



InterLab[®]

FCC Measurement/Technical Report on GI0643

Report Reference: MDE_OPTI_1101_FCCg

Test Laboratory:

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Germany
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40880 Ratingen



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 test 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 (10-1-10 Edition) and 15 (10-1-10 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

2009

OP-Mode	Setup	Port	Final Result
op-mode 4	Setup_b01	AC Port (power line)	passed

FCC Part 15, Subpart C

§ 15.247 (a) (1)

Occupied bandwidth

The measurement was performed according to FCC § 15.31

10-1-10 Edition

OP-Mode	Setup	Port	Final Result
op-mode 1b	Setup_a01	Per.ant.connector	passed
op-mode 1g	Setup_a01	Per.ant.connector	passed
op-mode 1n	Setup_a01	Per.ant.connector	passed
op-mode 2b	Setup_a01	Per.ant.connector	passed
op-mode 2g	Setup_a01	Per.ant.connector	passed
op-mode 2n	Setup_a01	Per.ant.connector	passed
op-mode 3b	Setup_a01	Per.ant.connector	passed
op-mode 3g	Setup_a01	Per.ant.connector	passed
op-mode 3n	Setup_a01	Per.ant.connector	passed

FCC Part 15, Subpart C

§ 15.247 (b) (1)

Peak power output

The measurement was performed according to FCC § 15.31

10-1-10 Edition

OP-Mode	Setup	Port	Final Result
op-mode 1b	Setup_a01	Per.ant.connector	passed
op-mode 1g	Setup_a01	Per.ant.connector	passed
op-mode 1n	Setup_a01	Per.ant.connector	passed
op-mode 2b	Setup_a01	Per.ant.connector	passed
op-mode 2g	Setup_a01	Per.ant.connector	passed
op-mode 2n	Setup_a01	Per.ant.connector	passed
op-mode 3b	Setup_a01	Per.ant.connector	passed
op-mode 3g	Setup_a01	Per.ant.connector	passed
op-mode 3n	Setup_a01	Per.ant.connector	passed

FCC Part 15, Subpart C

§ 15.247 (d)

Spurious RF conducted emissions

The measurement was performed according to FCC § 15.31

10-1-10 Edition

OP-Mode	Setup	Port	Final Result
op-mode 1b	Setup_a01	Per.ant.connector	passed
op-mode 1g	Setup_a01	Per.ant.connector	passed
op-mode 1n	Setup_a01	Per.ant.connector	passed
op-mode 2b	Setup_a01	Per.ant.connector	passed
op-mode 2g	Setup_a01	Per.ant.connector	passed
op-mode 2n	Setup_a01	Per.ant.connector	passed
op-mode 3b	Setup_a01	Per.ant.connector	passed
op-mode 3g	Setup_a01	Per.ant.connector	passed
op-mode 3n	Setup_a01	Per.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

2009

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
op-mode 1g	Setup_a01	Enclosure	passed
op-mode 2g	Setup_a01	Enclosure	passed
op-mode 3g	Setup_a01	Enclosure	passed
op-mode 1n	Setup_a01	Enclosure	passed
op-mode 2n	Setup_a01	Enclosure	passed
op-mode 3n	Setup_a01	Enclosure	passed

FCC Part 15, Subpart C
§ 15.247 (d)

Band edge compliance

The measurement was performed according to FCC § 15.31 / ANSI C63.4

10-1-10 Edition / 2009

OP-Mode	Setup	Port	Final Result
op-mode 1b	Setup_a01	Per.ant.connector	passed
op-mode 1g	Setup_a01	Per.ant.connector	passed
op-mode 1n	Setup_a01	Per.ant.connector	passed
op-mode 3b	Setup_a01	Per.ant.connector	passed
op-mode 3g	Setup_a01	Per.ant.connector	passed
op-mode 3n	Setup_a01	Per.ant.connector	passed
op-mode 3b	Setup_a01	Enclosure	passed
op-mode 3g	Setup_a01	Enclosure	passed
op-mode 3v	Setup_a01	Enclosure	passed

FCC Part 15, Subpart C
§ 15.247 (e)

Power density

The measurement was performed according to FCC § 15.31

10-1-10

OP-Mode	Setup	Port	Final Result
op-mode 1b	Setup_a01	Per.ant.connector	passed
op-mode 1g	Setup_a01	Per.ant.connector	passed
op-mode 1n	Setup_a01	Per.ant.connector	passed
op-mode 2b	Setup_a01	Per.ant.connector	passed
op-mode 2g	Setup_a01	Per.ant.connector	passed
op-mode 2n	Setup_a01	Per.ant.connector	passed
op-mode 3b	Setup_a01	Per.ant.connector	passed
op-mode 3g	Setup_a01	Per.ant.connector	passed
op-mode 3n	Setup_a01	Per.ant.connector	passed

This report replaces the test report reference number 4_OPTI_1101_FCCd

Responsible for
Accreditation Scope:

B. Roth

Responsible
for Test Report:

Madula

1 Administrative Data

1.1 Testing Laboratory

Company Name: 7Layers 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:
Laboratory accreditation no.: DAkkS D-PL-12140-01-01

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

Report Template Version: 2011-08-15

1.2 Project Data

Responsible for testing and report: Dipl.-Ing. Robert Machulec

Date of Test(s): 2011-08-08 to 2011-11-14
Date of Report: 2011-11-15

1.3 Applicant Data

Company Name: Option nv

Address: Gaston Geenslaan 14
B-3001 Leuven
Belgium

Contact Person: Mr. Jan Willems

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:	GI0643
Kind of Device:	USB Dongle
(optional)	
Voltage Type:	DC
Voltage level:	5.0 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 IEE802.11b, IEE802.11g and IEE802.11n

Specific product description for the EUT:

The Option model GI0643 is a Wireless Broadband USB modem with integrated WLAN features. The USB modem supports quad band GSM/(E)GPRS in the 850, 900, 1800 and 1900 MHz frequency bands and triple band UMTS/HSDPA/HSUPA in the 900, 1900 and 2100 frequency bands. In addition, the device supports HSDPA category 10, HSUPA category 6, antenna receiver diversity (band I and II) and equalizer. The GI0643 is an (E)GPRS class 12 terminal supporting circuit switched (CS) and packet switched (PS) data. The modem contains a USB swivel connector. The GI0643 has 2 main operating modes: the first mode is to act as a client, the second mode is to act as a WLAN hotspot.

The EUT provides the following ports:

Ports

Enclosure
DC power and data Port (USB)
Permanent antenna connector

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: 37490a01)	WLAN transceiver	GI0643	YM29B2B53W	2.0.2.0	2.1.1.0x	2011-06-20
Remark: EUT A is equipped with an integral antenna (gain= 0 dBi) and a permanent antenna connector.						
EUT B (Code: 37490b01)	WLAN transceiver	GI0643	YM29B2B548	2.0.2.0	2.1.1.0x	2011-06-20
Remark: EUT A is equipped with an integral antenna (gain= 0 dBi) and a permanent 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
AE 1	Laptop	Toshiba PA3378E-3AC3	-	Microsoft Windows 2000 Prof.	10441164G PCN0357	-
AE 2	AC/DC USB travel adapter	Medion MD 83053	-	-	MSN: 5003 7805	-

2.4 Auxiliary Equipment

For the purposes of this test report, auxiliary equipment is defined as equipment which is used temporarily to enable operational and control features especially used for the tests of the EUT which is not used during normal operation or equipment that is used during the tests in combination with the EUT but is not subject of this test report. It is necessary to configure the system in a typical fashion, as a customer would normally use it. But nevertheless Auxiliary Equipment can influence the test results.

Short Description	Equipment under Test	Type Designation	Serial no.	HW Status	SW Status	FCC ID
AUX1	Wi-Fi router	GlobeSurfre X-1	WF1Z97J0B W	-	-	-
AUX2	Laptop IBM	lenovo R60 9461-54G	L3-AA471 06/10	-	WinXP Prof. Ger.	-
AUX3	AC/DC Adapter (for laptop)	lenovo 90W 20V 92P1103	11S92P1103 Z1ZBEF716 1JH	-	-	-

2.5 EUT Setups

This chapter describes the combination of EUTs and equipment used for testing. The rationale for selecting the EUTs, ancillary and auxiliary equipment and interconnecting cables, is to test a representative configuration meeting the requirements of the referenced standards.

Setup No.	Combination of EUTs	Description and Rationale
Setup_a01	EUT A + AE 1 + AUX1 + AUX2 + AUX3	setup for conducted and radiated measurements (AUX1, AUX2 and AUX3 are used to enable the test mode)
Setup_b01	EUT A + AE 2	setup for conducted emissions at AC mains (AE2 is a exemplary used AC/USB power adapter)

2.6 Operating Modes

This chapter describes the operating modes of the EUT's used for testing.

Op. Mode	Description of Operating Modes	Remarks
op-mode 1b	TX-mode, the EUT transmits on the lowest channel (2412 MHz)	Worst case data rate 1 Mbps for conducted measurement
op-mode 1g	TX-mode, the EUT transmits on the lowest channel (2412 MHz)	Worst case data rate 6 Mbps for conducted measurement
op-mode 1n	TX-mode, the EUT transmits on the lowest channel (2412 MHz)	Worst case data rate 72 Mbps for conducted measurement
op-mode 2b	TX-mode, the EUT transmits on the mid channel (2437 MHz)	Worst case data rate 1 Mbps for conducted measurement
op-mode 2g	TX-mode, the EUT transmits on the mid channel (2437 MHz)	Worst case data rate 6 Mbps for conducted measurement
op-mode 2n	TX-mode, the EUT transmits on the mid channel (2437 MHz)	Worst case data rate 72 Mbps for conducted measurement
op-mode 3b	TX-mode, the EUT transmits on the highest channel (2462 MHz)	Worst case data rate 1 Mbps for conducted measurement
op-mode 3g	TX-mode, the EUT transmits on the highest channel (2462 MHz)	Worst case data rate 6 Mbps for conducted measurement
op-mode 3n	TX-mode, the EUT transmits on the highest channel (2462 MHz)	Worst case data rate 72 Mbps for conducted measurement
op-mode 4	EUT connected to AC via AC/DC USB adapter	GSM850 TCH 190, WLAN hot-spot function active

The EUT is over the air connected to a Wi-Fi router. The router can be configured in the needed operating mode by the IBM laptop. It is possible to connect the EUT to the router, with help of software in the Toshiba laptop.

2.7 Product labelling

2.7.1 FCC ID label

Please refer to the documentation of the applicant.

2.7.2 Location of the label on the EUT

Please refer to the documentation of the applicant.

3 Test Results

3.1 Conducted emissions (AC power line)

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

The test was performed according to: ANSI C 63.4, 2009

3.1.1 Test Description

The test set-up was made in accordance to the general provisions of ANSI C63.4–2009. The Equipment Under Test (EUT) was setup in a shielded room to perform the conducted emissions measurements in a typical installation configuration. The EUT was powered from 50μH || 50 Ohm Line Impedance Stabilization Network (LISN) which meets the requirements of ANSI C63.4–2009, Annex B, in the frequency range of the measurements. The LISN's unused connections were terminated with 50 Ohm loads. The measurement procedure consists of two steps. It is implemented into the EMI test software ES-K1 from R&S.

Step 1: Preliminary scan

Intention of this step is, to determine the conducted EMI-profile of the EUT.

EMI receiver settings:

- Detector: Peak - Maxhold
- Frequency range: 150 kHz – 30 MHz
- Frequency steps: 5 kHz
- IF-Bandwidth: 9 kHz
- Measuring time / Frequency step: 20 ms
- Measurement on phase + neutral lines of the power cords

On basis of this preliminary scan the highest amplitudes and the corresponding frequencies relative to the limit are identified. Emissions above the limit and emissions which are in the 10 dB range below the limit are considered.

Step 2: Final measurement

Intention of this step is, to determine the highest emissions with the settings defined in the test specification for the frequencies identified in step 1.

EMI receiver settings:

- Detector: Quasi-Peak
- IF - Bandwidth: 9 kHz
- Measuring time: 1 s / frequency

At each frequency determined in step 1, four measurements are performed in the following combinations:

- 1) Neutral lead - reference ground (PE grounded)
- 2) Phase lead - reference ground (PE grounded)
- 3) Neutral lead - reference ground (PE floating)
- 4) Phase lead - reference ground (PE floating)

The highest value is reported.

3.1.2 Test Requirements / Limits

FCC Part 15, Subpart C, §15.207

Frequency Range (MHz)	QP Limit (dBμV)	AV Limit (dBμV)
0.15 – 0.5	66 to 56	56 to 46
0.5 – 5	56	46
5 – 30	60	50

Used conversion factor: Limit (dBμV) = 20 log (Limit (μV)/1μV).

3.1.3 Test Protocol

Temperature: 26 °C
 Air Pressure: 1003 hPa
 Humidity: 42 %

Op. Mode		Setup	Port				
op-mode 4		Setup_b01	Enclosure				
Power line	Frequency MHz	Measured value QP dBµV	Measured value AV dBµV	QP Limit dBµV	AV Limit dBµV	Delta to QP limit dB	Delta to AV limit dB
N	–	–	–	–	–	–	–
L	–	–	–	–	–	–	–

Remark: No final measurement was performed because no frequencies (peaks) were found within the offset for acceptance analysis during the preliminary scan. Please see annex for the measurement plot.

3.1.4 Test result: Conducted emissions (AC power line)

FCC Part 15, Subpart C		Op. Mode	Result
		op-mode 4	passed



3.2 Occupied bandwidth

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

The test was performed according to: FCC §15.31

3.2.1 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

3.2.2 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.

3.2.3 Test Protocol

Temperature: 26 °C
Air Pressure: 1024 hPa
Humidity: 48 %

Op. Mode	Setup	Port
op-mode 1b	Setup_a01	Per.ant.connector
6 dB bandwidth MHz	Remarks	
10.104	-	

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 1g	Setup_a01	Per.ant.connector
6 dB bandwidth MHz	Remarks	
16.476	-	

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 1n	Setup_a01	Per.ant.connector
6 dB bandwidth MHz	Remarks	
17.676	-	

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 2b	Setup_a01	Per.ant.connector
6 dB bandwidth MHz	Remarks	
10.104	-	

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 2g	Setup_a01	Per.ant.connector
6 dB bandwidth MHz	Remarks	
16.476	-	

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 2n	Setup_a01	Per.ant.connector
6 dB bandwidth MHz	Remarks	
17.736	-	

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 3b	Setup_a01	Per.ant.connector
6 dB bandwidth MHz	Remarks	
10.104	-	

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 3g	Setup_a01	Per.ant.connector
6 dB bandwidth MHz	Remarks	
16.476	-	

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 3n	Setup_a01	Per.ant.connector
6 dB bandwidth MHz	Remarks	
17.736	-	

Remark: Please see annex for the measurement plot.

3.2.4 Test result: Occupied bandwidth

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



3.3 Peak power output

Standard FCC Part 15, 10-1-10 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 output power measurements. The results recorded were measured with the modulation which produces the worst-case (highest) output power. The reference level of the spectrum analyzer was set higher than the output power of the EUT. The EUT was connected to the spectrum analyzer via a short coax cable with a known loss.

3.3.2 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: $\text{Limit (dBm)} = 10 \log (\text{Limit (W)}/1\text{mW})$

=> Maximum Output Power: 30 dBm

3.3.3 Test Protocol

Temperature: 26 °C
Air Pressure: 1024 hPa
Humidity: 48 %

Op. Mode	Setup	Port
op-mode 1b	Setup_a01	Per.ant.connector
Output power Peak dBm	Output power RMS dBm	Remarks
16.37	13.26	The results are given as EIRP including antenna gain (0 dBi)

Remark: -

Op. Mode	Setup	Port
op-mode 1g	Setup_a01	Per.ant.connector
Output power Peak dBm	Output power RMS dBm	Remarks
20.69	12.05	The results are given as EIRP including antenna gain (0 dBi)

Remark: -

Op. Mode	Setup	Port
op-mode 1n	Setup_a01	Per.ant.connector
Output power Peak dBm	Output power RMS dBm	Remarks
21.5	12.08	The results are given as EIRP including antenna gain (0 dBi)

Remark: -

Op. Mode	Setup	Port
op-mode 2b	Setup_a01	Per.ant.connector
Output power Peak dBm	Output power RMS dBm	Remarks
15.87	12.99	The results are given as EIRP including antenna gain (0 dBi)

Remark: -

Op. Mode	Setup	Port
op-mode 2g	Setup_a01	Per.ant.connector
Output power Peak dBm	Output power RMS dBm	Remarks
20.7	12.21	The results are given as EIRP including antenna gain (0 dBi)

Remark: -

Op. Mode	Setup	Port
op-mode 2n	Setup_a01	Per.ant.connector
Output power Peak dBm	Output power RMS dBm	Remarks
20.64	12.12	The results are given as EIRP including antenna gain (0 dBi)

Remark: -

Op. Mode	Setup	Port
op-mode 3b	Setup_a01	Per.ant.connector
Output power Peak dBm	Output power RMS dBm	Remarks
15.29	12.22	The results are given as EIRP including antenna gain (0 dBi)

Remark: -

Op. Mode	Setup	Port
op-mode 3g	Setup_a01	Per.ant.connector
Output power Peak dBm	Output power RMS dBm	Remarks
19.88	11.67	The results are given as EIRP including antenna gain (0 dBi)

Remark: -

Op. Mode	Setup	Port
op-mode 3n	Setup_a01	Per.ant.connector
Output power Peak dBm	Output power RMS dBm	Remarks
20.15	11.75	The results are given as EIRP including antenna gain (0 dBi)

Remark: -

3.3.4 Test result: Peak power output

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

3.4 Spurious RF conducted emissions

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

The test was performed according to: FCC §15.31

3.4.1 Test Description

The Equipment Under Test (EUT) was set up 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

The reference value for the measurement of the spurious RF conducted emissions is determined during the test “band edge compliance” (cf. chapter **Error! Reference source not found.**). This value is used to calculate the 20 dBc limit.

3.4.2 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.

3.4.3 Test Protocol

Temperature: 26 °C
Air Pressure: 1024 hPa
Humidity: 48 %

Op. Mode	Setup	Port		
op-mode 1b	Setup_a01	Per.ant.connector		
Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta to limit dB
		0.51	-19.49	

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_a01	Per.ant.connector		
Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta to limit dB
		-3.42	-23.42	

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 1n	Setup_a01	Per.ant.connector		
Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta to limit dB
		-2.32	-22.32	

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_a01	Per.ant.connector		
Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta to limit dB
		0.70	-19.30	

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_a01	Per.ant.connector		
Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta to limit dB
		-3.61	-23.61	

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 2n	Setup_a01	Per.ant.connector		
Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta to limit dB
		-2.56	-22.56	

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_a01	Per.ant.connector		
Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta to limit dB
		0.33	-19.67	

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_a01	Per.ant.connector		
Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta to limit dB
		-4.58	-24.58	

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 3n	Setup_a01	Per.ant.connector		
Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta to limit dB
		-2.52	-22.52	

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

3.4.4 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

3.5 Spurious radiated emissions

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

The test was performed according to: ANSI C 63.4, 2009

3.5.1 Test Description

The test set-up was made in accordance to the general provisions of ANSI C63.4–2009. 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 influence of the EUT support table that is used between 30–1000 MHz was evaluated.

The test was performed at the distance of 3 m between the EUT and the receiving antenna. The measurement procedure is implemented into the EMI test software ES-K1 from R&S. The radiated emissions measurements were made in a typical installation configuration. Exploratory tests are performed at 3 orthogonal axes to determine the worst-case orientation of a body-worn or handheld EUT. The final test on all kind of EUTs is performed at 2 axes. A pre-check is also performed while the EUT is powered from both AC and DC (battery) power in order to find the worst-case operating condition.

1. Measurement up to 30 MHz

The test set-up was made in accordance to the general provisions of ANSI C 63.4-2009. 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 μ s
- 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 $\pm 22.5^\circ$ 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 $+ 22.5^\circ$ around the determined value
- Height variation range: -0.25m to $+ 0.25$ m 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 1 GHz

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
- IF Bandwidth = 1 MHz

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.

3.5.2 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 in MHz	Limit (μV/m)	Measurement distance (m)	Limit(dBμV/m @10m)
0.009 – 0.49	2400/F(kHz)	300	Limit (dBμV/m)+30dB
0.49 – 1.705	24000/F(kHz)	30	Limit (dBμV/m)+10dB
1.705 - 30	30	30	Limit (dBμV/m)+10dB

Frequency in MHz	Limit (μV/m)	Measurement distance (m)	Limit (dBμV/m)
30 - 88	100	3	40.0
88 - 216	150	3	43.5
216 - 960	200	3	46.0
above 960	500	3	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: $\text{Limit (dB}\mu\text{V/m)} = 20 \log (\text{Limit } (\mu\text{V/m})/1\mu\text{V/m})$

3.5.3 Test Protocol

Temperature: 25 °C
Air Pressure: 1013 hPa
Humidity: 41 %

3.5.3.1 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 / 99.2 kHz is an emission from the loop antenna's power supply.

3.5.3.2 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
Ver + Hor	1192	-	46.27	35.85	-	74	54	27.73	18.15
Ver + Hor	1325	-	45.71	36.83	-	74	54	28.29	17.17
Ver + Hor	1500	-	46.43	36.93	-	74	54	27.57	17.07
Ver + Hor	1590	-	46.17	36.55	-	74	54	27.83	17.45
Ver + Hor	7500	-	42.35	34.85	-	74	54	31.65	19.15

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
Ver + Hor	1192	-	45.88	36.19	-	74	54	28.12	17.81
Ver + Hor	1457	-	45.51	36.29	-	74	54	28.49	17.71
Ver + Hor	1500	-	45.89	36.93	-	74	54	28.11	17.07
Ver + Hor	7500	-	41.82	34.54	-	74	54	32.18	19.46

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
Ver + Hor	1330	-	47.47	36.08	-	74	54	26.53	17.92
Ver + Hor	1500	-	46.67	37.26	-	74	54	27.33	16.74
Ver + Hor	2385	-	49.78	39.77	-	74	54	24.22	14.23
Ver + Hor	2484	-	61.05	37.57	-	74	54	12.95	16.43
Ver + Hor	4500	-	39.76	34.37	-	74	54	34.24	19.63
Ver + Hor	7500	-	42.35	34.85	-	74	54	31.65	19.15

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

Op. Mode		Setup			Port				
op-mode 1g		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
Ver + Hor	1325	-	45.45	35.93	-	74	54	28.55	18.07
Ver + Hor	1500	-	45.89	37.00	-	74	54	28.11	17.00
Ver + Hor	4500	-	39.25	34.14	-	74	54	34.75	19.86
Ver + Hor	7500	-	42.06	34.35	-	74	54	31.94	19.65

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

Op. Mode		Setup			Port				
op-mode 2g		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
Ver + Hor	1193	-	45.21	34.27	-	74	54	28.79	19.73
Ver + Hor	1325	-	45.71	36.56	-	74	54	28.29	17.44
Ver + Hor	1500	-	46.54	37.13	-	74	54	27.46	16.87
Ver + Hor	4500	-	39.25	34.07	-	74	54	34.75	19.93
Ver + Hor	7500	-	41.82	34.42	-	74	54	32.18	19.58

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

Op. Mode		Setup			Port				
op-mode 3g		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
Ver + Hor	1500	-	46.54	37.00	-	74	54	27.46	17.00
Ver + Hor	4500	-	38.87	34.17	-	74	54	35.13	19.83
Ver + Hor	7500	-	41.68	34.42	-	74	54	32.32	19.58

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

Op. Mode		Setup			Port				
op-mode 1n		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
Ver + Hor	1500	-	45.76	36.65	-	74	54	28.24	17.35

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

Op. Mode		Setup			Port				
op-mode 2n		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
Ver + Hor	1193	-	45.12	34.75	-	74	54	28.88	19.25
Ver + Hor	1500	-	45.10	36.65	-	74	54	28.90	17.35
Ver + Hor	1590	-	45.23	35.12	-	74	54	28.77	18.88

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

Op. Mode		Setup			Port				
op-mode 3n		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
Ver + Hor	1500	-	45.23	36.58	-	74	54	28.77	17.42

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

3.5.4 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
		op-mode 1g	passed
		op-mode 2g	passed
		op-mode 3g	passed
		op-mode 1n	passed
		op-mode 2n	passed
		op-mode 3n	passed

3.6 Band edge compliance

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

The test was performed according to: ANSI C 63.4, 2009 FCC §15.31

3.6.1 Test Description

The measurement was performed using two procedures to show the compliance at the lowest and highest band edges of the used ISM bands.

1. To show the compliance at the lowest and highest band edges of the used ISM bands by a conducted measurement.

The Equipment Under Test (EUT) was placed in a shielded room and is set to transmit on the lowest channel (The lower band edge is 2400 MHz) and highest channel (The higher band edge is 2483.5 MHz).

Analyzer settings for conducted measurement:

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

2. To show compliance at the highest band edge of the used ISM band by a radiated measurement.

The Equipment Under Test (EUT) was placed inside FAC (fully anechoic chamber) to perform the measurements. The radiated emissions measurements were performed in a typical installation configuration. The measurement was carried out with a spectrum analyser, cable and horn antenna in a distance of 1 m using peak and average detector. The EUT is set to transmit on the highest channel (The higher band edge is 2483.5 MHz).

EMI receiver settings for radiated measurement:

- Detector: Peak, Average
- IF Bandwidth = 1 MHz

3.6.2 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)”.

3.6.3 Test Protocol

3.6.3.1 Lower band edge

Conducted measurement

Temperature: 26 °C
Air Pressure: 1024 hPa
Humidity: 48 %

Op. Mode	Setup	Port		
op-mode 1b	Setup_a01	Per.ant.connector		
Frequency MHz	Measured value dBm	Reference value dBm	Limit dBm	Delta to limit dB
2400.00	-42.08	0.51	-19.49	22.59

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port		
op-mode 1g	Setup_a01	Per.ant.connector		
Frequency MHz	Measured value dBm	Reference value dBm	Limit dBm	Delta to limit dB
2400.00	-38.15	-3.42	-23.42	14.73

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port		
op-mode 1n	Setup_a01	Per.ant.connector		
Frequency MHz	Measured value dBm	Reference value dBm	Limit dBm	Delta to limit dB
2400.00	-38.18	-2.32	-22.32	15.86

Remark: Please see annex for the measurement plot.

3.6.3.2 Higher band edge

Conducted measurement

Op. Mode	Setup	Port		
op-mode 3b	Setup_a01	Per.ant.connector		
Frequency MHz	Measured value dBm	Reference value dBm	Limit dBm	Delta to limit dB
2483.50	-43.68	0.33	-19.67	24.01

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port		
op-mode 3g	Setup_a01	Per.ant.connector		
Frequency MHz	Measured value dBm	Reference value dBm	Limit dBm	Delta to limit dB
2483.50	-45.26	-4.58	-24.58	20.68

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port		
op-mode 3n	Setup_a01	Per.ant.connector		
Frequency MHz	Measured value dBm	Reference value dBm	Limit dBm	Delta to limit dB
2483.50	-42.21	-2.52	-22.52	19.69

Remark: Please see annex for the measurement plot.

Radiated measurement

Temperature: 25 °C
Air Pressure: 1013 hPa
Humidity: 41 %

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	61.05	37.57	74.00	54.00	12.95	16.43

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	49.58	37.89	74.00	54.00	24.42	16.11

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port					
op-mode 3n	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	47.50	35.90	74.00	54.00	26.50	18.10

Remark: Please see annex for the measurement plot.

3.6.4 Test result: Band edge compliance

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



3.7 Power density

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

The test was performed according to: FCC §15.31

3.7.1 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

3.7.2 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.

3.7.3 Test Protocol

Temperature: 26 °C
Air Pressure: 1024 hPa
Humidity: 48 %

Op. Mode	Setup	Port
op-mode 1b	Setup_a01	Per.ant.connector
Power density dBm / 3 kHz	Remarks	
-12.03	-	

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 1g	Setup_a01	Per.ant.connector
Power density dBm / 3 kHz	Remarks	
-18.20	-	

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 1n	Setup_a01	Per.ant.connector
Power density dBm / 3 kHz	Remarks	
-16.63	-	

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 2b	Setup_a01	Per.ant.connector
Power density dBm / 3 kHz	Remarks	
-12.12	-	

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 2g	Setup_a01	Per.ant.connector
Power density dBm / 3 kHz	Remarks	
-17.05	-	

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 2n	Setup_a01	Per.ant.connector
Power density dBm / 3 kHz	Remarks	
-15.55	-	

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 3b	Setup_a01	Per.ant.connector
Power density dBm / 3 kHz	Remarks	
-13.38	-	

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 3g	Setup_a01	Per.ant.connector
Power density dBm / 3 kHz	Remarks	
-18.89	-	

Remark: Please see annex for the measurement plot.

