

Accredited testing laboratory

DAR-Registration number:
DAT-P-176/94-D1



Test report no.:
4-2170-02-04/06
SM-2500 SAT module

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Enclosure

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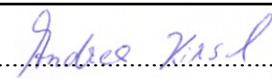
1 General Information

1.1 Notes

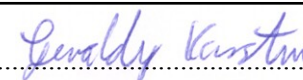
The test results of this test report relate exclusively to the test item specified in subclause 1.5. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.

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Tester:

Date	Name	Signature
30.10.2006	Andrea Kirsch	
30.10.2006	Karsten Gerald	

Technical responsibility for area of testing:

Date	Name	Signature
30.10.2006	Karsten Gerald	



1.2 Test laboratory

CETECOM ICT Services GmbH

Untertürkheimer Straße 6 - 10

D-66117 Saarbrücken

Germany

Telephone: + 49 681 5 98 - 0

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e-mail: info@ict.cetecom.de

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State of accreditation: The Test laboratory is accredited according to DIN EN ISO/IEC 17025.

DAR-Registration number: DAT-P-176/94-D1

Accredited Bluetooth® Test Facility (BQTF)

BLUETOOTH is a trademark owned by Bluetooth SIG, Inc. and licensed to CETECOM

Test location, where different from CETECOM ICT Services GmbH:

Name : - not applicable -

Street : - not applicable -

Town : - not applicable -

Country : - not applicable -

Telephone and Telefax : - not applicable -

1.3 Applicant's details

Name : Asia Pacific Satellite Industries Co., Ltd.

Department : Att. Mr. Hyoung-Won Ahn, General Manager

Street : 9FL, IT Castle 2-Dong, #550-1, Gasan-Dong

Town : GeumCheon-Gu, Seoul

Country : Korea

Telephone and Telefax : +82 2 2026 7780 / +82 2 2026 7772

Contact person's name : Mr. Hyoung-Won Ahn, General Manager

Telephone and Telefax : +82 2 2026 7780 / +82 2 2026 7772

1.4 Details of application

Date of receipt of order : 11.07.2006

Date of receipt of test item : 31.07.2006

Date(s) of test : 31.07. - 11.08.2006

Laboratory reference number : 018.06

Test report version : 2

Person(s) who have been present during the test: Mr. Pyo-Jin (Gerald) Kim, Mr. Kyung-Yong Kim, Mr. Y.S. Lee, Mr. Won-Jae Jung

1.5 Test item

1.5.1 General description

Type of test item : Thuraya Satellite Module
 Operating characteristics : GEM mode
 Type identification : **SM-2500 SAT module**
 Serial number(s) : see following table

List of components:

No.	Equipment	Manufacturer	Type name (version, part number)	Serial number	Note no.	tested (Y/N)
1	Thuraya Satellite Module	Asia Pacific Satellite Industries Co.Ltd	SM-2500	IMEI: 35601300-010151-2		yes

Note:

- 1) The item can optionally be equipped with this additional component.
- 2) The item can optionally be equipped with this component instead of no. xxx
- 3) Because of conceptional and mechanical equality the no. xxx was/were representatively tested.
- 4) This component corresponds with the no. xxx but it's not fully provided.
- 5) The item can be combined with this component. The test of this component is documented in test report no.xxxxx/xxxxx/xx.
- 6) This component was sufficiently taken into account, see test report no. xxxxx/xxxxx/xx.
- 7) This component is not part of the test item - it was representatively used to establish the operation and test modes.
- 8) This component is integrated repeatedly in the item because of redundancy - the redundant components were not tested because of equality to the primary parts.
- 9) This component is not relevant relating to the requirements of the test specification as well as baseband equipment - the EMC conformity and eventually the approval for connection to public telecommunication networks are only expected.

Antenna system(s):

Antenna size (mm)	Reflector shape	Concept	Manufacturer	Type	Transmit gain dBi (midband)	Receive gain dBi (midband)	Polarization
-/-	-/-	any	any	-/-	max. 6.0dBic	max. 6.0dBic	LHCP

Technical descriptions and documents:

No.	Document(s)

Technical Data

Transmitter frequency range(s)	: 1626.5 - 1660.5 MHz	Channel spacing	: 31.25 kHz ¹⁾
Receiver frequency range(s)	: 1525.0 - 1559.0 MHz		
Transmitter power	max. peak : 3.2 W	typical	: 3.2 W
Radiated power (EIRP)	max. peak : 11 dBW ²⁾	typical	: 11 dBW ²⁾
Intermediate frequency(ies)	: 246 MHz	Level (range)	: -20 dBm
Frequency stability	: Uncorrected: < ±5 ppm, Corrected: < ±0.006 ppm		
Kind of baseband signal	: voice / circuit data / packet data / fax		
Kind of modulation (s)	: $\pi/4$ - CQPSK		
Occupied bandwidth (99% / 20dB-bandwidth)	: approx. 34.4 kHz (see annex 3, plot no. 3, 8 and 13) ³⁾		
Assigned bandwidth	: approx. 86.25 kHz (see annex 3, plot no. 4, 5, 9, 10, 14 and 15) ³⁾		
Data rate(s) / FEC	: Tx: 2.4 / 4.8 / 9.6 / 14.4 kbps / Convolution (1/2, 1/3, 1/4, 1/5) ⁴⁾		
Power supply	: typ. 10 Vdc ⁴⁾		
Kind of transmission acc. to FCC §2.201 + §2.202	: 35k0G1W ⁴⁾		
FCC ID	: TZ5SM-2500		

¹⁾ channel spacing of Mobile

²⁾ for an antenna with an on-axis gain of max. +6.0 dBi

³⁾ for operating conditions defined below

⁴⁾ manufacturer's declaration

Additional information

SM-2500 is the Satellite Module for Thuraya satellite mobile communication service based on GMR-1 and GMPRS-1. It supports various services such as voice, circuit data, packet data and fax etc. It serves the various interfaces, UART, LCD, SIM, keypad, digital and analogue audio interfaces....etc.

The manufacturer declared that the Module can be connected to any suitable antenna with 6 dBi max. antenna gain.

1.5.2 Operating conditions

Operating condition 1: 1643.5 MHz / CH 544 (=fm, 1626.53125 MHz / Ch 1 =fu, 1660.46875 MHz / CH 1087 =fo)
Pi/4-CQPSK, 23.4 ksps (voice), approx 3.2 W

Operating condition 2: Idle-Mode (carrier off)

1.6 Test specifications

- 1) FCC 47 CFR (February 1, 2006), Part 15: Radio frequency devices
 - §15.207 Conducted limits
 - §15.209 Radiated emission limits, general requirement
- 2) FCC 47 CFR (October 1, 2005), Part 2: Frequency allocations and radio treaty matters
 - §2.1046 Measurements required: RF power output
 - §2.1049 Measurements required: Occupied bandwidth
 - §2.1051 Measurements required: Spurious emissions at antenna terminals
 - §2.1053 Measurements required: Field strength of spurious radiation
 - §2.1055 Measurements required: Frequency stability
- 3) FCC 47 CFR (October 1, 2005), Part 25: Satellite communications
 - §25.202 Frequencies, frequency tolerance and emission limitations
 - §25.216 Limits on emissions from mobile earth stations for protection of aeronautical radionavigation-satellite services

2 Technical test

2.1 Summary of test results

- ☒ No deviations from the technical specification(s) were ascertained in the course of the tests performed.
- ☐ The deviations as specified in subclause 2.5 and annex 3 were ascertained in the course of the tests performed.

This test report:

- ☒ documents a first test
- ☐ documents a repeat examination
- ☐ documents a verification of documents
- ☐ is only valid in association with test report no.: -----/-----/--.

Single test results are listed under subclause 2.5 and annex 3 of this report.

The test item was **not** tested to connect it with the public telecommunication network.

2.2 Test environment

The environment conditions are documented specially for each test in 2.5.2 and annex 3.

2.3 Measurement and test setup, measurement uncertainties

The measurement and test setup is in accordance to the specification and schematically shown in annex 1. The reference to each test is shown in 2.5.2 and annex 3. The measurement uncertainties are within the ranges, which are required in the test specifications. A closer inspection and precise consideration of the real measurement uncertainty and its documentation within this test report will be made only if any measured data is closer to the corresponding limit than the maximum uncertainty which is given in the specification. In this case special tests were performed by use of comparable methods and/or measuring equipment in order to prove the given test results are correct. The results of these additional tests will be reported only then if it is very critical to show that the limit is met or not.

2.4 Test equipment utilized

See annex 2

2.5 Test results

2.5.1 Test result overview

☐ in addition to test report no.:

Correspondance of the test item and its technical description:

☒ in accordance to the technical description
☐ not in accordance to the technical description

Performance test: Output power and spectrum of transmission:

Part 2: Frequency allocations and radio treaty matters; general rules and regulations

Section 2.1046 Measurements required: RF power output

Section 2.1049 Measurements required: Occupied bandwidth

☒ in accordance to the technical description
☐ not in accordance to the technical description

FCC 47 CFR (February 1, 2006)

Part 15: Radio frequency devices

Section 15.207 Conducted limits

☒ pass
☐ fail
☐ already tested (see test report no. xxx)
☐ not applicable

FCC 47 CFR (February 1, 2006)

Part 15: Radio frequency devices

Section 15.209 Radiated emission limits, general requirements

☒ pass
☐ fail
☐ already tested (see test report no. xxx)
☐ not applicable

FCC 47 CFR (October 1, 2005)

Part 2: Frequency allocations and radio treaty matters; general rules and regulations

Section 2.1055 Measurements required: Frequency stability

Part 25: Satellite communications

Section 25.202(d) Frequency tolerance of Earth stations

☒ pass
☐ fail
☐ already tested (see test report no. xxx)
☐ not applicable

FCC 47 CFR (October 1, 2005)

Part 2: Frequency allocations and radio treaty matters; general rules and regulations

Section 2.1051 Measurements required: Spurious emissions at antenna terminals

Part 25: Satellite communications

Section 25.202(f) Emission limitations

- | | |
|-------------------------------------|--|
| ☒ | pass |
| ☐ | fail |
| ☐ | already tested (see test report no. xxx) |
| ☐ | not applicable |

FCC 47 CFR (October 1, 2005)

Part 2: Frequency allocations and radio treaty matters; general rules and regulations

Section 2.1053 Measurements required: Field strength of spurious radiation

Part 25: Satellite communications

Section 25.202(f) Emission limitations

- | | |
|-------------------------------------|--|
| ☒ | pass |
| ☐ | fail |
| ☐ | already tested (see test report no. xxx) |
| ☐ | not applicable |

FCC 47 CFR (October 1, 2005)

Part 25: Satellite communications

Section 25.216 Limits on emissions from mobile earth stations for protection of aeronautical radionavigation-satellite services

- | | |
|-------------------------------------|--|
| ☒ | pass |
| ☐ | fail |
| ☐ | already tested (see test report no. xxx) |
| ☐ | not applicable |

2.5.2 Test documentation

Contents:

- Correspondance of the test item and its technical description	[X] -/-
- Function test, RF power output and occupied bandwidth	[X] §2.1046 and §2.1049
- Radio frequency devices, Conducted limits	[X] §15.207
- Radio frequency devices, Radiated emission limits, general requirements	[X] §15.209
- Frequency tolerance of Earth stations	[X] §2.1055 and §25.202(d)
- Conducted spurious emission limitations	[X] §2.1051 and §25.202(f)
- Radiated spurious emission limitations	[X] §2.1053 and §25.202(f)
- Limits on emissions from mobile earth stations for protection of aeronautical radionavigation-satellite services	[X] §25.216

Reference document: **FCC 47 CFR (October 1, 2005)****Part 25 - Satellite Communications**

Section: -/- Correspondence of the test item and its technical description

Remark and establishing:

The test item and its technical description (see subclause 1.5.1) was compared by spot checking.

Result of test:**In accordance to the technical description [X]****No accordance to the technical description []**Reference document: **FCC 47 CFR (October 1, 2005)****Part 25 - Satellite Communications**

Section: -/- Function tests

2.1046 Measurements required: RF power output

2.1049 Measurements required: Occupied bandwidth

Environment conditions: see also plots given below

date	temperature in °C	rel. humidity in %	voltage in V	laboratory / test system
31.07.2006	26	55	10	Laboratory 'RSC-Sat'

Power measurement by spectrum analyzer, 1 MHz bandwidth, max-hold mode

state	frequency (range)	reading level	data of correction attenuation / loss					result				remark
			direct coupl. dB	att. dB	cable dB	power splitt. dB	referred dBm	to output (-30) dBW	HPA (10 [^]) W	ant. gain dBi	EIRP dBW	
mod	1.6435	24.1	-/-	0.2	0.7	10.0	35.0	5.0	3.2	6.0	11.0	CH 544
mod	1.62659375	24.0	-/-	0.2	0.7	10.0	34.9	4.9	3.1	6.0	10.9	CH 3
mod	1.66046875	24.0	-/-	0.2	0.7	10.0	34.9	4.9	3.1	6.0	10.9	CH 1087

cw = continuous wave mod = modulated

Occupied Bandwidth:

measured value: 34.4 kHz, see also annex 3, plot 3, 8 and 13

Operating conditions of DUT:

see subclause 1.5.2: Operating condition 1 (deviations see table above)

Test setup(s):

see annex 1, test setup 1.2hk and 1.2hgj

Test equipment:

see annex 2, subclause 4: C217, R001, U214

Data of correction:

see annex 4

Photo documentation:

see annex 5

Remark and establishing:

see annex 3, part 1 plot 1 - 15

Result of test:**In accordance to the technical description [X]****No accordance to the technical description []**

Reference document: **FCC 47 CFR (February 1,2006)**
Part 15 - Radio frequency devices
 Section: 15.207 Conducted limits (150 kHz - 30 MHz)

Result of test: **see annex 3, plot 12**

Reference document: **FCC 47 CFR (February 1,2006)**
Part 15 - Radio frequency devices
 Section: 15.209 Radiated emission limits, general requirements

Environment conditions: see following plots

date	temperature in °C	rel. humidity in %	voltage in V	laboratory / test system
02.08.2006	25	50	10	Anechoic chamber 'F'
03.08.2006	25	50	10	Anechoic chamber 'C'
03.08.2006	25	50	10	Laboratory 'RSC-Sat'

Test results:

no.	frequency (range) GHz	reading level dBm	angle °	data of correction						ant.- pol. v h x x	result		limit value dBμV/m	result above limit dB	plot No.
				free field m	attenuation / loss dB	cable dB	ant. dB	gain ampl. dB			dBμV/m	dBμV/m			
1	.009 - 30									X					16
2	30 - 4000									X					20, 21, 24, 25
3	30 - 4000									X					22, 23
4	4G - 12G									X					26, 27
5	12G - 20G									X X					28

[X] Data of correction is considered in the reading level. These correction values are reported in the quality assurance documentation of the test system - because of clearness these correction data are not included in this test report.

[X] The spurious emissions which are shown in the plots given above were detected.

[] No spurious emissions were detected.

[] The table above contains the most important emissions only. Further information are shown in the given plots.

[] The measurement value is out of spec. The difference to the limit value is in the range of measurement uncertainty, however.

Operating conditions of DUT:

see subclause 1.5.2: Operating condition 2, Idle Mode

Test setup(s):

see annex 1, test setup 2.2 and 2.3

Test equipment:

see annex 2, subclause 1, 2 and 3: 1001 - 1013, 3001 - 3010, A037, C217, R001, U214

Data of correction:

see annex 4

Photo documentation:

see annex 5

Remark and establishing:

If the table above is not completely filled out the missing values can be found in the given plots.

The necessary calculations are done there.

Result of test: **pass [X]** **fail []**

Reference document: **FCC 47 CFR (October 1, 2005)**
Part 25 - Satellite Communications
Section: 25.202(d) Frequency tolerance of Earth stations
2.1055 Measurements required: Frequency stability
Conducted measurements within the band

Environment conditions:

date	temperature in °C	rel. humidity in %	voltage in V dc	laboratory / test system
03.08.2006	-30 to +50	-/-	10	Laboratory 'RSC-Sat'

Test results:

no.	temperature °C	soil [MHz]	left [MHz]	right [MHz]	is [MHz]	deviation [Hz]	deviation ppm	remark
1	-30	1643.5	1643.484407	1643.513333	1643.49887	-1130	-0.69	
2	-20	1643.5	1643.485689	1643.514455	1643.500072	72.0	0.04	
3	-10	1643.5	1643.48633	1643.515176	1643.500753	753	0.46	
4	0	1643.5	1643.48617	1643.515096	1643.500633	633	0.39	
5	+10	1643.5	1643.48609	1643.514936	1643.500513	513	0.31	
6	+20	1643.5	1643.485529	1643.514535	1643.500032	32.0	0.02	
7	+30	1643.5	1643.484968	1643.513974	1643.499471	-529	-0.32	
8	+40	1643.5	1643.484728	1643.513574	1643.499151	-849	-0.52	
9	+50	1643.5	1643.484888	1643.513734	1643.499311	-689	-0.42	

Operating conditions of DUT:

see subclause 1.5.2: Operating condition 1, fm

Test setup(s):

see annex 1, test setup 1.2cdhvj

Test equipment:

see annex 2, subclause 3: C217, R001, U214

Data of correction:Photo documentation:

see annex 4

Limit information:reference frequency ± 0.001 % (10 ppm)Remark and establishing:

Tests were performed with Spectrum analyzer HP 8565E.

After reaching the temperature given in the table above tests were paused for at least 15 minutes for temperature compensation of the DUT.

The manufacturer declared a frequency stability of $< \pm 5$ ppm uncorrected and $< \pm 0.006$ ppm corrected.**Result of test:****pass [X]****fail []**

Reference document:

FCC 47 CFR (February 1,2006)Part 25 - Satellite Communications

Section:

25.202(f)

Emission limitations

2.1053

Measurements required: Field strength of spurious radiation
Radiated measurements

Environment conditions:

date	temperature in °C	rel. humidity in %	voltage in V	laboratory / test system
02.08.2006	25	50	10	Anechoic chamber 'F'
02.08.2006	25	50	10	Anechoic chamber 'C'

Test results:

no.	frequency (range) MHz	reading level dBμV/ m	angle °	data of correction						ant.- polar.		result (-6dB) 10m		limit value dBμV/m	result above limit dB	plot no.
				attenuation / loss	free field	cable	ant.	gain		v	h	dBμV/m	dBμV/m			
1	25 - 4000									X	X					17
2	4G - 12.5G									X	X					18
3	12G - 20G									X	X					19
4																
5																
6																

[X] Data of correction is considered in the reading level. These correction values are reported in the quality assurance documentation of the test system - because of clearness these correction data are not included in this test report.

[X] The spurious emissions which are shown in the plots given above were detected.

[] No spurious emissions were detected.

[] The table above contains the most important emissions only. Further information are shown in the given plots.

[] The measurement value is out of spec. The difference to the limit value is in the range of measurement uncertainty, however.

Operating conditions of DUT:

see subclause 1.5.2: Operating condition 1

Special quality of measurement:Test setup(s):

see annex 1, test setup 2.1

Test equipment:

see annex 2, subclause 1, 2 and 3: 3001 - 3010, A037, C217, R001, U214

Data of correction:Photo documentation:

see annex 5

Remark and establishing:

If the table above is not completely filled out the missing values can be found in the given plots.

The necessary calculations are done there.

The radiated measurements were performed with a dummy load connected to the DUT and a measuring system including turntable and antenna lift to cover all three antenna planes.

Result of test:

pass [X]

fail []

Reference document: **FCC 47 CFR (October 1, 2005)**
Part 25 - Satellite Communications

Section: 25.202(f) Emission limitations
2.1051 Measurements required: Spurious emissions at antenna terminals
Conducted measurements

Result of test: **see annex 3, plot 29 - 54**

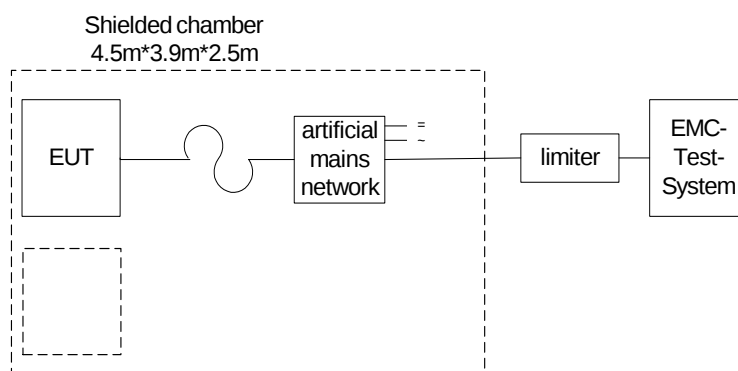
Reference document: **FCC 47 CFR (October 1, 2005)**
Part 25 - Satellite Communications

Section: 25.216 Limits on emissions from mobile earth stations for protection of
aeronautical radionavigation-satellite services

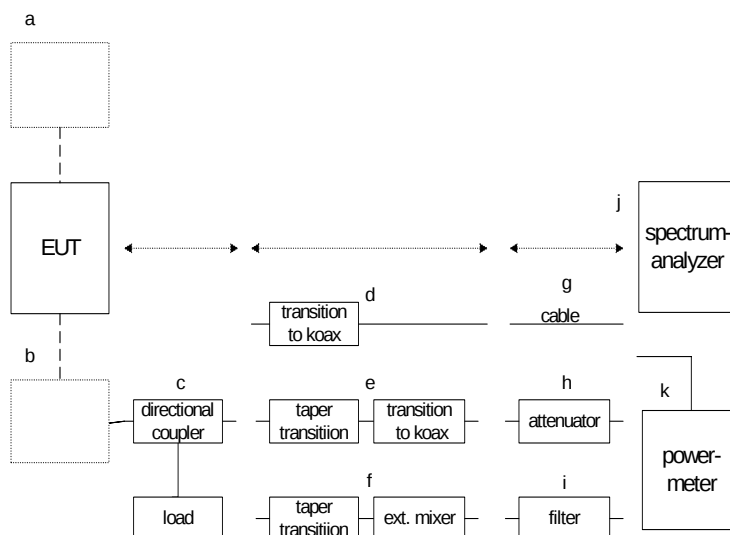
Result of test: **see annex 3, plot 55**

Annex 1: Measurement and test setups - schematic diagrams

1. Conducted measurements

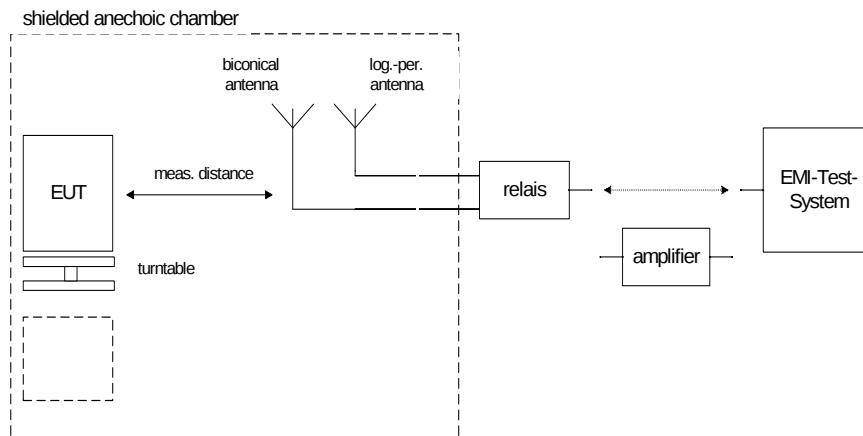


Setup 1.1

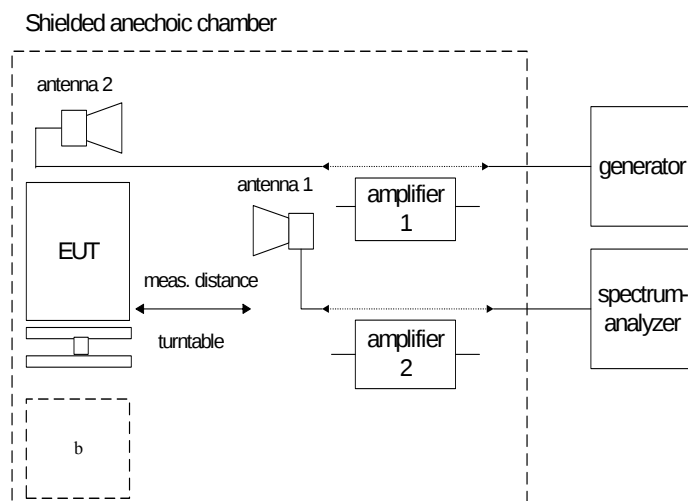


Setup 1.2 x...x

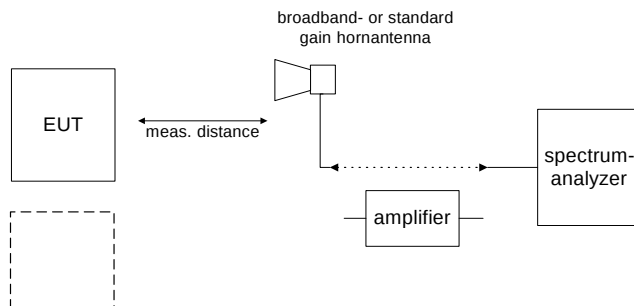
2. Radiation measurements



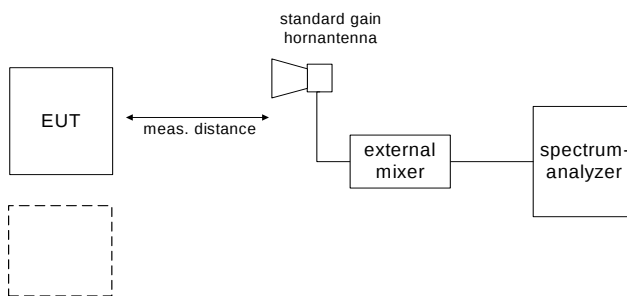
Setup 2.1



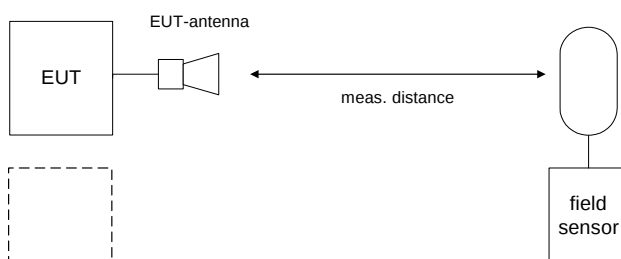
Setup 2.2



Setup 2.3



Setup 2.4



Setup 2.5

3. Measuring the EIRP of Spurious/Harmonic Emissions using Substitution Method

The following steps describe the procedure used to measure the radiated emissions from the mobile station. The site is constructed in accordance with ANSI C63.4:2003 requirements and is recognized by the FCC to be in compliance for a 3 and a 10 meter site. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier that can be as high as 1660.5 MHz. This was rounded up to 20 GHz. The spectrum was scanned with the mobile station transmitting a carrier in the middle of the transmit band.

The final open field emission (here 10m semi-anechoic chamber listed by FCC) test procedure is as follows:

- a) The test item was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna.
- b) The antenna output was terminated in a 50 ohm load.
- c) A double ridged waveguide antenna was placed on an adjustable height antenna mast 3 meters from the test item for emission measurements.
- d) Detected emissions were maximized at each frequency by rotating the test item and adjusting the receive antenna height and polarization. The maximum meter reading was recorded. The radiated emission measurements of the harmonics of the transmit frequency through the 10th harmonic were measured with peak detector and 1 MHz bandwidth. If the harmonic could not be detected above the noise floor, the ambient level was recorded.
- e) Now each detected emissions were substituted by the Substitution method, in accordance with the TIA/EIA 603.

