TEST REPORT

Report Number: 3124659LAX-001
Project Number: 3124659
Report Date: June 29, 2007

Testing performed on the
Remote Control System with Bluetooth module
Model: REMOTE CONTROL SLAVE AND REMOTE CONTROL MASTER
FCC ID: VGESIGREM
IC ID: 7228A-SIGREM

to

FCC Part 15.247 and RSS-210 (Annex 8)

for
Advanced Medical Optics

A2LA Certificate Number: 2085-01

Test Performed by:	**Test Authorized by:**
Intertek Testing Services NA, Inc	Advanced Medical Optics
27611 La Paz Road, Suite C	1700 East Street Andrew Place
Laguna Niguel, CA 92604	Santa Ana, CA 92799 USA

Prepared by: _____ **Date:** June 29, 2007
Sergey Marker

Reviewed by: _____ **Date:** June 29, 2007
Suresh Kondapalli

Report No. 3124659LAX-001

Equipment Under Test:	Remote Control System with Bluetooth module
Trade Name:	Advance Medical Optics
Model No.:	REMOTE CONTROL SLAVE AND REMOTE CONTROL MASTER
FCC ID:	VGESIGREM
Applicant:	Advanced Medical Optics
Contact:	Mr. Fred Lee
Address:	1700 East Street Andrew Place Santa Ana, CA 92799
Country	USA
Tel. Number:	714-247-8578
Fax number:	714-247-8678
Applicable Regulation:	FCC Part 15, Subpart C RSS-210, Annex 8
Test Site Location:	27611 La Paz Road., Suite C Laguna Niguel, CA 92677
Date of Test:	June 20 - 29, 2007

We attest to the accuracy of this report:

Sergey Marker,
EMC Manager

Suresh Kondapalli
EMC team Leader

TABLE OF CONTENTS

1.0 Introduction

The Equipment under Test (EUT) is a Bluetooth module (Frequency Hopping 2.4 GHz transceiver) installed in the Remote Control System (master and slave). This report is designed to show compliance of the 2.4 GHz transceiver with FCC Part 15.247 and RSS-210, Annex 8 requirements.

1.1 Summary of Tests

Test	Reference FCC Subpart C	Reference RSS-210	RESULTS
Output power	15.247(b)	A8.4(2)	Complies
20-dB Bandwidth	15.247(a)(1)	A8.1(2)	Complies
Channel Separation	15.247(a)(1)	A8.1(2)	Complies
Number of Hopping Channels	15.247(a)(1)	A8.1(4)	Complies
Average Channel Occupancy Time	15.47(a)(1)	A8.1(4)	Complies
Out-of-band Antenna Conducted Emission	15.247(c)	A8.5	Complies
Out-of-Band Radiated Emission (except emissions in Restricted Bands)	15.247(c)	A8.5	Not Applicable, device passed out-of-band antenna conducted emission
Radiated Emission in Restricted Bands	15.247(c), 15.205	A8.5, 2.7	Complies
RF exposure	15.247(i)	RSS-102	Complies
AC Conducted Emission	15.207	RSS-Gen	Complies
Radiated Emission from Digital Parts and receiver	15.109	RSS-Gen	Complies
Antenna Requirement	15.203	RSS-Gen	Complies

2.0 General Description

2.1 Product Description

Overview of the EUT

Applicant	Advanced Medical Optics 1700 East Street Andrew Place Santa Ana, CA 92799 USA
Manufacturer name & address	Advanced Medical Optics 1700 East Street Andrew Place Santa Ana, CA 92799 USA
Model Number	*Remote Control Slave & *Remote Control Master
FCC Identifier	VGESIGREM
IC Identifier	N/A
Manufacturer & Model of Spread Spectrum Module	National Semiconductor LMX9820A
Type of Transmission	Spread Spectrum, Frequency Hopping
Rated RF Output	1.26 mW
Frequency Range	2402-2480 MHz
Number of Channel(s)	79
Modulation Type	GFSK
Data Rate	704 kbps
Antenna(s) type & Gain	Patch antenna, gain = 1.8 dBi, fixed internal module

*Both, Remote Control Master and Remote Control Slave are transceivers

A production version of the sample was received on June 18, 2007 in good condition. As declared by the Applicant, it is identical to production units.

Test start date: June 19, 2007
Test end date: June 29, 2007

2.2 Related Submittal(s) Grants

None

2.3 Test Methodology

Radiated and AC Line conducted emissions measurements were performed according to the procedures in ANSI C63.4 (2003) and RSS-210. Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the **"Data Sheet"** of this Application. All other measurements were made in accordance with the procedures described in DA 00-705.

2.4 Test Facility

The test facility was a specially designed and constructed Open Area Test Site (OATS).
Test site included a metal ground plane constructed of 22-gauge sheet metal. It contained a 2.5 meter diameter turntable for floor standing equipment, and a fiber glass table measuring 1.5 x 1.5 x 0.8 meters for table top equipment. To facilitate testing, also it has heat and air conditioning systems to control environmental test conditions.
This test facility and site measurement data have been fully placed on file with the FCC, Industry of Canada and A2LA accredited.

Test Facility: Intertek ETL Semko
27611 La Paz Road, Suite C
Laguna Niguel, CA 92677

Accreditations:

FCC	Registration Number: 90711
A2LA	Certificate Number: 2085-01
IC	Reference Number: IC 3753

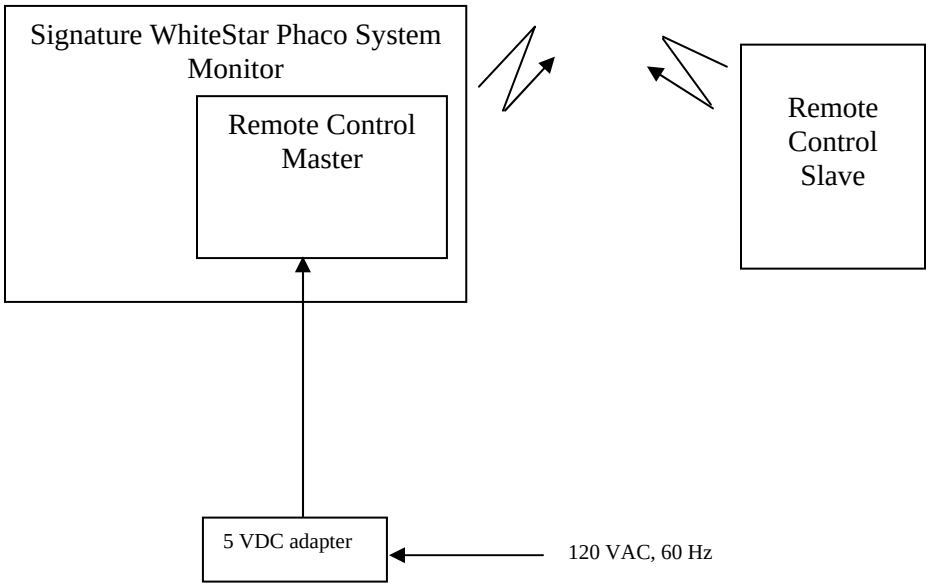
3.0 System Test Configuration

3.1 Equipment under Test and Support Equipment

Equipment Under Test		
Description	**Model Number**	**Serial Number**
Remote Control Slave (slave)	Remote Control Slave	N/A
Remote Control Master (master)	Remote Control Master	N/A

Item #	**Support Equipment**	
	Description	**Model No.**
1	Laptop	Compaq N610C
2	I.T.E Power Supply, 5 VDC	HK-A509-A05
3	Phaco System	Signature WhiteStar

3.2 Block Diagram of Test Setup



Note: Both, Remote Control Master and Remote Control Slave are transceivers

S = Shielded **U** = Unshielded	**F** = With Ferrite **m** = Length in Meters

3.3 Justification

For radiated emission measurements the EUT is placed on a non-conductive table. The EUT is attached to peripherals and they are connected and operational (as typical as possible). The EUT is wired to transmit full power. During testing, all cables are manipulated to produce worst-case emissions.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. All readings are extrapolated back to the equivalent three-meter reading using inverse scaling with distance.

Due to the fact that the schematics of both transceivers are identical, conducted tests on the transmitter were performed on one EUT. Radiated tests were performed on both EUT

3.4 Software Exercise Program

The EUT exercise program used during radiated and conducted testing, which exercised the various system components in a manner similar to a typical use.

3.5 Mode of Operation During Test

In normal operation the Remote Control Master powered from Signature White Star Phaco System's internal power supply. For testing purpose 5 VDC AC adapter was used. The Remote Control Slave was powered from rechargebal internal battaries.
The transmitter was tested in test mode (simulating the normal operation) which allows to control the device from a computer (laptop). With hopping disable, the EUT was setup to transmit continuously at the lowest, middle, and highest channels (frequencies). Some tests were performed with hopping enabled.

3.6 Modifications Required for Compliance

No modifications were installed by Intertek Testing Services during compliance testing in order to bring the product into compliance (Please note that this list does not include changes made specifically by AMO prior to compliance testing).

4.0 Measurement Results

4.1 Conducted Output Power at Antenna Terminals
FCC 15.247(b)(1)

4.1.1 Requirements

For systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, the maximum peak output power is 1 watt (30 dBm), for all other systems 0.125 W (21 dBm).

4.1.2 Test Procedure

The temporary antenna port of the EUT was connected to the input of a spectrum analyzer. Power was read directly and cable loss correction was added to the reading to obtain the power at the EUT antenna terminal.

In addition, the Power Density was measured with resolution bandwidth of 3 kHz.

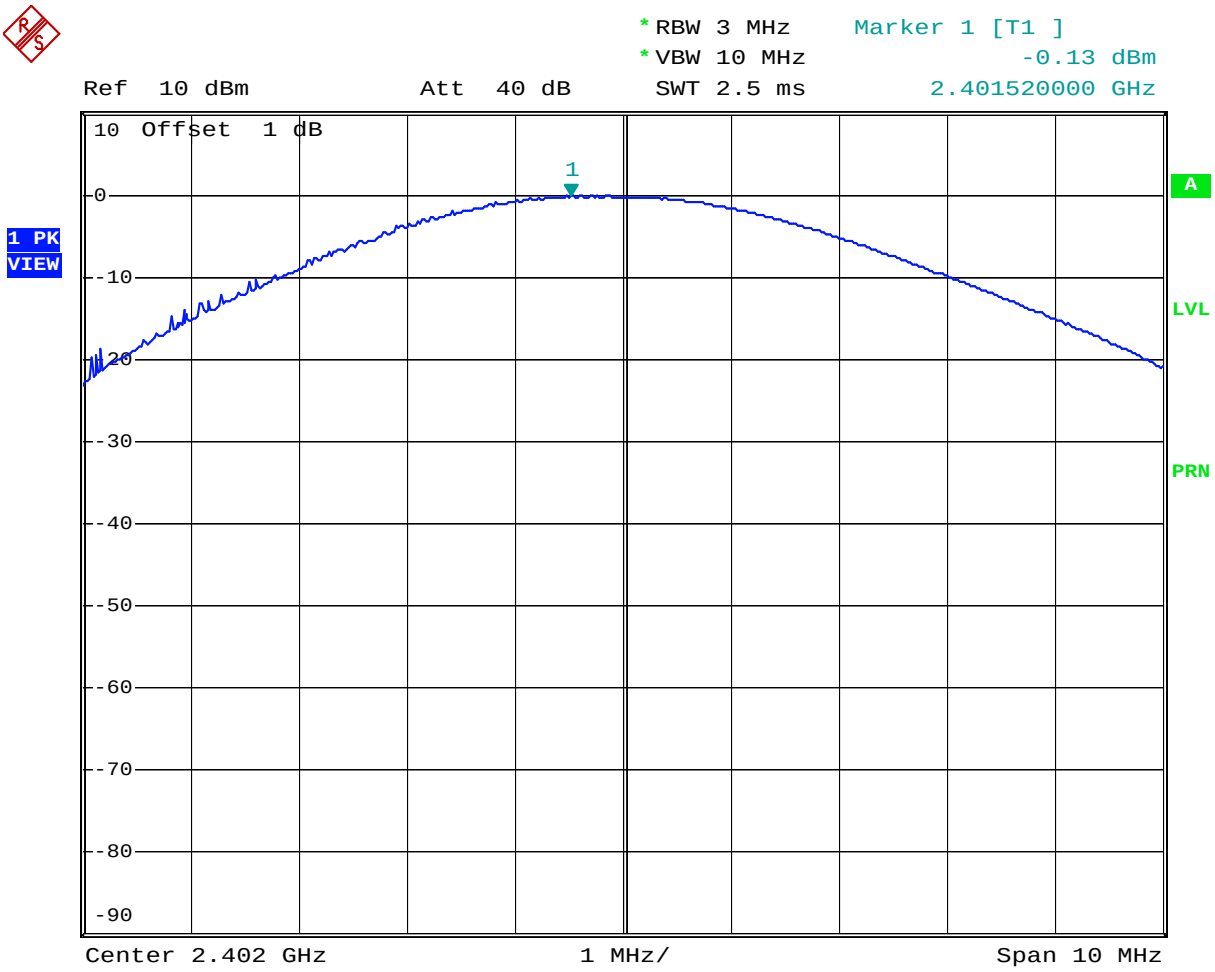
4.1.3 Test Results

Frequency (MHz)	Output in dBm	Output in mW	Plot number
2402	-0.13	0.97	1.1
2441	-0.33	0.93	1.2
2480	-0.67	0.86	1.3

Notes: 1. Hopping function was disabled during the test.
2. The EUT's antenna has less than 6 dBi gain.

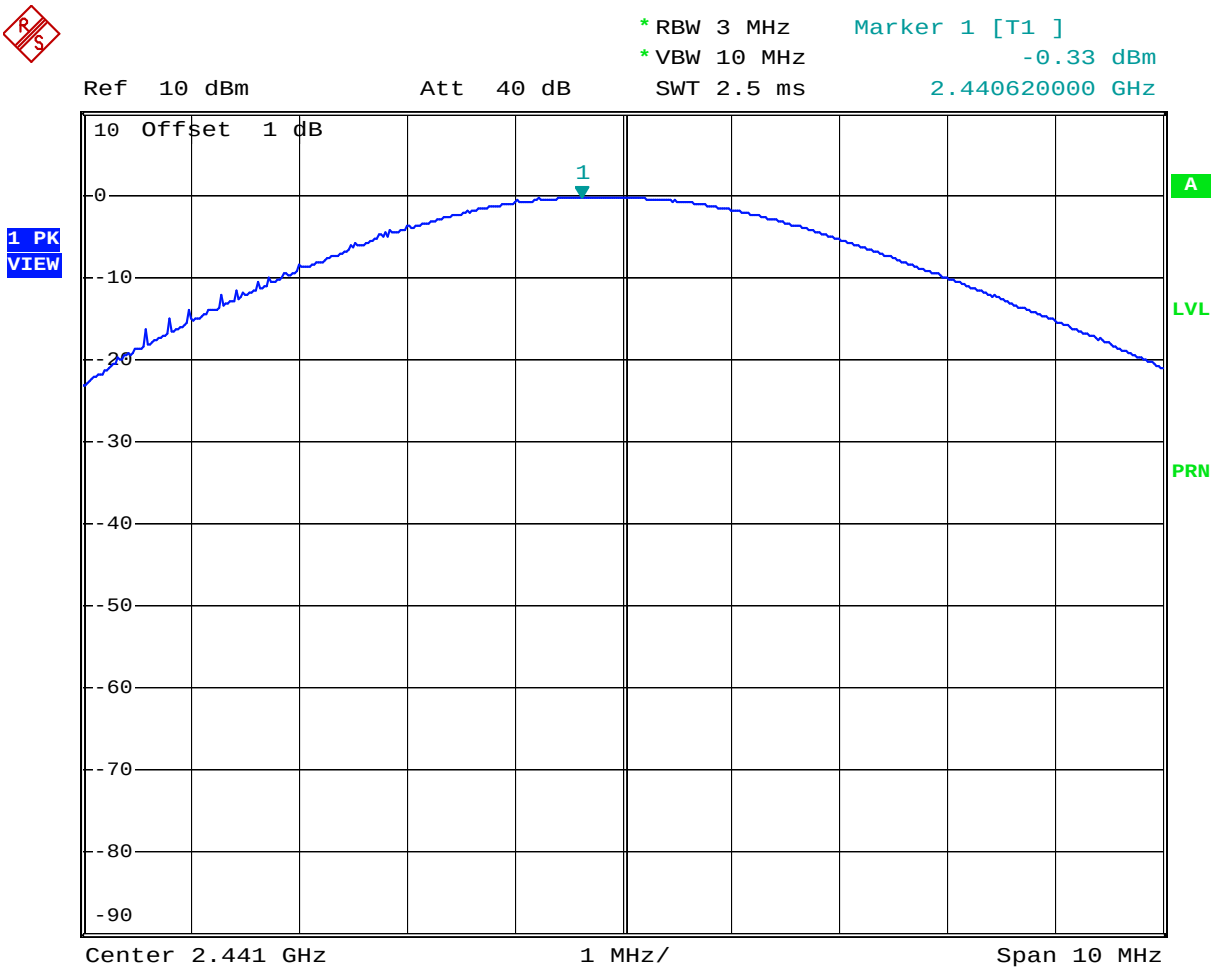
The Power Density in 3 kHz resolution bandwidth was measured as –3.29 dBm (see plots 1.4 – 1.6)

Plot 1.1



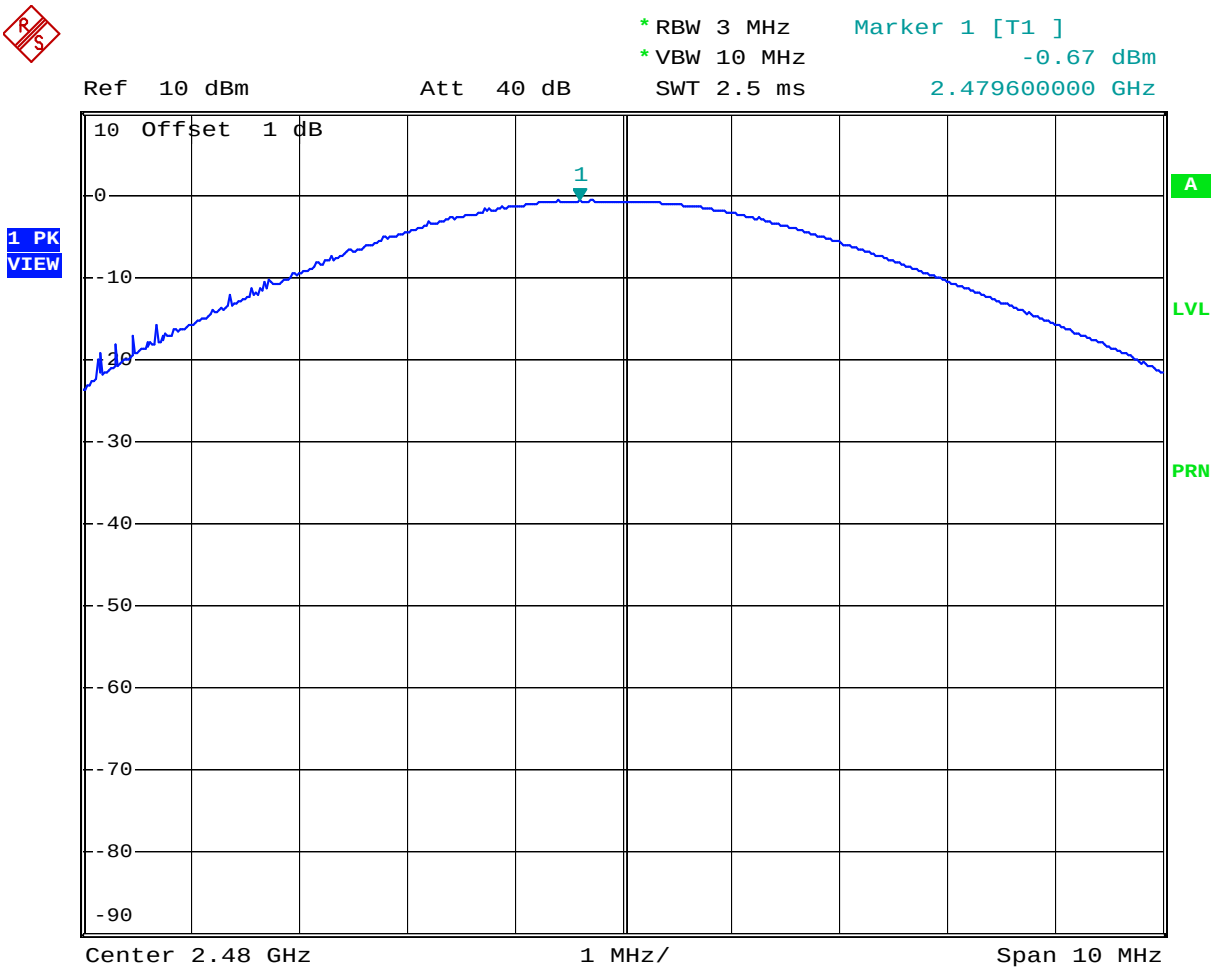
Comment: Peak Output Power
Date: 20.JUN.2007 12:00:23

