Untertürkheimer Straße 6-10 . D-66117 Saarbrücken **RSC-Laboratory**

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Accredited testing-laboratory

DAR registration number: DGA-PL-176/94-D1

Federal Motor Transport Authority (KBA) DAR registration number: KBA-P 00070-97

Recognized by the Federal Communications Commission Anechoic chamber registration no.: 90462 (FCC) Anechoic chamber registration no.: 3462C-1 (IC) **Certification ID: DE 0001 Accreditation ID: DE 0002**

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Test report no. : 1-1440-01-04/09 A

Type identification: Transceiver MTX-9450 / TRX-9450

: KAPSCH TrafficCom AG Applicant

FCC ID : XZU9450

IC Certification No: -/-

Test standards : 47 CFR Part 2

> 47 CFR Part 90 M **ASTM E2213 IEEE 802.11a**

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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 3.1.1. The 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 the CETECOM ICT Services GmbH.

Test laboratory	manager:	00022-2
2010-01-13	Marco Bertolino	M. Bortolino
Date	Name	Signature
2010-01-13	Stefan Bös	Stefan hos
Date	Name	Signature
_	onsibility for area of testing:	he but
2010-01-13	Michael Berg	M. 11/1/
Date	Name	Signature

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1.2 Testing laboratory

CETECOM ICT Services GmbH

Untertürkheimer Straße 6 - 10 66117 Saarbrücken

Germany

Phone: + 49 681 5 98 - 0

Fax: + 49 681 5 98 - 9075

e-mail: info@ICT.cetecom.de

Internet: http://www.cetecom-ict.de

State of accreditation: The test laboratory (area of testing) is accredited according to

DIN EN ISO/IEC 17025

DAR registration number: DGA-PL-176/94-D1

Accredited by: Federal Motor Transport Authority (KBA)
DAR registration number: KBA-P 00070-97

Testing location, if different from CETECOM ICT Services GmbH:

Name : Street : Town : Country : Phone : Fax :

1.3 Details of applicant

Name: KAPSCH TrafficCom AG

Street: Am Europlatz 2
Town: 1120 Vienna
Country: AUSTRIA

Telephone: +43-50 811-7857 Fax: +43-50 811-2209

Contact: Herbert Diemling

E-mail: herbert.diemling@kapsch.net

Telephone: +43-50 811-7857

1.4 Application details

Date of receipt of order: 2009-07-21

Date of receipt of test item: 2009-11-23

Date of start test: 2009-11-23

Date of end test: 2009-12-04

Persons(s) who have been present during the test:

Mr. Robert Povolny (Senior Hardware Engineer)

Mr. Markus Krapfenbauer (Radio Frequency Engineer)

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2 Test standard/s

47 CFR Part 2	2008-10	Frequency allocations and radio treaty matters; GENERAL RULES AND REGULATIONS
47 CFR Part 90	2008-10	Title 47 of the Code of Federal Regulations; Part 90 Private Land Mobile Radio Services / subpart M - Intelligent Transportation Systems Radio Service
IEEE 802.11 a	1999/2000	Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications High-speed Physical Layer in the 5 GHz Band
ASTM E2213	2003	Standard Specification for Telecommunications and Information Exchange between Roadside and Vehicle Systems - 5 GHz Band Dedicated Short Range Communications (DSRC) Medium Access Control (MAC) and Physical Layer (PHY) Specifications

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3 Technical tests

3.1 Details of manufacturer

Name:	KAPSCH TrafficCom AG
Street:	Am Europlatz 2
Town:	1120 Vienna
Country:	AUSTRIA

3.1.1 Test item

Kind of test item	:	Transceiver MTX-9450 / TRX-9450
Type identification	:	MTX-9450 / TRX-9450
S/N serial number		Unit 1: GFE00001
3/14 seriai number	•	Unit 2: GFE00003
HW hardware status		RF-Board: GS04
11W hardware status	•	Unit: GS01
SW software status	:	5.4b7-f33e1bab (Atheros)
Frequency Band [MHz]	:	5860 MHz – 5920 MHz
Type of Modulation	:	OFDM → BPSK (3 Mbit/s) / 64 QAM (27 Mbit/s)
Number of channels	:	7
		Integrated PCB antenna – for more information, please take a look at
		sub clause $8 \rightarrow$ Photos of the EUT
Antenna	:	
		The external antennas are connected by N-type connectors. (No
		specified antenna information available!)
Emission designator		Port 1: 8M27GXD
Elinssion designator	•	Port 2: 8M27GXD
Power Supply	:	48 V DC by power supply
Temperature Range	:	-30°C to +55 °C

Max. power radiated: 29.90 dBm Port 1 (high power port)
Max. power conducted: 19.89 dBm Port 1 (high power port)

Max. power radiated: 15.80 dBm Port 2 (low power port)
Max. power conducted: 10.08 dBm Port 2 (low power port)

FCC ID: XZU9450 IC: -

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3.1.2 Extreme conditions testing values

Description	Shortcut	Unit	Value
Nominal Temperature	T_{nom}	°C	20
Nominal Humidity	H_{nom}	%	53
Nominal Power Source	V_{nom}	V	48

Type of power source: DC by power supply

Deviations from these values are reported in chapter 2

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4 Summary of Measurement Results and list of all performed test cases

\boxtimes	N	0	deviati	ons	from	the	technical	specifi	cations	were	ascer	tained	ı

☐ There were deviations from the technical specifications ascertained

TC identifier	Description	verdict	date	Remark
RF-Testing	FCC Part 2 & Part 90 M, 802.11 a, ASTM E2213	PASS	2010-01-13	-/-

Test Case		Fail	Not applicable	Not performed
Antenna Gain	Yes			
Transmit Center Frequency Tolerance	Yes			
1 7				
Control Dead State Copping of 1991				
	Yes			
D W				
Transmit Spectrum Mask	Yes			
Modulation abaracteristics	Vac			
Wiodulation characteristics	168			
Maximum output power (conducted)	Yes			
Max. peak output power (radiated)	Yes			
2				
Spurious Emission - conducted (Transmitter)	Yes			
Spurious Emission -radiated (Transmitter)	Yes			
	Antenna Gain Transmit Center Frequency Tolerance Spectrum Bandwidth of a OFDM System / 20dB BW Transmit Spectrum Mask Modulation characteristics Maximum output power (conducted) Max. peak output power (radiated)	Antenna Gain Yes Transmit Center Frequency Tolerance Spectrum Bandwidth of a OFDM System / 20dB BW Transmit Spectrum Mask Yes Modulation characteristics Yes Maximum output power (conducted) Yes Spurious Emission - conducted (Transmitter) Yes	Antenna Gain Yes Transmit Center Frequency Tolerance Spectrum Bandwidth of a OFDM System / 20dB BW Transmit Spectrum Mask Yes Modulation characteristics Yes Maximum output power (conducted) Yes Spurious Emission - conducted (Transmitter) Yes	Antenna Gain Antenna Gain Transmit Center Frequency Tolerance Spectrum Bandwidth of a OFDM System / 20dB BW Transmit Spectrum Mask Yes Modulation characteristics Yes Maximum output power (conducted) Max. peak output power (radiated) Spurious Emission - conducted (Transmitter) Yes Fail applicable Applicable Yes Spectrum Mask Yes Spectrum Bandwidth of a OFDM System / 20dB Yes

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5 RF measurement testing

5.1 Measurements and results

For Part 2 / Part 90 we use the substitution method (TIA/EIA 603).

5.2 Referenced Documents

None

5.3 Additional comments

Setting antenna port 1: software power setting 28 = 20 dBm

Setting antenna port 2: software power setting 20 = 10 dBm

Manufacturer declaration: Differences between MTX and TRX

- The MTX-9450 unit disposes of the possibility to connect two external antennas. In this mode the internal antennas are deactivated.
- Integrated GPS module with external antenna connector
- and an additional system connector

All measurements are performed with the fully equipped transceiver unit (MTX-9450).

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5.4 Antenna gain

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

Port 1 (high power port):

	Channel 1 5860 MHz	Channel 2 5890 MHz	Channel 3 5900 MHz	Channel 4 5920 MHz
Conducted power [dBm] (measured)	19.89	19.55	9.40	19.88
Radiated power [dBm] (measured)	28.80	29.60	19.20	29.60
Gain [dBi] (calculated)	8.91	10.05	9.80	9.72

Port 2 (high power port):

	Channel 1 5860 MHz	Channel 2 5890 MHz	Channel 3 5900 MHz	Channel 4 5920 MHz
Conducted power [dBm] (measured)	10.03	10.01	9.97	10.08
Radiated power [dBm] (measured)	15.50	15.70	15.80	15.60
Gain [dBi] (calculated)	5.20	5.69	5.83	5.52

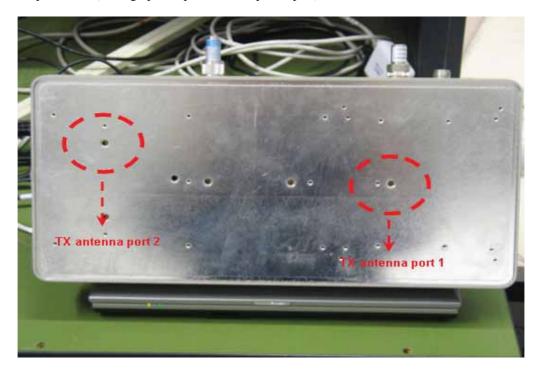
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5.5 Frequency Tolerance (2.1055 / 90.213 / 90.379 / ASTM §8.9.4 / IEEE 802.11 a 17.3.9.4 /)

Photo: Antenna port 1 & 2 (1 = high power port, 2 = low power port)



Port 1:

Tamparatur	5860 MHz	5860 MHz	5890 MHz	5890 MHz	5920 MHz	5920 MHz
Temperatur	F	kHz / PPM	F	kHz / PPM	F	kHz / PPM
55 C°	5860.0136	21.8 / 3.72	5890.0137	21.9 / 3.72	5920.0140	22.3 / 3.77
40 C°	5859.9873	-4.5 / -0.77	5889.9873	-4.5 / -0.76	5919.9874	-4.3 / -0.73
30 C°	5859.9842	-7.6 / -1.30	5889.9843	-7.5 / -1.27	5919.9848	-6.9 / -1.17
20 C°	5859.9918	0/0	5889.9918	0/0	5919.9917	0/0
20 C°	5859.9917	-0.1 / -0.02	5889.9919	0.1 / 0.02	5919.9918	0.1 / 0.02
V low	3839.9917	-0.17-0.02	3009.9919	0.17 0.02	3919.9916	0.17 0.02
20 C°	5859.9920	0.2 / 0.03	5889.9920	0.2 / 0.03	5919.9918	0.1 / 0.02
V high	3639.9920	0.27 0.03	3009.9920	0.27 0.03	3919.9916	0.17 0.02
10 C°	5860.0091	17.3 / 2.95	5890.0092	17.4 / 2.95	5920.0093	17.6 / 2.97
0 C°	5860.0210	29.2 / 4.98	5890.0214	29.6 / 5.03	5920.0216	29.9 / 5.05
-10 C°	5860.0372	45.4 / 7.75	5890.0376	45.8 / 7.78	5920.0378	46.1 / 7.79
-20 C°	5860.0463	54.5 / 9.30	5890.0466	54.8 / 9.30	5920.0469	55.2 / 9.32
-30 C°	5860.0396	47.8 / 8.16	5890.0398	48.0 / 8.15	5920.0402	48.5 / 8.19

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Port 2:

Tomananatum	5860 MHz	5860 MHz	5890 MHz	5890 MHz	5920 MHz	5920 MHz
Temperatur	F	kHz / PPM	F	kHz / PPM	F	kHz / PPM
55 C°	5860.0314	9.0 / 1.54	5890.0316	8.9 / 1.51	5920.0317	9.0 / 1.52
40 C°	5860.0137	-8.7 / -1.48	5890.0137	-9.0 / -1.53	5920.0137	-9.0 / -1.52
30 C°	5860.0131	-9.3 / -1.59	5890.0133	-9.4 / -1.60	5920.0134	-9.3 / -1.57
20 C°	5860.0224	0/0	5890.0227	0/0	5920.0227	0/0
20 C°	5860.0219	-0.5 / -0.09	5890.0221	-0,6 / -0,10	5920.0220	-0.7 / -0.12
V low	3600.0219	-0.57 -0.09	3690.0221	-0,07-0,10	3920.0220	-0.77-0.12
20 C°	5860.0214	-1.0 / -0.17	5890.0217	-1.0 / -0.17	5920.0221	-0.6 / -0.10
V high	3600.0214	-1.07-0.17	3690.0217	-1.07-0.17	3920.0221	-0.07 -0.10
10 C°	5860.0281	5.7 / 0.97	5890.0282	5.5 / 0.93	5920.0284	5.7 / 0.96
0 C°	5860.0367	14.3 / 2.44	5890.0369	14.2 / 2.41	5920.0372	14.5 / 2.45
-10 C°	5860.0458	23.4 / 3.99	5890.0462	23.5 / 3.99	5920.0466	23.9 / 4.04
-20 C°	5860.0506	28.2 / 4.81	5890.0509	28.2 / 4.79	5920.0513	28.6 / 4.83
-30 C°	5860.0412	18.8 / 3.21	5890.0414	18.7 / 3.17	5920.0415	9.8 / 1.66

Limits:

Under normal test conditions and extreme test condition (temperature & voltage)

The transmitted center frequency tolerance shall be ± 10 ppm maximum.

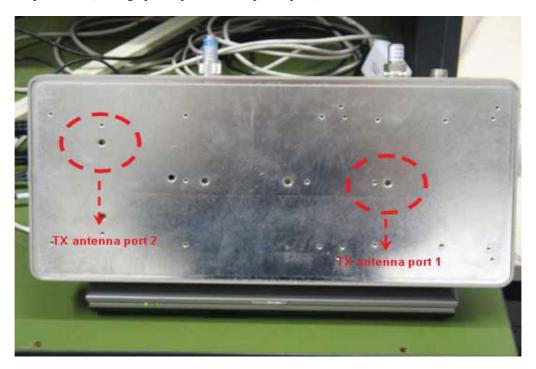
(according ASTM 8.9.4)

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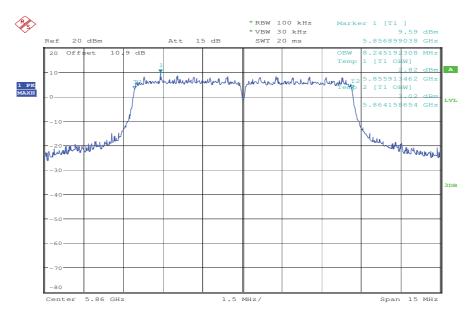


5.6 Spectrum Bandwidth of a OFDM System / 99% Bandwidth (2.1049 / 90.209 / 90.379 / ASTM E2213)

Photo: Antenna port 1 & 2 (1 = high power port, 2 = low power port)



Plot 1: Port 1, Channel 1 (5860 MHz), low data rate (3 Mbit/s)



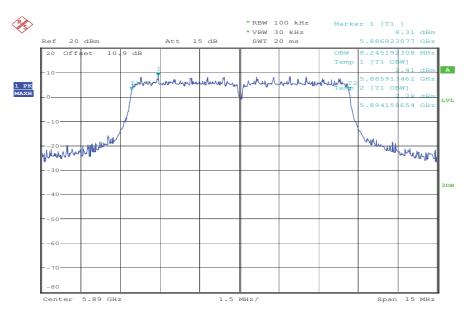
Date: 24.NOV.2009 11:47:48

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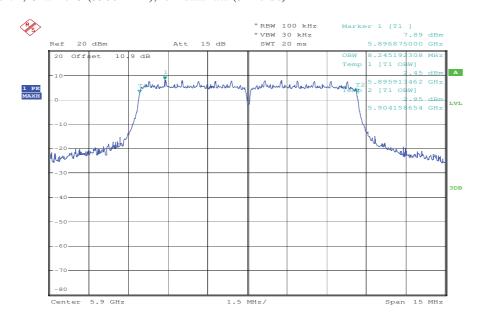


Plot 2: Port 1, Channel 2 (5890 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 11:51:09

Plot 3: Port 1, Channel 3 (5900 MHz), low data rate (3 Mbit/s)



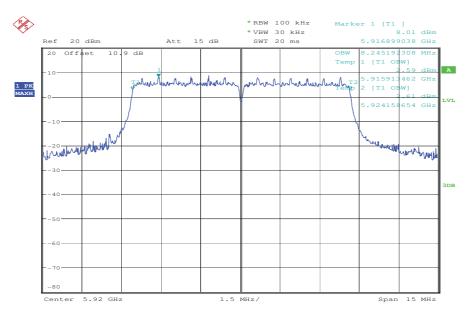
Date: 24.NOV.2009 11:57:09

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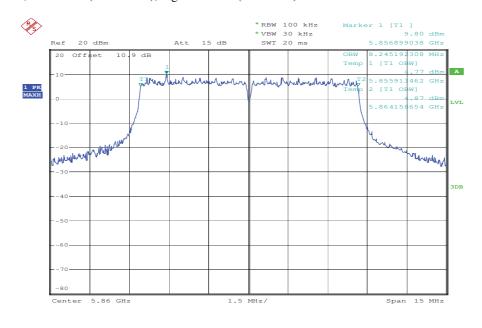


Plot 4: Port 1, Channel 4 (5920 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 11:59:12

Plot 5: Port 1, Channel 1 (5860 MHz), high data rate (27 Mbit/s)



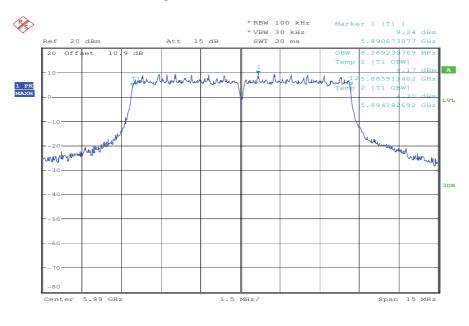
Date: 24.NOV.2009 11:48:35

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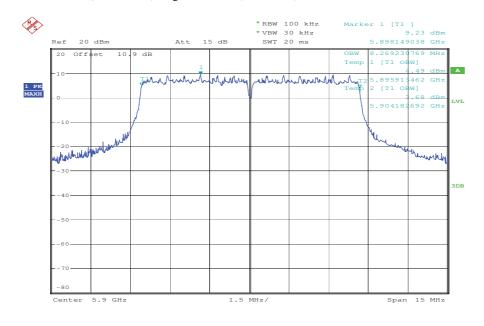