All measurements were done in horizontal and vertical polarization plane, the plot(s) show the worst case of both.

Annex 2: Measuring equipment used (statement of inventory)

1. EMC-Testcenter (006)

Item No.	X Measuring-equipment	Manufacturer	Type	Serialnumber	Identnumber	#	Cal.-/Verif.-cycle
1001	Controler	Rohde & Schwarz	PSM 7	883086/026	300002208	1	12 Mon.
1002	Spectrum monitor	Rohde & Schwarz	EZM	883086/026	300002208	1	12 Mon.
1003	Test receiver	Rohde & Schwarz	ESH3	881515/002	300002490	1	12 Mon.
1004	Relais matrix	Rohde & Schwarz	PSU	882943/029	300001484	1	12 Mon.
1005	Artificial mains network	Rohde & Schwarz	ESH2 Z5	882394/007	300001481	1	12 Mon.
1006	Artificial mains network	Rohde & Schwarz	ESH3 Z5	861189/014	300001458	1	12 Mon.
1007	Artificial mains network	Rohde & Schwarz	ESH3 Z5	892475/017	300002209	1	12 Mon.
1008	Artificial mains network	Rohde & Schwarz	ESH3 Z5	894981/019	300001077	1	12 Mon.
1009	Artificial mains network	Rohde & Schwarz	ESH3 Z6	836501652	300002210	1	12 Mon.
1010	Artificial mains network	Rohde & Schwarz	ESH3 Z6	861406/005	300001518	1	12 Mon.
1011	Artificial mains network	Rohde & Schwarz	ESH3 Z6	893689/012	300001504	1	12 Mon.
1012	Power supply	Hewlett Packard	6032A	2818A-03449	300002120	1	12 Mon.
1013	Loop antenna	Rohde & Schwarz	HMO20	832211/003	300002243	1	12 Mon.

2. Anechoic chamber 'C'

Item No.	X Measuring-equipment	Manufacturer	Type	Serialnumber	Identnumber	#	Cal.-/Verif.-cycle
3001	Spectrum Analyzer	Hewlett Packard	8566B	2747A05306	300001000	1	12 Mon.
3002	Spec. Analyzer Display	Hewlett Packard	85662A	2816A16541	300002297	1	12 Mon.
3003	Quasi-Peak-Adapter	Hewlett Packard	85650A	2811A01131	300000999	1	12 Mon.
3004	RF-Preselector	Hewlett Packard	85685A	2833A00768	400000081	1	12 Mon.
3005	Relais matrix	Hewlett Packard	3488A	2719A15012	300001143	1	12 Mon.
3006	Power supply	Hewlett Packard	6032A	2818A03450	300001040	1	12 Mon.
3007	Amplifier	Parzich GMBH	js42-00502650-28-5a	928979	300003143	1	12 Mon.
3008	Biconical antenna	Emco	3104	3758	300001602	1	12 Mon.
3009	Log.-per. antenna	Emco	3146	2130	300001603	1	12 Mon.
3010	Double ridged guide ant.	Emco	3115	3088	300001032	1	12 Mon.

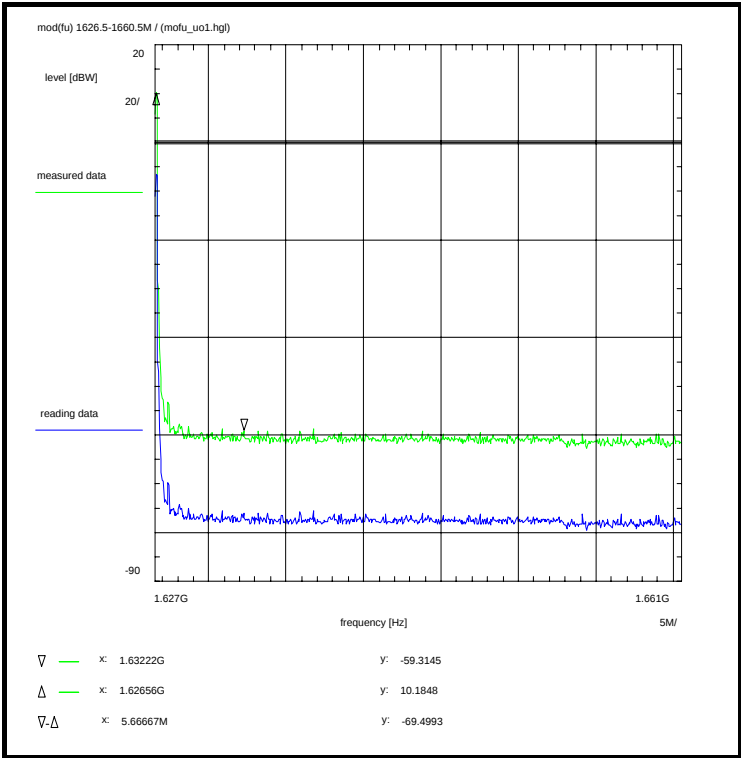
3. Laboratory 'RSC-Sat'

Item No.	X Measuring-equipment	Manufacturer	Type	Serialnumber	Identnumber	#	Cal.-/Verif.-cycle
A037	Horn Ant. 1-26.5GHz	EMCO	3115	8812-3089	300000307	1	12 Mon.
C217	1.5 m 50 Ω / K	Insulated Wire Inc.	KPS-1533-590	101995	300002290	1	12 Mon.
R001	Spectrum analyzer	Hewlett Packard	HP 8565E	3515A00283	300000916	1	12 Mon.
U019	Attenuator	Narda	375 BNM	43		1	12 Mon.
11b	Microw. Sys. Amplif. 0.5-26.5GHz	Hewlett-Packard	83017A	3123A00105	300002267	1	24 Mon.
U214	Attenuator 10dB, N-con.	Spinner	BN 745379	7/93	400000047	1	24 Mon.
WHPF	Highpass filter	TRILITHIC	5HC2600/12750-1.5-KK	-/-	300000104	1	24 Mon.
WStu	Stub Tuner (triple)	MICROLAB/FXR	S3-15N	-/-	300002831	1	24 Mon.

Annex 3: Measurement results

Annex 3 consists of 58 pages including this page.

Annex 3: Measurement result no. 1 (57)



Information on the measurement:

Environment condition:
Date & Time: Thu 03/Aug/2006 13:42:31
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:
Start frequency: 1.6265 GHz
Stop frequency: 1.6605 GHz
Center frequency: 1.6435 GHz
Frequency span: 34 MHz
Input attenuation: 40 dB
Resolution-BW: 30 kHz
Video-BW: 30 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):
Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 16.7 dB

Limit:
no limits defined

This test serves to verify the general function of the EUT and for orientation regarding to the spurious emissions which are expected within the band, furthermore for comparison of the actual power with the rated value at modulated carrier adjusted as close to the lower edge of the operating frequency band.

Subclause: -/- Function test
Modulated rf-carrier at the lower edge of the band (fu)
Measurement within the band

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 1

Test setup:
see annex 1: 1.2hgj

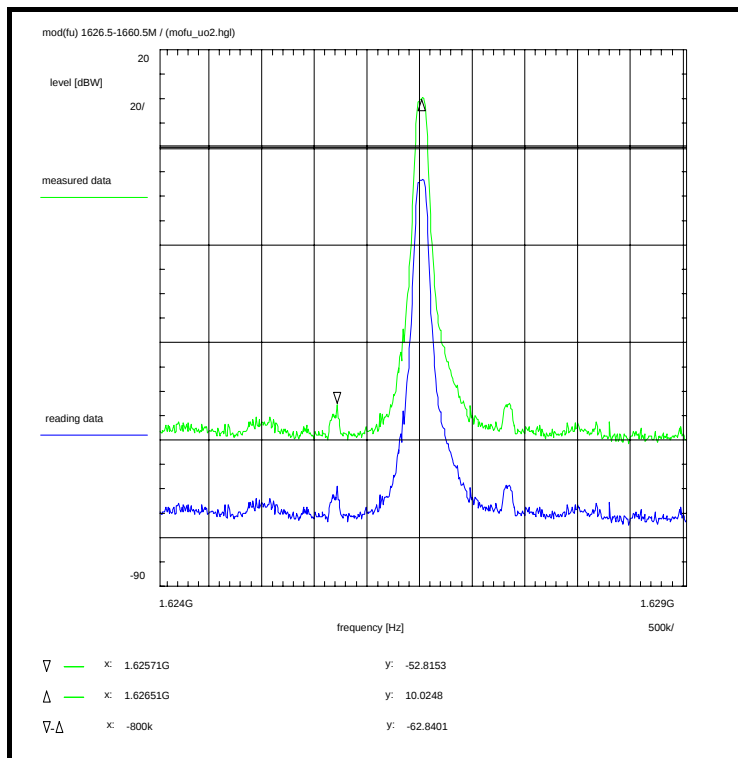
Test equipment:
see annex 2: C217, R001, U214

Data of correction:
see annex 4

Remark:

Test result: measurement for orientation

Remarks:
Test of general function of the EUT and measurement for orientation

Annex 3: Measurement result no. 2 (57)**Information on the measurement:**Environment condition:

Date & Time: Thu 03/Aug/2006 13:49:19
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 1.62403125 GHz
Stop frequency: 1.62903125 GHz
Center frequency: 1.62653125 GHz
Frequency span: 5 MHz
Input attenuation: 40 dB
Resolution-BW: 30 kHz
Video-BW: 30 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 16.7 dB

Limit:

no limits defined

This test serves to verify the general function of the EUT and for orientation regarding to the spurious emissions which are expected within the band, furthermore for comparison of the actual power with the rated value at modulated carrier adjusted as close to the lower edge of the operating frequency band.

Subclause: -/- Function test
Modulated rf-carrier at the lower edge of the band (fu)
Measurement within the band

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 1

Test setup:
see annex 1: 1.2hgj

Test equipment:
see annex 2: C217, R001, U214

Data of correction:
see annex 4

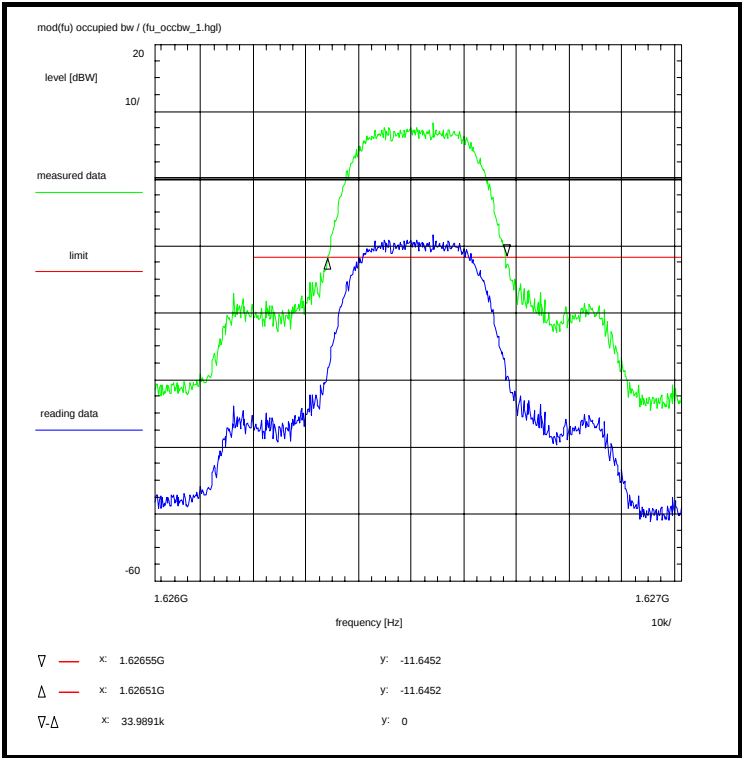
Remark:

Test result: measurement for orientation

Remarks:

Test of general function of the EUT and measurement for orientation

Annex 3: Measurement result no. 3 (57)



Information on the measurement:

Environment condition:
Date & Time: Thu 03/Aug/2006 13:57:42
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:
Start frequency: 1.62648125 GHz
Stop frequency: 1.62658125 GHz
Center frequency: 1.62653125 GHz
Frequency span: 100 kHz
Input attenuation: 40 dB
Resolution-BW: 3 kHz
Video-BW: 3 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):
Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 16.7 dB

Limit:
The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 % of the total mean power radiated by a given emission. (see §2.1049).
This occupied bandwidth corresponds to the 20 dB-bandwidth.

Subclause: -/- Function test
Modulated rf-carrier at the lower edge of the band (fu)
Determination of the 'occupied bandwidth'

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 1

Test setup:
see annex 1: 1.2hgj

Test equipment:
see annex 2: C217, R001, U214

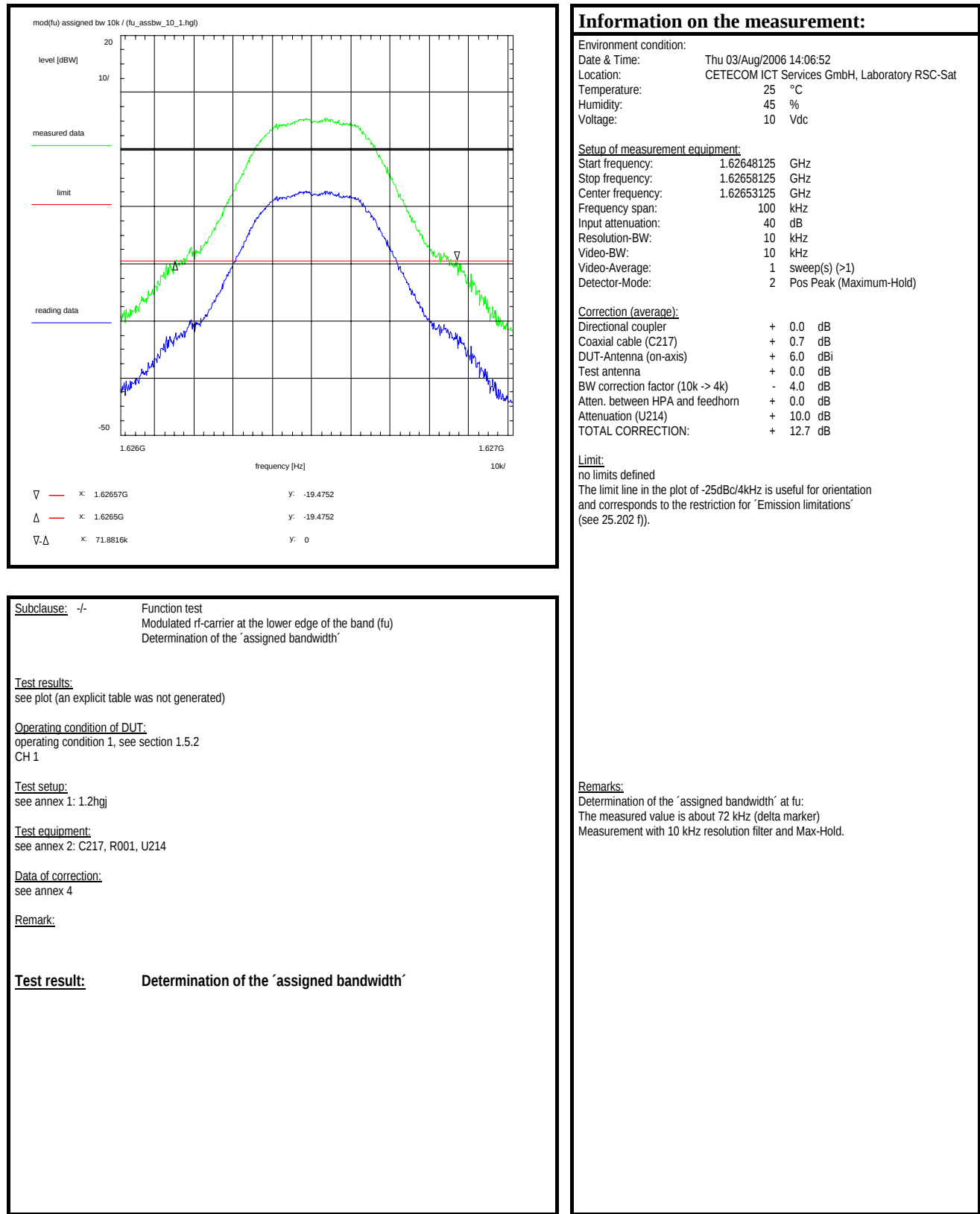
Data of correction:
see annex 4

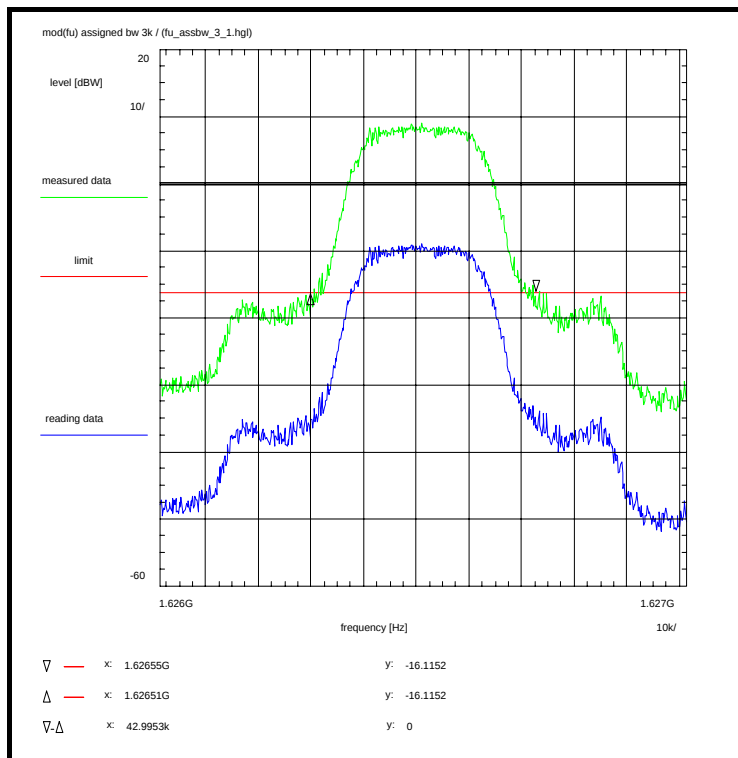
Remark:

Test result: Determination of the 'occupied bandwidth'

Remarks:
Determination of the 'occupied bandwidth' at fu:
The measured value is about 34 kHz (delta marker)
Measurement with 3 kHz resolution filter and Max-Hold.

Annex 3: Measurement result no. 4 (57)



Annex 3: Measurement result no. 5 (57)**Information on the measurement:****Environment condition:**

Date & Time: Thu 03/Aug/2006 14:12:24
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 45 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 1.62648125 GHz
Stop frequency: 1.62658125 GHz
Center frequency: 1.62653125 GHz
Frequency span: 100 kHz
Input attenuation: 40 dB
Resolution-BW: 3 kHz
Video-BW: 3 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (3k -> 4k) + 1.2 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 17.9 dB

Limit:

no limits defined
The limit line in the plot of -25dBc/4kHz is useful for orientation
and corresponds to the restriction for 'Emission limitations'
(see 25.202 f)).

Subclause: -/- Function test
Modulated rf-carrier at the lower edge of the band (fu)
Determination of the 'assigned bandwidth'

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 1

Test setup:
see annex 1: 1.2hgj

Test equipment:
see annex 2: C217, R001, U214

Data of correction:
see annex 4

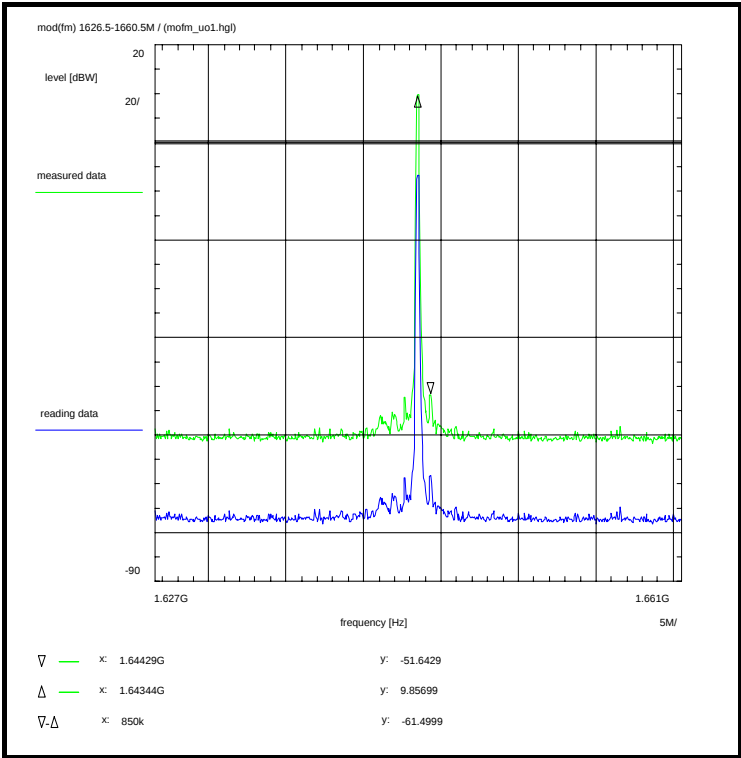
Remark:

Test result: Determination of the 'assigned bandwidth'

Remarks:

Determination of the 'assigned bandwidth' at fu:
The measured value is about 43 kHz (delta marker)
Measurement with 3 kHz resolution filter and Max-Hold.

Annex 3: Measurement result no. 6 (57)



Information on the measurement:

Environment condition:
Date & Time: Wed 02/Aug/2006 15:35:32
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 45 %
Voltage: 10 Vdc

Setup of measurement equipment:
Start frequency: 1.6265 GHz
Stop frequency: 1.6605 GHz
Center frequency: 1.6435 GHz
Frequency span: 34 MHz
Input attenuation: 40 dB
Resolution-BW: 30 kHz
Video-BW: 30 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):
Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 16.7 dB

Limit:
no limits defined

This test serves to verify the general function of the EUT and for orientation regarding to the spurious emissions which are expected within the band, furthermore for comparison of the actual power with the rated value at modulated carrier adjusted in the middle of the band (EIRP).

Subclause: -/- Function test
Modulated rf-carrier in the middle of the band (fm)
Measurement within the band

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 544

Test setup:
see annex 1: 1.2hgj

Test equipment:
see annex 2: C217, R001, U214

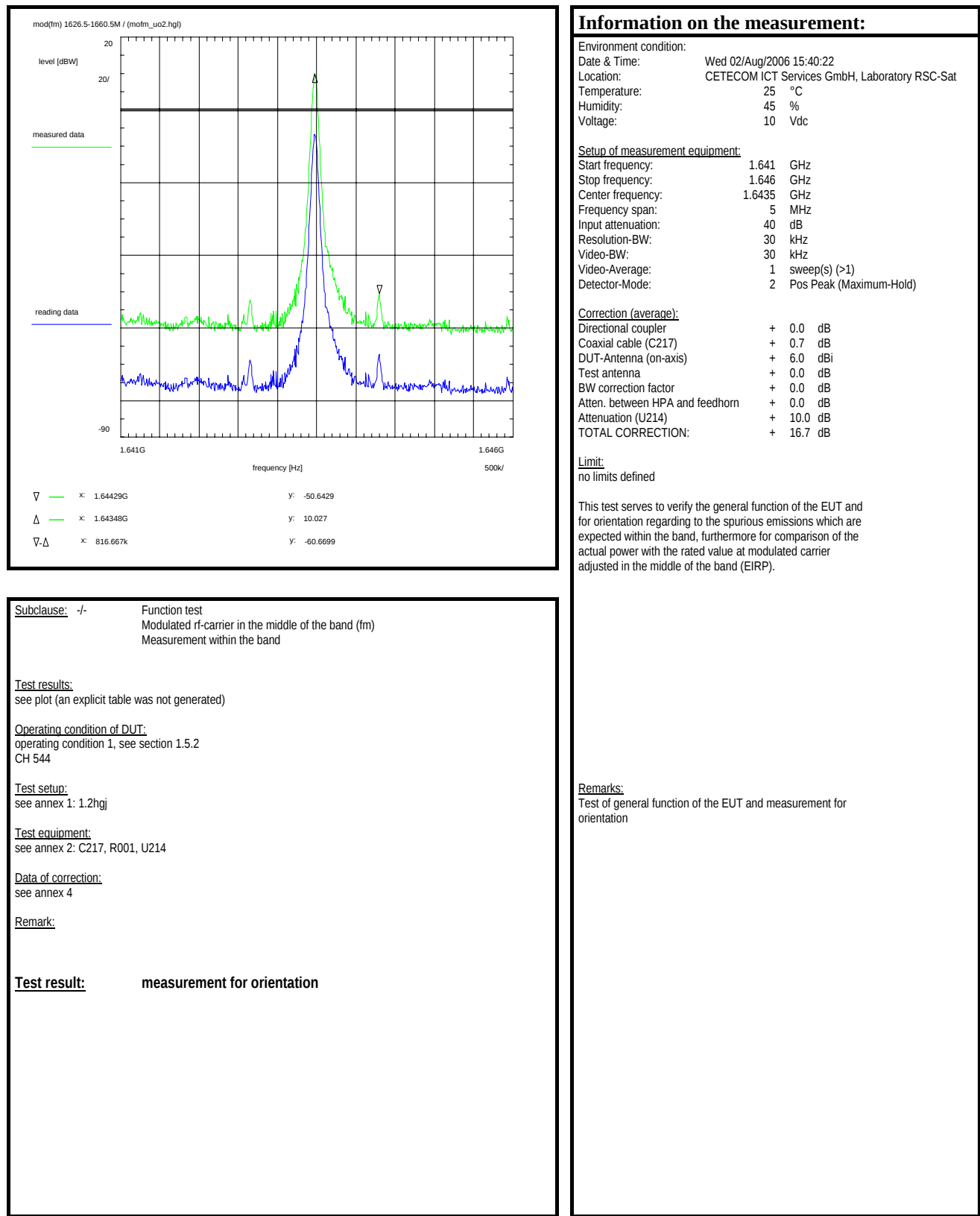
Data of correction:
see annex 4

Remark:

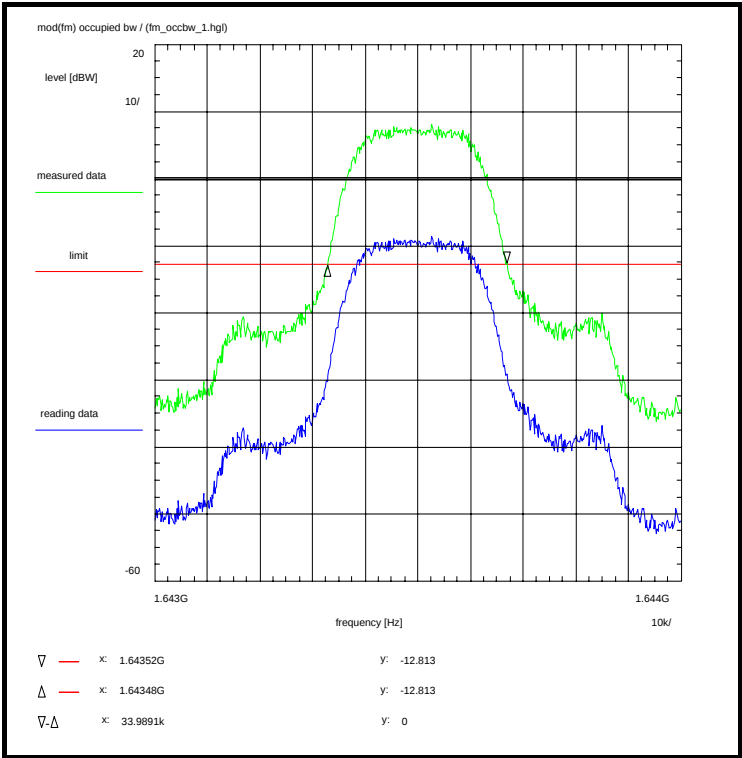
Test result: measurement for orientation

Remarks:
Test of general function of the EUT and measurement for orientation

Annex 3: Measurement result no. 7 (57)



Annex 3: Measurement result no. 8 (57)



Information on the measurement:

Environment condition:
Date & Time: Wed 02/Aug/2006 15:53:25
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 45 %
Voltage: 10 Vdc

Setup of measurement equipment:
Start frequency: 1.64345 GHz
Stop frequency: 1.64355 GHz
Center frequency: 1.6435 GHz
Frequency span: 100 kHz
Input attenuation: 40 dB
Resolution-BW: 3 kHz
Video-BW: 3 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):
Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 16.7 dB

Limit:
The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 % of the total mean power radiated by a given emission. (see §2.1049).
This occupied bandwidth corresponds to the 20 dB-bandwidth.

