TEST REPORT OF A 2.4 GHZ WLAN USB TRANSCEIVER, BRAND INTERSIL, TYPE ISL37101U, IN CONFORMITY WITH CFR 47 PART 15.247 (2001-5-24)

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MEASUREMENT/TECHNICAL REPORT

Intersil Corporation, The Netherlands

Model : ISL37101U

FCC ID: OSZ37101U

March 25, 2002

This report concerns (strike out one):	Original grant/certification ~~Class 2 change~~ ~~Verification~~
Equipment type:	Direct Sequence Spread Spectrum Transceiver
Deferred grant requested per 47 CFR 0.457(d)(1)(ii) ?	~~Yes~~ No

Report prepared by:		
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The data taken for this test and report herein was done in accordance with CFR 47 Part 15 and the measurement procedures of ANSI C63.4-1992. TNO Certification EPS at Niekerk, The Netherlands, certifies that the data is accurate and contains a true representation of the emission profile of the Equipment Under Test (EUT) on the date of the test as noted in the test report. I have reviewed the test report and find it to be an accurate description of the test(s) performed and the EUT so tested.

Date: March 25, 2002 Signature:

P. de Beer
TNO Certification EPS

Description of test item

Test item	:	2.4 GHz WLAN USB transceiver
Manufacturer	:	Intersil Corporation The Netherlands
Brand	:	Intersil
Type	:	ISL37101U
Receipt number	:	2
Receipt date	:	December 27, 2001

Applicant information

Applicant's representative	:	D.S. Sariredjo
Company	:	Intersil Corp., The Netherlands
Address	:	Rembrandtlaan 1a
Postal code	:	3723 BG
City	:	Bilthoven
PO-box	:	343
Postal code	:	3720 AH
City	:	Bilthoven
Country	:	The Netherlands
Telephone number	:	+31 (0)30 228 6060
Telefax number	:	+31 (0)30 228 6061

Test(s) performed

Location	:	Niekerk
Test(s) started	:	December 27, 2001
Test(s) completed	:	January 15, 2002
Purpose of test(s)	:	Type approval / certification
Test specification(s)	:	CFR 47 Part 15.247 (2001-5-24)

Test engineer : O.H. Hoekstra 

Report written by : O.H. Hoekstra

Project leader : P. de Beer 

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This report shall not be reproduced, except in full, without the written permission of TNO Physics and Electronics Laboratory.
The test results relate only to the item(s) tested.

Table of contents

1 General information

1.1 Product description

The 2.4 GHz WLAN USB transceiver is designed to operate in the 2.4 GHz ISM frequency band, channels 1 to 11, as specified by the FCC in the USA. The 2.4 GHz WLAN USB transceiver will also operate on channels 12 to 14, where permitted by local regulatory authorities. Operation channels are firmware programmed prior to end-user shipment so only the regulatory allowed channels are implemented.

The Intersil PRISM Chip Set allows for high-level integration for reduced size, increased throughput, improved radio performance and faster time to market. The 2.4 GHz WLAN USB transceiver implements Direct Sequence Spread Spectrum DSSS technology providing superior noise and signal jamming immunity, including less severe impact from unintentional radiators such as microwave ovens. The user can connect the 2.4 GHz WLAN USB transceiver in an ad-hoc peer to peer networking scheme, allowing for instant network setup in any office environment. By using an access point, the 2.4 GHz WLAN USB transceiver can be set up to allow for a greater number of users to interconnect, and to increase the coverage area.

1.2 Related submittal(s) and/or Grant(s)

Not applicable.

1.3 Tested system details

Details and an overview of the system and all its components, as it has been tested, can be found in table 1 below. FCC ID's are stated in this overview where applicable. The EUT is listed in the first row of this table 1.

Model	Serial #	FCC ID	Description	Cable Descriptions
ISL37101U	-	OSZ37101U	2.4 GHz WLAN USB transceiver	- Screened USB cable to notebook computer
IBM Thinkpad, type 2626	55-0634L	-	Notebook computer	- unshielded power cord to AC/DC power adapter
AC/DC power adapter, type 2k06543	2M04T793A0Z	-	AC to DC adapter 100-240 Vac to 16 Vdc / 3.36 A	- unshielded power cord to notebook computer - direct connection to AC Mains

Table 1 - Tested system details overview.

1.4 Test methodology

The test methodology used is based on the requirements of CFR 47 Part 15, issue of May 24, 2001, sections 15.107, 15.109, 15.205, 15.207, 15.209 and 15.247.

The test methods, which have been used, are based on ANSI C63.4: 1992.

Radiated emission tests above 30 MHz were performed at a measurement distance of 3 meters. Below 30 MHz the radiated emission tests were carried out at measurement distances of 3 and 10 meters. The test results regarding the radiated emission tests on frequencies below 30 MHz have been extrapolated in order to determine the field strength of the measured values at measurement distances of 30 and 300 meters (as required by CFR 47 Part 15).

Radiated emission tests on frequencies above 1 GHz were performed with appropriate pre-amplifiers, antennas and a spectrum analyzer. At frequencies on which radiated emissions were found the level at the input of the pre-amplifier was reproduced by means of a RF signal generator. The output level of the signal generator was then increased with the antenna factor in order to obtain the actual field strength value for each individual frequency on which radiated emissions were found.

1.5 Test facility

The Federal Communications Commission has reviewed the technical characteristics of the test facilities at TNO Certification EPS, located in Niekerk, 9822 TL Smidshornerweg 18, The Netherlands, and has found these test facilities to be in compliance with the requirements of CFR 47 Part 15, section 2.948, per October 23, 2000.

The description of the test facilities has been filed at the Office of the Federal Communications Commission. The facility has been added to the list of those laboratories performing these test services for the public on a fee basis.

The list of all public test facilities is available on the Internet at http://www.fcc.gov.

1.6 Product labeling

1.7 FCC ID Label

The following label shall be attached to the device under test.

FCC ID: OSZ37101U
This Device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

Figure 1 - FCC ID Caller

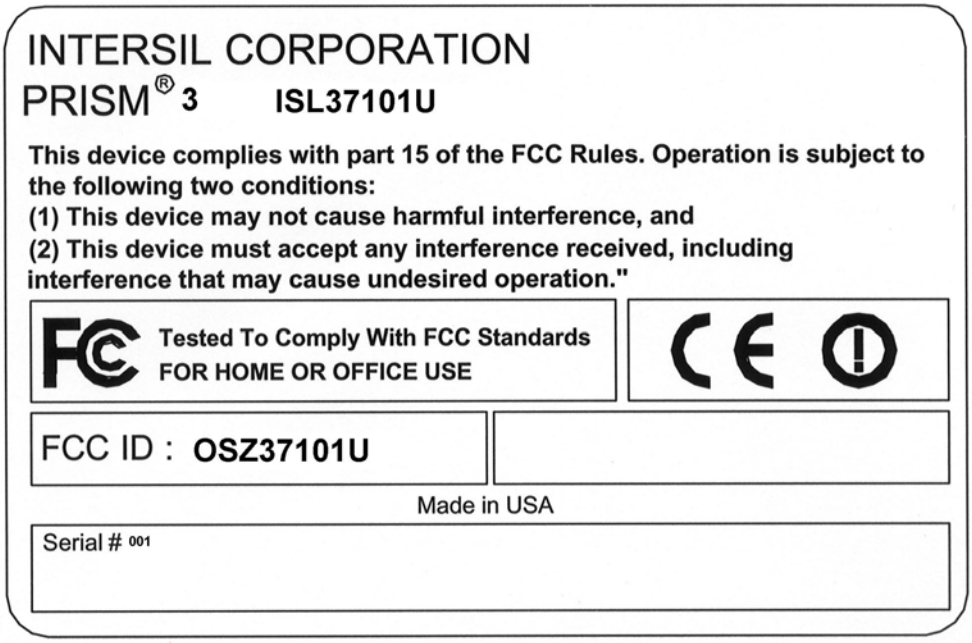


Figure 2 - FCC ID Caller, label

1.8 Location of the FCC ID Label on the EUT

The FCC ID Label will be placed on the front side of the 2.4 GHz WLAN USB transceiver (EUT).

See also the technical documentation, which has been submitted to the FCC/TCB, for more detailed information.

1.9 System test configuration

1.9.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it).

The justification and manipulation of cables and equipment in order to simulate a worst-case behavior of the test setup has been carried out as prescribed in ANSI C63.4: 1992.

Tests were performed at the lowest operating frequency (channel 1: 2412 MHz), the operating frequency in the middle of the specified frequency band (channel 6: 2437 MHz) and the highest operating frequency (channel 11: 2462 MHz). Further details may be found in table 2 below.

Channel	Operating frequencies (MHz)	Rated output power (dBm)	Test performed
1	2412	+20	***yes***
2	2417	+20	no
3	2422	+20	no
4	2427	+20	no
5	2432	+20	no
6	2437	+20	***yes***
7	2442	+20	no
8	2447	+20	no
9	2452	+20	no
10	2457	+20	no
11	2462	+20	***yes***

Table 2 - Specification of channels and rated maximum output power (including an antenna gain of 2 dBi).

The EUT was tested while connected to one of the USB expansion ports of a notebook computer. This enabled the EUT to function as intended. The EUT has an integral antenna, having a gain of 2 dBi.

1.9.2 EUT exercise software

The EUT could be enabled to transmit or receive continuously on channels 1 (2412 MHz), 6 (2437 MHz) and 11 (2462 MHz) by means of test software, which was supplied by the manufacturer of the EUT. Furthermore, the utilized test software also enables various transmission bit-rate settings in the range of 1 Mbit/s, 2 Mbit/s, 5.5 Mbit/s and 11 Mbit/s.

1.10 Special accessories

No special accessories are used and/or needed to achieve compliance with the appropriate sections of CFR 47 Part 15.

1.11 Equipment modifications

No modifications have been made to the equipment in order to achieve compliance with the appropriate sections of CFR 47 Part 15.

1.12 Configuration of the tested system

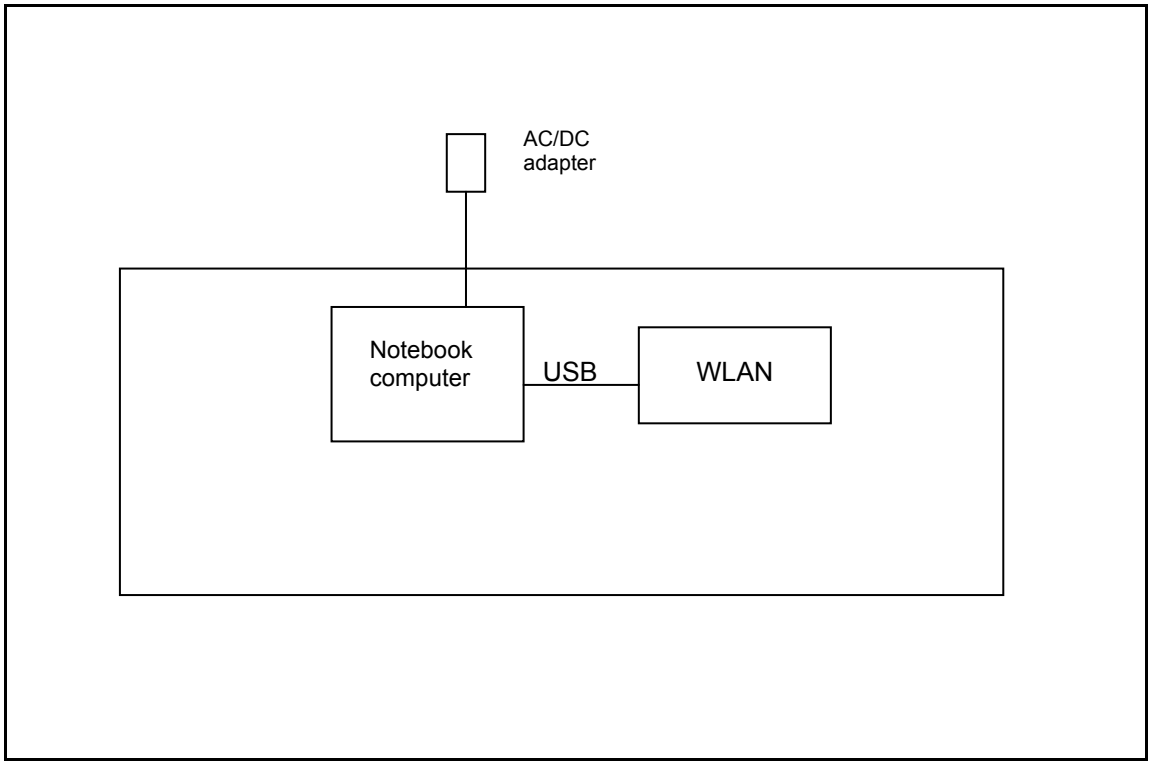


Figure 3 - Configuration of the tested system.

