



Inter**Lab**[®]

FCC Measurement/Technical Report on

WLAN transceiver

MMI3G+

Report Reference: MDE_HARMAN_0904_FCCe

Test Laboratory:

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DGA-PL-192/99-02

Note:

The following test results relate only to the devices specified in this document. This report shall not be reproduced in parts without the written approval of the testing laboratory.

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0 Summary

0.1 Technical Report Summary

Type of Authorization

Certification for an Intentional Radiator (Digital Device / Spread Spectrum).

Applicable FCC Rules

Prepared in accordance with the requirements of FCC Rules and Regulations as listed in 47 CFR Ch.1 Parts 2 (10-1-09 Edition) and 15 (10-1-09 Edition). The following subparts are applicable to the results in this test report.

Part 2, Subpart J - Equipment Authorization Procedures, Certification

Part 15, Subpart C – Intentional Radiators

§ 15.201 Equipment authorization requirement

§ 15.207 Conducted limits

§ 15.209 Radiated emission limits; general requirements

§ 15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz
and 5725-5850 MHz

Note:

The tests were selected and performed with reference to the FCC measurement guide line "Measurement of Digital Transmission Systems Operating under Section 15.247 March 23, 2005"

Summary Test Results:

The EUT complied with all performed tests as listed in chapter 0.2 Measurement Summary.



0.2 Measurement Summary

FCC Part 15, Subpart C			§ 15.207
Conducted emissions (AC power line)			
The measurement was performed according to ANSI C63.4			2003
OP-Mode	Setup	Port	Final Result
			N/A
FCC Part 15, Subpart C			§ 15.247 (a) (1)
Occupied bandwidth			
The measurement was performed according to FCC § 15.31			10-1-09
OP-Mode	Setup	Port	Final Result
op-mode 1b	Setup_b01	Temp.ant.connector	passed
op-mode 1g	Setup_b01	Temp.ant.connector	passed
op-mode 2b	Setup_b01	Temp.ant.connector	passed
op-mode 2g	Setup_b01	Temp.ant.connector	passed
op-mode 3b	Setup_b01	Temp.ant.connector	passed
op-mode 3g	Setup_b01	Temp.ant.connector	passed
FCC Part 15, Subpart C			§ 15.247 (b) (1)
Peak power output			
The measurement was performed according to FCC § 15.31			10-1-09
OP-Mode	Setup	Port	Final Result
op-mode 1b	Setup_b01	Temp.ant.connector	passed
op-mode 1g	Setup_b01	Temp.ant.connector	passed
op-mode 2b	Setup_b01	Temp.ant.connector	passed
op-mode 2g	Setup_b01	Temp.ant.connector	passed
op-mode 3b	Setup_b01	Temp.ant.connector	passed
op-mode 3g	Setup_b01	Temp.ant.connector	passed
FCC Part 15, Subpart C			§ 15.247 (d)
Spurious RF conducted emissions			
The measurement was performed according to FCC § 15.31			10-1-09
OP-Mode	Setup	Port	Final Result
op-mode 1b	Setup_b01	Temp.ant.connector	passed
op-mode 1g	Setup_b01	Temp.ant.connector	passed
op-mode 2b	Setup_b01	Temp.ant.connector	passed
op-mode 2g	Setup_b01	Temp.ant.connector	passed
op-mode 3b	Setup_b01	Temp.ant.connector	passed
op-mode 3g	Setup_b01	Temp.ant.connector	passed
FCC Part 15, Subpart C			§ 15.247 (d), § 15.35 (b), § 15.209
Spurious radiated emissions			
The measurement was performed according to ANSI C63.4			2003
OP-Mode	Setup	Port	Final Result
op-mode 1b	Setup_a01	Enclosure	passed
op-mode 2b	Setup_a01	Enclosure	passed
op-mode 3b	Setup_a01	Enclosure	passed

FCC Part 15, Subpart C**§ 15.247 (d)**

Band edge compliance

The measurement was performed according to FCC § 15.31
(10-1-09) / ANSI C63.4 (2003)

10-1-09 / 2003

OP-Mode	Setup	Port	Final Result
op-mode 1b	Setup_b01	Temp.ant.connector	passed
op-mode 1g	Setup_b01	Temp.ant.connector	passed
op-mode 3b	Setup_b01	Temp.ant.connector	passed
op-mode 3g	Setup_b01	Temp.ant.connector	passed
op-mode 3b	Setup_a01	Enclosure	passed
op-mode 3g	Setup_a01	Enclosure	passed

FCC Part 15, Subpart C**§ 15.247 (e)**

Power density

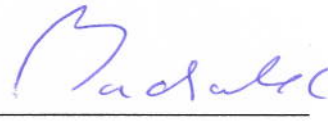
The measurement was performed according to FCC § 15.31

10-1-09

OP-Mode	Setup	Port	Final Result
op-mode 1b	Setup_b01	Temp.ant.connector	passed
op-mode 1g	Setup_b01	Temp.ant.connector	passed
op-mode 2b	Setup_b01	Temp.ant.connector	passed
op-mode 2g	Setup_b01	Temp.ant.connector	passed
op-mode 3b	Setup_b01	Temp.ant.connector	passed
op-mode 3g	Setup_b01	Temp.ant.connector	passed

N/A not applicable (the EUT is powered by DC)

This report replaces the report MDE_HARMAN_0904_FCCd

Responsible for
Accreditation Scope:Responsible
for Test Report:7 layers AG, Borsigstr. 11
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1 Administrative Data

1.1 Testing Laboratory

Company Name: 7 Layers AG
Address Borsigstr. 11
40880 Ratingen
Germany

This facility has been fully described in a report submitted to the FCC and accepted under the registration number 96716 .

The test facility is also accredited by the following accreditation organisation:
- Deutscher Akkreditierungs Rat DAR-Registration no. DGA-PL-192/99-02

Responsible for Accreditation Scope: Dipl.-Ing. Bernhard Retka
Dipl.-Ing. Robert Machulec
Dipl.-Ing. Thomas Hoell
Dipl.-Ing. Andreas Petz

Report Template Version: 2010-01-28

1.2 Project Data

Responsible for testing and report: Dipl.-Ing. Robert Machulec
Date of Test(s): 2009-12-10 to 2010-02-12
Date of Report: 2010-02-12

1.3 Applicant Data

Company Name: HARMAN/BECKER Automotive Systems GmbH
Address: Söflinger Strasse 100
89077 Ulm
Germany
Contact Person: Mr. Stefan Blaschek

1.4 Manufacturer Data

Company Name: please see applicant data
Address:
Contact Person:

2 Test object Data

2.1 General EUT Description

Equipment under Test:	WLAN transceiver
Type Designation:	MMI3G+
Kind of Device: (optional)	WLAN transceiver build in a head unit of car radio system
Voltage Type:	DC (CAR battery)
Voltage level:	12 V

General product description:

The WLAN (Wireless Local Area Network) Transceiver is operating in the 2.4 GHz ISM band in the range 2412.0 – 2462.0 MHz and uses the Direct Sequence Spread Spectrum (DSSS) Modulation.

The EUT supports the modes 802.11b (max 11Mbps) and 802.11g (max 54Mbps)

The EUT provides the following ports:

Ports

Temporary antenna connector
Enclosure

The main components of the EUT are listed and described in Chapter 2.2

2.2 EUT Main components

Type, S/N, Short Descriptions etc. used in this Test Report

Short Description	Equipment under Test	Type Designation	Serial No.	HW Status	SW Status	Date of Receipt
EUT A (Code: 43021a01)	WLAN transceiver	MMI3G+	9406GO097 501505	D	Bios controlled	2009-12-09
Remark: EUT A is equipped with an integral (gain = 2.0 dBi).						
EUT B (Code: 43074e01)	WLAN transceiver	MMI3G+	9406GQ097 501507	D	Bios controlled	2009-12-09
Remark: EUT B is equipped with a temporary antenna connector.						

NOTE: The short description is used to simplify the identification of the EUT in this test report.

2.3 Ancillary Equipment

For the purposes of this test report, ancillary equipment is defined as equipment which is used in conjunction with the EUT to provide operational and control features to the EUT. It is necessary to configure the system in a typical fashion, as a customer would normally use it. But nevertheless Ancillary Equipment can influence the test results.

Short Description	Equipment under Test	Type Designation	HW Status	SW Status	Serial no.	FCC ID
-	-	-	-	-	-	-

2.4 EUT Setups

This chapter describes the combination of EUTs and ancillary equipment used for testing.

Setup No.	Combination of EUT's	Description
Setup_a01	EUT A	setup for radiated measurements
Setup_b01	EUT B	setup for conducted measurements



2.5 Operating Modes

This chapter describes the operating modes of the EUT's used for testing. Additionally for radiated tests Bluetooth was activated at the same time.

Op. Mode	Description of Operating Modes	Remarks	Bluetooth frequencies
op-mode 1b	TX-mode, the EUT transmits on the lowest channel (2412 MHz)	Worst case data rate 1 Mbps	The EUT transmits on 2402 MHz
op-mode 1g	TX-mode, the EUT transmits on the lowest channel (2412 MHz)	Worst case data rate 6 Mbps	The EUT transmits on 2402 MHz
op-mode 2b	TX-mode, the EUT transmits on the mid channel (2437 MHz)	Worst case data rate 1 Mbps	The EUT transmits on 2441 MHz
op-mode 2g	TX-mode, the EUT transmits on the mid channel (2437 MHz)	Worst case data rate 6 Mbps	The EUT transmits on 2441 MHz
op-mode 3b	TX-mode, the EUT transmits on the highest channel (2462 MHz)	Worst case data rate 1 Mbps	The EUT transmits on 2480 MHz
op-mode 3g	TX-mode, the EUT transmits on the highest channel (2462 MHz)	Worst case data rate 6 Mbps	The EUT transmits on 2480 MHz

2.6 Product labeling

2.6.1 FCC ID label

Please refer to the documentation of the applicant.

2.6.2 Location of the label on the EUT

Please refer to the documentation of the applicant.

3 Test Results

3.1 Occupied bandwidth

Standard FCC Part 15, 10-1-09 Subpart C

The test was performed according to: FCC §15.31

3.1.1 Test Description

The Equipment Under Test (EUT) was setup in a shielded room to perform the occupied bandwidth measurements.

The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or first-order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical.

The results recorded were measured with the modulation which produce the worst-case (widest) occupied bandwidth.

The EUT was connected to spectrum analyzer via a short coax cable with a known loss. Analyzer settings:

- Resolution Bandwidth (RBW): 100 kHz
- Video Bandwidth (VBW): 300 kHz
- Span: 30 MHz

3.1.2 Test Requirements / Limits

FCC Part 15, Subpart C, §15.247 (a) (2)

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

3.1.3 Test Protocol

Temperature: 24 °C
Air Pressure: 1008 hPa
Humidity: 33 %

Op. Mode	Setup	Port
op-mode 1b	Setup_b01	Temp.ant.connector

6 dB bandwidth MHz	Remarks
10.10	-

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 1g	Setup_b01	Temp.ant.connector

6 dB bandwidth MHz	Remarks
16.64	-

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 2b	Setup_b01	Temp.ant.connector

6 dB bandwidth MHz	Remarks
10.15	-

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 2g	Setup_b01	Temp.ant.connector

6 dB bandwidth MHz	Remarks
16.64	-

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 3b	Setup_b01	Temp.ant.connector

6 dB bandwidth MHz	Remarks
10.06	-

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 3g	Setup_b01	Temp.ant.connector

6 dB bandwidth MHz	Remarks
16.64	-

Remark: Please see annex for the measurement plot.

3.1.4 Test result: Occupied bandwidth

FCC Part 15, Subpart C	Op. Mode	Result
	op-mode 1b	passed
	op-mode 1g	passed
	op-mode 2b	passed
	op-mode 2g	passed
	op-mode 3b	passed
	op-mode 3g	passed

3.2 Peak power output

Standard FCC Part 15, 10-1-09 Subpart C

The test was performed according to: FCC §15.31

3.2.1 Test Description

The Equipment Under Test (EUT) was set up in a shielded room to perform the output power measurements.

The results recorded were measured with the modulation which produces the worst-case (highest) output power.

Analyzer settings:

- Resolution Bandwidth (RBW): 50 MHz
- Video Bandwidth (VBW): 30 MHz
- Span: zero

3.2.2 Test Requirements / Limits

FCC Part 15, Subpart C, §15.247 (b) (3)

For systems using digital modulation techniques in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands: 1 watt.

Used conversion factor: Limit (dBm) = 10 log (Limit (W)/1mW)

=> Maximum Output Power: 30 dBm

3.2.3 Test Protocol

Temperature: 26 °C
Air Pressure: 1013 hPa
Humidity: 33 %

Op. Mode	Setup	Port
op-mode 1b	Setup_b01	Temp.ant.connector

Output power dBm	Remarks
11.63	The EIRP including antenna gain (2.0 dBi) is 13.63 dBm

Remark: -

Op. Mode	Setup	Port
op-mode 1g	Setup_b01	Temp.ant.connector

Output power dBm	Remarks
14.05	The EIRP including antenna gain (2.0 dBi) is 16.05 dBm

Remark: -



Op. Mode	Setup	Port
op-mode 2b	Setup_b01	Temp.ant.connector

Output power dBm	Remarks
10.41	The EIRP including antenna gain (2.0 dBi) is 12.41 dBm

Remark: -

Op. Mode	Setup	Port
op-mode 2g	Setup_b01	Temp.ant.connector

Output power dBm	Remarks
13.40	The EIRP including antenna gain (2.0 dBi) is 15.40 dBm

Remark: -

Op. Mode	Setup	Port
op-mode 3b	Setup_b01	Temp.ant.connector

Output power dBm	Remarks
10.46	The EIRP including antenna gain (2.0 dBi) is 12.46dBm

Remark: -

Op. Mode	Setup	Port
op-mode 3g	Setup_b01	Temp.ant.connector

Output power dBm	Remarks
13.56	The EIRP including antenna gain (2.0 dBi) is 15.56dBm

Remark: -

3.2.4 Test result: Peak power output

FCC Part 15, Subpart C		Op. Mode	Result
		op-mode 1b	passed
		op-mode 1g	passed
		op-mode 2b	passed
		op-mode 2g	passed
		op-mode 3b	passed
		op-mode 3g	passed

3.3 Spurious RF conducted emissions

Standard FCC Part 15, 10-1-09 Subpart C

The test was performed according to: FCC §15.31

3.3.1 Test Description

The Equipment Under Test (EUT) was set up in a shielded room to perform the spurious emissions measurements.

The EUT was connected to spectrum analyzer via a short coax cable with a known loss.

Analyzer settings:

- Detector: Peak-Maxhold
- Frequency range: 30 – 25000 MHz
- Resolution Bandwidth (RBW): 100 kHz
- Video Bandwidth (VBW): 300 kHz
- Sweep Time: 330 s

3.3.2 Test Requirements / Limits

FCC Part 15, Subpart C, §15.247 (c)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

3.3.3 Test Protocol

Temperature: 24 °C
Air Pressure: 1009 hPa
Humidity: 35 %

Op. Mode	Setup	Port		
op-mode 1b	Setup_b01	Temp.ant.connector		
Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta to limit dB
-	-	-3.08	-23.08	-

Remark: No (further) spurious emissions in the range 20 dB below the limit found. Please see annex for the measurement plot.

Op. Mode	Setup	Port		
op-mode 1g	Setup_b01	Temp.ant.connector		
Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta to limit dB
-	-	-9.79	-29.79	-

Remark: No (further) spurious emissions in the range 20 dB below the limit found. Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 2b	Setup_b01	Temp.ant.connector

Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta to limit dB
-	-	-7.64	-27.64	-

Remark: No (further) spurious emissions in the range 20 dB below the limit found. Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 2g	Setup_b01	Temp.ant.connector

Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta to limit dB
-	-	-14.47	-34.47	-

Remark: No (further) spurious emissions in the range 20 dB below the limit found. Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 3b	Setup_b01	Temp.ant.connector

Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta to limit dB
-	-	-4.25	-24.25	-

Remark: No (further) spurious emissions in the range 20 dB below the limit found. Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 3g	Setup_b01	Temp.ant.connector

Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta to limit dB
-	-	-11.25	-31.25	-

Remark: No (further) spurious emissions in the range 20 dB below the limit found. Please see annex for the measurement plot.

3.3.4 Test result: Spurious RF conducted emissions

FCC Part 15, Subpart C	Op. Mode	Result
	op-mode 1b	passed
	op-mode 1g	passed
	op-mode 2b	passed
	op-mode 2g	passed
	op-mode 3b	passed
	op-mode 3g	passed

3.4 Spurious radiated emissions

Standard FCC Part 15, 10-1-09 Subpart C

The test was performed according to: ANSI C 63.4, 2003

3.4.1 Test Description

The test set-up was made in accordance to the general provisions of ANSI C 63.4-2003. The Equipment Under Test (EUT) was set up on a non-conductive table 1.0 x 2.0 m in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna.

The radiated emissions measurements were made in a typical installation configuration. The measurement procedure is implemented into the EMI test software ES-K1 from R&S.

1. Measurement up to 30 MHz

The test set-up was made in accordance to the general provisions of ANSI C 63.4-2003. The Equipment Under Test (EUT) was set up on a non-conductive table in the anechoic chamber.

The radiated emissions measurements were made in a typical installation configuration. The measurement procedure is implemented into the EMI test software ES-K1 from R&S. The Loop antenna HFH2-Z2 is used.

Step 1: pre measurement

- Anechoic chamber
- Antenna distance: 10m
- Detector: Peak-Maxhold
- Frequency range: 0.009 - 0.15 and 0.15 – 30 MHz
- Frequency steps: 0.1 kHz and 5 kHz
- IF-Bandwidth: 0.2 kHz and 10 kHz
- Measuring time / Frequency step: 100 ms

Intention of this step is, to determine the radiated EMI-profile of the EUT. Afterwards the relevant emissions for the final measurement are identified.

Step 2: final measurement

For the relevant emissions determined in step 1, an additional measurement with the following settings will be performed. Intention of this step is to find the maximum emission level.

- Open area test side
- Antenna distance: according to the Standard
- Detector: Quasi-Peak
- Frequency range: 0.009 – 30 MHz
- Frequency steps: measurement at frequencies detected in step 1
- IF-Bandwidth: 200 Hz - 10 kHz
- Measuring time / Frequency step: 100 ms

2. Measurement above 30 MHz

Measurement up to 1 GHz

Step 1: Preliminary scan

Preliminary test to identify the highest amplitudes relative to the limit.

Settings for step 1:

- Detector: Peak-Maxhold
- Frequency range: 30 – 1000 MHz
- Frequency steps: 60 kHz
- IF-Bandwidth: 120 kHz
- Measuring time / Frequency step: 100 µs
- Turntable angle range: –180 to 180 °
- Turntable step size: 90°

- Height variation range: 1 – 3m
- Height variation step size: 2m
- Polarisation: Horizontal + Vertical

Intention of this step is, to determine the radiated EMI-profile of the EUT. Afterwards the relevant emissions for the final measurement are identified.

Step 2: second measurement

For the relevant emissions determined in step 1, an additional measurement with the following settings will be performed. Intention of this step is, to find out the approximate turntable angle and antenna height for each frequency.

- Detector: Peak – Maxhold
- Measured frequencies: in step 1 determined frequencies
- IF – Bandwidth: 120 kHz
- Measuring time: 100ms
- Turntable angle range: –180 to 180 °
- Turntable step size: 45°
- Height variation range: 1 – 4m
- Height variation step size: 0.5m
- Polarisation: horizontal + vertical

After this step the EMI test system has determined the following values for each frequency (of step 1):

- Frequency
- Azimuth value (of turntable)
- Antenna height

The last two values have now the following accuracy:

- Azimuth value (of turntable): 45°
- Antenna height: 0.5m

Step 3: final measurement

In this step the accuracy of the turntable azimuth and antenna height will be improved. This is necessary to find out the maximum value of every frequency.

