

**TEST REPORT OF A W-CDMA SUBSCRIBER
TERMINAL, MODEL CPE-310-200, BRAND SOMA
NETWORKS, IN ACCORDANCE WITH
47 CFR PART 24, SUBPART E (2004-10-01).**

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Description of EUT: W-CDMA subscriber terminal (PCS licensed transmitter)
Manufacturer: Sanyo Electric Co., Ltd.
Brand mark: SOMA Networks
Model: CPE-310-200
FCC ID: AEZCPE-310-200

MEASUREMENT/TECHNICAL REPORT

Sanyo Electric Co., Ltd.

Model : CPE-310-200

FCC ID: AEZCPE-310-200

December 5, 2005

This report concerns:	Original grant/certification	Class 2 change	Verification
Equipment type:	PCS licensed transmitter		
Deferred grant requested per 47 CFR 0.457(d)(1)(ii) ?		Yes	No
Report prepared by:	Company name : Sanyo Testing Laboratories Co., Ltd. Address : 7-3-2 Higashimachi, Ibukidai, Nishi-ku Postal code/city : Kobe-city, Hyogo Prefecture, 651-2242 Mailing address : - Postal code/city : - Country : Japan Telephone number : +81 78 993 1062 Telefax number : +81 78 993 1097		

The data taken for this test and report herein was done in accordance with 47 CFR Part 24, Subpart E (broadband PCS) and the measurement procedures of ANSI C63.4: 2003. Sanyo Testing Laboratories Co., Ltd. at Kobe-city, Japan, 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: December 5, 2005

Signature:

H. Wada
Sanyo Testing Laboratories Co., Ltd.



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Manufacturer: Sanyo Electric Co., Ltd.
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Description of test item

Test item : W-CDMA subscriber terminal
Manufacturer : Sanyo Electric Co., Ltd.
Brand : SOMA Networks
Model : CPE-310-200
Serial numbers : -
Revision : -
Receipt number : 1
Receipt date : November 22, 2005

Applicant information

Applicant's representative : Mr. O. Shimizu
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Test(s) performed

Location : Kobe-city
Test(s) started : November 22, 2005
Test(s) completed : November 25, 2005
Purpose of test(s) : Type approval / certification
Test specification(s) : 47 CFR Part 24, subpart E (2004-10-01)

Test engineer(s) : T. Fujiwara 

K. Yakamoto 

I. Nakajo 

:

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Description of EUT: W-CDMA subscriber terminal (PCS licensed transmitter)
Manufacturer: Sanyo Electric Co., Ltd.
Brand mark: SOMA Networks
Model: CPE-310-200
FCC ID: AEZCPE-310-200

1 General information

1.1 Product description

The W-CDMA subscriber terminal, brand SOMA Networks, model CPE-310-200, is designed to operate in the frequency band of 1850 - 1990 MHz, where the definitions of the various frequency blocks in this frequency range are listed en defined in 47 CFR Part 24, Subpart E (broadband PCS), section 24.229.

The W-CDMA subscriber terminal, brand SOMA Networks, model CPE-310-200, utilizes W-CDMA technology and does not contain any analog voice circuitry.

The W-CDMA subscriber terminal, brand SOMA Networks, model CPE-310-200, incorporates an integral antenna, having a gain of 4.5 dBi max.

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.

Description	Model number	Serial number	FCC ID	Cable descriptions
W-CDMA subscriber terminal including indoor unit	CPE-310-200	-	AEZCPE-310-200	-Shielded cable to indoor unit (power and ethernet) -Shielded ethernet cable to notebook computer -Shielded cable to telephone 1 -Shielded cable to telephone 2
AC/DC power adapter 100-240 VAC/1.3-0.7 Amps to +16 VDC/3.36 Amps	PAA060P	A-D0507000039	n.a.	-Unshielded DC power cord indoor unit -Unshielded power cord to AC mains
Telephone	AASTRA	G318240203993	5KGCHN-32409-TE-E	-Shielded cable to indoor unit
Telephone	P88-0071-0	87218758	n.a.	-Shielded cable to indoor unit
Notebook computer	PSA10N-28RU1	Z3050606J	n.a. (DoC)	-Shielded ethernet cable to indoor unit

Table 1 - Tested system details overview.



Description of EUT:	W-CDMA subscriber terminal (PCS licensed transmitter)
Manufacturer:	Sanyo Electric Co., Ltd.
Brand mark:	SOMA Networks
Model:	CPE-310-200
FCC ID:	AEZCPE-310-200

1.4 Test methodology

The test methodology used is based on the requirements of 47 CFR Part 24, Subpart E (2004-10-01), sections 24.232, 24.235, 24.237 and 24.238.

The test methods, which have been used, are based on ANSI C63.4: 2003.

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 47 CFR Part 15).

The bandwidth of the receiver is switching automatically to the right bandwidth in accordance with CISPR 16. This is implemented in the receiver. The antenna factors are programmed in the test receiver. The receiver automatically calculates the appropriate correction factor for the utilized antenna and also the appropriate antenna factor for the cable loss. The total correction is automatically added to the measured value.

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 Sanyo Testing Laboratories Co., Ltd., located at 7-3-2 Higashimachi, Ibukidai, Nishi-ku, Kobe-city, Hyogo Prefecture, 651-2242 , Japan.

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 laboratories performing these test services for the public (47 CFR Part 2, section 2.948).

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

1.6 Product labeling

In accordance with 47 CFR Part 2.925 (a)(1), the FCC ID shall be placed on a label, which is attached to the EUT.

For further details about the labeling requirements (size, legibility, etc.) as set by the Federal Communications Commission see 47 CFR Part 2.925 and 47 CFR Part 2.926.



1.7 System test configuration

1.7.1 Justification

The system was configured for testing in a typical fashion (as an end-user 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: 2003.

The tests were performed with the EUT operating at the lowest operating frequency (channel 1: 1852.5 MHz), the operating frequency in the middle of the specified frequency band (channel 6: 1877.5 MHz) and the highest operating frequency (channel 12: 1907.5 MHz). Further details may be found in table 2 below.

Channel	Transmitter frequency (MHz)	Maximum rated output power (dBm,EIRP)	Receiver frequency (MHz)
1	1852.5	+30.7	1932.5
2	1857.5	+30.7	1937.5
3	1862.5	+30.7	1942.5
4	1867.5	+30.7	1947.5
5	1872.5	+30.7	1952.5
6	1877.5	+30.7	1957.5
7	1882.5	+30.7	1962.5
8	1887.5	+30.7	1967.5
9	1892.5	+30.7	1972.5
10	1897.5	+30.7	1977.5
11	1902.5	+30.7	1982.5
12	1907.5	+30.7	1987.5

Table 2 - Specification of channels and rated maximum output power (dBm, EIRP).

1.7.2 EUT exercise software

The EUT could be enabled for operation on channel 1 (1852.5 MHz), channel 6 (1877.5 MHz) and channel 11 (1907.5 MHz) by means of test software, which was supplied by the manufacturer of the EUT. The test software could also be used to switch of the modulation of the carrier for those tests where this was necessary.

1.8 Special accessories

No special accessories are used and/or needed to achieve compliance with the appropriate sections of 47 CFR Part 24, Subpart E (broadband PCS).

1.9 Equipment modifications

No modifications have been made to the equipment in order to achieve compliance with the appropriate sections of 47 CFR Part 24, Subpart E (broadband PCS).

1.10 Configuration of the tested system

Not applicable. See table 1 in section 1.3 of this test report.

1.11 Block diagram(s) of the EUT

The block diagram is available as part of the documentation which is to be submitted to the FCC/TCB.

2 Transmitter tests

2.1 RF output power (conducted)

RF output power measurements (conducted) have been carried out in accordance with 47 CFR Part 24.232 (b) and 47 CFR Part 2.1046.

The maximum RF output power (conducted) was measured directly at the antenna connector in order to obtain reliable measurement results for a worst case MPE estimation.

The tests were performed with the EUT operating at the lowest operating frequency (channel 1: 1852.5 MHz), the operating frequency in the middle of the specified frequency band (channel 6: 1877.5 MHz) and the highest operating frequency (channel 12: 1907.5 MHz).

The measurements have been performed while using a power meter which was calibrated in terms of a RMS-equivalent voltage (as required by 47 CFR Part 24.232 (b)). The power meter was used in order to enable a measurement over the full bandwidth of the channel (as required by 47 CFR Part 24.232 (c)).

2.1.1 Test results

The results of the tests on the EUT, carried out in accordance with 47 CFR Part 24.232 (b) and 47 CFR Part 2.1046, are depicted in table 3.

Test conditions		RF output power (conducted, dBm)		
		channel 1	channel 6	channel 12
$T_{nom} = +20\text{ }^{\circ}\text{C}$	$V_{nom} = 120\text{ VAC}$	26.96	26.98	26.94
Antenna gain (peak, dBi)		4.50	4.50	4.50
Output power (calculated, dBm, EIRP)		31.46	31.48	31.44
Limit (dBm, EIRP)		33.00	33.00	33.00
Margin (dB)		1.54	1.52	1.56

Table 3 - Maximum RF output power (conducted)



2.2 RF output power (EIRP)

RF output power measurements (EIRP) have been carried out in accordance with 47 CFR Part 24.232 (b) and 47 CFR Part 2.1046.

The maximum radiated RF output power was measured by using the substitution measurement method.

The tests were performed with the EUT operating at the lowest operating frequency (channel 1: 1852.5 MHz), the operating frequency in the middle of the specified frequency band (channel 6: 1877.5 MHz) and the highest operating frequency (channel 12: 1907.5 MHz).

The measurements have been performed while using a power meter which was calibrated in terms of a RMS-equivalent voltage (as required by 47 CFR Part 24.232 (b)). The power meter was used in order to enable a measurement over the full bandwidth of the channel (as required by 47 CFR Part 24.232 (c)).

After measuring the maximum level of the radiated RF output power on channel 1, channel 6 and channel 12 with the power meter, the EUT was replaced by a horn antenna which was connected to a RF generator. This combination of RF generator and horn antenna was used to reproduce the measured level of the maximum radiated RF output power on channel 1, channel 6 and channel 12 and to obtain the appropriate correction factor for the test setup.

2.2.1 Test results

The results of tests on the EUT, carried out in accordance with 47 CFR Part 24.232 (b) and 47 CFR Part 2.1046, are depicted in table 4 and table 5.

Test conditions	RF output power (EIRP, dBm)		
	channel 1	channel 6	channel 12
Observed level on power meter (dBm)	-1.6	-2.1	-2.2
Correction factor (dB)	32.3	31.8	31.1
Radiated RF output power (EIRP, dBm)	30.7	29.7	28.9
Limit (dBm, EIRP)	33.0	33.0	33.0
Margin (dB)	2.3	3.3	4.1

Table 4 - Maximum RF output power (EIRP) with the antenna in a vertical position



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Brand mark: SOMA Networks
Model: CPE-310-200
FCC ID: AEZCPE-310-200

Test conditions	RF output power (EIRP, dBm)		
	channel 1	channel 6	channel 12
Observed level on power meter (dBm)	-14.1	-13.7	-13.4
Correction factor (dB)	29.2	29.2	28.9
Radiated RF output power (EIRP, dBm)	15.1	15.5	15.5
Limit (dBm, EIRP)	33.0	33.0	33.0
Margin (dB)	17.9	14.5	17.5

Table 5 - Maximum RF output power (EIRP) with the antenna in a horizontal position

2.2.2 Limit

The maximum allowable RF output power (EIRP) according to 47 CFR Part 24.232 (b) is 33 dBm.