Op. Mode	Setup	Port
op-mode 3n	Setup_a01	Per.ant.connector
Power density dBm / 3 kHz	Remarks	
-16.54	-	

Remark: Please see annex for the measurement plot.

3.7.4 Test result: Power density

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

4 Test Equipment

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

Test Equipment Anechoic Chamber

Lab ID:	Lab 2
Manufacturer:	Frankonia
Description:	Anechoic Chamber for radiated testing
Type:	10.58x6.38x6 m ³

Single Devices for Anechoic Chamber

Single Device Name	Type	Serial Number	Manufacturer	
Air compressor	none	-	Atlas Copco	
Anechoic Chamber	10.58 x 6.38 x 6.00 m ³	none	Frankonia	
	Calibration Details		Last Execution	Next Exec.
	FCC listing 96716 3m Part15/18		2011/01/11	2014/01/10
	IC listing 3699A-1 3m		2011/02/07	2014/02/06
Controller Maturo	MCU	961208	Maturo 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 Conducted emissions

Lab ID:	Lab 1
Manufacturer:	Rohde & Schwarz GmbH & Co.KG
Description:	EMI Conducted Auxiliary Equipment

Single Devices for Auxiliary Equipment for Conducted emissions

Single Device Name	Type	Serial Number	Manufacturer	
Cable "LISN to ESI"	RG214	W18.03+W48.03	Huber&Suhner	
	Calibration Details		Last Execution	Next Exec.
	Path Calibration		2010/11/06	2011/11/05
Two-Line V-Network	ESH 3-Z5	828304/029	Rohde & Schwarz GmbH & Co. KG	
Two-Line V-Network	ESH 3-Z5	829996/002	Rohde & Schwarz GmbH & Co. KG	
	Calibration Details		Last Execution	Next Exec.
	DKD calibration		2008/10/13	2011/10/12
	DKD calibration		2011/01/20	2013/01/19

Test Equipment Auxiliary Equipment for Radiated emissions

Lab ID: Lab 2
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	620/37	HD GmbH		
Biconical dipole	VUBA 9117	9117-108	Schwarzbeck	<i>Last Execution</i>	<i>Next Exec.</i>
	Standard Calibration			2008/10/27	2013/10/26
Broadband Amplifier 18MHz-26GHz	JS4-18002600-32-5P	849785	Miteq	<i>Last Execution</i>	<i>Next Exec.</i>
	Path Calibration			2011/05/11	2011/11/10
Broadband Amplifier 1GHz-4GHz	AFS4-01000400-1Q-10P-4	-	Miteq	<i>Last Execution</i>	<i>Next Exec.</i>
	Path Calibration			2011/05/11	2011/11/10
Broadband Amplifier 30MHz-18GHz	JS4-00101800-35-5P	896037	Miteq	<i>Last Execution</i>	<i>Next Exec.</i>
	Path Calibration			2011/05/11	2011/11/10
Cable "ESI to EMI Antenna"	EcoFlex10	W18.01-2+W38.01-2	Kabel Kusch	<i>Last Execution</i>	<i>Next Exec.</i>
	Path Calibration			2011/05/11	2011/11/10
Cable "ESI to Horn Antenna"	UFB311A+UFB293C	W18.02-2+W38.02-2	Rosenberger Micro-Coax	<i>Last Execution</i>	<i>Next Exec.</i>
	Path Calibration			2011/05/11	2011/11/10
Double-ridged horn	HF 906	357357/001	Rohde & Schwarz GmbH & Co. KG	<i>Last Execution</i>	<i>Next Exec.</i>
	Standard Calibration			2009/04/16	2012/04/15
Double-ridged horn	HF 906	357357/002	Rohde & Schwarz GmbH & Co. KG	<i>Last Execution</i>	<i>Next Exec.</i>
	Standard Calibration			2009/04/28	2012/04/27
High Pass Filter	4HC1600/12750-1.5-KK	9942011	Trilithic	<i>Last Execution</i>	<i>Next Exec.</i>
	Path Calibration			2011/05/11	2011/11/10
High Pass Filter	5HC2700/12750-1.5-KK	9942012	Trilithic	<i>Last Execution</i>	<i>Next Exec.</i>
	Path Calibration			2011/05/11	2011/11/10
High Pass Filter	5HC3500/12750-1.2-KK	200035008	Trilithic	<i>Last Execution</i>	<i>Next Exec.</i>
	Path Calibration			2011/05/11	2011/11/10
High Pass Filter	WHKX 7.0/18G-8SS	09	Wainwright	<i>Last Execution</i>	<i>Next Exec.</i>
	Path Calibration			2011/05/11	2011/11/10
Log.-per. Antenna	HL 562 Ultralog	830547/003	Rohde & Schwarz GmbH & Co. KG		

Single Devices for Auxiliary Equipment for Radiated emissions (continued)

Single Device Name	Type	Serial Number	Manufacturer	Last Execution	Next Exec.
Loop Antenna	Calibration Details				
	Standard Calibration			2009/05/27	2012/05/26
	HFH2-Z2	829324/006	Rohde & Schwarz GmbH & Co. KG		
Network Analyzer	Calibration Details				
	DKD calibration			2008/10/07	2011/10/06
	E5071B	MY42200813	Agilent		
Pyramidal Horn Antenna 26,5 GHz	Calibration Details				
	Standard Calibration			2010/11/09	2011/11/09
	3160-09	00083069	EMCO Elektronik GmbH		
Pyramidal Horn Antenna 40 GHz	3160-10	00086675	EMCO Elektronik GmbH		
Tilt device Maturo (Rohacell)	Antrieb TD1.5-10kg	TD1.5-10kg/024/3790709	Maturo GmbH		

Test Equipment Auxiliary Test Equipment

Lab ID:	Lab 2
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	Last Execution	Next Exec.
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 03 (Multimeter)	Fluke 177	86670383	Fluke Europe B.V.		
	Calibration Details				
	Standard calibration			2009/10/07	2011/10/06
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		
Vector Signal Generator	SMIQ 03B	832492/061	Rohde & Schwarz GmbH & Co.KG		

Test Equipment Digital Signalling Devices

Lab ID: Lab 1, Lab 2

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
Universal Radio Communication Tester	CMU 200	102366	Rohde & Schwarz GmbH & Co. KG	
	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	
	SW: K62, K69		2008/11/03	

Test Equipment Emission measurement devices

Lab ID: Lab 1, Lab 2
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
Power Sensor	NRV-Z1	836219/005	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		Last Execution Next Exec.
	Standard Calibration		2009/10/20 2011/10/19
Powermeter	NRVS	836333/064	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		Last Execution Next Exec.
	Standard calibration		2009/10/15 2011/10/14
Signal Generator	SMR 20	846834/008	Rohde & Schwarz GmbH & Co. KG
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 3
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 2011/10/06

Test Equipment Shielded Room 02

Lab ID: Lab 1
Manufacturer: Frankonia
Description: Shielded Room for conducted testing
Type: 12 qm
Serial Number: none

Test Equipment Shielded Room 07

Lab ID: Lab 3
Description: Shielded Room 4m x 6m

Test Equipment T/H Logger 04

Lab ID: Lab 3
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

Test Equipment Temperature Chamber 01

Lab ID: Lab 3
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		2010/03/16	2012/03/15

Test Equipment WLAN RF Test Solution

Lab ID: Lab 3
Manufacturer: 7 layers AG
Description: Regulatory WLAN RF Tests
Type: WLAN RF
Serial Number: 001

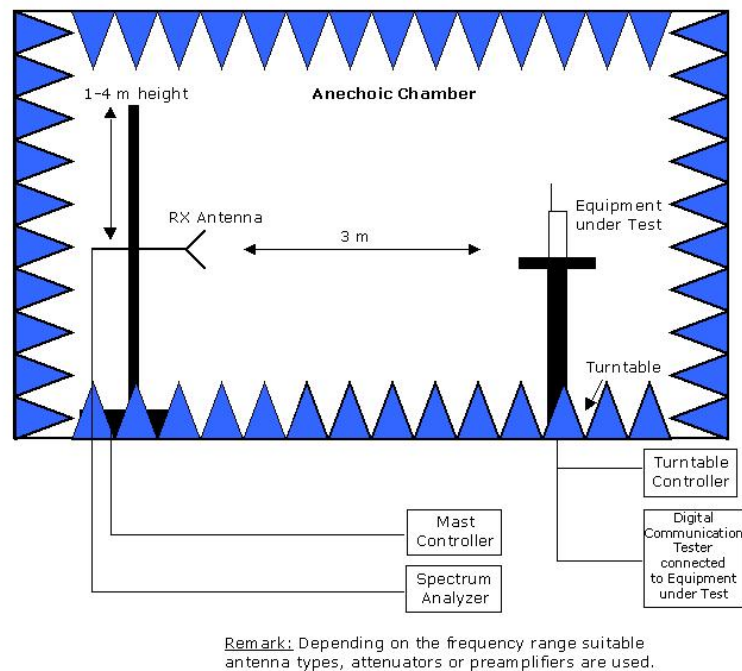
Single Devices for WLAN RF Test Solution

Single Device Name	Type	Serial Number	Manufacturer	
Arbitrary Waveform Generator	TGA12101	284482		
Power Meter NRVD	NRVD	832025/059	Last Execution	Next Exec.
	Calibration Details			
	Standard Calibration		2011/06/14	2012/06/13
Power Sensor NRV Z1 A	PROBE	832279/013		
	Calibration Details		Last Execution	Next Exec.
	Standard Calibration		2011/06/14	2012/06/13
Power Supply	NGSM 32/10	2725		
	Calibration Details		Last Execution	Next Exec.
	Standard Calibration		2011/06/15	2012/06/14
Rubidium Frequency Normal MFS	Datum MFS	002	Datum GmbH	
	Calibration Details		Last Execution	Next Exec.
	Standard Calibration		2011/08/17	2012/08/16
Signal Analyser FSIQ26	1119.6001.26	832695/007	Rohde & Schwarz GmbH & Co.KG	
Spectrum Analyser	FSU26	100136	Rohde & Schwarz GmbH & Co.KG	
	Calibration Details		Last Execution	Next Exec.
	Standard calibration		2011/05/11	2012/05/10
	HW/SW Status		Date of Start	Date of End
	FSU FW Update to v4.31 SP1, K5 v4.31 and K73 v4.31		2010/02/17	
TOCT Switching Unit	Switching Unit	030106	7 layers, Inc.	
Vector Signal Generator SMIQ03B	SMIQ03B	832870/017		
	Calibration Details		Last Execution	Next Exec.
	Standard Calibration		2010/06/23	2013/06/20

5 Photo Report

Photos are included in an external report.

6 Setup Drawings



Drawing 1: Setup in the Anechoic chamber:
 Measurements below 1 GHz: Semi-anechoic, conducting ground plane.
 Measurements above 1 GHz: Fully-anechoic, absorbers on all surfaces

7 FCC and IC Correlation of measurement requirements

The following tables show the correlation of measurement requirements for WLAN equipment and Digital Apparatus from FCC and IC standards.

WLAN equipment

Measurement	FCC reference	IC reference
Conducted emissions on AC mains	§ 15.207	RSS-Gen: 7.2.4
Occupied bandwidth	§ 15.247 (a) (1)	RSS-210: A8.1
Peak power output	§ 15.247 (b) (1)	RSS-210: A8.4
Spurious RF conducted emissions	§ 15.247 (d)	RSS-Gen: 6; RSS-210: A8.5
Spurious radiated emissions	§ 15.247 (d)	RSS-Gen: 6; RSS-210: A8.5
Band edge compliance	§ 15.247 (d)	RSS-210: A8.5
Power density	§ 15.247 (e)	RSS-210: A8.2 (b)
Antenna requirement	§ 15.203 / 15.204	RSS-Gen: 7.1.2

Digital Apparatus

Measurement	FCC reference	IC reference
Conducted Emissions (AC Power Line)	§15.107	ICES-003
Spurious Radiated Emissions	§15.109	ICES-003

8 Annex measurement plots

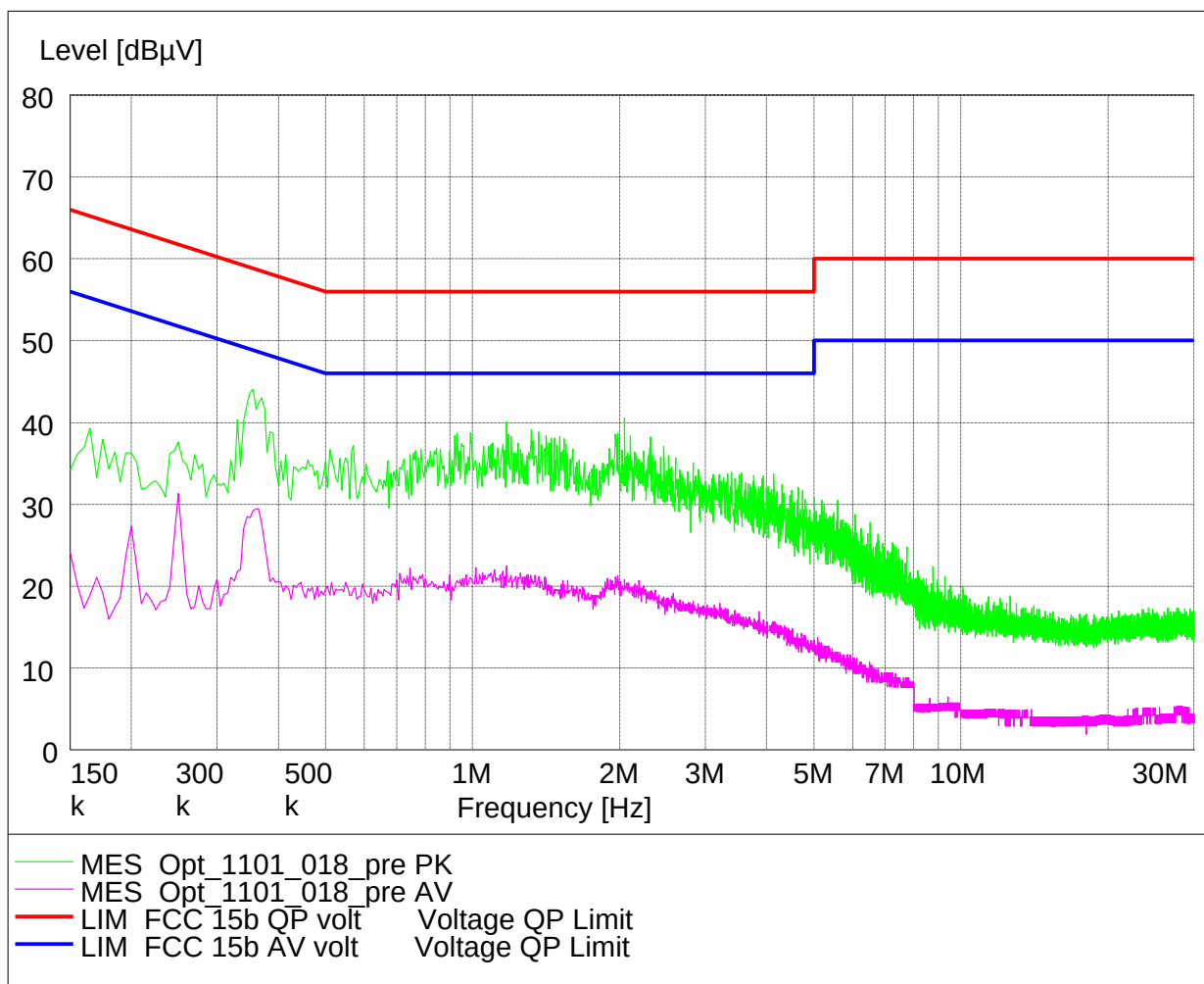
8.1 AC Mains conducted

Op. Mode

op-mode 4

Short Description: FCC Voltage

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	5.0 kHz	MaxPeak Average	20.0 ms	9 kHz	ESH3-Z5

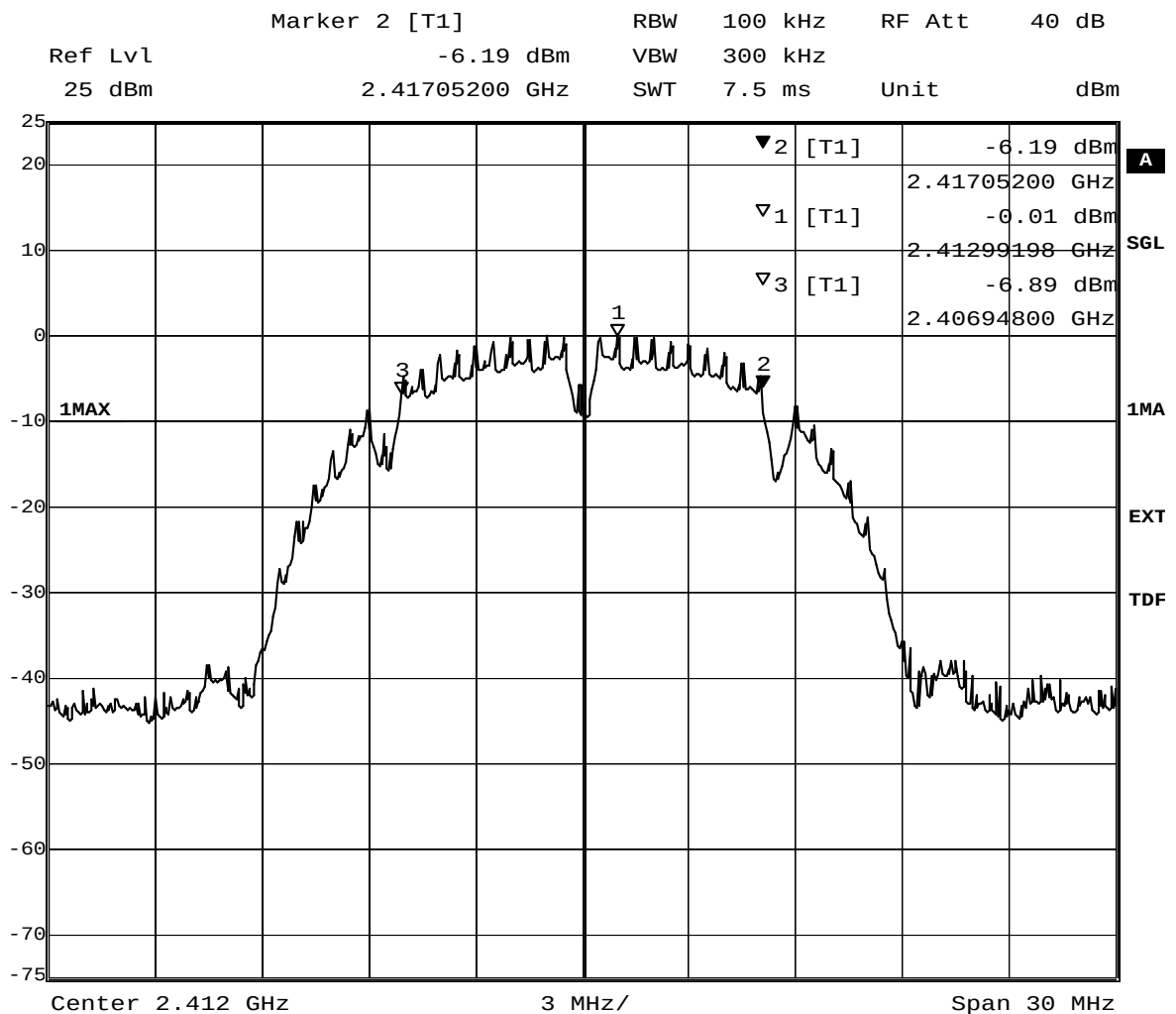


8.2 Occupied bandwidth

8.2.1 Occupied bandwidth operating mode 1

Op. Mode

op-mode 1b



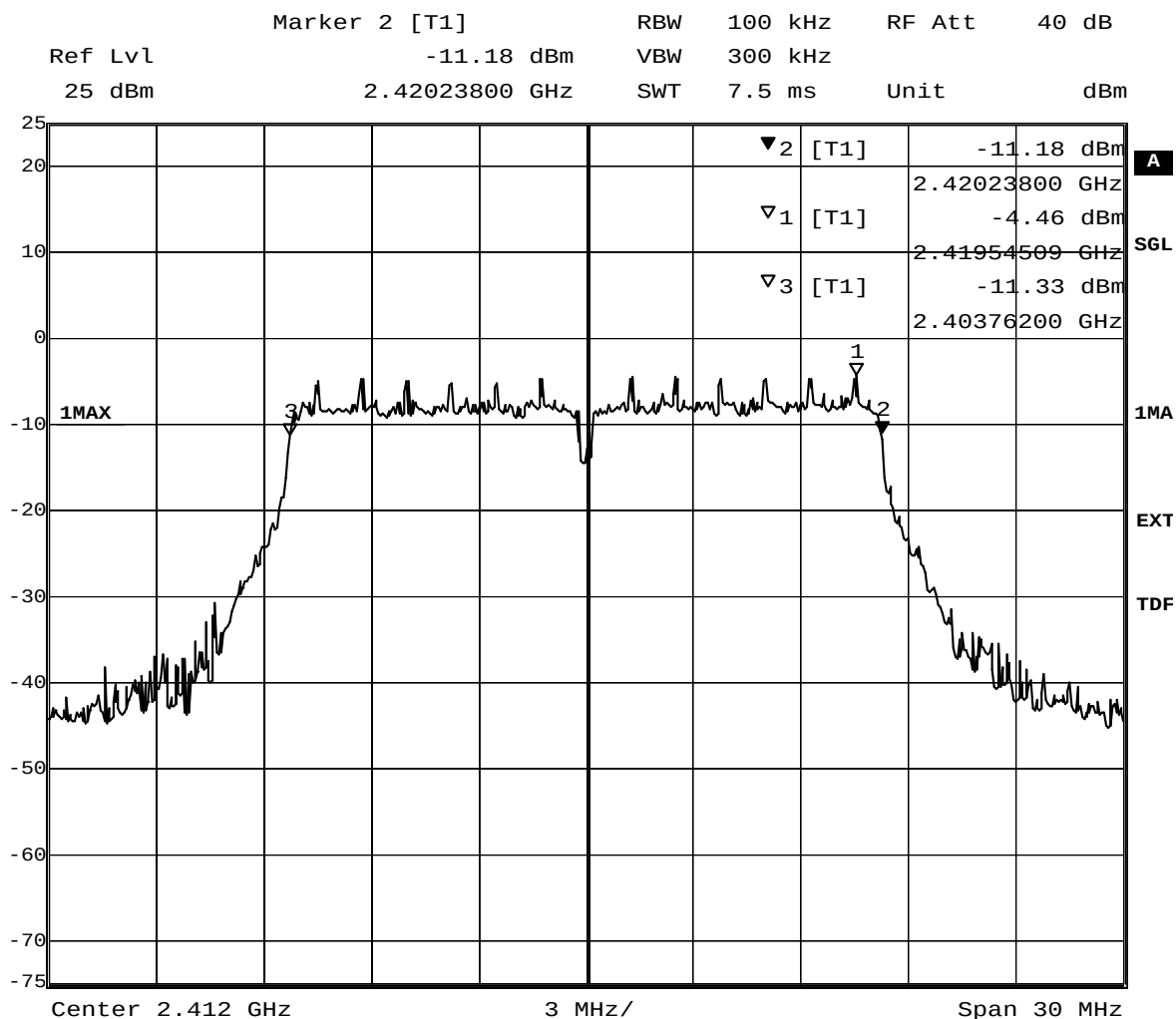
Title: 6dB Bandwidth

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

Date: 29.SEP.2011 17:01:03

Op. Mode

op-mode 1g



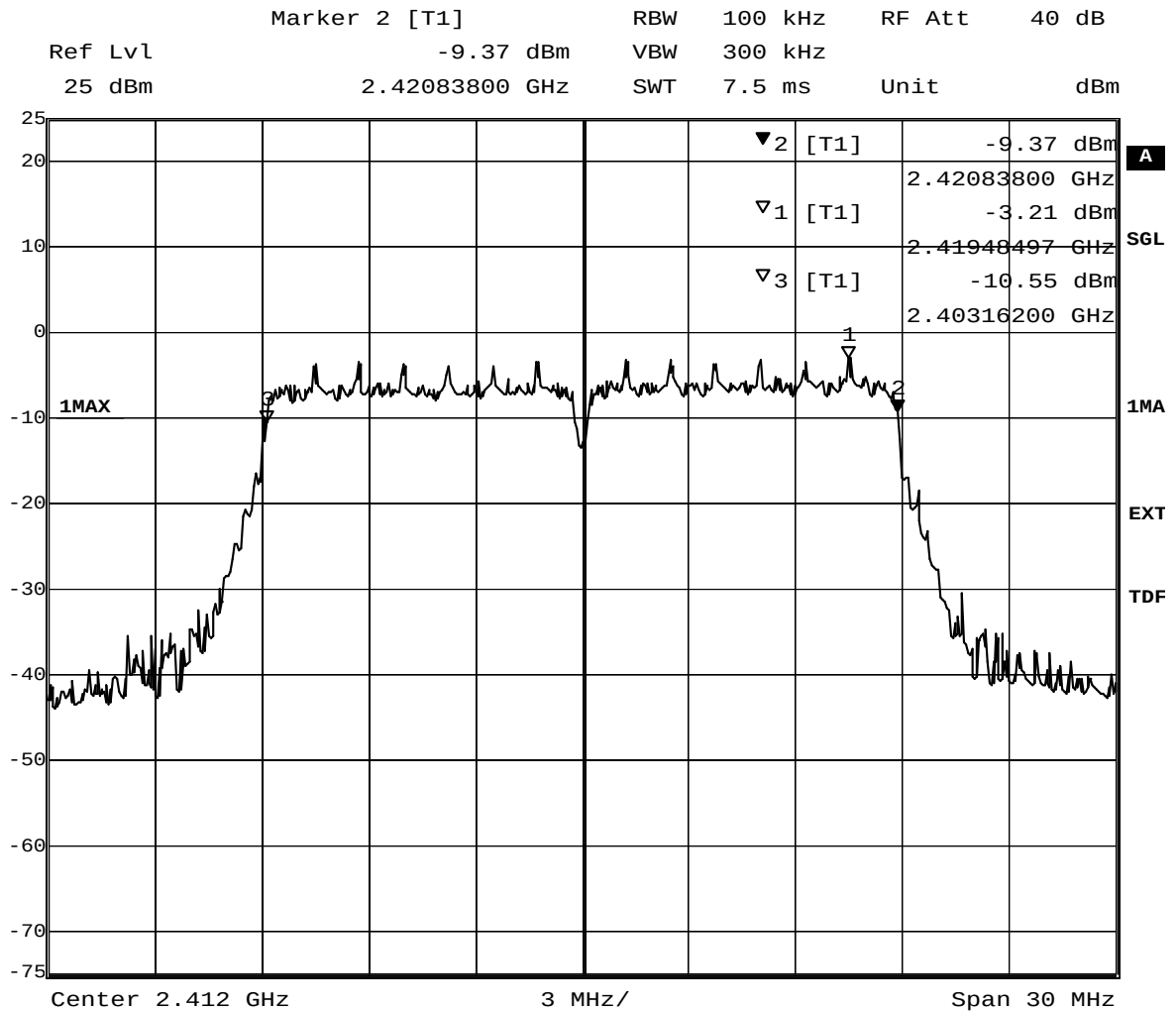
Title: 6dB Bandwidth

Comment A: CH B: 2412 MHz; 6dB bandwidth (kHz):16476

Date: 29.SEP.2011 14:03:32

Op. Mode

op-mode 1n



Title: 6dB Bandwidth

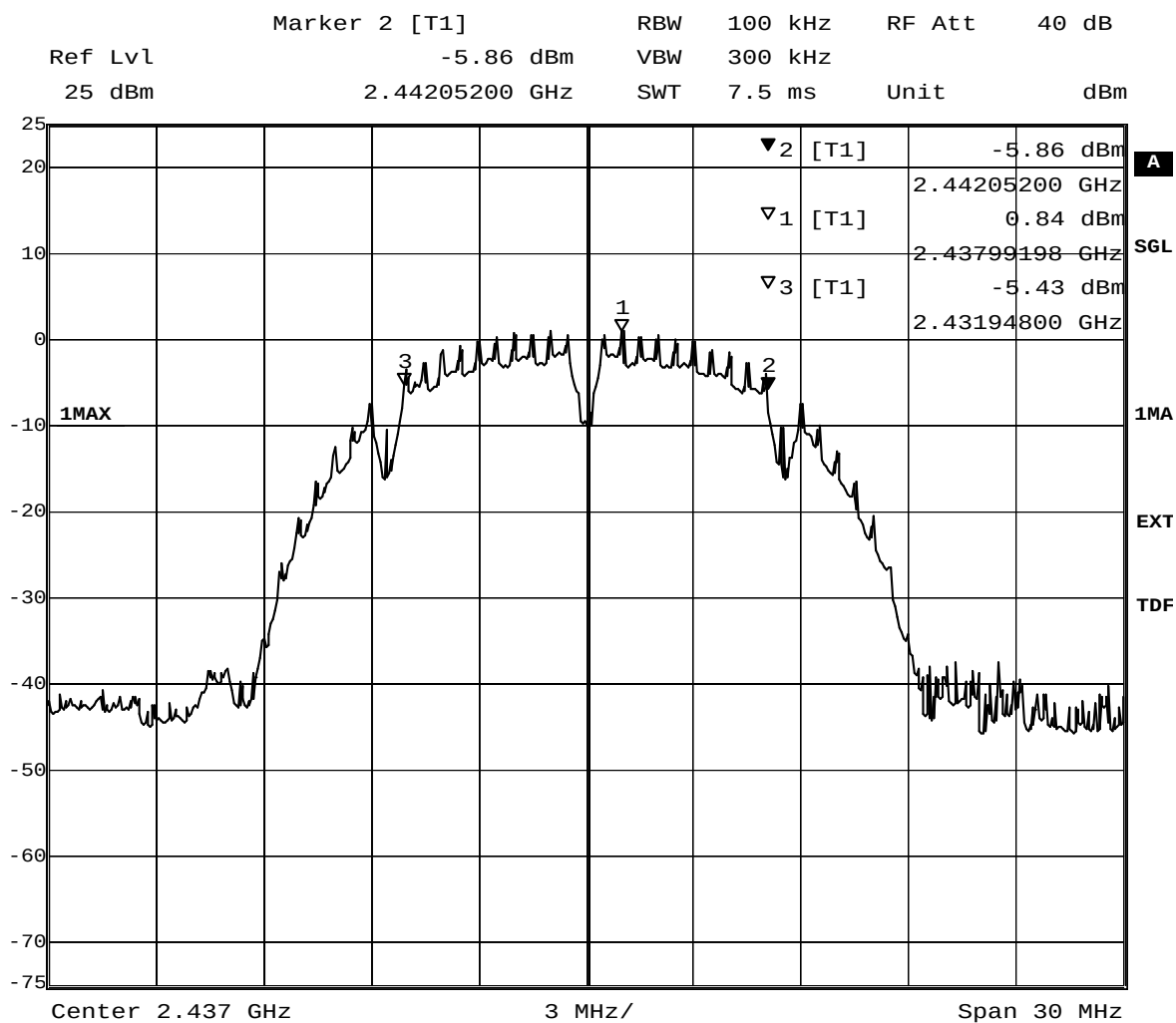
Comment A: CH B: 2412 MHz; 6dB bandwidth (kHz):17676

