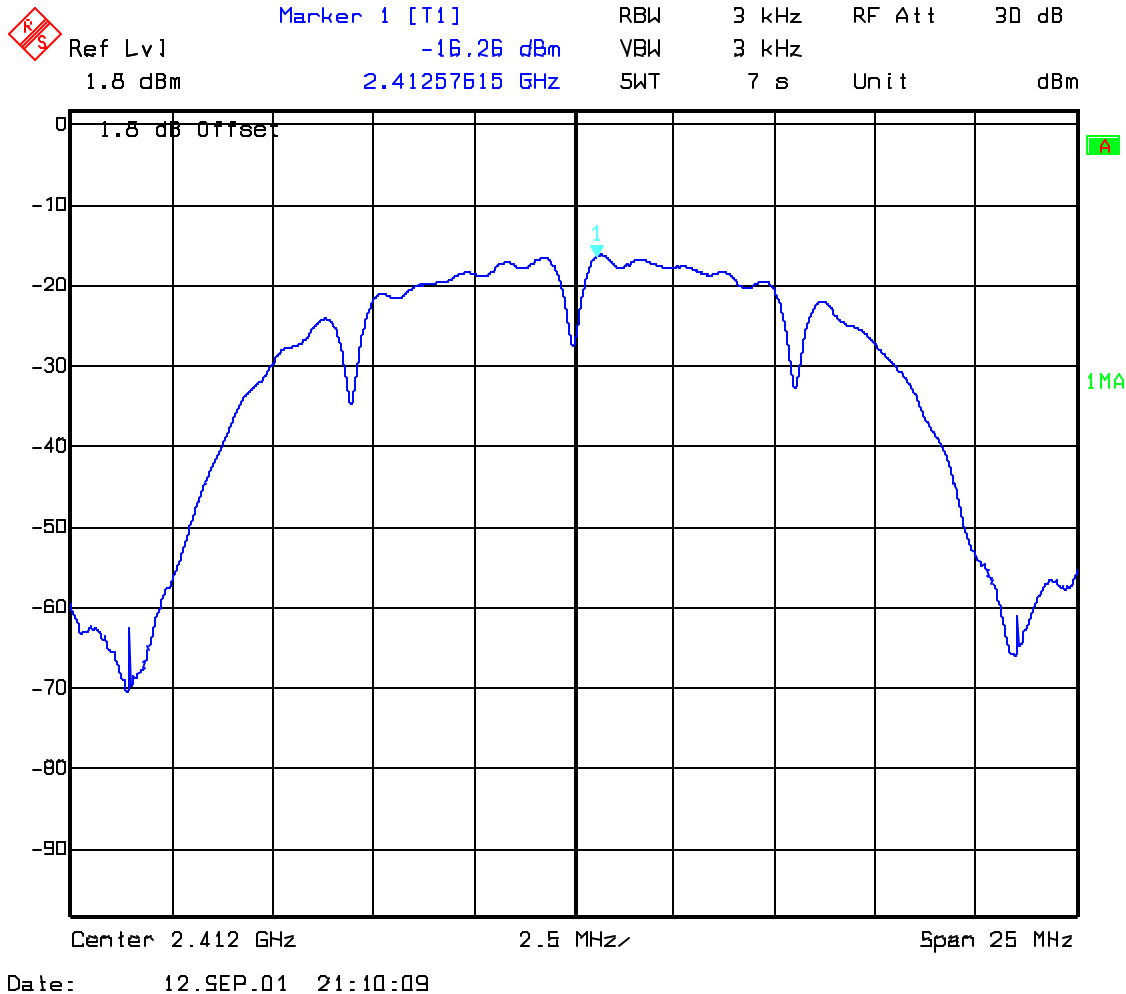
The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band

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

POWER SPECTRAL DENSITY

SUBCLAUSE § 15.247 (d)