Plot 1.2



Comment: Peak Output Power
Date: 20.JUN.2007 13:36:47

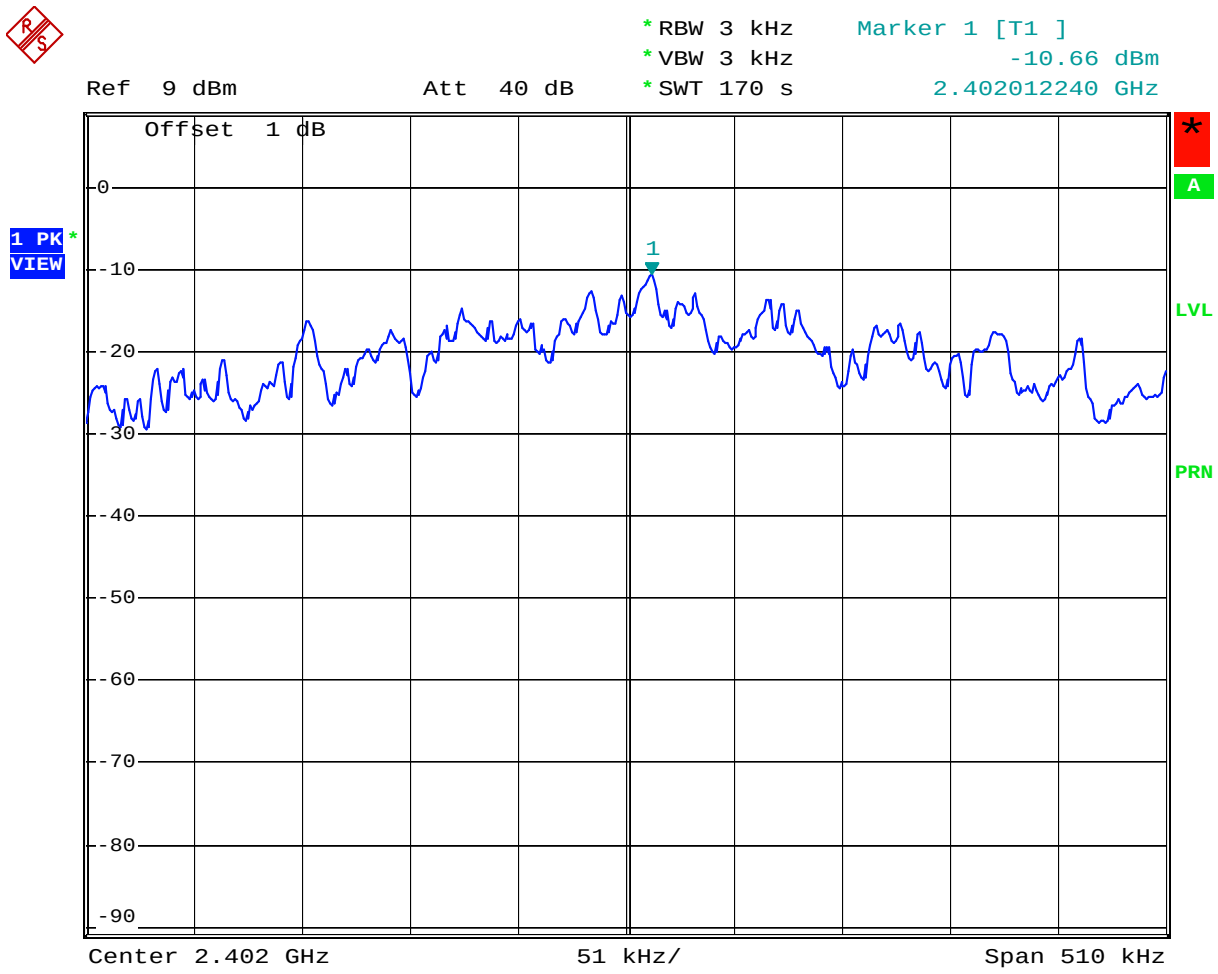
Plot 1.3



Comment: Peak Output Power
Date: 20.JUN.2007 13:32:21

Power Density

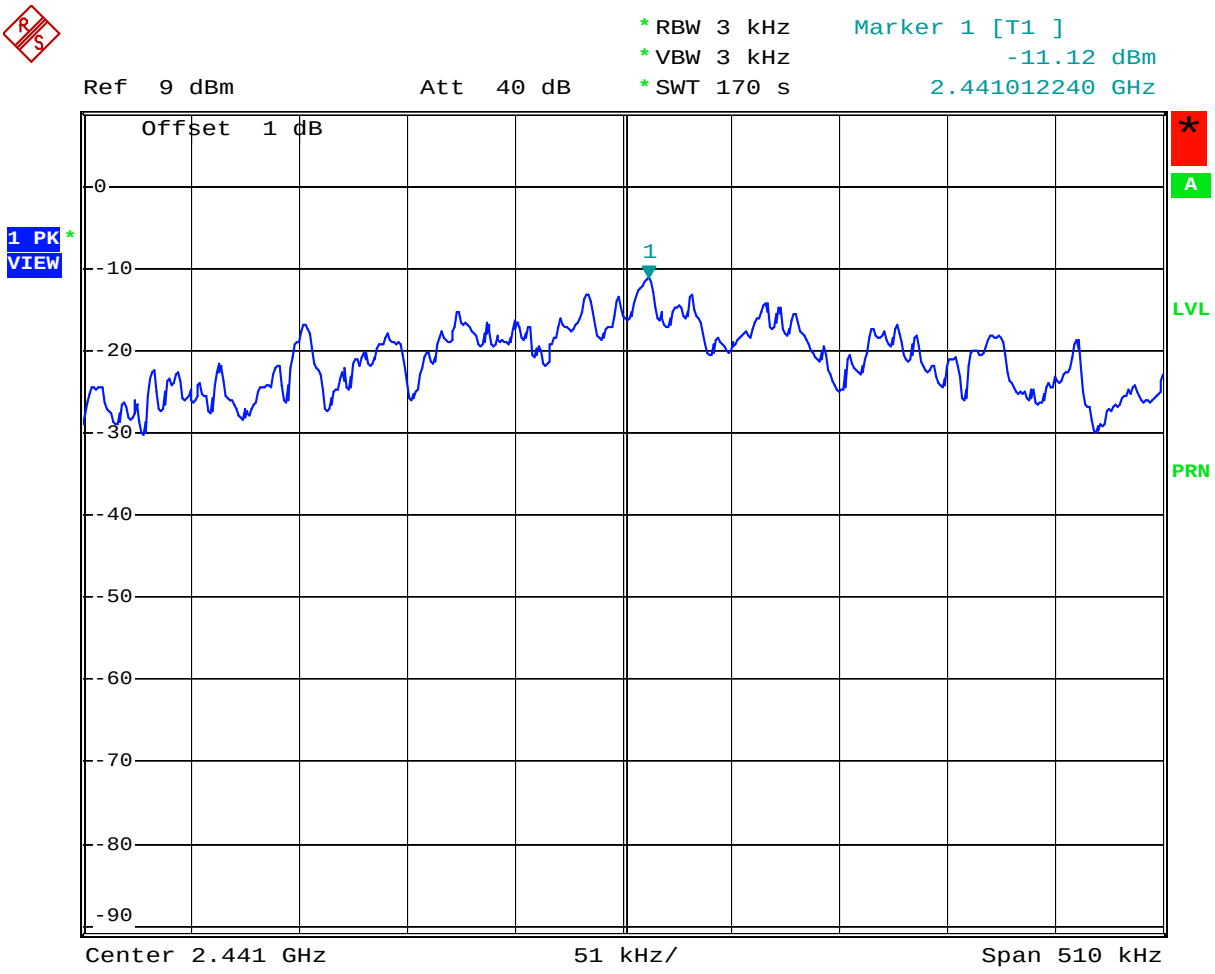
Plot 1.4



Comment: Power Density 2.402
Date: 19.JUN.2007 17:13:30

Power Density

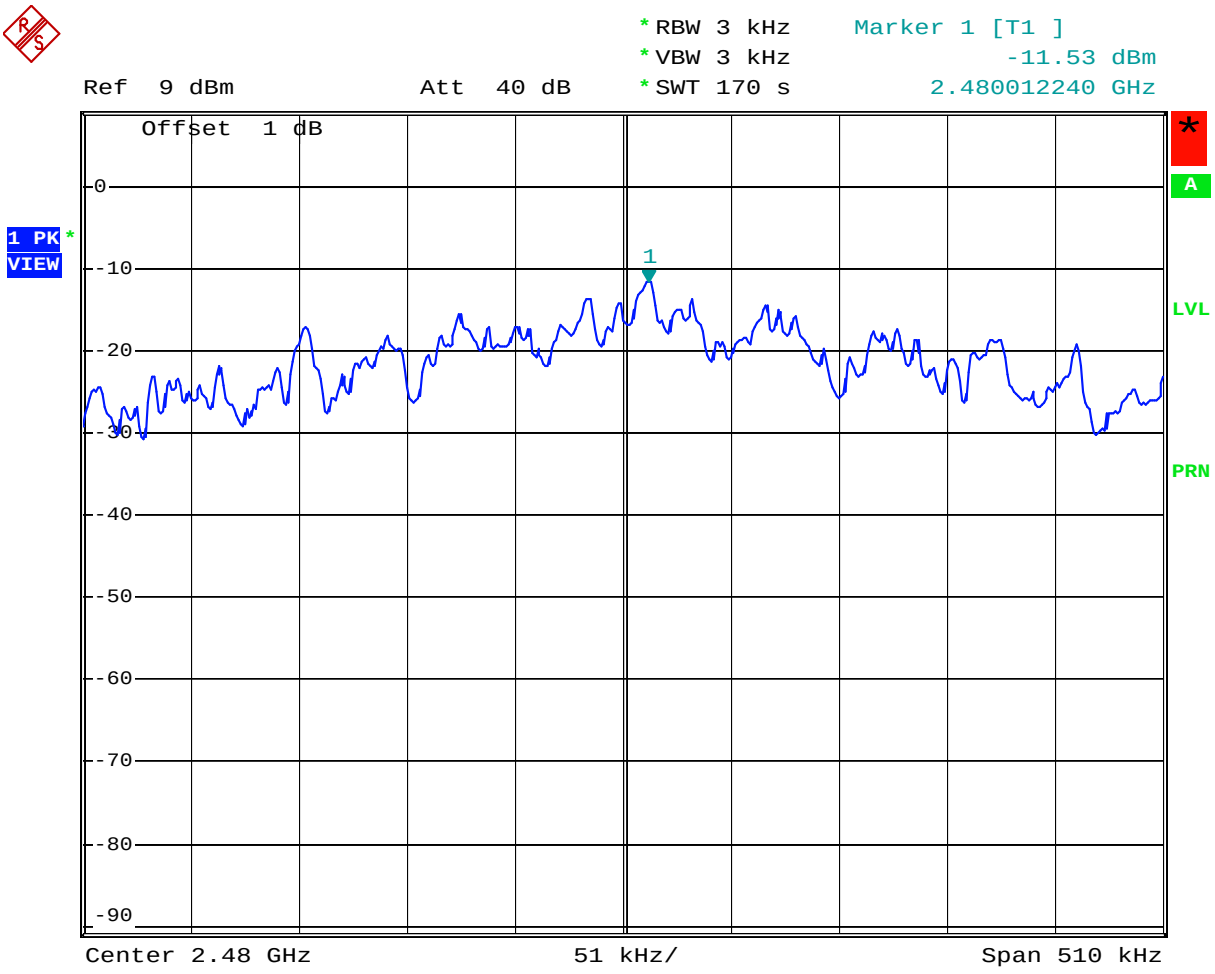
Plot 1.5



Comment: Power Density 2.441
Date: 19.JUN.2007 17:18:04

Power Density

Plot 1.6



Comment: Power Density 2.480
Date: 19.JUN.2007 17:22:36

4.2 Hopping Channel 20-dB Bandwidth
FCC 15.247(a)

4.2.1 Test Procedure

The antenna port of the EUT was connected to the input of a spectrum analyzer.
The spectrum analyzer resolution bandwidth was set to approximately 1% of the 20-dB Bandwidth. The 20-dB Bandwidth was measured by using the DELTA MARKER function of the analyzer.

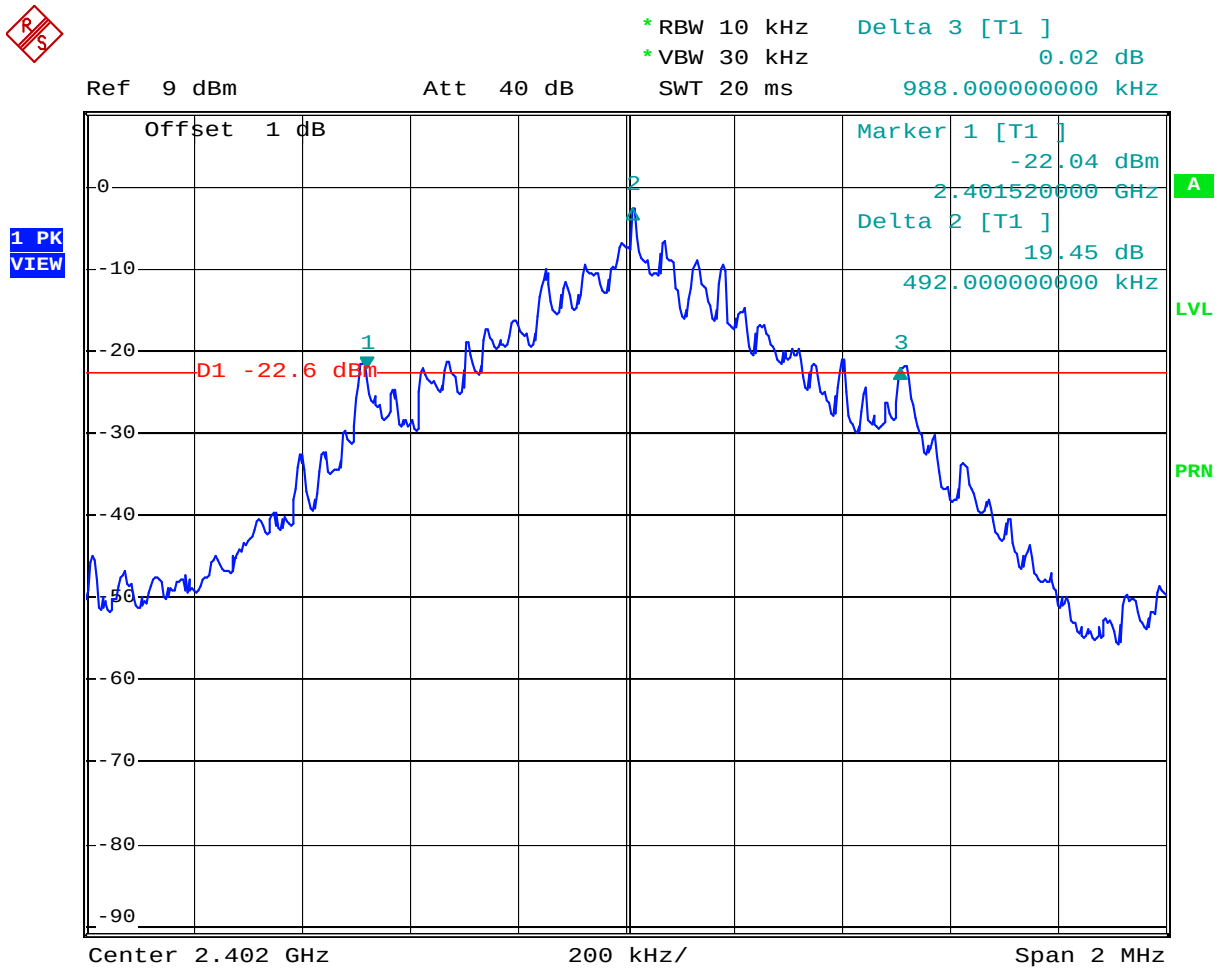
In addition, the occupied bandwidth (99%) was measured at the middle channel.

4.2.2 Test Results

Frequency (MHz)	20-dB channel bandwidth (MHz)	Plot
2402	0.988	2.1
2440	0.988	2.2
2480	0.996	2.3

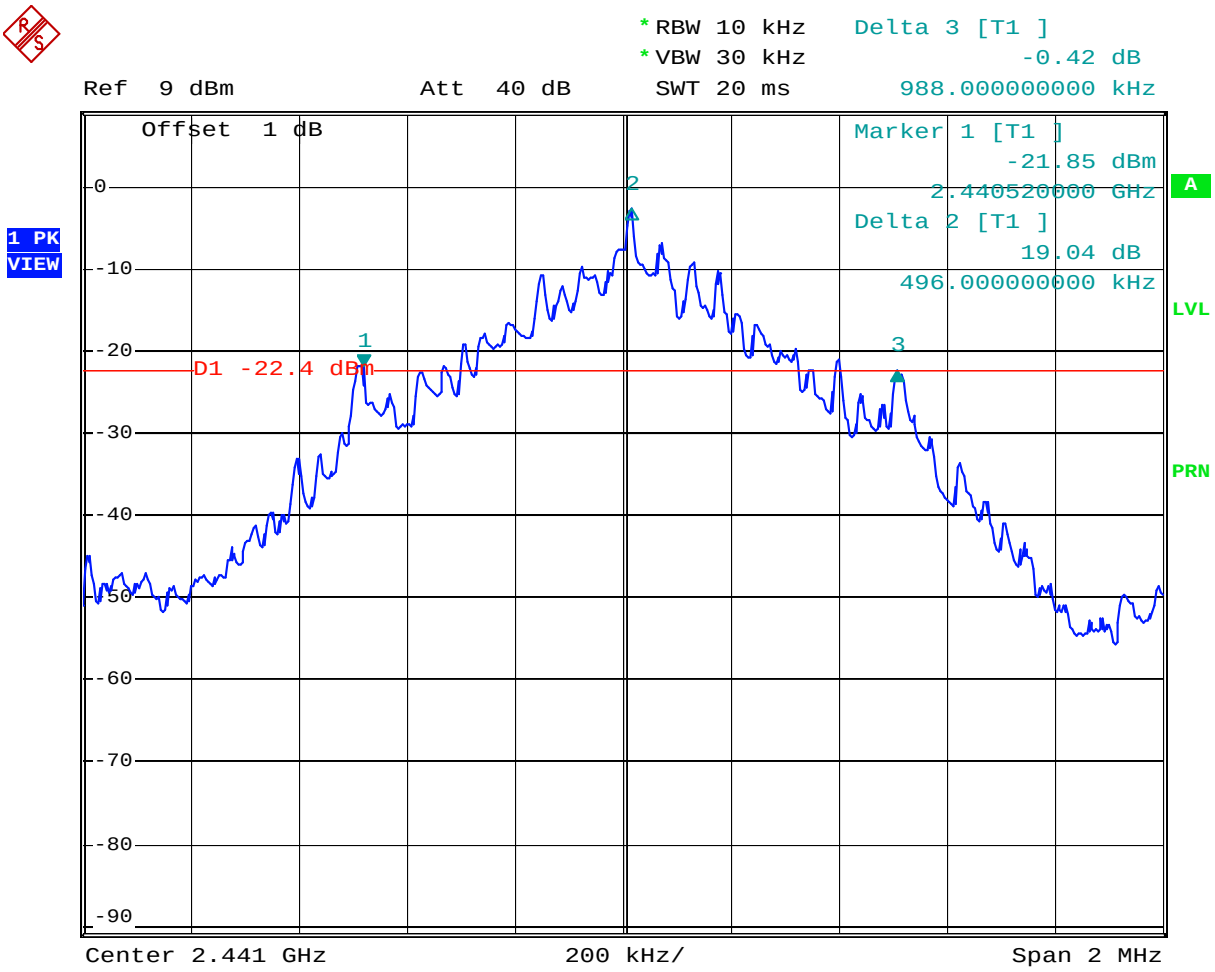
The 99% occupied bandwidth was measured as 0.976 MHz (see plot #2.4)

Plot 2.1



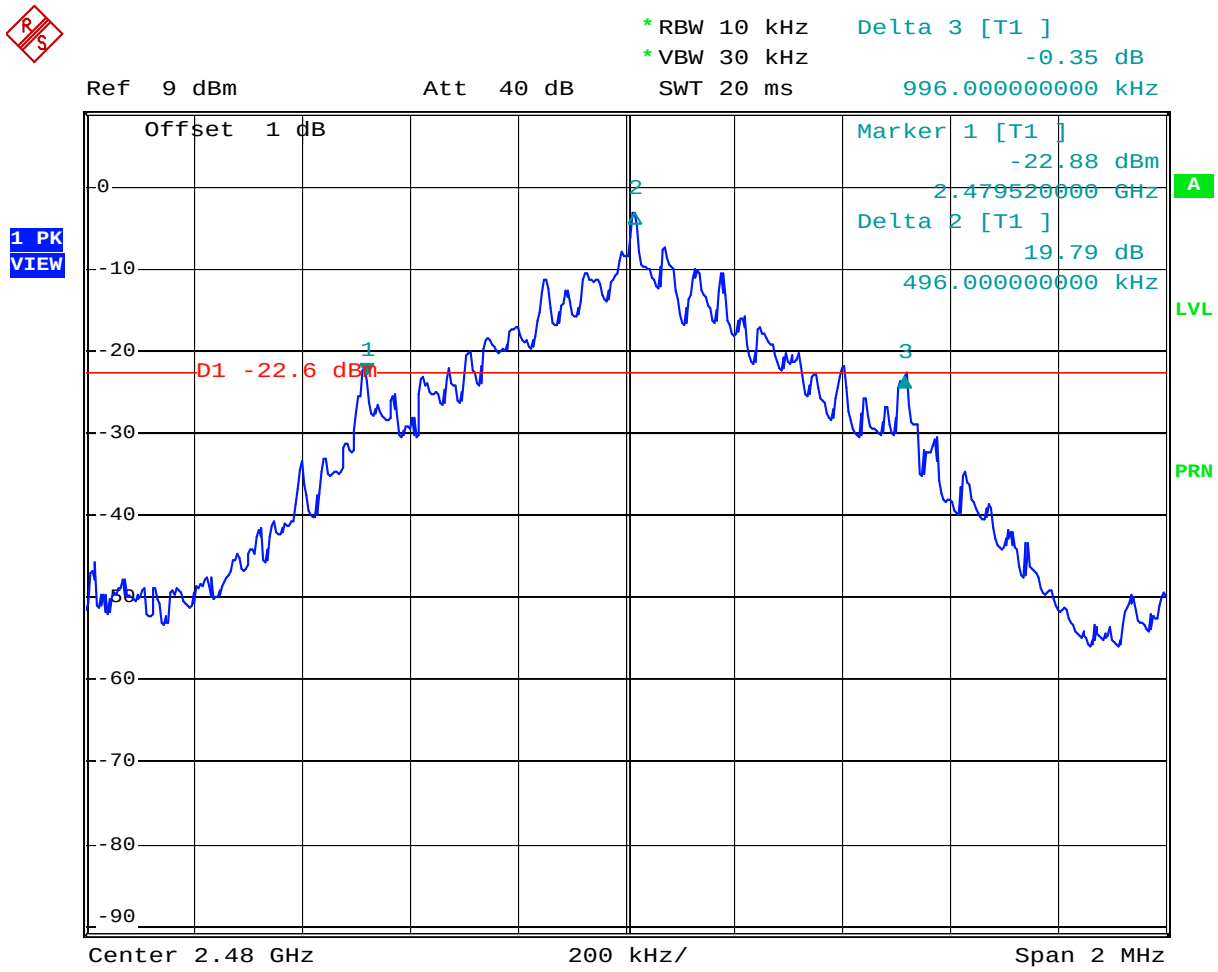
Comment: 20 dB OBW 2.402
Date: 20.JUN.2007 09:15:26

Plot 2.2



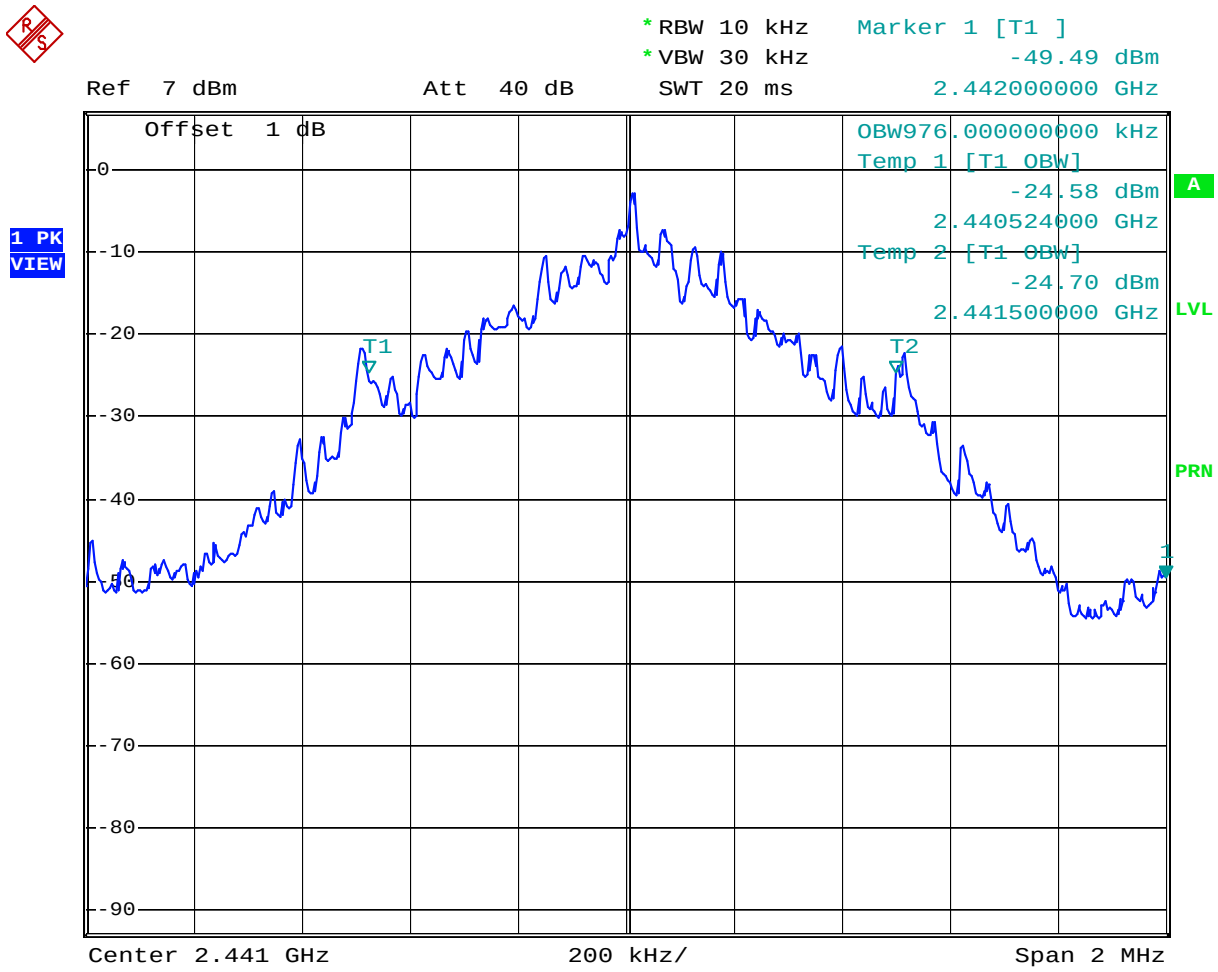
Comment: 20 dB OBW 2.441
Date: 20.JUN.2007 09:21:15

Plot 2.3



Comment: 20 dB OBW 2.480
Date: 20.JUN.2007 09:40:16

Plot 2.4



Comment: Occupied Bandwidth 99%
Date: 21.JUN.2007 11:59:54

4.3 Carrier Frequency Separation
FCC Ref: 15.247(a)(1)

4.3.1 Requirement

Systems shall have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20-dB bandwidth of the hopping channel, whichever is greater.