For each frequency, which was determined the turntable azimuth and antenna height will be adjusted. The turntable azimuth will be slowly varied by +/- 22.5° around this value. During this action the value of emission is continuously measured. The turntable azimuth at the highest emission will be recorded and adjusted. In this position the antenna height is also slowly varied by +/- 25 cm around the antenna height determined. During this action the value of emission is also continuously measured. The antenna height of the highest emission will also be recorded and adjusted.

- Detector: Peak – Maxhold
- Measured frequencies: in step 1 determined frequencies
- IF – Bandwidth: 120 kHz
- Measuring time: 100ms
- Turntable angle range: –22.5° to + 22.5 ° around the determined value
- Height variation range: -0.25m to + 0.25m around the determined value

Step 4: final measurement with QP detector

With the settings determined in step 3, the final measurement will be performed:

EMI receiver settings for step 4:

- Detector: Quasi-Peak(< 1GHz)
- Measured frequencies: in step 1 determined frequencies
- IF – Bandwidth: 120 kHz
- Measuring time: 1s

Measurement above 1GHz

The following modifications apply to the measurement procedure for the frequency range above 1 GHz:

The measurement distance was reduced to 1m. The results were extrapolated by the extrapolation factor of 20 dB/decade (inverse linear distance for field strength measurements, inverse linear-distance squared for the power reference level)



measurements). Due to the fact that in this frequency range a double ridged wave guided horn antenna (up to 18 GHz) and a horn antenna (18-25 GHz) are used, the steps 2-4 are omitted. Step 1 was performed with one height of the receiving antenna only.

EMI receiver settings:

- Detector: Peak, Average
- RBW = VBW = 100 kHz

After the measurement a plot will be generated which contains a diagram with the results of the preliminary scan and a chart with the frequencies and values of the results of the final measurement.

3.4.2 Test Requirements / Limits

FCC Part 15, Subpart C, §15.247 (d)

... In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

FCC Part 15, Subpart C, §15.209, Radiated Emission Limits

Frequency Range (MHz)	Class B Limit (dBμV/m)
30 – 88	40.0
88 – 216	43.5
216 – 960	46.0
above 960	54.0

§15.35(b)

..., there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit....

Used conversion factor: $\text{Limit (dB}\mu\text{V/m)} = 20 \log (\text{Limit } (\mu\text{V/m})/1\mu\text{V/m})$

3.4.3 Test Protocol

Temperature: 24 °C
Air Pressure: 1022 hPa
Humidity: 34 %

For radiated emissions the mode b was chosen as worst case and tested only.

3.4.3.1 Measurement up to 30 MHz

Op. Mode	Setup	Port
op-mode 1	Setup_a01	Enclosure

Polarisation	Frequency MHz	Corrected value dBµV / m			Limit dBµV / m	Limit dBµV / m	Limit dBµV / m	Delta to limit dB	Delta to limit dB
		QP	Peak	AV	QP	Peak	AV	QP / Peak	AV
0°	-	-	-	-	-	-	-	-	-
90°	-	-	-	-	-	-	-	-	-

Remark: No (further) spurious emissions in the range 20 dB below the limit found therefore step 2 was not performed. The found peak at 91.2 kHz is emission from loop antenna power supply.

3.4.3.2 Measurement above 30 MHz

Op. Mode	Setup	Port
op-mode 1b	Setup_a01	Enclosure

Polarisation	Frequency MHz	Corrected value dBµV / m			Limit dBµV / m	Limit dBµV / m	Limit dBµV / m	Delta to limit dB	Delta to limit dB
		QP	Peak	AV	QP	Peak	AV	QP / Peak	AV
Vertical + horizontal	1310	-	46.48	37.68	-	74	54	27.52	16.32
Vertical + horizontal	1500	-	46.74	37.58	-	74	54	27.26	16.42
Vertical + horizontal	1620	-	49.73	44.35	-	74	54	24.27	9.65
Vertical + horizontal	2375	-	50.12	39.07	-	74	54	23.88	14.93
Vertical + horizontal	4804	-	53.01	41.14	-	74	54	20.99	12.86
Vertical + horizontal	4824	-	48.24	45.75	-	74	54	25.76	8.25

Remark: No (further) spurious emissions in the range 20 dB below the limit found.

Op. Mode	Setup	Port
op-mode 2b	Setup_a01	Enclosure

Polarisation	Frequency MHz	Corrected value dBµV / m			Limit dBµV / m	Limit dBµV / m	Limit dBµV / m	Delta to limit dB	Delta to limit dB
		QP	Peak	AV	QP	Peak	AV	QP / Peak	AV
Vertical + horizontal	1310	-	46.63	37.68	-	74	54	27.37	16.32
Vertical + horizontal	1500	-	46.20	37.26	-	74	54	27.80	16.74
Vertical + horizontal	1620	-	49.48	44.55	-	74	54	24.52	9.45
Vertical + horizontal	2384	-	50.73	39.78	-	74	54	23.27	14.22
Vertical + horizontal	4874	-	42.51	36.20	-	74	54	31.49	17.80
Vertical + horizontal	4882	-	55.10	43.58	-	74	54	18.90	10.42
Vertical + horizontal	7312	-	49.09	41.85	-	74	54	24.91	12.15

Remark: No (further) spurious emissions in the range 20 dB below the limit found.

Op. Mode	Setup	Port
op-mode 3b	Setup_a01	Enclosure

Polarisation	Frequency MHz	Corrected value dBµV / m			Limit dBµV / m	Limit dBµV / m	Limit dBµV / m	Delta to limit dB	Delta to limit dB
		QP	Peak	AV	QP	Peak	AV	QP / Peak	AV
Vertical + horizontal	1310	-	45.96	37.85	-	74	54	28.04	16.15
Vertical + horizontal	1500	-	47.27	37.33	-	74	54	26.73	16.67
Vertical + horizontal	1620	-	49.85	44.51	-	74	54	24.15	9.49
Vertical + horizontal	4924	-	44.48	39.87	-	74	54	29.52	14.13
Vertical + horizontal	4960	-	58.38	45.41	-	74	54	15.62	8.59
Vertical + horizontal	7387	-	50.99	44.67	-	74	54	23.01	9.33
Vertical + horizontal	7440	-	47.64	34.27	-	74	54	26.36	19.73

Remark: No (further) spurious emissions in the range 20 dB below the limit found.

3.4.4 Test result: Spurious radiated emissions

FCC Part 15, Subpart C

Op. Mode	Result
op-mode 1b	passed
op-mode 2b	passed
op-mode 3b	passed



3.5 Band edge compliance

Standard FCC Part 15, 10-1-09 Subpart C

The test was performed according to: ANSI C 63.4, 2003 FCC §15.31

3.5.1 Test Description

The procedure to show compliance with the band edge requirement is divided into two measurements: 1. Show compliance of the lower band edge by a conducted measurement and 2. show compliance of the higher band edge by a radiated measurement.

For the first measurement the EUT is set to transmit on the lowest channel (2402 MHz). The lower band edge is 2400 MHz.

Analyzer settings:

- Detector: Peak
- RBW= 100 kHz
- VBW= 300 kHz

For the second measurement the EUT is set to transmit on the highest channel (2462 MHz). The higher band edge is 2483.5 MHz.

Analyzer settings:

- Detector: Peak, Average
- RBW = VBW = 100 kHz

3.5.2 Test Requirements / Limits

FCC Part 15.247 (d)

“In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

...

Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).”

For the measurement of the **lower band edge** the RF power at the band edge shall be “at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power...”

For the measurement of the **higher band edge** the limit is “specified in Section 15.209(a)”.

3.5.3 Test Protocol

3.5.3.1 Lower band edge

Temperature: 24 °C
Air Pressure: 1009 hPa
Humidity: 35 %

Op. Mode	Setup	Port
op-mode 1b	Setup_b01	Temp.ant.connector

Frequency MHz	Measured value dBm	Reference value dBm	Limit dBm	Delta to limit dB
2400.00	-56.36	-3.08	-23.08	33.28

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 1g	Setup_b01	Temp.ant.connector

Frequency MHz	Measured value dBm	Reference value dBm	Limit dBm	Delta to limit dB
2400.00	-42.64	-9.79	-29.79	12.85

Remark: Please see annex for the measurement plot.

3.5.3.2 Higher band edge

Conducted measurement

Temperature: 24 °C
Air Pressure: 1009 hPa
Humidity: 35 %

Op. Mode	Setup	Port
op-mode 3b	Setup_b01	Temp.ant.connector

Frequency MHz	Measured value dBm	Reference value dBm	Limit dBm	Delta to limit dB
2483.50	-60.09	-4.25	-24.25	35.84

Op. Mode	Setup	Port
op-mode 3g	Setup_b01	Temp.ant.connector

Frequency MHz	Measured value dBm	Reference value dBm	Limit dBm	Delta to limit dB
2483.50	-60.24	-11.55	-31.25	28.99



Radiated measurement

Temperature: 24 °C
Air Pressure: 1022 hPa
Humidity: 34 %

Op. Mode	Setup	Port
op-mode 3b	Setup_a01	Enclosure

Frequency MHz	Polarisation	Corrected value dBµV/m		Limit Peak dBµV/m	Limit AV dBµV/m	Delta to Peak limit/dB	Delta to AV limit dB
		Peak	AV				
2483.50	Vertical + horizontal	49.44	37.45	74.00	54.00	24.56	16.55

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 3g	Setup_a01	Enclosure

Frequency MHz	Polarisation	Corrected value dBµV/m		Limit Peak dBµV/m	Limit AV dBµV/m	Delta to Peak limit/dB	Delta to AV limit dB
		Peak	AV				
2483.50	Vertical + horizontal	49.85	38.20	74.00	54.00	24.15	15.80

Remark: Please see annex for the measurement plot.

3.5.4 Test result: Band edge compliance

FCC Part 15, Subpart C		Op. Mode	Result
		op-mode 1b	passed
		op-mode 1g	passed
		op-mode 3 b	passed
		op-mode 3 g	passed

3.6 Power density

Standard FCC Part 15, 10-1-09 Subpart C

The test was performed according to: FCC §15.31

3.6.1 Test Description

The EUT was connected to spectrum analyzer via a short coax cable with a known loss.

Analyzer settings:

- Detector: Peak-Maxhold
- Span: 300 kHz
- Resolution Bandwidth (RBW): 3 kHz
- Video Bandwidth (VBW): 30 kHz
- Sweep Time: Coupled

3.6.2 Test Requirements / Limits

FCC Part 15, Subpart C, §15.247 (e)

For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

3.6.3 Test Protocol

Temperature: 26 °C
Air Pressure: 1013 hPa
Humidity: 33 %

Op. Mode	Setup	Port
op-mode 1b	Setup_b01	Temp.ant.connector

Power density dBm / 3 kHz	Remarks
-17.41	-

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 1g	Setup_b01	Temp.ant.connector

Power density dBm / 3 kHz	Remarks
-15.94	-

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 2b	Setup_b01	Temp.ant.connector

Power density dBm / 3 kHz	Remarks
-18.77	-

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 2g	Setup_b01	Temp.ant.connector

Power density dBm / 3 kHz	Remarks
-17.80	-

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 3b	Setup_b01	Temp.ant.connector

Power density dBm / 3 kHz	Remarks
-18.69	-

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 3g	Setup_b01	Temp.ant.connector

Power density dBm / 3 kHz	Remarks
-17.59	-

Remark: Please see annex for the measurement plot.

3.6.4 Test result: Power density

FCC Part 15, Subpart C	Op. Mode	Result
	op-mode 1b	passed
	op-mode 1g	passed
	op-mode 2b	passed
	op-mode 2g	passed
	op-mode 3b	passed
	op-mode 3g	passed

4 Test Equipment

1 Test Equipment Details

1.1 List of Used Test Equipment

The calibration, hardware and software states are shown for the testing period.

Test Equipment Anechoic Chamber

Lab ID:	Lab 1		
Manufacturer:	Frankonia		
Description:	Anechoic Chamber for radiated testing		
Type:	10.58x6.38x6		
	<i>Calibration Details</i>	<i>Last Execution</i>	<i>Next Exec.</i>
	IC renewal	2009/01/21	2011/01/20
	FCC renewal	2009/01/07	2011/01/06

Single Devices for Anechoic Chamber

<i>Single Device Name</i>	<i>Type</i>	<i>Serial Number</i>	<i>Manufacturer</i>
Air compressor	none	-	Atlas Copco
Anechoic Chamber	10.58 x 6.38 x 6	none	Frankonia
	<i>Calibration Details</i>		<i>Last Execution</i> <i>Next Exec.</i>
	FCC listing 96716 3m Part15/18		2009/01/07 2011/01/06
	ANSI C64.3 NSA		2009/01/21 2011/01/20
Controller Innco 2000	CO 2000	CO2000/328/12470 406/L	Innco innovative constructions GmbH
EMC camera	CE-CAM/1	-	CE-SYS
EMC camera Nr.2	CCD-400E	0005033	Mitsubishi
Filter ISDN	B84312-C110-E1		Siemens&Matsushita
Filter Universal 1A	BB4312-C30-H3	-	Siemens&Matsushita

Test Equipment Auxiliary Equipment for Radiated emissions

Lab ID: Lab 1
Description: Equipment for emission measurements
Serial Number: see single devices

Single Devices for Auxiliary Equipment for Radiated emissions

Single Device Name	Type	Serial Number	Manufacturer	
Antenna mast	AS 620 P		HD GmbH	
Biconical dipole	VUBA 9117	9117108	Schwarzbeck	
	Calibration Details		Last Execution	Next Exec.
	Standard Calibration		2008/10/27	2013/10/26
Broadband Amplifier 18MHz-26GHz	JS4-18002600-32-5P	849785	Miteq	
	Calibration Details		Last Execution	Next Exec.
	Path Calibration		2009/11/16	2010/05/15
Broadband Amplifier 1GHz-4GHz	AFS4-01000400-1Q-10P-4	-	Miteq	
	Calibration Details		Last Execution	Next Exec.
	Path Calibration		2009/11/16	2010/05/15
Broadband Amplifier 30MHz-18GHz	JS4-00101800-35-5P	896037	Miteq	
	Calibration Details		Last Execution	Next Exec.
	Path Calibration		2009/11/16	2010/05/15
Cable "ESI to EMI Antenna"	EcoFlex10	W18.01-2+W38.01-2	Kabel Kusch	
	Calibration Details		Last Execution	Next Exec.
	Path Calibration		2009/11/16	2010/05/15
Cable "ESI to Horn Antenna"	UFB311A+UFB293C	W18.02-2+W38.02-2	Rosenberger Micro-Coax	
	Calibration Details		Last Execution	Next Exec.
	Path Calibration		2009/11/16	2010/05/15
Double-ridged horn	HF 906	357357/001	Rohde & Schwarz GmbH & Co. KG	
	Calibration Details		Last Execution	Next Exec.
	Standard Calibration		2009/04/16	2012/04/15
Double-ridged horn	HF 906	357357/002	Rohde & Schwarz GmbH & Co. KG	
	Calibration Details		Last Execution	Next Exec.
	Standard Calibration		2009/04/28	2012/04/27
Dreheinheit	DE 325		HD GmbH	
High Pass Filter	4HC1600/12750-1.5-KK	9942011	Trilithic	
	Calibration Details		Last Execution	Next Exec.
	Path Calibration		2009/11/16	2010/05/15
High Pass Filter	5HC2700/12750-1.5-KK	9942012	Trilithic	
	Calibration Details		Last Execution	Next Exec.
	Path Calibration		2009/11/16	2010/05/15
High Pass Filter	5HC3500/12750-1.2-KK	200035008	Trilithic	
	Calibration Details		Last Execution	Next Exec.
	Path Calibration		2009/11/16	2010/05/15
Log.-per. Antenna	HL 562 Ultralog	830547/003	Rohde & Schwarz GmbH & Co. KG	
	Calibration Details		Last Execution	Next Exec.
	Standard Calibration		2009/05/27	2012/05/26

Single Devices for Auxiliary Equipment for Radiated emissions (continued)

Single Device Name	Type	Serial Number	Manufacturer
Loop Antenna	HFH2-Z2	829324/006	Rohde & Schwarz GmbH & Co. KG
	<i>Calibration Details</i>		<i>Last Execution</i> <i>Next Exec.</i>
	DKD calibration		2008/10/07 2011/10/06
Pyramidal Horn Antenna 3160-09 26,5 GHz		00083069	EMCO Elektronik GmbH
Pyramidal Horn Antenna 3160-10 40 GHz		00086675	EMCO Elektronik GmbH

Test Equipment Auxiliary Test Equipment

Lab ID:	Lab 1
Manufacturer:	see single devices
Description:	Single Devices for various Test Equipment
Type:	various
Serial Number:	none

Single Devices for Auxiliary Test Equipment

Single Device Name	Type	Serial Number	Manufacturer
AC Power Source	Chroma 6404	64040001304	Chroma ATE INC.
Broadband Power Divider 1506A / 93459 N (Aux)		LM390	Weinschel Associates
Broadband Power Divider WA1515 SMA		A855	Weinschel Associates
Digital Multimeter 01 (Multimeter)	Voltcraft M-3860M	IJ096055	Conrad Electronics
Digital Multimeter 03 (Multimeter)	Fluke 177	86670383	Fluke Europe B.V.
	<i>Calibration Details</i>		<i>Last Execution</i> <i>Next Exec.</i>
	Standard calibration		2009/10/07 2011/10/06
Digital Oscilloscope [SA2] (Aux)	TDS 784C	B021311	Tektronix GmbH
Fibre optic link Satellite (Aux)	FO RS232 Link	181-018	Pontis
Fibre optic link Transceiver (Aux)	FO RS232 Link	182-018	Pontis
Isolating Transformer	LTS 604	1888	Thalheimer Transformatorenwerke GmbH
Notch Filter Ultra Stable (Aux)	WRCA800/960-6EEK	24	Wainwright
Spectrum Analyser	FSP3	836722/011	Rohde & Schwarz GmbH & Co. KG
	<i>Calibration Details</i>		<i>Last Execution</i> <i>Next Exec.</i>
	DKD calibration		2008/10/06 2011/10/05

Test Equipment Digital Signalling Devices

Lab ID: Lab 1

Description: Signalling equipment for various wireless technologies.