2.3 Occupied bandwidth

Occupied bandwidth measurements have been carried out in accordance with 47 CFR Part 24.238 (b) and 47 CFR Part 2.1049.

Both the occupied bandwidth at -26 dB below maximum RF output power and the 99% occupied bandwidth tests were performed with the EUT operating at the lowest operating frequency (channel 1: 1852.5 MHz), the operating frequency in the middle of the specified frequency band (channel 6: 1877.5 MHz) and the highest operating frequency (channel 12: 1907.5 MHz).

RBW and VBW of the spectrum analyzer have been set to 50 kHz which is 1% of the maximum allowable emission bandwidth of 5 MHz. Plots of the measurements have been made available on the next pages of this test report.

2.3.1 Test results

The results of tests on the EUT, carried out in accordance with 47 CFR Part 24.238 (b) and 47 CFR Part 2.1049, are depicted in table 6 and table 7.

Test conditions		Occupied bandwidth (MHz @ -26 dB)		
		channel 1	channel 6	channel 12
$T_{nom} = +20\text{ }^{\circ}\text{C}$	$V_{nom} = 120\text{ VAC}$	4.660	4.660	4.680

Table 6 - Occupied bandwidth (-26 dB below maximum RF output power)

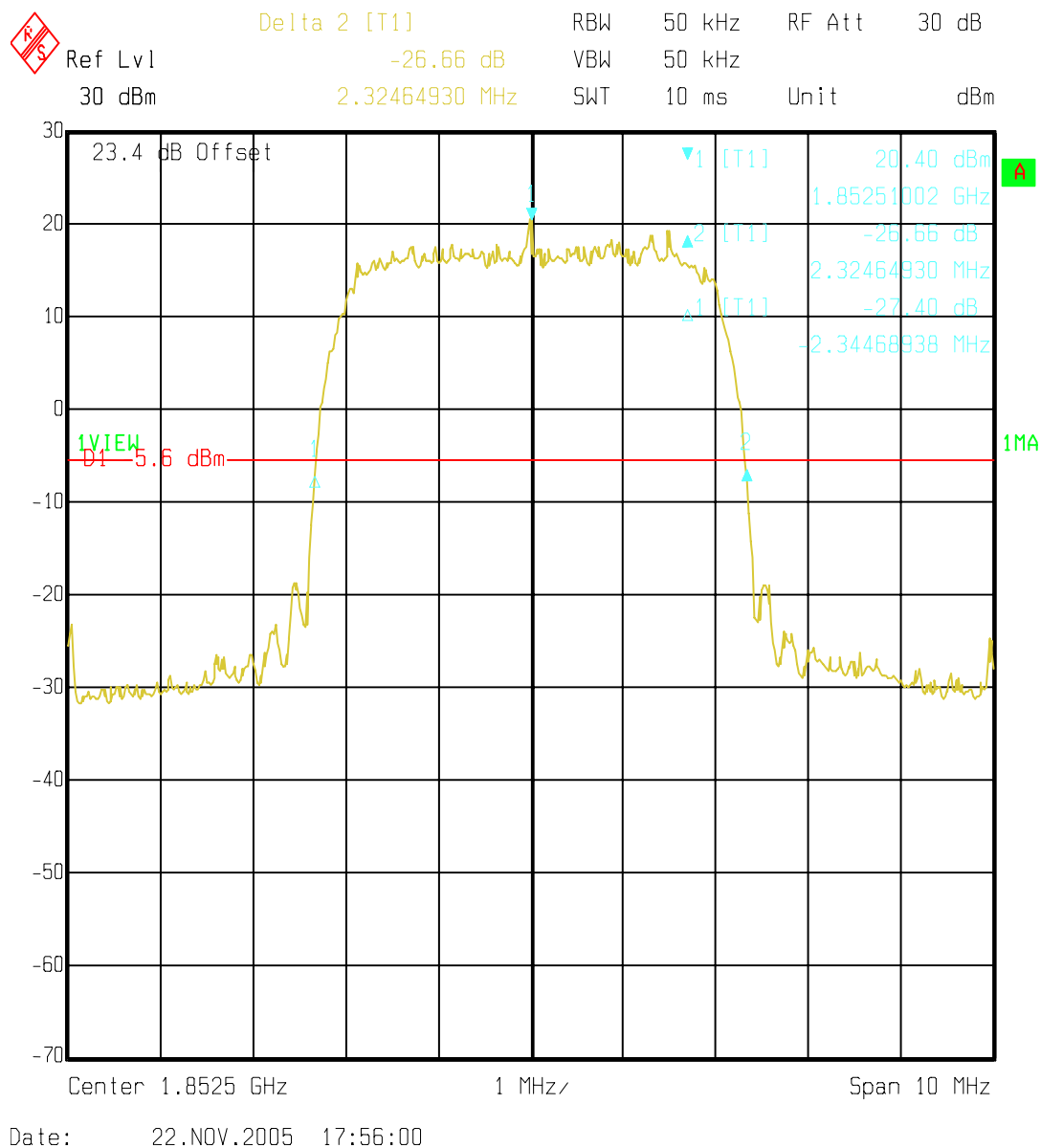
Test conditions		Occupied bandwidth (MHz @ 99%)		
		channel 1	channel 6	channel 12
$T_{nom} = +20\text{ }^{\circ}\text{C}$	$V_{nom} = 120\text{ VAC}$	4.148	4.148	4.148

Table 7 - Occupied bandwidth (99%)

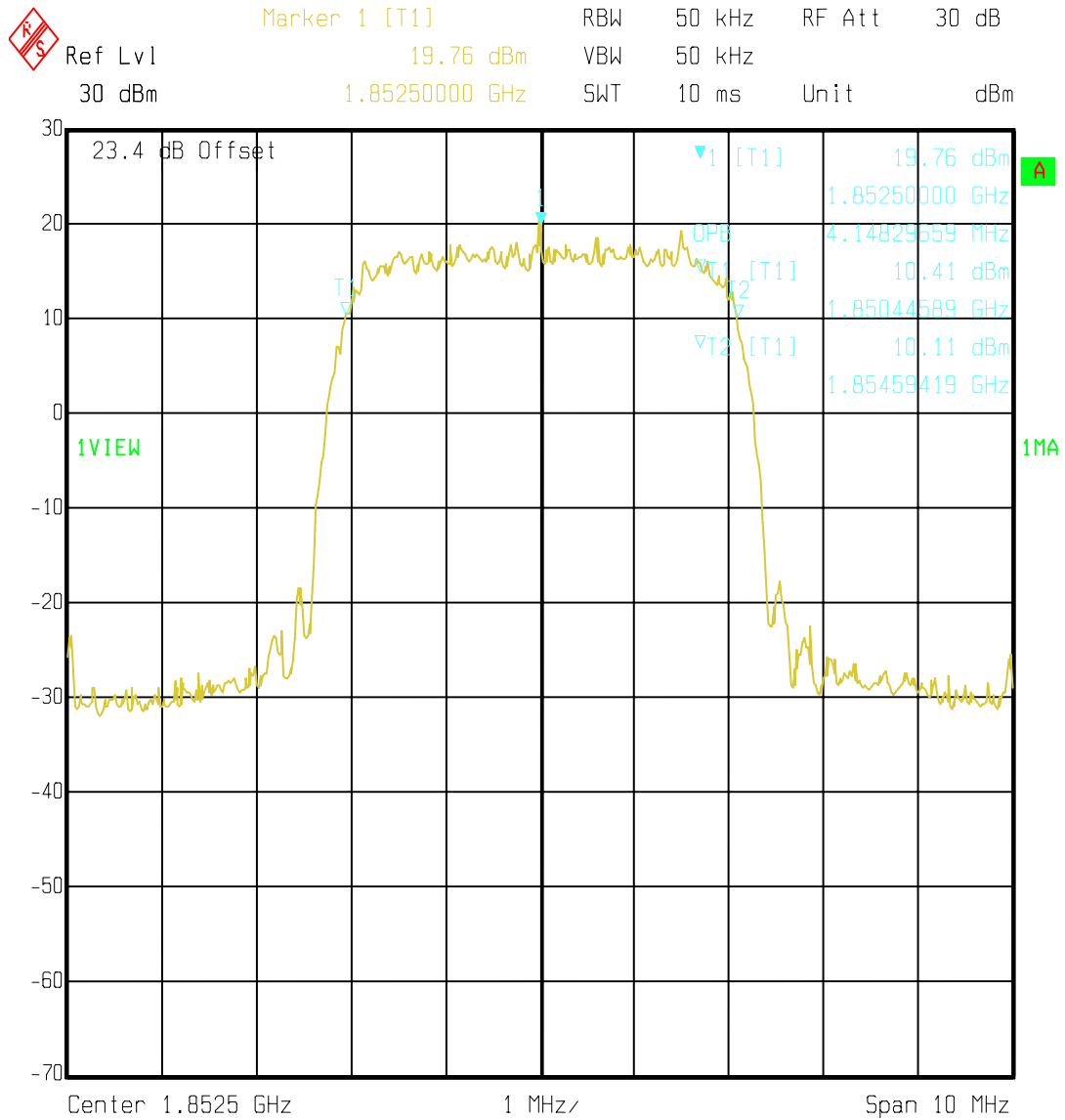
2.3.2 Limit

The maximum allowable occupied bandwidth is 5 MHz.