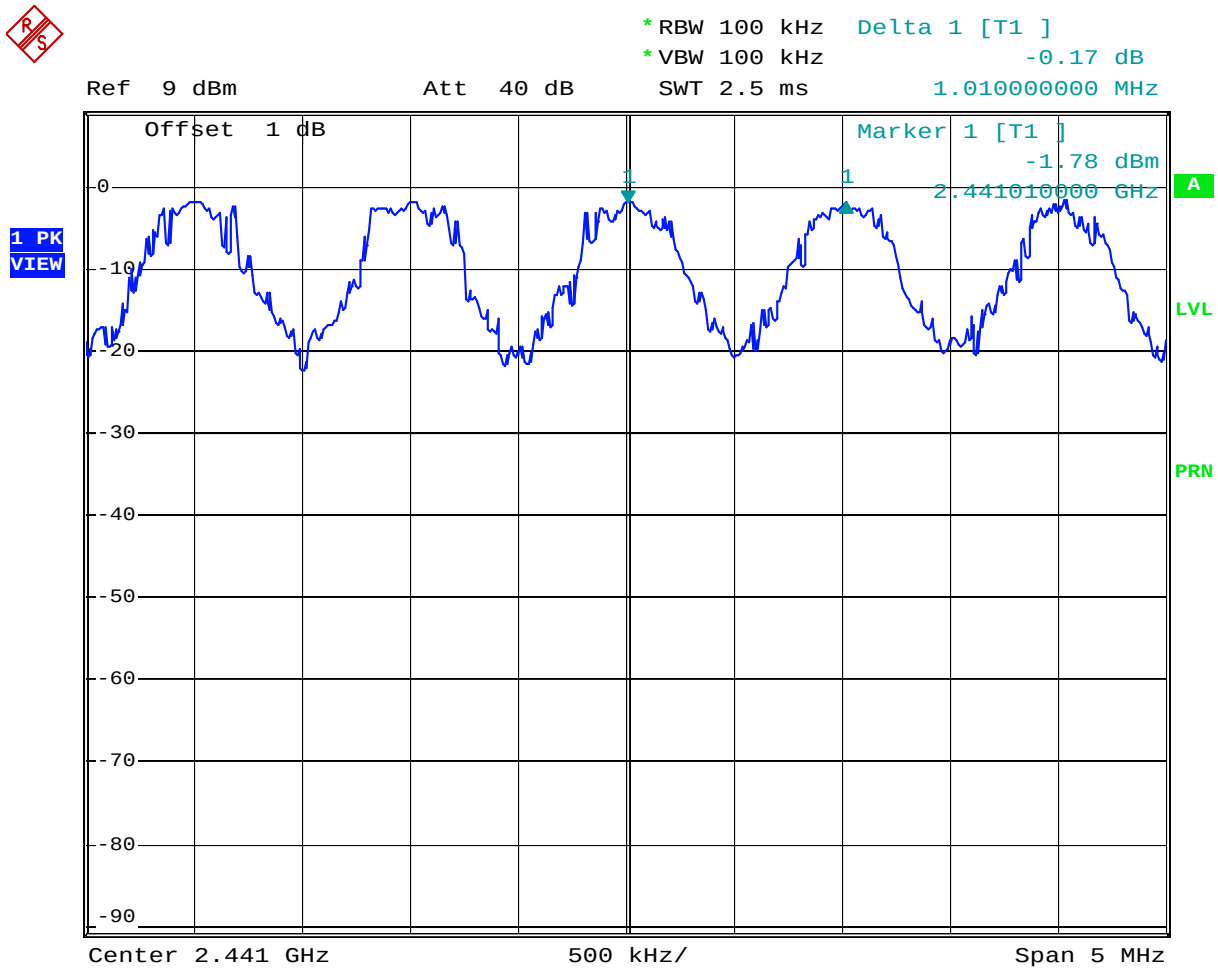
4.3.2 Test Procedure

Using the DELTA MARKER function of the analyzer, the frequency separation between two adjacent channels was measured and compared against the limit.

4.3.3 Test Results

Please refer to the attached spectrum analyzer plot # 3.1 for the test result. The channel separation is 1.010 MHz.

Plot 3.1



Comment: Carrier Frequency Separation
Date: 20.JUN.2007 10:56:52

4.4 Number of Hopping Channels
FCC Ref: 15.247(a)(1)(iii)

4.4.1 Requirement

Systems operating in the 2400-2483.5 MHz band shall use at least 15 hopping channels.

4.4.2 Test Procedure

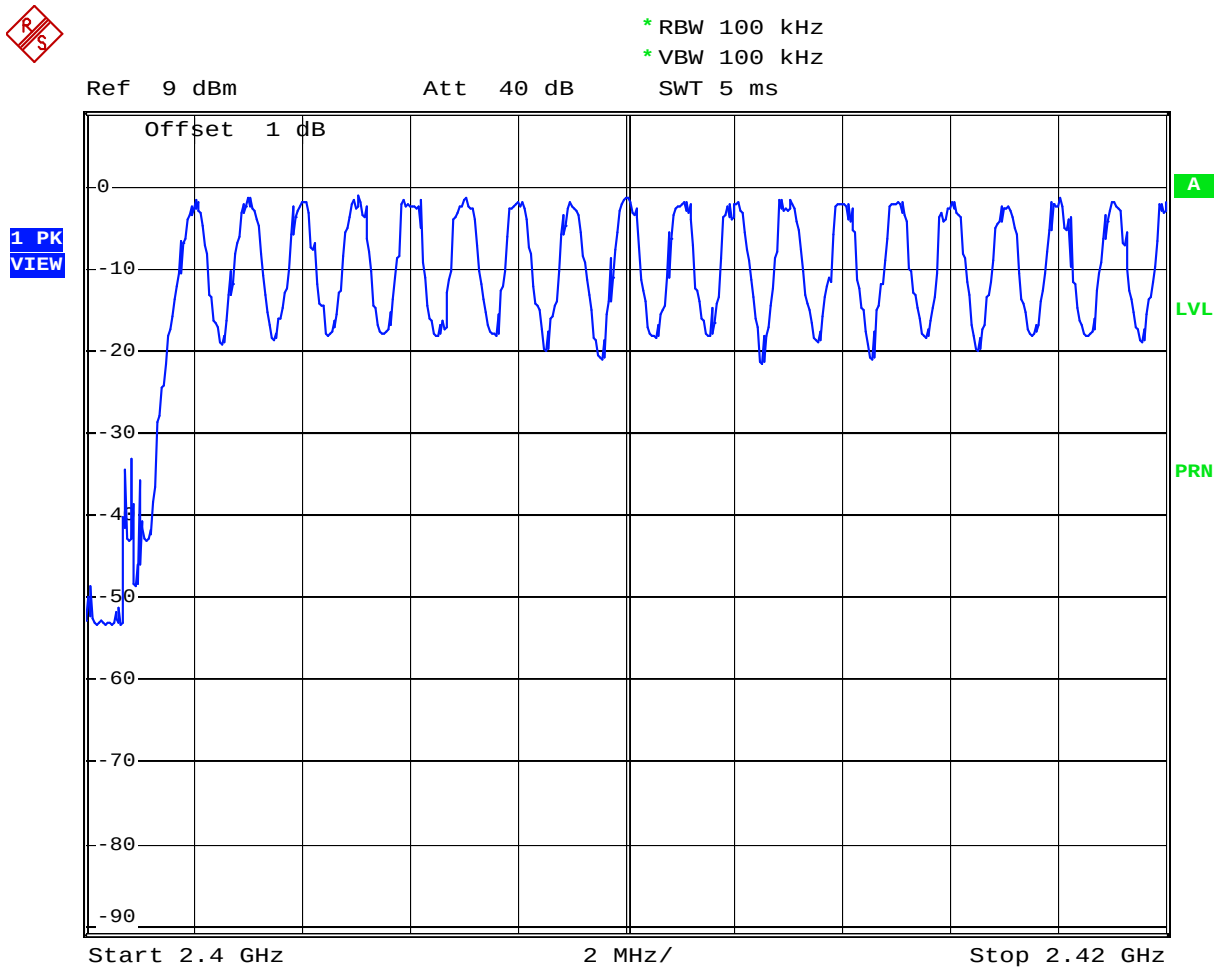
The RF passband of the EUT was divided into 3 approximately equal bands. With the analyzer set to MAX HOLD, readings were taken for 1 - 2 minutes in each band. The channel peaks so recorded were added together, and the total number compared to the minimum number of channels required in the regulation.

4.4.3 Test Results

Number of hopping channels	79

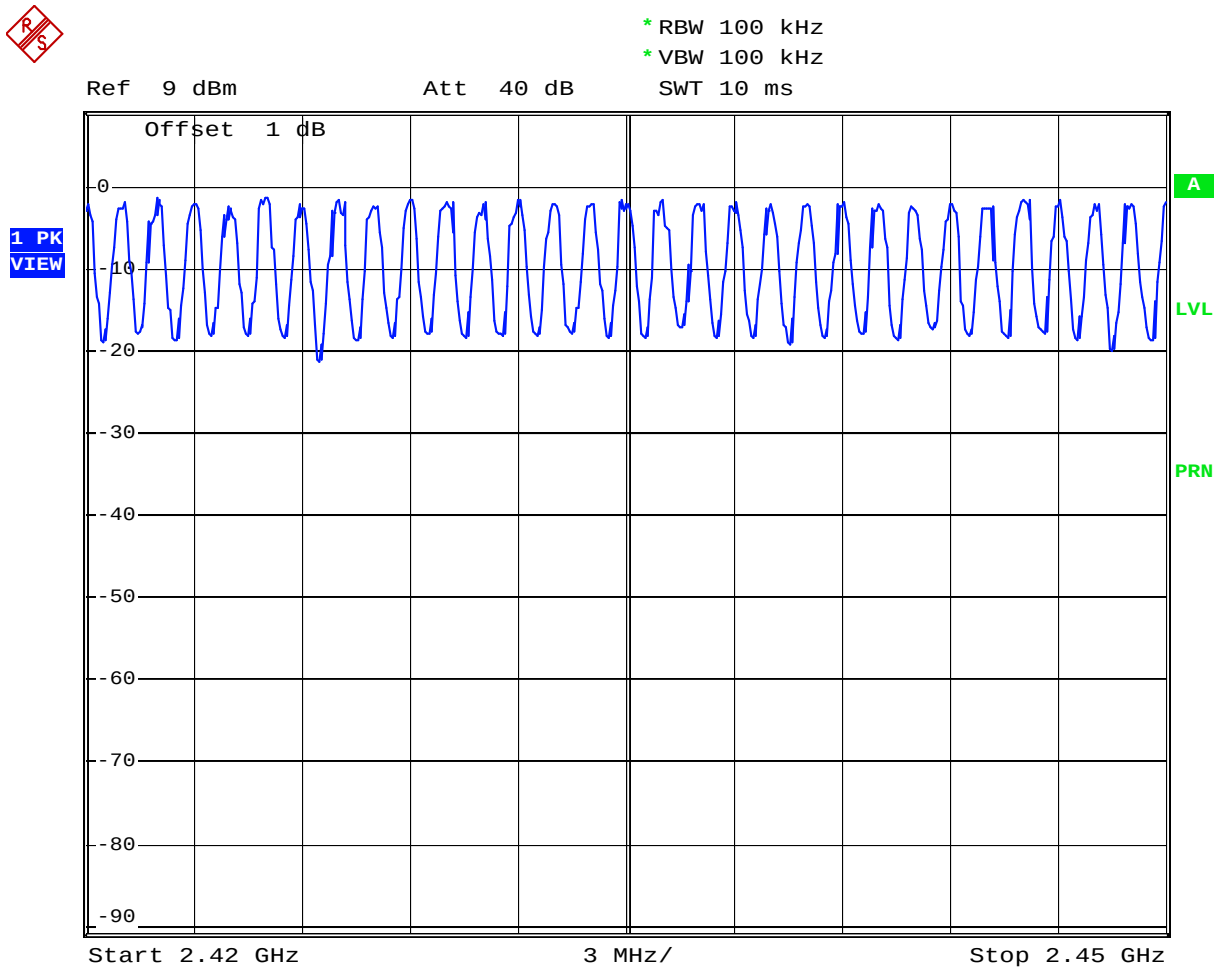
Refer to attached spectrum analyzer charts: Plots 4.1-4.3.

Plot 4.1



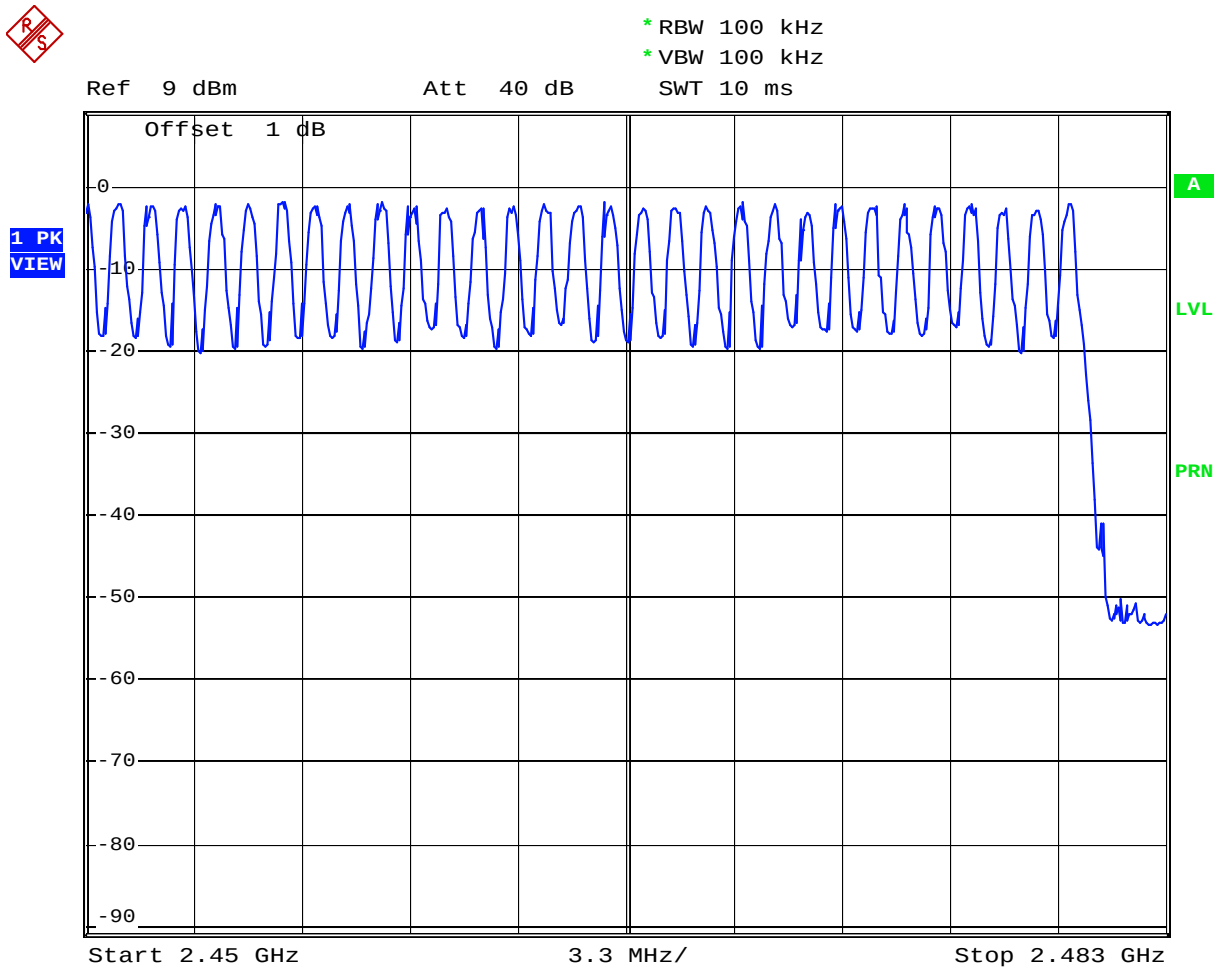
Comment: Number of hopping channels
Date: 20.JUN.2007 11:05:48

Plot 4.2



Comment: Number of hopping channels
Date: 20.JUN.2007 11:08:20

Plot 4.3



Comment: Number of hopping channels
Date: 20.JUN.2007 11:10:40

4.5 Average Channel Occupancy Time
FCC 15.247(a)(1)(ii)(iii)

4.5.1 Requirement

For systems operating in the 2400-2483.5 MHz band, the average time of occupancy on any channel shall not be greater than 0.4 second within a period of 0.4 second multiplied by the number of hopping channels employed.

4.5.2 Test Procedure

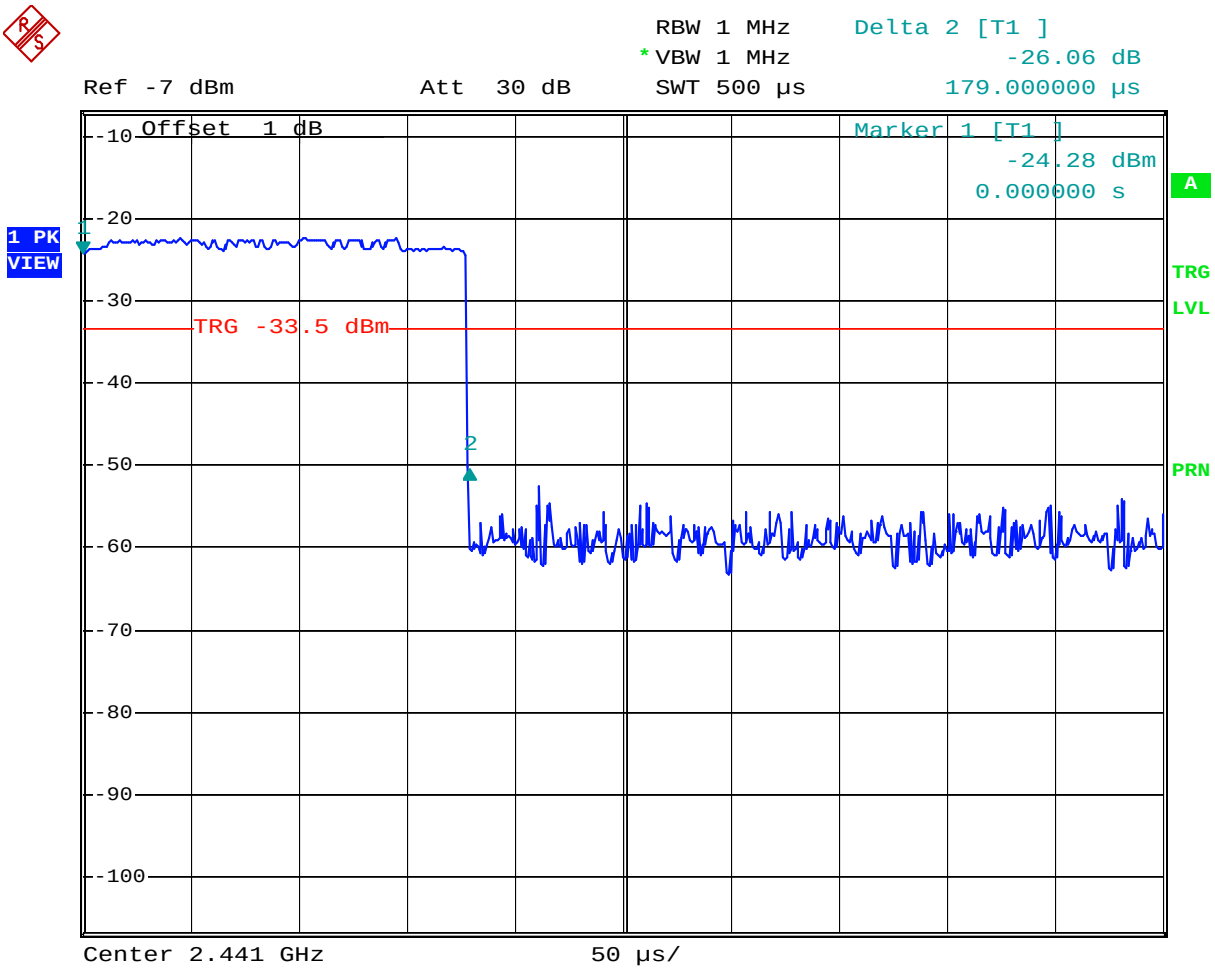
The spectrum analyzer center frequency was set to one of the known hopping channels, the SPAN was set to ZERO SPANS, and the TRIGGER was set to VIDEO. The time duration of the transmission so captured was measured with the MARKER DELTA function.

Since the radio is employed 79 hopping channels, the Occupancy Time was calculated for the period of 0.4 * 79 = 31.6 sec.

4.5.3 Test Results (see plots 5.1 and 5.2)

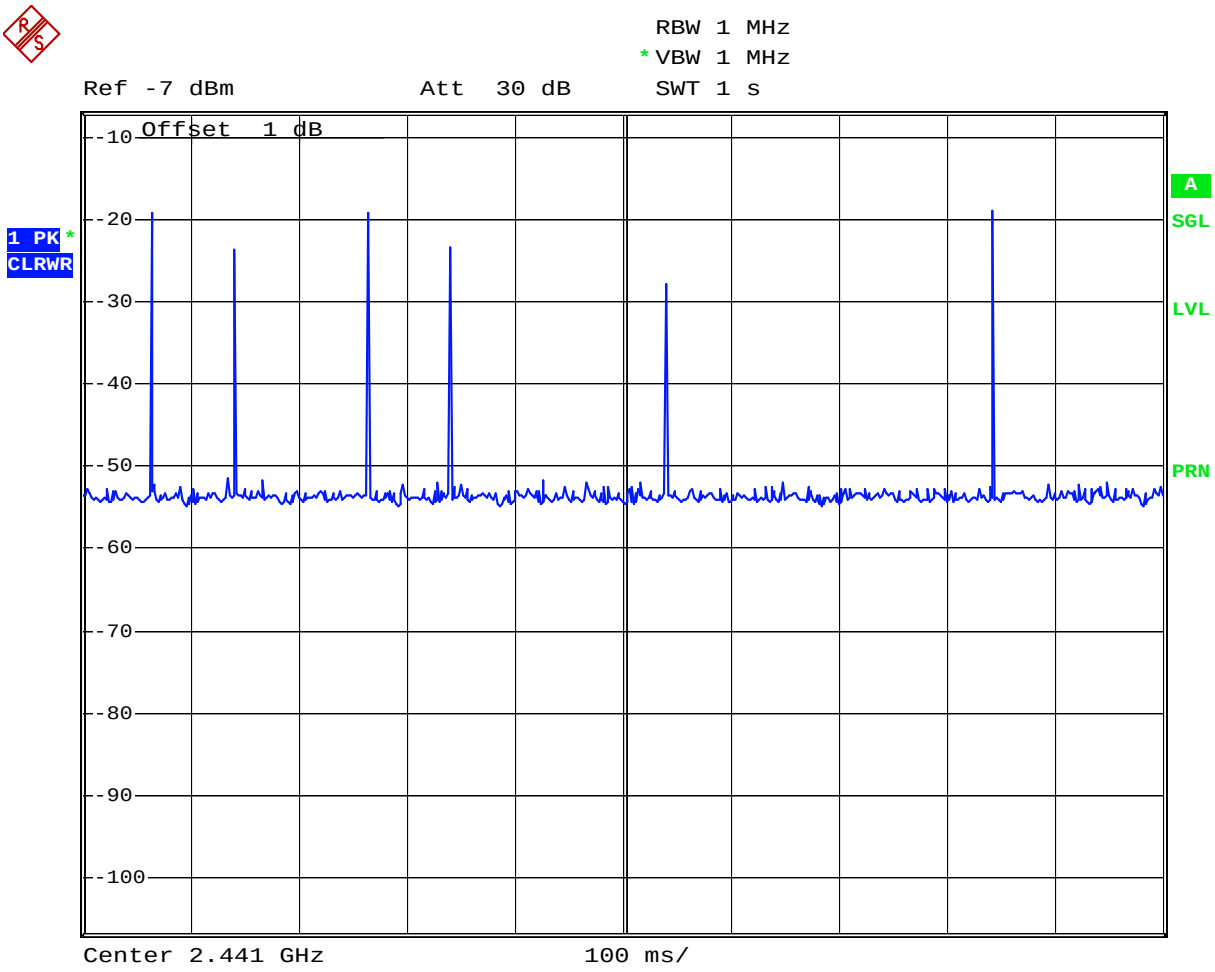
0.000179 * 6 * 31.6 = 0.034 sec.