Single Devices for Digital Signalling Devices

Single Device Name	Type	Serial Number	Manufacturer
Bluetooth Signalling Unit CBT CBT		100589	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		Last Execution Next Exec.
	Standard Calibration		2008/08/14 2011/08/13
Digital Radio Communication Tester	CMD 55	831050/020	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		Last Execution Next Exec.
	Standard calibration		2008/10/07 2010/10/06
Digital Radio Test Set	6103E	2359	Racal Instruments, Ltd.
Universal Radio Communication Tester	CMU 200	102366	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		Last Execution Next Exec.
	Standard calibration		2009/02/16 2011/02/15
	HW/SW Status		Date of Start Date of End
	Hardware: B11, B21V14, B21-2, B41, B52V14, B52-2, B53-2, B56V14, B68 3v04, PCMCIA, U65V04 Software: K21 4v21, K22 4v21, K23 4v21, K24 4v21, K42 4v21, K43 4v21, K53 4v21, K56 4v22, K57 4v22, K58 4v22, K59 4v22, K61 4v22, K62 4v22, K63 4v22, K64 4v22, K65 4v22, K66 4v22, K67 4v22, K68 4v22, K69 4v22 Firmware: µP1 8v50 02.05.06 ---		2007/07/16
Universal Radio Communication Tester	CMU 200	837983/052	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		Last Execution Next Exec.
	Standard calibration		2008/12/01 2011/11/30
	HW/SW Status		Date of Start Date of End
	HW options: B11, B21V14, B21-2, B41, B52V14, B52-2, B53-2, B54V14, B56V14, B68 3v04, B95, PCMCIA, U65V02 SW options: K21 4v11, K22 4v11, K23 4v11, K24 4v11, K27 4v10, K28 4v10, K42 4v11, K43 4v11, K53 4v10, K65 4v10, K66 4v10, K68 4v10, Firmware: µP1 8v40 01.12.05 ---		2007/01/02
Vector Signal Generator	SMU200A	100912	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		Last Execution Next Exec.
	Standard calibration		2008/10/28 2011/10/27



Test Equipment Emission measurement devices

Lab ID: Lab 1
Description: Equipment for emission measurements
Serial Number: see single devices

Single Devices for Emission measurement devices

Single Device Name	Type	Serial Number	Manufacturer
Personal Computer	Dell	30304832059	Dell
Signal Generator	SMR 20	846834/008	Rohde & Schwarz GmbH & Co. KG
Calibration Details			Last Execution Next Exec.
Standard Calibration			2007/12/05 2010/12/04
Spectrum Analyzer	ESIB 26	830482/004	Rohde & Schwarz GmbH & Co. KG
Calibration Details			Last Execution Next Exec.
Standard Calibration			2009/12/03 2011/12/02

Test Equipment Multimeter 12

Lab ID: Lab 2
Description: Ex-Tech 520
Serial Number: 05157876

Single Devices for Multimeter 12

Single Device Name	Type	Serial Number	Manufacturer
Digital Multimeter 12 (Multimeter)	EX520	05157876	Extech Instruments Corp.
Calibration Details			Last Execution Next Exec.
Standard calibration			2009/10/07 2010/10/06
Standard calibration			2009/10/07 2011/10/06

Test Equipment Regulatory Bluetooth RF Test Solution

Lab ID: Lab 2
Description: Regulatory Bluetooth RF Tests
Type: Bluetooth RF
Serial Number: 001

Single Devices for Regulatory Bluetooth RF Test Solution

Single Device Name	Type	Serial Number	Manufacturer	
ADU 200 Relay Box 7	Relay Box	A04380	Ontrak Control Systems Inc.	
Bluetooth Signalling Unit CBT	1153.9000.35	100302	Rohde & Schwarz GmbH & Co.KG	
	Calibration Details		Last Execution	Next Exec.
	Standard Calibration		2009/08/06	2010/08/05
Power Meter NRVD	857.8008.02	832025/059	Rohde & Schwarz GmbH & Co.KG	
	Calibration Details		Last Execution	Next Exec.
	Standard Calibration		2009/04/28	2010/04/27
Power Sensor NRV Z1 A	828.3018.03	832279/013	Rohde & Schwarz GmbH & Co.KG	
	Calibration Details		Last Execution	Next Exec.
	Standard Calibration		2009/06/23	2010/06/22
Power Supply	NGSM 32/10	2725	Rohde & Schwarz GmbH & Co.KG	
	Calibration Details		Last Execution	Next Exec.
	Standard Calibration		2009/04/28	2010/04/27
Rubidium Frequency Normal MFS	828.3018.03	002	Datum GmbH	
	Calibration Details		Last Execution	Next Exec.
	Standard Calibration		2009/06/23	2010/06/22
Signal Analyser FSIQ26	1119.6001.26	832695/007	Rohde & Schwarz GmbH & Co.KG	
	Calibration Details		Last Execution	Next Exec.
	Standard Calibration		2009/06/24	2011/06/23
Signal Generator	SMP03	833680/003	Rohde & Schwarz GmbH & Co.KG	
	Calibration Details		Last Execution	Next Exec.
	Standard Calibration		2009/06/23	2012/06/22
Vector Signal Generator SMIQ03B B	1125.5555.03	832870/017	Rohde & Schwarz GmbH & Co.KG	
	Calibration Details		Last Execution	Next Exec.
	Standard		2007/05/24	2010/05/23

Test Equipment Shielded Room 07

Lab ID: Lab 2
Description: Shielded Room 4m x 6m

Test Equipment T/H Logger 04

Lab ID: Lab 2
Description: Lufft Opus10
Serial Number: 7481

Single Devices for T/H Logger 04

Single Device Name	Type	Serial Number	Manufacturer
ThermoHygro DataloggerOpus10 THI (8152.00) 04 (Environ)		7481	Lufft Mess- und Regeltechnik GmbH
Calibration Details			Last Execution Next Exec.
Standard calibration			2009/01/23 2010/01/22

Test Equipment Temperature Chamber 01

Lab ID: Lab 2
Manufacturer: see single devices
Description: Temperature Chamber KWP 120/70
Type: Weiss
Serial Number: see single devices

Single Devices for Temperature Chamber 01

Single Device Name	Type	Serial Number	Manufacturer
Temperature Chamber Weiss 01	KWP 120/70	59226012190010	Weiss Umwelttechnik GmbH
Calibration Details			Last Execution Next Exec.
Specific calibration			2009/03/12 2010/03/11

Test Equipment Additional WLAN Regulatory RF Test Solution

Lab ID: Lab 2
Manufacturer: see single devices
Description: Additional used equipmant
Type: WLAN
Serial Number: see single devices

Single Devices for Additional WLAN Regulatory RF Test Solution

Single Device Name	Type	Serial Number	Manufacturer
Signal Analyser	FSU	20046	Rohde & Schwarz GmbH & Co.KG
Calibration Details			Last Execution Next Exec.
Specific calibration			2010/02/08 2012/02/07

5 Photo Report



Photo 1: Test setup for radiated measurements (Enclosure, below 30 MHz)

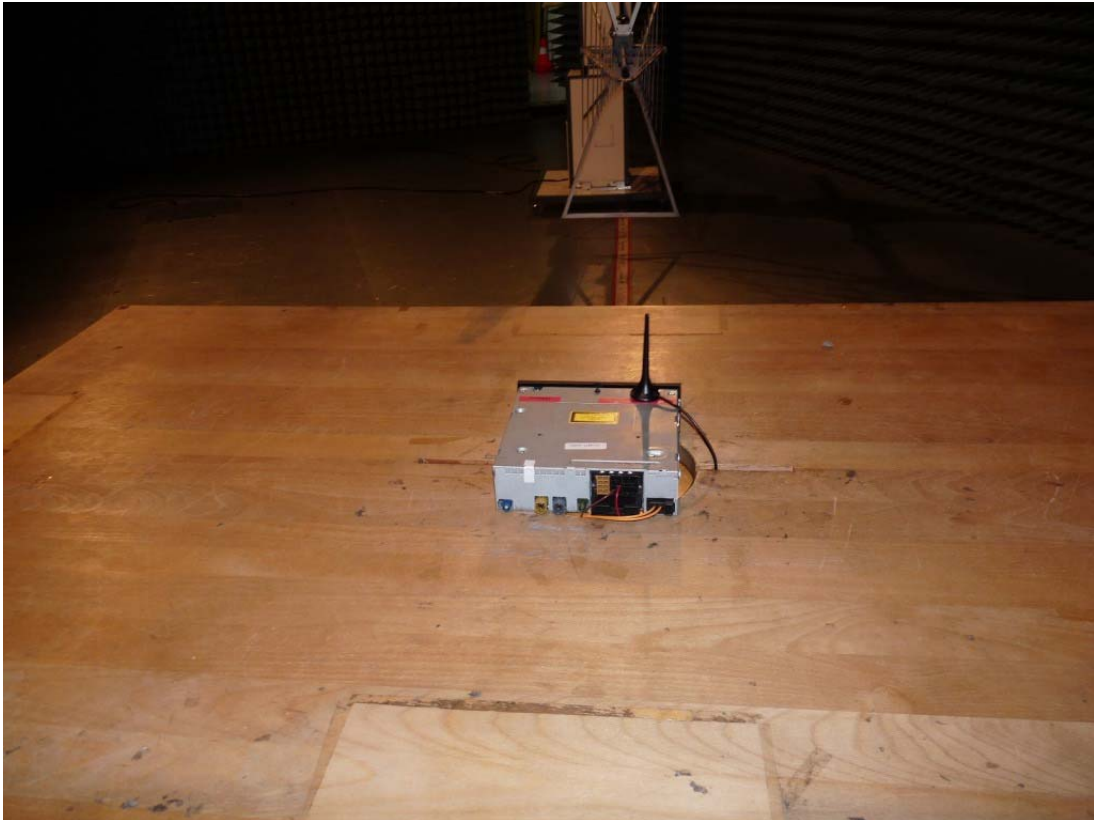


Photo 2: Test setup for radiated measurements (Enclosure, 30 MHz to 1 GHz)



Photo 3: Test setup for radiated measurements (Enclosure, above 1 GHz)



Photo 4: EUT (front side)

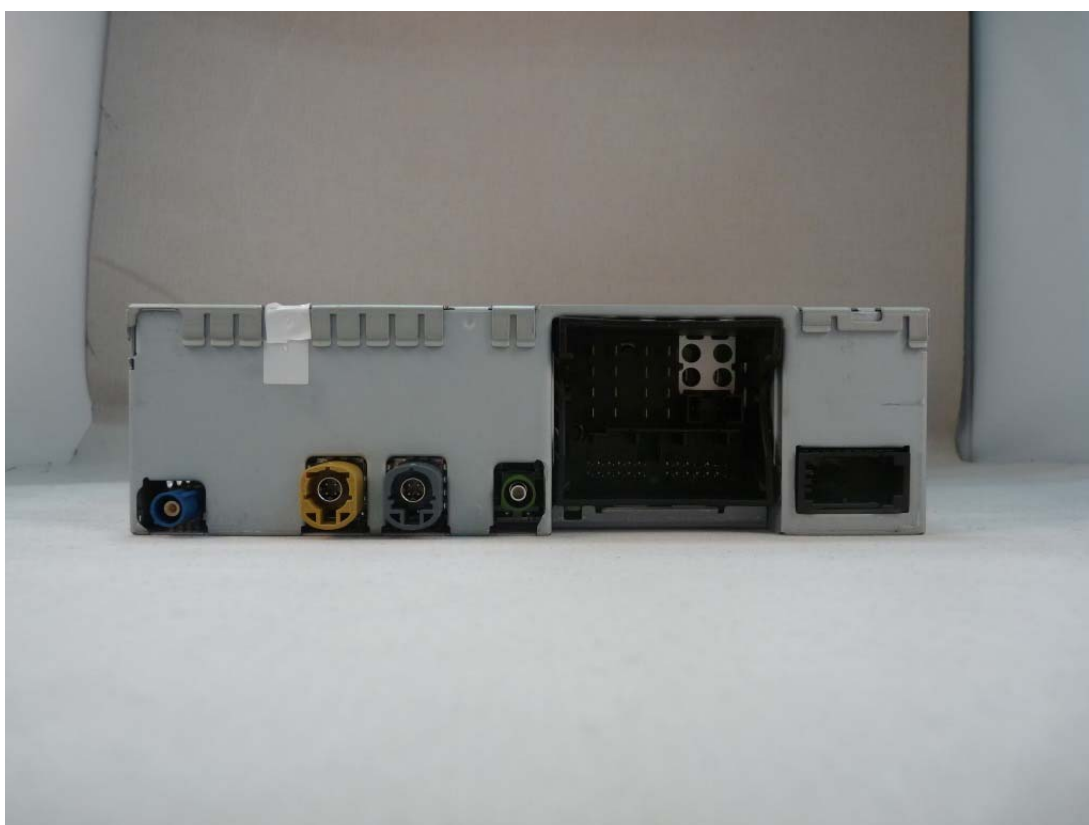
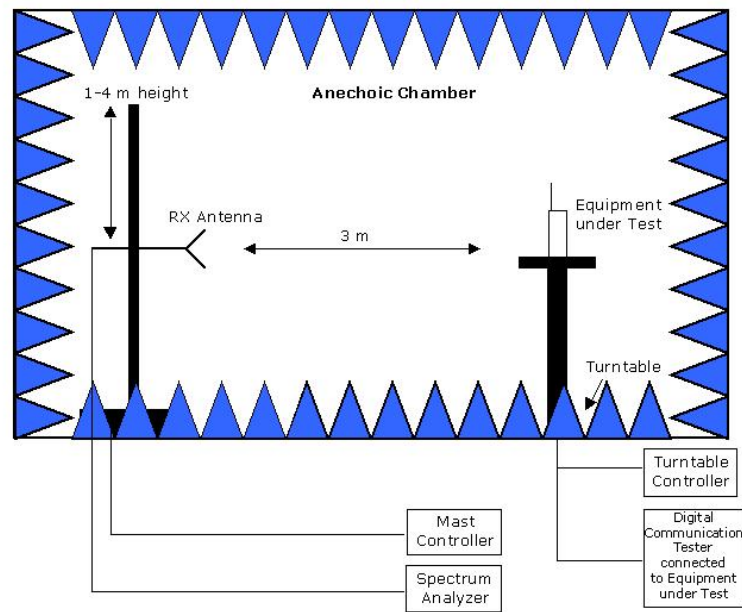


Photo 5: EUT (rear side)

6 Setup Drawings



Remark: Depending on the frequency range suitable antenna types, attenuators or preamplifiers are used.

Drawing 1: Setup in the Anechoic chamber. For measurements below 1 GHz the ground was replaced by a conducting groundplane.

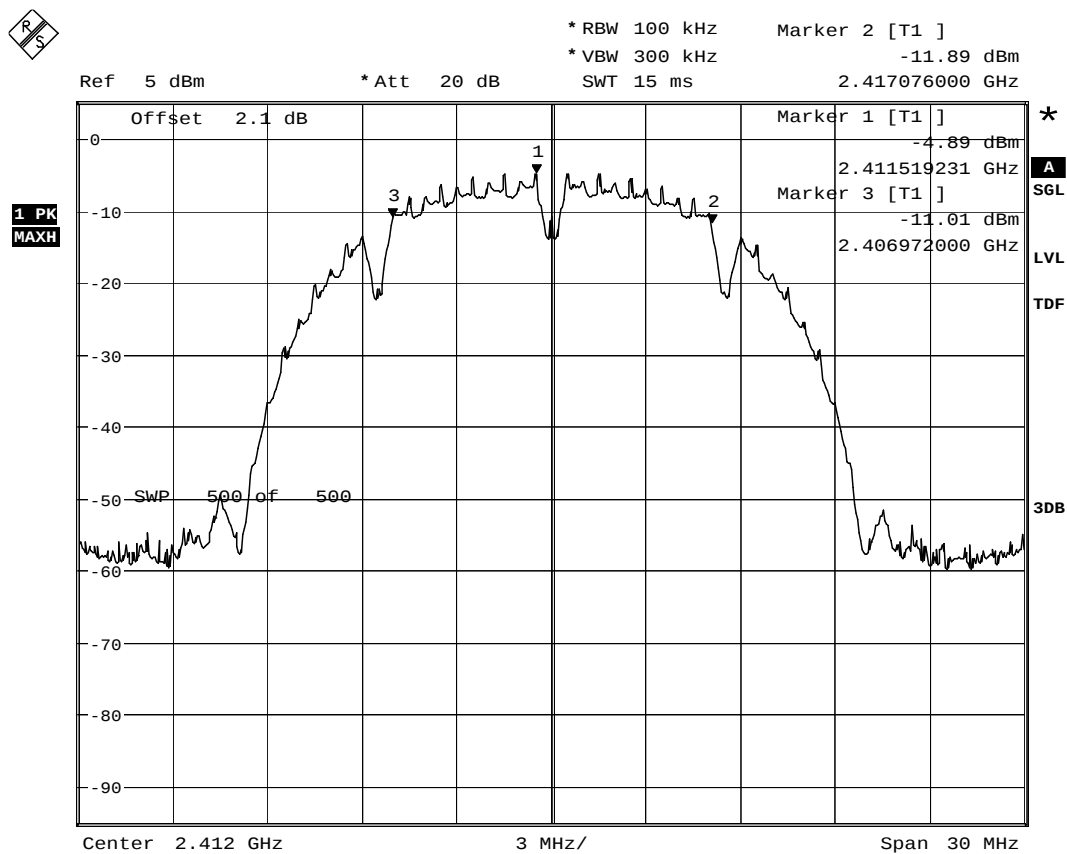
7 Annex measurement plots

7.1 Occupied bandwidth

7.1.1 Occupied bandwidth operating mode 1

Op. Mode

op-mode 1b

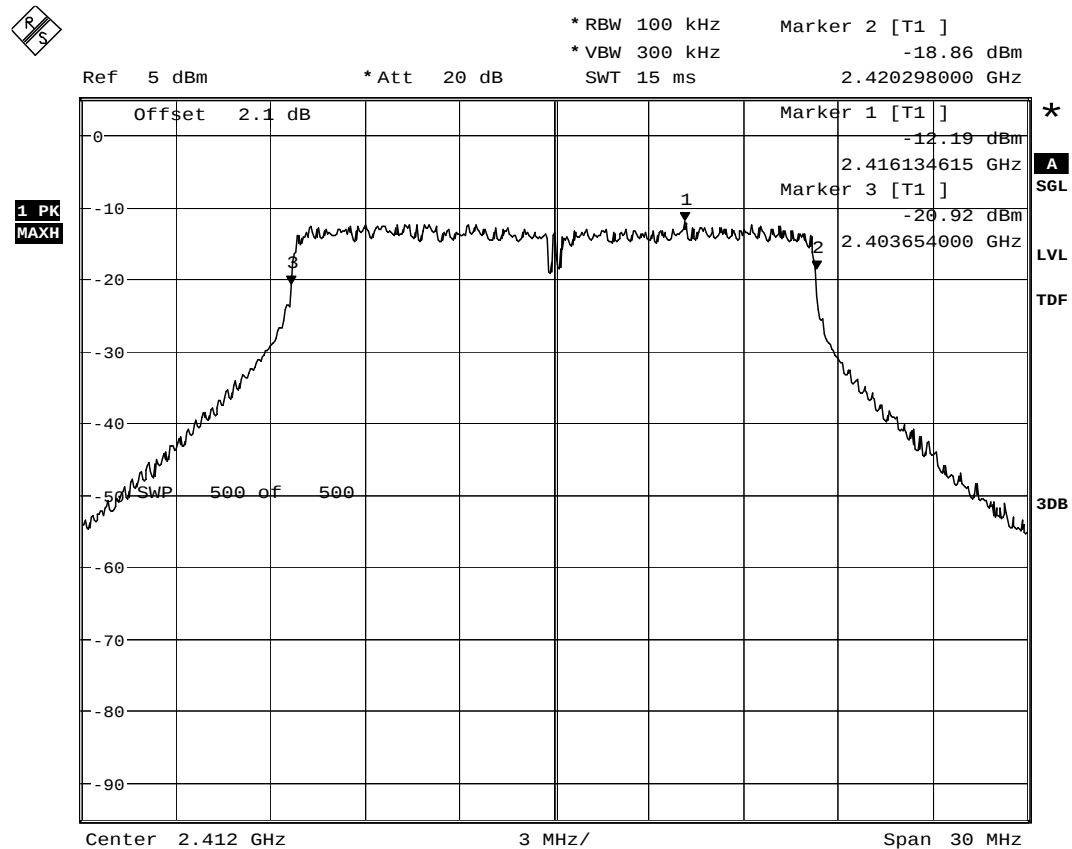


CH B: 2412 MHz; 6dB bandwidth (kHz):10104

Date: 11.FEB.2010 15:27:45

Op. Mode

op-mode 1g



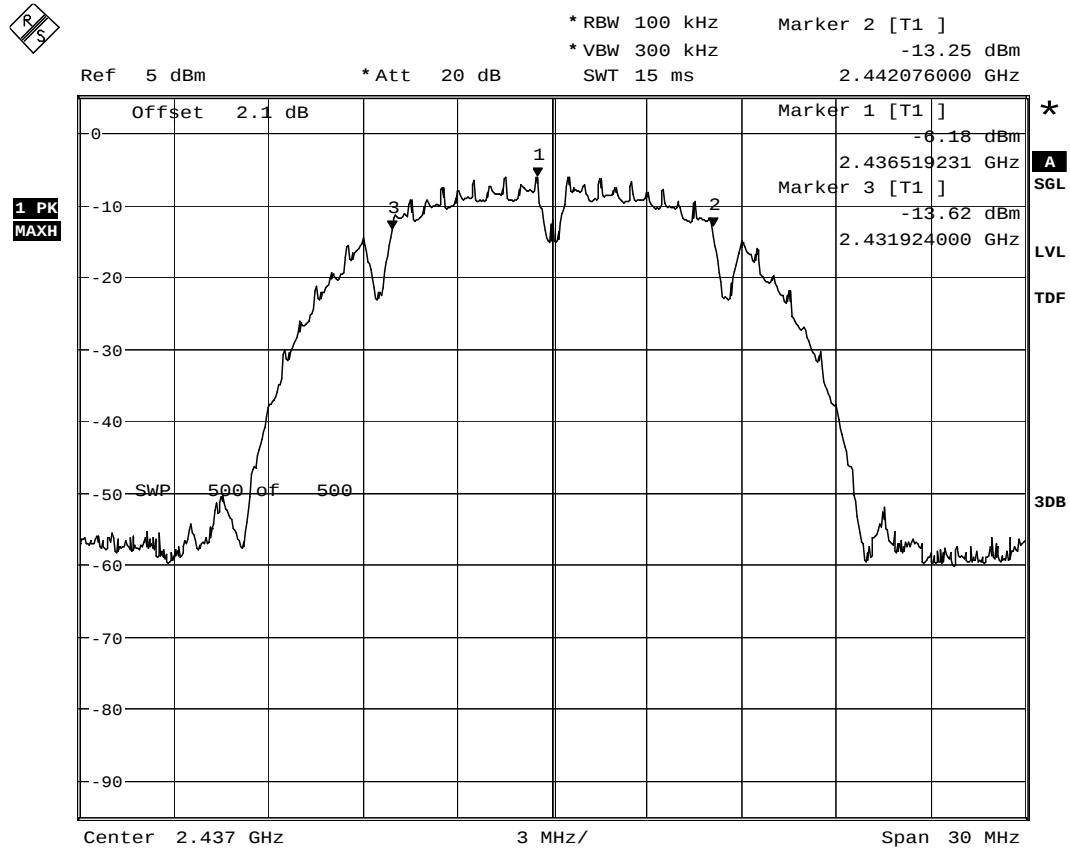
CH B: 2412 MHz; 6dB bandwidth (kHz):16644

