

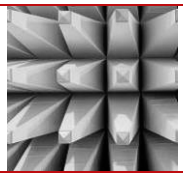

CETECOM ICT Services
consulting - testing - certification

TEST REPORT

Test report no.: 1-1554-01-27/09

Deutscher Akkreditierungs Rat DAR

Testing laboratory

CETECOM ICT Services GmbH
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Accredited test laboratory:
The test laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025
DAR registration number: DGA-PL-176/94-D1

Area of Testing: Radio/Satellite Communications

Applicant

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Manufacturer

Digi International GmbH
Branch Breisach
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79206 Breisach / Germany

Test standard/s

Arib T66	特定無線設備の技術基準適合証明等に関する規則 Ordinance concerning Technical Regulations Conformity Certification etc. of Specified Radio Equipment Article 2 clause (1) Item (19) (3)

For further applied test standards please refer to section 3 of this test report.

Test item

Kind of test item:	WLAN Modul
Model name:	ConnectCore Wi-i.Mx51
Frequency [MHz]:	ISM band 5470 MHz to 5725 MHz (Lowest channel 5500 MHz; highest channel 5700 MHz)
Power supply:	100 V AC by AC/DC power supply
Temperature range:	-20 °C to +55 °C

This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test performed:

cn=Marco Bertolino, o=CETECOM ICT Services GmbH, ou=BTL-100826, email=marco.bertolino@cetecom.com, c=DE
2011.03.12 12:50:43 +01'00'
Marco Bertolino

Test report authorised:

cn=Andreas Keller, o=Cetecom ICT Services GmbH, ou=KLL-100830, email=Andreas.Keller@cetecom.com, c=DE
2011.03.12 12:27:30 +01'00'
Andreas Keller

1 Table of contents

1 Table of contents 2

2 General information 3

2.1 Notes 3
2.2 Application details 3

3 Test standard/s 3

4 Test environment 3

5 Test item 4

5.1 Cabinet 4

6 Test laboratories sub-contracted 4

7 Summary of measurement results 5

8 RF measurement testing 7

8.1 Description of test setup 7
8.1.1 Radiated measurements 7
8.1.2 Conducted measurements 9
8.2 Additional comments 9

9 Transmitter test results 10

9.1 Antenna gain 10
9.2 Maximum output power (conducted) / data rate 17
9.3 Antenna power (conducted) & tolerance of antenna power 26
9.4 Frequency tolerance 28
9.5 Modulation method 30
9.6 Spurious emission intensity – conducted & out - band leakage power 31
9.7 Spurious emission intensity - radiated 44
9.8 Occupied & spreading bandwidth 64
9.9 Adjacent channel emitted power 71
9.10 Spreading factor 75
9.11 Staying time 75
9.12 Dwell time 76
9.13 Receiver – limit of secondarily emitted radio wave strength - conducted 79
9.14 Receiver – limit of secondarily emitted radio wave strength - radiated 81
9.15 Interference prevention function 85
9.16 Carrier sensing function 85
9.17 Enclosure requirements 85

10 Test equipment and ancillaries used for tests 86

Annex A Photographs of the test setup 88

Annex B External photographs of the EUT 93

Annex C Internal photographs of the EUT 104

Annex D Document history 108

Annex E Further information 108

2 General information

2.1 Notes

The test results of this test report relate exclusively to the test item specified in this test report. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM ICT Services GmbH.
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2.2 Application details

Date of receipt of order:	2011-02-17
Date of receipt of test item:	2011-02-17
Start of test:	2010-12-01
End of test:	2011-03-11
Person(s) present during the test:	-/-

3 Test standard/s

Test standard	Version	Test standard description
		特定無線設備の技術基準適合証明等に関する規則 Ordinance concerning Technical Regulations Conformity Certification etc. of Specified Radio Equipment Article 2 clause (1) Item (19) (3)
Arib T66	-/-	Ordinance Regulating Radio Equipment 無線設備規則 Ordinance Regulating Radio Equipment Chapter I General Provision Chapter II Transmitting Equipment Chapter III Receiving Equipment Chapter IV, Section 4.17, Article 49.20.3

4 Test environment

Temperature:	T_{nom}	+24 °C	during room temperature tests
	T_{max}	+55 °C	during high temperature test
	T_{min}	-20 °C	during low temperature test
Relative humidity content:		60 %	
Air pressure:		not relevant for this kind of testing	
Power supply:	V_{nom}	100 V	AC by AC/DC power supply
	V_{max}	110 V	
	V_{min}	90 V	

5 Test item

Kind of test item	:	WLAN Modul
Type identification	:	Connect Core Wi-i.Mx51
S/N serial number	:	Prototype 55001445-92
HW hardware status	:	No information available!
SW software status	:	No information available!
Frequency band [MHz]	:	5470 MHz to 5725 MHz ISM band lowest channel 5500 MHz → highest channel 5700 MHz
Type of modulation	:	OFDM technology with BPSK, QPSK, 16- & 64 QAM modulation
Number of channels	:	11
Antenna	:	External rod antenna → for more information, please take a look at the annex B – external photos of the EUT.
Power supply	:	100 V AC by AC/DC power supply
Temperature range	:	-20°C to +55 °C

5.1 Cabinet

Evaluation board:

Size	21.0 cm * 18.5 cm * 2.5 cm
Weight	50.83 g without WLAN module
Cabinet	No cabinet! (see photos for details)

Module:

Size	8.2 cm * 5.0 cm * 0.8 cm
Weight	26.35 g
Cabinet	No cabinet! (see photos for details)

6 Test laboratories sub-contracted

None

7 Summary of measurement results

☒	**No deviations from the technical specifications were ascertained**
☐	There were deviations from the technical specifications ascertained

TC identifier	Description	verdict	date	Remark
RF-Testing	特定無線設備の技術基準適合証明等に関する規則 Ordinance concerning Technical Regulations Conformity Certification etc. of Specified Radio Equipment Article 2 clause (1) Item (19) (3) Ordinance Regulating Radio Equipment 無線設備規則 Ordinance Regulating Radio Equipment Chapter I General Provision Chapter II Transmitting Equipment Chapter III Receiving Equipment Chapter IV, Section 4.17, Article 49.20.3	Pass	2011-03-12	-/-

Test Specification Clause	Test Case	temperature conditions	power source voltages	Mode	Pass	Fail	NA	NP	Remark
9.1	Antenna gain	Nominal	Nominal	OFDM	☒	☐	☐	☐	-/-
9.2	Output power / data rate	Nominal	Nominal	OFDM	☐	☐	☐	☐	No passed / fail criteria
9.3	Antenna power (conducted) & tolerance of antenna power	Nominal	Nominal	OFDM	☒	☐	☐	☐	-/-
		Nominal	Low	OFDM	☒	☐	☐	☐	
		Nominal	High	OFDM	☒	☐	☐	☐	
9.4	Frequency tolerance	Nominal	Nominal	OFDM	☒	☐	☐	☐	-/-
9.5	Modulation method	Nominal	Nominal	OFDM	☒	☐	☐	☐	-/-
9.6	Spurious emission intensity - conducted	Nominal	Nominal	OFDM	☒	☐	☐	☐	-/-
9.7	Spurious emission intensity - radiated	Nominal	Nominal	OFDM	☒	☐	☐	☐	-/-
9.8	Occupied & spreading bandwidth	Nominal	Nominal	OFDM	☒	☐	☐	☐	-/-
9.9	Adjacent channel emitted power	Nominal	Nominal	OFDM	☒	☐	☐	☐	-/-

9.10	Spreading factor	Nominal	Nominal	OFDM	☒	☐	☐	☐	-/-
9.11	Staying time	Nominal	Nominal	-/-	☐	☐	☒	☐	-/-
9.12	Dwell time	Nominal	Nominal	OFDM	☒	☐	☐	☐	-/-
9.13	Receiver – limit of secondarily emitted radio wave strength – conducted	Nominal	Nominal	-/-	☒	☐	☐	☐	-/-
9.14	Receiver – limit of secondarily emitted radio wave strength - radiated	Nominal	Nominal	-/-	☒	☐	☐	☐	-/-
9.15	Interference prevention function	Nominal	Nominal	-/-	☒	☐	☐	☐	-/-
9.16	Carrier sensing function	Nominal	Nominal	-/-	☒	☐	☐	☐	-/-
9.17	Enclosure requirements	Nominal	Nominal	-/-	☐	☐	☒	☐	-/-

Note:
NA = Not applicable; NP = Not performed

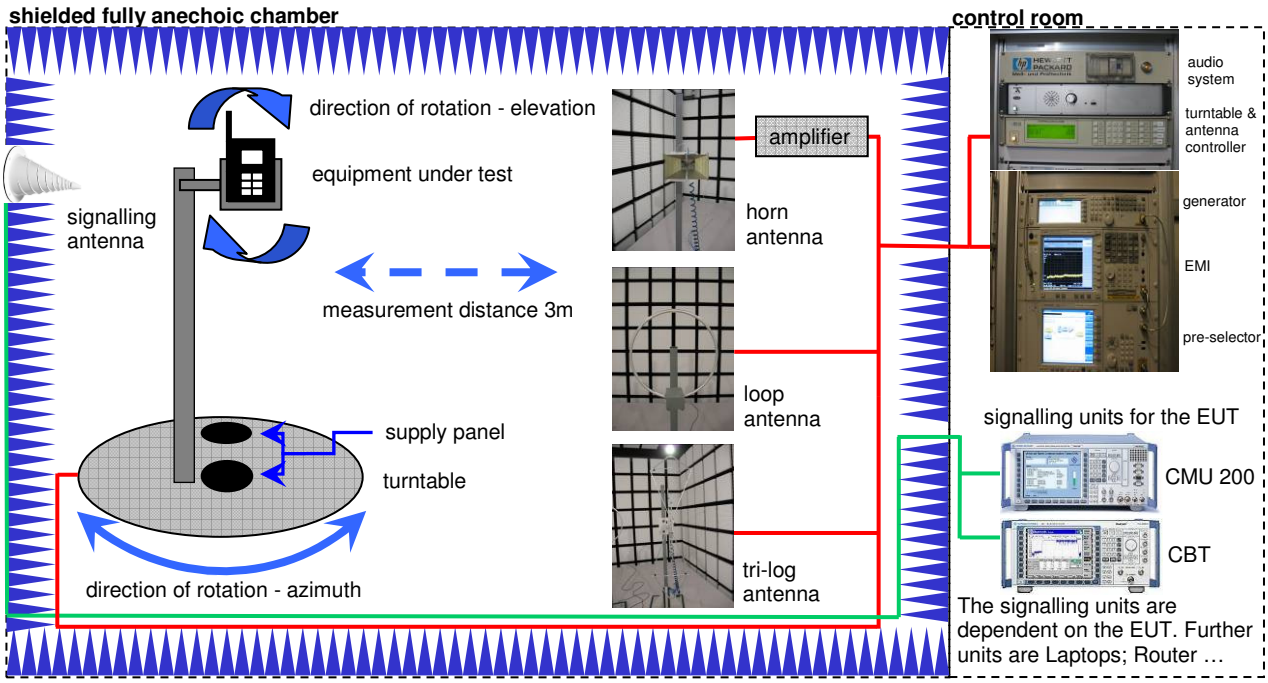
8 RF measurement testing

8.1 Description of test setup

8.1.1 Radiated measurements

The radiated emissions from the EUT are performed in a fully anechoic chamber. The EUT is placed on a non conductive turntable and powered with nominal voltage. The signalling is performed either from outside the chamber with a signalling unit (AP or other) by air link using a signalling antenna or directly by special test software from the customer.

Fully anechoic chamber

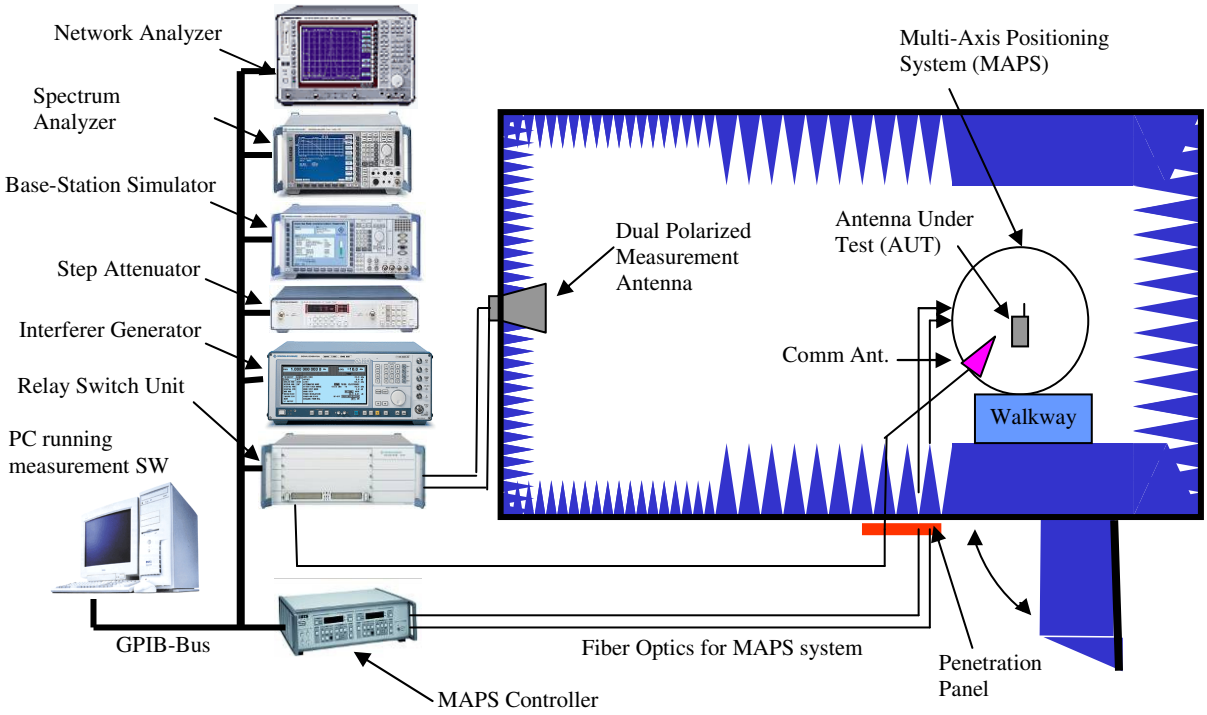


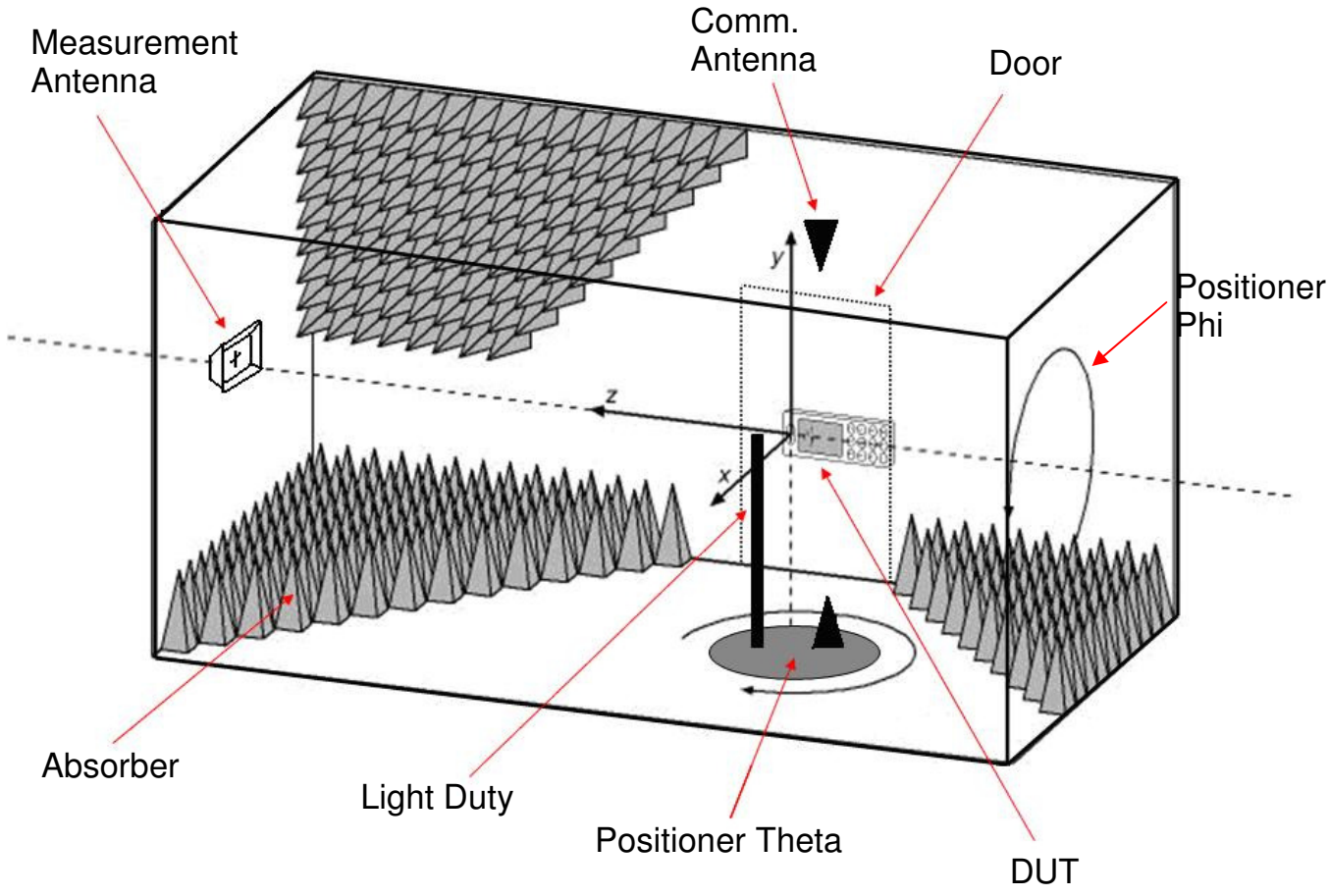
Picture 1: Diagram radiated measurements

9 kHz - 30 MHz:	active loop antenna
30 MHz - 1GHz:	tri-log antenna
>1GHz:	horn antenna

OTA chamber:

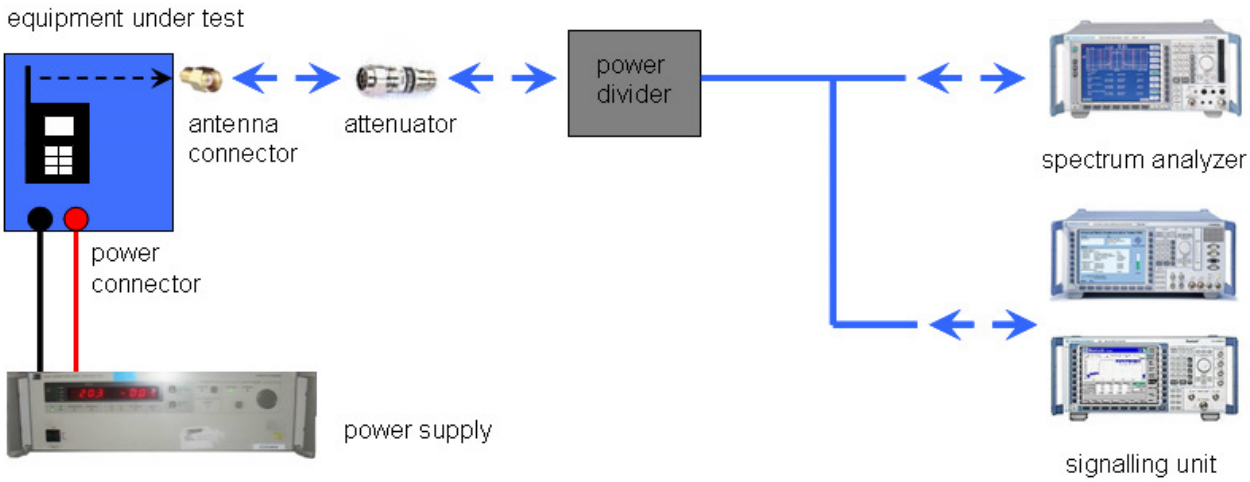
The Rectangular Chamber consists of a shielded enclosure constructed of rigid steel panels. The chamber is treated with pyramidal and wedge shaped absorbers. Lighting in the chamber is RF-filtered and consists of four incandescent lamps mounted in recessed waveguide vents in the chamber ceiling. A single leaf swing type shielded door is provided for equipment and personal access into the chamber. The Anechoic Rectangular Chamber is capable of meeting RF attenuation level better than 100 dB throughout the frequency range of 700 MHz to 18 GHz, so that testing performed within the chamber does not interfere with other testing activities at the facility and vice versa. Power is supplied on separate circuits to the chamber and control area. All power filters provide a minimum of 100 dB attenuation over a frequency range of 14 kHz to 18 GHz if tested per MIL STD 220A.


Network Analyzer
Spectrum Analyzer
Base-Station Simulator
Step Attenuator
Interferer Generator
Relay Switch Unit
PC running measurement SW
GPIB-Bus
MAPS Controller
Multi-Axis Positioning System (MAPS)
Dual Polarized Measurement Antenna
Antenna Under Test (AUT)
Comm Ant.
Walkway
Fiber Optics for MAPS system
Penetration Panel


Measurement Antenna
Comm. Antenna
Door
Positioner Phi
Absorber
Light Duty
Positioner Theta
DUT

8.1.2 Conducted measurements

The EUT's RF signal is coupled out by the antenna connector which is supplied by the manufacturer. The signal is first 10dB attenuated before it is power divided (~6dB loss per branch). One of the signal paths is connected to the signalling unit (AP or other), the other one is connected to the spectrum analyzer. The specific losses for both signal paths are first checked within a calibration. The measurement readings on the signalling unit/spectrum analyzer are corrected by the specific test set-up loss. The attenuator, power divider, signalling unit and the spectrum analyzer are impedance matched on 50 Ohm. If special software is used, there is no power divider necessary.



Picture 2: Diagram conducted measurements

The term measuring receiver refers to either a selective voltmeter or a spectrum analyser.

Frequency being measured f	Measuring receiver bandwidth 6 dB	Spectrum analyser bandwidth 3dB
f < 150 kHz	200 Hz or	300 Hz
150 kHz ≤ f < 25 MHz	9 kHz or	10 kHz
25 MHz ≤ f < 1000 MHz	120 kHz or	100 kHz
1000 MHz ≤ f		1 MHz
NOTE: Specific requirements in CEPT/ERC/Recommendation 70-03 [2] shall be applied where applicable.		

8.2 Additional comments

Provided channels: 5500 MHz, 5520 MHz, 5540 MHz, 5560 MHz, 5580 MHz, 5600 MHz, 5620 MHz, 5640 MHz, 5660 MHz, 5680 MHz, 5700 MHz

9 Transmitter test results

9.1 Antenna gain

The antenna gain is calculated by the difference of radiated power in EIRP and the conducted power of the module.

Measurement parameter	
Detector:	Peak (worst case)
Sweep time:	Auto
Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Span:	40 MHz
Trace-Mode:	Max Hold
Additional EUT parameters:	Power index 26 OFDM

Results:

	lowest channel 5500 MHz	mid channel 5600 MHz	highest channel 5700 MHz
Conducted peak power [dBm] OFDM (measured)	5.91	4.55	1.98
Radiated peak power [dBm] OFDM (calculated)EIRP*)	10.40	8.13	5.00
Gain [dBi] calculated	4.49	3.58	3.02

*) max found peak (see Annex Antenna Diagram)

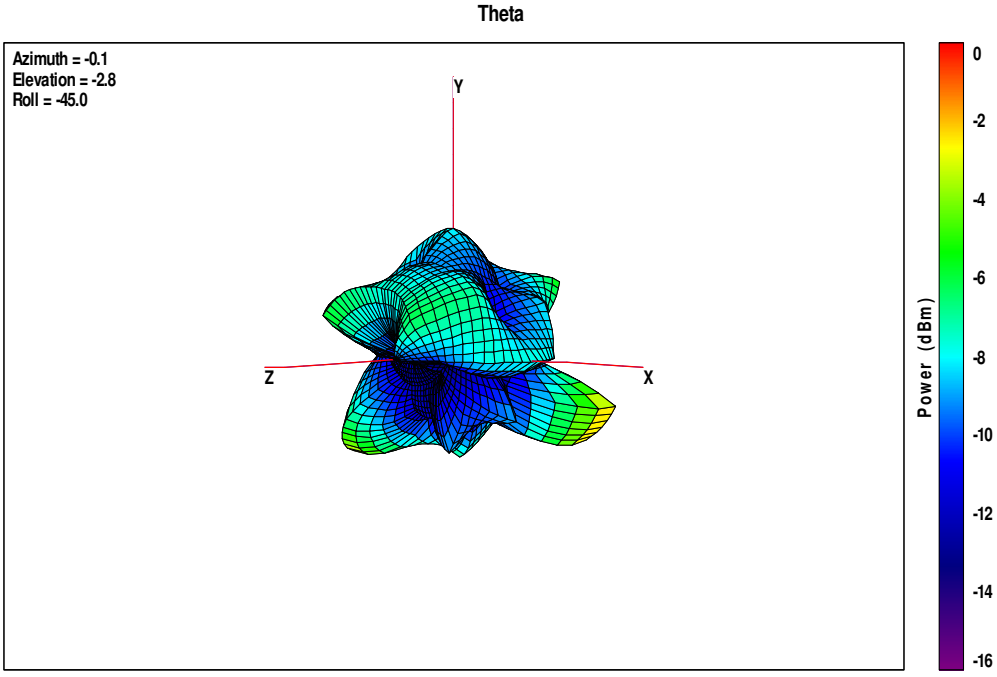
Limit:

No limitation! **Maximum conducted power = 10 mW / MHz** **Maximum radiated power = 50 mW / MHz (with TPC)** **Maximum radiated power = 25 mW / MHz (without TPC)**

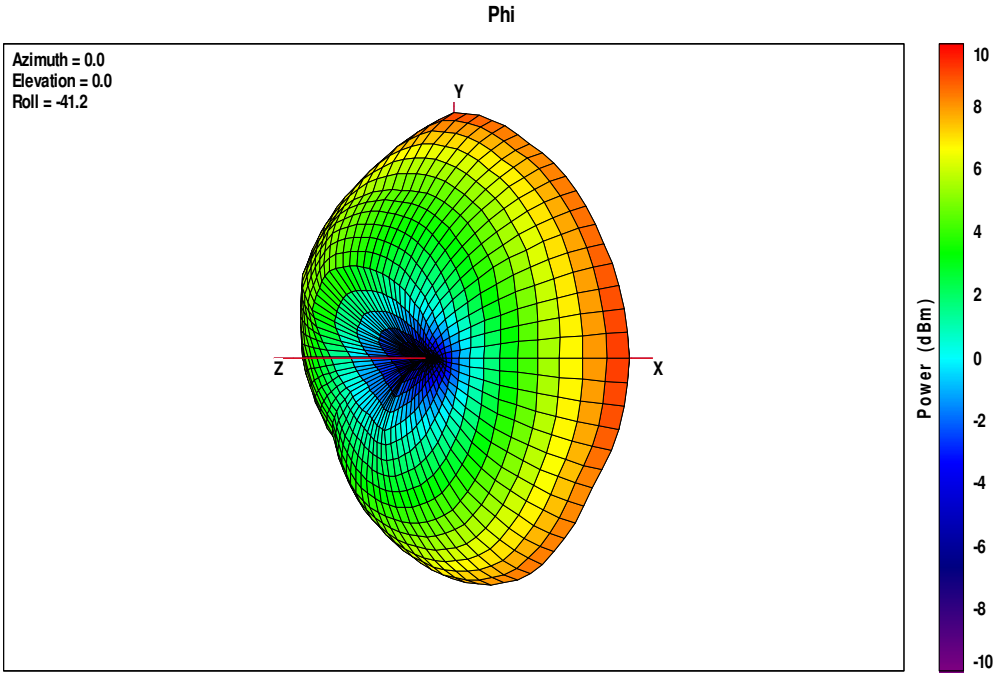
Result: The result of the measurement is passed.

Plots:

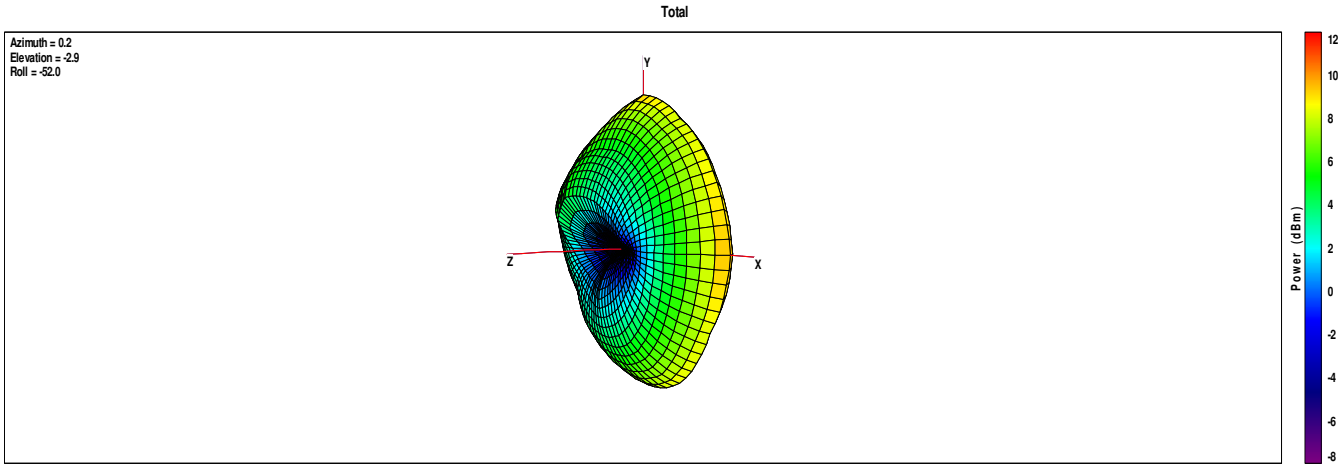
Plot 1: Antenna diagram, 5500 MHz (vertical) – all values are in dBm



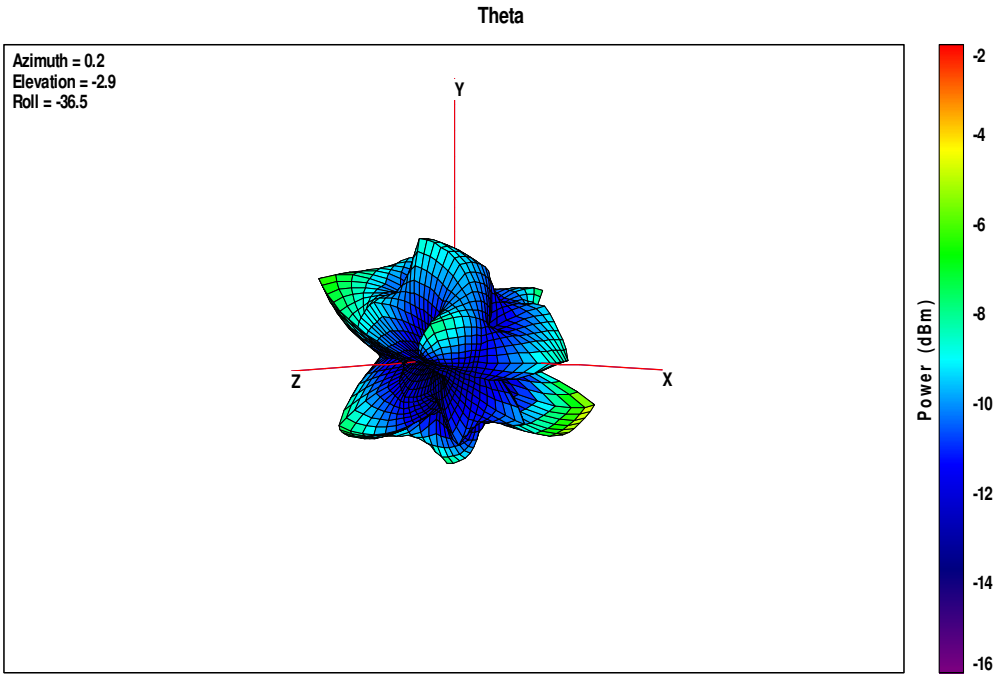
Plot 2: Antenna diagram, 5500 MHz (horizontal) – all values are in dBm



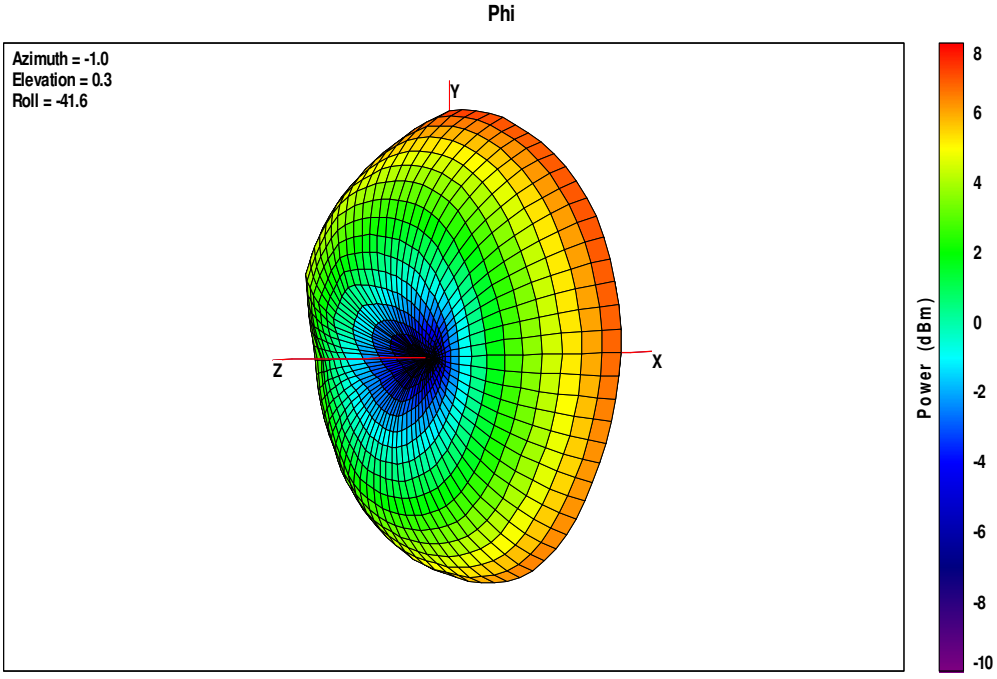
Plot 3: Antenna diagram, 5500 MHz (vertical & horizontal – vectorial summation) – all values are in dBm



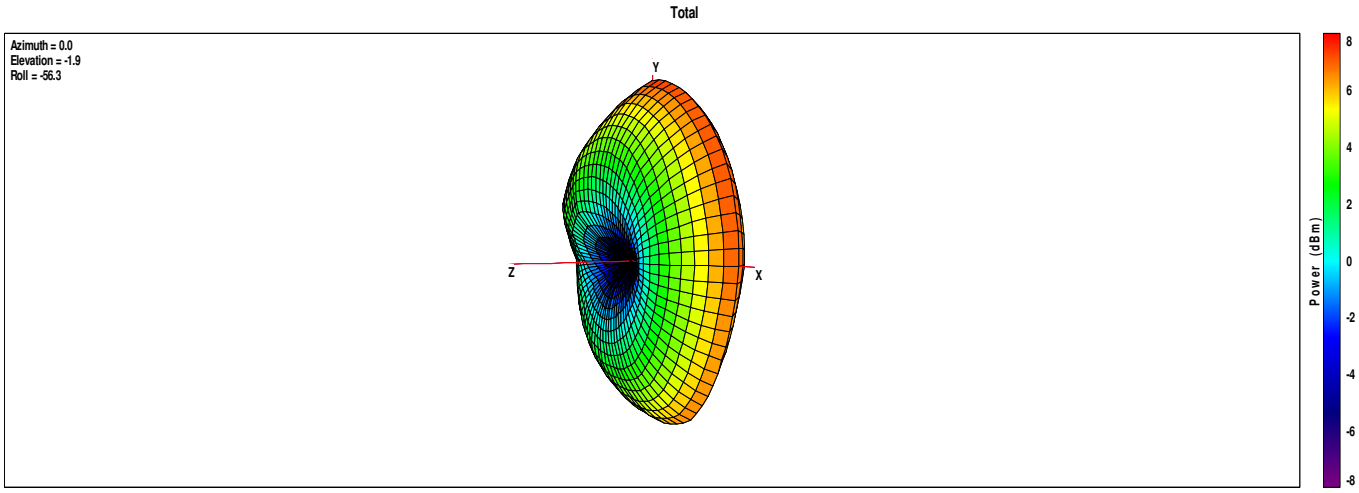
Plot 4: Antenna diagram, 5600 MHz (vertical) – all values are in dBm



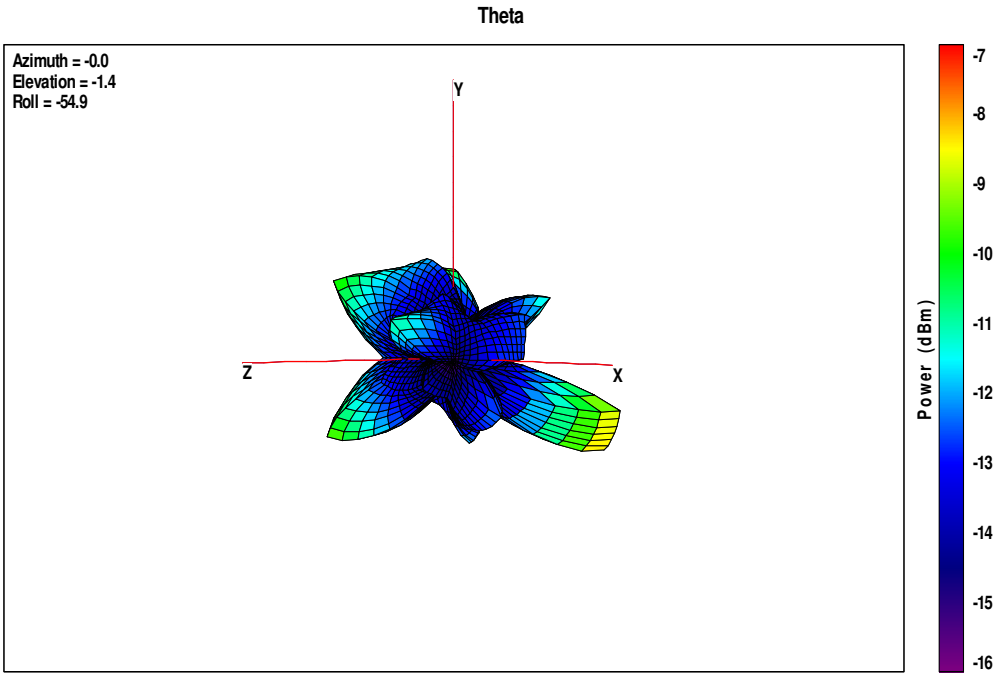
Plot 5: Antenna diagram, 5600 MHz (horizontal) – all values are in dBm



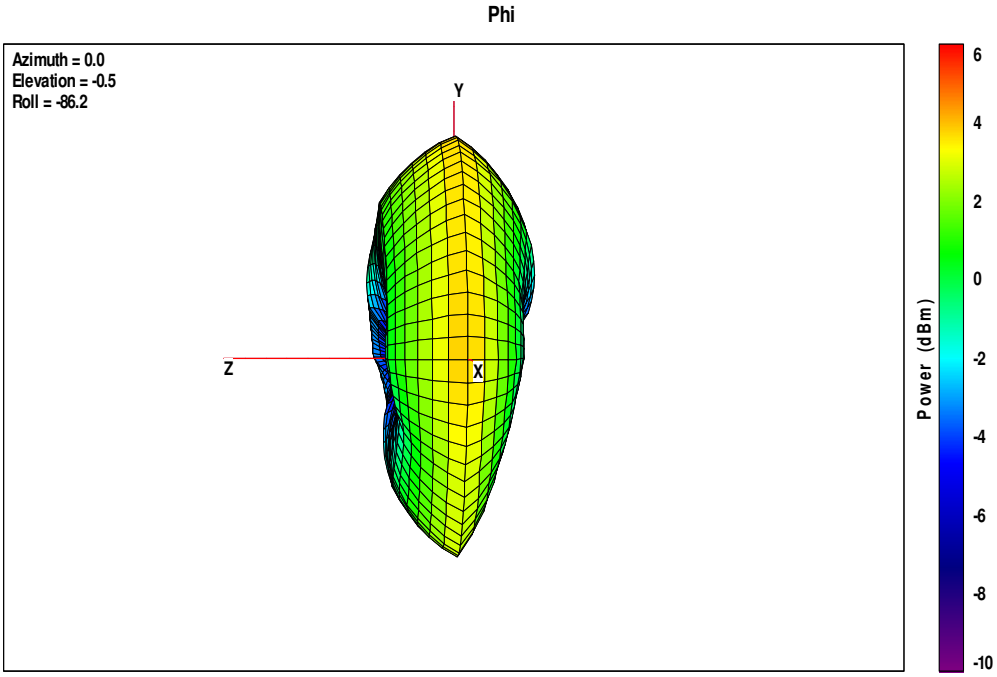
Plot 6: Antenna diagram, 5600 MHz (vertical & horizontal – vectorial summation) – all values are in dBm



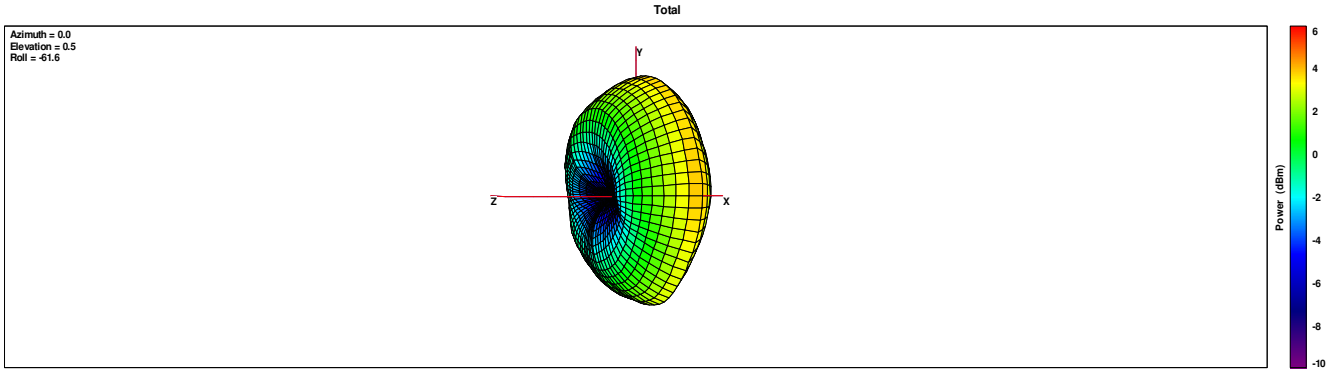
Plot 7: Antenna diagram, 5700 MHz (vertical) – all values are in dBm



Plot 8: Antenna diagram, 5700 MHz (horizontal) – all values are in dBm



Plot 9: Antenna diagram, 5700 MHz (vertical & horizontal – vectorial summation) – all values are in dBm



9.2 Maximum output power (conducted) / data rate

Description:

Measurement of the maximum output power conducted. This measurement is performed only at the middle channel in both modes and all data rates to determine the data rate per mode which results in the highest output power. This mode will be selected for all further measurements.