2.3.3 Plots of test results (occupied bandwidth)

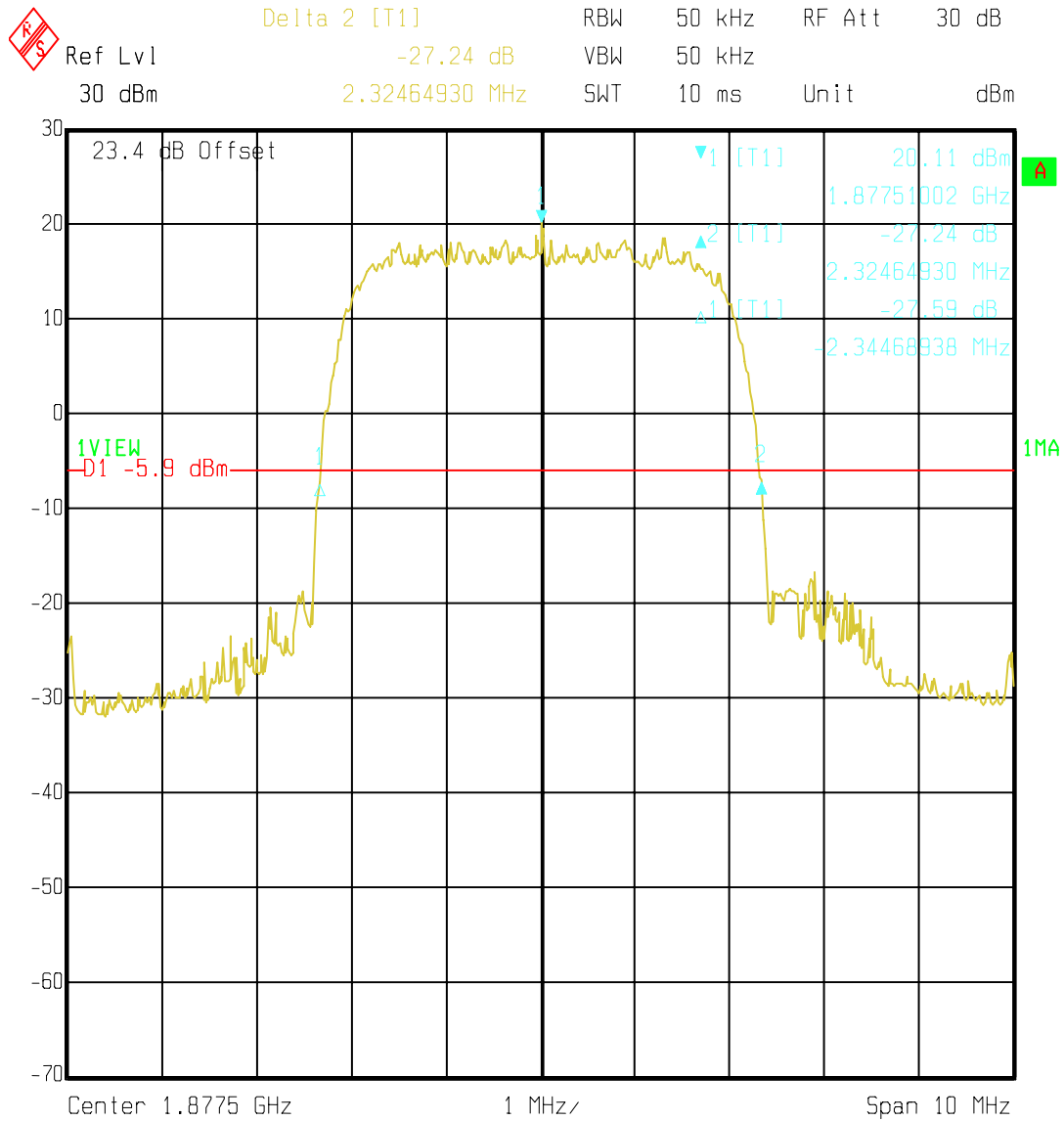


Plot 1 - Occupied bandwidth (-26 dB, channel 1, 1852.5 MHz)



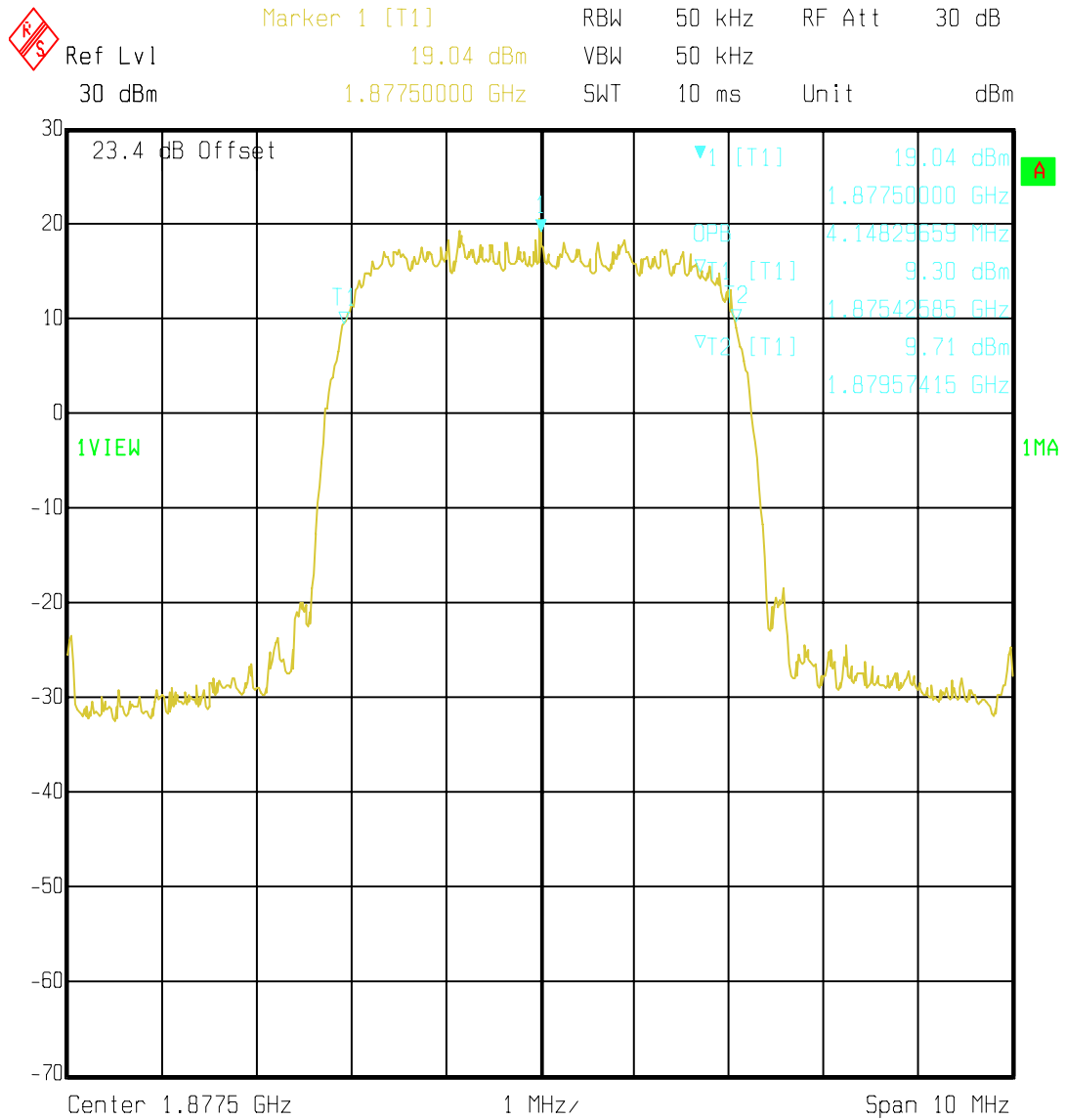
Date: 22.NOV.2005 17:42:03

Plot 2 - Occupied bandwidth (99%, channel 1, 1852.5 MHz)



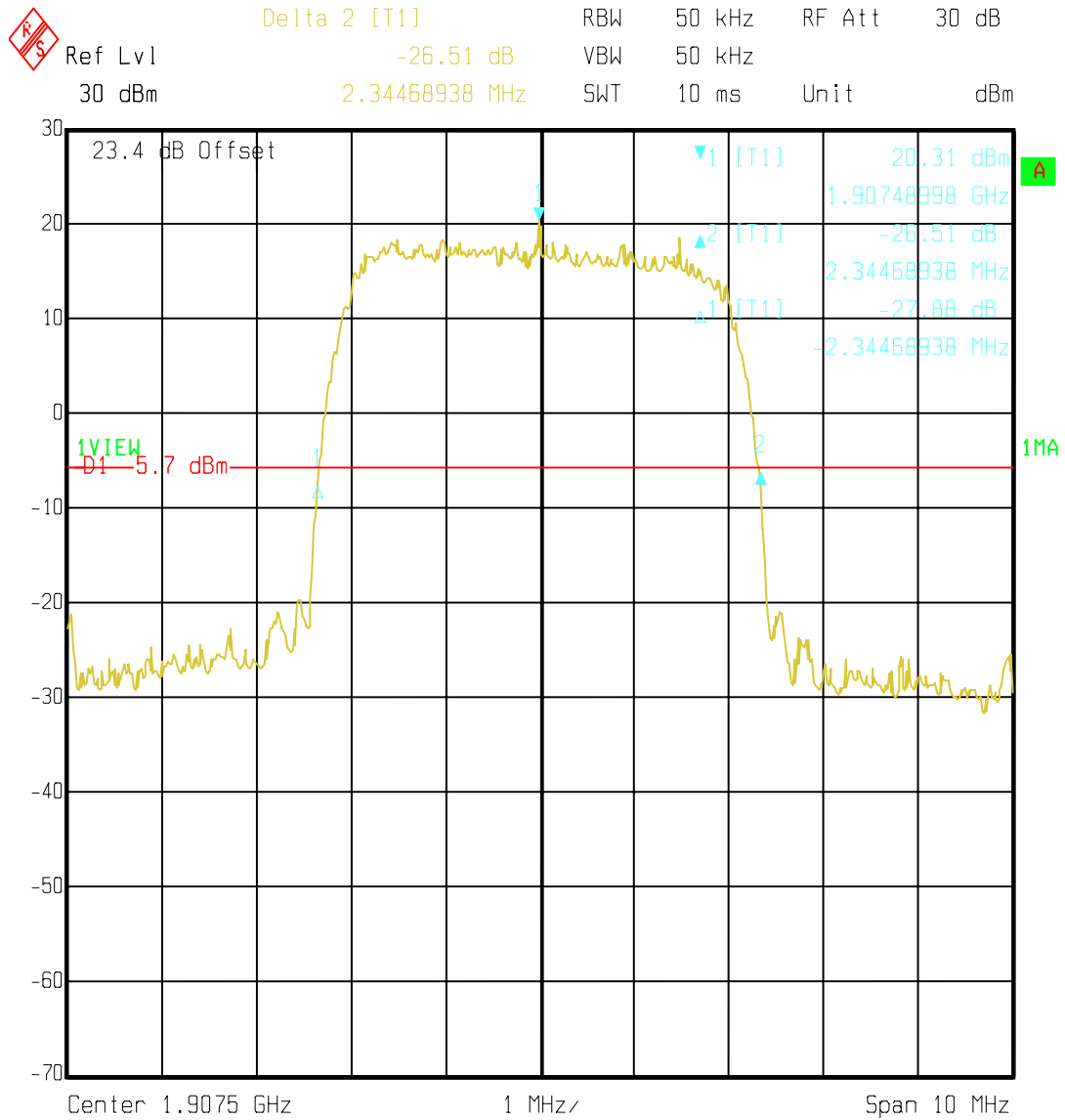
Date: 22.NOV.2005 17:52:35

Plot 3 - Occupied bandwidth (-26 dB, channel 6, 1877.5 MHz)