Date: 11.FEB.2010 15:16:51

7.1.2 Occupied bandwidth operating mode 2

Op. Mode

op-mode 2b

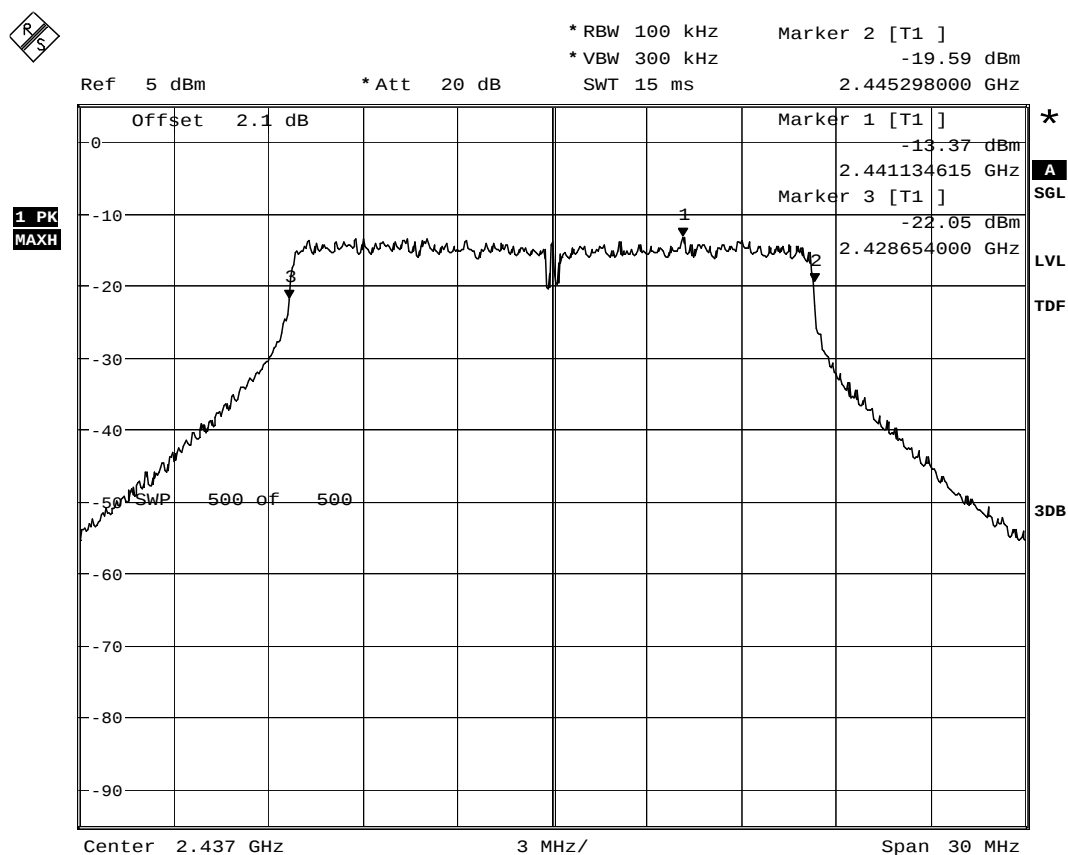


CH M: 2437 MHz; 6dB bandwidth (kHz):10152

Date: 11.FEB.2010 15:59:16

Op. Mode

op-mode 2g



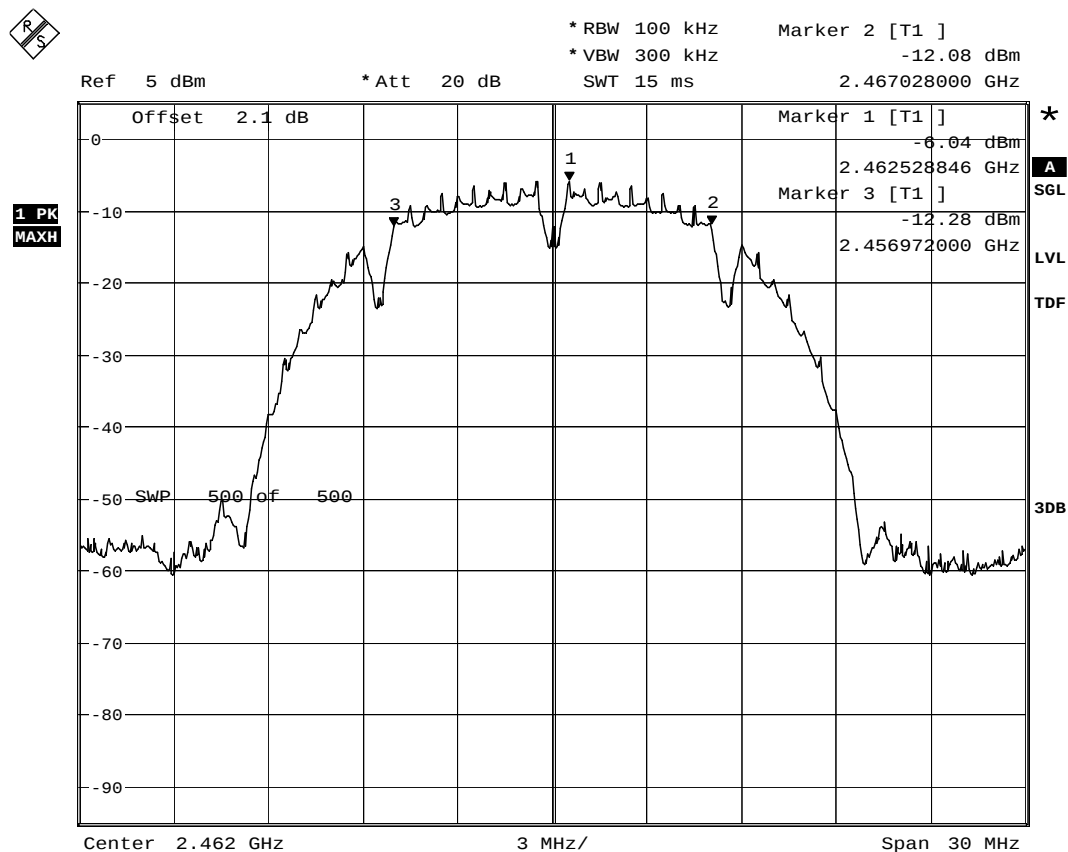
CH M: 2437 MHz; 6dB bandwidth (kHz):16644

Date: 11.FEB.2010 16:07:16

7.1.3 Occupied bandwidth operating mode 3

Op. Mode

op-mode 3b

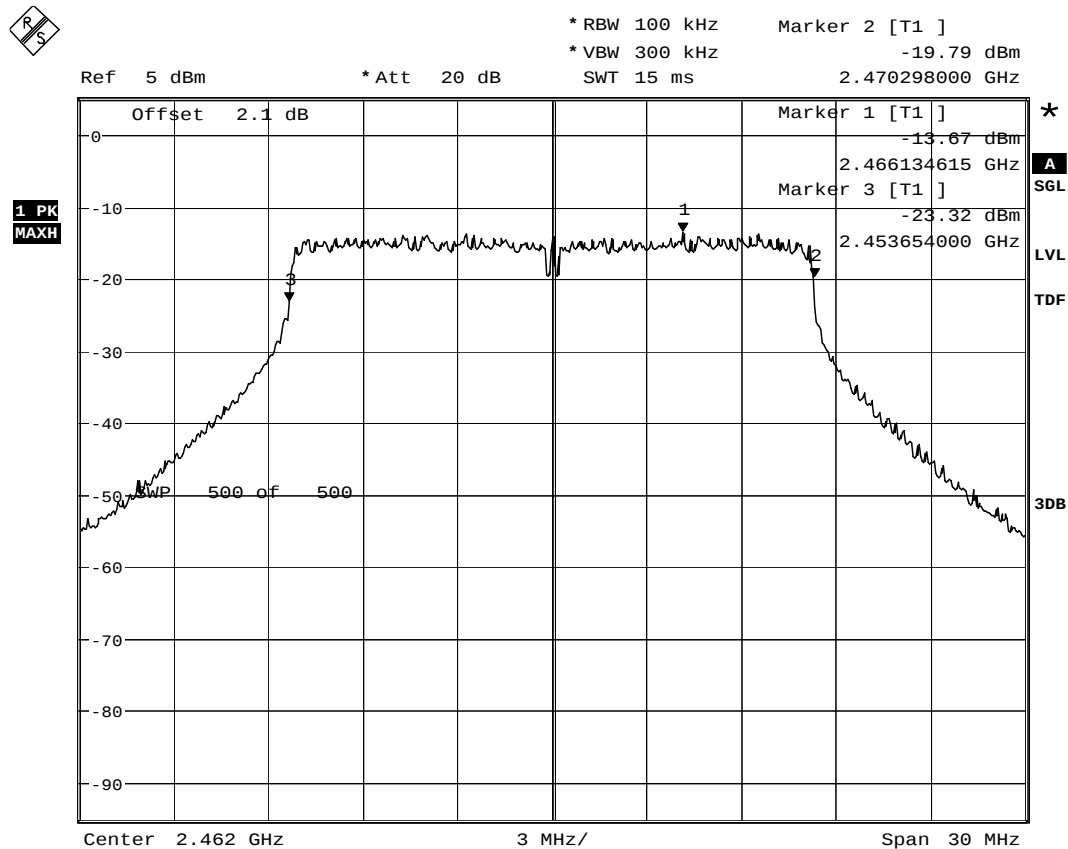


CH T: 2462 MHz; 6dB bandwidth (kHz):10056

Date: 11.FEB.2010 16:23:23

Op. Mode

op-mode 3g



CH T: 2462 MHz; 6dB bandwidth (kHz):16644

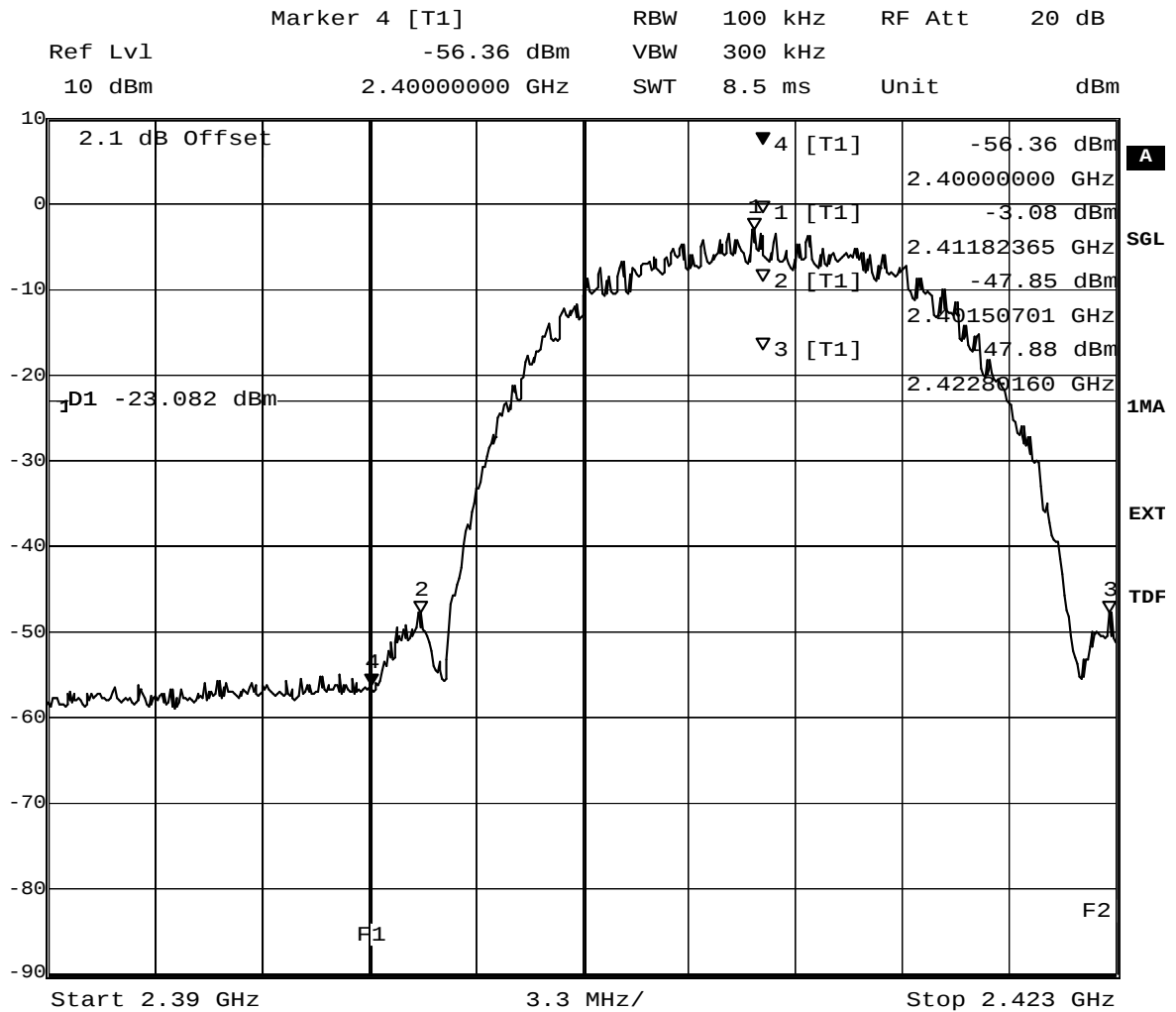
Date: 11.FEB.2010 16:15:08

7.2 Band edge compliance and Spurious RF emissions conducted

7.2.1 Band edge compliance conducted operating mode 1

Op. Mode

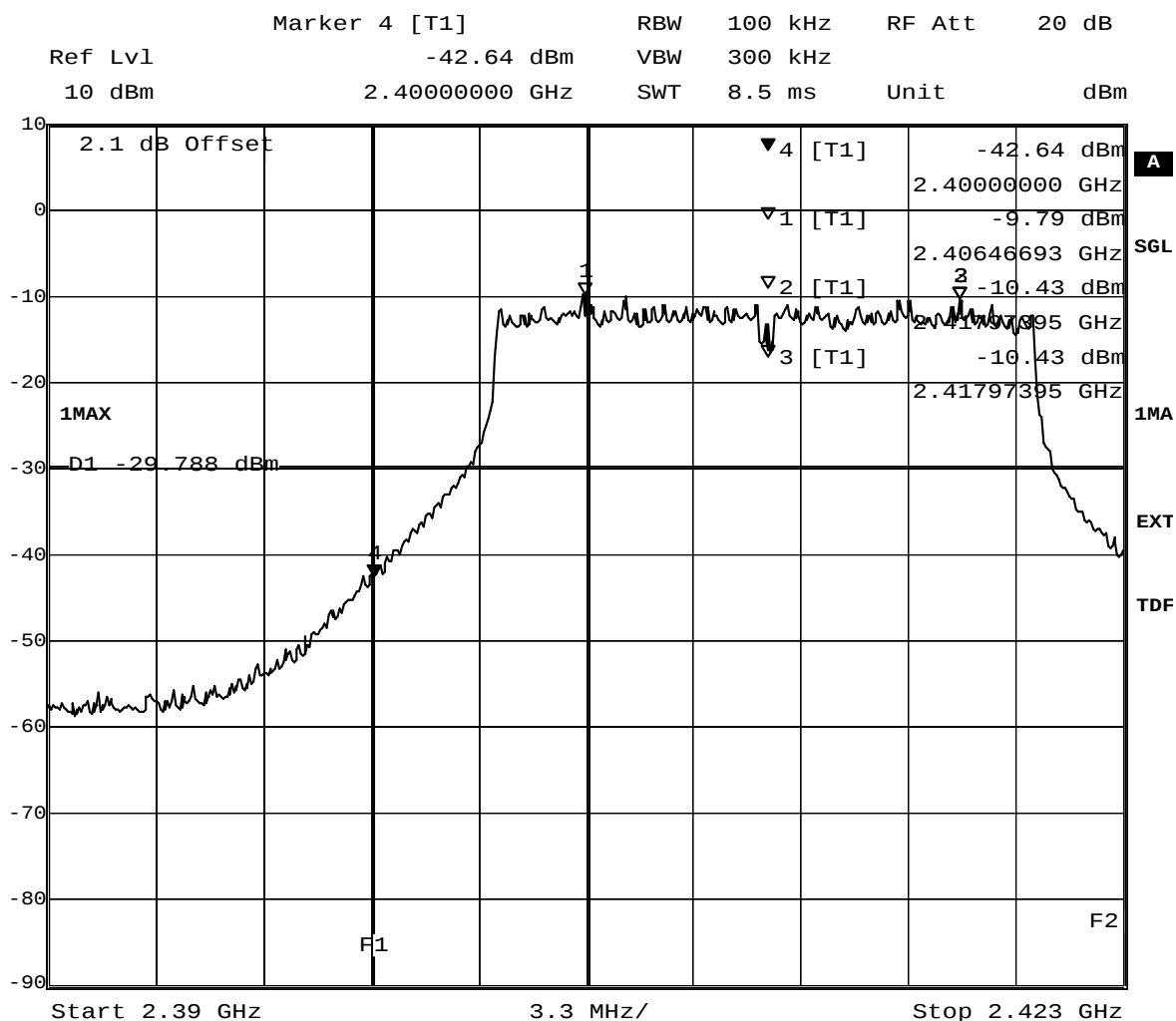
op-mode 1b



Title: Band Edge Compliance
 Comment A: CH B: 2412 MHz
 Date: 28.JAN.2010 09:31:07