Plot 6: Port 1, Channel 2 (5890 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 11:53:38

Plot 7: Port 1, Channel 3 (5900 MHz), high data rate (27 Mbit/s)



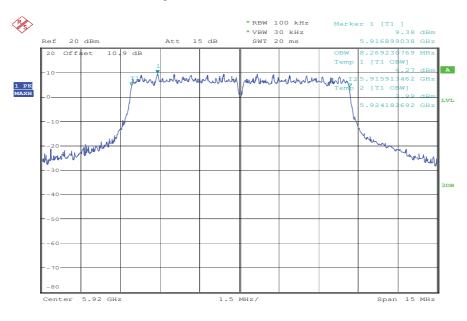
Date: 24.NOV.2009 11:54:55

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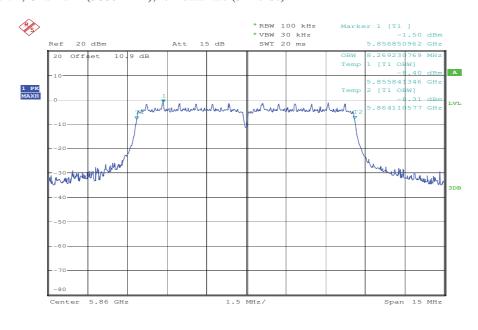


Plot 8: Port 1, Channel 4 (5920 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 12:00:48

Plot 9: Port 2, Channel 1 (5860 MHz), low data rate (3 Mbit/s)



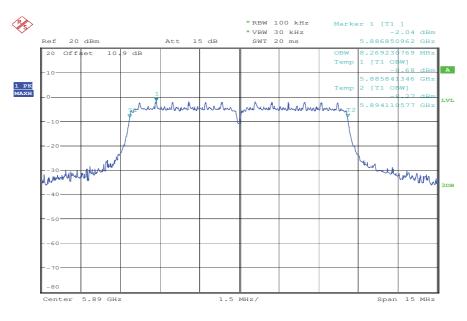
Date: 24.NOV.2009 12:33:34

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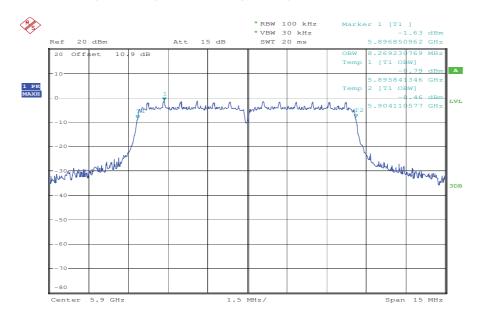


Plot 10: Port 2, Channel 2 (5890 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 12:39:13

Plot 11: Port 2, Channel 3 (5900 MHz), low data rate (3 Mbit/s)



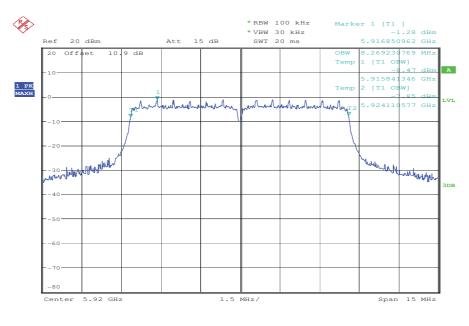
Date: 24.NOV.2009 12:40:11

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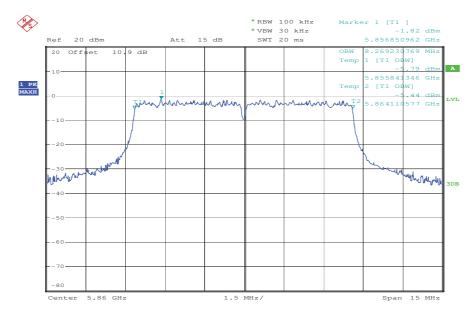


Plot 12: Port 2, Channel 4 (5920 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 12:45:20

Plot 13: Port 2, Channel 1 (5860 MHz), high data rate (27 Mbit/s)



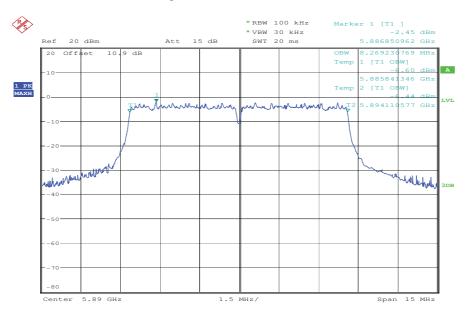
Date: 24.NOV.2009 12:35:24

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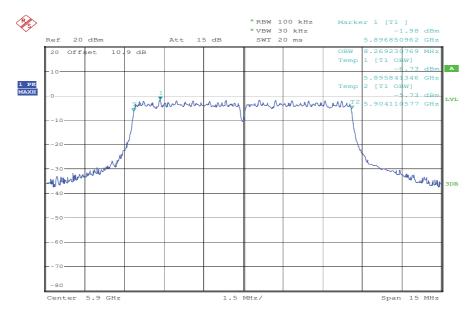


Plot 14: Port 2, Channel 2 (5890 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 12:37:04

Plot 15: Port 2, Channel 3 (5900 MHz), high data rate (27 Mbit/s)



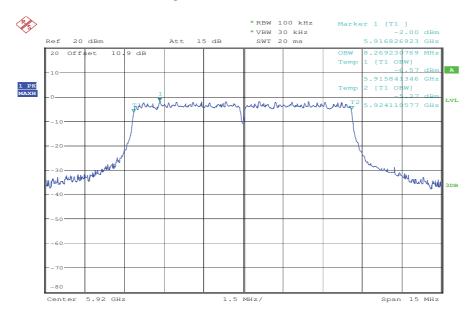
Date: 24.NOV.2009 12:41:51

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Plot 16: Port 2, Channel 4 (5920 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 12:43:39

Results: Port 1, low data rate

Test conditions		20 dB BANDWIDTH [MHz]				
Frequency [MHz]		5860	5890	5900	5920	
T_{nom}	V_{nom}	8.25	8.25	8.25	8.25	
Measurement uncertainty		±100 kHz				

RBW: 100 kHz / VBW 30 kHz

Results: Port 1, high data rate

Test conditions		20 dB BANDWIDTH [MHz]				
Frequency [MHz]		5860	5890	5900	5920	
T_{nom}	V_{nom}	8.25	8.27	8.27	8.27	
Measurement uncertainty		±100 kHz				

RBW: 100 kHz / VBW 30 kHz

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Results: Port 2, low data rate

Test conditions		20 dB BANDWIDTH [MHz]			
Frequency [MHz]		5860	5890	5900	5920
T_{nom}	V_{nom}	8.27	8.27	8.27	8.27
Measurement uncertainty		±100 kHz			

RBW: 100 kHz / VBW 30 kHz

Results: Port 2, high data rate

Test conditions		20 dB BANDWIDTH [MHz]			
Frequency [MHz]		5860	5890	5900	5920
T_{nom}	V_{nom}	8.27	8.27	8.27	8.27
Measurement uncertainty		±100 kHz			

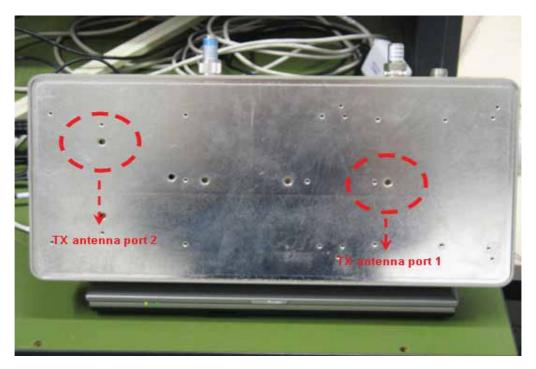
RBW: 100 kHz / VBW 30 kHz

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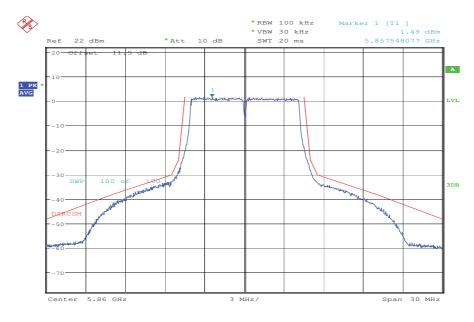
5.7 Transmit Spectrum Mask (90.210 / 90.379 / ASTM 8.9.2)

Photo: Antenna port 1 & 2 (1 = high power port, 2 = low power port)



EUT is specified as Class C equipment.

Plot 1: Port 1, Channel 1 (5860 MHz), low data rate (3 Mbit/s)



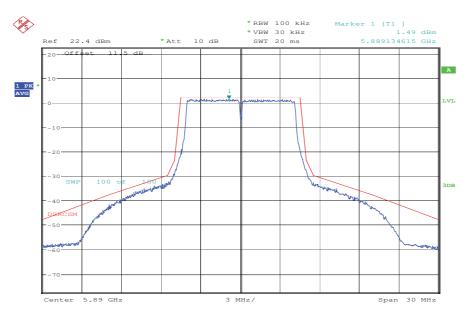
Date: 25.NOV.2009 09:40:19

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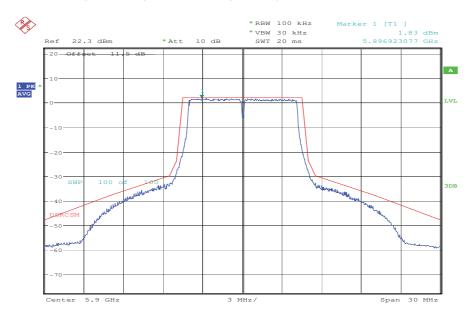


Plot 2: Port 1, Channel 2 (5890 MHz), low data rate (3 Mbit/s)



Date: 25.NOV.2009 09:42:41

Plot 3: Port 1, Channel 3 (5900 MHz), low data rate (3 Mbit/s)



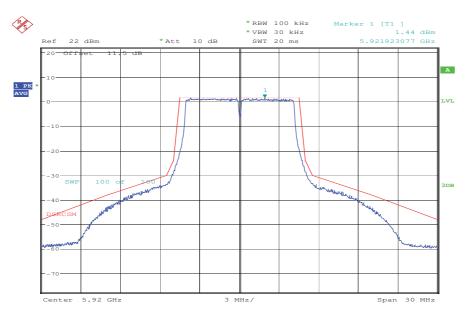
Date: 25.NOV.2009 09:43:44

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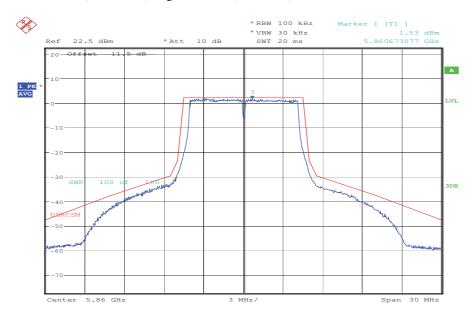


Plot 4: Port 1, Channel 4 (5920 MHz), low data rate (3 Mbit/s)



Date: 25.NOV.2009 09:47:28

Plot 5: Port 1, Channel 1 (5860 MHz), high data rate (27 Mbit/s)



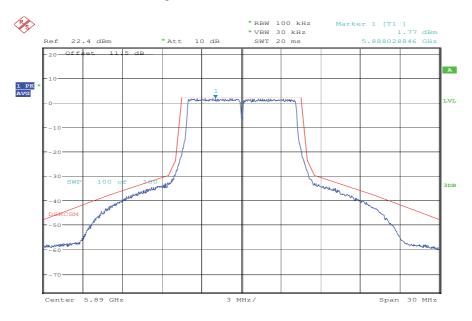
Date: 25.NOV.2009 09:41:14

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Test report no.: 1-1440-01-04/09 A

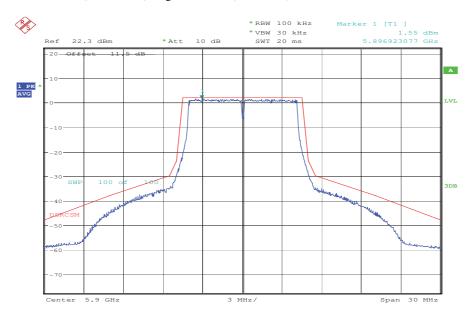


Plot 6: Port 1, Channel 2 (5890 MHz), high data rate (27 Mbit/s)



Date: 25.NOV.2009 09:42:12

Plot 7: Port 1, Channel 3 (5900 MHz), high data rate (27 Mbit/s)



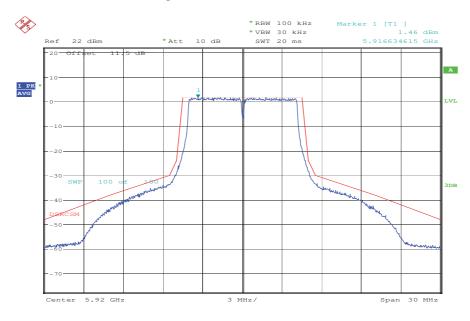
Date: 25.NOV.2009 09:44:41

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Test report no.: 1-1440-01-04/09 A

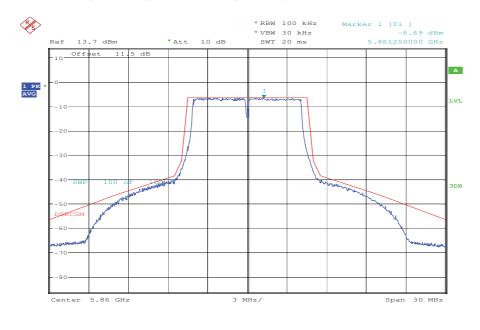


Plot 8: Port 1, Channel 4 (5920 MHz), high data rate (27 Mbit/s)



Date: 25.NOV.2009 09:48:28

Plot 7: Port 2, Channel 1 (5860 MHz), low data rate (3 Mbit/s)



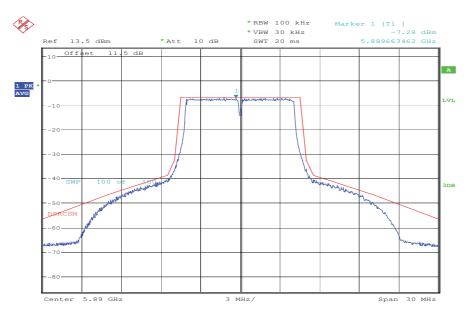
Date: 25.NOV.2009 09:56:04

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Test report no.: 1-1440-01-04/09 A

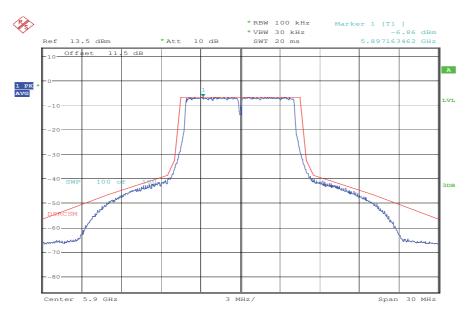


Plot 8: Port 2, Channel 2 (5890 MHz), low data rate (3 Mbit/s)



Date: 25.NOV.2009 09:54:29

Plot 9: Port 2, Channel 3 (5900 MHz), low data rate (3 Mbit/s)



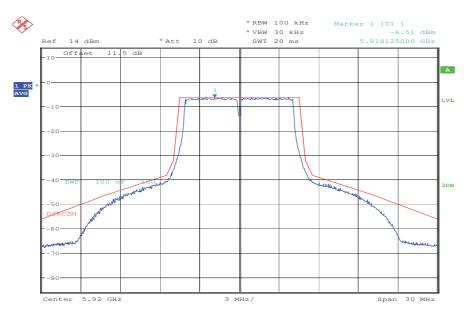
Date: 25.NOV.2009 09:53:51

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Test report no.: 1-1440-01-04/09 A

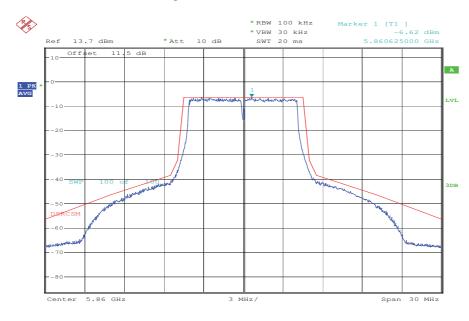


Plot 10: Port 2, Channel 4 (5920 MHz), low data rate (3 Mbit/s)



Date: 25.NOV.2009 09:51:58

Plot 11: Port 2, Channel 1 (5860 MHz), high data rate (27 Mbit/s)



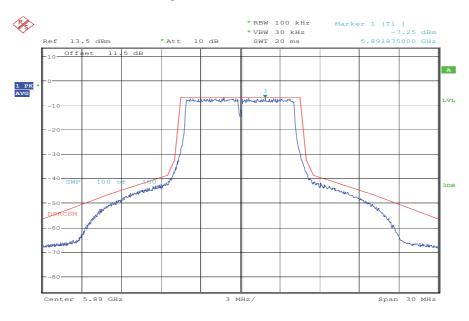
Date: 25.NOV.2009 09:55:39

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Test report no.: 1-1440-01-04/09 A

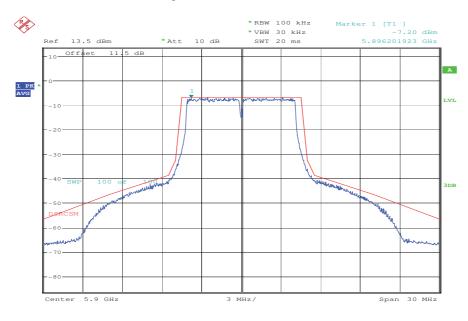


Plot 12: Port 2, Channel 2 (5890 MHz), high data rate (27 Mbit/s)



Date: 25.NOV.2009 09:54:56

Plot 13: Port 2, Channel 3 (5900 MHz), high data rate (27 Mbit/s)

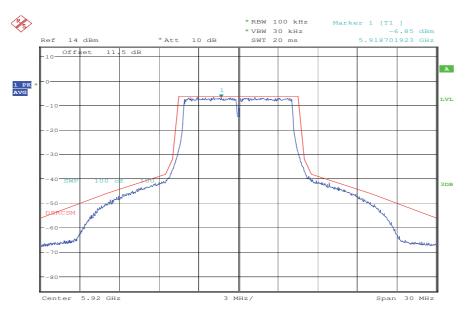


Date: 25.NOV.2009 09:53:10

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Plot 14: Port 2, Channel 4 (5920 MHz), high data rate (27 Mbit/s)



Date: 25.NOV.2009 09:52:25

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5.8 Modulation characteristics (ASTM Table 3 / 2.1047 / 90.207)

The EUT used for different data rates – different sub-carrier modulations!