Subclause: -/- Function test
Modulated rf-carrier in the middle of the band (fm)
Determination of the 'occupied bandwidth'

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 544

Test setup:
see annex 1: 1.2hgj

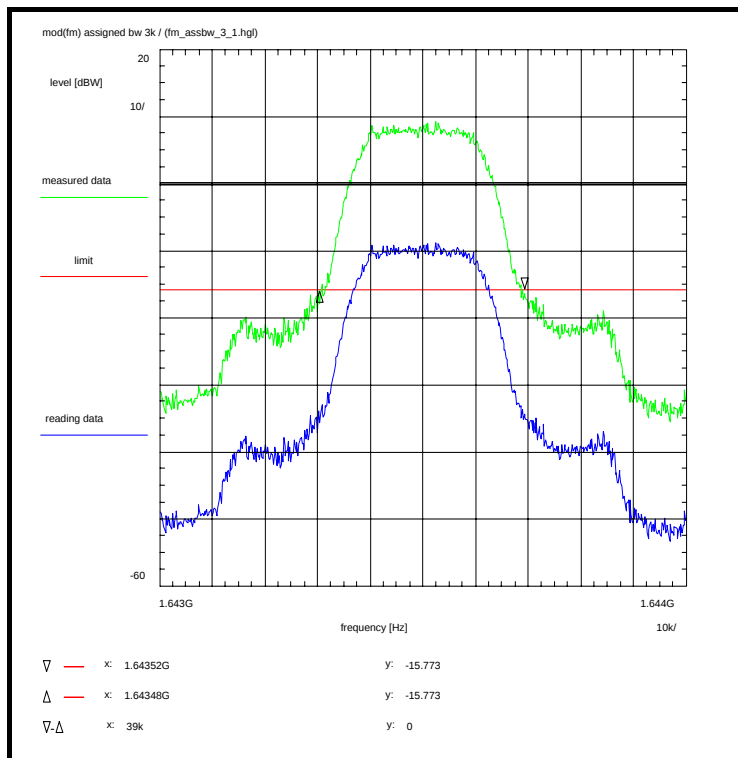
Test equipment:
see annex 2: C217, R001, U214

Data of correction:
see annex 4

Remark:

Test result: Determination of the 'occupied bandwidth'

Remarks:
Determination of the 'occupied bandwidth' at fm:
The measured value is about 34 kHz (delta marker).
Measurement with 3 kHz resolution filter and Max-Hold.

Annex 3: Measurement result no. 10 (57)**Information on the measurement:****Environment condition:**

Date & Time: Wed 02/Aug/2006 16:24:13
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 45 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 1.64345 GHz
Stop frequency: 1.64355 GHz
Center frequency: 1.6435 GHz
Frequency span: 100 kHz
Input attenuation: 40 dB
Resolution-BW: 3 kHz
Video-BW: 3 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (3k -> 4k) + 1.2 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 17.9 dB

Limit:

no limits defined
The limit line in the plot of -25dBc/4kHz is useful for orientation
and corresponds to the restriction for 'Emission limitations'
(see 25.202 f)).

Subclause: -/- Function test
Modulated rf-carrier in the middle of the band (fm)
Determination of the 'assigned bandwidth'

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 544

Test setup:
see annex 1: 1.2hgj

Test equipment:
see annex 2: C217, R001, U214

Data of correction:
see annex 4

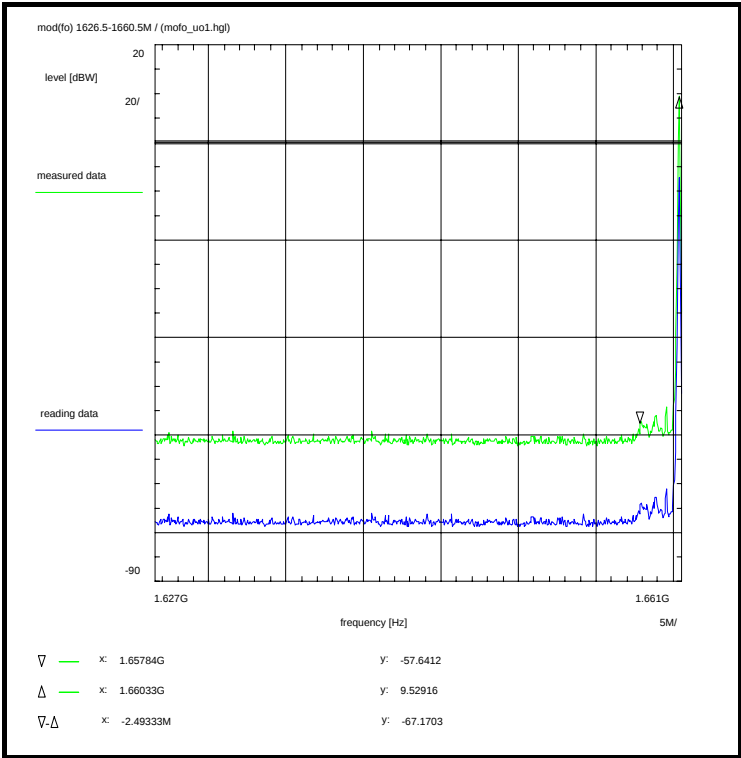
Remark:

Test result: Determination of the 'assigned bandwidth'

Remarks:

Determination of the 'assigned bandwidth' at fm:
The measured value is about 39 kHz (delta marker)
Measurement with 3 kHz resolution filter and Max-Hold.

Annex 3: Measurement result no. 11 (57)



Information on the measurement:

Environment condition:
Date & Time: Thu 03/Aug/2006 10:08:14
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:
Start frequency: 1.6265 GHz
Stop frequency: 1.6605 GHz
Center frequency: 1.6435 GHz
Frequency span: 34 MHz
Input attenuation: 40 dB
Resolution-BW: 30 kHz
Video-BW: 30 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):
Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 16.7 dB

Limit:
no limits defined

This test serves to verify the general function of the EUT and for orientation regarding to the spurious emissions which are expected within the band, furthermore for comparison of the actual power with the rated value at modulated carrier adjusted as close to the upper edge of the operating frequency band.

Subclause: -/- Function test
Modulated rf-carrier at the upper edge of the band (fo)
Measurement within the band

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 1087

Test setup:
see annex 1: 1.2hgj

Test equipment:
see annex 2: C217, R001, U214

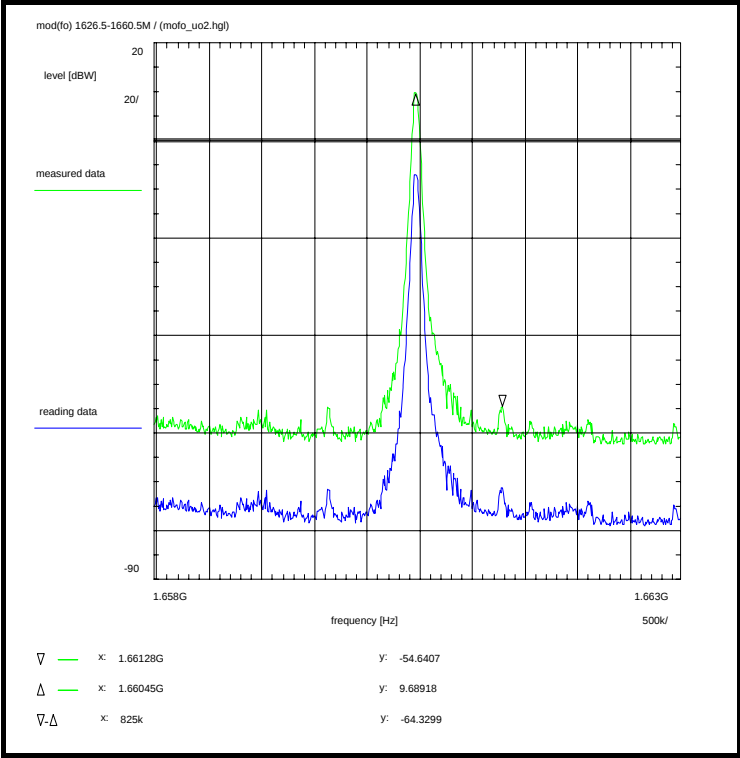
Data of correction:
see annex 4

Remark:

Test result: measurement for orientation

Remarks:
Test of general function of the EUT and measurement for orientation

Annex 3: Measurement result no. 12 (57)



Information on the measurement:

Environment condition:
Date & Time: Thu 03/Aug/2006 10:10:00
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:
Start frequency: 1.65796875 GHz
Stop frequency: 1.66296875 GHz
Center frequency: 1.66046875 GHz
Frequency span: 5 MHz
Input attenuation: 40 dB
Resolution-BW: 30 kHz
Video-BW: 30 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):
Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 16.7 dB

Limit:
no limits defined

This test serves to verify the general function of the EUT and for orientation regarding to the spurious emissions which are expected within the band, furthermore for comparison of the actual power with the rated value at modulated carrier adjusted as close to the upper edge of the operating frequency band.

Subclause: -/- Function test
Modulated rf-carrier at the upper edge of the band (fo)
Measurement within the band

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 1087

Test setup:
see annex 1: 1.2hgj

Test equipment:
see annex 2: C217, R001, U214

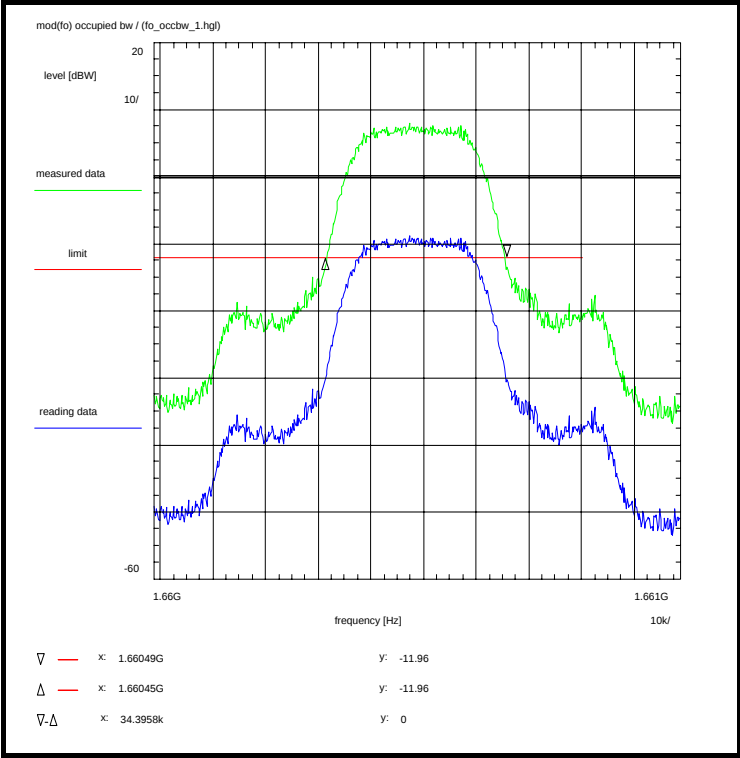
Data of correction:
see annex 4

Remark:

Test result: measurement for orientation

Remarks:
Test of general function of the EUT and measurement for orientation

Annex 3: Measurement result no. 13 (57)



Information on the measurement:

Environment condition:
Date & Time: Thu 03/Aug/2006 10:25:54
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:
Start frequency: 1.66041875 GHz
Stop frequency: 1.66051875 GHz
Center frequency: 1.66046875 GHz
Frequency span: 100 kHz
Input attenuation: 40 dB
Resolution-BW: 3 kHz
Video-BW: 3 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):
Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 16.7 dB

Limit:
The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 % of the total mean power radiated by a given emission. (see §2.1049).
This occupied bandwidth corresponds to the 20 dB-bandwidth.

Subclause: -/- Function test
Modulated rf-carrier at the upper edge of the band (f₀)
Determination of the 'occupied bandwidth'

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 1087

Test setup:
see annex 1: 1.2hgj

Test equipment:
see annex 2: C217, R001, U214

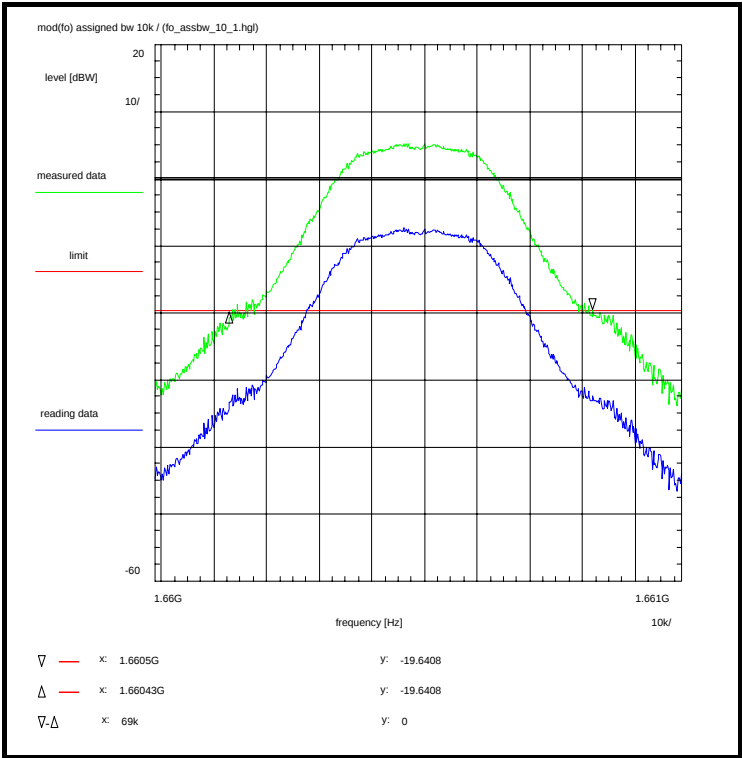
Data of correction:
see annex 4

Remark:

Test result: Determination of the 'occupied bandwidth'

Remarks:
Determination of the 'occupied bandwidth' at f₀:
The measured value is about 34.4 kHz (delta marker)
Measurement with 3 kHz resolution filter and Max-Hold.

Annex 3: Measurement result no. 14 (57)



Information on the measurement:

Environment condition:
Date & Time: Thu 03/Aug/2006 10:30:28
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:
Start frequency: 1.66041875 GHz
Stop frequency: 1.66051875 GHz
Center frequency: 1.66046875 GHz
Frequency span: 100 kHz
Input attenuation: 40 dB
Resolution-BW: 10 kHz
Video-BW: 10 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):
Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (10k -> 4k) - 4.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 12.7 dB

Limit:
no limits defined
The limit line in the plot of -25dBc/4kHz is useful for orientation
and corresponds to the restriction for 'Emission limitations'
(see 25.202 f)).

Subclause: -/- Function test
Modulated rf-carrier at the upper edge of the band (fo)
Determination of the 'assigned bandwidth'

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 1087

Test setup:
see annex 1: 1.2hgj

Test equipment:
see annex 2: C217, R001, U214

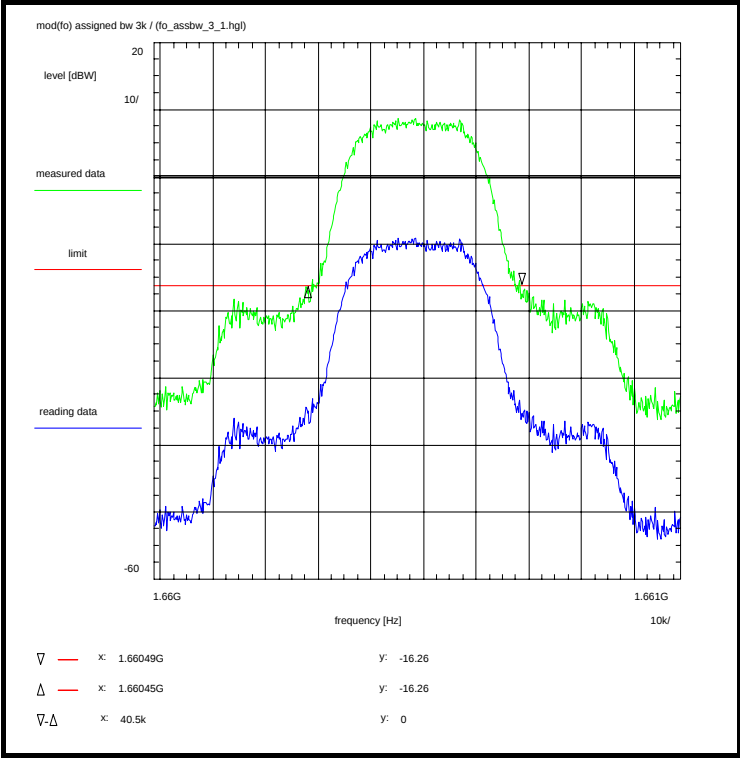
Data of correction:
see annex 4

Remark:

Test result: Determination of the 'assigned bandwidth'

Remarks:
Determination of the 'assigned bandwidth' at fo:
The measured value is about 69 kHz (delta marker)
Measurement with 10 kHz resolution filter and Max-Hold.

Annex 3: Measurement result no. 15 (57)



Information on the measurement:

Environment condition:
Date & Time: Thu 03/Aug/2006 10:37:29
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:
Start frequency: 1.66041875 GHz
Stop frequency: 1.66051875 GHz
Center frequency: 1.66046875 GHz
Frequency span: 100 kHz
Input attenuation: 40 dB
Resolution-BW: 3 kHz
Video-BW: 3 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):
Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (3k -> 4k) + 1.2 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 17.9 dB

Limit:
no limits defined
The limit line in the plot of -25dBc/4kHz is useful for orientation
and corresponds to the restriction for 'Emission limitations'
(see 25.202 f)).

Subclause: -/- Function test
Modulated rf-carrier at the upper edge of the band (fo)
Determination of the 'assigned bandwidth'

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 1087

Test setup:
see annex 1: 1.2hgj

Test equipment:
see annex 2: C217, R001, U214

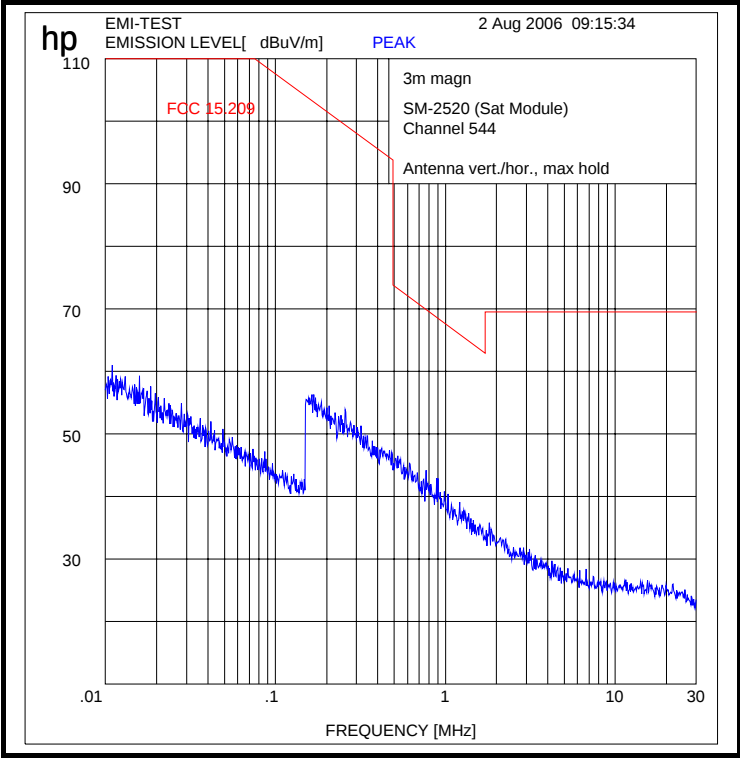
Data of correction:
see annex 4

Remark:

Test result: Determination of the 'assigned bandwidth'

Remarks:
Determination of the 'assigned bandwidth' at fo:
The measured value is about 40.5 kHz (delta marker)
Measurement with 3 kHz resolution filter and Max-Hold.

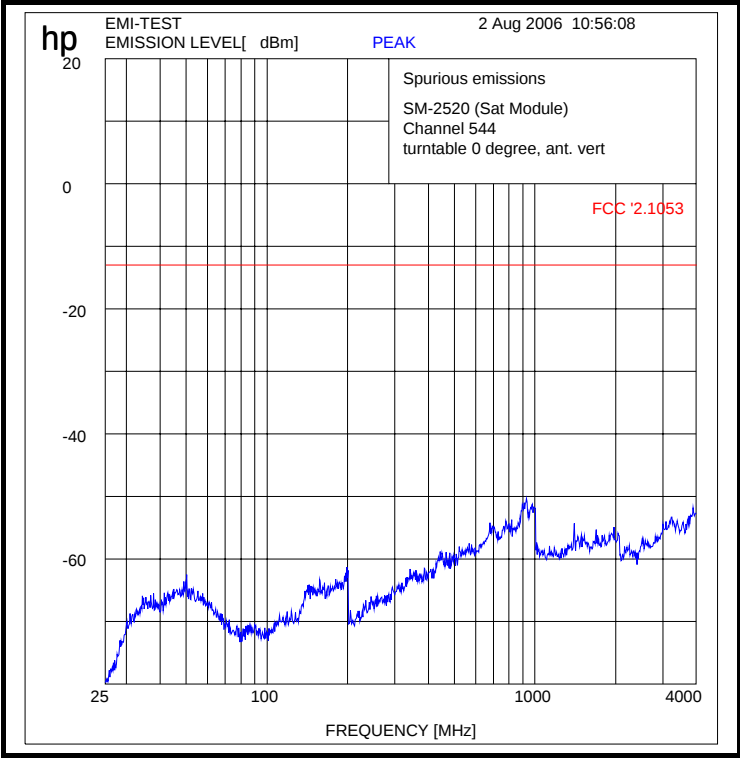
Annex 3: Measurement result no. 16 (57)



Information on the measurement:

-/-

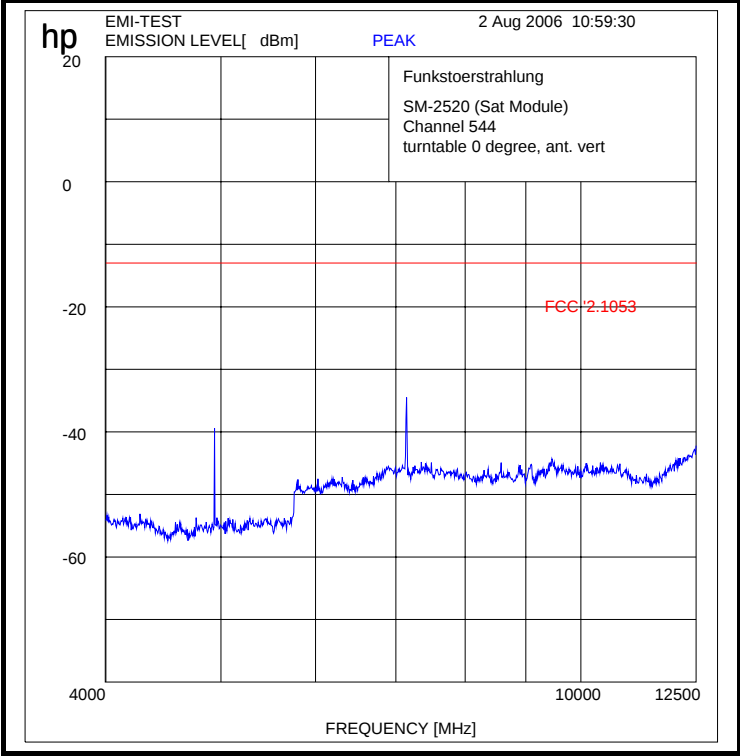
Annex 3: Measurement result no. 17 (57)



Information on the measurement:

-/-

Annex 3: Measurement result no. 18 (57)

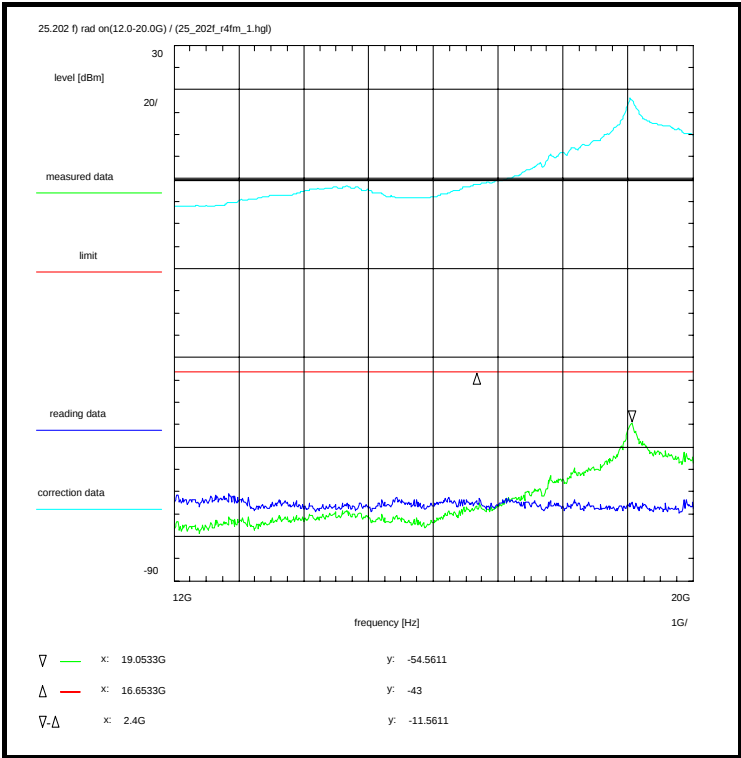


Information on the measurement:

=====			
EMI-TEST		2 Aug 2006 10:59:30	
=====			
1. FCC CFR 47,Part 15J WITHOUT PRESELECTOR			
1.7 FCC 72.1053 4-12 GHz			
=====			
Peaks above -30 dB of Limit Line #1			
peak criteria = 6 dB			
PEAK#	FREQ (MHz)	(dBm)	DELTA
1	4937.6	-39.4	-26.4
2	7147.9	-34.5	-21.5

-/-

Annex 3: Measurement result no. 19 (57)



Information on the measurement:

Environment condition:
Date & Time: Wed 02/Aug/2006 17:37:16
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 45 %
Voltage: 10 Vdc

Setup of measurement equipment:
Start frequency: 12 GHz
Stop frequency: 20 GHz
Center frequency: 16 GHz
Frequency span: 8 GHz
Input attenuation: 0 dB
Resolution-BW: 100 kHz
Video-BW: 100 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):
Directional coupler (WHPF) + 0.8 dB
Coaxial cable (C217) + 2.3 dB
DUT-Antenna + 0.0 dBi
Test antenna (A037) - 12.7 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (16.00GHz, 1m) + 56.5 dB
Amplifier (11b) - 33.5 dB
TOTAL CORRECTION: - -6 dB

Limit:
Limit acc. to 25.202 f): -(43.0+10log(Pmax))dBc/4kHz
This corresponds to -43.0 dBm.