Date: 29.SEP.2011 13:23:55

8.2.2 Occupied bandwidth operating mode 2

Op. Mode

op-mode 2b



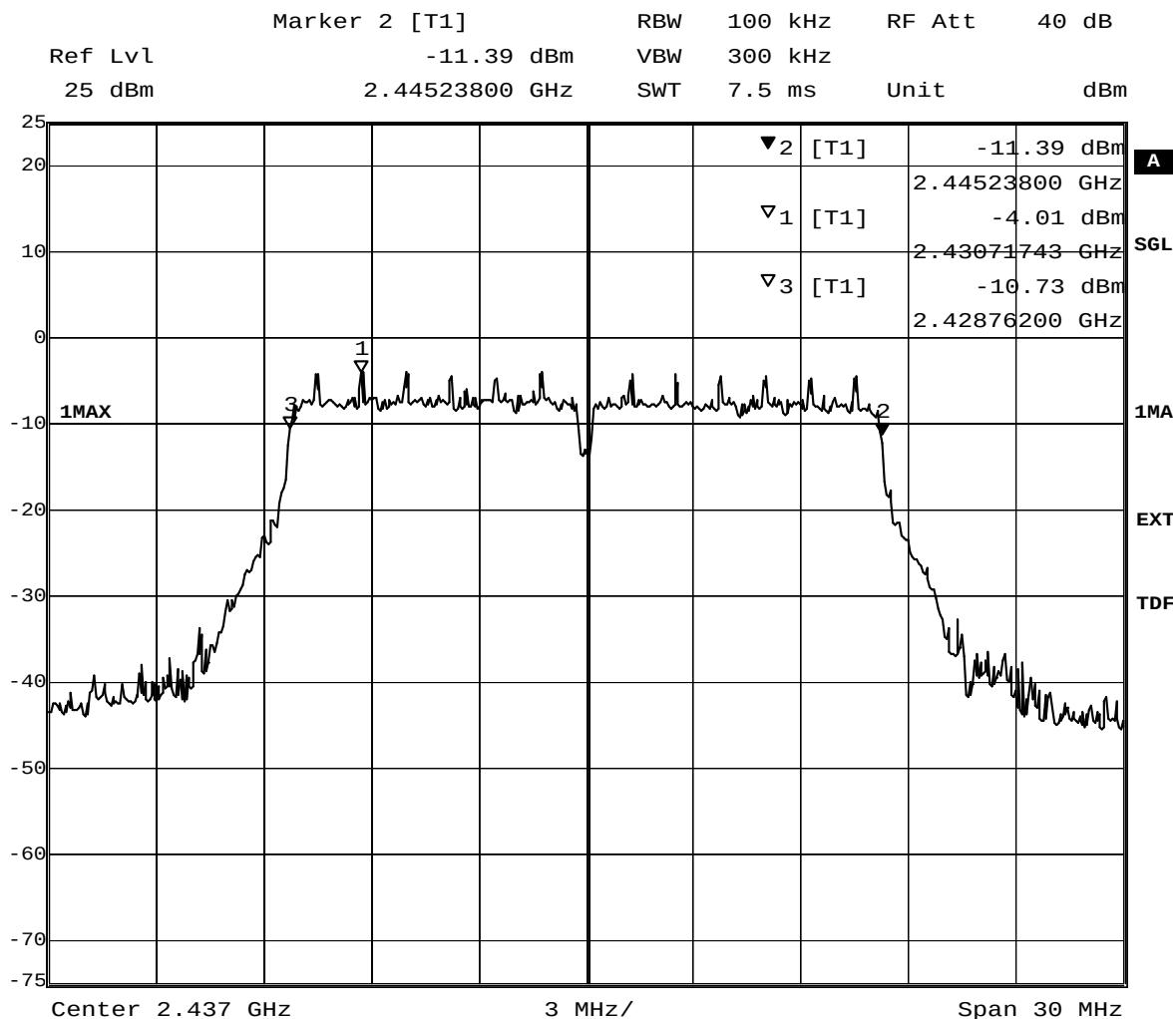
Title: 6dB Bandwidth

Comment A: CH M: 2437 MHz; 6dB bandwidth (kHz):10104

Date: 29.SEP.2011 16:26:23

Op. Mode

op-mode 2g



Title: 6dB Bandwidth

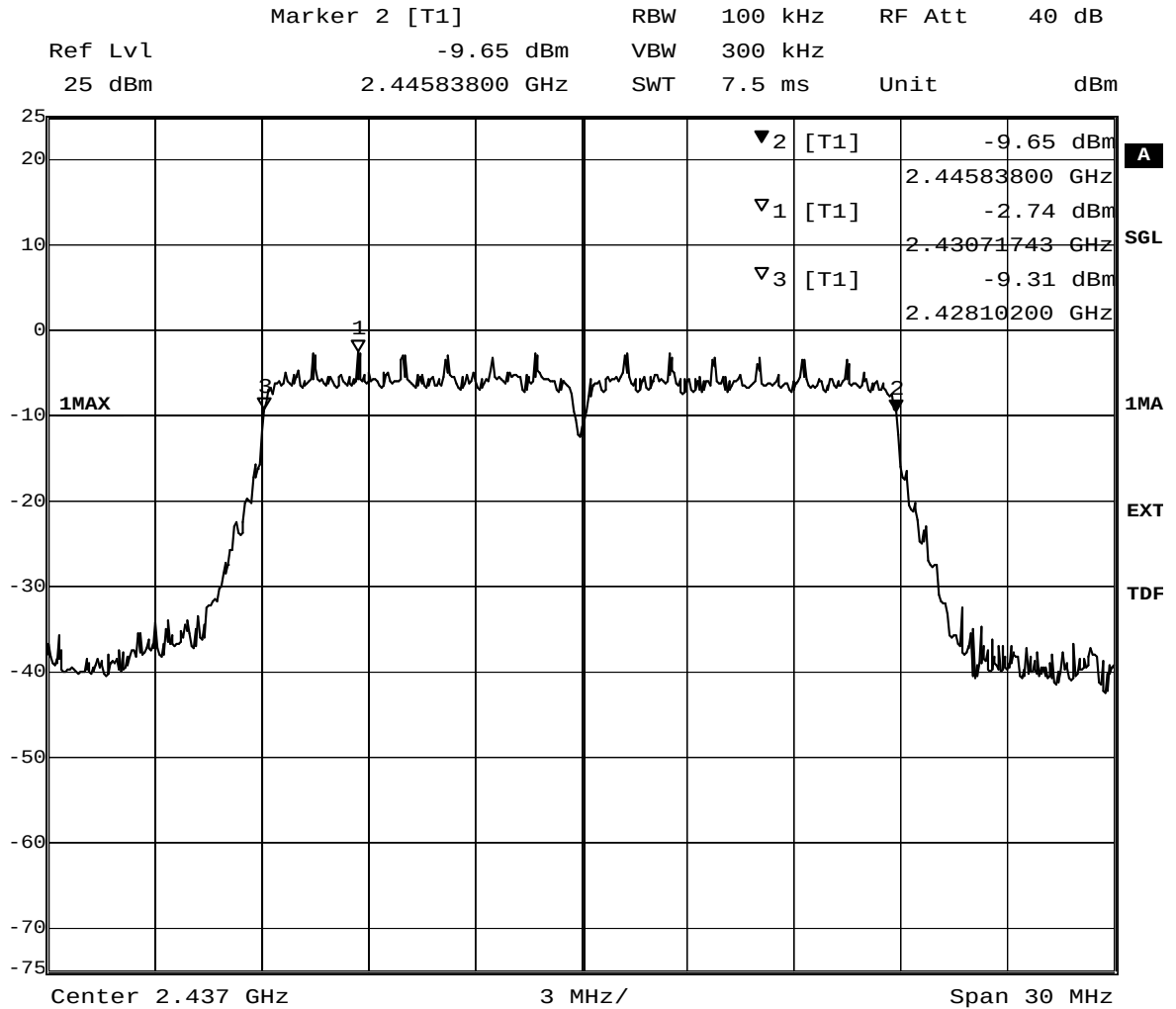
Comment A: CH M: 2437 MHz; 6dB bandwidth (kHz):16476

Date: 29.SEP.2011 14:36:53



Op. Mode

op-mode 2n



Title: 6dB Bandwidth

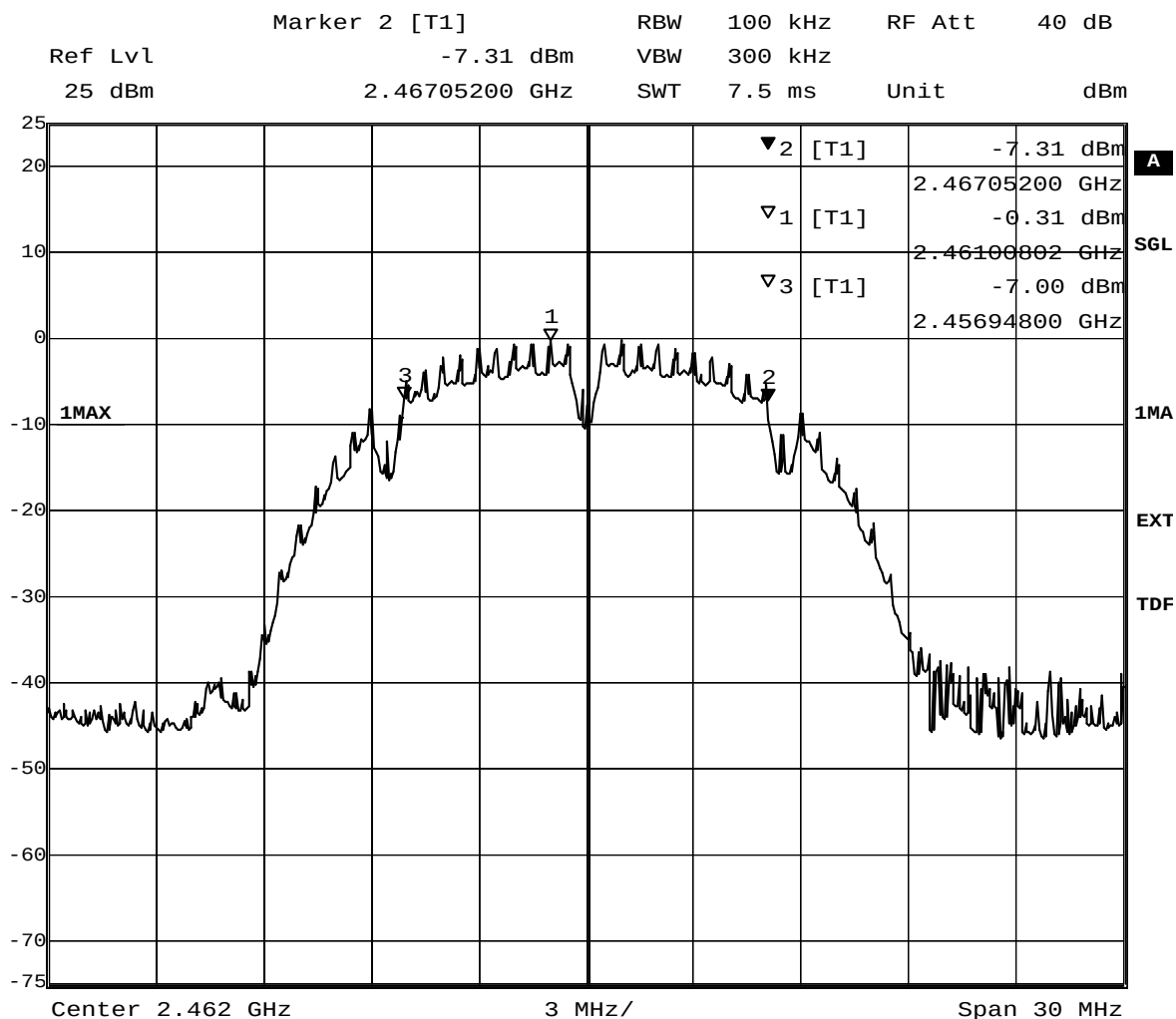
Comment A: CH M: 2437 MHz; 6dB bandwidth (kHz):17736

Date: 29.SEP.2011 12:31:28

8.2.3 Occupied bandwidth operating mode 3

Op. Mode

op-mode 3b



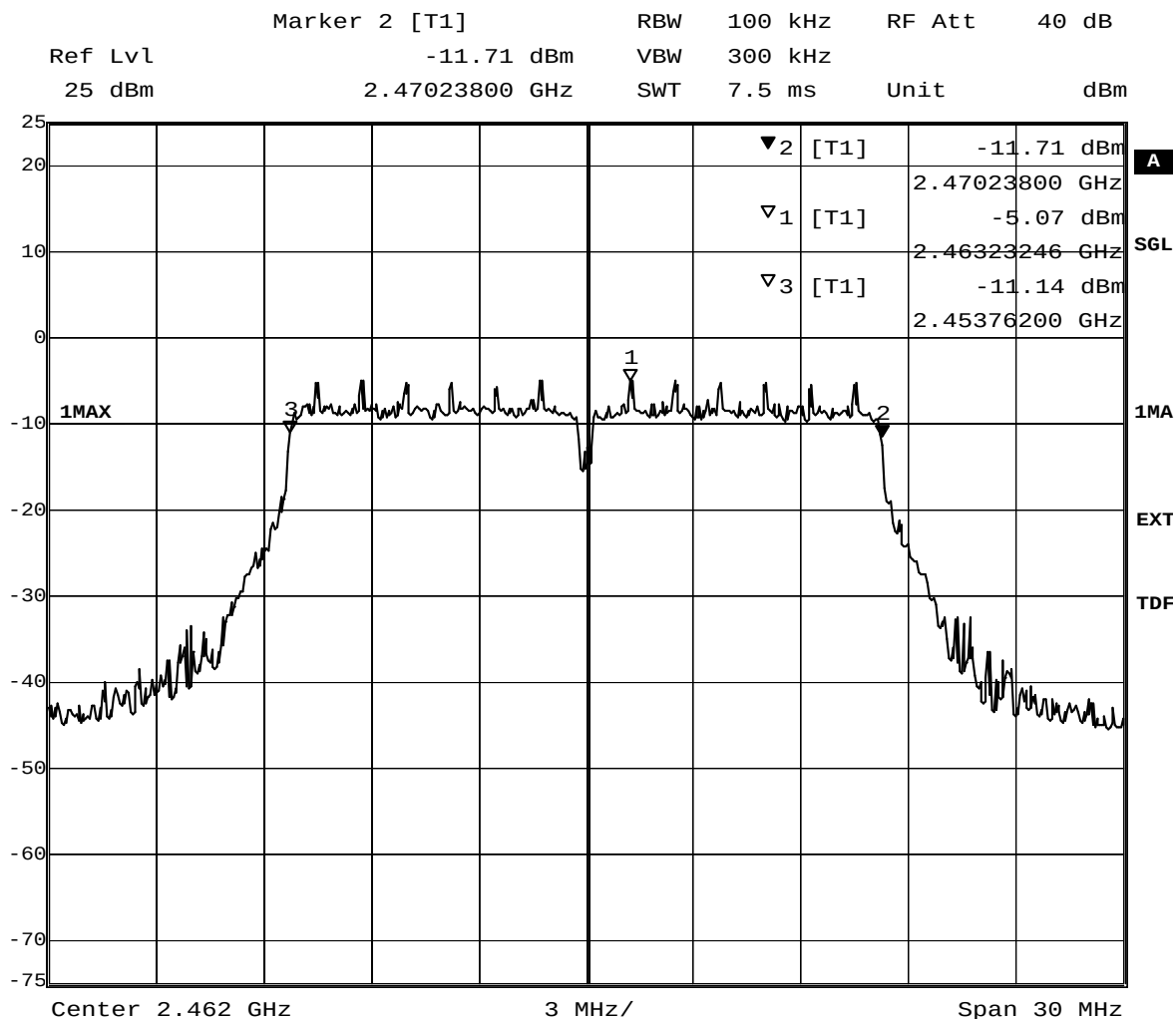
Title: 6dB Bandwidth

Comment A: CH T: 2462 MHz; 6dB bandwidth (kHz):10104

Date: 29.SEP.2011 15:52:51

Op. Mode

op-mode 3g



Title: 6dB Bandwidth

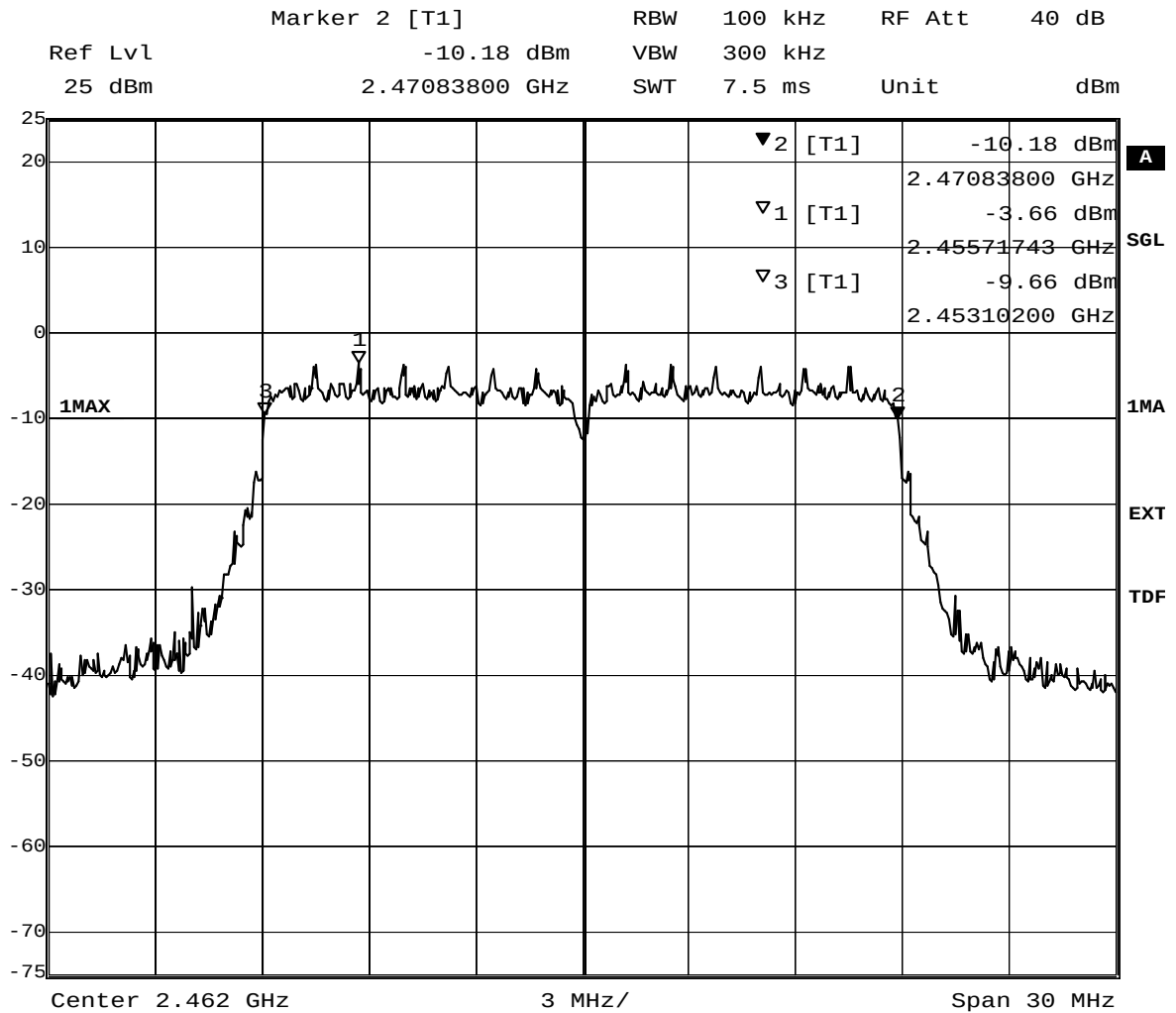
Comment A: CH T: 2462 MHz; 6dB bandwidth (kHz):16476

