TEST REPORT

No. 2012TAR098

for

TCT Mobile Limited

UMTS TriBand / GSM Quadband mobile phone

Model Name: Cocktail S

Marketing Name：one touch 995S

FCC ID: RAD231

IC:9238A-0006

with

Hardware Version: PIO4

Software Version: 21S

Issued Date: Mar 21, 2012

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of TMC Beijing.

Test Laboratory:

DAR accreditation (DIN EN ISO/IEC 17025): No. DGA-PL-114/01-02

FCC 2.948 Listed: No.733176

IC O.A.T.S listed: No.6629A-1

TMC Beijing, Telecommunication Metrology Center of Ministry of Industry and Information Technology

3/F Shou Xiang Technology Building, No.51 Xueyuan Road, Hai Dian District, Beijing, P. R. China,100191.

Tel:+86(0)10-62304633-2604, Fax:+86(0)10-62304793, Email:welcome@emcite.com, web: www.emcite.com

CONTENTS

1. Test Laboratory

1.1. Testing Location

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT

Address: 3/F Shou Xiang Technology Building, No.51 Xueyuan Road, Hai Dian District, Beijing, P. R. China

Postal Code: 100191

Telephone: 00861062304633

Fax: 00861062304793
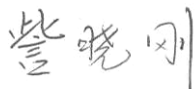
1.2. Testing Environment

Normal Temperature: 15-35℃

Relative Humidity: 20-75%
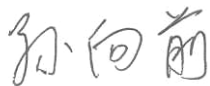
1.3. Project data

Testing Start Date: Mar 05, 2012

Testing End Date: Mar 21, 2012

1.4. Signature

Zi Xiaogang
(Prepared this test report)

Sun Xiangqian
(Reviewed this test report)

Lu Bingsong
Deputy Director of the laboratory
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	TCT Mobile Limited
Address /Post:	5F, E building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203
City:	Shanghai
Country:	China
Telephone:	0086-21-61460890
Fax:	0086-21-61460602

2.2. Manufacturer Information

Company Name:	TCT Mobile Limited
Address /Post:	5F, E building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203
City:	Shanghai
Country:	China
Telephone:	0086-21-61460890
Fax:	0086-21-61460602

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	UMTS TriBand / GSM Quadband mobile phone
Model Name	Cocktail S
Marketing Name	one touch 995S
FCC ID	RAD231
IC	9238A-0006
Frequency	GSM 850MHz; PCS 1900MHz; WCDMA BAND IV; WCDMA BAND V;
Antenna	Internal
Output power	31.62 dBm maximum ERP measured for GSM850
Extreme vol. Limits	3.5VDC to 4.2VDC (nominal: 3.7VDC)
Extreme temp. Tolerance	-30°C to +50°C

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of Telecommunication Metrology Center of MIIT of People's Republic of China.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
N03	012997000000029	PIO4	21S
N04	012997000000011	PIO4	21S

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description
AE1	Battery
AE2	Charger

AE1

Model	CAB31Y0006C1
Manufacturer	BYD
Capacitance	1500 mAh
Nominal Voltage	3.7V

AE2

Model	CBA3002AG0C1
Manufacturer	BYD
Length of DC line	120cm

*AE ID: is used to identify the test sample in the lab internally.

3.4. <u>General Description</u>

The Equipment Under Test (EUT) is a model of UMTS TriBand / GSM Quadband mobile phone with integrated antenna. Manual and specifications of the EUT were provided to fulfil the test. Samples undergoing test were selected by the Client.

4. Reference Documents

4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 24	PERSONAL COMMUNICATIONS SERVICES	V 10.1.06
FCC Part 22	PUBLIC MOBILE SERVICES	V 10.1.06
RSS-Gen	RSS-Gen — General Requirements and Information for the Certification of Radiocommunication Equipment	Issue 3, December 2010
RSS-132	Cellular Telephones Employing New Technologies Operating in the Bands 824-849 MHz and 869-894 MHz	Issue 2, September 2005
RSS-133	2 GHz Personal Communications Services	Issue 5, February 2009
ANSI/TIA-603-C	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	2004
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2003

5. LABORATORY ENVIRONMENT

Semi-anechoic chamber (23 meters×17meters×10meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
Normalised site attenuation (NSA)	**<** ±3.2 dB, 10 m distance, from 30 to 1000 MHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 2000 MHz

Control room did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. =30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

Conducted chamber did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

Fully-anechoic chamber (6.8 meters×3.08 meters×3.53 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 80 to 2000 MHz

6. <u>SUMMARY OF TEST RESULTS</u>

GSM 850

Items	Test Name	Clause in FCC rules	Clause in IC rules RSS-Gen and RSS-132	Section in this report	Verdict
1	Output Power	§2.1046(a), 22.913(a)	4.4	A.1	P
2	Emission Limit	22.917, 2.1051	4.5	A.2	P
3	CONDUCTED EMISSION	15.107/15.207			P
4	Frequency Stability	22.235, 2.1055	4.3	A.4	P
5	Occupied Bandwidth	2.1049(h)(i)	4.1/4.6.1	A.5	P
6	Emission Bandwidth	22.917(b)	4.6.1	A.6	P
7	Band Edge Compliance	22.917(b)	4.5	A.7	P
8	Conducted Spurious Emission	22.917, 2.1057	4.5	A.8	P

PCS 1900

Items	Test Name	Clause in FCC rules	Clause in IC rules RSS-Gen and RSS- 133	Section in this report	Verdict
1	Output Power	24.232(b)	6.4	A.1	P
2	Emission Limit	24.238, 2.1051	6.5	A.2	P
3	CONDUCTED EMISSION	15.107/15.207			P
4	Frequency Stability	24.235, 2.1055	6.3	A.4	P
5	Occupied Bandwidth	2.1049(h)(i)	4.1/4.6.1	A.5	P
6	Emission Bandwidth	24.238(b)	4.6.1	A.6	P
7	Band Edge Compliance	24.238(b)	6.5	A.7	P
8	Conducted Spurious Emission	24.238, 2.1057	6.5	A.8	P

Receiver Radiated Emission

Items	Test Name	Clause in FCC rules	Clause in IC rules		Section in this report	Verdict
			RSS-132	RSS-133		
1	Receiver Radiated Emissions	15.109 , 2.1053	4.6	6.6	A.9	P

7. <u>Test Equipments Utilized</u>

NO.	NAME	TYPE	SERIES NUMBER	PRODUCER	CAL DUE DATE
1	Test Receiver	ESCI	100766	R&S	2012-12-06
2	Test Receiver	ESI40	831564/002	R&S	2012-07-12
3	BiLog Antenna	VULB9163	9163-175	Schwarzbeck	2012-07-05
4	BiLog Antenna	VULB9163	9163-302	Schwarzbeck	2012-07-10
5	Signal Generator	SMB100A	102063	R&S	2012-07-05
7	LISN	ESH2-Z5	829991/012	R&S	2012-07-20
8	Spectrum Analyzer	FSU26	200030	R&S	2012-12-18
9	Spectrum Analyzer	FSU46	100054	R&S	2012-10-14
10	Universal Radio Communication Tester	CMU200	100680	R&S	2012-12-23
11	Universal Radio Communication Tester	CMU200	109914	R&S	2012-07-21
12	Dual-Ridge Waveguide Horn Antenna	3117	00119024	ETS	2012-08-31
13	Dual-Ridge Waveguide Horn Antenna	3117	00119021	ETS	2013-07-09
14	Dual-Ridge Waveguide Horn Antenna	3116	2663	EMCO	2012-07-01
15	Dual-Ridge Waveguide Horn Antenna	3116	2661	EMCO	2012-07-01
16	Climatic chamber	PL-2G	343074	ESPEC	2012-12-15

ANNEX A: MEASUREMENT RESULTS

A.1   OUTPUT POWER   (§22.913(a)/§24.232(b))

A.1.1 Summary
During the process of testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication tester (CMU-200) to ensure max power transmission and proper modulation.
This result contains peak output power and EIRP measurements for the EUT. In all cases, output power is within the specified limits.

A.1.2 Conducted
A.1.2.1 Method of Measurements
The EUT was set up for the max output power with pseudo random data modulation.
The power was measured with Rhode & Schwarz Spectrum Analyzer FSU (peak)
These measurements were done at 3 frequencies, 1850.2 MHz, 1880.0MHz and 1909.8MHz for PCS1900 band; 824.4MHz, 836.6MHz and 848.8MHz for GSM850 band. (bottom, middle and top of operational frequency range).

A.1.2.2 Test Condition

RBW	VBW	Sweep Time	Span
1MHz	1MHz	300ms	10MHz

GSM850
Limit

	Power step	Nominal Peak output power (dBm)
GSM	5	33dBm(2W)
GPRS	3	33dBm(2W)
EGPRS	6	27dBm(0.5W)

Measurement result
GSM（GMSK）

Frequency(MHz)	Power Step	Peak output power(dBm)
824.2	5	32.57
836.6	5	32.66
848.8	5	32.58

GPRS（GMSK，1Slot）

Frequency(MHz)	Power Step	Peak output power(dBm)
824.2	3	32.33
836.6	3	32.38
848.8	3	32.20

EGPRS（8PSK，1Slot）

Frequency(MHz)	Power Step	Peak output power(dBm)
824.2	6	**26.10**
836.6	6	25.94
848.8	6	25.88

PCS1900

Limit

	Power step	Nominal Peak output power (dBm)
GSM	0	30dBm(1W)
GPRS	3	30dBm(1W)
EGPRS	5	26dBm(0.4W)

Measurement result

GSM（GMSK）

Frequency(MHz)	Power Step	Peak output power(dBm)
1850.2	0	28.50
1880.0	0	29.10
1909.8	0	**29.56**

GPRS（GMSK，1Slot）

Frequency(MHz)	Power Step	Peak output power(dBm)
1850.2	3	28.53
1880.0	3	28.37
1909.8	3	**28.66**

EGPRS（8PSK，1Slot）

Frequency(MHz)	Power Step	Peak output power(dBm)
1850.2	5	25.17
1880.0	5	**25.22**
1909.8	5	24.91

A.1.3 Radiated

A.1.3.1 Description

This is the test for the maximum radiated power from the EUT.

Rule Part 24.232(b) specifies, "Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power" and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage."

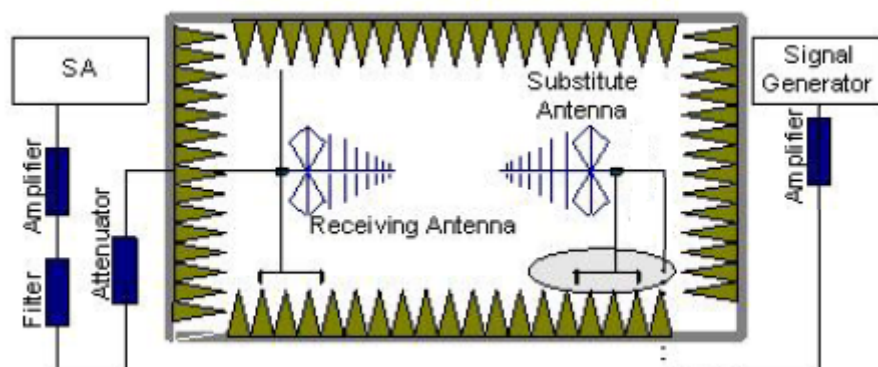Rule Part 22.913(a) specifies " The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts."

A.1.3.2 Method of Measurement

The measurements procedures in TIA-603C-2004 are used.

1. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.

2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).

3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.

In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is

connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna.
    The cable loss (P_{cl}) ,the Substitution Antenna Gain (G_a) and the Amplifier Gain (P_{Ag}) should be recorded after test.
    The measurement results are obtained as described below:
    Power(EIRP)=P_{Mea}+ P_{Ag} + P_{cl} + G_a

5. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.

6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.

GSM 850-ERP   22.913(a)

Limits

	Power Step	Burst Peak ERP (dBm)
GSM	5	≤38.45dBm (7W)
GPRS	3	≤38.45dBm (7W)
EGPRS	6	≤38.45dBm (7W)

Measurement result

GSM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a Antenna Gain(dB)	Correction (dBm)	Peak ERP(dBm)	Polarization
824.20	-18.30	2.26	-53.00	0.84	2.15	29.45	H
836.60	-16.34	2.26	-53.00	0.90	2.15	**31.35**	H
848.80	-16.41	2.28	-53.00	0.95	2.15	31.21	H

GPRS

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a Antenna Gain(dB)	Correction (dBm)	Peak ERP(dBm)	Polarization
824.20	-17.70	2.26	-53.00	0.84	2.15	30.05	H
836.60	-17.04	2.26	-53.00	0.90	2.15	30.65	H
848.80	-16.00	2.28	-53.00	0.95	2.15	**31.62**	H

EGPRS

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a Antenna Gain(dB)	Correction (dBm)	Peak ERP(dBm)	Polarization
824.20	-21.60	2.26	-53.00	0.84	2.15	26.15	H
836.60	-19.41	2.26	-53.00	0.90	2.15	28.28	H
848.80	-18.91	2.28	-53.00	0.95	2.15	**28.71**	H

Frequency**:** 848.80 MHz

Peak ERP(dBm)= P_{Mea}(-16.00dBm)- P_{cl}(2.28dB) - P_{Ag}(-53.00dB) - G_a (0.95dB)-2.15dBm
=31.62dBm

ANALYZER SETTINGS: RBW = VBW = 3MHz

PCS1900-EIRP   24.232(b)

Limits

	Power Step	Burst Peak EIRP (dBm)
GSM	0	≤33dBm (2W)
GPRS	3	≤33dBm (2W)
EGPRS	5	≤33dBm (2W)

Measurement result

GSM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a Antenna Gain(dB)	Peak EIRP(dBm)	Polarization
1850.20	-19.20	5.95	-50.00	-4.56	**29.41**	H
1880.00	-18.87	7.05	-50.00	-4.43	28.51	H
1909.80	-16.64	9.12	-50.00	-4.30	28.54	H

GPRS

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a Antenna Gain(dB)	Peak EIRP(dBm)	Polarization
1850.20	-18.85	5.95	-50.00	-4.56	**29.76**	H
1880.00	-18.26	7.05	-50.00	-4.43	29.12	H
1909.80	-16.49	9.12	-50.00	-4.30	28.69	H

EGPRS

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a Antenna Gain(dB)	Peak EIRP(dBm)	Polarization
1850.20	-20.08	5.95	-50.00	-4.56	**28.53**	H
1880.00	-20.22	7.05	-50.00	-4.43	27.16	H
1909.80	-17.80	9.12	-50.00	-4.30	27.38	H

Frequency**:** 1850.20 MHz

Peak EIRP(dBm)= P_{Mea}(-18.85dBm) - P_{cl}(5.95dB) - P_{Ag}(-50.00dB) - G_a (-4.56dB) =29.76dBm

ANALYZER SETTINGS: RBW = VBW = 3MHz

A.2   EMISSION LIMT   (§2.1051/§22.917§24.238)

A.2.1 Measurement Method

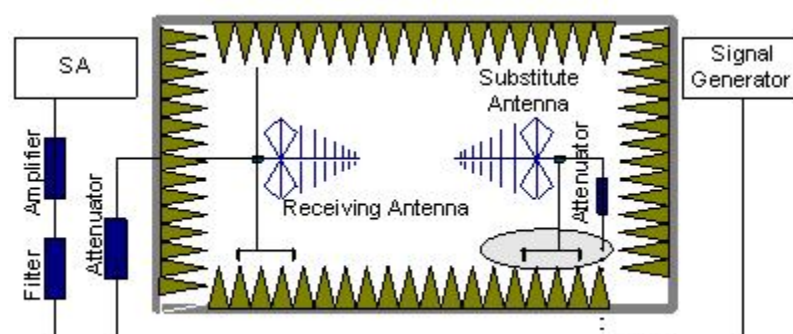The measurement procedures in TIA-603C-2004 are used.

The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier that can be as high as 1910 MHz. The resolution bandwidth is set as outlined in Part 24.238 and Part 22.917. The spectrum is scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of PCS1900 and GSM850

The procedure of radiated spurious emissions is as follows:

1. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector.

2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).
3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.

In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the

substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. The Path loss (P_{pl}) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain (G_a) should be recorded after test.
   A amplifier should be connected in for the test.
   The Path loss (P_{pl}) is the summation of the cable loss and the gain of the amplifier.
   The measurement results are obtained as described below:
   Power(EIRP)=P_{Mea}+ P_{pl} + G_a

5. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.

6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.

A.2.2 Measurement Limit

Part 24.238 and Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

A.2.3 Measurement Results

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of PCS1900 (1850.2 MHz, 1880 MHz and 1909.8 MHz) and GSM850 (824.2MHz, 836.6MHz, 848.8MHz) . It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the PCS1900 and GSM850 into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

A.2.4 Measurement Results Table

Frequency	Channel	Frequency Range	Result
GSM 850MHz	Low	30MHz-10GHz	Pass
	Middle	30MHz-10GHz	Pass
	High	30MHz-10GHz	Pass
GSM 1900MHz	Low	30MHz-20GHz	Pass
	Middle	30MHz-20GHz	Pass
	High	30MHz-20GHz	Pass

A.2.5 Sweep Table

Working Frequency	Subrange (GHz)	RBW	VBW	Sweep time (s)
850MHz	0.03~1	100KHz	300KHz	10
	1-2	1 MHz	3 MHz	2
	2~5	1 MHz	3 MHz	3
	5~8	1 MHz	3 MHz	3
	8~10	1 MHz	3 MHz	3
1900MHz	0.03~1	100KHz	300KHz	10
	1-2	1 MHz	3 MHz	2
	2~5	1 MHz	3 MHz	3
	5~8	1 MHz	3 MHz	3
	8~11	1 MHz	3 MHz	3
	11~14	1 MHz	3 MHz	3
	14~18	1 MHz	3 MHz	3
	18~20	1 MHz	3 MHz	2

GSM Mode Channel 128/824.2MHz

Frequency(MHz)	PMea(dBm)	Path Loss	Antenna Gain	Correction (dBm)	Peak ERP(dBm)	Limit （dBm）	Polarization
1648.60	-47.96	3.57	-5.45	2.15	-48.23	-13.00	H
1930.21	-42.94	9.66	-4.21	2.15	-50.54	-13.00	H
4019.58	-66.69	5.91	-8.51	2.15	-66.24	-13.00	V
5178.97	-69.60	7.39	-9.81	2.15	-69.33	-13.00	H
6515.31	-66.23	7.72	-10.62	2.15	-65.48	-13.00	H
8371.01	-66.64	7.65	-12.12	2.15	-64.32	-13.00	V

GSM Mode Channel 190/836.6MHz

Frequency(MHz)	PMea(dBm)	Path Loss	Antenna Gain	Correction (dBm)	Peak ERP(dBm)	Limit （dBm）	Polarization
1673.02	-44.66	3.46	-5.34	2.15	-44.93	-13.00	H
1930.15	-43.35	9.67	-4.21	2.15	-50.96	-13.00	H
3728.87	-66.41	5.41	-8.17	2.15	-65.80	-13.00	H
4506.13	-70.00	6.25	-8.81	2.15	-69.59	-13.00	H
5125.79	-65.52	7.01	-9.78	2.15	-64.90	-13.00	V
6875.14	-66.77	7.60	-10.98	2.15	-65.54	-13.00	H

GSM Mode Channel 251/848.8MHz

Frequency(MHz)	PMea(dBm)	Path Loss	Antenna Gain	Correction (dBm)	Peak ERP(dBm)	Limit （dBm）	Polarization
1697.70	-43.05	3.62	-5.23	2.15	-43.59	-13.00	H
1930.17	-43.09	9.66	-4.21	2.15	-50.69	-13.00	H
3383.52	-68.38	5.04	-7.62	2.15	-67.95	-13.00	H
4171.48	-69.32	6.19	-8.60	2.15	-69.06	-13.00	H
5095.40	-69.21	7.54	-9.76	2.15	-69.14	-13.00	V
8967.73	-66.47	7.89	-12.57	2.15	-63.94	-13.00	V

GSM Mode Channel 512/1850.2MHz

Frequency(MHz)	PMea(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit （dBm）	Polarization
3396.02	-71.80	5.05	-7.65	-69.20	-13.00	H
5550.44	-53.24	8.71	-10.02	-51.93	-13.00	V
9107.52	-67.96	8.02	-12.60	-63.38	-13.00	V
12951.49	-52.68	9.95	-13.24	-49.39	-13.00	V
14801.12	-56.92	11.61	-13.54	-54.99	-13.00	V
17928.82	-60.66	12.28	-13.56	-59.38	-13.00	V

GSM Mode Channel 661/1880.0MHz

Frequency(MHz)	PMea(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit （dBm）	Polarization
4249.65	-70.68	6.02	-8.65	-68.05	-13.00	H
5639.87	-57.26	9.58	-10.06	-56.78	-13.00	V
7804.86	-65.52	7.53	-11.70	-61.35	-13.00	H
10239.30	-64.53	8.60	-12.45	-60.68	-13.00	H
13159.59	-49.20	10.27	-13.46	-46.01	-13.00	V
15040.09	-51.97	11.32	-13.49	-49.80	-13.00	V

GSM Mode Channel 810/1909.8MHz

Frequency(MHz)	PMea(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit （dBm）	Polarization
3240.04	-69.13	5.02	-7.28	-66.87	-13.00	V
5729.49	-54.89	10.05	-10.09	-54.85	-13.00	V
10129.33	-64.23	8.48	-12.43	-60.28	-13.00	V
11459.41	-47.65	9.24	-12.40	-44.49	-13.00	V
13369.03	-45.96	10.52	-13.67	-42.81	-13.00	V
15278.37	-44.43	11.25	-13.44	-42.24	-13.00	V

A.3 CONDUCTED EMISSION (§15.107§15.207)

The measurement procedure in ANSI C63.4-1003 is used. Conducted Emission is measured with travel charger.

A.3.1 Limit

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi -Peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50
* Decreases with logarithm of the frequency		

A.3.2 Measurement result
GSM850MHz

MES 11A09560_1C_fin QP
MES 11A09560_1C_fin AV
MES 11A09560_1C_pre PK
MES 11A09560_1C_pre AV
LIM EN 55022 V QP   Voltage QP Limit
LIM EN 55022 V AV   Voltage AV Limit
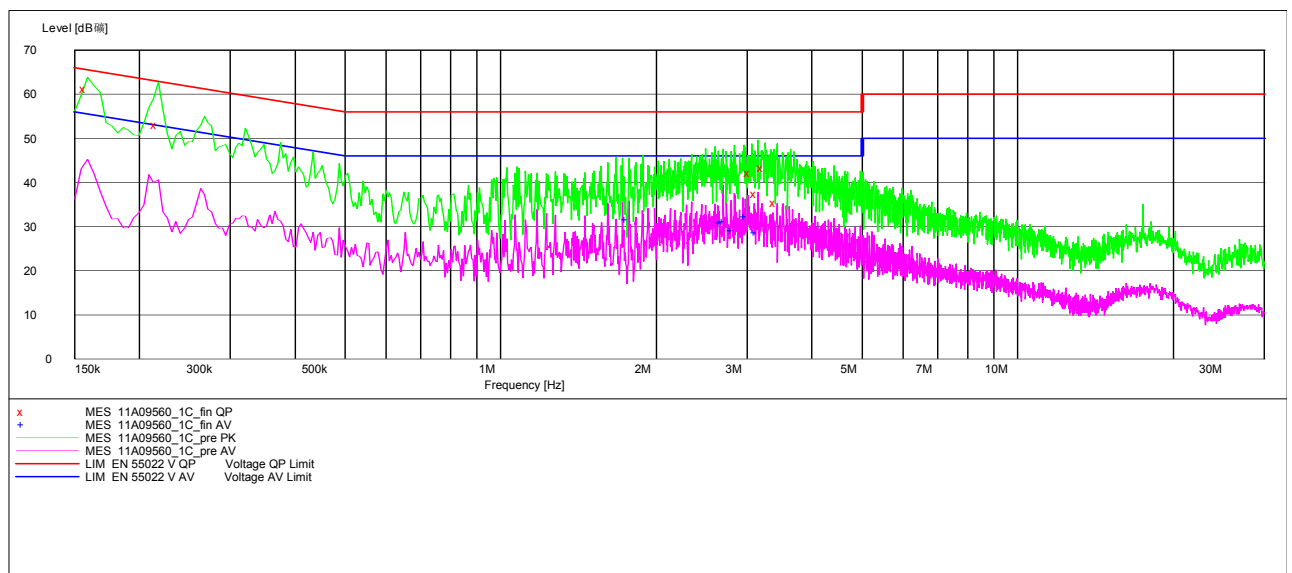
MEASUREMENT RESULT: "11A09560_1C_fin QP"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.159000	61.20	10.1	66	4.3	L1	GND
0.217500	53.10	10.1	63	9.8	L1	GND
3.060939	42.10	10.1	56	13.9	L1	GND
3.147768	37.50	10.1	56	18.5	L1	GND
3.250022	43.30	10.1	56	12.7	L1	GND
3.423317	35.50	10.1	56	20.5	L1	GND

MEASUREMENT RESULT: "11A09560_1C_fin AV"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
1.770000	31.60	10.1	46	14.4	L1	GND
2.693522	30.90	10.1	46	15.1	L1	GND
2.731458	31.20	10.1	46	14.8	L1	GND
2.831480	29.00	10.1	46	17.0	L1	GND
3.006389	32.30	10.1	46	13.7	L1	GND
3.147768	28.60	10.1	46	17.4	L1	GND

PCS1900MHz

x   MES 11A09560_DC_fin QP
+   MES 11A09560_DC_fin AV
     MES 11A09560_DC_pre PK
     MES 11A09560_DC_pre AV
     LIM EN 55022 V QP   Voltage QP Limit
     LIM EN 55022 V AV   Voltage AV Limit
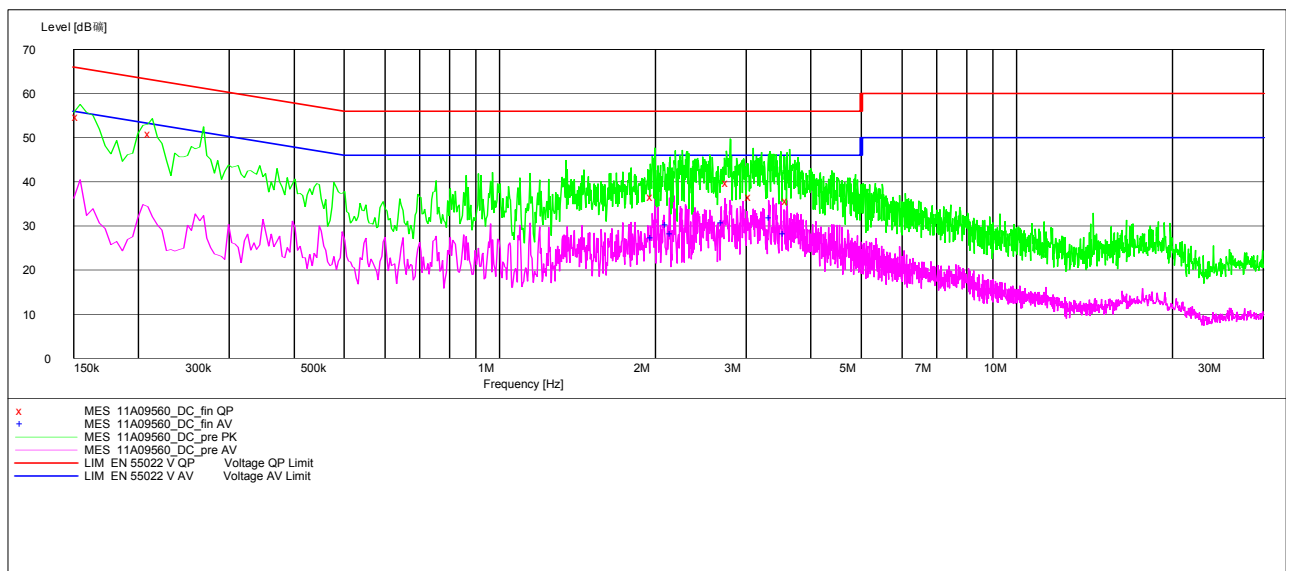
MEASUREMENT RESULT: "11A09560_DC_fin QP"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.154500	54.80	10.1	66	11.0	L1	GND
0.213000	50.80	10.1	63	12.2	L1	GND
1.995000	36.70	10.1	56	19.3	L1	GND
2.792155	39.80	10.1	56	16.2	L1	GND
3.091671	36.70	10.1	56	19.3	N	GND
3.642055	35.70	10.1	56	20.3	N	GND

MEASUREMENT RESULT: "11A09560_DC_fin AV"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
1.995000	27.40	10.1	46	18.6	L1	GND
2.127793	30.30	10.1	46	15.7	L1	GND
2.175075	28.30	10.1	46	17.7	L1	GND
2.731458	30.70	10.1	46	15.3	L1	GND
3.375771	31.80	10.1	46	14.2	L1	GND
3.598654	28.30	10.1	46	17.7	L1	GND

MP3

×	MES 12A00902_MC_fin QP	
+	MES 12A00902_MC_fin AV	
	MES 12A00902_MC_pre PK	
	MES 12A00902_MC_pre AV	
	LIM EN 55022 V QP	Voltage QP Limit
	LIM EN 55022 V AV	Voltage AV Limit
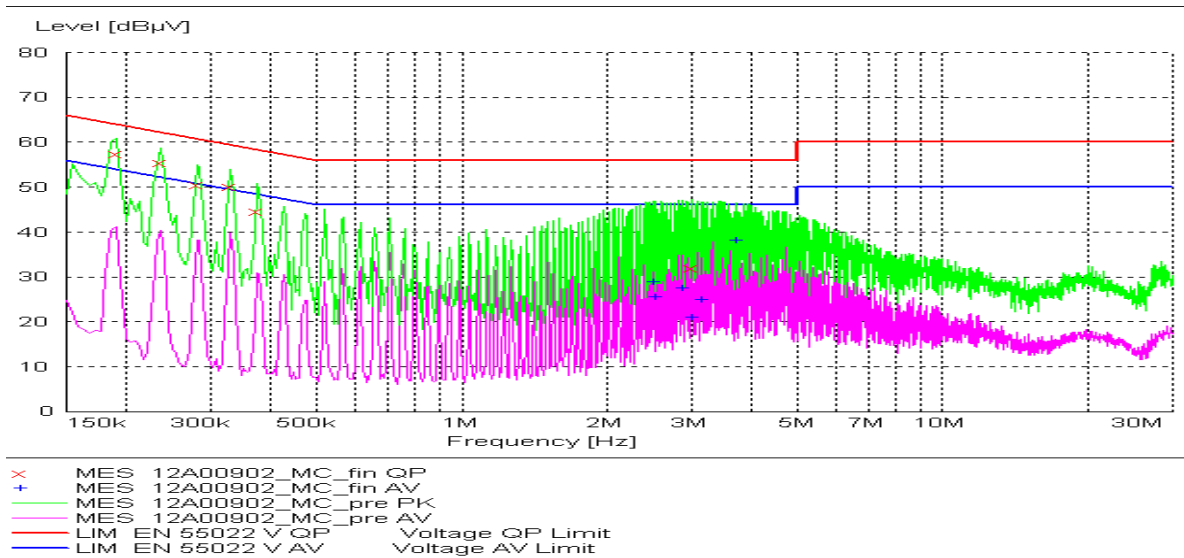
MEASUREMENT RESULT: "12A00902_MC_fin QP"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.190500	57.40	10.1	64	6.6	L1	GND
0.235500	55.40	10.1	62	6.9	N	GND
0.280500	50.40	10.1	61	10.4	N	GND
0.330000	50.10	10.1	60	9.4	N	GND
0.375000	44.60	10.1	58	13.8	L1	GND
3.006389	32.00	10.1	56	24.0	N	GND

MEASUREMENT RESULT: "12A00902_MC_fin AV"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBμV	dB	dBμV		dB	
2.491606	28.90	10.1	46	17.1	L1	GND
2.536815	25.40	10.1	46	20.6	L1	GND
2.865628	27.50	10.1	46	18.5	L1	GND
3.006389	20.90	10.1	46	25.1	N	GND
3.147768	24.80	10.1	46	21.2	L1	GND
3.722986	38.00	10.2	46	8.0	L1	GND

Camera
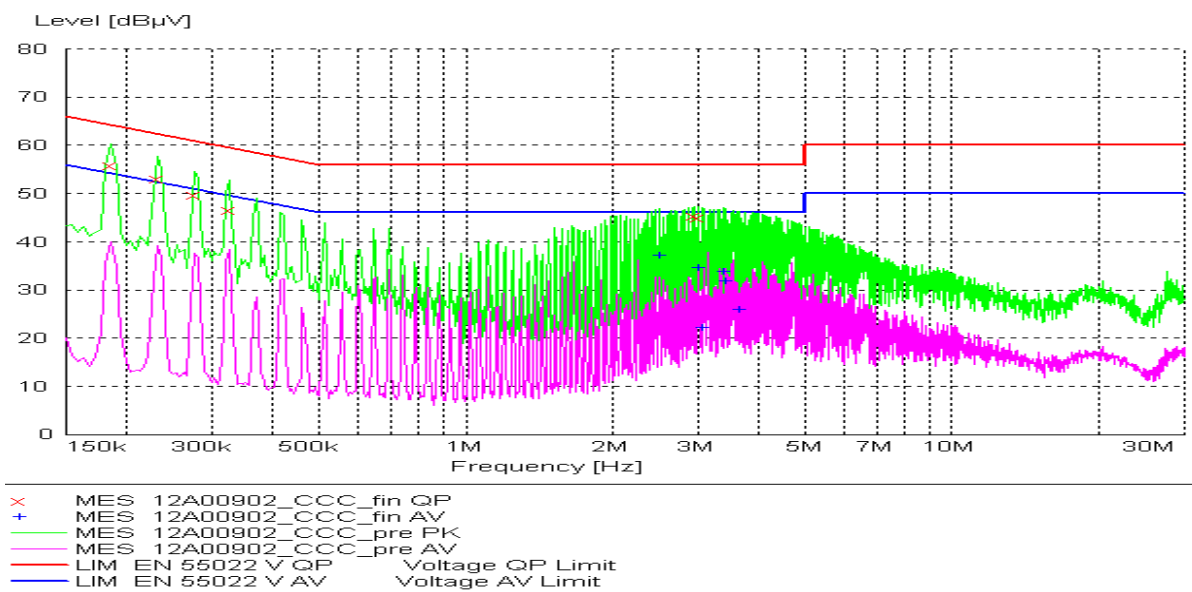
MEASUREMENT RESULT: "12A00902_CCC_fin QP"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBμV	dB	dBμV		dB	
0.186000	55.80	10.1	64	8.4	L1	GND
0.231000	53.10	10.1	62	9.3	N	GND
0.276000	49.70	10.1	61	11.3	N	GND
0.325500	46.60	10.1	60	13.0	N	GND
2.958717	45.40	10.1	56	10.6	L1	GND
3.006389	44.90	10.1	56	11.1	L1	GND

MEASUREMENT RESULT: "12A00902_CCC_fin AV"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBμV	dB		dBμV	dB	
2.496589	37.10	10.1	46	8.9	L1	GND
3.006389	34.50	10.1	46	11.5	L1	GND
3.054829	22.10	10.1	46	23.9	N	GND
3.375771	33.80	10.1	46	12.2	L1	GND
3.423317	31.70	10.1	46	14.3	L1	GND
3.656637	25.90	10.1	46	20.1	L1	GND

A.4 FREQUENCY STABILITY   (§2.1055/§24.235)

A.4.1 Method of Measurement

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a "call mode". This is accomplished with the use of R&S CMU200 DIGITAL RADIO COMMUNICATION TESTER.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30℃.
3. With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on channel 661 for PCS 1900 and channel 190 for GSM850 measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10℃ increments from -30℃ to +50℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
5. Remeasure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments remeasuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50℃.
7. With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 C increments from +50℃ to -30℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

A.4.2 Measurement Limit

A.4.2.1 For Hand carried battery powered equipment

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.   As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.5VDC and 4.2VDC, with a nominal voltage of 3.7VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance of -10 % and +12.5 %. For the purposes of measuring frequency stability these voltage limits are to be used.