The used measurement settings are for the data rate verification only and not a passed / fail criteria.

Measurement:

Measurement parameter	
Detector:	Sample
Sweep time:	Auto
Video bandwidth:	1 MHz
Resolution bandwidth:	1 MHz
Span:	30 MHz
Trace-Mode:	Max hold

Results:

OFDM	Maximum Output Power Conducted [dBm]							
Data Rate [MBit/s]	6	9	12	18	24	36	48	54
Ch 120 - 5600 MHz	12.33	12.38	12.51	12.62	13.02	13.19	13.30	**13.41**
Measurement uncertainty	± 0.5 dB							

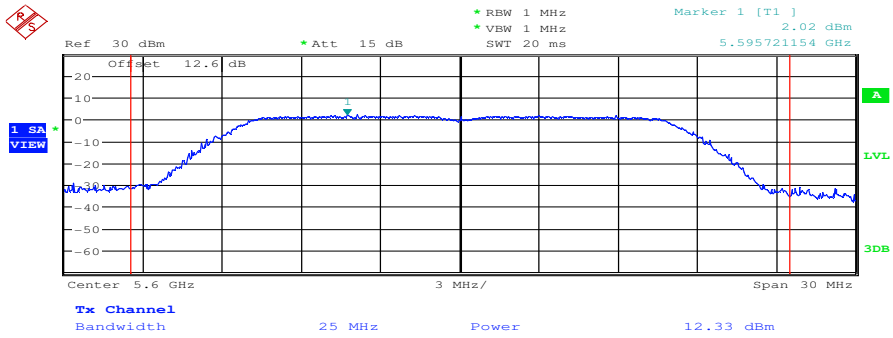
OFDM	Maximum Output Power Conducted [dBm]							
Data Rate [MBit/s]	mcs0	mcs1	mcs2	mcs3	mcs4	mcs5	mcs6	mcs7
Ch 120 - 5600 MHz	13.14	12.81	12.94	13.22	13.42	13.46	13.56	**13.57**
Measurement uncertainty	± 0.5 dB							

Result: **Selected data rate for all measurements:** **OFDM / a – mode: 54 MBit/s**
OFDM / n – mode: mcs 7

Band 1: 5470 MHz – 5725 MHz

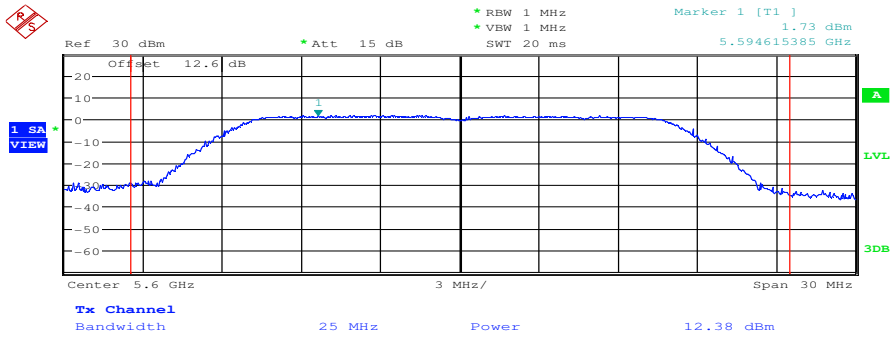
OFDM – mode / a – mode:

Plot 1: OFDM – mode; middle channel – 5600 MHz; power index 26; 6 MBit/s



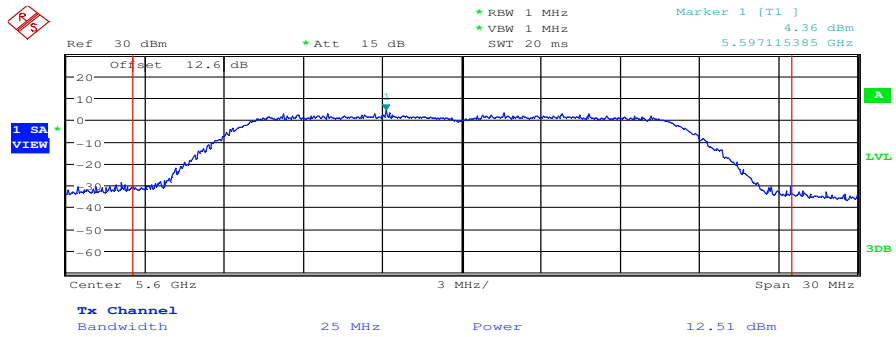
Date: 1.DEC.2010 15:28:19

Plot 2: OFDM – mode; middle channel – 5600 MHz; power index 26; 9 MBit/s



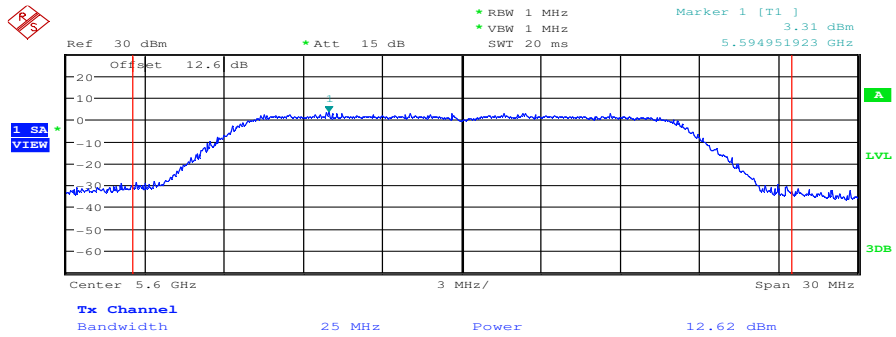
Date: 1.DEC.2010 15:31:47

Plot 3: OFDM – mode; middle channel – 5600 MHz; power index 26; 12 MBit/s



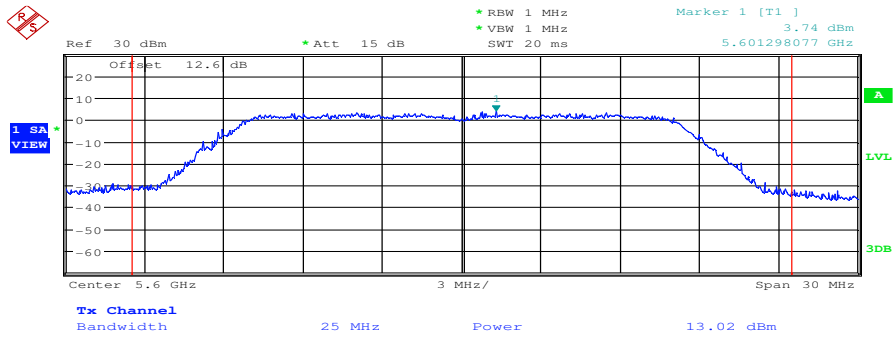
Date: 1.DEC.2010 15:34:43

Plot 4: OFDM – mode; middle channel – 5600 MHz; power index 26; 18 MBit/s



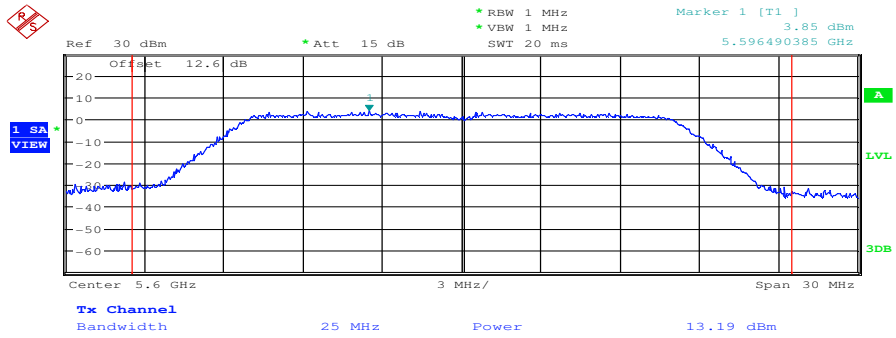
Date: 1.DEC.2010 15:36:27

Plot 5: OFDM – mode; middle channel – 5600 MHz; power index 26; 24 MBit/s



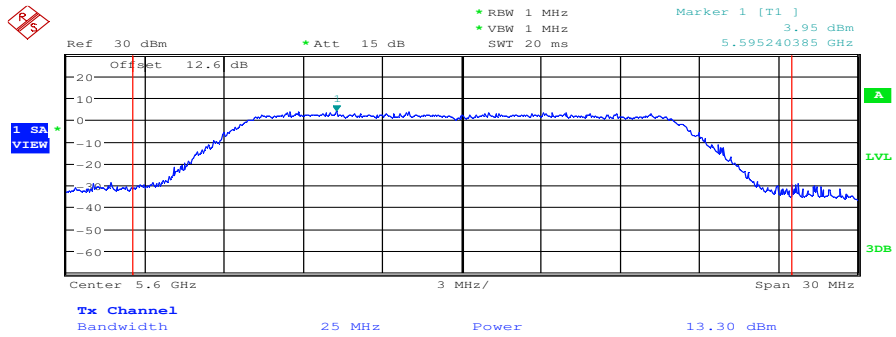
Date: 1.DEC.2010 15:37:48

Plot 6: OFDM – mode; middle channel – 5600 MHz; power index 26; 36 MBit/s

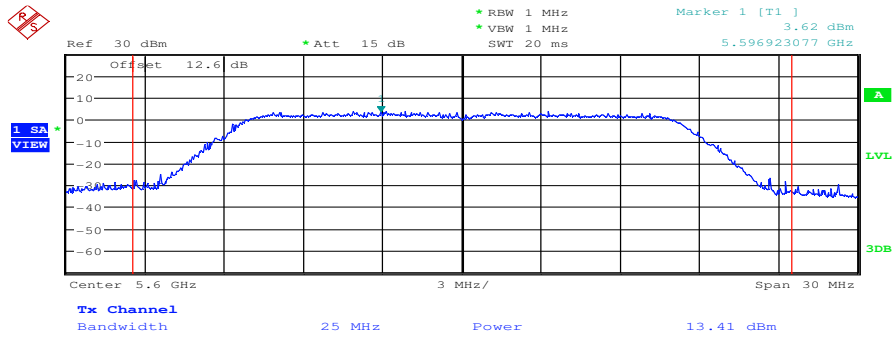


Date: 1.DEC.2010 15:39:28

Plot 7: OFDM – mode; middle channel – 5600 MHz; power index 26; 48 MBit/s

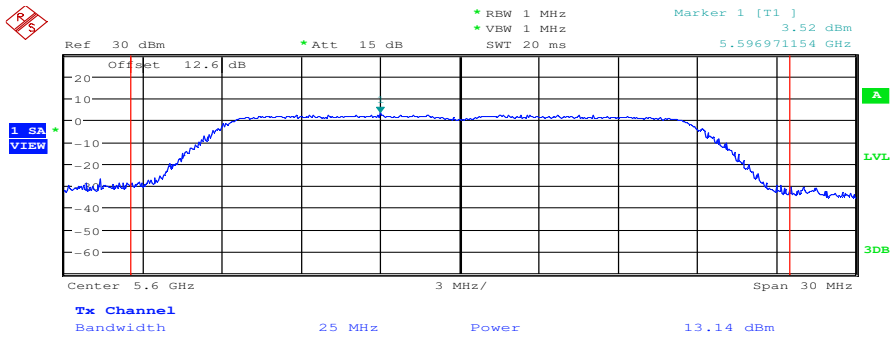


Plot 8: OFDM – mode; middle channel – 5600 MHz; power index 26; 54 MBit/s



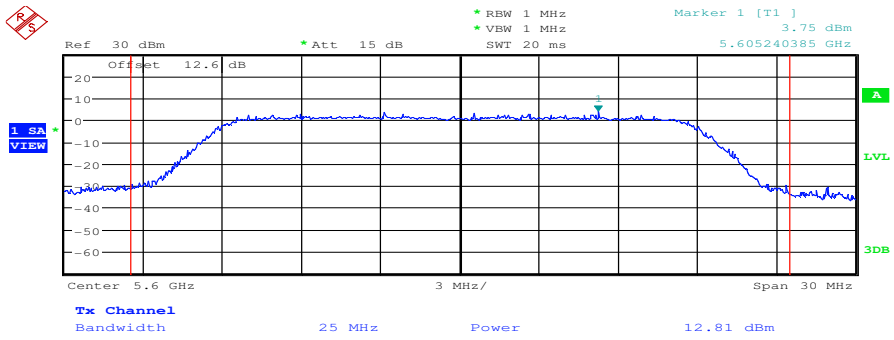
OFDM – mode / n – mode:

Plot 1: OFDM – mode; middle channel – 5600 MHz; power index 26; mcs0



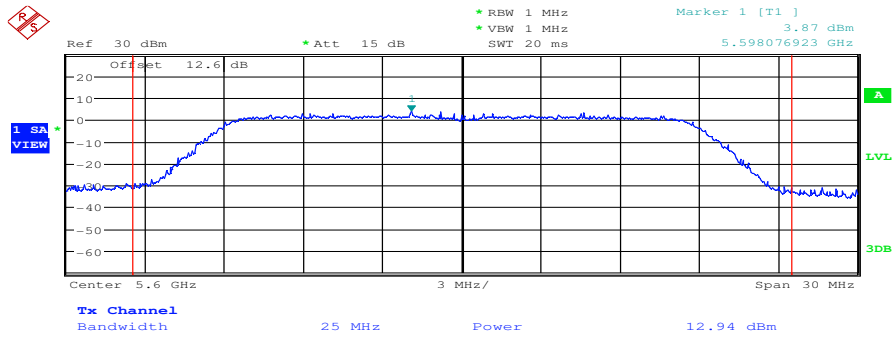
Date: 2.DEC.2010 07:06:22

Plot 2: OFDM – mode; middle channel – 5600 MHz; power index 26; mcs1

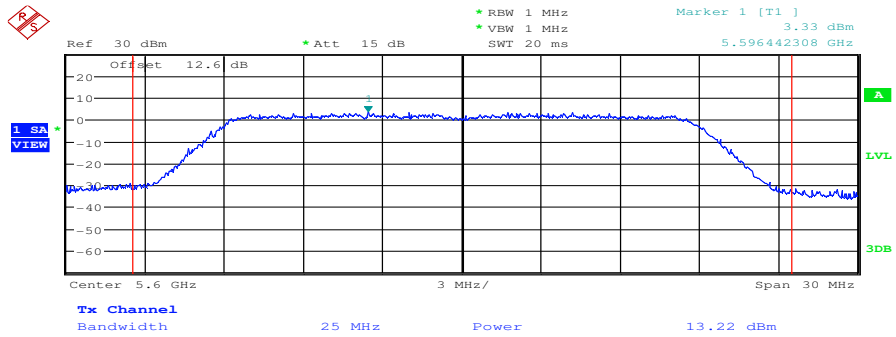


Date: 2.DEC.2010 07:08:40

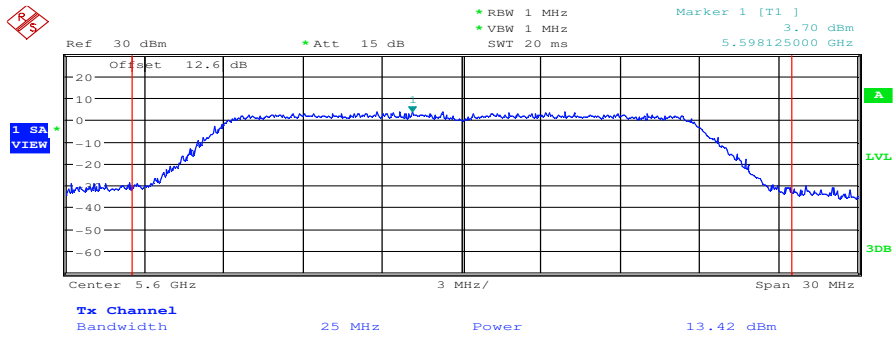
Plot 3: OFDM – mode; middle channel – 5600 MHz; power index 26; mcs2



Plot 4: OFDM – mode; middle channel – 5600 MHz; power index 26; mcs3

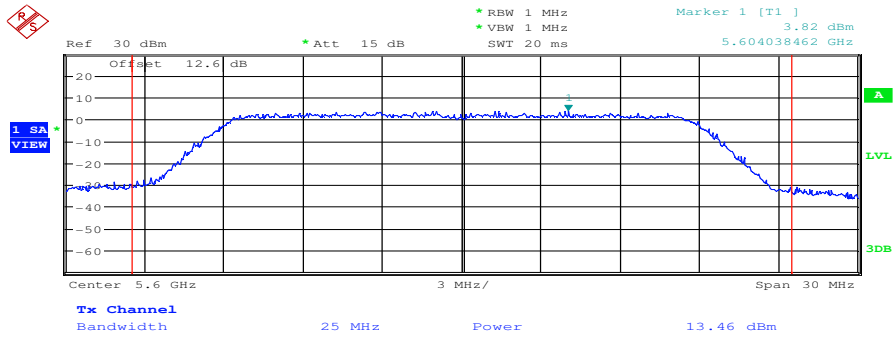


Plot 5: OFDM – mode; middle channel – 5600 MHz; power index 26; mcs4



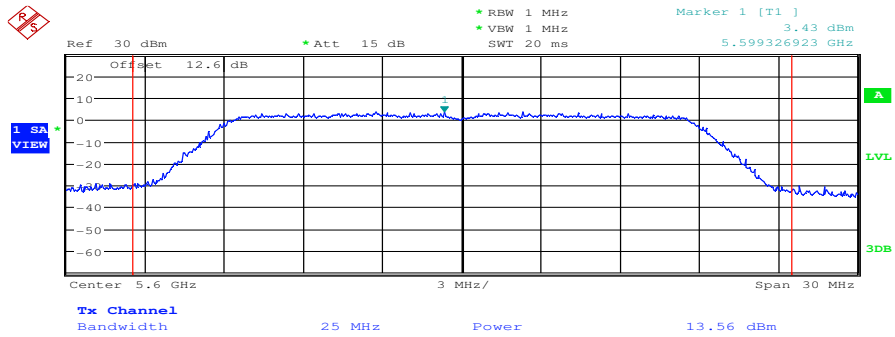
Date: 2.DEC.2010 07:14:52

Plot 6: OFDM – mode; middle channel – 5600 MHz; power index 26; mcs5



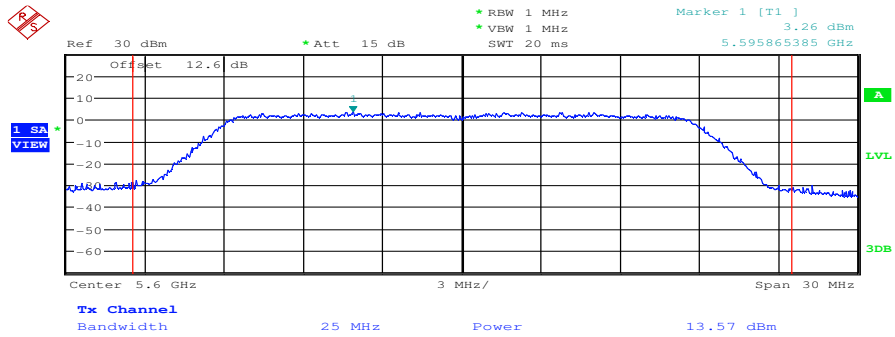
Date: 2.DEC.2010 07:16:49

Plot 7: OFDM – mode; middle channel – 5600 MHz; power index 26; mcs6



Date: 2.DEC.2010 07:19:34

Plot 8: OFDM – mode; middle channel – 5600 MHz; power index 26; mcs7



Date: 2.DEC.2010 07:22:33

9.3 Antenna power (conducted) & tolerance of antenna power

Measurement parameter:

Measurement parameter	
Detector:	Peak (worst case)
Sweep time:	Auto
Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Trace-Mode:	40 MHz
Additional EUT parameters:	Power index 26 OFDM a & n – mode

Results: OFDM / g – mode, power index 26, 54 Mbit/s

Technology / Frequency	*Temperature /Voltage conditions*	*Output power conducted*
OFDM – 5500 MHz	T_{nom} / V_{nom}	5.91
OFDM – 5600 MHz		4.55
OFDM – 5700 MHz		1.98
OFDM – 5500 MHz	T_{nom} / V_{low}	5.90
OFDM – 5600 MHz		4.57
OFDM – 5700 MHz		1.88
OFDM – 5500 MHz	T_{nom} / V_{high}	5.83
OFDM – 5600 MHz		4.52
OFDM – 5700 MHz		1.90

Results: OFDM / n – mode, power index 26, MCS7

Technology / Frequency	*Temperature /Voltage conditions*	*Output power conducted*
OFDM – 5500 MHz	T_{nom} / V_{nom}	5.89
OFDM – 5600 MHz		4.25
OFDM – 5700 MHz		2.39
OFDM – 5500 MHz	T_{nom} / V_{low}	5.84
OFDM – 5600 MHz		4.27
OFDM – 5700 MHz		2.30
OFDM – 5500 MHz	T_{nom} / V_{high}	5.84
OFDM – 5600 MHz		4.20
OFDM – 5700 MHz		2.34

Highest detected value: **5.91 dBm / 3.9 mW**

Lowest detected value: **1.88 dBm / 1.54 mW**

Rated power: **3 mW / RP +50 % = 4.5 mW / RP -50% = 1.5 mW**

All detected values are within +50 % and -50 % of the rated power values of each technology!

Limit:

Limit	max. 10 mW/MHz

Result: **The result of the measurement is passed.**

9.4 Frequency tolerance

Measurement parameter:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 kHz
Video bandwidth:	1 kHz
Trace-Mode:	Max Hold
Additional EUT parameters:	Power index 26 OFDM

The results are valid for all technologies –OFDM a – mode and n – mode!
Both modes use the same oscillator!

Results (normal temperature / normal voltage):

	lowest channel f_{TX} *= 5500 MHz*	*mid channel* f_{TX} *= 5600 MHz*	*highest channel* f_{TX} *= 5700 MHz*
Frequency offset [kHz]	2.0	2.4	2.3
Offset [ppm] related to f_{TX}	0.4	0.4	0.4

Results (high temperature / low voltage):

	lowest channel f_{TX} *= 5500 MHz*	*mid channel* f_{TX} *= 5600 MHz*	*highest channel* f_{TX} *= 5700 MHz*
Frequency offset [kHz]	-20.2	-21.2	-21.1
Offset [ppm] related to f_{TX}	-3.7	-3.8	-3.7

Results (high temperature / high voltage):

	lowest channel f_{TX} *= 5500 MHz*	*mid channel* f_{TX} *= 5600 MHz*	*highest channel* f_{TX} *= 5700 MHz*
Frequency offset [kHz]	-20.1	-21.3	-21.1
Offset [ppm] related to f_{TX}	-3.7	-3.8	-3.7

Results (low temperature / low voltage):

	lowest channel f_{TX} = 5500 MHz	*mid channel* f_{TX} = 5600 MHz	*highest channel* f_{TX} = 5700 MHz
Frequency offset [kHz]	34.3	34.1	34.9
Offset [ppm] related to f_{TX}	6.2	6.1	6.1

Results (low temperature / high voltage):

	lowest channel f_{TX} = 5500 MHz	*mid channel* f_{TX} = 5600 MHz	*highest channel* f_{TX} = 5700 MHz
Frequency offset [kHz]	34.3	34.3	34.9
Offset [ppm] related to f_{TX}	6.2	6.1	6.1

Limit & Verdict:

Limit	< 20ppm

Result: **The result of the measurement is passed.**

9.5 Modulation method

OFDM technology with BPSK, QPSK, 16 QAM and 64 QAM modulation.

Result: **The result of the measurement is passed.**

9.6 Spurious emission intensity – conducted & out - band leakage power

Measurement parameter:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	f <= 1GHz : 1 MHz f > 1GHz : 1 MHz
Video bandwidth:	f <= 1GHz : 10 kHz f > 1GHz : 10 kHz
Span:	See plot
Trace-Mode:	Max Hold
Additional EUT parameters:	Test mode (modulated carrier) OFDM Power index 26

Results:

OFSM / a – mode	lowest channel f_{TX} = 5500 MHz		mid channel f_{TX} = 5600 MHz		highest channel f_{TX} = 5700 MHz	
Found peaks:	F [MHz]	Level [dBm]	F [MHz]	Level [dBm]	F [MHz]	Level [dBm]
	No critical peaks found (see plots).					

OFSM / n – mode	lowest channel f_{TX} = 5500 MHz		mid channel f_{TX} = 5600 MHz		highest channel f_{TX} = 5700 MHz	
Found peaks:	F [MHz]	Level [dBm]	F [MHz]	Level [dBm]	F [MHz]	Level [dBm]
	No critical peaks found (see plots).					

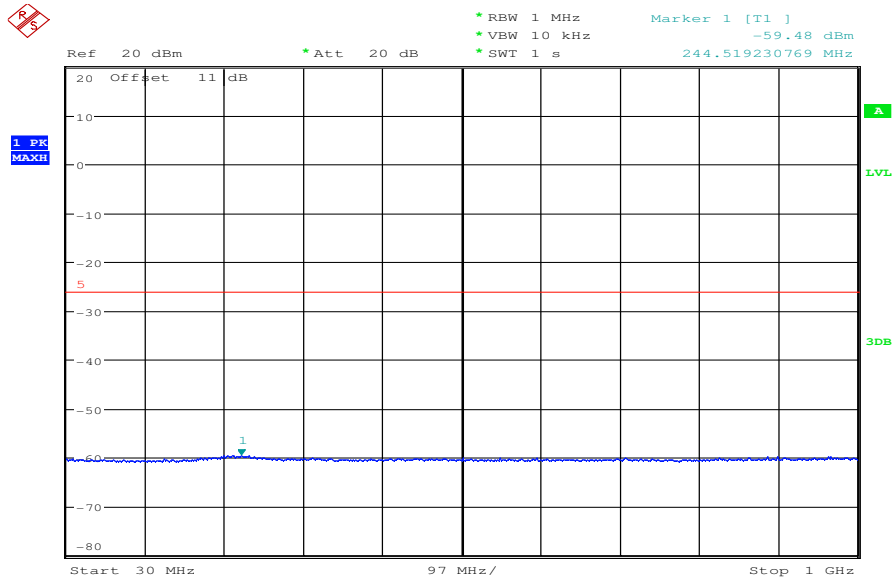
Limit: band 3

Limit	30 MHz <= f <= 5455 MHz: 2.5uW (-26.02 dBm) 5455 MHz <= f <= 5460 MHz: 2.5uW (-26.02 dBm) 5460 MHz <= f <= 5470 MHz: 12.5uW (-19.03 dBm) 5470 MHz <= f <= 5725 MHz: 50mW (17 dBm with TPC) 5470 MHz <= f <= 5725 MHz: 25mW (14 dBm without TPC) 5725 MHz <= f <= 5740 MHz: 12.5uW (-19.03dBm) 5740 MHz <= f <= 5745 MHz: 2.5uW (-26.02dBm) 5745 MHz <= f <= 26000 MHz: 2.5uW (-26.02dBm)

Result: **The result of the measurement is passed.**

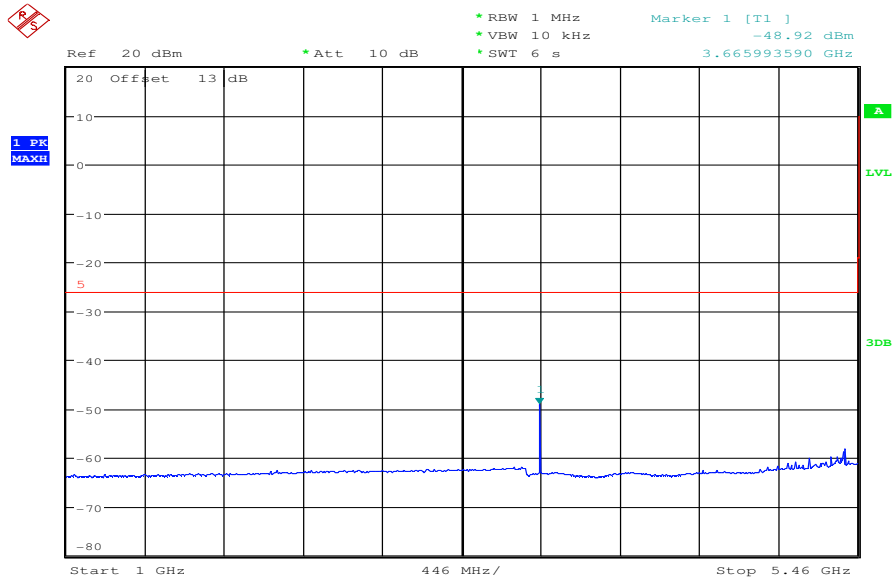
Plots: OFDM / a – mode, power index 26, 54 MBit/s

Plot 1: OFDM, lowest channel, 30 MHz – 1000 MHz



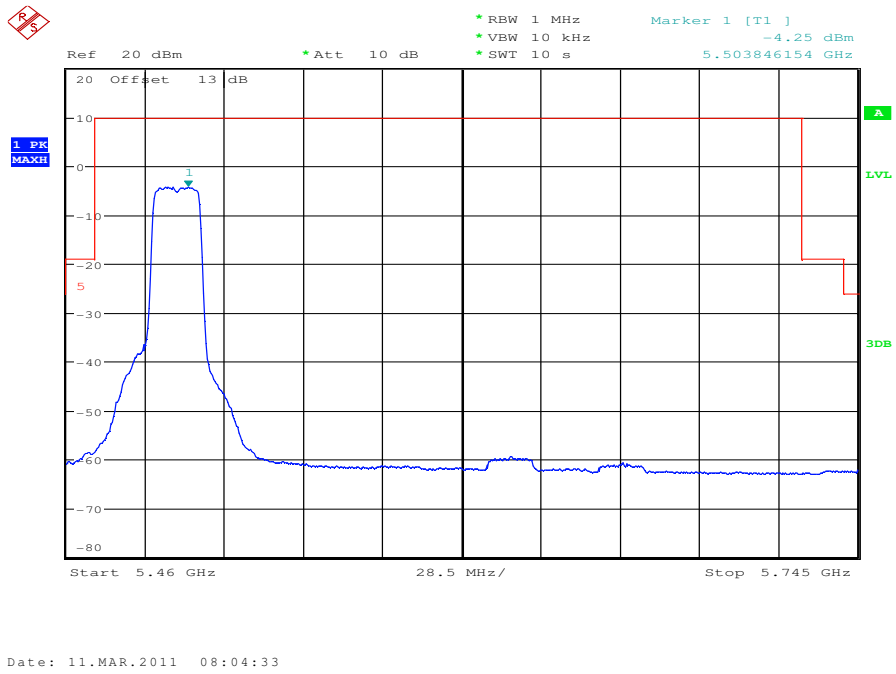
Date: 11.MAR.2011 07:31:08

Plot 2: OFDM, lowest channel, 1000 MHz – 5460 MHz

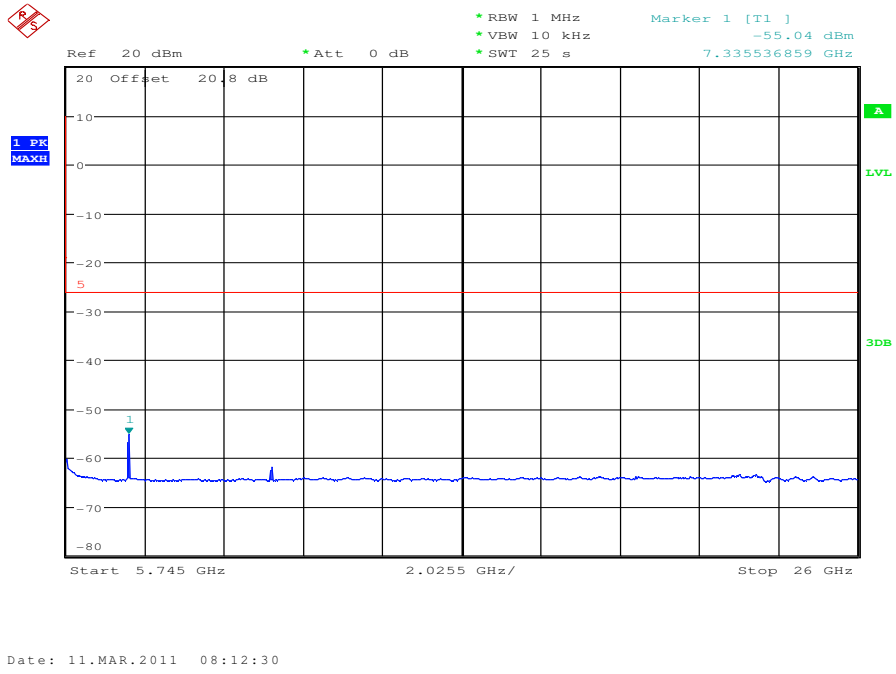


Date: 11.MAR.2011 07:58:22

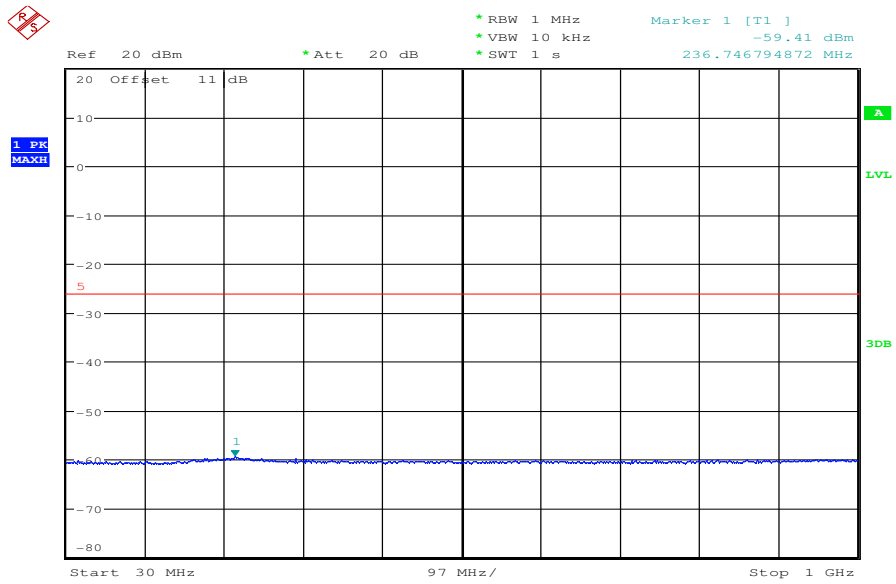
Plot 3: OFDM, lowest channel, 5460 MHz – 5745 MHz



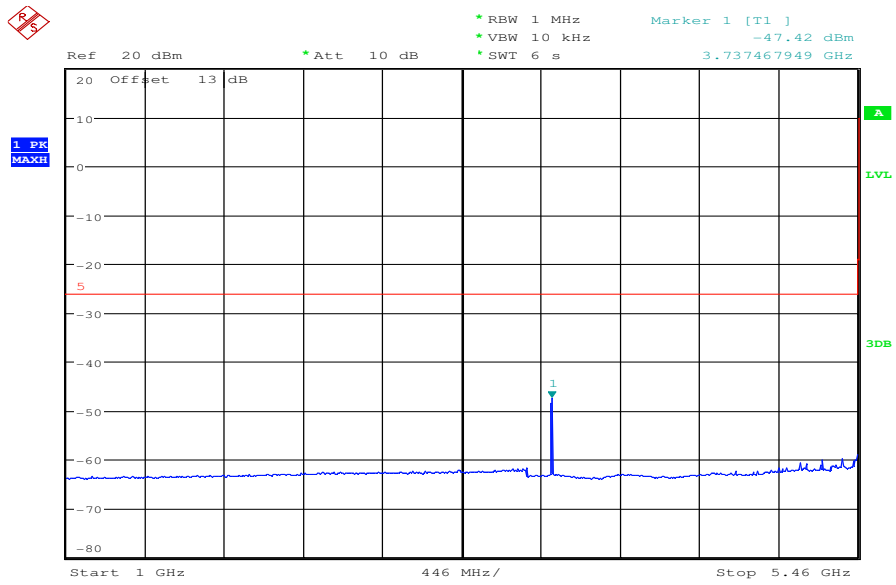
Plot 4: OFDM, lowest channel, 5745 MHz – 26000 MHz