3 Mbit/s data rate	BPSK modulation
4.5 Mbit/s data rate	BPSK modulation
6 Mbit/s data rate	QPSK modulation
9 Mbit/s data rate	QPSK modulation
12 Mbit/s data rate	16-QAM modulation
18 Mbit/s data rate	16-QAM modulation
24 Mbit/s data rate	64-QAM modulation
27 Mbit/s data rate	64-QAM modulation

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5.9 Maximum output power (conducted) (2.1046 / 90.205 / 90.379 / ASTM 8.9.1)

Plot 1: Port 1, Channel 1 (5860 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 13:53:01

Plot 2: Port 1, Channel 2 (5890 MHz), low data rate (3 Mbit/s)



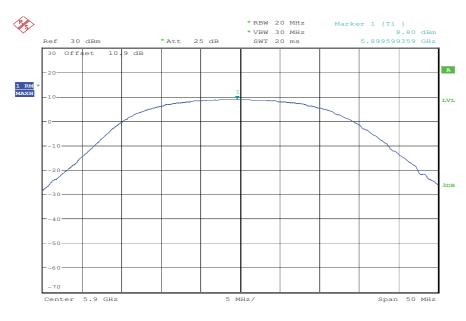
Date: 24.NOV.2009 13:55:48

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Test report no.: 1-1440-01-04/09 A

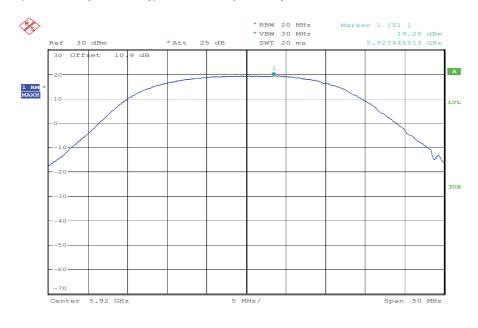


Plot 3: Port 1, Channel 3 (5900 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 14:01:27

Plot 4: Port 1, Channel 4 (5920 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 14:03:44

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Plot 5: Port 1, Channel 1 (5860 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 13:54:14

Plot 6: Port 1, Channel 2 (5890 MHz), high data rate (27 Mbit/s)



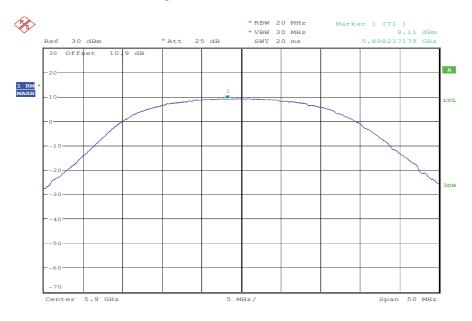
Date: 24.NOV.2009 13:59:23

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Test report no.: 1-1440-01-04/09 A

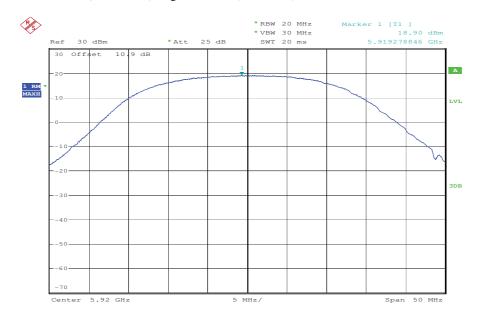


Plot 7: Port 1, Channel 3 (5900 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 14:00:38

Plot 8: Port 1, Channel 4 (5920 MHz), high data rate (27 Mbit/s)



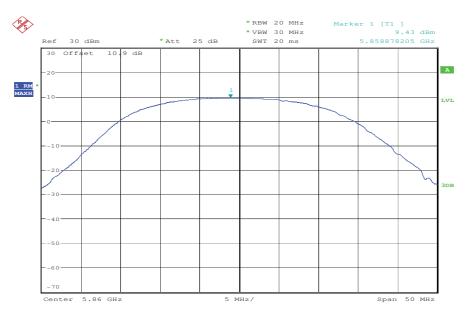
Date: 24.NOV.2009 14:04:39

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Test report no.: 1-1440-01-04/09 A

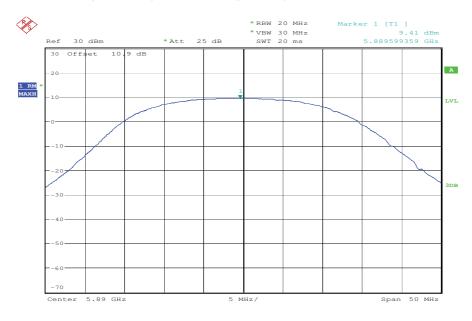


Plot 9: Port 2, Channel 1 (5860 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 14:12:35

Plot 10: Port 2, Channel 2 (5890 MHz), low data rate (3 Mbit/s)



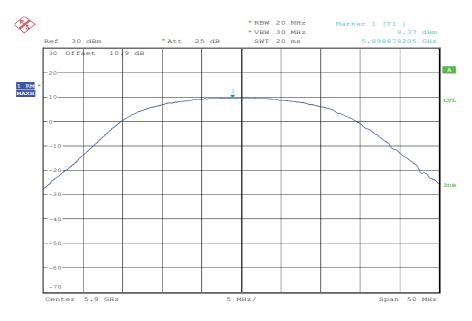
Date: 24.NOV.2009 14:10:36

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Test report no.: 1-1440-01-04/09 A

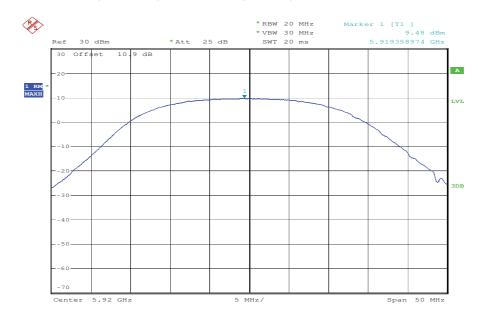


Plot 11: Port 2, Channel 3 (5900 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 14:09:44

Plot 12: Port 2, Channel 4 (5920 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 14:06:55

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Test report no.: 1-1440-01-04/09 A

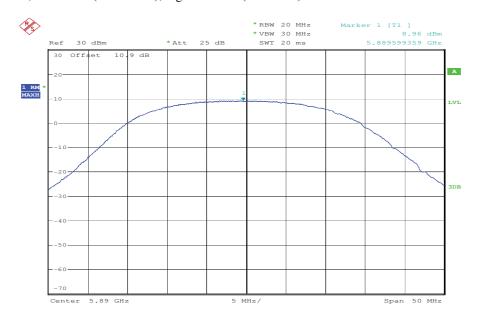


Plot 13: Port 2, Channel 1 (5860 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 14:11:57

Plot 14: Port 2, Channel 2 (5890 MHz), high data rate (27 Mbit/s)



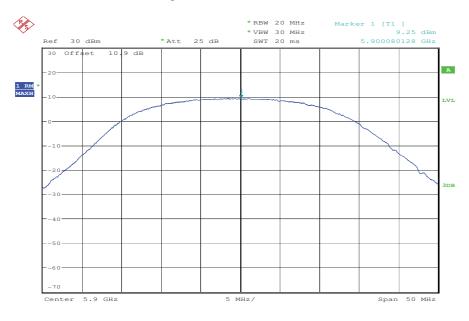
Date: 24.NOV.2009 14:11:16

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Test report no.: 1-1440-01-04/09 A

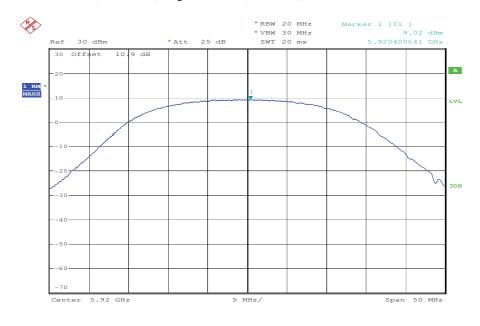


Plot 15: Port 2, Channel 3 (5900 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 14:08:49

Plot 16: Port 2, Channel 4 (5920 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 14:07:38

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Test report no.: 1-1440-01-04/09 A



Results*: Port 1, low data rate

Test conditions		Max. output power [dBm]				
Frequency [MHz]		5860	5890	5900	5920	
T _{nom}	V _{nom}	19.29	18.95	8.80	19.28	
Measurement uncertainty		±3dB				

Results*: Port 1, high data rate

Test conditions		Max. output power [dBm]			
Frequen	Frequency [MHz]		5890	5900	5920
T _{nom}	V _{nom}	19.11	19.06	9.11	18.90
Measurement uncertainty		±3dB			

Results*: Port 2, low data rate

Test conditions		Max. output	power [dBm]		
Frequency [MHz]		5860	5890	5900	5920
T _{nom}	V _{nom}	9.43	9.41	9.37	9.48
Measurement uncertainty		±3dB			

Results*: Port 2, high data rate

Test conditions		Max. output power [dBm]			
Frequency [MHz]		5860	5890	5900	5920
T _{nom}	V _{nom}	9.43	8.96	9.25	9.02
Measurement uncertainty			±3	dB	

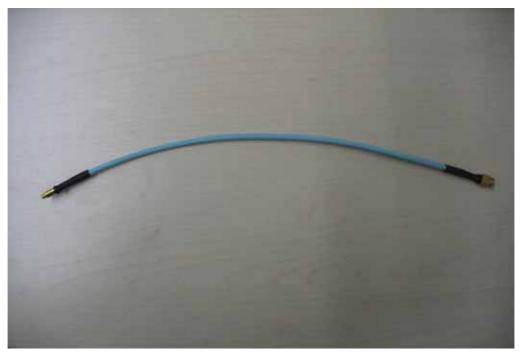
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Recalculated measurement results: Results* + Adapter cable correction (+0.6 dB)

Photo: Adapter cable (measurement cable to antenna connector)



Results: Port 1, low data rate

Test conditions		Max. output power [dBm]			
Frequency [MHz]		5860	5890	5900	5920
T _{nom}	V _{nom}	19.89	19.55	9.40	19.88
Measurement uncertainty		±3dB			

Results: Port 1, high data rate

Test co	Test conditions Max. output power [dBm]				
Frequency [MHz]		5860	5890	5900	5920
T _{nom}	V _{nom}	19.71	19.66	9.71	19.50
Measurement uncertainty			±3	dB	

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Results: Port 2, low data rate

Test conditions		Max. output power [dBm]			
Frequency [MHz]		5860	5890	5900	5920
T _{nom}	V _{nom}	10.03	10.01	9.97	10.08
Measurement uncertainty		±3dB			

Results: Port 2, high data rate

Test conditions Max. output power [dBm]					
Frequen	Frequency [MHz]		5890	5900	5920
T _{nom}	V _{nom}	10.03	9.56	9.85	9.62
Measurement uncertainty		±3dB			

Limits:

Under normal test conditions only	Class C / 20 dBm

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Test report no.: 1-1440-01-04/09 A



5.10~ Max. peak output power (radiated) (2.1046~/~90.205~/~90.379~/~ASTM~8.9.1)

Results: Port 1, low data rate

Test conditions		Max. output power [dBm]			
Frequency [MHz]		5860	5890	5900	5920
T _{nom}	V _{nom}	28.80	29.60	19.20	29.60
Measurement uncertainty		±3dB			

Results: Port 1, high data rate

Test conditions Max. output power [dBi		power [dBm]			
Frequency [MHz]		5860	5890	5900	5920
T _{nom}	V _{nom}	28.80	29.30	19.30	29.90
Measurement uncertainty			±30	dB	

Results: Port 2, low data rate

Test conditions		Max. output power [dBm]				
Frequen	Frequency [MHz]		5890	5900	5920	
T _{nom}	V _{nom}	15.50	15.70	15.80	15.60	
Measurement uncertainty		±3dB				

Results: Port 2, high data rate

Test conditions		Max. output power [dBm]			
Frequency [MHz]		5860	5890	5900	5920
T _{nom}	V _{nom}	15.70	15.70	15.60	15.80
Measurement uncertainty		±3dB			

The radiated values are calculated with the antenna gain.

Limits:

	5860 MHz to 5890 MHz : 33 dBm		
Under normal test conditions only	5890 MHz to 5910 MHz : 23 dBm		
	5920 MHz : 33 dBm		

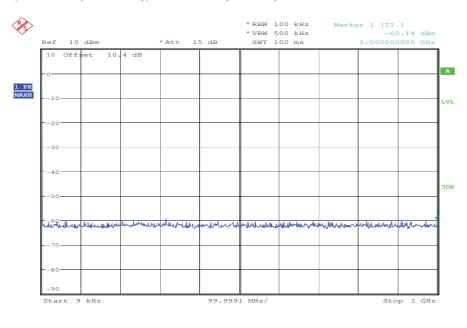
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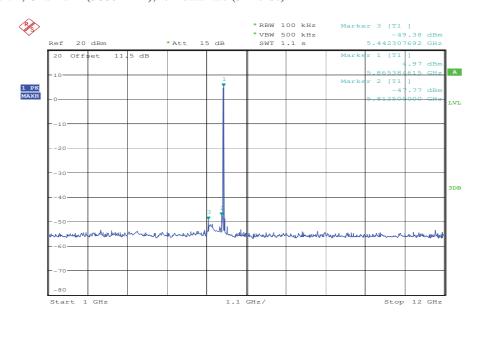
5.11~ Spurious Emissions - conducted Transmitter (2.1051 / 90.210 / 90.379 / ASTM 8.9.2)

Plot 1: Port 1, Channel 1 (5860 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 14:32:17

Plot 2: Port 1, Channel 1 (5860 MHz), low data rate (3 Mbit/s)



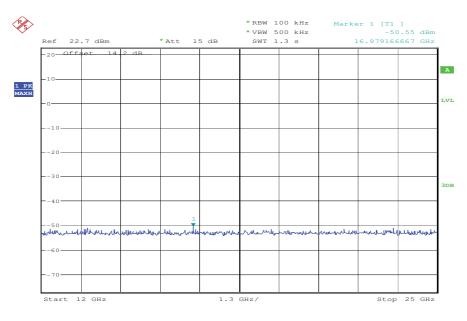
Date: 24.NOV.2009 14:34:10

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Test report no.: 1-1440-01-04/09 A

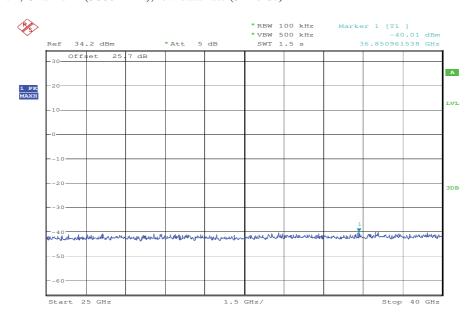


Plot 3: Port 1, Channel 1 (5860 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 14:35:16

Plot 4: Port 1, Channel 1 (5860 MHz), low data rate (3 Mbit/s)



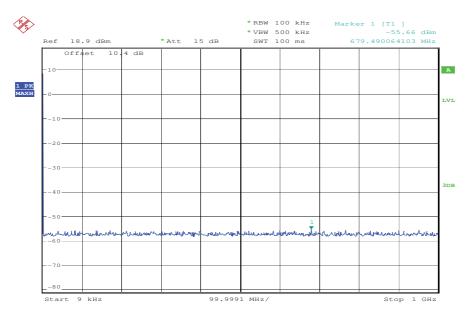
Date: 24.NOV.2009 14:36:57

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Test report no.: 1-1440-01-04/09 A

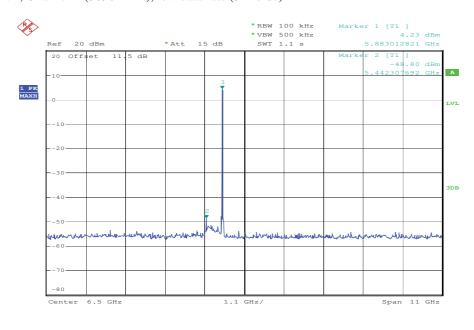


Plot 5: Port 1, Channel 2 (5890 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 14:39:33

Plot 6: Port 1, Channel 2 (5890 MHz), low data rate (3 Mbit/s)



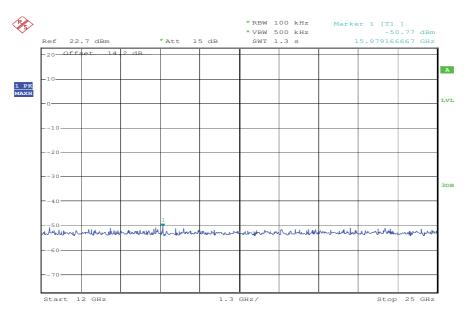
Date: 24.NOV.2009 14:51:56

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Test report no.: 1-1440-01-04/09 A