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations, modulated carrier in the middle of the band
Radiation coming out of DUT-cabinet(s): 12.0 GHz - 20.0 GHz

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 544

Test setup:
see annex 1: 2.3

Test equipment:
see annex 2: 11b, A037, C217, R001, U019, WHPF

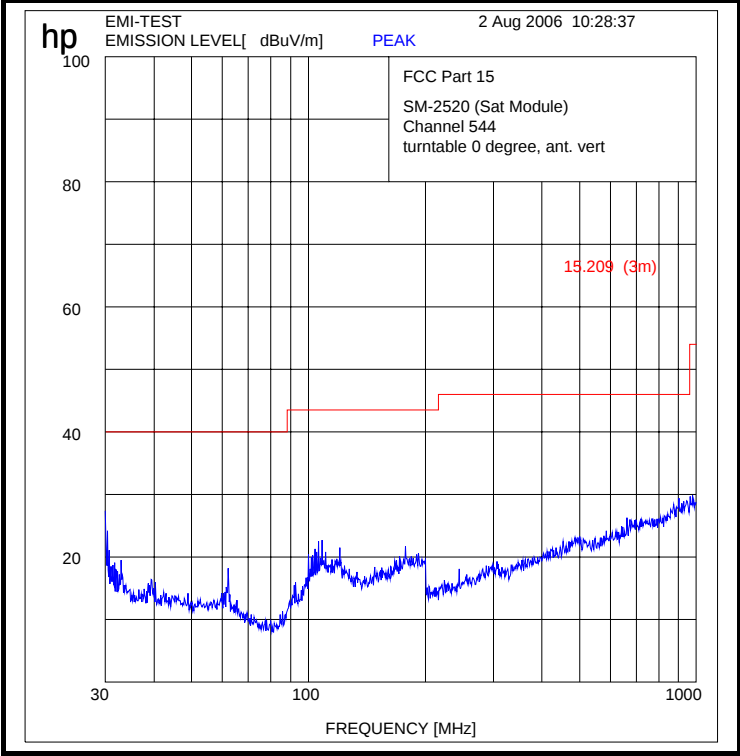
Data of correction:
see annex 4

Remark:

Test result: Test passed

Remarks:
Carrier-on state. Carrier in the middle of the band (fm).
Radiated measurement in 1 m test distance.

Annex 3: Measurement result no. 20 (57)



Information on the measurement:

EMI-TEST2 Aug 2006 10:28:37

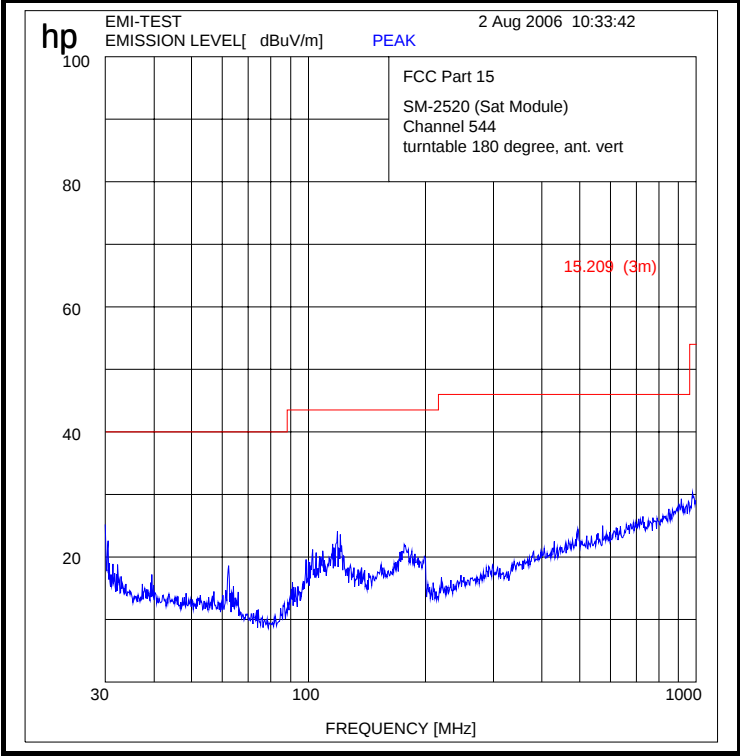
1. FCC CFR 47,Part 15J WITHOUT PRESELECTOR
1.18 FCC Part 15 30 MHz - 1 GHz

Peaks above -30 dB of Limit Line #1
peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/m)	DELTA
1	62.17	18.2	-21.8
2	108.51	22.7	-20.8
3	177.82	21.7	-21.8

-/-

Annex 3: Measurement result no. 21 (57)



Information on the measurement:

EMI-TEST 2 Aug 2006 10:33:42

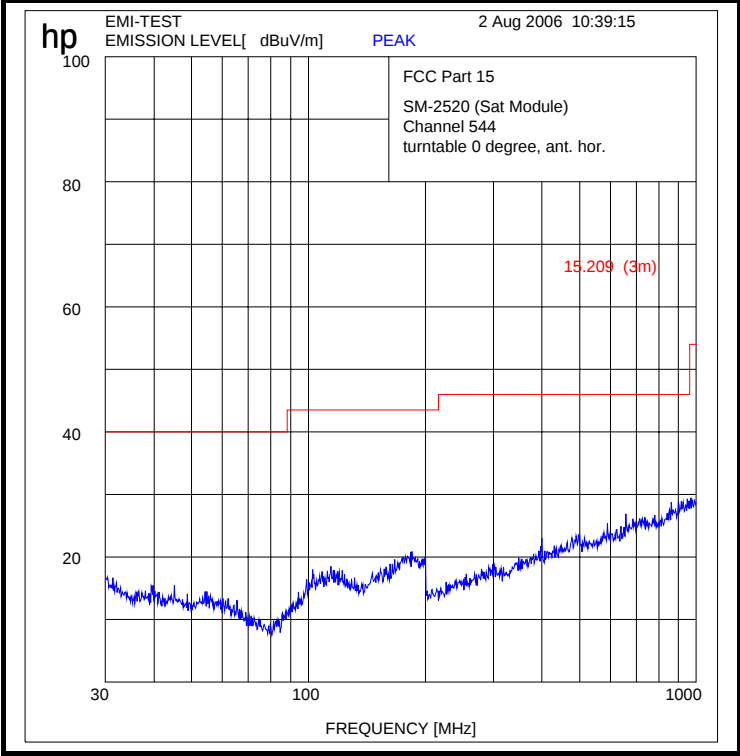
1. FCC CFR 47, Part 15J WITHOUT PRESELECTOR
1.18 FCC Part 15 30 MHz - 1 GHz

Peaks above -30 dB of Limit Line #1
peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/m)	DELTA
1	62.39	18.6	-21.4
2	118.85	24.1	-19.4
3	176.57	22	-21.5

-/-

Annex 3: Measurement result no. 22 (57)



Information on the measurement:

EMI-TEST2 Aug 2006 10:39:15

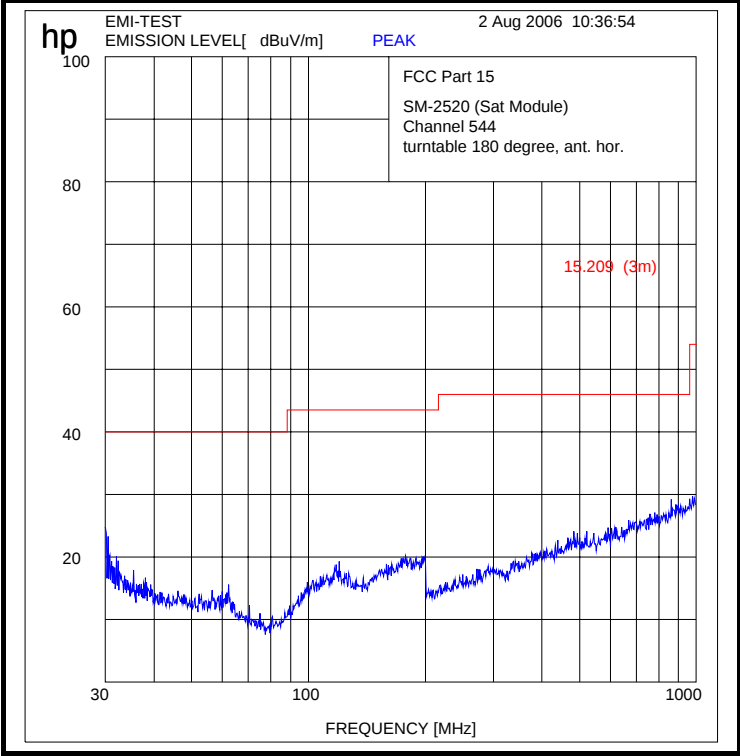
1. FCC CFR 47,Part 15J WITHOUT PRESELECTOR
1.18 FCC Part 15 30 MHz - 1 GHz

Peaks above -30 dB of Limit Line #1
peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/m)	DELTA
1	184.8	20.9	-22.6

-/-

Annex 3: Measurement result no. 23 (57)



Information on the measurement:

EMI-TEST2 Aug 2006 10:36:54

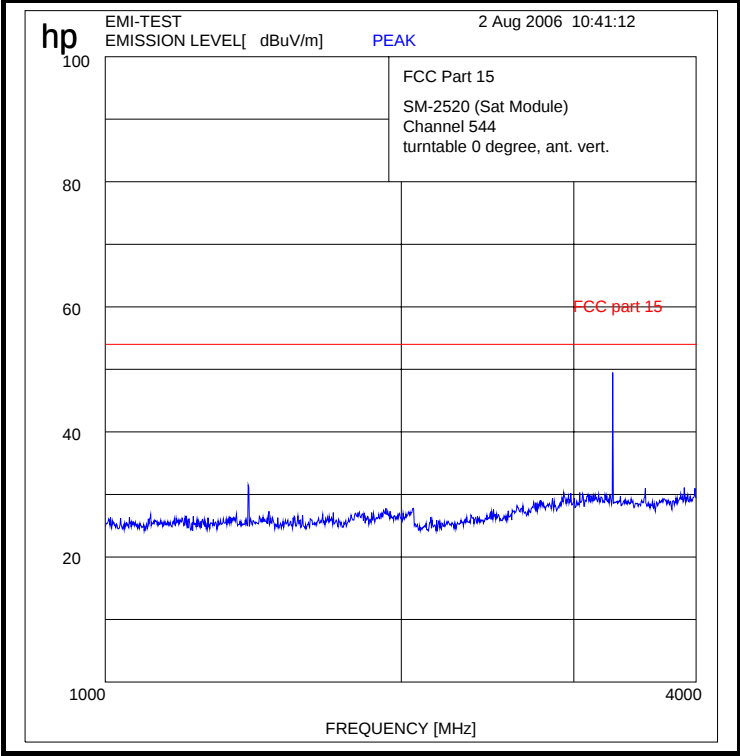
1. FCC CFR 47,Part 15J WITHOUT PRESELECTOR
1.18 FCC Part 15 30 MHz - 1 GHz

Peaks above -30 dB of Limit Line #1
peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/m)	DELTA
1	30.53	23.3	-16.7
2	177.82	20.2	-23.3

-/-

Annex 3: Measurement result no. 24 (57)



Information on the measurement:

EMI-TEST2 Aug 2006 10:41:12

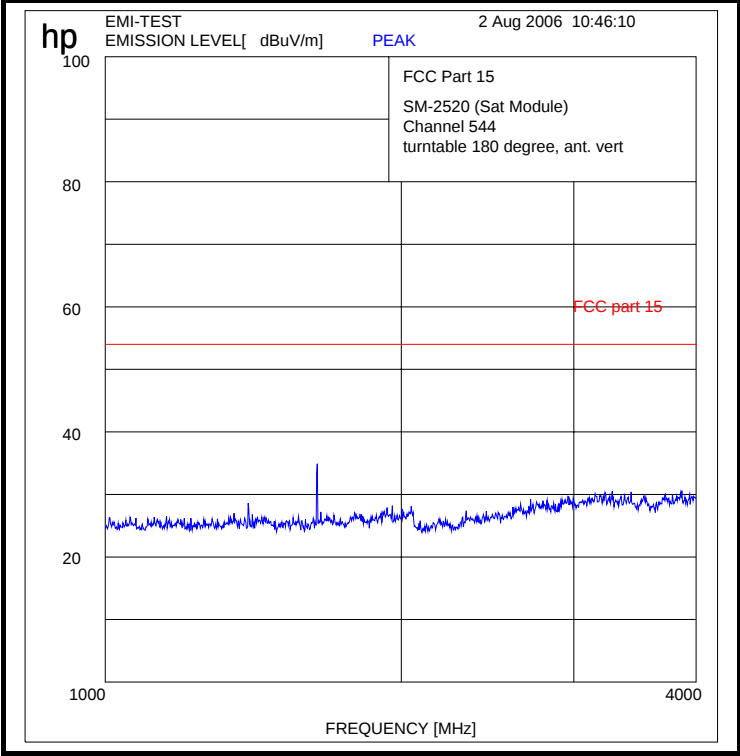
1. FCC CFR 47,Part 15J WITHOUT PRESELECTOR
1.5 FCC Part 15.1 - 4 GHz

Peaks above -30 dB of Limit Line #1
peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/m)	DELTA
1	1398.1	31.5	-22.5
2	3285.9	49.5	-4.5

-/-

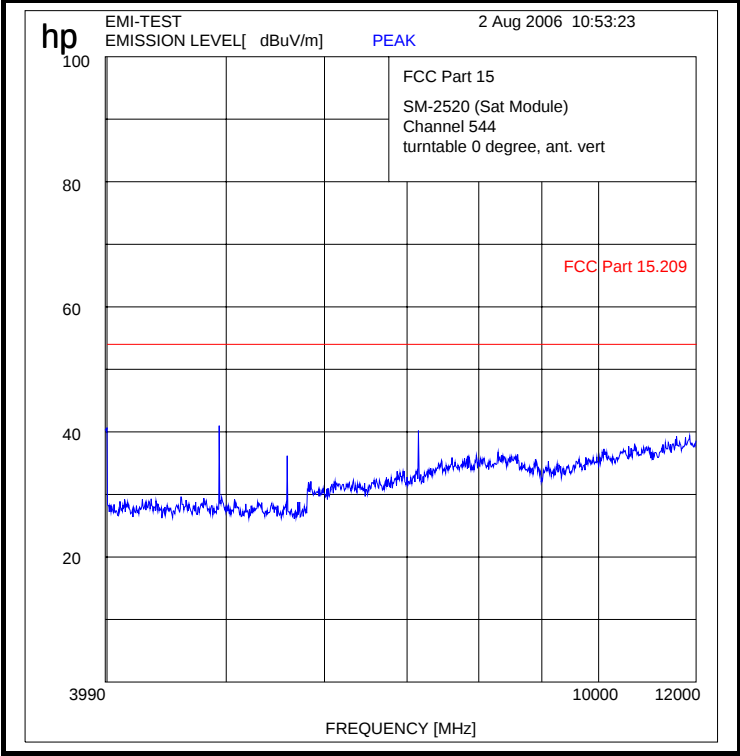
Annex 3: Measurement result no. 25 (57)



Information on the measurement:			
EMI-TEST	2 Aug 2006 10:46:10		
1. FCC CFR 47,Part 15J WITHOUT PRESELECTOR			
1.5 FCC Part 15.1 - 4 GHz			
Peaks above -30 dB of Limit Line #1			
peak criteria = 6 dB			
PEAK#	FREQ (MHz)	(dBuV/m)	DELTA
1	1644.1	34.9	-19.1

-/-

Annex 3: Measurement result no. 26 (57)



Information on the measurement:

EMI-TEST2 Aug 2006 10:53:23

1. FCC CFR 47,Part 15J WITHOUT PRESELECTOR
1.4 FCC Part 15 4 - 12 GHz

Peaks above -30 dB of Limit Line #1
peak criteria = 6 dB

PEAK#	FREQ (MHz)	(dBuV/m)	DELTA
1	4933.7	41	-13.0
2	5599	36.2	-17.8
3	7147.8	40.2	-13.8

-/-

EMI TEST
EMISSION LEVEL[dBuV/m] PEAK

2 Aug 2006 10:51:09

hp

FCC Part 15
SM-2520 (Sat Module)
Channel 544
turntable 180 degree, ant. vert

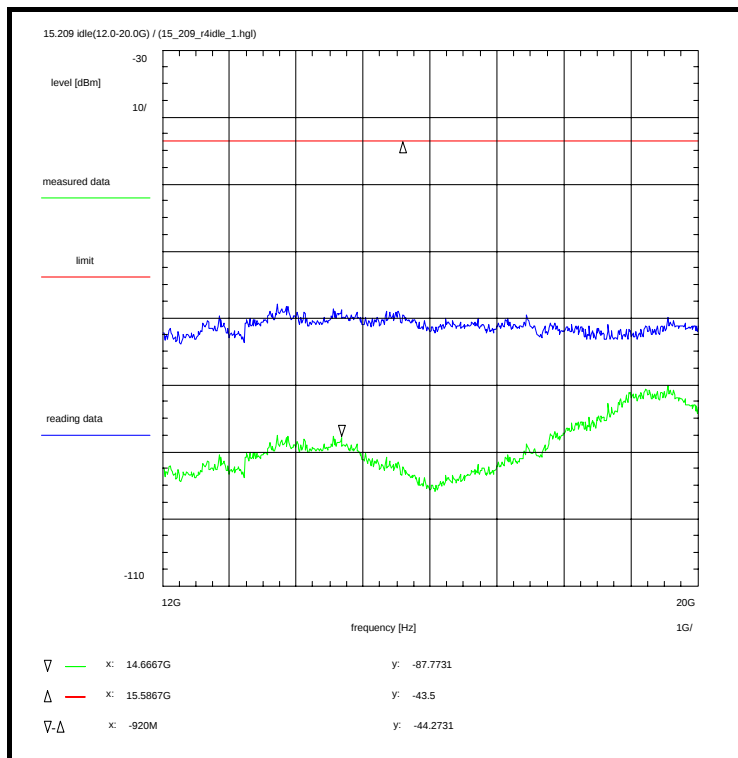
FCC Part 15.209

3990 10000 12000

FREQUENCY [MHz]

PEAK#	FREQ (MHz)	(dBuV/m)	DELTA
1	4933.7	42.7	-11.3

-/-

Annex 3: Measurement result no. 28 (57)**Information on the measurement:****Environment condition:**

Date & Time: Thu 03/Aug/2006 09:05:05
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 12 GHz
Stop frequency: 20 GHz
Center frequency: 16 GHz
Frequency span: 8 GHz
Input attenuation: 0 dB
Resolution-BW: 1 MHz
Video-BW: 1 MHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable (C217) + 2.3 dB
DUT-Antenna + 0.0 dBi
Test antenna (A037) - 12.7 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Distance correction (1m->3m) - 9.5 dB
TOTAL CORRECTION: -19.9 dB

Limit:

Limit acc. to 15.209: 54.0 dBuV/m
This corresponds to -43.5 dBm in a 3 m test distance.
Distance correction factor $20 \cdot \lg(1/3) = -9.5$ dB

Subclause: 15.209 Radiated emissions 12.0 - 20.0 GHz
Idle-mode
Radiation coming out of DUT-cabinet(s): 12.0 GHz - 20.0 GHz

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 2, see section 1.5.2
Idle Mode

Test setup:
see annex 1: 2.3

Test equipment:
see annex 2: A037, C217, R001, U019

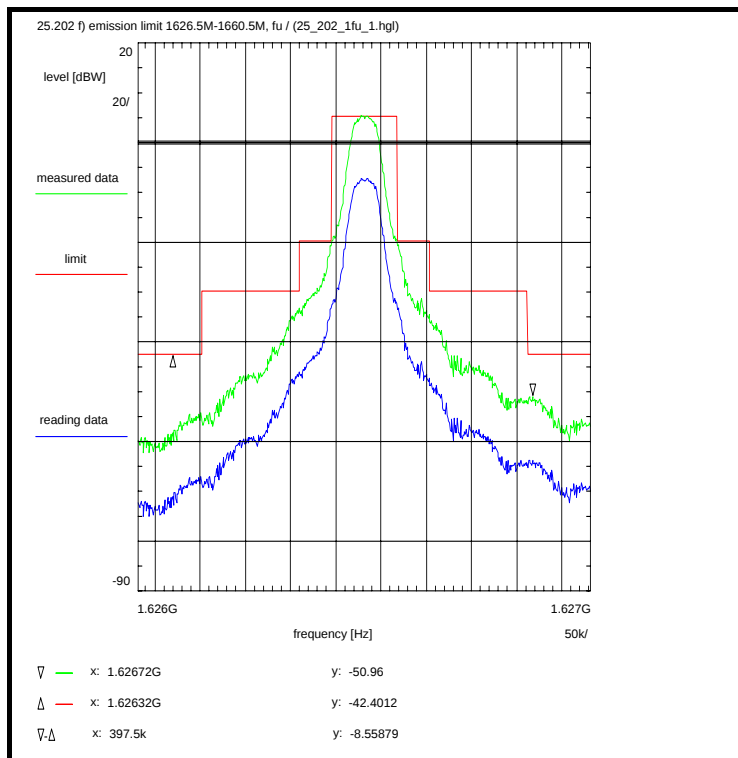
Data of correction:
see annex 4

Remark:

Test result: Test passed

Remarks:

Measurement distance: 1m
Idle-mode.

Annex 3: Measurement result no. 29 (57)**Information on the measurement:****Environment condition:**

Date & Time: Thu 03/Aug/2006 14:26:07
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 1.62628125 GHz
Stop frequency: 1.62678125 GHz
Center frequency: 1.62653125 GHz
Frequency span: 500 kHz
Input attenuation: 40 dB
Resolution-BW: 10 kHz
Video-BW: 10 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (10k -> 4k) - 4.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 12.7 dB

Limit:**Limit acc. to 25.202 f):**

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see section 1.5.2
CH 1

Test setup:

see annex 1: 1.2hgj

Test equipment:

see annex 2: C217, R001, U214

Data of correction:

see annex 4

Remark:**Test result:**

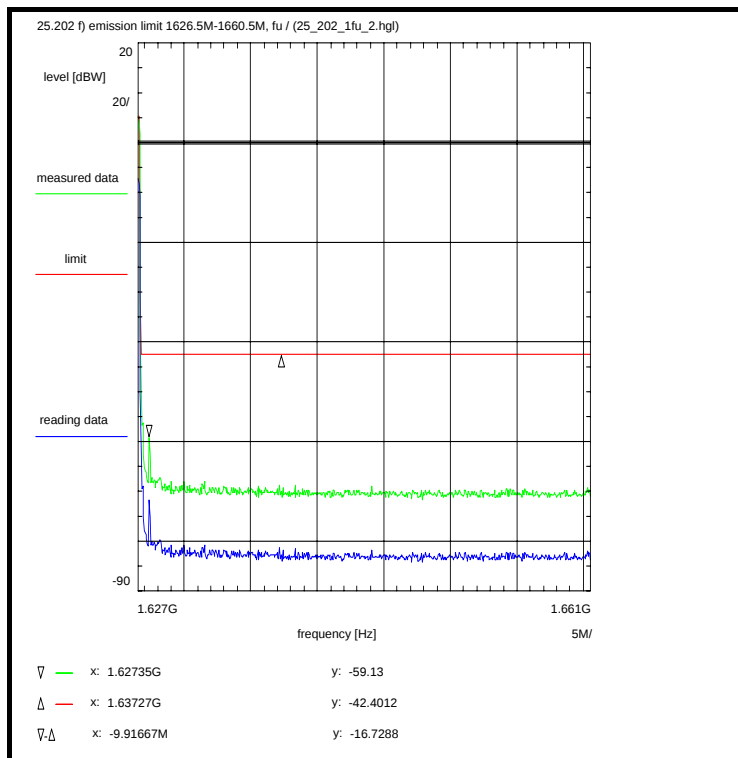
Test passed

Remarks:

Carrier-on state / Carrier at the lower edge of the band (fu)

For EIRP calculation:

'worst-case' = maximum antenna gain

Annex 3: Measurement result no. 30 (57)**Information on the measurement:****Environment condition:**

Date & Time: Thu 03/Aug/2006 14:28:41
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 1.6265 GHz
Stop frequency: 1.6605 GHz
Center frequency: 1.6435 GHz
Frequency span: 34 MHz
Input attenuation: 40 dB
Resolution-BW: 10 kHz
Video-BW: 10 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (10k -> 4k) - 4.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 12.7 dB

Limit:**Limit acc. to 25.202 f):**

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see section 1.5.2
CH 1

Test setup:

see annex 1: 1.2hgj

Test equipment:

see annex 2: C217, R001, U214

Data of correction:

see annex 4

Remark:

Test result: Test passed

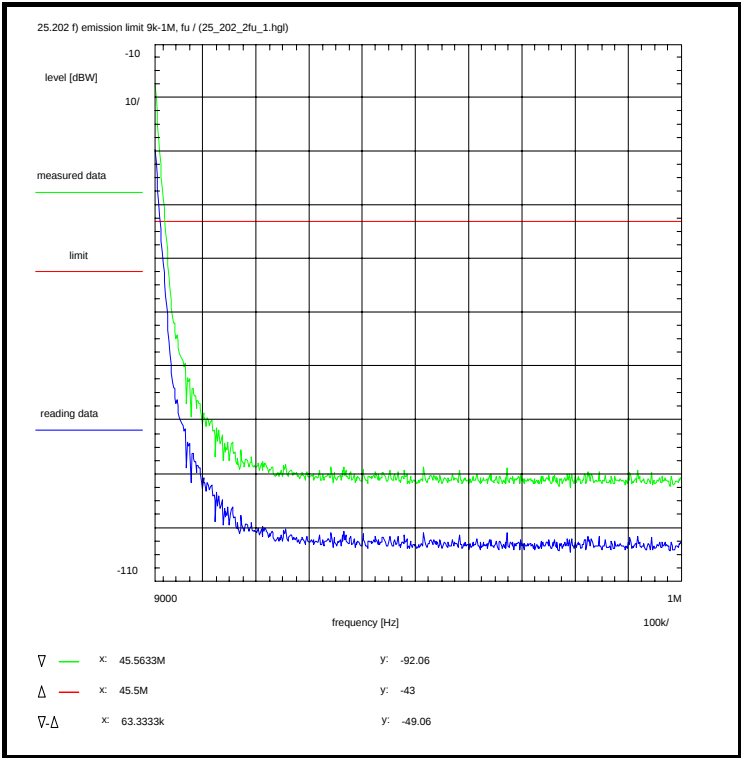
Remarks:

Carrier-on state / Carrier at the lower edge of the band (fu)

For EIRP calculation:

'worst-case' = maximum antenna gain

Annex 3: Measurement result no. 31 (57)



Information on the measurement:

Environment condition:
Date & Time: Thu 03/Aug/2006 14:31:24
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:
Start frequency: 9 kHz
Stop frequency: 1 MHz
Center frequency: 504.5 kHz
Frequency span: 991 kHz
Input attenuation: 20 dB
Resolution-BW: 10 kHz
Video-BW: 10 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):
Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.2 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (10k -> 4k) - 4.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 9.9 dB
TOTAL CORRECTION: + 12.1 dB

Limit:
Limit acc. to 25.202 f):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 1

Test setup:
see annex 1: 1.2hgj

Test equipment:
see annex 2: C217, R001, U214

Data of correction:
see annex 4

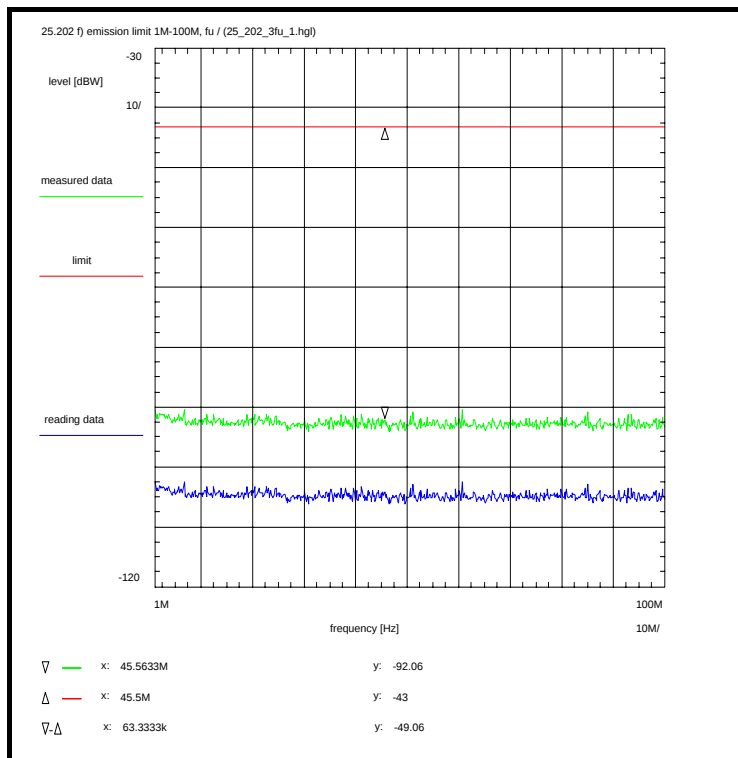
Remark:

Test result: Test passed

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)

For EIRP calculation:
'worst-case' = maximum antenna gain

Rather left the plot shows the zero line of the spectrum analyzer.