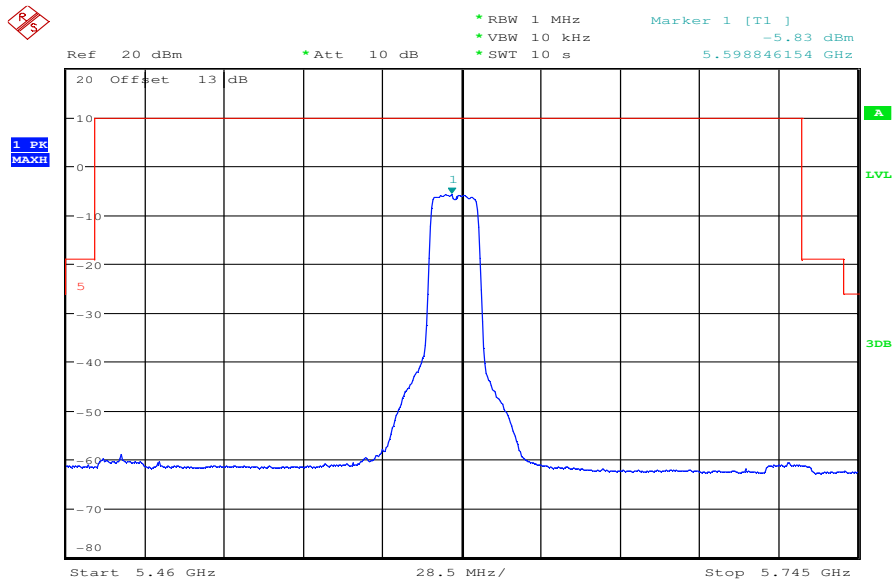
Plot 5: OFDM, middle channel, 30 MHz – 1000 MHz



Plot 6: OFDM, middle channel, 1000 MHz – 5460 MHz

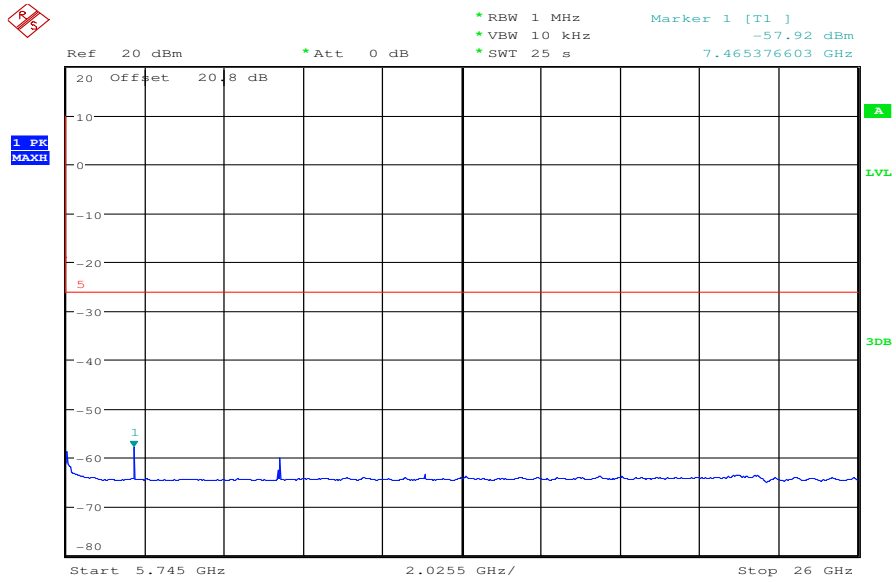


Plot 7: OFDM, middle channel, 5460 MHz – 5745 MHz



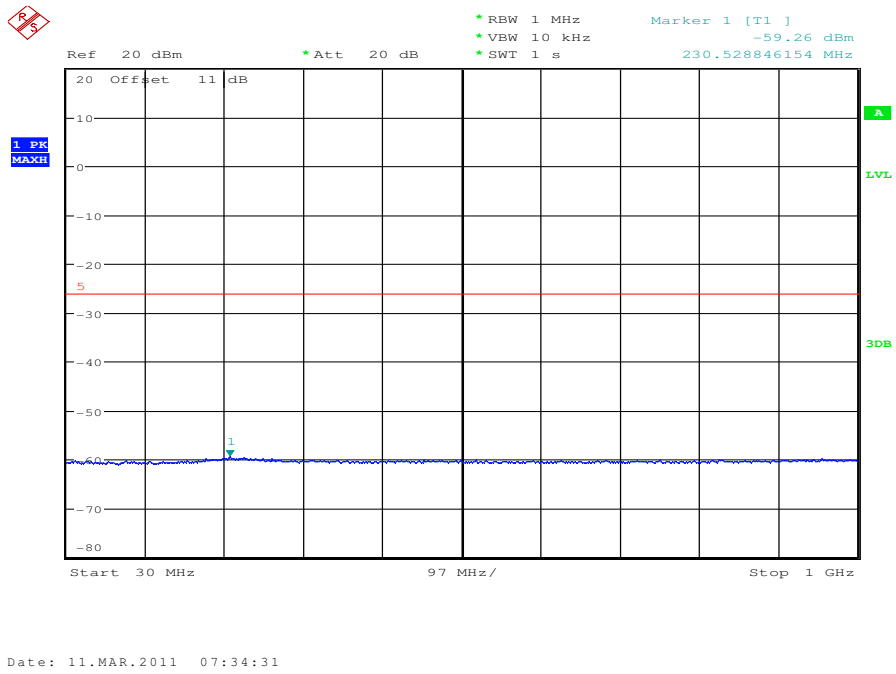
Date: 11.MAR.2011 08:06:52

Plot 8: OFDM, middle channel, 5745 MHz – 26000 MHz

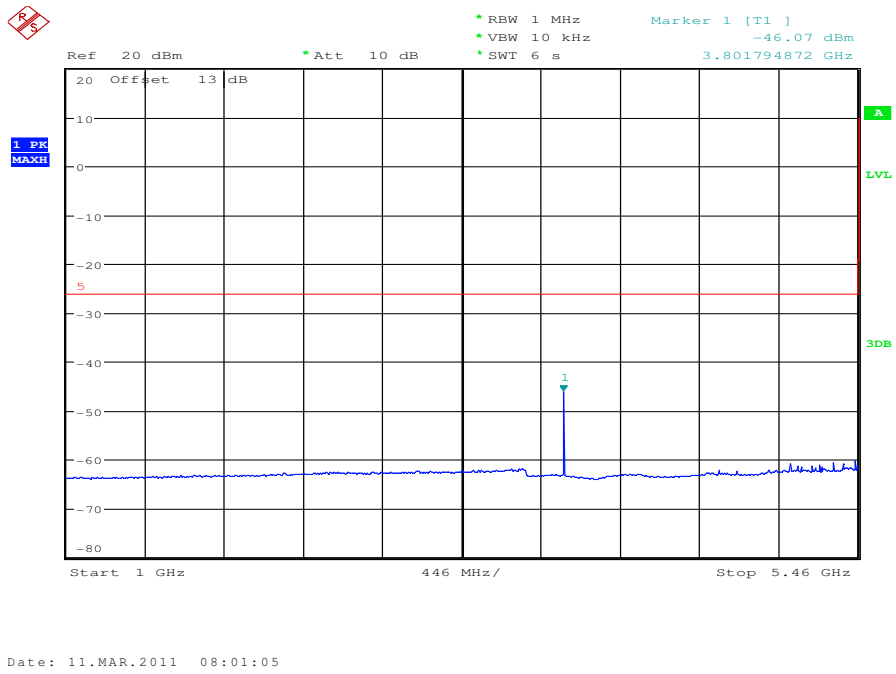


Date: 11.MAR.2011 08:14:26

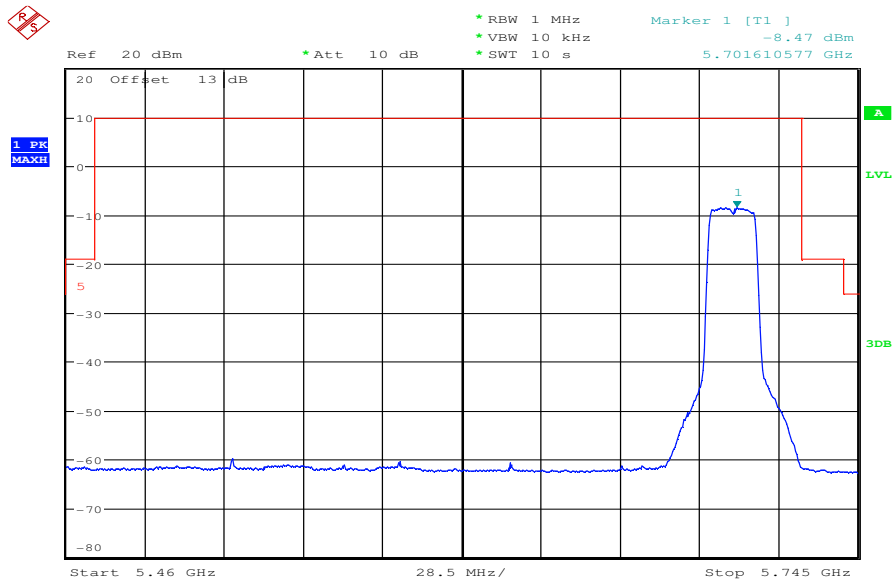
Plot 9: OFDM, highest channel, 30 MHz – 1000 MHz



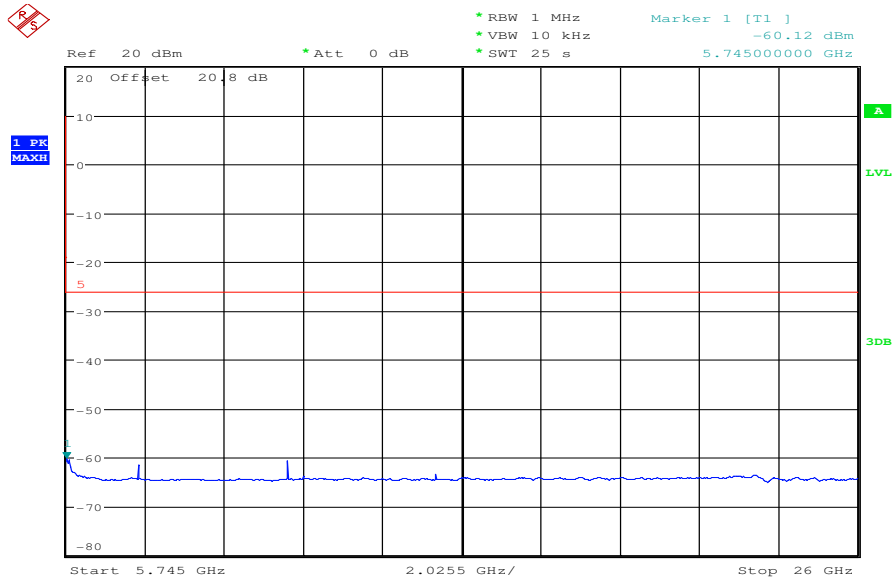
Plot 10: OFDM, highest channel, 1000 MHz – 5460 MHz



Plot 11: OFDM, highest channel, 5460 MHz – 5745 MHz

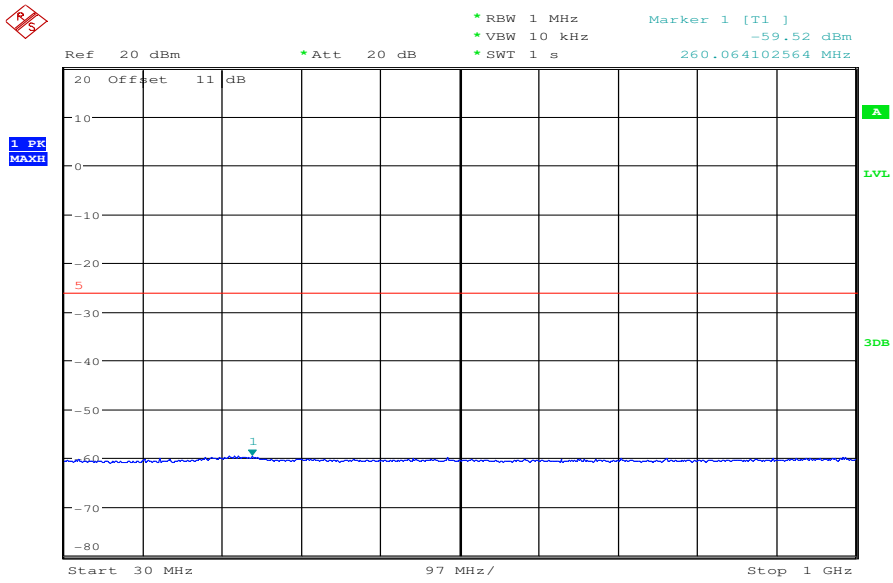


Plot 12: OFDM, highest channel, 5745 MHz – 26000 MHz



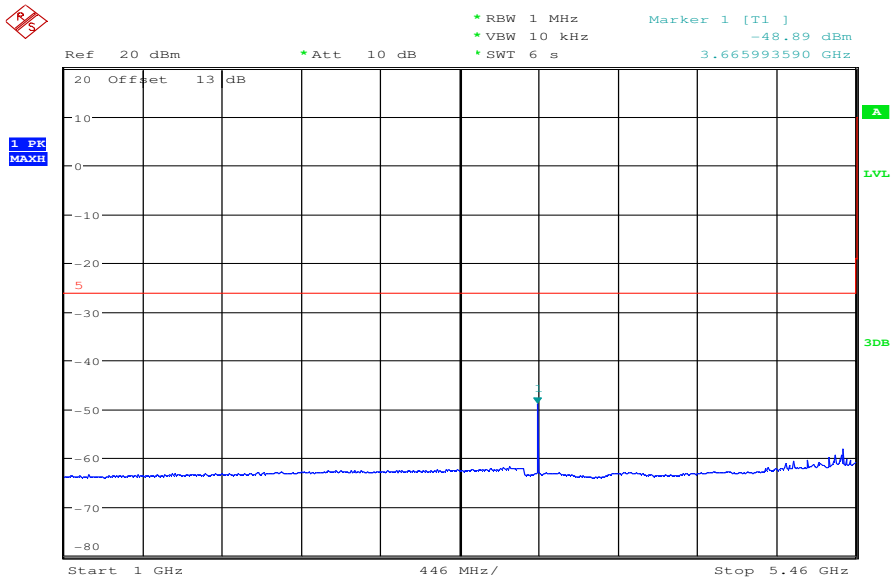
Plots: OFDM / n – mode, power index 26, MCS 7

Plot 1: OFDM, lowest channel, 30 MHz – 1000 MHz



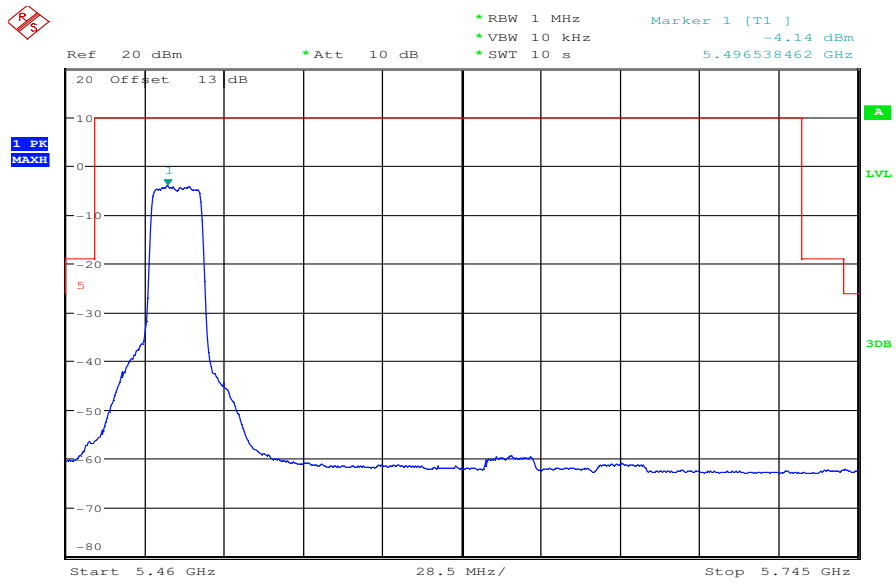
Date: 11.MAR.2011 07:31:51

Plot 2: OFDM, lowest channel, 1000 MHz – 5460 MHz

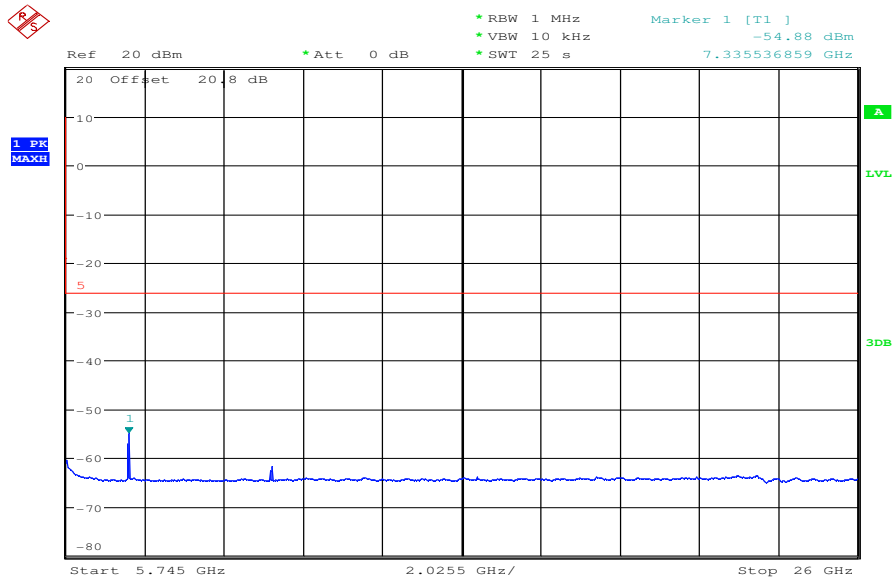


Date: 11.MAR.2011 07:59:00

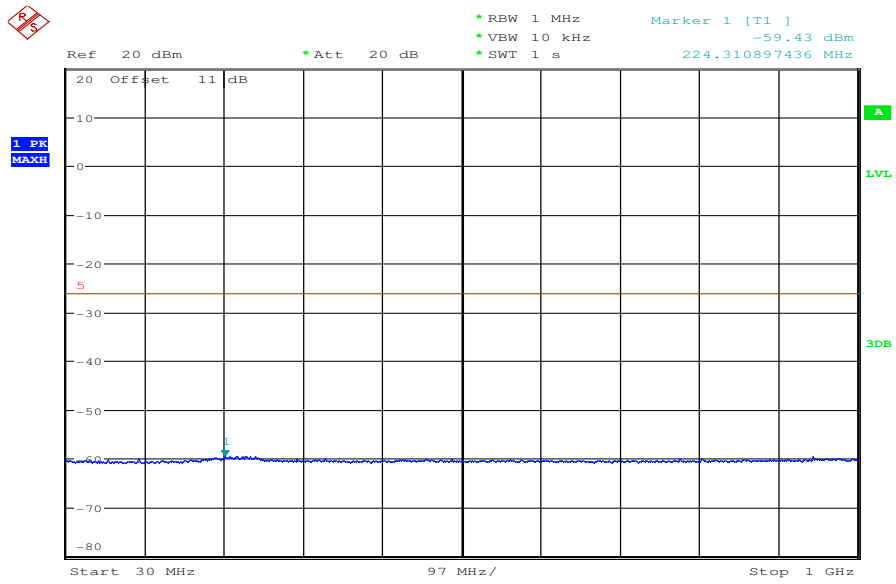
Plot 3: OFDM, lowest channel, 5460 MHz – 5745 MHz



Plot 4: OFDM, lowest channel, 5745 MHz – 26000 MHz

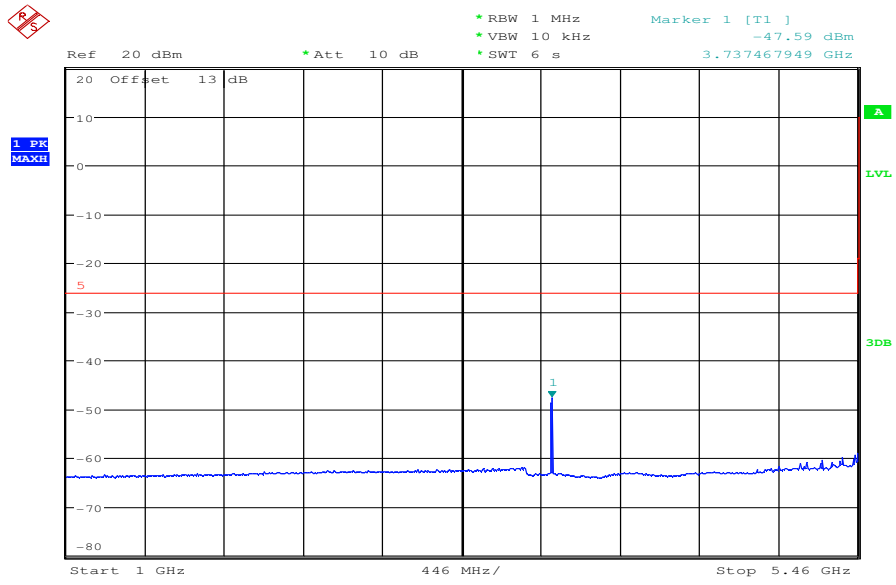


Plot 5: OFDM, middle channel, 30 MHz – 1000 MHz



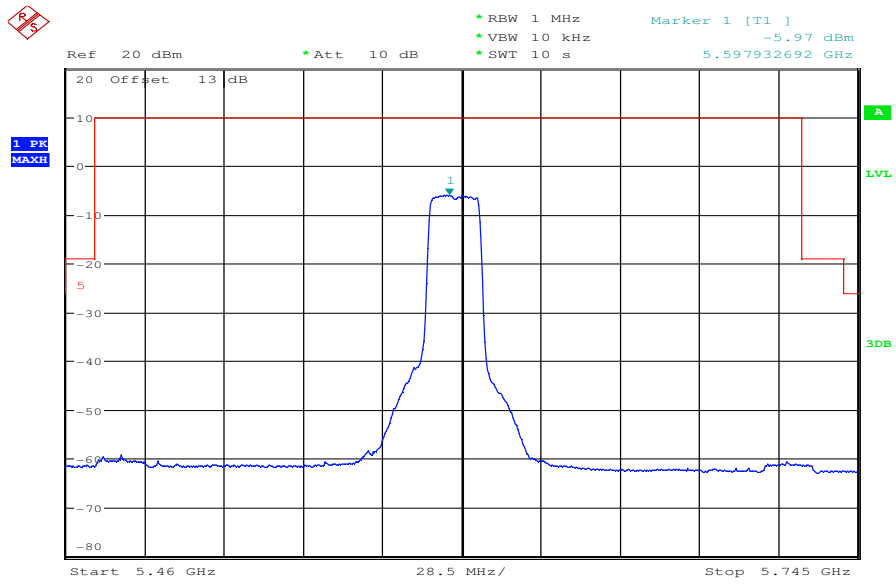
Date: 11.MAR.2011 07:33:29

Plot 6: OFDM, middle channel, 1000 MHz – 5460 MHz



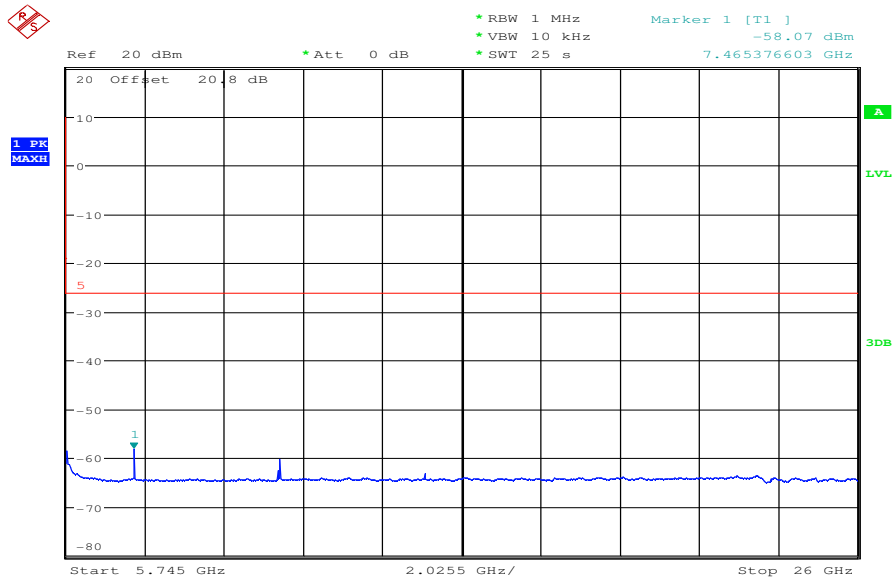
Date: 11.MAR.2011 08:00:18

Plot 7: OFDM, middle channel, 5460 MHz – 5745 MHz



Date: 11.MAR.2011 08:07:59

Plot 8: OFDM, middle channel, 5745 MHz – 26000 MHz



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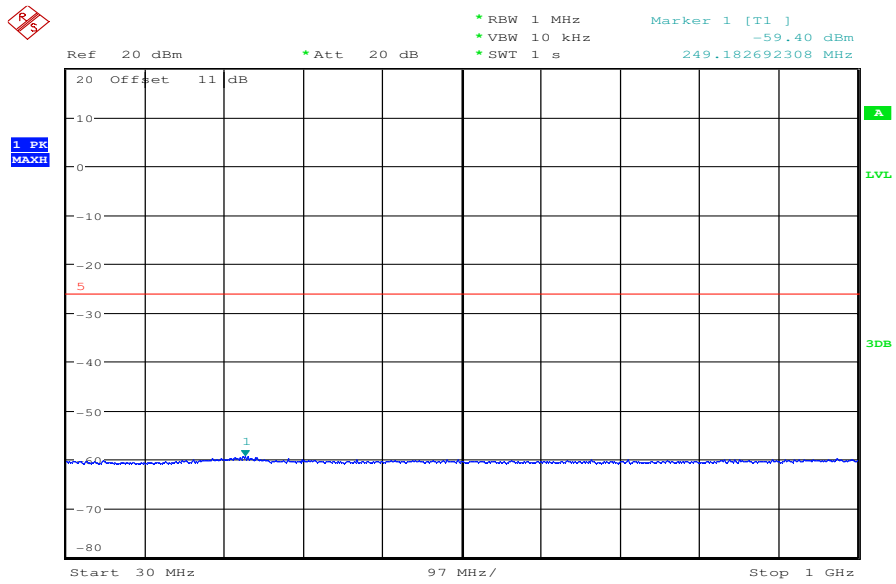
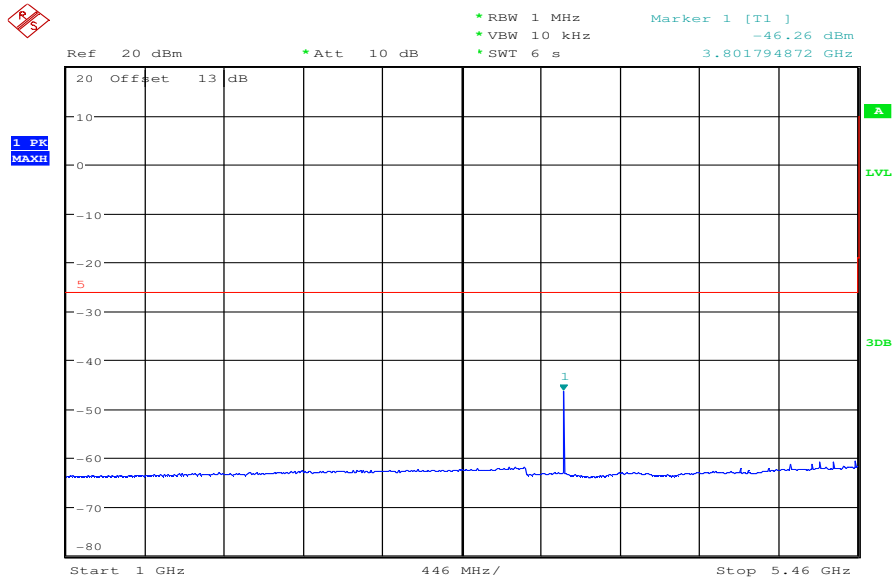
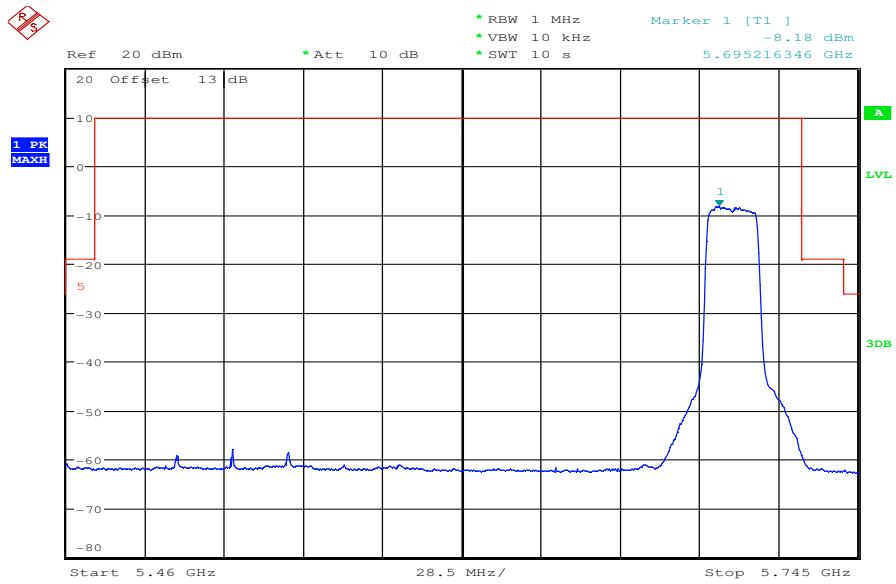
Plot 9: OFDM, highest channel, 30 MHz – 1000 MHz



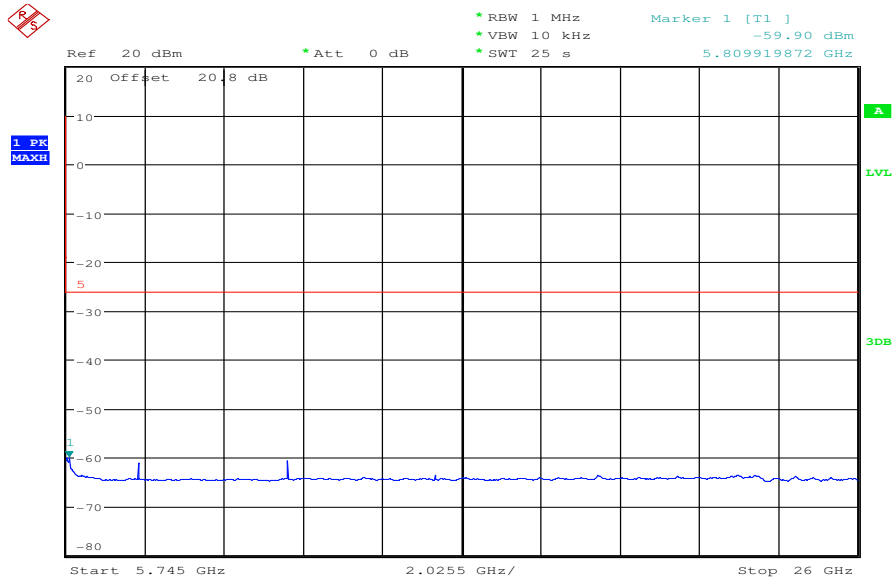
Plot 10: OFDM, highest channel, 1000 MHz – 5460 MHz



Plot 11: OFDM, highest channel, 5460 MHz – 5745 MHz



Plot 12: OFDM, highest channel, 5745 MHz – 26000 MHz



9.7 Spurious emission intensity - radiated

Measurement parameter:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	f <= 1GHz : 1 MHz f > 1GHz : 1 MHz
Video bandwidth:	f <= 1GHz : 1 MHz f > 1GHz : 1 MHz
Span:	100 MHz steps
Trace-Mode:	Max Hold
Additional EUT parameters:	Test mode (modulated carrier) Modulation with highest output power used Power index 26

Results:

OFDM / a – mode	lowest channel f_{TX}= 5500 MHz		mid channel f_{TX} = 5600 MHz		highest channel f_{TX} = 5700 MHz	
Found peaks:	F [MHz]	Level [dBm]	F [MHz]	Level [dBm]	F [MHz]	Level [dBm]
	3666.8	-42.25 (vertical) -45.38 (horizontal)	All detected emissions are more than 6 dB below the limit.		All detected emissions are more than 6 dB below the limit.	
	11000	-33.11 (vertical) -36.83 (horizontal)	-/-	-/-	-/-	-/-
	For emissions above 12.75 GHz, please take a look at the plots!					

OFDM / n – mode	lowest channel f_{TX}= 5500 MHz		mid channel f_{TX} = 5600 MHz		highest channel f_{TX} = 5700 MHz	
Found peaks:	F [MHz]	Level [dBm]	F [MHz]	Level [dBm]	F [MHz]	Level [dBm]
	3666.8	-41.95 (vertical) -44.18 (horizontal)	All detected emissions are more than 6 dB below the limit.		All detected emissions are more than 6 dB below the limit.	
	11000	-33.11 (vertical) -36.14 (horizontal)	-/-	-/-	-/-	-/-
	For emissions above 12.75 GHz, please take a look at the plots!					

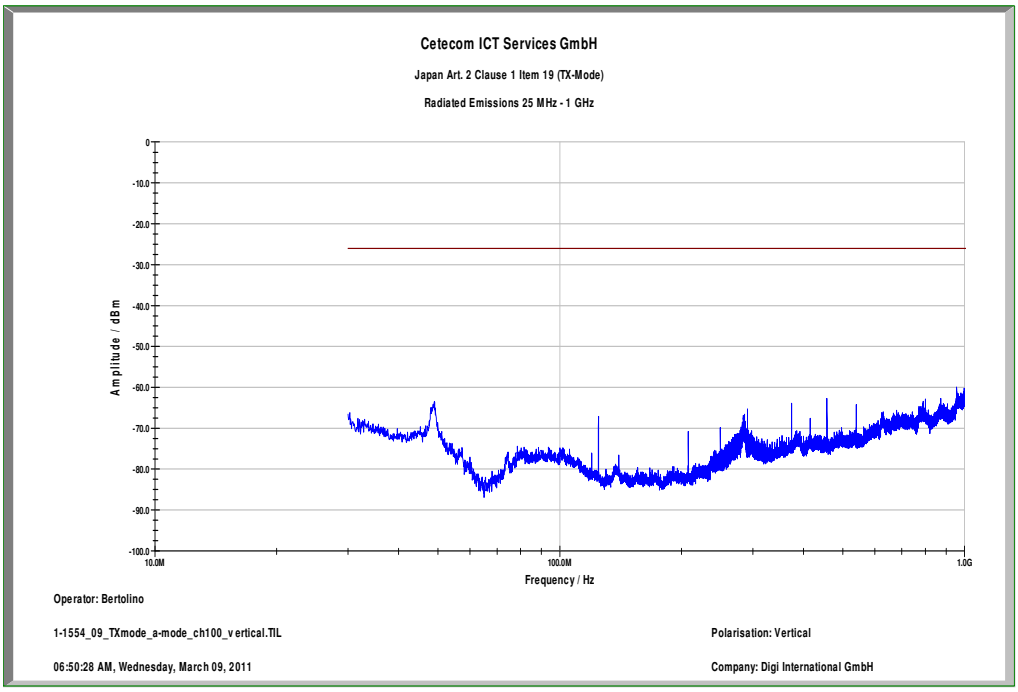
Limit:

Limit	30 MHz <= f <= 5455 MHz: 2.5uW (-26.02 dBm) 5455 MHz <= f <= 5460 MHz: 2.5uW (-26.02 dBm) 5460 MHz <= f <= 5470 MHz: 12.5uW (-19.03 dBm) 5470 MHz <= f <= 5725 MHz: 50mW (17 dBm with TPC) 5470 MHz <= f <= 5725 MHz: 25mW (14 dBm without TPC) 5725 MHz <= f <= 5740 MHz: 12.5uW (-19.03dBm) 5740 MHz <= f <= 5745 MHz: 2.5uW (-26.02dBm) 5745 MHz <= f <= 26000 MHz: 2.5uW (-26.02dBm)

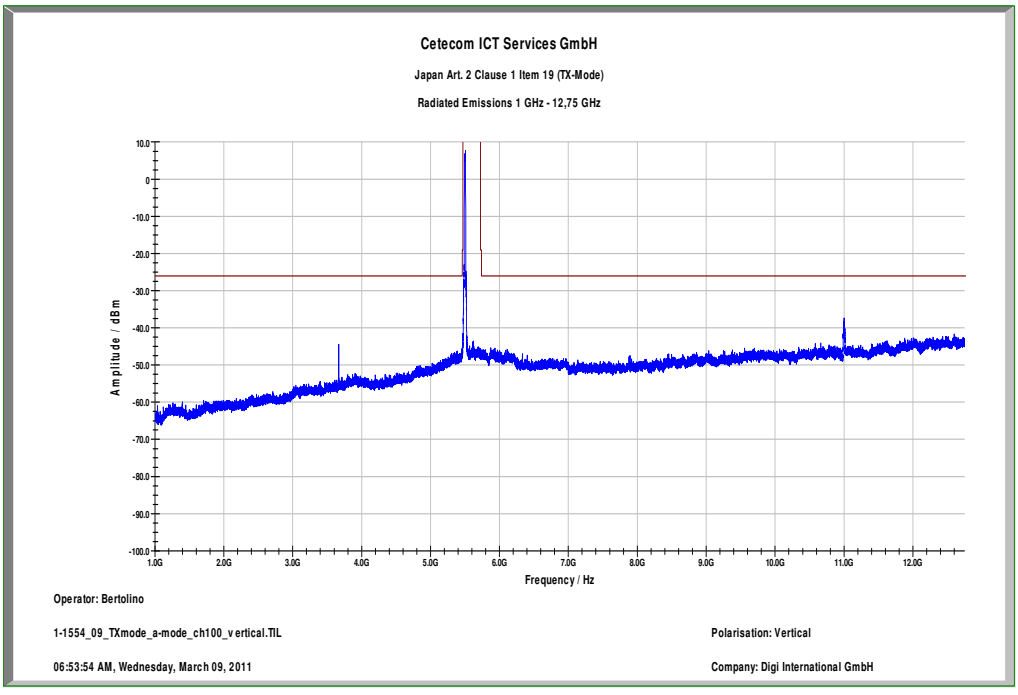
Result: **The result of the measurement is passed.**

Plots: OFDM / a – mode

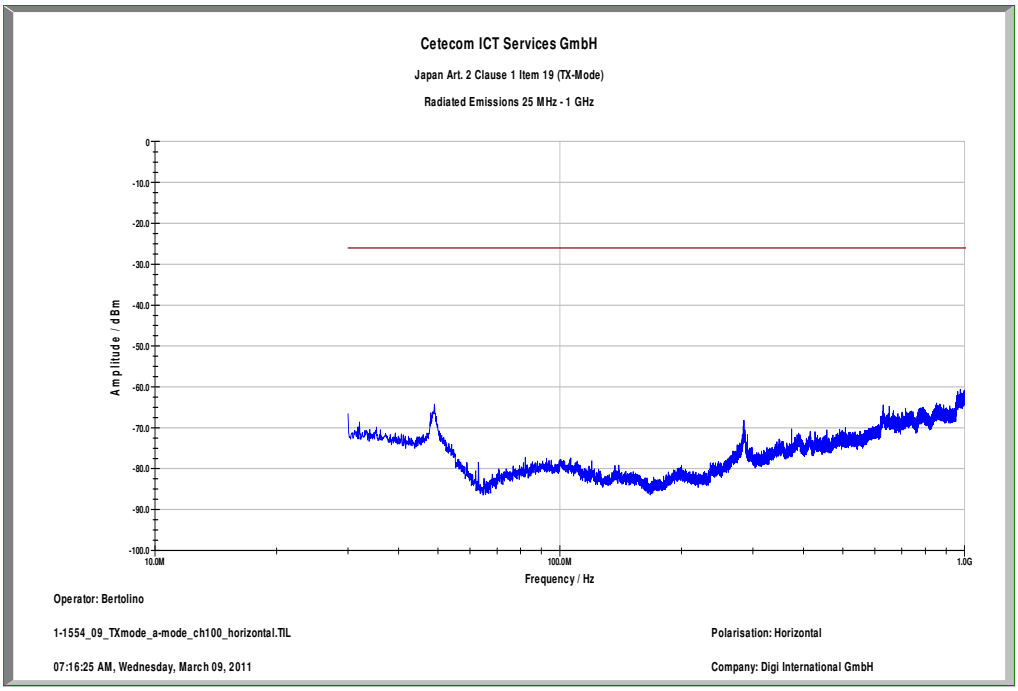
Plot 1: Lowest channel – 5500 MHz; (30MHz – 1 GHz) – vertical