Date: 29.SEP.2011 15:09:01



Op. Mode

op-mode 3n



Title: 6dB Bandwidth

Comment A: CH T: 2462 MHz; 6dB bandwidth (kHz):17736

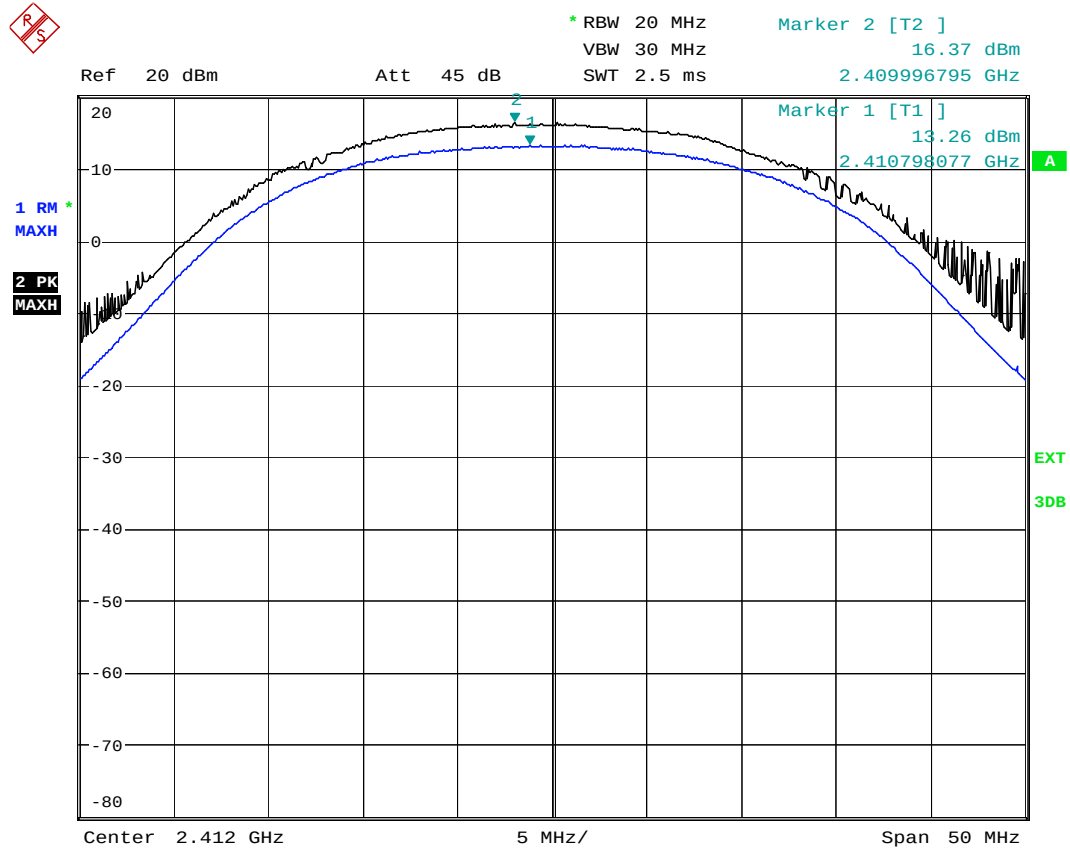
Date: 29.SEP.2011 11:57:36

8.3 Peak power output

8.3.1 Peak power output operating mode 1

Op. Mode

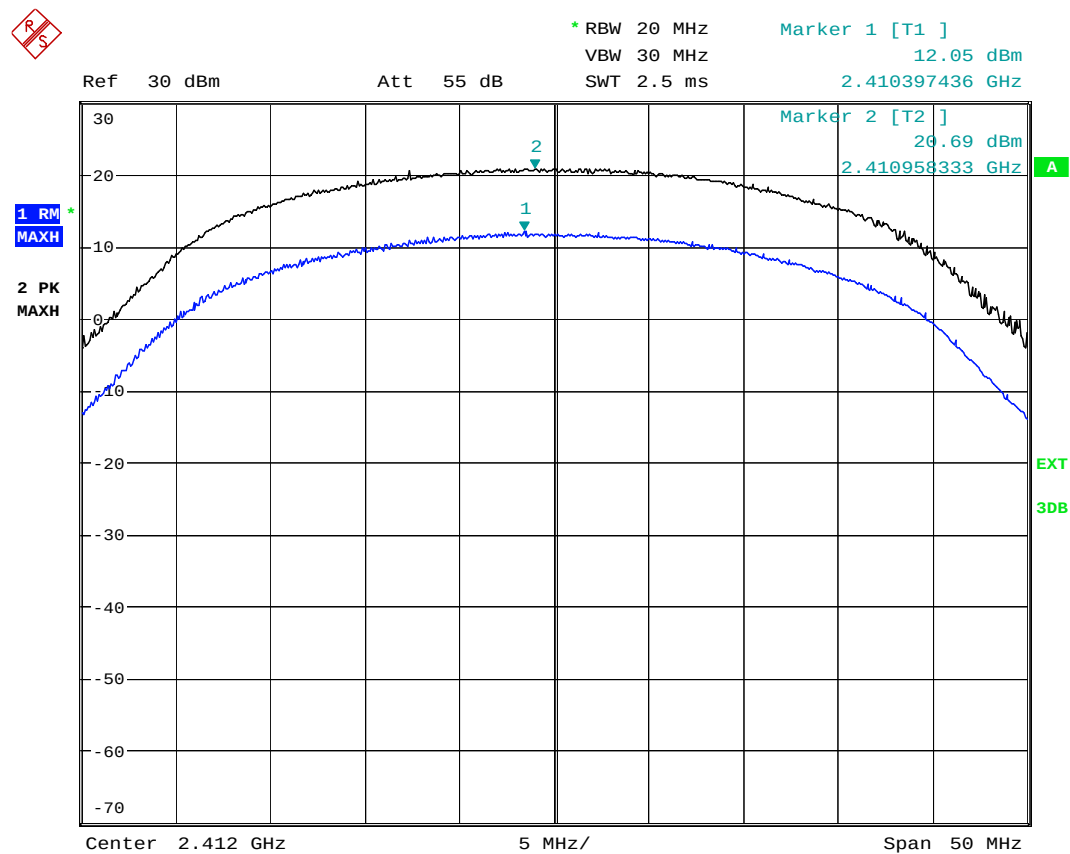
op-mode 1b



Date: 21.SEP.2011 11:20:32

Op. Mode

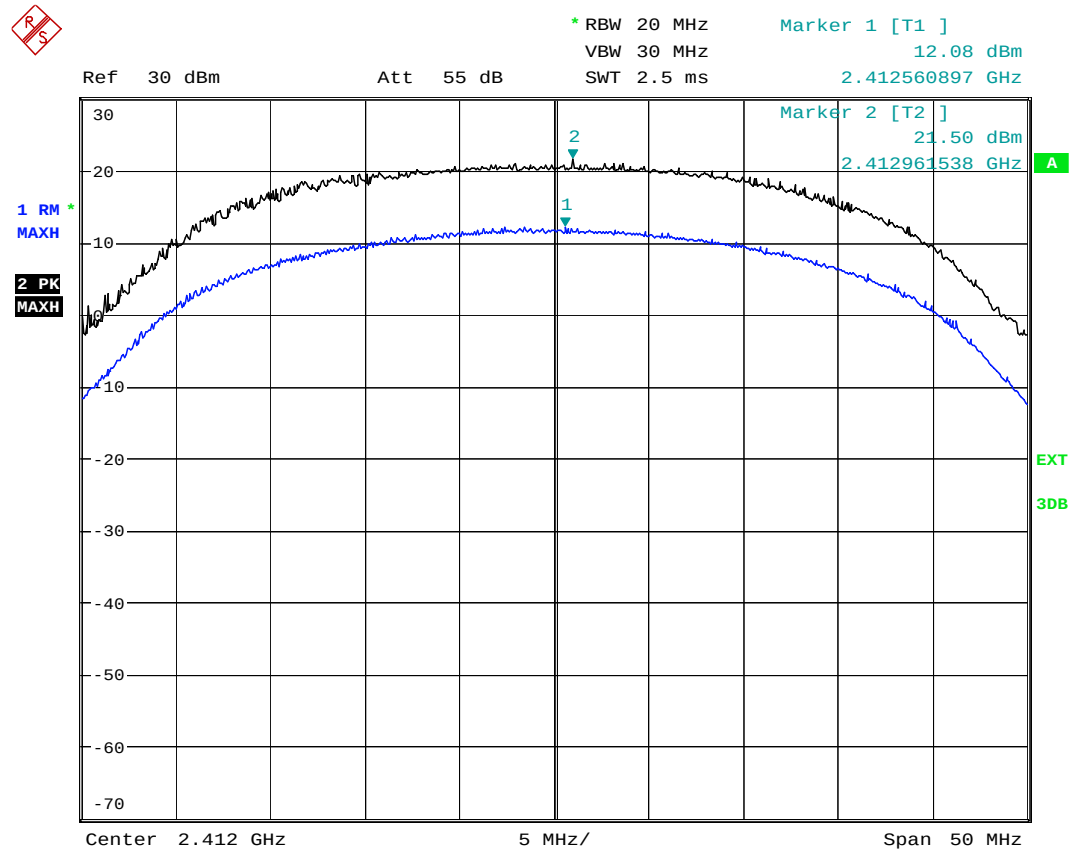
op-mode 1g



Date: 21.SEP.2011 10:15:00

Op. Mode

op-mode 1n

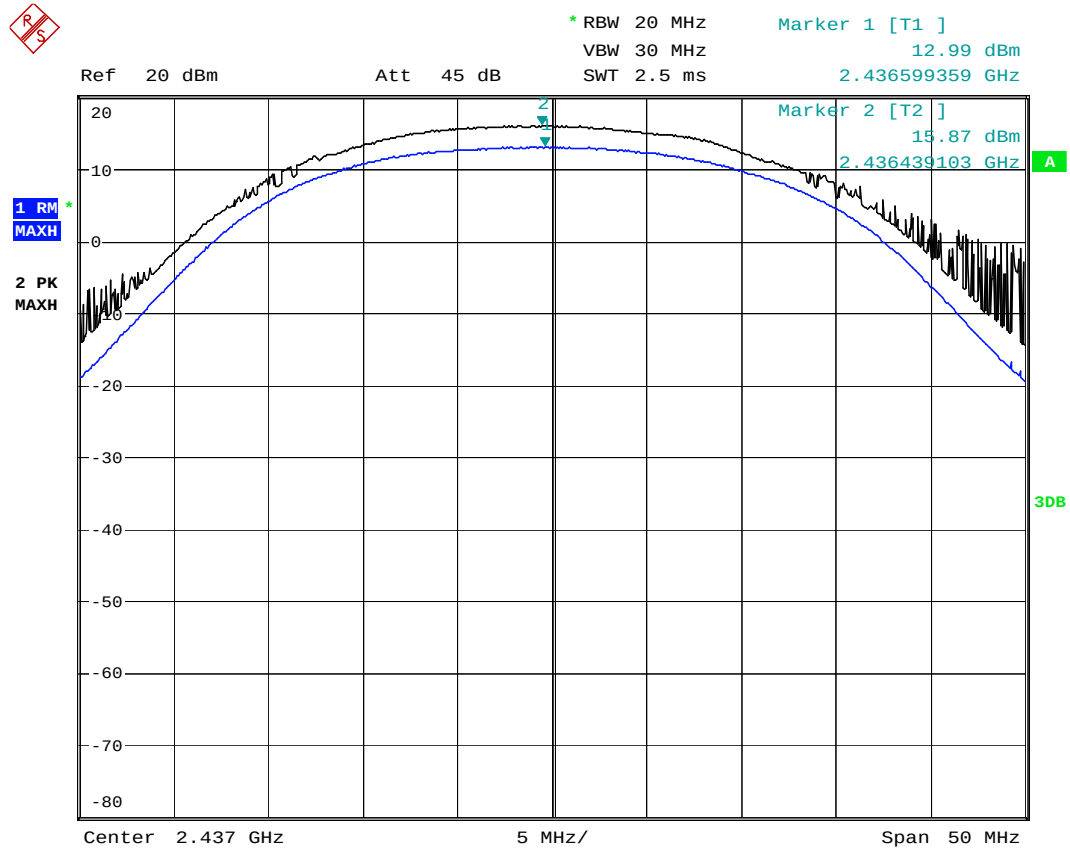


Date: 21.SEP.2011 10:39:42

8.3.2 Peak power output operating mode 2

Op. Mode

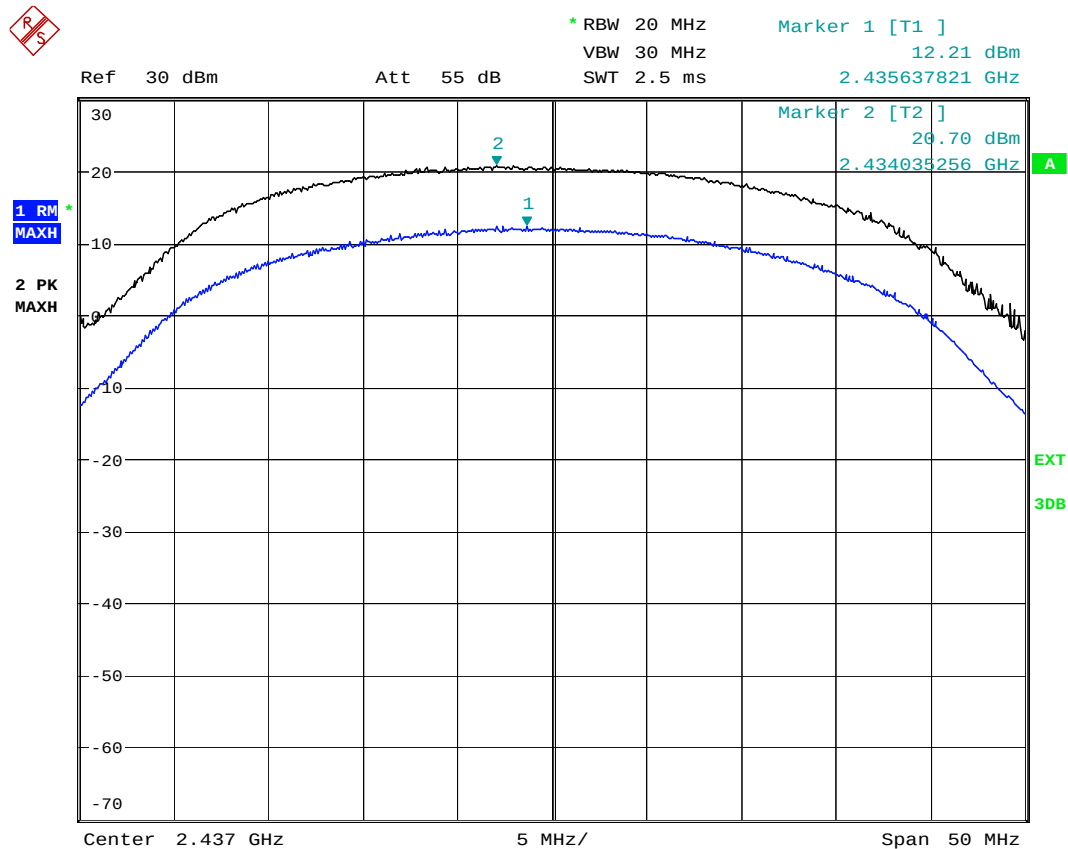
op-mode 2b



Date: 26.SEP.2011 14:12:07

Op. Mode

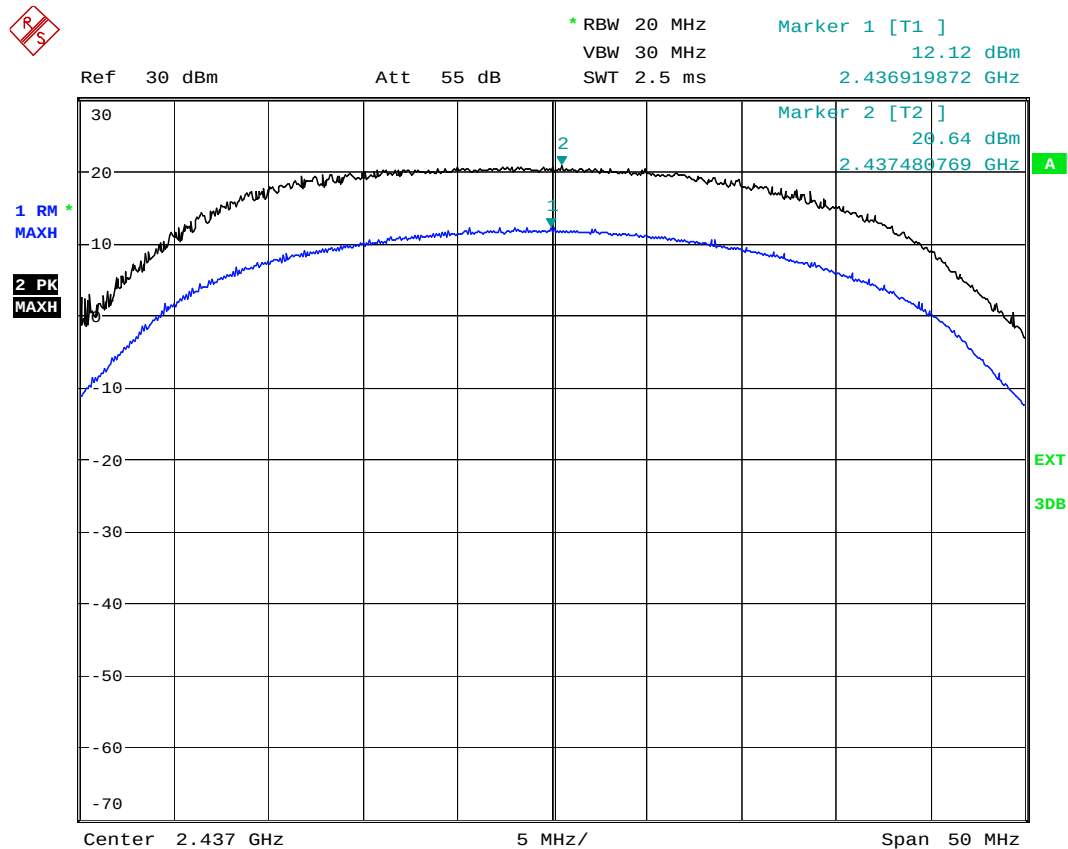
op-mode 2g



Date: 21.SEP.2011 10:18:18

Op. Mode

op-mode 2n

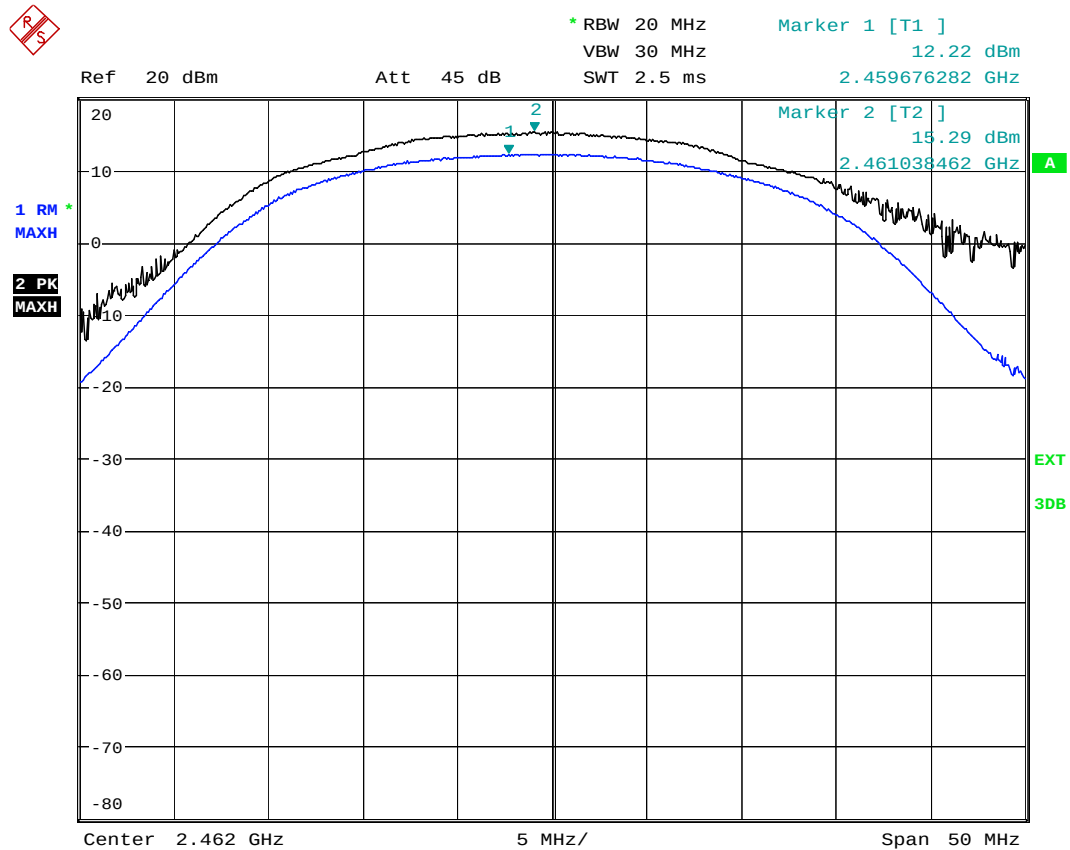


Date: 21.SEP.2011 10:53:55

8.3.3 Peak power output operating mode 3

Op. Mode

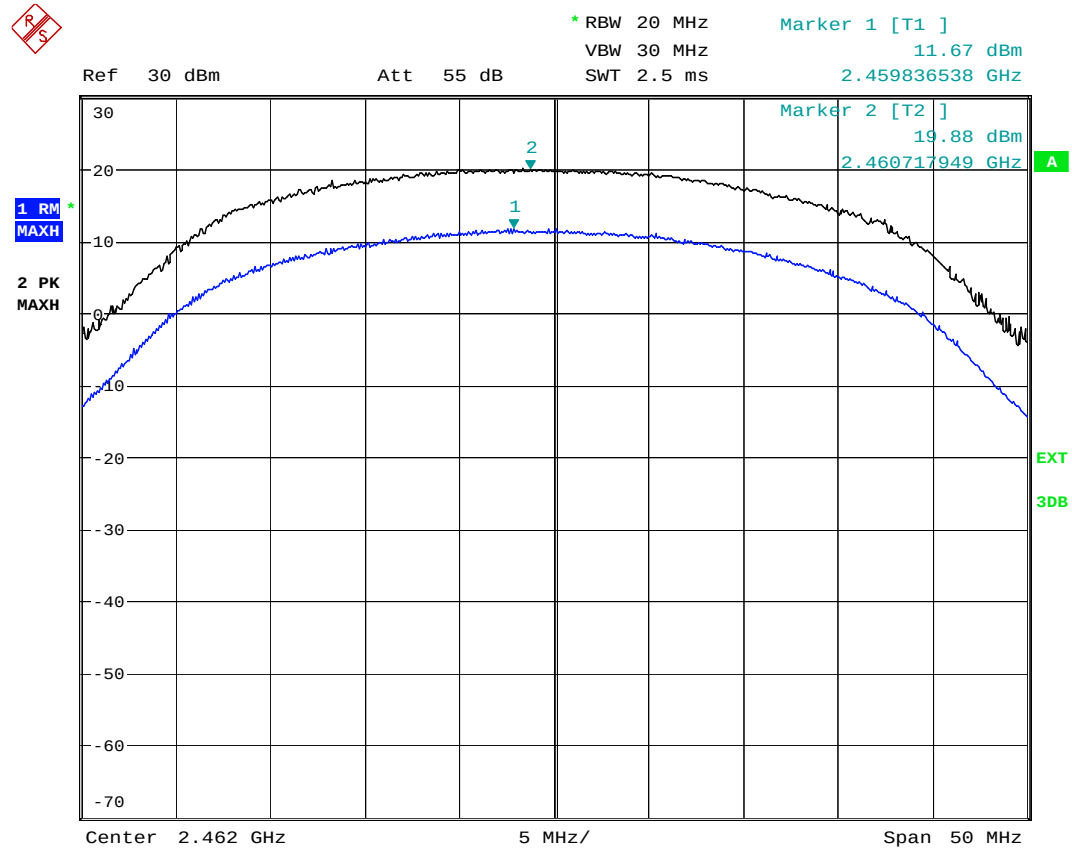
op-mode 3b



Date: 21.SEP.2011 12:13:15

Op. Mode

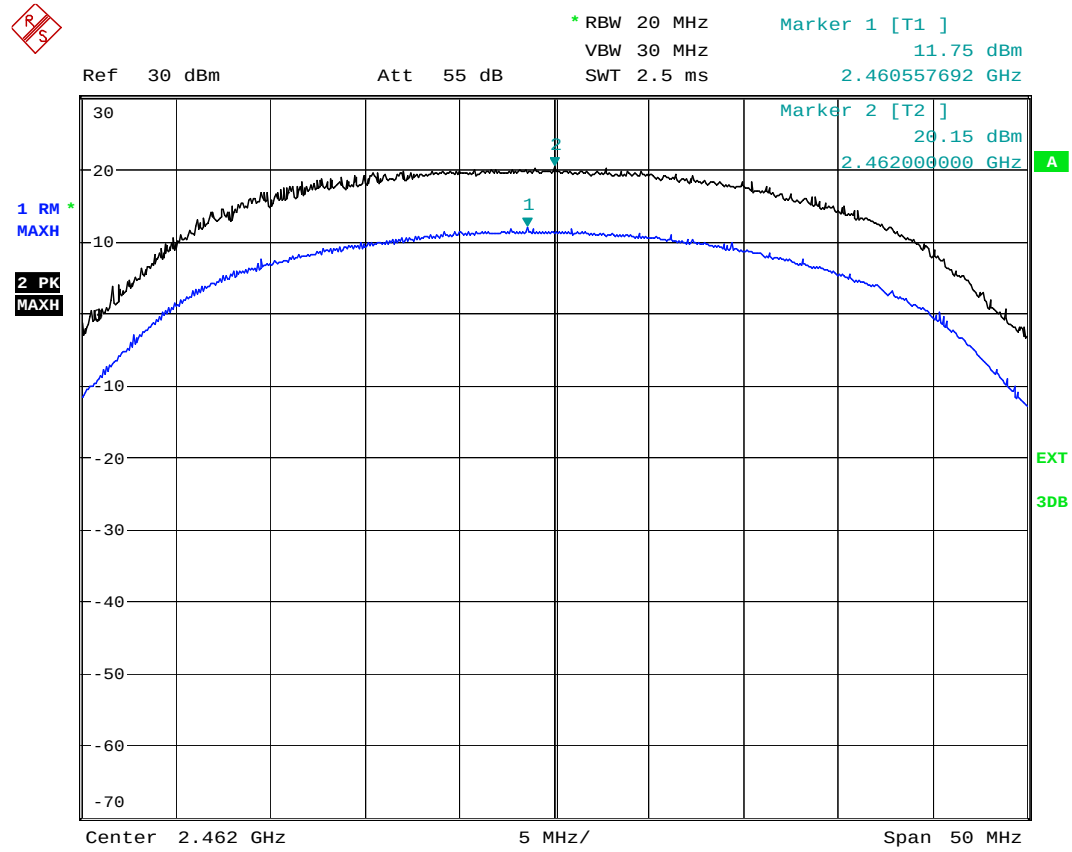
op-mode 3g



Date: 21.SEP.2011 10:20:54

Op. Mode

op-mode 3n



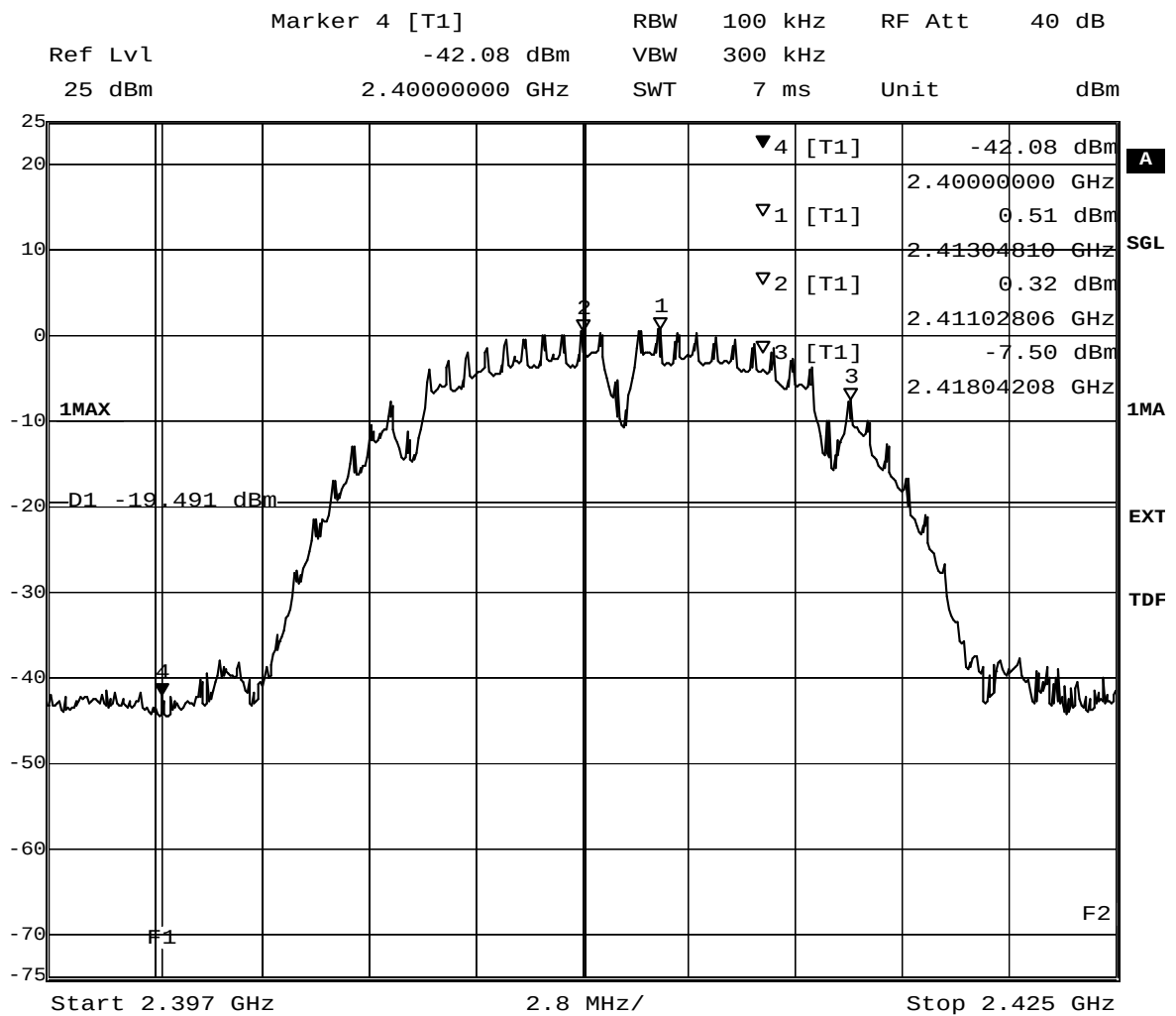
Date: 21.SEP.2011 10:57:55

8.4 Band edge compliance conducted and Spurious RF conducted emission

8.4.1 Band edge compliance conducted operating mode 1b

Op. Mode

op-mode 1b

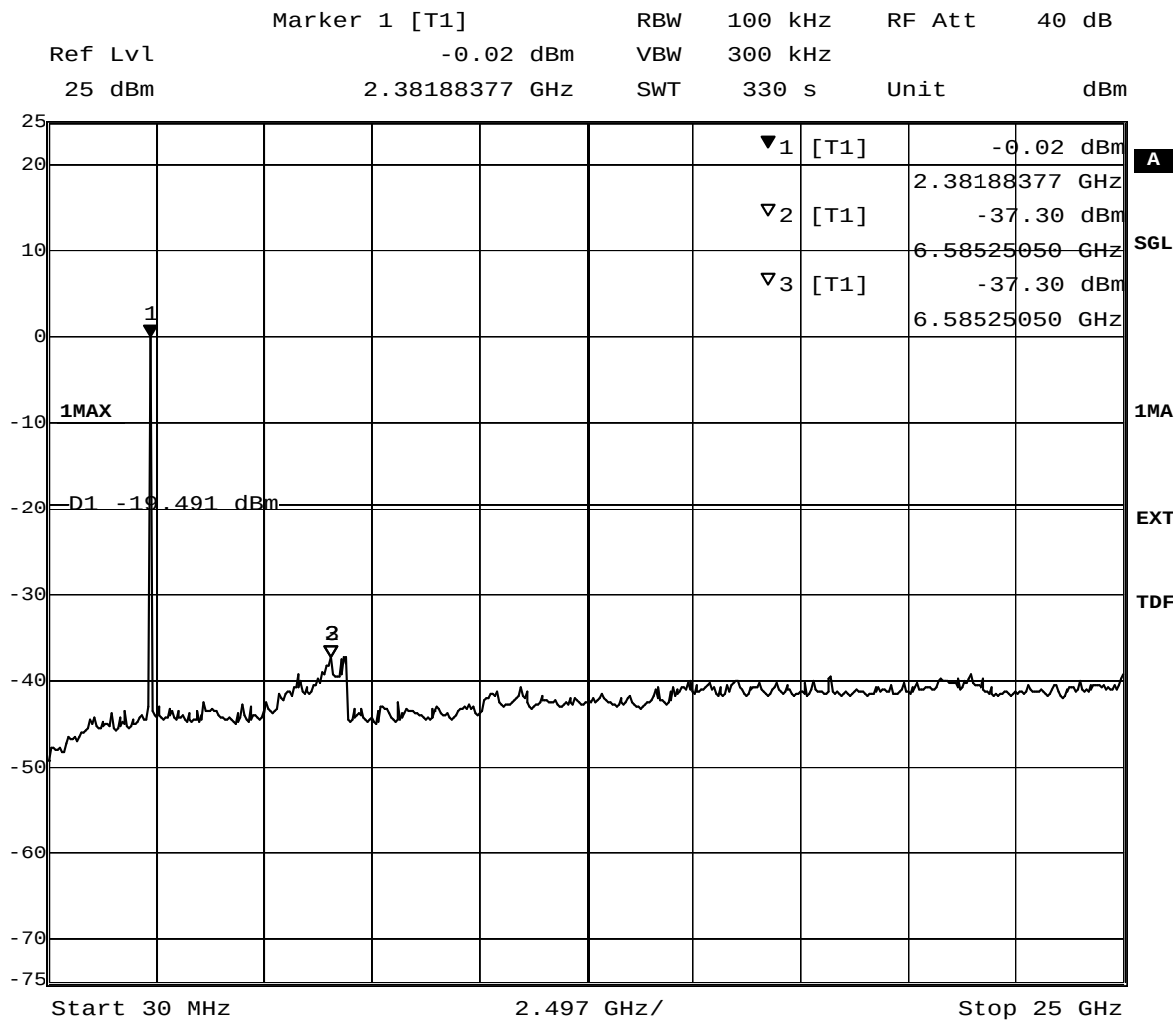


Title: Band Edge Compliance
 Comment A: CH B: 2412 MHz
 Date: 29.SEP.2011 16:46:56