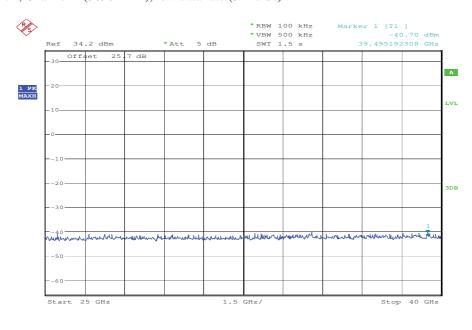


Plot 7: Port 1, Channel 2 (5890 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 14:57:20

Plot 8: Port 1, Channel 2 (5890 MHz), low data rate (3 Mbit/s)



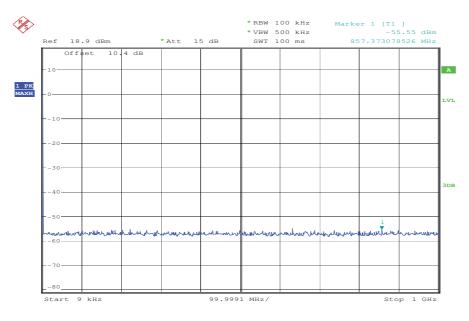
Date: 24.NOV.2009 15:04:37

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Test report no.: 1-1440-01-04/09 A

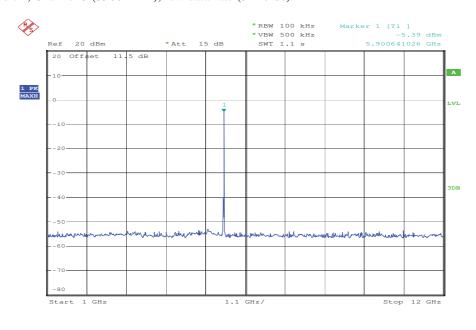


Plot 9: Port 1, Channel 3 (5900 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 14:40:34

Plot 10: Port 1, Channel 3 (5900 MHz), low data rate (3 Mbit/s)



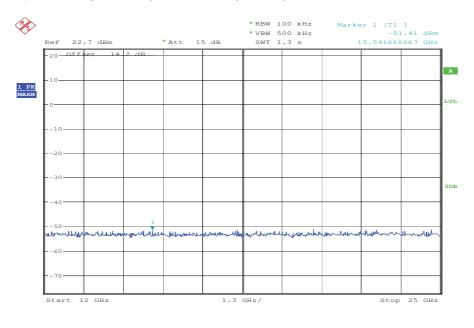
Date: 24.NOV.2009 14:46:43

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Test report no.: 1-1440-01-04/09 A

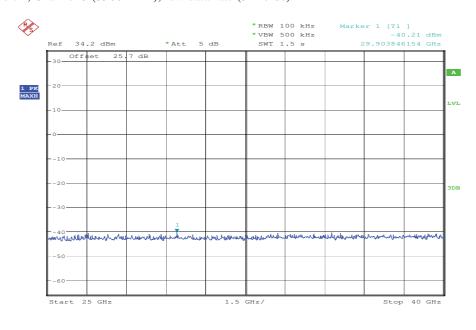


Plot 11: Port 1, Channel 3 (5900 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 14:58:08

Plot 12: Port 1, Channel 3 (5900 MHz), low data rate (3 Mbit/s)



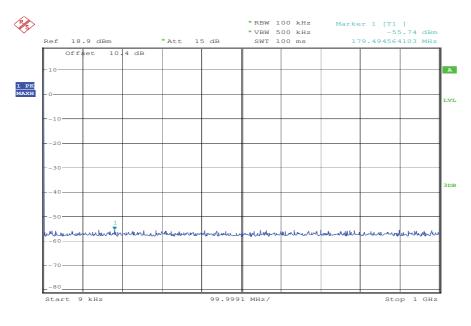
Date: 24.NOV.2009 15:03:48

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Test report no.: 1-1440-01-04/09 A

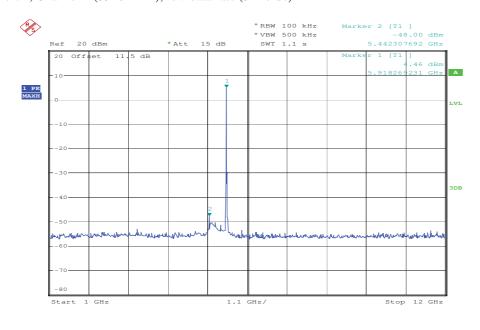


Plot 13: Port 1, Channel 4 (5920 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 14:42:30

Plot 14: Port 1, Channel 4 (5920 MHz), low data rate (3 Mbit/s)



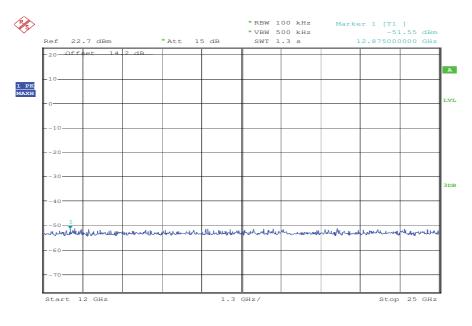
Date: 24.NOV.2009 14:43:58

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Test report no.: 1-1440-01-04/09 A

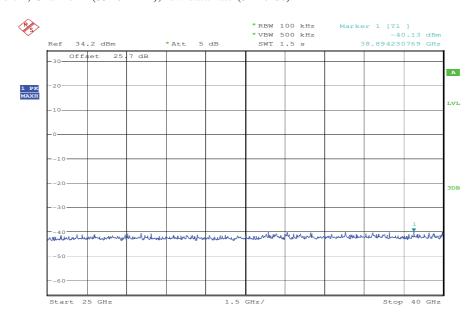


Plot 15: Port 1, Channel 4 (5920 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 15:00:19

Plot 16: Port 1, Channel 4 (5920 MHz), low data rate (3 Mbit/s)



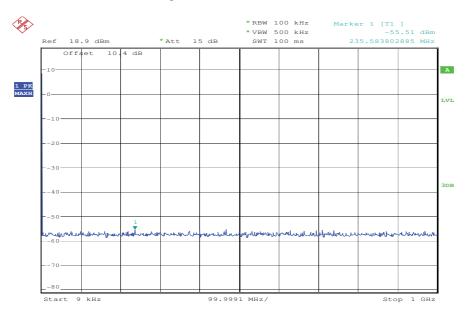
Date: 24.NOV.2009 15:01:41

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Test report no.: 1-1440-01-04/09 A

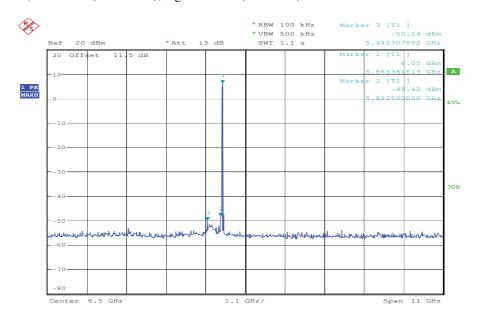


Plot 17: Port 1, Channel 1 (5860 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 14:38:09

Plot 18: Port 1, Channel 1 (5860 MHz), high data rate (27 Mbit/s)



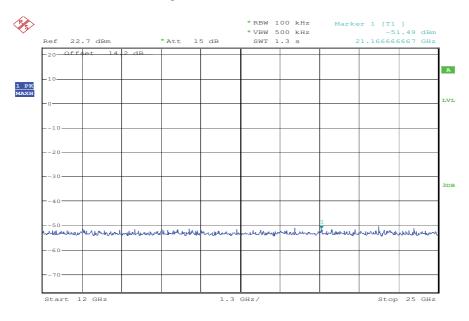
Date: 24.NOV.2009 14:53:16

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Test report no.: 1-1440-01-04/09 A

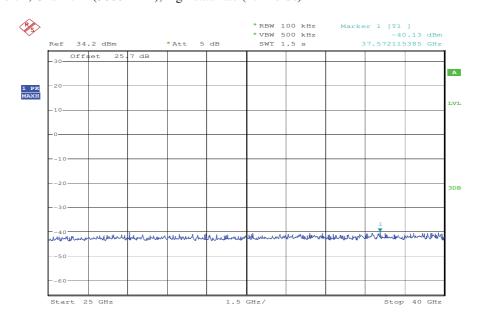


Plot 19: Port 1, Channel 1 (5860 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 14:55:48

Plot 20: Port 1, Channel 1 (5860 MHz), high data rate (27 Mbit/s)



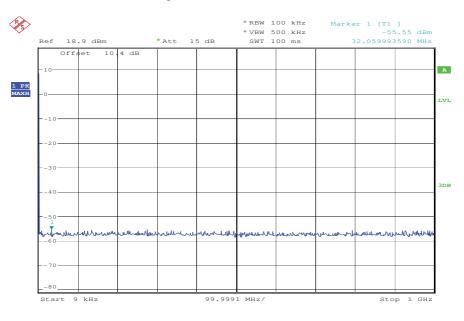
Date: 24.NOV.2009 15:06:03

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Test report no.: 1-1440-01-04/09 A

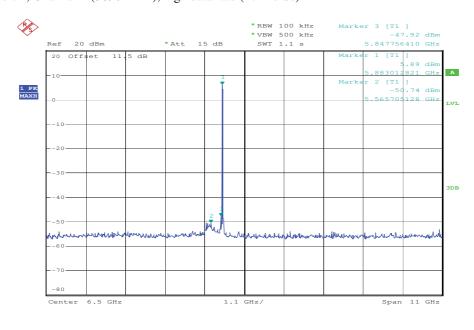


Plot 21: Port 1, Channel 2 (5890 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 14:38:52

Plot 22: Port 1, Channel 2 (5890 MHz), high data rate (27 Mbit/s)



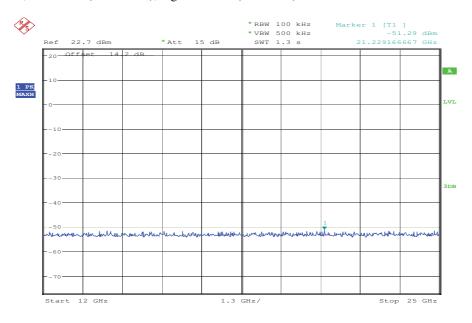
Date: 24.NOV.2009 14:52:39

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Test report no.: 1-1440-01-04/09 A

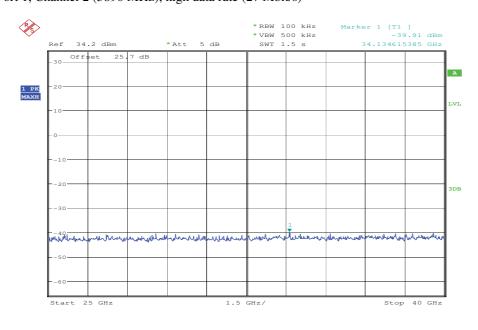


Plot 23: Port 1, Channel 2 (5890 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 14:56:31

Plot 24: Port 1, Channel 2 (5890 MHz), high data rate (27 Mbit/s)



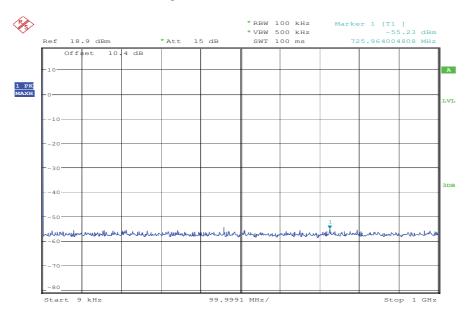
Date: 24.NOV.2009 15:05:22

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Test report no.: 1-1440-01-04/09 A

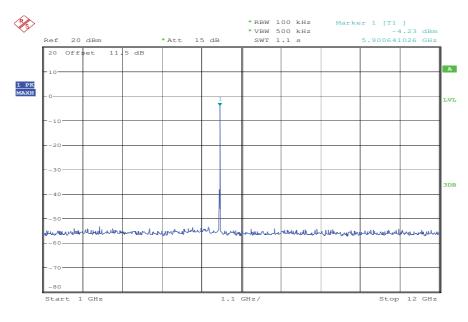


Plot 25: Port 1, Channel 3 (5900 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 14:41:13

Plot 26: Port 1, Channel 3 (5900 MHz), high data rate (27 Mbit/s)



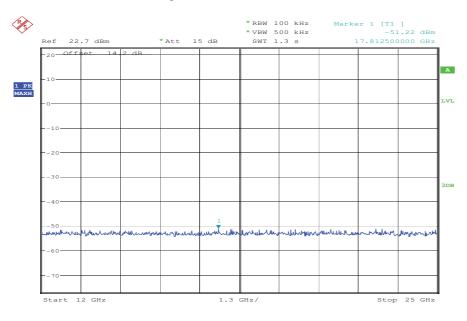
Date: 24.NOV.2009 14:45:25

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Test report no.: 1-1440-01-04/09 A

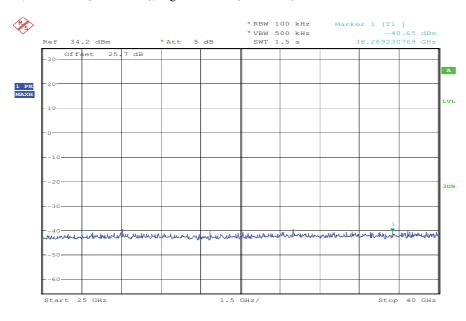


Plot 27: Port 1, Channel 3 (5900 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 14:59:01

Plot 28: Port 1, Channel 3 (5900 MHz), high data rate (27 Mbit/s)



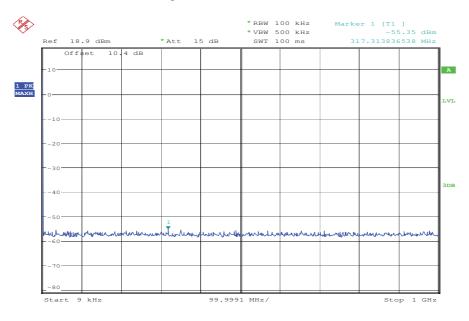
Date: 24.NOV.2009 15:03:03

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Test report no.: 1-1440-01-04/09 A

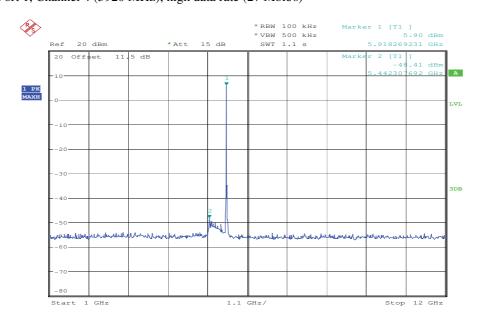


Plot 29: Port 1, Channel 4 (5920 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 14:41:53

Plot 30: Port 1, Channel 4 (5920 MHz), high data rate (27 Mbit/s)



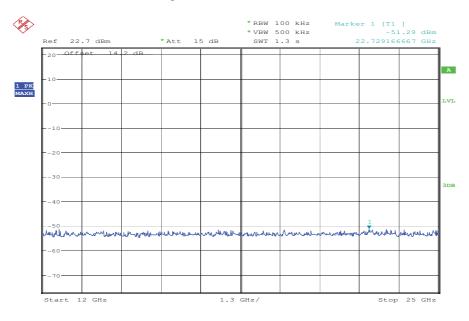
Date: 24.NOV.2009 14:44:43

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Test report no.: 1-1440-01-04/09 A

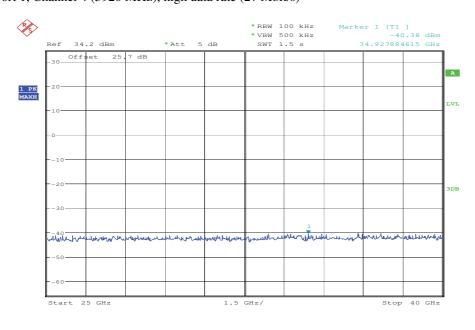


Plot 31: Port 1, Channel 4 (5920 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 14:59:36

Plot 32: Port 1, Channel 4 (5920 MHz), high data rate (27 Mbit/s)



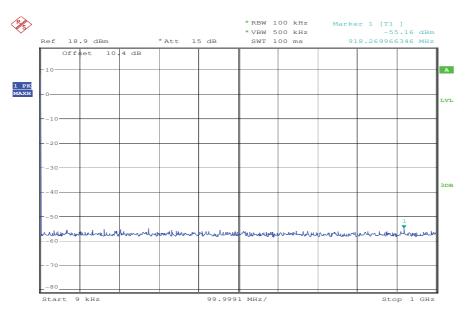
Date: 24.NOV.2009 15:02:20

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Test report no.: 1-1440-01-04/09 A

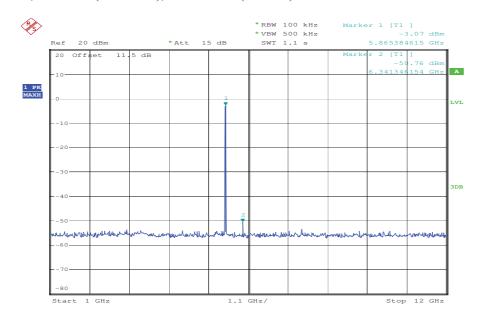


Plot 33: Port 2, Channel 1 (5860 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 15:22:44

Plot 34: Port 2, Channel 1 (5860 MHz), low data rate (3 Mbit/s)



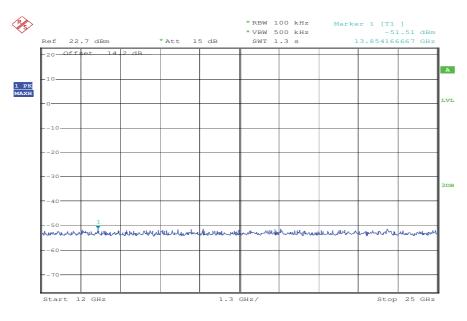
Date: 24.NOV.2009 15:44:11

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Test report no.: 1-1440-01-04/09 A