Plot 5.1



Comment: Time of Occupancy
Date: 20.JUN.2007 15:53:13

Plot 5.2



Comment: Time of Occupancy
Date: 20.JUN.2007 16:02:26

4.6 Out-of Band-Conducted Emissions
FCC 15.247(c)

4.6.1 Requirement

In any 100 kHz bandwidth outside the EUT pass-band, the RF power shall be at least 20 dB below that of the maximum in-band 100 kHz emission.

4.6.2 Test Procedure

A spectrum analyzer was connected to the antenna port of the transmitter. Analyzer Resolution Bandwidth was set to 100 kHz. For each channel investigated, the in-band and out-of-band emission measurements were performed. The out-of-band emissions were measured from 30 MHz to 25 GHz.

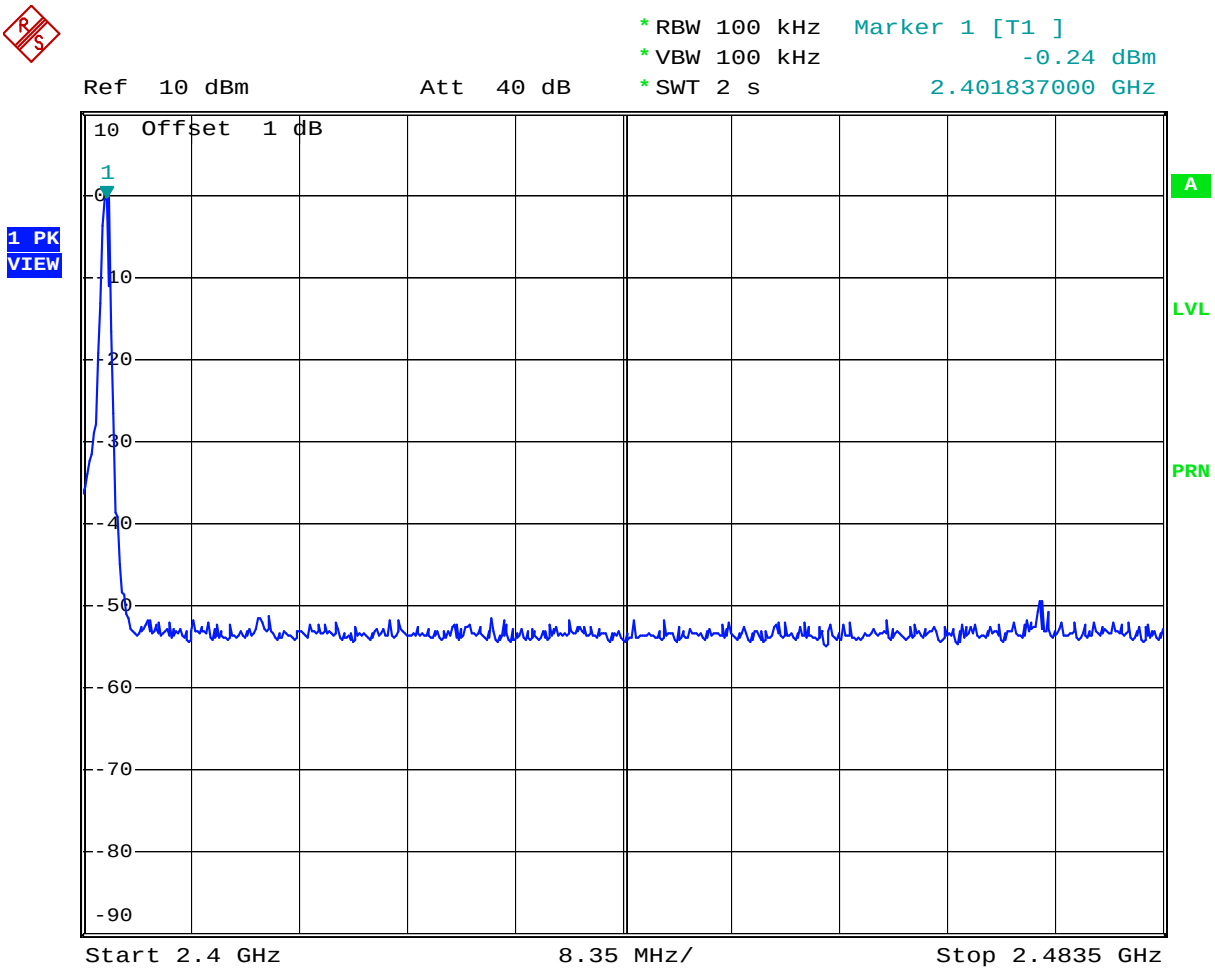
4.6.3 Test Results

Refer to the following plots for the test result:

Description	Comments	Plot number
In-band Emissions, F=2402 MHz		6.1
In-band Emissions, F=2441 MHz		6.2
In-band Emissions, F=2480 MHz		6.3
Emissions on the low band-edge frequency	Fixed channel, 2402 MHz	6.4
Emissions on the low band-edge frequency	Hopping mode	6.5
Emissions on the high band-edge frequency	Fixed channel, 2480 MHz	6.6
Emissions on the high band-edge frequency	Hopping mode	6.7
Out-of-band low Channel Emissions	Fixed channel, 2402 MHz	6.8 – 6.10
Out-of-band middle Channel Emissions	Fixed channel, 2441 MHz	6.11 – 6.13
Out-of-band high Channel Emissions	Fixed channel, 2480 MHz	6.14 – 6.16

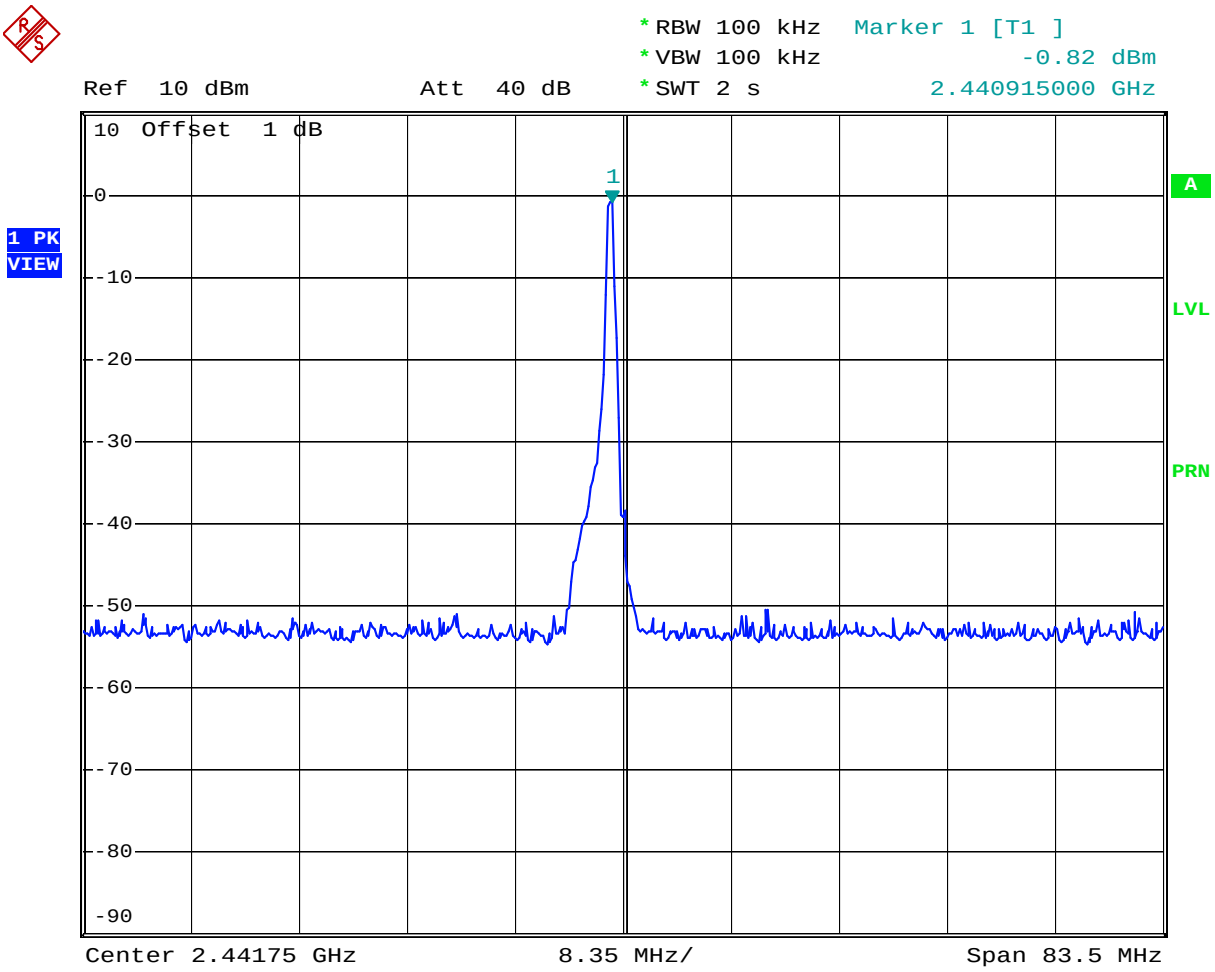
The attenuation is more than 20 dB.

Plot 6.1



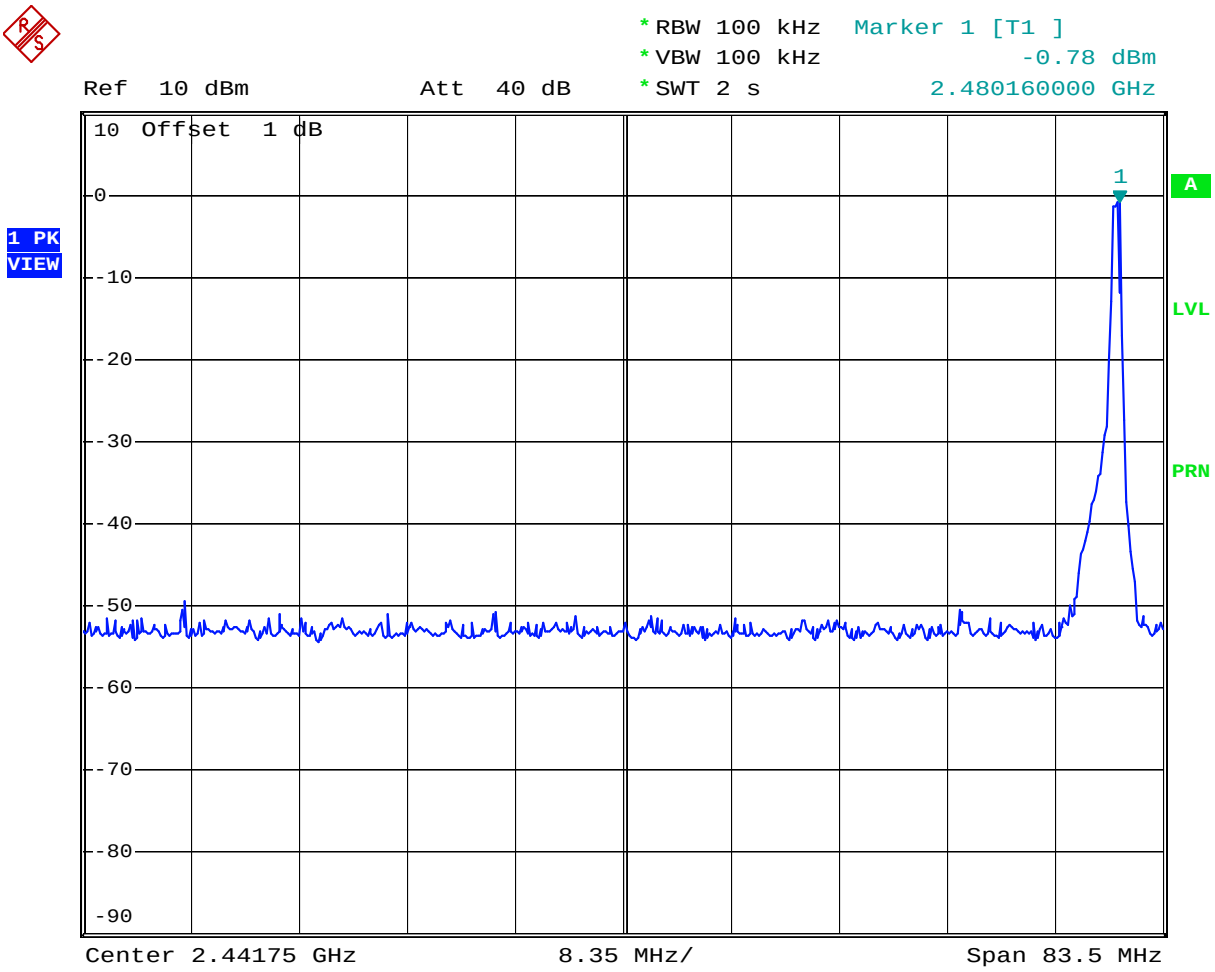
Comment: In-band emissions, f=2402 MHz
Date: 21.JUN.2007 09:29:41

Plot 6.2



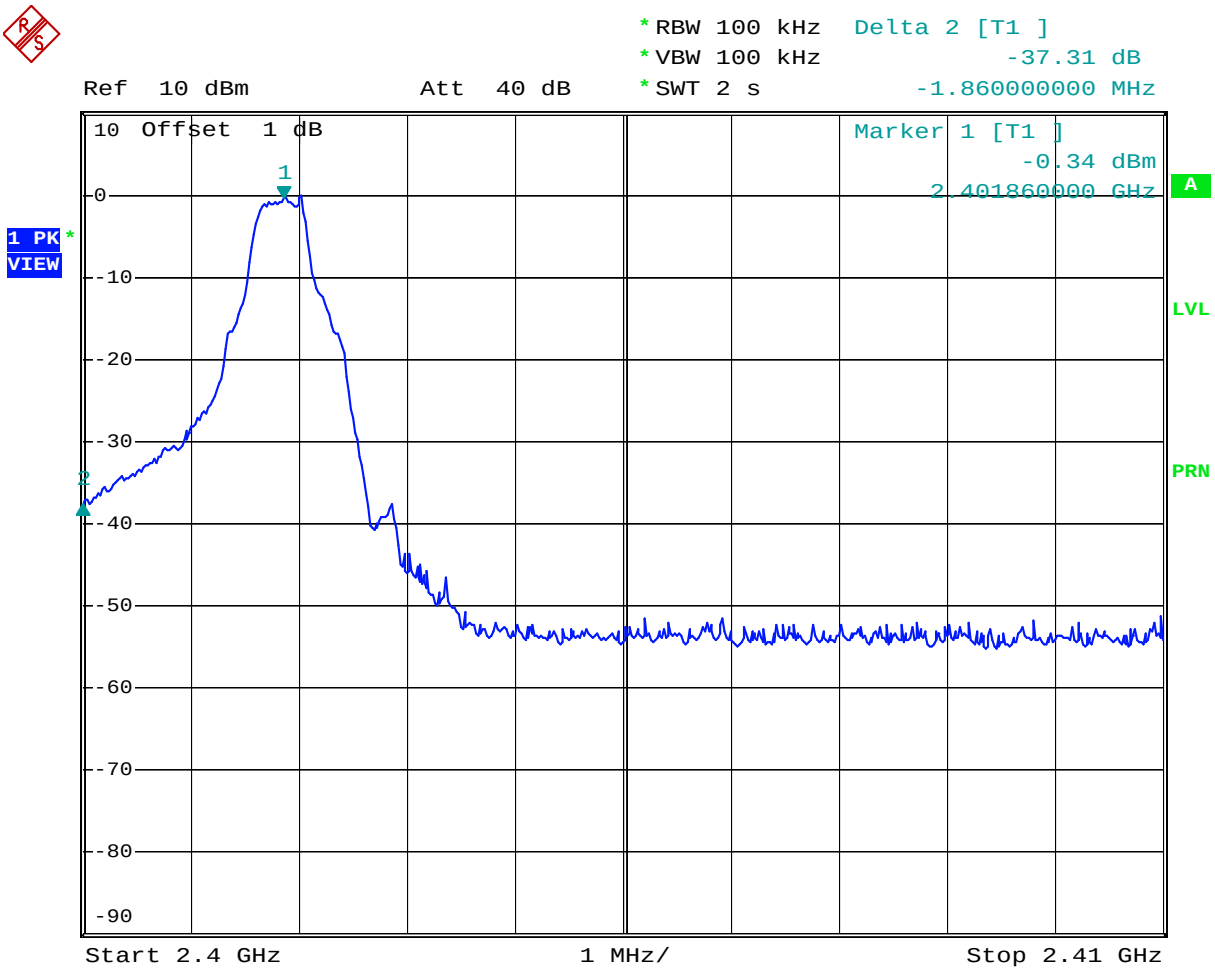
Comment: In-band emissions, f=2441+ MHz
Date: 21.JUN.2007 09:31:13

Plot 6.3



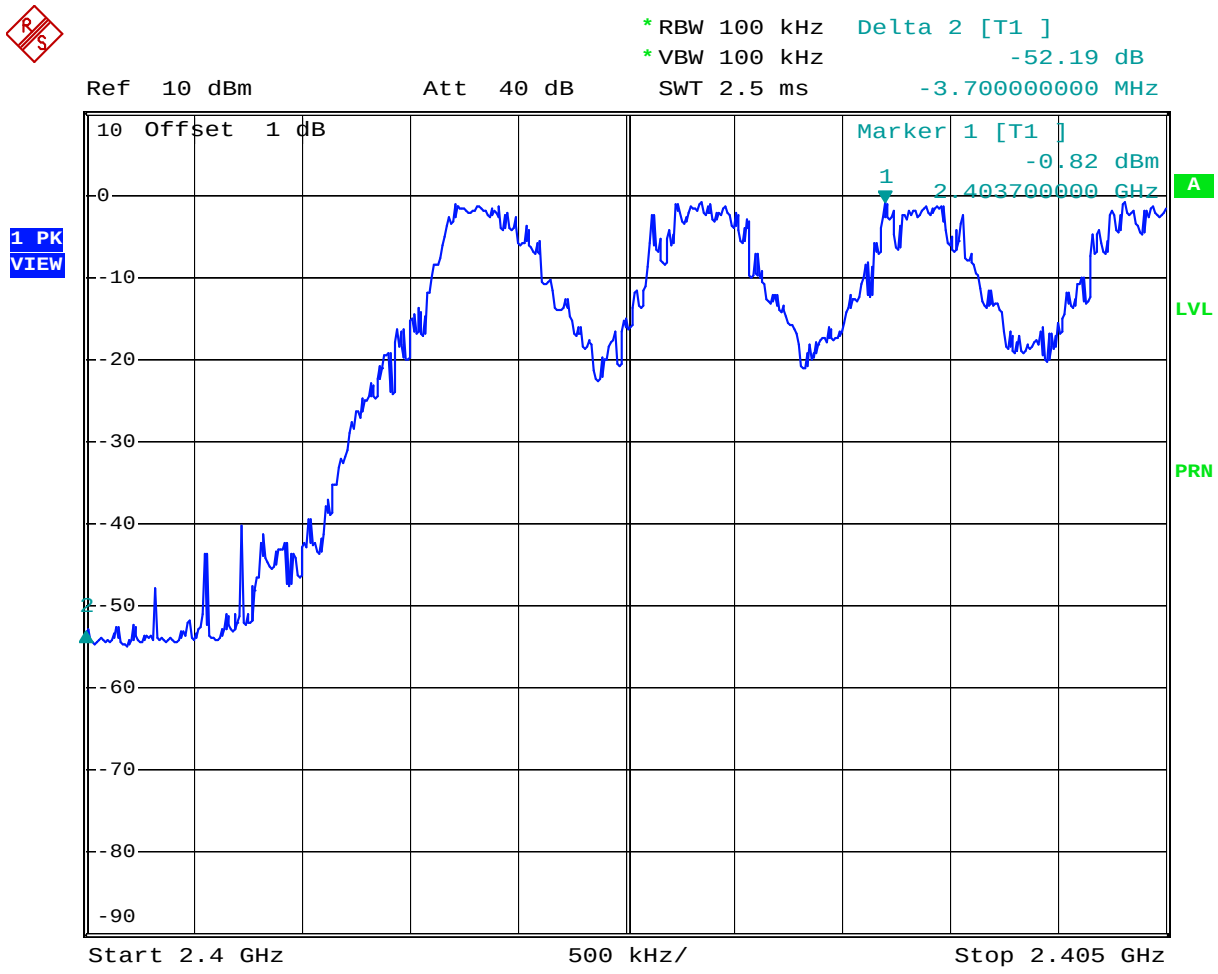
Comment: In-band emissions, f=2480 MHz
Date: 21.JUN.2007 09:32:44

Plot 6.4



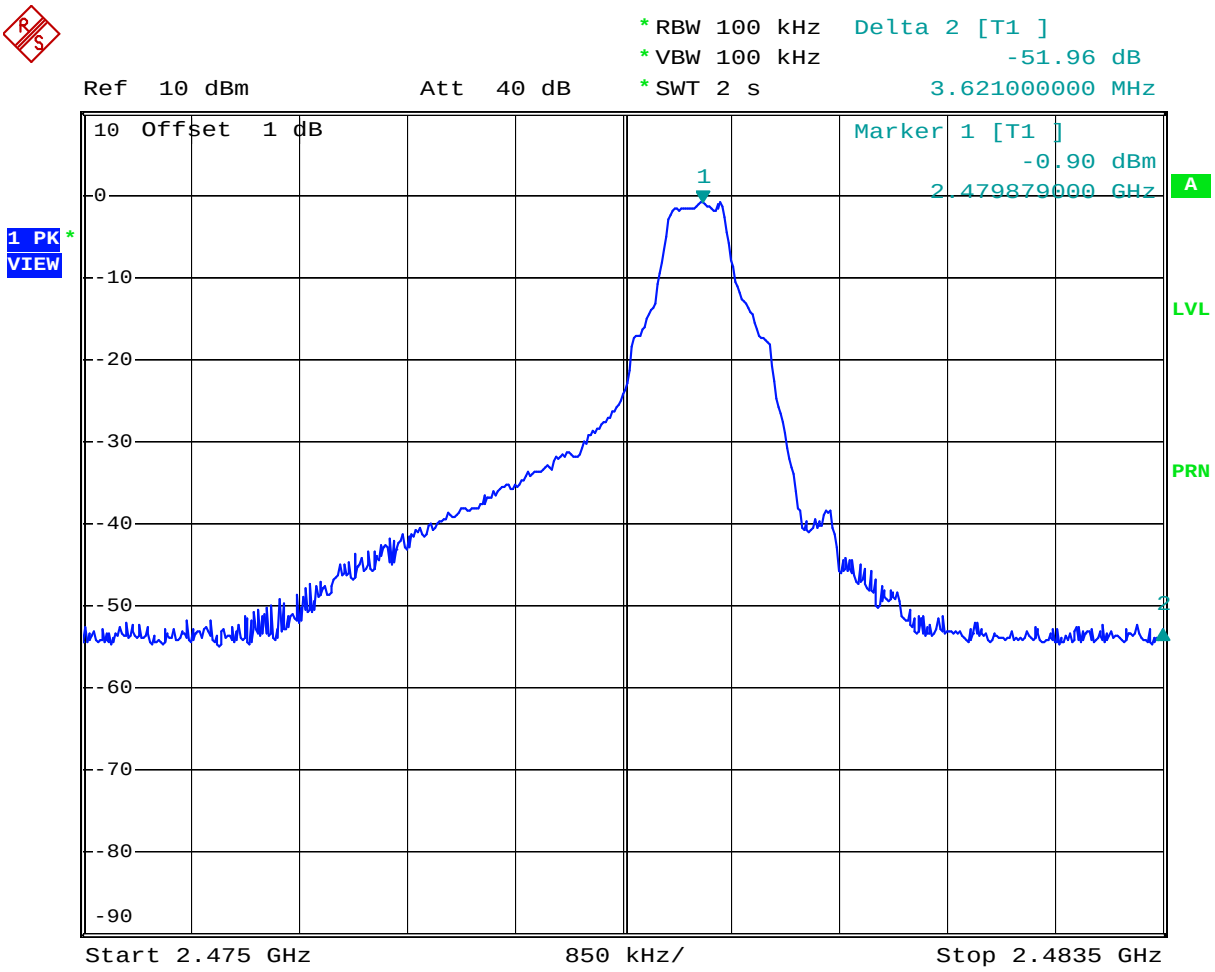
Comment: Band-edge frequency emission, f=2402 MHz
Date: 21.JUN.2007 09:43:57