8.4.2 Spurious RF conducted emission operating mode 1b

Op. Mode

op-mode 1b

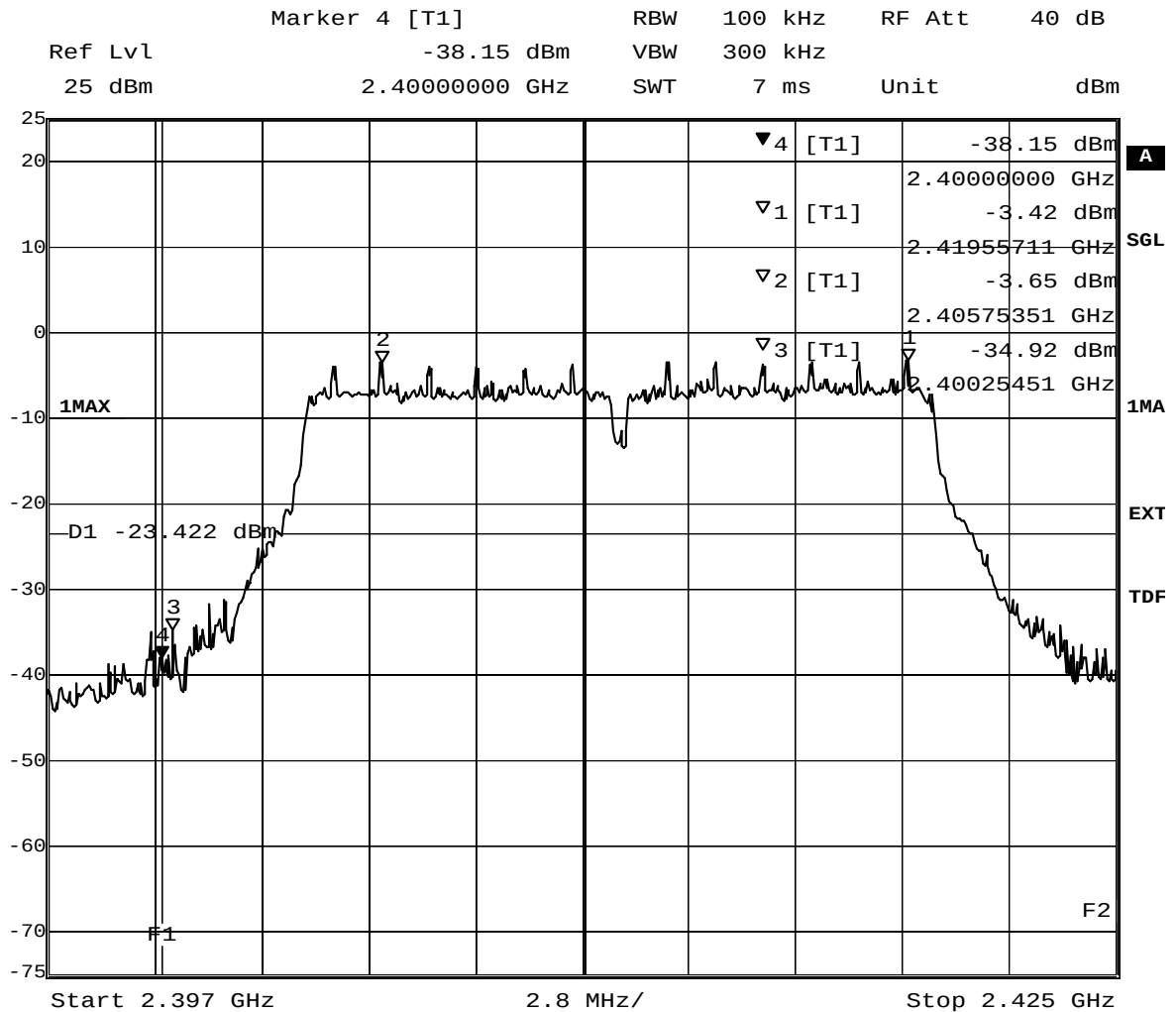


Title: spurious emissions
 Comment A: CH B: 2412 MHz
 Date: 29.SEP.2011 16:58:34

8.4.3 Band edge compliance conducted operating mode 1g

Op. Mode

op-mode 1g

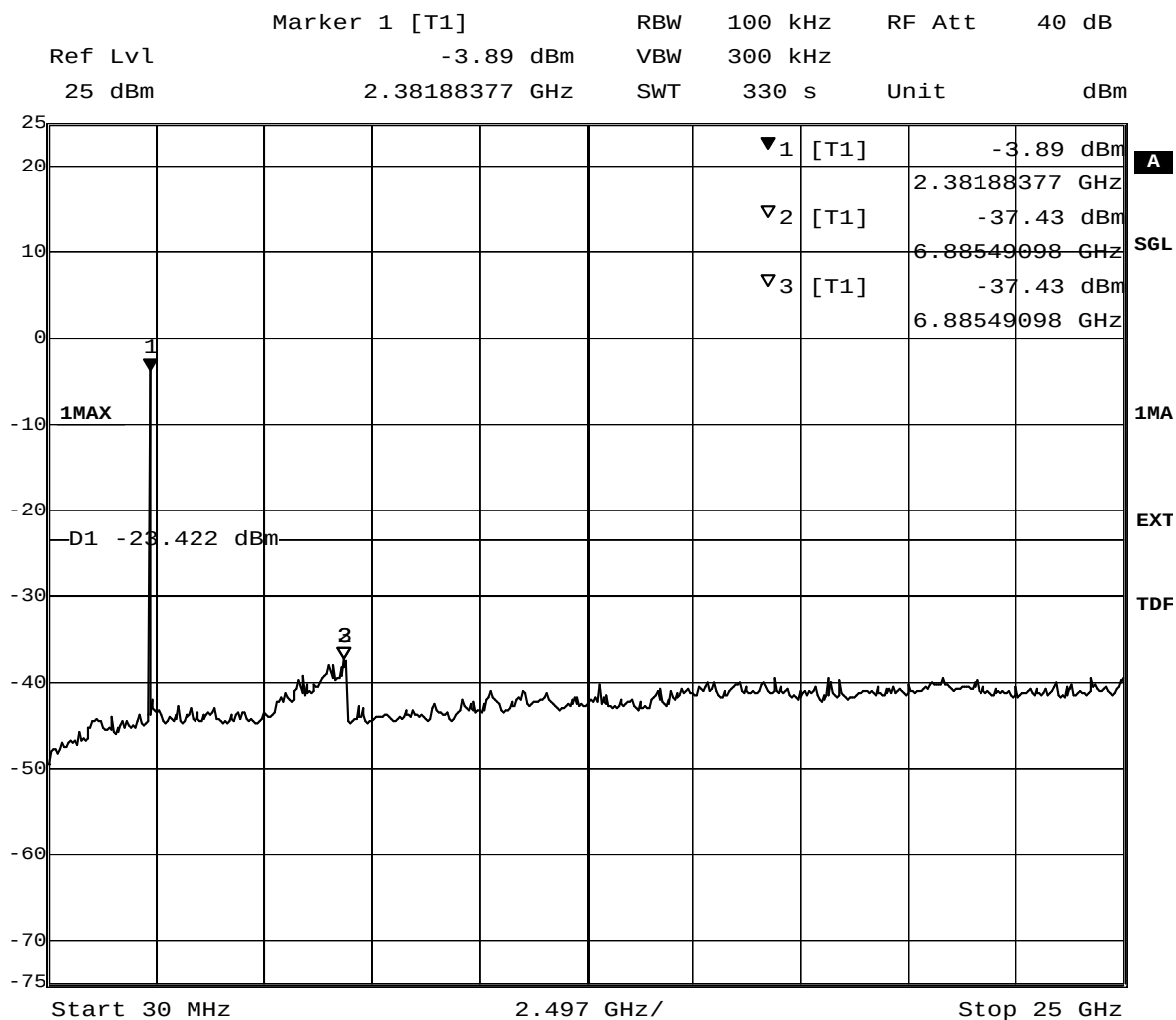


Title: Band Edge Compliance
 Comment A: CH B: 2412 MHz
 Date: 29.SEP.2011 13:50:00

8.4.4 Spurious RF conducted emission operating mode 1g

Op. Mode

op-mode 1g

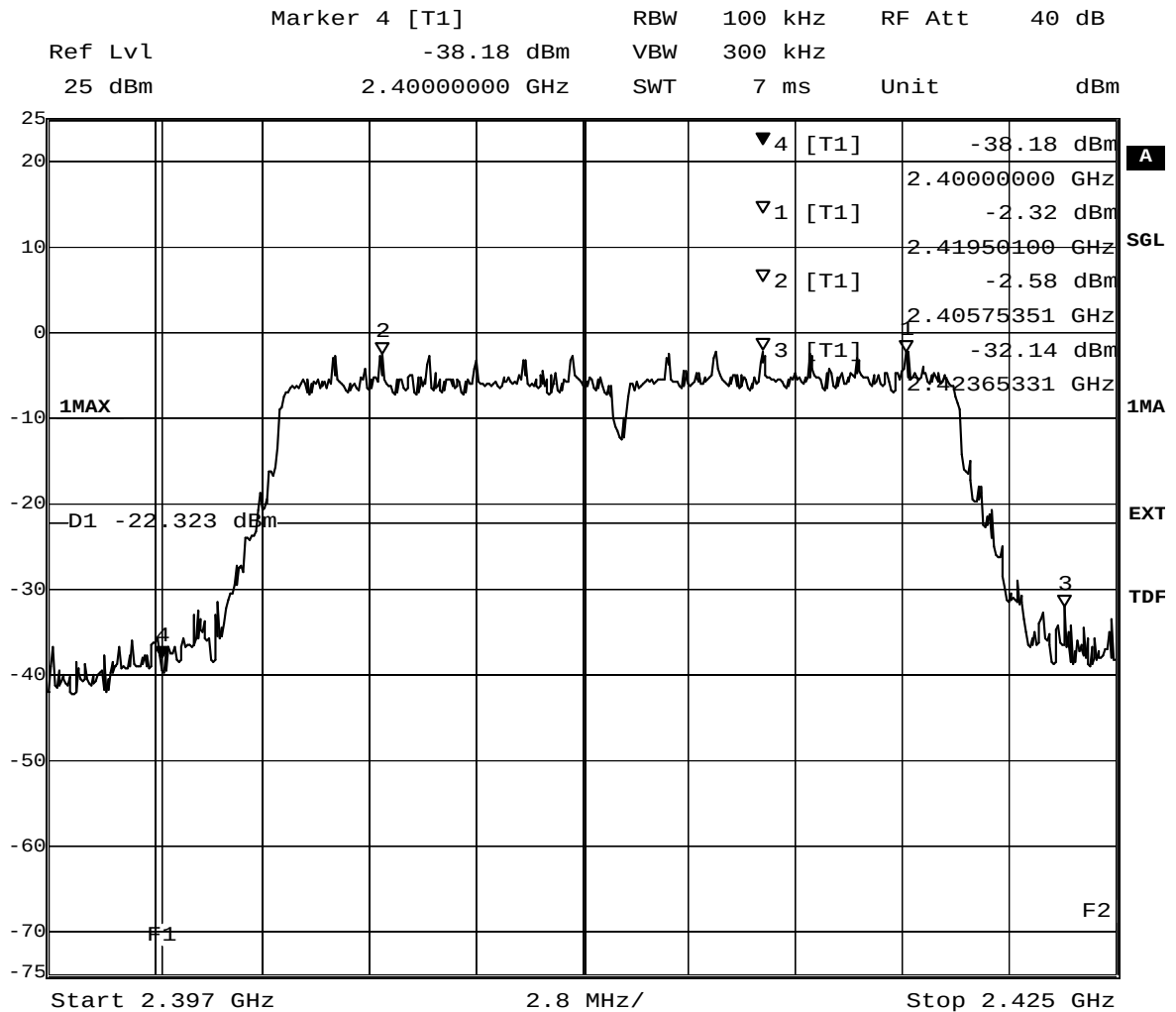


Title: spurious emissions
 Comment A: CH B: 2412 MHz
 Date: 29.SEP.2011 14:01:38

8.4.5 Band edge compliance conducted operating mode 1n

Op. Mode

op-mode 1n

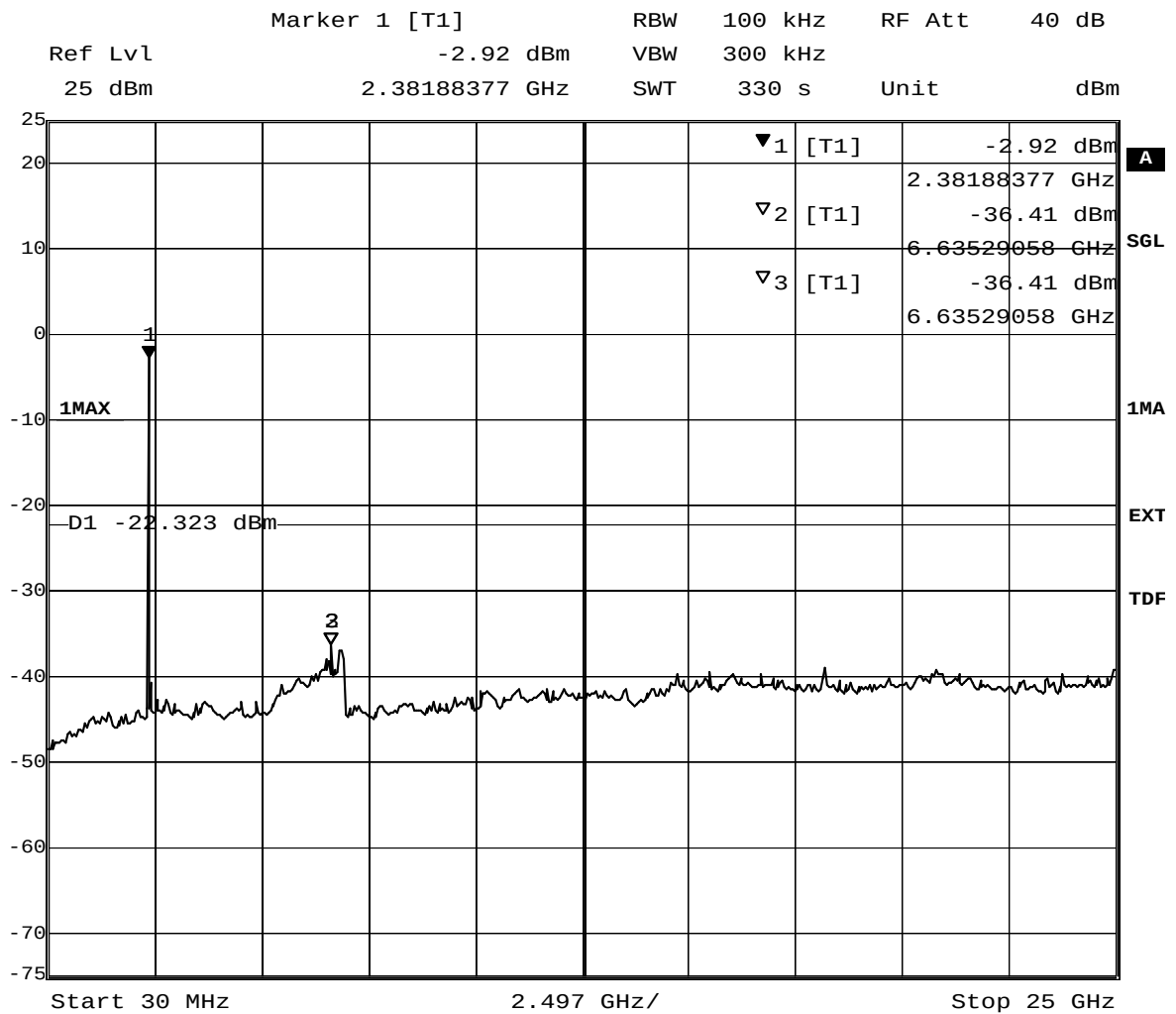


Title: Band Edge Compliance
 Comment A: CH B: 2412 MHz
 Date: 29.SEP.2011 13:10:28

8.4.6 Spurious RF conducted emission operating mode 1n

Op. Mode

op-mode 1n

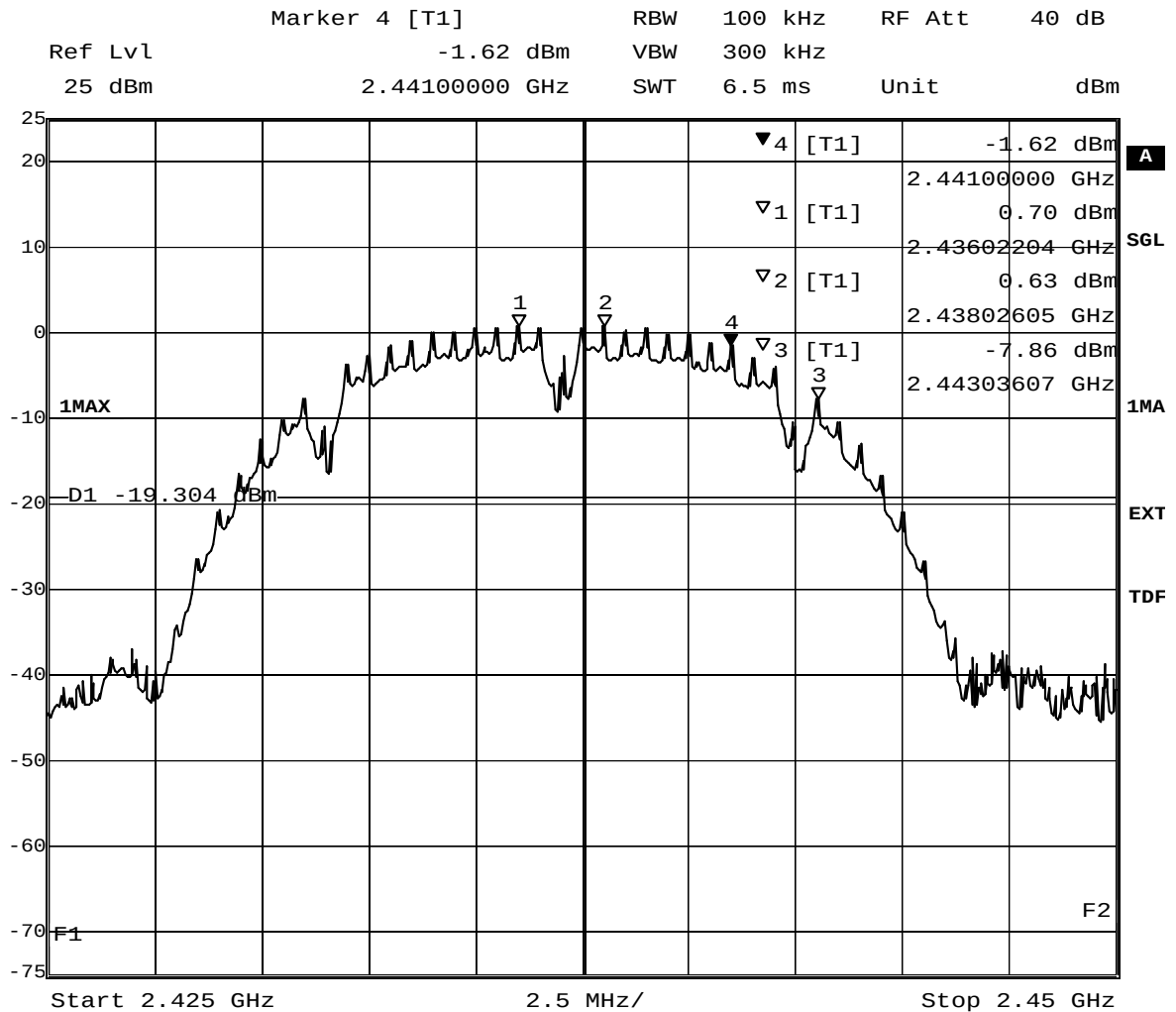


Title: spurious emissions
 Comment A: CH B: 2412 MHz
 Date: 29.SEP.2011 13:22:06

8.4.7 Spurious RF conducted emissions operating mode 2b

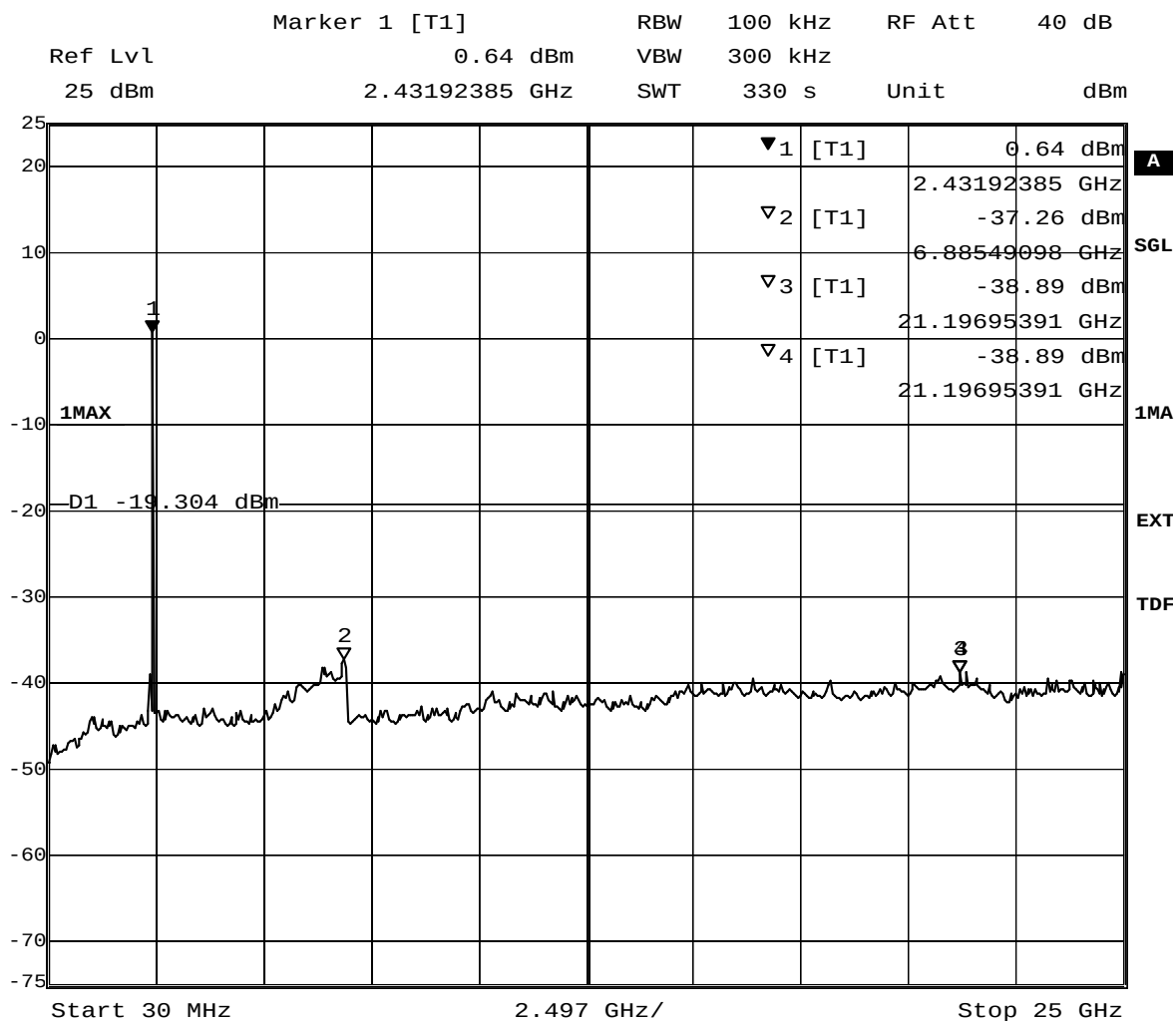
Op. Mode

op-mode 2b



Title: Band Edge Compliance
 Comment A: CH M: 2437 MHz
 Date: 29.SEP.2011 16:12:15

(determination of reference value for spurious emissions measurement)