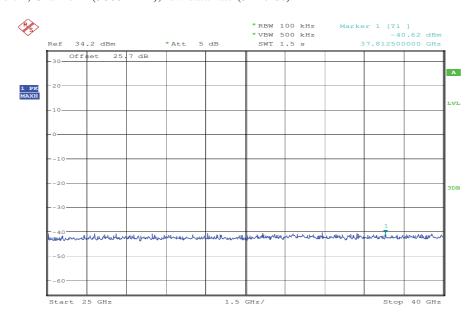


Plot 35: Port 2, Channel 1 (5860 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 15:45:06

Plot 36: Port 2, Channel 1 (5860 MHz), low data rate (3 Mbit/s)



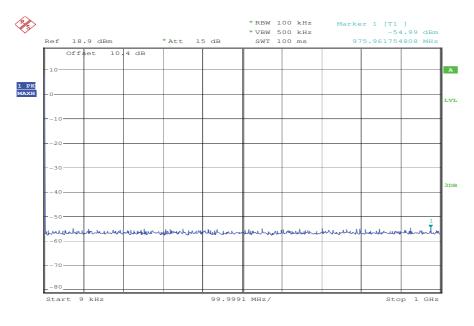
Date: 24.NOV.2009 15:58:27

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Test report no.: 1-1440-01-04/09 A

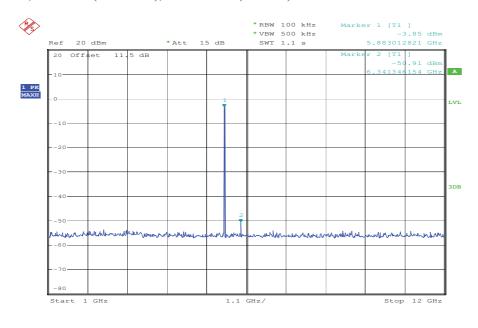


Plot 37: Port 2, Channel 2 (5890 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 15:28:50

Plot 38: Port 2, Channel 2 (5890 MHz), low data rate (3 Mbit/s)



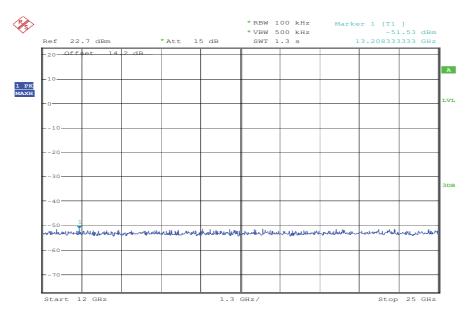
Date: 24.NOV.2009 15:42:19

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Test report no.: 1-1440-01-04/09 A

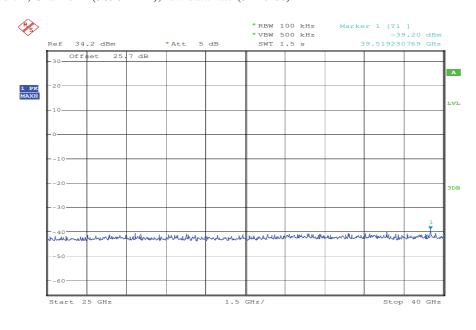


Plot 39: Port 2, Channel 2 (5890 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 15:49:47

Plot 40: Port 2, Channel 2 (5890 MHz), low data rate (3 Mbit/s)



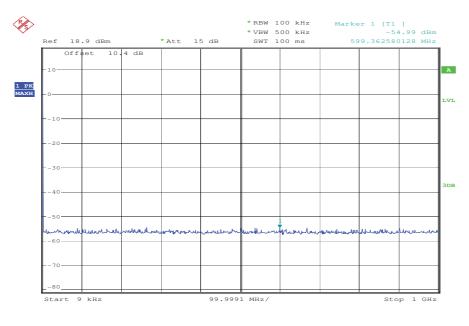
Date: 24.NOV.2009 15:56:14

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Test report no.: 1-1440-01-04/09 A

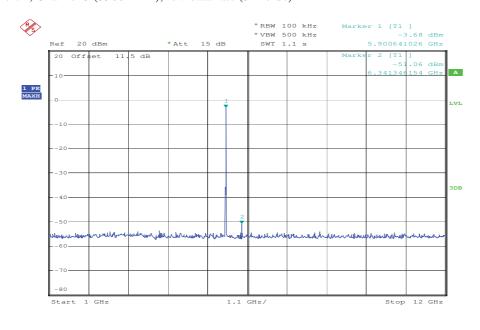


Plot 41: Port 2, Channel 3 (5900 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 15:32:24

Plot 42: Port 2, Channel 3 (5900 MHz), low data rate (3 Mbit/s)



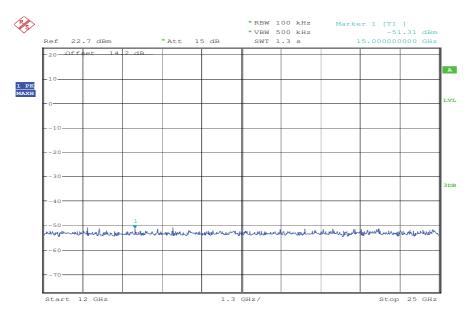
Date: 24.NOV.2009 15:41:37

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Test report no.: 1-1440-01-04/09 A

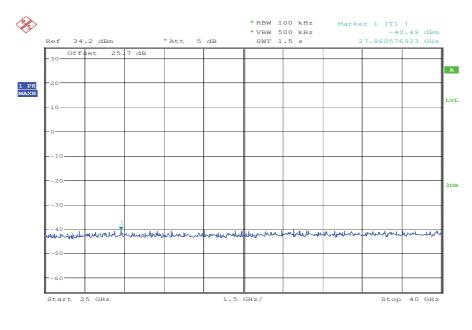


Plot 43: Port 2, Channel 3 (5900 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 15:50:30

Plot 44: Port 2, Channel 3 (5900 MHz), low data rate (3 Mbit/s)



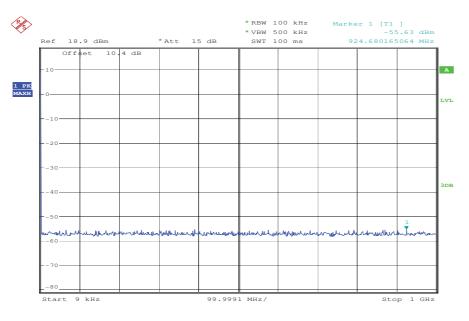
Date: 24.NOV.2009 15:55:28

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Test report no.: 1-1440-01-04/09 A

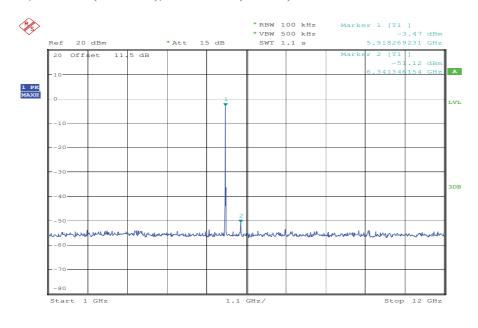


Plot 45: Port 2, Channel 4 (5920 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 15:34:45

Plot 46: Port 2, Channel 4 (5920 MHz), low data rate (3 Mbit/s)



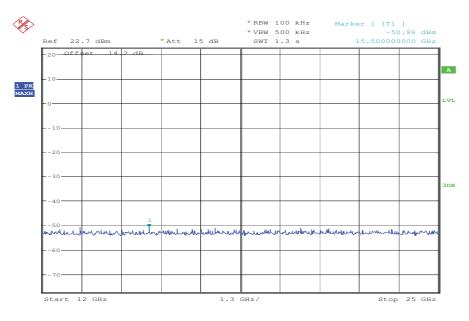
Date: 24.NOV.2009 15:39:42

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Test report no.: 1-1440-01-04/09 A

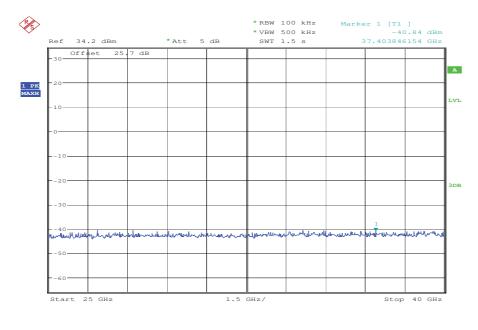


Plot 47: Port 2, Channel 4 (5920 MHz), low data rate (3 Mbit/s)



Date: 24.NOV.2009 15:52:34

Plot 48: Port 2, Channel 4 (5920 MHz), low data rate (3 Mbit/s)



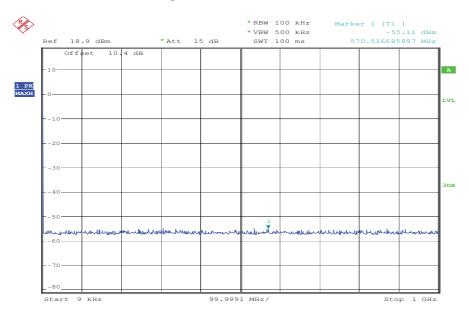
Date: 24.NOV.2009 15:53:38

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Test report no.: 1-1440-01-04/09 A

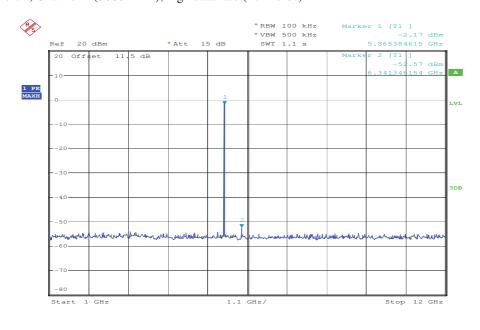


Plot 49: Port 2, Channel 1 (5860 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 15:24:58

Plot 50: Port 2, Channel 1 (5860 MHz), high data rate (27 Mbit/s)



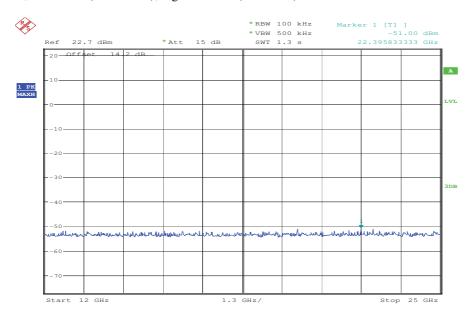
Date: 24.NOV.2009 15:43:19

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Test report no.: 1-1440-01-04/09 A

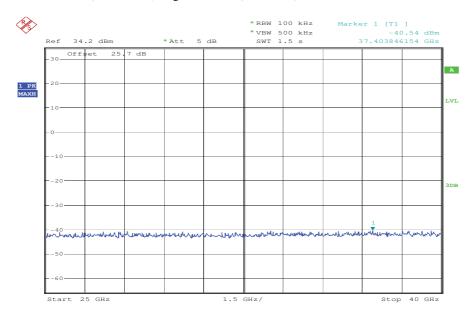


Plot 51: Port 2, Channel 1 (5860 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 15:48:24

Plot 52: Port 2, Channel 1 (5860 MHz), high data rate (27 Mbit/s)



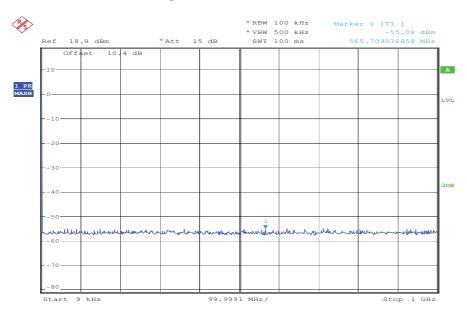
Date: 24.NOV.2009 15:57:45

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Test report no.: 1-1440-01-04/09 A

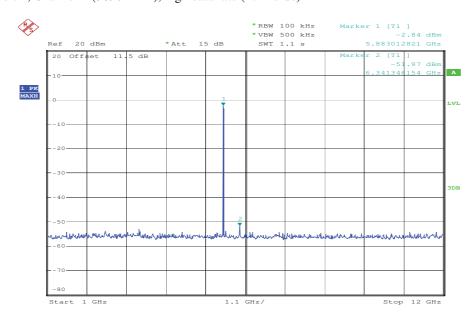


Plot 53: Port 2, Channel 2 (5890 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 15:27:01

Plot 54: Port 2, Channel 2 (5890 MHz), high data rate (27 Mbit/s)



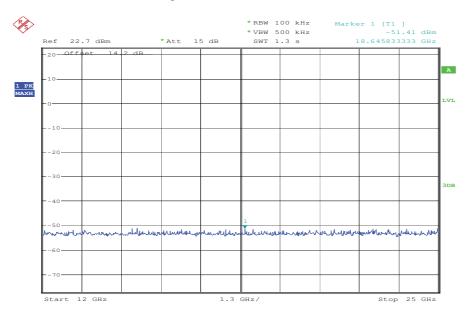
Date: 24.NOV.2009 15:42:50

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Test report no.: 1-1440-01-04/09 A

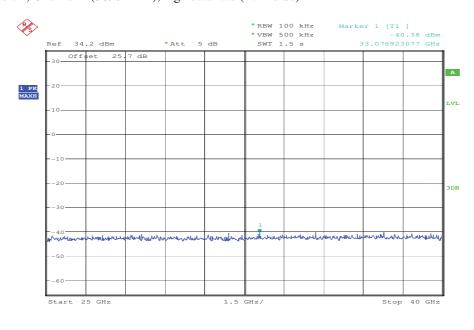


Plot 55: Port 2, Channel 2 (5890 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 15:49:06

Plot 56: Port 2, Channel 2 (5890 MHz), high data rate (27 Mbit/s)



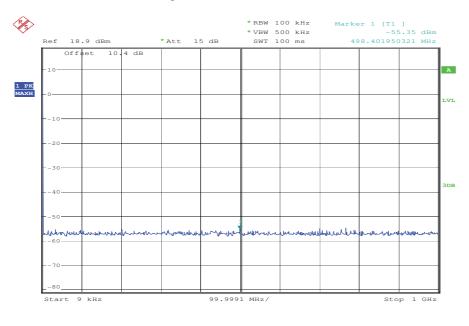
Date: 24.NOV.2009 15:56:44

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Test report no.: 1-1440-01-04/09 A

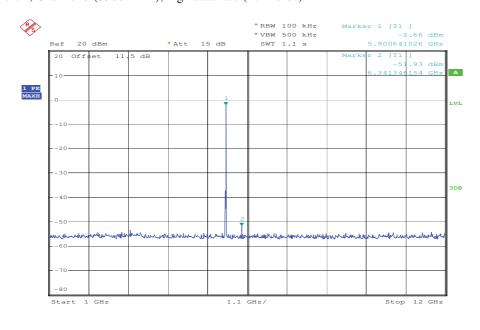


Plot 57: Port 2, Channel 3 (5900 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 15:33:20

Plot 58: Port 2, Channel 3 (5900 MHz), high data rate (27 Mbit/s)



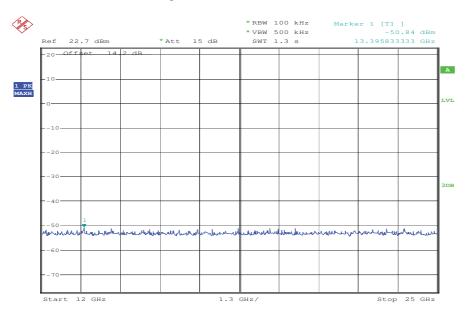
Date: 24.NOV.2009 15:40:56

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Test report no.: 1-1440-01-04/09 A

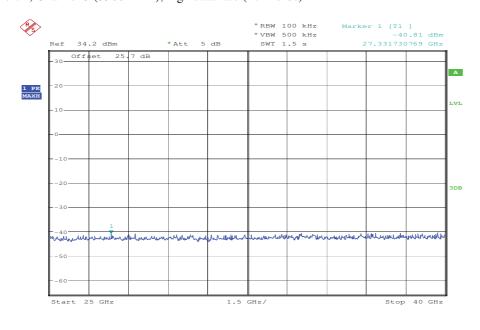


Plot 59: Port 2, Channel 3 (5900 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 15:51:09

Plot 60: Port 2, Channel 3 (5900 MHz), high data rate (27 Mbit/s)



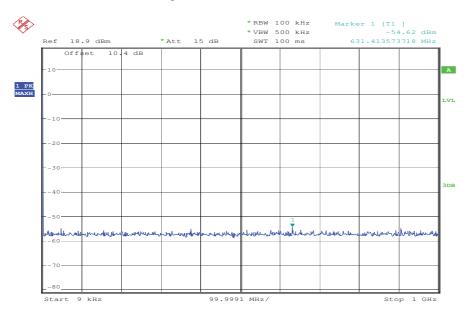
Date: 24.NOV.2009 15:54:47

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Test report no.: 1-1440-01-04/09 A

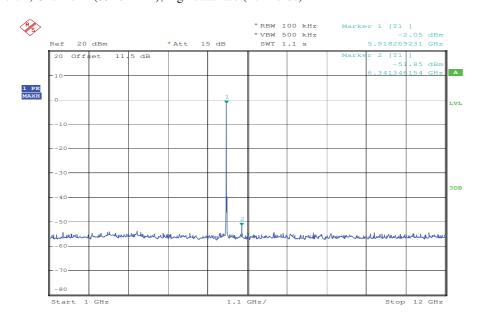


Plot 61: Port 2, Channel 4 (5920 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 15:33:59

Plot 62: Port 2, Channel 4 (5920 MHz), high data rate (27 Mbit/s)



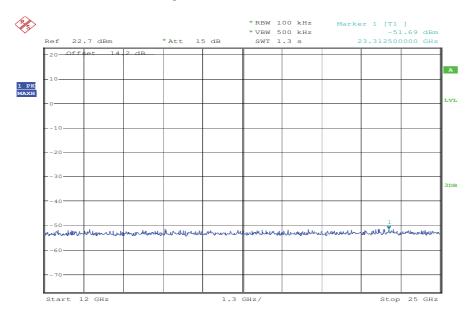
Date: 24.NOV.2009 15:40:13

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Test report no.: 1-1440-01-04/09 A

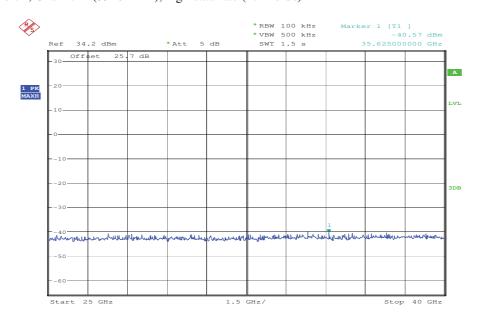


Plot 63: Port 2, Channel 4 (5920 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 15:51:48

Plot 64: Port 2, Channel 4 (5920 MHz), high data rate (27 Mbit/s)



Date: 24.NOV.2009 15:54:09

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Result & Limits: Port 1, low & high data rate

			E	mission Limitations	S	
f [MHz]		amplit emis [dE	sion	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
	5860					Operating frequency
emissi	al peaks detected ons are below th (according to AS	e -25 dB	m	-25 dBm		Complies
	5890					Operating frequency
emissi	No critical peaks detected. All detected emissions are below the -25 dBm criteria.(according to ASTM E2213)			-25 dBm		Complies
	1					
	5900					Operating frequency
emissi	al peaks detected ons are below th (according to AS	e -25 dB	m	-25 dBm		Complies
	5920					Operating frequency
No critical peaks detected. All detected emissions are below the -25 dBm criteria.(according to ASTM E2213)		-25 dBm		Complies		
Measur	rement uncertain	nty			± 3dB	

Limit:

Under normal test conditions only	-25 dBm
-----------------------------------	---------

Note: For emissions that fall into restricted bands you find the radiated emissions later in the report.