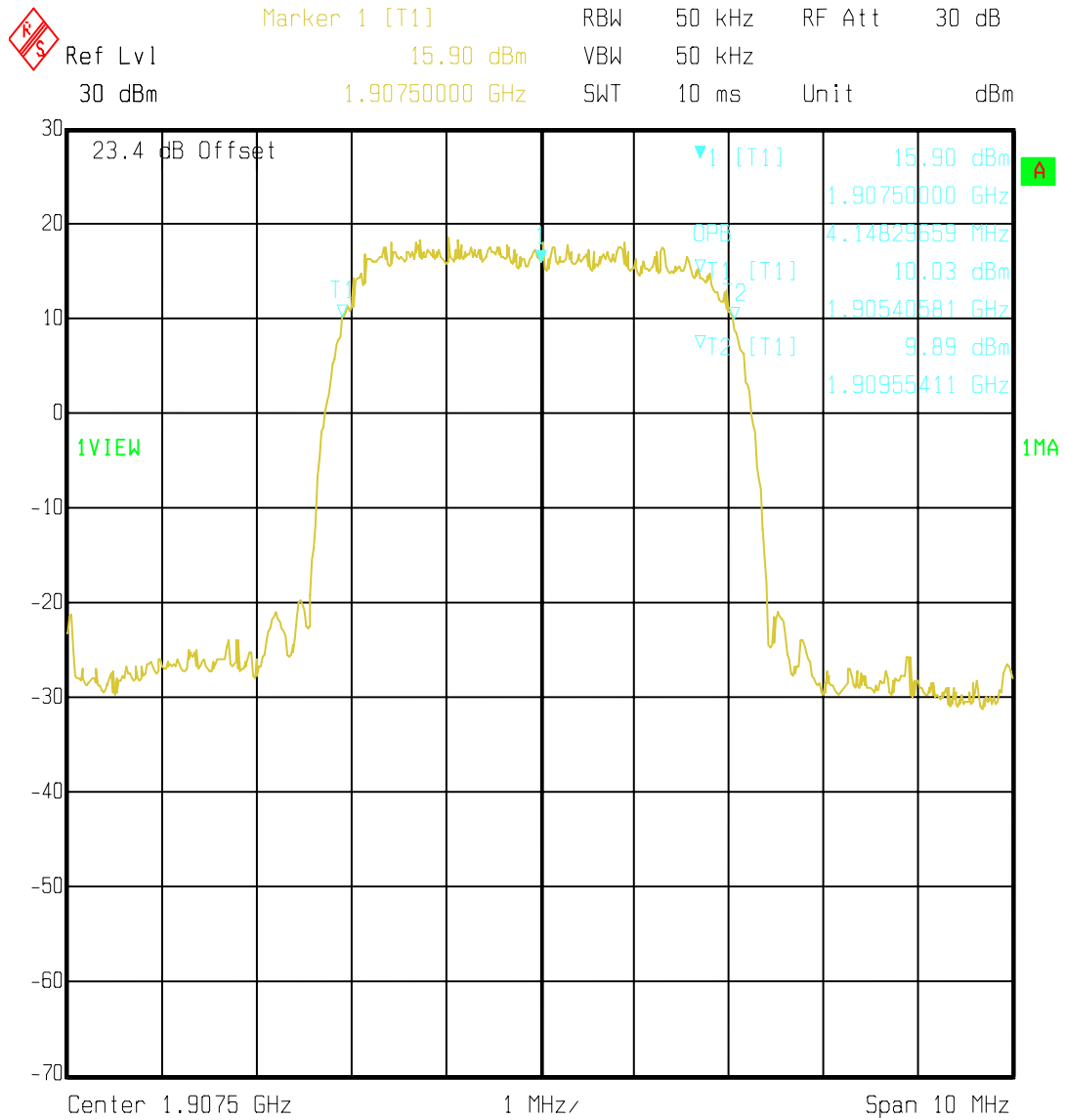
Date: 22.NOV.2005 17:44:13

Plot 4 - Occupied bandwidth (99%, channel 6, 1877.5 MHz)



Date: 22.NOV.2005 17:49:48

Plot 5 - Occupied bandwidth (-26 dB, channel 12, 1907.5 MHz)



Date: 22.NOV.2005 17:46:11

Plot 6 - Occupied bandwidth (99%, channel 12, 1907.5 MHz)



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2.4 Spurious emissions at the antenna terminals

Spurious emissions measurements have been carried out in accordance with 47 CFR Part 24.238 (a) and 47 CFR Part 2.1051 at the antenna terminals of the EUT.

The tests were performed with the EUT operating at the lowest operating frequency (channel 1: 1852.5 MHz), the operating frequency in the middle of the specified frequency band (channel 6: 1877.5 MHz) and the highest operating frequency (channel 12: 1907.5 MHz).

Plots of the measurements have been made available on the next pages of this test report.

2.4.1.1 Test results

Please refer to the plots 7-12 on the next pages of this test report for the test results of the spurious emissions measurements in the frequency range of 30 MHz - 20 GHz.

Please refer to the plots 13-14 on the next pages of this test report for the test results of the spurious emissions levels at the bandedges of the assigned frequency band.

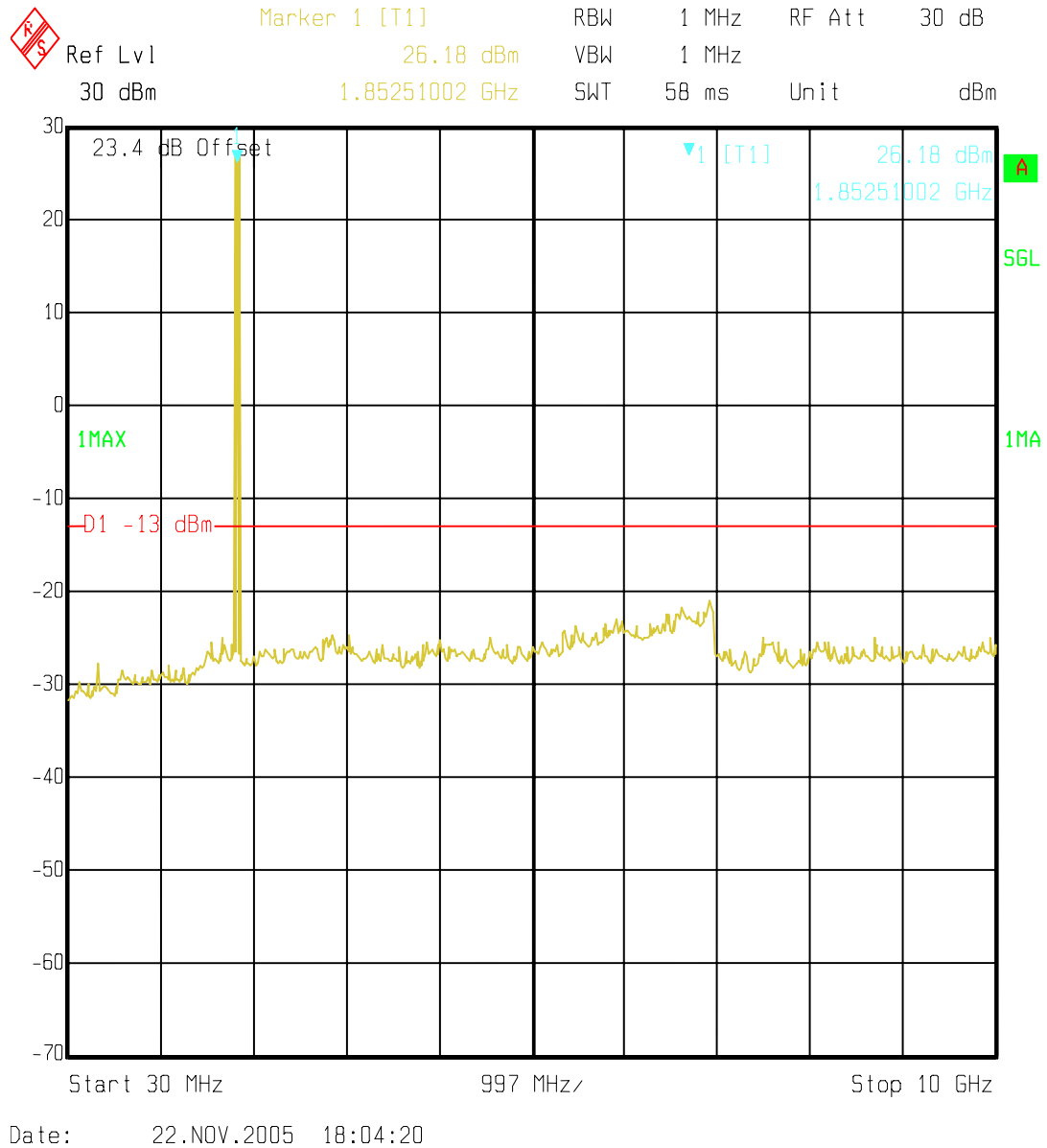
2.4.2 Limit.

The spurious emissions limit at the antenna terminals is obtained as follows (with reference to 47 CFR Part 24.238 (a)):

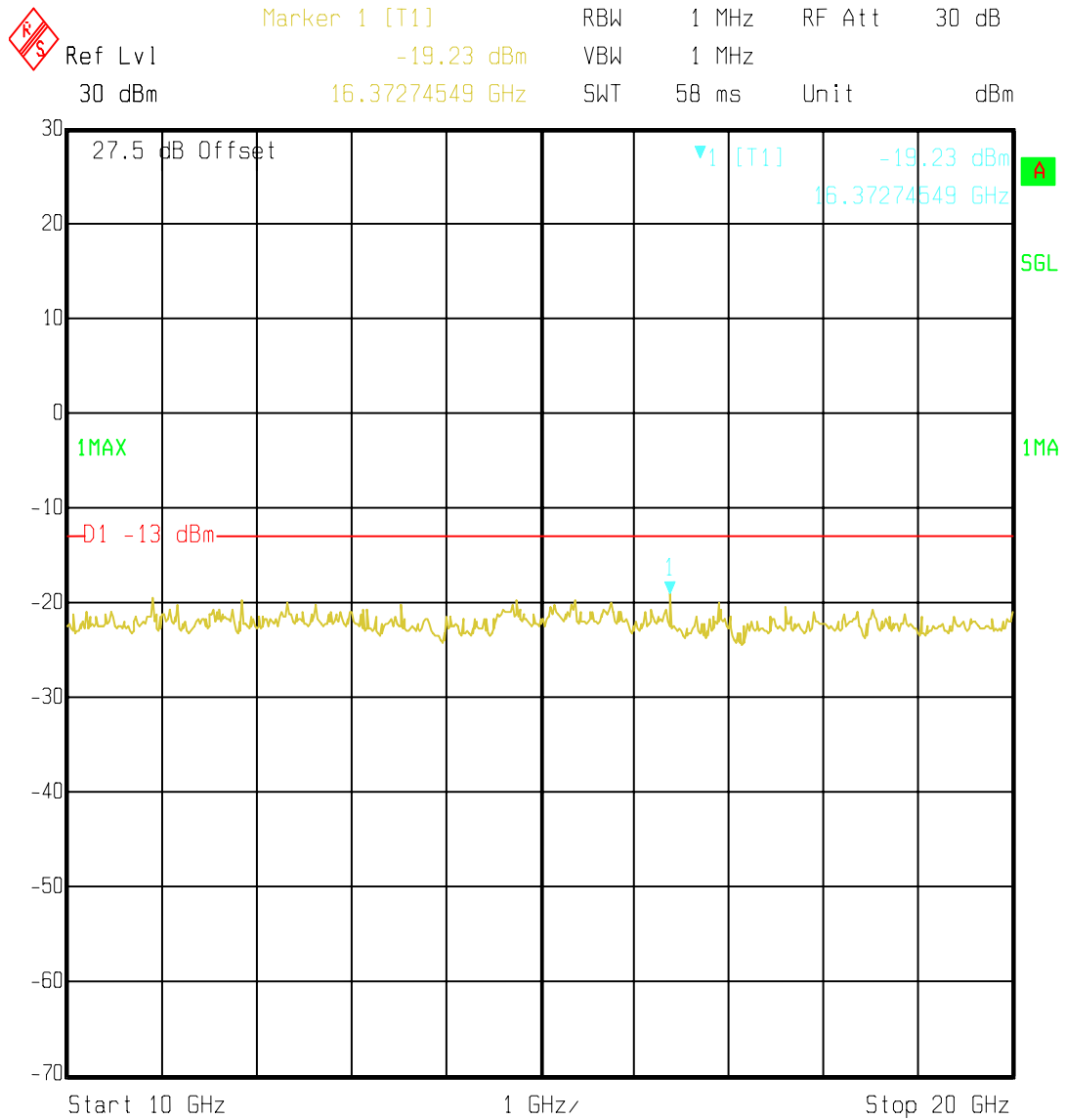
Maximum RF output power (conducted) is: 26.98 dBm = 0.499 Watts = P