Plot 6.5



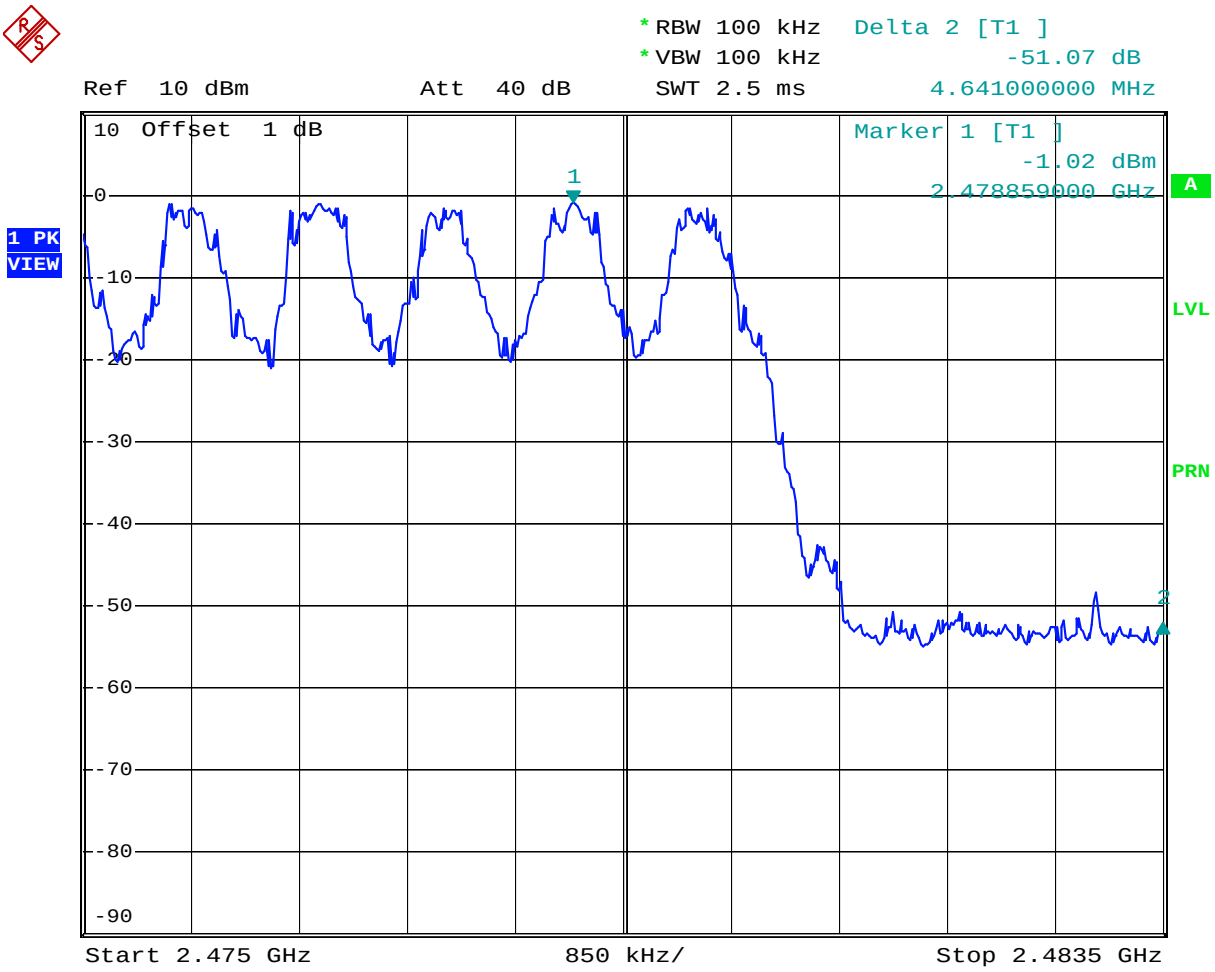
Comment: Band-edge frequency emissions, hopping mode
Date: 21.JUN.2007 10:38:18

Plot 6.6



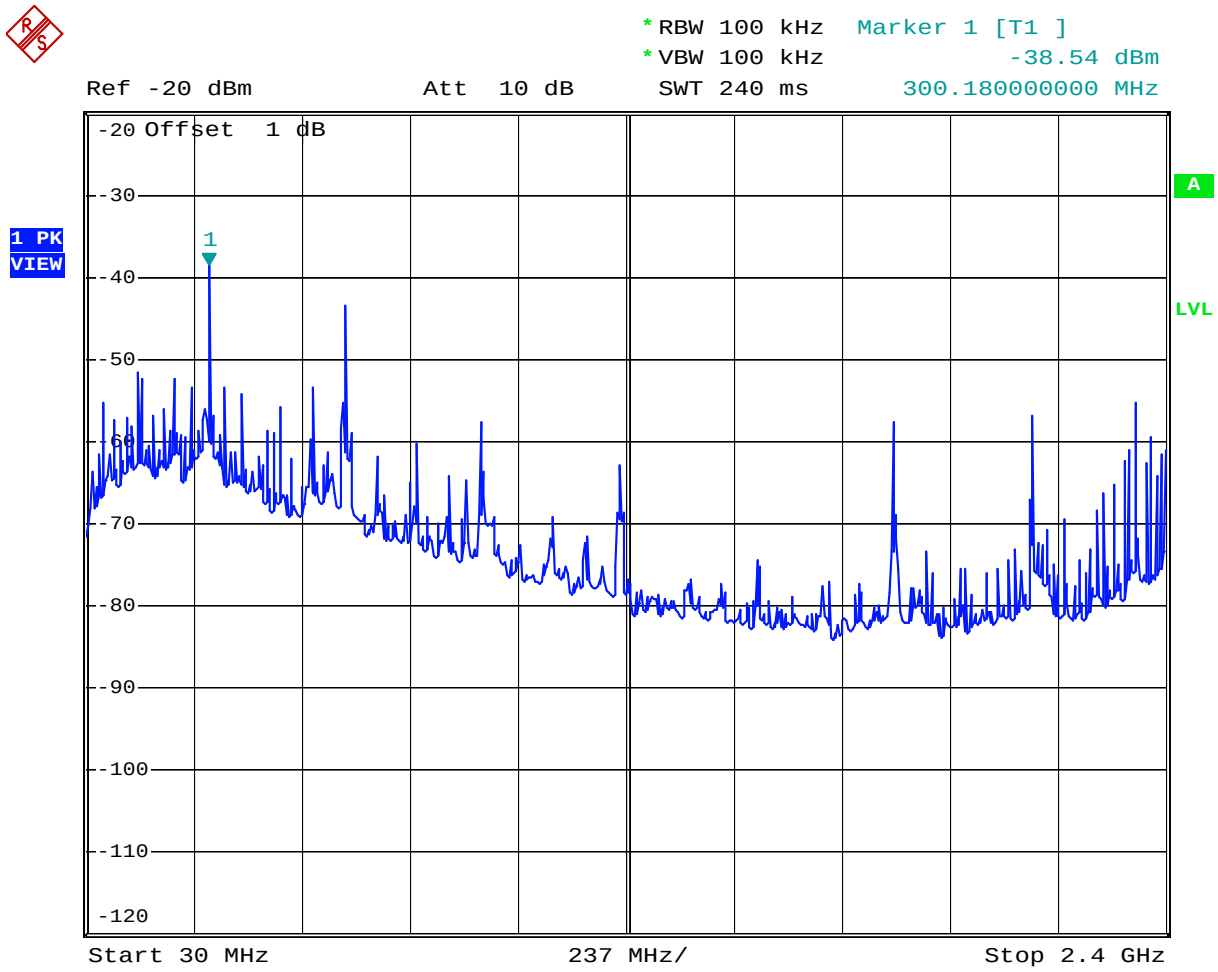
Comment: Band-edge frequency emission, f=2480 MHz
Date: 21.JUN.2007 09:53:32

Plot 6.7



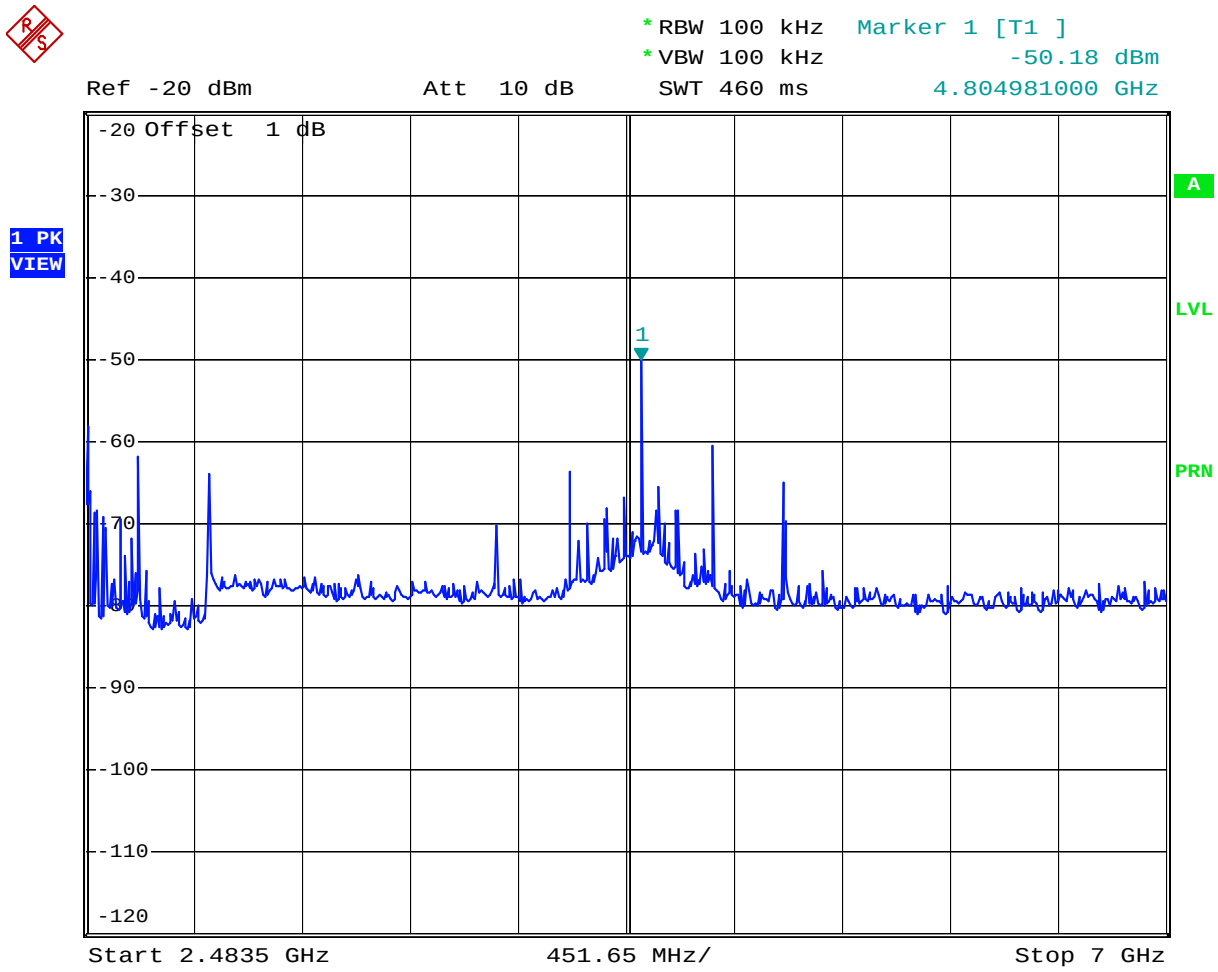
Comment: Band-edge frequency emissions, hopping mode
Date: 21.JUN.2007 10:36:32

Plot 6.8



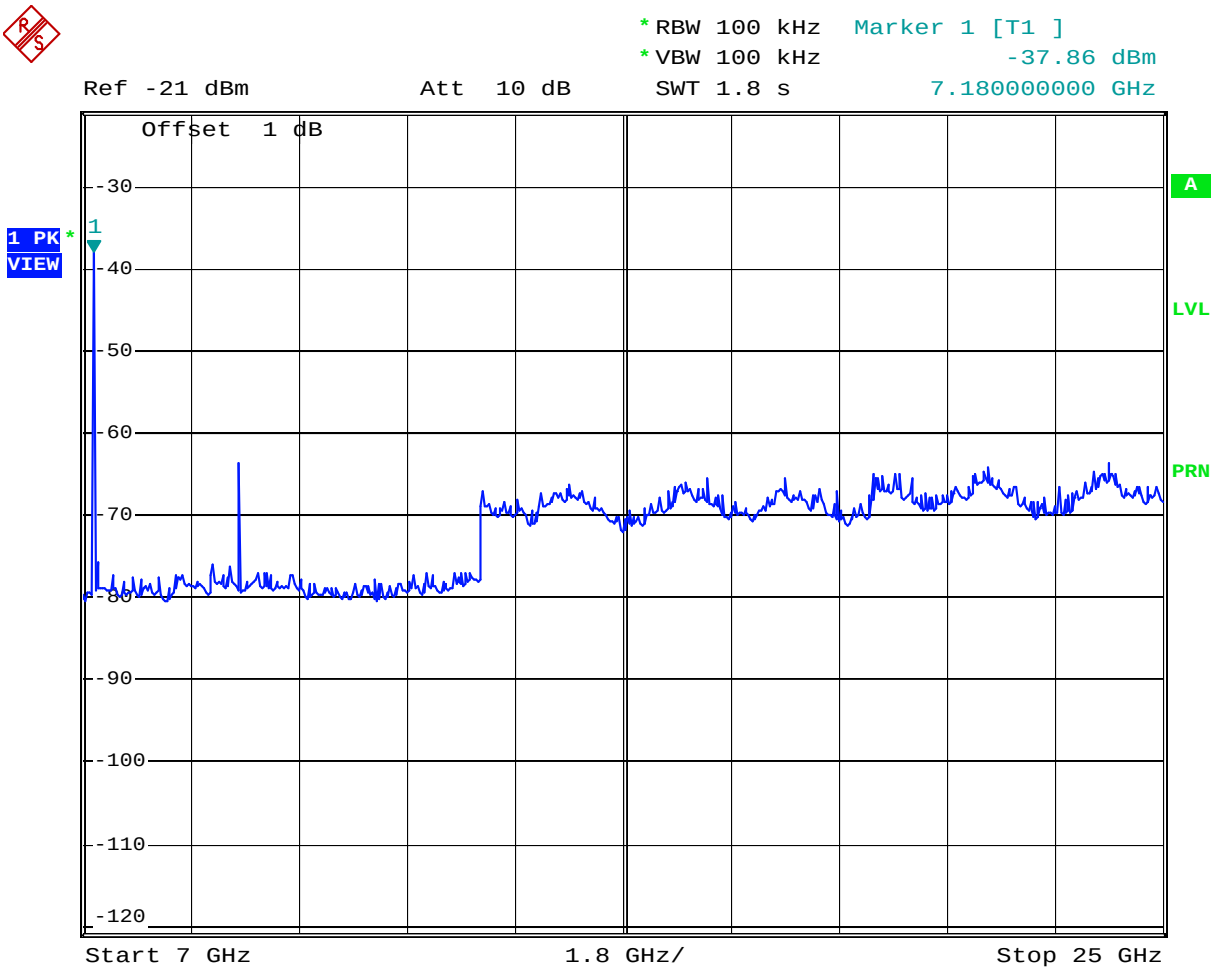
Comment: Out-of-band emission emission, f=2402 MHz
Date: 21.JUN.2007 10:14:50

Plot 6.9



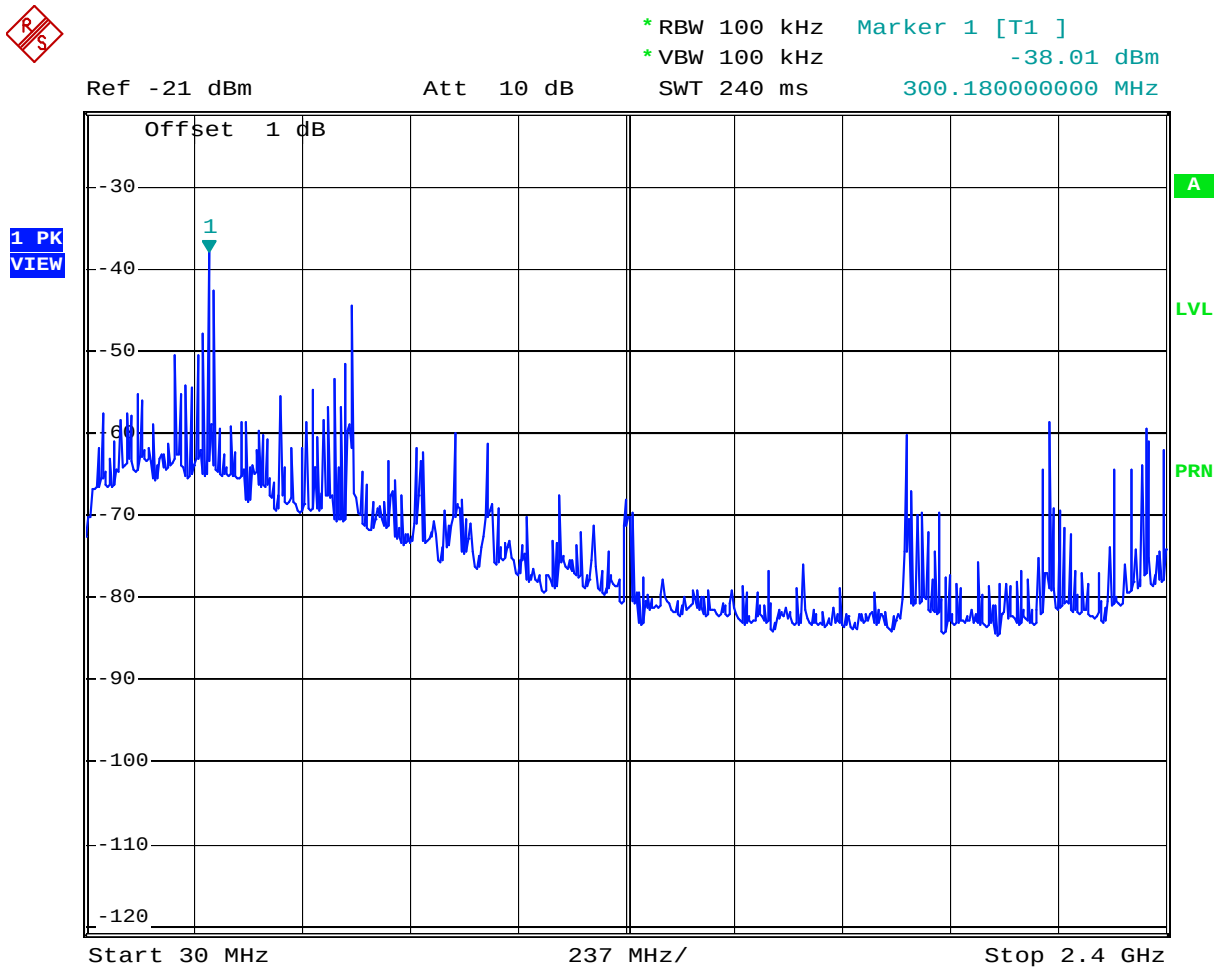
Comment: Out-of-band emission emission, f=2402 MHz
Date: 21.JUN.2007 10:12:31

Plot 6.10



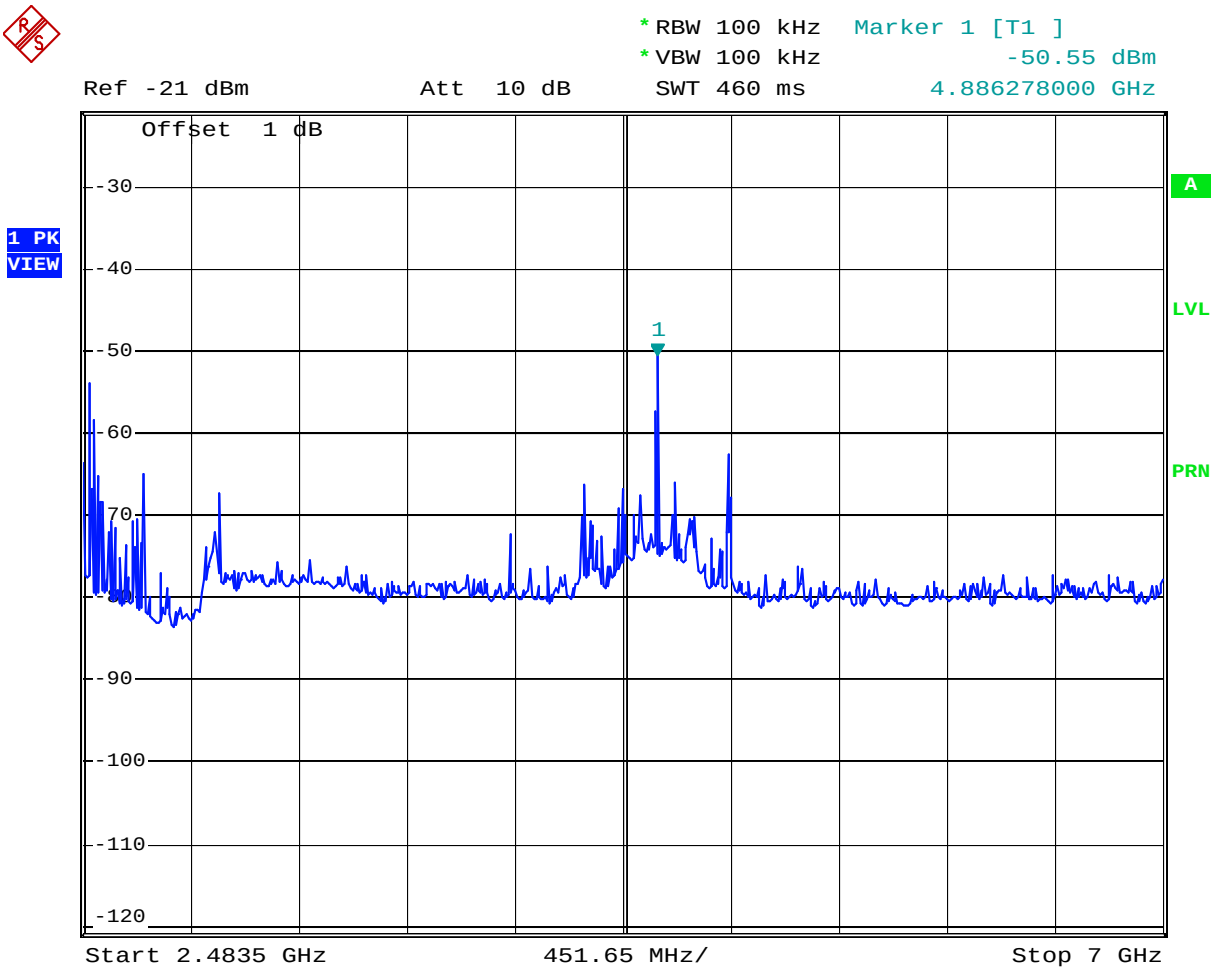
Comment: Out-of-band emissions, f=2402 MHz
Date: 21.JUN.2007 11:00:11