Low Channel: 2412 MHz



LIMIT

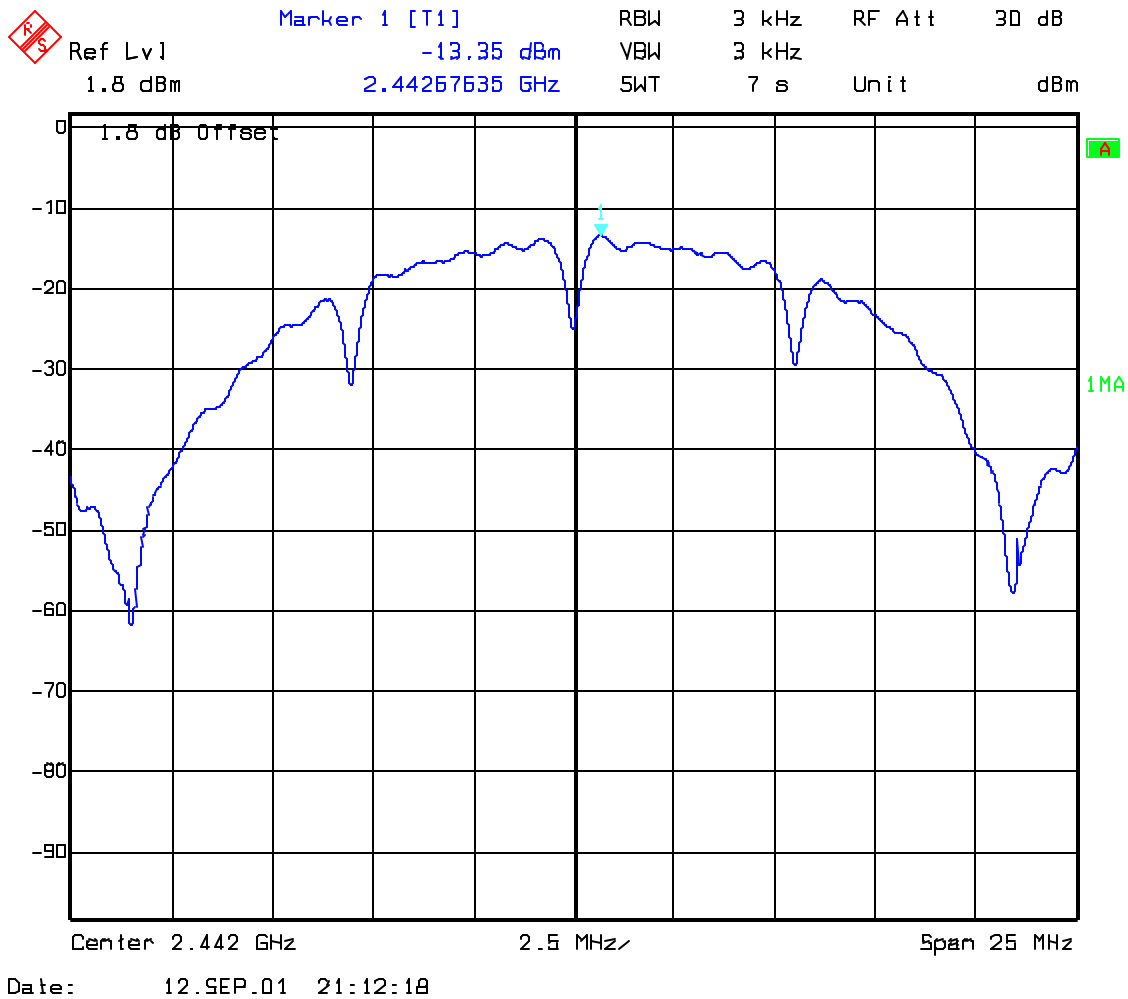
SUBCLAUSE §15.247(d)

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

POWER SPECTRAL DENSITY

SUBCLAUSE § 15.247 (d)