Limit = $P - (43 + (10 \log P) \text{ dB}) = 26.98 - (43 + (10 \log 0.499)) = 26.98 \text{ dBm} - 39.98 \text{ dB} = -13 \text{ dBm}$

2.4.3 Plots of test results (spurious emissions at the antenna terminals)

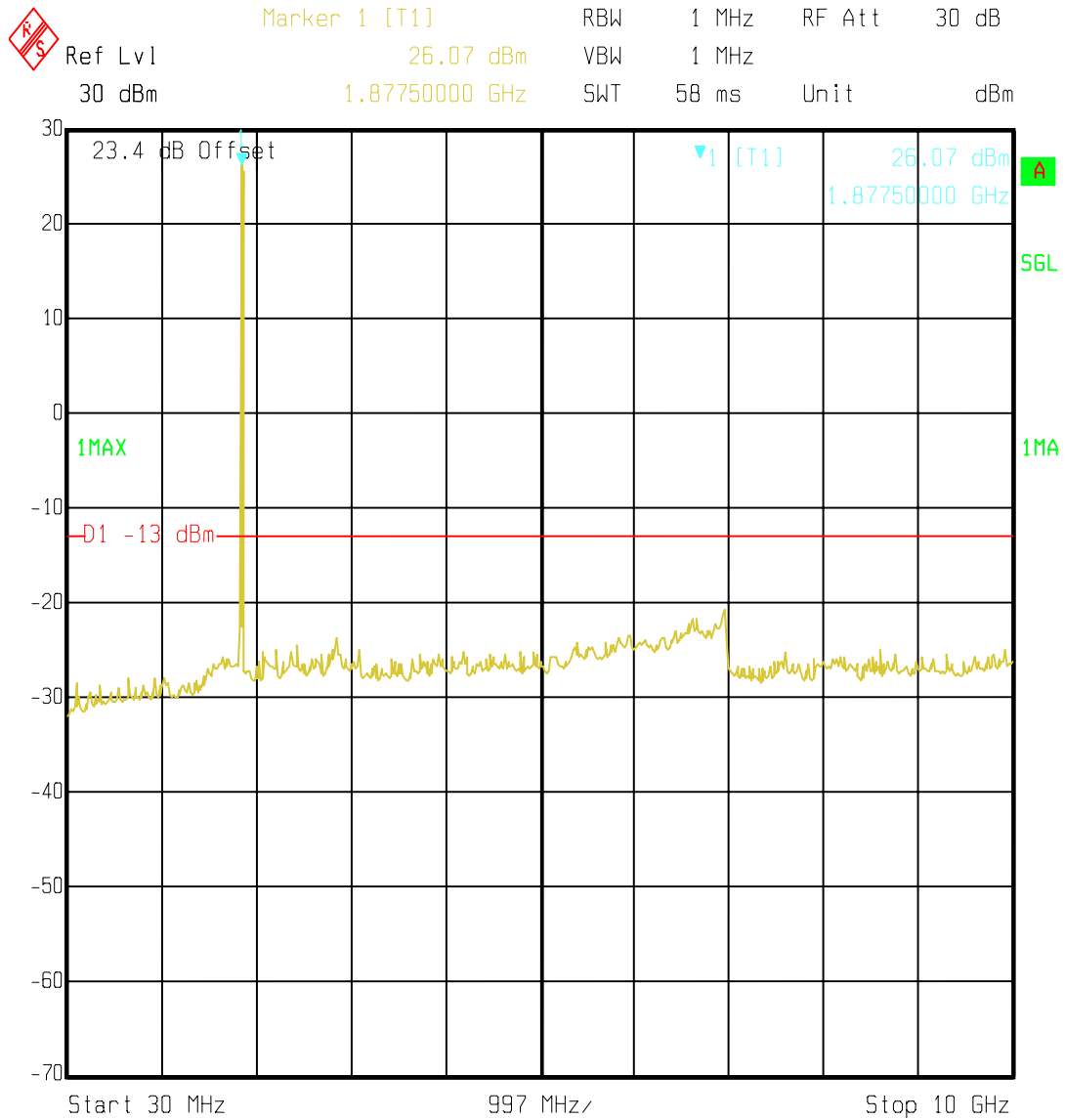


Plot 7 - Spurious emissions at the antenna terminals (30 MHz - 10 GHz, channel 1, 1852.5 MHz)



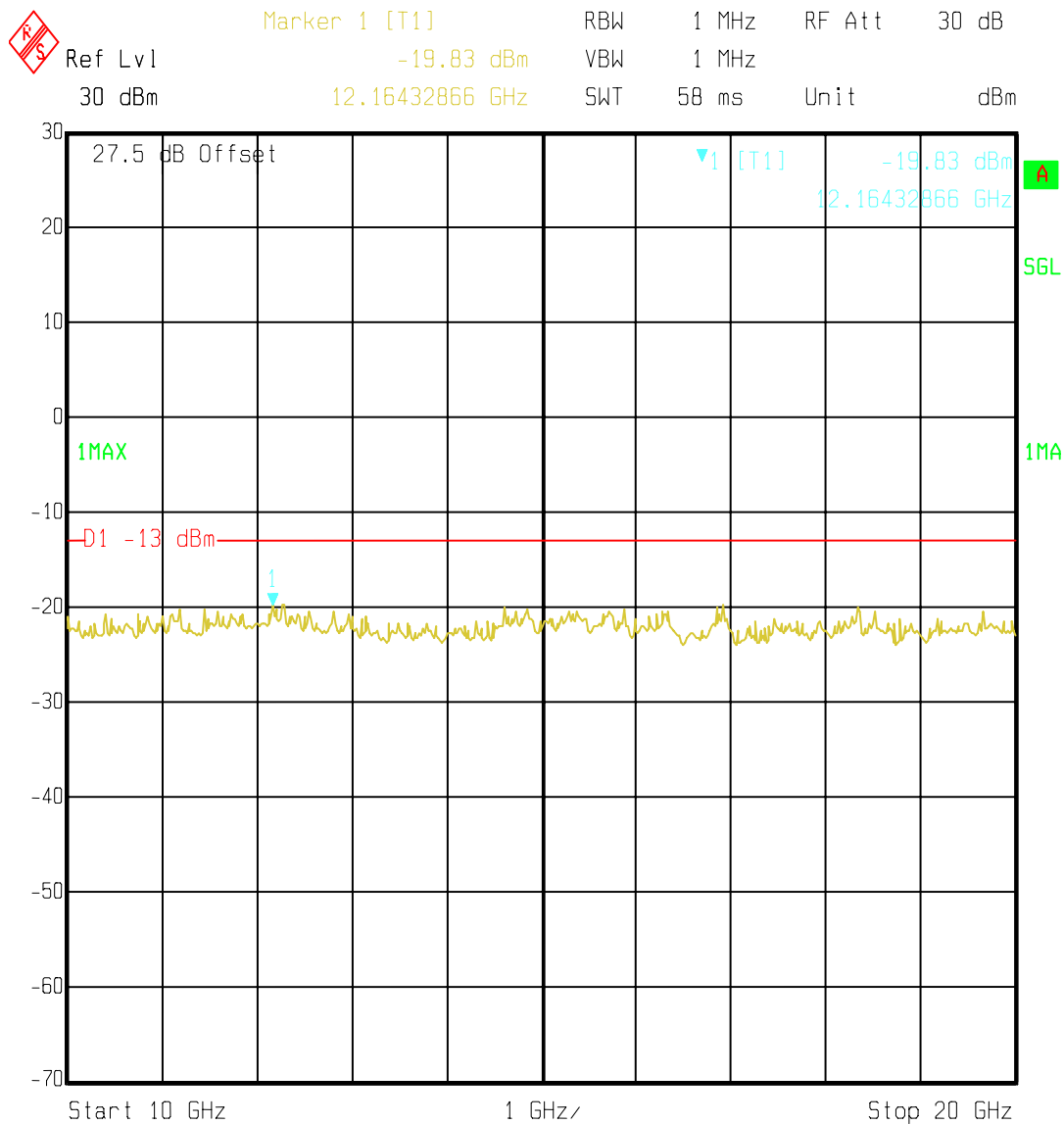
Date: 22.NOV.2005 18:15:33

Plot 8 - Spurious emissions at the antenna terminals (10 GHz - 20 GHz, channel 1, 1852.5 MHz)