Op. Mode

op-mode 1g



Title: Band Edge Compliance

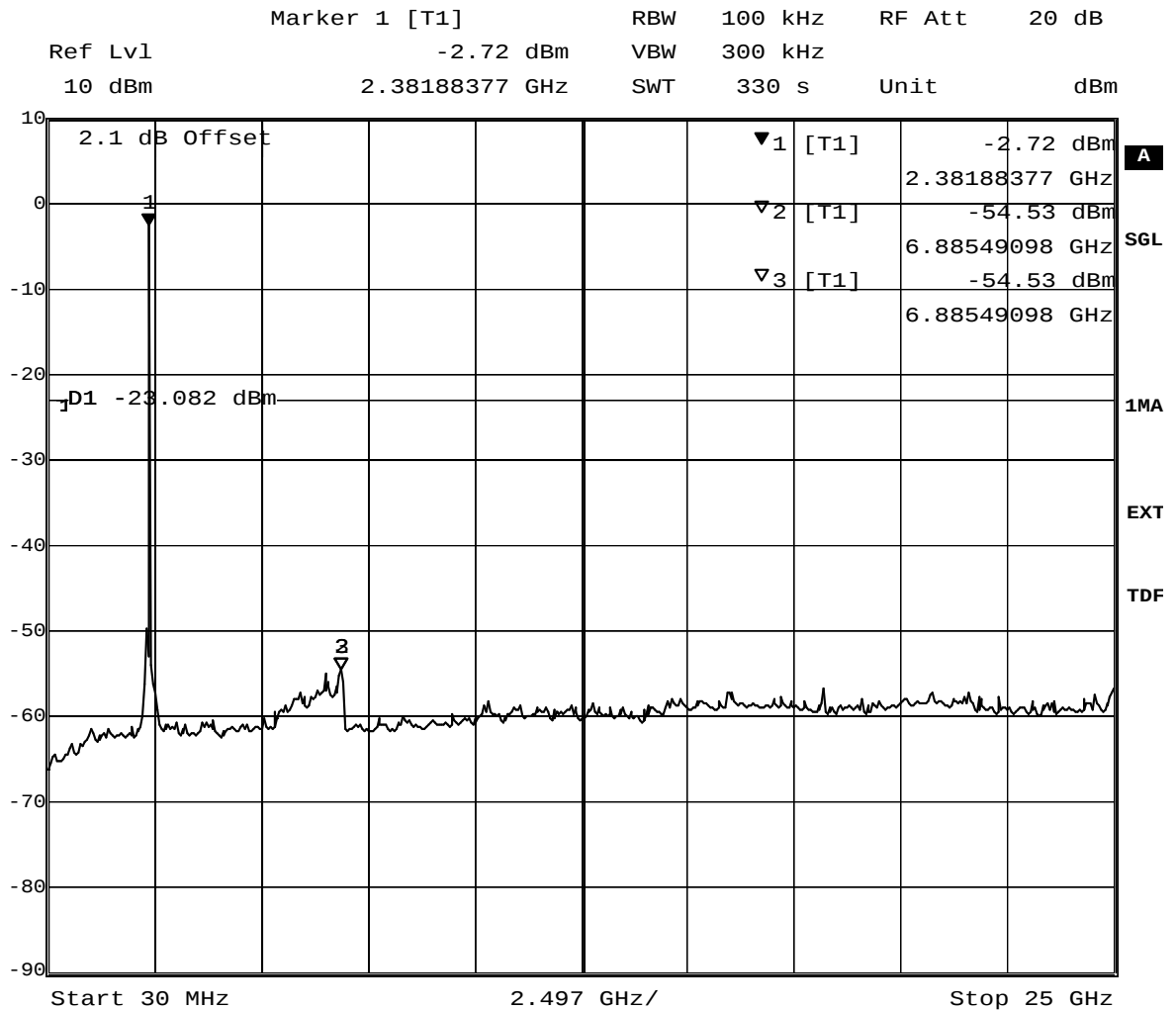
Comment A: CH B: 2412 MHz

Date: 28.JAN.2010 09:52:16

7.2.2 Spurious RF conducted emission operating mode 1

Op. Mode

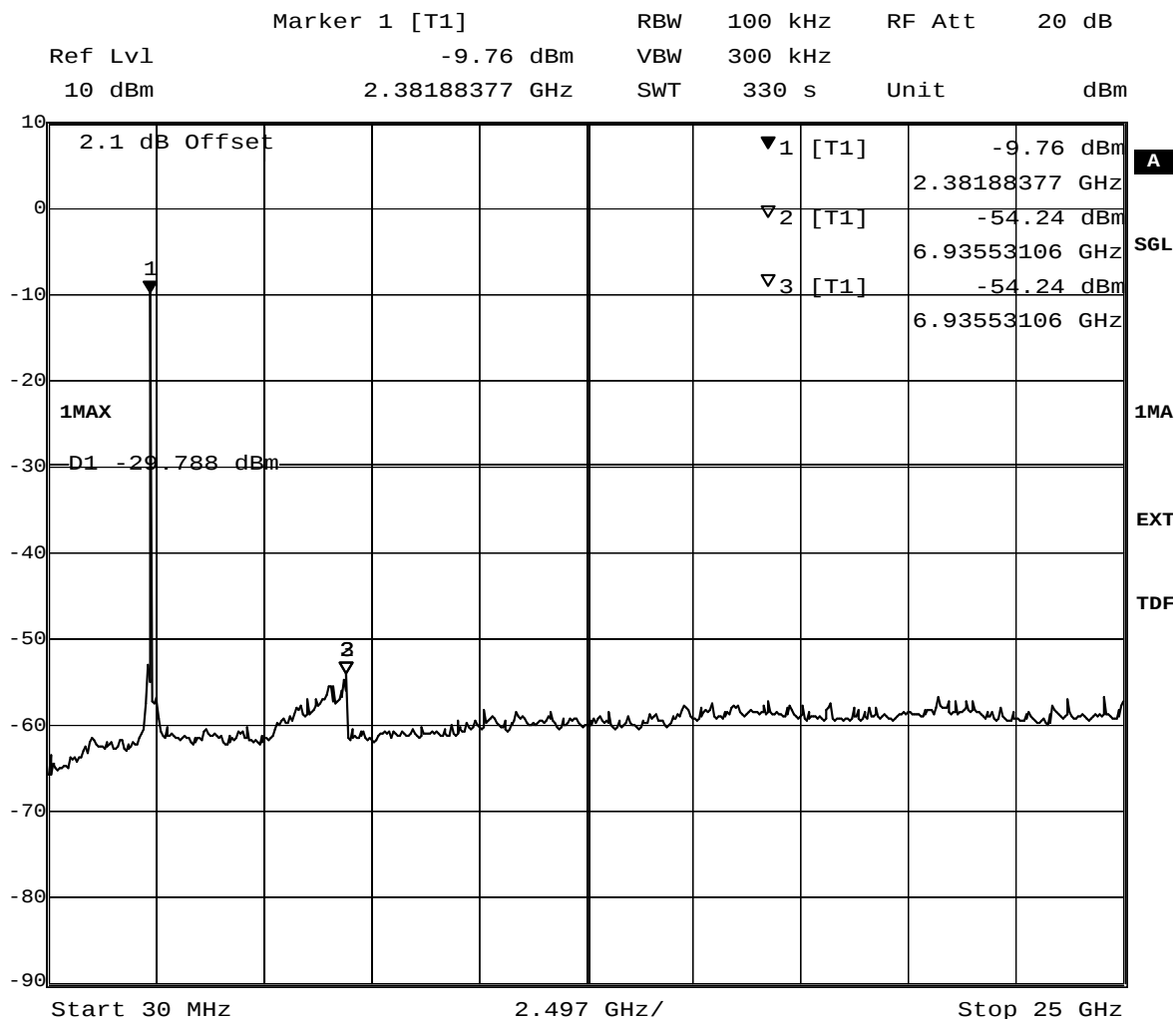
op-mode 1b



Title: spurious emissions
 Comment A: CH B: 2412 MHz
 Date: 28.JAN.2010 09:42:45

Op. Mode

op-mode 1g

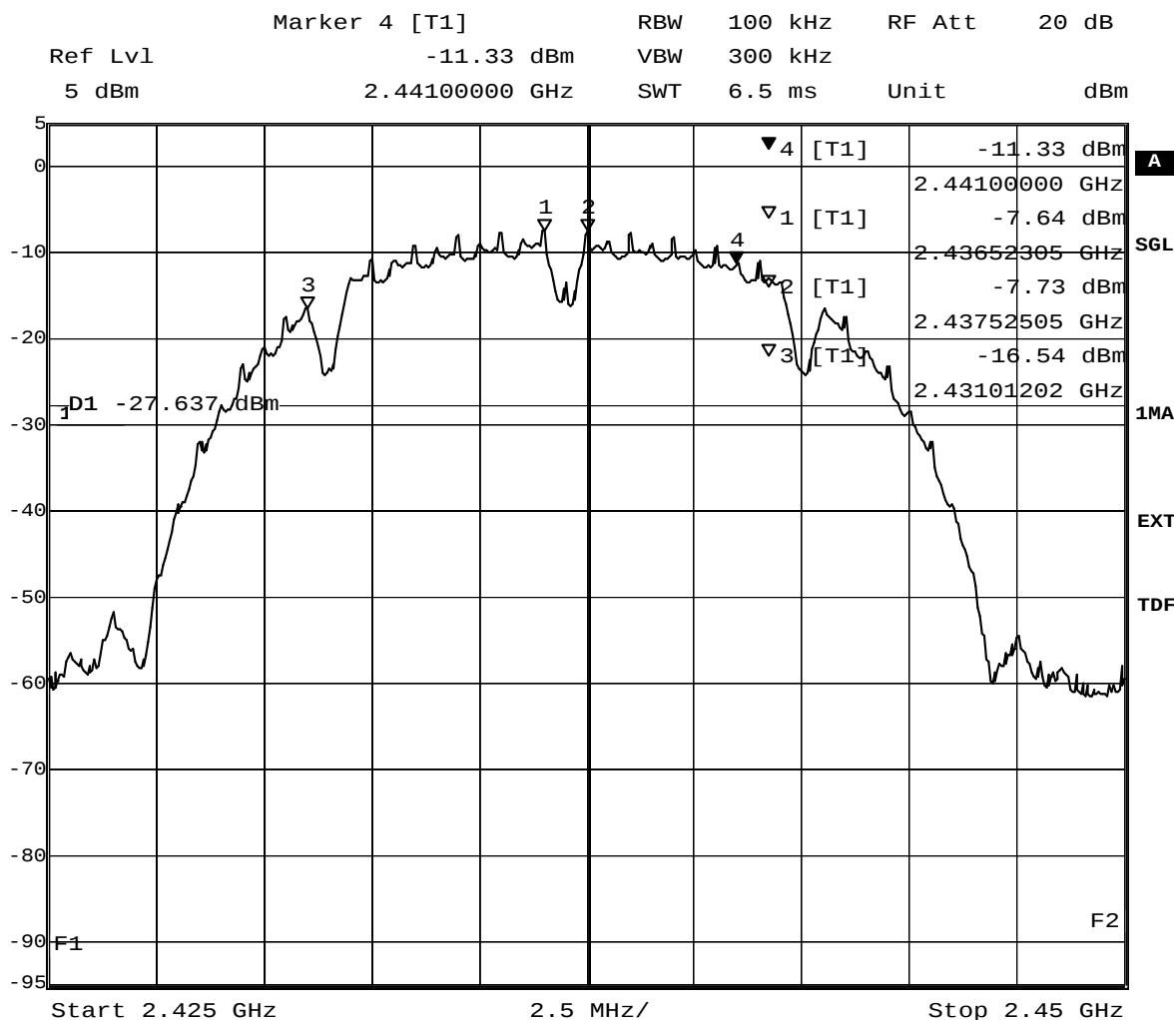


Title: spurious emissions
 Comment A: CH B: 2412 MHz
 Date: 28.JAN.2010 10:03:55

7.2.3 Spurious RF conducted emission operating mode 2

Op. Mode

op-mode 2b

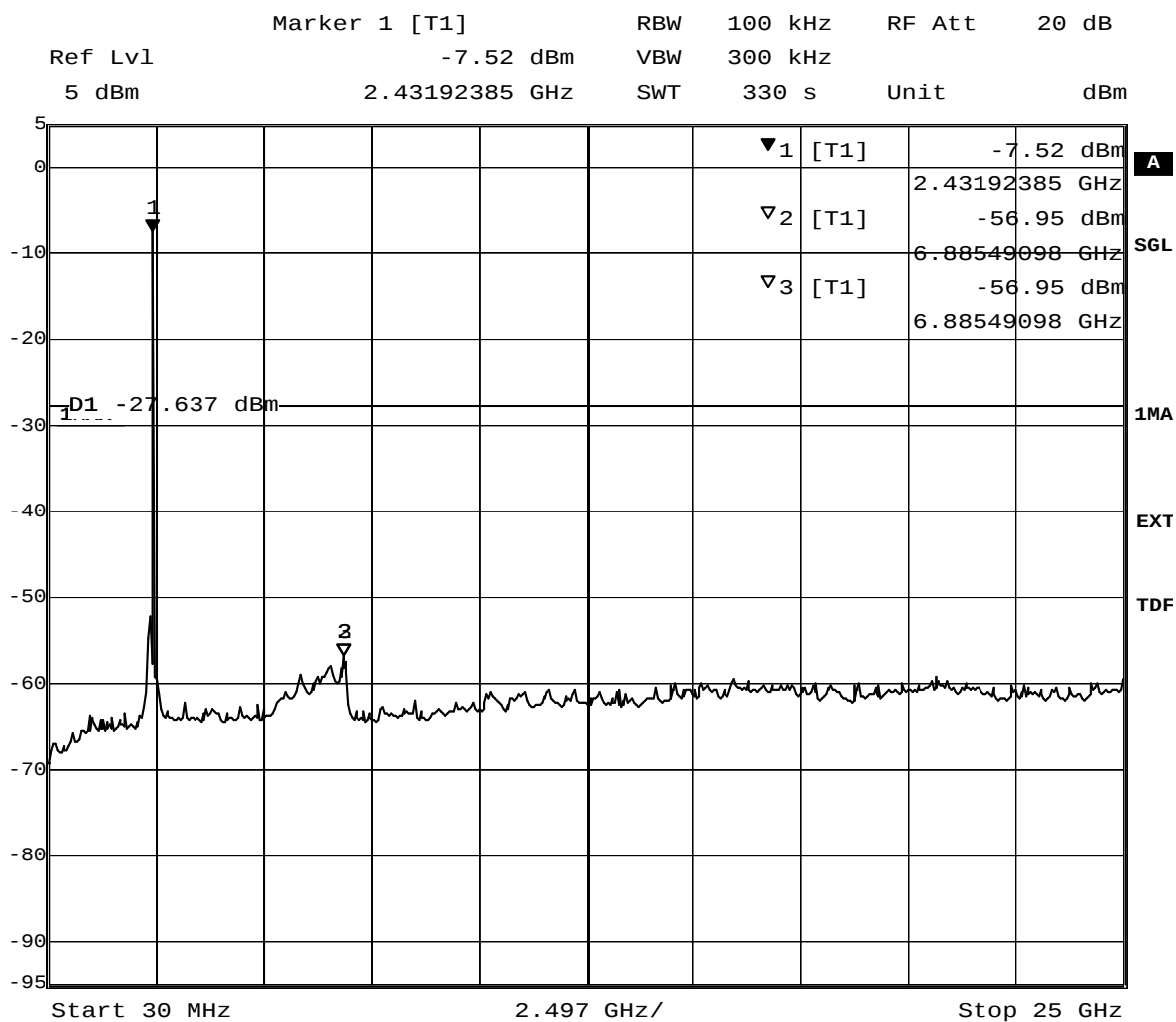


Title: Band Edge Compliance

Comment A: CH M: 2437 MHz

Date: 3.FEB.2010 12:55:18

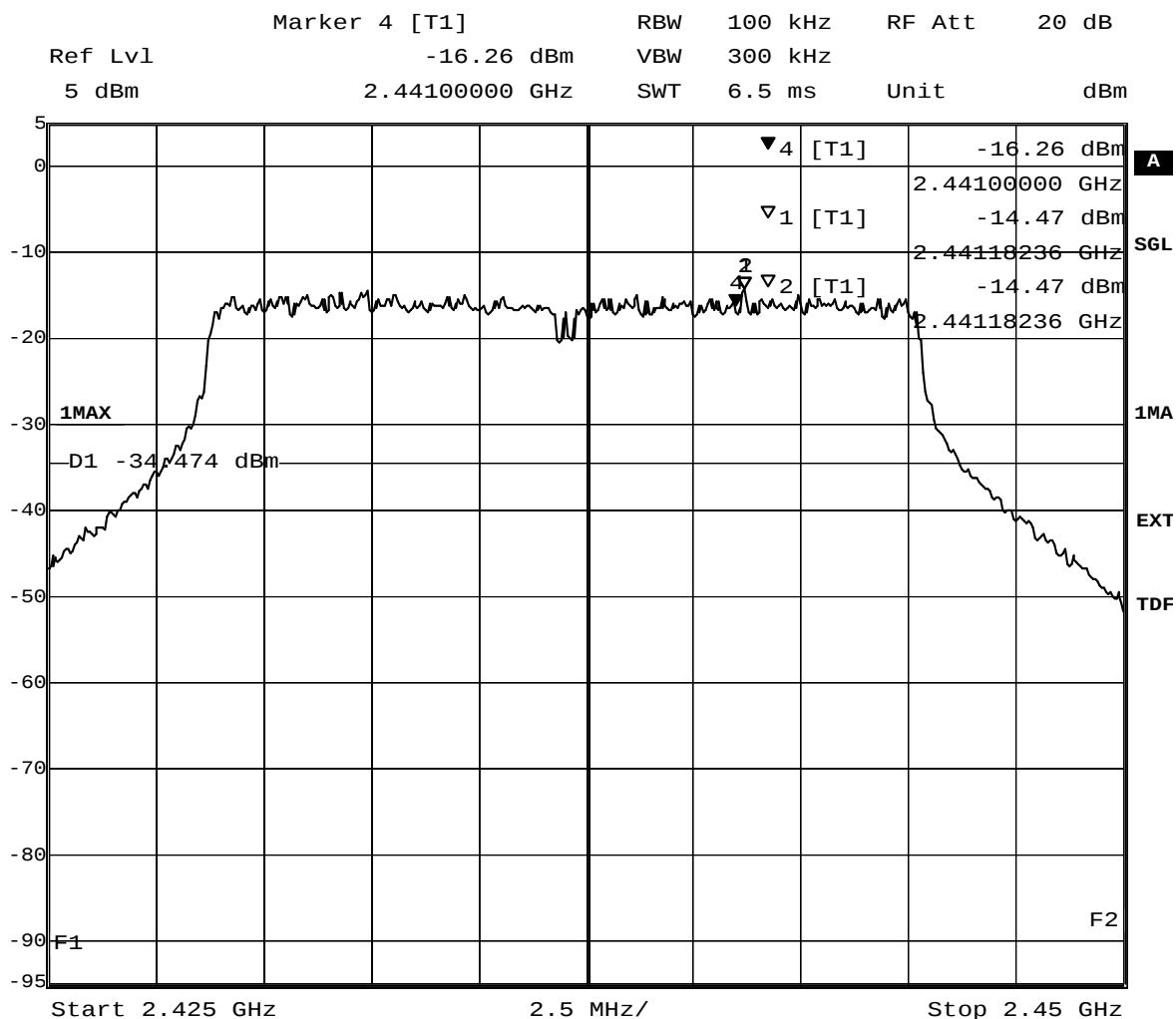
(determination of reference value for spurious emissions measurement)