Mid Channel: 2442 MHz



LIMIT

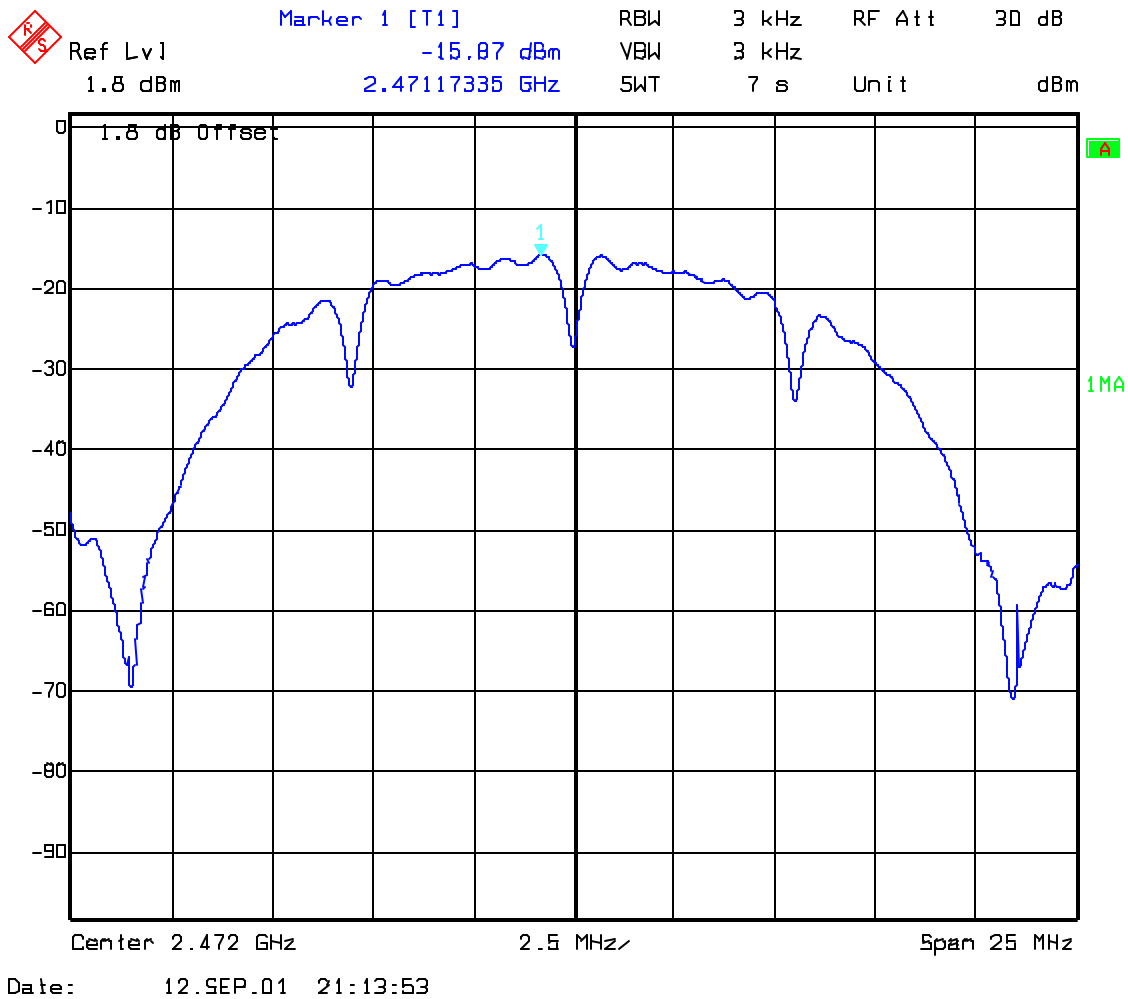
SUBCLAUSE §15.247(d)

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

POWER SPECTRAL DENSITY

SUBCLAUSE § 15.247 (d)

High Channel: 2472 MHz



LIMIT

SUBCLAUSE §15.247(d)

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

PROCESSING GAIN OF DSSS SYSTEMS SUBCLAUSE §15.247 (e)

(NOTE: The processing gain data is provided by Chip Set Manufacturer – see separate test report)