1.13 Block diagram(s) of the EUT

The block diagram is available as an exhibit of the submitted documentation for FCC/TCB certification.

2 Radiated emission data

2.1 Test results with EUT operating in receive mode on channel 1

The results of the radiated emission tests, carried out in accordance with CFR 47 Part 15.109 and CFR 47 Part 15.209 with the EUT operating in receive mode on channel 1 (2412 MHz), are depicted in table 3.

Frequency (MHz)	Test results quasi peak (dBµV/m)		Test results average (dBµV/m)		Test results peak (dBµV/m)		Resolution bandwidth (kHz)	Quasi peak limits (dBµV/m)	Average limits (dBµV/m)	Peak limits (dBµV/m)
	V	H	V	H	V	H				
48.0	19.6	19.1	-	-	-	-	120	40.0	-	-
70.9	25.1	22.8	-	-	-	-	120	40.0	-	-
163.0	28.0	25.5	-	-	-	-	120	43.5	-	-
176.0	37.1	34.5	-	-	-	-	120	43.5		
198.4	33.9	31.7	-	-	-	-	120	43.5		
228.3	33.9	30.7	-	-	-	-	120	46.0		
261.0	33.5	30.2	-	-	-	-	120	46.0		
326.2	31.2	29.5	-	-	-	-	120	46.0		
456.6	31.8	31.4	-	-	-	-	120	46.0		
523.1	36.5	32.3	-	-	-	-	120	46.0		
729.1	32.1	<30.0	-	-	-	-	120	46.0		
796.6	32.7	38.8	-	-	-	-	120	46.0		
847.9	32.0	<30.0	-	-	-	-	120	46.0		
1000	-	-	n.t.	n.t.	36.7	37.4	1000	-	54.0	74.0
1128	-	-	n.t.	n.t.	31.9	30.2	1000	-	54.0	74.0
1261	-	-	n.t.	n.t.	30.3	35.7	1000	-	54.0	74.0
1399	-	-	n.t.	n.t.	32.6	30.1	1000	-	54.0	74.0
1466	-	-	n.t.	n.t.	33.1	31.7	1000	-	54.0	74.0
1599	-	-	n.t.	n.t.	34.5	32.8	1000	-	54.0	74.0
1865	-	-	n.t.	n.t.	34.6	34.2	1000	-	54.0	74.0
4824	-	-	n.t.	n.t.	46.3	50.7	1000	-	54.0	74.0
9648	-	-	n.t.	n.t.	48.6	44.7	1000	-	54.0	74.0
9648-26500	-	-	n.t.	n.t.	<44.0	<44.0	1000	-	54.0	74.0

Table 3 - Test results with the EUT operating in receive mode on channel 1 (2412 MHz).

Note: Above 1 GHz, all measured values of the spurious emissions with the detector in peak mode are below the applicable limits which are valid when using an average detector. Therefore, all spurious emissions above 1 GHz have been measured with the peak detector only (n.t. = not tested).

Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : January 16, 2002

2.2 Test results with EUT operating in receive mode on channel 6

The results of the radiated emission tests, carried out in accordance with CFR 47 Part 15.109 and CFR 47 Part 15.209 with the EUT operating in receive mode on channel 6 (2437 MHz), are depicted in table 4.

Frequency (MHz)	Test results quasi peak (dBµV/m)		Test results average (dBµV/m)		Test results peak (dBµV/m)		Resolution bandwidth (kHz)	Quasi peak limits (dBµV/m)	Average limits (dBµV/m)	Peak limits (dBµV/m)
	V	H	V	H	V	H				
48.0	19.6	19.1	-	-	-	-	120	40.0	-	-
70.9	25.1	22.8	-	-	-	-	120	40.0	-	-
163.0	28.0	25.5	-	-	-	-	120	43.5	-	-
176.0	37.1	34.5	-	-	-	-	120	43.5		
198.4	33.9	31.7	-	-	-	-	120	43.5		
228.3	33.9	30.7	-	-	-	-	120	46.0		
261.0	33.5	30.2	-	-	-	-	120	46.0		
326.2	31.2	29.5	-	-	-	-	120	46.0		
456.6	31.8	31.4	-	-	-	-	120	46.0		
523.1	36.5	32.3	-	-	-	-	120	46.0		
729.1	32.1	<30.0	-	-	-	-	120	46.0		
796.6	32.7	38.8	-	-	-	-	120	46.0		
847.9	32.0	<30.0	-	-	-	-	120	46.0		
1000	-	-	n.t.	n.t.	36.7	37.4	1000	-	54.0	74.0
1128	-	-	n.t.	n.t.	31.9	30.2	1000	-	54.0	74.0
1261	-	-	n.t.	n.t.	30.3	35.7	1000	-	54.0	74.0
1399	-	-	n.t.	n.t.	32.6	30.1	1000	-	54.0	74.0
1466	-	-	n.t.	n.t.	33.1	31.7	1000	-	54.0	74.0
1599	-	-	n.t.	n.t.	34.5	32.8	1000	-	54.0	74.0
1865	-	-	n.t.	n.t.	34.6	34.2	1000	-	54.0	74.0
4874	-	-	n.t.	n.t.	44.4	49.1	1000	-	54.0	74.0
9748	-	-	n.t.	n.t.	49.0	44.2	1000	-	54.0	74.0
9748-26500	-	-	n.t.	n.t.	<44.0	<44.0	1000	-	54.0	74.0

Table 4 - Test results with the EUT operating in receive mode on channel 6 (2437 MHz).

Note: Above 1 GHz, all measured values of the spurious emissions with the detector in peak mode are below the applicable limits which are valid when using an average detector. Therefore, all spurious emissions above 1 GHz have been measured with the peak detector only (n.t. = not tested).

Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : January 16, 2002

2.3 Test results with EUT operating in receive mode on channel 11

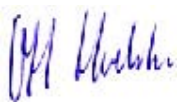
The results of the radiated emission tests, carried out in accordance with CFR 47 Part 15.109 and CFR 47 Part 15.209 with the EUT operating in receive mode on channel 11 (2462 MHz), are depicted in table 5.

Frequency (MHz)	Test results quasi peak (dBµV/m)		Test results average (dBµV/m)		Test results peak (dBµV/m)		Resolution bandwidth (kHz)	Quasi peak limits (dBµV/m)	Average limits (dBµV/m)	Peak limits (dBµV/m)
	V	H	V	H	V	H				
48.0	19.6	19.1	-	-	-	-	120	40.0	-	-
70.9	25.1	22.8	-	-	-	-	120	40.0	-	-
163.0	28.0	25.5	-	-	-	-	120	43.5	-	-
176.0	37.1	34.5	-	-	-	-	120	43.5		
198.4	33.9	31.7	-	-	-	-	120	43.5		
228.3	33.9	30.7	-	-	-	-	120	46.0		
261.0	33.5	30.2	-	-	-	-	120	46.0		
326.2	31.2	29.5	-	-	-	-	120	46.0		
456.6	31.8	31.4	-	-	-	-	120	46.0		
523.1	36.5	32.3	-	-	-	-	120	46.0		
729.1	32.1	<30.0	-	-	-	-	120	46.0		
796.6	32.7	38.8	-	-	-	-	120	46.0		
847.9	32.0	<30.0	-	-	-	-	120	46.0		
1000	-	-	n.t.	n.t.	36.7	37.4	1000	-	54.0	74.0
1128	-	-	n.t.	n.t.	31.9	30.2	1000	-	54.0	74.0
1261	-	-	n.t.	n.t.	30.3	35.7	1000	-	54.0	74.0
1399	-	-	n.t.	n.t.	32.6	30.1	1000	-	54.0	74.0
1466	-	-	n.t.	n.t.	33.1	31.7	1000	-	54.0	74.0
1599	-	-	n.t.	n.t.	34.5	32.8	1000	-	54.0	74.0
1865	-	-	n.t.	n.t.	34.6	34.2	1000	-	54.0	74.0
4924	-	-	n.t.	n.t.	45.4	48.5	1000	-	54.0	74.0
9848	-	-	n.t.	n.t.	48.1	43.3	1000	-	54.0	74.0
9848-26500	-	-	n.t.	n.t.	<44.0	<44.0	1000	-	54.0	74.0

Table 5 - Test results with the EUT operating in receive mode on channel 11 (2462 MHz).

Note: Above 1 GHz, all measured values of the spurious emissions with the detector in peak mode are below the applicable limits which are valid when using an average detector. Therefore, all spurious emissions above 1 GHz have been measured with the peak detector only (n.t. = not tested).

Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : January 16, 2002

2.4 Test results with EUT operating in transmit mode on channel 1.

The results of the radiated emission tests, carried out in accordance with CFR 47 Part 15.205 (restricted bands of operation) with the EUT operating in transmit mode on channel 1 (2412 MHz), are depicted in table 6.

Frequency (MHz)	Test results quasi peak (dBµV/m)		Test results average (dBµV/m)		Test results peak (dBµV/m)		Resolution bandwidth (kHz)	Quasi peak limits (dBµV/m)	Average limits (dBµV/m)	Peak limits (dBµV/m)
	V	H	V	H	V	H				
163.0	29.3	25.8	-	-	-	-	120	43.5	-	-
260.0	35.1	30.9	-	-	-	-	120	46.0	-	-
326.0	32.2	25.8	-	-	-	-	120	46.0	-	-
1062	-	-	n.t.	n.t.	35.5	31.3	1000	-	54.0	74.0
1128	-	-	n.t.	n.t.	37.5	36.4	1000	-	54.0	74.0
1594	-	-	n.t.	n.t.	35.9	33.7	1000	-	54.0	74.0
1732	-	-	n.t.	n.t.	34.1	<34.0	1000	-	54.0	74.0
2264	-	-	29.6	38.8	37.7	47.7	1000	-	54.0	74.0
4824	-	-	n.t.	n.t.	40.2	44.1	1000	-	54.0	74.0
9670	-	-	n.t.	n.t.	43.6	<34.0	1000	-	54.0	74.0
>9670-26500	-	-	n.t.	n.t.	<44.0	<44.0	1000	-	54.0	74.0

Table 6 - Test results with the EUT operating in transmit mode on channel 1 (2412 MHz).

Note: Radiated emission tests have been performed with all possible transmission bit-rates (1 Mbit/s, 2 Mbit/s, 5.5 Mbit/s and 11 Mbit/s) in transmit mode. The highest values measured of the spurious emission components are reported by means of table 6.