A.4.2.2 For equipment powered by primary supply voltage

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the

fundamental emission stays within the authorized frequency block. For this EUT section 2.1055(d)(1) applies. This requires varying primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

A.4.3 Measurement results

GSM 850
Frequency Error vs Voltage

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.5	-20	0.035
3.7	-22	0.038
4.2	-24	0.041

Frequency Error vs Temperature

temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-30	-24	0.041
-20	-22	0.038
-10	-22	0.038
0	-20	0.035
10	-20	0.035
20	-20	0.035
30	-22	0.038
40	-22	0.038
50	-24	0.041

PCS 1900
Frequency Error vs Voltage

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.5	-43	0.038
3.7	-47	0.041
4.2	-45	0.039

Frequency Error vs Temperature

temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-30	-47	0.041
-20	-45	0.039
-10	-45	0.039
0	-43	0.038
10	-43	0.038
20	-43	0.038
30	-45	0.039
40	-45	0.039
50	-47	0.041

A.5 OCCUPIED BANDWIDTH   (§2.1049(h)(i))

A.5.1 Occupied Bandwidth Results

Similar to conducted emissions; occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of PCS1900 band and GSM850 band. The table below lists the measured -20dBc BW. Spectrum analyzer plots are included on the following pages.

GSM 850(-20dBc)

Frequency(MHz)	Occupied Bandwidth (-20dBc BW)(kHz)
824.2	243.589
836.6	246.794
848.8	243.589

GSM 850

Channel 128-Occupied Bandwidth (-20dBc BW)
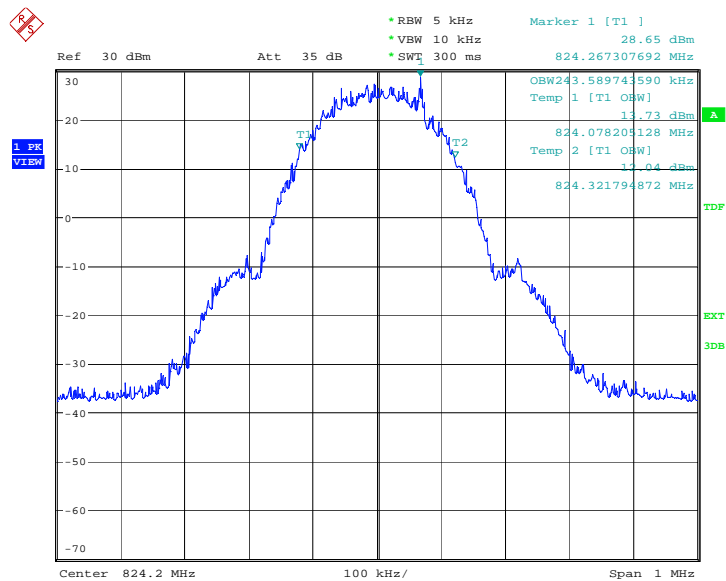
Date: 5.DEC.2011 07:19:00

Channel 190-Occupied Bandwidth (-20dBc BW)
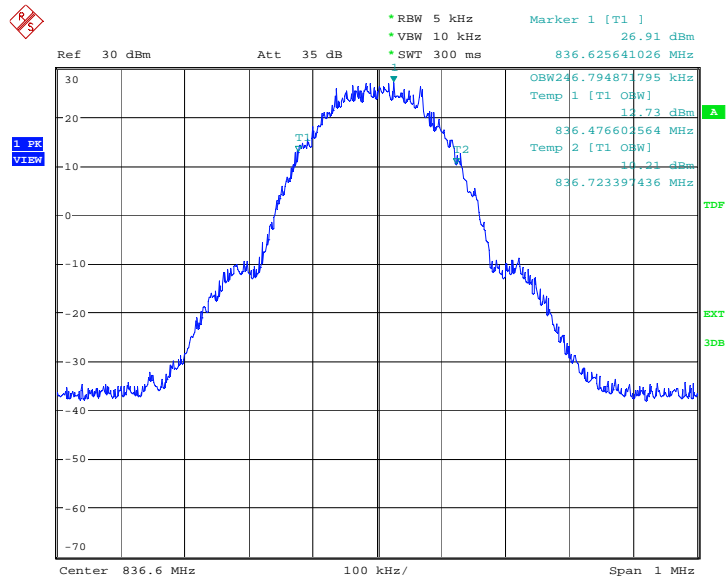
Date: 5.DEC.2011 07:19:32
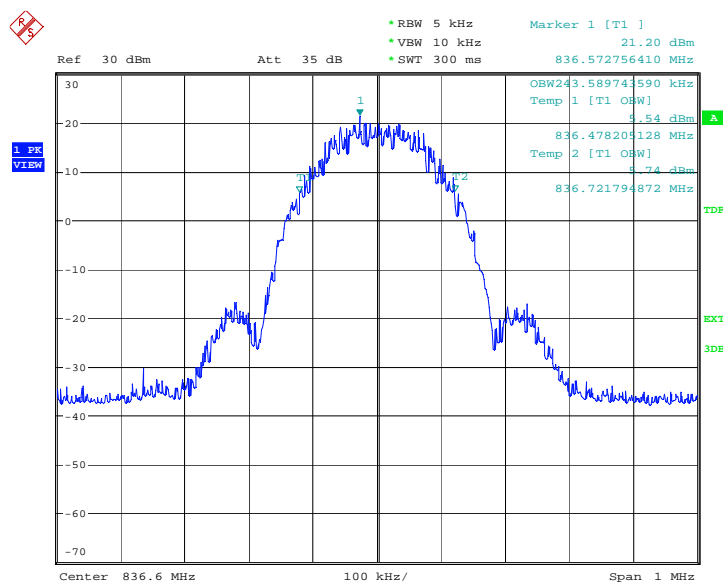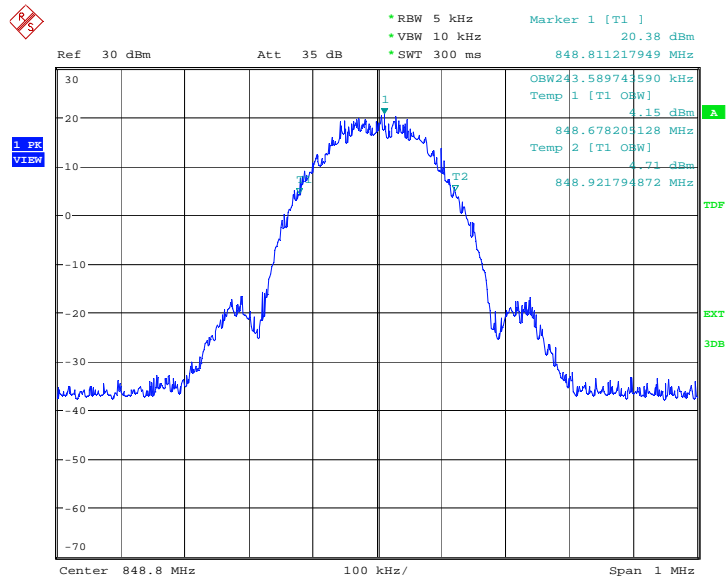
Channel 251-Occupied Bandwidth (-20dBc BW)
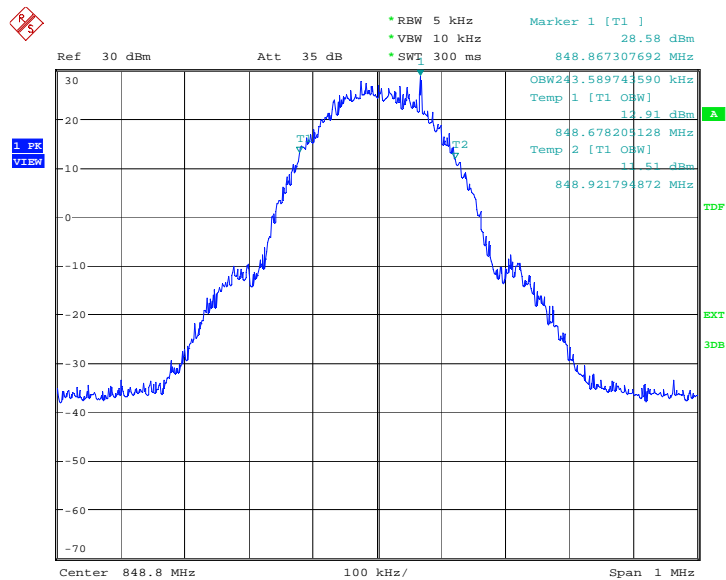
Date: 5.DEC.2011 07:20:04

GSM 850(-20dBc)-IC

Frequency(MHz)	Occupied Bandwidth (-20dBc BW)(kHz)
824.2	106.730
836.6	101.923
848.8	93.910

GSM 850

Channel 128-Occupied Bandwidth Reference Level
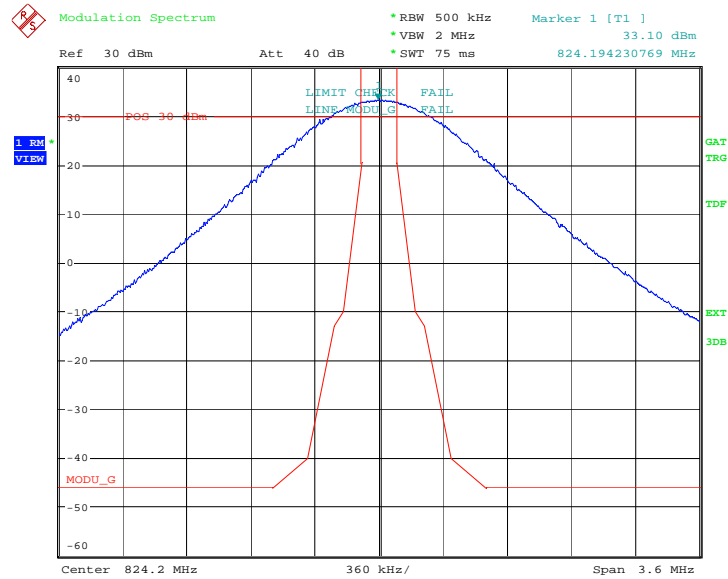
Date: 6.DEC.2011 23:31:36

Channel 128-Occupied Bandwidth (-20dBc BW)
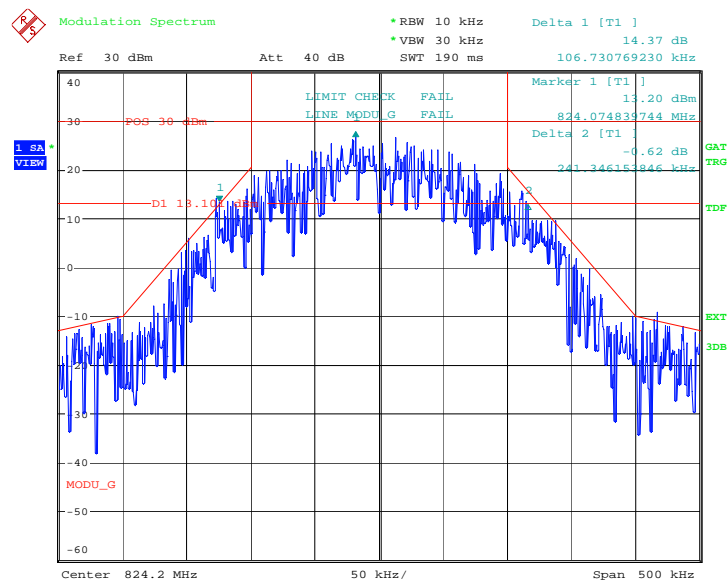
Date: 6.DEC.2011 23:32:41

Channel 190-Occupied Bandwidth Reference Level

```
R&S   Modulation Spectrum          * RBW 500 kHz      Marker 1 [T1 ]
                                    * VBW 2 MHz                   32.79 dBm
      Ref  30 dBm        Att  40 dB * SWT 75 ms        836.594230769 MHz
```

40	
30	LIMIT CHECK FAIL
	LINE MODU_G FAIL
POS 30 dBm	
1 RM VIEW	GAT TRG
20	
10	TDF
0	
-10	EXT 3DB
-20	
-30	
-40	
-50	
-60	MODU_G

```
Center 836.6 MHz                360 kHz/                    Span 3.6 MHz
```

Date: 6.DEC.2011 23:33:42

Channel 190-Occupied Bandwidth (-20dBc BW)

```
R&S   Modulation Spectrum          * RBW 10 kHz       Delta 1 [T1 ]
                                    * VBW 30 kHz                  13.84 dB
      Ref  30 dBm        Att  40 dB   SWT 190 ms       101.923076923 kHz
```

40	Marker 1 [T1]
30	LIMIT CHECK FAIL 12.95 dBm
	LINE MODU_G FAIL 836.473237179 MHz
POS 30 dBm	Delta 2 [T1]
1 SA VIEW	-0.04 dB
20	242.948717948 kHz GAT TRG
1 2	
D1 12.785	TDF
10	
0	
-10	EXT 3DB
-20	
-30	
-40	
MODU_G	
-50	
-60	

```
Center 836.6 MHz                 50 kHz/                   Span 500 kHz
```
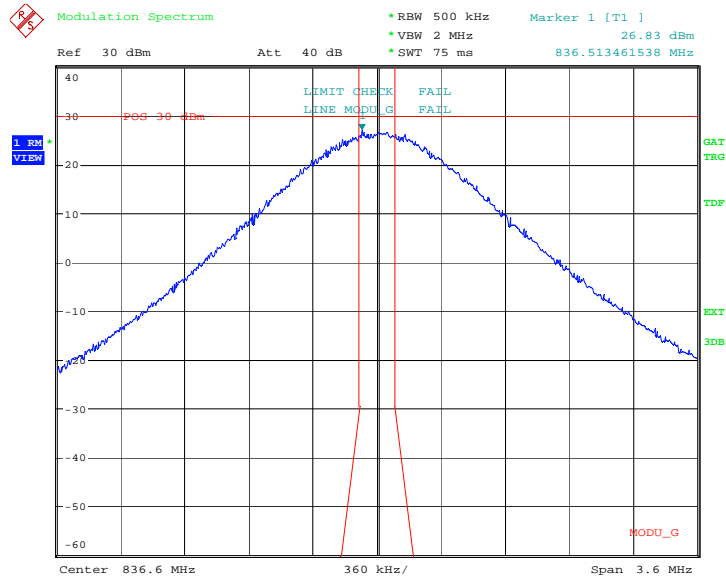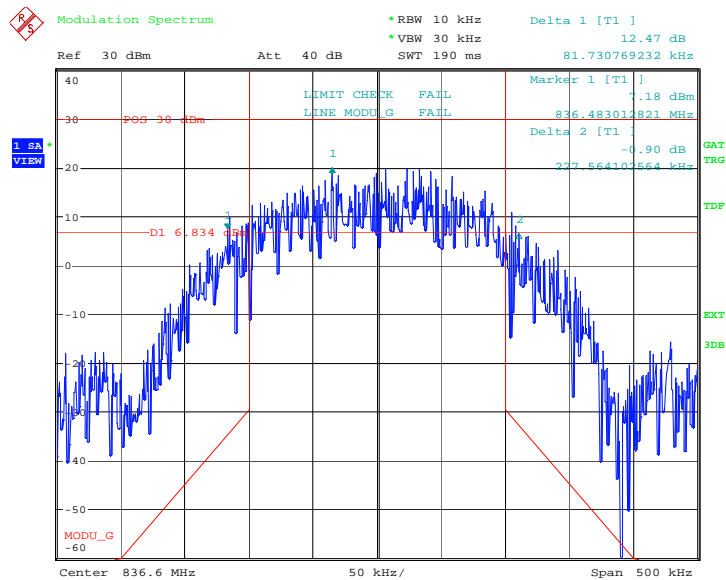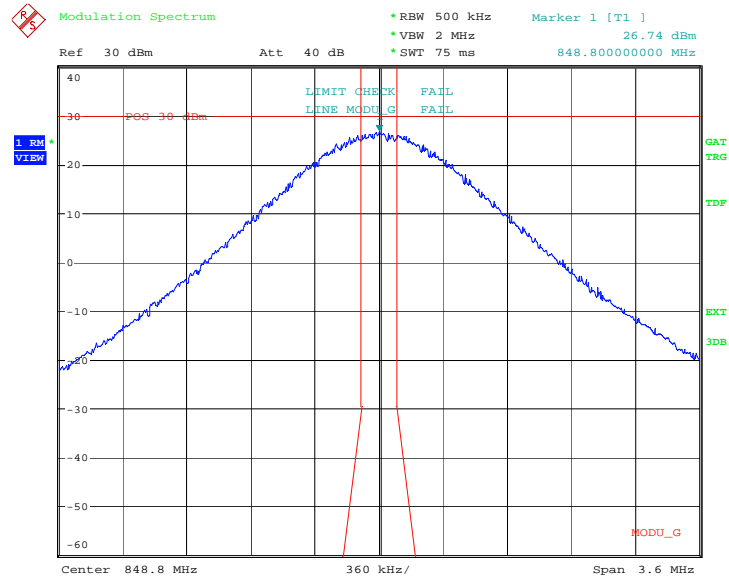
Date: 6.DEC.2011 23:34:22

Channel 251-Occupied Bandwidth Reference Level
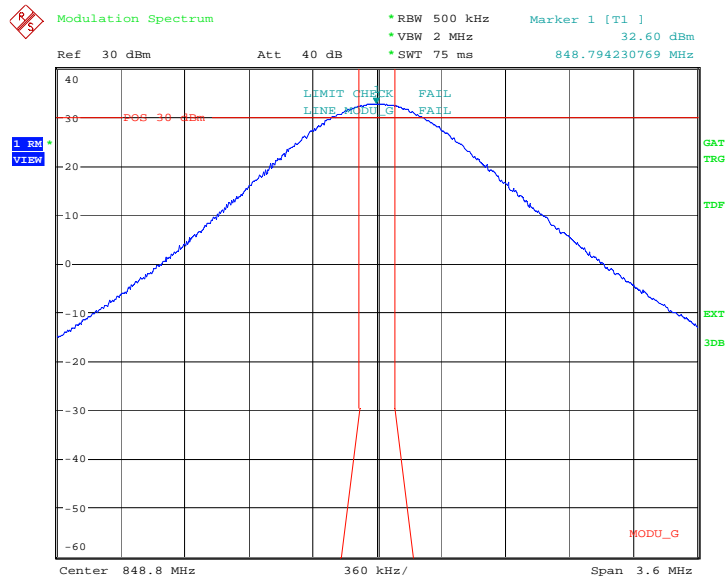
Date: 6.DEC.2011 23:35:21
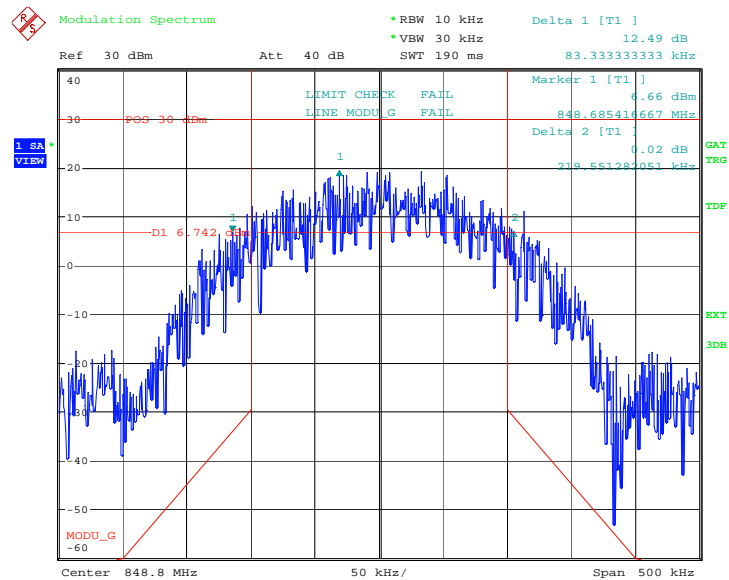
Channel 251-Occupied Bandwidth (-20dBc BW)
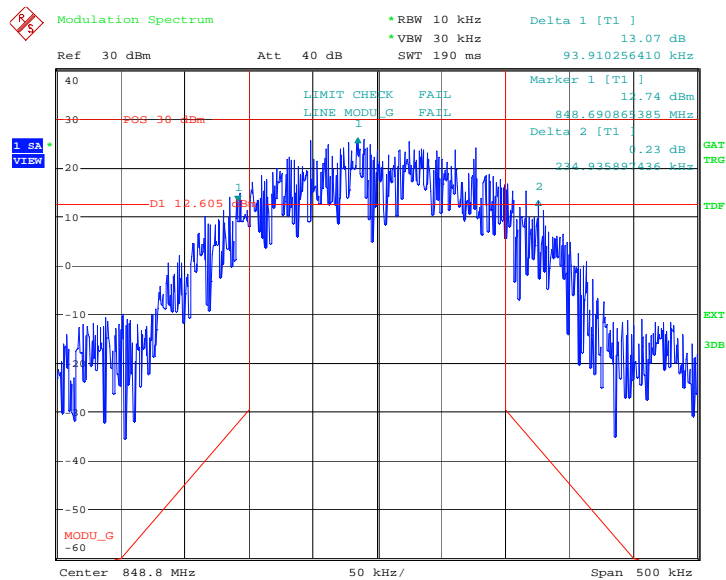
Date: 6.DEC.2011 23:38:40

GPRS 850(-20dBc)

Frequency(MHz)	Occupied Bandwidth (-20dBc BW)(kHz)
824.2	245.192
836.6	246.794
848.8	243.589

GPRS 850

Channel 128-Occupied Bandwidth (-20dBc BW)
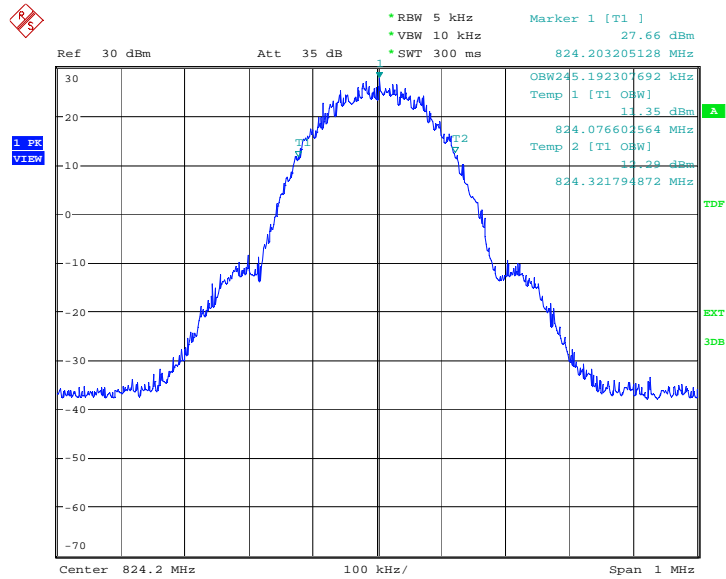
Date: 12.DEC.2011 06:52:47

Channel 190-Occupied Bandwidth (-20dBc BW)
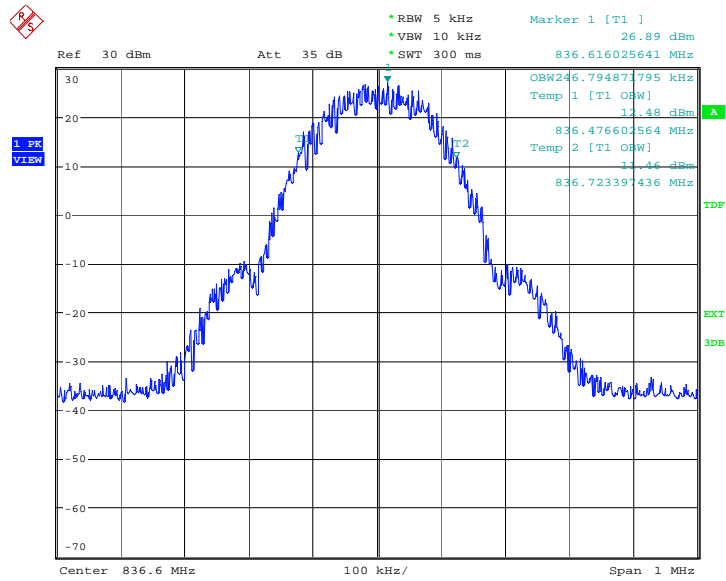
Date: 12.DEC.2011 06:53:19

Channel 251-Occupied Bandwidth (-20dBc BW)
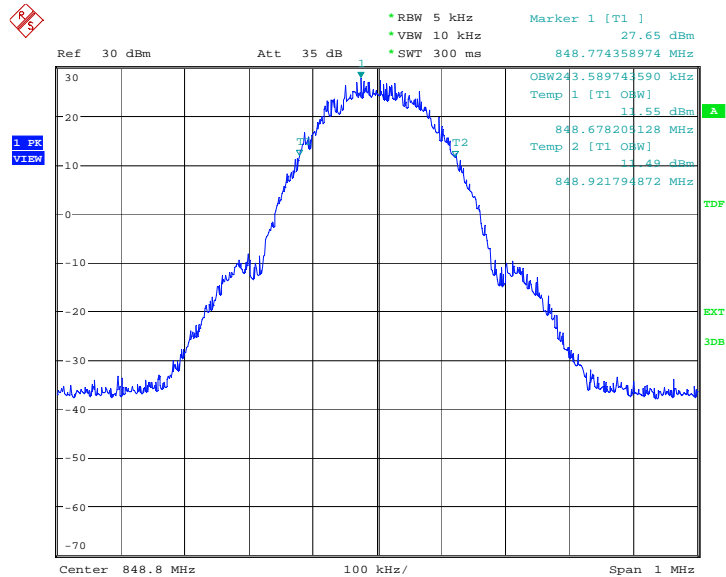
Date: 12.DEC.2011 06:53:51

GPRS 850(-20dBc)-IC

Frequency(MHz)	Occupied Bandwidth (-20dBc BW)(kHz)
824.2	121.955
836.6	99.839
848.8	79.487

GPRS 850

Channel 128-Occupied Bandwidth Reference Level
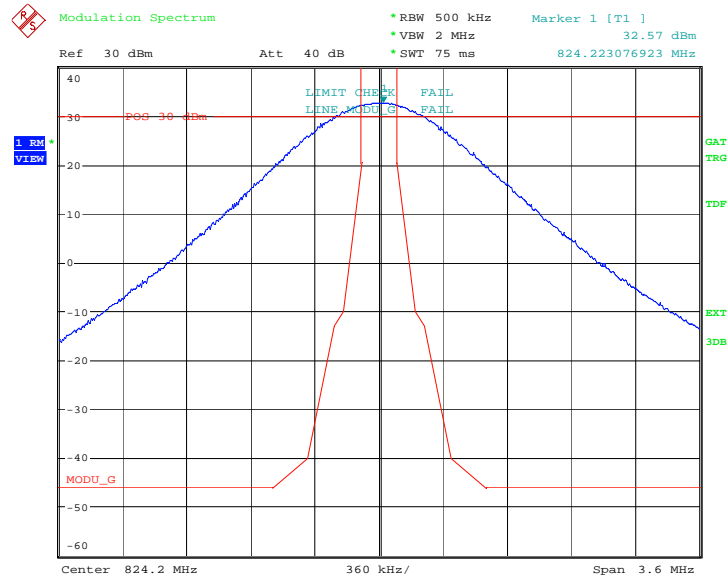
Date: 12.DEC.2011 07:43:42