Annex 3: Measurement result no. 32 (57)**Information on the measurement:****Environment condition:**

Date & Time: Thu 03/Aug/2006 14:32:45
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 1 MHz
Stop frequency: 100 MHz
Center frequency: 50.5 MHz
Frequency span: 99 MHz
Input attenuation: 20 dB
Resolution-BW: 10 kHz
Video-BW: 10 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.2 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (10k -> 4k) - 4.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 9.9 dB
TOTAL CORRECTION: + 12.1 dB

Limit:**Limit acc. to 25.202 f):**

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 1

Test setup:
see annex 1: 1.2hgj

Test equipment:
see annex 2: C217, R001, U214

Data of correction:
see annex 4

Remark:

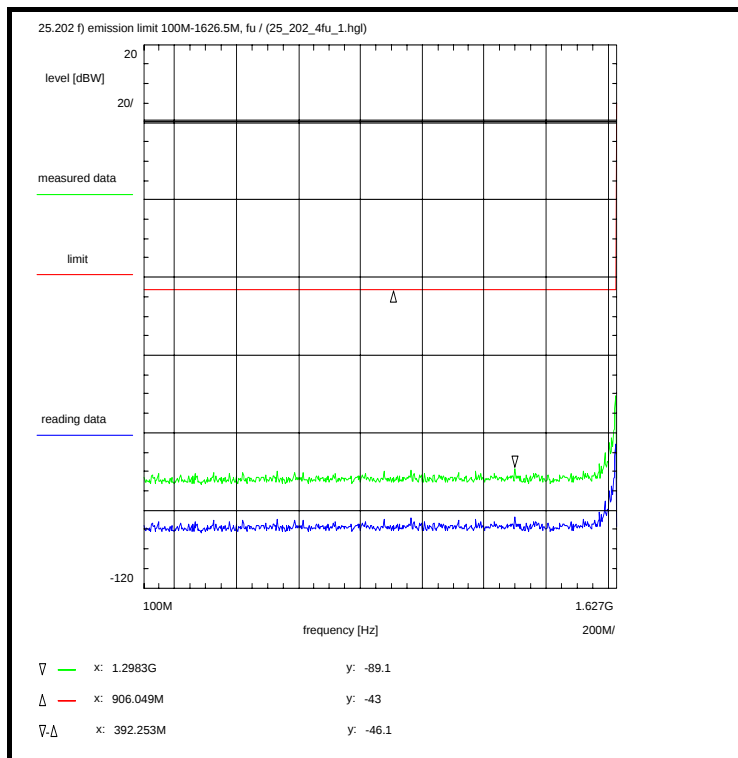
Test result: Test passed

Remarks:

Carrier-on state / Carrier at the lower edge of the band (fu)

For EIRP calculation:

'worst-case' = maximum antenna gain

Annex 3: Measurement result no. 33 (57)**Information on the measurement:**Environment condition:

Date & Time: Thu 03/Aug/2006 14:38:10
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 100 MHz
Stop frequency: 1.6265 GHz
Center frequency: 863.25 MHz
Frequency span: 1.5265 GHz
Input attenuation: 20 dB
Resolution-BW: 10 kHz
Video-BW: 10 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.5 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (10k -> 4k) - 4.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 9.9 dB
TOTAL CORRECTION: + 12.4 dB

Limit:Limit acc. to 25.202 f):

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see section 1.5.2
CH 1

Test setup:

see annex 1: 1.2hgj

Test equipment:

see annex 2: C217, R001, U214

Data of correction:

see annex 4

Remark:

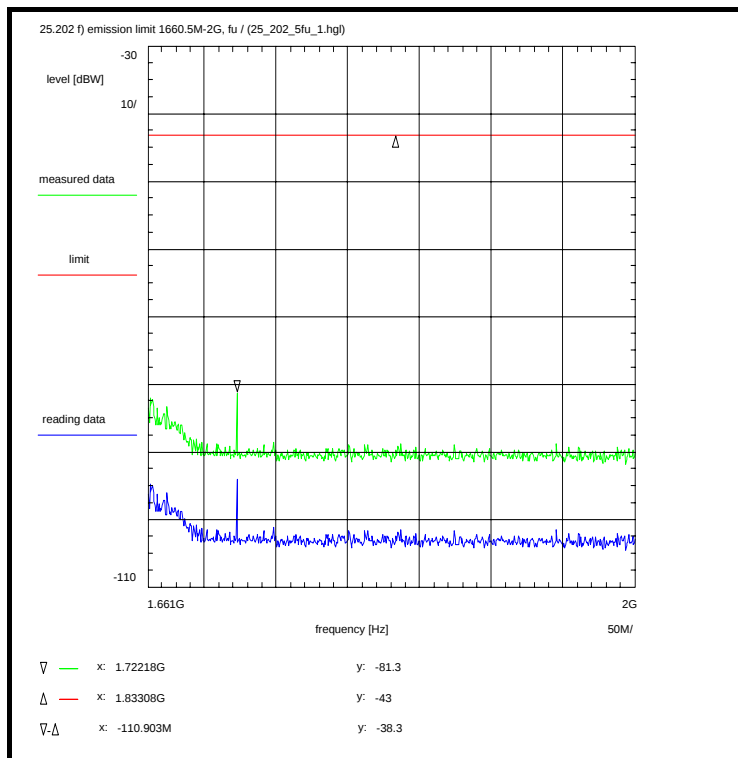
Test result: Test passed

Remarks:

Carrier-on state / Carrier at the lower edge of the band (fu)

For EIRP calculation:

'worst-case' = maximum antenna gain

Annex 3: Measurement result no. 34 (57)**Information on the measurement:****Environment condition:**

Date & Time: Thu 03/Aug/2006 14:40:12
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 1.6605 GHz
Stop frequency: 2 GHz
Center frequency: 1.83025 GHz
Frequency span: 339.5 MHz
Input attenuation: 20 dB
Resolution-BW: 10 kHz
Video-BW: 10 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (10k -> 4k) - 4.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 12.7 dB

Limit:**Limit acc. to 25.202 f):**

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 1

Test setup:
see annex 1: 1.2hgj

Test equipment:
see annex 2: C217, R001, U214

Data of correction:
see annex 4

Remark:

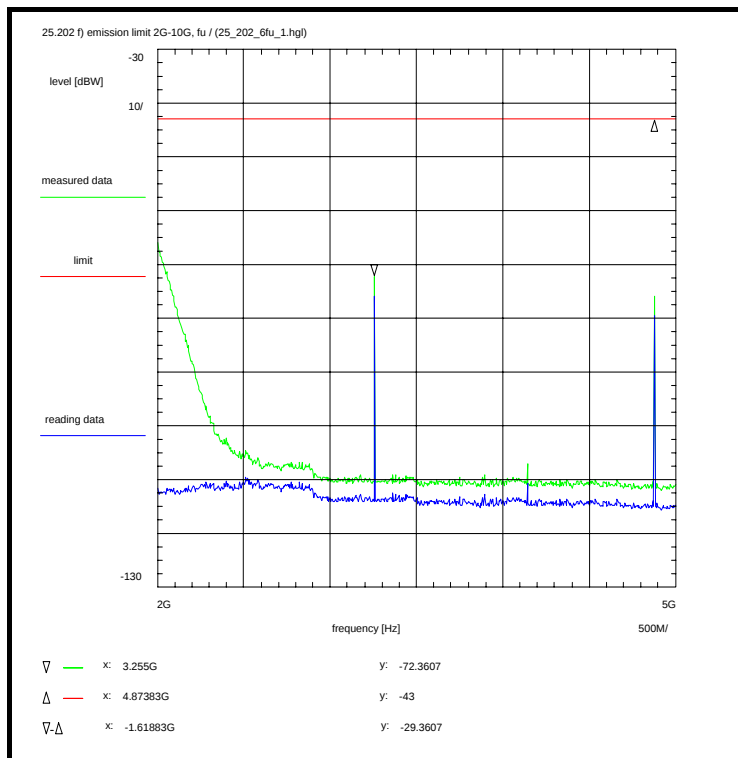
Test result: Test passed

Remarks:

Carrier-on state / Carrier at the lower edge of the band (fu)

For EIRP calculation:

'worst-case' = maximum antenna gain

Annex 3: Measurement result no. 35 (57)**Information on the measurement:****Environment condition:**

Date & Time: Thu 03/Aug/2006 14:53:32
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 2 GHz
Stop frequency: 5 GHz
Center frequency: 3.5 GHz
Frequency span: 3 GHz
Input attenuation: 0 dB
Resolution-BW: 100 kHz
Video-BW: 100 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler (WHPF) + 3.6 dB
Coaxial cable (C217) + 1.0 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 6.6 dB

Limit:**Limit acc. to 25.202 f):**

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see section 1.5.2
CH 1

Test setup:

see annex 1: 1.2hgij

Test equipment:

see annex 2: C217, R001, U214, WHPF

Data of correction:

see annex 4

Remark:

Test result: Test passed

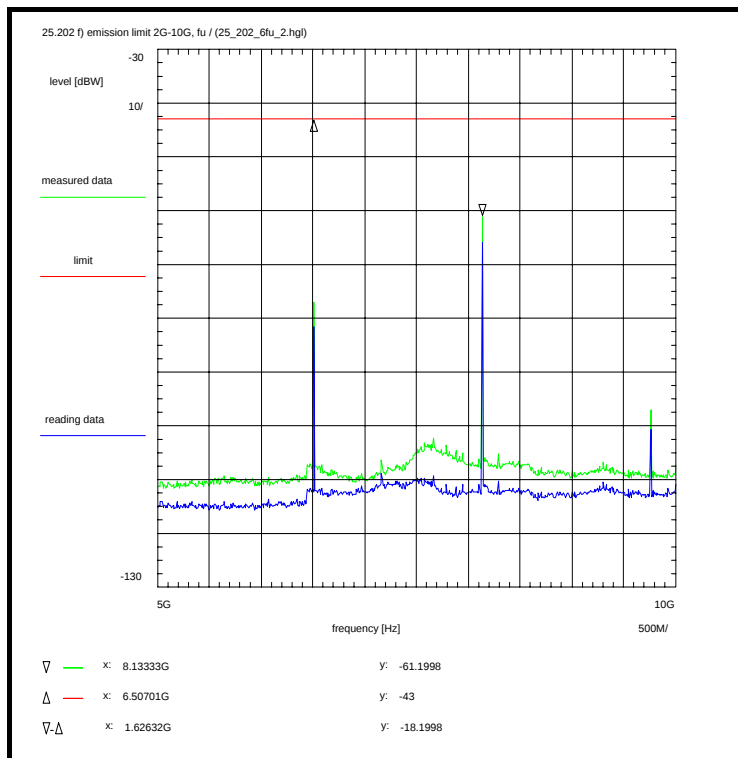
Remarks:

Carrier-on state / Carrier at the lower edge of the band (fu)

For EIRP calculation:

'worst-case' = maximum antenna gain

Rather left the plot shows the frequency response of the high pass filter.
The plot shows the 2nd and 3rd harmonic.

Annex 3: Measurement result no. 36 (57)**Information on the measurement:****Environment condition:**

Date & Time: Thu 03/Aug/2006 15:12:27
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 5 GHz
Stop frequency: 10 GHz
Center frequency: 7.5 GHz
Frequency span: 5 GHz
Input attenuation: 0 dB
Resolution-BW: 100 kHz
Video-BW: 100 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler (WHPF) + 0.3 dB
Coaxial cable (C217) + 1.5 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.4 dB
TOTAL CORRECTION: + 4.2 dB

Limit:**Limit acc. to 25.202 f):**

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see section 1.5.2
CH 1

Test setup:

see annex 1: 1.2hgij

Test equipment:

see annex 2: C217, R001, U214, WHPF

Data of correction:

see annex 4

Remark:**Test result:**

Test passed

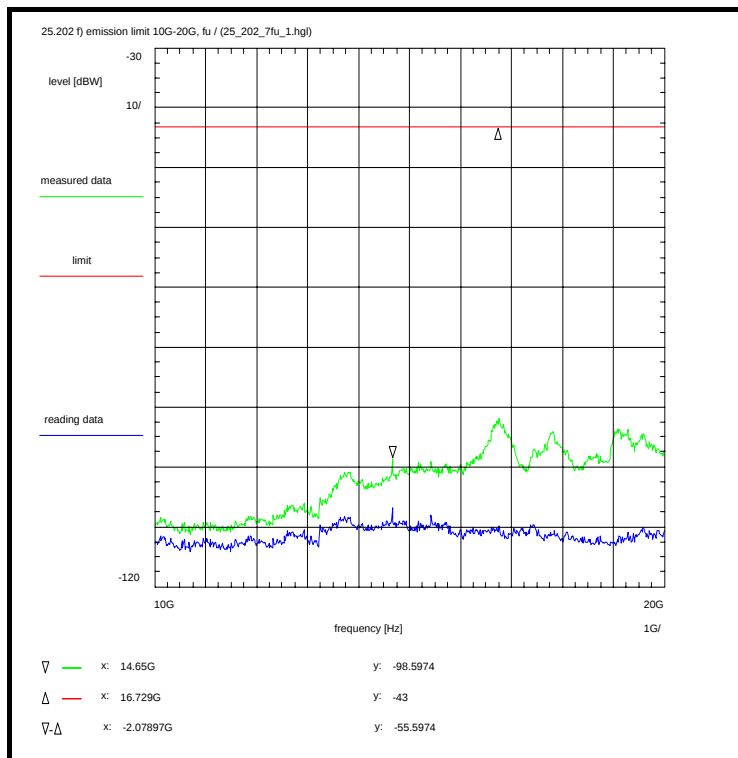
Remarks:

Carrier-on state / Carrier at the lower edge of the band (fu)

For EIRP calculation:

'worst-case' = maximum antenna gain

The plot shows the 4th, 5th and 6th harmonic.

Annex 3: Measurement result no. 37 (57)**Information on the measurement:****Environment condition:**

Date & Time: Thu 03/Aug/2006 15:22:45
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 10 GHz
Stop frequency: 20 GHz
Center frequency: 15 GHz
Frequency span: 10 GHz
Input attenuation: 0 dB
Resolution-BW: 100 kHz
Video-BW: 100 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler (WHPF) + 0.7 dB
Coaxial cable (C217) + 2.2 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 14.2 dB
TOTAL CORRECTION: + 9.1 dB

Limit:**Limit acc. to 25.202 f):**

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see section 1.5.2
CH 1

Test setup:

see annex 1: 1.2hgij

Test equipment:

see annex 2: C217, R001, U214, WHPF

Data of correction:

see annex 4

Remark:

Test result: Test passed

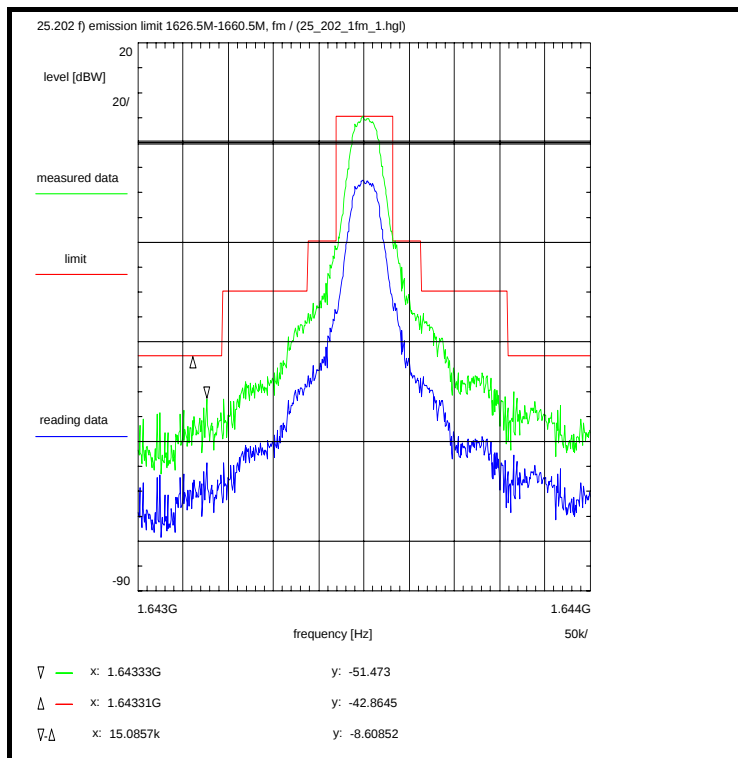
Remarks:

Carrier-on state / Carrier at the lower edge of the band (fu)

For EIRP calculation:

'worst-case' = maximum antenna gain

The marker shows the 9th harmonic.

Annex 3: Measurement result no. 38 (57)**Information on the measurement:**Environment condition:

Date & Time: Wed 02/Aug/2006 16:40:54
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 45 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 1.64325 GHz
Stop frequency: 1.64375 GHz
Center frequency: 1.6435 GHz
Frequency span: 500 kHz
Input attenuation: 40 dB
Resolution-BW: 10 kHz
Video-BW: 10 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (10k -> 4k) - 4.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 12.7 dB

Limit:Limit acc. to 25.202 f):

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 544

Test setup:
see annex 1: 1.2hgj

Test equipment:
see annex 2: C217, R001, U214

Data of correction:
see annex 4

Remark:

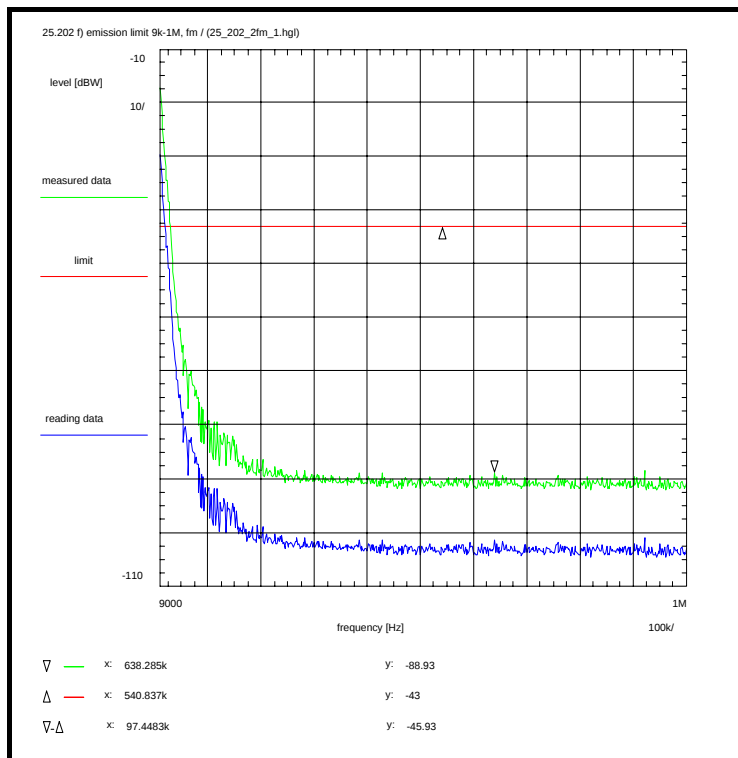
Test result: Test passed

Remarks:

Carrier-on state / Carrier in the middle of the band (fm)

For EIRP calculation:

'worst-case' = maximum antenna gain

Annex 3: Measurement result no. 39 (57)**Information on the measurement:**Environment condition:

Date & Time: Wed 02/Aug/2006 16:43:51
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 45 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 9 kHz
Stop frequency: 1 MHz
Center frequency: 504.5 kHz
Frequency span: 991 kHz
Input attenuation: 20 dB
Resolution-BW: 10 kHz
Video-BW: 10 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.5 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (10k -> 4k) - 4.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 9.9 dB
TOTAL CORRECTION: + 12.4 dB

Limit:Limit acc. to 25.202 f):

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 544

Test setup:

see annex 1: 1.2hgj

Test equipment:

see annex 2: C217, R001, U214

Data of correction:

see annex 4

Remark:

Test result: Test passed

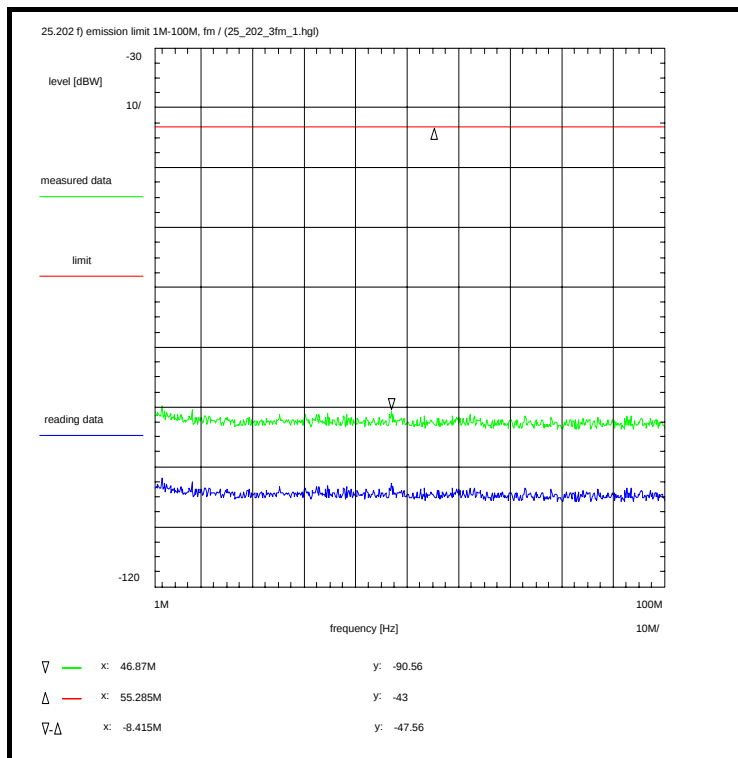
Remarks:

Carrier-on state / Carrier in the middle of the band (fm)

For EIRP calculation:

'worst-case' = maximum antenna gain

Rather left the plot shows the zero line of the spectrum analyzer.