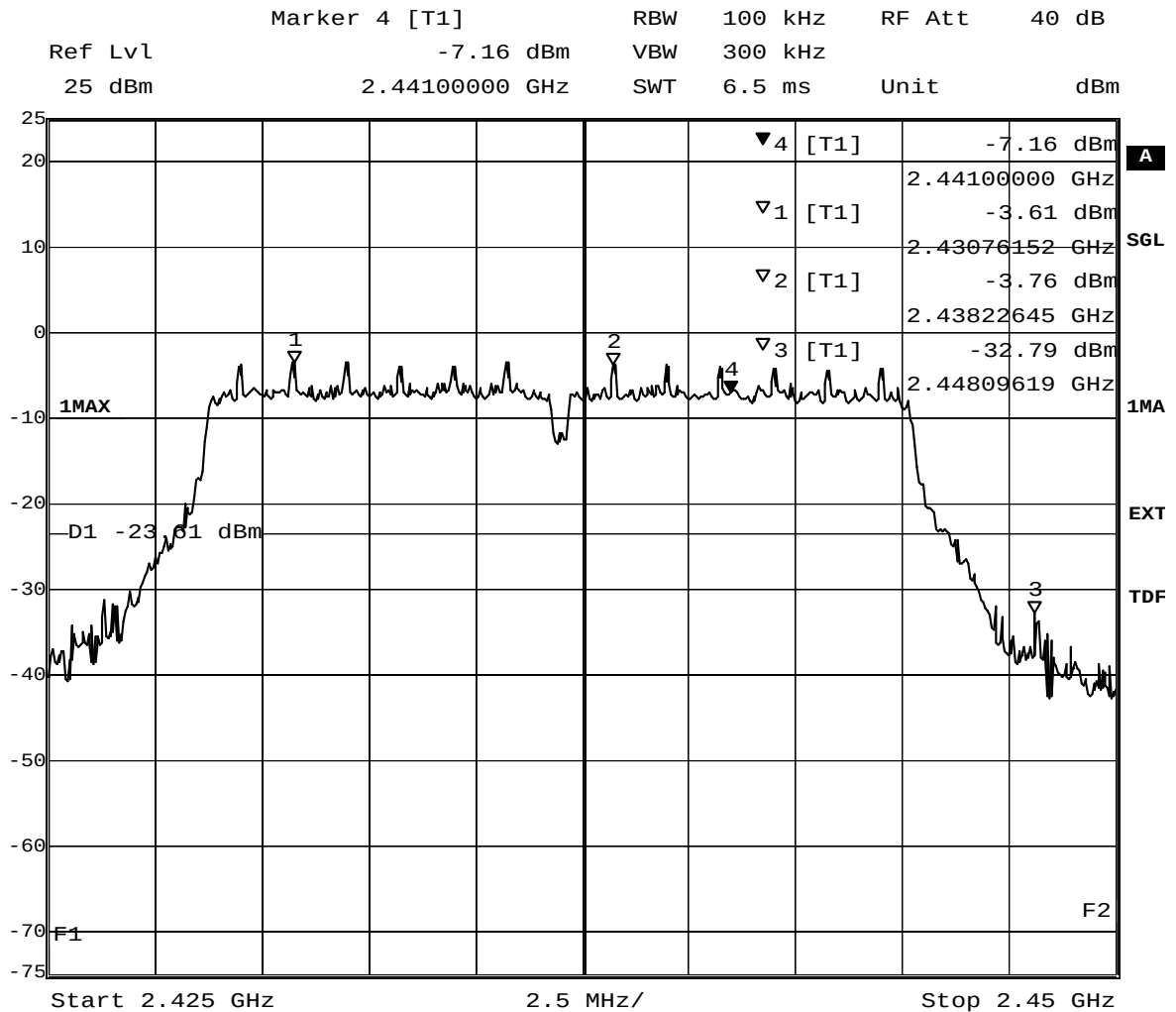


Title: spurious emissions
 Comment A: CH M: 2437 MHz
 Date: 29.SEP.2011 16:23:53

8.4.8 Spurious RF conducted emissions operating mode 2g

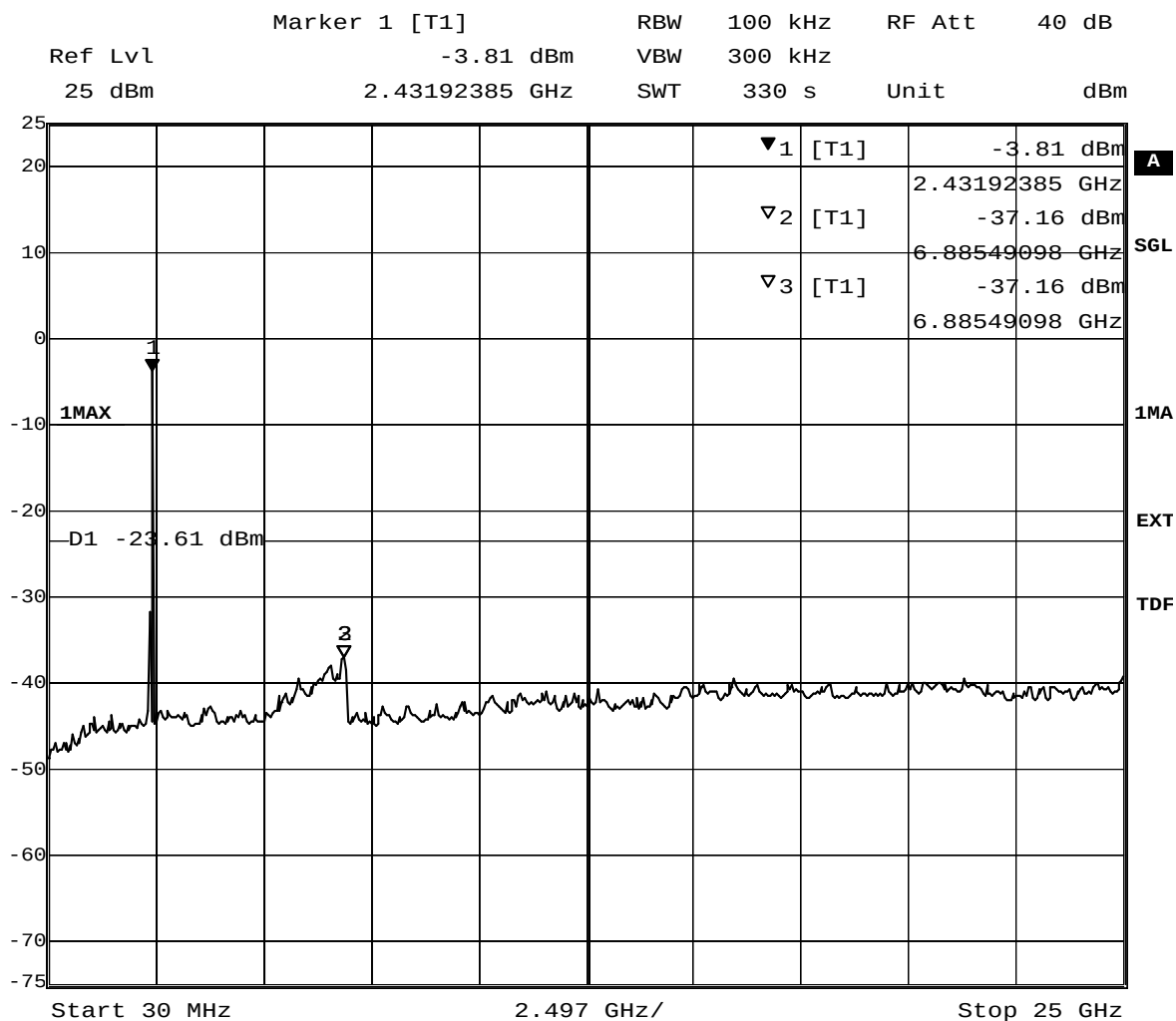
Op. Mode

op-mode 2g



Title: Band Edge Compliance
 Comment A: CH M: 2437 MHz
 Date: 29.SEP.2011 14:23:20

(determination of reference value for spurious emissions measurement)

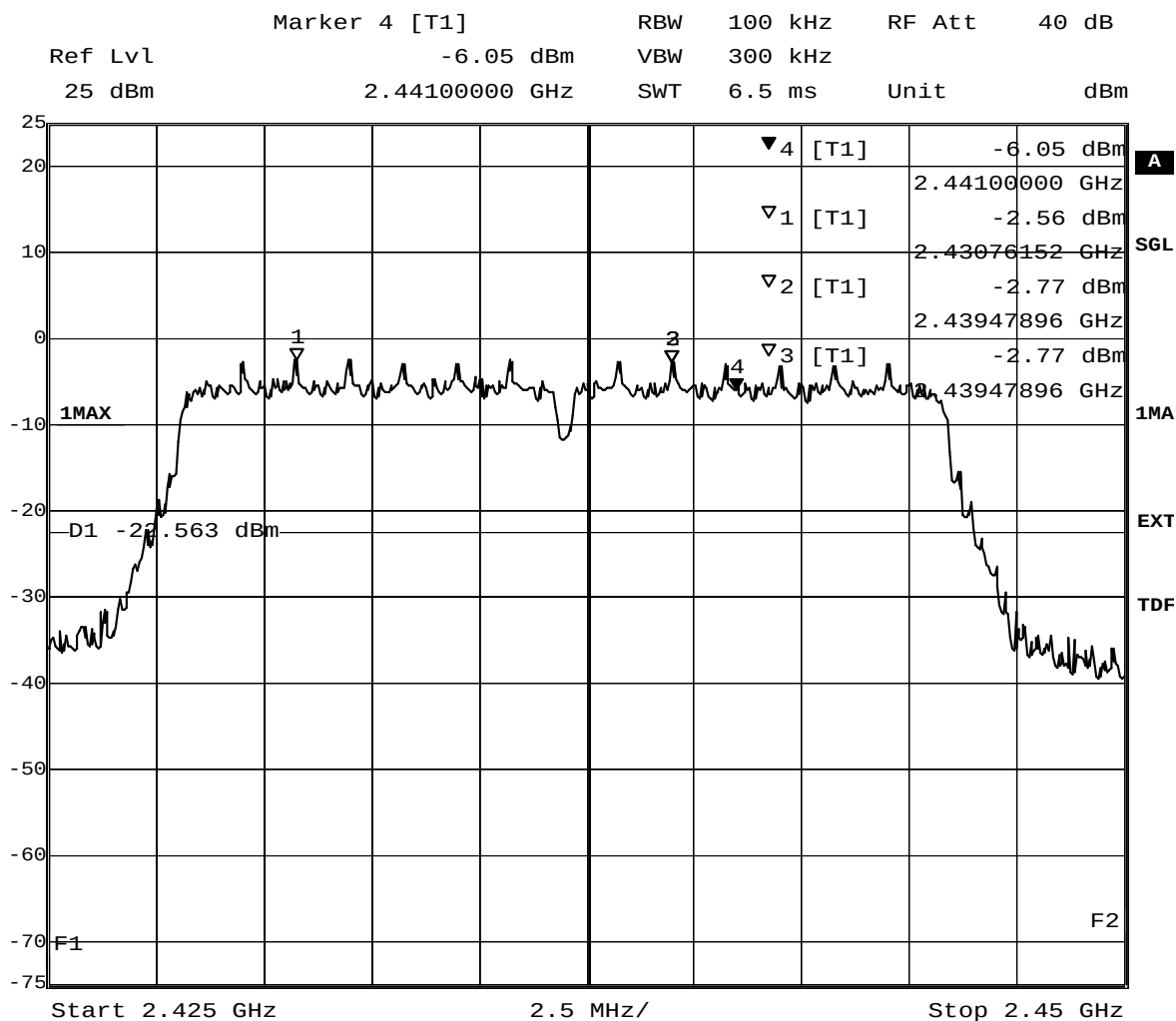


Title: spurious emissions
 Comment A: CH M: 2437 MHz
 Date: 29.SEP.2011 14:34:58

8.4.9 Spurious RF conducted emission operating mode 2n

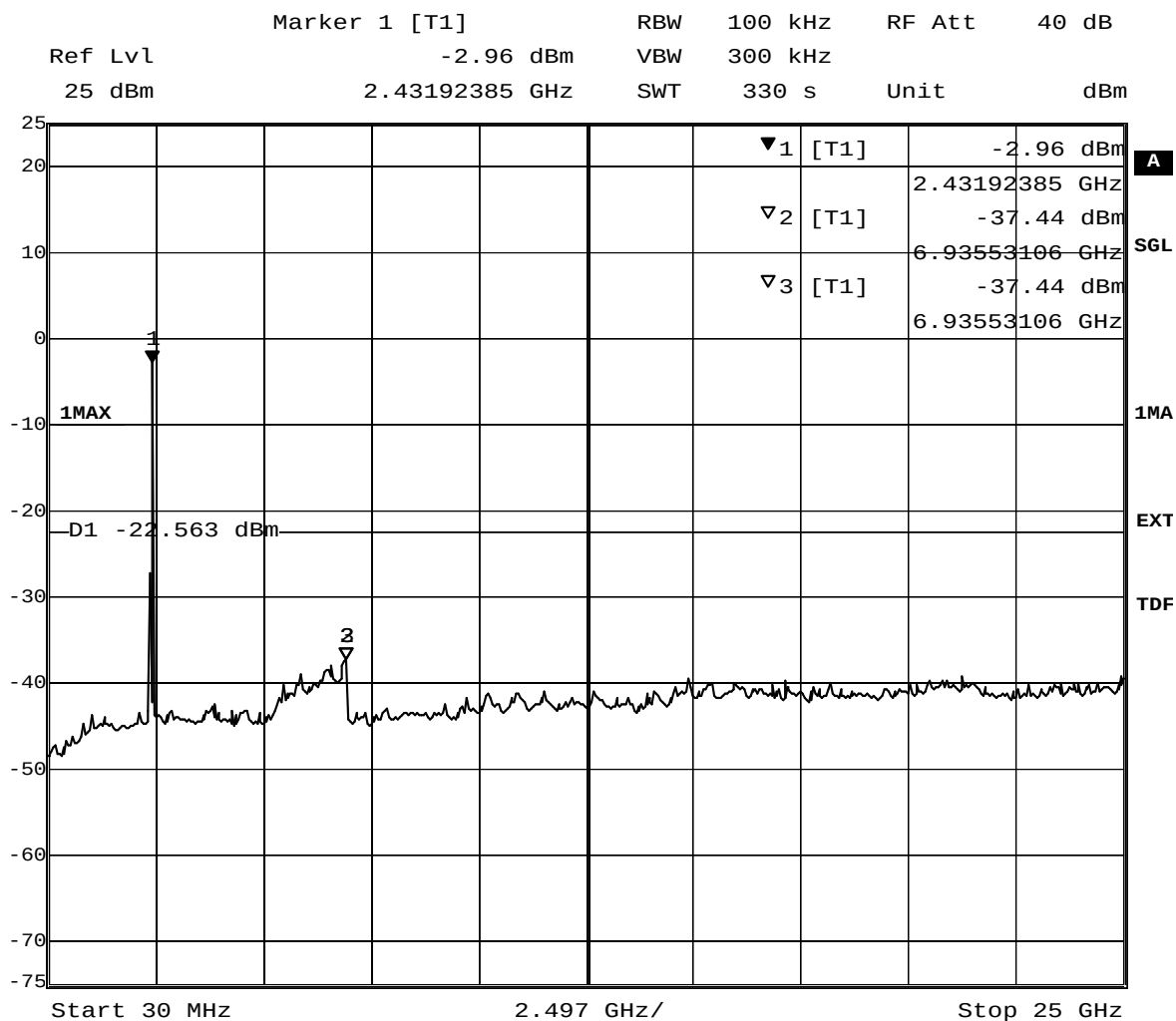
Op. Mode

op-mode 2n



Title: Band Edge Compliance
 Comment A: CH M: 2437 MHz
 Date: 29.SEP.2011 12:18:02

(determination of reference value for spurious emissions measurement)

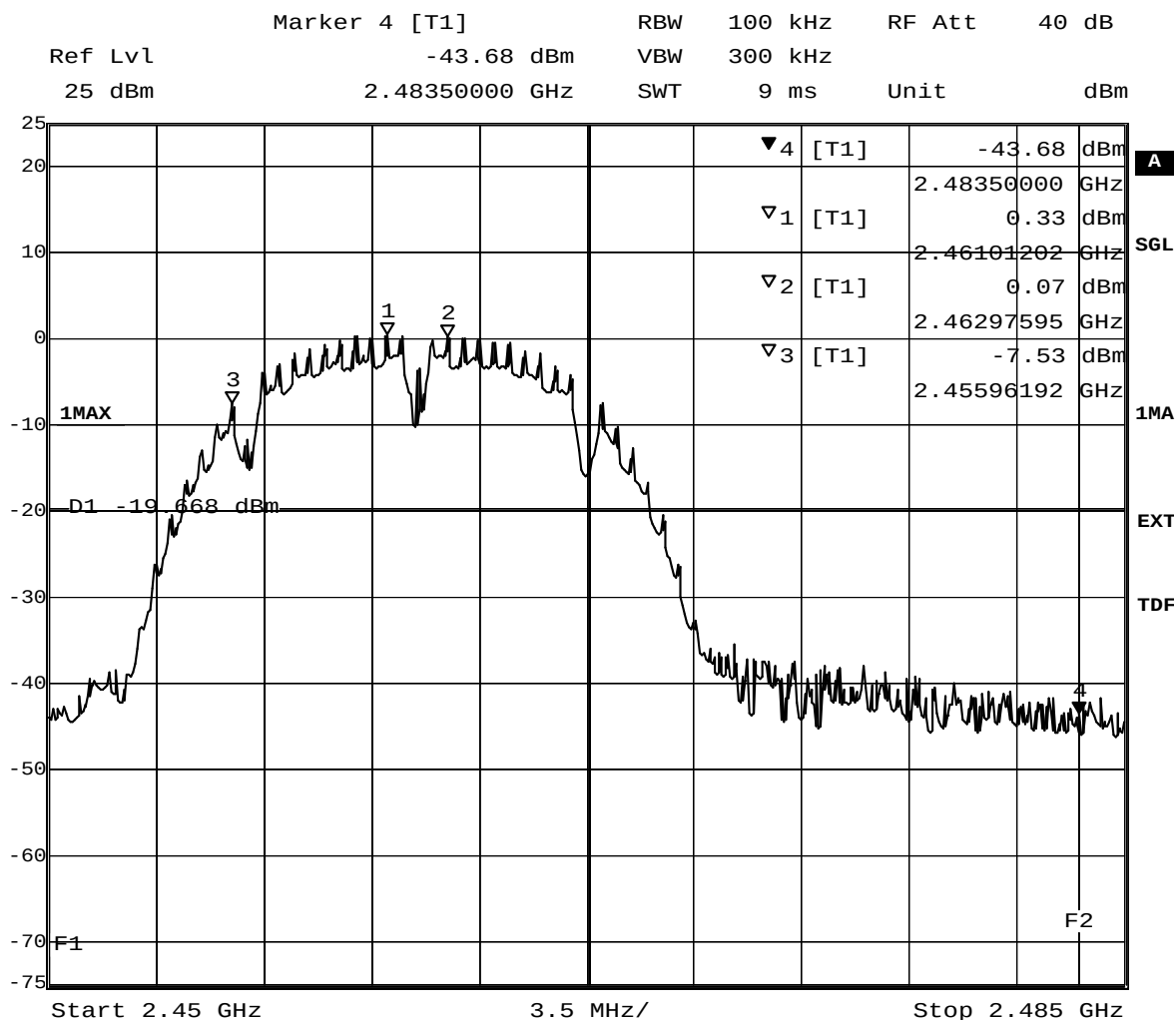


Title: spurious emissions
 Comment A: CH M: 2437 MHz
 Date: 29.SEP.2011 12:29:40

8.4.10 Band edge compliance conducted operating mode 3b

Op. Mode

op-mode 3b



Title: Band Edge Compliance

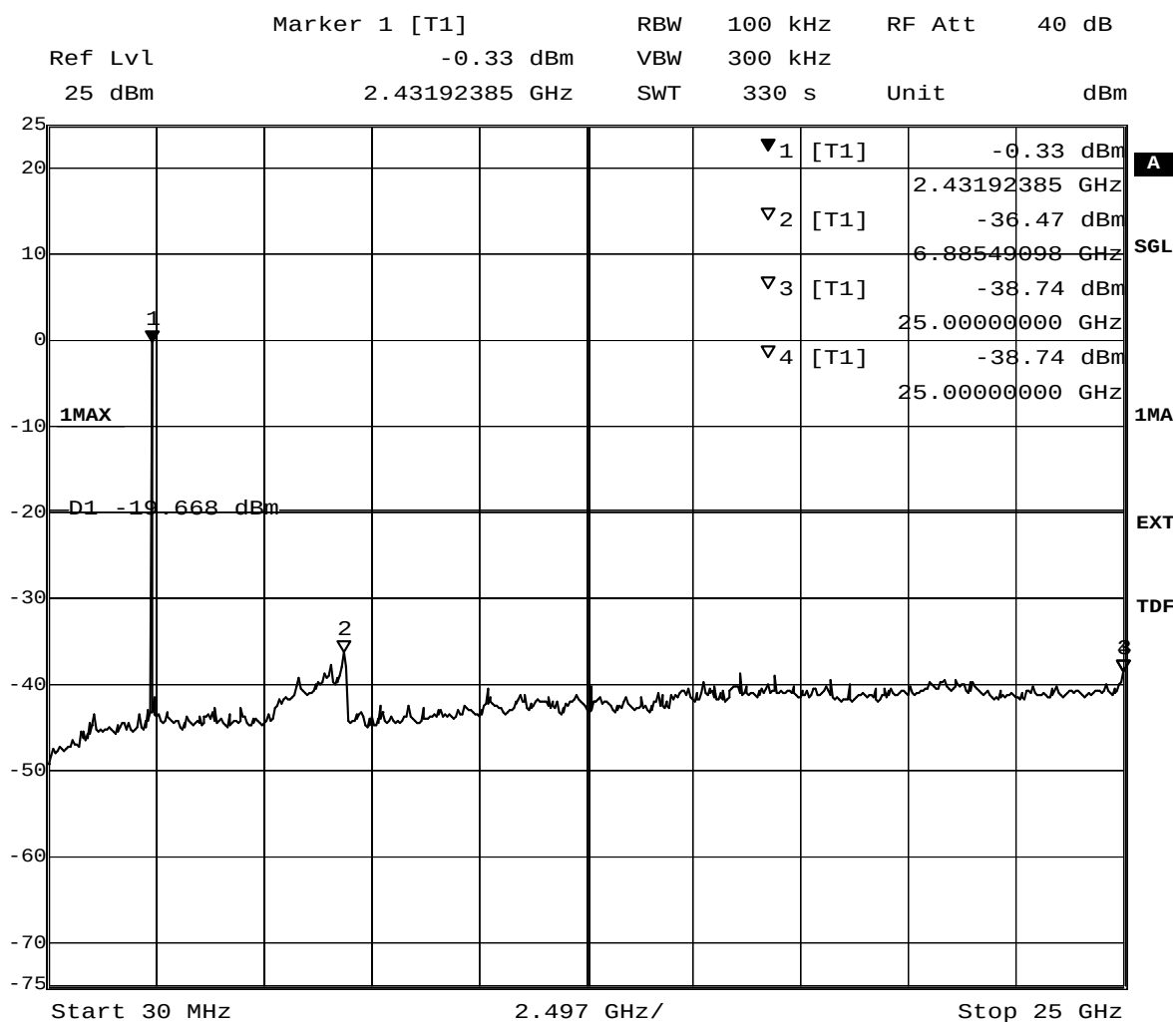
Comment A: CH T: 2462 MHz

Date: 29.SEP.2011 15:38:43

8.4.11 Spurious RF conducted emission operating mode 3b

Op. Mode

op-mode 3b

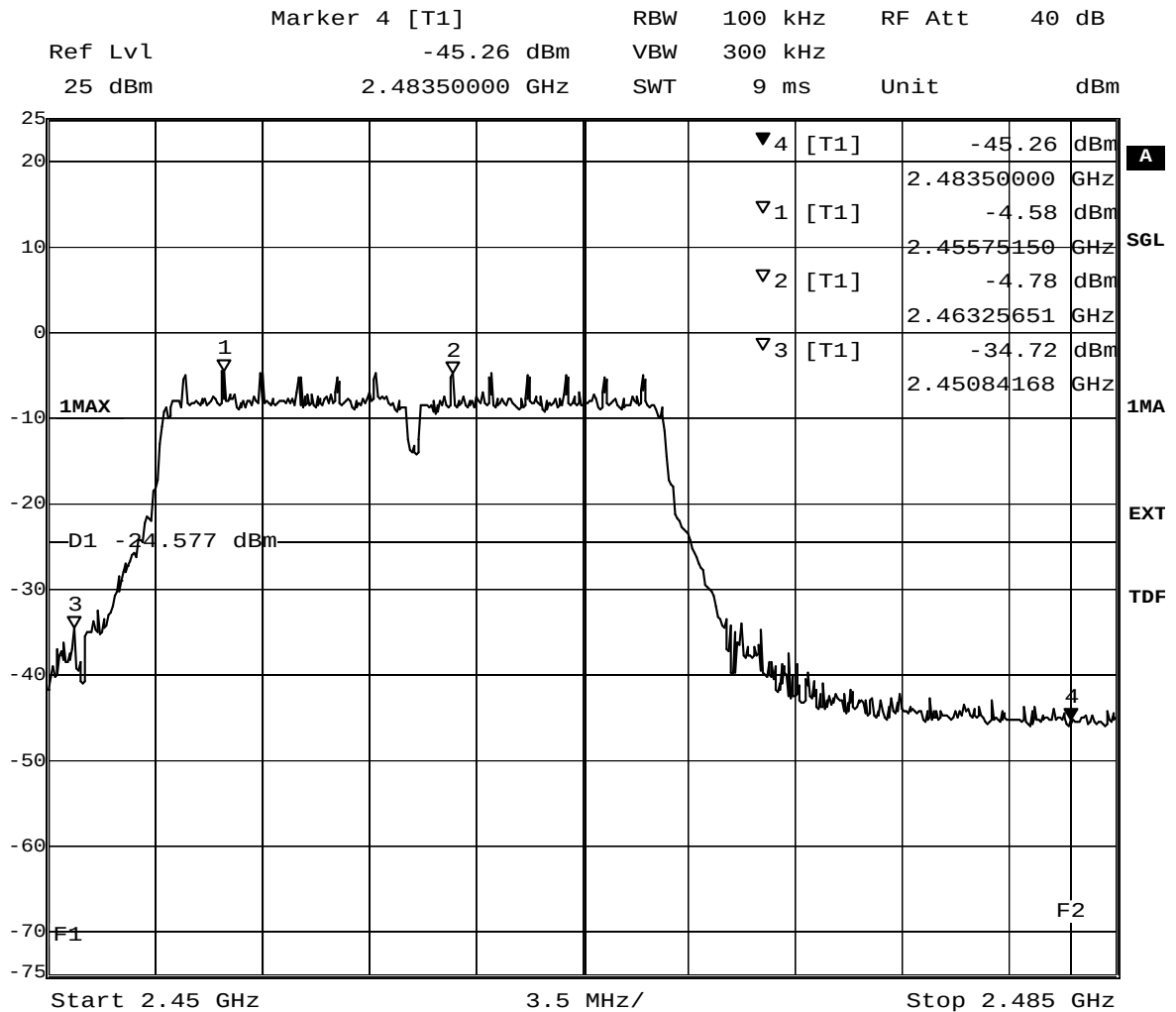


Title: spurious emissions
 Comment A: CH T: 2462 MHz
 Date: 29.SEP.2011 15:50:21

8.4.12 Band edge compliance conducted operating mode 3g

Op. Mode

op-mode 3g

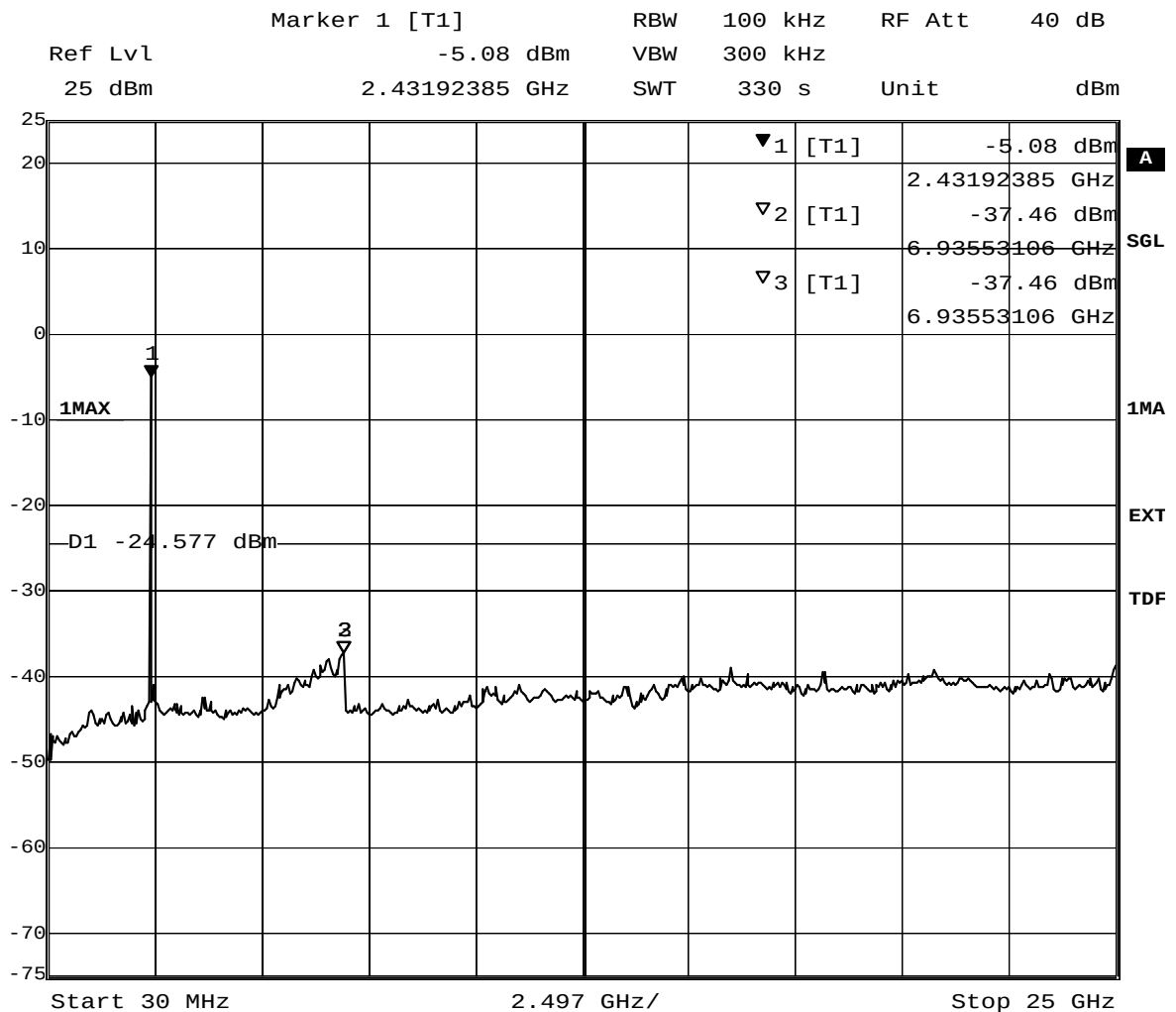


Title: Band Edge Compliance
 Comment A: CH T: 2462 MHz
 Date: 29.SEP.2011 14:55:29