Note: Above 1 GHz, all measured values of the spurious emissions with the detector in peak mode are below the applicable limits which are valid when using an average detector. Therefore, all spurious emissions above 1 GHz have been measured with the peak detector only (n.t. = not tested).

Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : January 16, 2002

2.5 Test results with EUT operating in transmit mode on channel 6.

The results of the radiated emission tests, carried out in accordance with CFR 47 Part 15.205 (restricted bands of operation) with the EUT operating in transmit mode on channel 6 (2437 MHz), are depicted in table 7.

Frequency (MHz)	Test results quasi peak (dBµV/m)		Test results average (dBµV/m)		Test results peak (dBµV/m)		Resolution bandwidth (kHz)	Quasi peak limits (dBµV/m)	Average limits (dBµV/m)	Peak limits (dBµV/m)
	V	H	V	H	V	H				
163.0	29.3	25.8	-	-	-	-	120	43.5	-	-
260.0	35.1	30.9	-	-	-	-	120	46.0	-	-
326.0	32.2	25.8	-	-	-	-	120	46.0	-	-
1062	-	-	n.t.	n.t.	35.5	31.3	1000	-	54.0	74.0
1128	-	-	n.t.	n.t.	37.5	36.4	1000	-	54.0	74.0
1594	-	-	n.t.	n.t.	35.9	33.7	1000	-	54.0	74.0
1732	-	-	n.t.	n.t.	34.1	<34.0	1000	-	54.0	74.0
2288	-	-	28.0	38.4	36.9	46.8	1000	-	54.0	74.0
4874	-	-	n.t.	n.t.	38.4	44.4	1000	-	54.0	74.0
>4874-26500	-	-	n.t.	n.t.	<44.0	<44.0	1000	-	54.0	74.0

Table 7 - Test results with the EUT operating in transmit mode on channel 6 (2437 MHz).

Note: Radiated emission tests have been performed with all possible transmission bit-rates (1 Mbit/s, 2 Mbit/s, 5.5 Mbit/s and 11 Mbit/s) in transmit mode. The highest values measured of the spurious emission components are reported by means of table 7.

Note: Above 1 GHz, all measured values of the spurious emissions with the detector in peak mode are below the applicable limits which are valid when using an average detector. Therefore, all spurious emissions above 1 GHz have been measured with the peak detector only (n.t. = not tested).

Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : January 16, 2002

2.6 Test results with EUT operating in transmit mode on channel 11.

The results of the radiated emission tests, carried out in accordance with CFR 47 Part 15.205 (restricted bands of operation) with the EUT operating in transmit mode on channel 11 (2462 MHz), are depicted in table 8.

Frequency (MHz)	Test results quasi peak (dBµV/m)		Test results average (dBµV/m)		Test results peak (dBµV/m)		Resolution bandwidth (kHz)	Quasi peak limits (dBµV/m)	Average limits (dBµV/m)	Peak limits (dBµV/m)
	V	H	V	H	V	H				
163.0	29.3	25.8	-	-	-	-	120	43.5	-	-
260.0	35.1	30.9	-	-	-	-	120	46.0	-	-
326.0	32.2	25.8	-	-	-	-	120	46.0	-	-
1062	-	-	n.t.	n.t.	35.5	31.3	1000	-	54.0	74.0
1128	-	-	n.t.	n.t.	37.5	36.4	1000	-	54.0	74.0
1594	-	-	n.t.	n.t.	35.9	33.7	1000	-	54.0	74.0
1732	-	-	n.t.	n.t.	34.1	<34.0	1000	-	54.0	74.0
2312	-	-	26.5	37.0	35.5	45.0	1000	-	54.0	74.0
4932	-	-	n.t.	n.t.	38.3	42.9	1000	-	54.0	74.0
>4932-26500	-	-	n.t.	n.t.	<44.0	<44.0	1000	-	54.0	74.0

Table 8 - Test results with the EUT operating in transmit mode on channel 11 (2462 MHz).

Note: Radiated emission tests have been performed with all possible transmission bit-rates (1 Mbit/s, 2 Mbit/s, 5.5 Mbit/s and 11 Mbit/s) in transmit mode. The highest values measured of the spurious emission components are reported by means of table 8.

Note: Above 1 GHz, all measured values of the spurious emissions with the detector in peak mode are below the applicable limits which are valid when using an average detector. Therefore, all spurious emissions above 1 GHz have been measured with the peak detector only (n.t. = not tested).

Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : January 16, 2002

3 Conducted emission data

The (worst-case) results of the conducted emission tests at the 110 Volts AC mains connection terminals of the notebook computer in which the EUT is built-in, carried out in accordance with CFR 47 Part 15.107 and CFR 47 Part 15.207 with the EUT operating in transmit and/or receive mode on channels 1 (2412 MHz), 6 (2437 MHz) and 11 (2462 MHz) while utilizing all possible transmission bit-rates (1 Mbit/s, 2 Mbit/s, 5.5 Mbit/s and 11 Mbit/s), are depicted in table 9.

Frequency (MHz)	Measurement results dB(µV) Neutral	Measurement results dB(µV) Line 1	Limits dB(µV)	Margin (dB) Neutral	Margin (dB) Line 1	Result
	QP	QP	QP	QP	QP	
0.500	29.7	27.6	48.0	-18.3	-20.4	PASS
0.741	28.2	25.4	48.0	-19.8	-22.6	PASS
1.113	28.5	24.7	48.0	-19.5	-23.3	PASS
7.353	34.1	32.8	48.0	-13.9	-15.2	PASS
8.532	32.6	29.4	48.0	-15.4	-18.6	PASS
10.279	34.0	32.8	48.0	-14.0	-15.2	PASS
23.925	22.5	26.3	48.0	-25.5	-21.7	PASS

Table 9 - Test results with the EUT operating in transmit/receive mode.

Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : January 16, 2002

4 Testresults of measurements in accordance with CFR 47 Part 15.247

4.1 Minimum 6 dB bandwidth

The results of tests on the EUT, carried out in accordance with CFR 47 Part 15.247 (a)(2), are depicted in table 10.

Transmission bit-rate (Mbit/s)	Minimum 6 dB bandwidth (kHz)			Limit (kHz)
	Channel 1 (2412 MHz)	Channel 6 (2437 MHz)	Channel 11 (2462 MHz)	
1	12150	12080	12150	>500
2	12080	12150	12150	>500
5.5	11250	11250	11630	>500
11	11700	11700	11700	>500

Table 10 - Minimum 6 dB bandwidth.

Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : January 16, 2002

4.2 Maximum peak output power

The results of tests on the EUT, carried out in accordance with CFR 47 Part 15.247 (b)(1), are depicted in table 11.

Transmission bit-rate (Mbit/s)	Maximum peak output power (dBm)			Limit (dBm)
	Channel 1 (2412 MHz)	Channel 6 (2437 MHz)	Channel 11 (2462 MHz)	Antenna gain < 6 dBi
1	17.6	17.5	17.3	30.0
2	17.9	17.8	17.6	30.0
5.5	17.3	17.2	16.9	30.0
11	17.6	17.5	17.3	30.0

Table 11 - Maximum peak output power.

Notes:
Maximum values from measurements with supply voltages varied between 85% and 115% are noted down here. However, there are no differences in measurement results due to voltage variations between 85% and 115%. As the antenna gain does not exceed 6 dBi, no reduction of the maximum peak output power is required.

Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : January 16, 2002

4.3 Radiated emission data outside restricted bands

The results of tests on the EUT, carried out in accordance with CFR 47 Part 15.247 (c), are depicted in table 12.

Radiated emission data outside restricted bands in a 100 kHz bandwidth shall be at least 20 dB below the highest level in a 100 kHz bandwidth within the band.

Frequency (MHz)	dB below working channel (based on field strength)	Limit (dB)
2397.50	-29.6	<-20.0
2400.00	-36.0	<-20.0
Other frequencies	<-40.0	<-20.0

Table 12 -Radiated emission outside restricted bands, field strength

Note:
Worst case situations for transmissions with all bit-rate / channel 1, channel 6, channel 11 combinations.

Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : January 16, 2002

4.4 Conducted emission data outside restricted bands

The results of tests on the EUT, carried out in accordance with CFR 47 Part 15.247 (c), are depicted in table 13.

Conducted emission data outside restricted bands in a 100 kHz bandwidth shall be at least 20 dB below the highest level in a 100 kHz bandwidth within the band.

Frequency (MHz)	dB below working channel	Limit (dB)
2397.50	-29.6	<-20.0
2400	-36.0	<-20.0
Other frequencies	<-40.0	<-20.0

Table 13 -Conducted emission outside restricted bands

Note:
Worst case situations for transmissions with all bit-rate / channel 1, channel 6, channel 11 combinations.

Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : January 16, 2002

4.5 Peak power spectral density

The results of the tests on the EUT, carried out in accordance with CFR 47 Part 15.247 (d), are depicted in table 14.

Transmission bitrate (Mbit/s)	Peak power spectral density (conducted) in any 3 kHz band (dBm)			Limit (dBm)
	Channel 1 (2412 MHz)	Channel 6 (2437 MHz)	Channel 11 (2462 MHz)	
1	-9.8	-10.0	-10.4	<8.0
2	-8.6	-8.7	-9.2	<8.0
5.5	-8.7	-8.5	-8.9	<8.0
11	-6.8	-7.0	-7.2	<8.0

Table 14 - Peak power spectral density.

Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : January 16, 2002

4.6 Processing gain

The test results of the processing test are available in a test report, issued by Intersil Corporation. This test report is available as part of the technical documentation which has been submitted to the FCC/TCB.

Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : January 16, 2002

5 Plots of measurement data

For reference purposes and visualization of spectrum analyzer settings during the measurements, a selection of plots of measurement data is included in this test report.

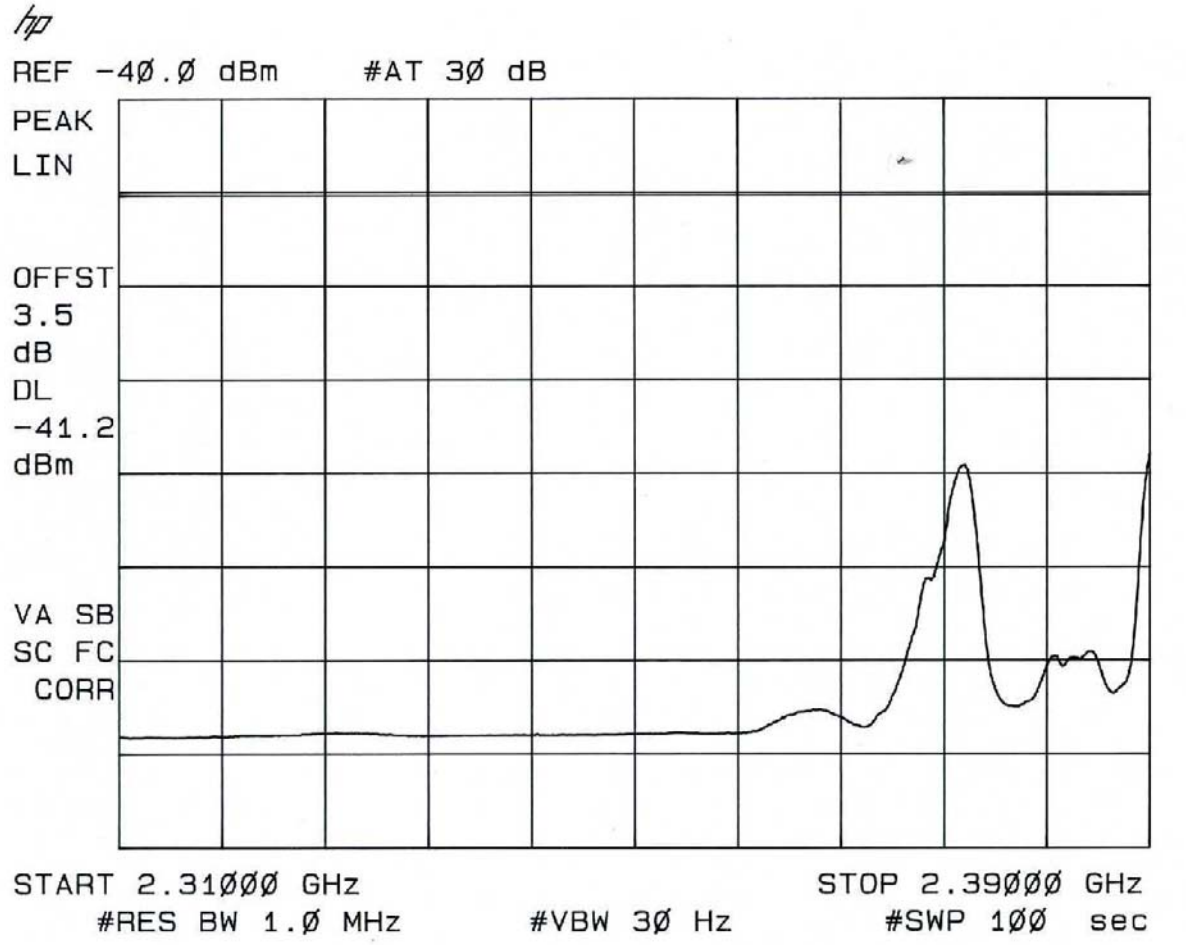
Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : January 16, 2002