Title: spurious emissions
 Comment A: CH M: 2437 MHz
 Date: 3.FEB.2010 13:06:57

Op. Mode

op-mode 2g

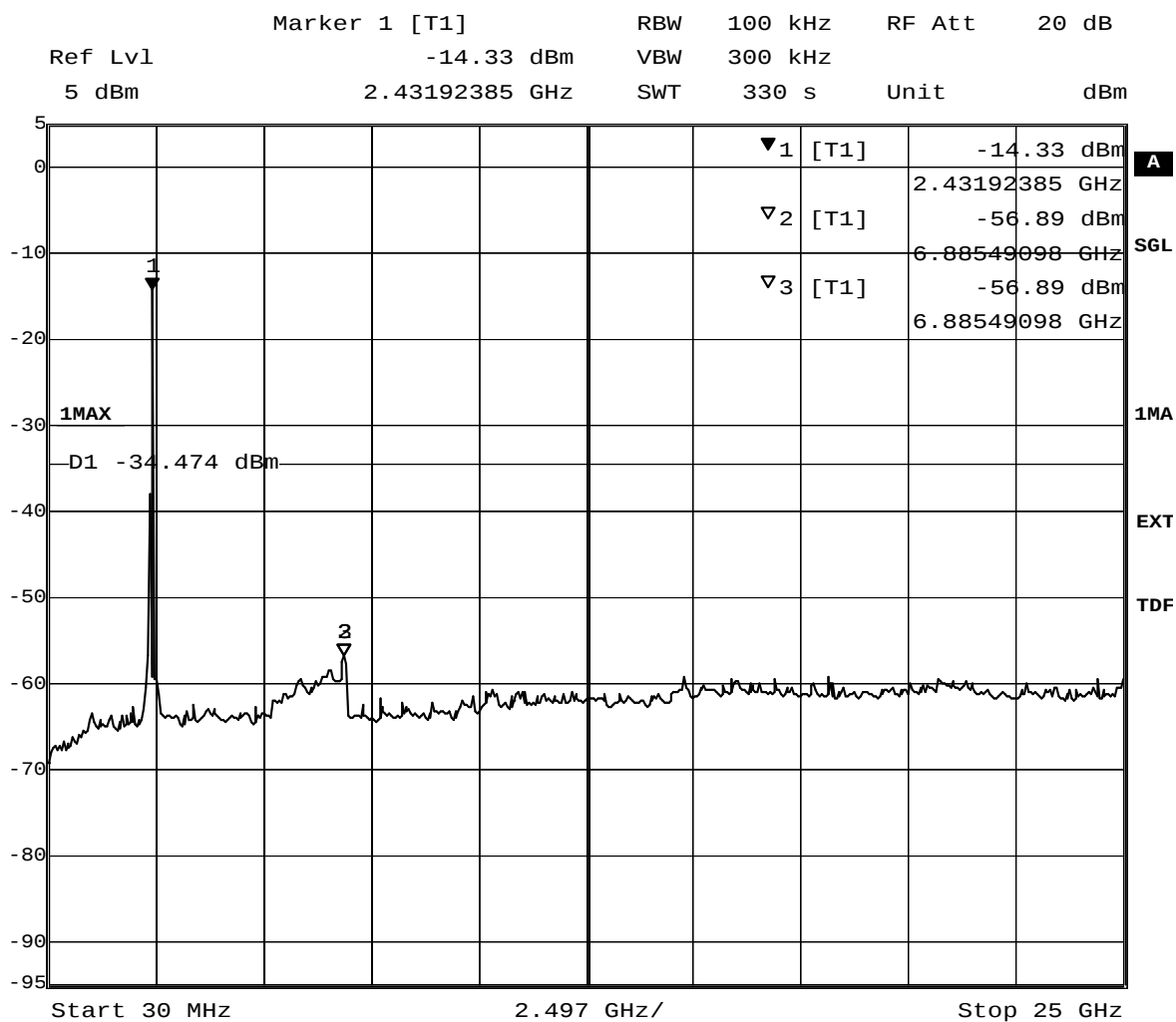


Title: Band Edge Compliance

Comment A: CH M: 2437 MHz

Date: 3.FEB.2010 13:29:32

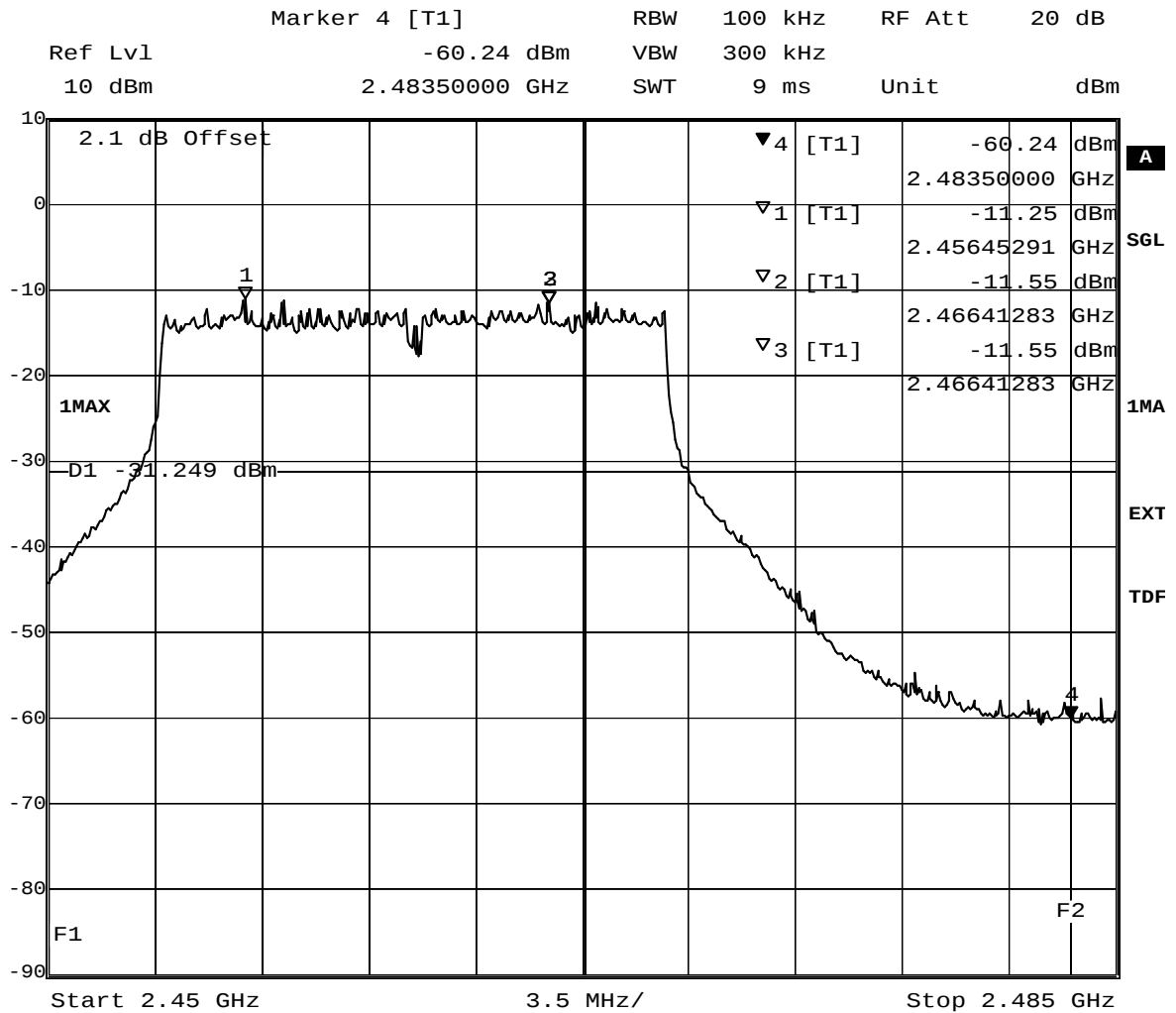
(determination of reference value for spurious emissions measurement)



Title: spurious emissions
 Comment A: CH M: 2437 MHz
 Date: 3.FEB.2010 13:41:11

Op. Mode

op-mode 3g



Title: Band Edge Compliance

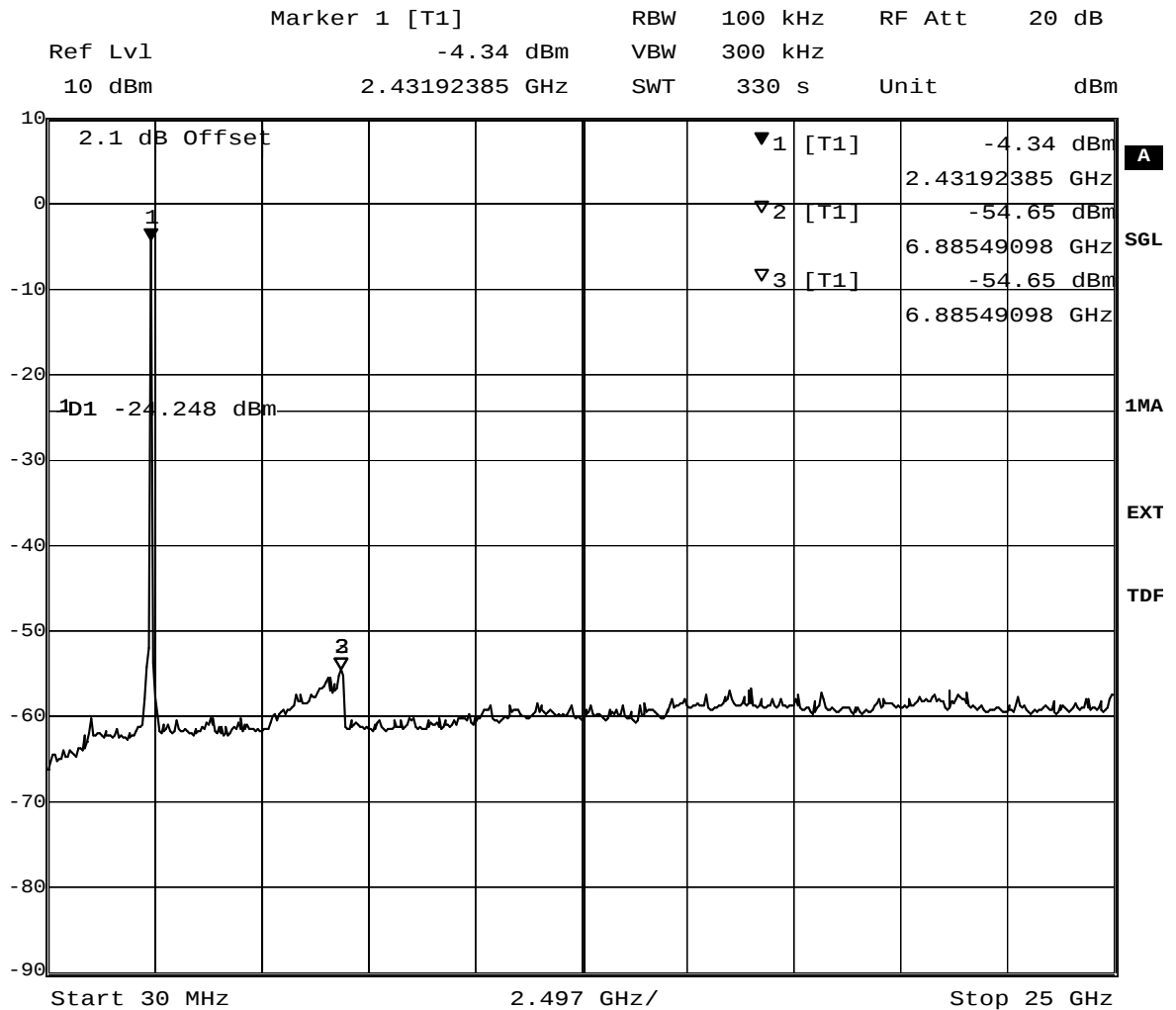
Comment A: CH T: 2462 MHz

Date: 28.JAN.2010 10:05:50

7.2.5 Spurious RF conducted emission operating mode 3

Op. Mode

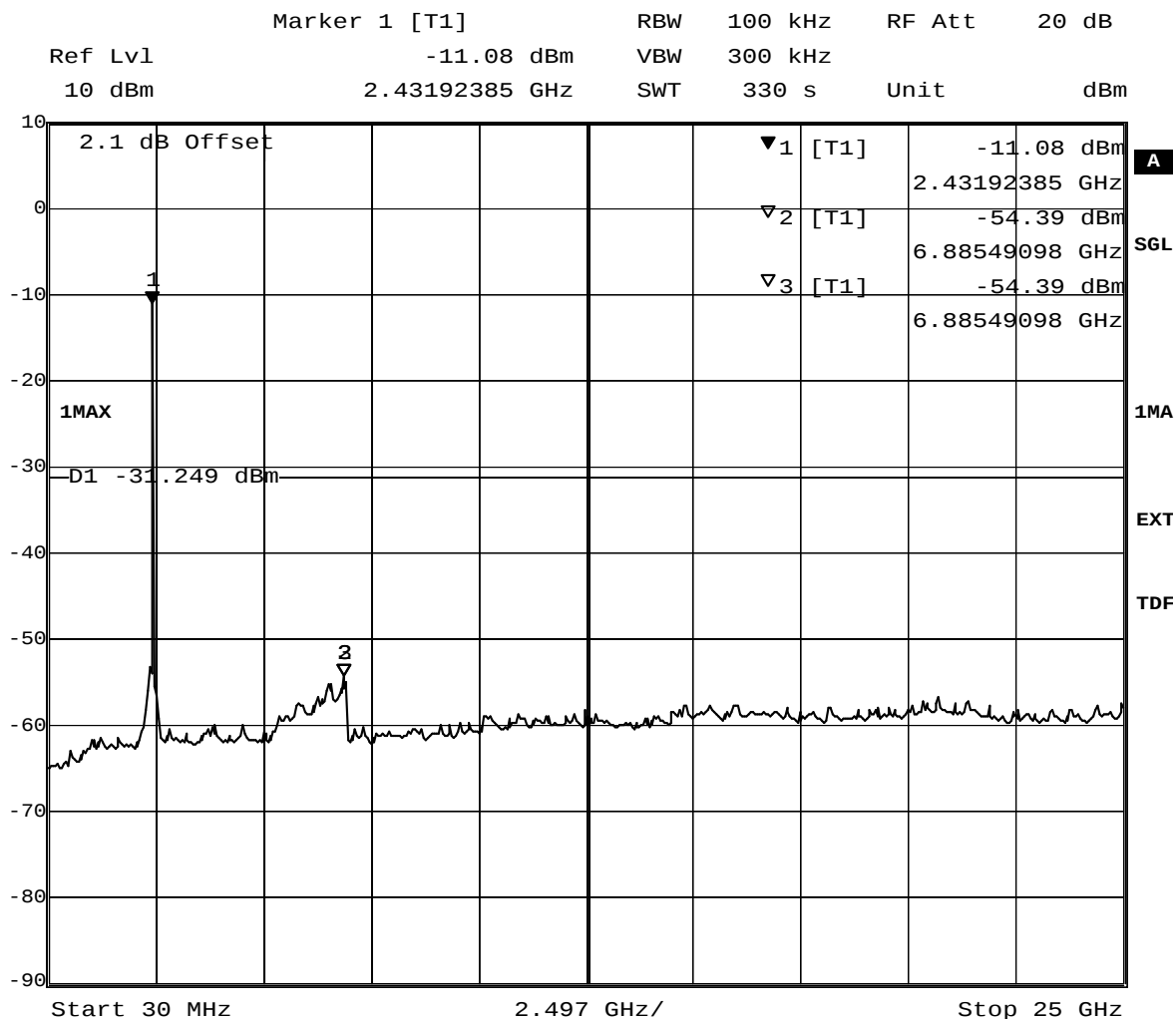
op-mode 3b



Title: spurious emissions
 Comment A: CH T: 2462 MHz
 Date: 28.JAN.2010 10:30:25

Op. Mode

op-mode 3g



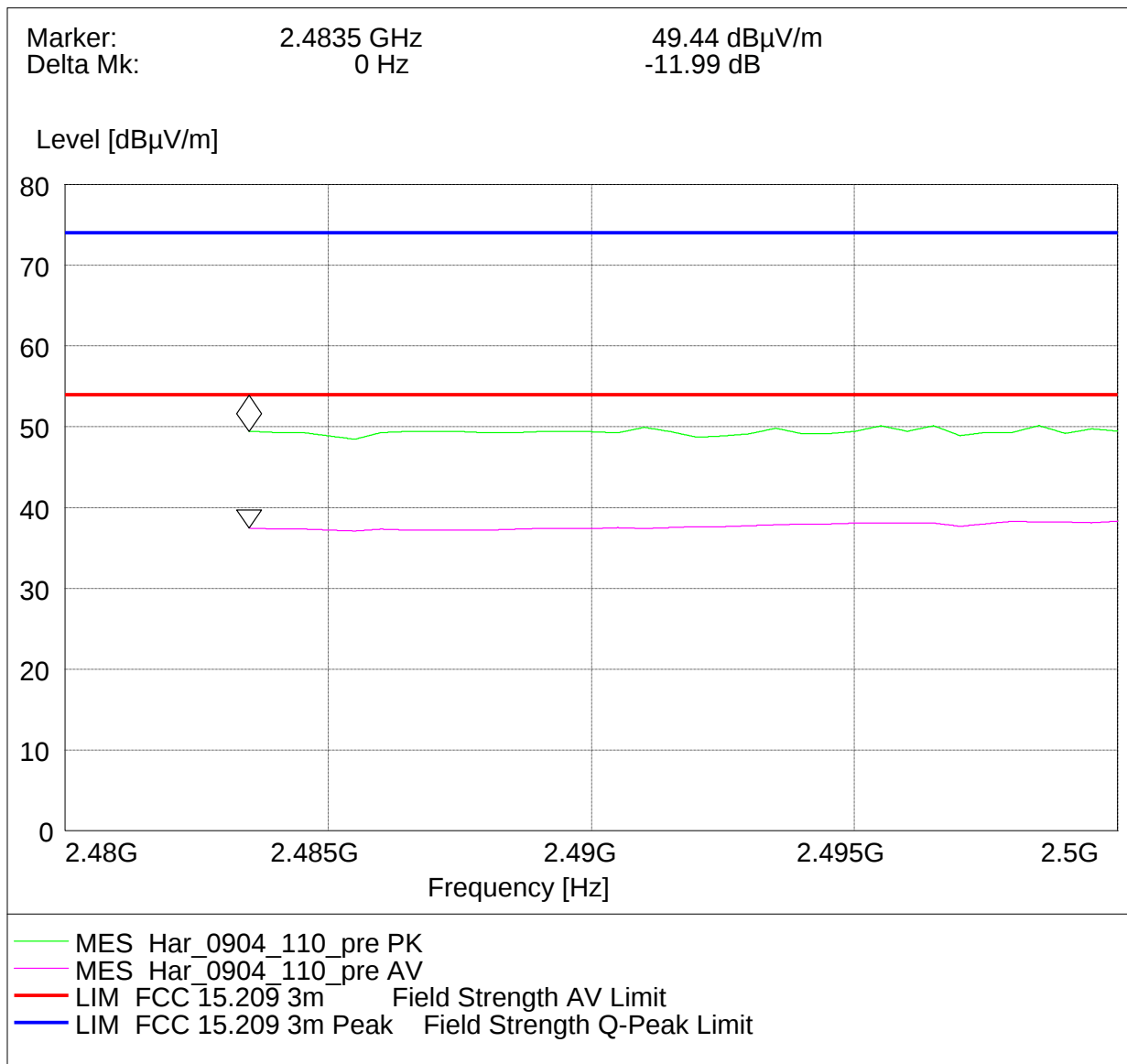
Title: spurious emissions
 Comment A: CH T: 2462 MHz
 Date: 28.JAN.2010 10:17:28