Plot 6.11



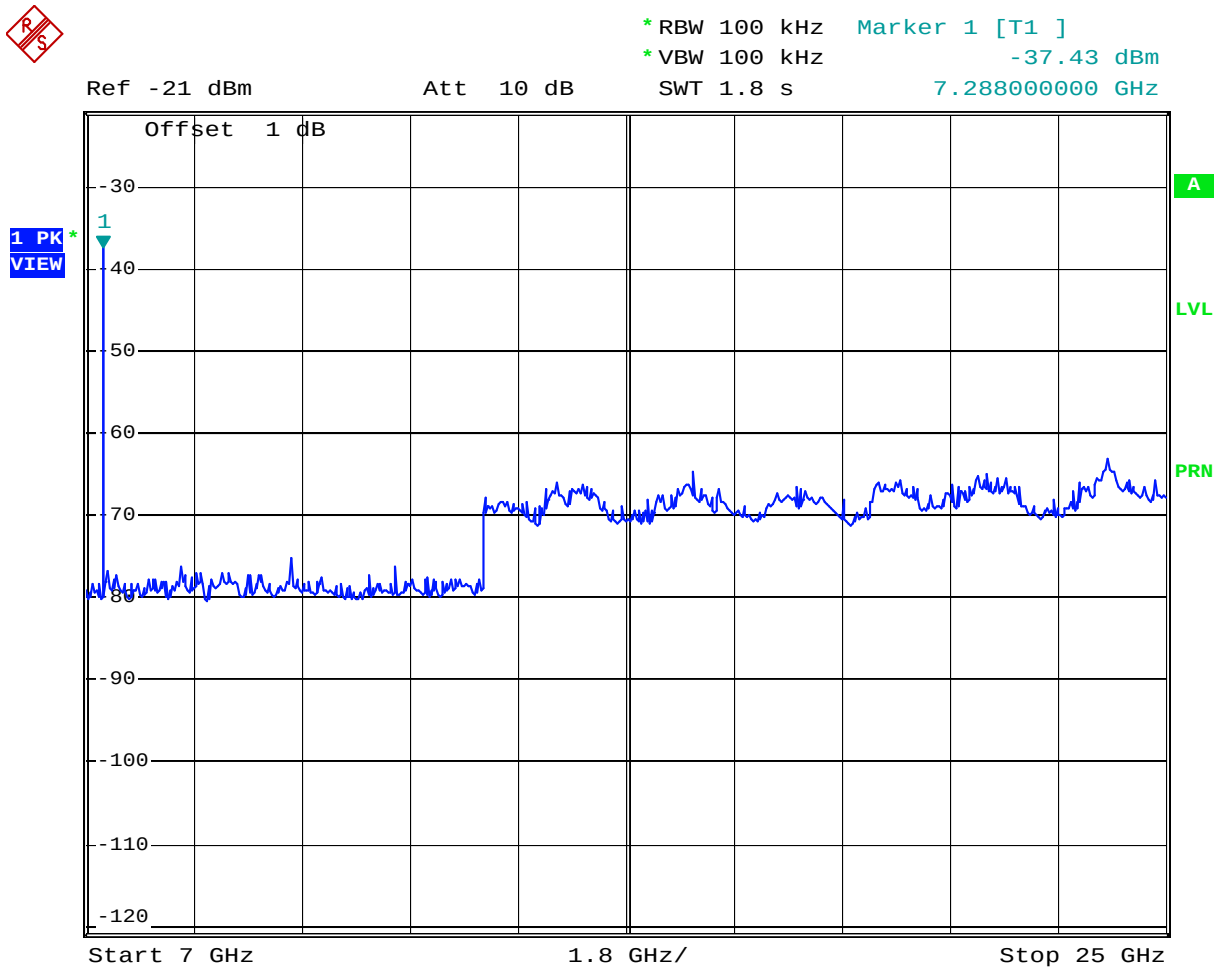
Comment: Out-of-band emissions, f=2441 MHz
Date: 21.JUN.2007 11:02:44

Plot 6.12



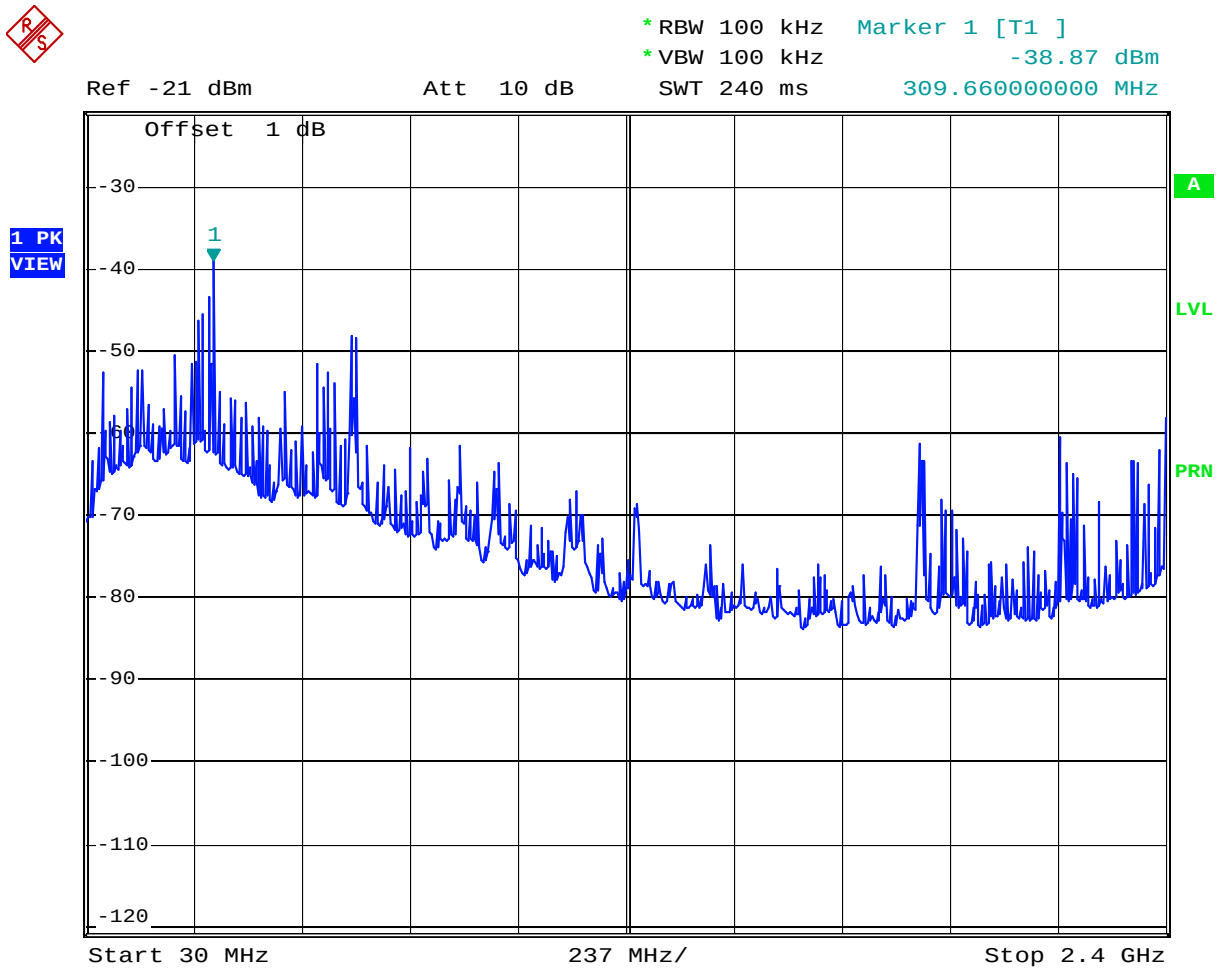
Comment: Out-of-band emissions, f=2441 MHz
Date: 21.JUN.2007 11:05:12

Plot 6.13



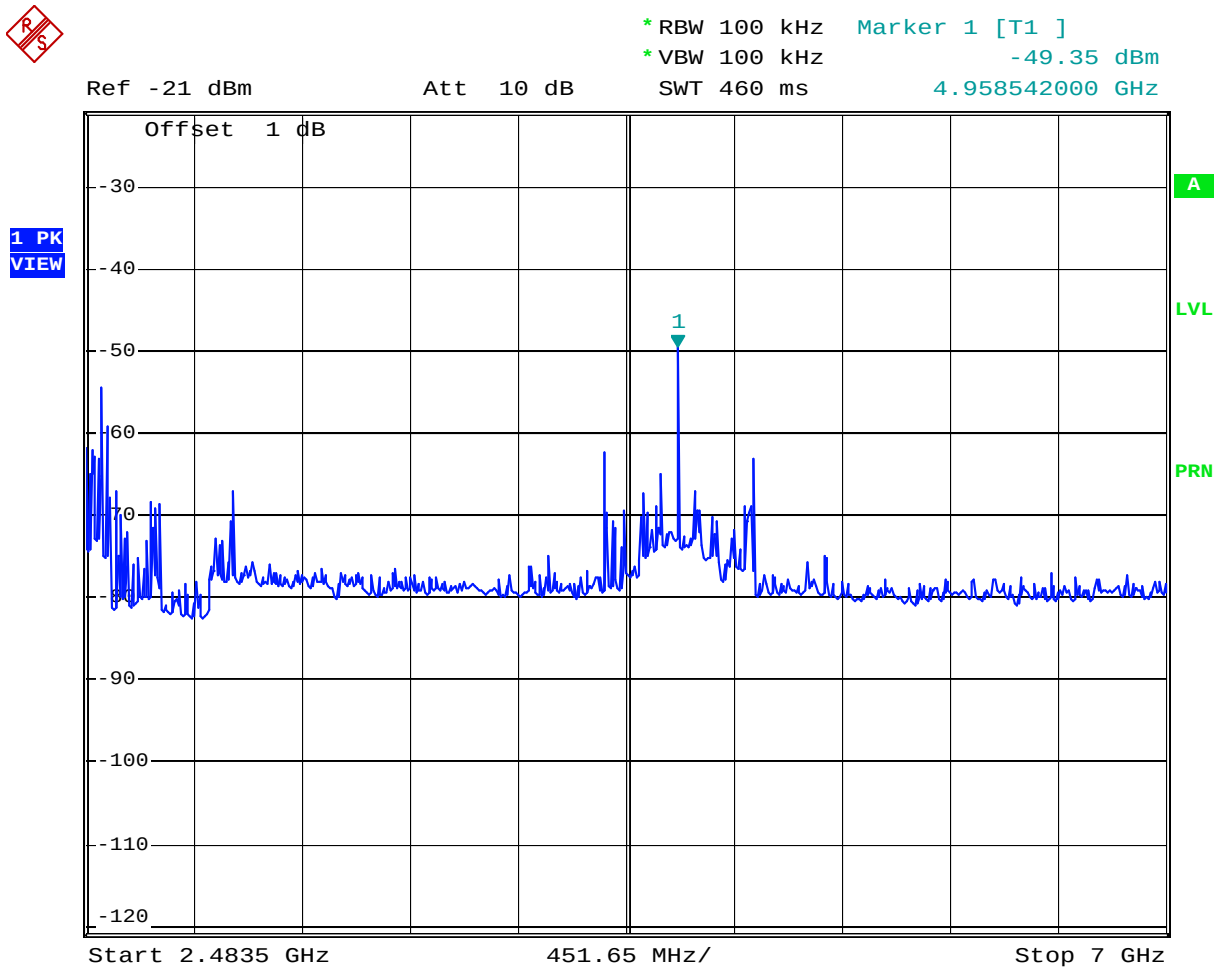
Comment: Out-of-band emissions, f=2441 MHz
Date: 21.JUN.2007 11:06:35

Plot 6.14



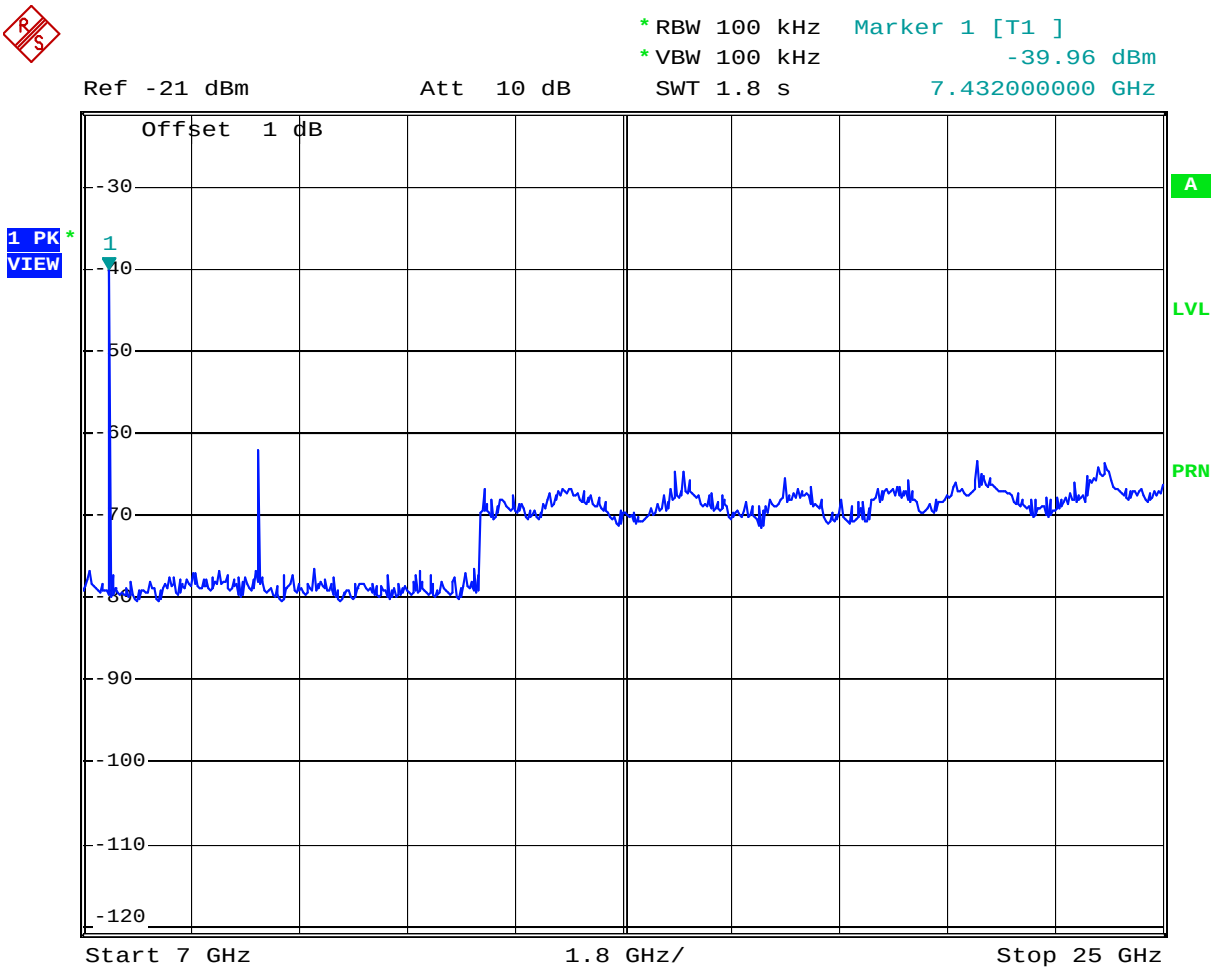
Comment: Out-of-band emissions, f=2480 MHz
Date: 21.JUN.2007 11:08:23

Plot 6.15



Comment: Out-of-band emissions, f=2480 MHz
Date: 21.JUN.2007 11:09:36

Plot 6.16



Comment: Out-of-band emissions, f=2480 MHz
Date: 21.JUN.2007 11:10:50

4.7 Out-of-Band Radiated Emissions (except emissions in restricted bands) FCC 15.247(c)

For out-of-band radiated emissions (except for frequencies in restricted bands) that are close to or that exceed the 20 dB attenuation requirement described in the specification, radiated measurements were performed at a 3 m separation distance to determine whether these emissions complied with the general radiated emission requirement.

Not performed, the EUT passed out-of-band antenna conducted emission test.

4.8 Transmitter Radiated Emissions in Restricted Bands
FCC 15.247 (c), 15.205, 15.209

4.8.1 Test Procedure

Radiated emission measurements were performed from 30 MHz to 25,000 MHz. Spectrum Analyzer Resolution Bandwidth is 100 kHz or greater for frequencies 30 MHz to 1000 MHz, 1 MHz - for frequencies above 1000 MHz.

The EUT is placed on a non-conductive table. If the EUT attaches to peripherals, they are connected and operational (as typical as possible). During testing, all cables were manipulated to produce worst case emissions. The signal is maximized through rotation. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters.

Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. All readings are extrapolated back to the equivalent three-meter reading using inverse scaling with distance.

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG
Where FS = Field Strength in dB(μV/m)
RA = Receiver Amplitude (including preamplifier) in dB(μV)
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

Assume a receiver reading of 52.0 dB(μV) is obtained. The antennas factor of 7.4 dB(1/m) and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving field strength of 32 dB(μV/m). This value in dB(μV/m) was converted to its corresponding level in μV/m.
RA = 52.0 dB(μV)
AF = 7.4 dB(1/m)
CF = 1.6 dB
AG = 29.0 dB
FS = 52.0+7.4+1.6-29.0 = 32 dB(μV/m)
Level in μV/m = Common Antilogarithm [(32 dBμV/m)/20] = 39.8 μV/m

Calculation of Average Factor

Average Factor (AV) in dB = 20 log (duty cycle)

The specification for output field strength for frequencies above 1000 MHz according to FCC rules specify measurements with average detectors. During the tests EUT was wired to operate at continuous transmitting mode (CW). For field strength measurements of emission from transmitter, average factor was calculated and added to the peak emission obtained in CW mode and compared to the limit specified for average detector.

The time period over the duty cycle is measured is 100 milliseconds, or the repetition cycle, whichever is a shorter time frame. The worst case (highest percentage on) duty cycle is used for calculation.
The duty cycle is simply the 0n-time divided by the period:

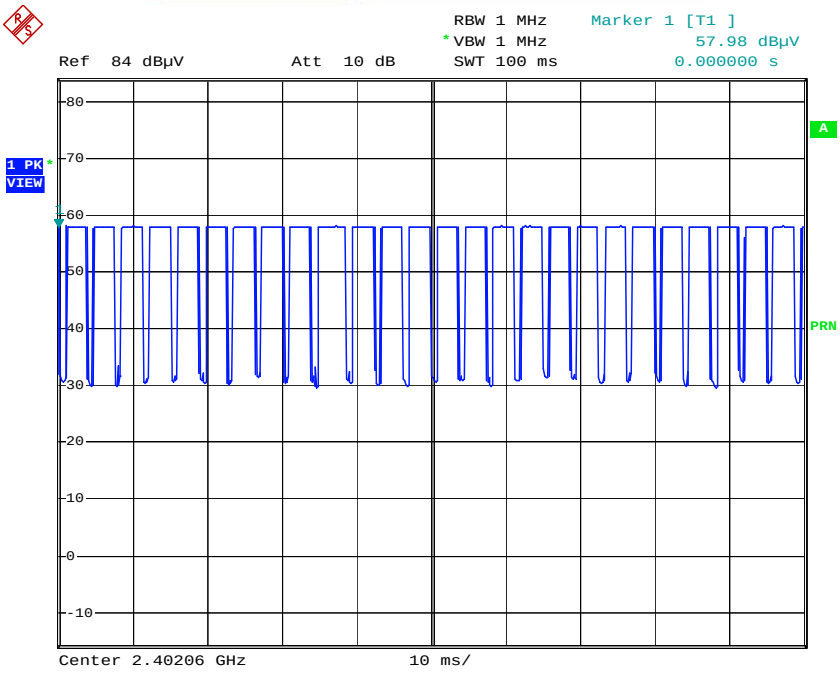
Time period = 100 ms
Number of pulses = 26
Pulse duration = 3 ms

Effective period of the cycle = 3 ms x 26 = 78 ms

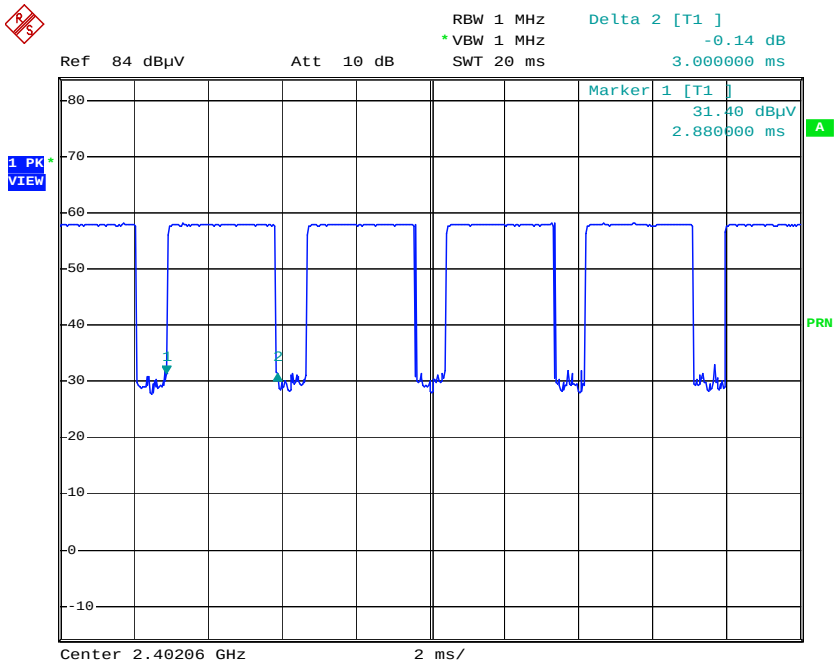
DC = 78 ms/100 ms = 0.78

AV = 20 log 0.78 = -2.2 dB

Plot on the next page shows the transmission timing over 100 ms time frame.