Annex 3: Measurement result no. 40 (57)**Information on the measurement:**Environment condition:

Date & Time: Wed 02/Aug/2006 16:46:26
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 45 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 1 MHz
Stop frequency: 100 MHz
Center frequency: 50.5 MHz
Frequency span: 99 MHz
Input attenuation: 20 dB
Resolution-BW: 10 kHz
Video-BW: 10 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.2 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (10k -> 4k) - 4.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 9.9 dB
TOTAL CORRECTION: + 12.1 dB

Limit:Limit acc. to 25.202 f):

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 544

Test setup:

see annex 1: 1.2hgj

Test equipment:

see annex 2: C217, R001, U214

Data of correction:

see annex 4

Remark:

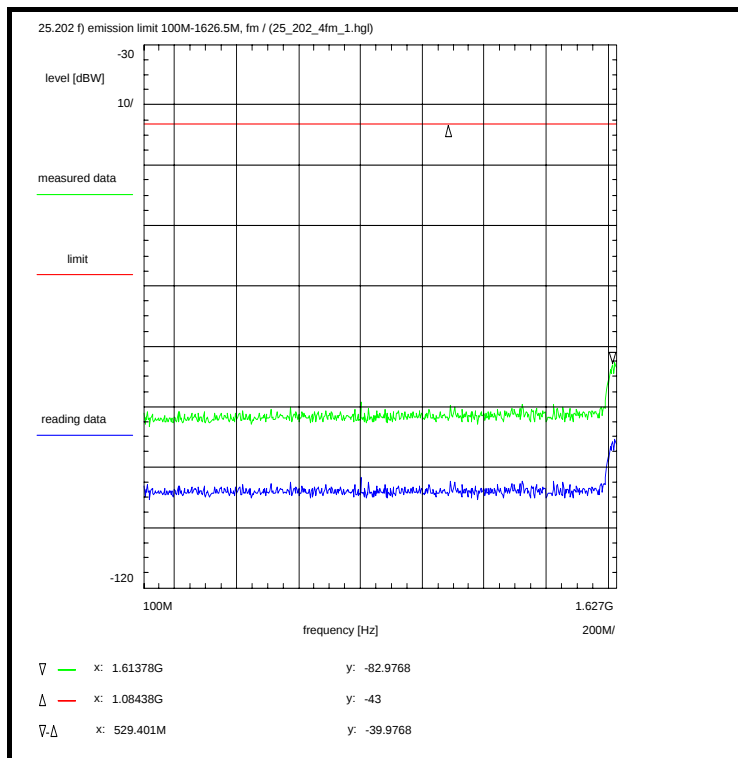
Test result: Test passed

Remarks:

Carrier-on state / Carrier in the middle of the band (fm)

For EIRP calculation:

'worst-case' = maximum antenna gain

Annex 3: Measurement result no. 41 (57)**Information on the measurement:**Environment condition:

Date & Time: Wed 02/Aug/2006 16:48:26
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 45 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 100 MHz
Stop frequency: 1.6265 GHz
Center frequency: 863.25 MHz
Frequency span: 1.5265 GHz
Input attenuation: 20 dB
Resolution-BW: 10 kHz
Video-BW: 10 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.5 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (10k -> 4k) - 4.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 9.9 dB
TOTAL CORRECTION: + 12.4 dB

Limit:Limit acc. to 25.202 f):

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 544

Test setup:

see annex 1: 1.2hgj

Test equipment:

see annex 2: C217, R001, U214

Data of correction:

see annex 4

Remark:

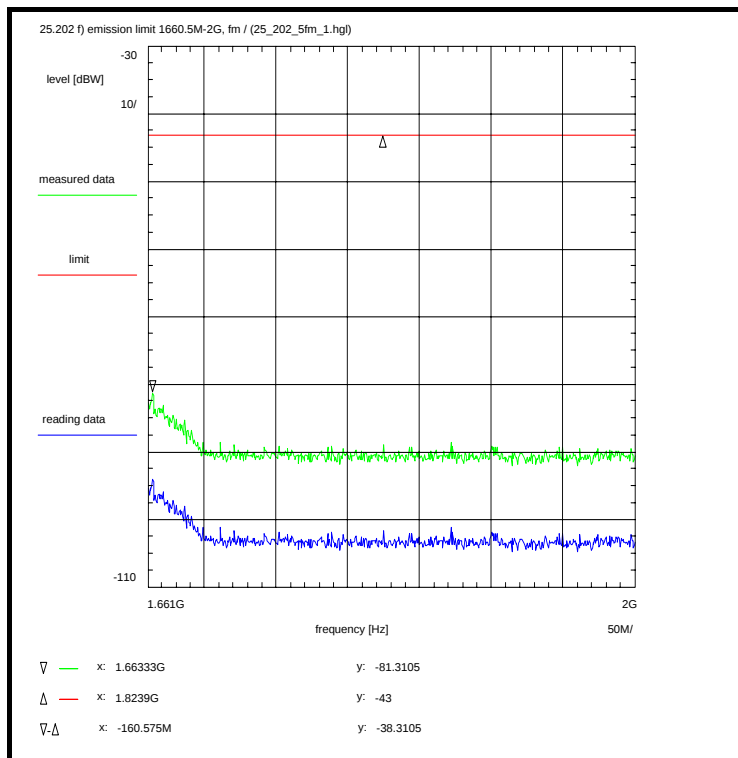
Test result: Test passed

Remarks:

Carrier-on state / Carrier in the middle of the band (fm)

For EIRP calculation:

'worst-case' = maximum antenna gain

Annex 3: Measurement result no. 42 (57)**Information on the measurement:**Environment condition:

Date & Time: Wed 02/Aug/2006 16:50:15
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 45 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 1.6605 GHz
Stop frequency: 2 GHz
Center frequency: 1.83025 GHz
Frequency span: 339.5 MHz
Input attenuation: 20 dB
Resolution-BW: 10 kHz
Video-BW: 10 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (10k -> 4k) - 4.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 12.7 dB

Limit:Limit acc. to 25.202 f):

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 544

Test setup:
see annex 1: 1.2hgj

Test equipment:
see annex 2: C217, R001, U214

Data of correction:
see annex 4

Remark:

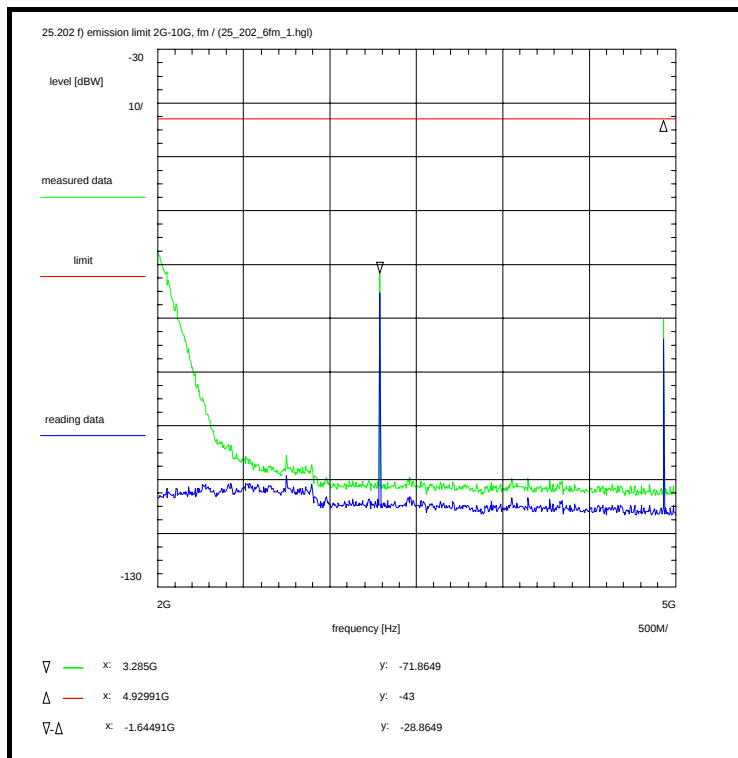
Test result: **Test passed**

Remarks:

Carrier-on state / Carrier in the middle of the band (fm)

For EIRP calculation:

'worst-case' = maximum antenna gain

Annex 3: Measurement result no. 43 (57)**Information on the measurement:**Environment condition:

Date & Time: Wed 02/Aug/2006 16:58:31
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 45 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 2 GHz
Stop frequency: 5 GHz
Center frequency: 3.5 GHz
Frequency span: 3 GHz
Input attenuation: 0 dB
Resolution-BW: 100 kHz
Video-BW: 100 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler (WHPF) + 3.6 dB
Coaxial cable (C217) + 1.0 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 6.6 dB

Limit:Limit acc. to 25.202 f):

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 544

Test setup:

see annex 1: 1.2hgij

Test equipment:

see annex 2: C217, R001, U214, WHPF

Data of correction:

see annex 4

Remark:

Test result: Test passed

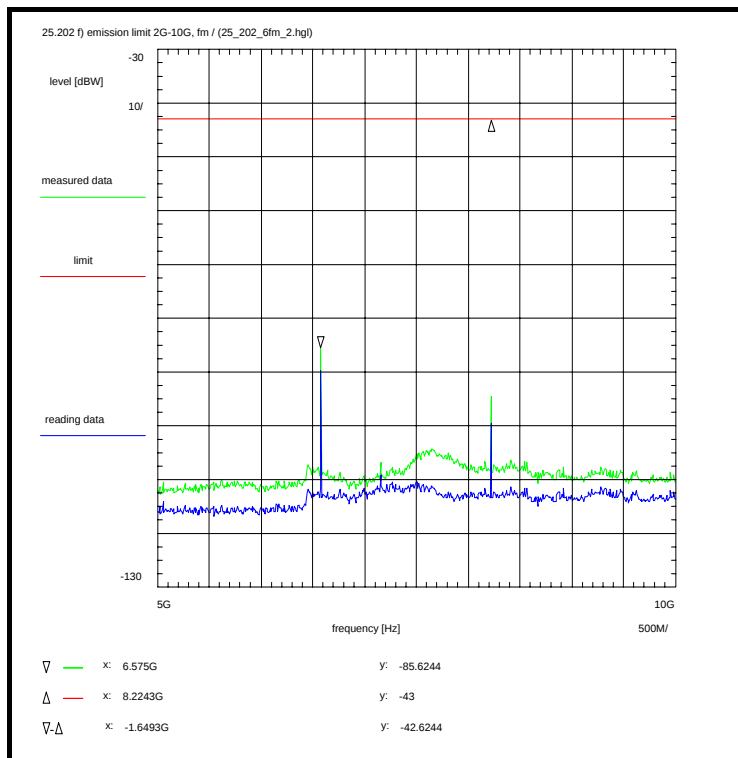
Remarks:

Carrier-on state / Carrier in the middle of the band (fm)

For EIRP calculation:

'worst-case' = maximum antenna gain

Rather left the plot shows the frequency response of the high pass filter.
The plot shows the 2nd and 3rd harmonic.

Annex 3: Measurement result no. 44 (57)**Information on the measurement:**Environment condition:

Date & Time: Wed 02/Aug/2006 17:01:06
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 45 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 5 GHz
Stop frequency: 10 GHz
Center frequency: 7.5 GHz
Frequency span: 5 GHz
Input attenuation: 0 dB
Resolution-BW: 100 kHz
Video-BW: 100 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler (WHPF) + 0.3 dB
Coaxial cable (C217) + 1.5 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.4 dB
TOTAL CORRECTION: + 4.2 dB

Limit:Limit acc. to 25.202 f):

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 544

Test setup:

see annex 1: 1.2hgij

Test equipment:

see annex 2: C217, R001, U214, WHPF

Data of correction:

see annex 4

Remark:

Test result: Test passed

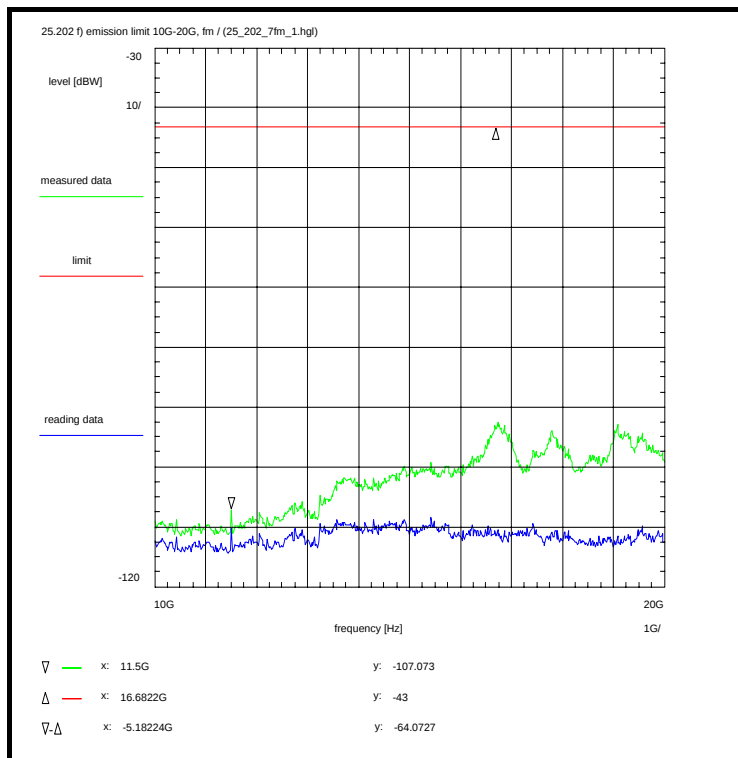
Remarks:

Carrier-on state / Carrier in the middle of the band (fm)

For EIRP calculation:

'worst-case' = maximum antenna gain

The plot shows the 4th and 5th harmonic.

Annex 3: Measurement result no. 45 (57)**Information on the measurement:**Environment condition:

Date & Time: Wed 02/Aug/2006 17:04:59
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 45 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 10 GHz
Stop frequency: 20 GHz
Center frequency: 15 GHz
Frequency span: 10 GHz
Input attenuation: 0 dB
Resolution-BW: 100 kHz
Video-BW: 100 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler (WHPF) + 0.7 dB
Coaxial cable (C217) + 2.2 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 14.2 dB
TOTAL CORRECTION: + 9.1 dB

Limit:Limit acc. to 25.202 f):

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 544

Test setup:

see annex 1: 1.2hgij

Test equipment:

see annex 2: C217, R001, U214, WHPF

Data of correction:

see annex 4

Remark:

Test result: Test passed

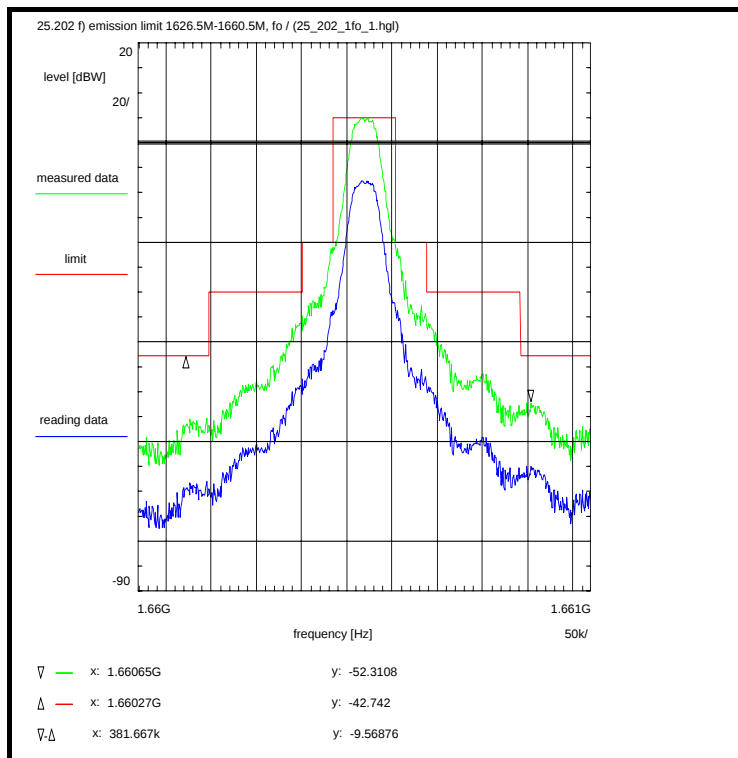
Remarks:

Carrier-on state / Carrier in the middle of the band (fm)

For EIRP calculation:

'worst-case' = maximum antenna gain

The marker shows the 7th harmonic.

Annex 3: Measurement result no. 46 (57)**Information on the measurement:****Environment condition:**

Date & Time: Thu 03/Aug/2006 10:41:15
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 1.66021875 GHz
Stop frequency: 1.66071875 GHz
Center frequency: 1.66046875 GHz
Frequency span: 500 kHz
Input attenuation: 40 dB
Resolution-BW: 10 kHz
Video-BW: 10 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (10k -> 4k) - 4.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 12.7 dB

Limit:**Limit acc. to 25.202 f):**

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the upper edge of the band (fo)

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see section 1.5.2
CH 1087

Test setup:

see annex 1: 1.2hgj

Test equipment:

see annex 2: C217, R001, U214

Data of correction:

see annex 4

Remark:

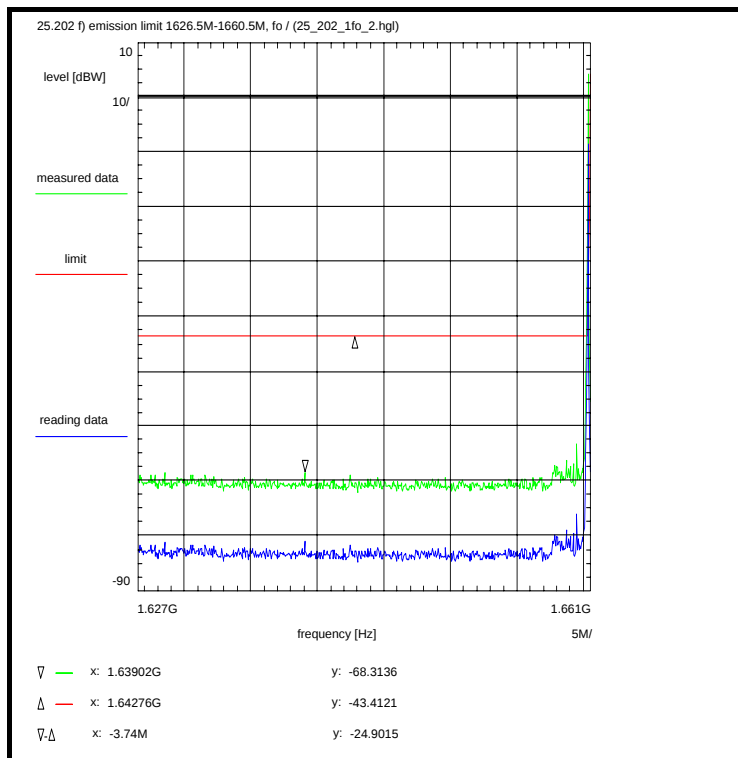
Test result: Test passed

Remarks:

Carrier-on state / Carrier at the upper edge of the band (fo)

For EIRP calculation:

'worst-case' = maximum antenna gain

Annex 3: Measurement result no. 47 (57)**Information on the measurement:****Environment condition:**

Date & Time: Thu 03/Aug/2006 11:27:26
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 1.6265 GHz
Stop frequency: 1.6605 GHz
Center frequency: 1.6435 GHz
Frequency span: 34 MHz
Input attenuation: 40 dB
Resolution-BW: 10 kHz
Video-BW: 10 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable + 0.7 dB
DUT-Antenna + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor - 4.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Freefield attenuation + 10.0 dB
TOTAL CORRECTION: + 12.7 dB

Limit:**Limit acc. to 25.202 f):**

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the upper edge of the band (fo)

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see section 1.5.2
CH 1087

Test setup:

see annex 1: 1.2hgj

Test equipment:

see annex 2: C217, R001, U214

Data of correction:

see annex 4

Remark:

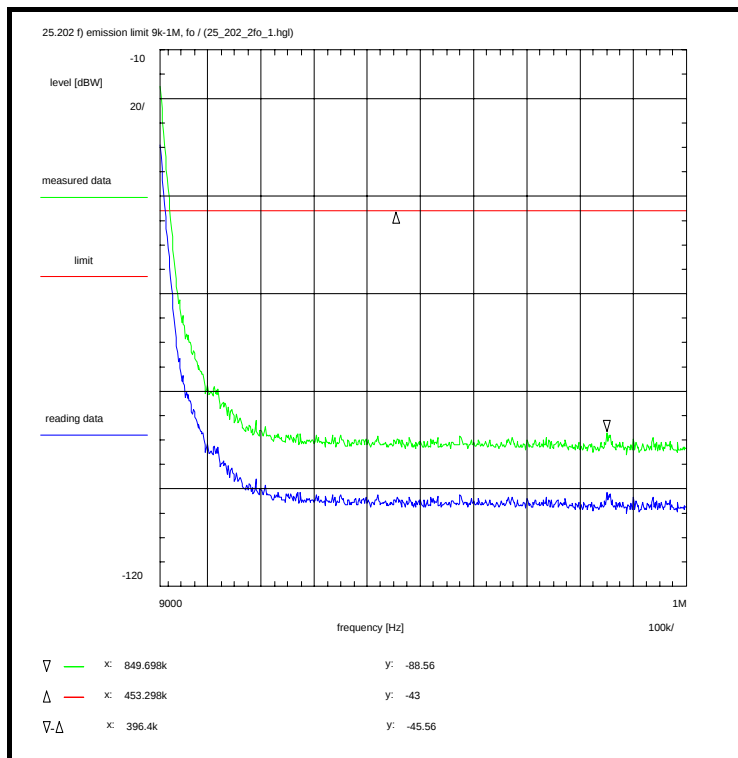
Test result: Test passed

Remarks:

Carrier-on state / Carrier at the upper edge of the band (fo)

For EIRP calculation:

'worst-case' = maximum antenna gain

Annex 3: Measurement result no. 48 (57)**Information on the measurement:****Environment condition:**

Date & Time: Thu 03/Aug/2006 11:38:20
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 9 kHz
Stop frequency: 1 MHz
Center frequency: 504.5 kHz
Frequency span: 991 kHz
Input attenuation: 20 dB
Resolution-BW: 10 kHz
Video-BW: 10 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.2 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (10k -> 4k) - 4.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 9.9 dB
TOTAL CORRECTION: + 12.1 dB

Limit:**Limit acc. to 25.202 f):**

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the upper edge of the band (fo)

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see section 1.5.2
CH 1087

Test setup:

see annex 1: 1.2hgj

Test equipment:

see annex 2: C217, R001, U214

Data of correction:

see annex 4

Remark:

Test result: Test passed

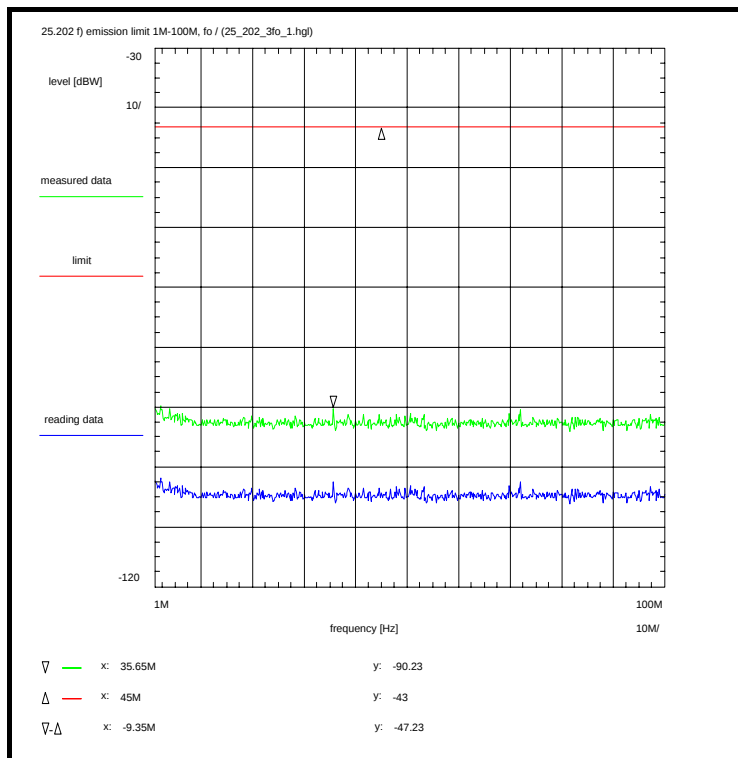
Remarks:

Carrier-on state / Carrier at the upper edge of the band (fo)

For EIRP calculation:

'worst-case' = maximum antenna gain

Rather left the plot shows the zero line of the spectrum analyzer.

Annex 3: Measurement result no. 49 (57)**Information on the measurement:****Environment condition:**

Date & Time: Thu 03/Aug/2006 11:39:51
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 1 MHz
Stop frequency: 100 MHz
Center frequency: 50.5 MHz
Frequency span: 99 MHz
Input attenuation: 20 dB
Resolution-BW: 10 kHz
Video-BW: 10 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.2 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (10k -> 4k) - 4.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 9.9 dB
TOTAL CORRECTION: + 12.1 dB

Limit:**Limit acc. to 25.202 f):**

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the upper edge of the band (fo)

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see section 1.5.2
CH 1087

Test setup:

see annex 1: 1.2hgj

Test equipment:

see annex 2: C217, R001, U214

Data of correction:

see annex 4

Remark:

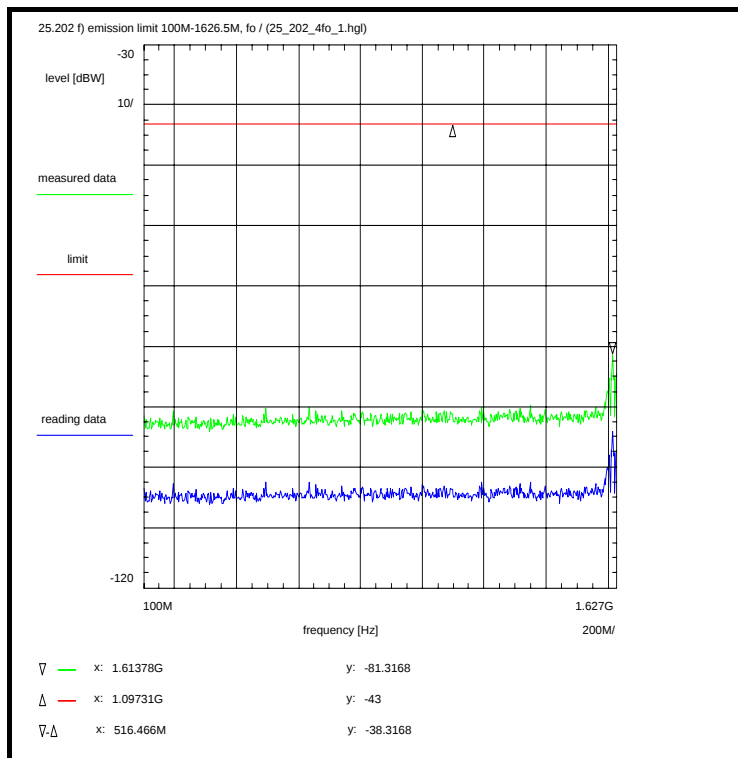
Test result: Test passed

Remarks:

Carrier-on state / Carrier at the upper edge of the band (fo)

For EIRP calculation:

'worst-case' = maximum antenna gain

Annex 3: Measurement result no. 50 (57)**Information on the measurement:****Environment condition:**

Date & Time: Thu 03/Aug/2006 11:44:41
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 100 MHz
Stop frequency: 1.6265 GHz
Center frequency: 863.25 MHz
Frequency span: 1.5265 GHz
Input attenuation: 20 dB
Resolution-BW: 10 kHz
Video-BW: 10 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.5 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (10k -> 4k) - 4.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 9.9 dB
TOTAL CORRECTION: + 12.4 dB

Limit:**Limit acc. to 25.202 f):**

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the upper edge of the band (fo)

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 1087

Test setup:
see annex 1: 1.2hgj

Test equipment:
see annex 2: C217, R001, U214

Data of correction:
see annex 4

Remark:

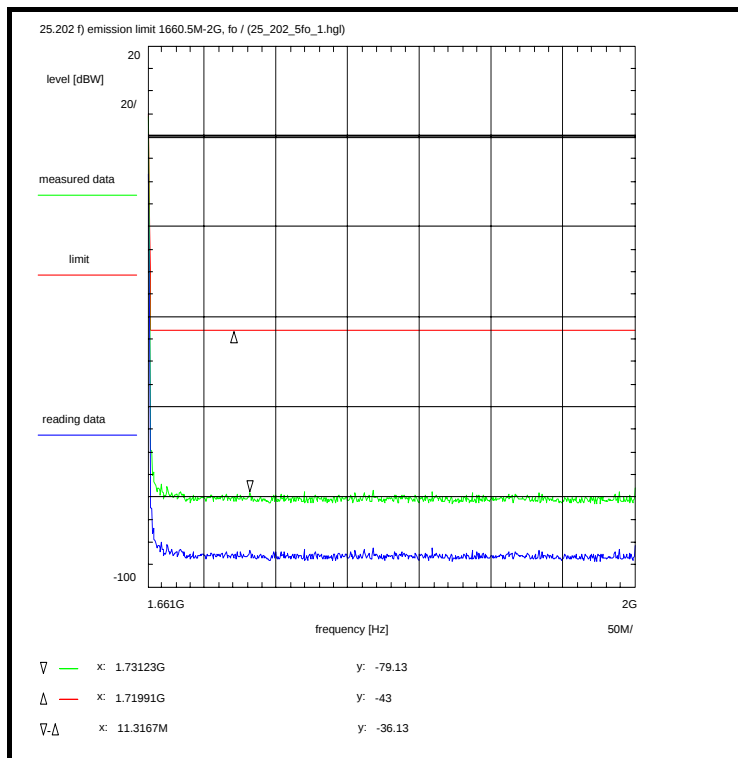
Test result: Test passed

Remarks:

Carrier-on state / Carrier at the upper edge of the band (fo)

For EIRP calculation:

'worst-case' = maximum antenna gain

Annex 3: Measurement result no. 51 (57)**Information on the measurement:****Environment condition:**

Date & Time: Thu 03/Aug/2006 11:56:41
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 1.6605 GHz
Stop frequency: 2 GHz
Center frequency: 1.83025 GHz
Frequency span: 339.5 MHz
Input attenuation: 30 dB
Resolution-BW: 10 kHz
Video-BW: 10 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (10k -> 4k) - 4.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 12.7 dB

Limit:**Limit acc. to 25.202 f):**

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the upper edge of the band (fo)

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see section 1.5.2
CH 1087

Test setup:

see annex 1: 1.2hgj

Test equipment:

see annex 2: C217, R001, U214

Data of correction:

see annex 4

Remark:

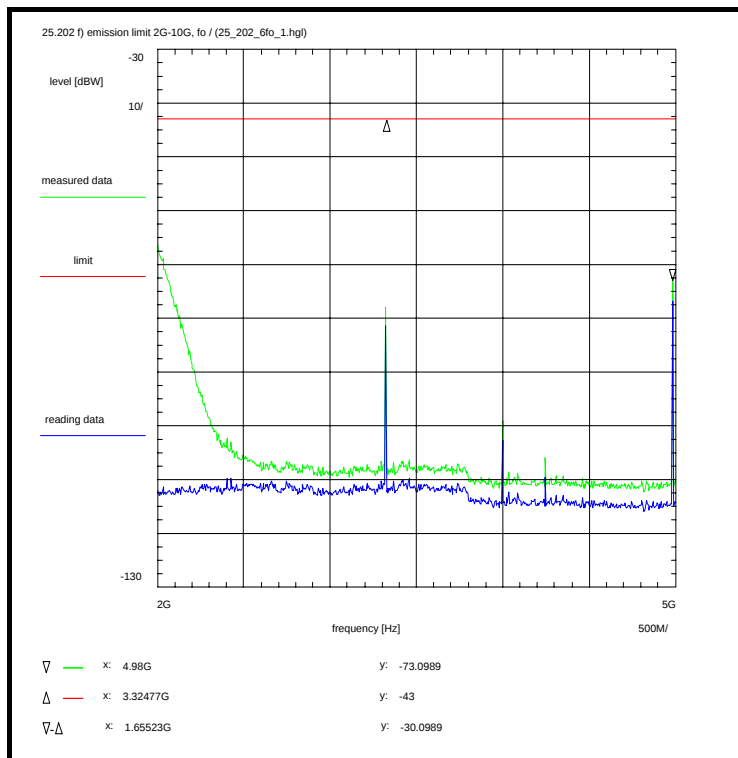
Test result: Test passed

Remarks:

Carrier-on state / Carrier at the upper edge of the band (fo)

For EIRP calculation:

'worst-case' = maximum antenna gain

Annex 3: Measurement result no. 52 (57)**Information on the measurement:****Environment condition:**

Date & Time: Thu 03/Aug/2006 12:19:46
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 2 GHz
Stop frequency: 5 GHz
Center frequency: 3.5 GHz
Frequency span: 3 GHz
Input attenuation: 0 dB
Resolution-BW: 100 kHz
Video-BW: 100 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler (WHPF) + 3.6 dB
Coaxial cable (C217) + 1.0 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 6.6 dB

Limit:**Limit acc. to 25.202 f):**

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the upper edge of the band (fo)

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see section 1.5.2
CH 1087

Test setup:

see annex 1: 1.2hgij

Test equipment:

see annex 2: C217, R001, U214, WHPF

Data of correction:

see annex 4

Remark:**Test result:**

Test passed

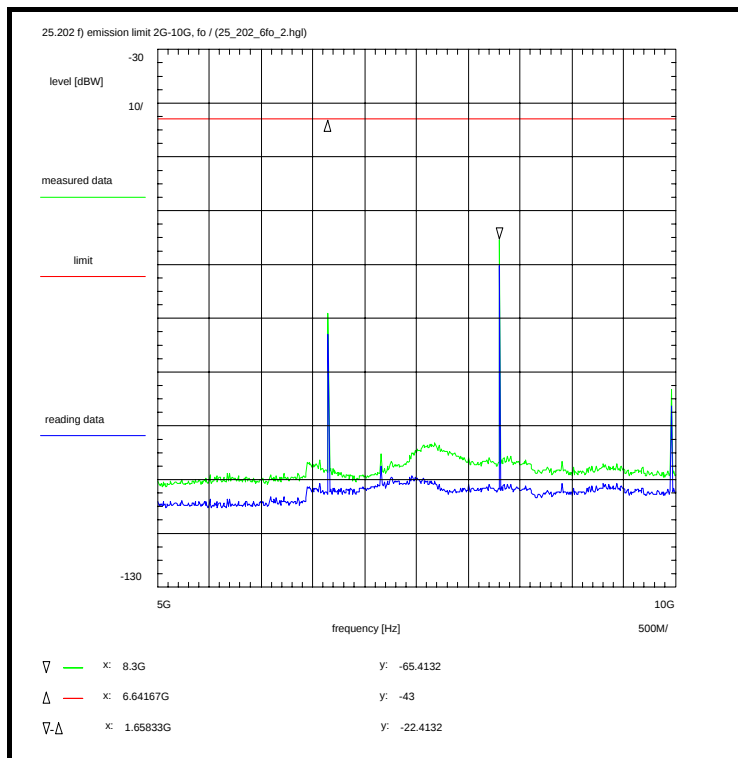
Remarks:

Carrier-on state / Carrier at the upper edge of the band (fo)

For EIRP calculation:

'worst-case' = maximum antenna gain

Rather left the plot shows the frequency response of the high pass filter.
The plot shows the 2nd and 3rd harmonic and two spurious.

Annex 3: Measurement result no. 53 (57)**Information on the measurement:****Environment condition:**

Date & Time: Thu 03/Aug/2006 13:16:44
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 5 GHz
Stop frequency: 10 GHz
Center frequency: 7.5 GHz
Frequency span: 5 GHz
Input attenuation: 0 dB
Resolution-BW: 100 kHz
Video-BW: 100 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler (WHPF) + 0.3 dB
Coaxial cable (C217) + 1.5 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.4 dB
TOTAL CORRECTION: + 4.2 dB

Limit:**Limit acc. to 25.202 f):**

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: $-(43+10\log(P_{max}))\text{dBc/4kHz}$

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the upper edge of the band (fo)

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see section 1.5.2
CH 1087

Test setup:
see annex 1: 1.2hgij

Test equipment:
see annex 2: C217, R001, U214, WHPF

Data of correction:
see annex 4

Remark:

Test result: Test passed

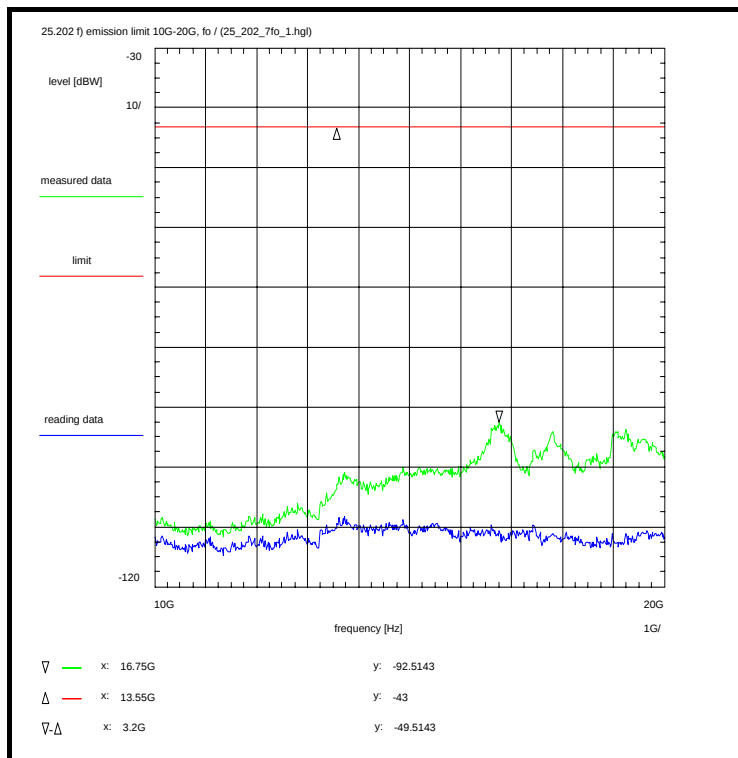
Remarks:

Carrier-on state / Carrier at the upper edge of the band (fo)

For EIRP calculation:

'worst-case' = maximum antenna gain

The plot shows the 4th, 5th and 6th harmonic.

Annex 3: Measurement result no. 54 (57)**Information on the measurement:****Environment condition:**

Date & Time: Thu 03/Aug/2006 13:21:09
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 50 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 10 GHz
Stop frequency: 20 GHz
Center frequency: 15 GHz
Frequency span: 10 GHz
Input attenuation: 0 dB
Resolution-BW: 100 kHz
Video-BW: 100 kHz
Video-Average: 1 sweep(s) (>1)
Detector-Mode: 2 Pos Peak (Maximum-Hold)

Correction (average):

Directional coupler (WHPF) + 0.7 dB
Coaxial cable (C217) + 2.2 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 14.2 dB
TOTAL CORRECTION: + 9.1 dB

Limit:**Limit acc. to 25.202 f):**

50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -(43+10log(Pmax))dBc/4kHz

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the upper edge of the band (fo)

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see section 1.5.2
CH 1087

Test setup:

see annex 1: 1.2hgij

Test equipment:

see annex 2: C217, R001, U214, WHPF

Data of correction:

see annex 4

Remark:

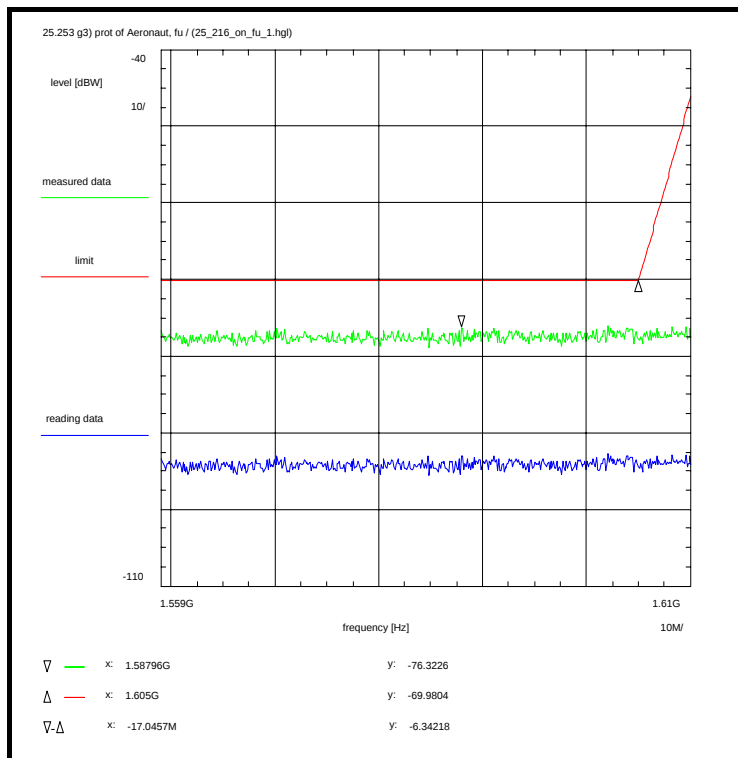
Test result: Test passed

Remarks:

Carrier-on state / Carrier at the upper edge of the band (fo)

For EIRP calculation:

'worst-case' = maximum antenna gain

Annex 3: Measurement result no. 55 (57)**Information on the measurement:****Environment condition:**

Date & Time: Tue 01/Aug/2006 09:54:31
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 25 °C
Humidity: 55 %
Voltage: 10 Vdc

Setup of measurement equipment:

Start frequency: 1.559 GHz
Stop frequency: 1.61 GHz
Center frequency: 1.5845 GHz
Frequency span: 51 MHz
Input attenuation: 20 dB
Resolution-BW: 1 MHz
Video-BW: 1 MHz
Video-Average: 100 sweep(s) (>1)
Detector-Mode: 1 Sample (VidAvg / VidBW<300Hz)

Correction (average):

Directional coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation (U214) + 10.0 dB
TOTAL CORRECTION: + 16.7 dB

Limit:**Limits acc. to 25.216 c) f) h):**

1559.0 - 1605.0 MHz: -70dBW/1MHz
1605.0 - 1610.0 MHz: -70 to -46dBW/1MHz
(linearly interpolated)

The EIRP, averaged over any two-millisecond active transmission interval from the MESS in the carrier-on state shall not exceed the limits above.

Subclause: 25.216 Limits on emissions from mobile earth stations for protection of aeronautical radionavigation-satellite service

Carrier-on state, modulated carrier at the lower edge of the band (fu)
Conducted measurement at the antenna-connector

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see section 1.5.2
CH 3

Test setup:

see annex 1: 1.2hgj

Test equipment:

see annex 2: C217, R001, U214

Data of correction:

see annex 4

Remark:**Test result:**

Test passed

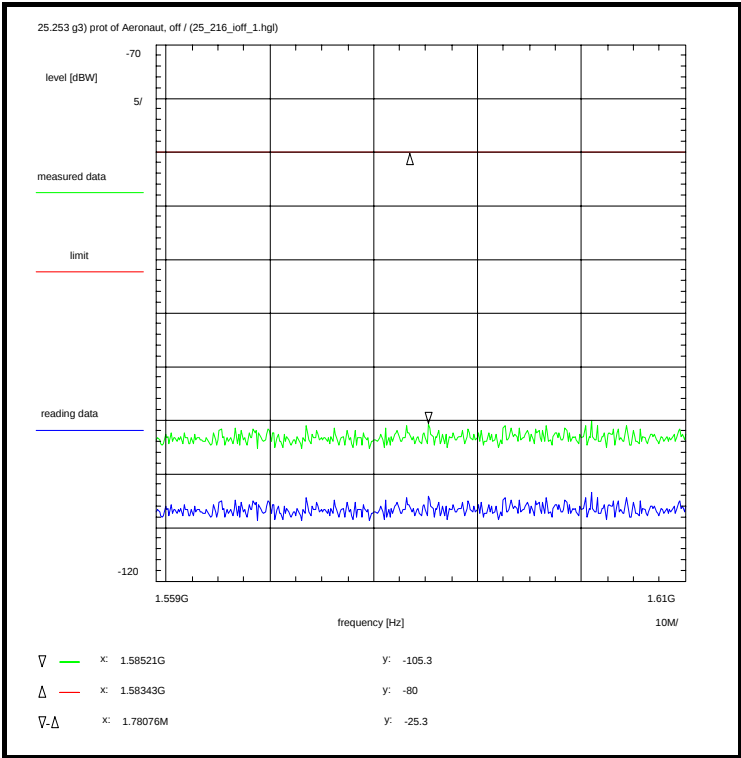
Remarks:

Carrier-on state / Carrier at the lower edge of the band (fu)

For EIRP calculation:

'worst-case' = nominal on-axis antenna gain at fu
Measurement with 1 MHz resolution/video filter and noise averaging.

Annex 3: Measurement result no. 57 (57)



Information on the measurement:

Environment condition:
Date & Time: Mon 31/Jul/2006 15:07:50
Location: CETECOM ICT Services GmbH, Laboratory RSC-Sat
Temperature: 26 °C
Humidity: 55 %
Voltage: 10 Vdc

Setup of measurement equipment:
Start frequency: 1.559 GHz
Stop frequency: 1.61 GHz
Center frequency: 1.5845 GHz
Frequency span: 51 MHz
Input attenuation: 0 dB
Resolution-BW: 1 MHz
Video-BW: 1 MHz
Video-Average: 100 sweep(s) (>1)
Detector-Mode: 1 Sample (VidAvg / VidBW<300Hz)

Correction (average):
Directional Coupler + 0.0 dB
Coaxial cable (C217) + 0.7 dB
DUT-Antenna (on-axis) + 6.0 dBi
Test antenna + 0.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuation + 0.0 dB
TOTAL CORRECTION: + 6.7 dB

Limit:
Limits acc. to 25.216 i): -80dBW/1MHz
The EIRP, averaged over any two-millisecond active transmission interval from the MESS in the carrier-off state shall not exceed the limit above.

Subclause: 25.216 Limits on emissions from mobile earth stations for protection of aeronautical radionavigation-satellite service
Carrier-off state, conducted measurement at the antenna-connector

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 2, see section 1.5.2

Test setup:
see annex 1: 1.2g)

Test equipment:
see annex 2: C217, R001

Data of correction:
see annex 4

Remark:

Test result: Test passed

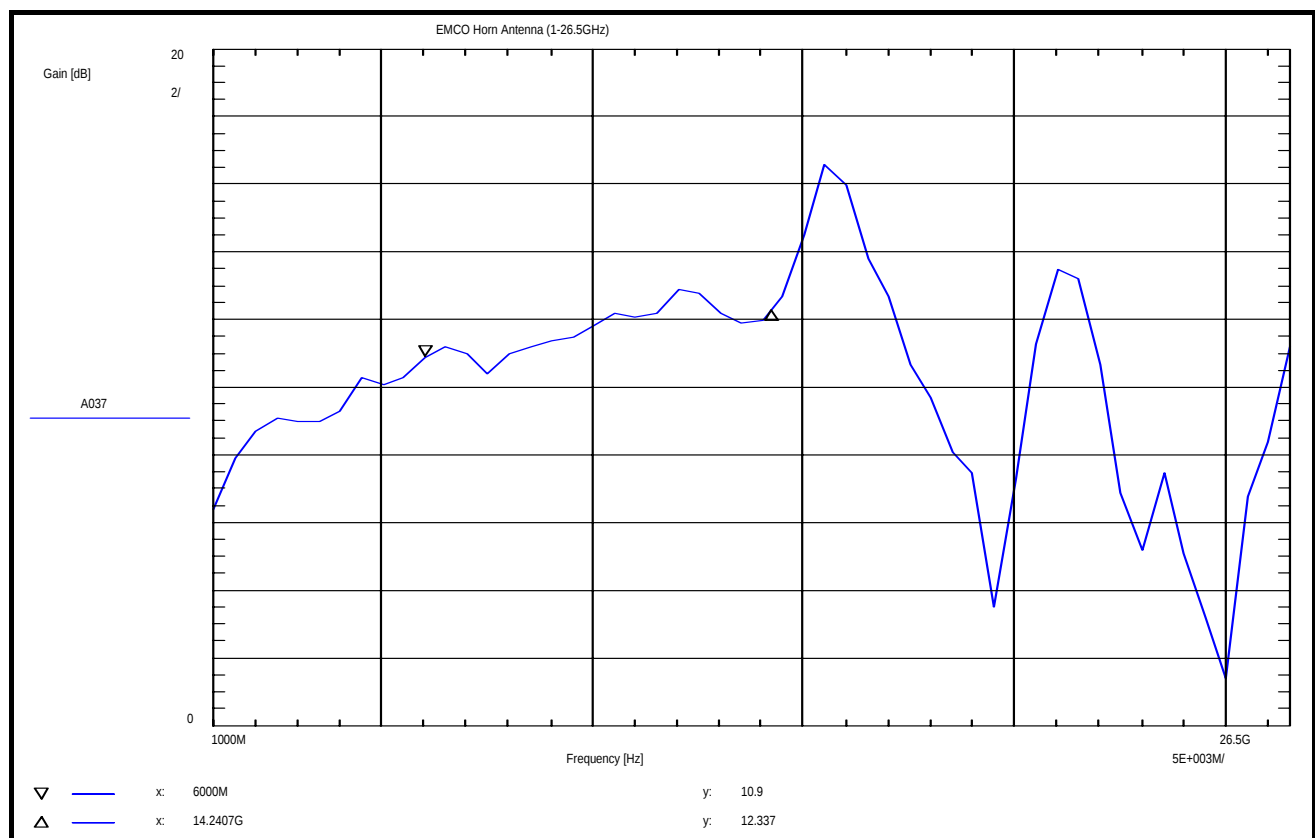
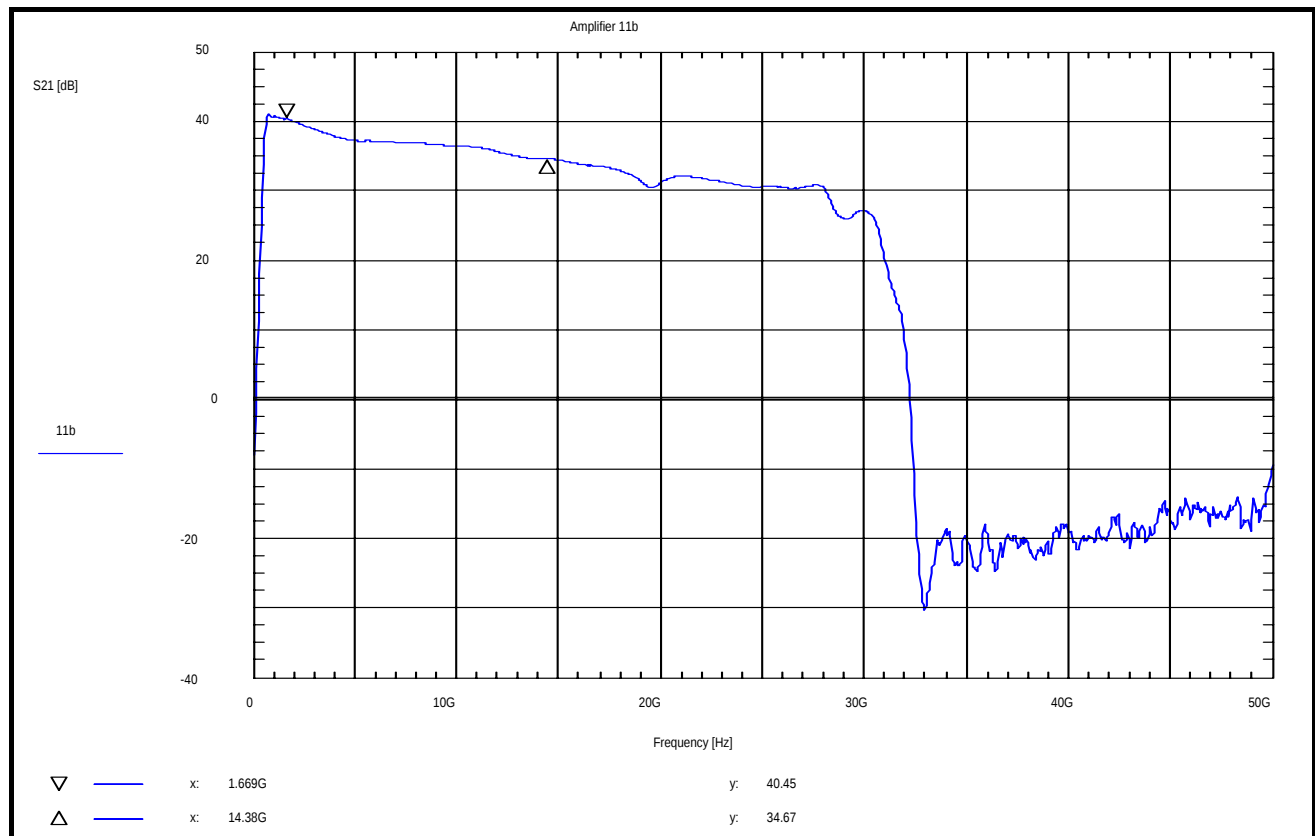
Remarks:
Carrier-off state
Measurement with 1 MHz resolution/video filter and noise averaging.

Annex 4: Data of correction

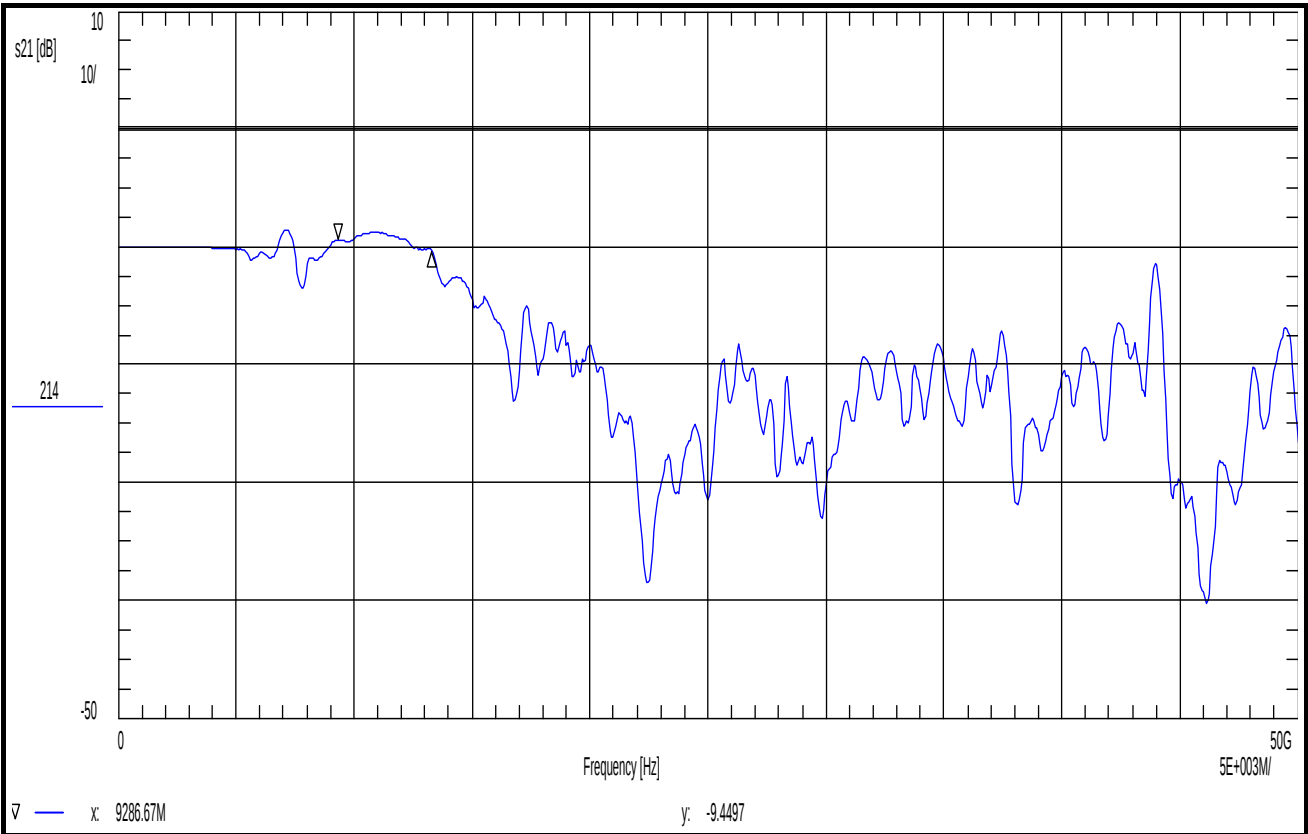
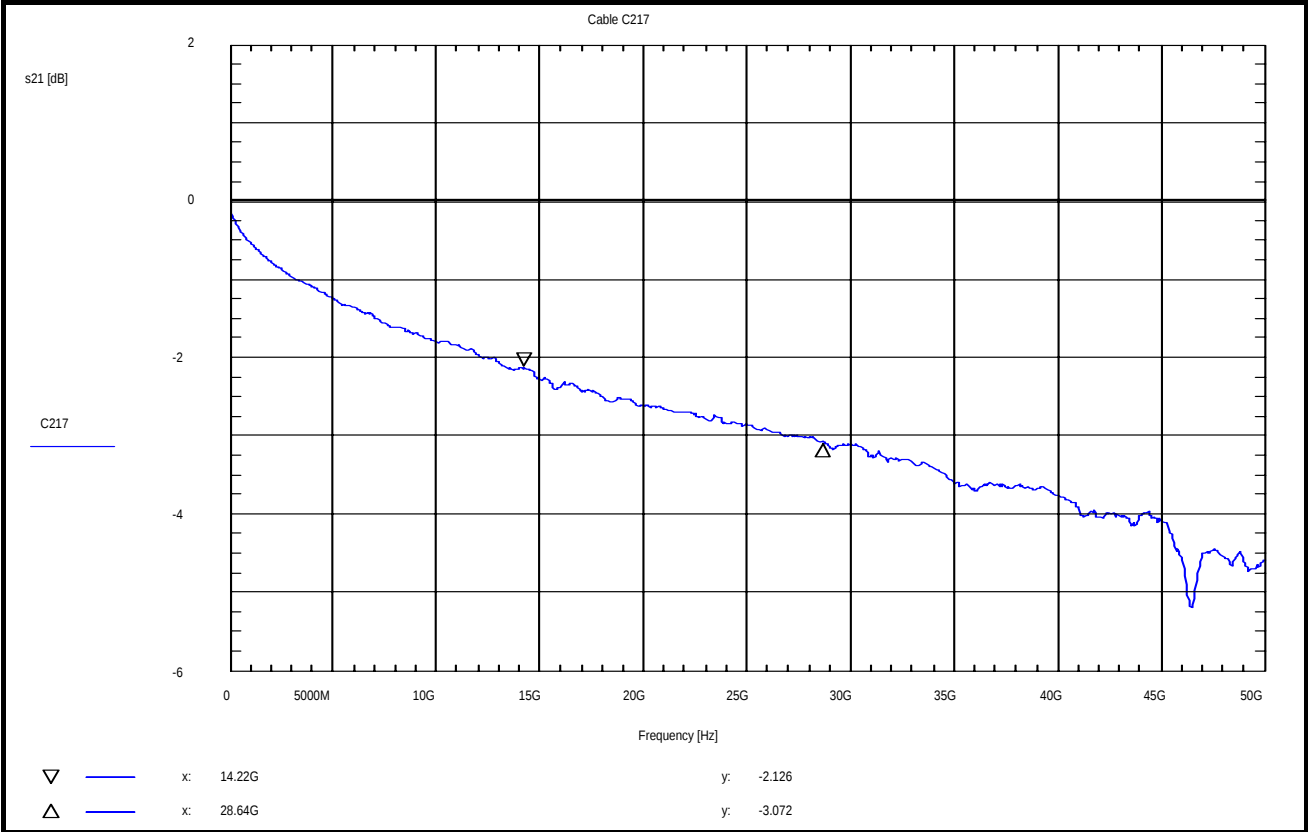
Annex 4 consists of 4 pages including this page.