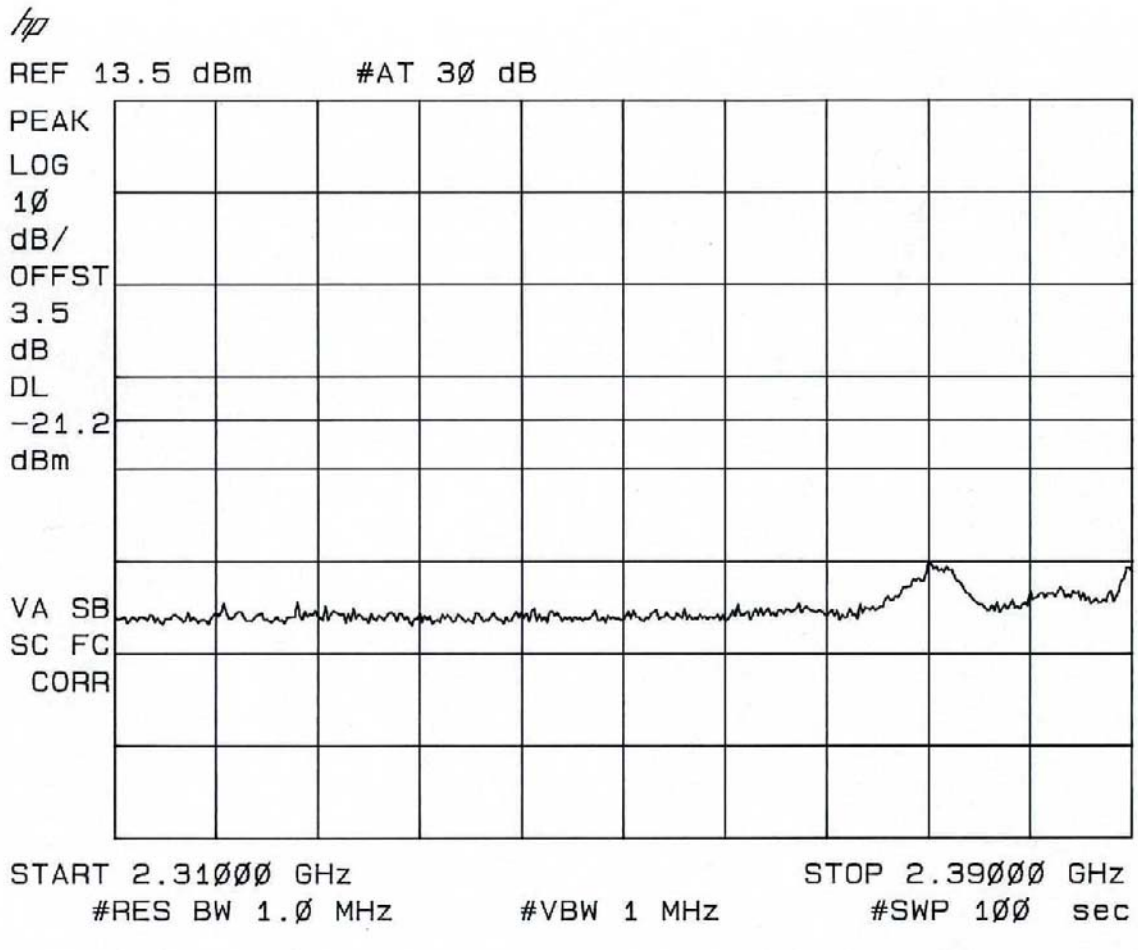
5.1 Emission in restricted bands nearest to the band 2400 - 2483.5 MHz



Plot 1 - Average measurement values in restricted band 2310 - 2390 MHz.

Average measurement values in restricted band. All possible transmission bitrates (1 Mbit/s, 2 Mbit/s, 5.5 Mbit/s and 11 Mbit/s), conducted measurement, corrected for 2 dBi antenna gain (including antenna cable losses) and 1.5 dB cable losses (measurement cable)

Note: 54 dBµV/m :: -41.2 dBm display line setting.



Plot 2 - Peak measurement values in restricted band 2310 - 2390 MHz.

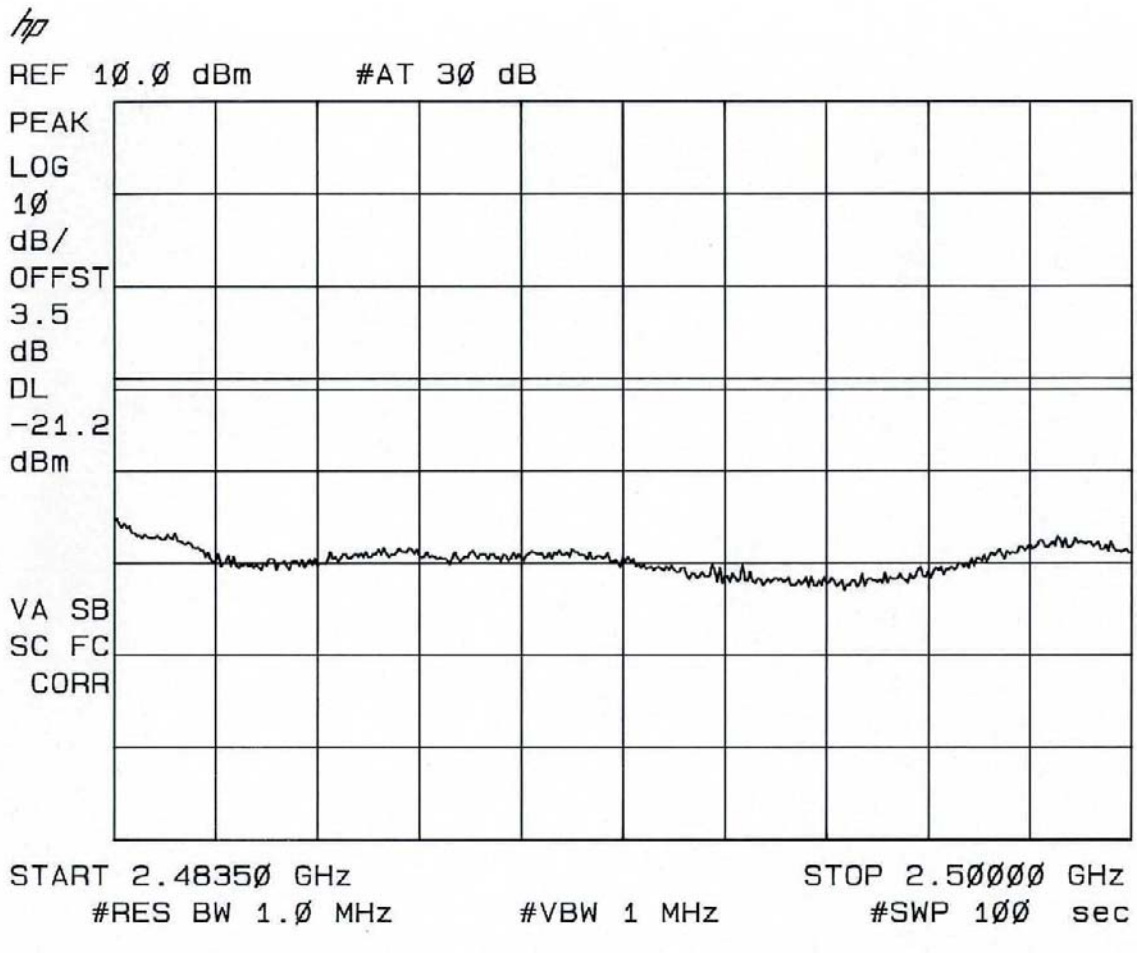
Peak measurement values in restricted band. All possible transmission bitrates (1 Mbit/s, 2 Mbit/s, 5.5 Mbit/s and 11 Mbit/s), conducted measurement, corrected for 2 dBi antenna gain (including antenna cable losses) and 1.5 dB cable losses (measurement cable).

Note: 74 dBµV/m :: -21.2 dBm display line setting.

Plot 3 - Average measurement values in restricted band 2483.5 - 2500 MHz.

Average measurement values in restricted band. All possible transmission bitrates (1 Mbit/s, 2 Mbit/s, 5.5 Mbit/s and 11 Mbit/s), conducted measurement, corrected for 2 dBi antenna gain (including antenna cable losses) and 1.5 dB cable losses (measurement cable).

Note: 54 dBµV/m :: -41.2 dBm display line setting.