Comment: Average Duty Cycle
Date: 28.JUN.2007 13:43:58



Comment: Average Duty Cycle
Date: 28.JUN.2007 13:46:17

4.8.2 Test Results

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

The EUT passed the test by 0.5 dB

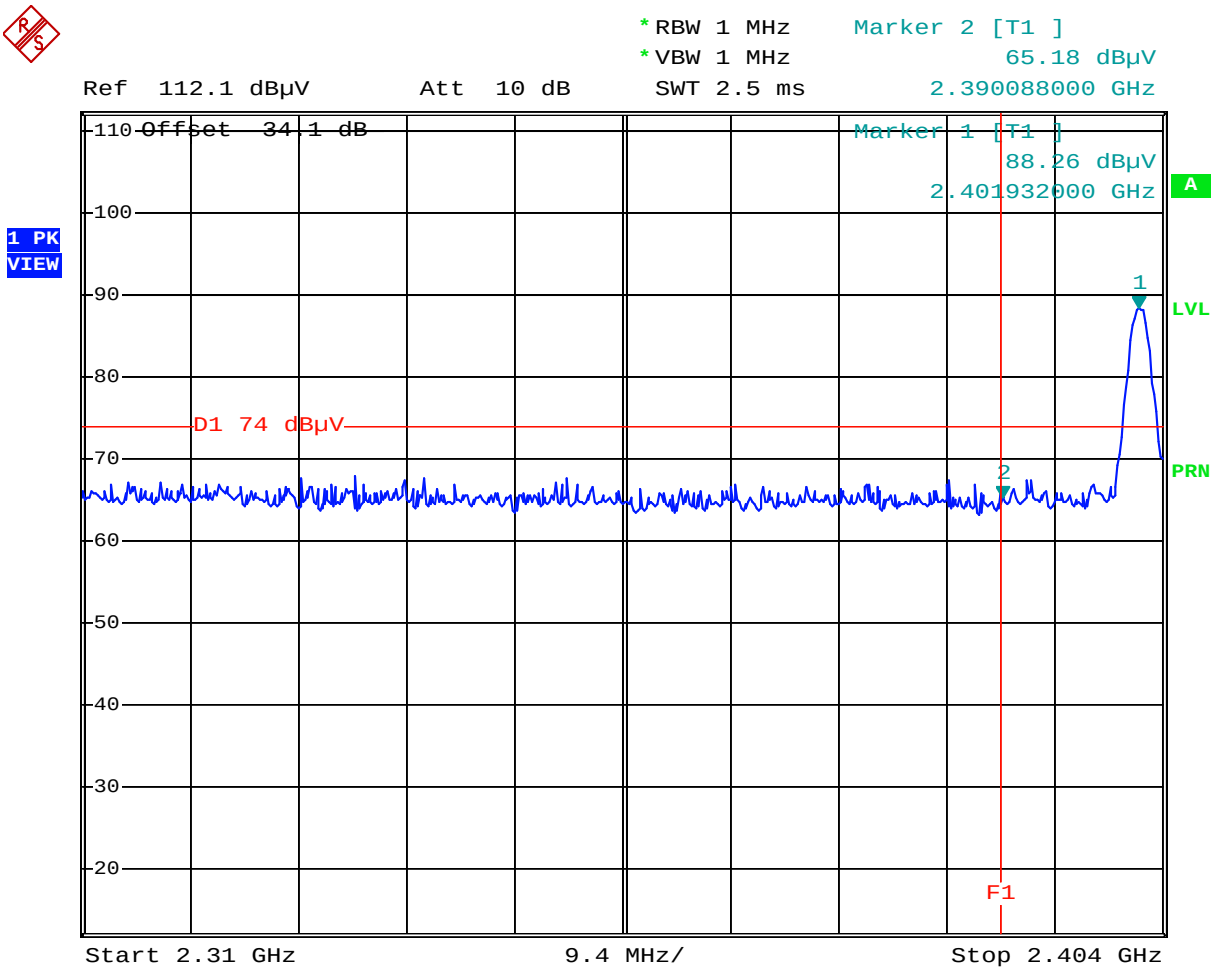
Temperature: 21.0 C						AMO				
Humidity: 48.8 %						Model: Remote Control Slave				
Measured at 1 & 3 m										
Frequency MHz	Polarity	Detector	SA reading dB(uV)	Cable loss dB	Pre- amp gain dB	Ant. factor dB(1/m)	D.C.F dB	Field Strength dB(uV/m)	Limit dB(uV/m)	Margin dB
Tx, @ 2402 MHz										
4804	V	AV	45.4	8.7	-37.4	32.5	0	49.2	54.0	-4.8
4804	V	PK	58.8	8.7	-37.4	32.5	0	62.6	74.0	-11.4
*12010	V/H	AV	32.0	14.6	-37.2	38.1	-9.5	38.0	54.0	-16.0
*12010	V/H	PK	48.0	14.6	-37.2	38.1	-9.5	54.0	74.0	-20.0
*19216	V/H	AV	35.9	20.4	-52.6	45.0	-9.5	39.2	54.0	-14.8
*19216	V/H	PK	56.7	20.4	-37.4	45.0	-9.5	60.0	74.0	-14.0
Tx, @ 2441 MHz										
4882	V	AV	48.5	8.8	-37.4	32.5	0	52.4	54.0	-1.6
4882	V	PK	60.1	8.8	-37.4	32.5	0	64.0	74.0	-10.0
7323	V	AV	44.4	11.1	-37.2	34.7	0	53.0	54.0	-1.0
7323	V	PK	57.5	11.1	-37.2	34.7	0	66.1	74.0	-7.9
*12205	V/H	AV	33.9	15.0	-36.7	38.4	-9.5	41.1	54.0	-12.9
*12205	V/H	PK	46.8	15.0	-36.7	38.4	-9.5	54.0	74.0	-20.0
*19528	V/H	AV	35.8	20.7	-52.6	45.4	-9.5	39.8	54.0	-14.2
*19528	V/H	PK	56.6	20.7	-52.6	45.4	-9.5	60.6	74.0	-13.4
Tx, @ 2480 MHz										
4960	V	AV	45.5	8.9	-37.9	31.8	0	48.3	54.0	-5.7
4960	V	PK	57.7	8.9	-37.9	31.8	0	60.5	74.0	-13.5
7440	V	AV	44.1	11.3	-37.2	35.3	0	53.5	54.0	-0.5
7440	V	PK	61.0	11.3	-37.2	35.3	0	70.4	74.0	-3.6
*12400	V/H	AV	31.6	15.0	-36.7	38.9	-9.5	39.3	54.0	-14.7
*12400	V/H	PK	47.4	15.0	-36.7	38.9	-9.5	55.1	74.0	-18.9
*19840	V/H	AV	35.7	20.9	-52.6	45.5	-9.5	40.0	54.0	-14.0
*19840	V/H	PK	56.5	20.9	-52.6	45.5	-9.5	60.8	74.0	-13.2

* Noise floor

All other emissions not reported are at least 10 dB below the limit

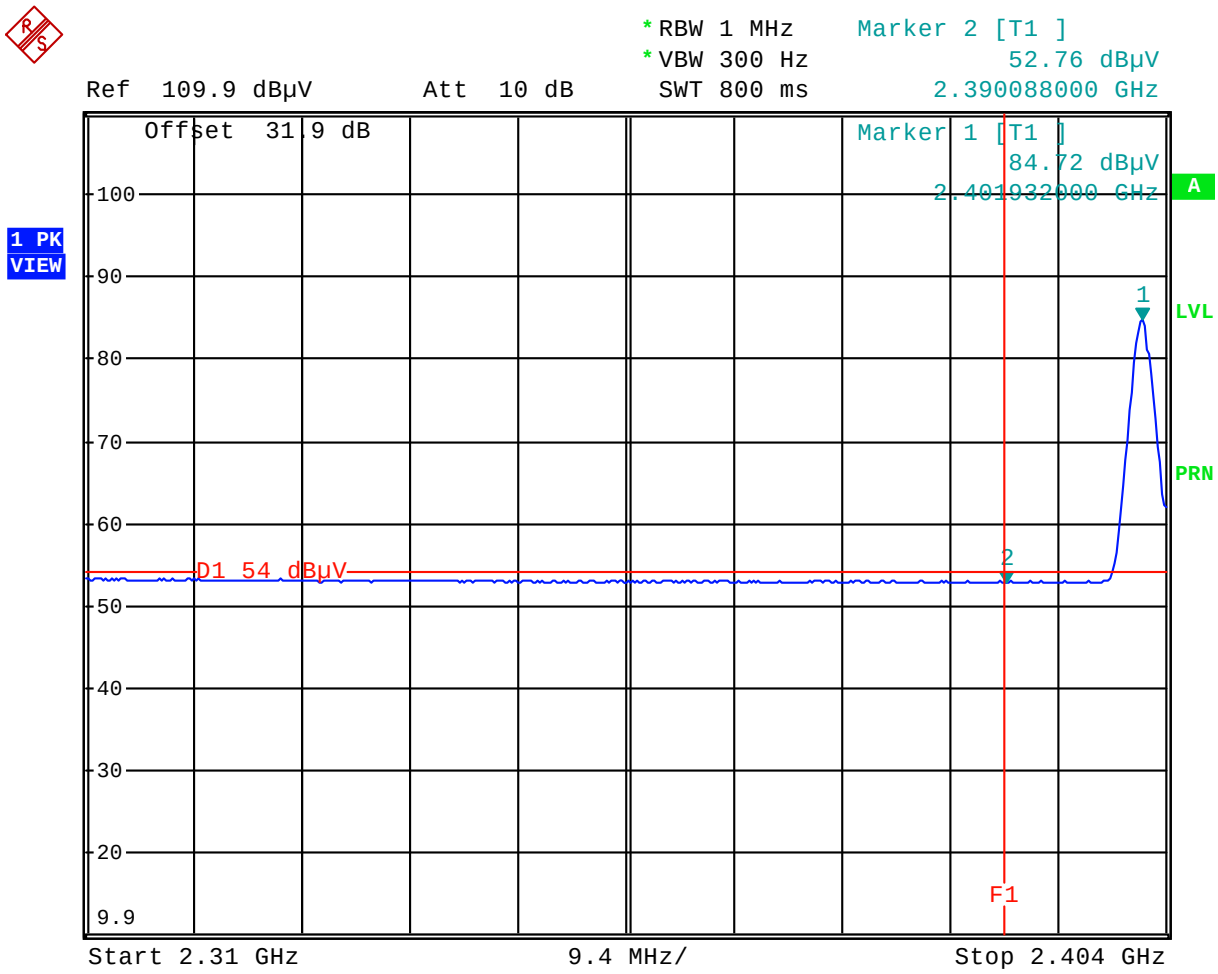
Graphs on the following pages show compliance with radiated emission limits at the band-edge of the restricted bands.

Radiated Emission in Restricted Bands at the band-edge frequency



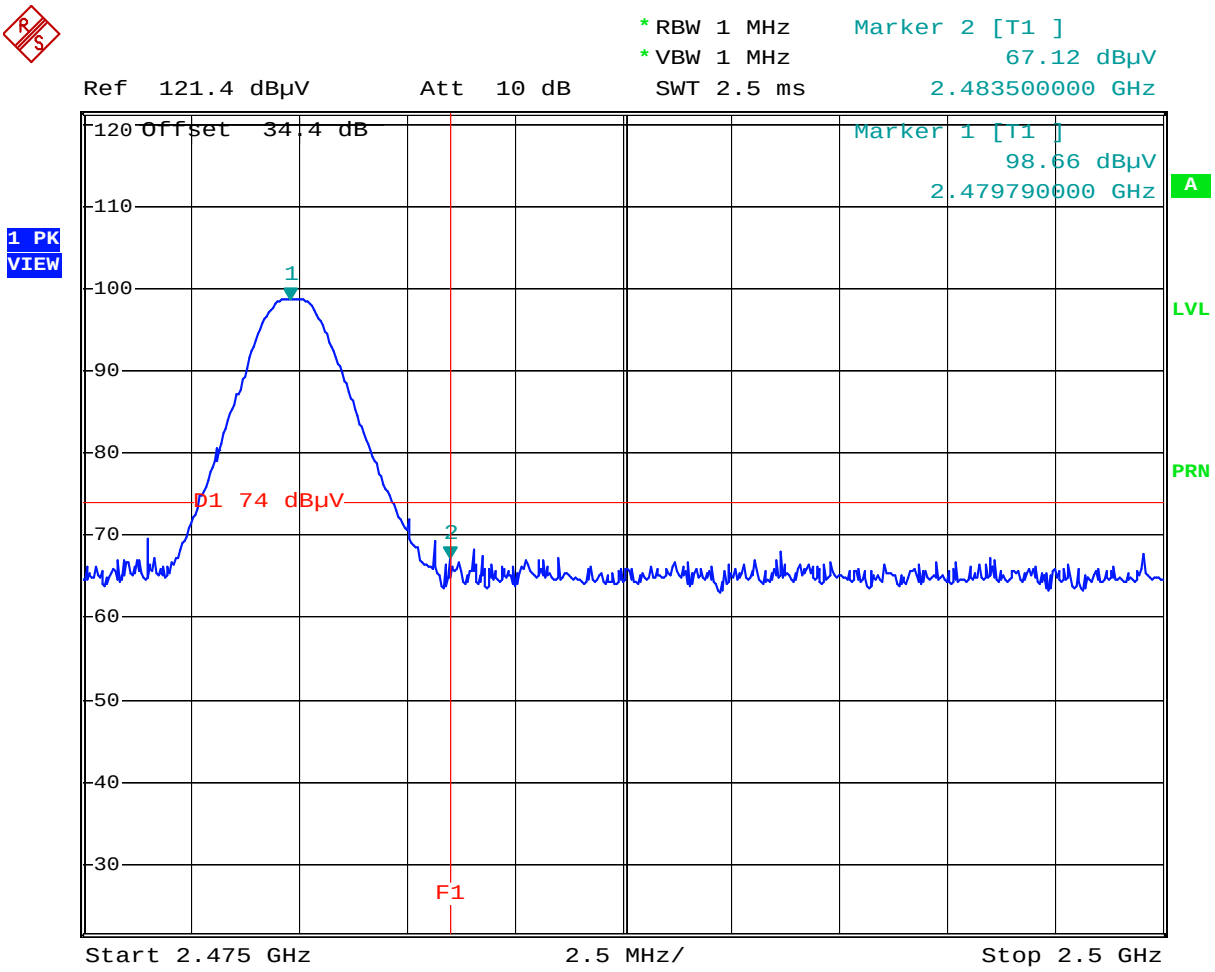
Comment: Band-edge emission, peak
Date: 29.JUN.2007 11:12:52

Note: Antenna Factor and Cable Loss are included in the SA OFFSET



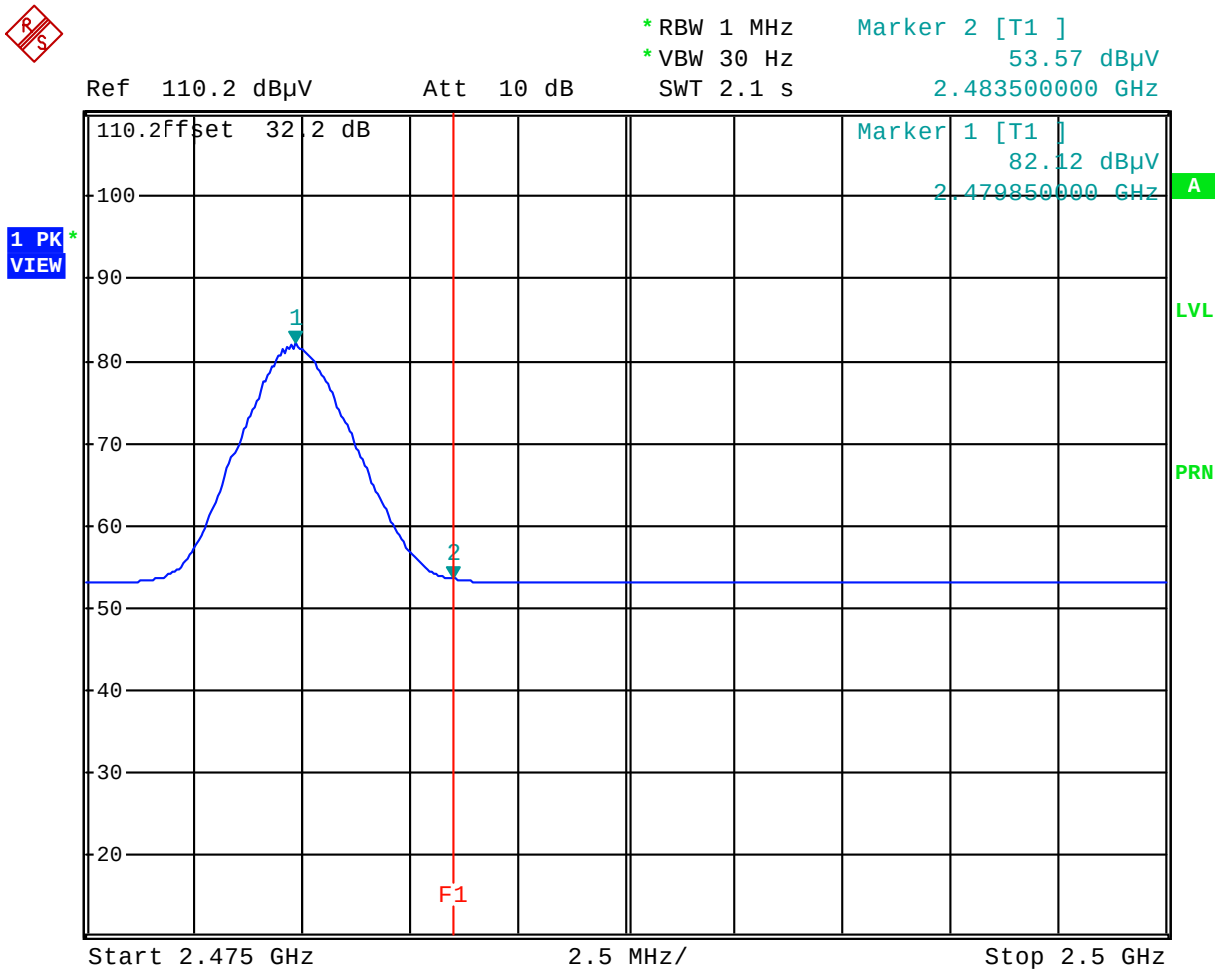
Comment: Band-edge emission, average
Date: 29.JUN.2007 11:19:41

Note: Antenna Factor, Cable Loss and Average Factor are included in the SA OFFSET



Comment: Band-edge emission, peak
Date: 29.JUN.2007 15:51:24

Note: Antenna Factor and Cable Loss are included in the SA OFFSET



Comment: Band-edge emission,average
Date: 29.JUN.2007 10:37:54

Note: Antenna Factor, Cable Loss and Average Factor are included in the SA OFFSET

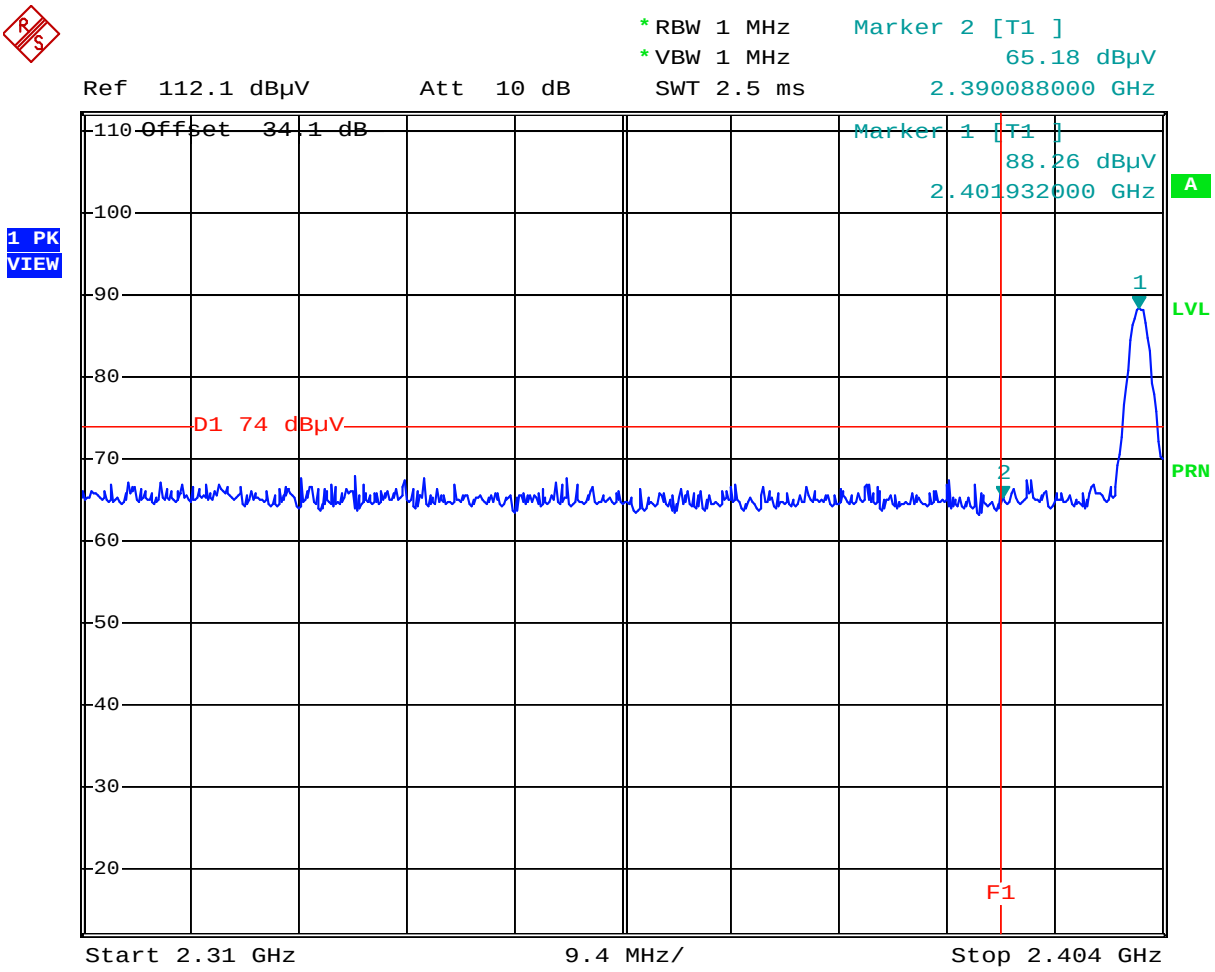
Temperature: 21.0 C							AMO			
Humidity: 48.8 %							Model: Remote Control Master			
Measured at 1 & 3 m										
Frequency MHz	Polarity	Detector	SA reading dB(uV)	Cable loss dB	Pre- amp gain dB	Ant. factor dB(1/m)	D.C.F dB	Field Strength dB(uV/m)	Limit dB(uV/m)	Margin dB
Tx, @ 2402 MHz										
4804	V	AV	47.8	8.7	-37.4	32.5	0	51.6	54.0	-2.4
4804	V	PK	56.9	8.7	-37.4	32.5	0	60.7	74.0	-13.3
*12010	V/H	AV	32.0	14.6	-37.2	38.1	-9.5	38.0	54.0	-16.0
*12010	V/H	PK	47.5	14.6	-37.2	38.1	-9.5	53.5	74.0	-20.5
*19216	V/H	AV	35.5	20.4	-52.6	45.0	-9.5	38.8	54.0	-15.2
*19216	V/H	PK	56.3	20.4	-37.4	45.0	-9.5	59.6	74.0	-14.4
Tx, @ 2441 MHz										
4882	V	AV	46.6	8.8	-37.4	32.5	0	50.5	54.0	-3.5
4882	V	PK	56.2	8.8	-37.4	32.5	0	60.1	74.0	-13.9
7323	V	AV	38.7	11.1	-37.2	34.7	0	47.3	54.0	-6.7
7323	V	PK	53.0	11.1	-37.2	34.7	0	61.6	74.0	-12.4
*12205	V/H	AV	32.3	15.0	-36.7	38.4	-9.5	39.5	54.0	-14.5
*12205	V/H	PK	47.8	15.0	-36.7	38.4	-9.5	55.0	74.0	-19.0
*19528	V/H	AV	35.8	20.7	-52.6	45.4	-9.5	39.8	54.0	-14.2
*19528	V/H	PK	56.6	20.7	-52.6	45.4	-9.5	60.6	74.0	-13.4
Tx, @ 2480 MHz										
4960	V	AV	47.4	8.9	-37.9	31.8	0	50.2	54.0	-3.8
4960	V	PK	56.7	8.9	-37.9	31.8	0	59.5	74.0	-14.5
7440	H	AV	41.9	11.3	-37.2	35.3	0	52.0	54.0	-2.0
7440	H	PK	54.2	11.3	-37.2	35.3	0	64.1	74.0	-9.9
*12400	V/H	AV	31.6	15.0	-36.7	38.9	-9.5	39.3	54.0	-14.7
*12400	V/H	PK	47.4	15.0	-36.7	38.9	-9.5	55.1	74.0	-18.9
*19840	V/H	AV	35.7	20.9	-52.6	45.5	-9.5	40.0	54.0	-14.0
*19840	V/H	PK	56.5	20.9	-52.6	45.5	-9.5	60.8	74.0	-13.2

* Noise floor

All other emissions not reported are at least 10 dB below the limit

Graphs on the following pages show compliance with radiated emission limits at the band-edge of the restricted bands.