no.	list of contents
1	Amplifier '11b': Transmission data (NWA-measurement)
2	Gain versus frequency diagrams of Horn Ant. 1-26.5GHz: 'A037' '
3	Coaxial cable 'C217': Transmission data (NWA-measurement)
4	10dB-Attenuator N-connected 'U214': Transmission data (NWA-measurement)

Annex 4: Data of correction 1 - 2



Annex 4: Data of correction 3 - 4



Annex 5: Photographs

Annex 5 consists of 15 pages including this page.

no.:	list of contents
1	Test setup for conducted measurements in the test laboratory: cable, 10 dB Attenuator and Thuraya Satellite Module
2	see #1
3	see #1
4	Thuraya Satellite Module
5	see #4, detail view
6	see #4, detail view
7	see #4, detail view
8	see #4, detail view
9	Test setup for conducted measurements (frequency stability) in the climatic exposure test cabinet: cable and Thuraya Satellite Module
10	see #9, detail view
11	see #4, detail view, type label
12	see #11
13	see #11
14	Test setup for radiated measurements in anechoic chamber (30 MHz - 12.5 GHz), turn-table 0°

Photo no.: 1

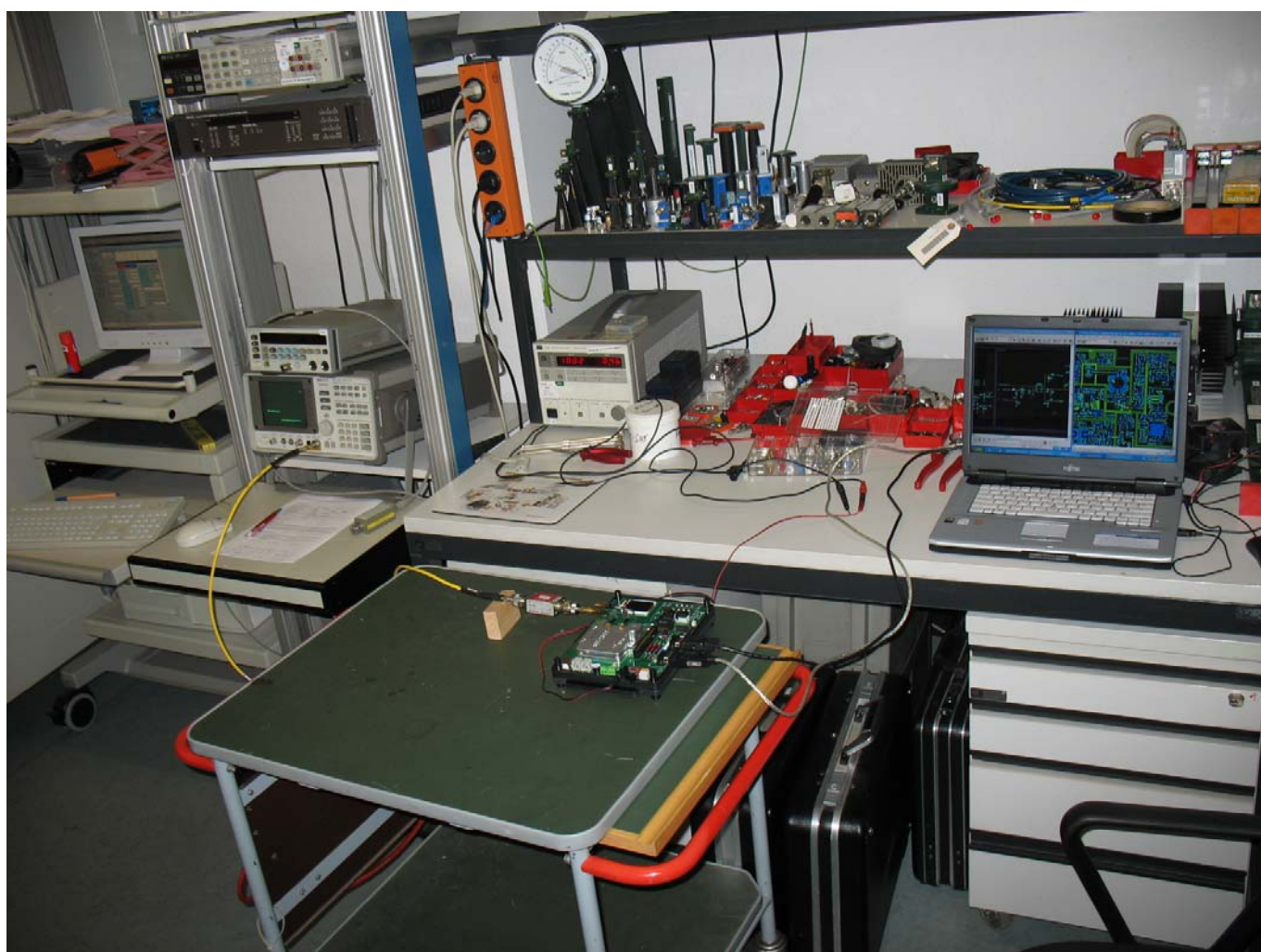


Photo no.: 2



Photo no.: 3

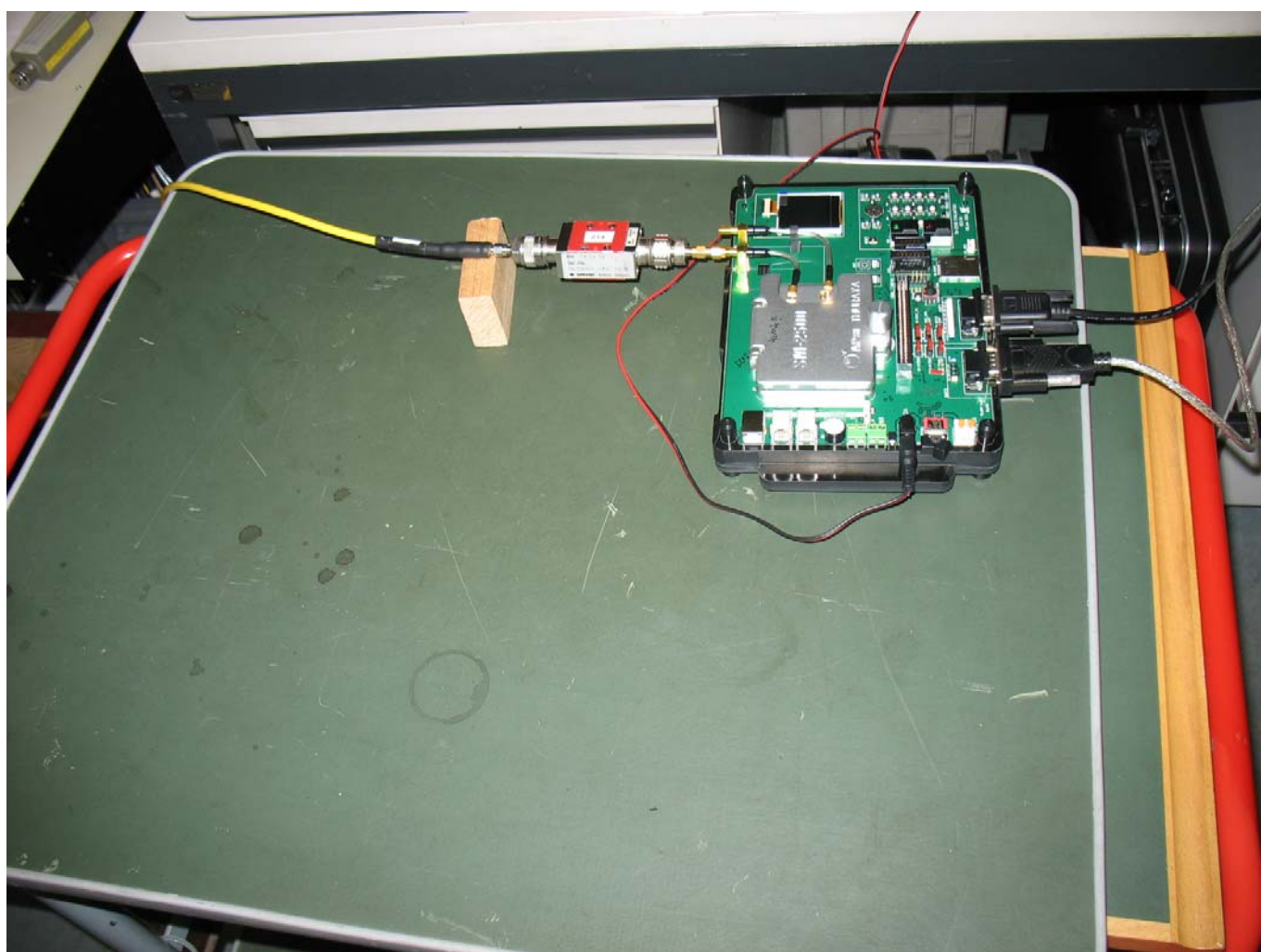


Photo no.: 4

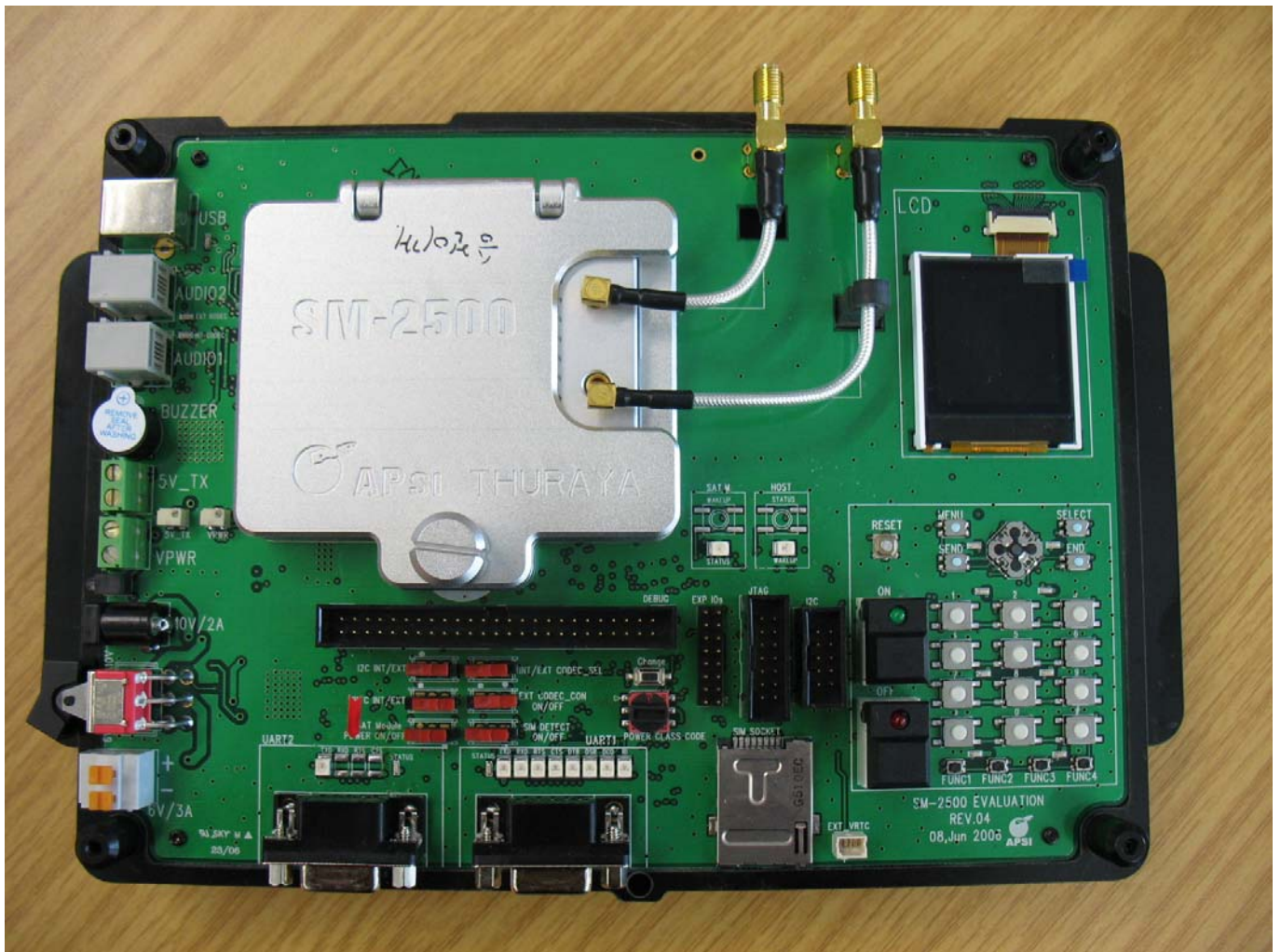


Photo no.: 5



Photo no.: 6



Photo no.: 7

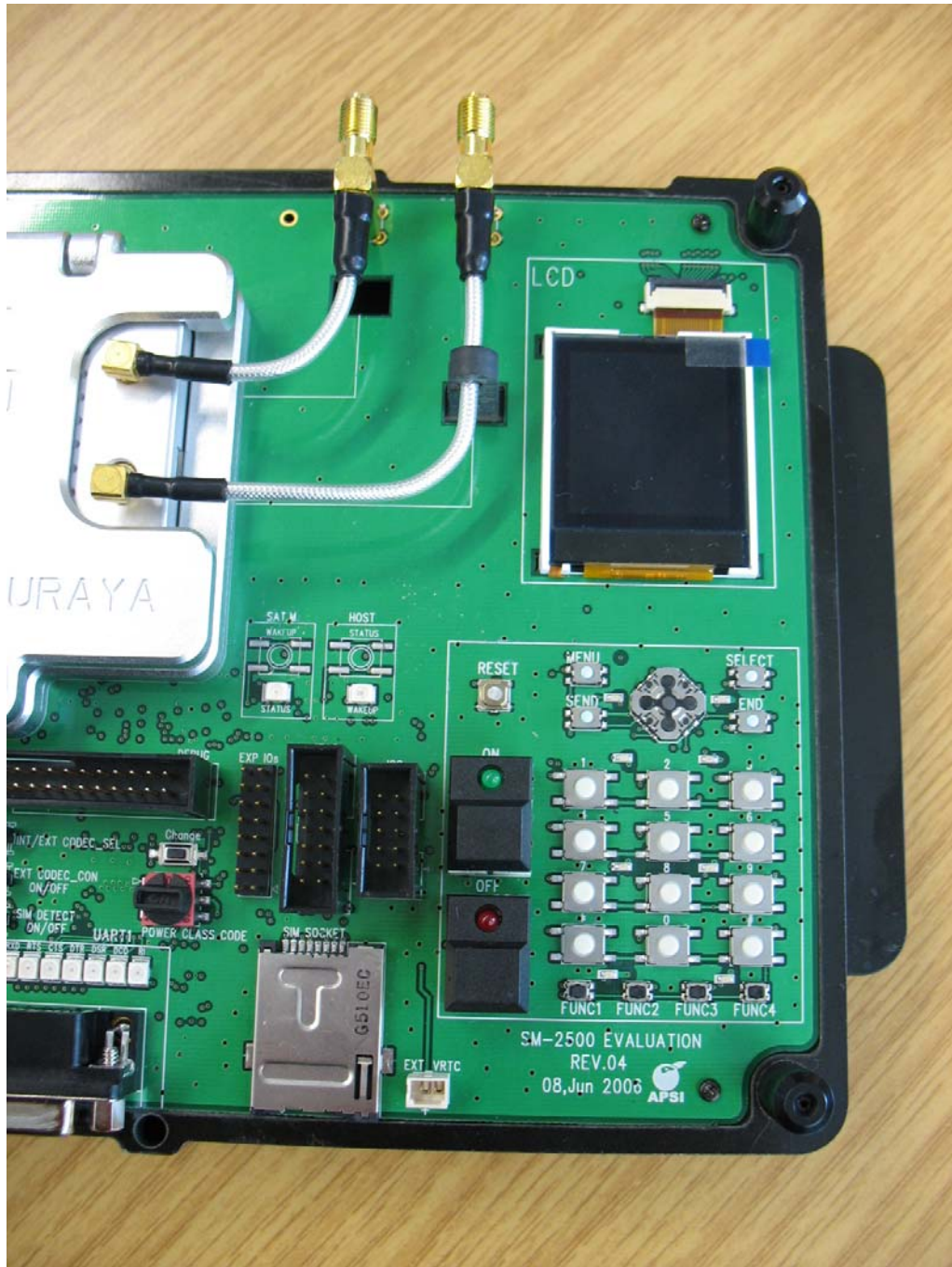


Photo no.: 8



Photo no.: 9



Photo no.: 10

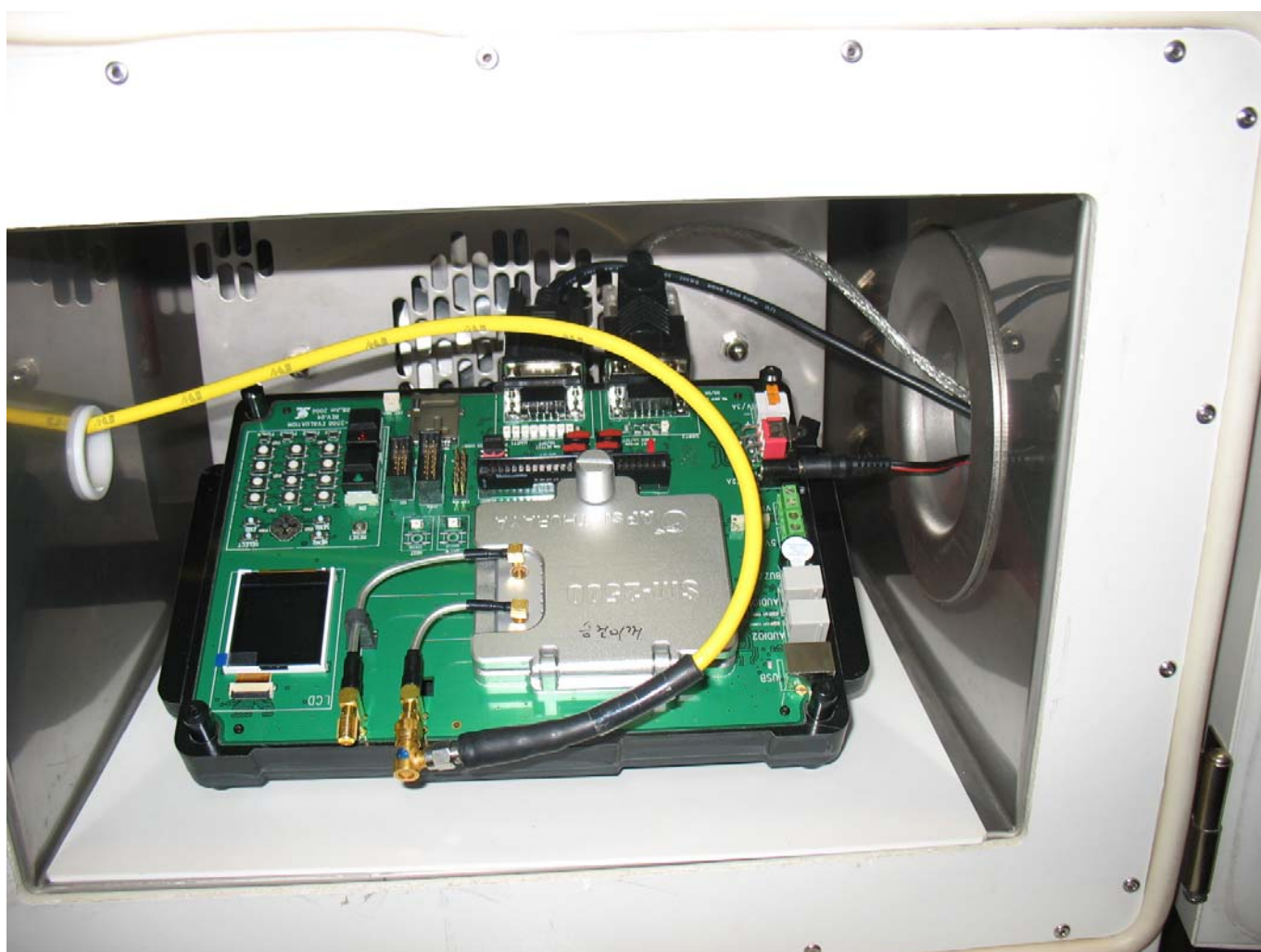


Photo no.: 11



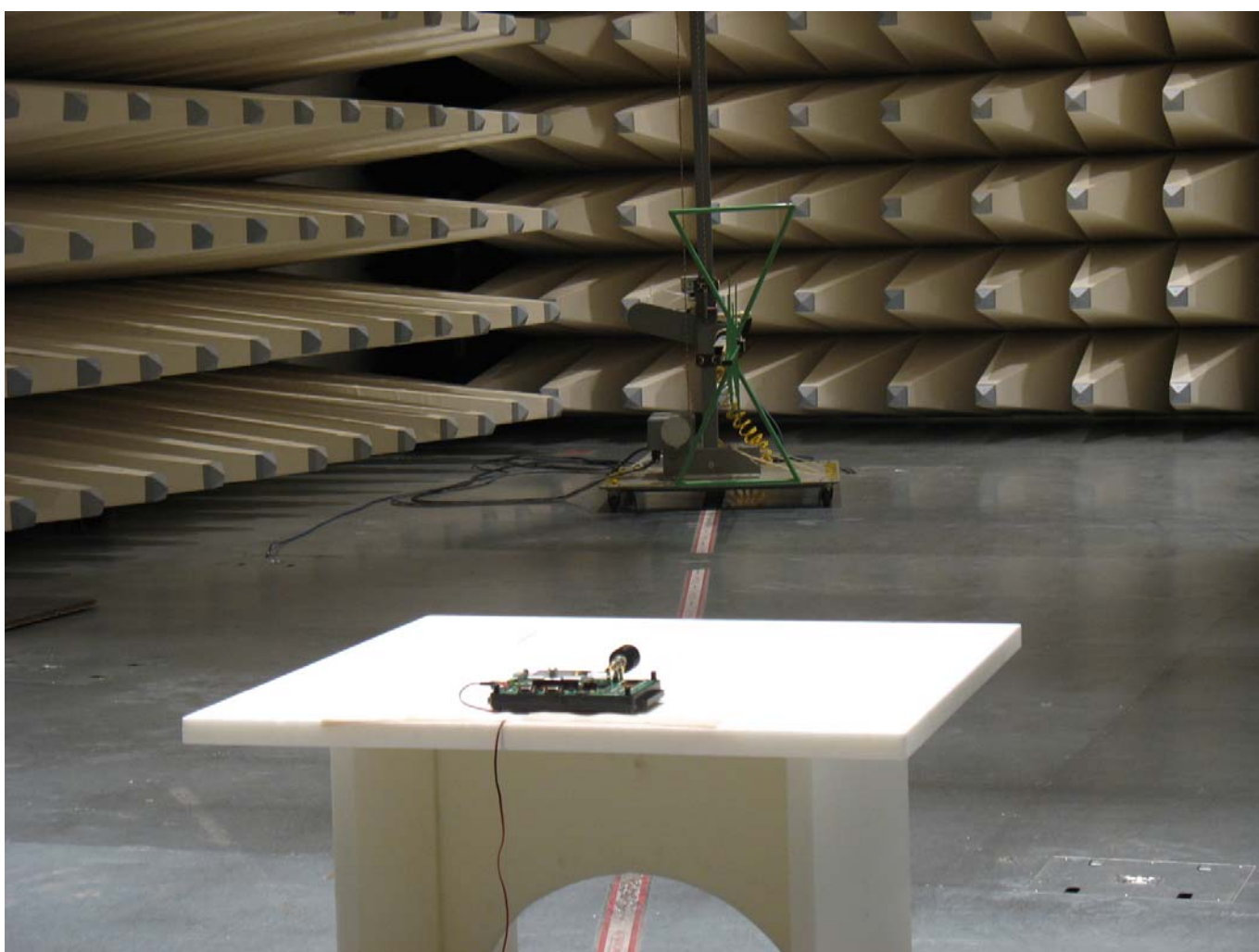
Photo no.: 12



Photo no.: 13



Photo no.: 14



Annex 6: Technical description(s) of the test item

Annex 6 consists of 2 pages including this page.

no.	list of contents
1	Asia Pacific Satellite Industries Co., Ltd., Technical Specification and Description of SM-2500

1. Technical Specification of SM-2500

Transmitter frequency range(s)	1626.5~1660.5 MHz	
Channel Bandwidth	31.25 KHz	
Receiver frequency range(s)	1525~1559 MHz	
Transmitter power	Max 3.2 W	Typical 1.8 W
Radiated power (EIRP)		
Intermediate frequency	246MHz	Level -20 dBm
Frequency Accuracy	Uncorrected: < ±5ppm	Corrected : < ±0.006ppm
Kind of Baseband signal	voice / circuit data / packet data / fax	
Kind of modulation (s)	$\pi/4$ - CQPSK	
Occupied bandwidth	Please put the measured value at Cetecom	
Nominated bandwidth	Please put the measured value at Cetecom	
Data rate(s)	Tx: 2.4Kbps /4.8Kbps/ 9.6Kbps /14.4Kbps	Rx2.4Kbps /4.8Kbps/ 9.6Kbps /60Kbps
FEC	Convolution (1/2, 1/3, 1/4,1/5)	
Power supply	Typ 3.7Vdc / Typ. 5.0Vdc for PA	

2. Description of SM-2500

It supports various services such as voice, circuit data, packet data and fax etc.
SM-2500 serves the various interfaces , UART, LCD, SIM, keypad, digital and analogue audio interfaces....etc.



Hyoung Won Ahn

Asia Pacific Satellite Industries Co., Ltd.