Channel 128-Occupied Bandwidth (-20dBc BW)
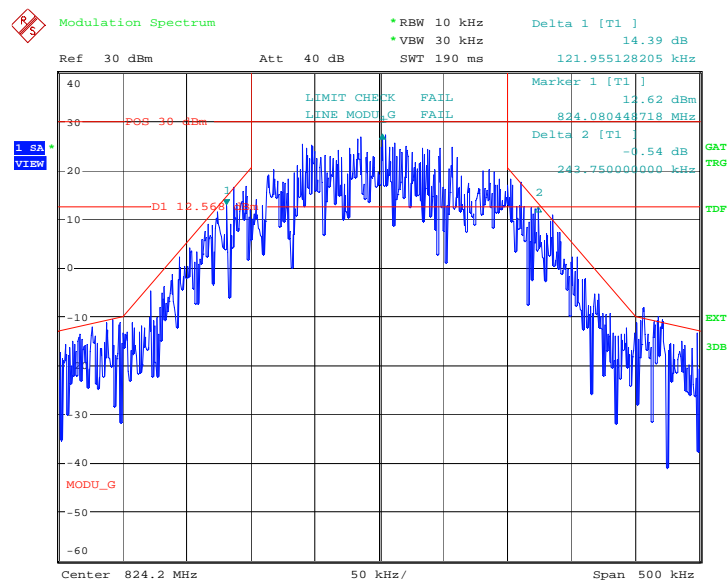
Date: 12.DEC.2011 07:44:22

Channel 190-Occupied Bandwidth Reference Level
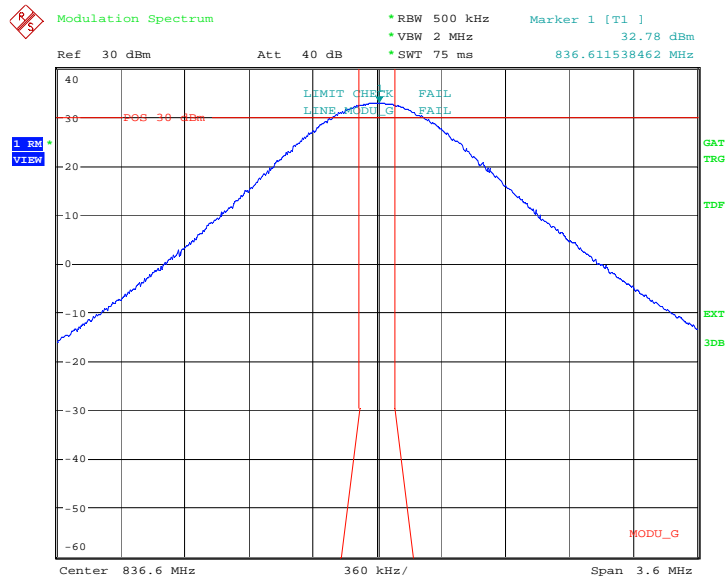
Date: 12.DEC.2011 07:45:12

Channel 190-Occupied Bandwidth (-20dBc BW)
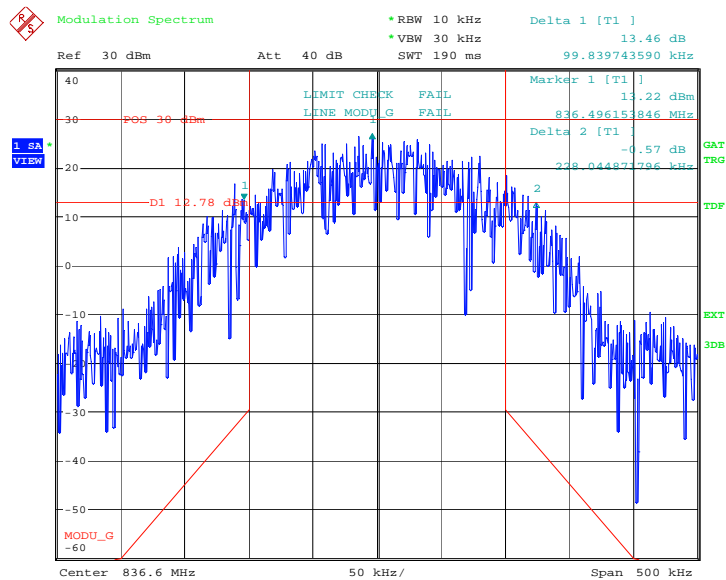
Date: 12.DEC.2011 07:45:56

Channel 251-Occupied Bandwidth Reference Level
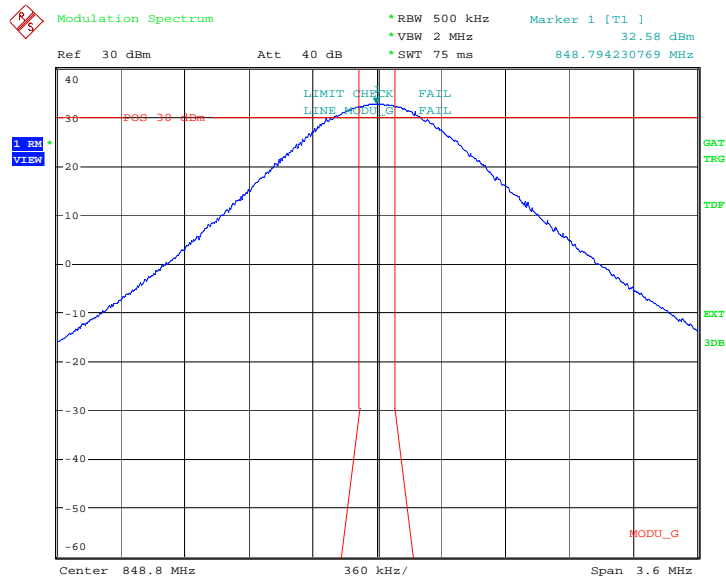
Date: 12.DEC.2011 07:47:31

Channel 251-Occupied Bandwidth (-20dBc BW)
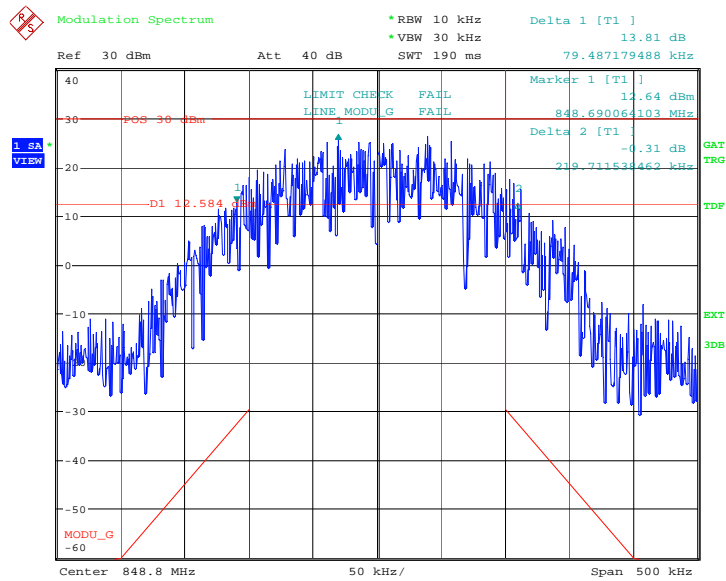
Date: 12.DEC.2011 07:48:12

EGPRS 850(-20dBc)

Frequency(MHz)	Occupied Bandwidth (-20Bc BW)(kHz)
824.2	248.397
836.6	243.589
848.8	243.589

EGPRS 850

Channel 128-Occupied Bandwidth (-20dBc BW)
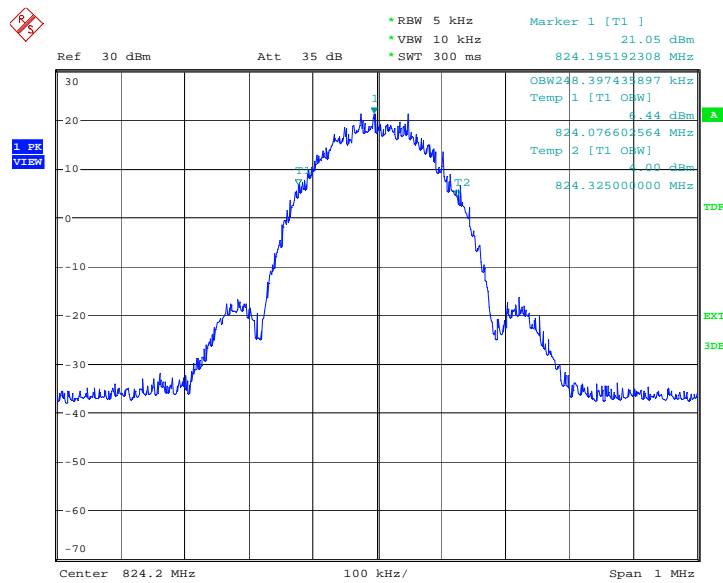
Date: 12.DEC.2011 07:00:05

Channel 190-Occupied Bandwidth (-20dBc BW)

Date: 12.DEC.2011 07:00:37
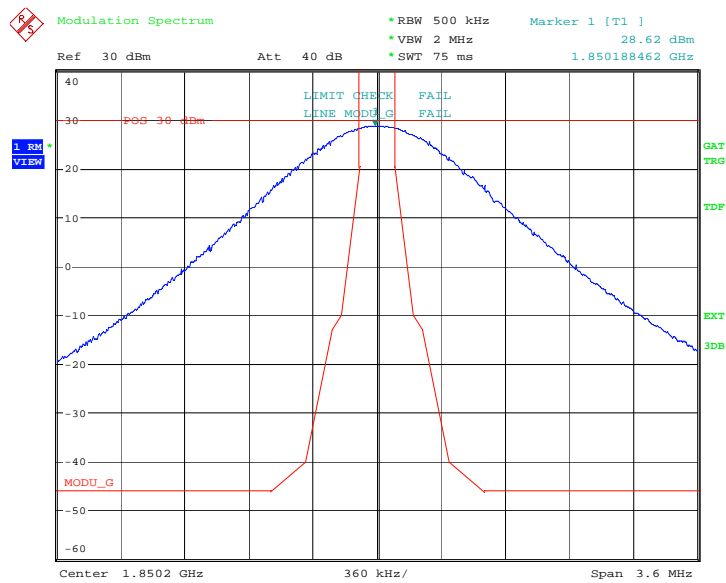
Channel 251-Occupied Bandwidth (-20dBc BW)

Date: 12.DEC.2011 07:01:08

EGPRS 850(-20dBc)-IC

Frequency(MHz)	Occupied Bandwidth (-20Bc BW)(kHz)
824.2	100.641
836.6	81.730
848.8	83.333

EGPRS 850

Channel 128-Occupied Reference level
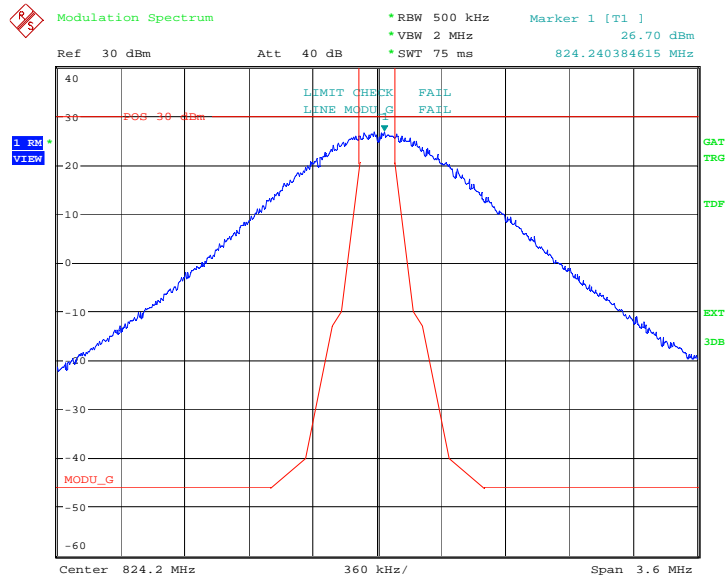
Date: 12.DEC.2011 07:30:07

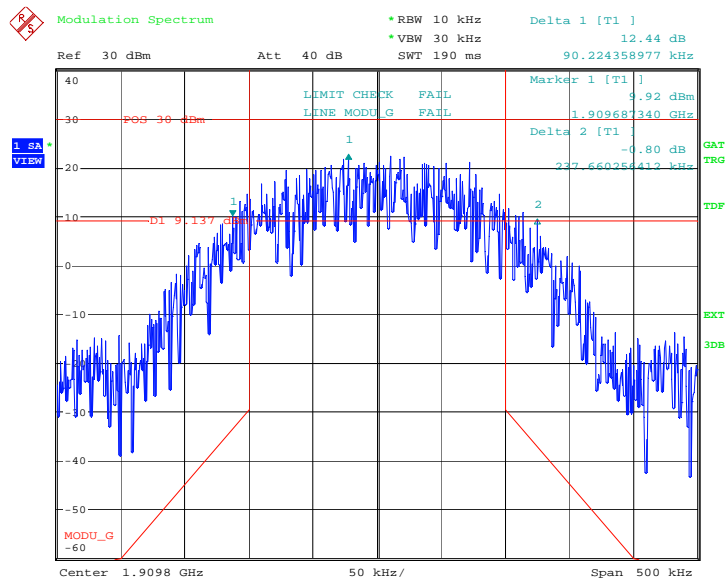**Channel 128-Occupied Bandwidth (-20dBc BW)**
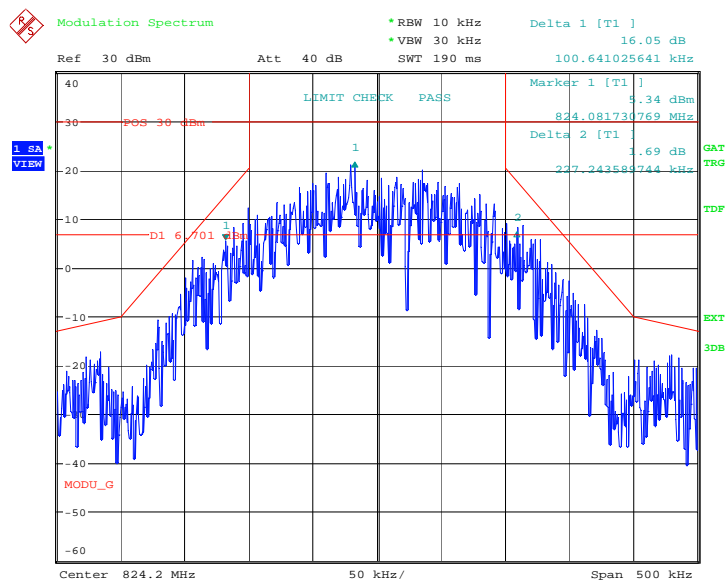
Date: 12.DEC.2011 07:31:07

Channel 190-Occupied Bandwidth Reference level

Date: 12.DEC.2011 07:32:01

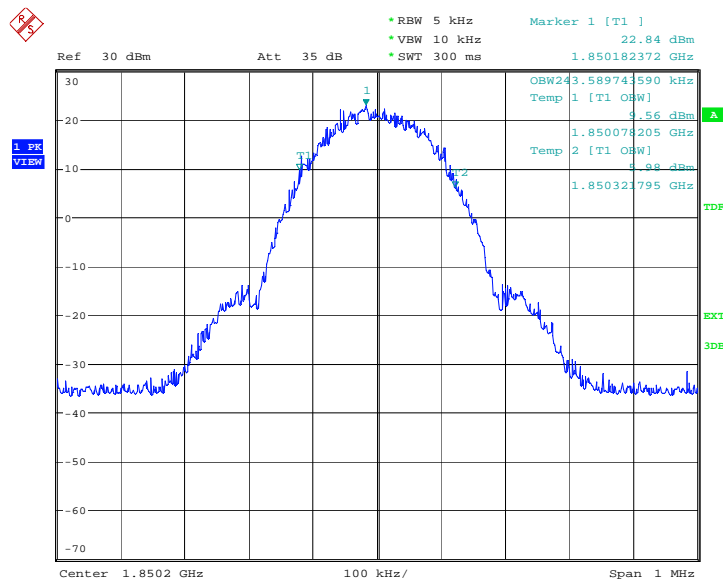## Channel 190-Occupied Bandwidth (-20dBc BW)

Date: 12.DEC.2011 07:32:43

Channel 251-Occupied Reference Level

```
R&S   Modulation Spectrum              * RBW  500 kHz    Marker 1 [T1 ]
                                       * VBW  2 MHz                26.74 dBm
      Ref   30 dBm        Att  40 dB   * SWT  75 ms          848.800000000 MHz
```

40	
30	POS 30 dBm LIMIT CHECK FAIL
	LINE MODU_G FAIL
20	
10	
0	
-10	
-20	
-30	
-40	
-50	
-60	MODU_G

```
Center  848.8 MHz             360 kHz/              Span  3.6 MHz
```

1 RM VIEW   GAT TRG   TDF   EXT   3DB

Date: 12.DEC.2011 07:33:39

Channel 251-Occupied Bandwidth (-20dBc BW)

```
R&S   Modulation Spectrum              * RBW  10 kHz    Delta 1 [T1 ]
                                       * VBW  30 kHz               12.49 dB
      Ref   30 dBm        Att  40 dB     SWT  190 ms          83.333333333 kHz
```

Marker 1 [T1]
6.66 dBm
848.685416667 MHz
Delta 2 [T1]
0.02 dB
219.551282051 kHz

40	
30	POS 30 dBm LIMIT CHECK FAIL
	LINE MODU_G FAIL
20	
10	D1 6.742 dB
0	
-10	
-20	
-40	
-50	
MODU_G -60	

```
Center  848.8 MHz             50 kHz/               Span  500 kHz
```

1 SA VIEW   GAT TRG   TDF   EXT   3DB

Date: 12.DEC.2011 07:34:34

PCS 1900(-20dBc)

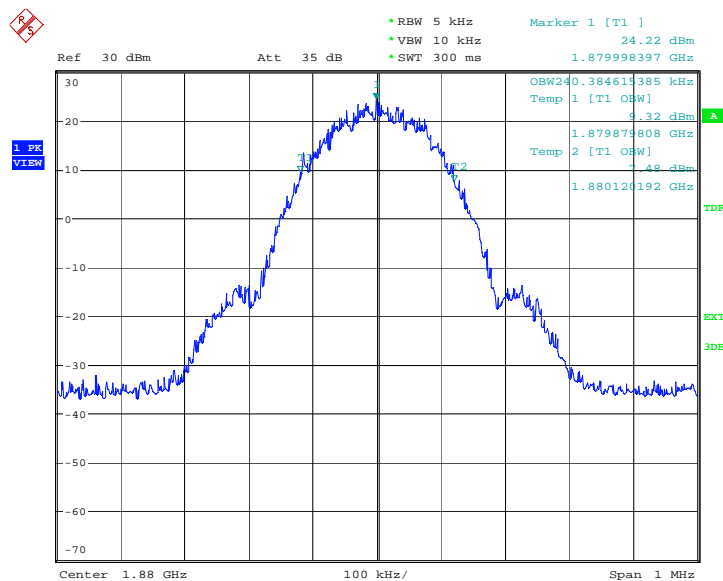| Frequency(MHz)	Occupied Bandwidth (-20dBc BW)(kHz)
1850.2	243.589
1880.0	243.589
1909.8	245.192

PCS 1900

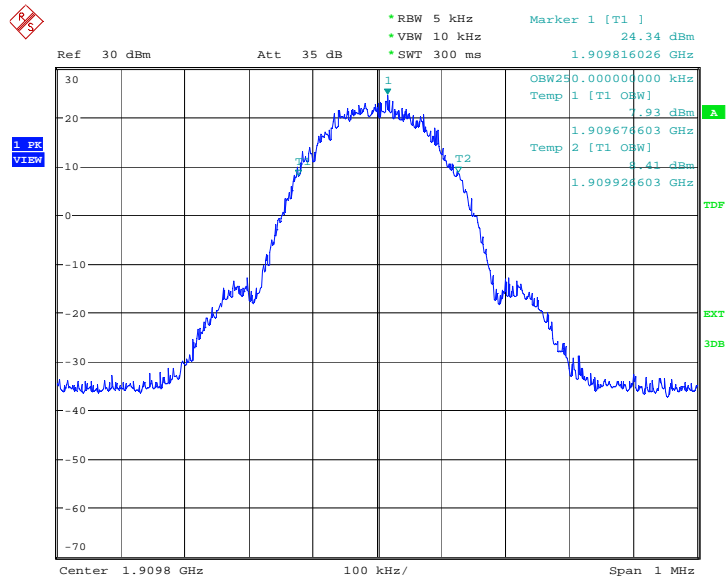**Channel 512-Occupied Bandwidth (-20dBc BW)**
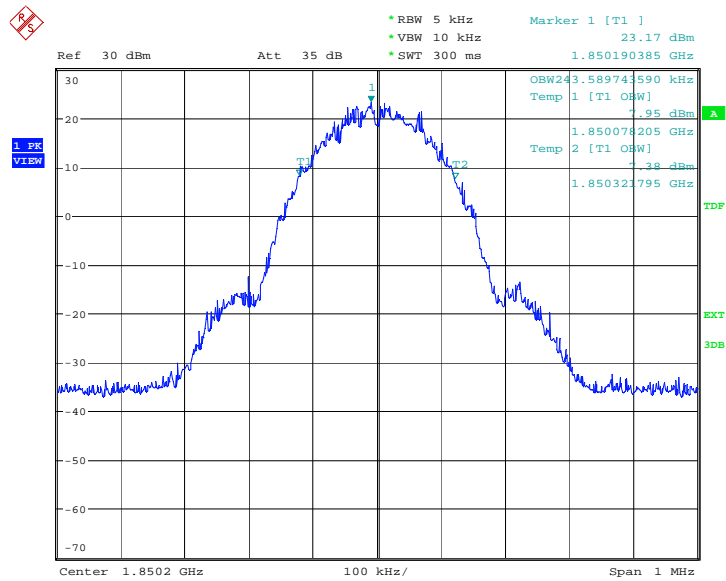
Date: 6.DEC.2011 07:18:40

Channel 661-Occupied Bandwidth (-20dBc BW)
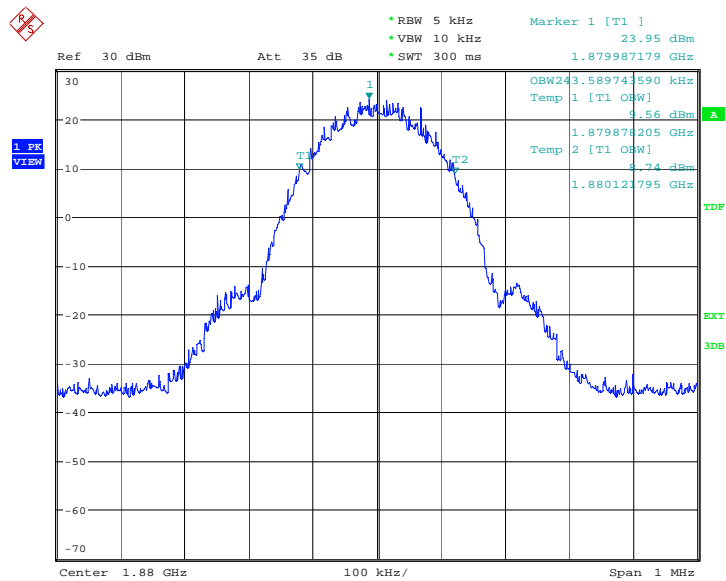
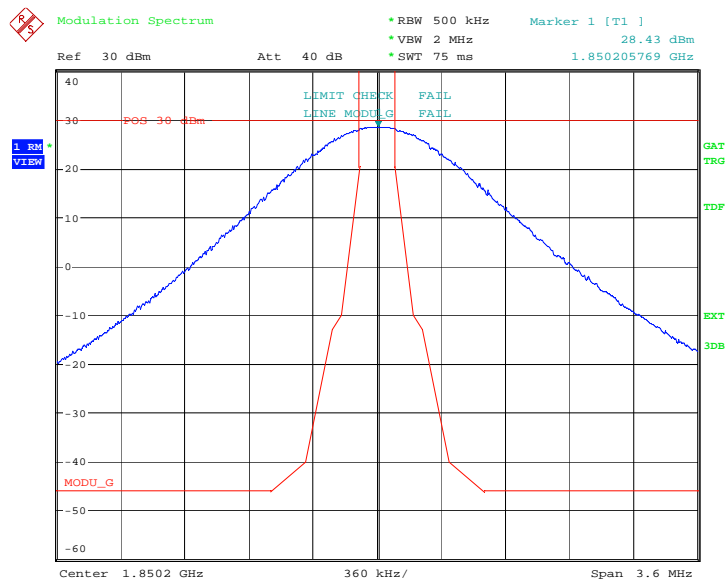Date: 6.DEC.2011 07:19:13

Channel 810-Occupied Bandwidth (-20dBc BW)
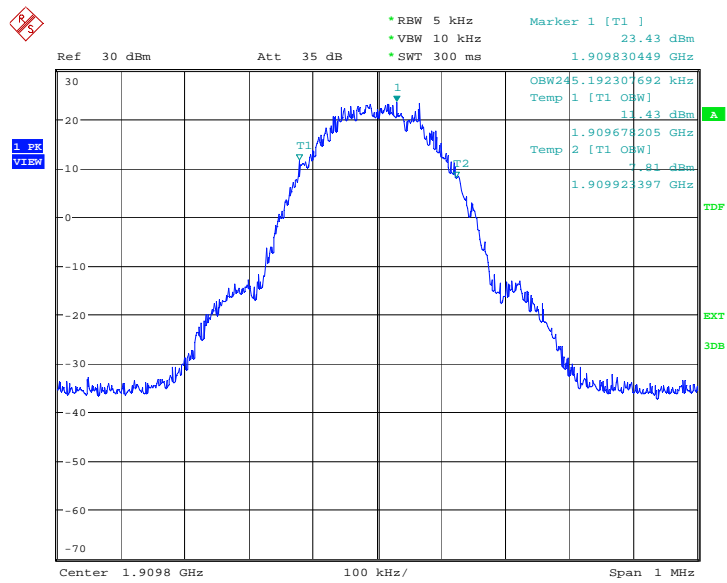
Date: 6.DEC.2011 07:19:45

PCS 1900(-20dBc)-IC

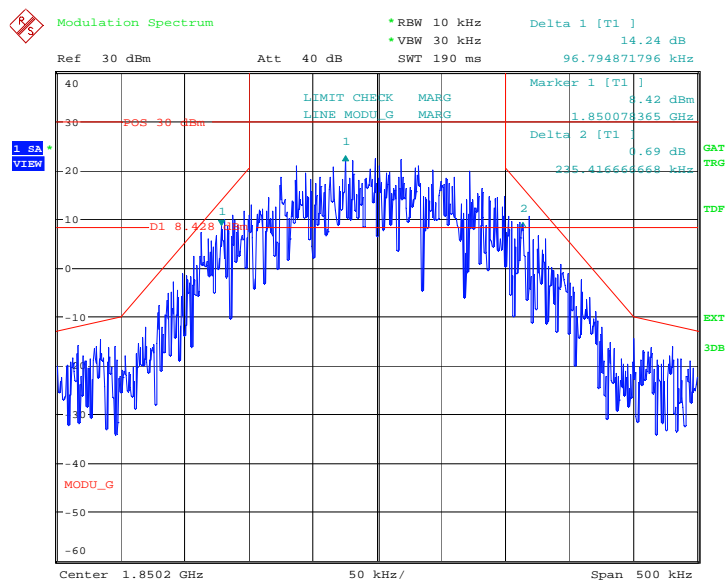| Frequency(MHz)	Occupied Bandwidth (-20dBc BW)(kHz)
1850.2	110.096
1880.0	127.884
1909.8	90.224

PCS 1900

Channel 512-Occupied Bandwidth Reference Level

Date: 6.DEC.2011 08:06:35

Channel 512-Occupied Bandwidth (-20dBc BW)
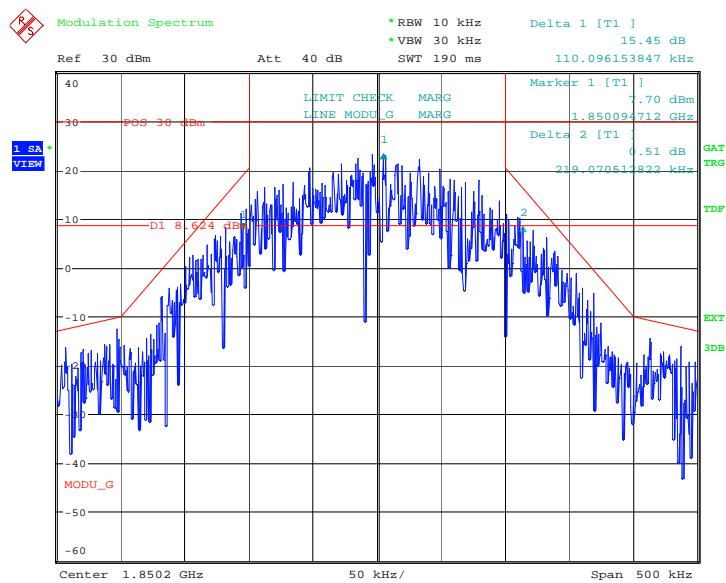
Date: 6.DEC.2011 08:11:42

Channel 661-Occupied Reference Level


```
                          Modulation Spectrum          * RBW 500 kHz      Marker 1 [T1 ]
                                                       * VBW 2 MHz                    29.26 dBm
                          Ref  30 dBm        Att 40 dB * SWT 75 ms        1.880011538 GHz
```