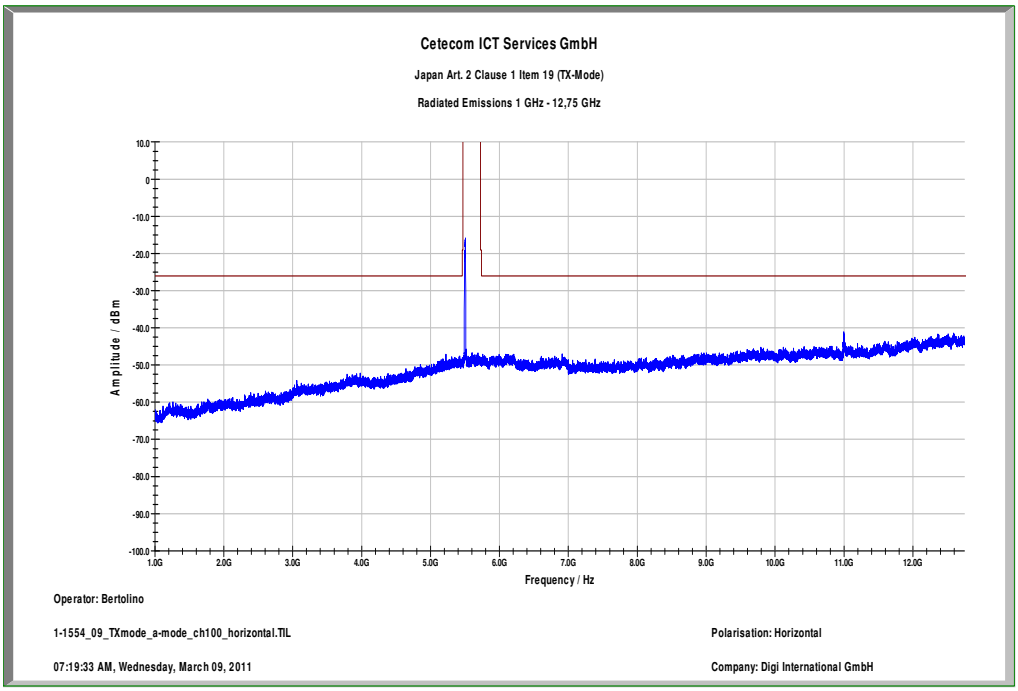
Plot 2: Lowest channel – 5500 MHz; (1 GHz – 12.75 GHz) – vertical



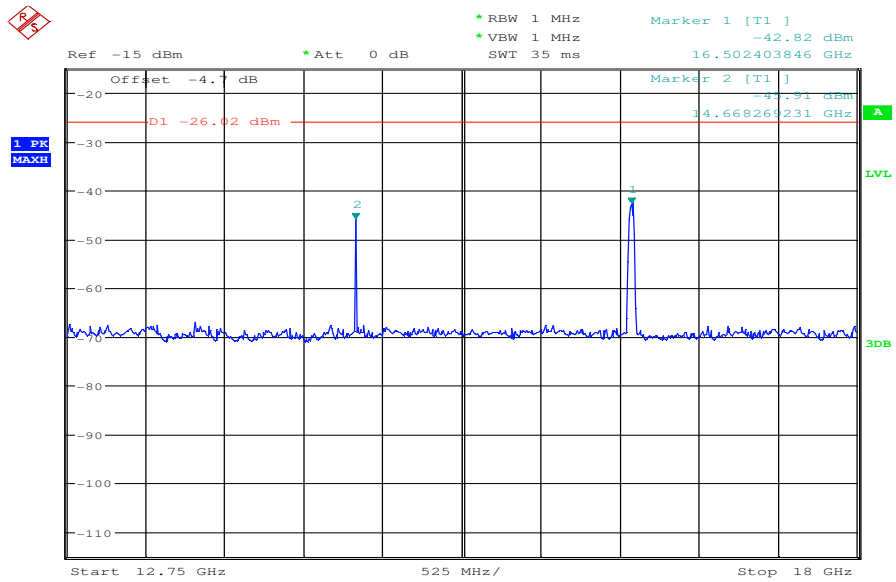
Plot 3: Lowest channel – 5500 MHz; (30MHz – 1 GHz) – horizontal



Plot 4: Lowest channel – 5500 MHz; (1 GHz – 12.75 GHz) – horizontal

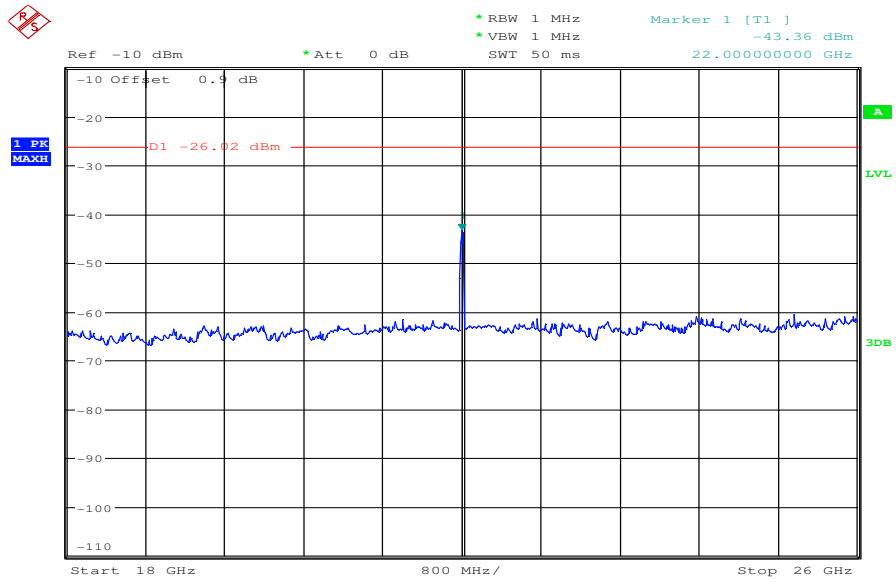


Plot 5: Lowest channel – 5500 MHz; (12.75 GHz – 18 GHz) – vertical & horizontal



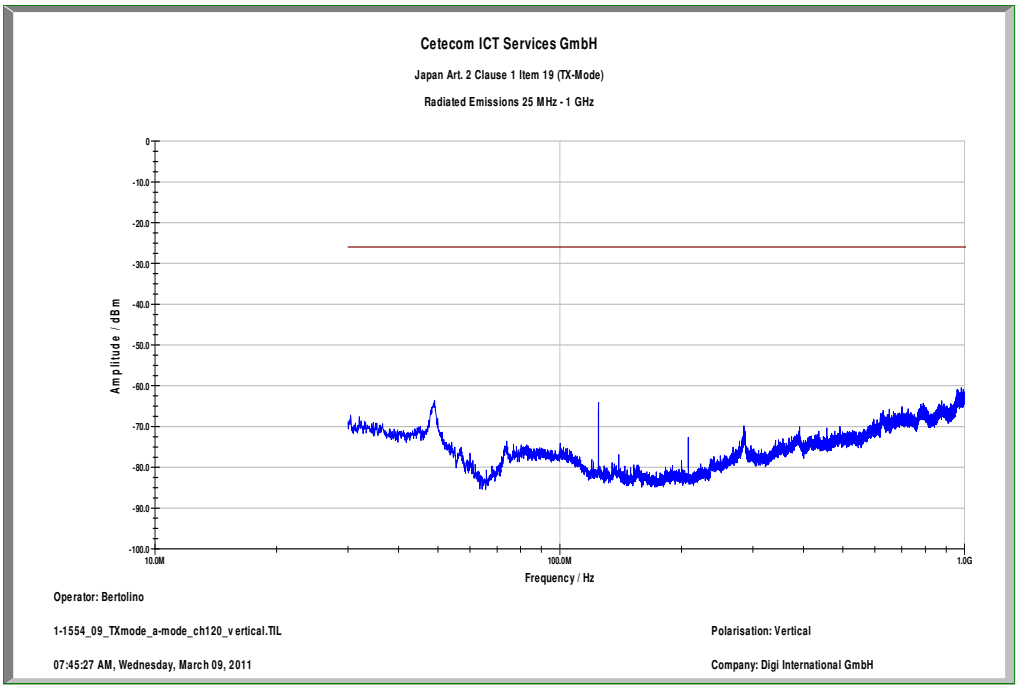
Date: 11.MAR.2011 09:47:06

Plot 6: Lowest channel – 5500 MHz; (18 GHz – 26 GHz) – vertical & horizontal

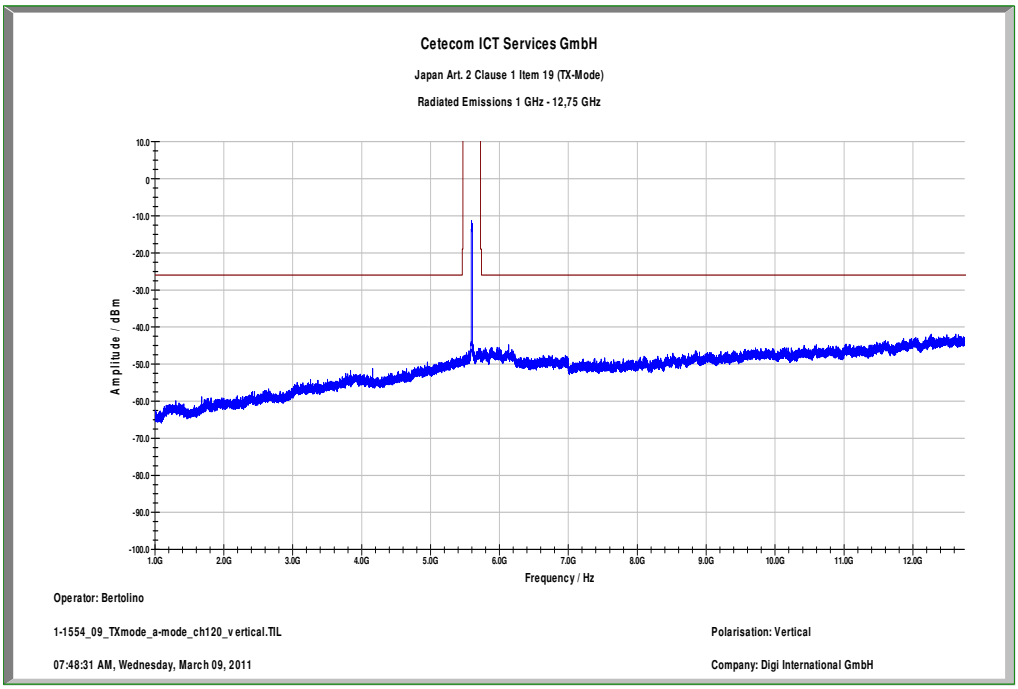


Date: 11.MAR.2011 09:55:32

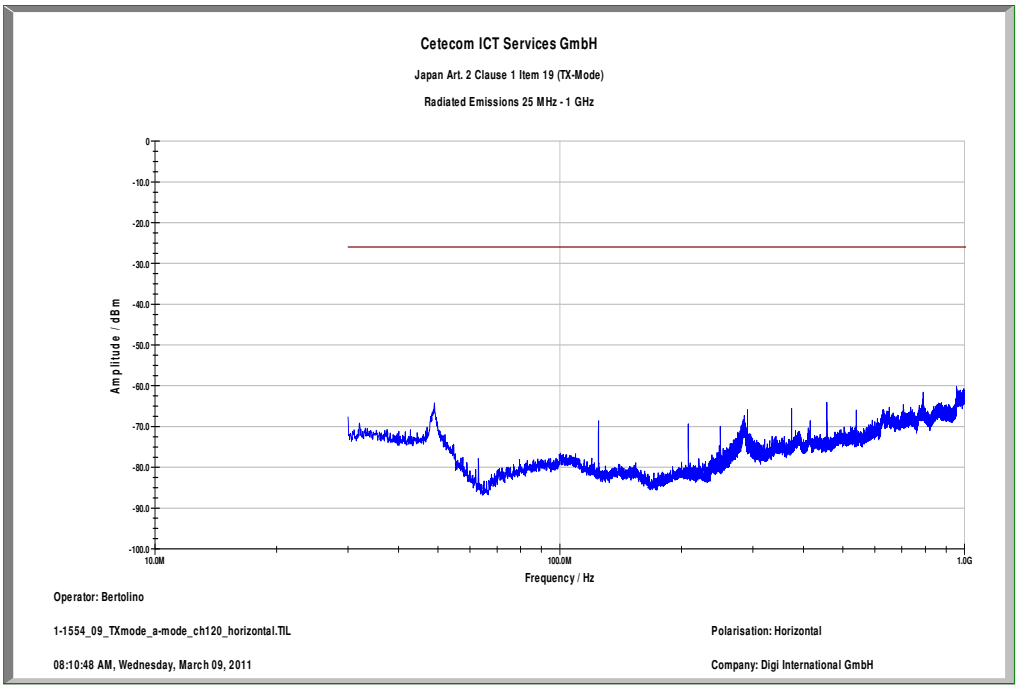
Plot 7: Middle channel – 5600 MHz; (30MHz – 1 GHz) – vertical



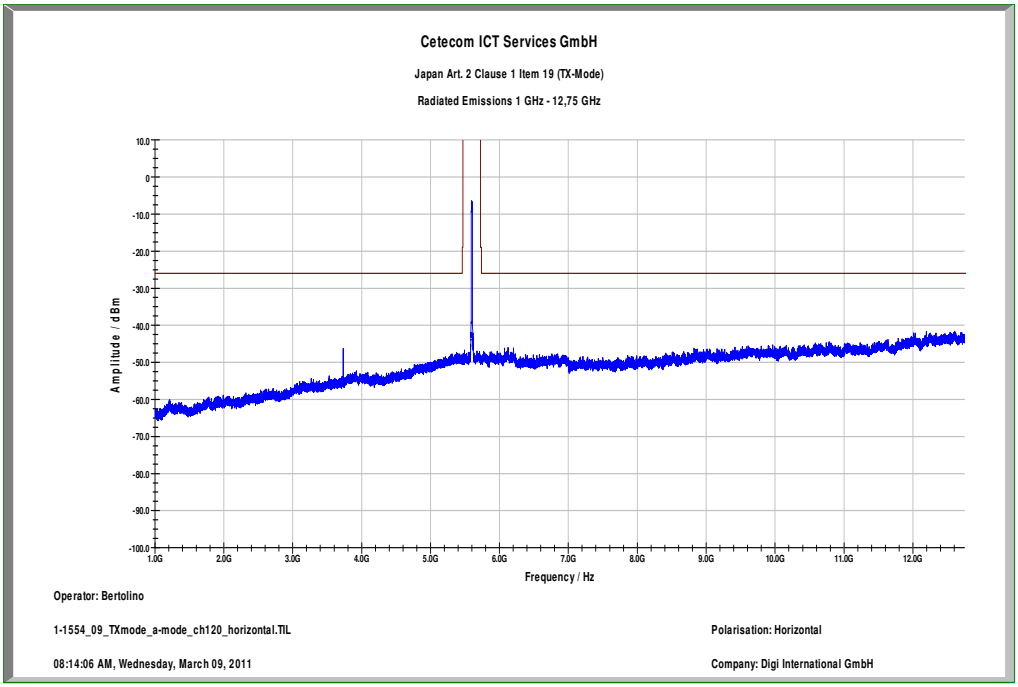
Plot 8: Middle channel – 5600 MHz; (1 GHz – 12.75 GHz) – vertical



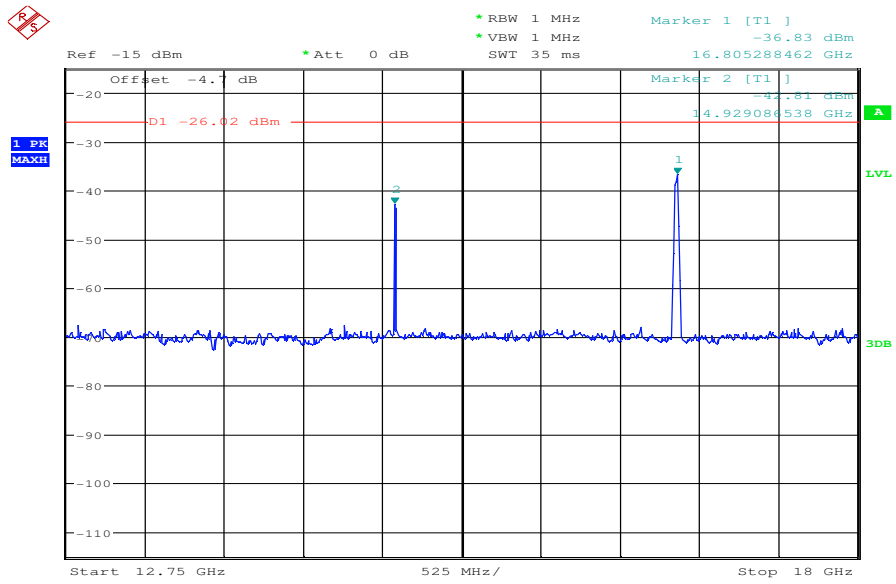
Plot 9: Middle channel – 5600 MHz; (30MHz – 1 GHz) – horizontal



Plot 10: Middle channel – 5600 MHz; (1 GHz – 12.75 GHz) – horizontal

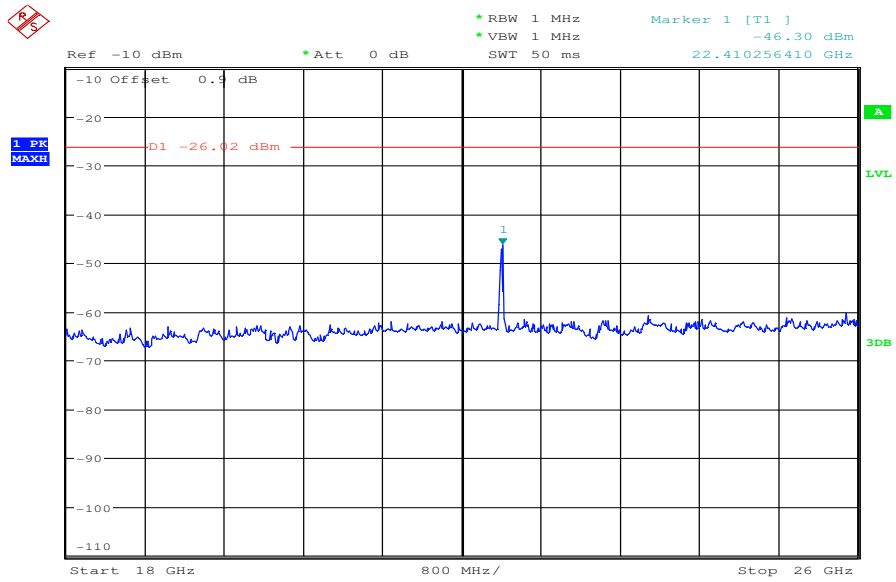


Plot 11: Middle channel – 5600 MHz; (12.75 GHz – 18 GHz) – vertical & horizontal



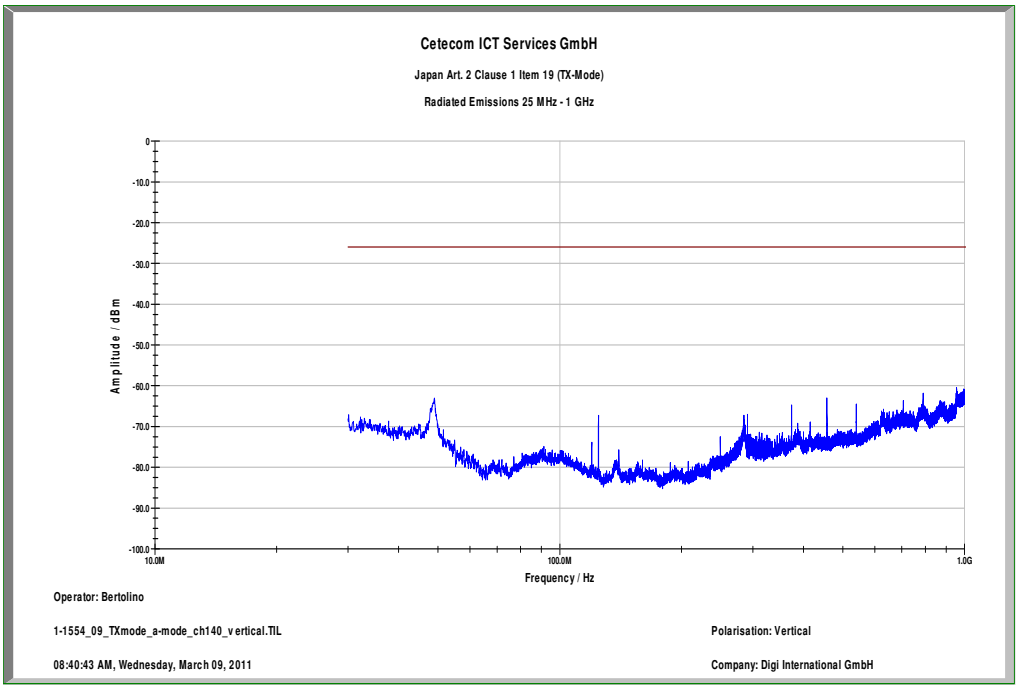
Date: 11.MAR.2011 09:49:47

Plot 12: Middle channel – 5600 MHz; (18 GHz – 26 GHz) – vertical & horizontal

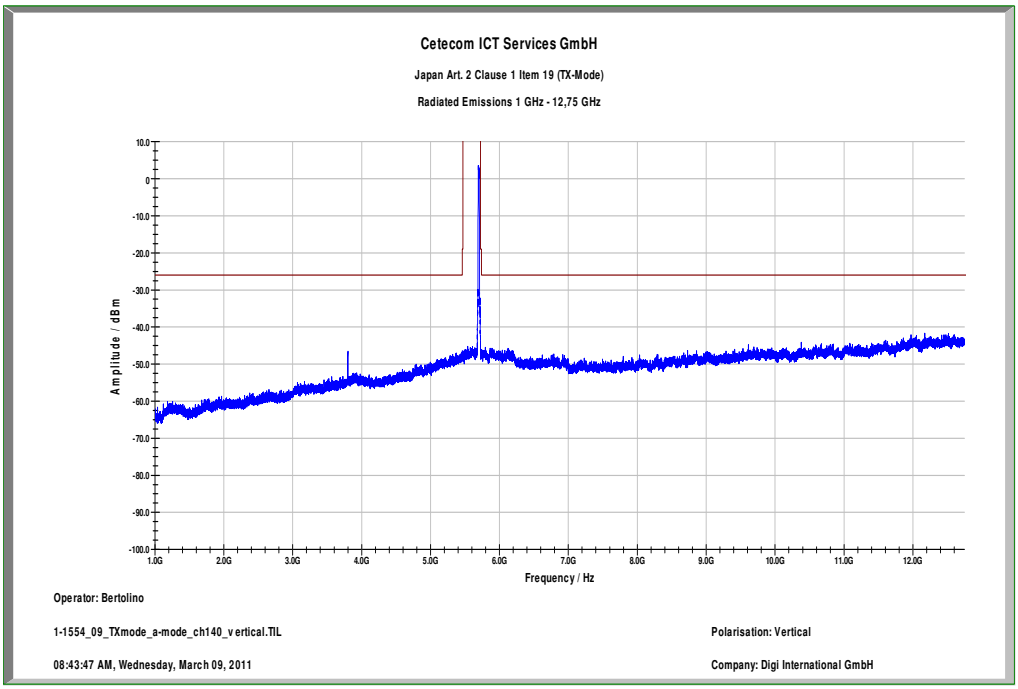


Date: 11.MAR.2011 09:58:22

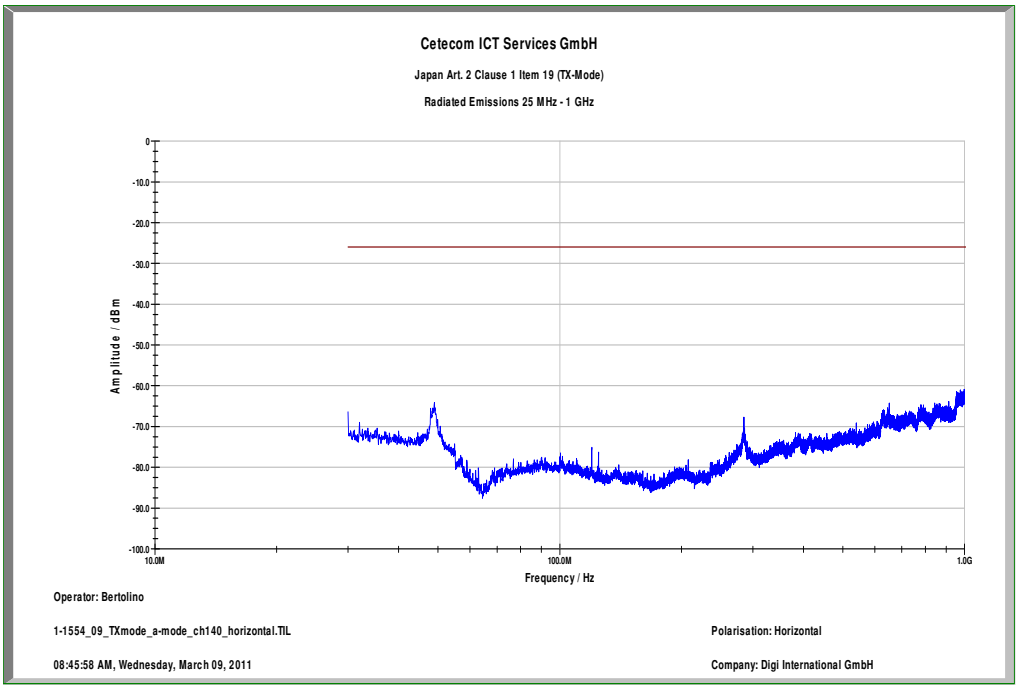
Plot 13: Highest channel – 5700 MHz; (30MHz – 1 GHz) – vertical



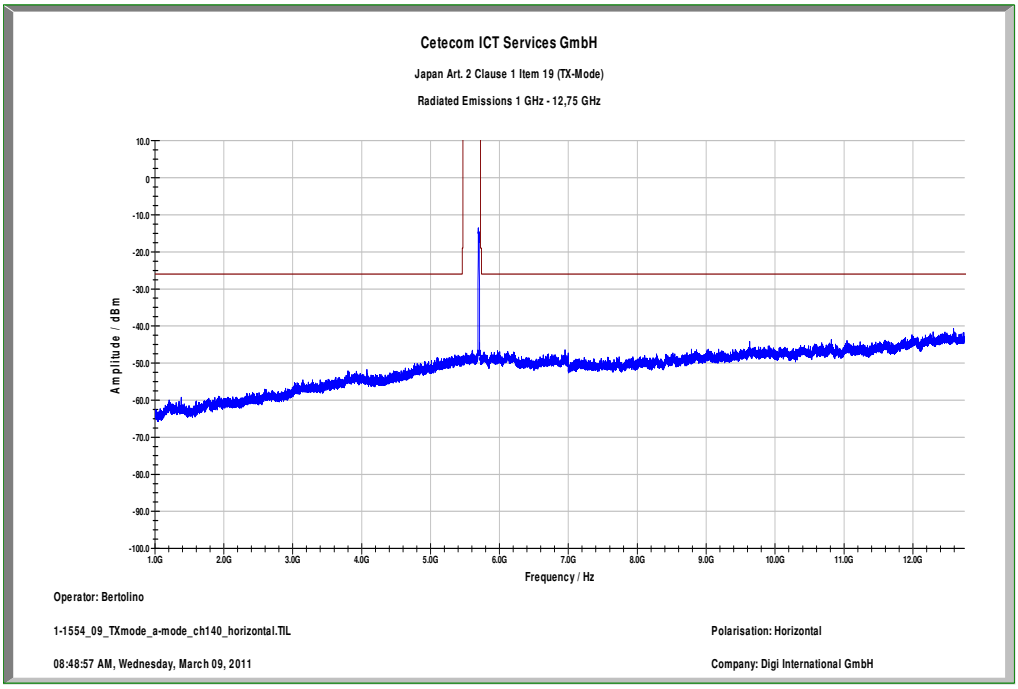
Plot 14: Highest channel – 5700 MHz; (1 GHz – 12.75 GHz) – vertical



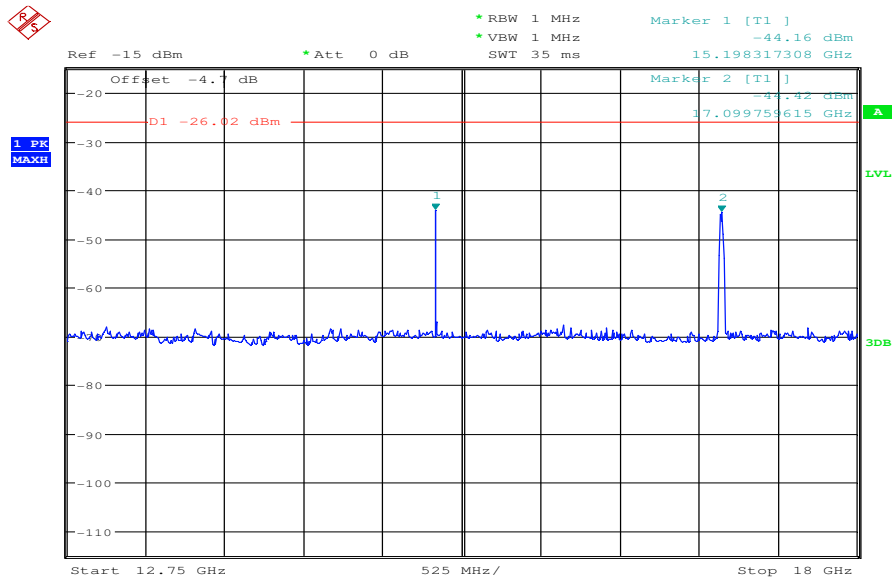
Plot 15: Highest channel – 5700 MHz; (30MHz – 1 GHz) – horizontal



Plot 16: Highest channel – 5700 MHz; (1 GHz – 12.75 GHz) – horizontal

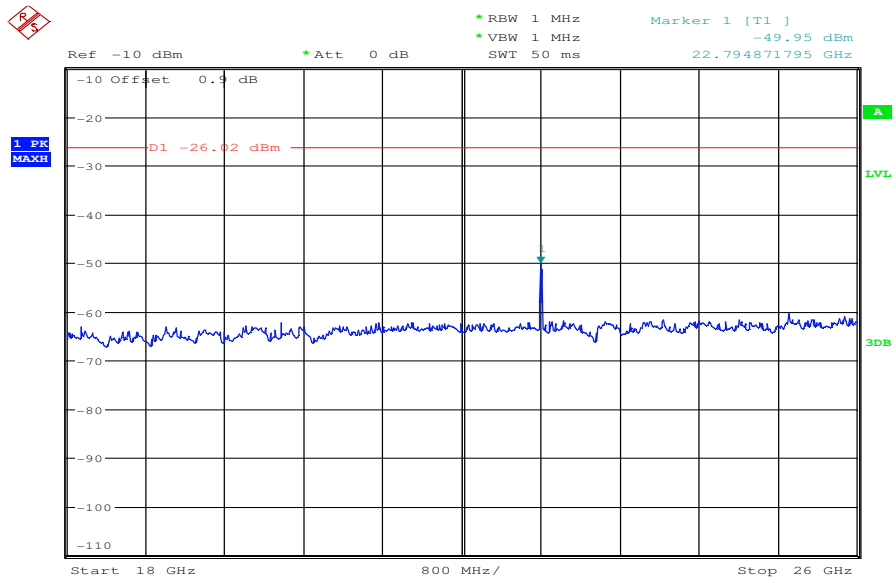


Plot 17: Highest channel – 5700 MHz; (12.75 GHz – 18 GHz) – vertical & horizontal



Date: 11.MAR.2011 09:52:13

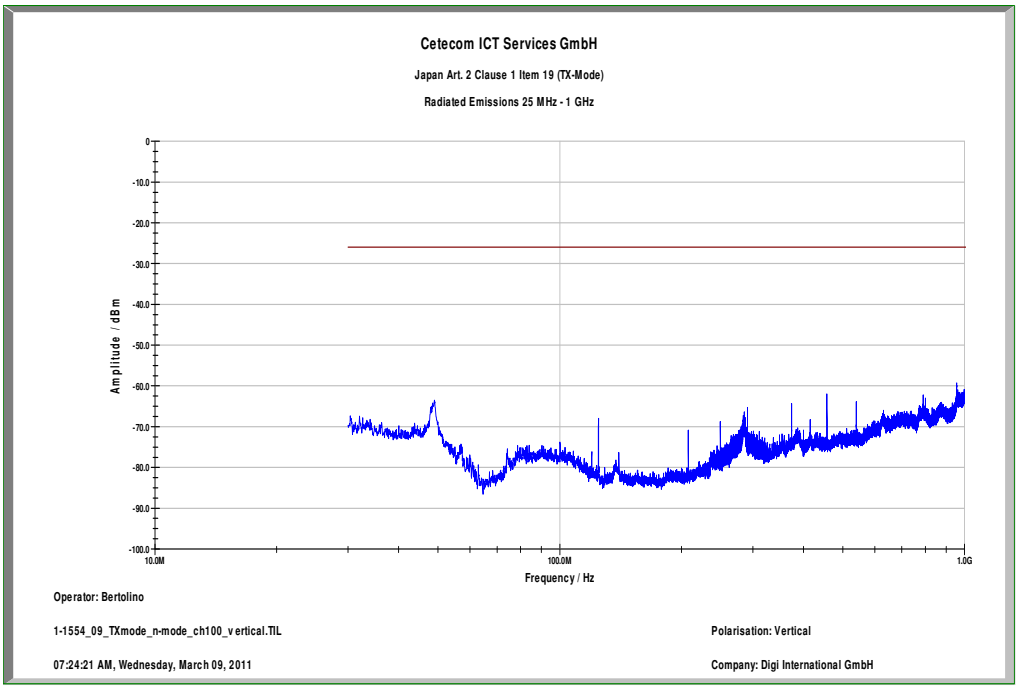
Plot 18: Highest channel – 5700 MHz; (18 GHz – 26 GHz) – vertical & horizontal



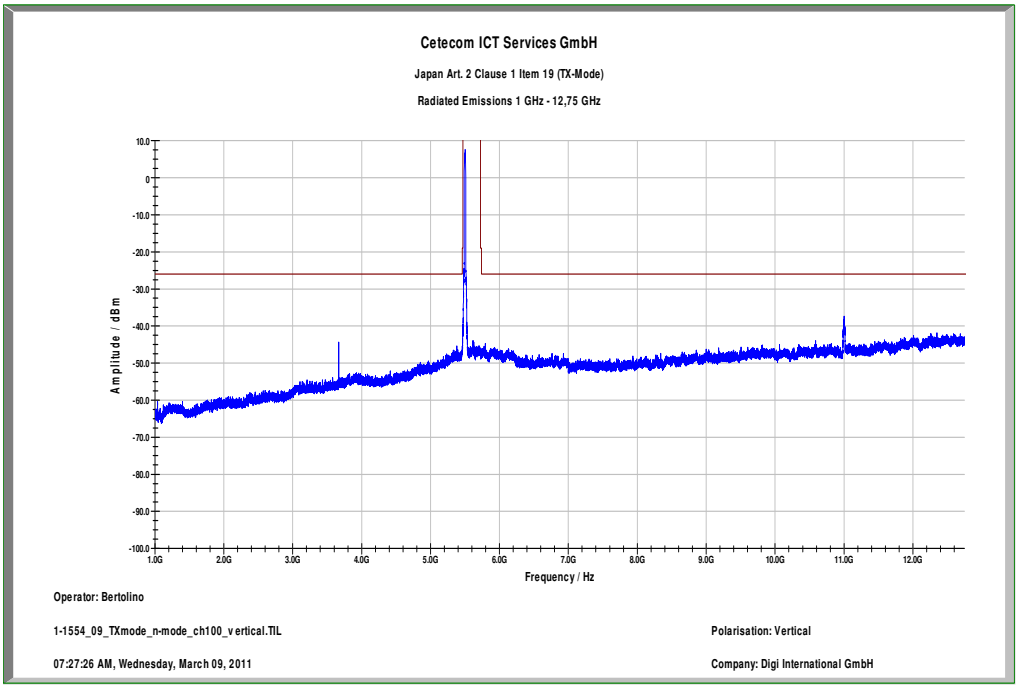
Date: 11.MAR.2011 10:00:36

Plots: OFDM / n – mode

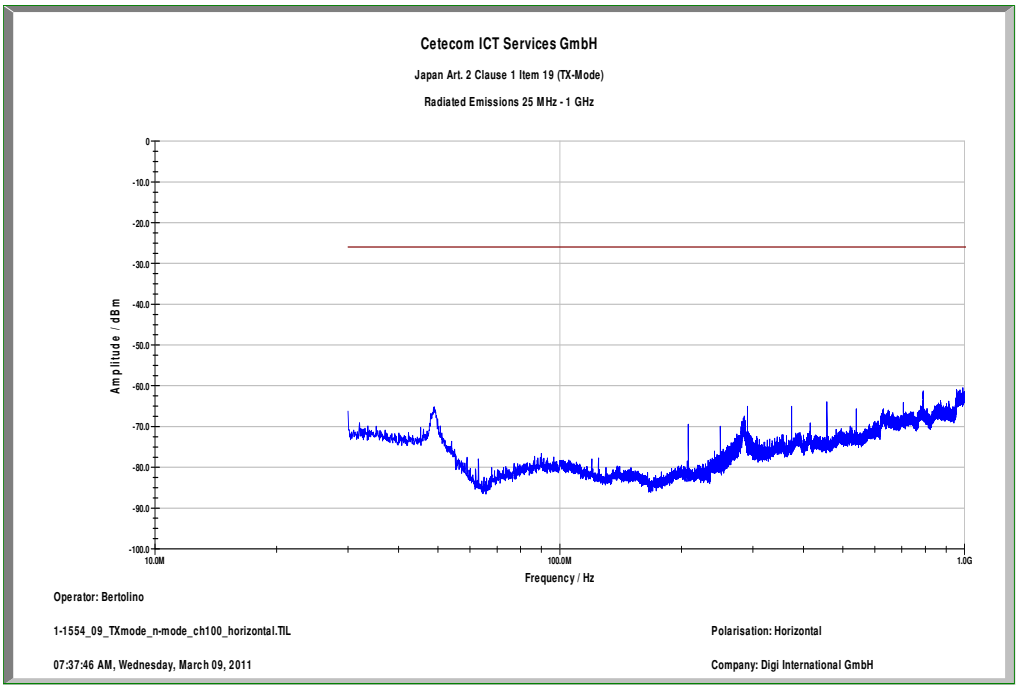
Plot 1: Lowest channel – 5500 MHz; (30MHz – 1 GHz) – vertical