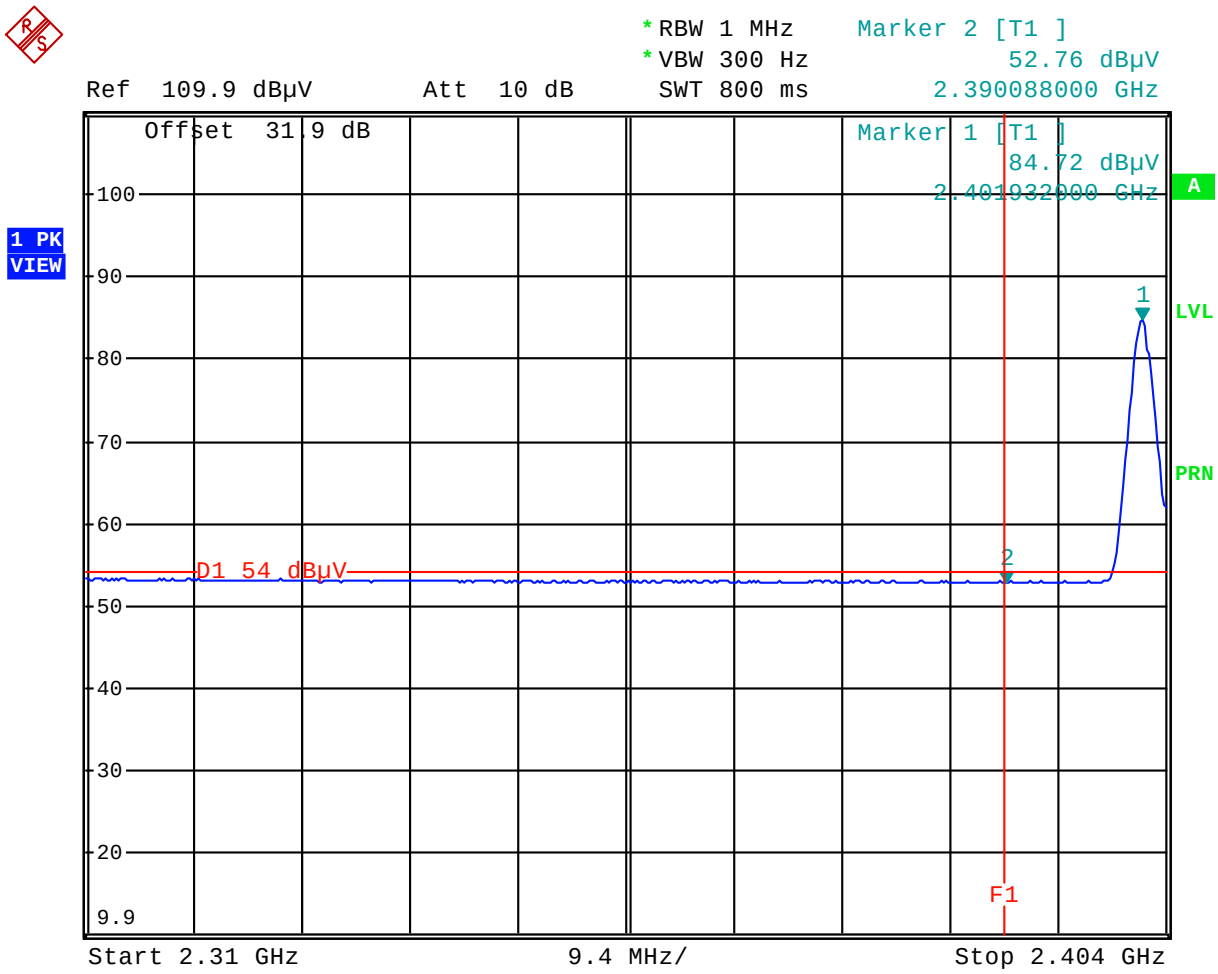
Radiated Emission in Restricted Bands at the band-edge frequency



Comment: Band-edge emission, peak
Date: 29.JUN.2007 11:12:52

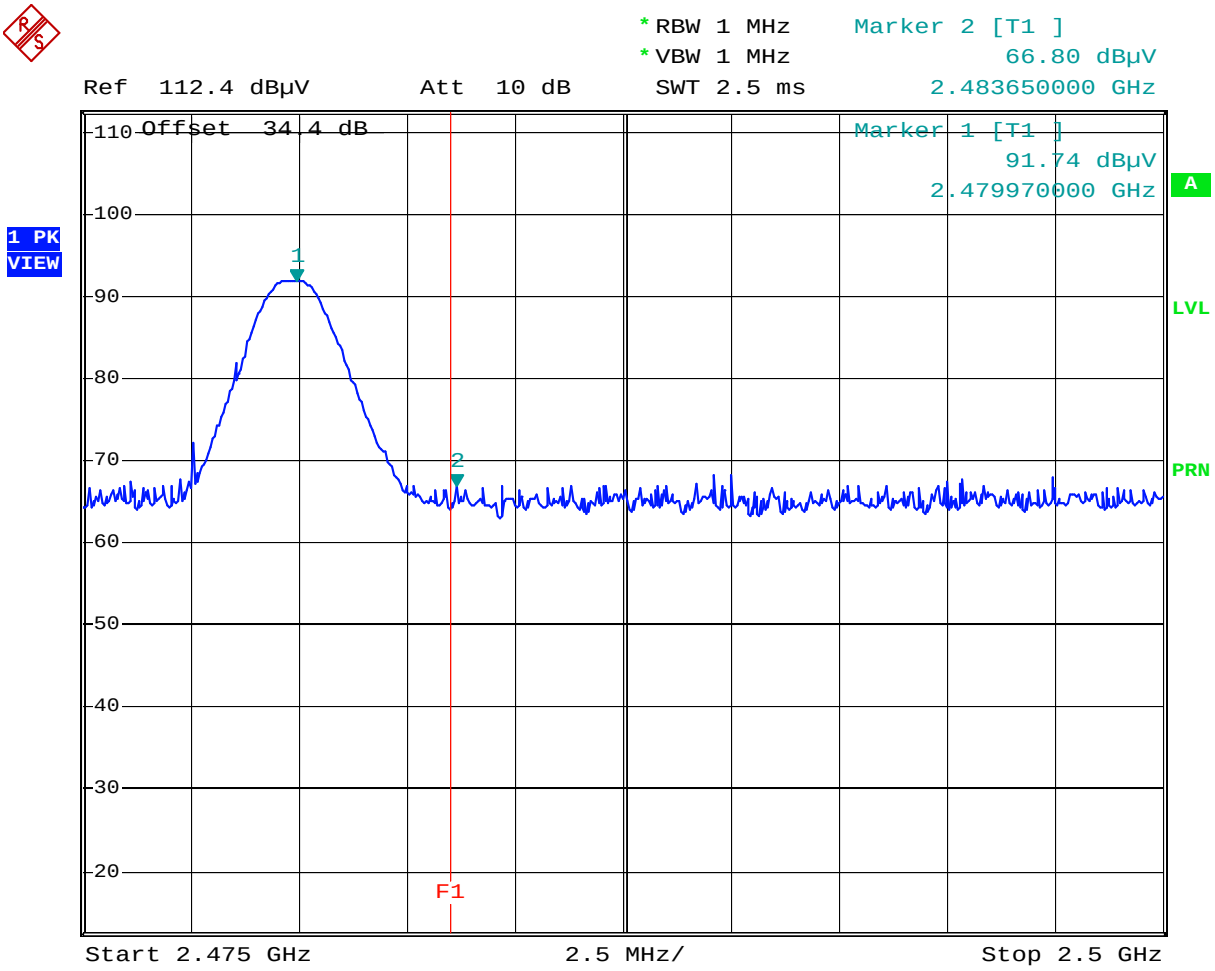
Note: Antenna Factor and Cable Loss are included in the SA OFFSET

Plot 8.1



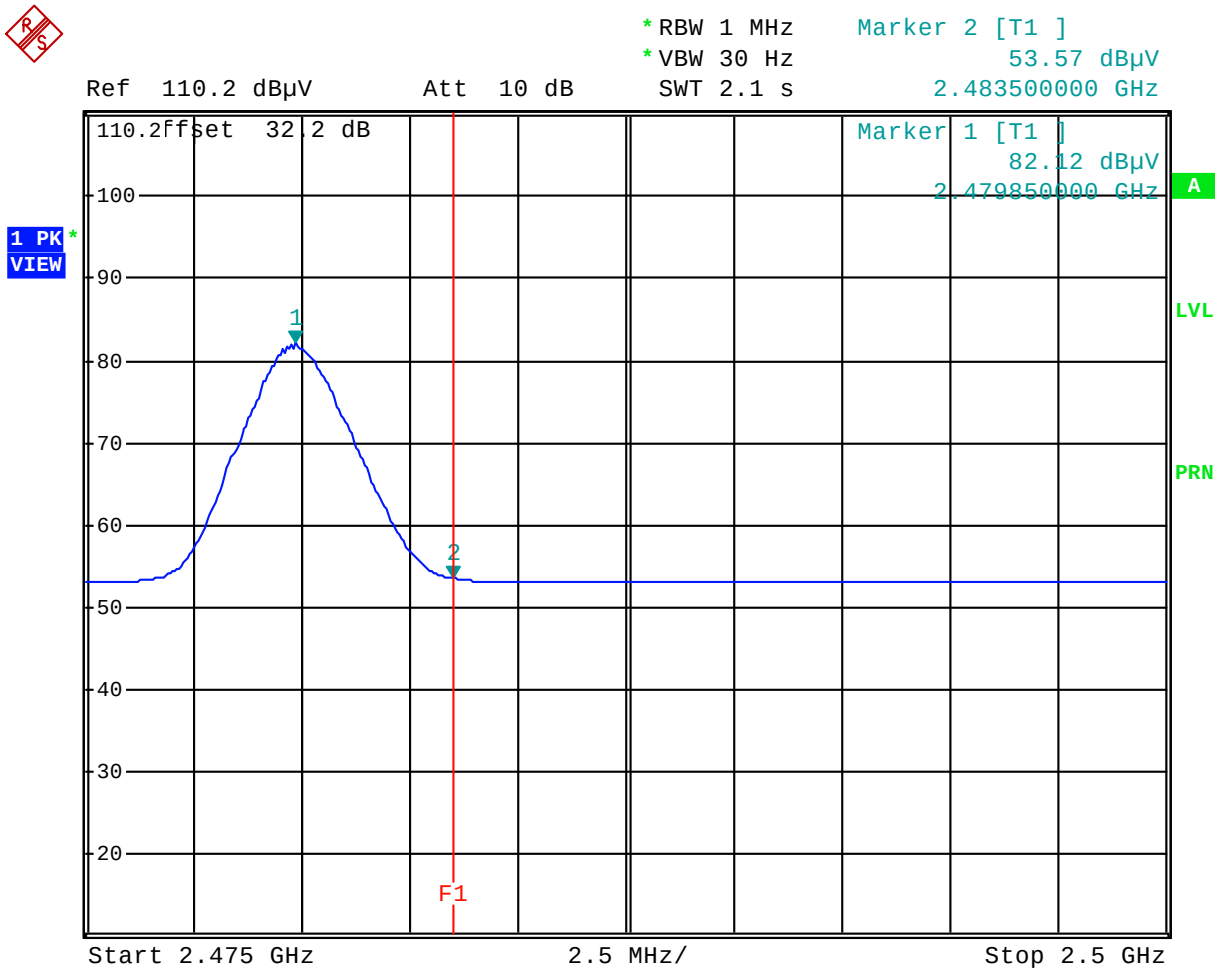
Comment: Band-edge emission,average
Date: 29.JUN.2007 11:19:41

Note: Antenna Factor, Cable Loss and Average Factor are included in the SA OFFSET



Comment: Band-edge emission, peak
Date: 29.JUN.2007 10:31:25

Note: Antenna Factor and Cable Loss are included in the SA OFFSET



Comment: Band-edge emission,average
Date: 29.JUN.2007 10:37:54

Note: Antenna Factor, Cable Loss and Average Factor are included in the SA OFFSET

4.9 Radiated Emissions from Digital Parts and Receiver
FCC Ref: 15.109

4.9.1 Test Limits:

Parameter:	FCC 15.109
Requirement:	FCC 15.109, class B
30-88 MHz 88-216 MHz 216-960 MHz Above 960 MHz	40 dBµ @ 3 m 43.5 dBµV @ 3 m 46 dBµV @ 3 m 54 dBµV @ 3 m

4.9.2 Test Procedure:

See section 4.8 for details of test procedure.

4.9.3 Test Result

Standard: FCC Part 15, Subpart B (15.109) Measurement Uncertainty: 4.2 dB
Company: AMO Temperature: 24°C
Job No. 3124659 Relative Humidity: 49 %
Model Name: Remote Control System
Mode: Standby/Receiving

Frequency	Detector	Polarization	Field level	Distance	D.C.F.	Limit	Margin
MHz			(dBuV/m)	m	dB	(dBuV/m)	(dB)
Remote Control Master							
534.4	QP	H	35.7	3	0.0	46	-10.3
1177	AV	V	32.6	3	0.0	54	-21.4
1336	AV	V	30.0	3	0.0	54	-24.0
Remote Control Slave							
NONE							

Notes:

a) The field strength shown in the table for QP and AV Detector (Vertical and Horizontal levels) includes Antenna factor, Cable loss and Pre-amplifier Gain (if applicable).

b) All emissions not reported were at least 20 dB below the limits or noise level of EMI receiver.

c) Negative signs (-) in Margin column signify levels below the limits.

d) Analyzer setting: RBW ≥1 MHz, VBW ≥ 1 MHz, for freq. > 1 GHz
RBW ≥100kKHz, VBW ≥ 100 kHz, for freq. < 1 GHz
RBW ≥1 kHz, VBW ≥ 1 kHz for freq, < 150 kHz
Detector mode: Average (>1 GHz and < 150 kHz) and Quasi-peak (<1 GHz).

e) D.C.F: Distance Correction Factor

4.10 AC Line Conducted Emission
FCC 15.207:

4.10.1 Test Limits

Table 3-2 FCC Part 15 Subpart B, and ICES 003 Limits for Conducted Emissions at the AC Mains Ports

Frequency Band MHz	Class A Limit dB (μV)		Class B Limit dB (μV)	
	Quasi-Peak	Average	Quasi-Peak	Average
0.15-0.50	79	66	66 to 56 Decreases linearly with the logarithm of the frequency	56 to 46 Decreases linearly with the logarithm of the frequency
0.50-5.00	73	60	56	46
5.00-30.00	73	60	60	50

Note: At the transition frequency the lower limit applies.

4.10.2 Test Procedure

Measurements are carried out using quasi-peak and average detector receivers in accordance with CISPR 16. A LISN is required to provide a defined impedance at high frequencies across the power feed at the point of measurement of terminal voltage and also to provide isolation of the circuit under test from the ambient noise on the power lines. A LISN as defined in CISPR 16 shall be used.

The EUT is located so that the distance between the boundary of the EUT and the closest surface of the LISN is 0.8m.

Where a flexible mains cord is provided by the manufacturer, this shall be 1m long or if in excess of 1m, the excess cable is folded back and forth as far as possible so as to form a bundle not exceeding 0.4m in length.

The EUT is arranged and connected with cables terminated in accordance with the product specification.

Conducted disturbance is measured between the phase lead and the reference ground, and between the neutral lead and the reference ground. Both measured values are reported.

The EUT, where intended for tabletop use, is placed on a table whose top is 0.8m above the ground plane. A vertical, metal reference plane is placed 0.4m from the EUT. The vertical metal reference-plane is at least 2m by 2m. The EUT shall be kept at least 0.8m from any other metal surface or other ground plane not being part of the EUT. The table is constructed of non-conductive materials. Its dimensions are 1m by 1.5m, but July be extended for larger EUT.

Floor standing EUTs are placed on a horizontal metal ground plane and isolated from the ground plane by 3 to 12 mm of insulating material. The metal ground plane extends at least 0.5m beyond the boundaries of the EUT and has minimum dimensions of 2m by 2m.

Equipment setup for conducted disturbance tests followed the guidelines of ANSI C63.4 (2003).

4.10.3 Test Results

Tested By:	Sergey Marker
Test Date:	June 28, 2007

Standard: FCC 15.107/207, ICES-003
Test: Conducted Emissions
Frequency Range: 150 kHz to 30 MHz
Limits: Class B

Measurement Uncertainty: 2.4 dB
Temperature: 24˚C
Relative Humidity: 48%

Tested with ITE P/N HK-A509-A05 power supply:

Measurements made on selected frequencies from neutral conductor are given below:

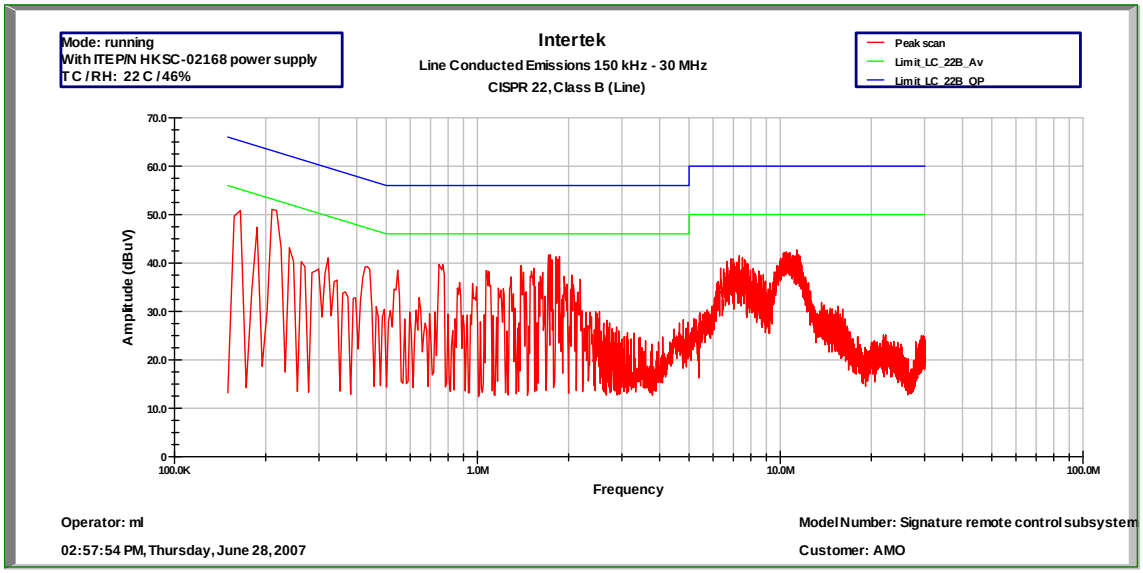
Frequency	Level (AV)	Limit (AV)	Level (QP)	Limit (QP)	Margin
MHZ	(dBµV)	(dBµV)	(dBµV)	(dBµV)	dB
0.212	36.6	53.4	48.8	63.4	-14.6
0.322	23.8	49.8	37.1	59.8	-22.7
0.426	33.4	47.3	40.0	57.3	-17.3
1.647	24.5	46.0	42.1	56.0	-13.9
6.900	24.7	50.0	37.5	60.0	-22.5
10.770	32.6	50.0	39.1	60.0	-20.9

Measurements made on selected frequencies from line conductor are given below:

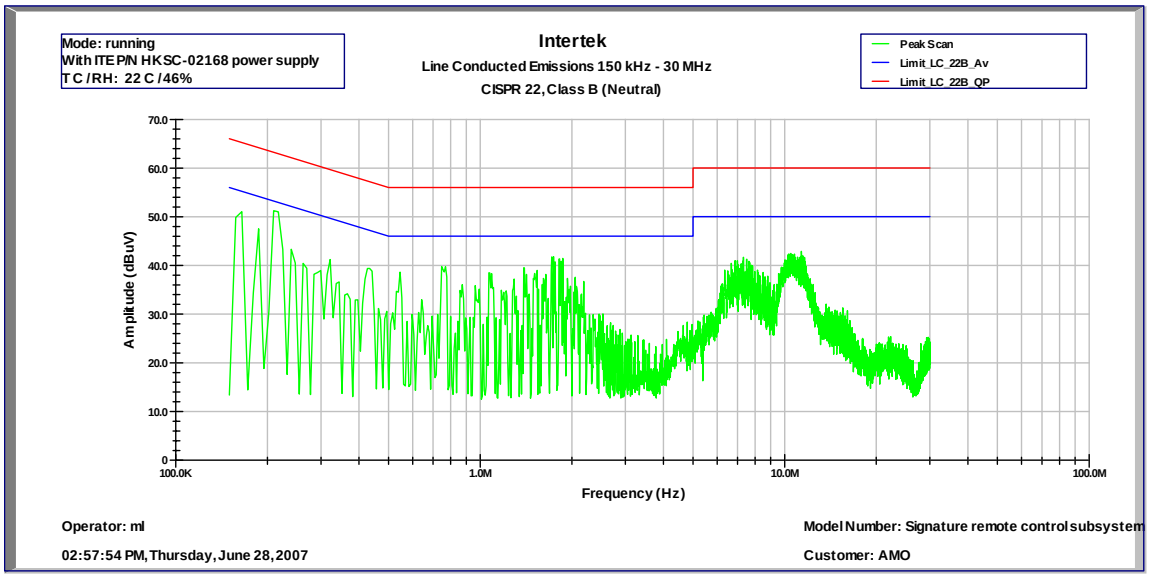
Frequency	Level (AV)	Limit (AV)	Level (QP)	Limit (QP)	Margin
MHZ	(dBµV)	(dBµV)	(dBµV)	(dBµV)	dB
0.173	35.8	53.4	48.5	63.4	-14.9
0.209	22.3	49.8	36.4	59.8	-23.4
0.387	32.9	47.3	40.4	57.3	-16.9
0.416	26.8	46.0	42.1	56.0	-13.9
0.452	25.0	50.0	37.9	60.0	-22.1
7.595	31.5	50.0	38.2	60.0	-21.8

Note 1: a) A complete scan from 0.15 - 30 MHz was made.
b) Analyzer setting: RBW ≥9 kHz, VBW ≥9 kHz
Detector mode: Quasi-peak and Average
c) All other measurements were more than 20 dBs below the limit lines.
d) Next page(s) show prescan results.

Results:	**Complies** by 13.9 dB



Conducted Disturbance at AC Mains, Neutral conductor



Conducted Disturbance at AC Mains, Line conductor

5.0 RF Exposure evaluation

The EUT is a Bluetooth device used in mobile application, at least 20 cm from any body part of the user or near by persons.

The maximum conducted power is 0.97 mW (-0.13 dBm).
Antenna is fix-mounted, 1.8 dBi gain. Therefore, to comply with RF Exposure Requirement, the MPE is calculated.

The maximum Peak EIRP: -0.13 dBm + 1.8 dBi = 1.67 dBm or 1.5 mW.
The Power Density can be calculated using the formula:

$$S = EIRP/ 4\pi D^2$$

Where: S is Power Density in W/m^2
D is the distance from the antenna.

At 0.2 m, S = 0.002 W/m^2, which is below the MPE Limit of 10 W/m^2

Note: In case if this device may be moved close then 0.2 m from the body part, it meets the SAR requirements without testing due to the lower output power.

6.0 List of test equipment

Measurement equipment used for emission compliance testing utilized the equipment on the following list:

Receivers / Spectrum Analyzers

DESCRIPTION	SERIAL NO.	LAST CAL DATE	CAL DUE	TICK IF USED
HP 8546A Receiver RF Section	3549A00261	1/02/07	1/02/08	X
HP 85460A RF Filter Section	3448A00265	1/02/07	1/02/08	X
Tile Software	Rev. 3.0 G	N/A	N/A	X
R & S FSP40 Spectrum Analyzer	100027	3/10/07	3/10/08	X

Antennas / Preamplifiers

DESCRIPTION	SERIAL NO.	LAST CAL DATE	CAL DUE	TICK IF USED
ETS Lindgren Biconical Antenna 3110B	56996	4/17/07	4/17/08	X
A.H.System SAS-510-4 Logperiodic Antenna	156	1/19/07	1/19/08	X
ETS Lindgren 3115 Horn Antenna	00031626	4/16/07	4/16/08	X
ETS Lindgren 3116 Horn Antenna	00028304	03/22/07	03/22/08	X
Agilent RF Preamplifier 8447D	2944A101	12/22/06	12/22/07	X
HP RF Preamplifier 8449B	30080116	1/03/07	1/03/08	X
Miteg				

Artificial Mains Networks/Absorbing Clamps

DESCRIPTION	SERIAL NO.	LAST CAL DATE	CAL DUE	TICK IF USED
EMCO 3816/2NM 16A LISN	1039	10/04/06	10/04/07	
EMCO 3825/2 25 A LISN	2527	8/17/06	8/17/07	X

7.0 Document History

Revision/ Job Number	Writer Initials	Date	Change
1.0 / 3124659	SM	June 29, 2007	Original document
2.0 / 3124659	SM	August 7, 2007	Added Radiated Emission from Digital Parts and Receiver test