Date: 6.DEC.2011 08:14:55

Channel 661-Occupied Bandwidth (-20dBc BW)


```
                          Modulation Spectrum          * RBW 10 kHz      Delta 1 [T1 ]
                                                       * VBW 30 kHz                    12.46 dB
                          Ref  30 dBm        Att 40 dB   SWT 190 ms      127.884615386 kHz
```
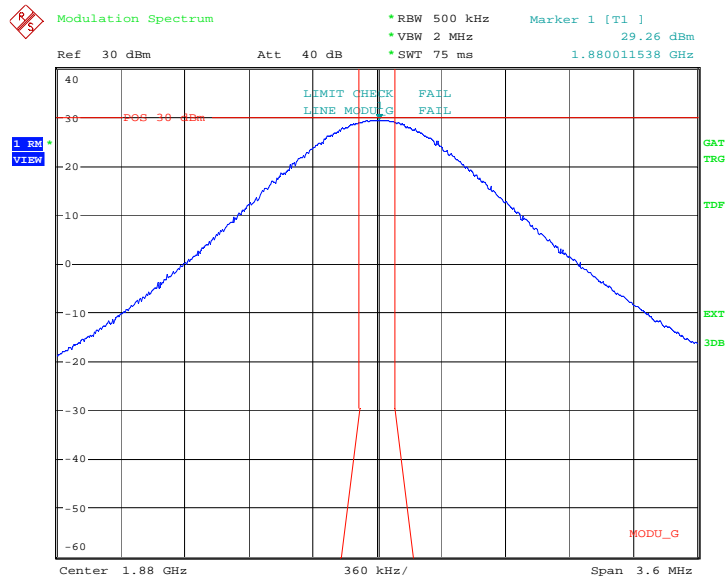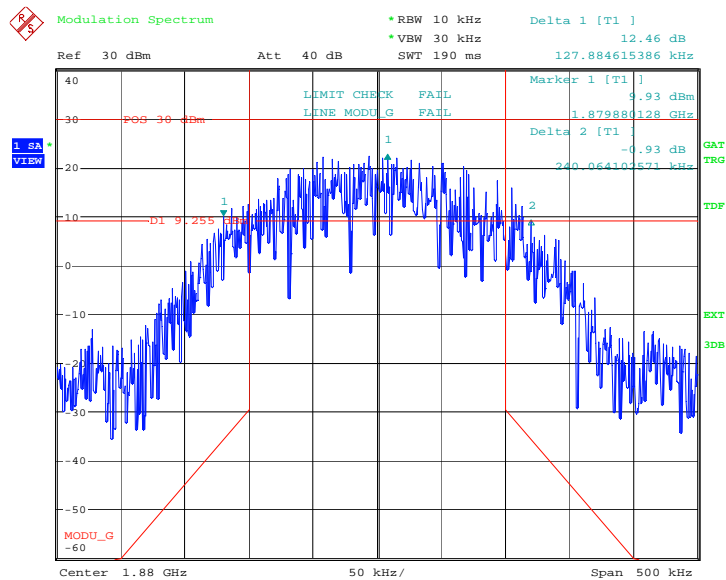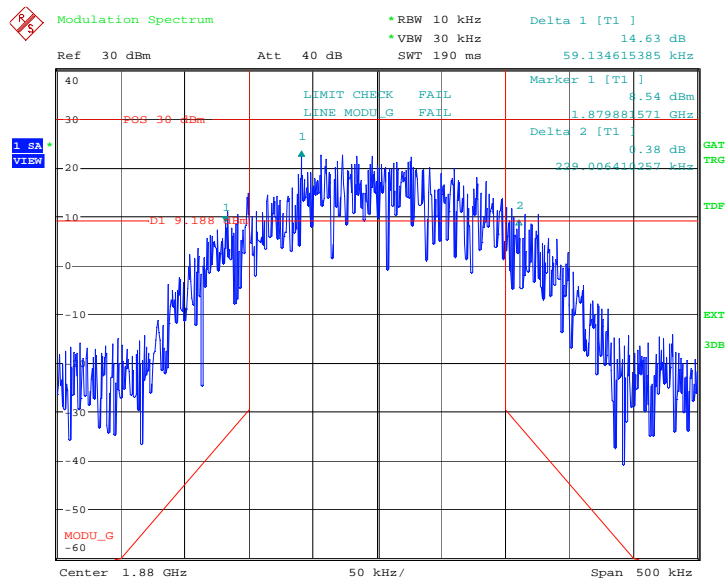
Date: 6.DEC.2011 08:22:38

Channel 810-Occupied Bandwidth Reference Level
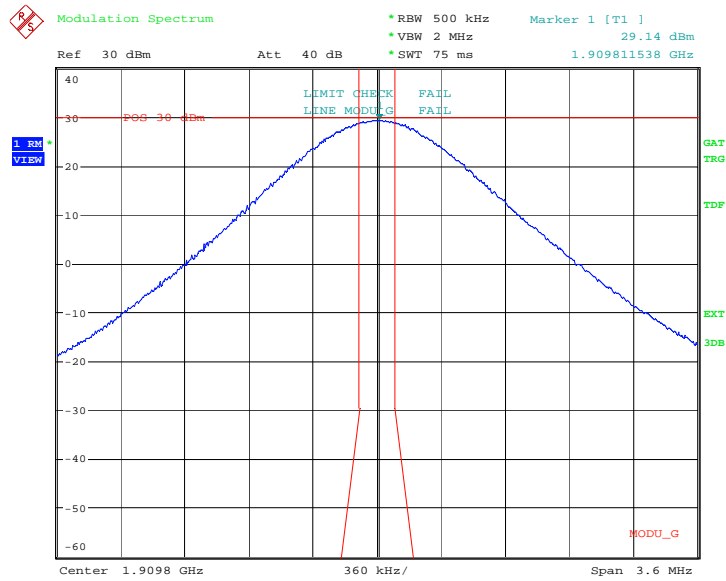
Date: 6.DEC.2011 08:28:54
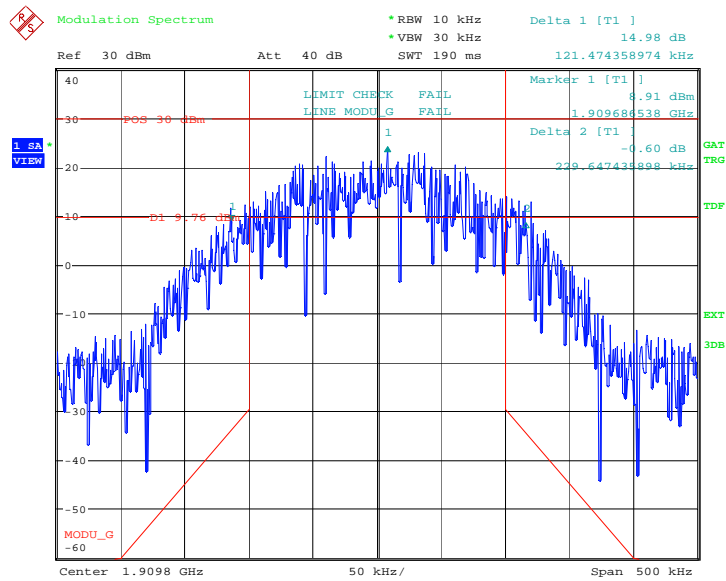
Channel 810-Occupied Bandwidth (-20dBc BW)

Date: 6.DEC.2011 08:30:38

GPRS 1900(-20dBc)

Frequency(MHz)	Occupied Bandwidth (-20dBc BW)(kHz)
1850.2	243.589
1880.0	240.384
1909.8	250.000

GPRS 1900

Channel 512-Occupied Bandwidth -20dBc BW)

Date: 12.DEC.2011 07:05:01

Channel 661-Occupied Bandwidth (-20dBc BW)

Date: 12.DEC.2011 07:05:33
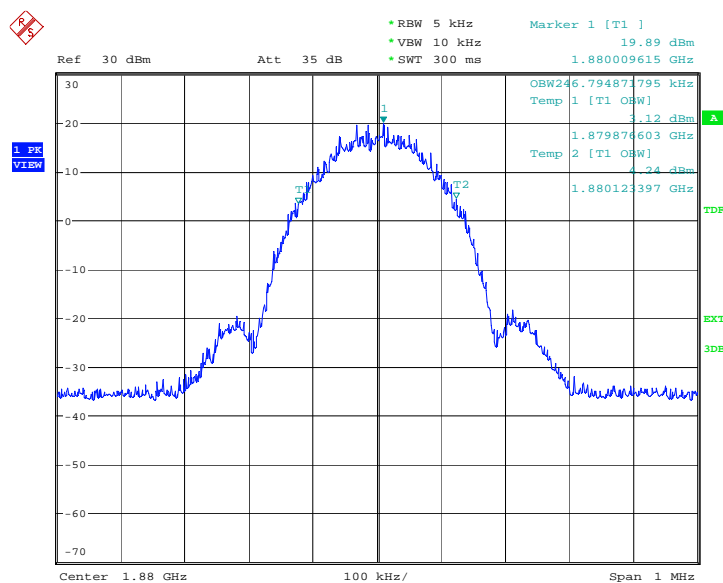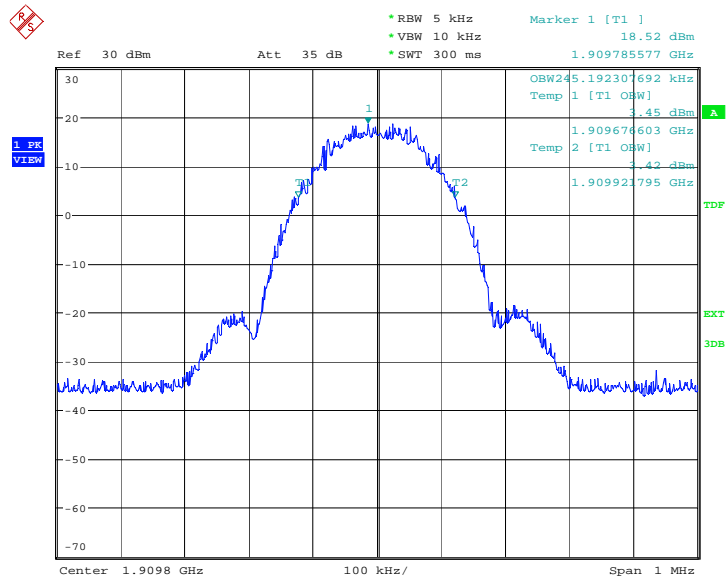
Channel 810-Occupied Bandwidth (-20dBc BW)

Date: 12.DEC.2011 07:06:05

GPRS 1900(-20dBc)-IC

Frequency(MHz)	Occupied Bandwidth (-20dBc BW)(kHz)
1850.2	96.794
1880.0	95.134
1909.8	121.474

GPRS 1900

Channel 512-Occupied Bandwidth Reference Level

Date: 12.DEC.2011 07:36:46

Channel 512-Occupied Bandwidth -20dBc BW)

Date: 12.DEC.2011 07:37:28

Channel 661-Occupied Bandwidth Reference Level
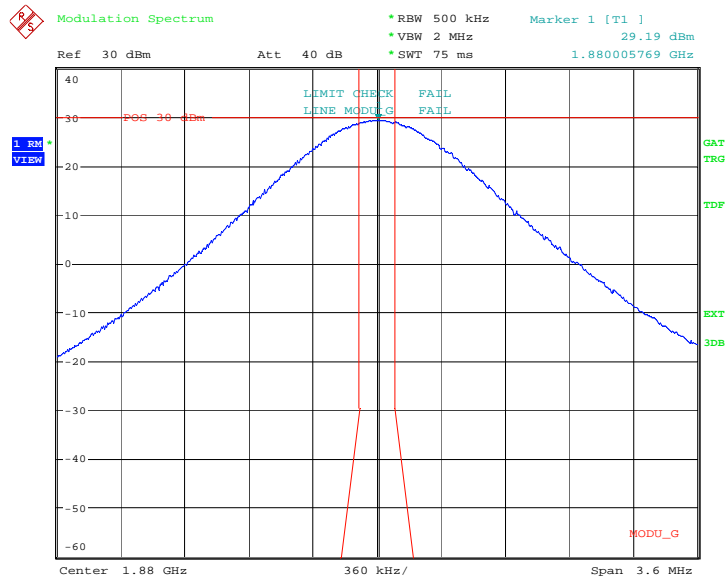
Date: 12.DEC.2011 07:38:20

Channel 661-Occupied Bandwidth (-20dBc BW)

Date: 12.DEC.2011 07:39:18

Channel 810-Occupied Reference Level
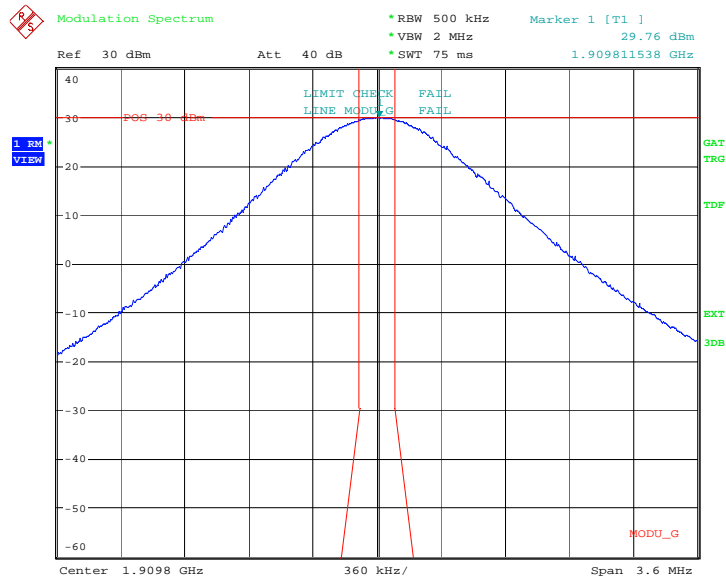
Date: 12.DEC.2011 07:40:20

Channel 810-Occupied Bandwidth (-20dBc BW)

Date: 12.DEC.2011 07:41:05

EGPRS 1900(-20dBc)

Frequency(MHz)	Occupied Bandwidth (-20dBc BW)(kHz)
1850.2	248.397
1880.0	246.794
1909.8	245.192

EGPRS 1900

Channel 512-Occupied Bandwidth (-20dBc BW)
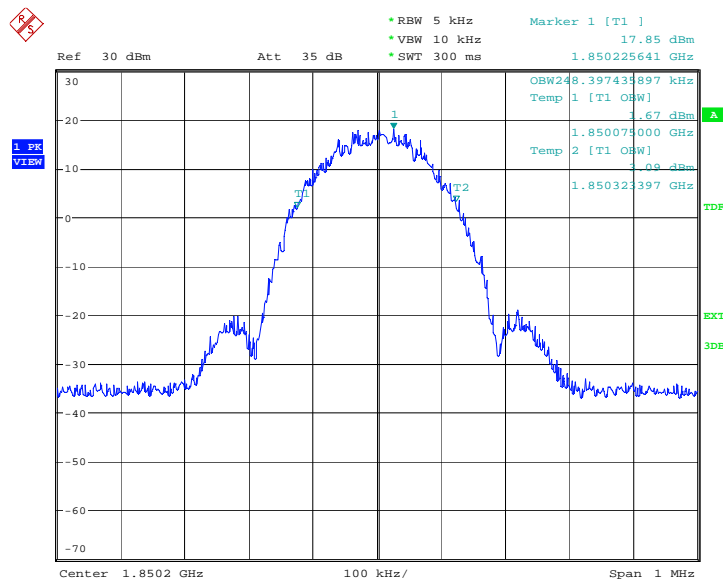
Date: 12.DEC.2011 07:10:08

Channel 661-Occupied Bandwidth (-20dBc BW)

Date: 12.DEC.2011 07:10:41
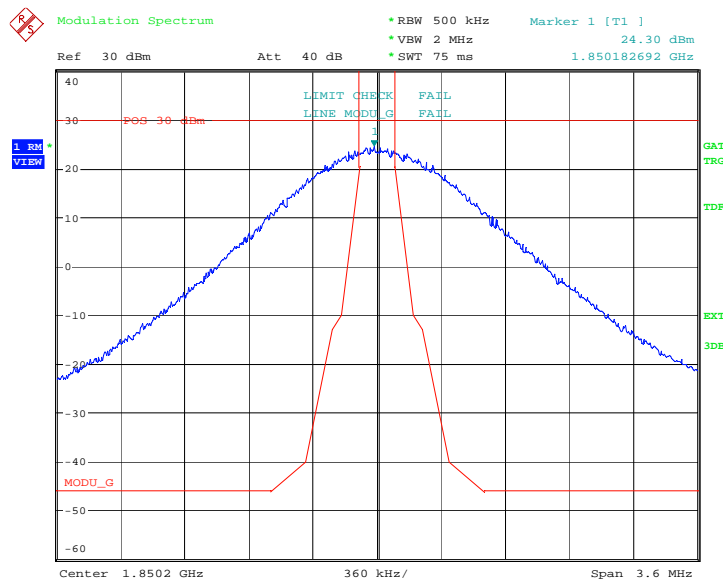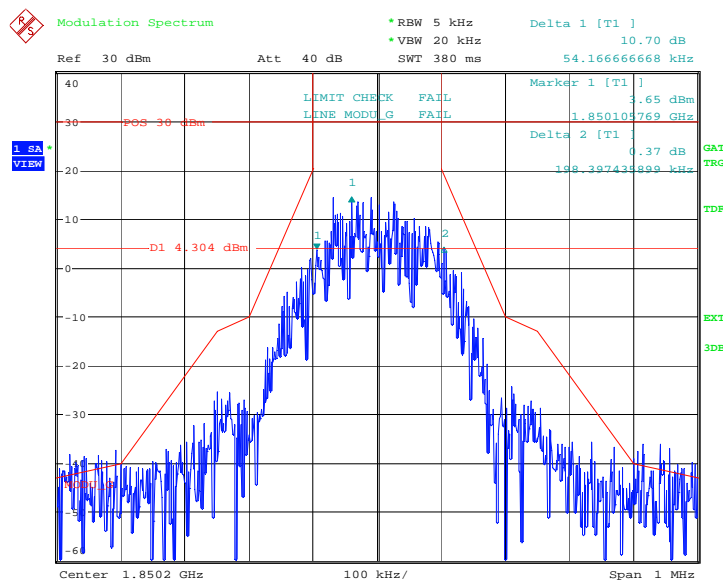
Channel 810-Occupied Bandwidth (-20dBc BW)


```
                                              * RBW  5 kHz        Marker 1 [T1 ]
                                              * VBW  10 kHz                 18.52 dBm
        Ref   30 dBm          Att   35 dB     * SWT  300 ms         1.909785577 GHz

  30                                          OBW245.192307692 kHz
                                              Temp 1 [T1 OBW]
   20                                   1              3.45 dBm        A
                                                       1.909676603 GHz
   10                                         Temp 2 [T1 OBW]
                                                       3.42 dBm
    0                                                  1.909921795 GHz   TDF

  -10

  -20                                                                    EXT

  -30                                                                    3DB

  -40

  -50

  -60

  -70
        Center  1.9098 GHz        100 kHz/              Span  1 MHz
```

Date: 12.DEC.2011 07:11:13

EGPRS 1900(-20dBc)-IC

Frequency(MHz)	Occupied Bandwidth (-20dBc BW)(kHz)
1850.2	94.166
1880.0	81.089
1909.8	118.269

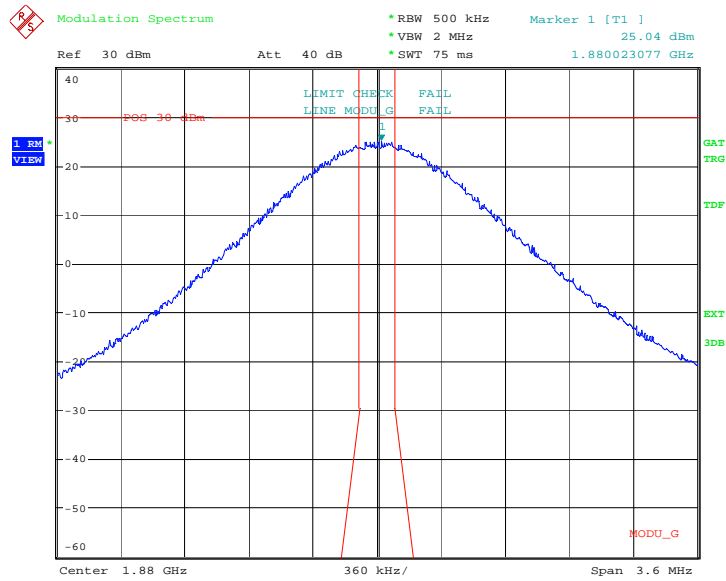**EGPRS 1900**
Channel 512-Occupied Reference Level

Date: 12.DEC.2011 07:18:48
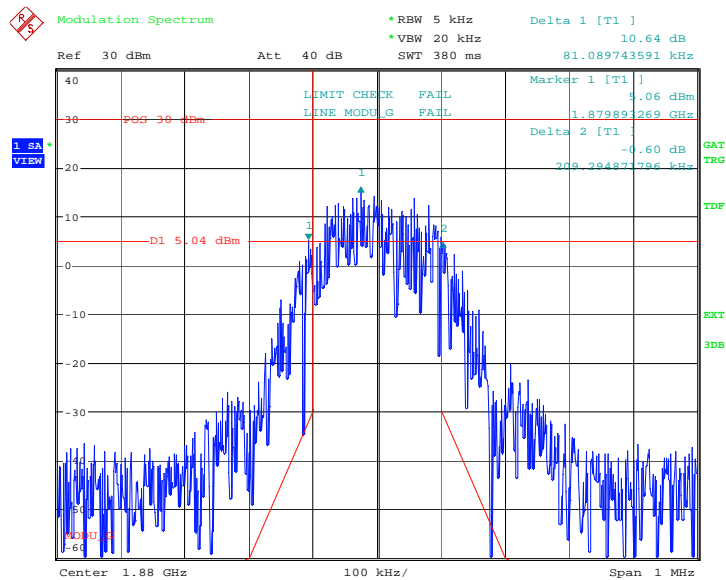
Channel 512-Occupied Bandwidth (-20dBc BW)

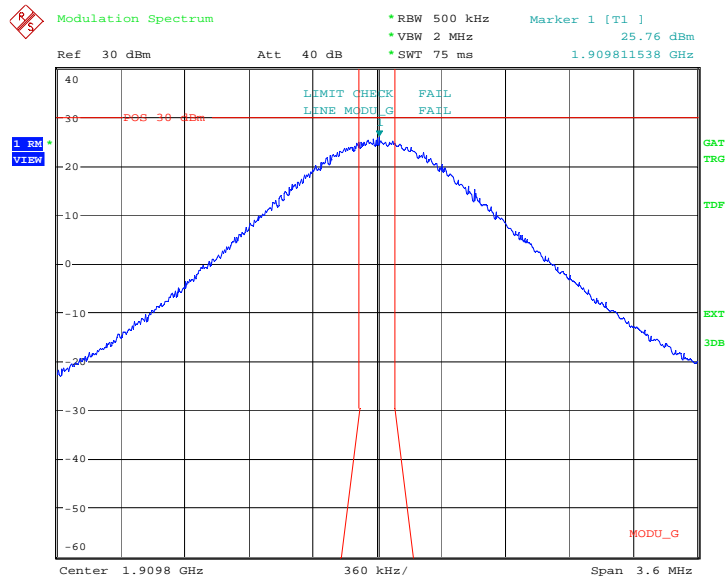Date: 12.DEC.2011 07:19:42

Channel 661-Occupied Reference Level

```
R&S   Modulation Spectrum          *RBW 500 kHz      Marker 1 [T1 ]
                                   *VBW 2 MHz                   25.04 dBm
      Ref  30 dBm        Att  40 dB  *SWT 75 ms       1.880023077 GHz

  40
                             LIMIT CHECK    FAIL
  30    POS 30 dBm           LINE MODU_G    FAIL
1 RM
VIEW                                                              GAT
  20                                                              TRG

  10                                                              TDF

   0

 -10                                                              EXT
                                                                  3DB
 -20

 -30

 -40

 -50

 -60                                              MODU_G

  Center  1.88 GHz              360 kHz/           Span  3.6 MHz
```

Date: 12.DEC.2011 07:20:53

Channel 661-Occupied Bandwidth (-20dBc BW)

```
R&S   Modulation Spectrum          *RBW 5 kHz       Delta 1 [T1 ]
                                   *VBW 20 kHz                 10.64 dB
      Ref  30 dBm        Att  40 dB  SWT 380 ms      81.089743591 kHz

  40
                             LIMIT CHECK    FAIL      Marker 1 [T1 ]
  30    POS 30 dBm           LINE MODU_G    FAIL                 9.06 dBm
1 SA                                                 1.879893269 GHz
VIEW                                                 Delta 2 [T1 ]
  20                                                          -0.60 dB
                                1                     209.294871796 kHz  GAT
                                                                  TRG
  10
                                                                  TDF
   0                                                              
 -D1 5.04 dBm
 -10                                                              EXT
                                                                  3DB
 -20

 -30

 -40

 -50
  MODU_G
 -60

  Center  1.88 GHz              100 kHz/           Span  1 MHz
```

Date: 12.DEC.2011 07:21:54

Channel 810-Occupied Reference Level

Date: 12.DEC.2011 07:23:05

Channel 810-Occupied Bandwidth (-20dBc BW)
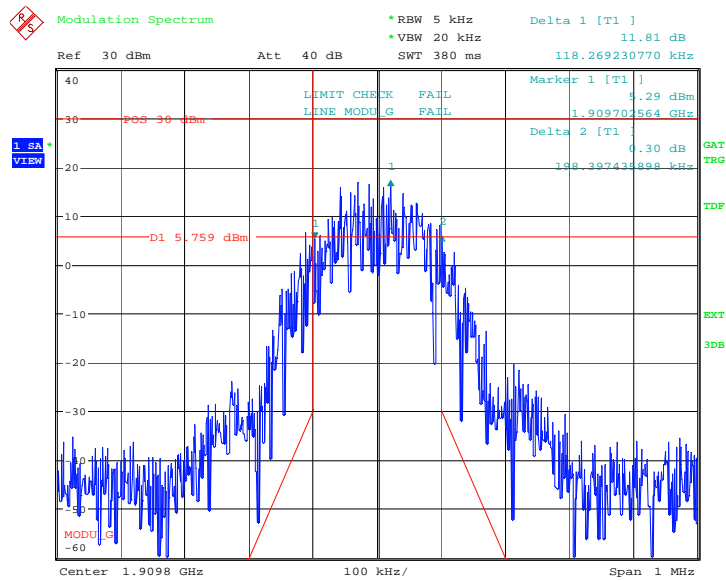
Date: 12.DEC.2011 07:24:46

A.6 EMISSION BANDWIDTH   (§22.917(b)/§24.238(b))

A.6.1Emission Bandwidth Results

Similar to conducted emissions; Emission bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of PCS1900 band and GSM850 band. Table below lists the measured -26dBc BW. Spectrum analyzer plots are included on the following pages.

GSM 850(-26dBc)

Frequency(MHz)	Occupied Bandwidth (–26dBc BW)(kHz)
824.2	304.487
836.6	309.294
848.8	307.692

GSM 850
Channel 128-Occupied Bandwidth (-26dBc BW)
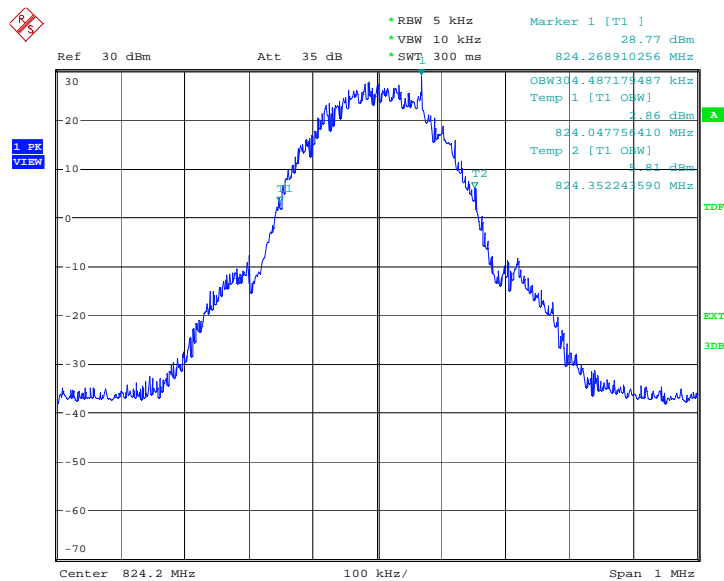
Date: 5.DEC.2011 07:20:37

Channel 190-Occupied Bandwidth (-26dBc BW)
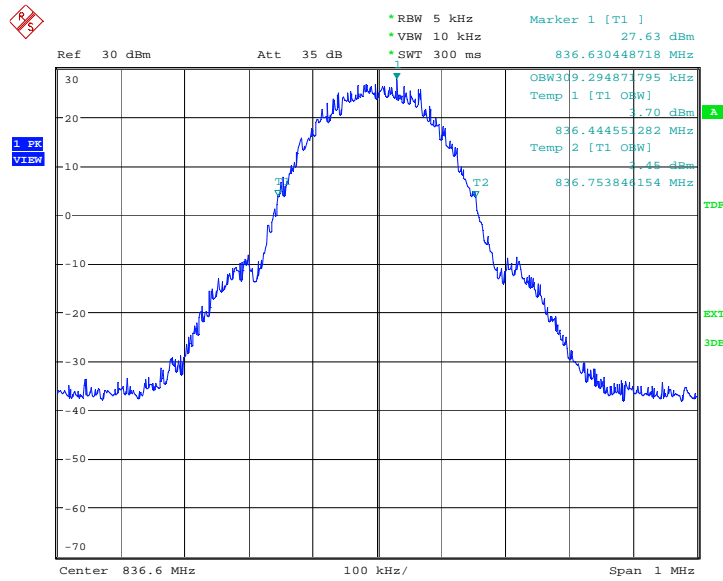
Date: 5.DEC.2011 07:21:09

Channel 251-Occupied Bandwidth (-26dBc BW)
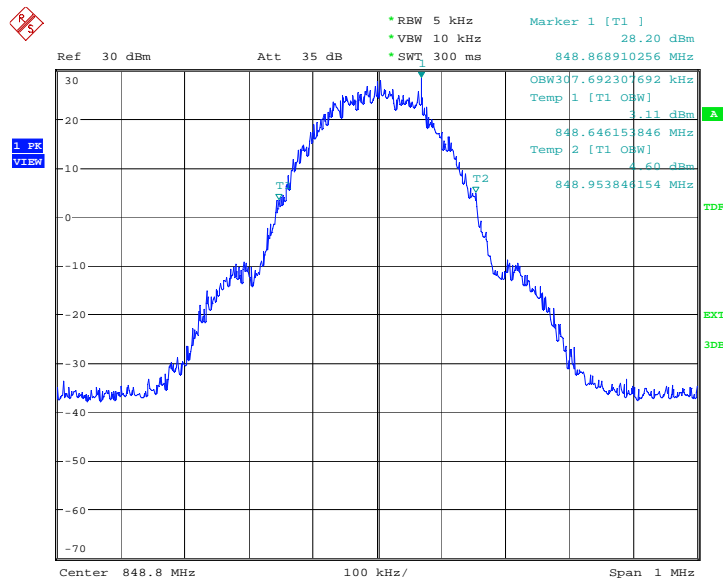
Date: 5.DEC.2011 07:21:41

GSM 850(-26dBc)-IC

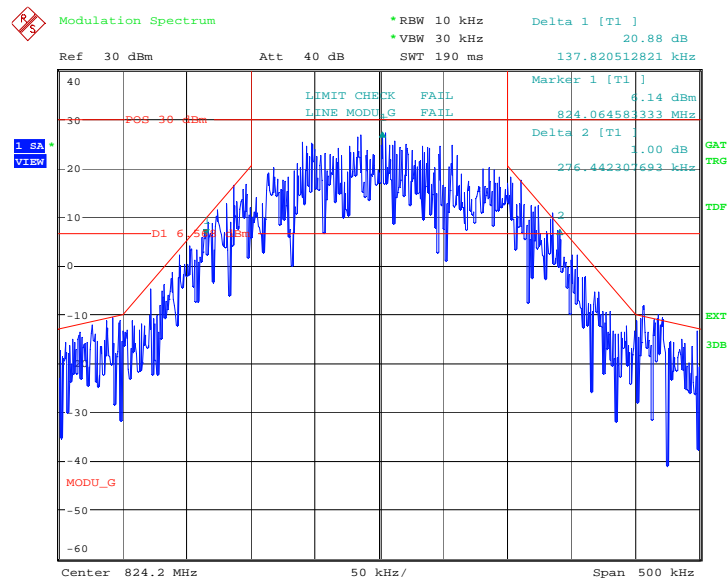| Frequency(MHz)	Occupied Bandwidth (–26dBc BW)(kHz)
824.2	115.384
836.6	116.185
848.8	125.000