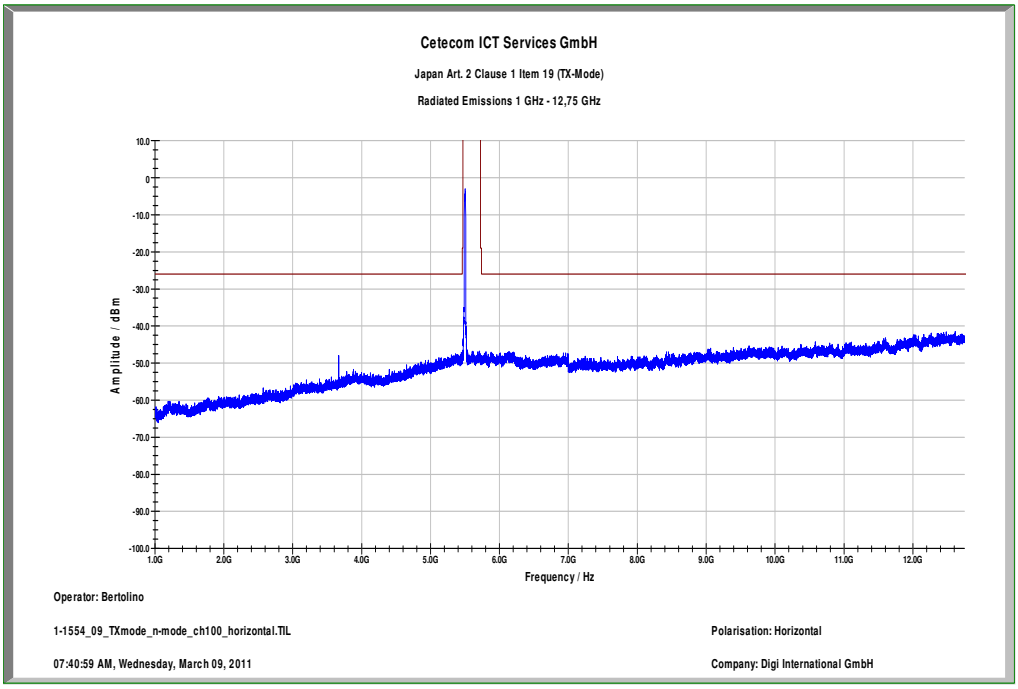
Plot 2: Lowest channel – 5500 MHz; (1 GHz – 12.75 GHz) – vertical



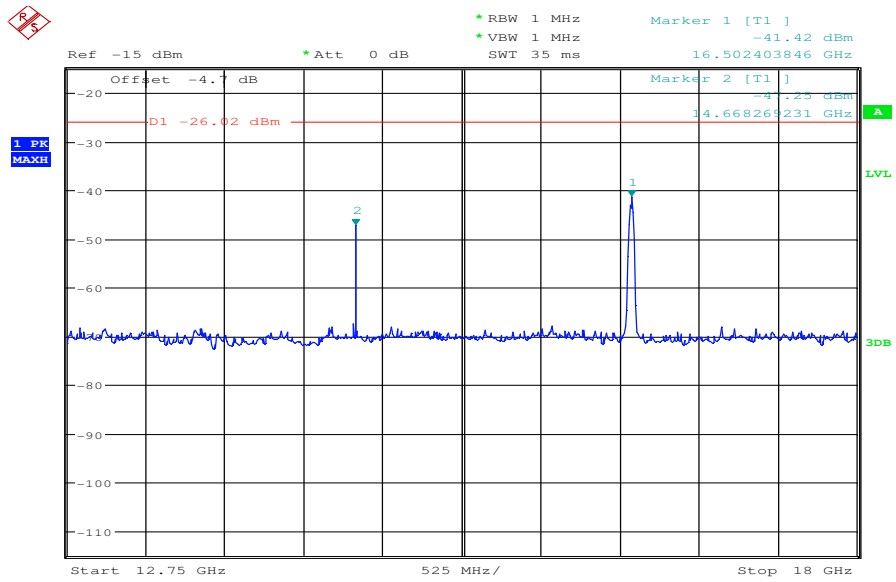
Plot 3: Lowest channel – 5500 MHz; (30MHz – 1 GHz) – horizontal



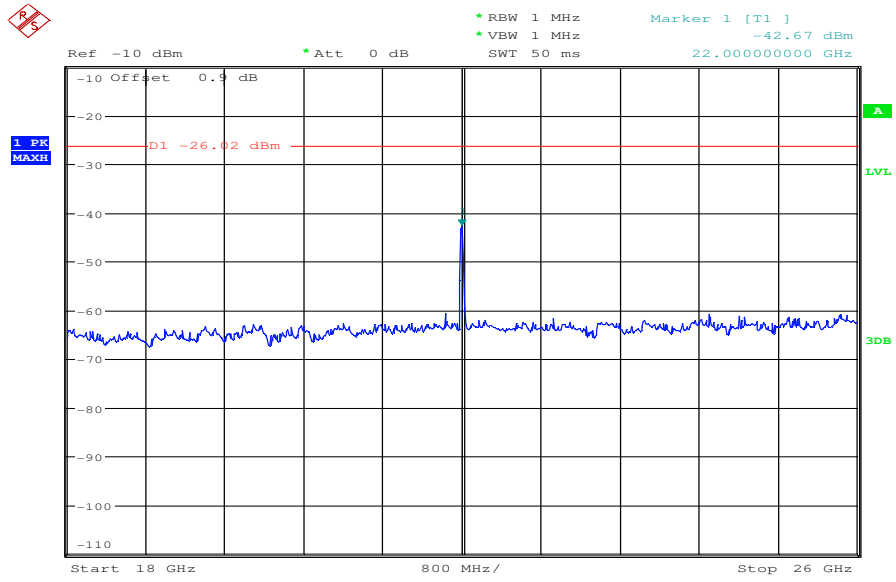
Plot 4: Lowest channel – 5500 MHz; (1 GHz – 12.75 GHz) – horizontal



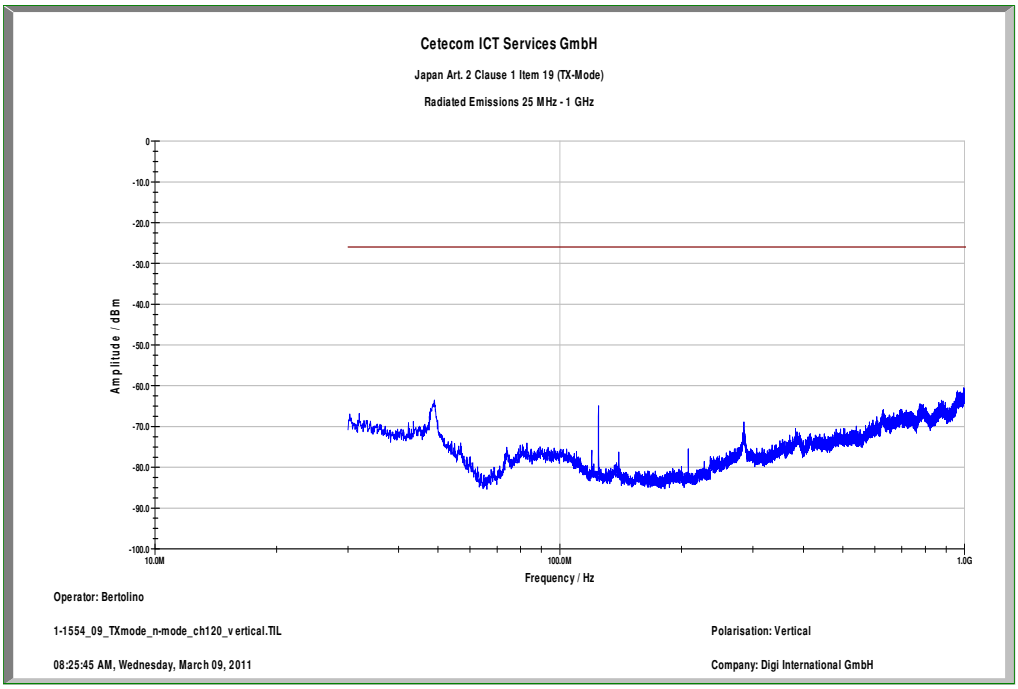
Plot 5: Lowest channel – 5500 MHz; (12.75 GHz – 18 GHz) – vertical & horizontal



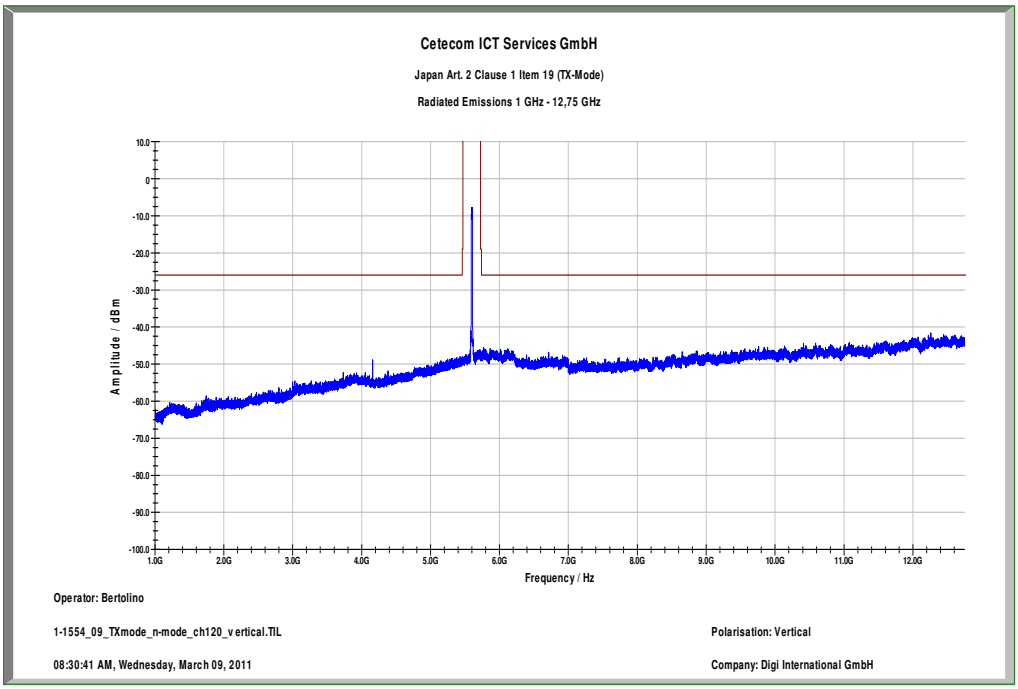
Plot 6: Lowest channel – 5500 MHz; (18 GHz – 26 GHz) – vertical & horizontal



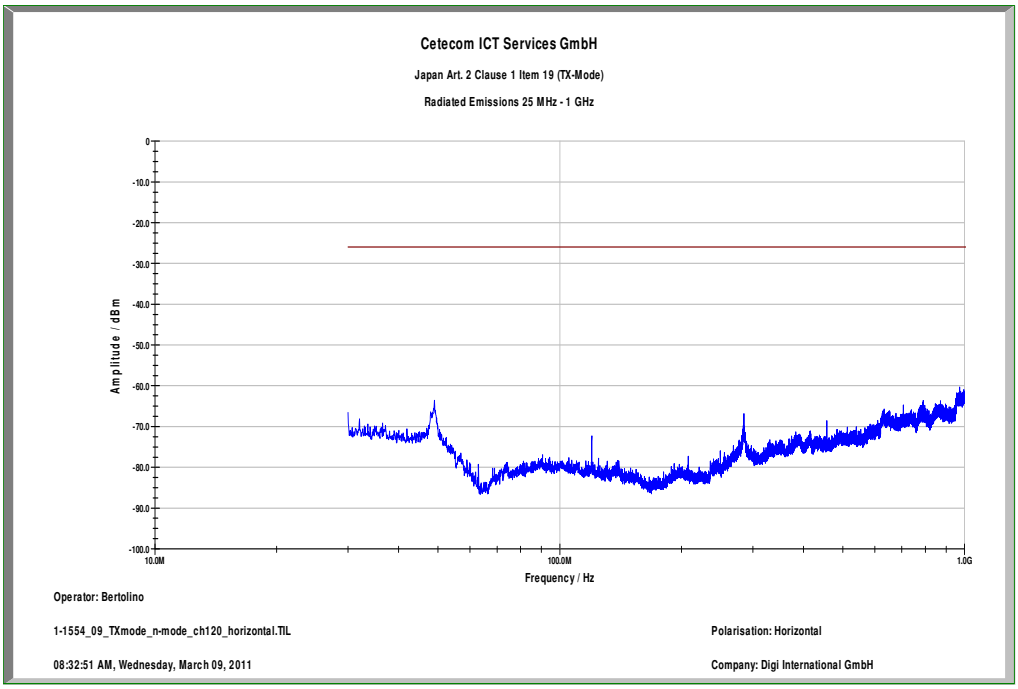
Plot 7: Middle channel – 5600 MHz; (30MHz – 1 GHz) – vertical



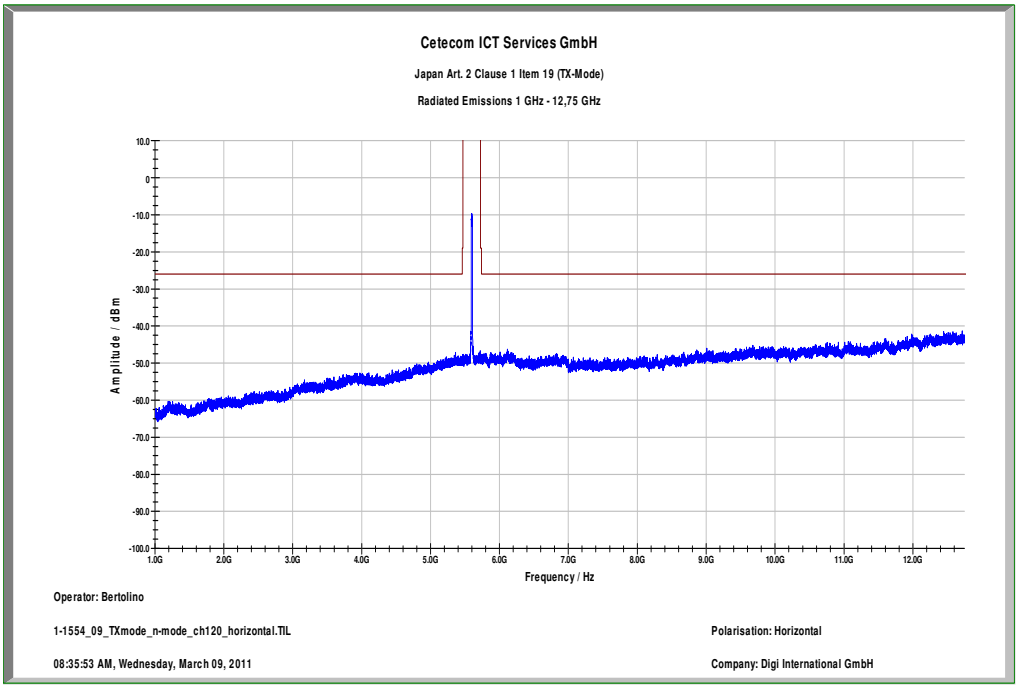
Plot 8: Middle channel – 5600 MHz; (1 GHz – 12.75 GHz) – vertical



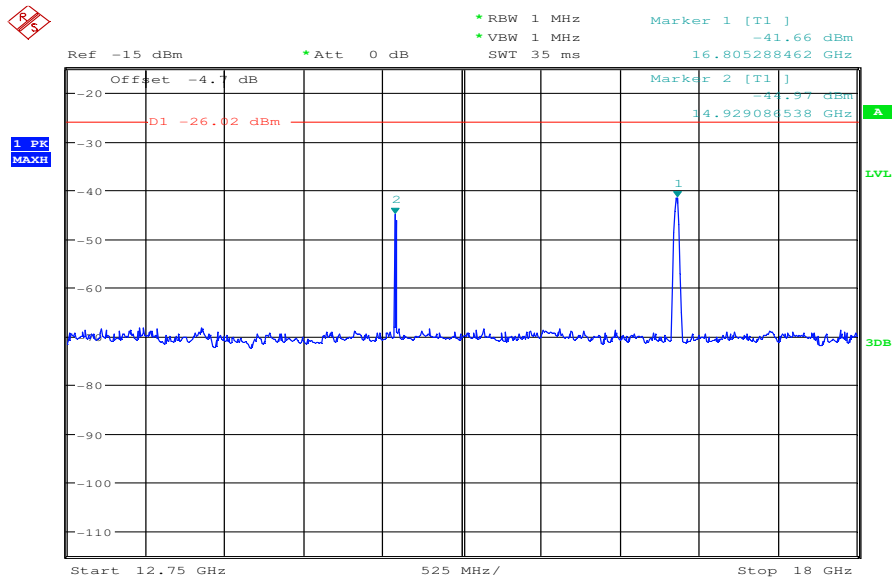
Plot 9: Middle channel – 5600 MHz; (30MHz – 1 GHz) – horizontal



Plot 10: Middle channel – 5600 MHz; (1 GHz – 12.75 GHz) – horizontal

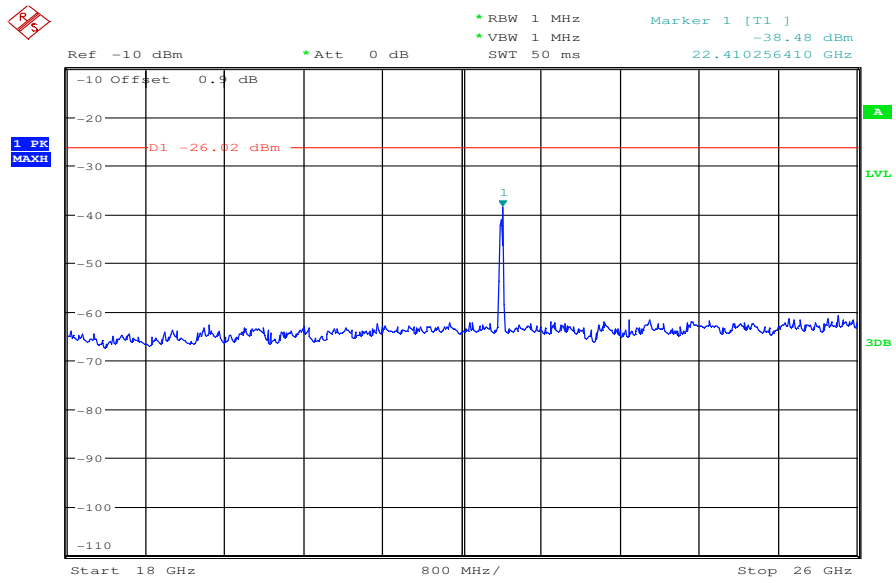


Plot 11: Middle channel – 5600 MHz; (12.75 GHz – 18 GHz) – vertical & horizontal



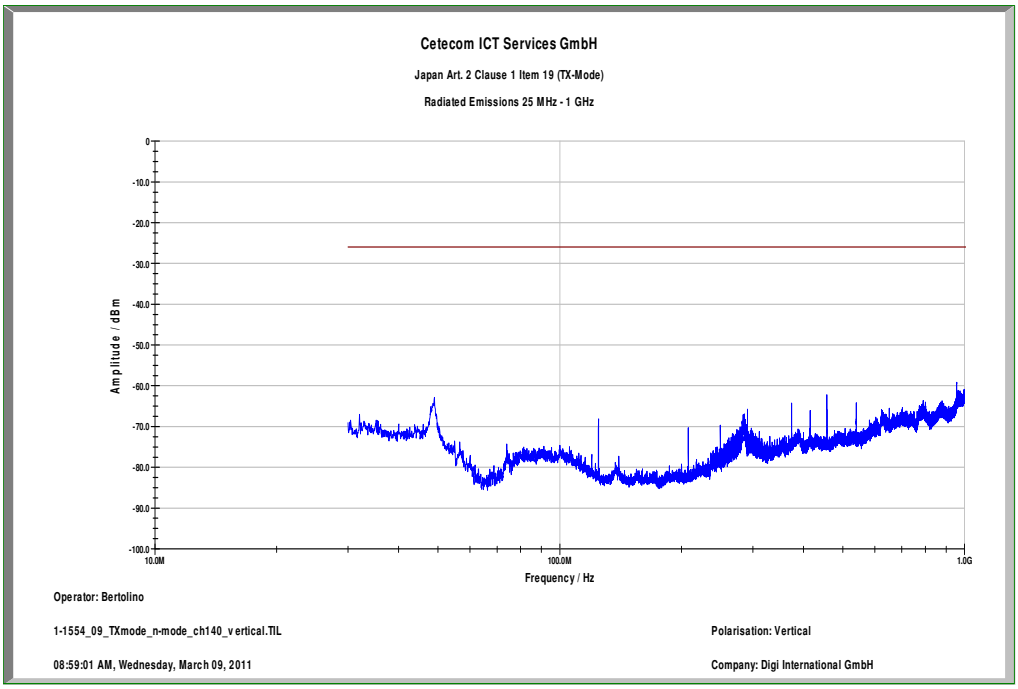
Date: 11.MAR.2011 09:50:44

Plot 12: Middle channel – 5600 MHz; (18 GHz – 26 GHz) – vertical & horizontal

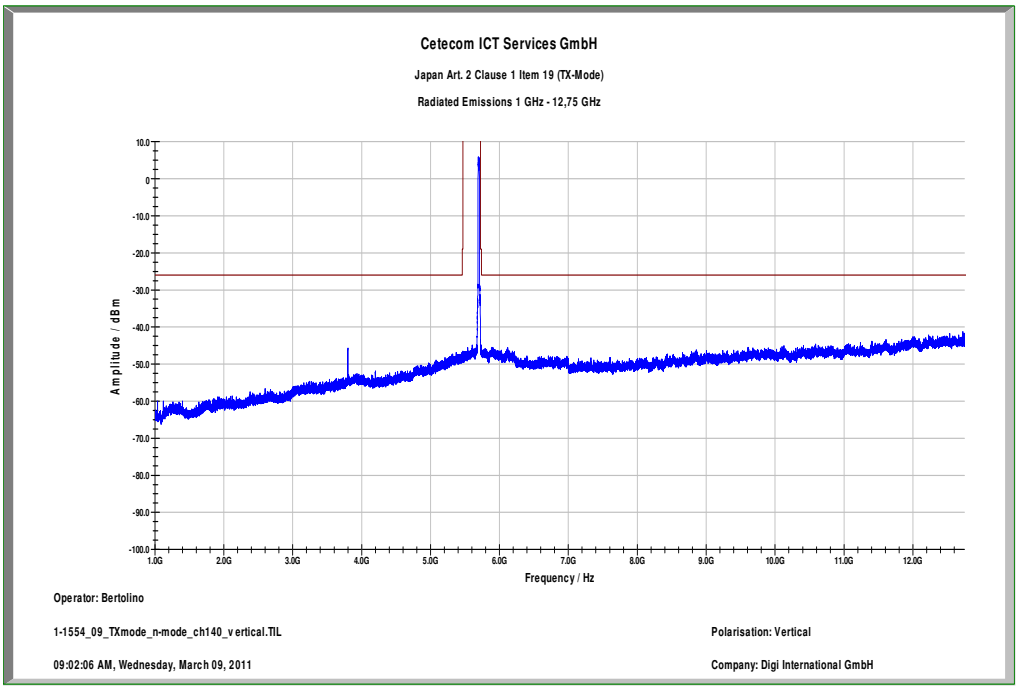


Date: 11.MAR.2011 09:59:20

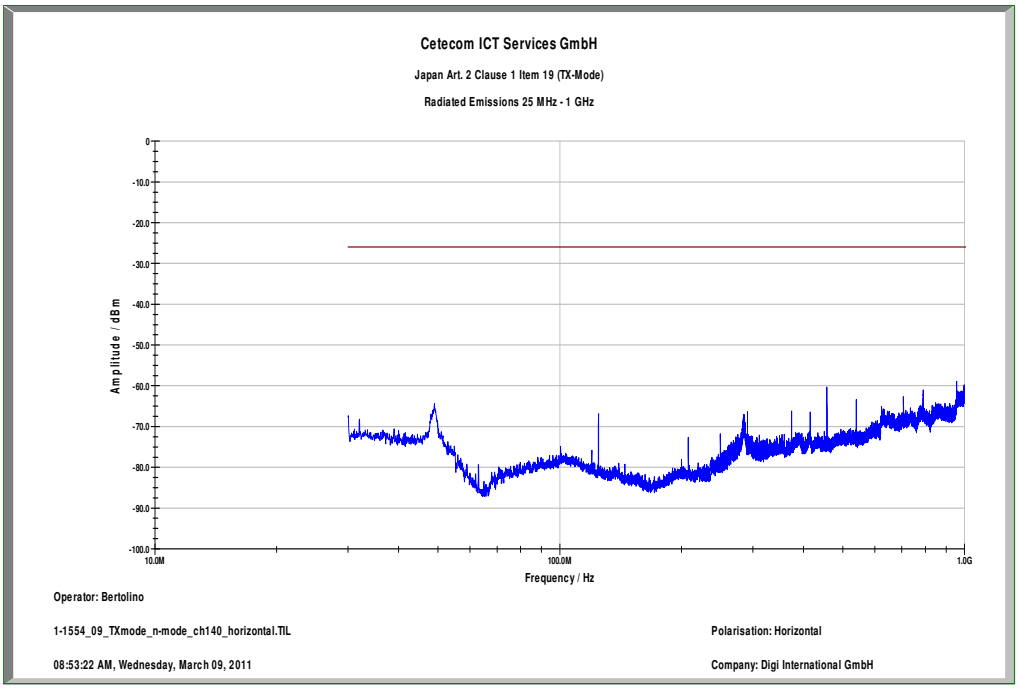
Plot 13: Highest channel – 5700 MHz; (30MHz – 1 GHz) – vertical



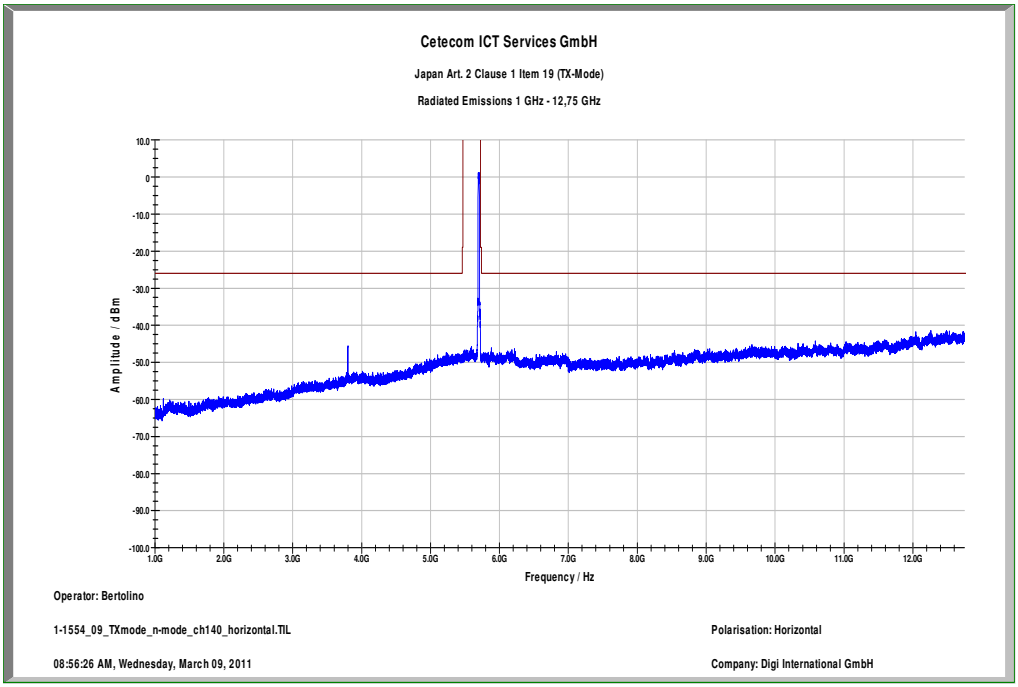
Plot 14: Highest channel – 5700 MHz; (1 GHz – 12.75 GHz) – vertical



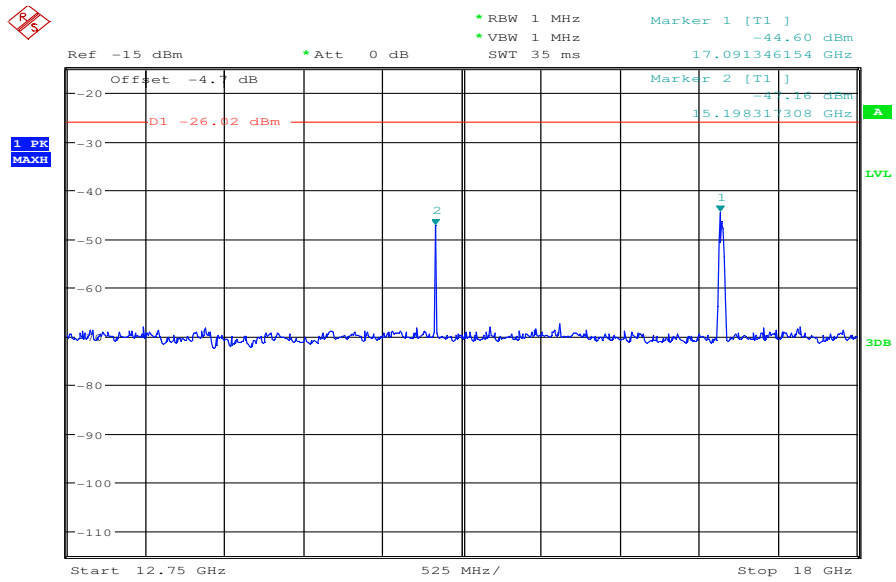
Plot 15: Highest channel – 5700 MHz; (30MHz – 1 GHz) – horizontal



Plot 16: Highest channel – 5700 MHz; (1 GHz – 12.75 GHz) – horizontal

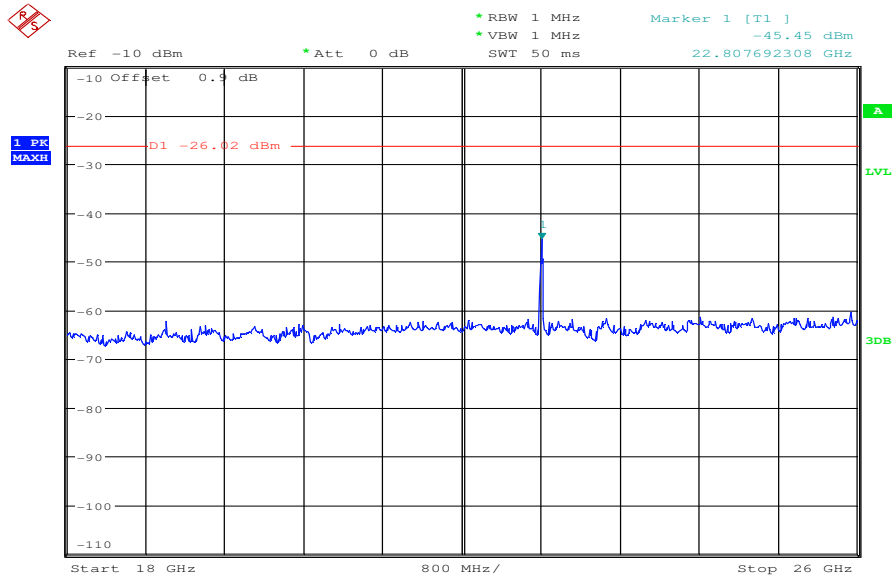


Plot 17: Highest channel – 5700 MHz; (12.75 GHz – 18 GHz) – vertical & horizontal



Date: 11.MAR.2011 09:53:07

Plot 18: Highest channel – 5700 MHz; (18 GHz – 26 GHz) – vertical & horizontal



Date: 11.MAR.2011 10:01:26

9.8 Occupied & spreading bandwidth

Measurement parameter:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	10 kHz (less than 3% of the acceptable value)
Video bandwidth:	10 kHz (comparable to RBW)
Span:	40 MHz (2-3.5 times of the acceptable value)
Trace-Mode:	Max Hold
Additional EUT parameters:	Power index 26 OFDM a & n – mode

Results: OFDM a – mode

	lowest channel 5500 MHz	middle channel 5600 MHz	highest channel 5700 MHz
Spreading bandwidth [MHz] (90% bandwidth)	16.73	16.73	16.79
Occupied bandwidth [MHz] (99% bandwidth)	18.40	18.27	18.46

Results: OFDM n – mode

	lowest channel 5500 MHz	middle channel 5600 MHz	highest channel 5700 MHz
Spreading bandwidth [MHz] (90% bandwidth)	17.95	17.95	17.95
Occupied bandwidth [MHz] (99% bandwidth)	19.29	19.17	19.10

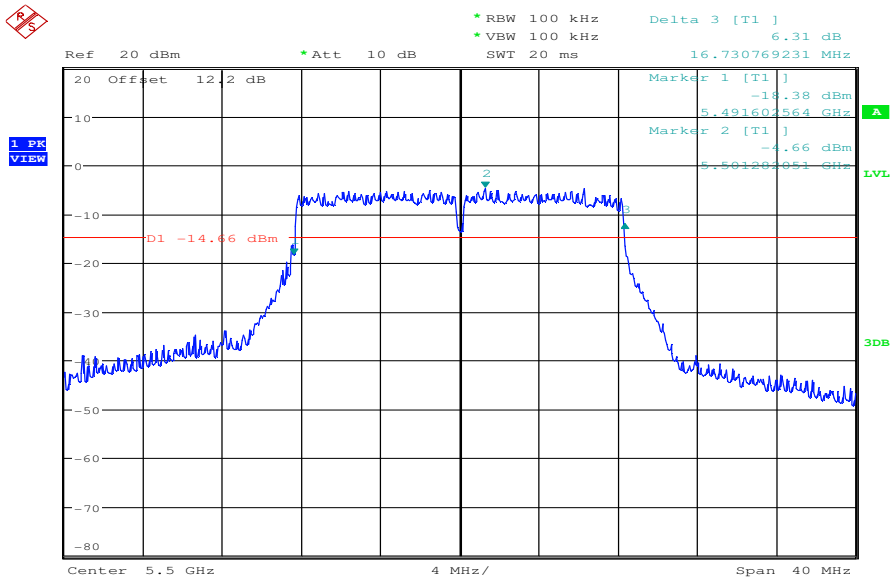
Limit:

Limit Occupied Bandwidth	< 19.7 MHz
Limit Spreading Bandwidth	> 500 kHz

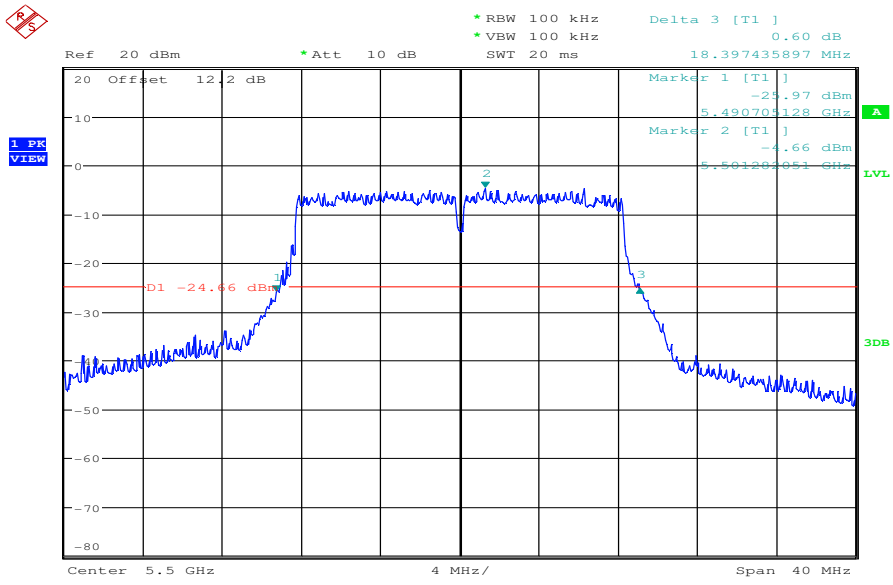
Result: **The result of the measurement is passed.**

Plots: OFDM / a – mode, power index 26, 54 MBit/s

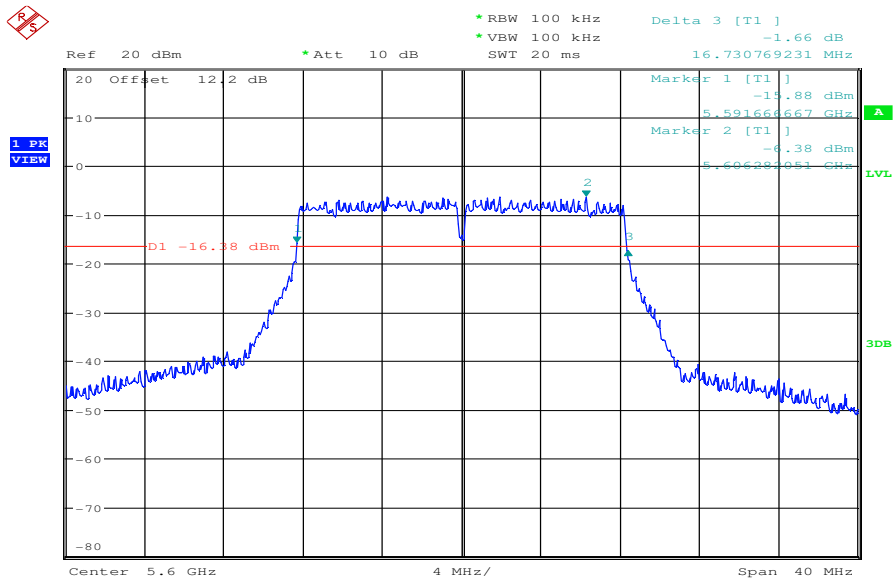
Plot 1: OFDM (lowest channel – 5500 MHz, 90% bandwidth)



Plot 2: OFDM (lowest channel – 5500 MHz, 99% bandwidth)

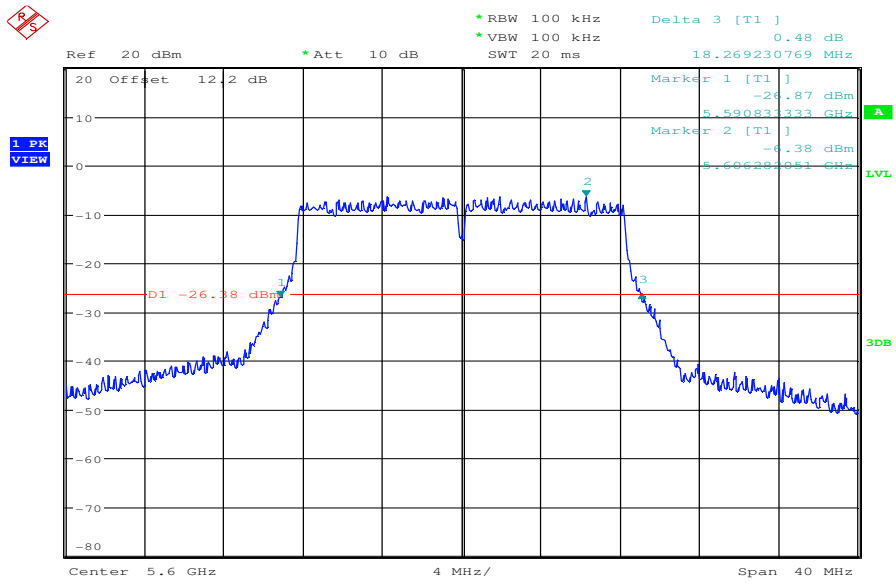


Plot 3: OFDM (middle channel – 5600 MHz, 90%bandwidth)