7.2.6 Band edge compliance radiated operating mode 3

Op. Mode **higher band edge**

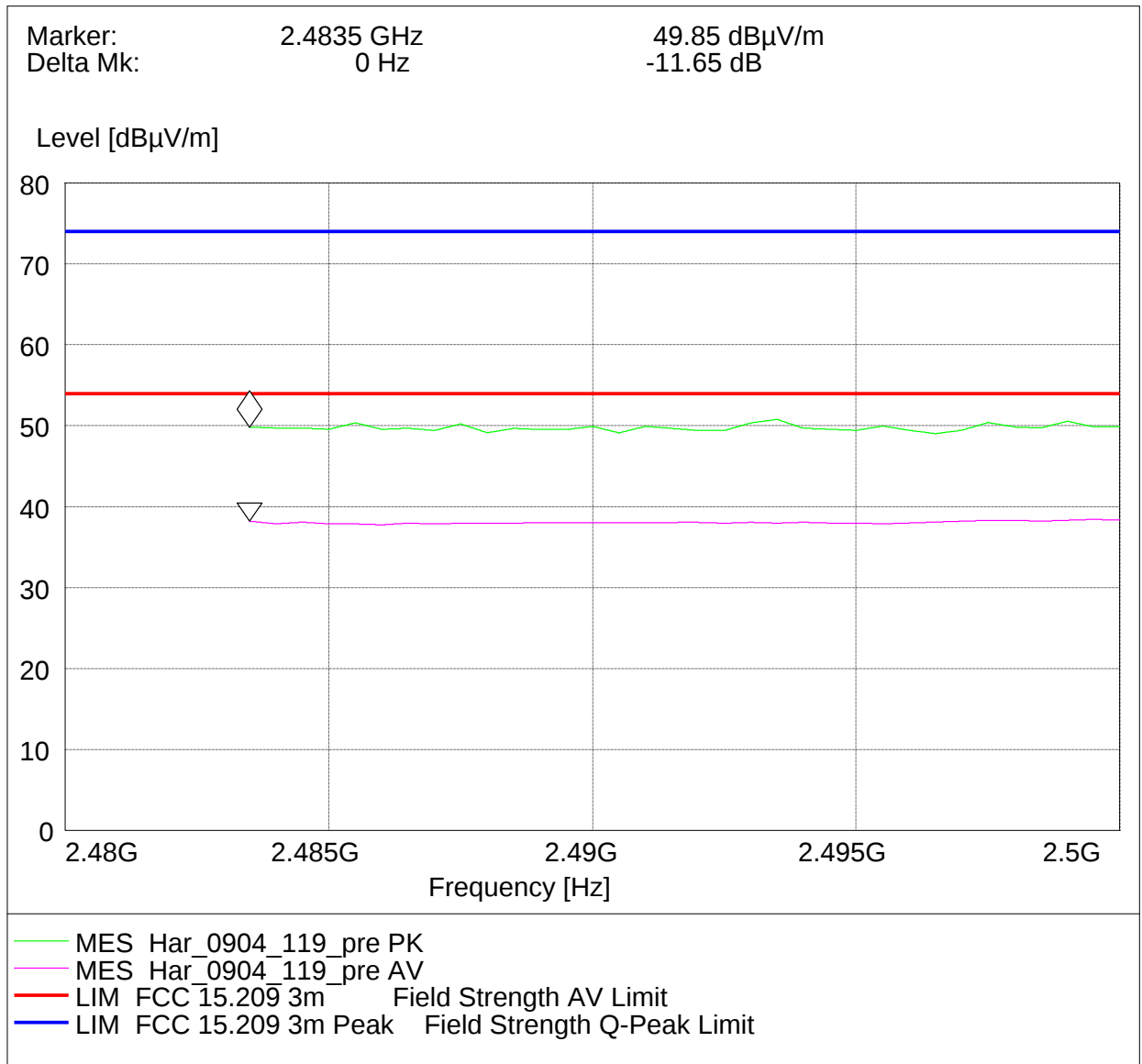
op-mode 3b **TX on 2462 MHz**

Radiated measurement



Op. Mode **higher band edge**
op-mode 3g **TX on 2462 MHz**

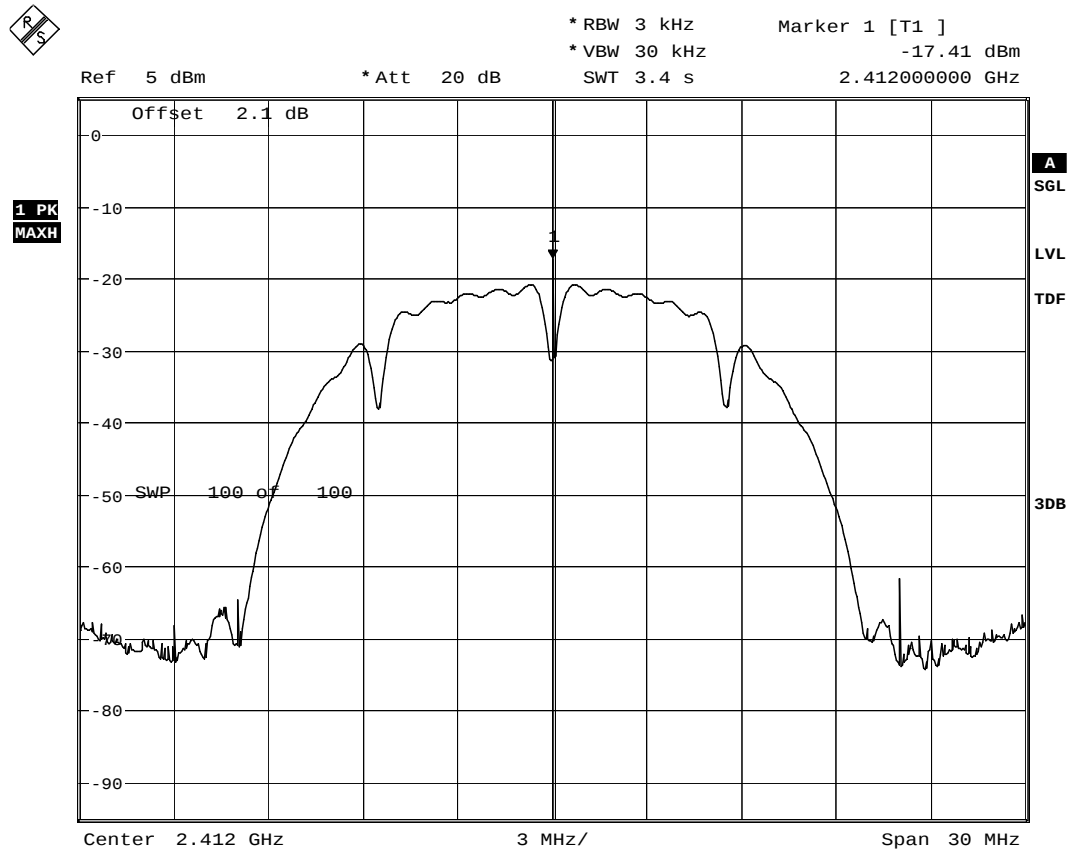
Radiated measurement



7.3 Power density

Op. Mode

op-mode 1b

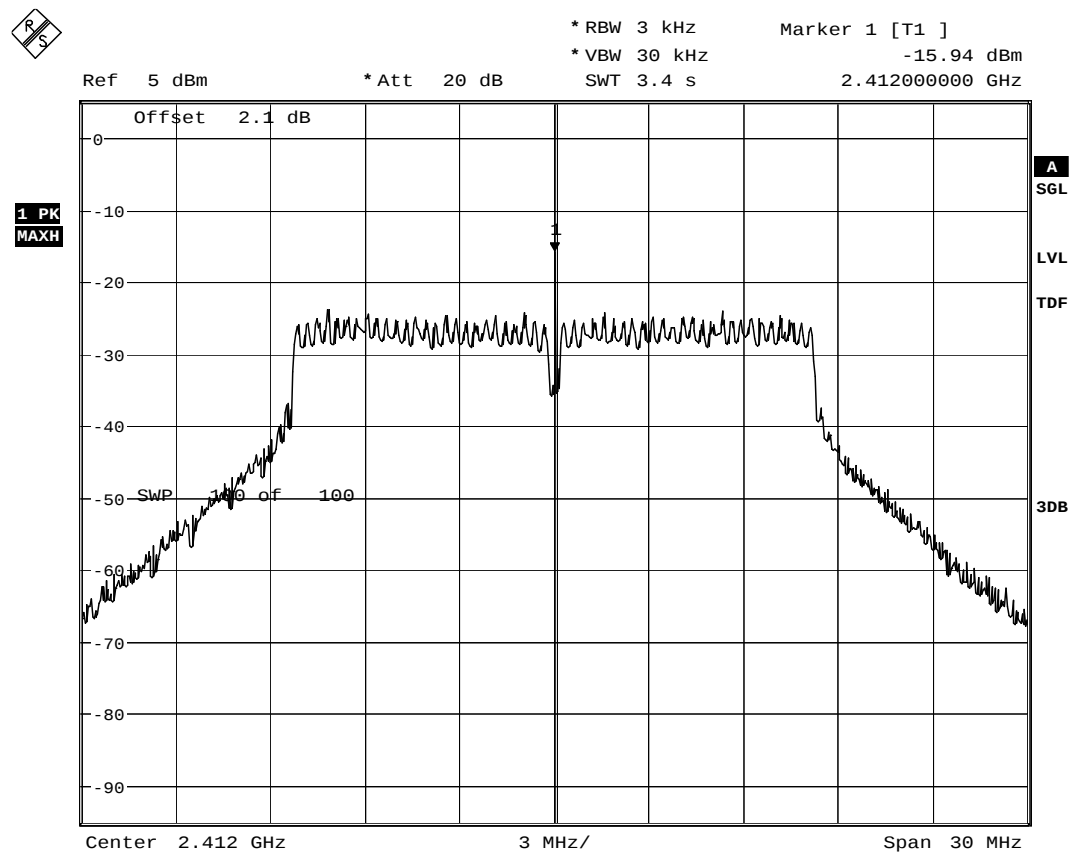


CH B: 2412 MHz;

Date: 12.FEB.2010 10:17:32

Op. Mode

op-mode 1g

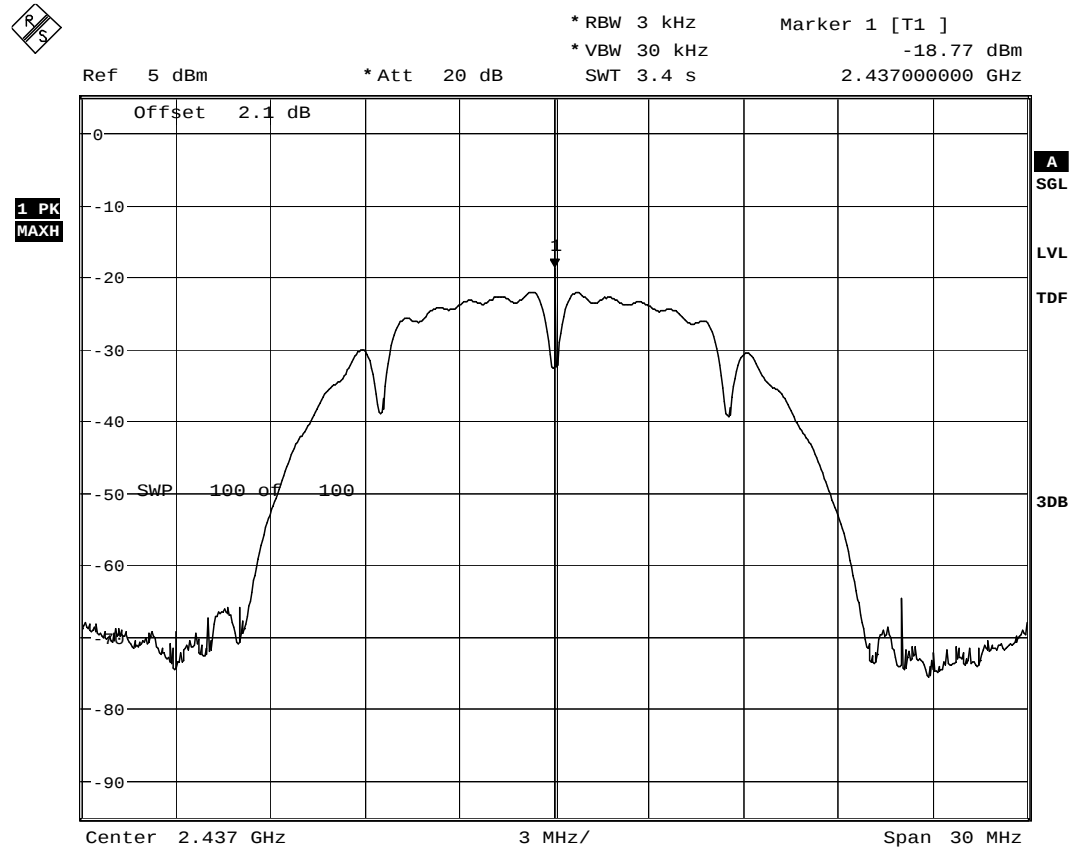


CH B: 2412 MHz;

Date: 12.FEB.2010 10:11:12

Op. Mode

op-mode 2b



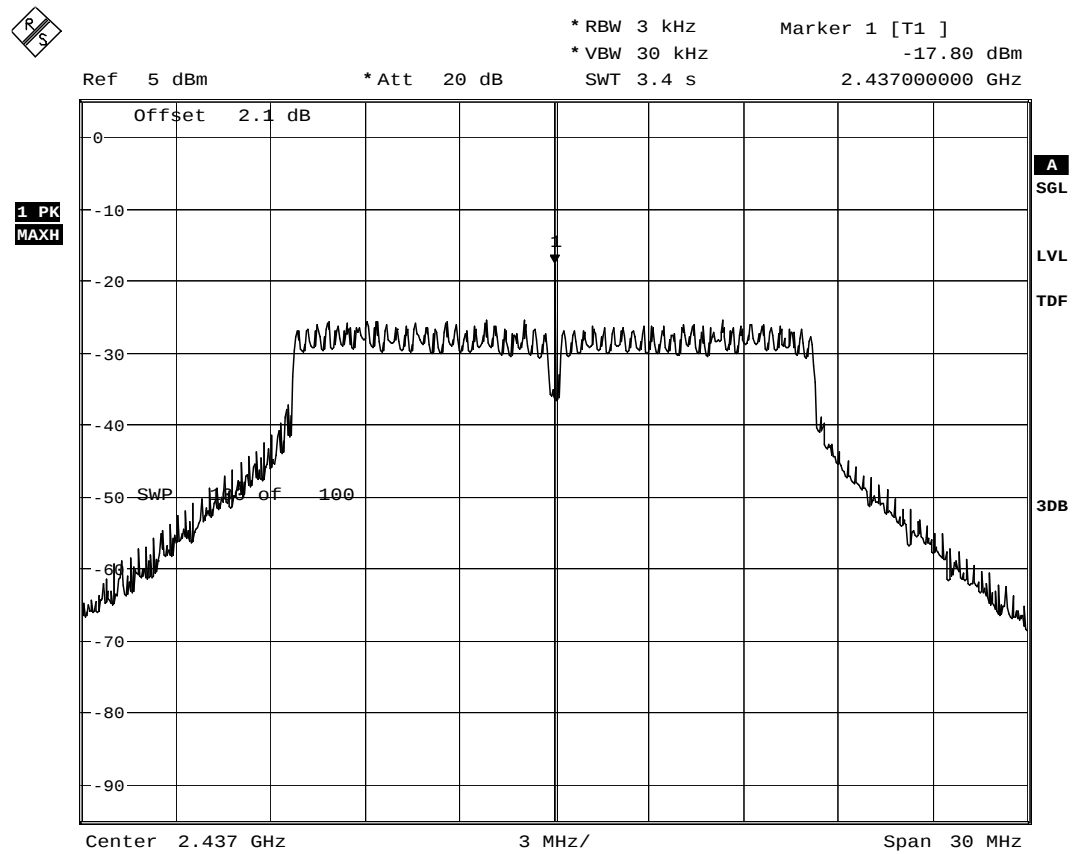
CH M: 2437 MHz;

Date: 12.FEB.2010 10:24:55



Op. Mode

op-mode 2g

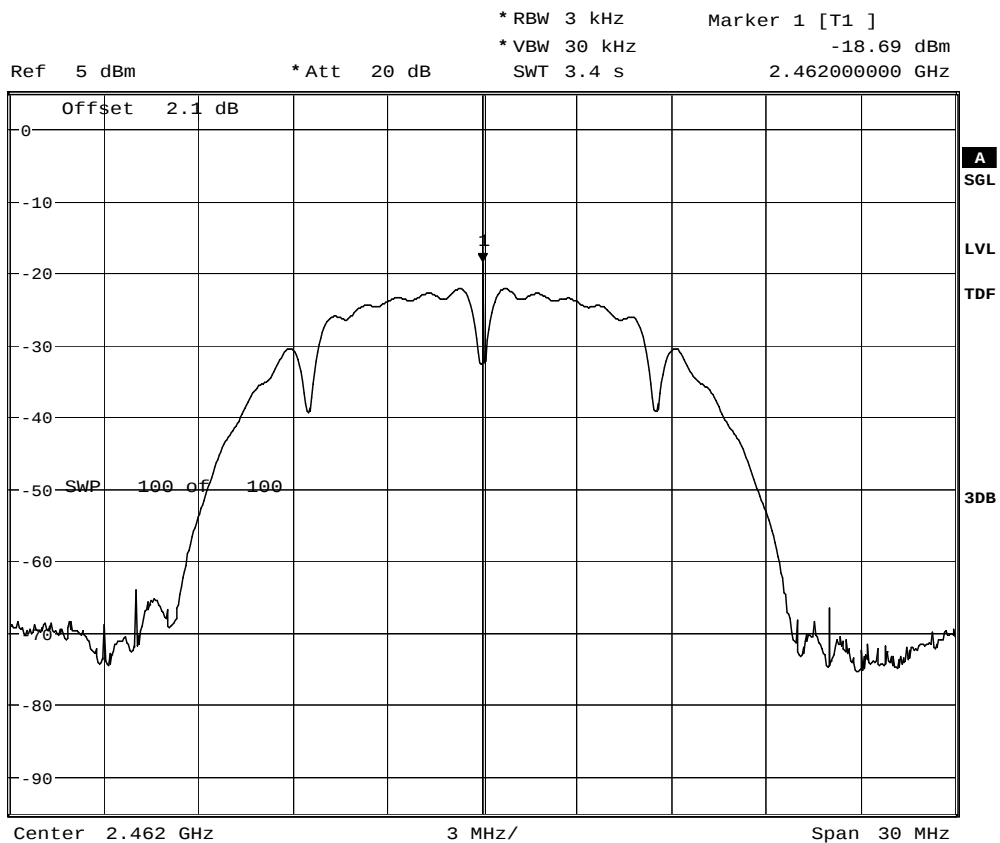


CH M: 2437 MHz;