GSM 850

Channel 128-Occupied Bandwidth Reference Level
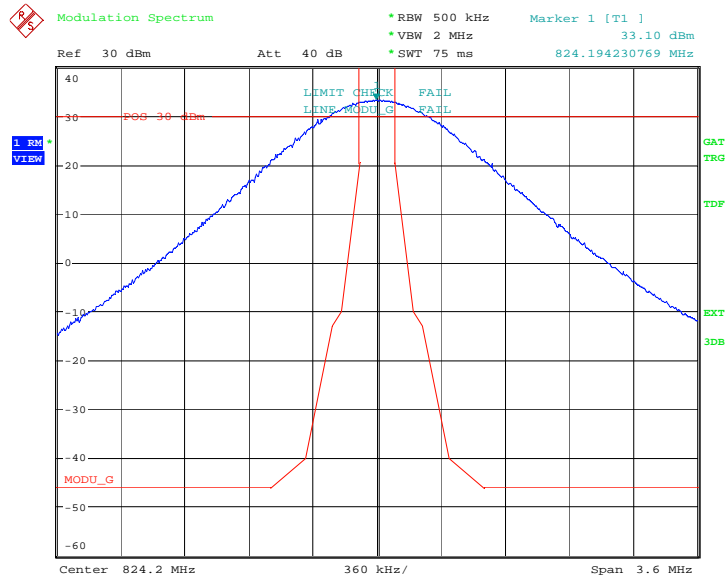
Date: 6.DEC.2011 23:31:36

Channel 128-Occupied Bandwidth (-26dBc BW)
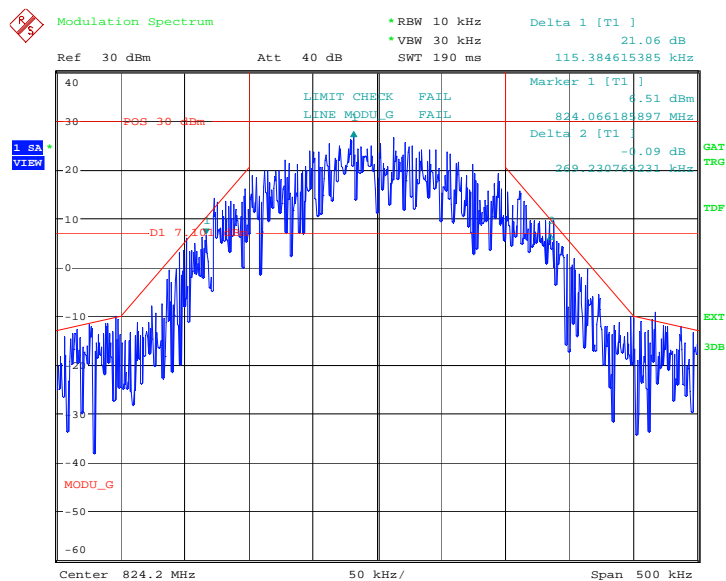
Date: 6.DEC.2011 23:33:27

Channel 190-Occupied Bandwidth Reference Level

```
R&S    Modulation Spectrum          * RBW  500 kHz      Marker 1 [T1 ]
                                     * VBW  2 MHz                  32.79 dBm
       Ref  30 dBm          Att  40 dB    * SWT 75 ms       836.594230769 MHz

       40
                                LIMIT CHECK   FAIL
       30  POS 30 dBm           LINE MODU_G   FAIL
1 RM                                                                  GAT
VIEW                                                                  TRG
       20
                                                                     TDF
       10

        0

      -10                                                            EXT

      -20                                                            3DB

      -30

      -40

      -50
                                                              MODU_G
      -60
       Center  836.6 MHz          360 kHz/           Span  3.6 MHz
```

Date: 6.DEC.2011 23:33:42

Channel 190-Occupied Bandwidth (-26dBc BW)

```
R&S    Modulation Spectrum          * RBW  10 kHz      Delta 1 [T1 ]
                                     * VBW  30 kHz                20.60 dB
       Ref  30 dBm          Att  40 dB    SWT 190 ms        116.185897436 kHz

       40
                                LIMIT CHECK   FAIL     Marker 1 [T1 ]
       30  POS 30 dBm           LINE MODU_G   FAIL                6.19 dBm
1 SA                                                   836.458974359 MHz
VIEW                                                   Delta 2 [T1 ]
       20                                                        -0.45 dB    GAT
                                                       278.044871796 kHz     TRG
       10  D1 6.19 dBm                                                TDF

        0

      -10                                                            EXT

                                                                     3DB
      -20

      -30

      -40

      -50
       MODU_G
      -60
       Center  836.6 MHz           50 kHz/            Span  500 kHz
```

Date: 6.DEC.2011 23:35:07

Channel 251-Occupied Bandwidth Reference Level

Modulation Spectrum
* RBW 500 kHz
* VBW 2 MHz
* SWT 75 ms

Ref 30 dBm   Att 40 dB

Marker 1 [T1]
32.60 dBm
848.794230769 MHz

LIMIT CHECK   FAIL
LINE MODU_G   FAIL

POS 30 dBm

1 RM VIEW

MODU_G

Center 848.8 MHz   360 kHz/   Span 3.6 MHz

Date: 6.DEC.2011 23:35:21

Channel 251-Occupied Bandwidth (-26dBc BW)

Modulation Spectrum
* RBW 10 kHz
* VBW 30 kHz
SWT 190 ms

Ref 30 dBm   Att 40 dB

Delta 1 [T1]
19.64 dB
125.000000000 kHz

LIMIT CHECK   FAIL
LINE MODU_G   FAIL

Marker 1 [T1]
6.18 dBm
848.659775641 MHz

Delta 2 [T1]
0.57 dB
274.038461538 kHz

POS 30 dBm

1 SA VIEW

D1 6.dBm

MODU_G

Center 848.8 MHz   50 kHz/   Span 500 kHz

Date: 6.DEC.2011 23:39:13

GPRS 850(-26dBc)

Frequency(MHz)	Occupied Bandwidth (–26dBc BW)(kHz)
824.2	307.692
836.6	307.692
848.8	309.294

GPRS 850

Channel 128-Occupied Bandwidth (-26dBc BW)
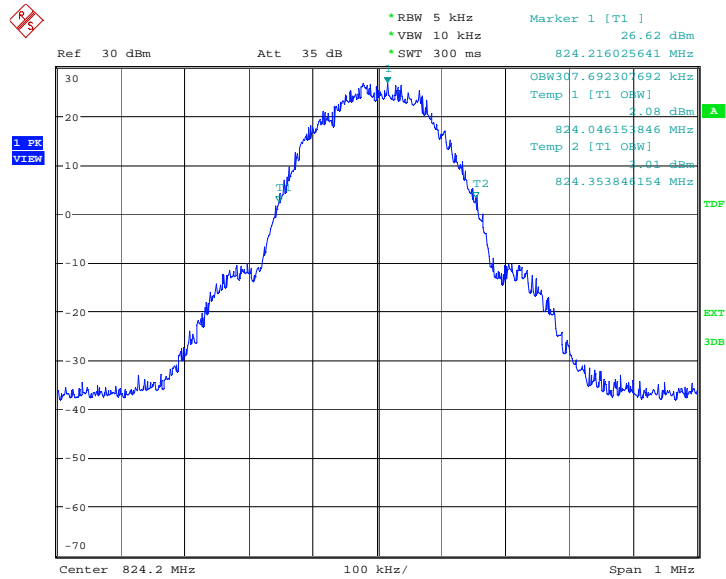
Date: 12.DEC.2011 06:54:25

Channel 190-Occupied Bandwidth (-26dBc BW)
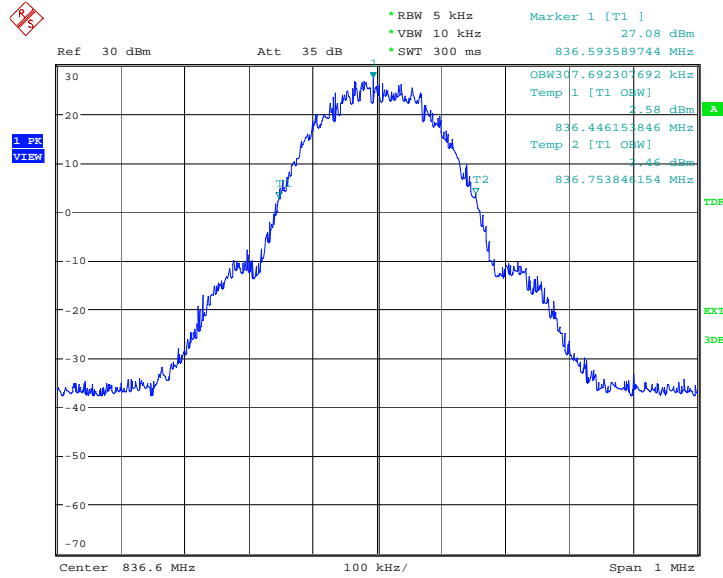
Date: 12.DEC.2011 06:54:57

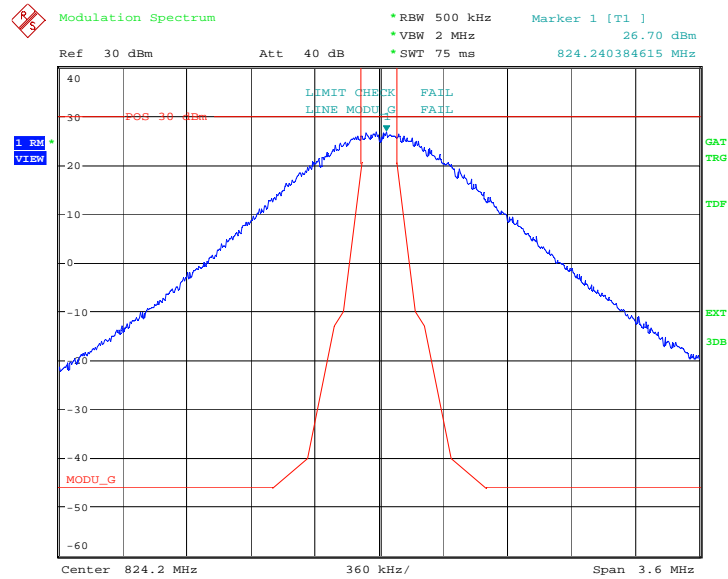## Channel 251-Occupied Bandwidth (-26dBc BW)

Date: 12.DEC.2011 06:55:29
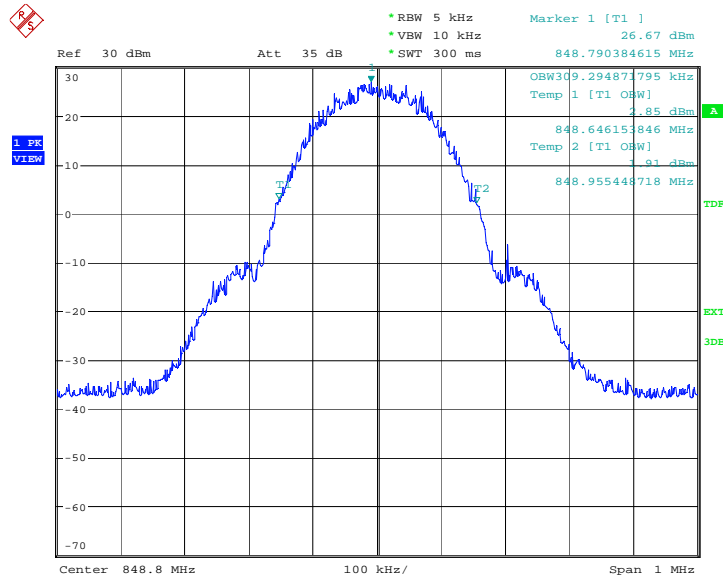
GPRS 850(-26dBc)-IC

Frequency(MHz)	Occupied Bandwidth (–26dBc BW)(kHz)
824.2	137.820
836.6	129.807
848.8	102.564

GPRS 850

Channel 128-Occupied Bandwidth Reference Level
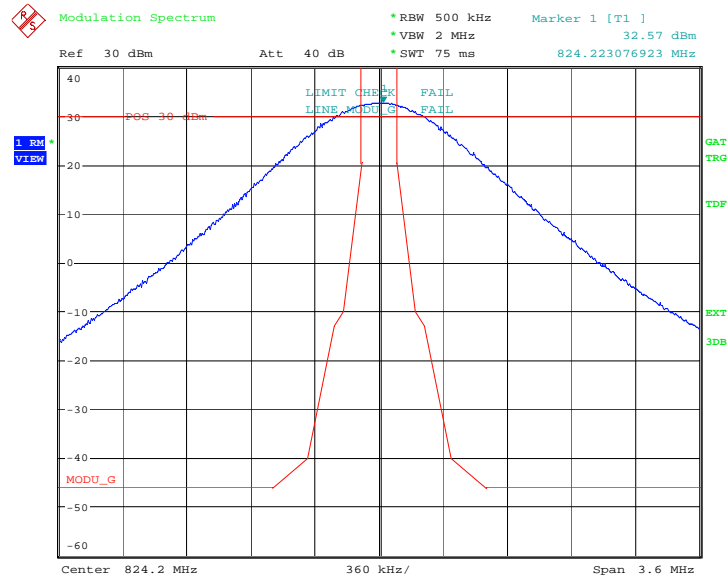
Date: 12.DEC.2011 07:43:42

Channel 128-Occupied Bandwidth (-26dBc BW)

Date: 12.DEC.2011 07:44:58

Channel 190-Occupied Bandwidth (-20dBc BW)
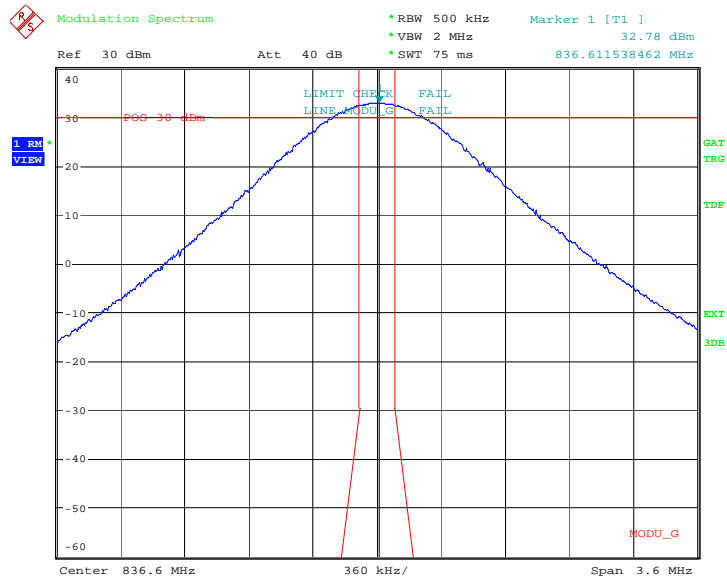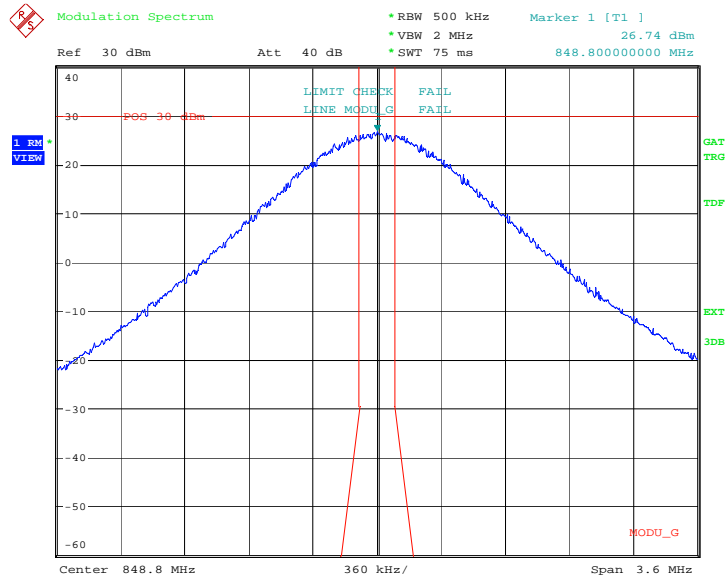

Date: 12.DEC.2011 07:45:12

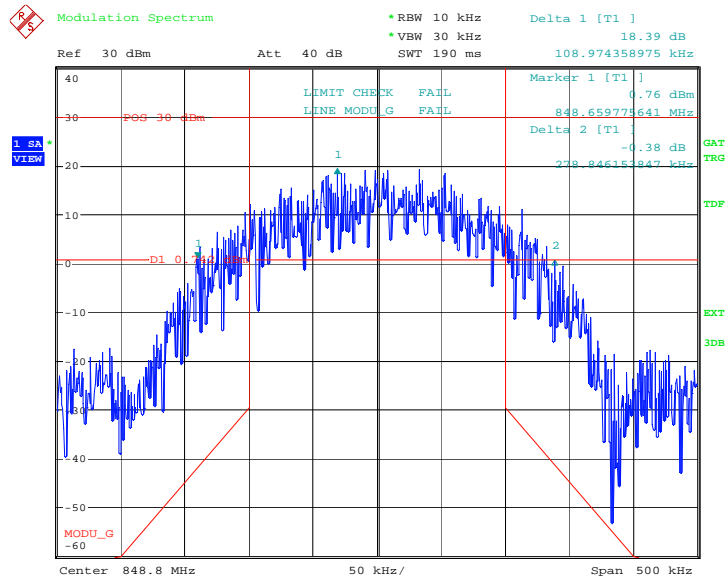## Channel 190-Occupied Bandwidth (-20dBc BW)
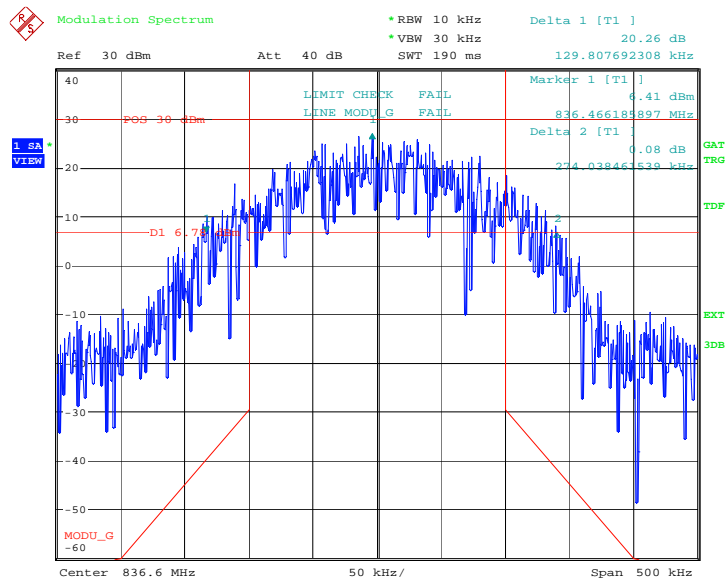
Date: 12.DEC.2011 07:47:17

Channel 251-Occupied Bandwidth Reference Level
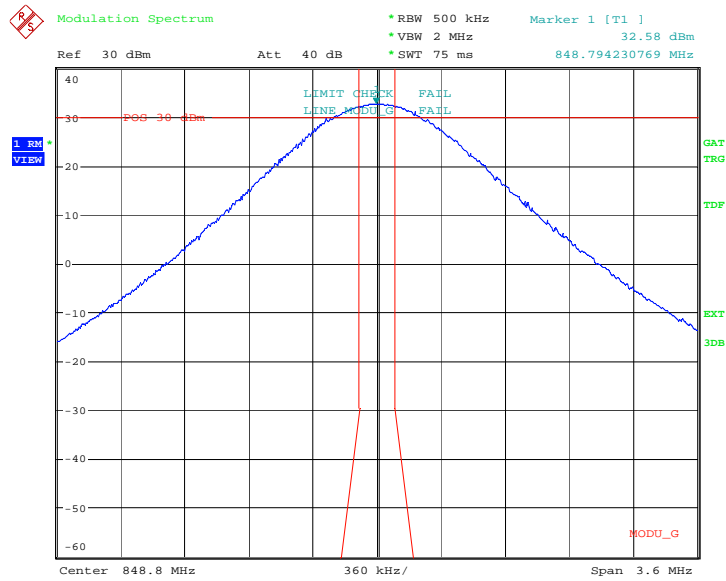
Date: 12.DEC.2011 07:47:31
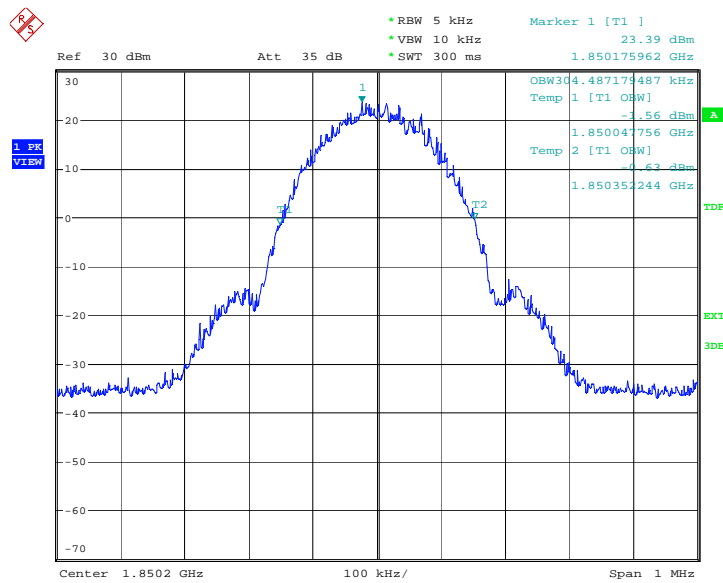
Channel 251-Occupied Bandwidth (-26dBc BW)
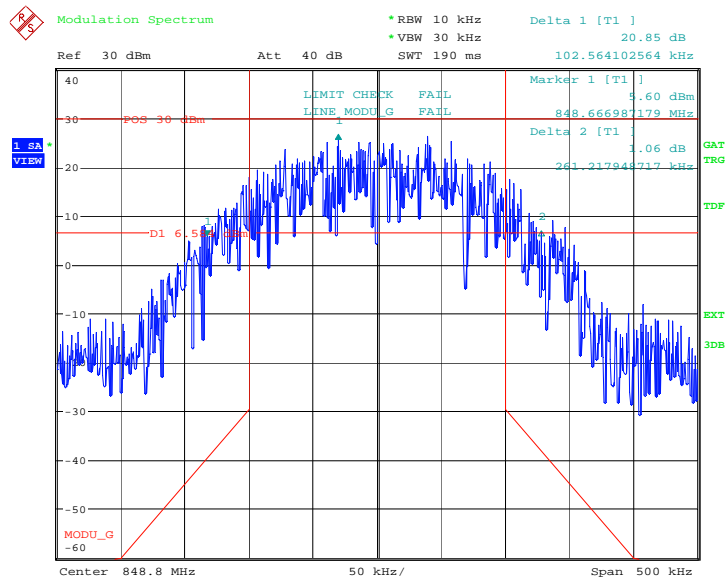
Date: 12.DEC.2011 07:49:10

EGPRS 850(-26dBc)

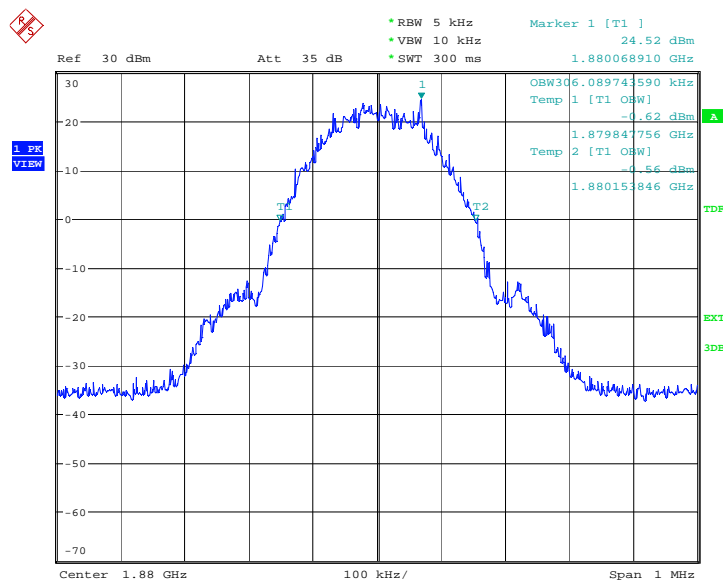| Frequency(MHz)	Occupied Bandwidth (–26dBc BW)(kHz)
824.2	298.076
836.6	301.282
848.8	299.679

EGPRS 850

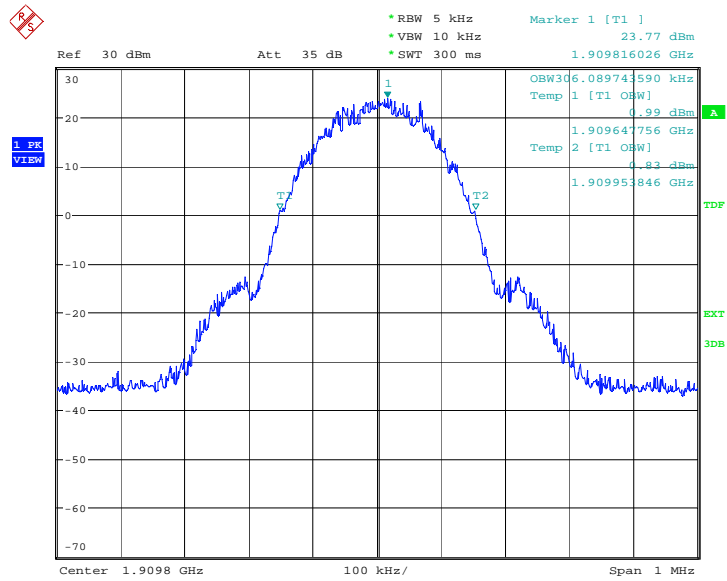**Channel 128-Occupied Bandwidth (-26dBc BW)**
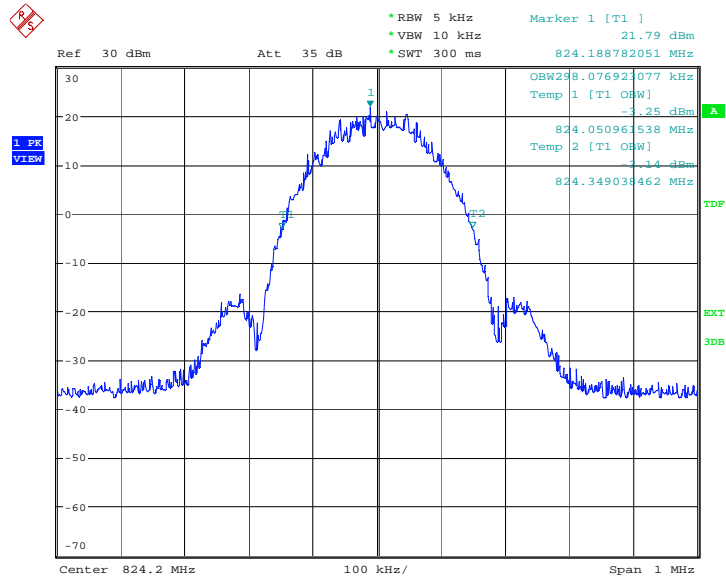
Date: 12.DEC.2011 07:01:41

Channel 190-Occupied Bandwidth (-26dBc BW)
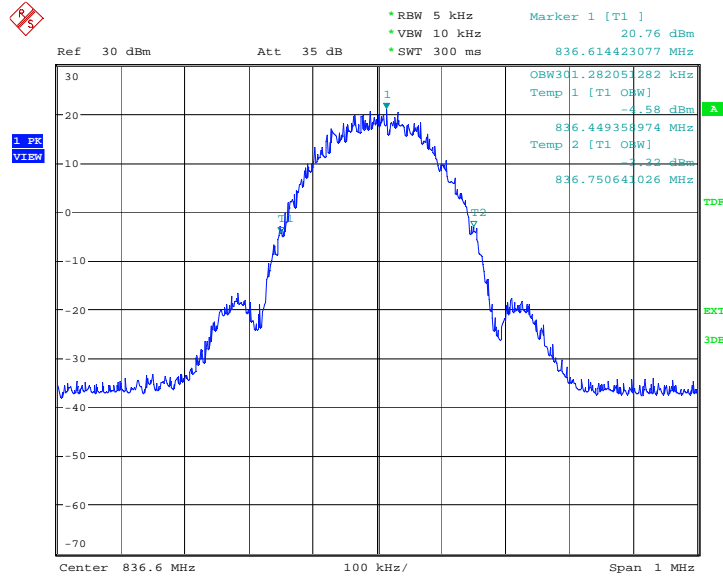
Date: 12.DEC.2011 07:02:14

Channel 251-Occupied Bandwidth (-26dBc BW)
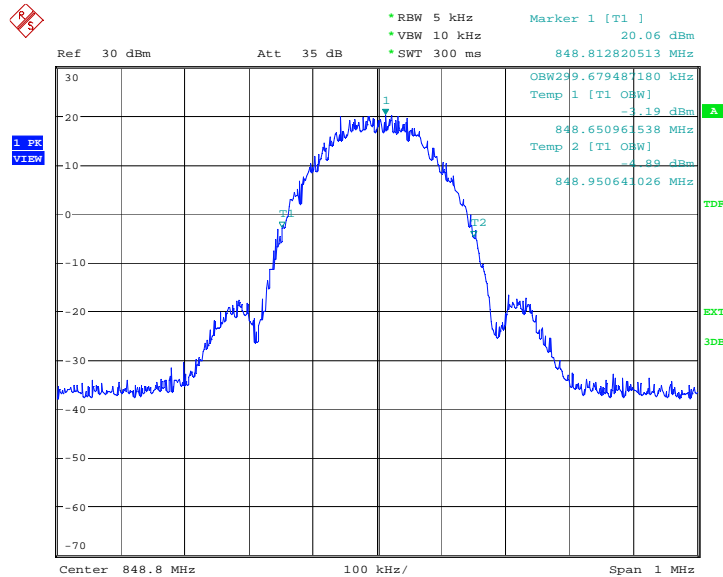
Date: 12.DEC.2011 07:02:46

EGPRS 850(-26dBc)-IC

Frequency(MHz)	Occupied Bandwidth (–26dBc BW)(kHz)
824.2	122.596
836.6	103.365
848.8	108.974

EGPRS 850

Channel 128-Occupied Reference level

Date: 12.DEC.2011 07:30:07

Channel 128-Occupied Bandwidth (-26dBc BW)
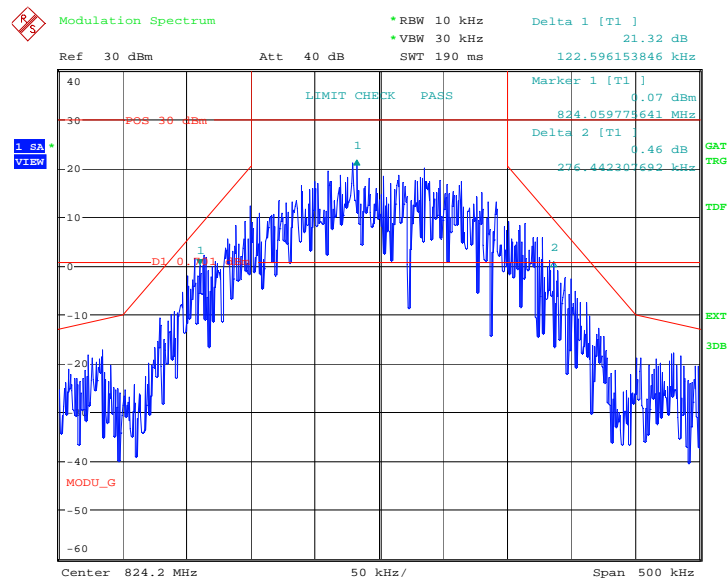
Date: 12.DEC.2011 07:31:47

Channel 190-Occupied Bandwidth Reference level

```
R&S   Modulation Spectrum              * RBW 500 kHz    Marker 1 [T1 ]
                                       * VBW 2 MHz            26.83 dBm
      Ref  30 dBm          Att  40 dB  * SWT 75 ms       836.513461538 MHz
```