CONDUCTED EMISSIONS

§ 15.107/207

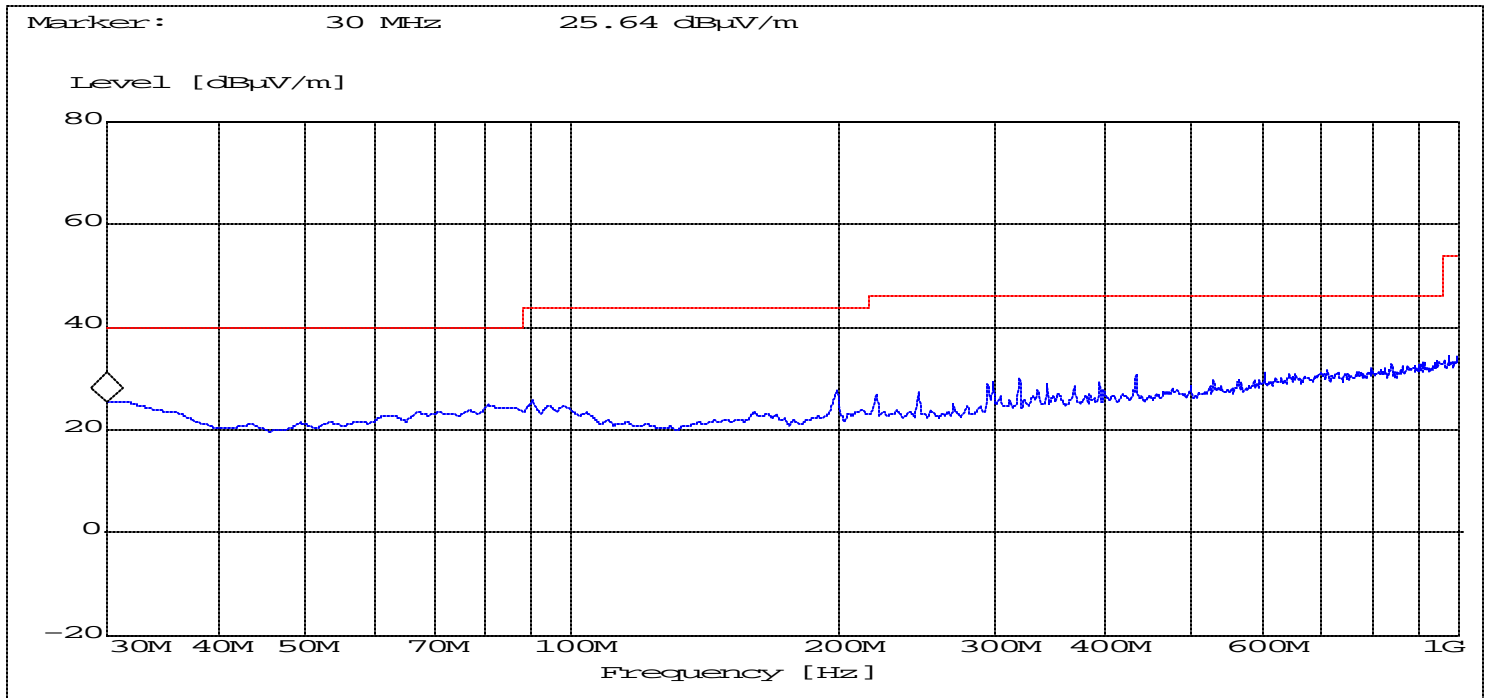
Measured with AC/DC power adapter plugged in LISN

**This test is covered by Test report No. 2_2203-C/00 issued by
CETECOM ICT Services GmbH, Saarbrücken, Germany.**

RECEIVER SPURIOUS RADIATION

§ 15.209

Mid Channel (2442MHz): 30MHz – 1GHz



Limits

SUBCLAUSE § 15.209

Frequency (MHz)	Field strength (µV/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: All measurements were done in peak mode)

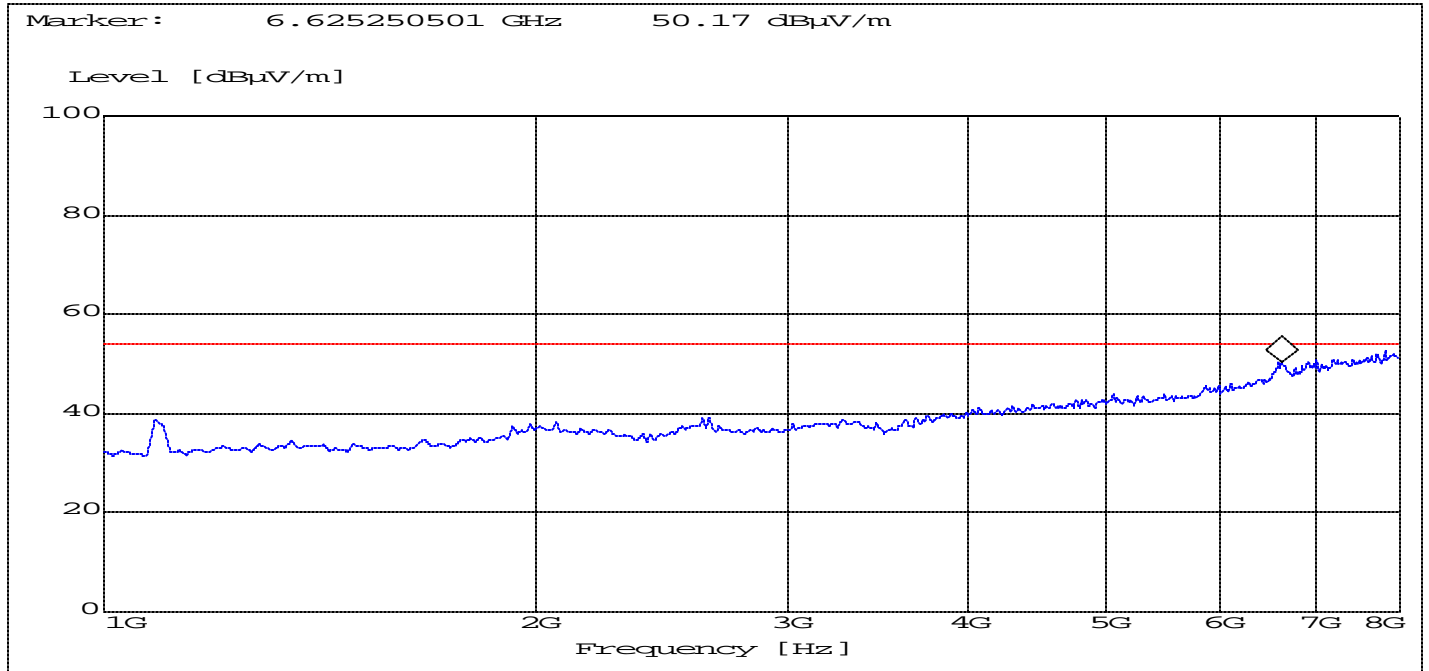
ANALYZER SETTINGS: f < 1 GHz : RBW/VBW: 100 kHz