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Test report no.: 1-1440-01-04/09 A



Result & Limits: Port 2, low & high data rate

			E	mission Limitations	.	
f [MHz]		amplit emis [dE	sion	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
	5860			•	-	Operating frequency
emissi	al peaks detected ons are below th (according to AS	e -25 dB	m	-25 dBm		Complies
	5890					Operating frequency
emissi	No critical peaks detected. All detected emissions are below the -25 dBm criteria.(according to ASTM E2213)			-25 dBm		Complies
	5900					Operating frequency
emissi	al peaks detected ons are below the (according to AS	e -25 dB	m	-25 dBm		Complies
	5920					Operating frequency
No critical peaks detected. All detected emissions are below the -25 dBm criteria.(according to ASTM E2213)		-25 dBm		Complies		
Measu	rement uncertair	nty			± 3dB	

Limit:

Under normal test conditions only	-25 dBm
-----------------------------------	---------

Note: For emissions that fall into restricted bands you find the radiated emissions later in the report.

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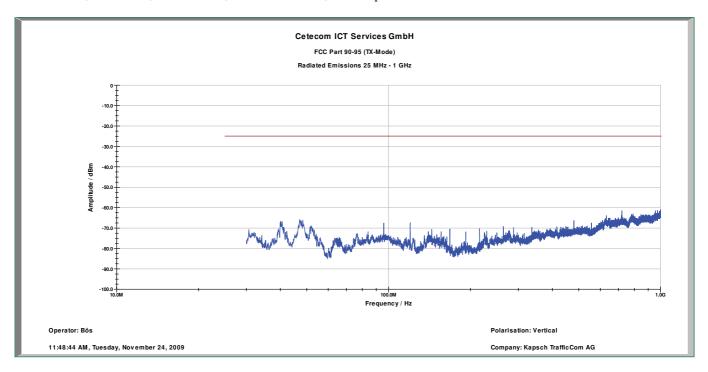
Test report no.: 1-1440-01-04/09 A



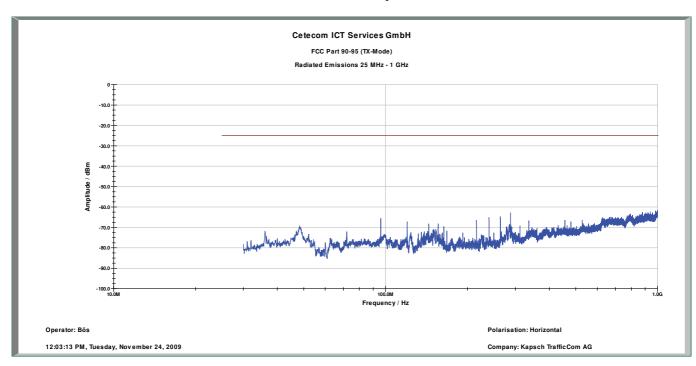
5.12 Spurious Emissions - radiated (Transmitter) (2.1053 / 90.210 / 90.379 / ASTM 8.9.2)

Port 1 (high power port)

Plot 1: Port 1, 5860 MHz, low data rate, 30 MHz – 1 GHz, vertical polarization



Plot 2: Port 1, 5860 MHz, low data rate, 30 MHz – 1 GHz, horizontal polarization

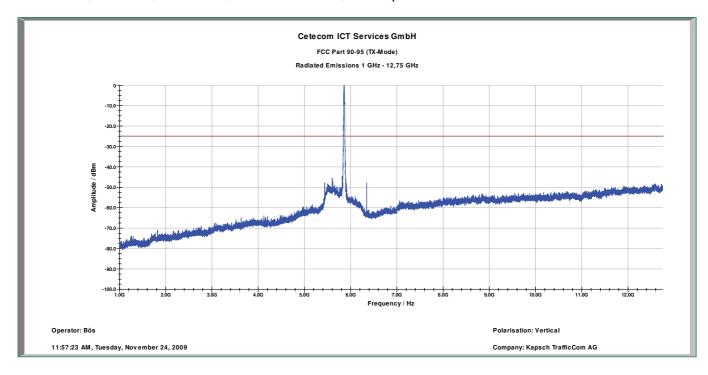


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Test report no.: 1-1440-01-04/09 A

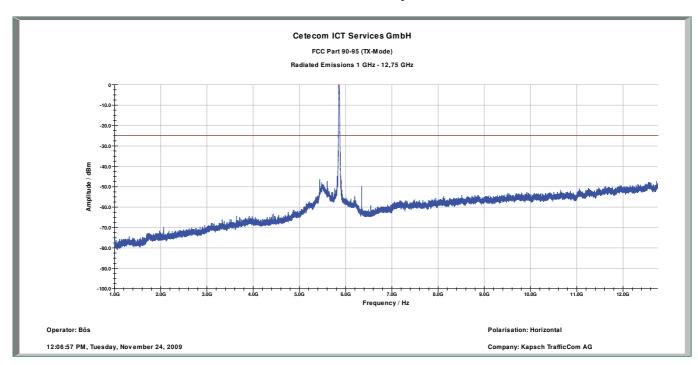


Plot 3: Port 1, 5860 MHz, low data rate, 1 GHz – 12.75 GHz, vertical polarization



The detected emission 6346 MHz do not fall into a restricted band.

Plot 4: Port 1, 5860 MHz, low data rate, 1 GHz – 12.75 GHz, horizontal polarization



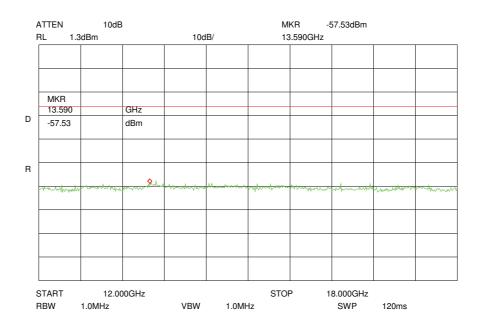
The detected emission 6346 MHz do not fall into a restricted band.

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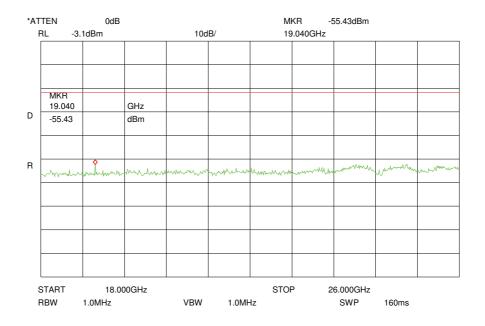
Test report no.: 1-1440-01-04/09 A



Plot 5: Port 1, 5860 MHz, low data rate, 12 GHz – 18 GHz, vertical & horizontal polarization (valid for all channels)



Plot 6: Port 1, 5860 MHz, low data rate, 18 GHz – 26 GHz, vertical & horizontal polarization (valid for all channels)

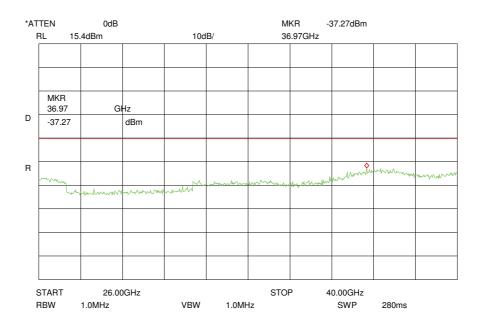


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Plot 7: Port 1, 5860 MHz, low data rate, 26 GHz – 40 GHz, vertical & horizontal polarization (valid for all channels)

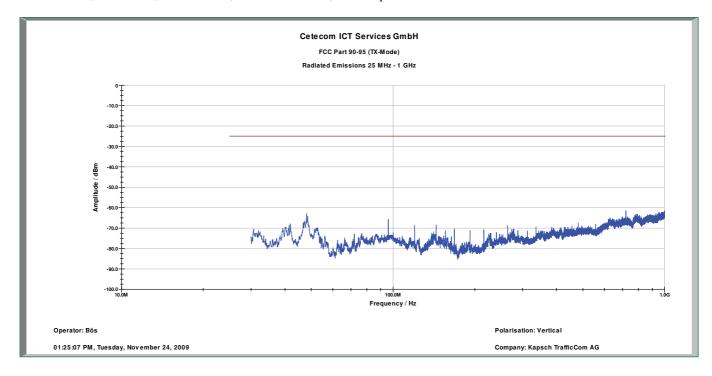


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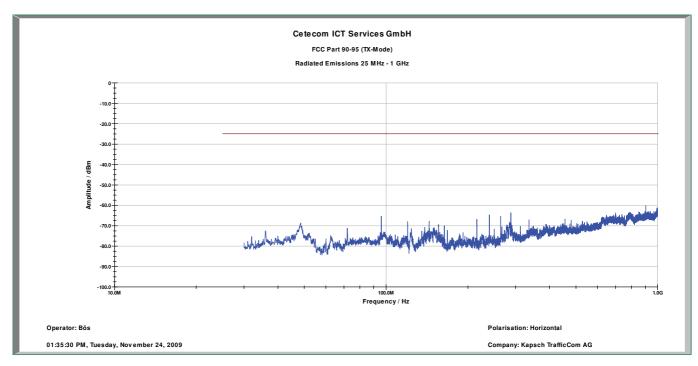
Test report no.: 1-1440-01-04/09 A



Plot 8: Port 1, 5890 MHz, low data rate, 30 MHz – 1 GHz, vertical polarization



Plot 9: Port 1, 5890 MHz, low data rate, 30 MHz – 1 GHz, horizontal polarization

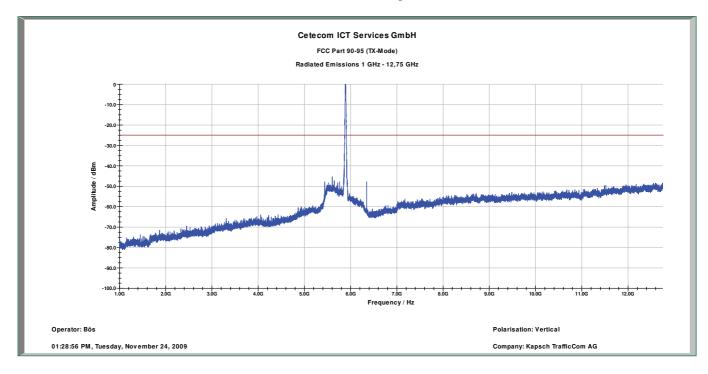


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Test report no.: 1-1440-01-04/09 A

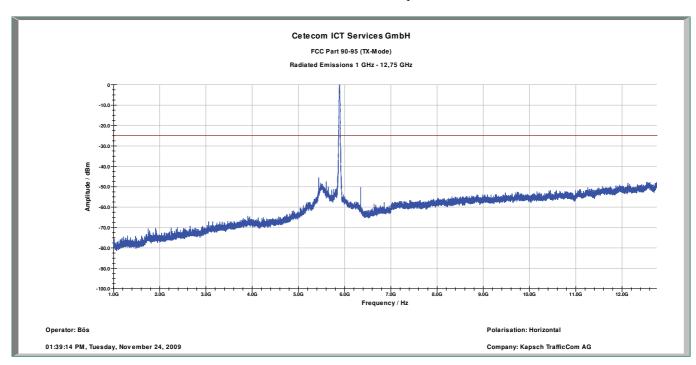


Plot 10: Port 1, 5890 MHz, low data rate, 1 GHz – 12.75 GHz, vertical polarization



The detected emission 6346 MHz do not fall into a restricted band.

Plot 11: Port 1, 5890 MHz, low data rate, 1 GHz – 12.75 GHz, horizontal polarization



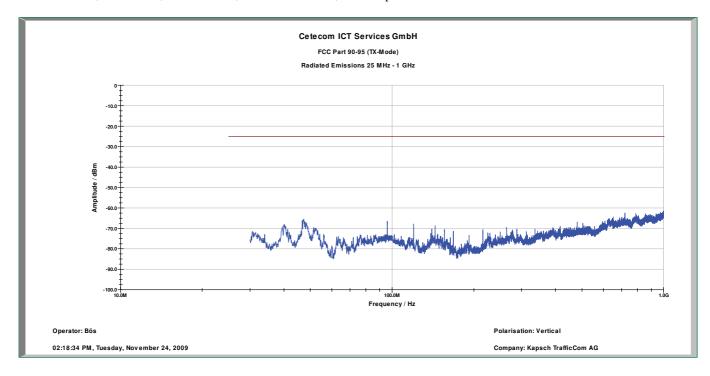
The detected emission 6346 MHz do not fall into a restricted band.

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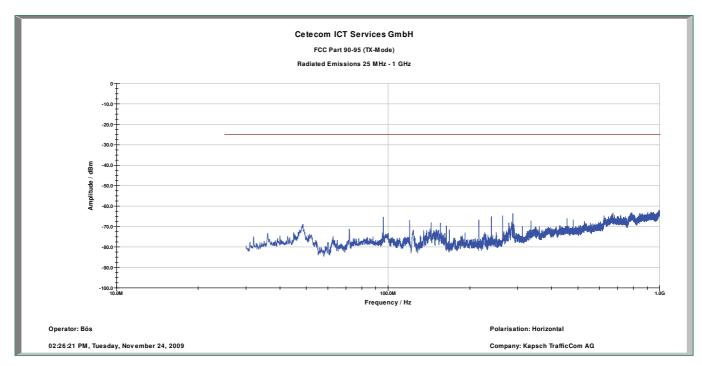
Test report no.: 1-1440-01-04/09 A



Plot 12: Port 1, 5900 MHz, low data rate, 30 MHz – 1 GHz, vertical polarization



Plot 13: Port 1, 5900 MHz, low data rate, 30 MHz – 1 GHz, horizontal polarization

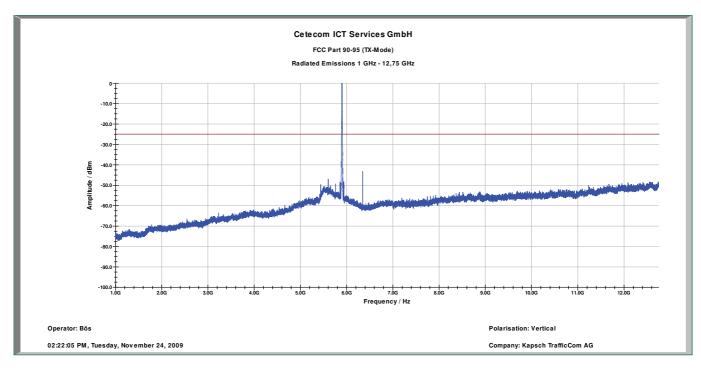


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Test report no.: 1-1440-01-04/09 A

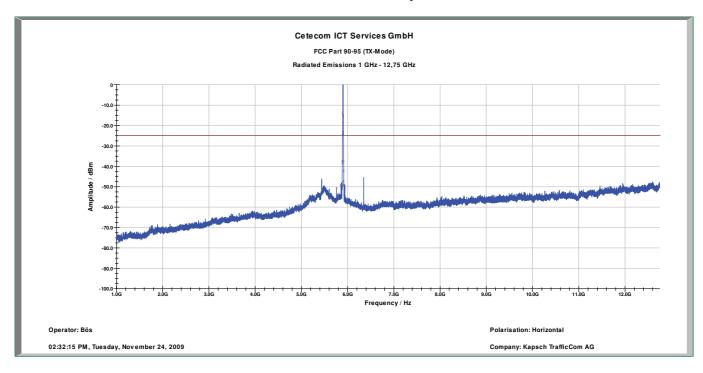


Plot 14: Port 1, 5900 MHz, low data rate, 1 GHz – 12.75 GHz, vertical polarization



The detected emission 6346 MHz do not fall into a restricted band.

Plot 15: Port 1, 5900 MHz, low data rate, 1 GHz – 12.75 GHz, horizontal polarization



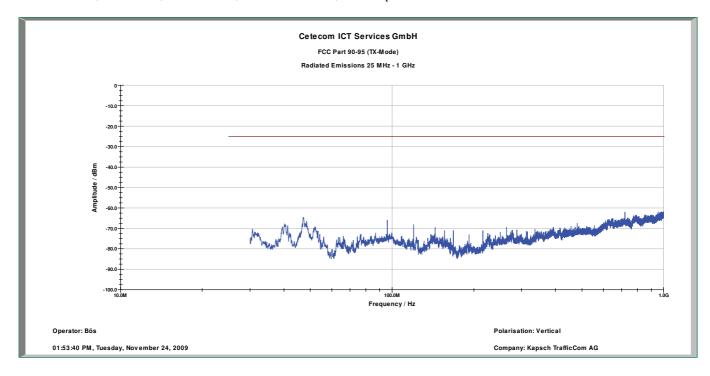
The detected emission 6346 MHz do not fall into a restricted band.