LIMIT CHECK   FAIL
LINE MODU_G   FAIL

POS 30 dBm

```
Center  836.6 MHz         360 kHz/              Span  3.6 MHz
```

MODU_G

Date: 12.DEC.2011 07:32:01

Channel 190-Occupied Bandwidth (-26dBc BW)

```
R&S   Modulation Spectrum              * RBW 10 kHz     Delta 1 [T1 ]
                                       * VBW 30 kHz           19.34 dB
      Ref  30 dBm          Att  40 dB    SWT 190 ms     103.365384616 kHz
```

Marker 1 [T1]
0.31 dBm
836.461378205 MHz

LIMIT CHECK   FAIL
LINE MODU_G   FAIL

Delta 2 [T1]
1.21 dB
276.442307692 kHz

POS 30 dBm

D1 0.8

MODU_G

```
Center  836.6 MHz         50 kHz/               Span  500 kHz
```
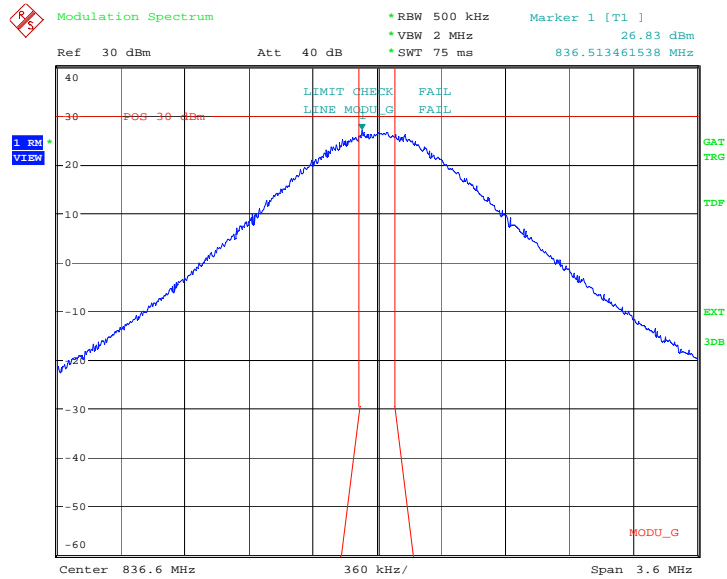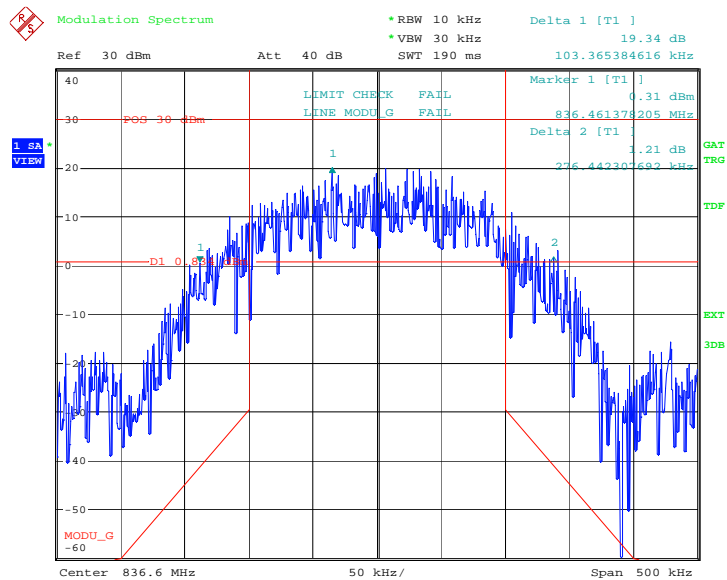
Date: 12.DEC.2011 07:33:25

Channel 251-Occupied Bandwidth Reference Level


```
R&S    Modulation Spectrum              * RBW  500 kHz      Marker 1 [T1 ]
                                        * VBW  2 MHz                   26.74 dBm
       Ref  30 dBm           Att  40 dB * SWT  75 ms          848.800000000 MHz
        40
                                        LIMIT CHECK    FAIL
        30   POS 30 dBm                 LINE MODU_G    FAIL                  GAT
1 RM                                                                        TRG
VIEW    20
                                                                            TDF
        10
         0
       -10                                                                  EXT
                                                                            3DB
       -20
       -30
       -40
       -50
                                                                     MODU_G
       -60
       Center  848.8 MHz            360 kHz/              Span  3.6 MHz
```

Date: 12.DEC.2011 07:33:39

Channel 251-Occupied Bandwidth (-26dBc BW)


```
R&S    Modulation Spectrum              * RBW  10 kHz      Delta 1 [T1 ]
                                        * VBW  30 kHz                   18.39 dB
       Ref  30 dBm           Att  40 dB   SWT  190 ms       108.974358975 kHz
        40
                                        LIMIT CHECK    FAIL  Marker 1 [T1 ]
        30   POS 30 dBm                 LINE MODU_G    FAIL          0.76 dBm
                                                            848.659775641 MHz
1 SA                                                        Delta 2 [T1 ]
VIEW    20                          1                            -0.38 dB      GAT
                                                            279.846153847 kHz  TRG
        10
                                                                            TDF
         0   D1 0                              2
       -10                                                                  EXT
                                                                            3DB
       -20
       -30
       -40
       -50
       MODU_G
       -60
       Center  848.8 MHz            50 kHz/               Span  500 kHz
```

Date: 12.DEC.2011 07:35:17

PCS 1900(-26dBc)

Frequency(MHz)	Occupied Bandwidth (–26dBc BW)(kHz)
1850.2	304.487
1880.0	306.089
1909.8	306.089

PCS 1900

Channel 512-Occupied Bandwidth (-26dBc BW)

Date: 6.DEC.2011 07:20:19

Channel 661-Occupied Bandwidth (-26dBc BW)

Date: 6.DEC.2011 07:20:51
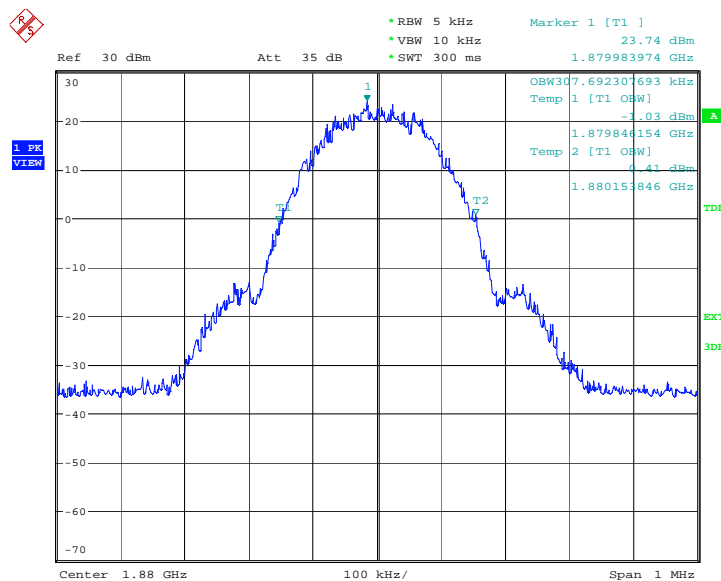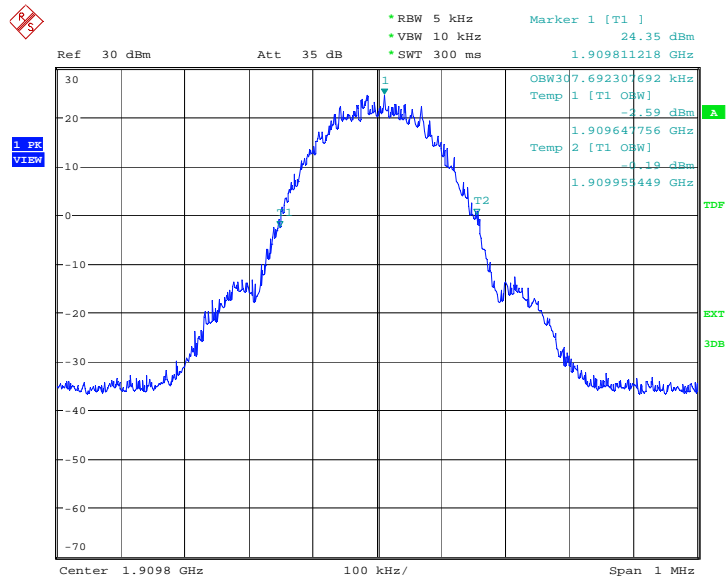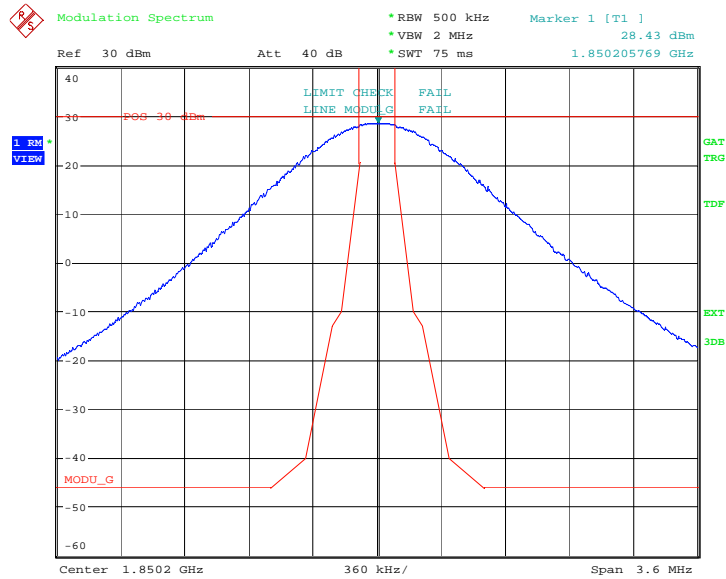
Channel 810-Occupied Bandwidth (-26dBc BW)


```
                                    * RBW  5 kHz        Marker 1 [T1 ]
                                    * VBW  10 kHz                    23.77 dBm
        Ref  30 dBm        Att  35 dB    * SWT 300 ms        1.909816026 GHz
```

Date: 6.DEC.2011 07:21:23

PCS 1900(-26dBc)-IC

Frequency(MHz)	Occupied Bandwidth (−26dBc BW)(kHz)
1850.2	149.038
1880.0	145.833
1909.8	119.871

PCS 1900

Channel 512-Occupied Bandwidth Reference Level
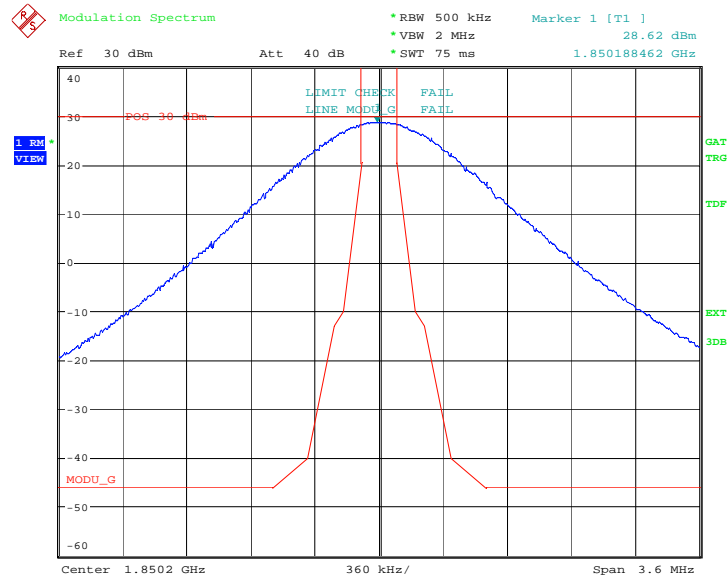
Date: 6.DEC.2011 08:06:35

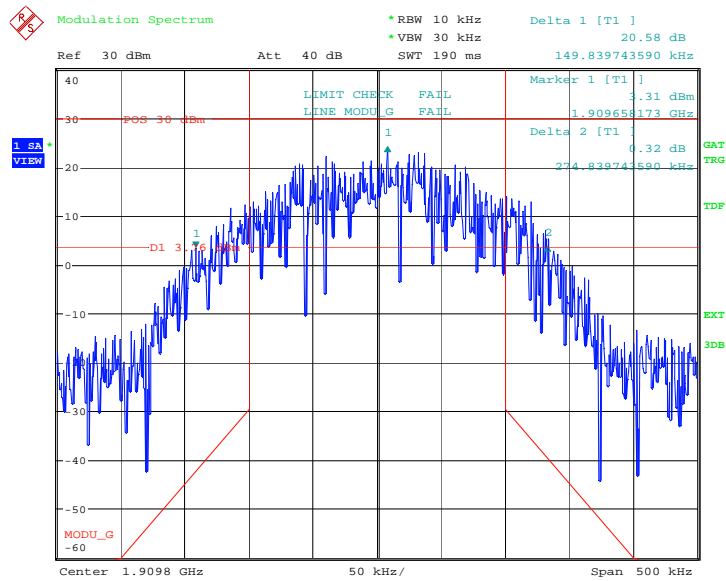**Channel 512-Occupied Bandwidth (-26dBc BW)**
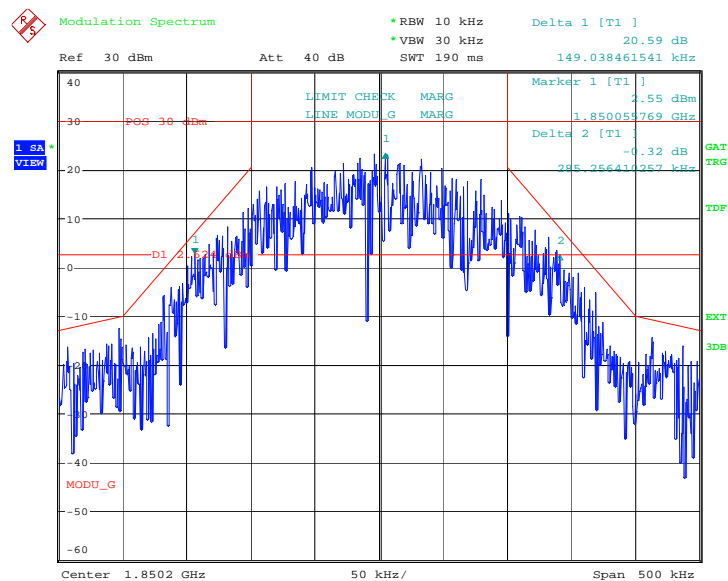
Date: 6.DEC.2011 08:14:41

Channel 661-Occupied Reference Level
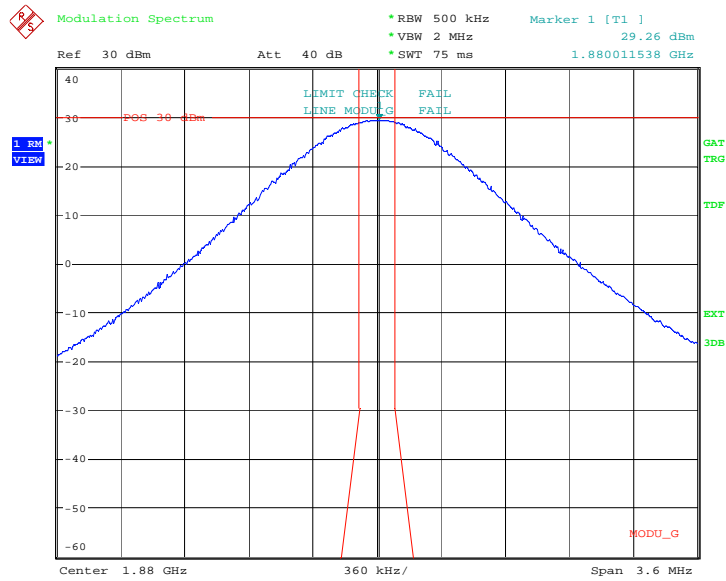
Date: 6.DEC.2011 08:14:55

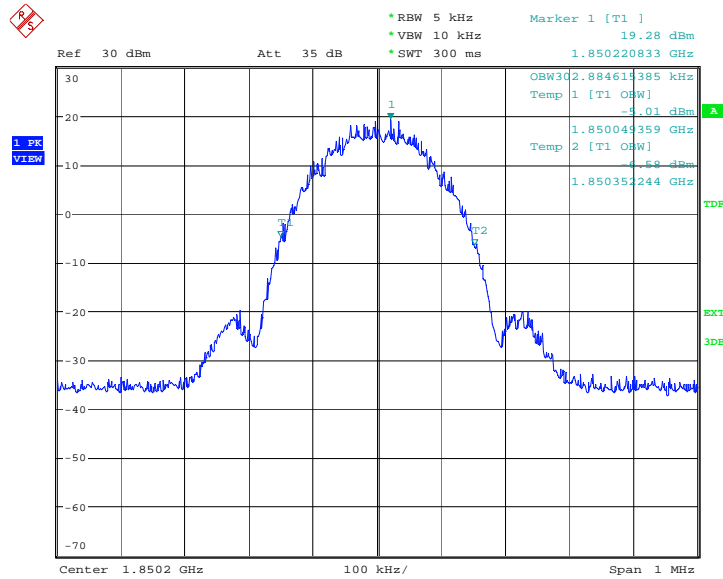## Channel 661-Occupied Bandwidth (-26dBc BW)
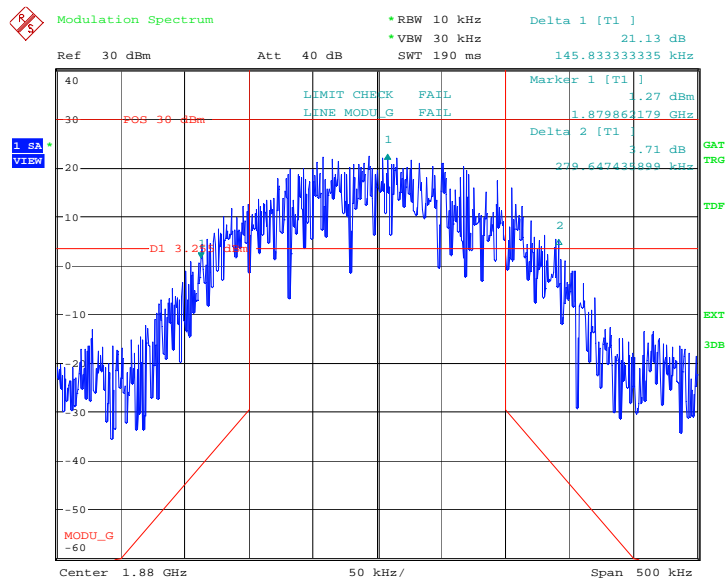
Date: 6.DEC.2011 08:28:40

Channel 810-Occupied Bandwidth Reference Level
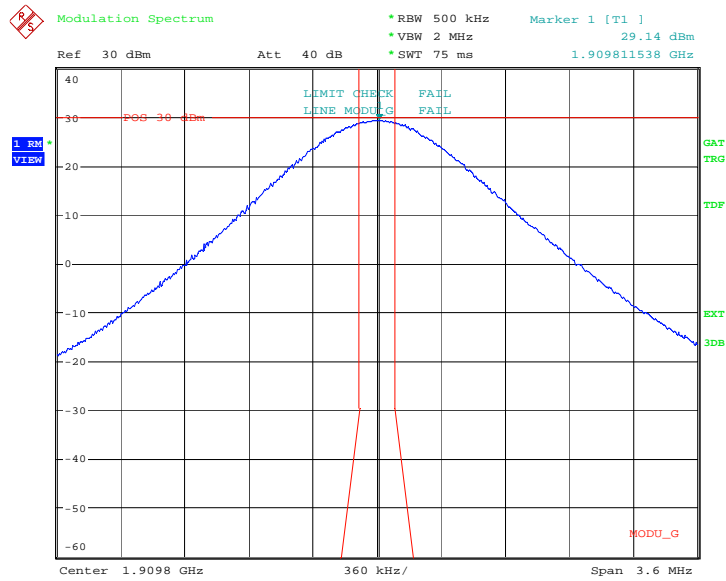
Date: 6.DEC.2011 08:28:54

Channel 810-Occupied Bandwidth (-26dBc BW)
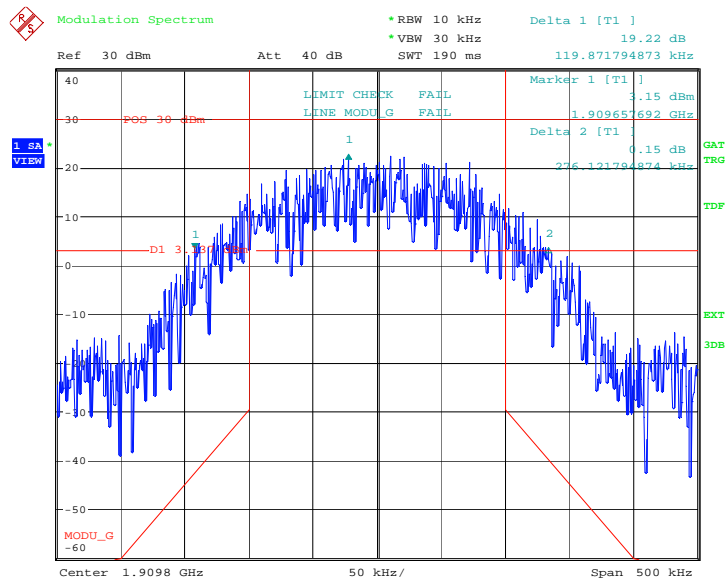
Date: 6.DEC.2011 08:32:44

GPRS 1900(-26dBc)

Frequency(MHz)	Occupied Bandwidth (–26dBc BW)(kHz)
1850.2	306.089
1880.0	307.692
1909.8	307.692

GPRS 1900
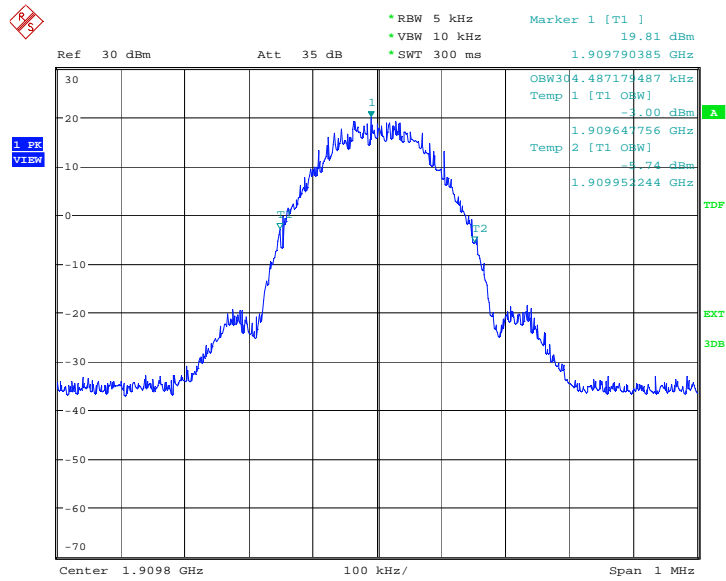
Channel 512-Occupied Bandwidth (-26dBc BW)
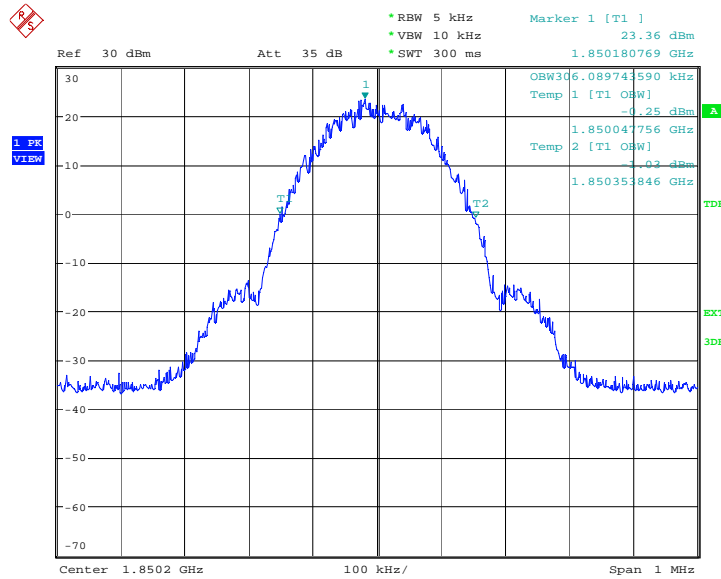
Date: 12.DEC.2011 07:06:39

Channel 661-Occupied Bandwidth (-26dBc BW)

Date: 12.DEC.2011 07:07:11
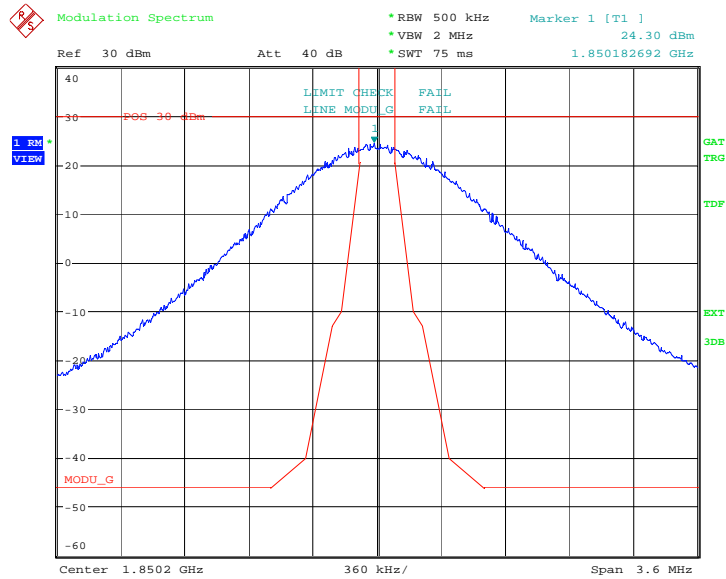
Channel 810-Occupied Bandwidth (-26dBc BW)


```
                                    * RBW  5 kHz        Marker 1 [T1 ]
                                    * VBW  10 kHz                    24.35 dBm
     Ref  30 dBm          Att  35 dB  * SWT 300 ms          1.909811218 GHz

     30                                        1      OBW307.692307692 kHz
                                                       Temp 1 [T1 OBW]
     20                                                           -2.59 dBm     A
1 PK                                                    1.909647756 GHz
VIEW 10                                                 Temp 2 [T1 OBW]
                                                                  -0.19 dBm
      0                                          T2     1.909955449 GHz         TDF

    -10

    -20                                                                         EXT

    -30                                                                         3DB

    -40

    -50

    -60

    -70
     Center  1.9098 GHz          100 kHz/              Span  1 MHz
```

Date: 12.DEC.2011 07:07:43

GPRS 1900(-26dBc)-IC

| Frequency(MHz)	Occupied Bandwidth (–26dBc BW)(kHz)
1850.2	118.589
1880.0	80.929
1909.8	149.839

GPRS 1900

Channel 512-Occupied Bandwidth Reference Level

Date: 12.DEC.2011 07:36:46

Channel 512-Occupied Bandwidth -26dBc BW)
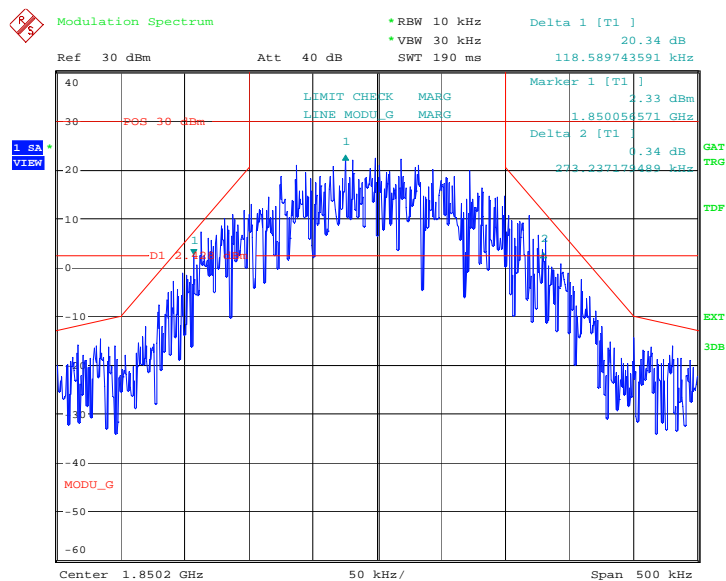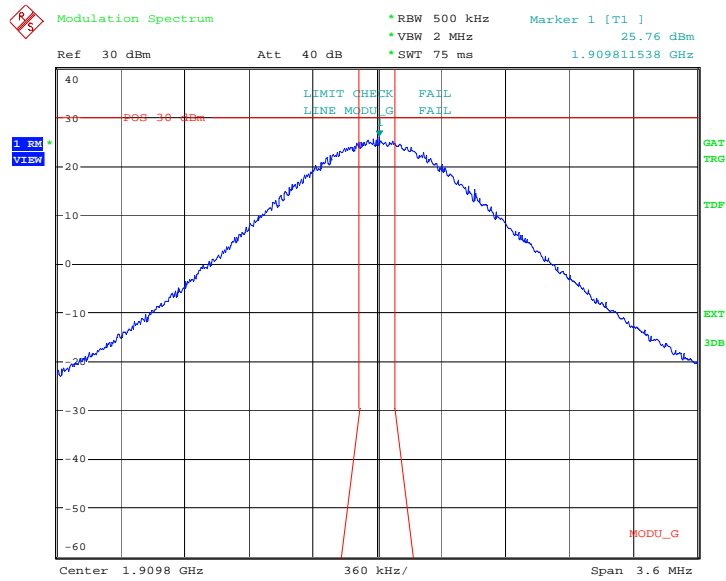

Date: 12.DEC.2011 07:38:06

Channel 661-Occupied Bandwidth Reference Level
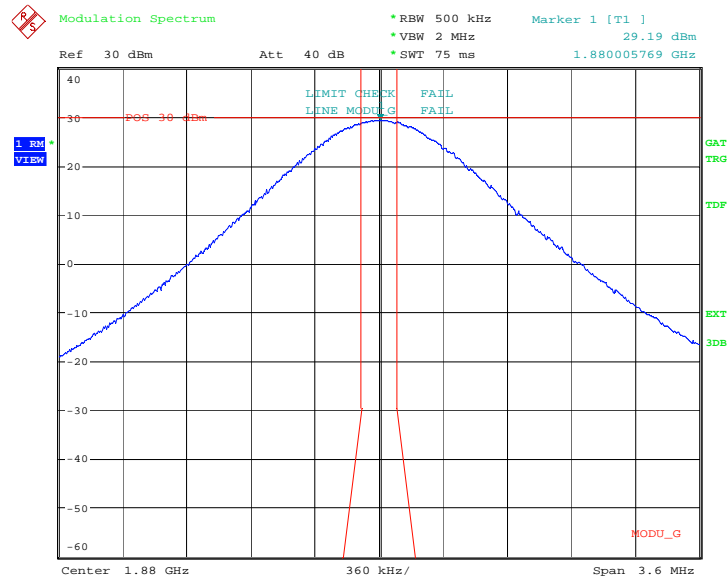
Date: 12.DEC.2011 07:38:20