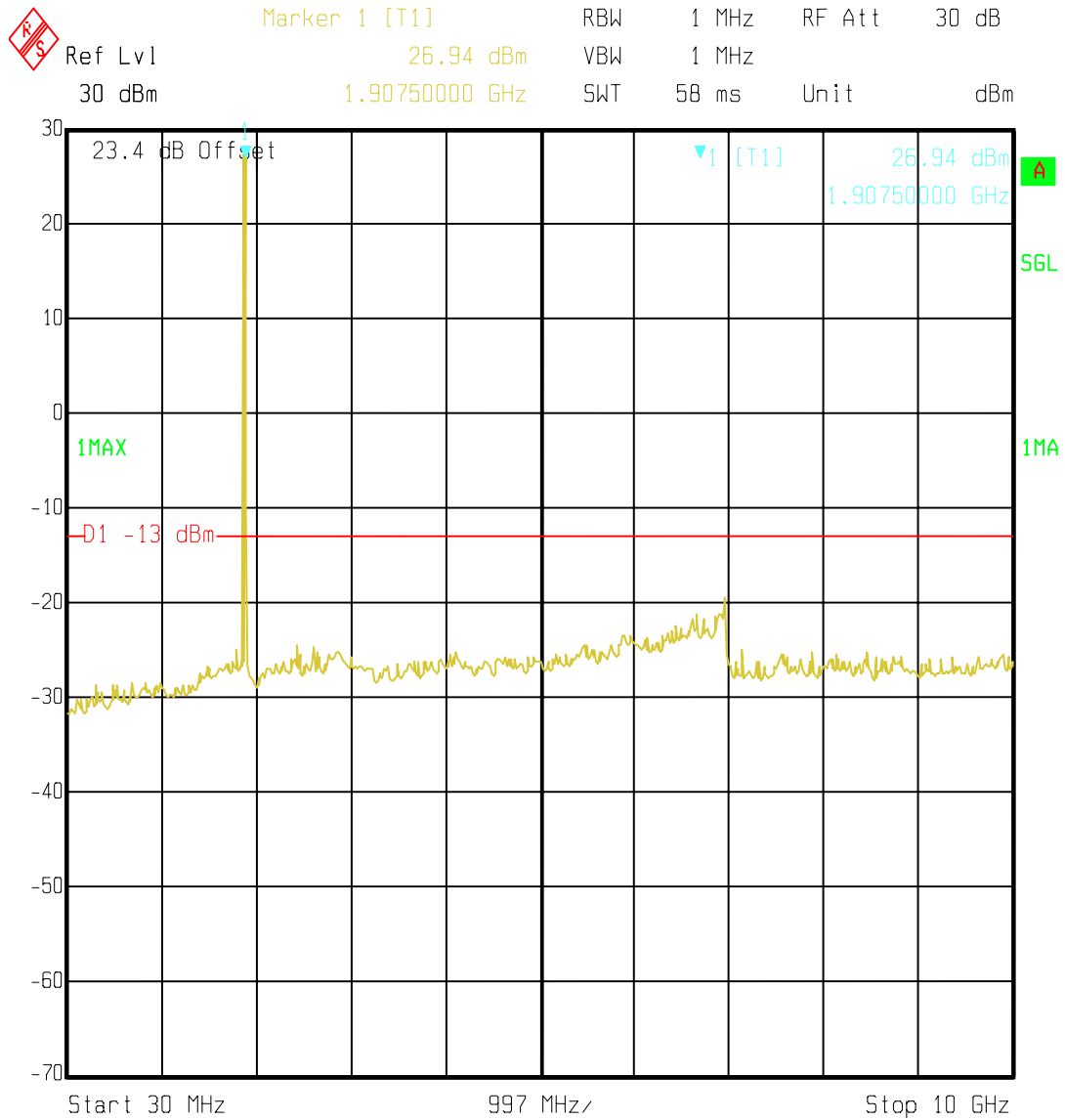
Date: 22.NOV.2005 18:10:27

Plot 9 - Spurious emissions at the antenna terminals (30 MHz - 10 GHz, channel 6, 1877.5 MHz)



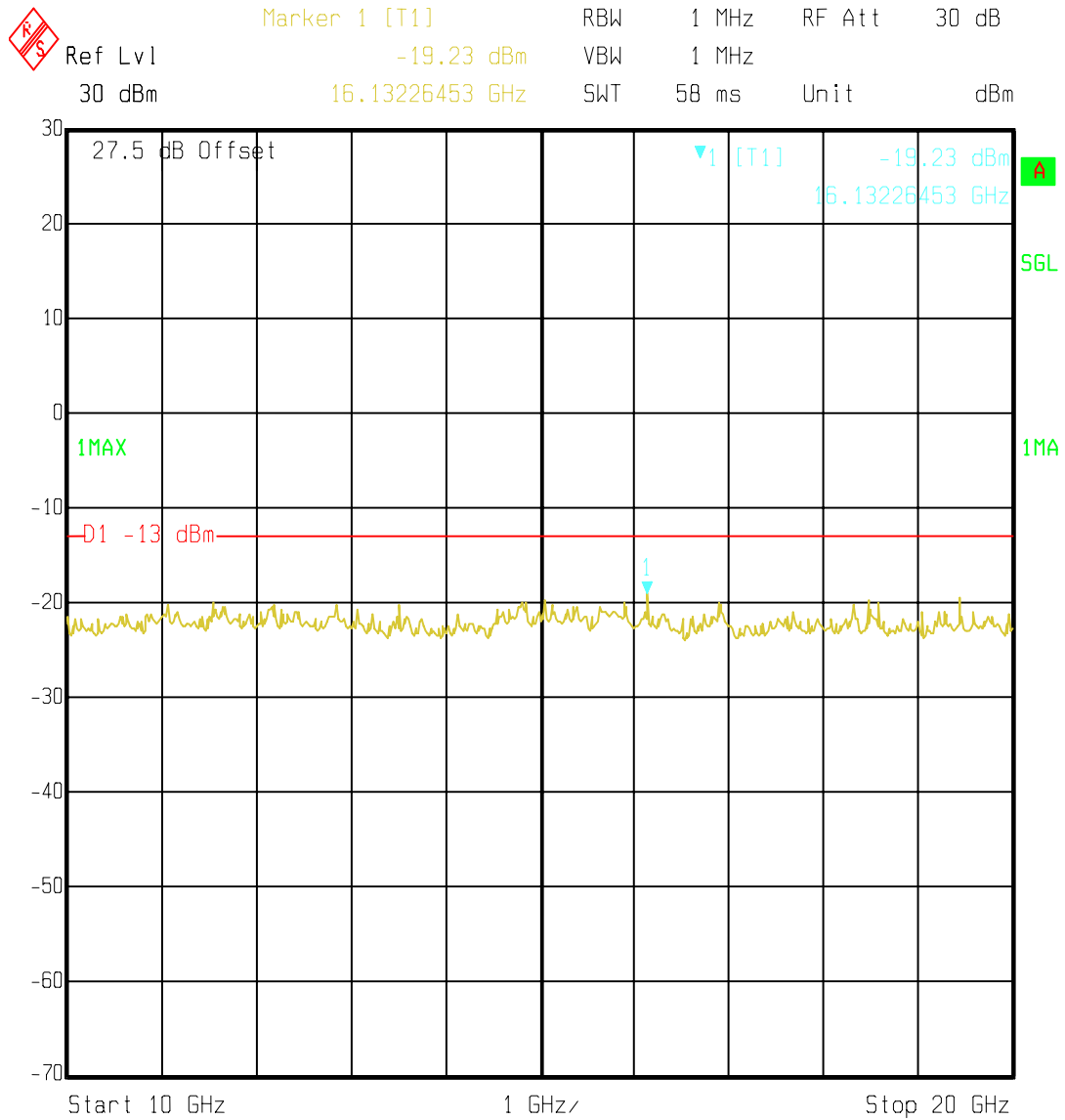
Date: 22.NOV.2005 18:13:47

Plot 10 - Spurious emissions at the antenna terminals (10 GHz - 20 GHz, channel 6, 1877.5 MHz)



Date: 22.NOV.2005 18:08:07

Plot 11 - Spurious emissions at the antenna terminals (30 MHz - 20 GHz, channel 12, 1907.5 MHz)

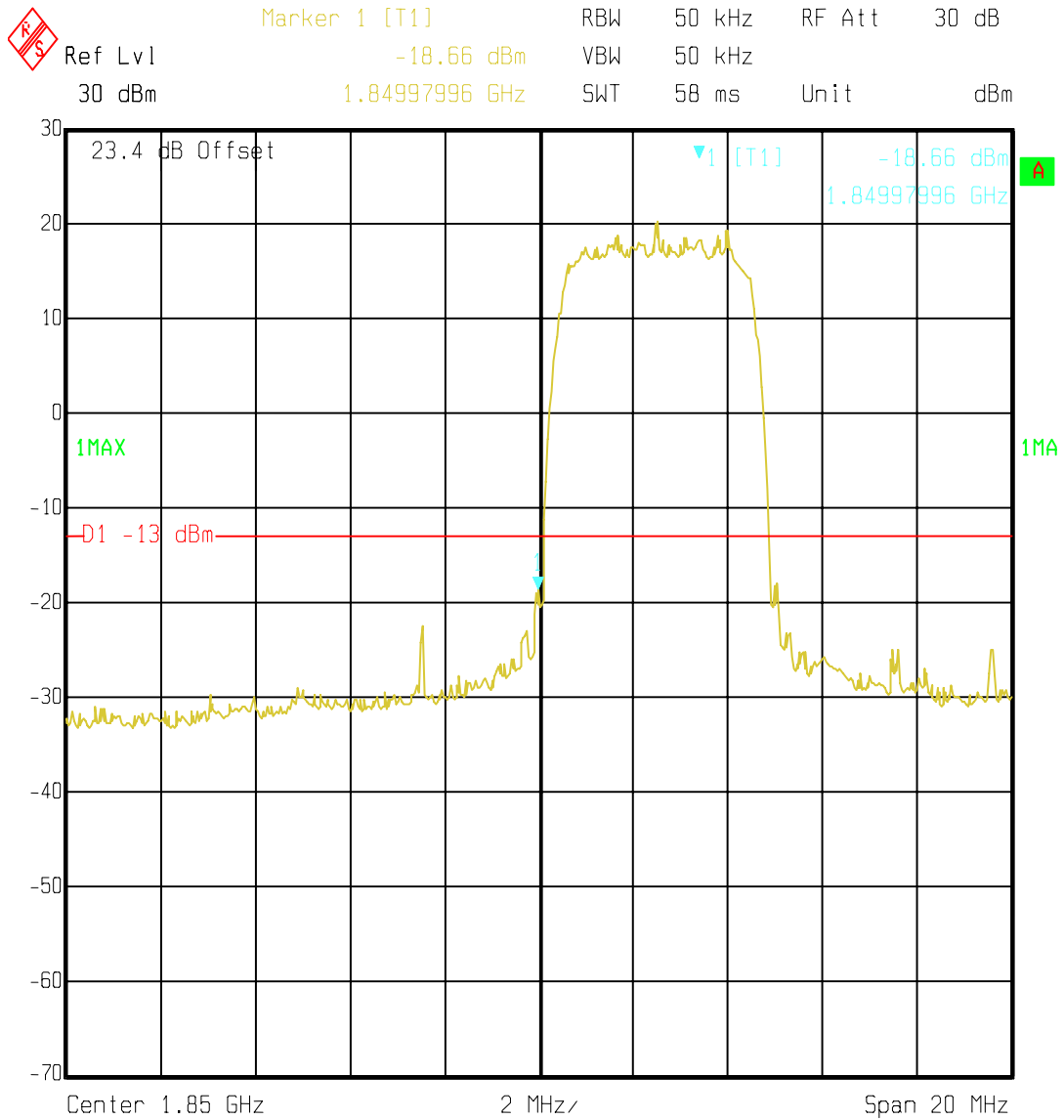


Date: 22.NOV.2005 18:17:00

Plot 12 - Spurious emissions at the antenna terminals (10 GHz - 20 GHz, channel 12, 1907.5 MHz)