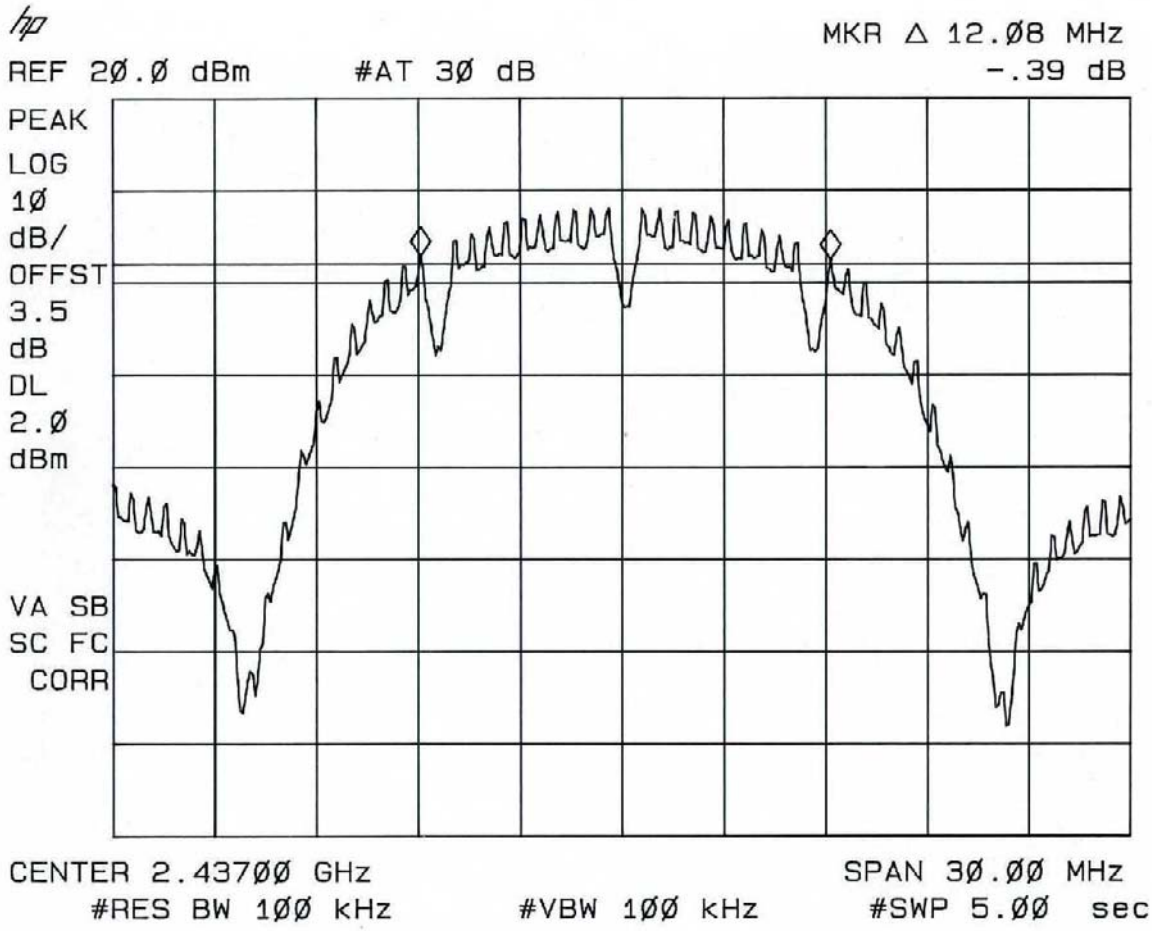


Plot 4 - Peak measurement values in restricted band 2483.5 - 2500 MHz.

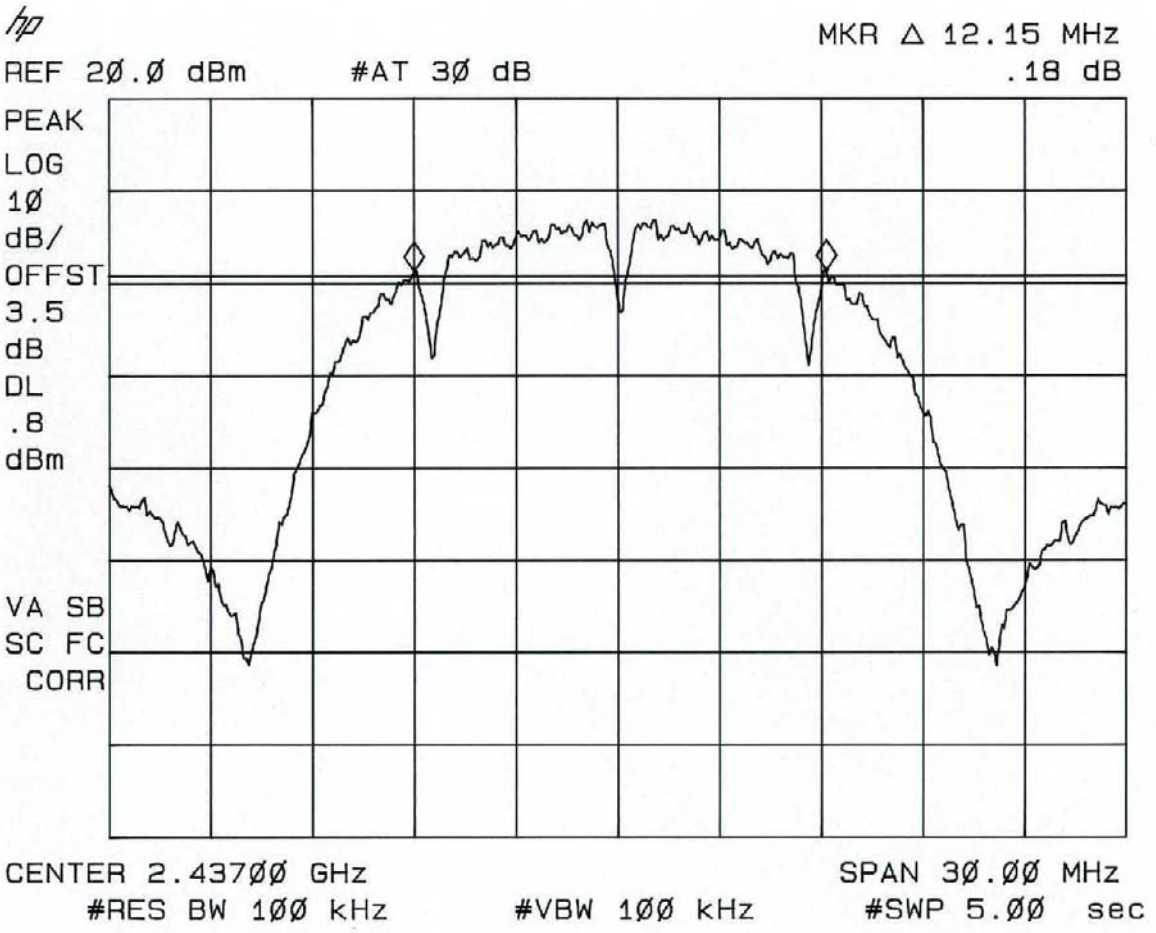
Peak measurement values in restricted band. All possible transmission bitrates (1 Mbit/s, 2 Mbit/s, 5.5 Mbit/s and 11 Mbit/s), conducted measurement, corrected for 2 dBi antenna gain (including antenna cable losses) and 1.5 dB cable losses (measurement cable).

Note: 74 dBµV/m :: -21.2 dBm display line setting.

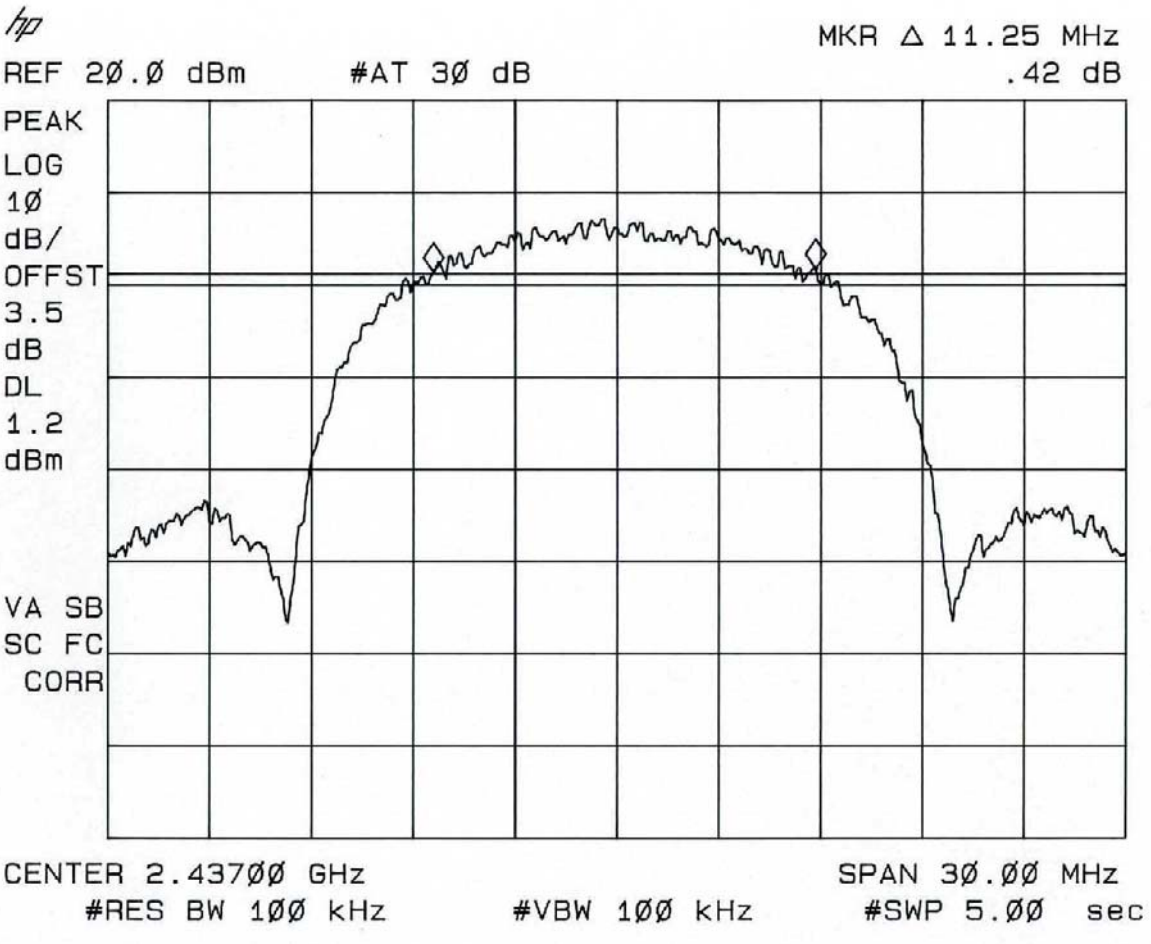
5.2 Minimum 6 dB bandwidth



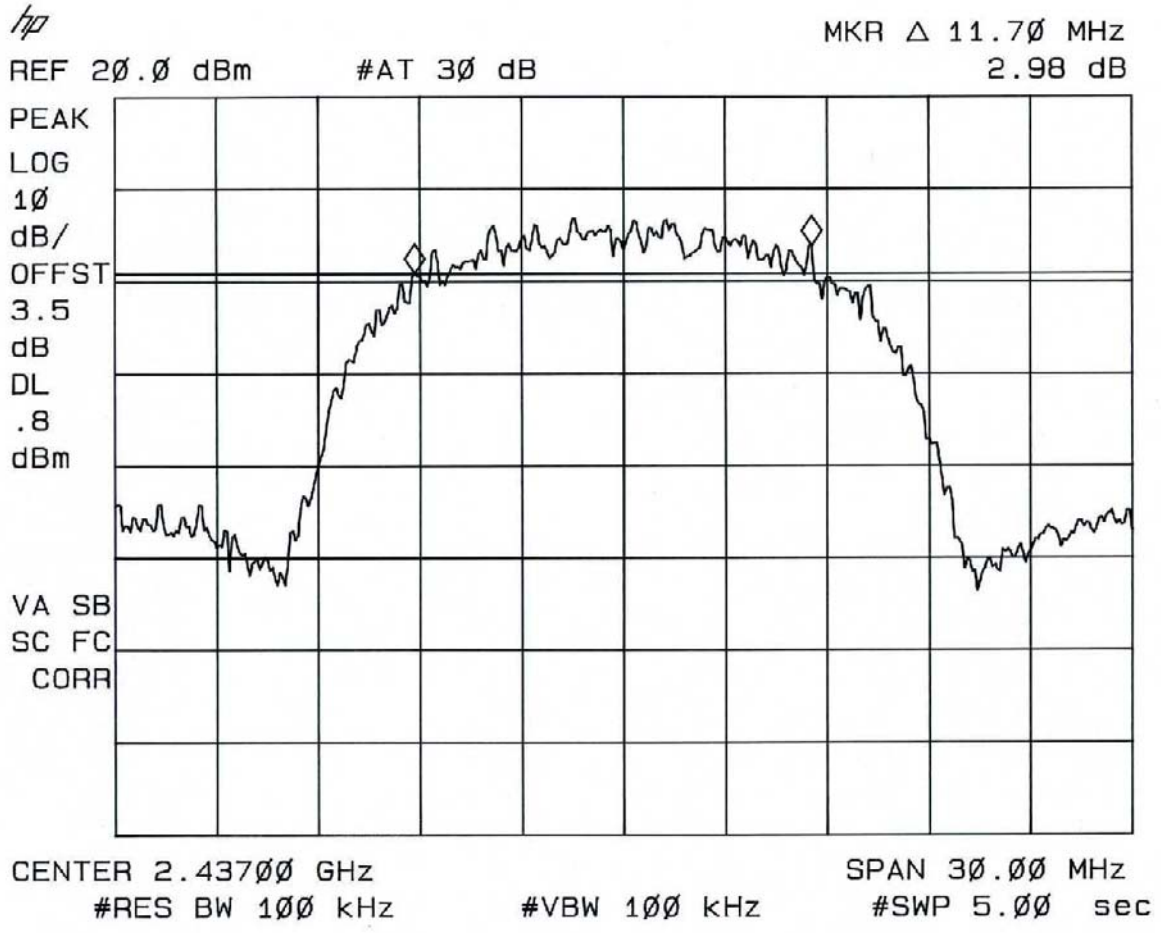
Plot 5 - Minimum 6 dB bandwidth at a transmission bitrate of 1 Mbit/s.