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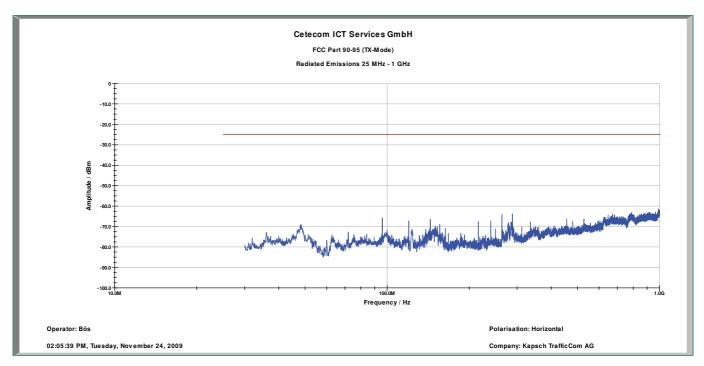
Test report no.: 1-1440-01-04/09 A



Plot 16: Port 1, 5920 MHz, low data rate, 30 MHz – 1 GHz, vertical polarization



Plot 17: Port 1, 5920 MHz, low data rate, 30 MHz – 1 GHz, horizontal polarization

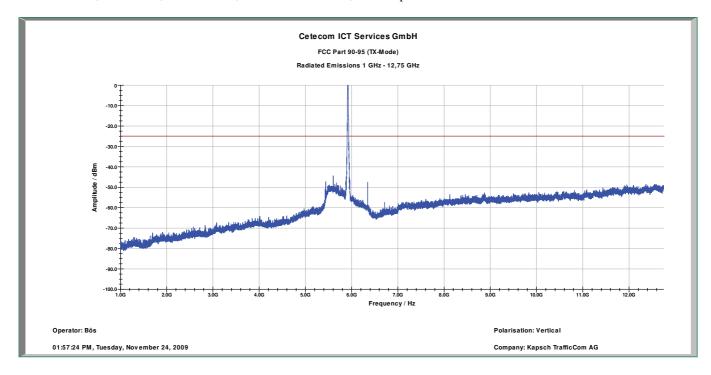


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Test report no.: 1-1440-01-04/09 A

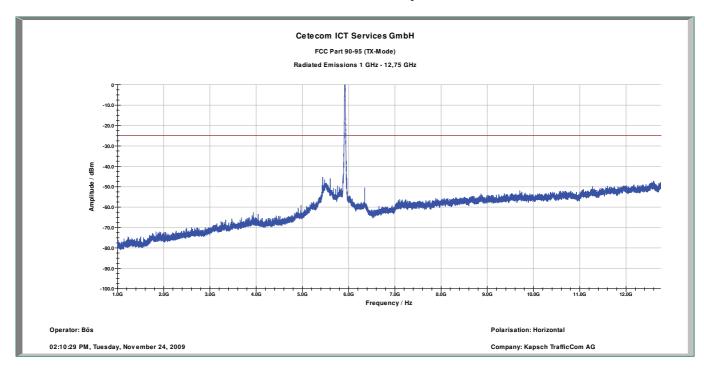


Plot 18: Port 1, 5920 MHz, low data rate, 1 GHz – 12.75 GHz, vertical polarization



The detected emission 6346 MHz do not fall into a restricted band.

Plot 19: Port 1, 5920 MHz, low data rate, 1 GHz – 12.75 GHz, horizontal polarization



The detected emission 6346 MHz do not fall into a restricted band.

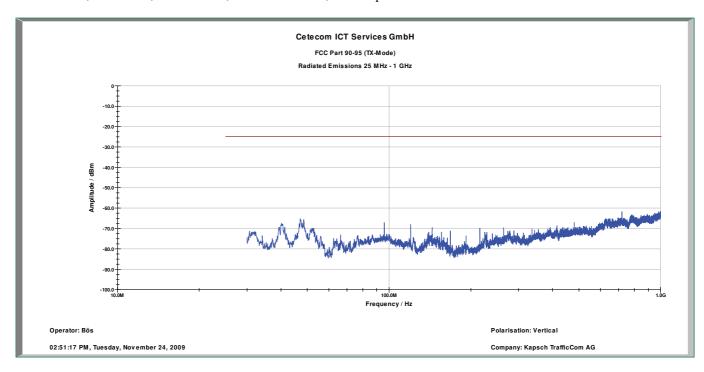
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Test report no.: 1-1440-01-04/09 A

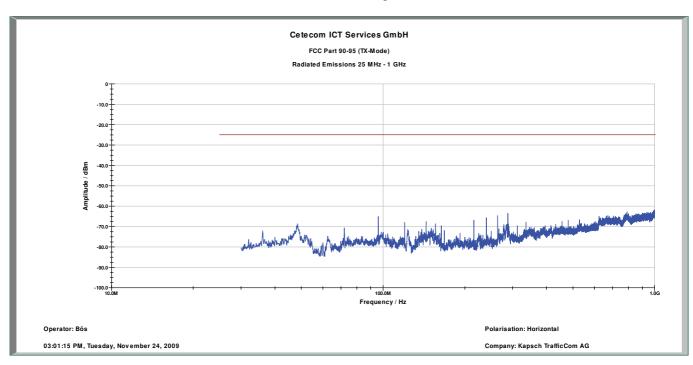


Port 2 (low power port)

Plot 1: Port 2, 5860 MHz, low data rate, 30 MHz – 1 GHz, vertical polarization



Plot 2: Port 2, 5860 MHz, low data rate, 30 MHz – 1 GHz, horizontal polarization

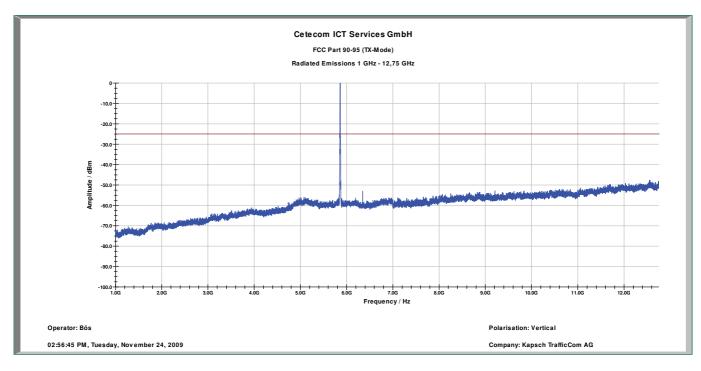


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Test report no.: 1-1440-01-04/09 A

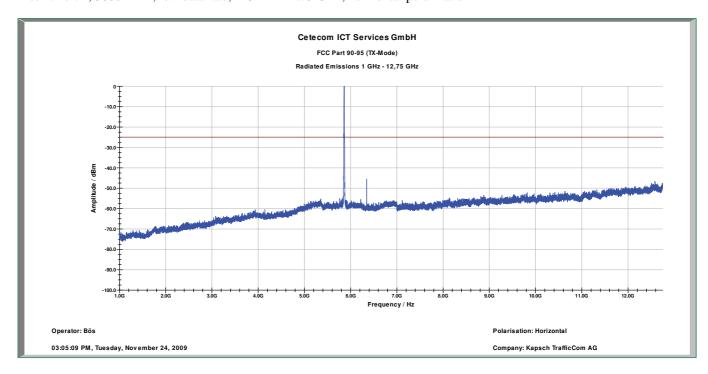


Plot 3: Port 2, 5860 MHz, low data rate, 1 GHz – 12.75 GHz, vertical polarization



The detected emission 6346 MHz do not fall into a restricted band.

Plot 4: Port 2, 5860 MHz, low data rate, 1 GHz – 12.75 GHz, horizontal polarization



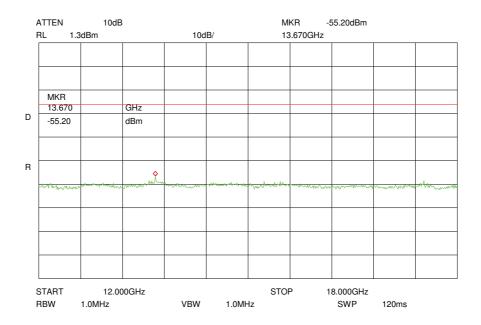
The detected emission 6346 MHz do not fall into a restricted band.

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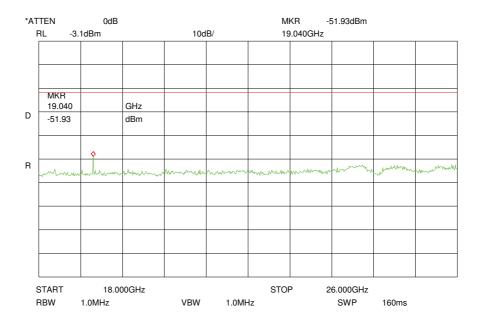
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Plot 5: Port 2, 5860 MHz, low data rate, 12 GHz – 18 GHz, vertical & horizontal polarization (valid for all channels)



Plot 6: Port 2, 5860 MHz, low data rate, 18 GHz – 26 GHz, vertical & horizontal polarization (valid for all channels)

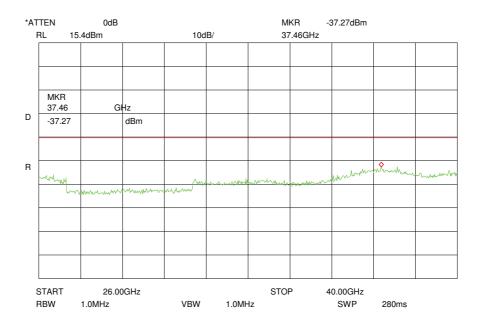


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Plot 7: Port 2, 5860 MHz, low data rate, 26 GHz – 40 GHz, vertical & horizontal polarization (valid for all channels)

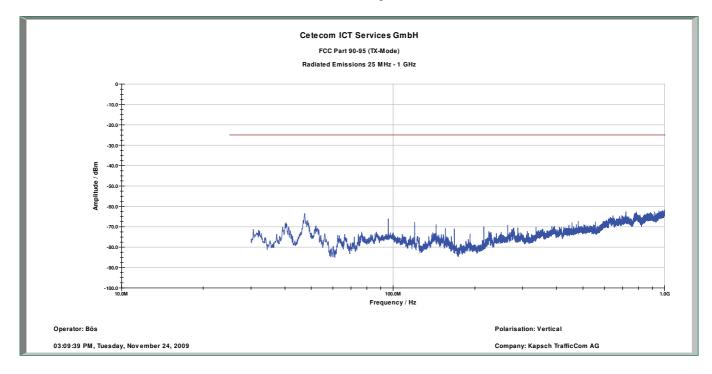


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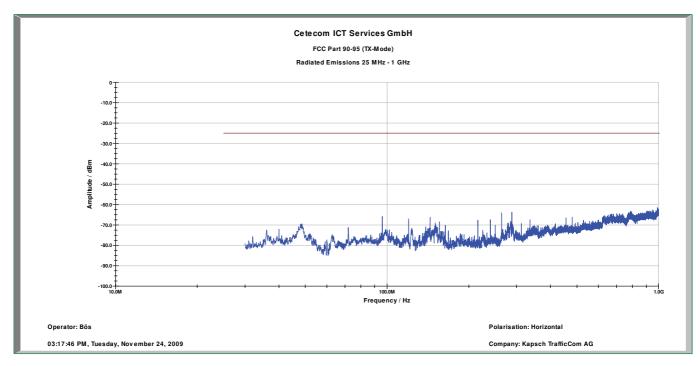
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Plot 8: Port 2, 5890 MHz, low data rate, 30 MHz – 1 GHz, vertical polarization



Plot 9: Port 2, 5890 MHz, low data rate, 30 MHz – 1 GHz, horizontal polarization

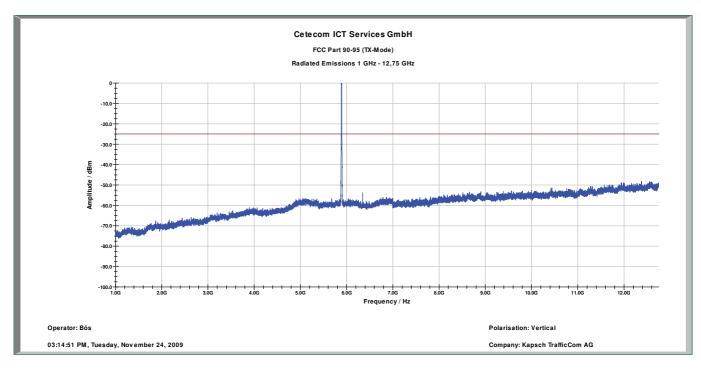


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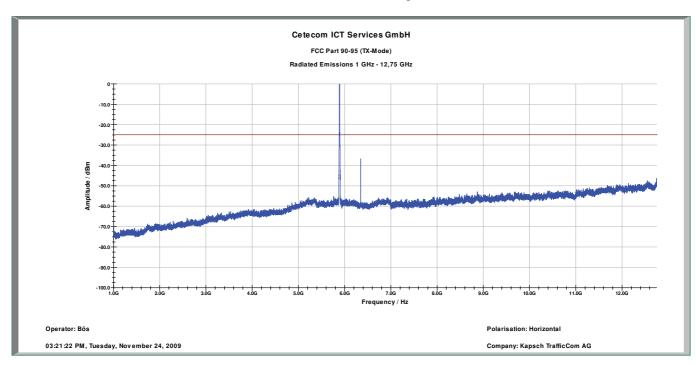


Plot 10: Port 2, 5890 MHz, low data rate, 1 GHz – 12.75 GHz, vertical polarization



The detected emission 6346 MHz do not fall into a restricted band.

Plot 11: Port 2, 5890 MHz, low data rate, 1 GHz – 12.75 GHz, horizontal polarization



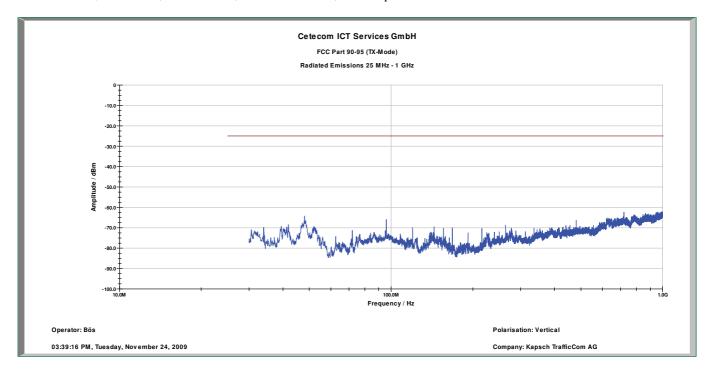
The detected emission 6346 MHz do not fall into a restricted band.

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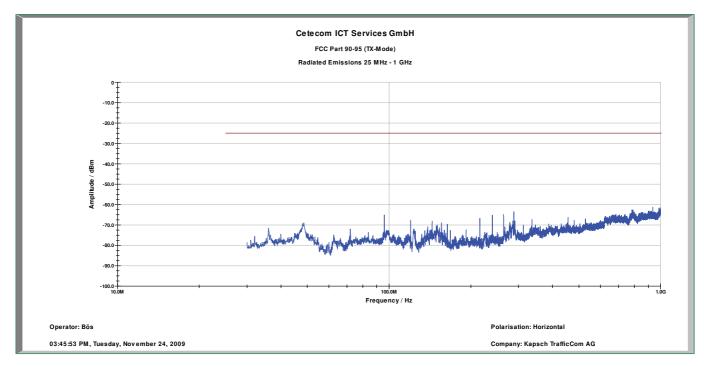
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Plot 12: Port 2, 5900 MHz, low data rate, 30 MHz – 1 GHz, vertical polarization



Plot 13: Port 2, 5900 MHz, low data rate, 30 MHz – 1 GHz, horizontal polarization

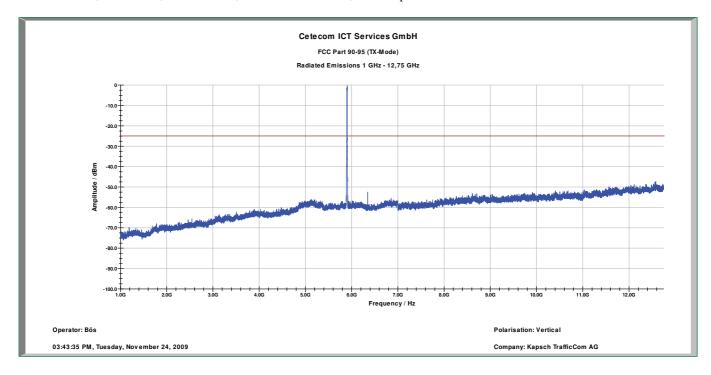


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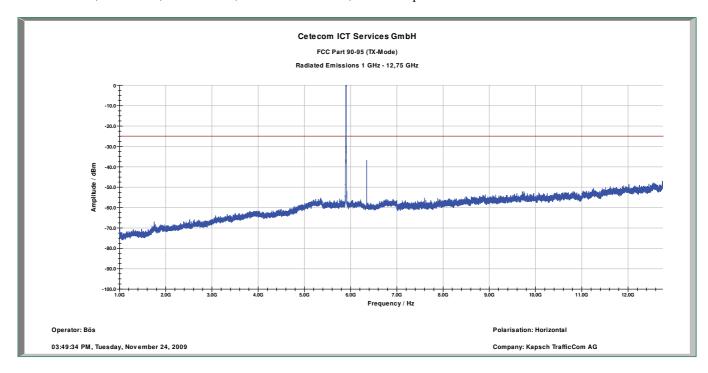


Plot 14: Port 2, 5900 MHz, low data rate, 1 GHz – 12.75 GHz, vertical polarization



The detected emission 6346 MHz do not fall into a restricted band

Plot 15: Port 2, 5900 MHz, low data rate, 1 GHz – 12.75 GHz, horizontal polarization



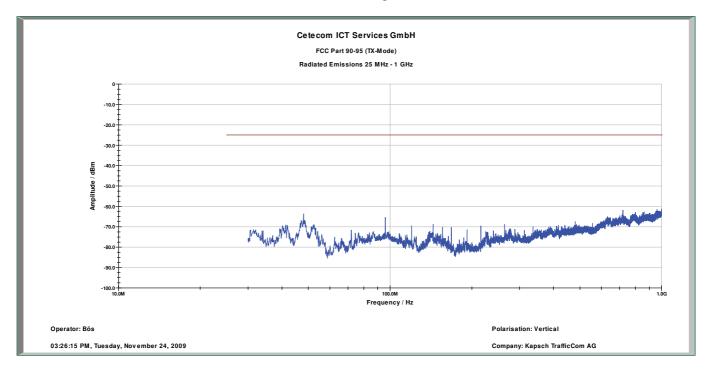
The detected emission 6346 MHz do not fall into a restricted band.