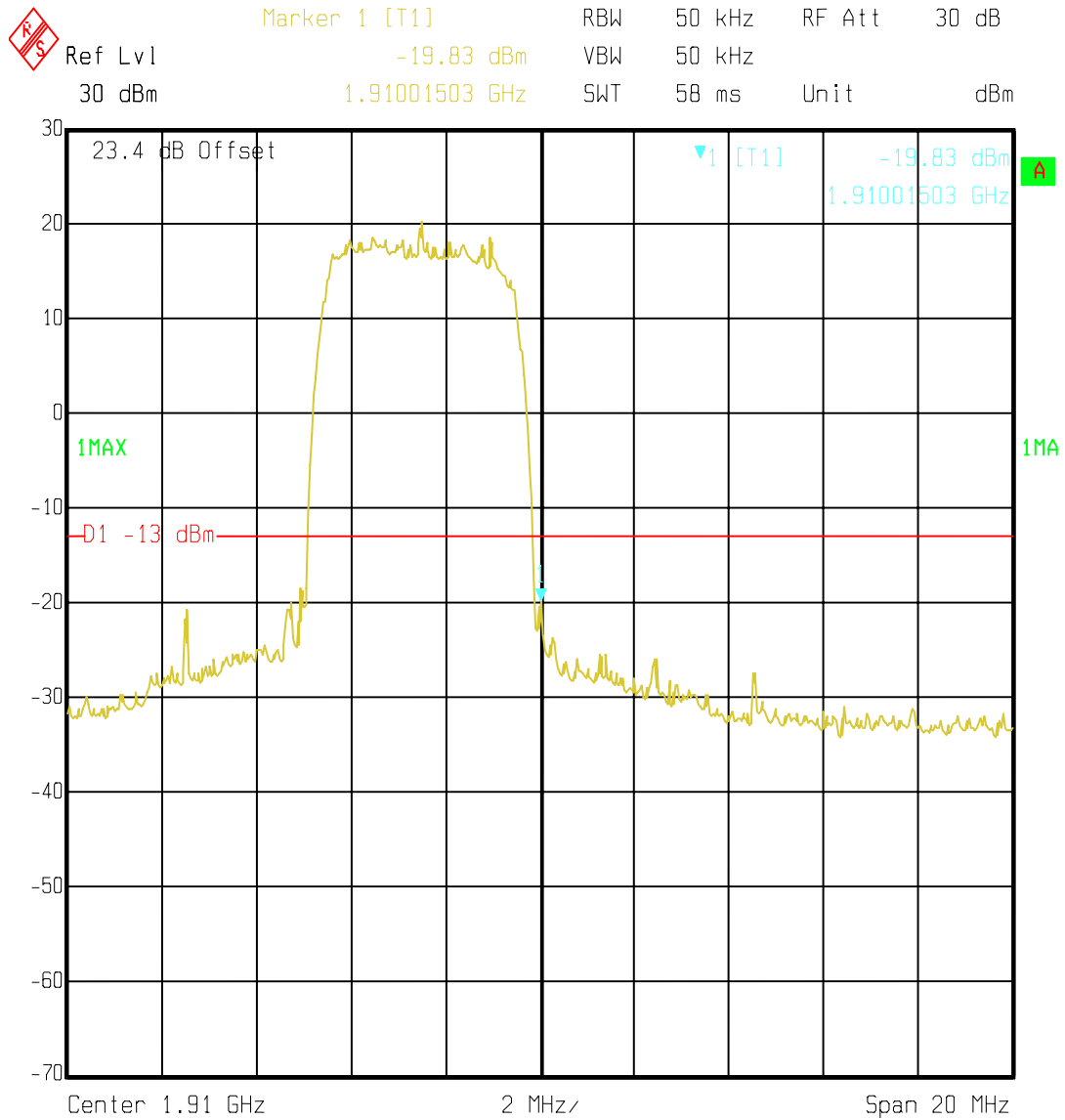


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Date: 22.NOV.2005 18:27:43

Plot 13 - Lower bandedge (channel 1, 1852.5 MHz)



Date: 22.NOV.2005 18:23:45

Plot 14 - Upper bandedge (channel 12, 1907.5 MHz)



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2.5 Radiated emissions

Radiated emissions measurements have been carried out in accordance with 47 CFR Part 24.238 (a) and 47 CFR Part 2.1053.

The tests were performed with the EUT operating at the lowest operating frequency (channel 1: 1852.5 MHz), the operating frequency in the middle of the specified frequency band (channel 6: 1877.5 MHz) and the highest operating frequency (channel 12: 1907.5 MHz).

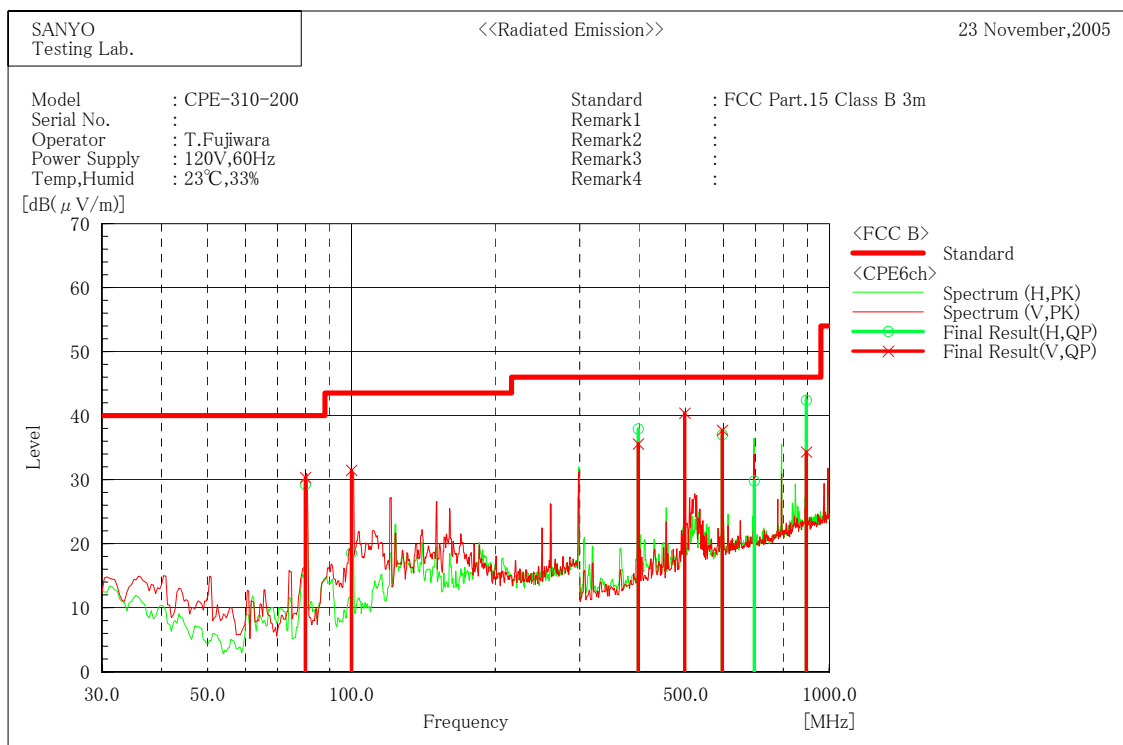
From pre-scans it showed that in the frequency range of 30 - 1000 MHz operation of the EUT on channel 6: 1852.5 MHz yielded the worst-case test results. The pre-scan test results have been filed, and are available for future inspection, at the test laboratory.

In the frequency range of 1 - 20 GHz, the maximum levels of radiated emissions were measured by using the substitution measurement method.

After measuring the maximum levels of the radiated emissions on channel 1: 1852.5 MHz, channel 6: 1877.5 MHz and channel 12: 1907.5 MHz with the spectrum analyzer, the EUT was replaced by a horn antenna which was connected to a RF generator. This combination of RF generator and horn antenna was used to reproduce the measured levels of the radiated emissions on channel 1: 1852.5 MHz, channel 6: 1877.5 MHz and channel 12: 1907.5 MHz and to obtain the appropriate correction factor for the test setup.

2.5.1 Test results

2.5.1.1 Frequency range of 30 - 1000 MHz (EUT operating on channel 6: 1877.5 MHz)



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μ V)]	c.f [dB(1/m)]	Result QP [dB(μ V/m)]	Limit [dB(μ V/m)]	Margin QP [dB]	Height [cm]	Angle [°]
1	80.000	H	59.6	-30.3	29.3	40.0	10.7	225.0	192.0
2	100.000	H	45.2	-26.6	18.6	43.5	24.9	317.0	206.0
3	398.114	H	55.8	-17.9	37.9	46.0	8.1	100.0	203.0
4	597.171	H	50.5	-13.5	37.0	46.0	9.0	100.0	42.0
5	696.700	H	41.8	-12.0	29.8	46.0	16.2	166.0	208.0
6	895.758	H	51.8	-9.4	42.4	46.0	3.6	166.0	208.0
7	80.000	V	60.6	-30.3	30.3	40.0	9.7	101.0	235.0
8	100.000	V	58.1	-26.6	31.5	43.5	12.0	102.0	221.0
9	398.114	V	53.5	-17.9	35.6	46.0	10.4	128.0	189.0
10	497.644	V	56.1	-15.7	40.4	46.0	5.6	102.0	189.0
11	597.171	V	51.2	-13.5	37.7	46.0	8.3	100.0	176.0
12	895.758	V	43.7	-9.4	34.3	46.0	11.7	133.0	161.0

Graph 1 - Frequency range of 30 - 1000 MHz (EUT operating on channel 6: 1877.5 MHz)

2.5.1.2 Frequency range of 1 - 20 GHz (EUT operating on channel 1: 1852.5 MHz)

The results of tests on the EUT in the frequency range of 1 - 20 GHz, carried out in accordance with 47 CFR Part 24.238 (a) and 47 CFR Part 2.1053, are depicted in table 8.

Frequency (GHz)	Measurement results (dBm)		Correction factor (dB)		Test results (dBm)		Resolution bandwidth (MHz)	Limits (dBm)
	V	H	V	H	V	H		
1.168	-47.5	-43.2	+1.9	-8.2	-45.6	-51.4	1	-13.0
3.707	-47.7	-48.2	+2.6	-8.3	-45.1	-56.6	1	-13.0
5.545	-38.2	-46.1	+5.0	-5.4	-33.2	-51.5	1	-13.0
13.952	-58.0	-58.4	+19.9	+11.0	-38.1	-47.4	1	-13.0
19.166	-52.6	-62.9	+9.6	+9.6	-43.0	-53.3	1	-13.0

Table 8 - Frequency range of 1 - 20 GHz (EUT operating on channel 1: 1852.5 MHz)

Note: Field strength values of radiated emissions at frequencies not listed in table 8 are more than 20 dB below the applicable limit.

2.5.1.3 Frequency range of 1 - 20 GHz (EUT operating on channel 6: 1877.5 MHz)

The results of tests on the EUT in the frequency range of 1 - 20 GHz, carried out in accordance with 47 CFR Part 24.238 (a) and 47 CFR Part 2.1053, are depicted in table 9.

Frequency (GHz)	Measurement results (dBm)		Correction factor (dB)		Test results (dBm)		Resolution bandwidth (MHz)	Limits (dBm)
	V	H	V	H	V	H		
1.168	-49.3	-40.5	+1.9	-8.2	-47.4	-48.7	1	-13.0
3.749	-44.1	-41.5	+2.6	-8.3	-41.5	-49.8	1	-13.0
5.643	-45.1	-50.9	+5.0	-5.4	-40.1	-56.3	1	-13.0
11.267	<<	-58.2	<<	+6.2	<<	-52.0	1	-13.0
12.369	-61.1	<<	+21.0	<<	-40.1	<<	1	-13.0
18.786	-56.5	<<	+10.0	<<	-46.5	<<	1	-13.0
19.443	-51.3	-61.4	+9.6	+9.6	-41.7	-51.8	1	-13.0

Table 9 - Frequency range of 1 - 20 GHz (EUT operating on channel 6: 1877.5 MHz)

Note: Field strength values of radiated emissions at frequencies not listed in table 9 are more than 20 dB below the applicable limit.