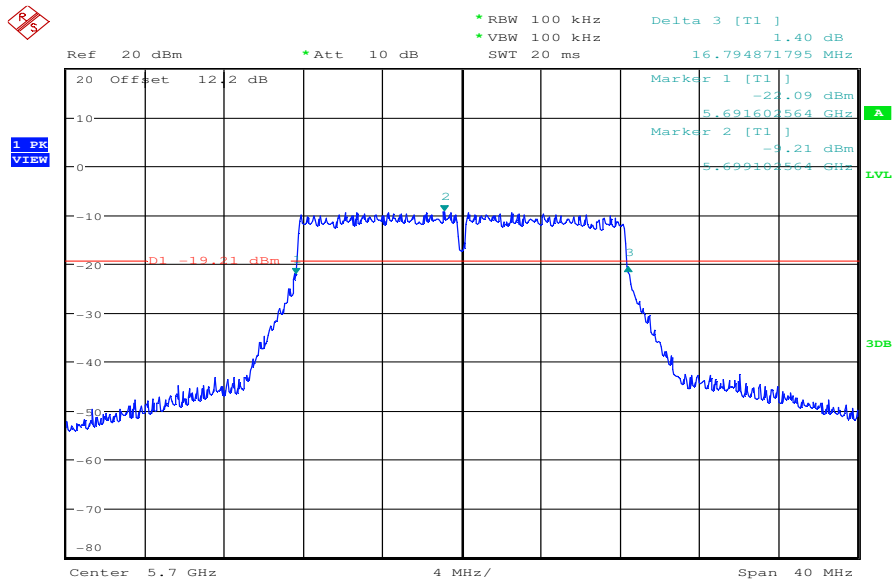
Date: 10.MAR.2011 14:03:06

Plot 4: OFDM (middle channel – 5600 MHz, 99%bandwidth)



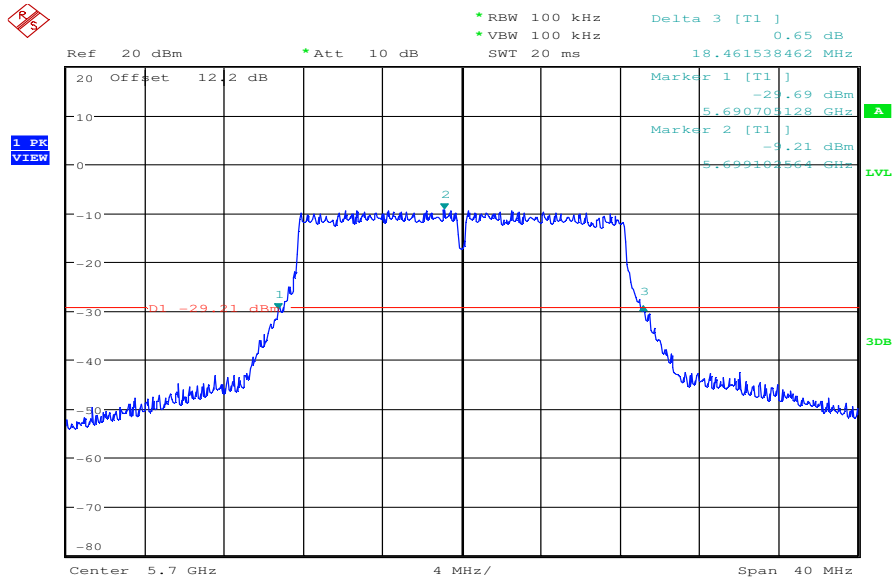
Date: 10.MAR.2011 14:04:01

Plot 5: OFDM (highest channel – 5700 MHz, 90%bandwidth)



Date: 10.MAR.2011 14:41:35

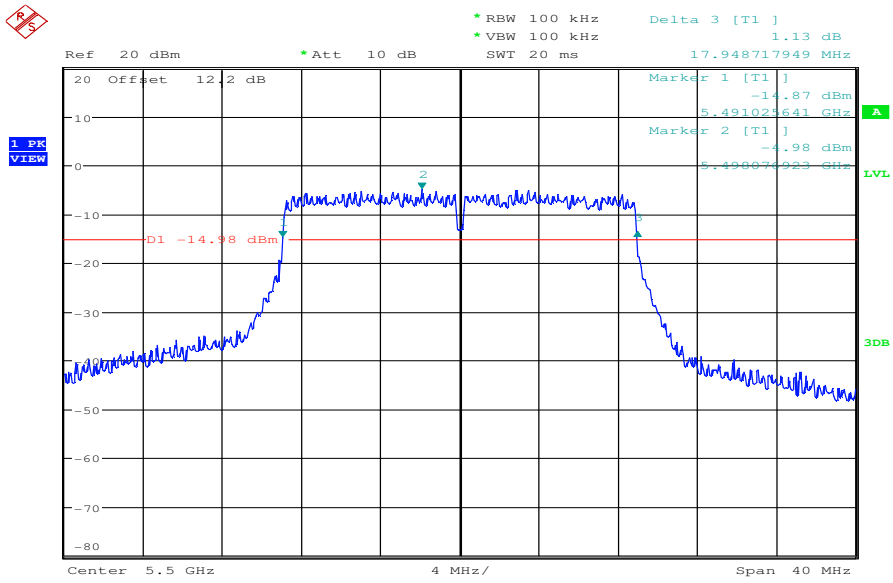
Plot 6: OFDM (highest channel – 5700 MHz, 99%bandwidth)



Date: 10.MAR.2011 14:42:06

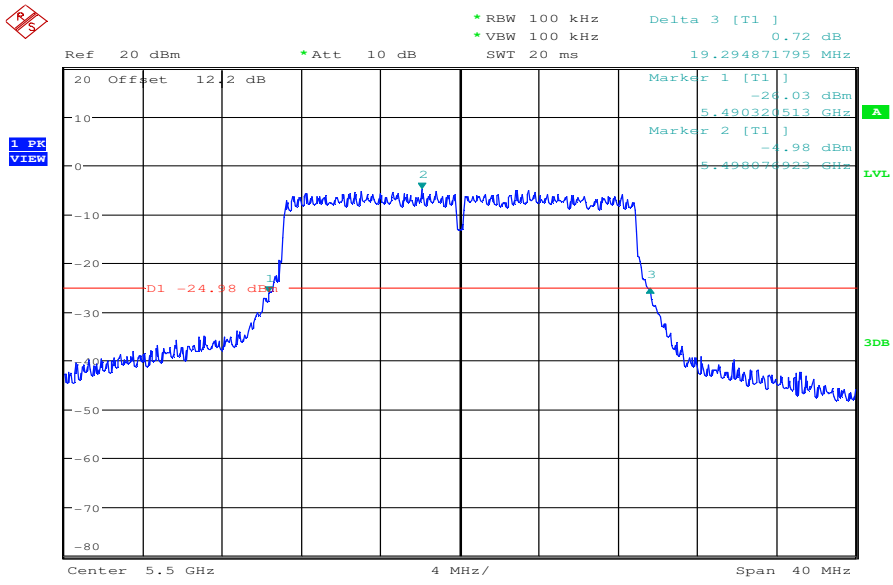
Plots: OFDM / n – mode, power index 26, MCS 7

Plot 1: OFDM (lowest channel – 5500 MHz, 90% bandwidth)



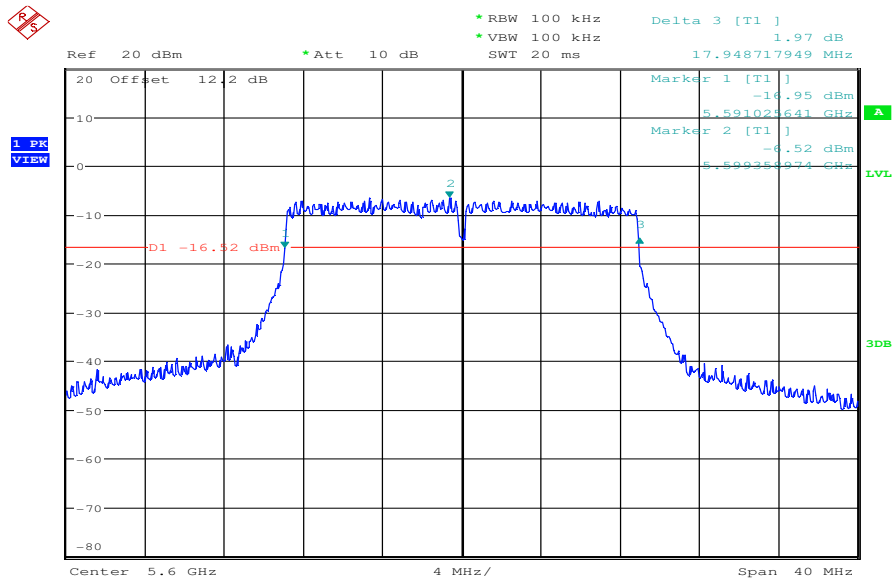
Date: 10.MAR.2011 14:00:17

Plot 2: OFDM (lowest channel – 5500 MHz, 99% bandwidth)

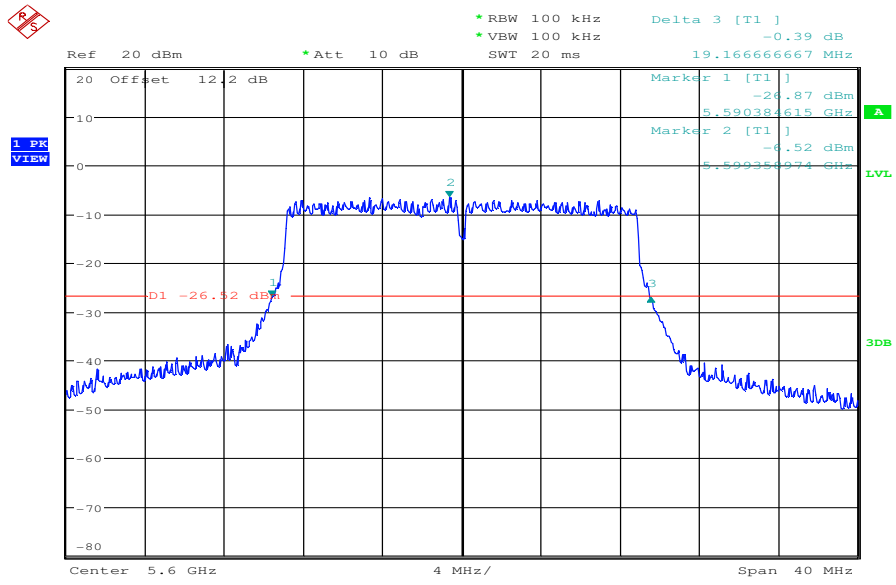


Date: 10.MAR.2011 14:01:04

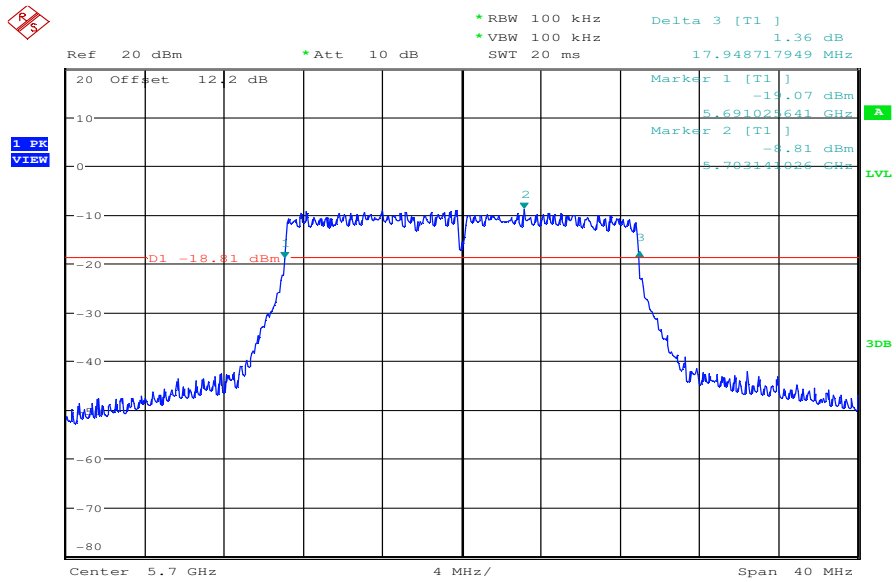
Plot 3: OFDM (middle channel – 5600 MHz, 90%bandwidth)



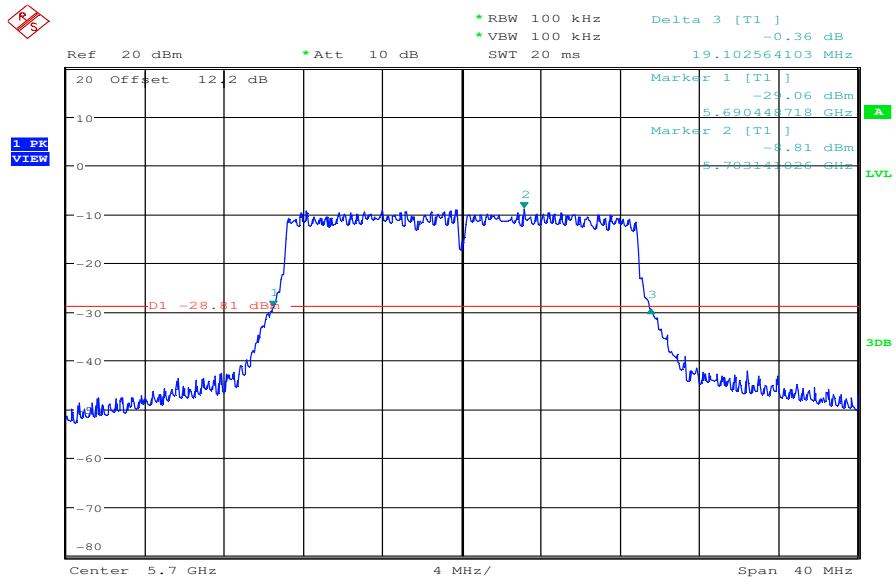
Plot 4: OFDM (middle channel – 5600 MHz, 99%bandwidth)



Plot 5: OFDM (highest channel – 5700 MHz, 90%bandwidth)



Plot 6: OFDM (highest channel – 5700 MHz, 99%bandwidth)



9.9 Adjacent channel emitted power

Measurement parameter:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 MHz
Video bandwidth:	1 MHz
Span:	200 MHz
Trace-Mode:	Max. hold
Additional EUT parameters:	Max. power

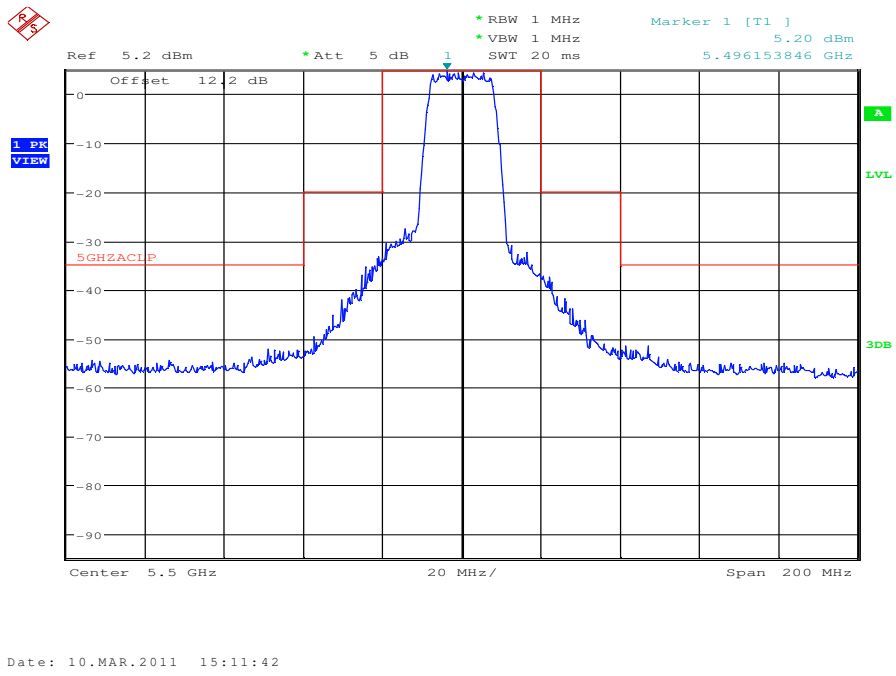
Limit:

Limit	**≥ 25 dBc; f0 ± 20 MHz** **≥ 40 dBc; f0 ± 40 MHz**

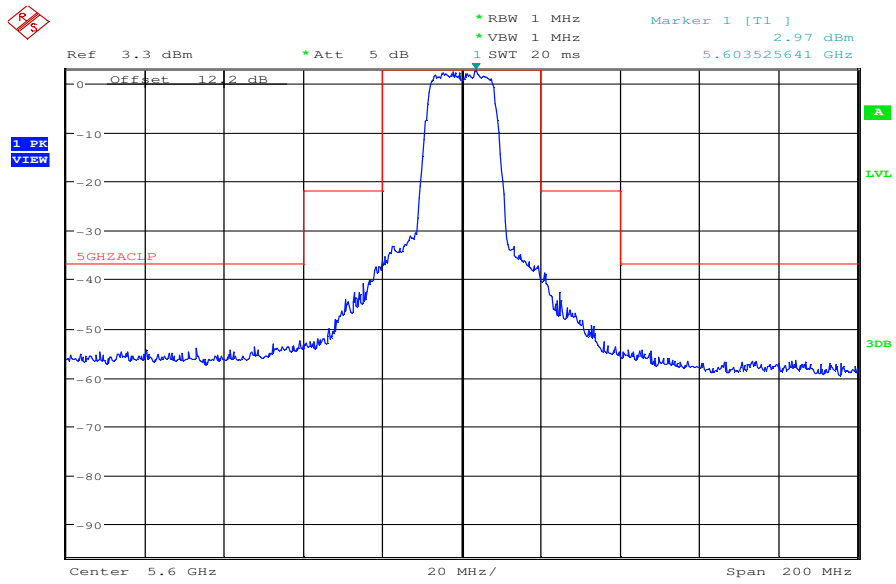
Result: **The result of the measurement is passed.**

Results: OFDM a – mode

Plot 1: 5500 MHz

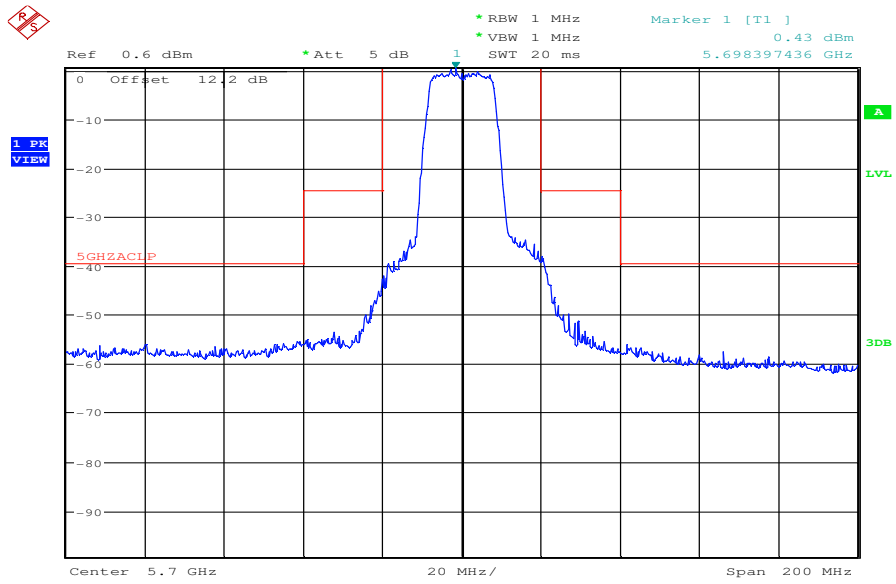


Plot 2: 5600 MHz



Date: 10.MAR.2011 15:15:46

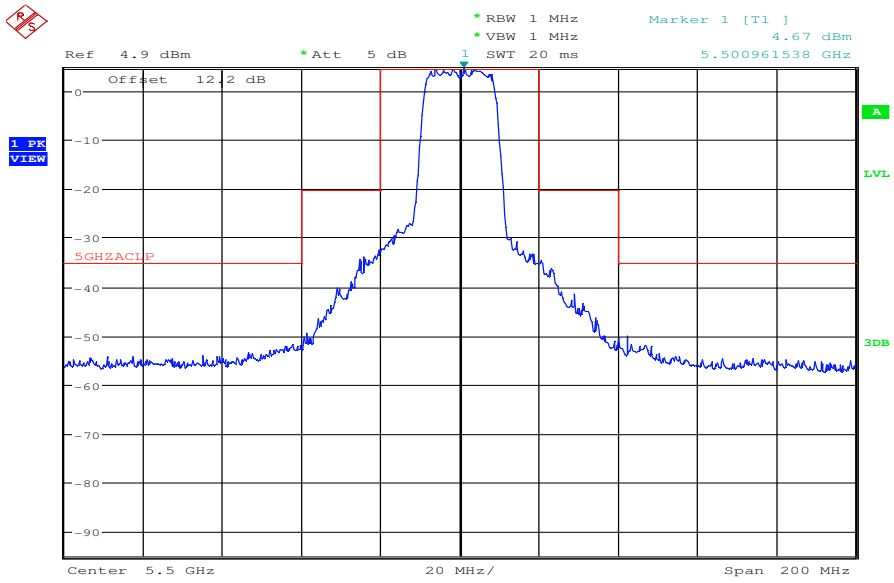
Plot 3: 5700 MHz



Date: 10.MAR.2011 15:18:34

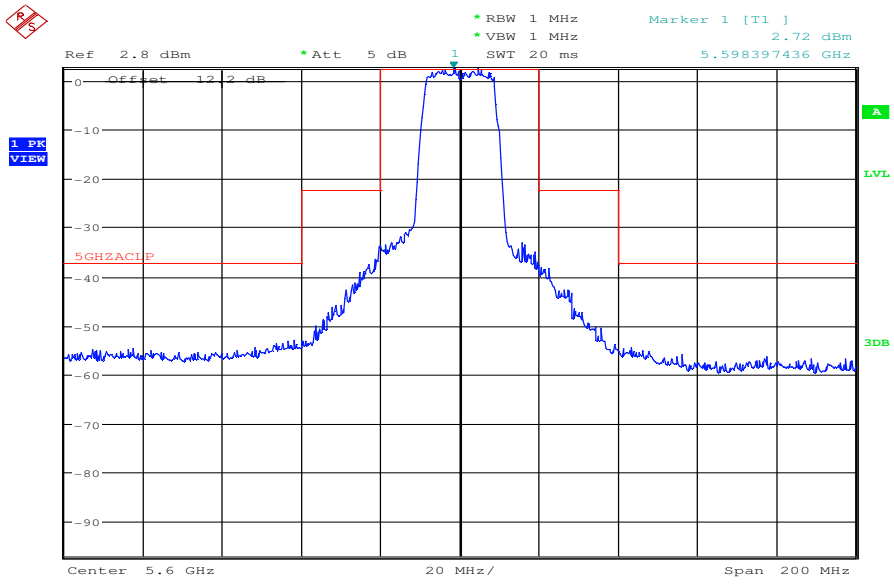
Results: OFDM n – mode

Plot 1: 5500 MHz



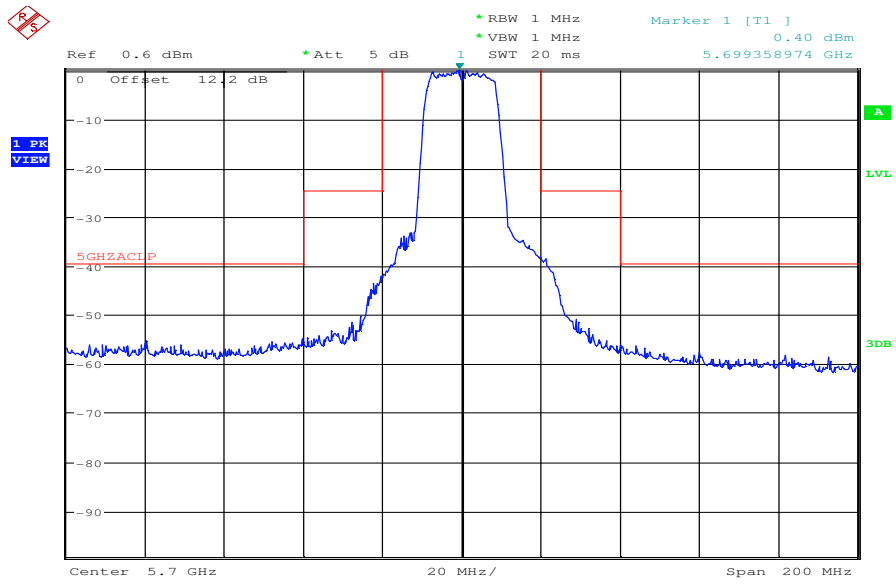
Date: 10.MAR.2011 15:13:01

Plot 2: 5600 MHz



Date: 10.MAR.2011 15:16:59

Plot 3: 5700 MHz



9.10 Spreading factor

> 5 for devices using WLAN Standard

Result: The result of the measurement is passed.

9.11 Staying time

Not applicable – only required for hopping systems

Limit:

Limit	< 400ms

Result: The result of the measurement is passed.

9.12 Dwell time

Measurement parameter:

Measurement parameter	
Detector:	Positive peak
Sweep time:	See plot!
Resolution bandwidth:	1 MHz
Video bandwidth:	1 MHz
Span:	Zero span
Trace-Mode:	View
Additional EUT parameters:	Positive peak

Results:

Limit:

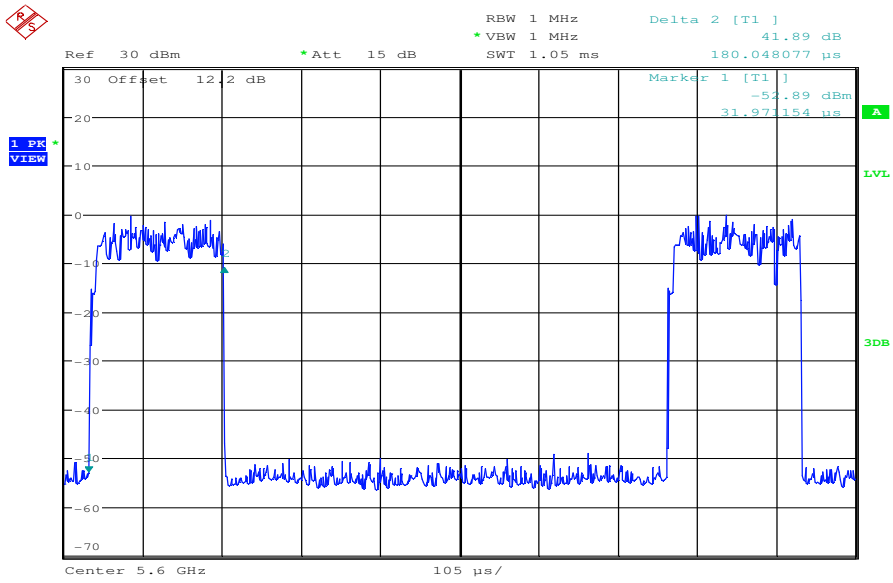
Limit	**< 400ms**

Result: **The result of the measurement is passed.**

DC correction factor: OFDM / a – mode

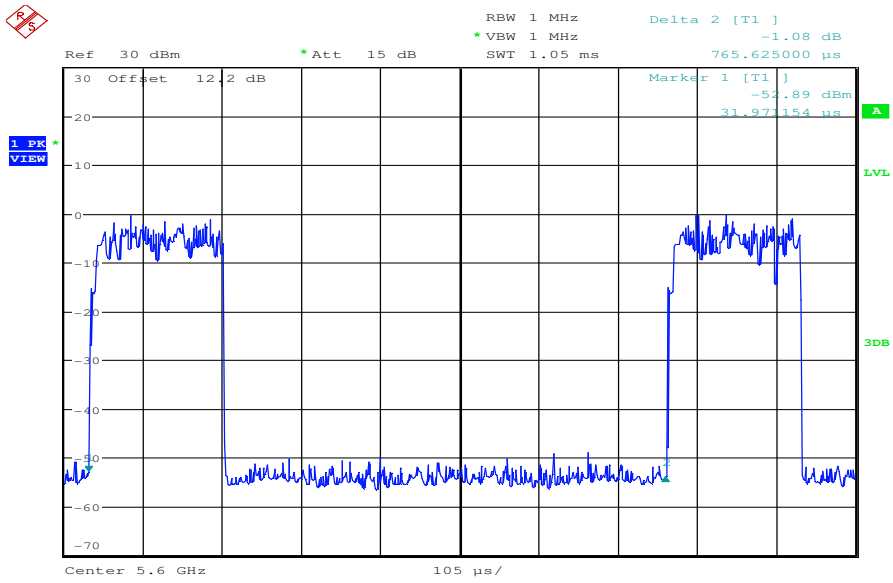
Test configuration: provided burst transmit test

Plot 1: Timing



Date: 11.MAR.2011 08:43:40

Plot 2: Timing



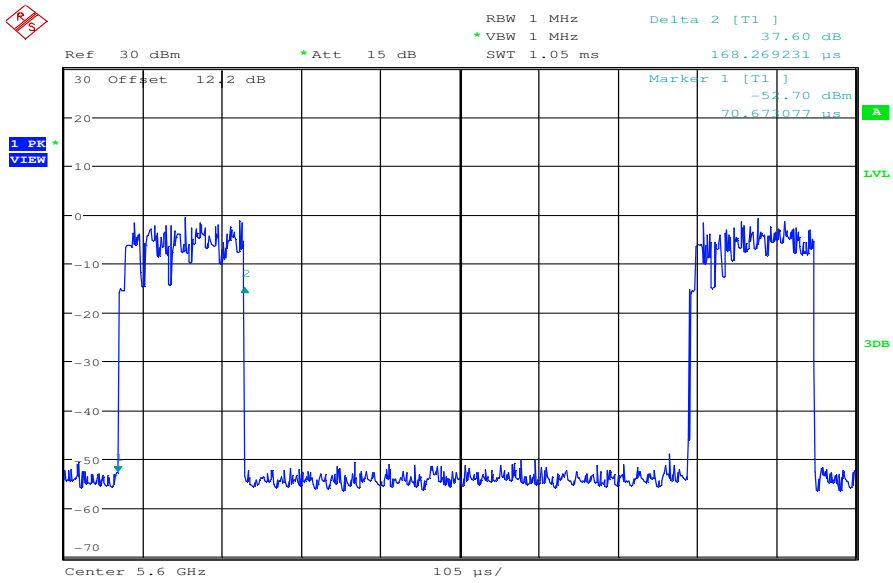
Date: 11.MAR.2011 08:43:59

DC: 23.5 %

DC correction factor: **OFDM / n – mode**

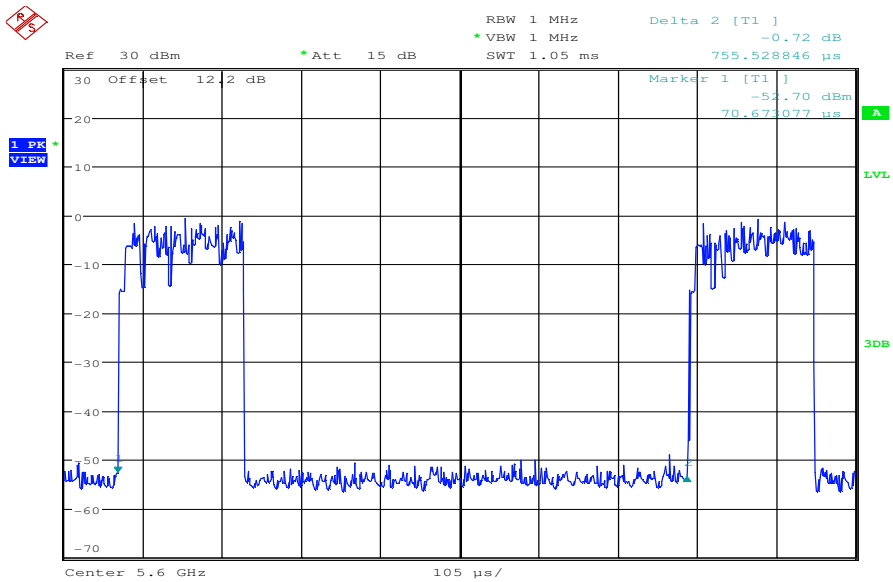
Test configuration: provided burst transmit test

Plot 1: Timing



Date: 11.MAR.2011 08:47:11

Plot 2: Timing



Date: 11.MAR.2011 08:47:30

DC: 22.3 %

9.13 Receiver – limit of secondarily emitted radio wave strength - conducted

Measurement parameter:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	f <= 1GHz : 1 MHz f > 1GHz : 1 MHz
Video bandwidth:	f <= 1GHz : 10 kHz f > 1GHz : 10 kHz
Span:	See plots
Trace-Mode:	Max Hold
Additional EUT parameters:	Idle mode

Results:

	Receiver mode	
Found peaks:	F [MHz]	Level [dBm]
	No critical peaks found (see plot).	

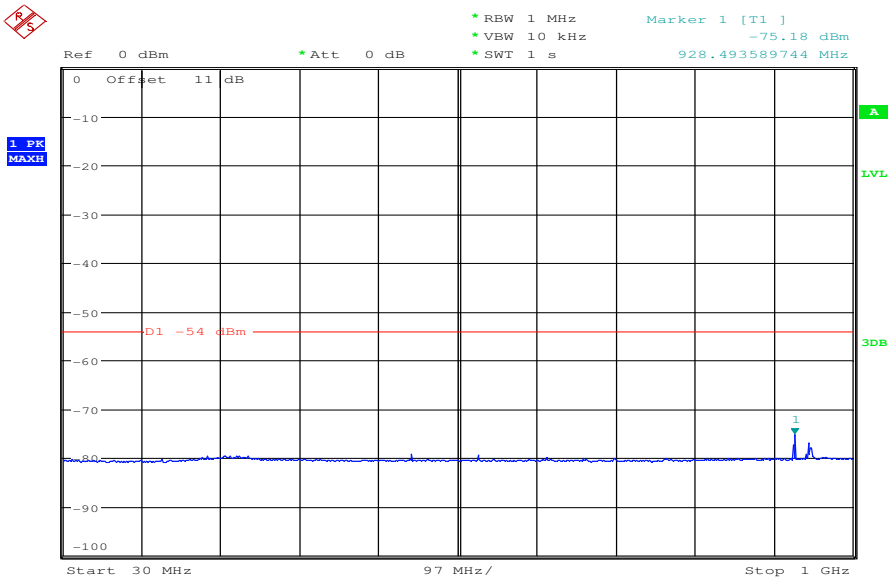
Limit & Verdict:

Limit	1000 MHz ≥ f : 4 nW 1000 MHz < f : 20 nW

Result: **The result of the measurement is passed.**

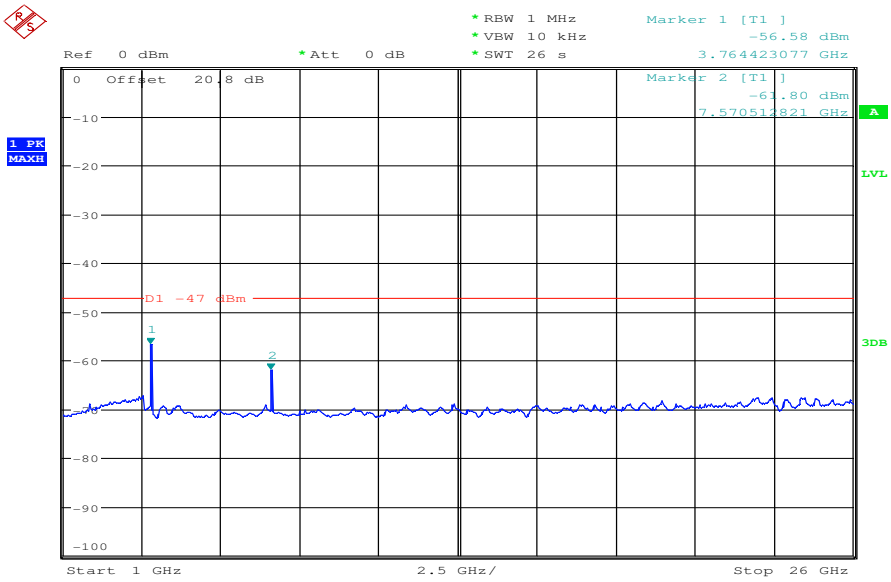
Plots:

Plot 1: Idle / RX – mode, 30 MHz – 1 GHz



Date: 11.MAR.2011 08:19:19

Plot 2: Idle / RX – mode, 1 GHz – 26 GHz



Date: 11.MAR.2011 08:20:56

9.14 Receiver – limit of secondarily emitted radio wave strength - radiated

Measurement parameter:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	f <= 1GHz : 1 MHz f > 1GHz : 1 MHz
Video bandwidth:	f <= 1GHz : 1 MHz f > 1GHz : 1 MHz
Span:	100 MHz steps
Trace-Mode:	Max Hold
Additional EUT parameters:	Idle mode

Results:

	Receiver mode	
Found peaks:	F [MHz]	Level [dBm]
	290.95	-59.77 (vertical) -60.94 (horizontal)
	457.19	-57.96 (vertical) -56.83 (horizontal)
	540.292	-58.63 (vertical) -58.14 (horizontal)
	For measurements above 12.75 GHz, please take a look at the plots.	