Date: 12.FEB.2010 10:01:04

Op. Mode

op-mode 3b

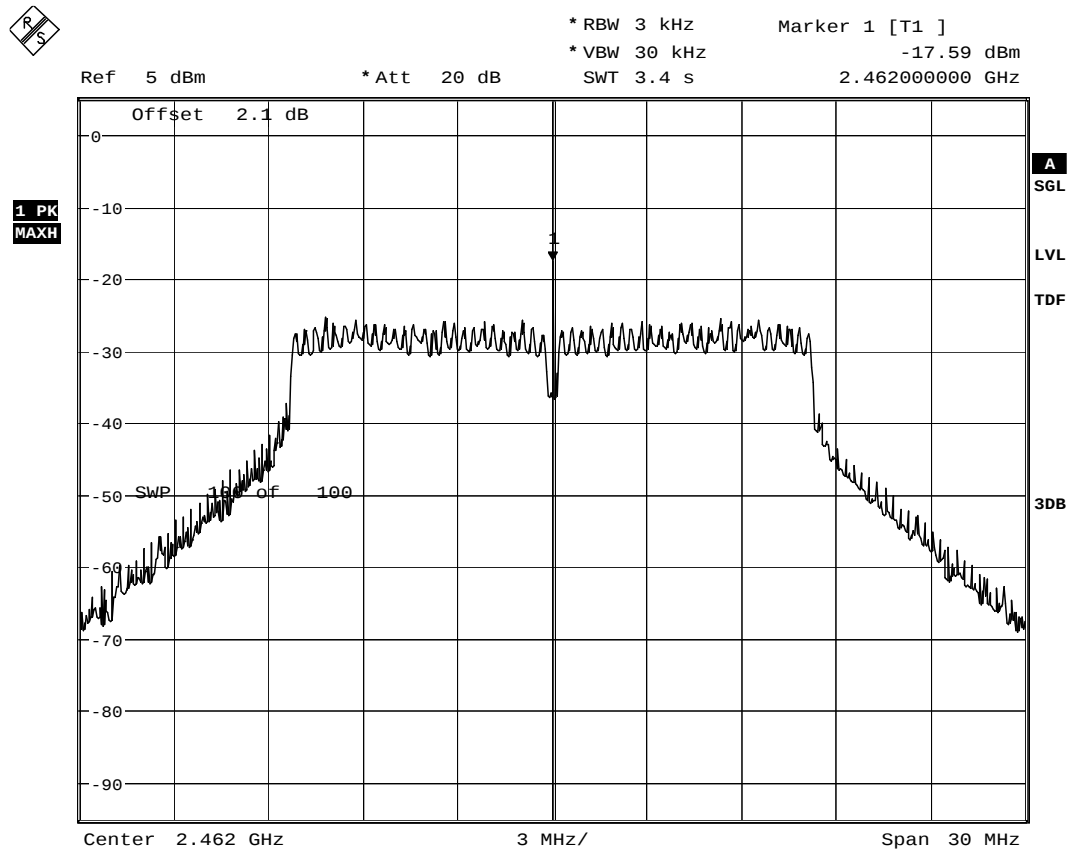


CH T: 2462 MHz;

Date: 12.FEB.2010 10:38:17

Op. Mode

op-mode 3g



CH T: 2462 MHz;

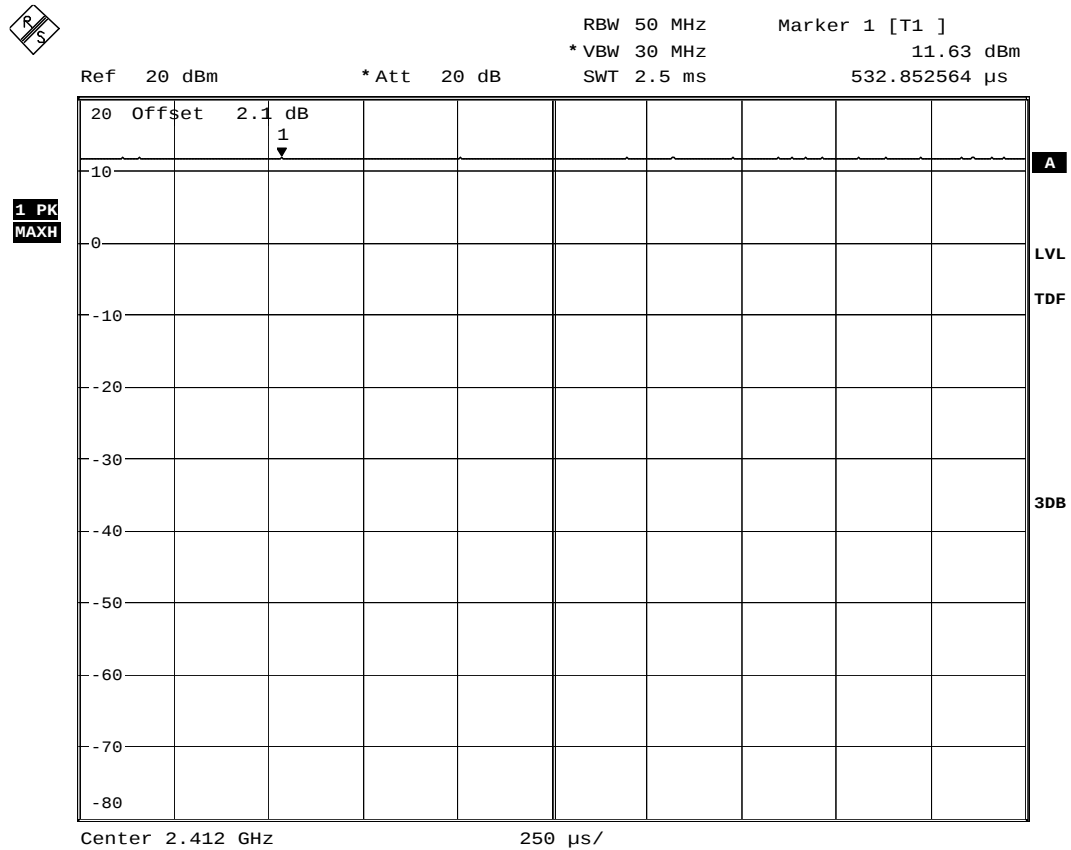
Date: 12.FEB.2010 09:53:52



7.4 Peak power output

Op. Mode

op-mode 1b

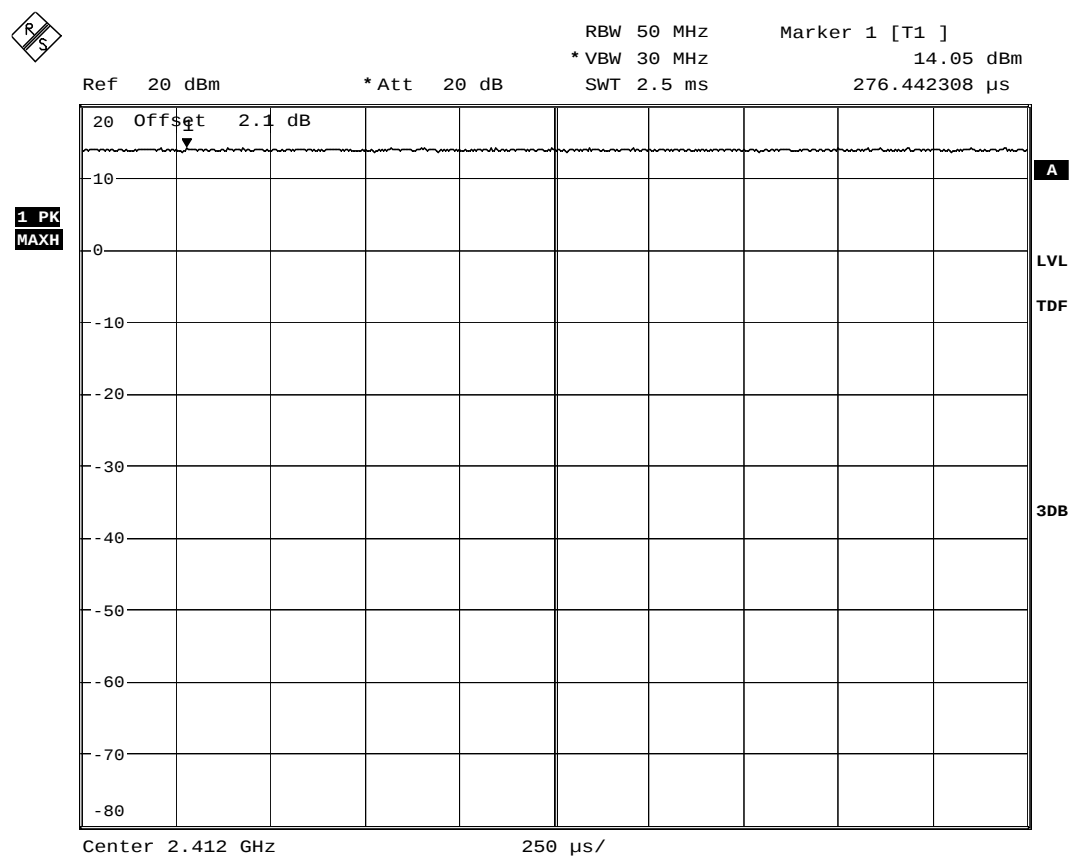


Date: 12.FEB.2010 09:43:10



Op. Mode

op-mode 1g

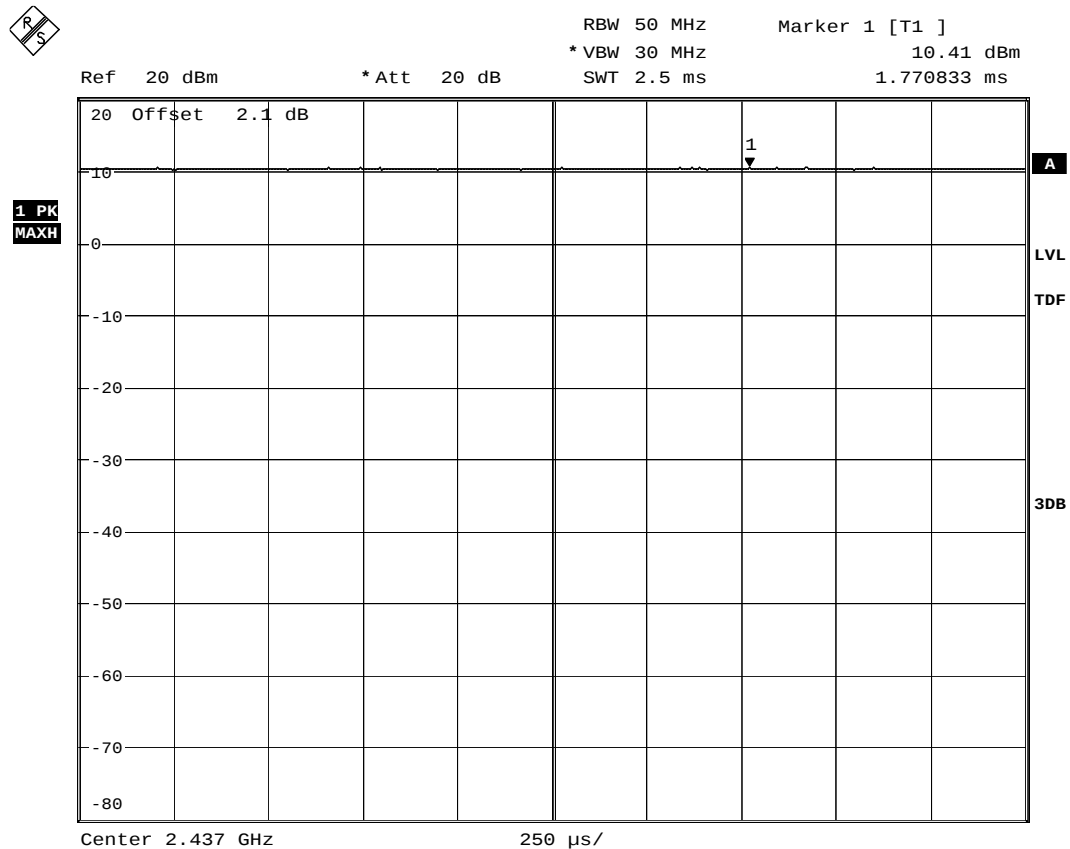


Date: 12.FEB.2010 09:43:35



Op. Mode

op-mode 2b

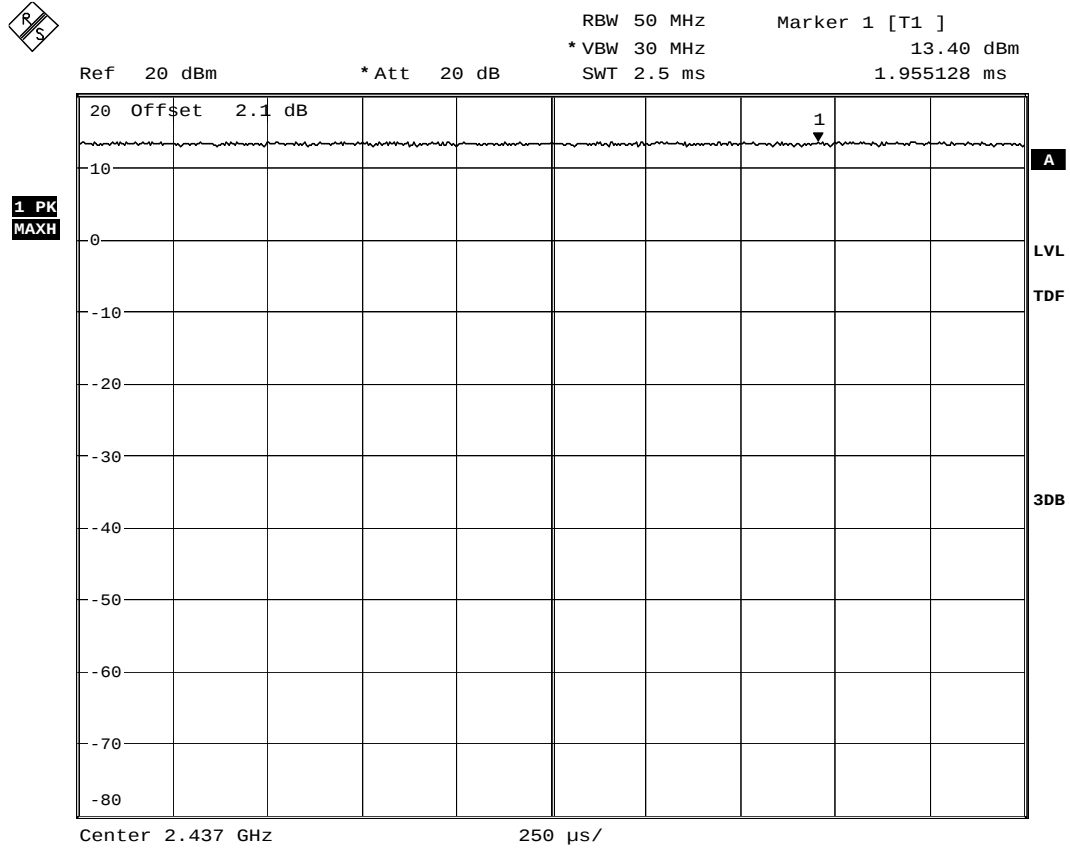


Date: 12.FEB.2010 09:44:08



Op. Mode

op-mode 2g

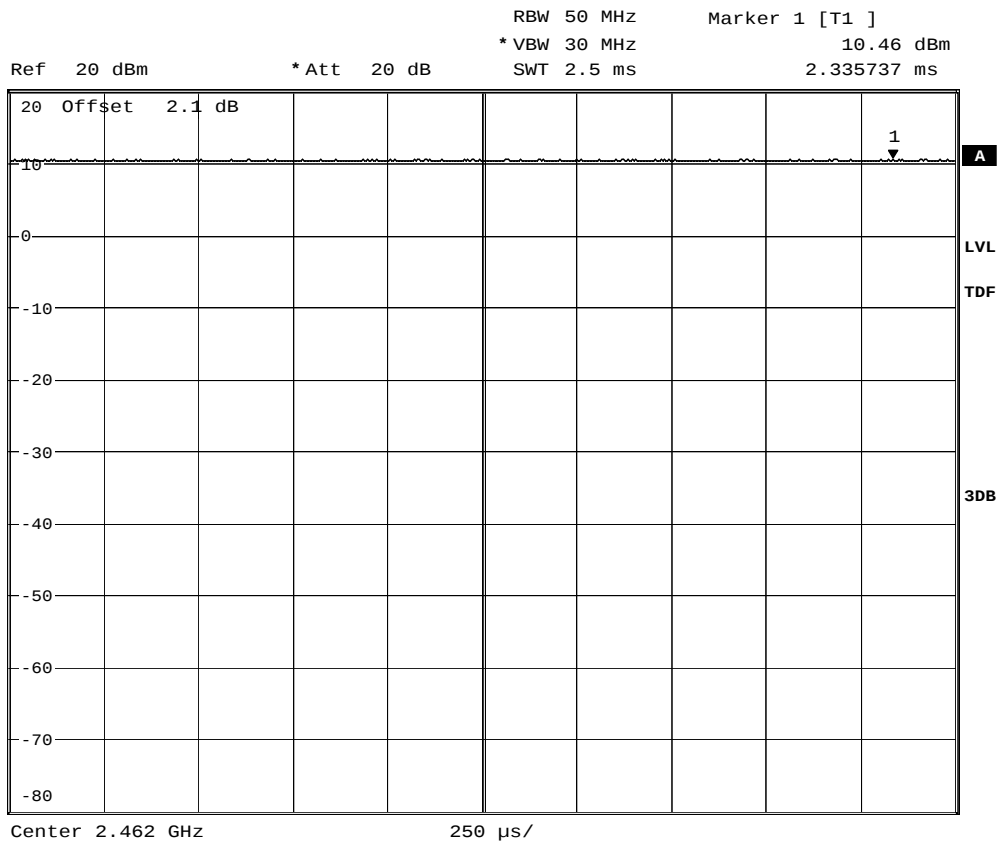


Date: 12.FEB.2010 09:44:36



Op. Mode

op-mode 3b

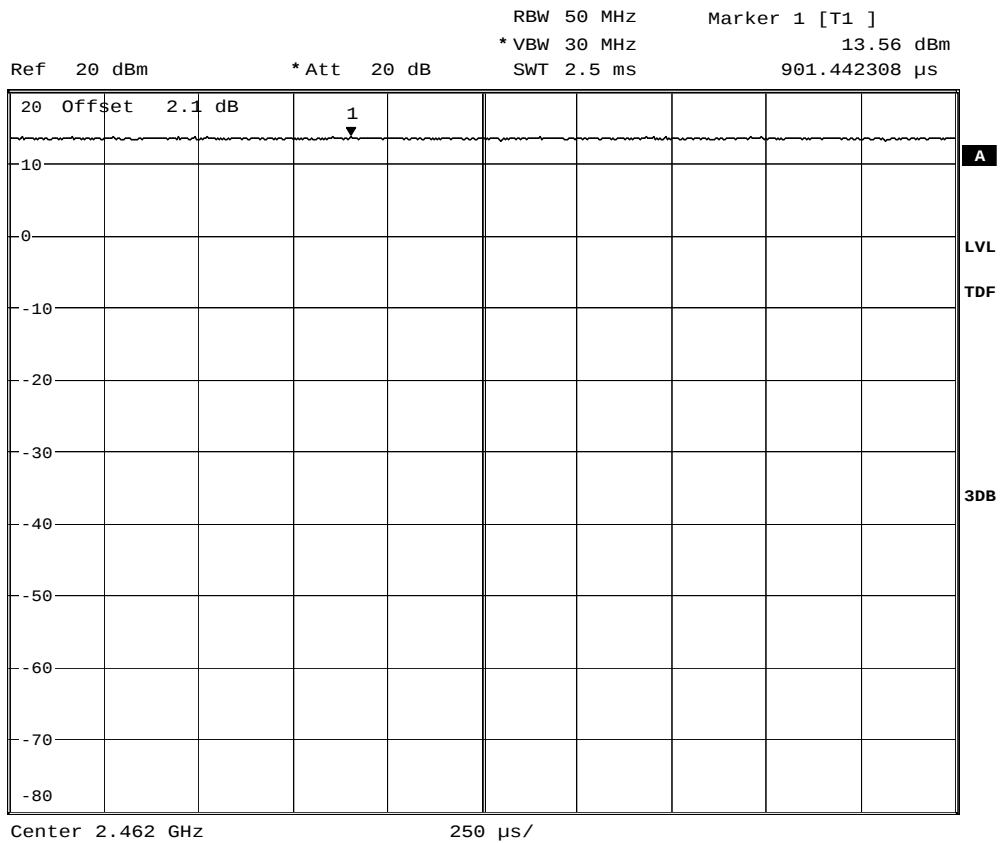


45:15



Op. Mode

op-mode 3g



Date: 12.FEB.2010 09:46:06