2.5.1.4 Frequency range of 1 - 20 GHz (EUT operating on channel 12: 1907.5 MHz)

The results of tests on the EUT in the frequency range of 1 - 20 GHz, carried out in accordance with 47 CFR Part 24.238 (a) and 47 CFR Part 2.1053, are depicted in table 10.

Frequency (GHz)	Measurement results (dBm)		Correction factor (dB)		Test results (dBm)		Resolution bandwidth (MHz)	Limits (dBm)
	V	H	V	H	V	H		
1.168	-49.4	-42.4	+1.9	-8.2	-47.5	-50.6	1	-13.0
3.819	-43.0	-41.7	+2.6	-8.3	-40.4	-50.0	1	-13.0
11.467	<<	-58.3	<<	+6.2	<<	-52.1	1	-13.0
12.589	-58.9	<<	+19.4	<<	-39.5	<<	1	-13.0
19.066	-52.9	-63.2	+10.0	+10.0	-42.9	-53.2	1	-13.0
19.776	-55.9	-55.9	+9.6	+9.6	-46.3	-46.3	1	-13.0

Table 10 - Frequency range of 1 - 20 GHz (EUT operating on channel 12: 1907.5 MHz)

Note: Field strength values of radiated emissions at frequencies not listed in table 10 are more than 20 dB below the applicable limit.



Description of EUT:	W-CDMA subscriber terminal (PCS licensed transmitter)
Manufacturer:	Sanyo Electric Co., Ltd.
Brand mark:	SOMA Networks
Model:	CPE-310-200
FCC ID:	AEZCPE-310-200

2.5.2 Limit.

The radiated emissions limit is obtained as follows (with reference to 47 CFR Part 24.238 (a)):

Maximum RF output power (EIRP) is: 30.7 dBm = 1.175 Watts = P

Limit = P - (43 + (10 log P) dB) = 30.7 - (43 + (10 log 1.175)) = 30.7 dBm - 43.7 dB = -13 dBm

The limit expressed in dBuV/m @ 3 meters measurement distance can be calculated as follows:

-13.0 dBm = 50.1×10^{-3} mW = 50.1×10^{-6} Watts

$E^2 = 50.1 \times 10^{-6} / 0.3$

$E = 12.9 \times 10^{-3}$ V/m = 12922.8 uV/m = 82.2 dBuV/m @ 3 meters measurement distance

2.6 Frequency stability over temperature variations

Frequency stability over temperature variations tests have been carried out in accordance with 47 CFR Part 24.235 and 47 CFR Part 2.1055 (a)(1).

The tests were performed with the EUT operating at the lowest operating frequency (channel 1: 1852.5 MHz). The center frequency of the spectrum analyzer was set to channel 1 of the EUT. Resolution bandwidth (RBW) was set to 1 kHz, video bandwidth (VBW) was set to 100 Hz. The spectrum analyzer indicated the frequency in Hz.

EUT transmitted a CW signal. The RF output power level was set to the maximum value as indicated in the user instructions before the frequency stability over voltage variations test was carried out.

The reference frequency of the channel was obtained first by carrying out the test at +20 °C and 120 VAC. The frequency drift in Hz was derived from the difference between the measured frequency at +20 °C and the measured frequency at a different ambient temperature.

2.6.1 Test results

The results of tests on the EUT, carried out in accordance with 47 CFR Part 24.235 and 47 CFR Part 2.1055 (a)(1), are depicted in table 11.

Test conditions		Frequency (GHz)	Frequency stability (drift, Hz)
T = -30 °C	V _{nom} = 120 VAC	1.852498697	-814
T = -20 °C	V _{nom} = 120 VAC	1.852498627	-884
T = -10 °C	V _{nom} = 120 VAC	1.852498549	-962
T = 0 °C	V _{nom} = 120 VAC	1.852498983	-528
T = +10 °C	V _{nom} = 120 VAC	1.852499304	-207
T = +20 °C	V_{nom} = 120 VAC	1.852499511	0
T = +30 °C	V _{nom} = 120 VAC	1.852499509	-2
T = +40 °C	V _{nom} = 120 VAC	1.852499486	-25
T = +50 °C	V _{nom} = 120 VAC	1.852499509	-2

Table 11 - Frequency stability over temperature variations

2.6.2 Limit

The limit was calculated from the measured occupied bandwidth (-26 dB) at +20 °C and 120 VAC. The maximum allowable occupied bandwidth is 5 MHz. The limit for the maximum allowable frequency drift was calculated from:

(maximum allowable occupied bandwidth - measured occupied bandwidth) / 2

(5.00 MHz - 4.68 MHz) / 2 = 0.32 MHz / 2 = 160 kHz

2.7 Frequency stability over voltage variations

Frequency stability over voltage variations tests have been carried out in accordance with 47 CFR Part 24.235 and 47 CFR Part 2.1055 (d)(1).

The tests were performed with the EUT operating at the lowest operating frequency (channel 1: 1852.5 MHz). The center frequency of the spectrum analyzer was set to channel 1 of the EUT. Resolution bandwidth (RBW) was set to 1 kHz, video bandwidth (VBW) was set to 100 Hz. The spectrum analyzer indicated the frequency in Hz.

EUT transmitted a CW signal. The RF output power level was set to the maximum value as indicated in the user instructions before the frequency stability over voltage variations test was carried out.

The reference frequency of the channel was obtained first by carrying out the test at +20 °C and 120 VAC. The frequency drift in Hz was derived from the difference between the measured frequency at +20 °C and the measured frequency at a different AC mains voltage.

2.7.1 Test results

The results of tests on the EUT, carried out in accordance with 47 CFR Part 24.235 and 47 CFR Part 2.1055 (d)(1), are depicted in table 12.

Test conditions		Frequency (GHz)	Frequency stability (drift, Hz)
T = +20 °C	V _{min} (-15%) = 102 VAC	1.852499509	-2
T = +20 °C	V _{nom} = 120 VAC	1.852499511	0
T = +20 °C	V _{max} (+15%) = 138 VAC	1.852499531	-2

Table 12 - Frequency stability over voltage variations

2.7.2 Limit

The limit was calculated from the measured occupied bandwidth (-26 dB) at +20 °C and 120 VAC. The maximum allowable occupied bandwidth is 5 MHz. The limit for the maximum allowable frequency drift was calculated from:

(maximum allowable occupied bandwidth - measured occupied bandwidth) / 2

$(5.00 \text{ MHz} - 4.68 \text{ MHz}) / 2 = 0.32 \text{ MHz} / 2 = 160 \text{ kHz}$

3 List of test equipment

Test Instruments used:

ID	Instruments	Maker	S/N	LAST Cal.	Next Cal.
1	Receiver ESCS30	ROHDE&SCHWARZ	S/N:100032	6/°05	6/°06
2	Spectrum Analyzer FSEM30	ROHDE&SCHWARZ	S/N:100162	9/°05	9/°06
3	Spectrum Analyzer R3261C	ADVANTEST	S/N:81720519	7/°05	7/°06
4	Power Meter E4418B	Agilent	S/N:GB41299475	10/°05	10/°06
5	Signal Generator E8241A	Agilent	S/N:US41140257	11/°03	11/°05
6	Temperature and Humidity Chamber PVL-4GAV5-100	TABAI ESPEC CORP.	S/N:2517520	10/°04	10/°07

Test Accessories used:

ID	Accessories	Maker	S/N	LAST Cal.	Next Cal.
11	Selector NS4008S	TOYO Corporation	S/N:0206001	7/°05	7/°06 *1
12	LISN ESH2-Z5	ROHDE&SCHWARZ	S/N 825640/015	7/°05	7/°06
13	LISN KNW-407	Kyoritsu	S/N:8-1468-3	7/°05	7/°05
14	50 Ω terminator	SUHNER	S/N:50TER011	6/°04	6/°06
15	Pulse Limiter ESH3Z2	ROHDE&SCHWARZ	S/N:357.8810.52	7/°05	7/°06 *1
16	Power Sensor	Agilent	S/N:E9301H	4/°05	4/°06
17	Band Reject Filter NF-49BT	TOYO Corporation	S/N:022		
18	Attenuator (20dB) WA4	WEINSCHEL	S/N:A677		
19	Attenuator (10dB) 6810.17.A	SUHNER	S/N:-	used for 1-8GHz measurement	
20	Attenuator (10dB) WA2-10	WEINSCHEL	S/N:A208	used for 8-18GHz measurement	

*1: On-site Calibration

Test Antenna and Amp used:

ID	Antenna , Amp	Maker (frequency band)	S/N	LAST Cal.	Next Cal.
31	Biconical BBA9106	SBK (30-300MHz)	S/N:9103 2034	6/°05	6/°06
32	Log-Peri UHALP9108A	SBK (300M-1GHz)	S/N:0498	6/°05	6/°06
33	Duble Ridged Hone Ant. BBHA9120B (Receiving)	SBK (1-8GHz)	S/N:9120B 227	8/°05	8/°06
34	Duble Ridged Hone Ant. BBHA9120B (Radiation)	SBK (1-8GHz)	S/N:9120B 228	6/°05	6/°06
35	Duble Ridged Hone Ant. BBHA9120C (Receiving)	SBK (8-18GHz)	S/N:9120C-321	9/°05	9/°06
36	Duble Ridged Hone Ant. BBHA9120C (Radiation)	SBK (8-18GHz)	S/N:9120C-322	6/°05	6/°06
37	Standard Gain Hone (With Amp.) 12A-18 115300(Receiving)	MI Technologies (18-26GHz)	S/N:22938PA	10/°05	10/°06
38	Standard Gain Hone 12A-18 115300(Radiation)	MI Technologies (18-26GHz)	S/N:22939PA	-	-
39	AMP NUL-5132	TSJ (30M-1GHz)	S/N:030528	7/°05	7/°06 *1
40	AMP TPA0108-40	TOYO Corporation (1-8GHz)	S/N:	7/°05	7/°06 *1
41	AMP TPA0618-35	TOYO Corporation (8-18GHz)	S/N:	7/°05	7/°06 *1



Description of EUT: W-CDMA subscriber terminal (PCS licensed transmitter)
Manufacturer: Sanyo Electric Co., Ltd.
Brand mark: SOMA Networks
Model: CPE-310-200
FCC ID: AEZCPE-310-200

Measurement item	ID No.
RF output power (conducted)	4,16,18
Occupied bandwidth.	2,18
Spurious emissions at the antenna terminals.	2,18
Radiated Emissions (30M-1GHz)	1,3,11,31,32,39
Radiated Emissions (1-8GHz)	2,5,17,19,33,34,40
Radiated Emissions (8-18GHz)	2,5,20,35,36,41
Radiated Emissions (18-20GHz)	2,5,20,37,38
Conducted Emissions	1,3,11,12,13,14,15
Frequency stability over temperature variations & Frequency stability over voltage variations	2,6,18
Effective radiated power	2,4,5,16,33,34,40