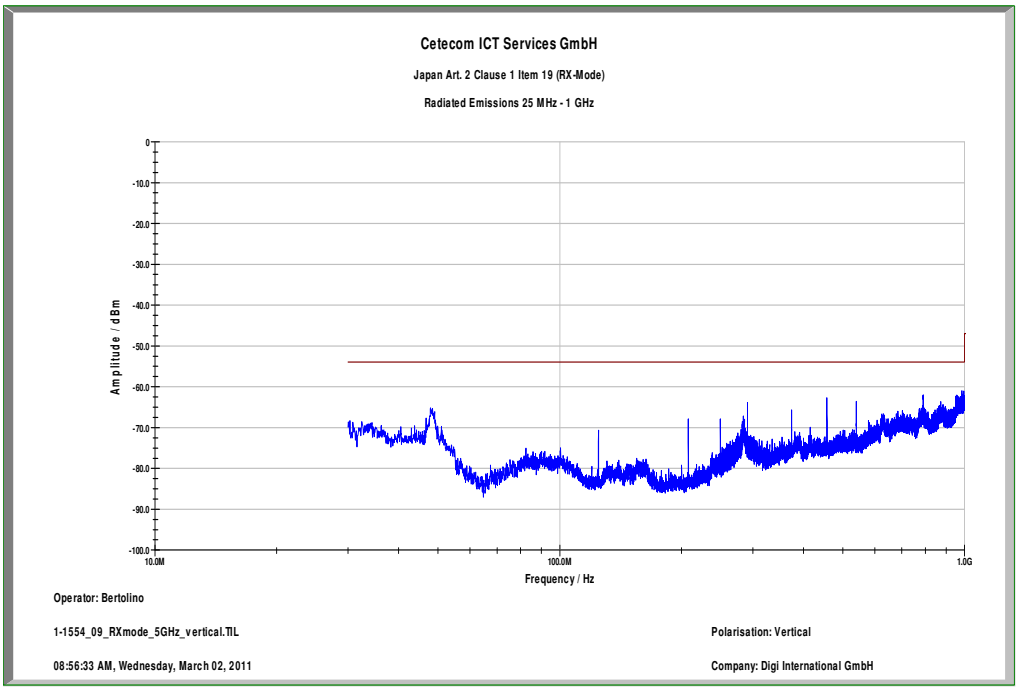
Limit & Verdict:

Limit	1000 MHz ≥ f : 4 nW 1000 MHz < f : 20 nW

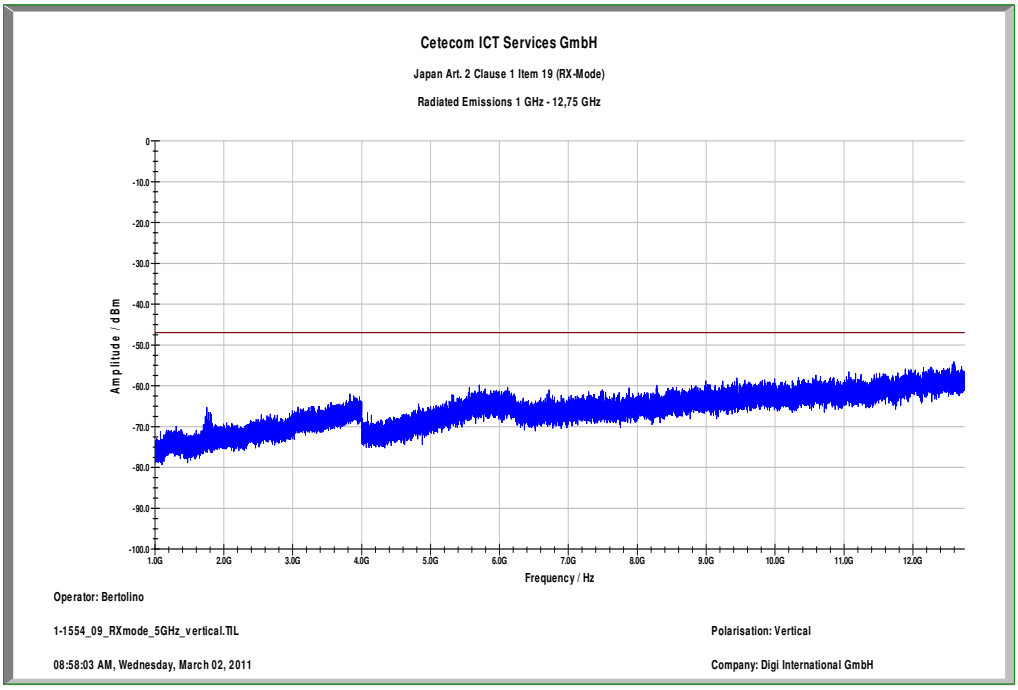
Result: **The result of the measurement is passed.**

Plots:

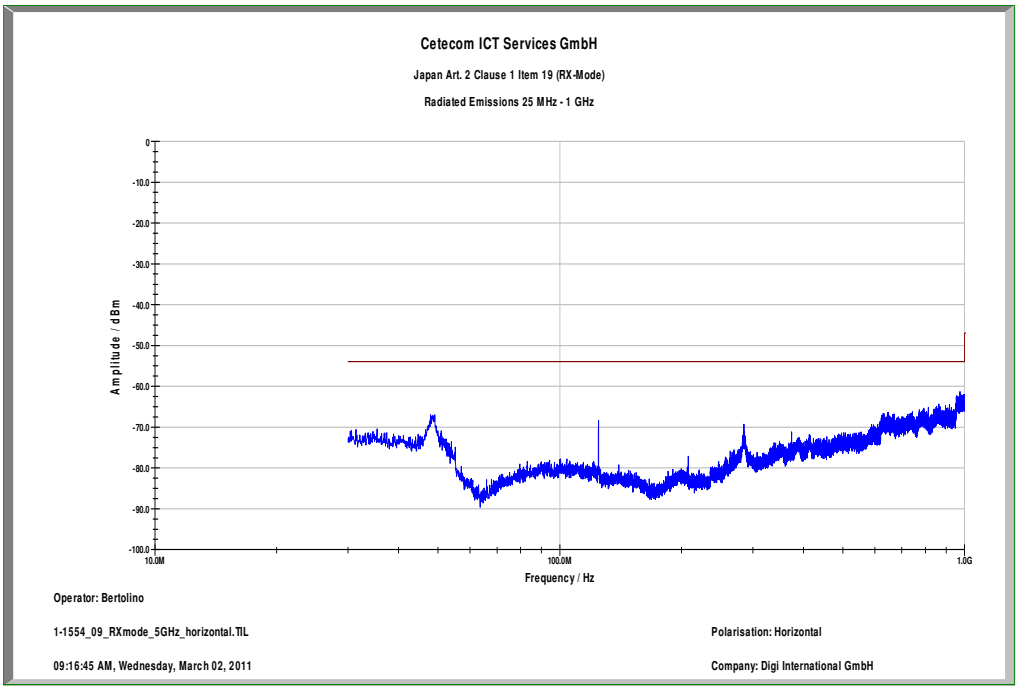
Plot 1: Idle / RX – mode (30 MHz – 1 GHz), vertical polarization



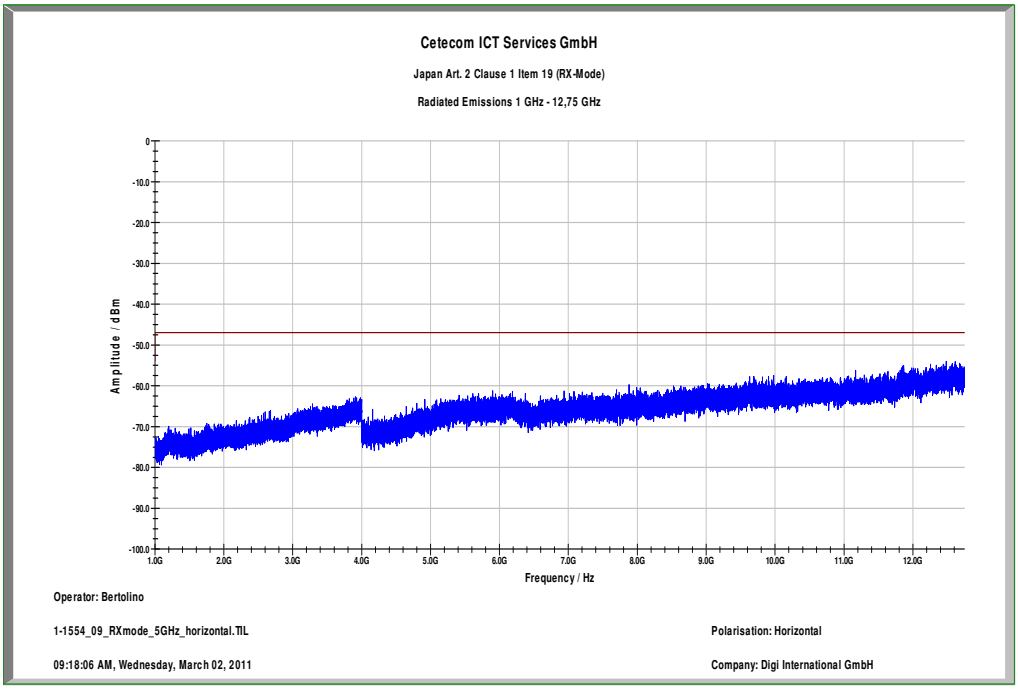
Plot 2: Idle / RX – mode (1 GHz – 12.75 GHz), vertical polarization



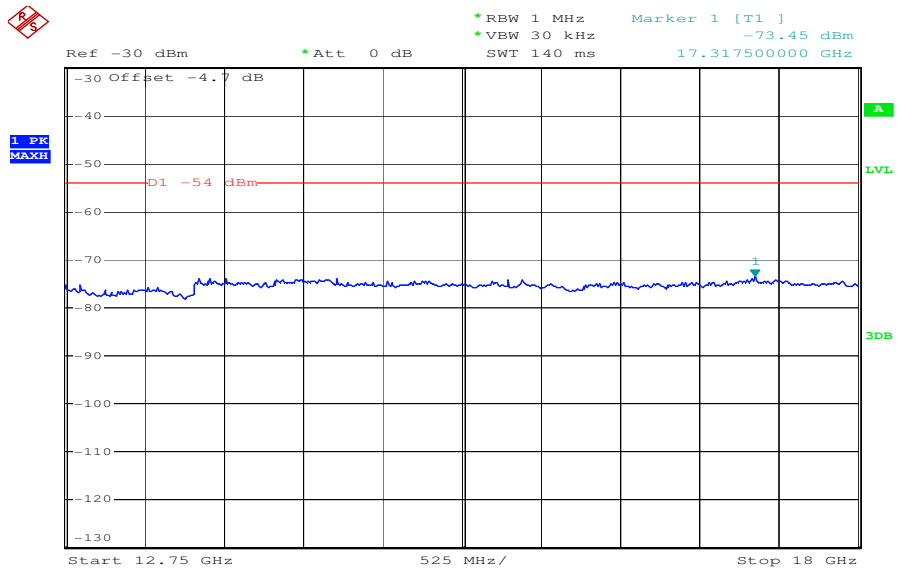
Plot 3: Idle / RX – mode (30 MHz – 1 GHz), horizontal polarization



Plot 4: Idle / RX – mode (1 GHz – 12.75 GHz), horizontal polarization

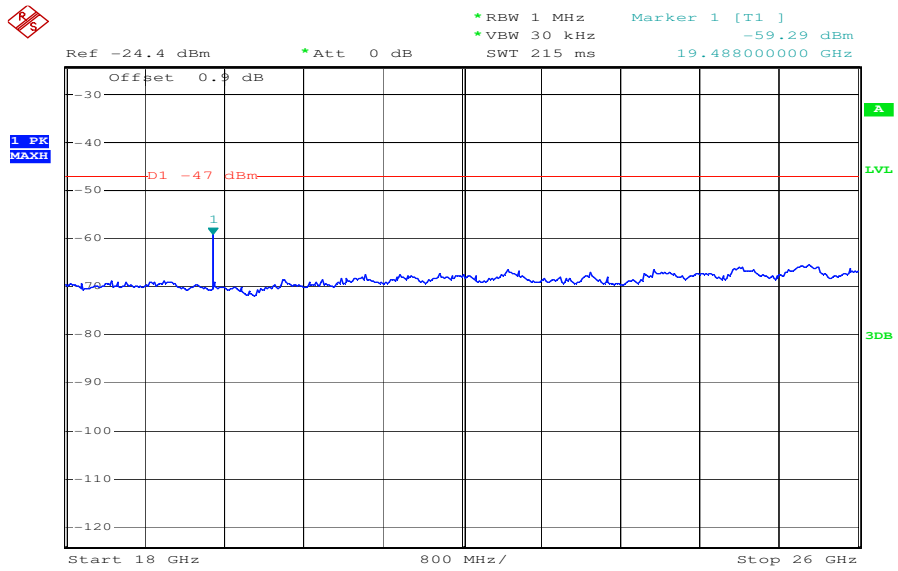


Plot 5: Idle / RX – mode (12.75 GHz – 18 GHz), vertical & horizontal polarization



Date: 2.MAR.2011 14:00:04

Plot 6: Idle / RX – mode (18 GHz – 26 GHz), vertical & horizontal polarization



Date: 2.MAR.2011 14:02:45

9.15 Interference prevention function

Interference Prevention Function:

(Article 9.4): Via Identification Code unexpected login incidences to extraneous receivers are avoided

Result: **The result of the measurement is passed.**

9.16 Carrier sensing function

Carrier sensing function:

The sample does not transmit or stop transmission when detecting an interferer in the same transmitting channel.

Result: **The result of the measurement is passed.**

9.17 Enclosure requirements

Not applicable! The EUT is a WLAN module without housing!

Result: **-/-**

10 Test equipment and ancillaries used for tests

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, rf-generating and signalling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Labor/Item).

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	n. a.	Isolating Transformer	RT5A	Grundig	8041	300001626	g		
2	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vlKl!	05.03.2009	05.09.2011
3	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996		23.03.2009	
4	n. a.	Relais Matrix	PSU	R&S	890167/024	300001168	ne		
5	n. a.	Isolating Transformer	RT5A	Grundig	9242	300001263	ne		
6	n. a.	Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143	ne		
7	n. a.	TILE-Software Emission	Quantum Change, Modell TILE-ICS/FULL	EMCO	none	300003451	ne		
8	n. a.	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789	ne		
9	n. a.	PSA Spectrum Analyzer 3 Hz - 26.5 GHz	E4440A	Agilent Technologies	MY48250080	300003812	k	08.09.2010	08.09.2012
10	n. a.	RF Filter Section 9kHz - 1GHz	N9039A	Agilent Technologies	MY48260003	300003825	vlKl!	08.09.2010	08.09.2012
11	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	vlKl!	17.12.2008	17.12.2011
12	n. a.	Splitter	15542	Mini Circuits	15542	400000086	ev		
13	n. a.	Splinter	42000	Anaren	4730	400000085	ev		
14	n. a.	Switch Unit	TS-RSP	R&S	100155	300003281	ev		
15	n. a.	CTIA-Chamber	CTIA-Chamber AMS 8500	ETS-Lindgren Finnland		300003327-0000	ne		
16	n. a.	Limiting Amplifier (Microwave Amplifier)	LA 02-801	JCA Technology	101	300003341	ne		
17	n. a.	Spectrum Analyzer 9kHz - 30 GHz	FSP30	R&S	100623	300003464	Ve	25.06.2010	25.06.2012
18	A026	Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda		300000787	ne		
19	A029	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda		300002442	ne		
20	n. a.	Temperature Test Chamber	VT 4002	Heraeus Voetsch	521/83761	300002326	Ve	28.05.2009	28.05.2011
21	n. a.	Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443	ve	01.07.2010	01.07.2012
22	11b	Microwave System Amplifier, 0.5-26.5 GHz; 25 dB gain	83017A	HP Meßtechnik	3123A00105	300002268	ev		

Agenda: Kind of Calibration

k	calibration / calibrated	EK	limited calibration
ne	not required (k, ev, izw, zw not required)	zw	cyclical maintenance (external cyclical maintenance)
ev	periodic self verification	izw	internal cyclical maintenance
Ve	long-term stability recognized	g	blocked for accredited testing
vlkl!	Attention: extended calibration interval		
NK!	Attention: not calibrated	*)	next calibration ordered / currently in progress

Annex A Photographs of the test setup

Photo documentation:

Photo 1: chamber C

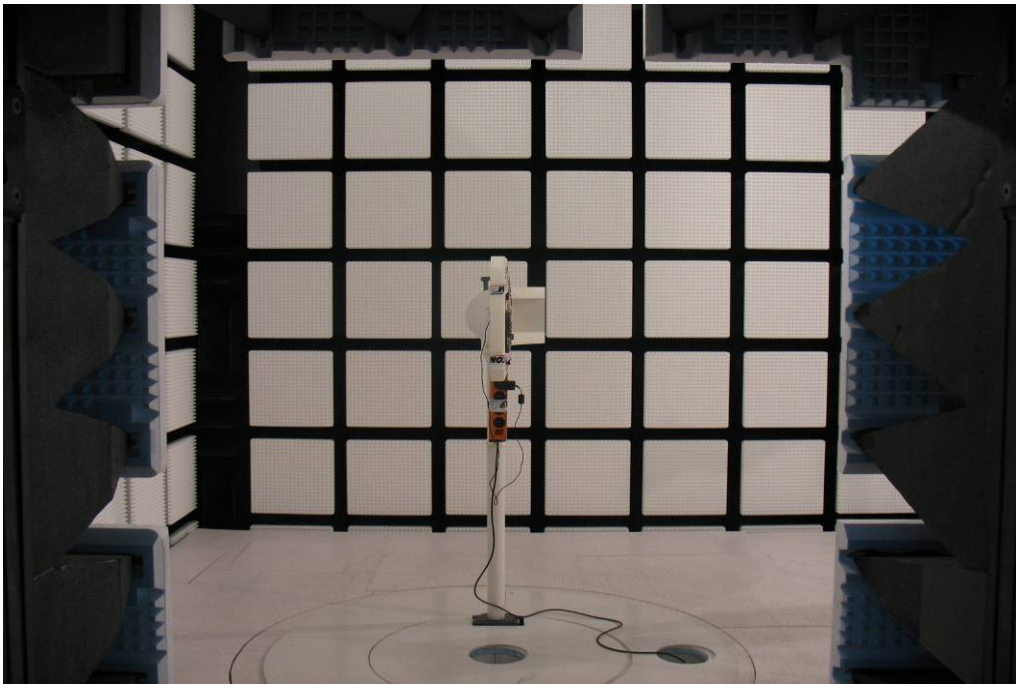


Photo 2: chamber C

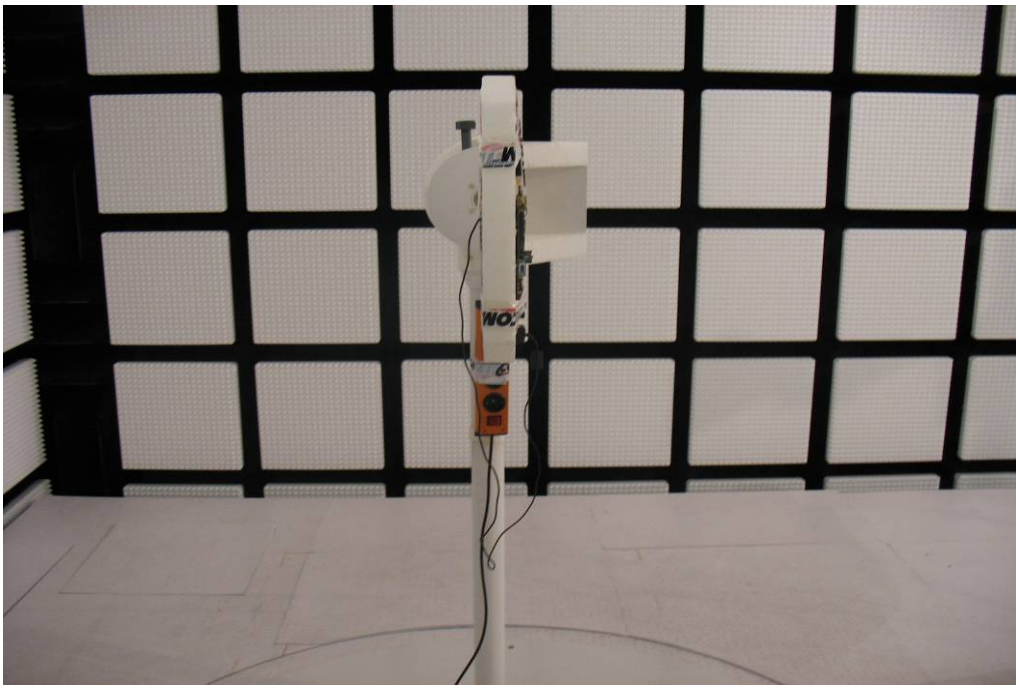


Photo 3: chamber C

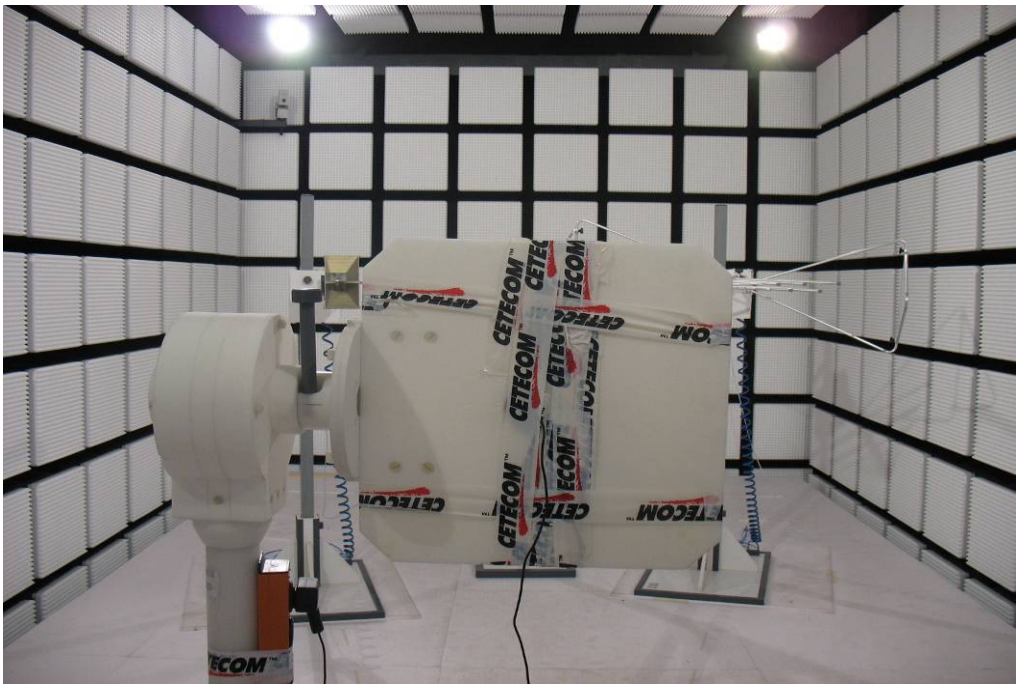


Photo 4: chamber C

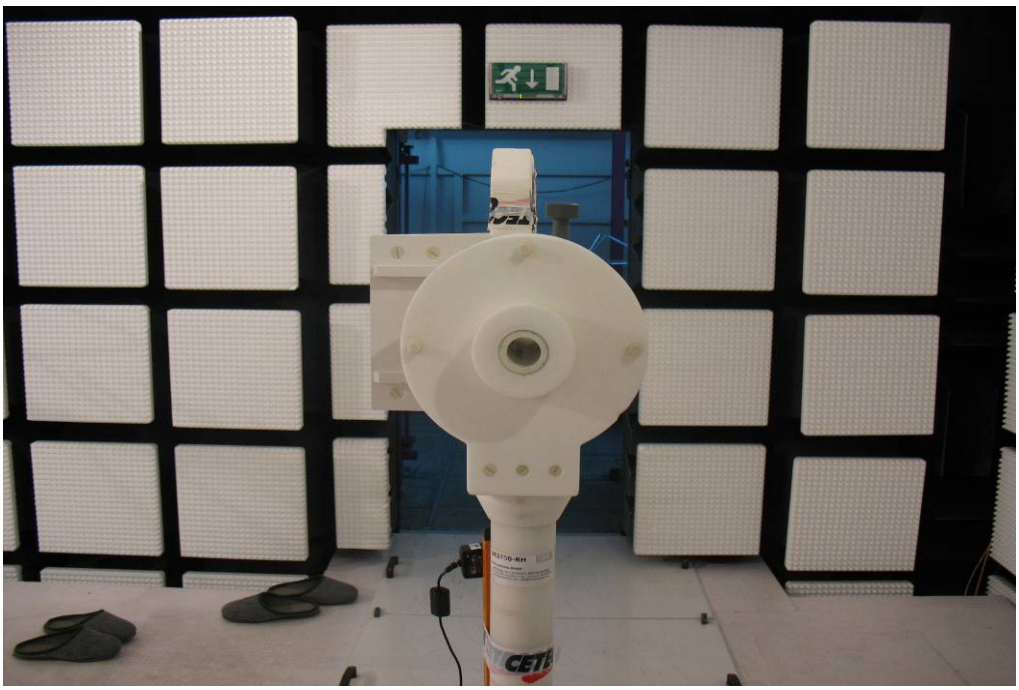


Photo 5: chamber C

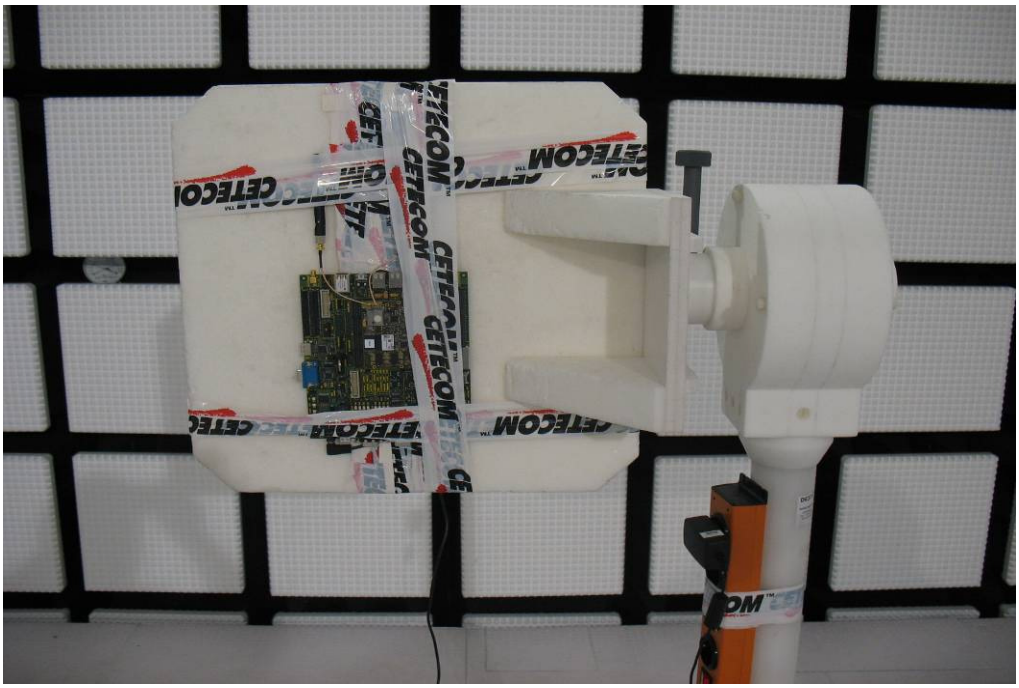


Photo 6: chamber C

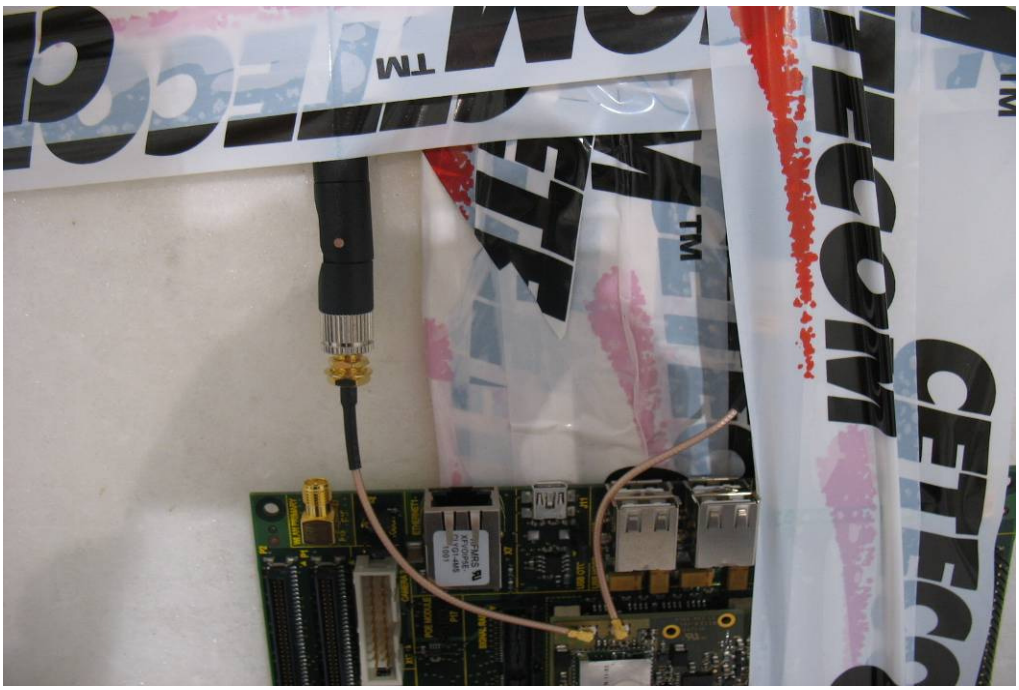


Photo 7: chamber C

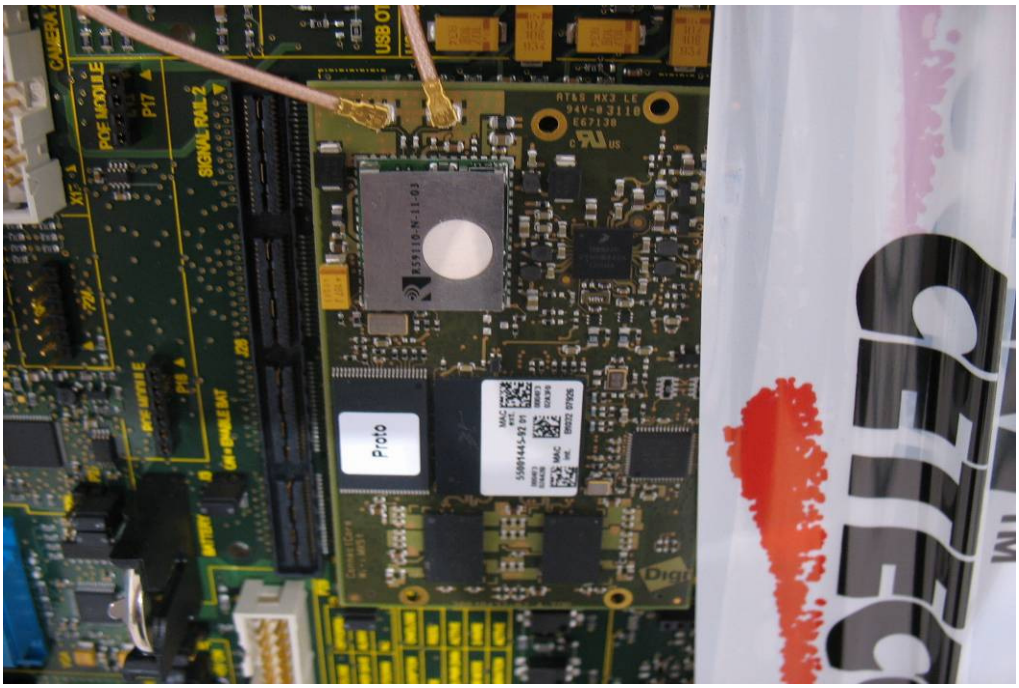


Photo 8: OTA chamber

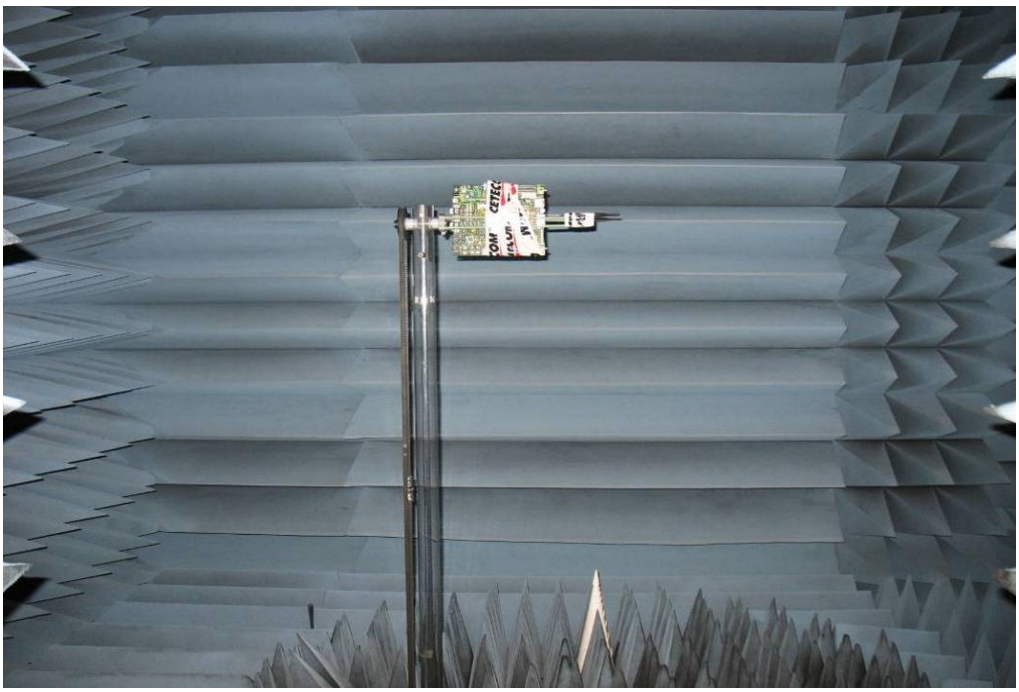


Photo 9: OTA chamber

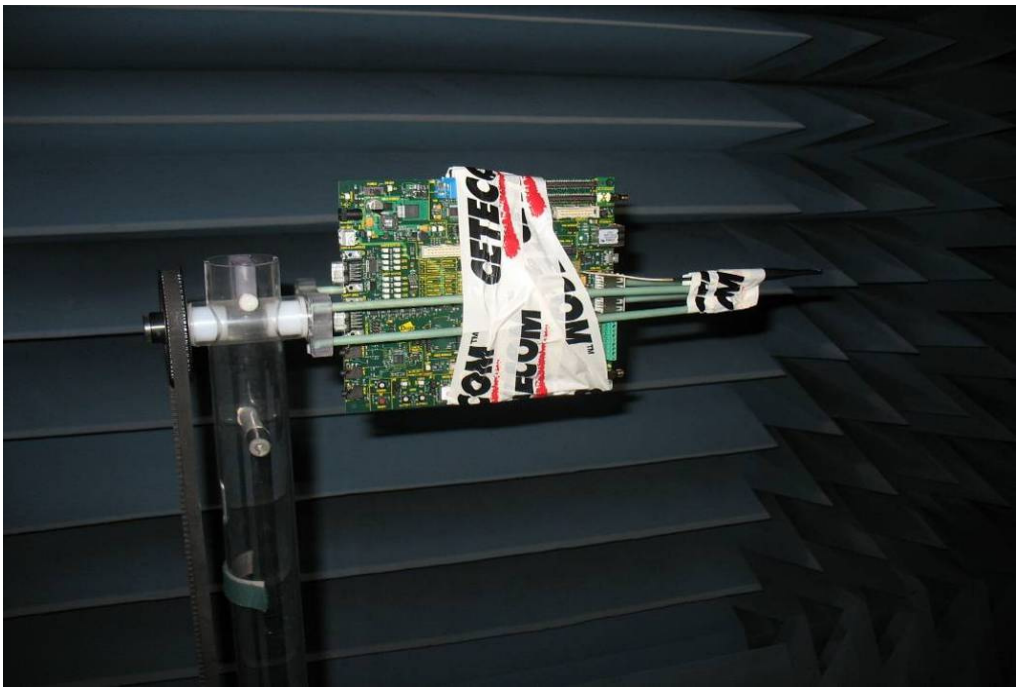
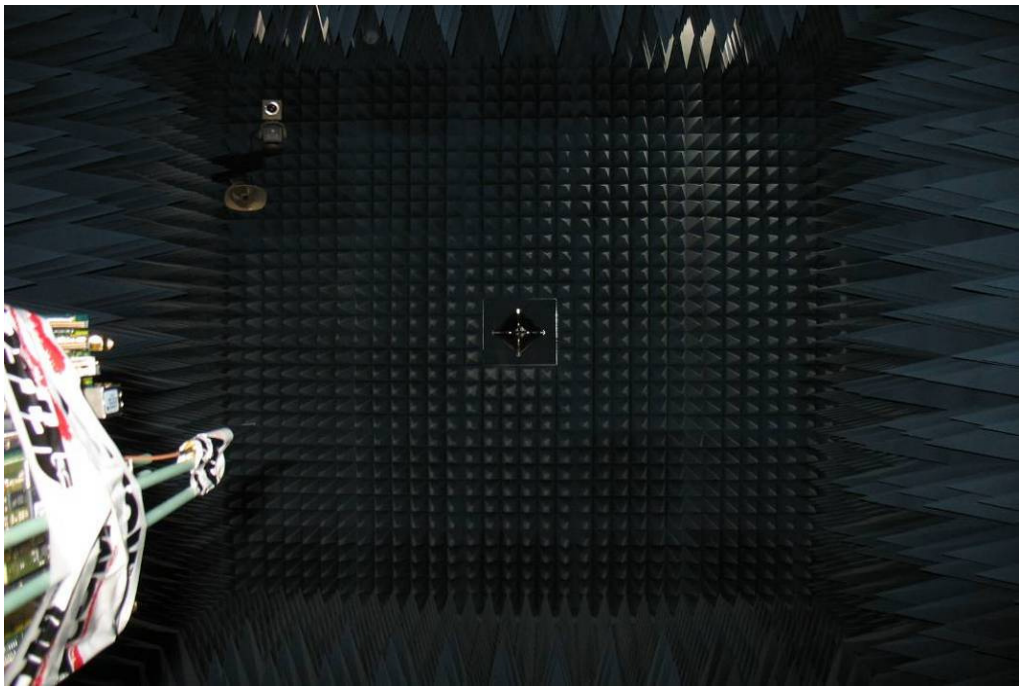


Photo 10: OTA chamber



Annex B External photographs of the EUT

Photo documentation:

Photo 1: evaluation board with WLAN module

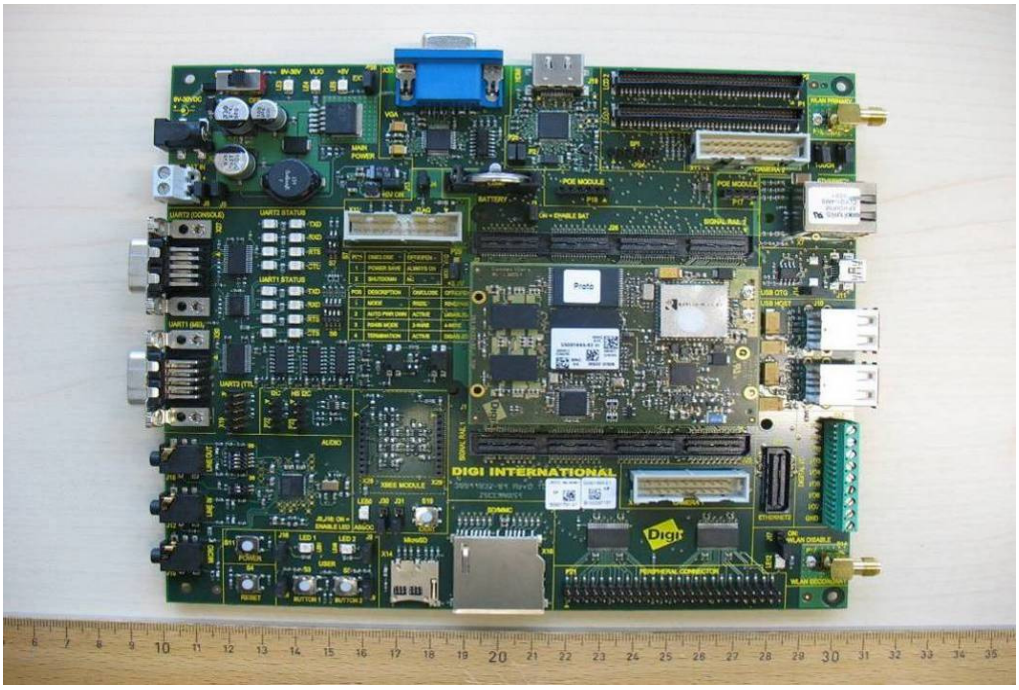


Photo 2: evaluation board with WLAN module

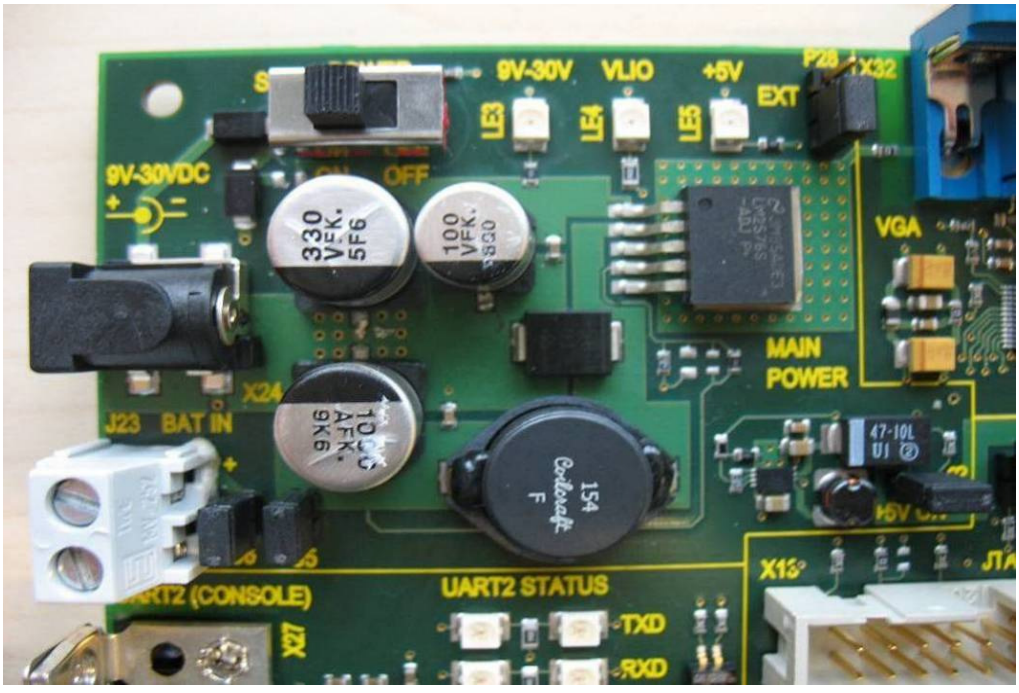


Photo 3: evaluation board with WLAN module

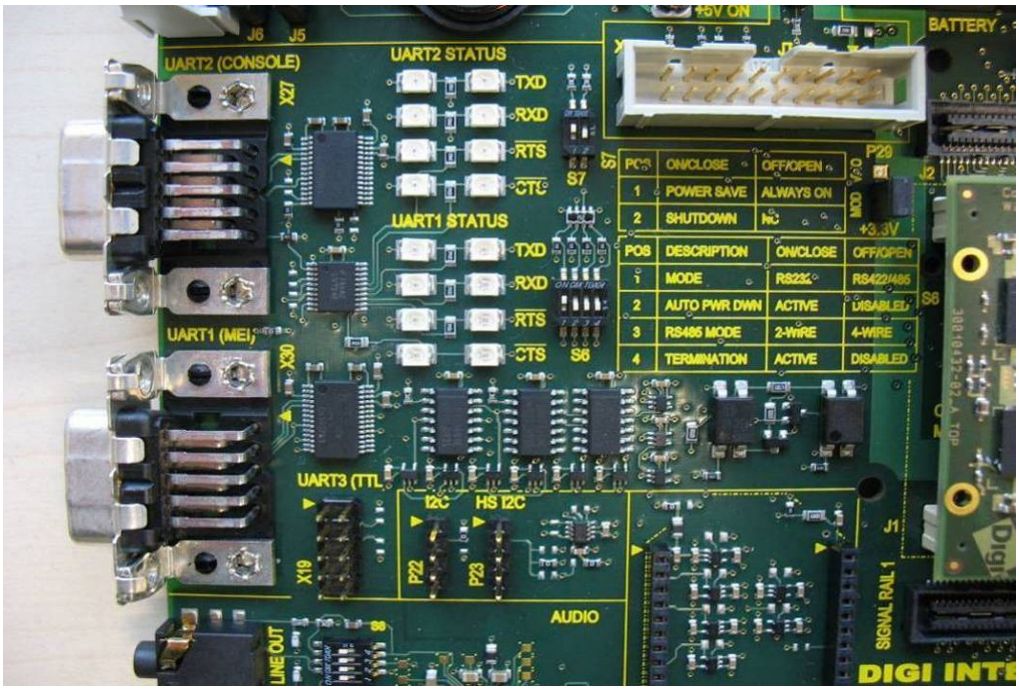


Photo 4: evaluation board with WLAN module

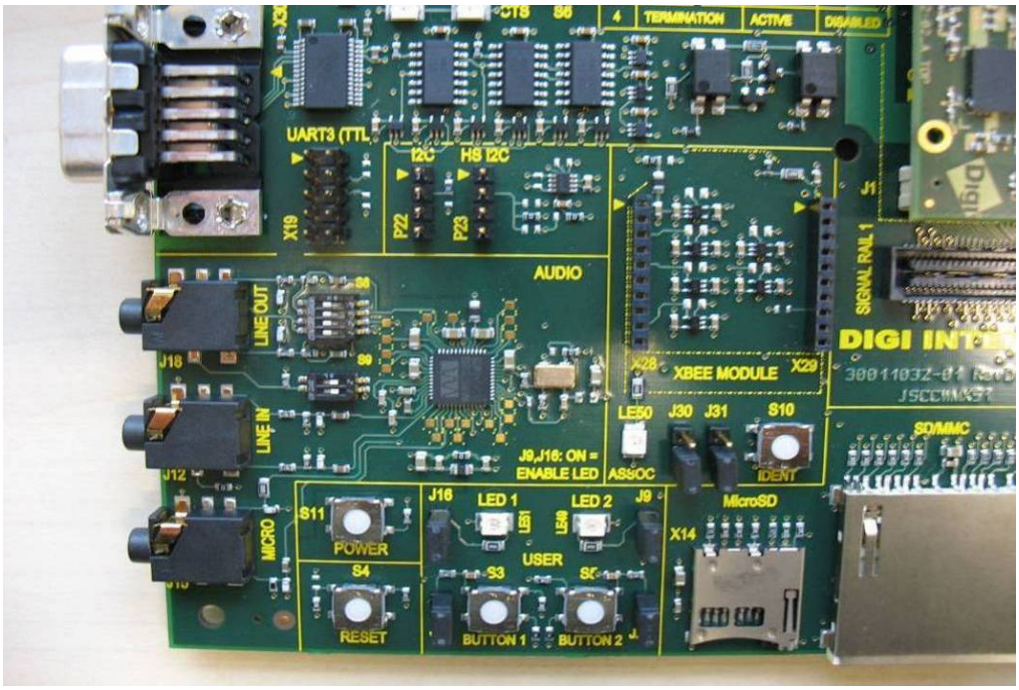


Photo 5: evaluation board with WLAN module

Photo 6: evaluation board with WLAN module

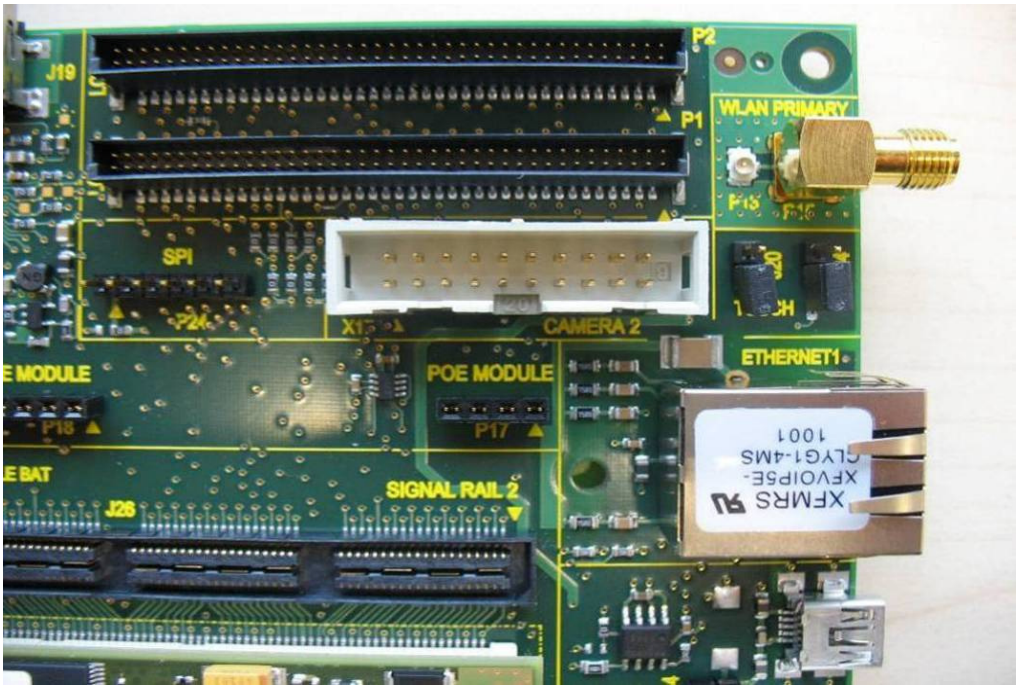


Photo 7: evaluation board with WLAN module

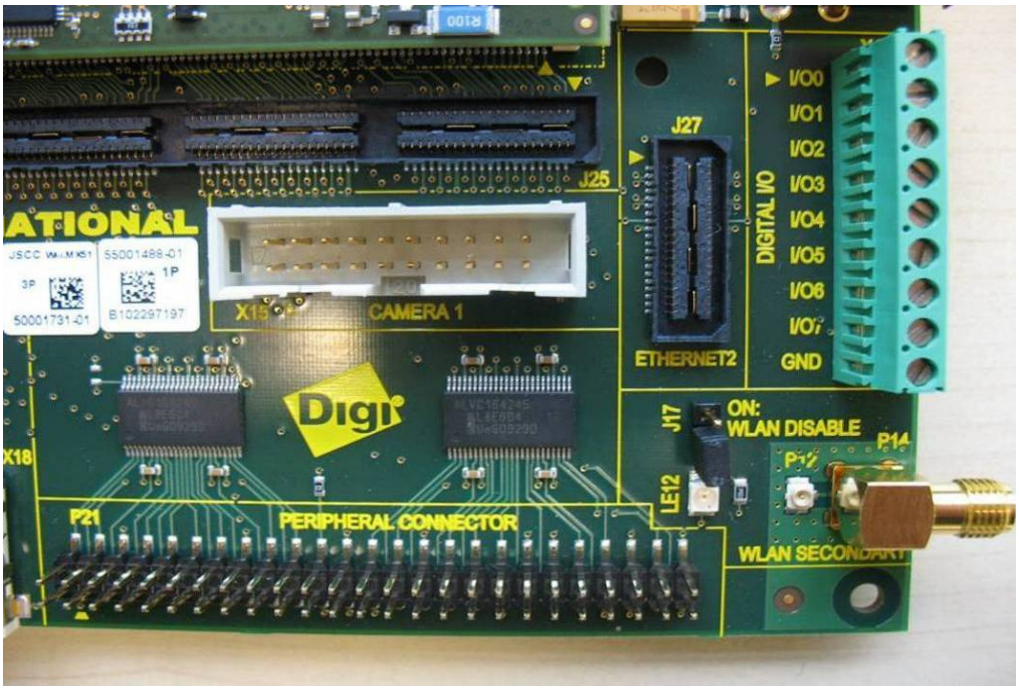


Photo 8: evaluation board with WLAN module

Photo 9: evaluation board with WLAN module

Photo 10: WLAN module

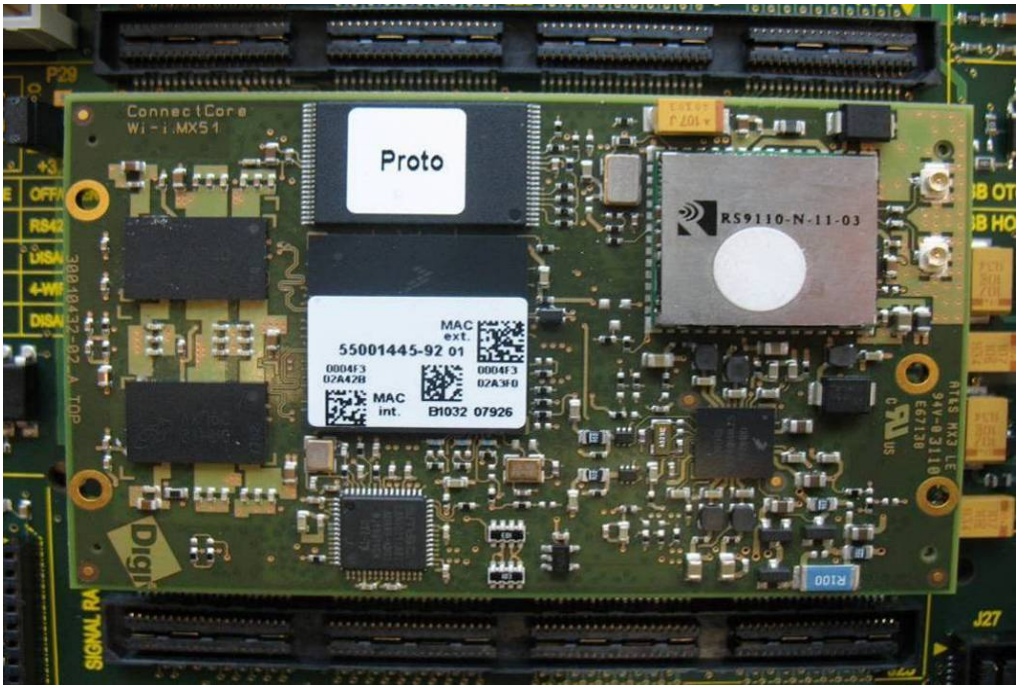


Photo 11: WLAN module

Photo 12: WLAN module

Photo 13: WLAN module, antenna ports RX and TX

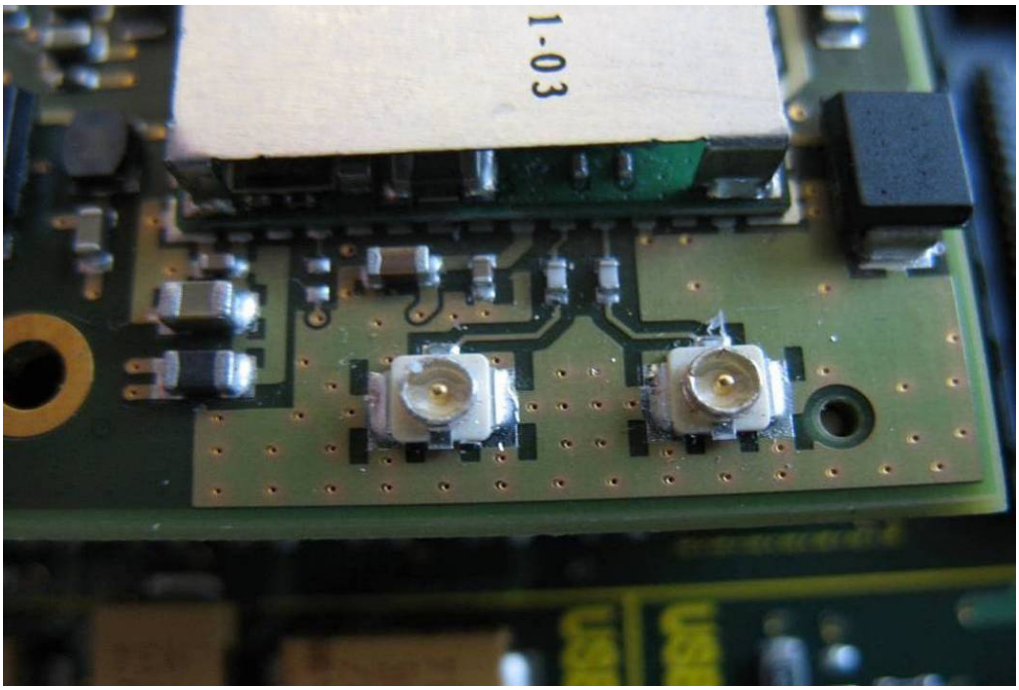


Photo 14: WLAN module

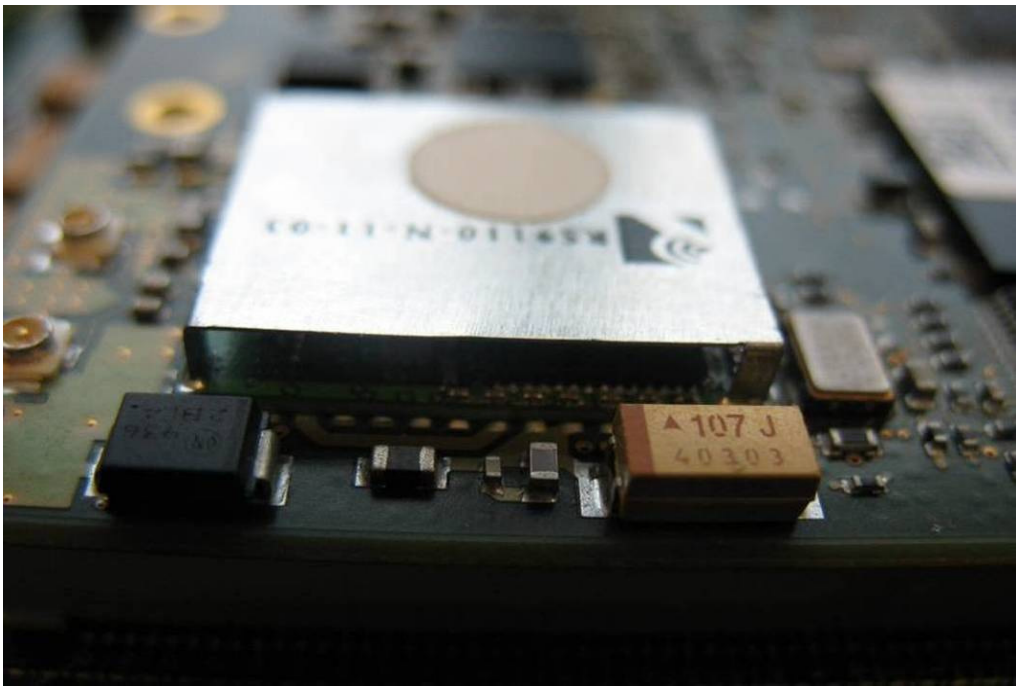


Photo 15: antenna

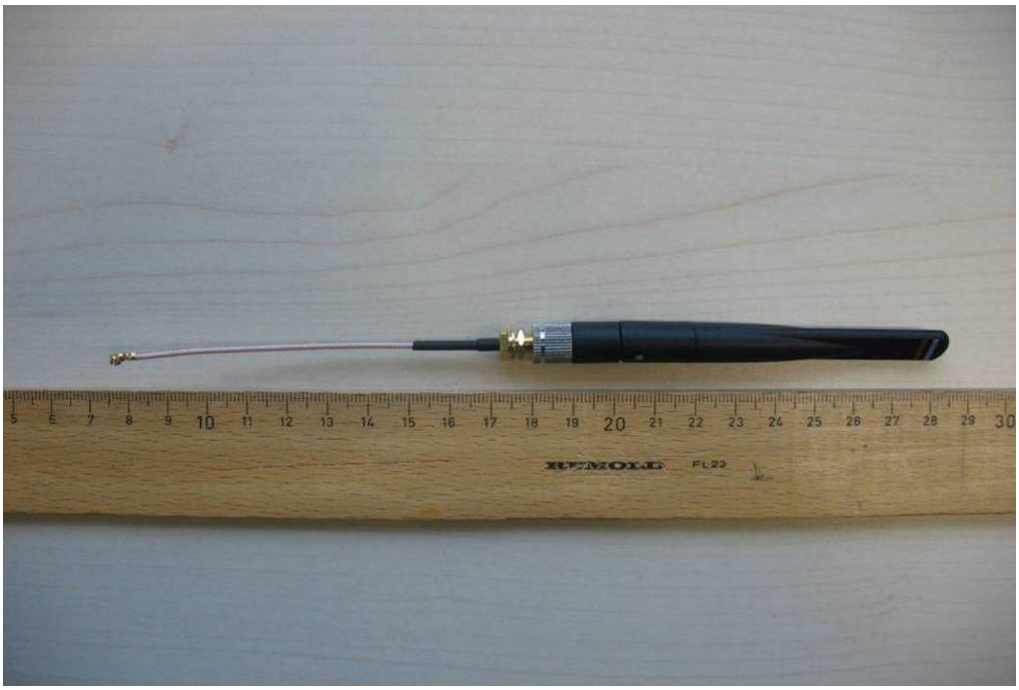


Photo 16: power supply

Photo 17: power supply

Photo 18: power supply

Photo 19: power supply

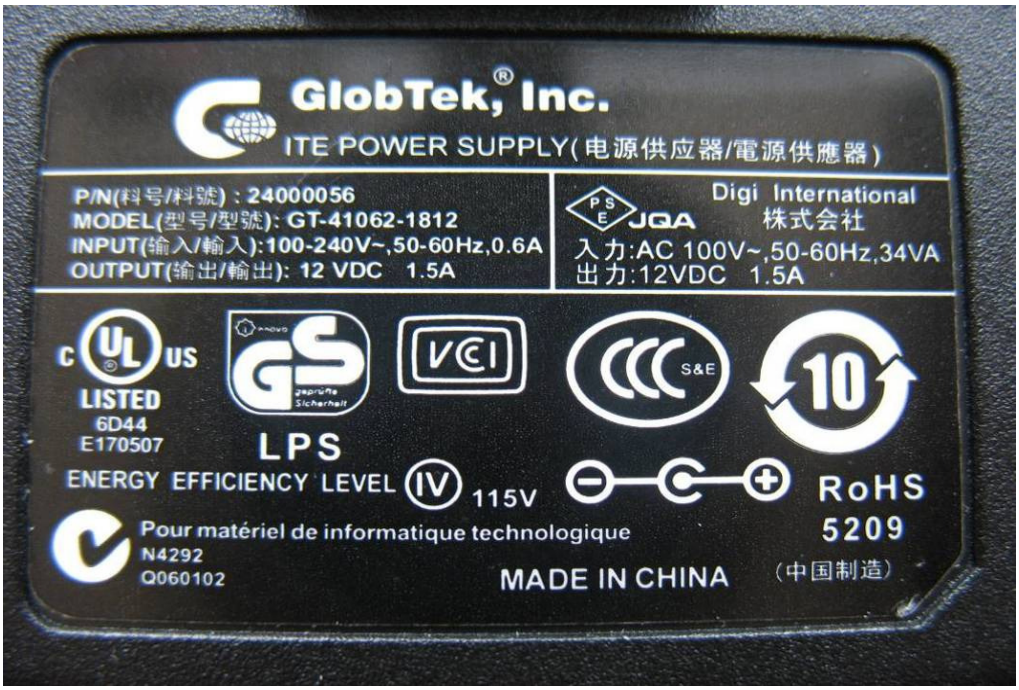


Photo 20: power supply

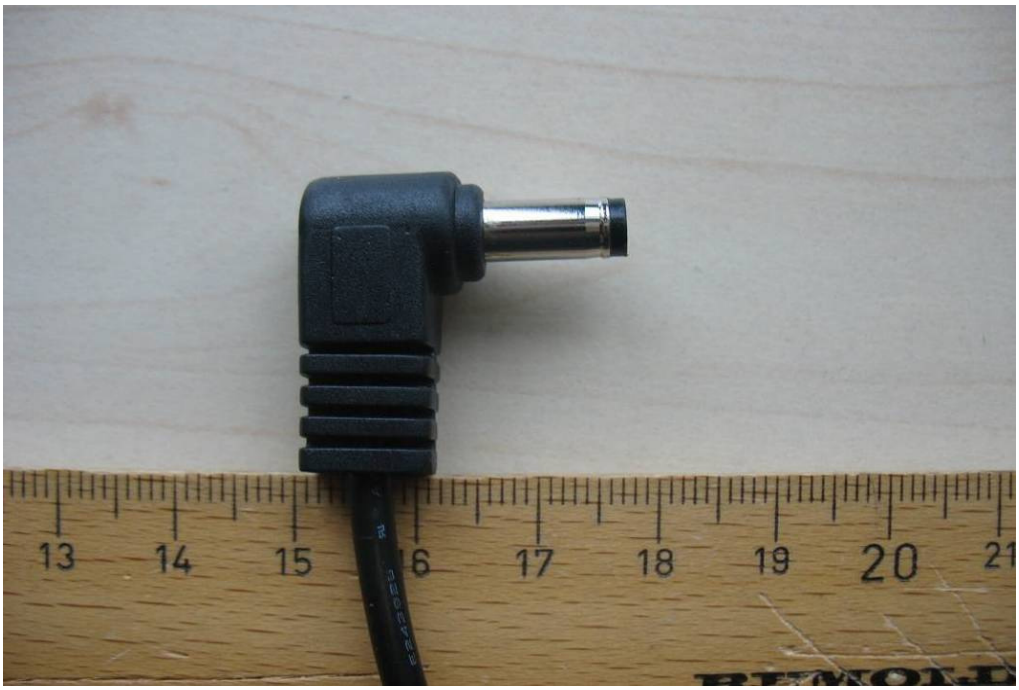


Photo 21: power supply

Annex C Internal photographs of the EUT

Photo documentation:

Photo 1: evaluation board

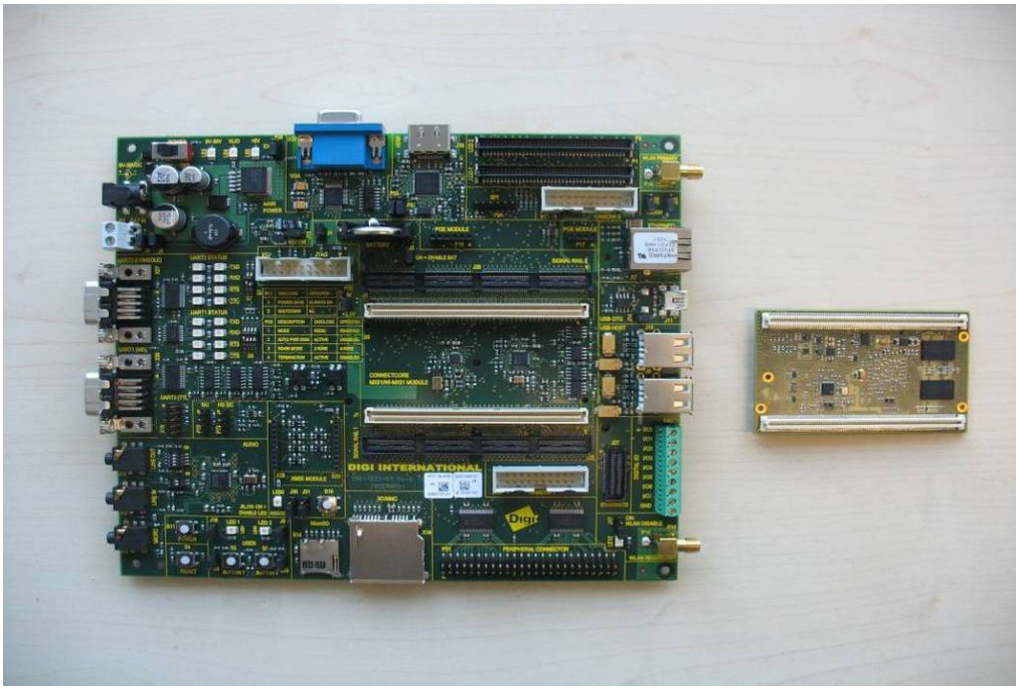


Photo 2: evaluation board

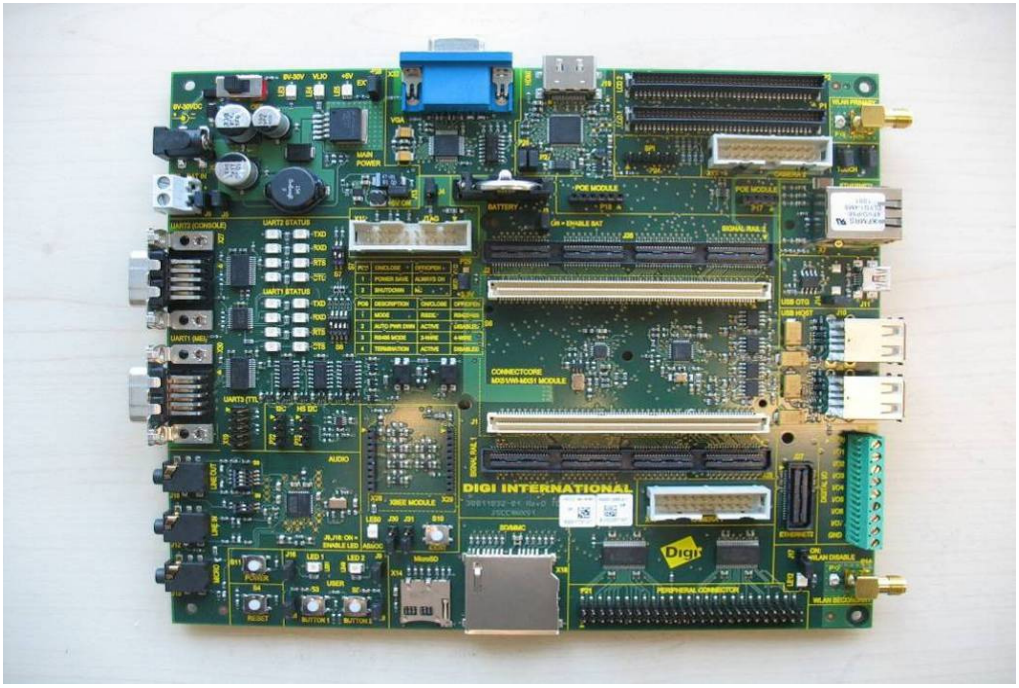


Photo 3: evaluation board

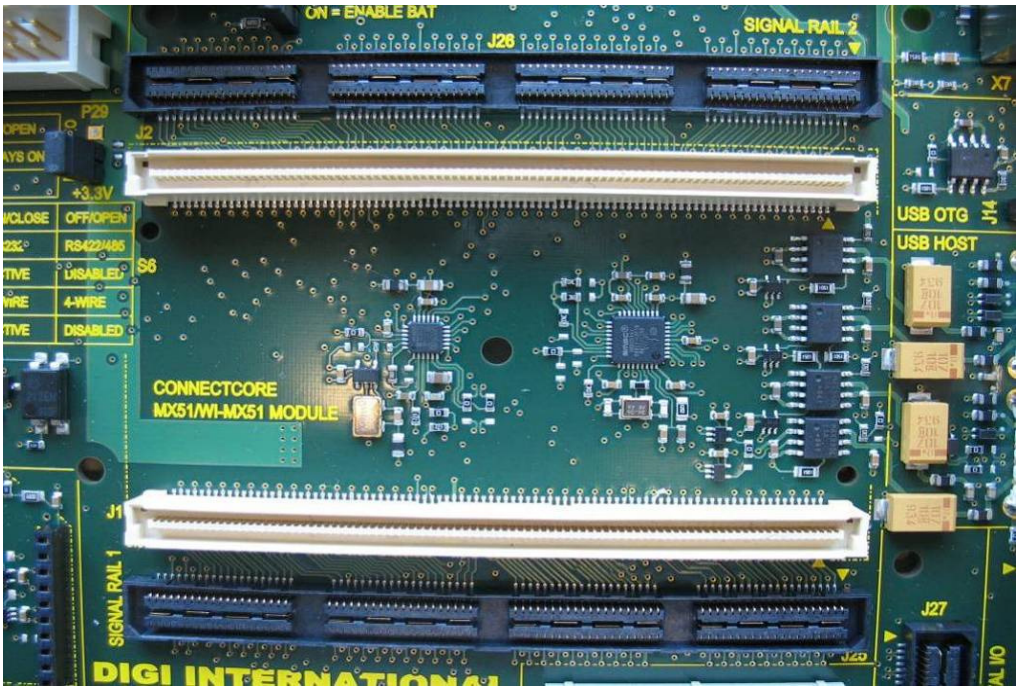


Photo 4: WLAN module / back side

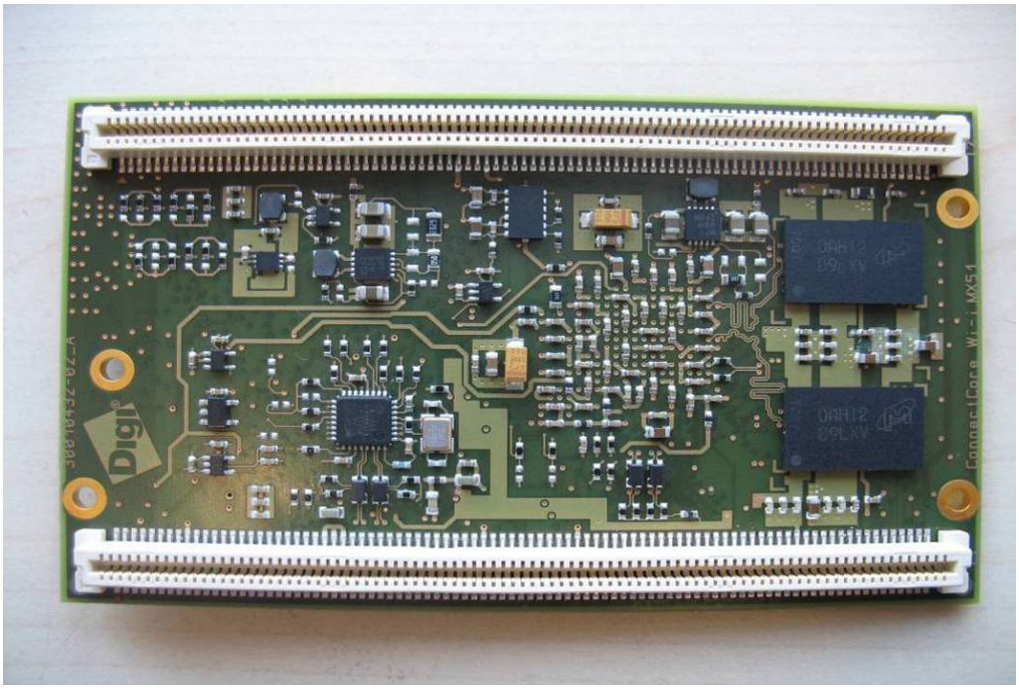


Photo 5: WLAN module / front side

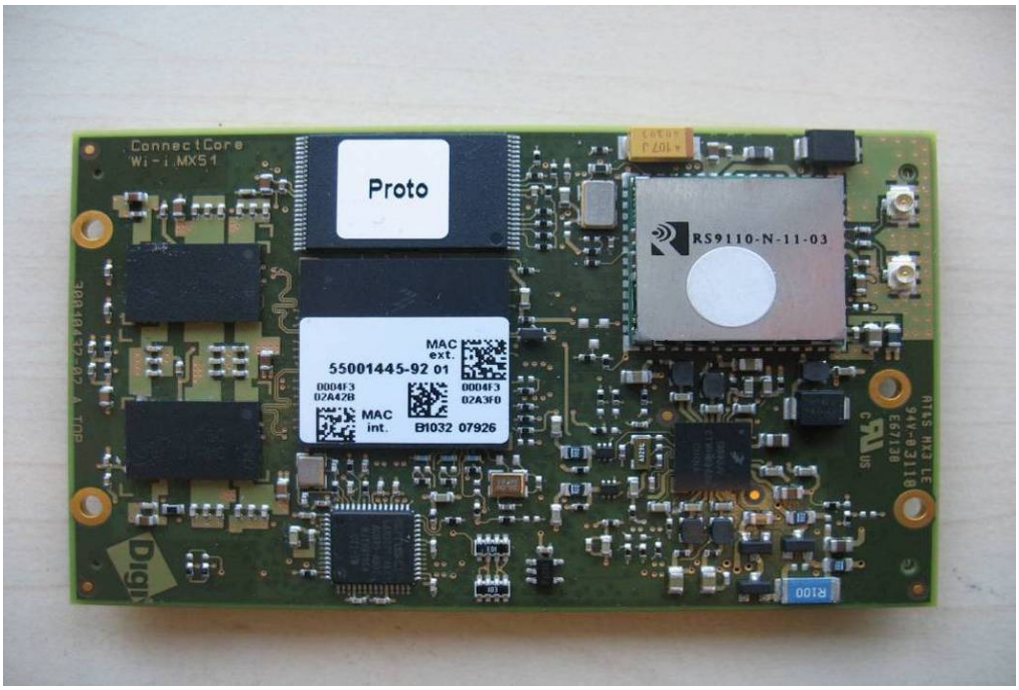


Photo 6: WLAN module / front side without shielding

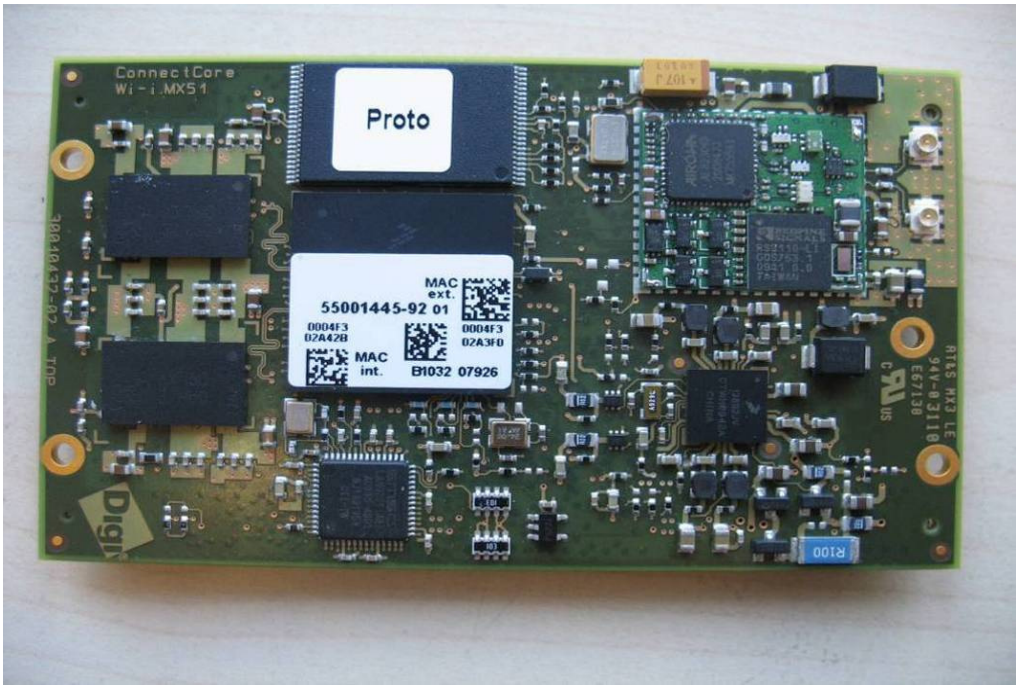
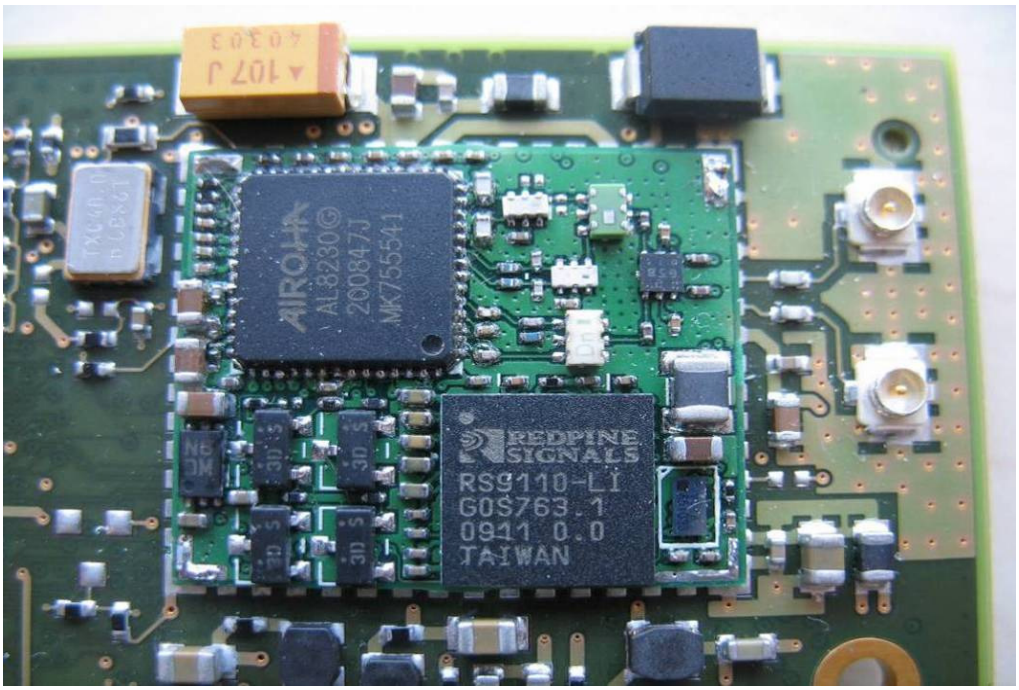


Photo 7: WLAN module / front side without shielding



Annex D Document history

Version	Applied changes	Date of release
1.0	Initial release	2011-03-11

Annex E Further information

Glossary

DUT	-	Device under Test
EMC	-	Electromagnetic Compatibility
EUT	-	Equipment under Test
FCC	-	Federal Communication Commission
FCC ID	-	Company Identifier at FCC
HW	-	Hardware
IC	-	Industry Canada
Inv. No.	-	Inventory number
N/A	-	not applicable
S/N	-	Serial Number
SW	-	Software