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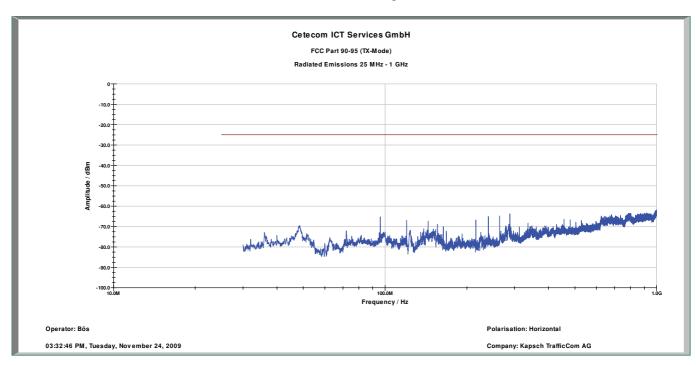
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Plot 16: Port 2, 5920 MHz, low data rate, 30 MHz – 1 GHz, vertical polarization



Plot 17: Port 2, 5920 MHz, low data rate, 30 MHz – 1 GHz, horizontal polarization

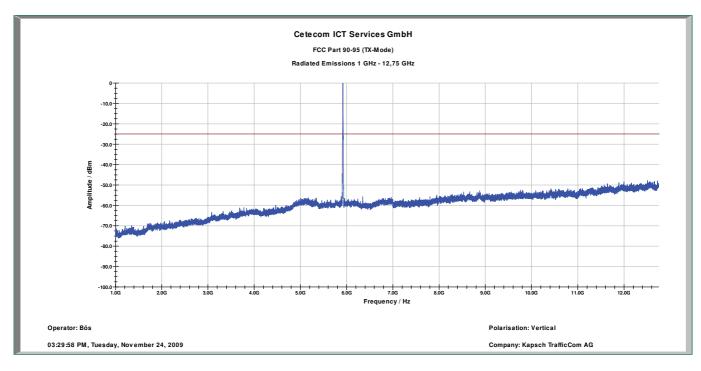


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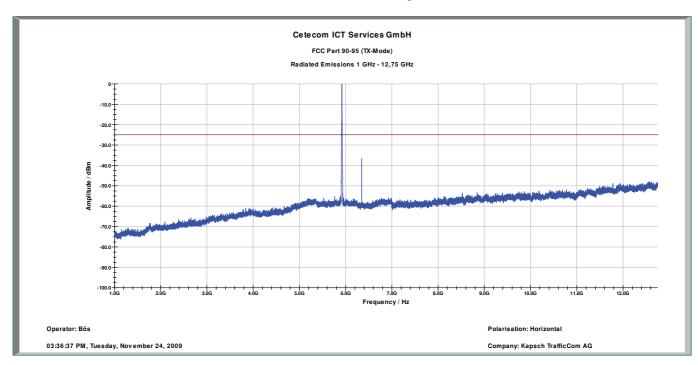


Plot 18: Port 2, 5920 MHz, low data rate, 1 GHz – 12.75 GHz, vertical polarization



The detected emission 6346 MHz do not fall into a restricted band.

Plot 19: Port 2, 5920 MHz, low data rate, 1 GHz – 12.75 GHz, horizontal polarization



The detected emission 6346 MHz do not fall into a restricted band.

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Results: Port 1

	SPURIOUS EMISSIONS LEVEL												
	5860 MHz			5890 MHz			5900 MHz						
F [MHz]	Detector	Level [dBm]	F [MHz]	Detector	Level [dBm]	F [MHz]	Detector	Level [dBm]					
No crit	ical peaks de	etected.	No crit	ical peaks de	etected.	5440	-39.12						
Measurement uncertainty					±3	dB							

	SPURIOUS EMISSIONS LEVEL												
	5920 MHz												
F [MHz]	Detector	Level [dBm]	F [MHz]	Detector	Level [dBm]	F [MHz]	Detector	Level [dBm]					
5595	PP	-34.13											
Measu	rement unce	rtainty			±3	dB							

f < 1 GHz: RBW/VBW: 100 kHz $f \ge 1 \text{ GHz}: RBW/VBW: 1 \text{ MHz}$

Limit:

Under normal test conditions only	-25 dBm
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Results: Port 2

	SPURIOUS EMISSIONS LEVEL												
	5860 MHz			5890 MHz			5900 MHz						
F [MHz]	Detector	Level [dBm]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]					
No crit	No critical peaks detected.			No critical peaks detected.			No critical peaks detected.						
Measu	rement unce	rtainty			±3	dB							

			SPURIOUS	S EMISSIO	NS LEVEL			
	5920 MHz							
F [MHz]	Detector	Level [dBm]	F [MHz]	Detector	Level [dBm]	F [MHz]	Detector	Level [dBm]
No crit	No critical peaks detected.							
Measu	rement unce	rtainty			±3	dB		

f < 1 GHz: RBW/VBW: 100 kHz $f \ge 1 \text{ GHz}: RBW/VBW: 1 \text{ MHz}$

Limit:

Under normal test conditions only	-25 dBm
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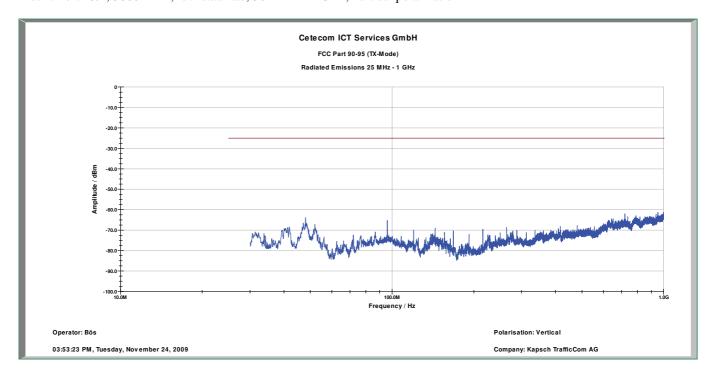
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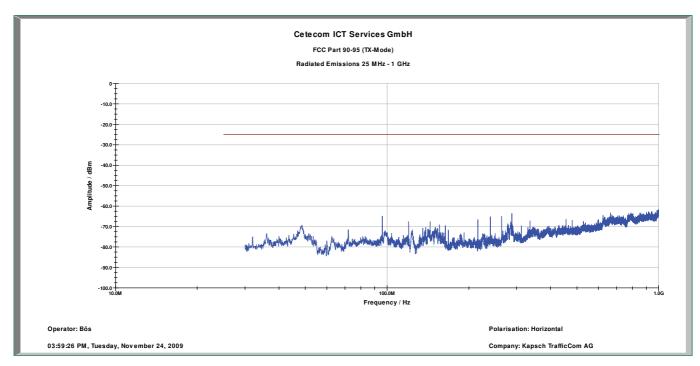


Co-located mode: Port 1 & Port2

Plot 1: Port 1&2, 5860 MHz, low data rate, 30 MHz – 1 GHz, vertical polarization



Plot 2: Port 1&2, 5860 MHz, low data rate, 30 MHz – 1 GHz, horizontal polarization

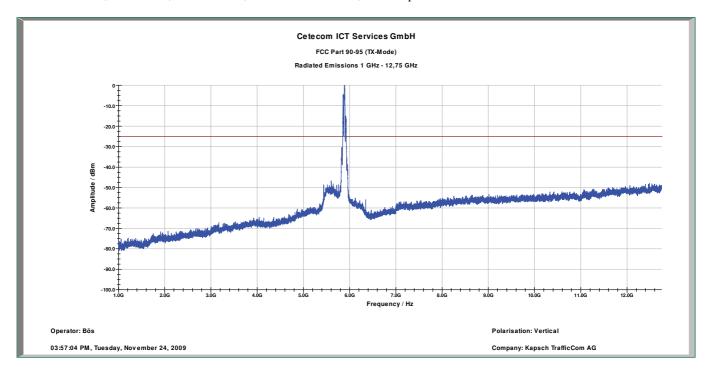


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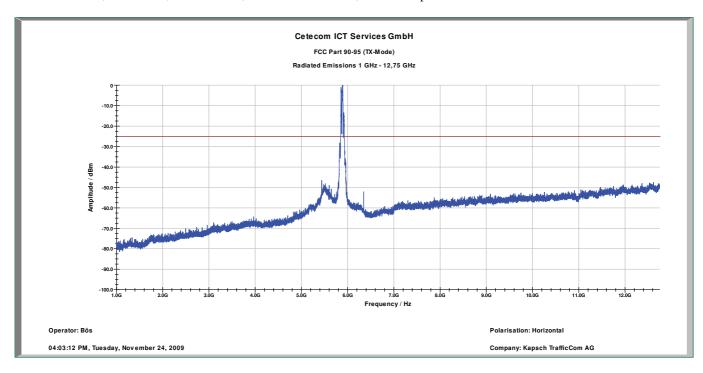


Plot 3: Port 1&2, 5860 MHz, low data rate, 1 GHz – 12.75 GHz, vertical polarization



The detected emission 6346 MHz do not fall into a restricted band.

Plot 4: Port 1&2, 5860 MHz, low data rate, 1 GHz – 12.75 GHz, horizontal polarization



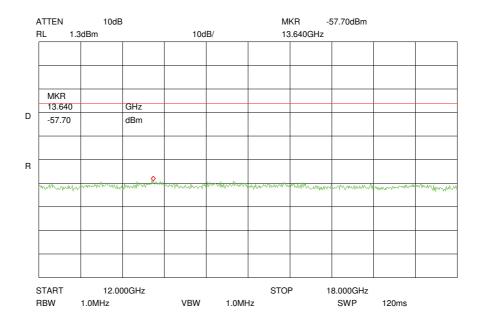
The detected emission 6346 MHz do not fall into a restricted band.

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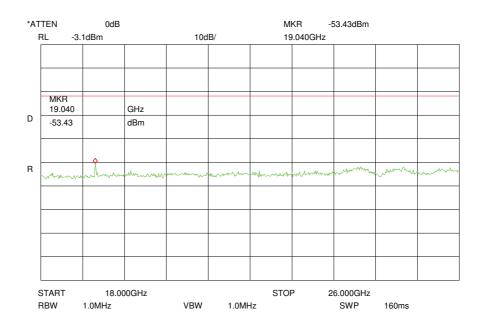
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Plot 5: Port 1&2, 5860 MHz, low data rate, 12 GHz – 18 GHz, vertical & horizontal polarization (valid for all channels)



Plot 6: Port 1&2, 5860 MHz, low data rate, 18 GHz – 26 GHz, vertical & horizontal polarization (valid for all channels)

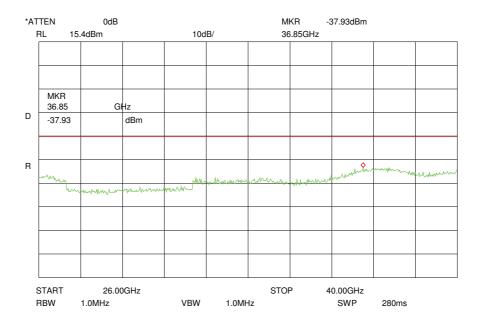


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Plot 7: Port 1&2, 5860 MHz, low data rate, 26 GHz – 40 GHz, vertical & horizontal polarization (valid for all channels)



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6 Test equipment and ancillaries used for tests

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

All reported calibration intervals are calibrations according to the EN/ISO/IEC 17025 standard. These calibrations were performed from an accredited external calibration laboratory.

Additional to these calibrations the laboratory performed comparison measurements with other calibrated systems and performed a weekly chamber inspection.

All used devices are connected with a 10 MHz external reference.

According to the manufacturers' instruction is it possible to establish a calibration interval for the FSP unit of 24 month, if the device has an external 10 MHz reference.

Anechoic chamber C:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration	
1	Anechoic chamber	MWB	87400/02	300000996	Monthly verification			
2	System-Rack 85900	HP I.V.	*	300000222	n.a.			
3	Measurement System 1							
4	PSA-Spektrumanalysator 3 Hz - 26.5 GHz (E4440A)	Agilent	MY48250080	300003812	05.08.2008	24	05.08.2010	
5	EMI Preselector 9 kHz - 1 GHz (N9039A)	Agilent	MY48260003	300003825	19.08.2008	24	19.08.2010	
6	Microwave Analog Signal Generator (N5183A)	Agilent	MY47420220	300003813	06.08.2008	24	06.08.2010	
7	PC	F+W			n.a.			
8	TILE	TILE			n.a.			
9	TRILOG Super Broadband Antenna (VULB9163)	Schwarzbeck	371	300003854	Monthly verification (System cal.)			
10	Double Ridged Antenna 3115	EMCO	3088	300001032	Monthly verification (System cal.)			
11	Active Loop Antenna 6502	EMCO	2210	300001015	Monthly verification (System cal.)			
12	Switch / Control Unit 3488A	HP	2719A15013	300001156	n.a.			
13	Power Supply 6032A	HP	2818A03450	300001040	08.01.2009	36	08.01.2012	
14	Busisolator	Kontron		300001056	n.a.			
15	Leitungsteiler 11850C	HP		300000997	Monthly verifica	tion (System cal.))	
16	Power attenuator 8325	Byrd	1530	300001595	Monthly verifica	tion (System cal.))	
17	Band reject filter WRCG1855/1910	Wainwright	7	300003350	Monthly verifica	tion (System cal.))	
18	Band reject filter WRCG2400/2483	Wainwright	11	300003351	Monthly verifica	tion (System cal.))	
19	Hochpassfilter WHK1.1/15G- 10SS	Wainwright	3	300003255	Monthly verifica	tion (System cal.))	
20	Hochpassfilter WHKX2.9/18G- 12SS	Wainwright	1	300003492	Monthly verifica	tion (System cal.))	
21	Hochpassfilter WHKX7.0/18G- 8SS	Wainwright	18	300003789	Monthly verifica	tion (System cal.))	
22	Switch / Control Unit 3488A	HP	2605e08770	300001443	n.a.			
23	Trenntrafo RT5A	Grundig	9242	300001263	n.a.			
24	Relais Matrix PSU	R&S	890167/024	300001168	n.a.			
25	Netznachbildung ESH3-Z5	R&S	828576/020	300001210	n.a.			

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System Rack Room 005:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No.	Last	Frequency	Next
				Cetecom	Calibration	(months)	Calibration
1	FSP 30	R&S	100886	300003575	25.08.2008	24	25.08.2010
2	CBT	R&S	100313	300003516	03.09.2008	24	03.09.2010
3	Switch Matrix	HP		300000929	n.a.		
4	Power Supply 6625A	HP	3041A00544	300002270	13.05.2007	36	13.05.2010
5	Signal Generator SMIQ03B	R&S	836206/0092	300002680	30.05.2007	36	30.05.2010

Signalling Units:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No.	Last	Frequency	Next
				Cetecom	Calibration	(months)	Calibration
1	CBT	R&S	100313	300003516	03.09.2008	24	03.09.2010
2	CBT	R&S	100185	300003416	27.08.2008	24	27.08.2010
3	CMU-200	R&S	103992	300003231	04.06.2008	24	04.06.2010
4	CMU-200	R&S	106240	300003321	27.08.2008	24	27.08.2010
5	CMU-200	R&S	832221/0055	300002862	20.03.2008	24	20.03.2010

Climatic Box:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Climatic box VT 4002	Heraeus Vötsch	58566046820010	300003019	28.05.2009	24	28.05.2011
2	Climatic box CTS T-40/50	CTS	064023	300003540	04.06.2009	24	04.06.2011

SRD Laboratory Room 005:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No.	Last	Frequency	Next
				Cetecom	Calibration	(months)	Calibration
1	Spektrum Analyzer 8566B	HP	2747A05275	300000219	18.01.2008	24	18.01.2010
2	Spektrum Analyzer Display 85662A	HP	2816A16497	300001690	23.01.2008	24	23.01.2010
3	Quasi-Peak-Adapter 85650A	HP	2811A01135	300000216	23.01.2008	24	23.01.2010
4	Power Supply	Heiden	003202	300001187	12.05.2007	36	12.05.2010
5	Power Supply	Heiden	1701	300001392	12.05.2007	36	12.05.2010

SRD Laboratory Room 011:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	NRP Power Meter	R&S	100212	300003780	27.02.2008	24	27.02.2010

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Anechoic chamber F:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No.	Last	Frequency	Next
				Cetecom	Calibration	(months)	Calibration
1	Control Computer	F+W	FW0502032	300003303	-/-	-/-	-/-
2	Trilog Antenna VULB 9163	Schwarzbeck	295	300003787	01.04.2008	24	01.04.2010
3	Amplifier - 0518C-138	Veritech Micro- wave Inc.	-/-	-/-	-/-	-/-	-/-
4	Switch - 3488A	HP		300000368	-/-	-/-	-/-
5	EMI Test receiver - ESCI	R&S	100083	300003312	01.06.2009	24	01.06.2011
6	Turntable Controller - 1061 3M	EMCO	1218	300000661	-/-	-/-	-/-
7	Tower Controller 1051 Controller	ЕМСО	1262	300000625	-/-	-/-	-/-
8	Tower - 1051	EMCO	1262	300000625	-/-	-/-	-/-
10	Ultra Notch-Filter Rejected band Ch. 62	WRCD	9	-/-	-/-	-/-	-/-

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