Channel 661-Occupied Bandwidth (-26dBc BW)
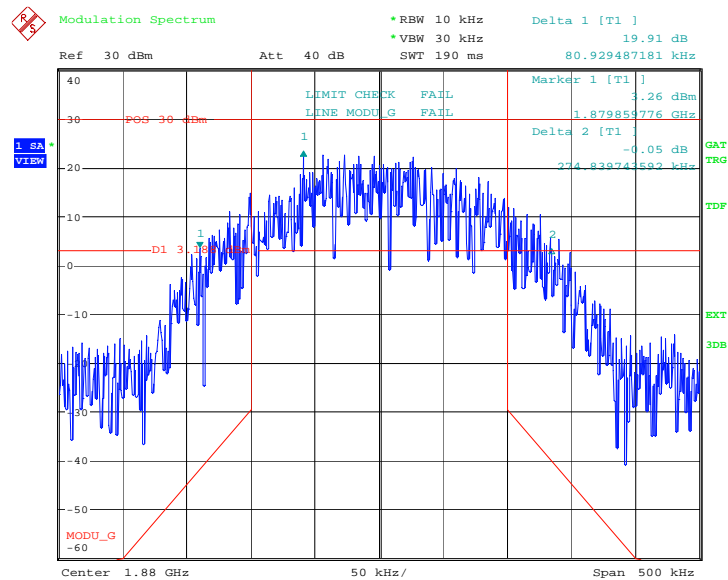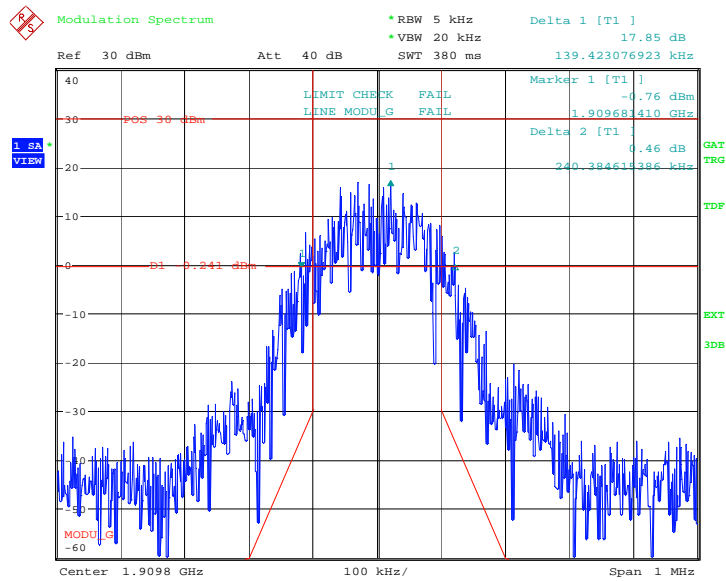

Date: 12.DEC.2011 07:40:06

Channel 810-Occupied Reference Level
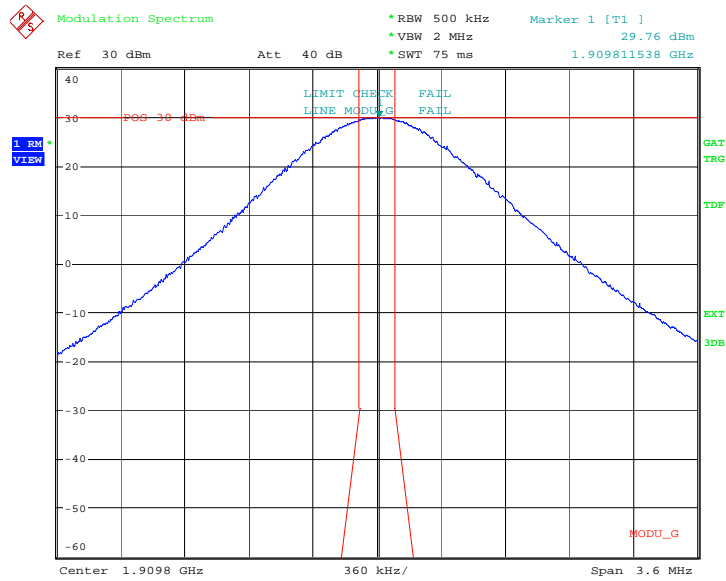
Date: 12.DEC.2011 07:40:20

Channel 810-Occupied Bandwidth (-26dBc BW)

Date: 12.DEC.2011 07:42:00

EGPRS 1900(-26dBc)

Frequency(MHz)	Occupied Bandwidth (–26dBc BW)(kHz)
1850.2	302.884
1880.0	304.487
1909.8	304.487

EGPRS 1900

Channel 512-Occupied Bandwidth (-26dBc BW)

Date: 12.DEC.2011 07:11:47

Channel 661-Occupied Bandwidth (-26dBc BW)
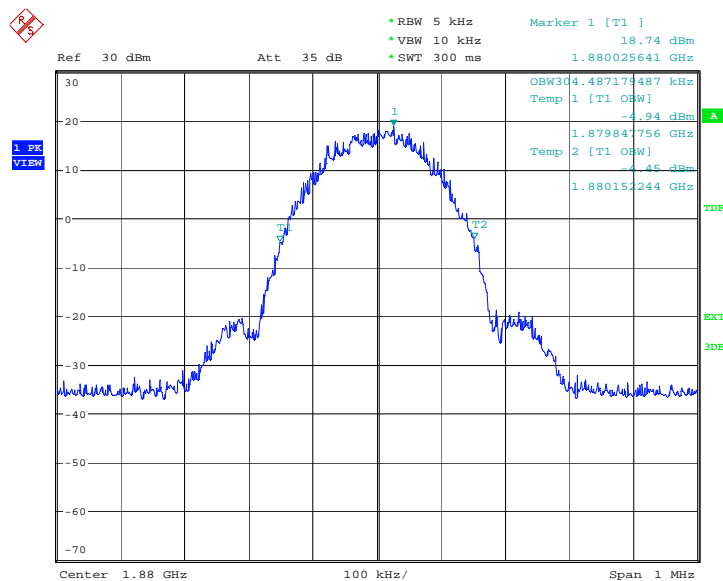
Date: 12.DEC.2011 07:12:19

Channel 810-Occupied Bandwidth (-26dBc BW)

```
                                    * RBW 5 kHz        Marker 1 [T1 ]
                                    * VBW 10 kHz                  19.81 dBm
    Ref  30 dBm          Att  35 dB  * SWT 300 ms       1.909790385 GHz

    30                                             OBW304.487179487 kHz
                                                   Temp 1 [T1 OBW]
    20                              1                         -3.00 dBm   A
                                                   1.909647756 GHz
    10                                             Temp 2 [T1 OBW]
                                                            -5.74 dBm
     0                                             1.909952244 GHz         TDF
    -10
                                                                          EXT
    -20
                                                                          3DB
    -30
    -40
    -50
    -60
    -70
    Center  1.9098 GHz            100 kHz/                 Span  1 MHz
```

Date: 12.DEC.2011 07:12:51

EGPRS 1900(-26dBc)-IC

Frequency(MHz)	Occupied Bandwidth (–26dBc BW)(kHz)
1850.2	80.128
1880.0	97.756
1909.8	139.423

EGPRS 1900

Channel 512-Occupied Reference Level

Date: 12.DEC.2011 07:18:48

Channel 512-Occupied Bandwidth (-26dBc BW)
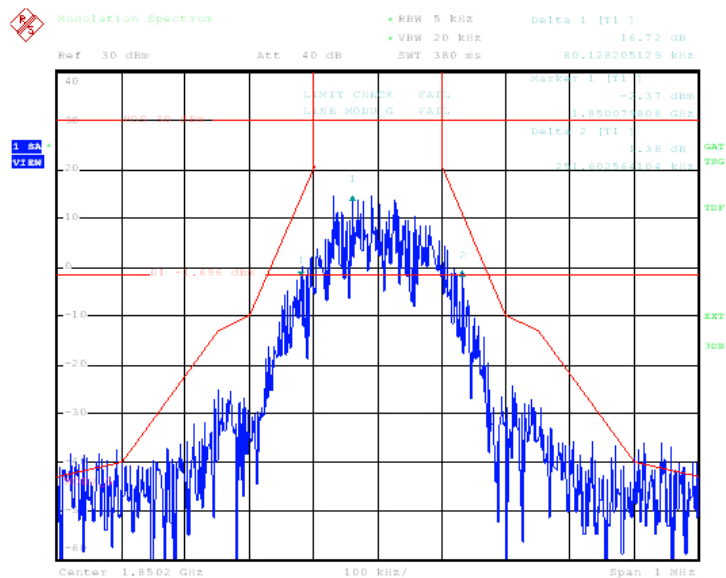
Date: 12.DEC.2011 07:20:39

Channel 661-Occupied Reference Level
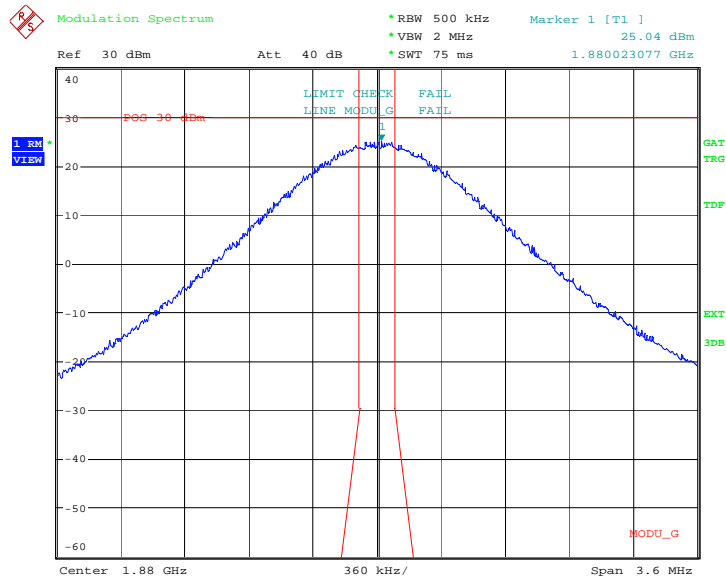
Date: 12.DEC.2011 07:20:53

Channel 661-Occupied Bandwidth (-26dBc BW)
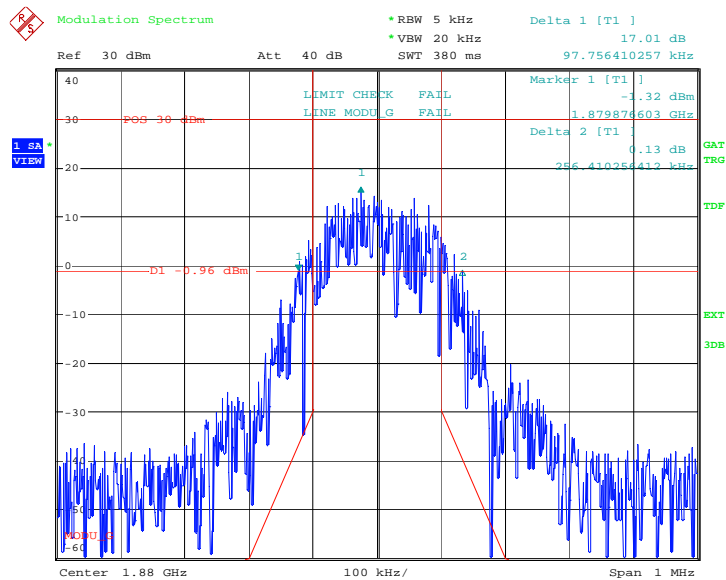
Date: 12.DEC.2011 07:22:51

Channel 810-Occupied Reference Level

```
R&S    Modulation Spectrum          *RBW 500 kHz      Marker 1 [T1 ]
                                     *VBW 2 MHz                    25.76 dBm
       Ref  30 dBm        Att  40 dB  *SWT 75 ms       1.909811538 GHz
```

Center 1.9098 GHz · 360 kHz/ · Span 3.6 MHz

Date: 12.DEC.2011 07:23:05

Channel 810-Occupied Bandwidth (-26dBc BW)

```
R&S    Modulation Spectrum          *RBW 5 kHz        Delta 1 [T1 ]
                                     *VBW 20 kHz                   17.85 dB
       Ref  30 dBm        Att  40 dB   SWT 380 ms      139.423076923 kHz
                                                       Marker 1 [T1 ]
                                                              -0.76 dBm
                                                       1.909681410 GHz
                                                       Delta 2 [T1 ]
                                                               0.46 dB
                                                       240.384615386 kHz
```

Center 1.9098 GHz · 100 kHz/ · Span 1 MHz

Date: 12.DEC.2011 07:25:31

A.7 BAND EDGE COMPLIANCE   (§22.917(b)/§24.238(b))

GSM 850
LOW BAND EDGE BLOCK-A (GSM850)-Channel 128
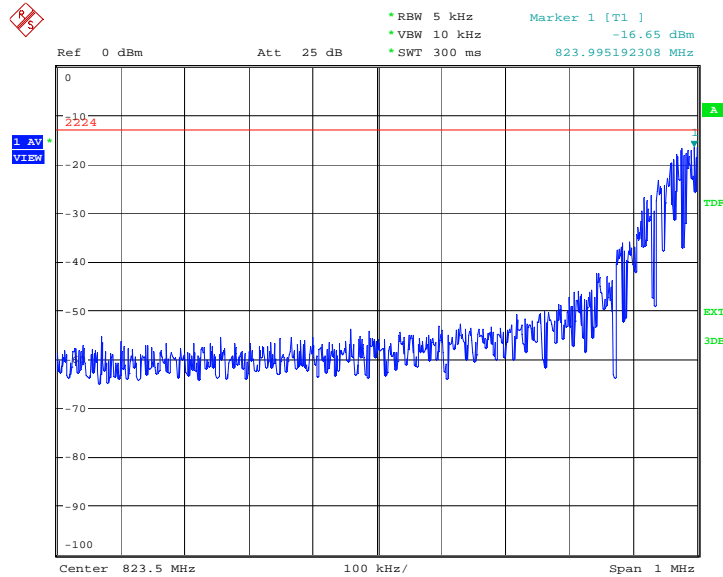
Date: 5.DEC.2011 07:21:51

HIGH BAND EDGE BLOCK-C (GSM850) –Channel 251
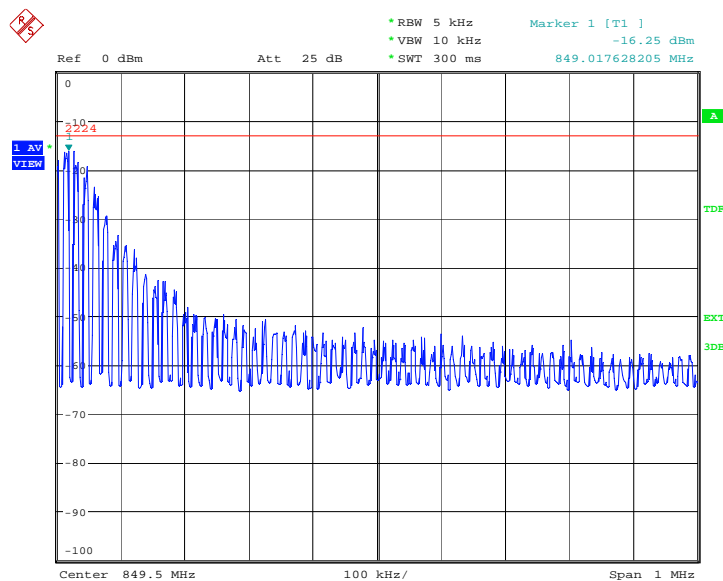
Date: 5.DEC.2011 07:22:00

GPRS 850
LOW BAND EDGE BLOCK-A (GSM850)-Channel 128


```
                              * RBW  5 kHz        Marker 1 [T1 ]
                              * VBW 10 kHz                -15.03 dBm
        Ref   0 dBm      Att  25 dB  * SWT 300 ms    823.991987179 MHz
```
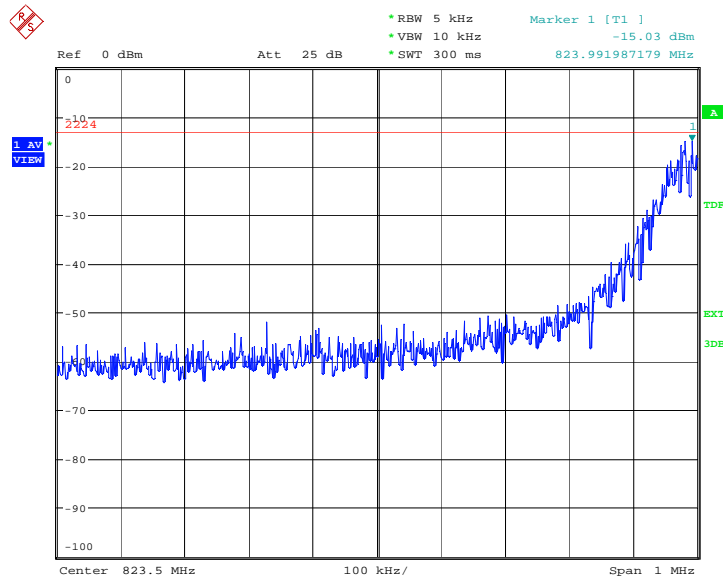
Date: 12.DEC.2011 06:55:38

HIGH BAND EDGE BLOCK-C (GSM850) –Channel 251


```
                              * RBW  5 kHz        Marker 1 [T1 ]
                              * VBW 10 kHz                -14.71 dBm
        Ref   0 dBm      Att  25 dB  * SWT 300 ms    849.022435897 MHz
```
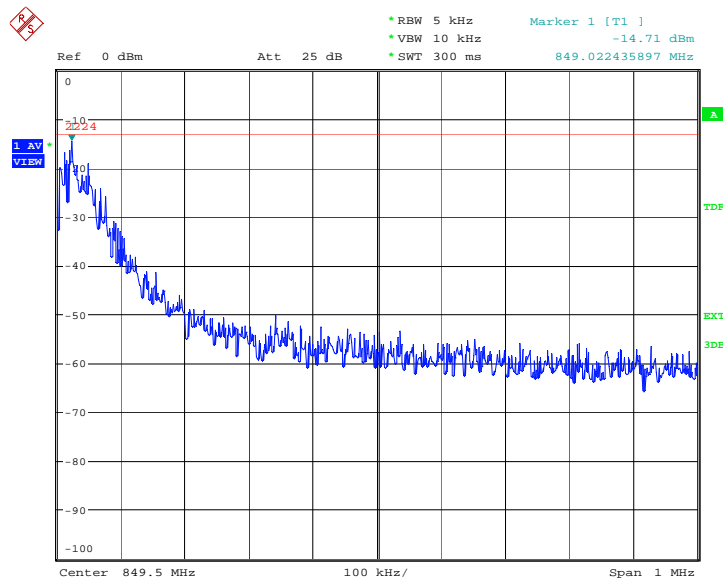
Date: 12.DEC.2011 06:55:47

EGPRS 850
LOW BAND EDGE BLOCK-A (GSM850)-Channel 128
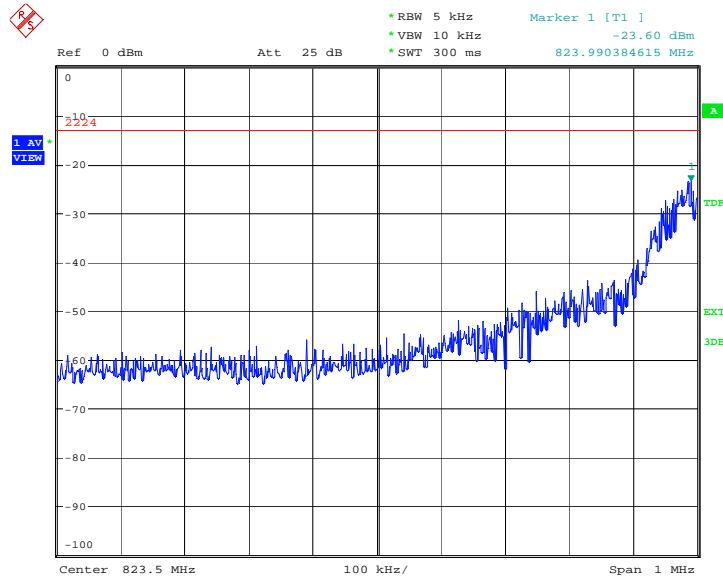
Date: 12.DEC.2011 07:02:55

HIGH BAND EDGE BLOCK-C (GSM850) –Channel 251
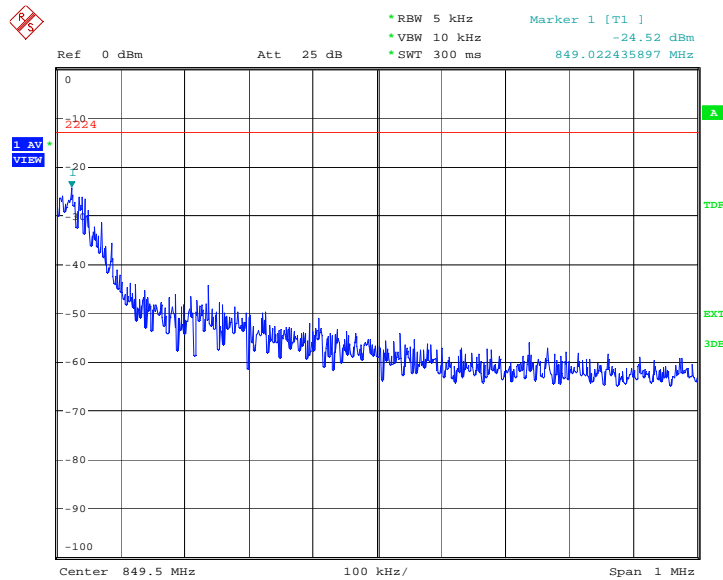
Date: 12.DEC.2011 07:03:03

PCS 1900
LOW BAND EDGE BLOCK-A (PCS-1900)-Channel 512
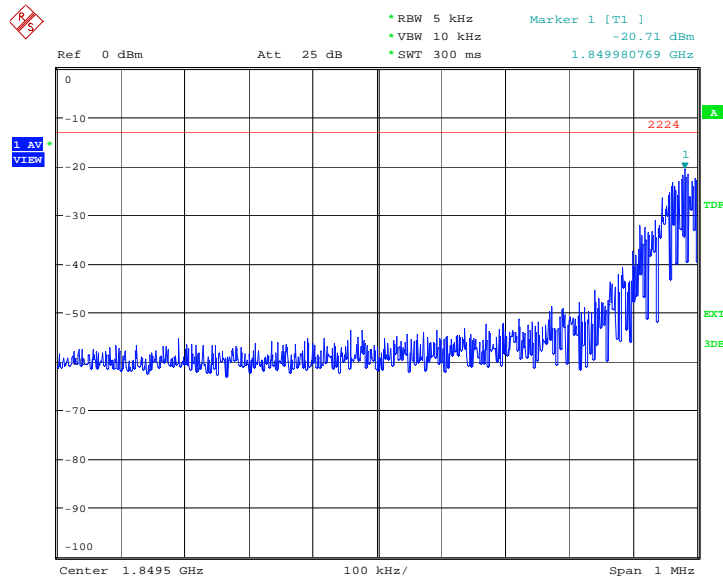
Date: 6.DEC.2011 07:21:32

HIGH BAND EDGE BLOCK-C (PCS-1900) –Channel 810
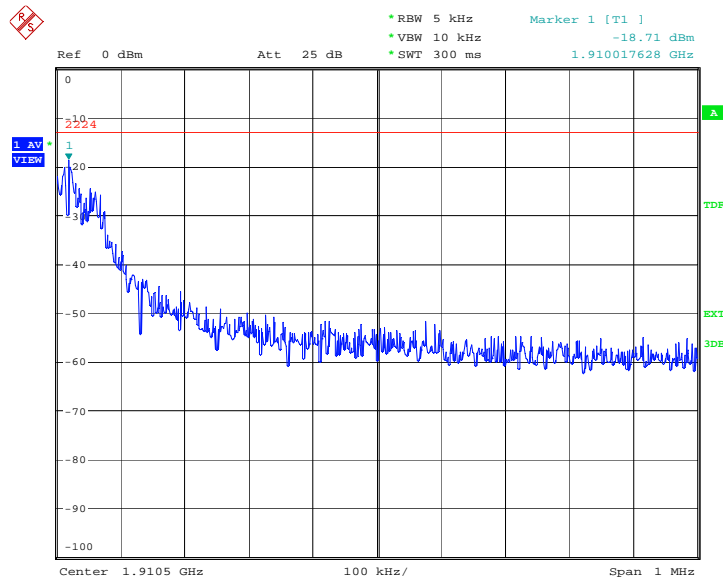
Date: 6.DEC.2011 07:21:41

GPRS 1900

LOW BAND EDGE BLOCK-A (PCS-1900)-Channel 512
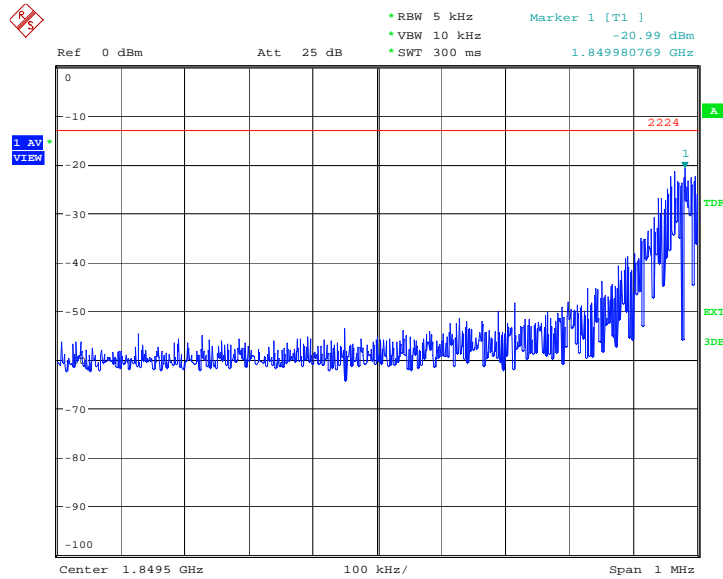
Date: 12.DEC.2011 07:07:52

HIGH BAND EDGE BLOCK-C (PCS-1900) –Channel 810
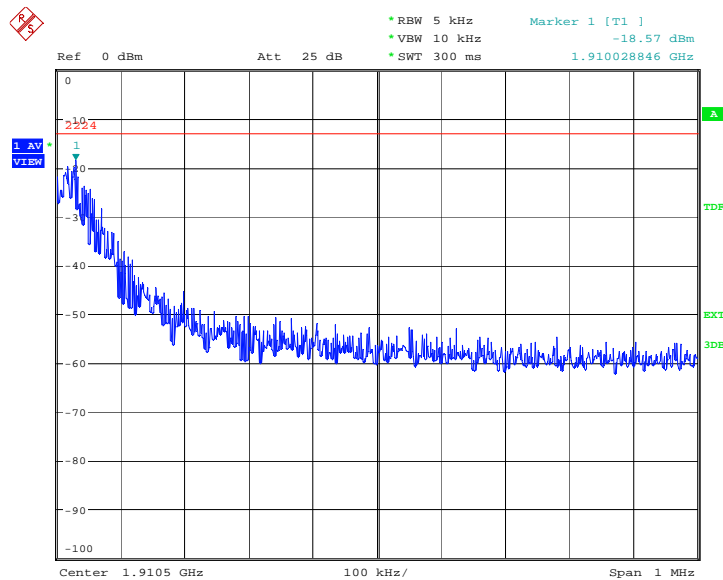
Date: 12.DEC.2011 07:08:01

EGPRS 1900

LOW BAND EDGE BLOCK-A (PCS-1900)-Channel 512
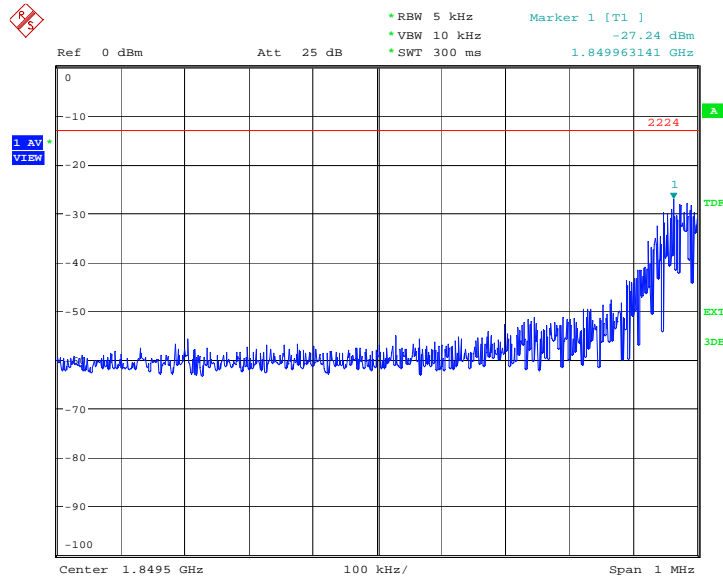
Date: 12.DEC.2011 07:13:00

HIGH BAND EDGE BLOCK-C (PCS-1900) –Channel 810
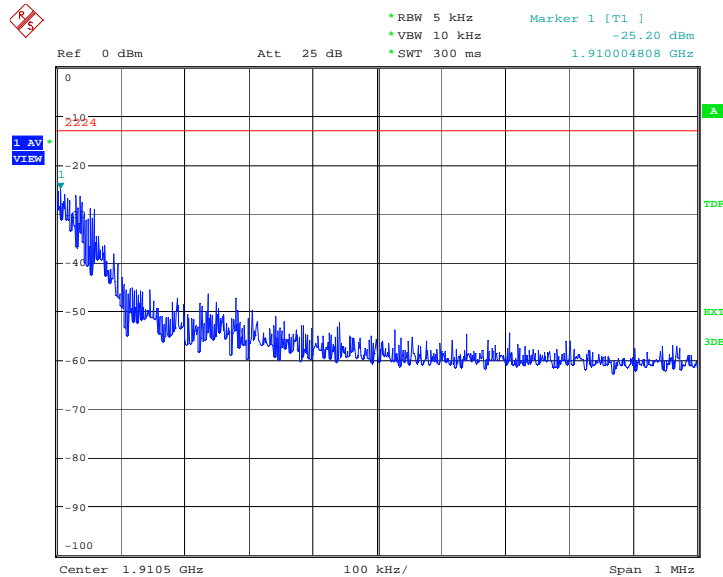
Date: 12.DEC.2011 07:13:09

A.8 CONDUCTED SPURIOUS EMISSION　(§2.1057/§22.917/§24.238)

A.8.1 Measurement Method

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment of PCS1900 band, this equates to a frequency range of 30 MHz to 19.1 GHz, data taken from 30 MHz to 20 GHz. For GSM850, data taken from 30 MHz to 10 GHz.

2. The sweep time is set automatically by instrument itself. That should be the optimal sweep time for the span and the RBW. If the sweep time is too short, that is sweep is too fast, the sweep result is not accurate; If the sweep time is too long, that is sweep is too low, some frequency components may be lost. The instrument will give a optimal sweep time according the selected span and RBW.

3. The procedure to get the conducted spurious emission is as follows:
   The trace mode is set to MaxHold to get the highest signal at each frequency;
   Wait 25 seconds;
   Get the result.

4. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.