Plot 6 - Minimum 6 dB bandwidth at a transmission bitrate of 2 Mbit/s.

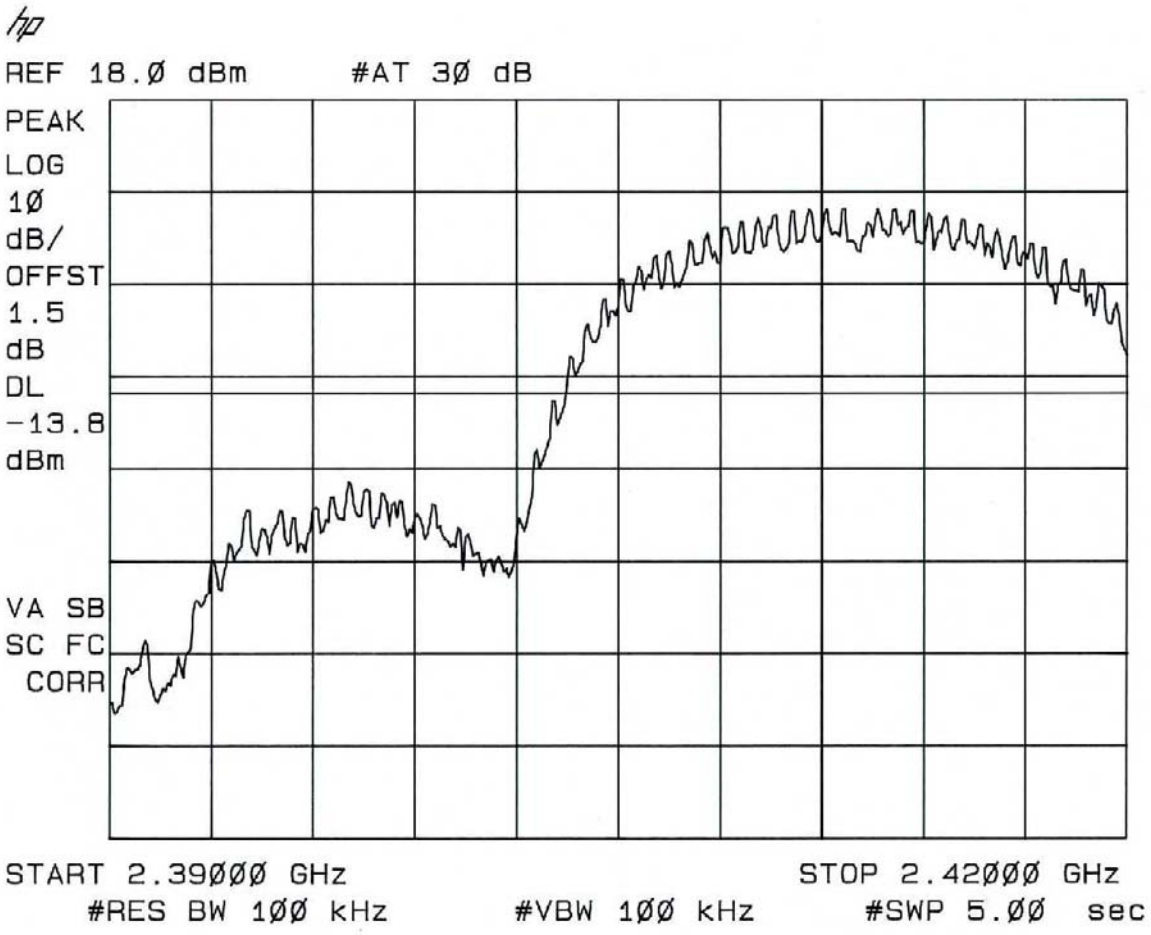


Plot 7 - Minimum 6 dB bandwidth at a transmission bitrate of 5.5 Mbit/s.



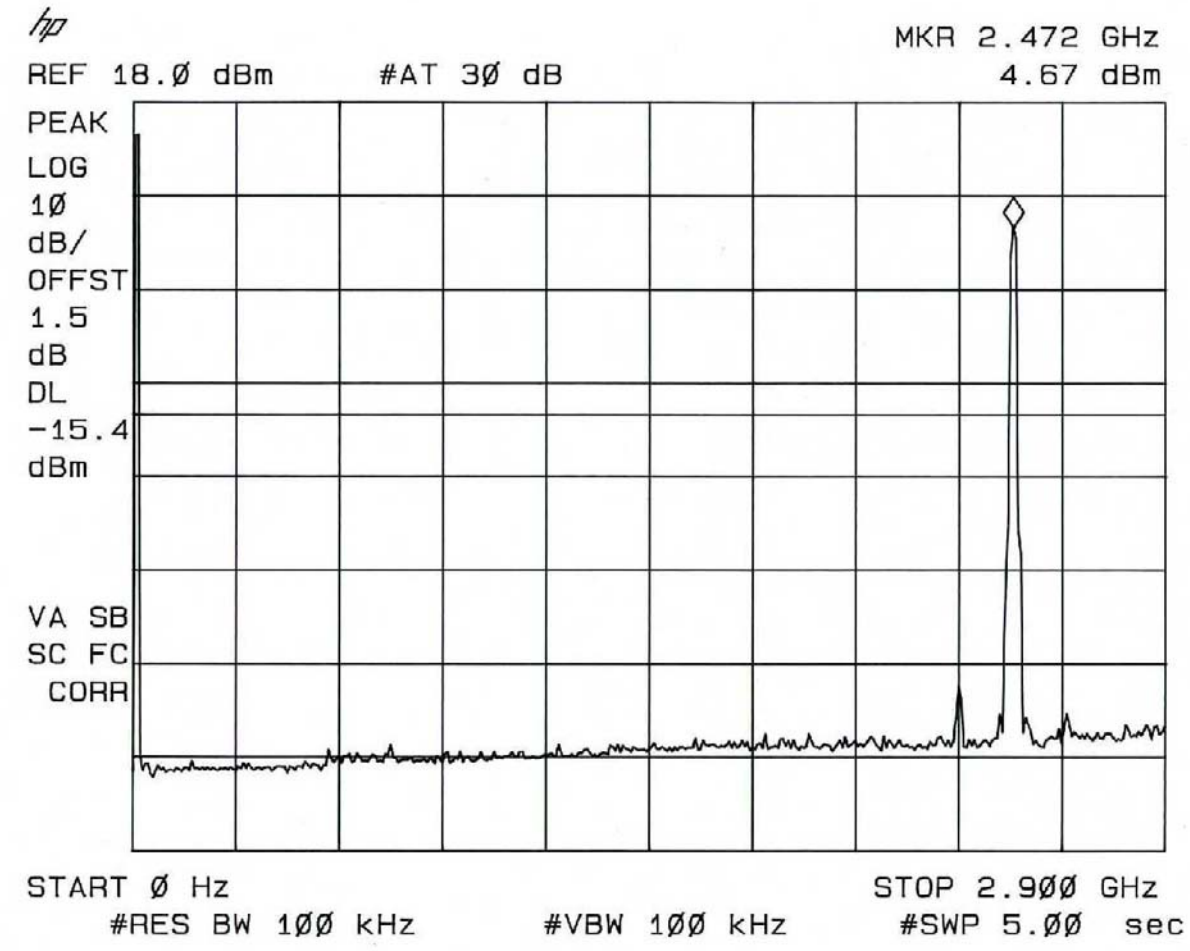
Plot 8 - Minimum 6 dB bandwidth at a transmission bitrate of 11 Mbit/s.

5.3 Conducted emission data outside restricted bands



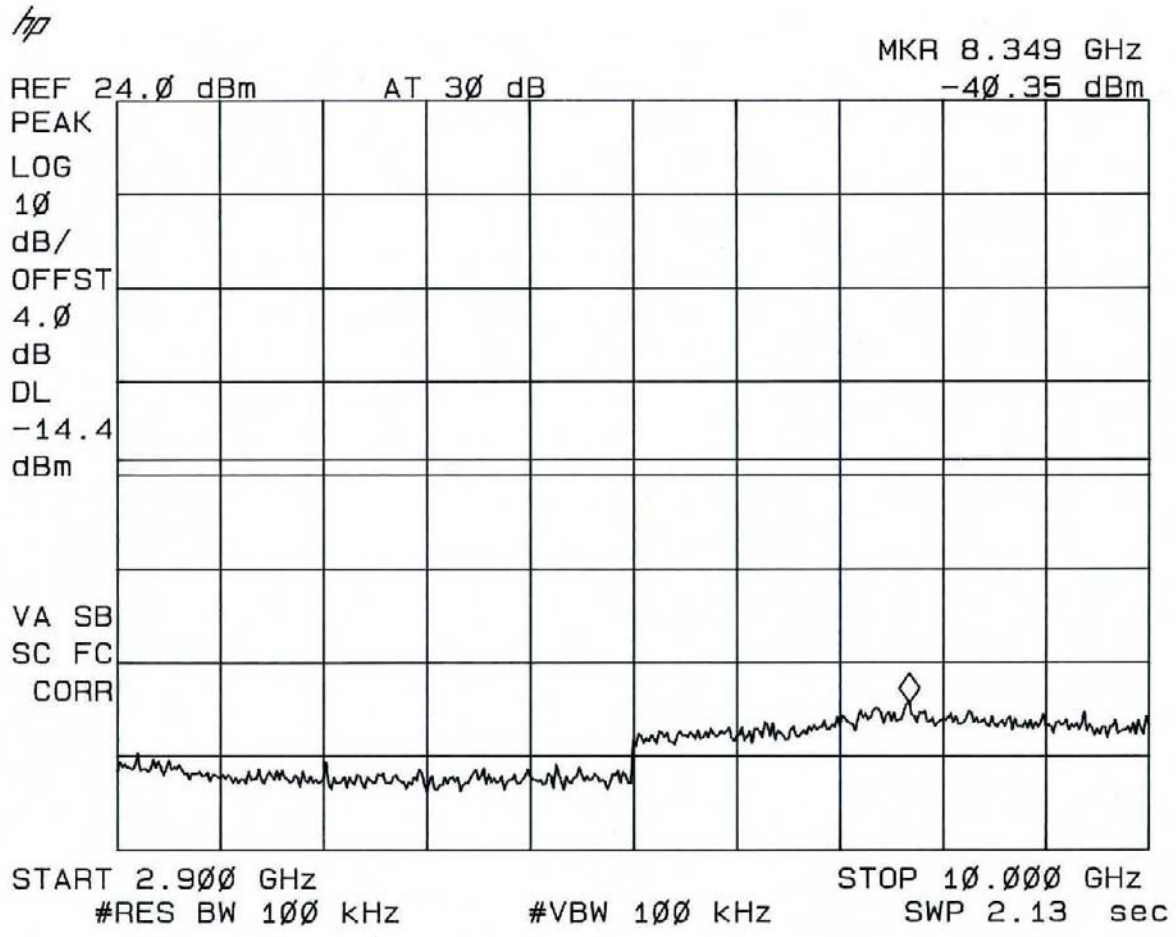
Plot 9 - Conducted emission outside restricted bands.