8.4.13 Spurious RF conducted emission operating mode 3g

Op. Mode

op-mode 3g

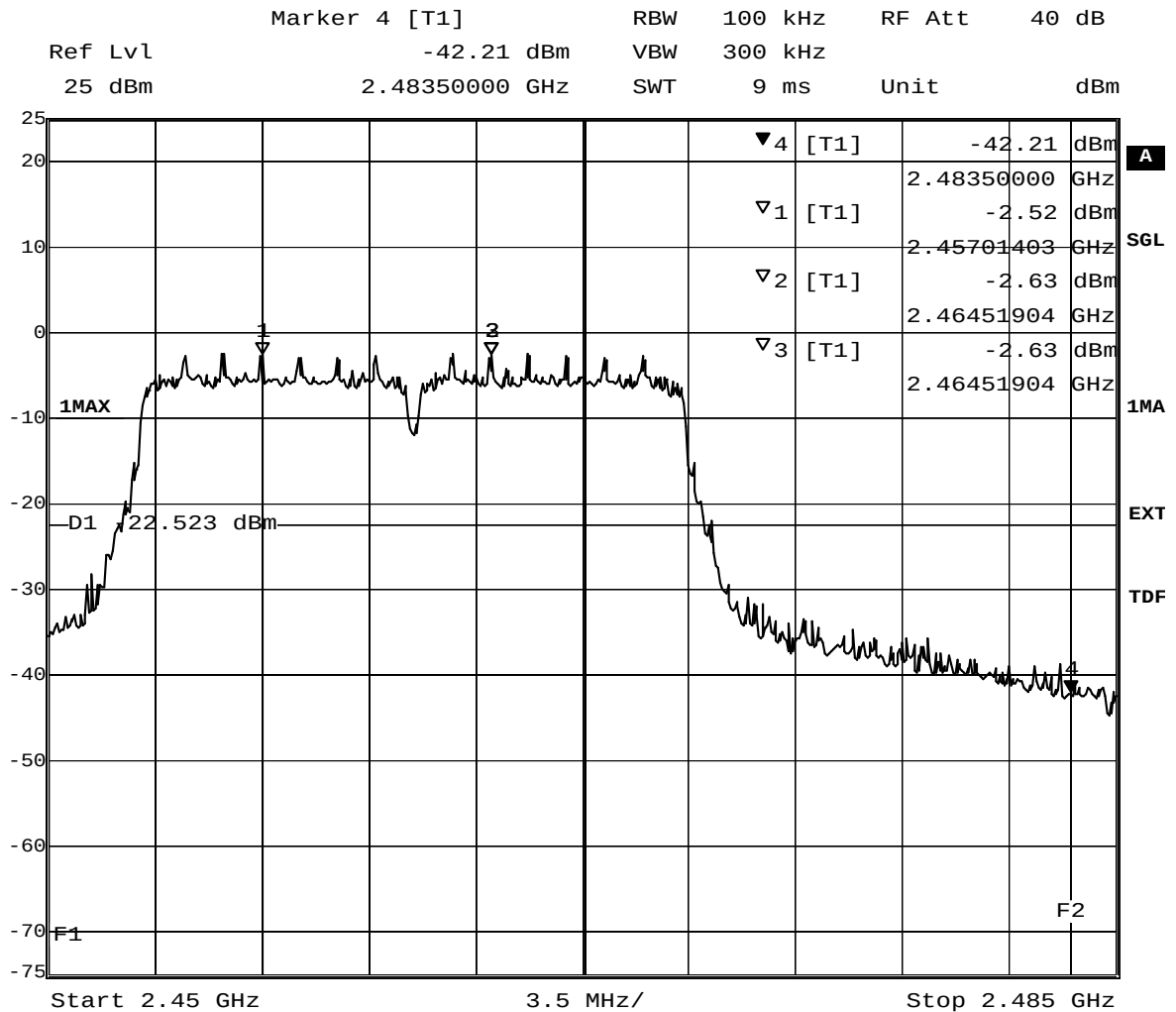


Title: spurious emissions
 Comment A: CH T: 2462 MHz
 Date: 29.SEP.2011 15:07:07

8.4.14 Band edge compliance conducted operating mode 3n

Op. Mode

op-mode 3n

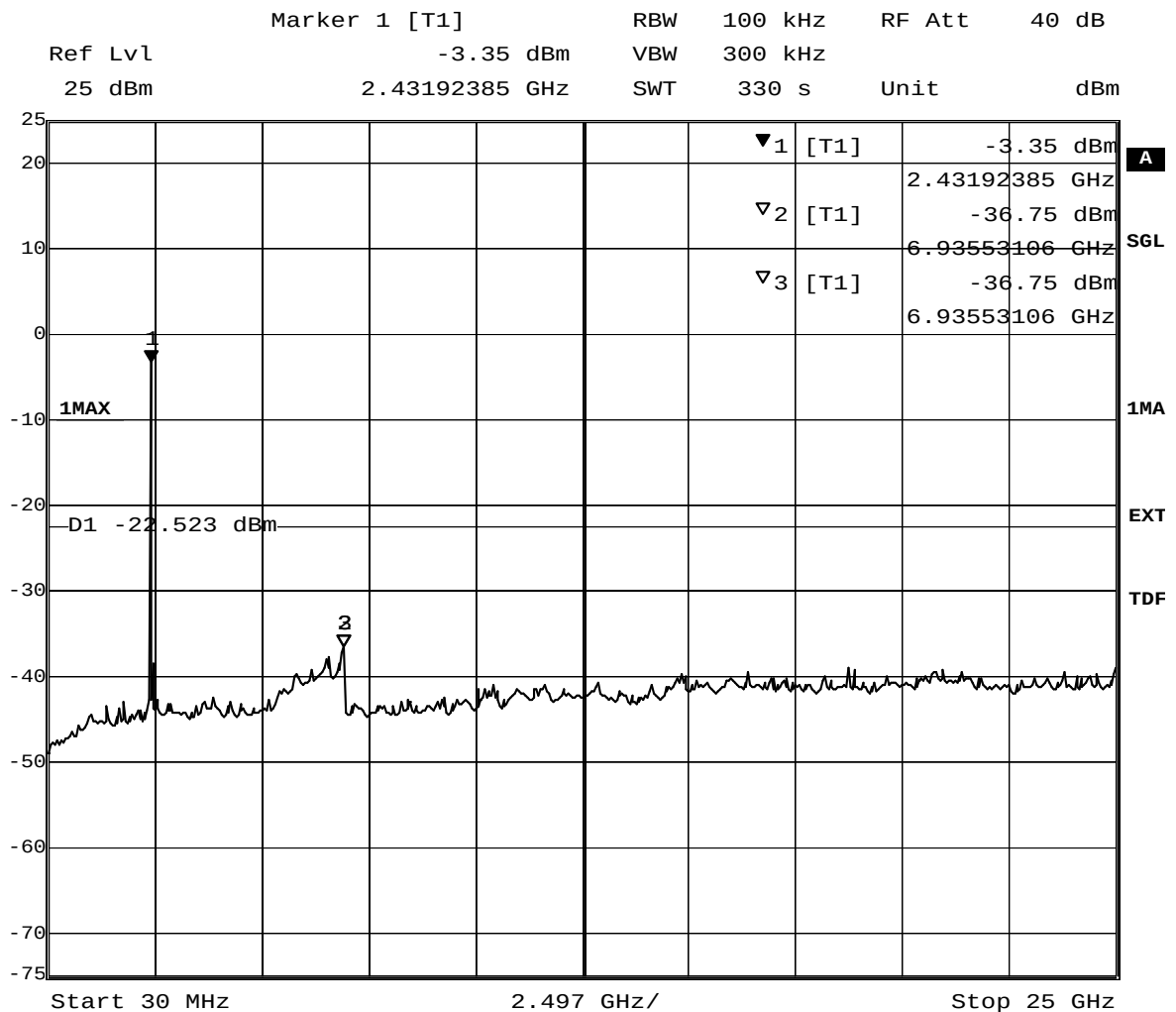


Title: Band Edge Compliance
 Comment A: CH T: 2462 MHz
 Date: 29.SEP.2011 11:44:10

8.4.15 Spurious RF conducted emission operating mode 3n

Op. Mode

op-mode 3n



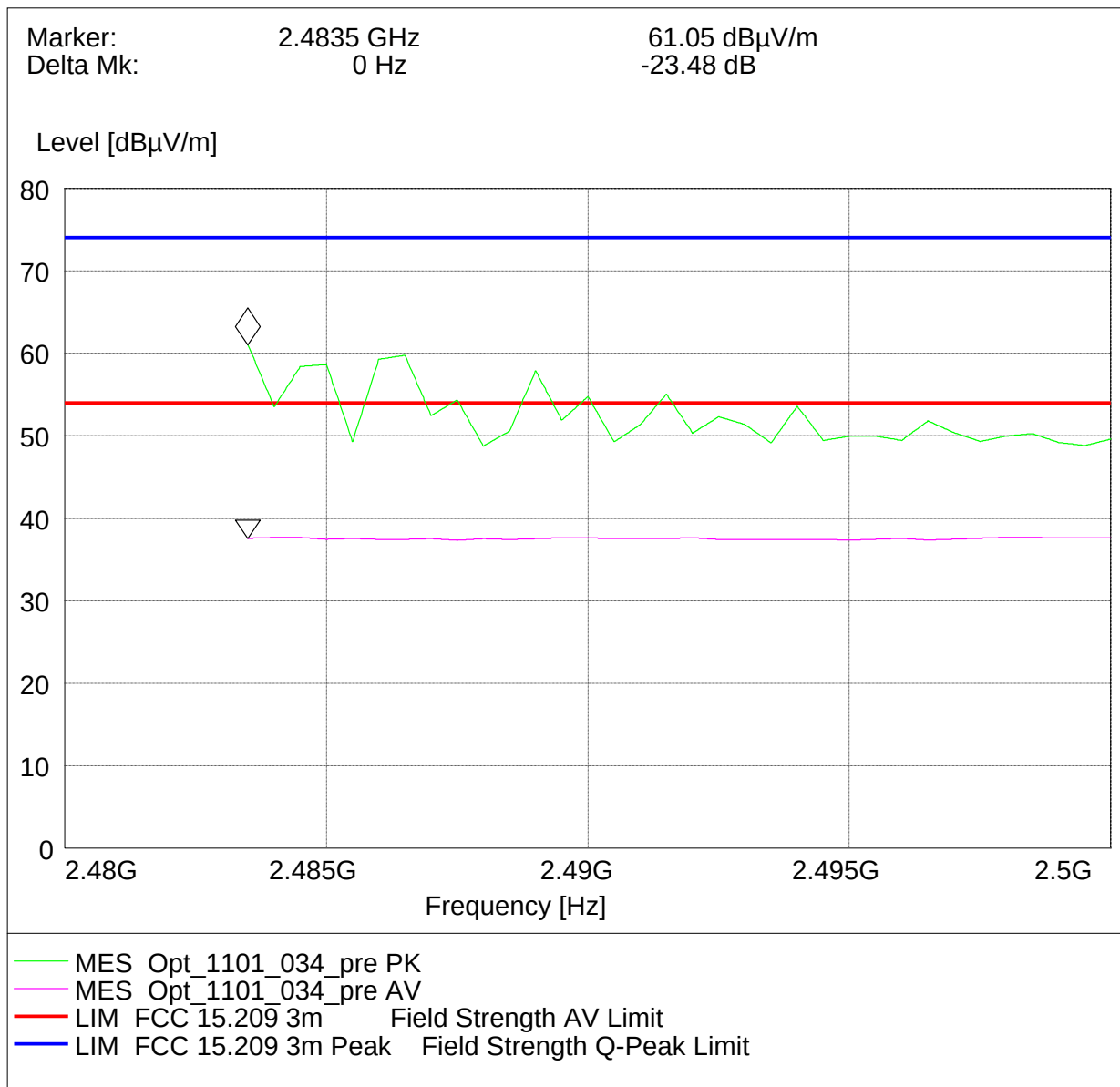
Title: spurious emissions
 Comment A: CH T: 2462 MHz
 Date: 29.SEP.2011 11:55:49