f ≥ 1GHz : RBW/VBW: 1 MHz

RECEIVER SPURIOUS RADIATION

§ 15.209

Mid Channel (2442MHz): 1GHz – 8GHz



Limits

SUBCLAUSE § 15.209

Frequency (MHz)	Field strength (µV/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: All measurements were done in peak mode)

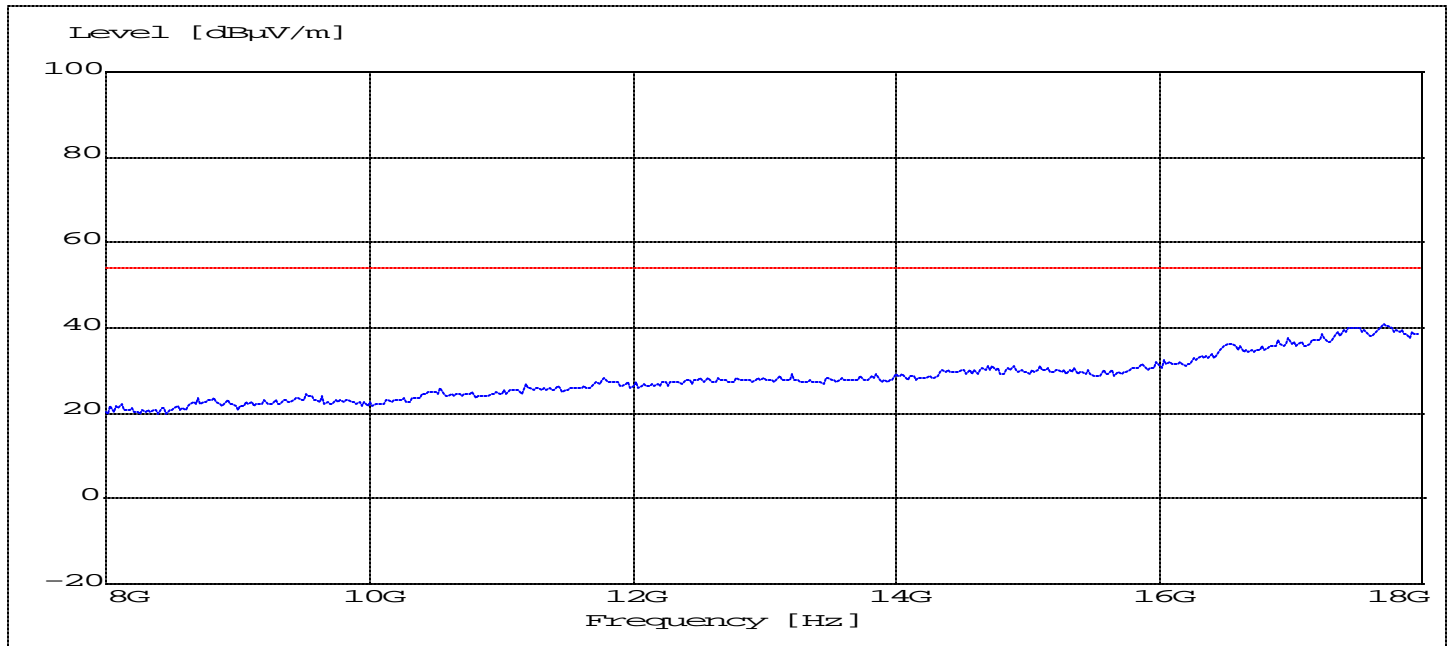
ANALYZER SETTINGS: f < 1 GHz : RBW/VBW: 100 kHz