Conducted emission data outside restricted bands in a 100 kHz bandwidth shall be at least 20 dB below the highest level in a 100 kHz bandwidth within the band. Display line :: -20 dB limit line. Corrected (offset) for cable losses.



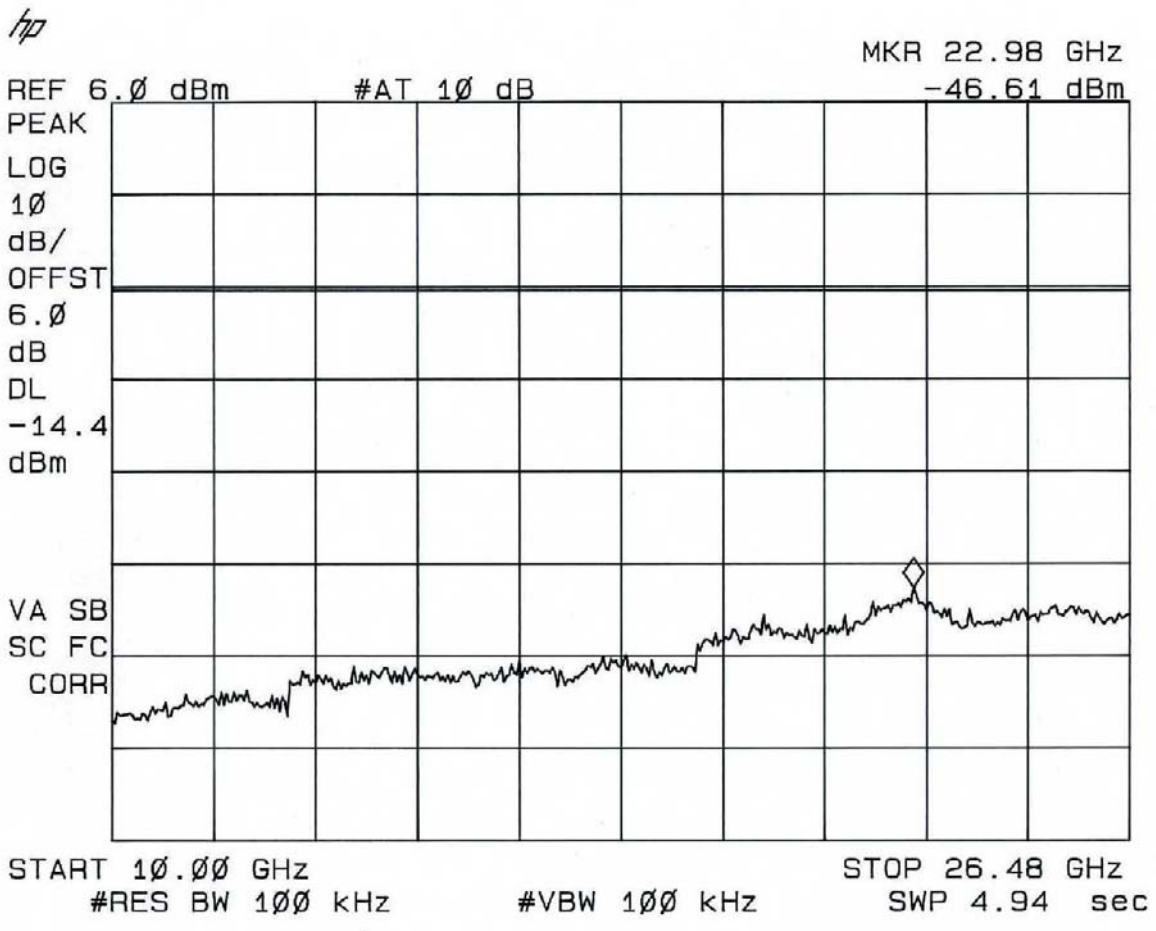
Plot 10 - Conducted emission outside restricted band.

Conducted emission data outside restricted bands in a 100 kHz bandwidth shall be at least 20 dB below the highest level in a 100 kHz bandwidth within the band. Display line :: -20 dB limit line. Corrected (offset) for cable losses.



Plot 11 - Conducted emission outside restricted band.

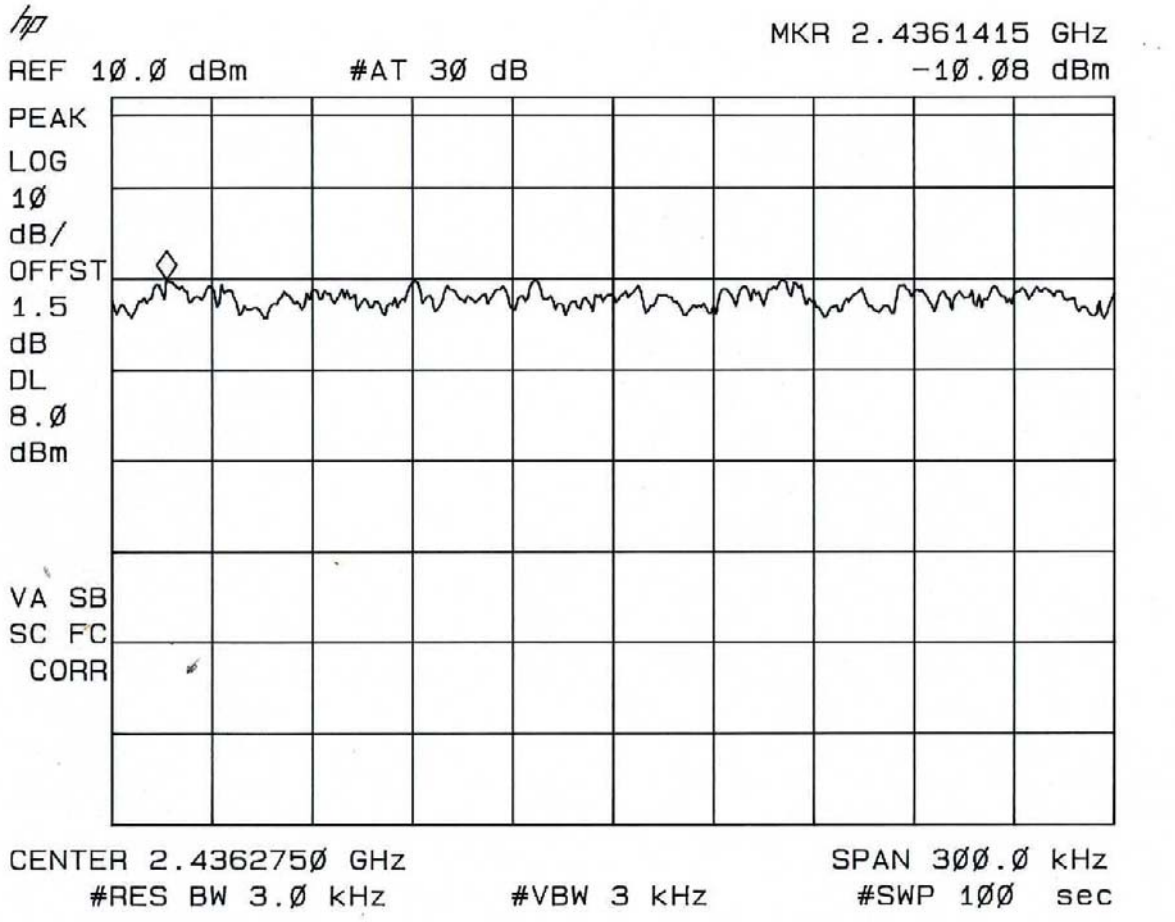
Conducted emission data outside restricted bands in a 100 kHz bandwidth shall be at least 20 dB below the highest level in a 100 kHz bandwidth within the band. Display line :: -20 dB limit line. Corrected (offset) for cable losses.



Plot 12 - Conducted emission outside restricted band.

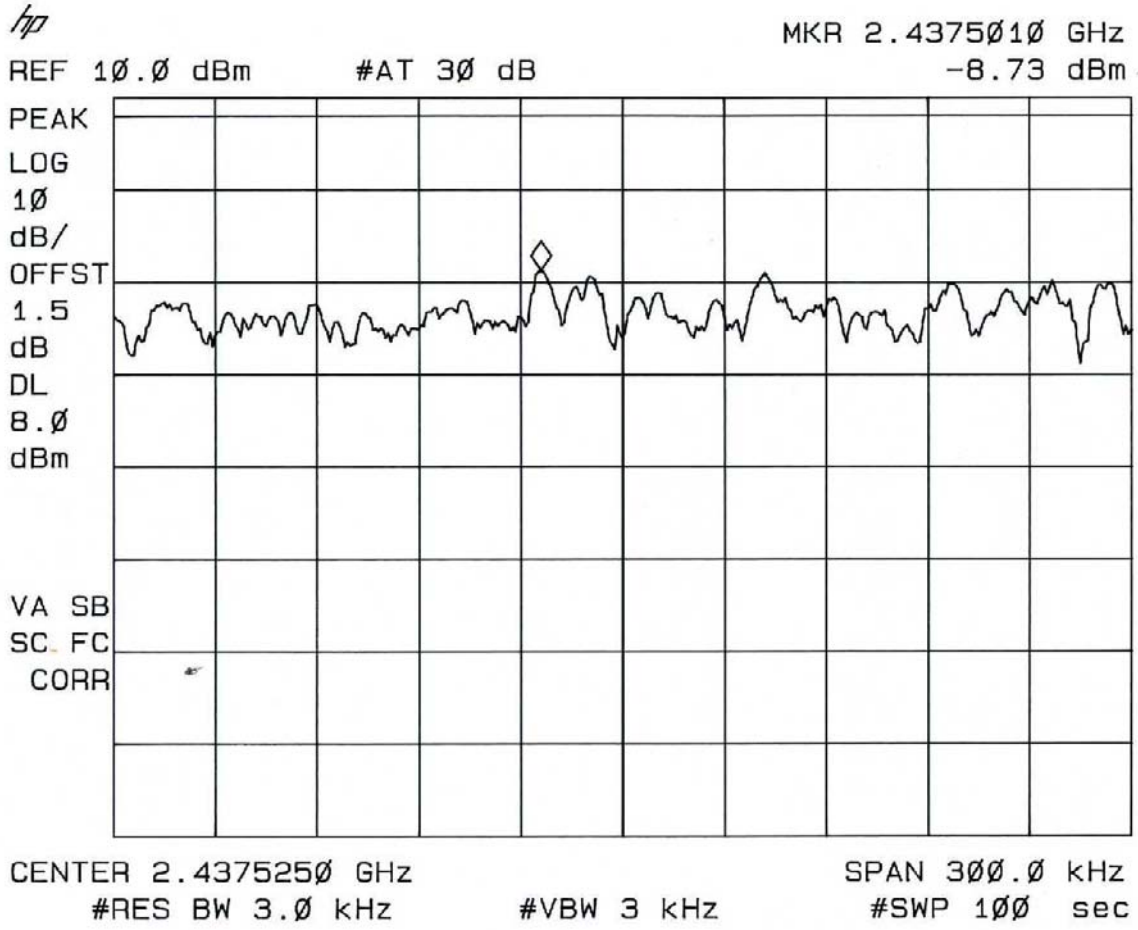
Conducted emission data outside restricted bands in a 100 kHz bandwidth shall be at least 20 dB below the highest level in a 100 kHz bandwidth within the band. Display line :: -20 dB limit line. Corrected (offset) for cable losses.