8.4.16 Band edge compliance radiated operating mode 3

Op. Mode higher band edge

op-mode 3b

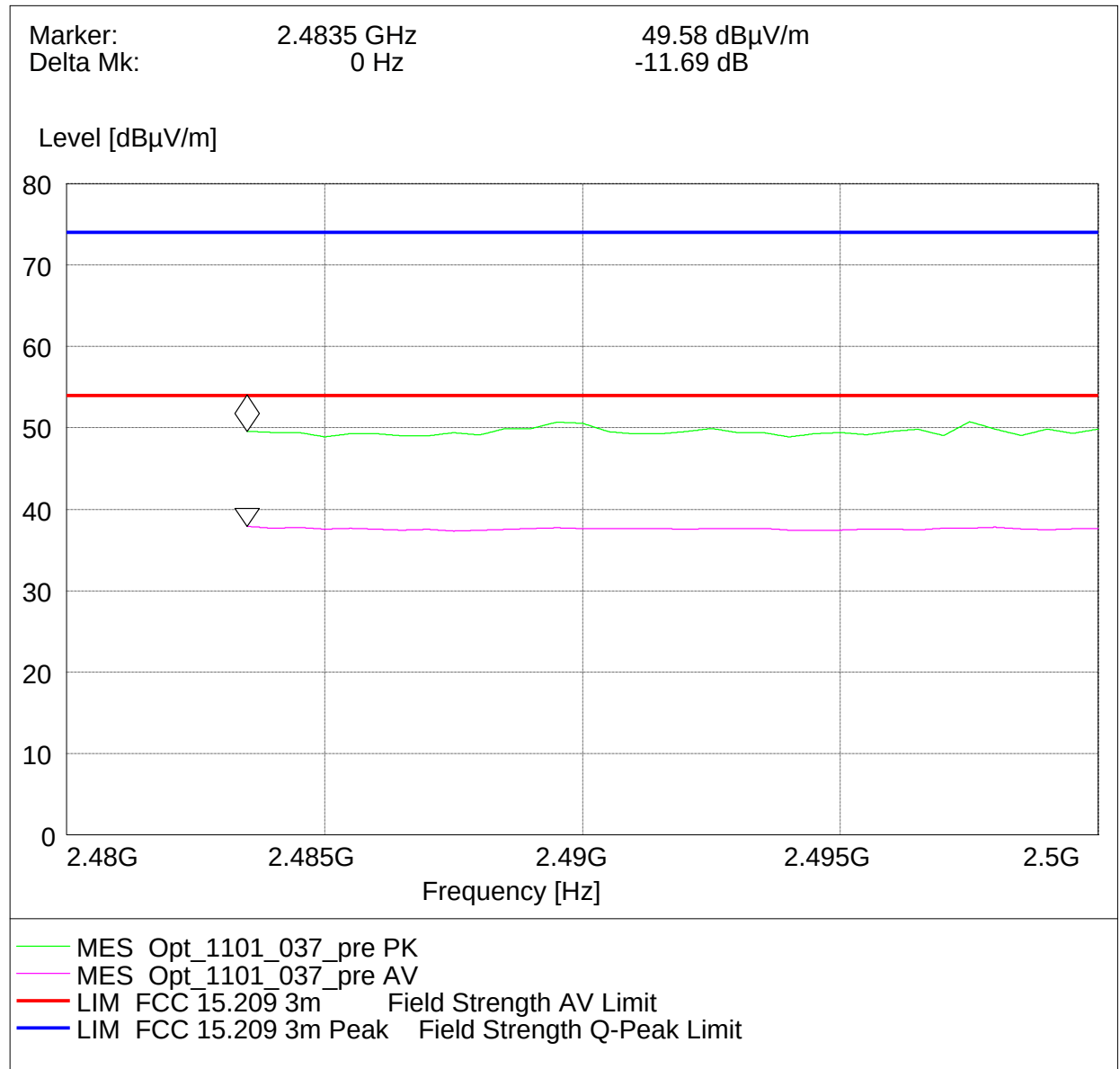
Radiated measurement



Op. Mode higher band edge

op-mode 3g

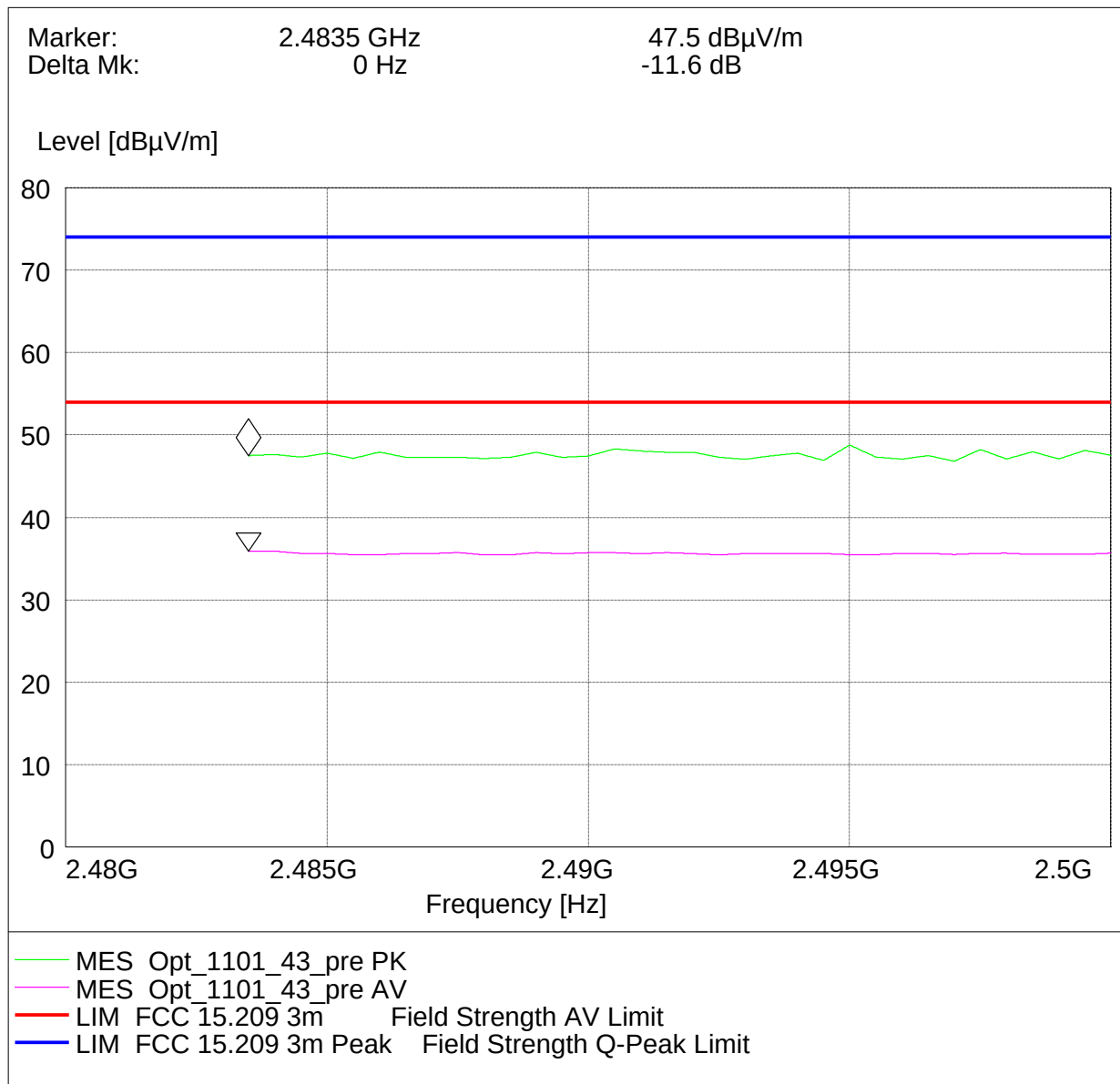
Radiated measurement



Op. Mode higher band edge

op-mode 3n

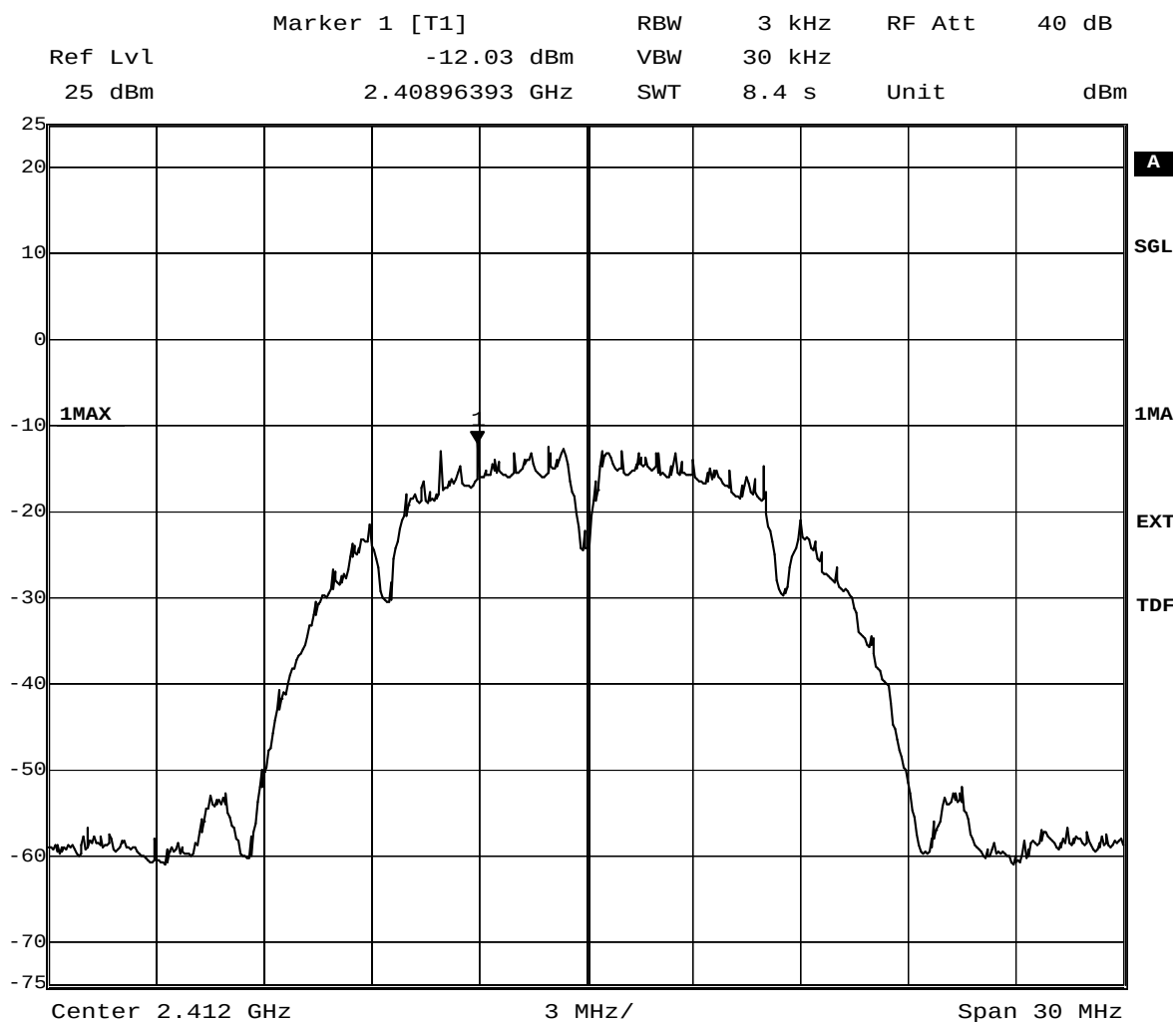
Radiated measurement



8.5 Power density

Op. Mode

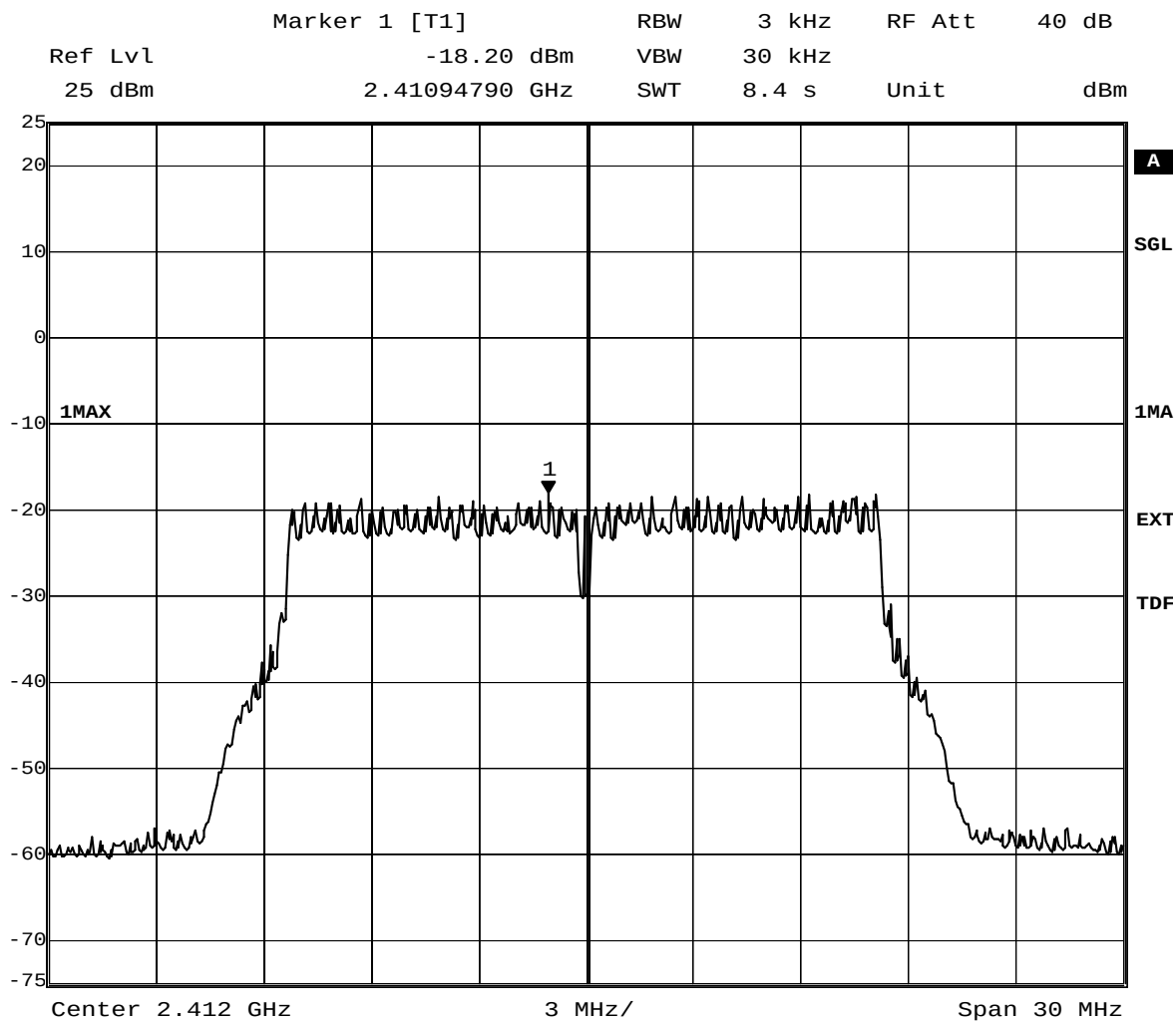
op-mode 1b



Title: Power Density
 Comment A: CH B: 2412 MHz;
 Date: 29.SEP.2011 17:15:45

Op. Mode

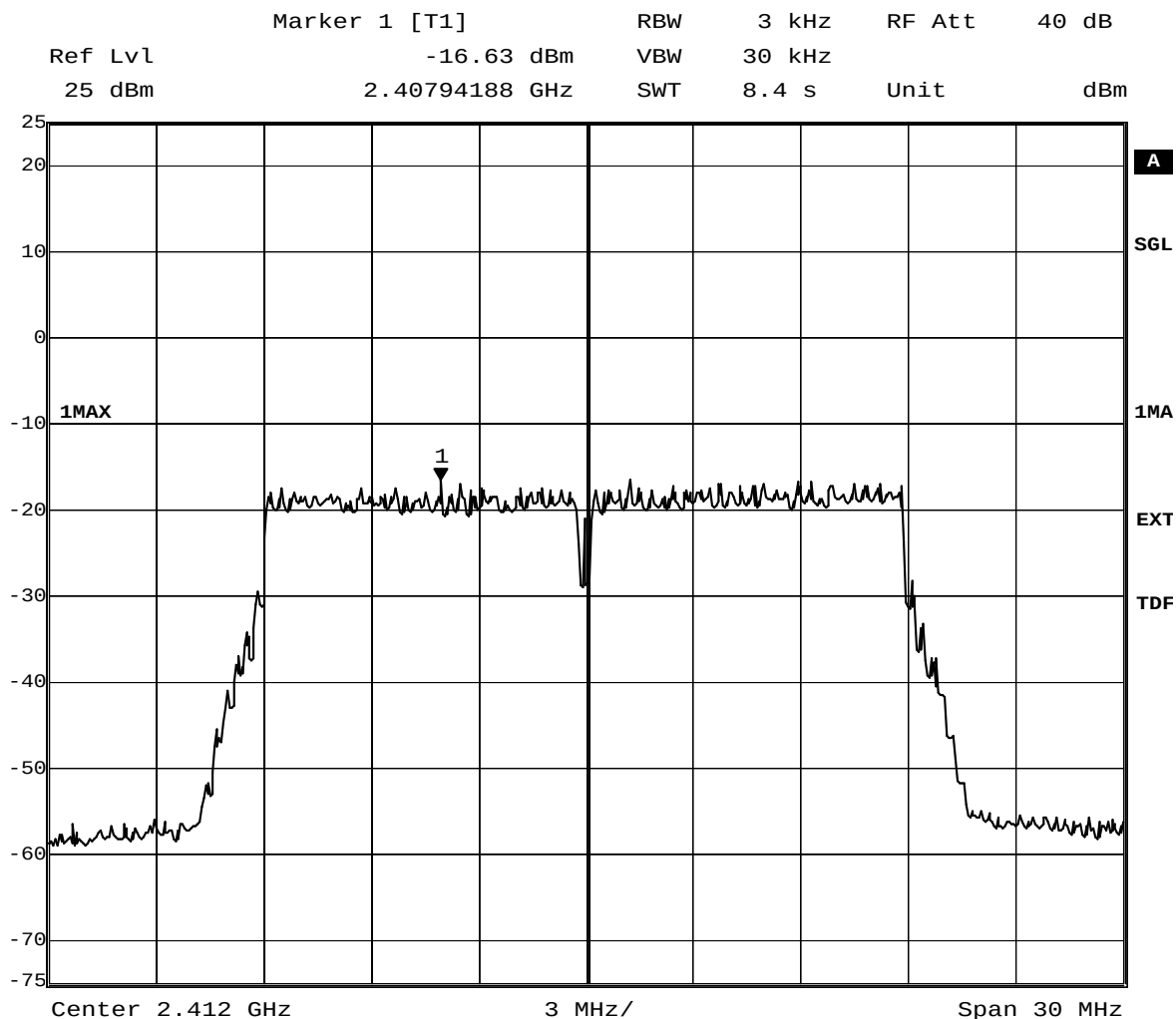
op-mode 1g



Title: Power Density
 Comment A: CH B: 2412 MHz;
 Date: 29.SEP.2011 14:18:14

Op. Mode

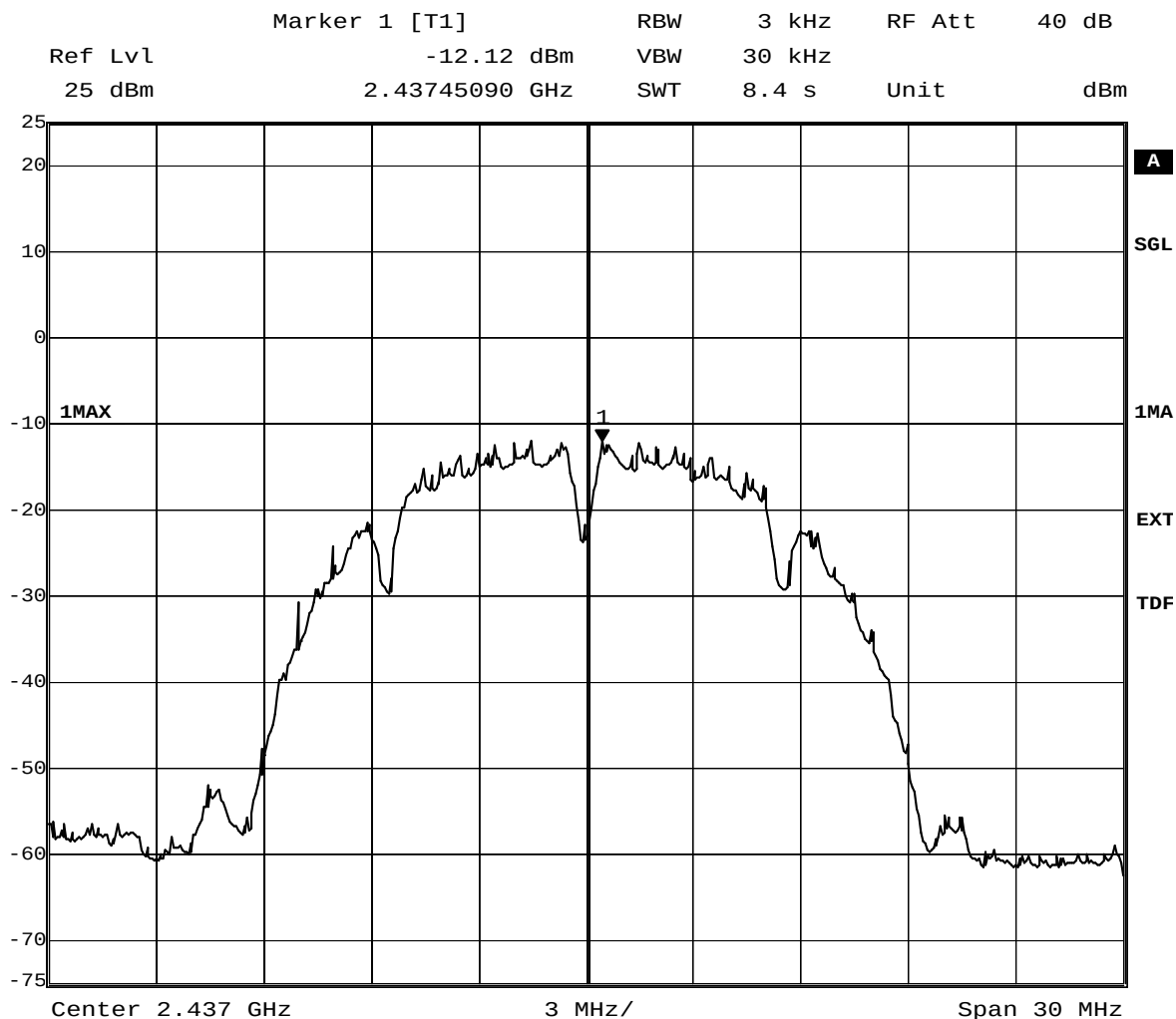
op-mode 1n



Title: Power Density
 Comment A: CH B: 2412 MHz;
 Date: 29.SEP.2011 13:38:37

Op. Mode

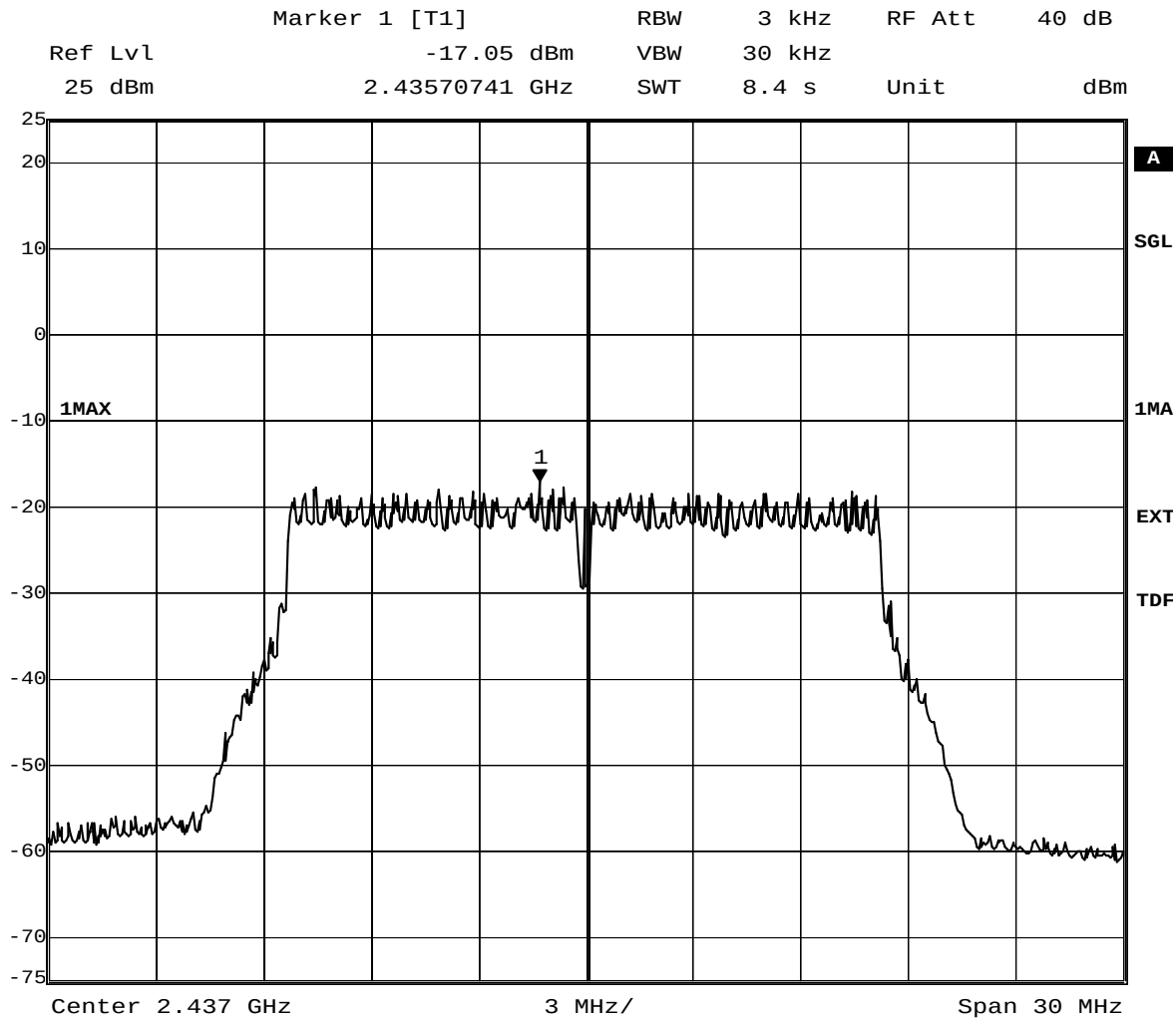
op-mode 2b



Title: Power Density
 Comment A: CH M: 2437 MHz;
 Date: 29.SEP.2011 16:41:04

Op. Mode

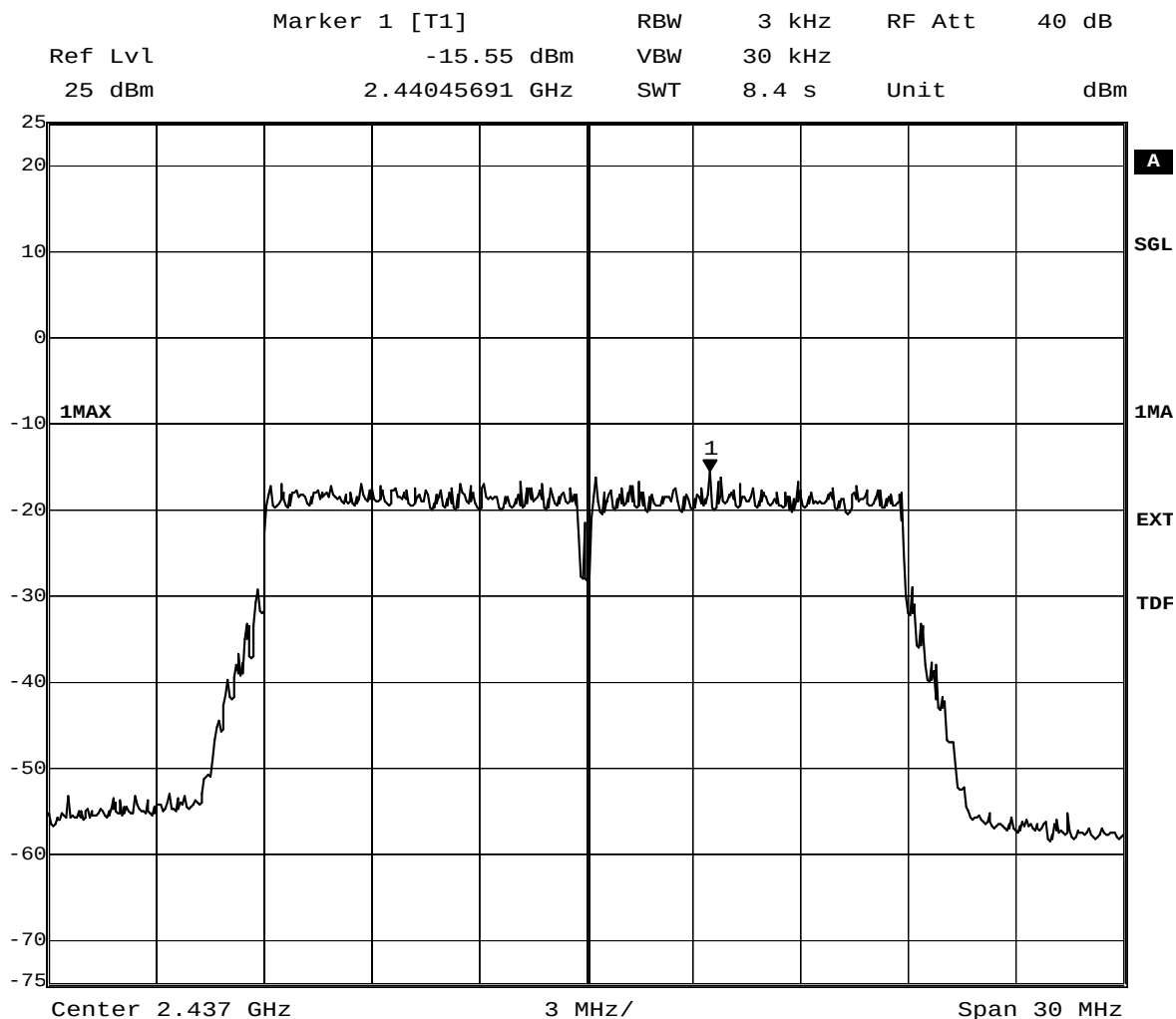
op-mode 2g



Title: Power Density
 Comment A: CH M: 2437 MHz;
 Date: 29.SEP.2011 14:51:34

Op. Mode

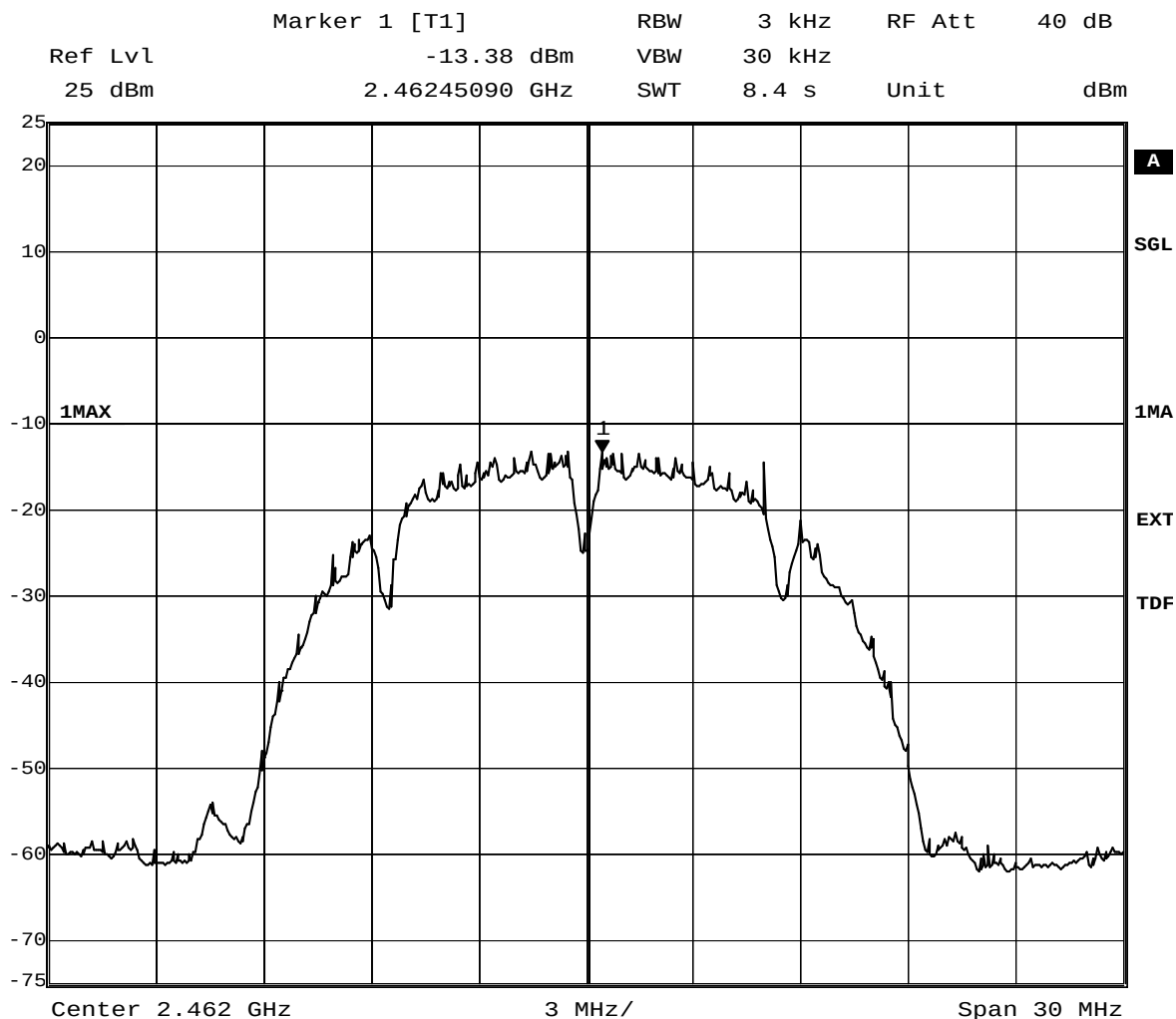
op-mode 2n



Title: Power Density
 Comment A: CH M: 2437 MHz;
 Date: 29.SEP.2011 12:46:10

Op. Mode

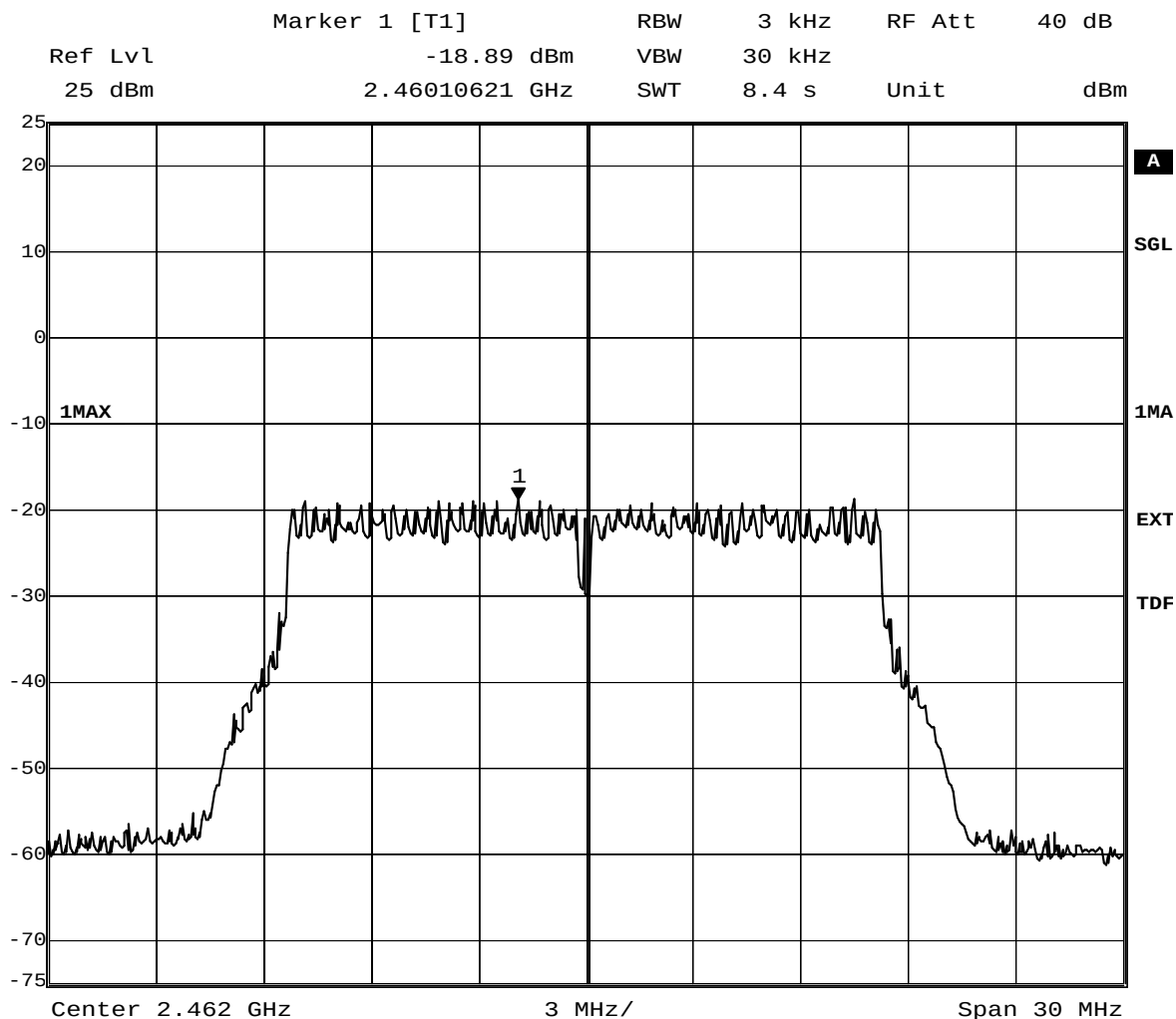
op-mode 3b



Title: Power Density
 Comment A: CH T: 2462 MHz;
 Date: 29.SEP.2011 16:07:33

Op. Mode

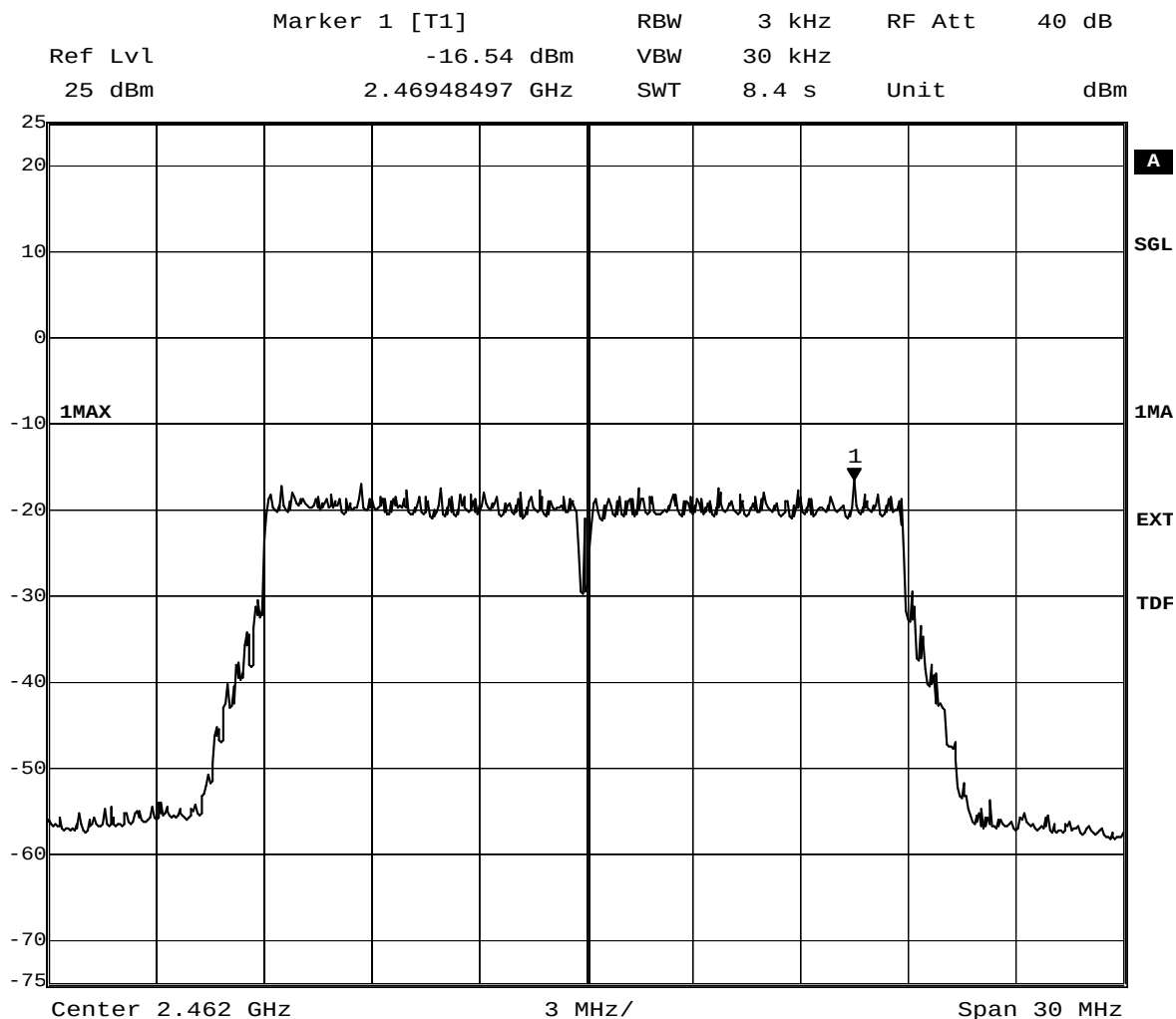
op-mode 3g



Title: Power Density
 Comment A: CH T: 2462 MHz;
 Date: 29.SEP.2011 15:23:43

Op. Mode

op-mode 3n



Title: Power Density
 Comment A: CH T: 2462 MHz;
 Date: 29.SEP.2011 12:12:18