f ≥ 1GHz : RBW/VBW: 1 MHz

RECEIVER SPURIOUS RADIATION

§ 15.209

Mid Channel (2442MHz): 8GHz – 18GHz



Limits

SUBCLAUSE § 15.209

Frequency (MHz)	Field strength (µV/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: All measurements were done in peak mode)

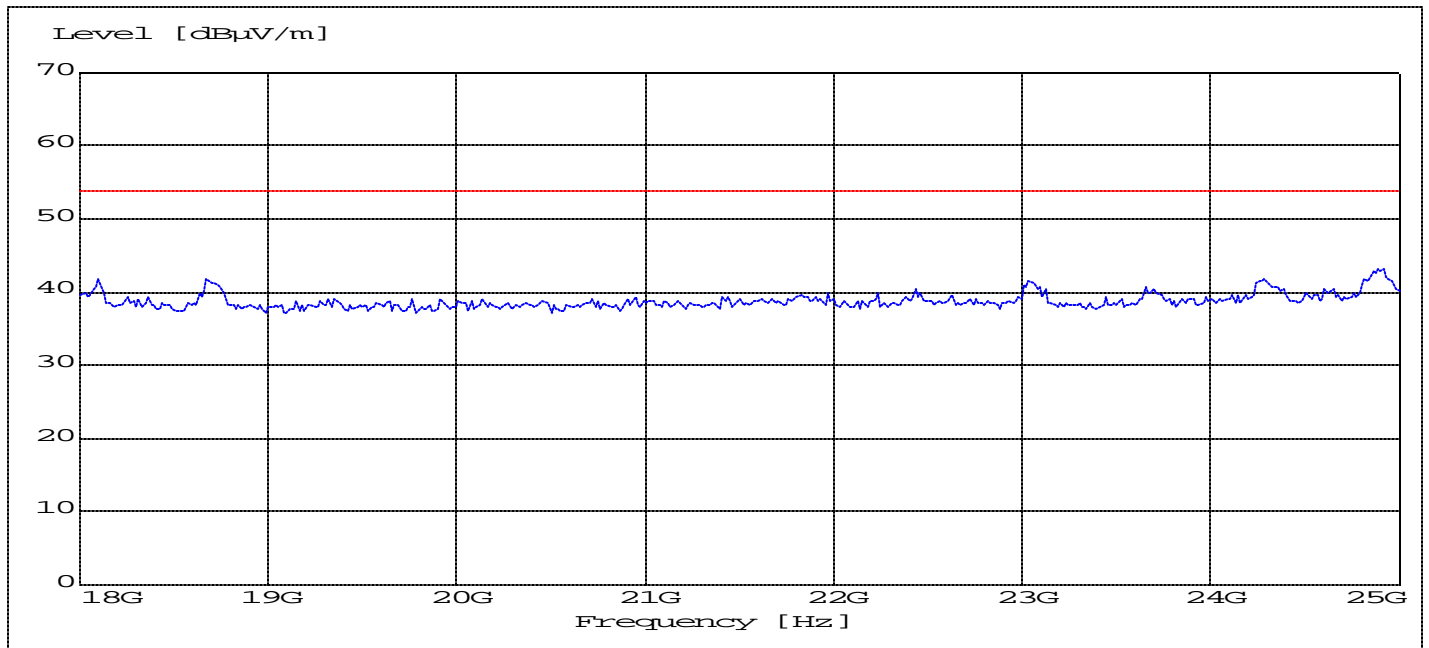
ANALYZER SETTINGS: f < 1 GHz : RBW/VBW: 100 kHz

f ≥ 1GHz : RBW/VBW: 1 MHz

RECEIVER SPURIOUS RADIATION

§ 15.209

Mid Channel (2442MHz): 18GHz – 25GHz



Limits

SUBCLAUSE § 15.209

Frequency (MHz)	Field strength (µV/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: All measurements were done in peak mode)

ANALYZER SETTINGS: f < 1 GHz : RBW/VBW: 100 kHz

f ≥ 1GHz : RBW/VBW: 1 MHz