5.4 Peak power spectral density



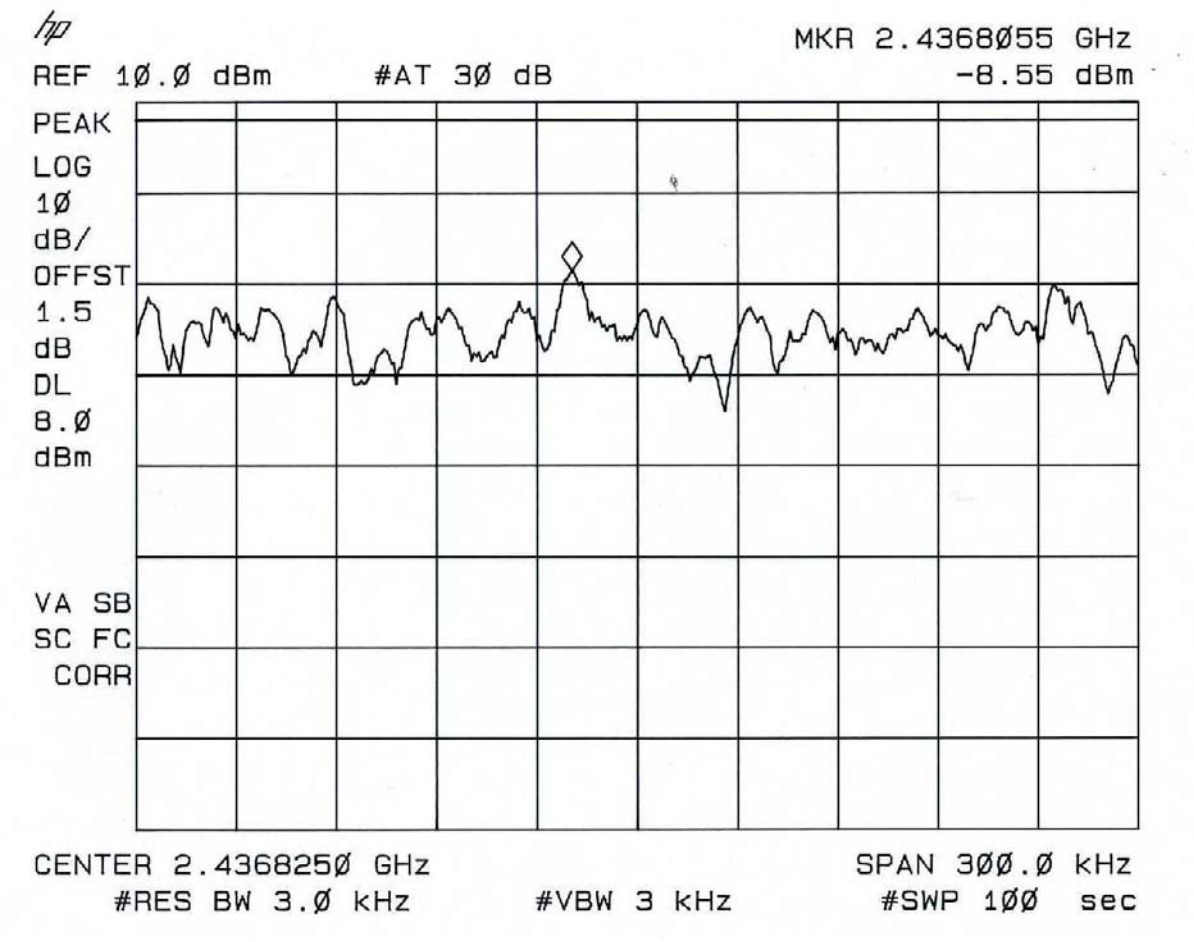
Plot 13 - Peak power spectral density (conducted) from the intentional radiator in any 3 kHz band.

Peak power spectral density (conducted) in a 3 kHz bandwidth at a transmission bitrate of 1 Mbit/s. Corrected (offset) for cable losses.



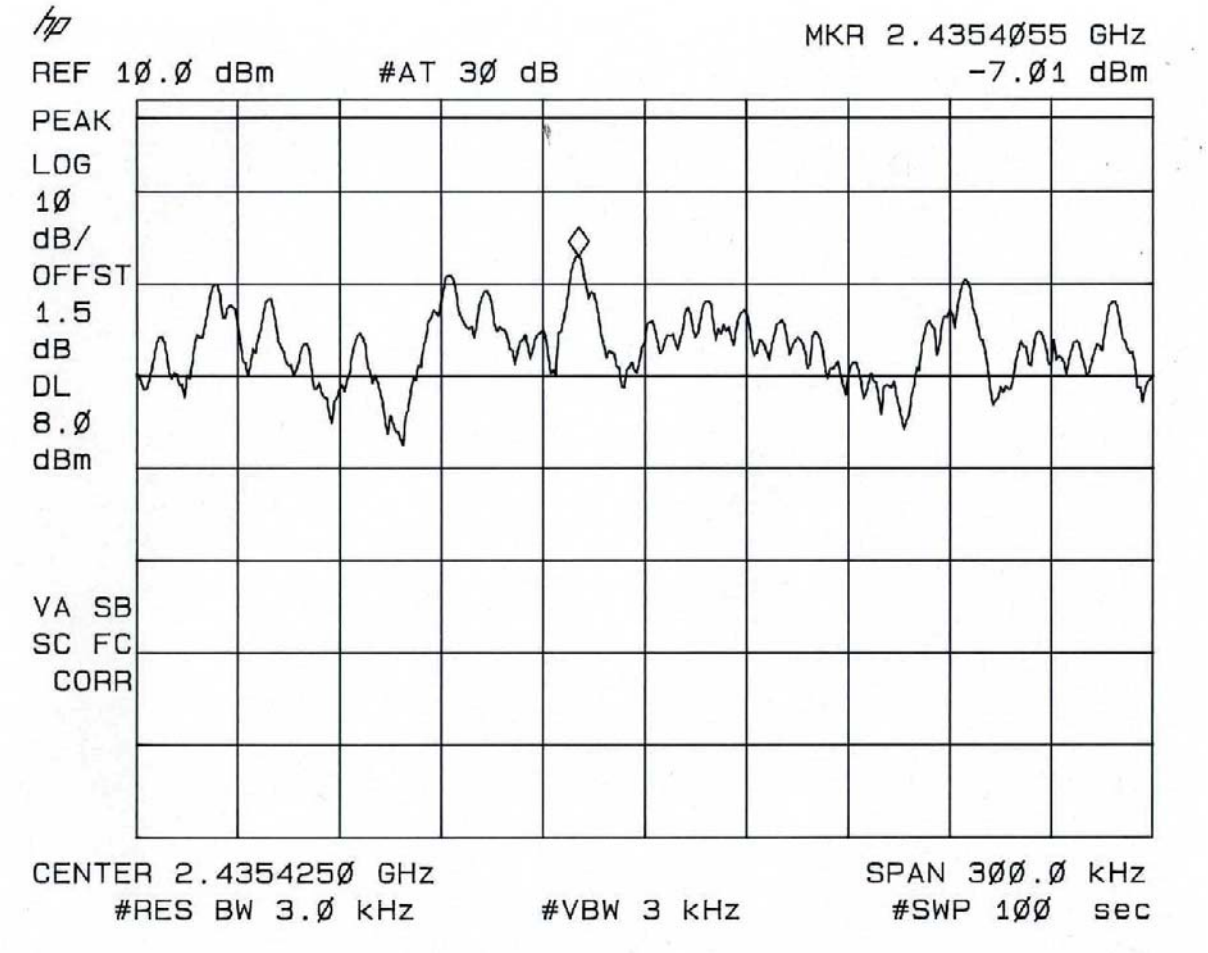
Plot 14 - Peak power spectral density (conducted) from the intentional radiator in any 3 kHz band.

Peak power spectral density (conducted) in a 3 kHz bandwidth at a transmission bitrate of 2 Mbit/s. Corrected (offset) for cable losses.



Plot 15 - Peak power spectral density (conducted) from the intentional radiator in any 3 kHz band.

Peak power spectral density (conducted) in a 3 kHz bandwidth at a transmission bitrate of 5.5 Mbit/s. Corrected (offset) for cable losses.



Plot 16 - Peak power spectral density (conducted) from the intentional radiator in any 3 kHz band.

Peak power spectral density (conducted) in a 3 kHz bandwidth at a transmission bitrate of 11 Mbit/s. Corrected (offset) for cable losses.

6 List of utilized test equipment

Inventory number	Description	Brand	Type
12471	Biconical antenna 20MHz-200MHz	EATON	94455-1
12473	Log-per antenna 200-1000MHz	EATON	96005
12476	Antenna mast	EMCO	TR3
12477	Antenna mast 1-4 mtr	Poelstra	--
12482	Loop antenna	EMCO	6507
12483	Guidehorn	EMCO	3115
12484	Guidehorn	EMCO	3115
12488	Guidehorn 18 - 26.5 GHz	EMCO	RA42-K-F-4B-C
12533	Signalgenerator	MARCONI	2032
12559	Digital storage oscilloscope	Le Croy	9310M
12561	DC Power Supply 20A/70V	DELTA	SM7020D
12567	Plotter	HP	7440A
12605	calibrated dipole 28MHz-1GHz	Emco	3121c
12608	HF milliwattmeter	Hewlett Packard	HP435a
12609	Power sensor 10MHz-18GHz	Hewlett Packard	HP8481A
12636	Polyester chamber	Polyforce	--
12640	Temperature chamber	Heraeus	VEM03/500
13664	Spectrum analyzer	HP	HP8593E
13078	Preamplifier 0.1 GHz - 12 GHz	Miteq	AMF-3D-001120-35-14p
13452	Digital multi meter	HP	34401A
13526	Signalgenerator 20 GHz	Hewlett & Packard	83620A
13594	Preamplifier 10 GHz - 25 GHz	Miteq	AMF-6D-100250-10p
13886	Open Area testsite	Comtest	--
14051	Anechoic room	Comtest	--
14450	2.4 GHz bandrejectfilter	BSC	XN-1783
15633	Biconilog Testantenna	Chase	CBL 6111B
15667	Measuring receiver	R&S	ESCS 30
99045	DC Power Supply 3A/30V	DELTA	E030/3
99055	Non-conducting support	NMi	--
99061	Non-conducting support 150cm	NMi	--
99068	Detector N-F/BNC-F	Radiall	R451576000
99069	Cable 5m RG214	NMi	--
99071	Cable 10m RG214	NMi	--
99076	Bandpassfilter 4 - 10 GHz	Reactel	7AS-7G-6G-511
99077	Regulating trafo	RFT	LTS006
99112	Tripod	Chase	--
99136	Bandpassfilter 10 - 26.5 GHz	Reactel	9HS-10G/26.5G-S11