GSM850 Transmitter

Channel	Frequency (MHz)
128	824.2
190	836.6
251	848.8

PCS1900 Transmitter

Channel	Frequency (MHz)
512	1850.2
661	1880.0
810	1909.8

A. 8.2 Measurement Limit

Part 24.238 and Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.
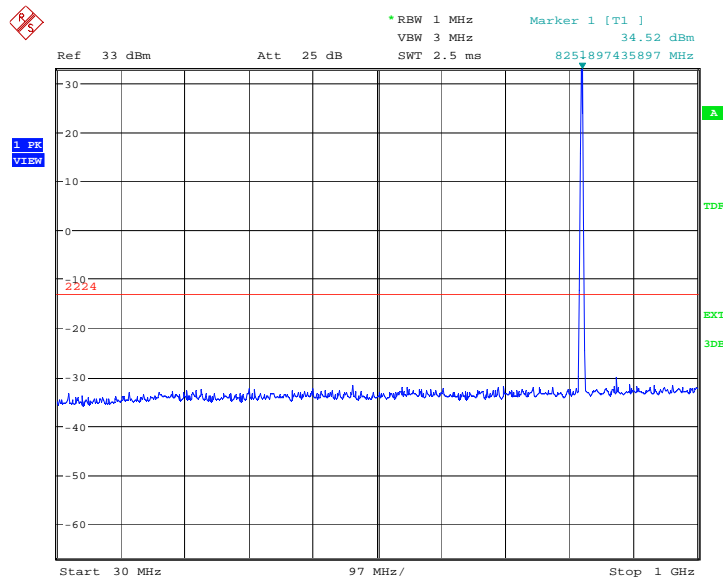
A. 8.3 Measurement result

GSM850

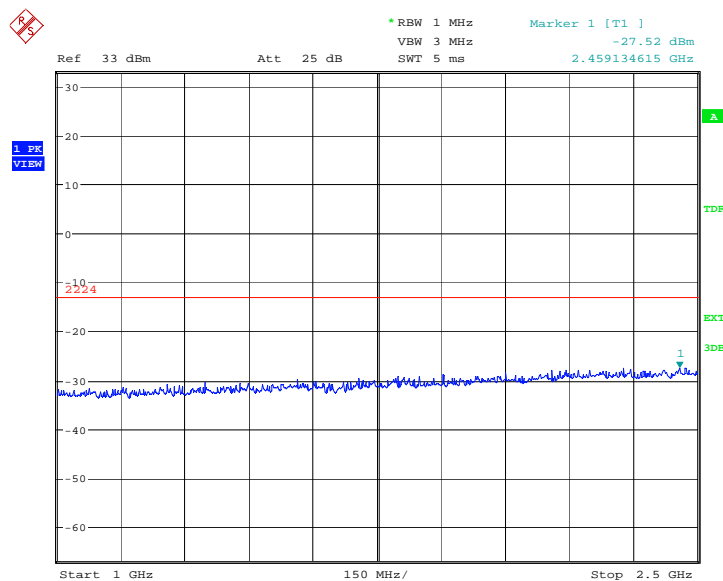### A.8.3.1 Channel 128: 30MHz – 1GHz

Spurious emission limit –13dBm.

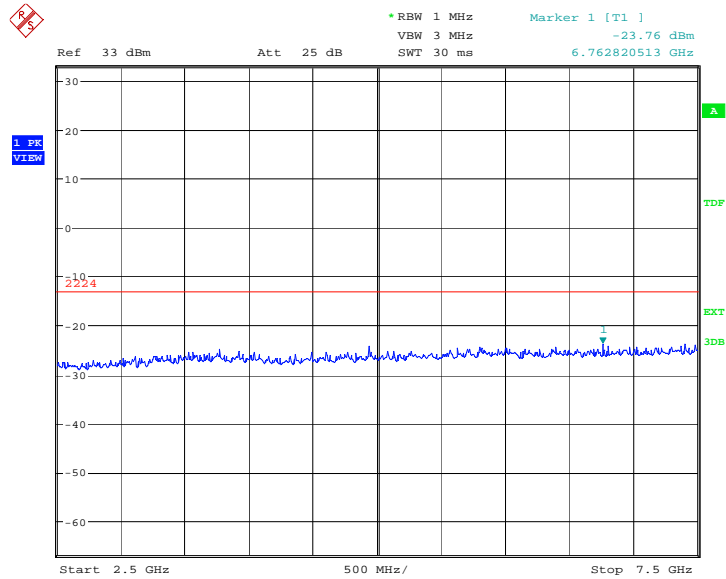**NOTE: peak above the limit line is the carrier frequency.**


```
                                        * RBW  1 MHz      Marker 1 [T1 ]
                                          VBW  3 MHz              34.52 dBm
      Ref  33 dBm            Att  25 dB    SWT  2.5 ms    8251897435897 MHz
```
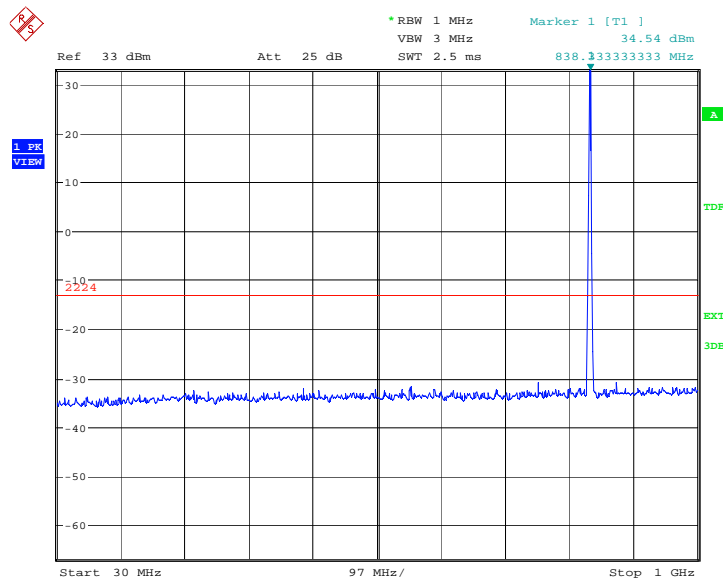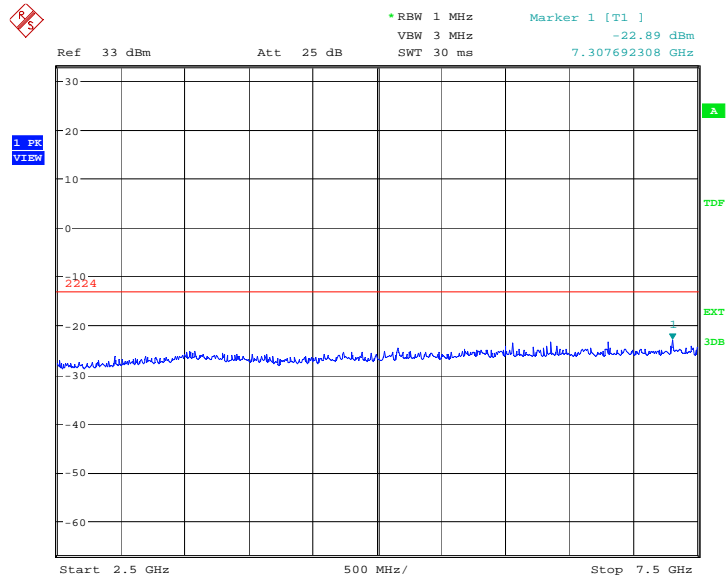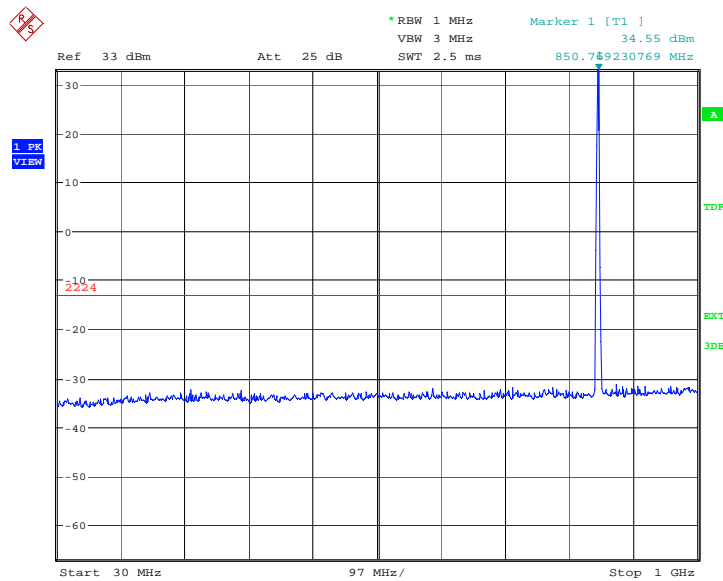
Date: 5.DEC.2011 07:22:29

A.8.3.2 Channel 128: 1GHz – 2.5GHz

Spurious emission limit –13dBm.


```
                                        * RBW  1 MHz      Marker 1 [T1 ]
                                          VBW  3 MHz             -27.52 dBm
      Ref  33 dBm            Att  25 dB    SWT  5 ms      2.459134615 GHz
```

Date: 5.DEC.2011 07:22:57

A.8.3.3 Channel 128: 2.5GHz – 7.5GHz

Spurious emission limit –13dBm.

```
                                    * RBW  1 MHz      Marker 1 [T1 ]
                                      VBW  3 MHz           -23.76 dBm
    Ref  33 dBm        Att  25 dB     SWT 30 ms        6.762820513 GHz
```



```
Start 2.5 GHz              500 MHz/              Stop 7.5 GHz
```

Date: 5.DEC.2011 07:23:26

A.8.3.4 Channel 128: 7.5GHz –10GHz

Spurious emission limit –13dBm.

```
                                    * RBW  1 MHz      Marker 1 [T1 ]
                                      VBW  3 MHz           -21.03 dBm
    Ref  33 dBm        Att  25 dB     SWT 20 ms        9.947916667 GHz
```



```
Start 7.5 GHz              250 MHz/              Stop 10 GHz
```
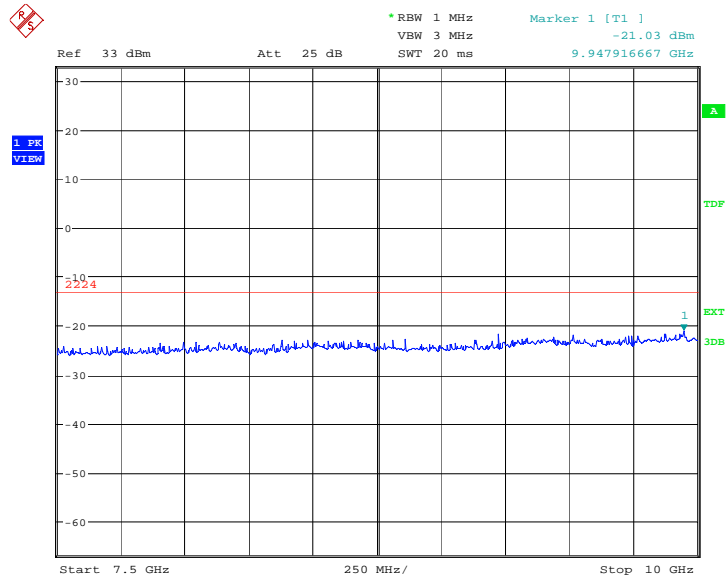
Date: 5.DEC.2011 07:23:54

A.8.3.5 Channel 190: 30MHz – 1GHz

Spurious emission limit –13dBm

NOTE: peak above the limit line is the carrier frequency.

Date: 5.DEC.2011 07:24:23
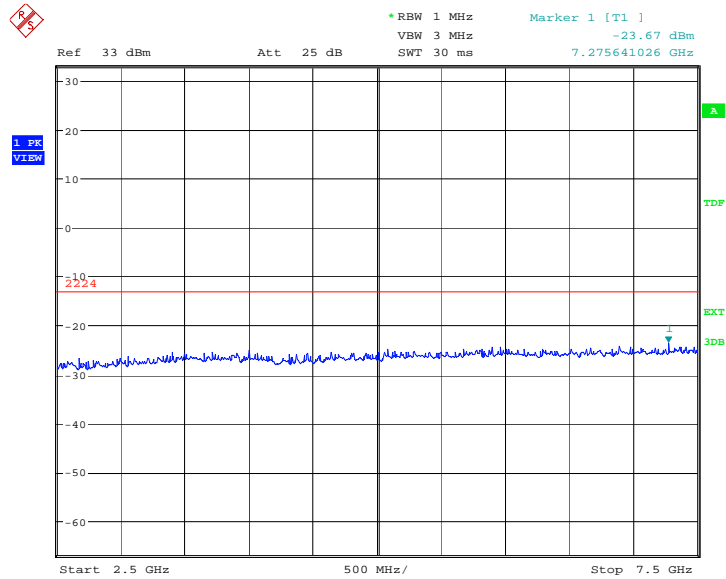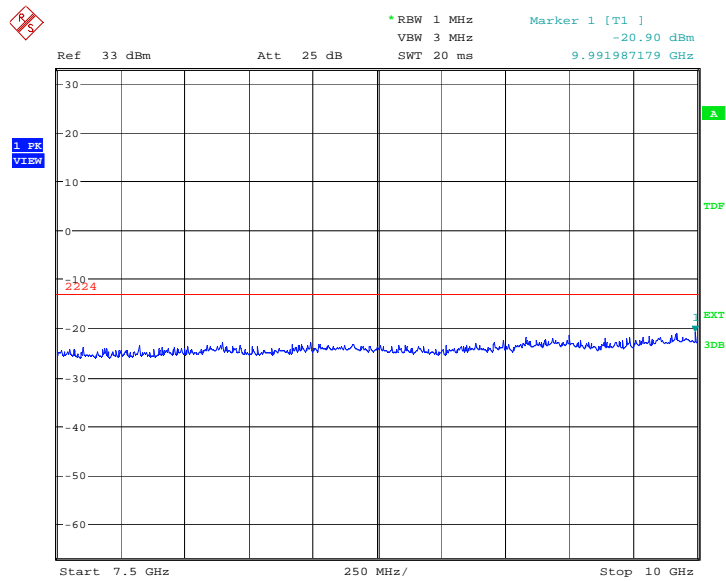
A.8.3.6 Channel 190: 1GHz –2.5GHz

Spurious emission limit –13dBm
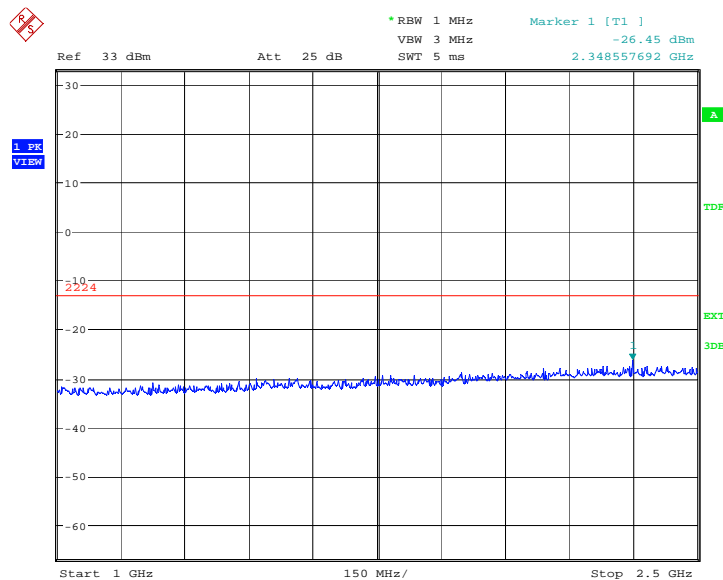
Date: 5.DEC.2011 07:24:51

A.8.3.7 Channel 190: 2.5GHz –7.5GHz
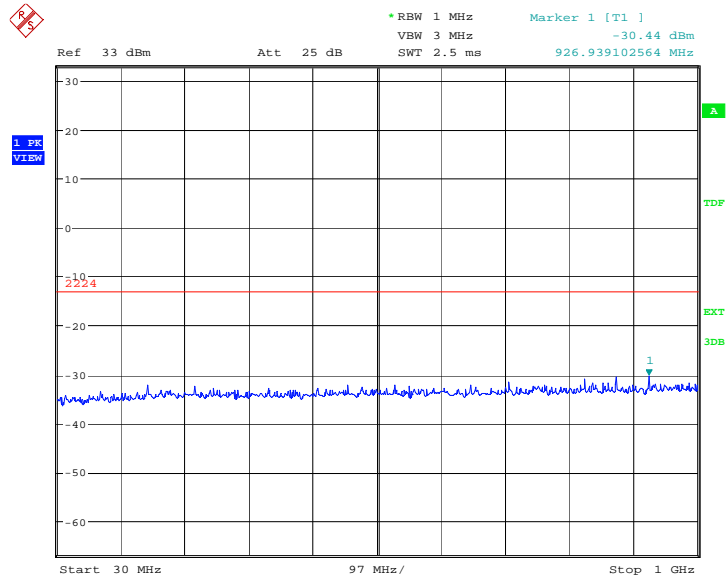
Spurious emission limit –13dBm

Date: 5.DEC.2011 07:25:20

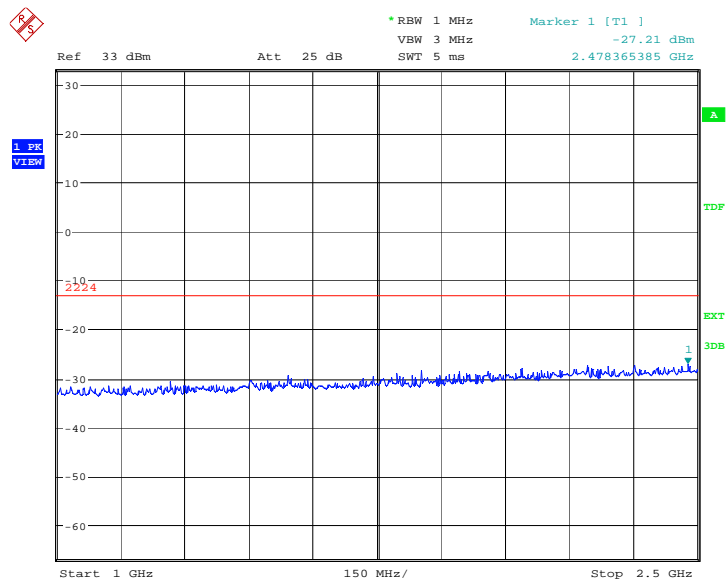### A.8.3.8 Channel 190: 7.5GHz –10GHz

Spurious emission limit –13dBm
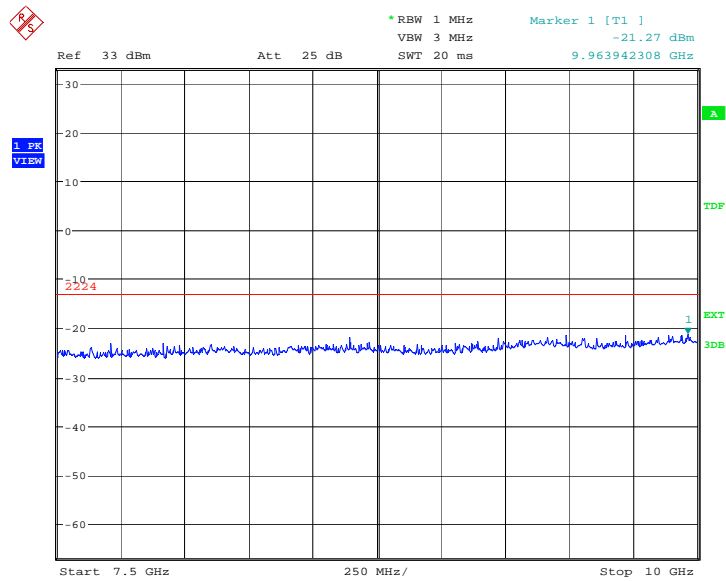
Date: 5.DEC.2011 07:25:48

A.8.3.9 Channel 251: 30MHz – 1GHz
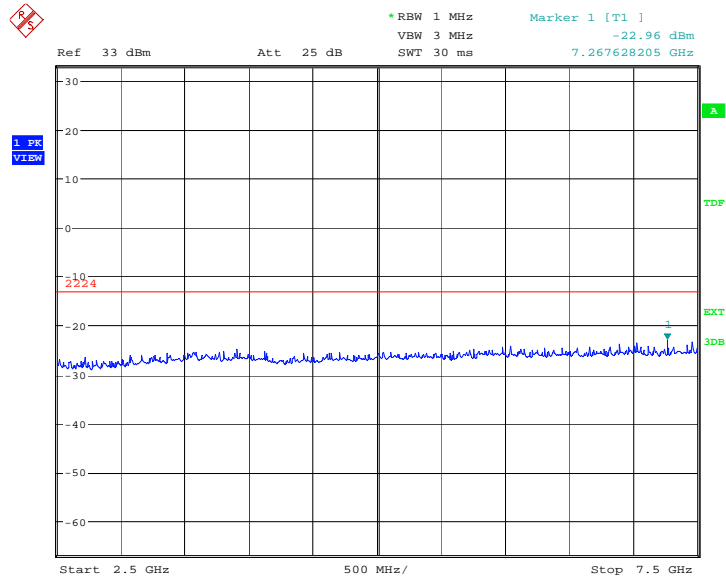
Spurious emission limit –13dBm.

NOTE: peak above the limit line is the carrier frequency.

Date: 5.DEC.2011 07:26:17

A.8.3.10 Channel 251: 1GHz – 2.5GHz

Spurious emission limit –13dBm.
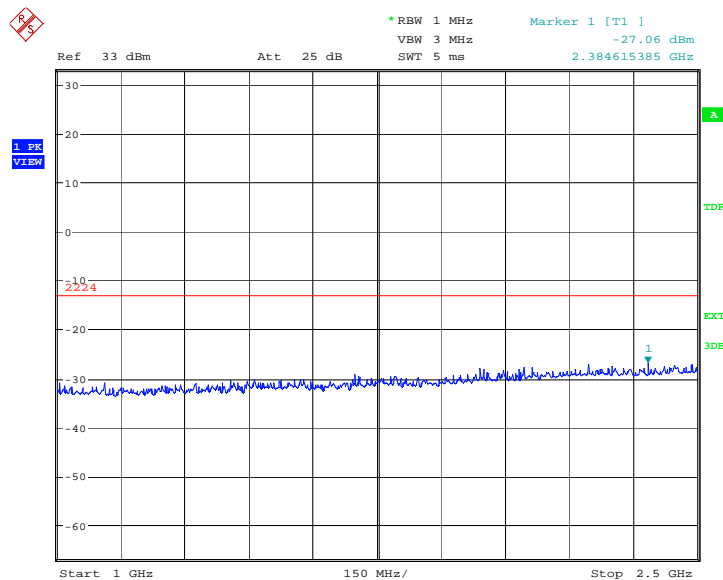
Date: 5.DEC.2011 07:26:46

A.8.3.11 Channel 251:2.5GHz – 7.5GHz

Spurious emission limit –13dBm.

```
                                    *RBW  1 MHz       Marker 1 [T1 ]
                                     VBW  3 MHz            -23.67 dBm
          Ref  33 dBm      Att  25 dB   SWT 30 ms      7.275641026 GHz
        -30                                                              A
1 PK
VIEW    -20
        -10
          0
        -10                                                             TDF
      2224
        -20                                                            EXT
                                                                      3DB
        -30
        -40
        -50
        -60
        Start  2.5 GHz          500 MHz/            Stop  7.5 GHz
```

Date: 5.DEC.2011 07:27:14

A.8.3.12 Channel 251: 7.5GHz – 10GHz

Spurious emission limit –13dBm.

```
                                    *RBW  1 MHz       Marker 1 [T1 ]
                                     VBW  3 MHz            -20.90 dBm
          Ref  33 dBm      Att  25 dB   SWT 20 ms      9.991987179 GHz
        -30                                                              A
1 PK
VIEW    -20
        -10
          0
        -10                                                             TDF
      2224
        -20                                                            EXT
                                                                      3DB
        -30
        -40
        -50
        -60
        Start  7.5 GHz          250 MHz/            Stop  10 GHz
```

Date: 5.DEC.2011 07:27:43

A.8.3.13 Idle mode: 30MHz – 1GHz

Spurious emission limit –13dBm.

Date: 5.DEC.2011 07:28:11

A.8.3.14 Idle mode: 1GHz – 2.5GHz

Spurious emission limit –13dBm.

Date: 5.DEC.2011 07:28:40

A.8.3.15 Idle mode: 2.5GHz – 7.5GHz

Spurious emission limit –13dBm.

Date: 5.DEC.2011 07:29:08

A.8.3.16 Idle mode: 7.5GHz – 10GHz
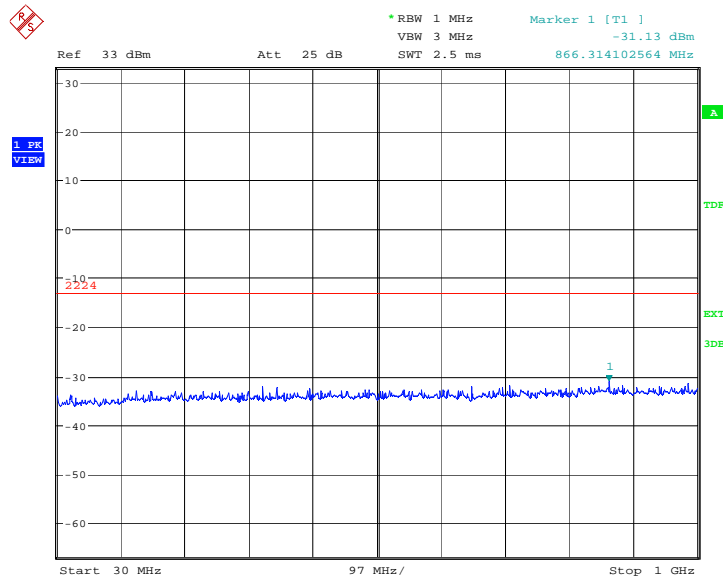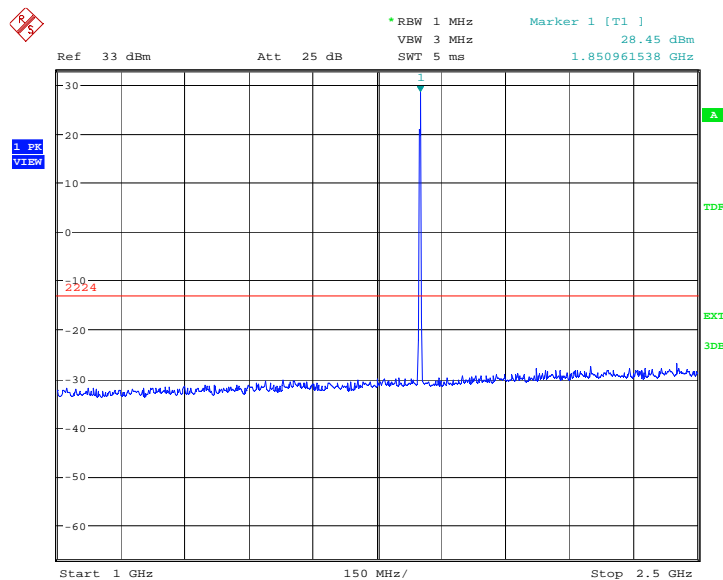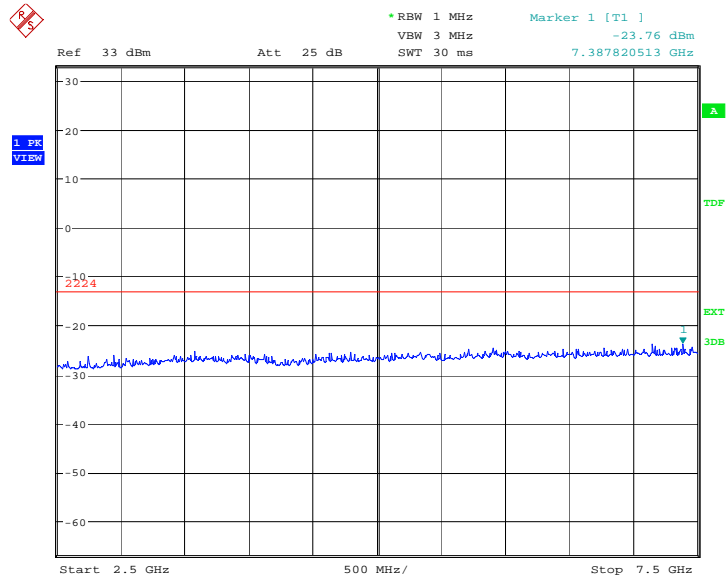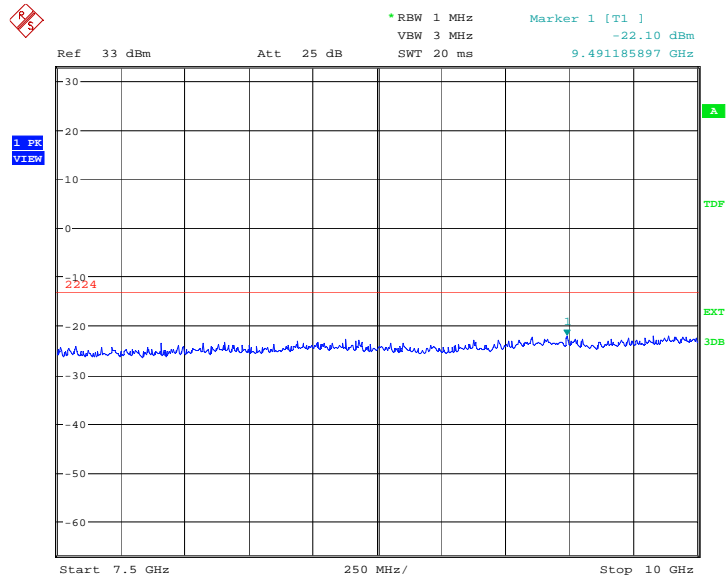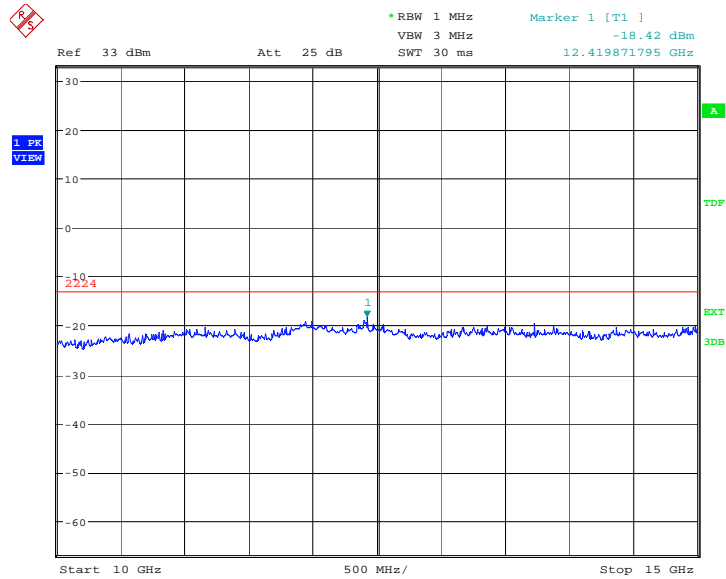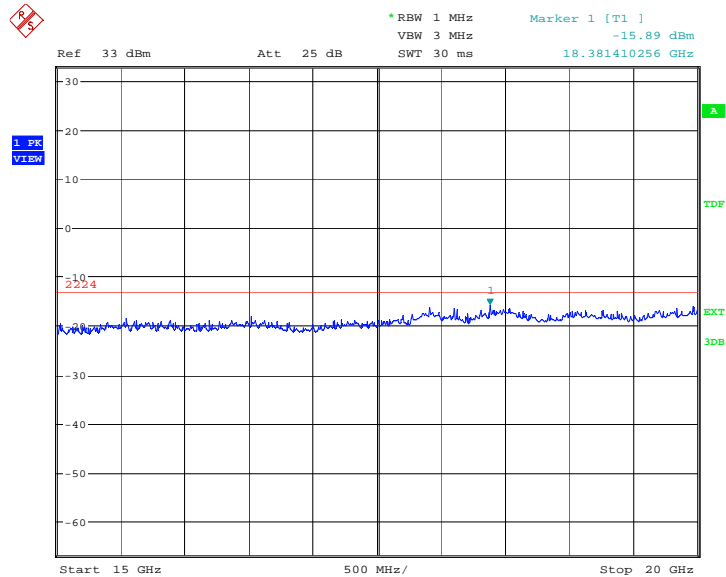
Spurious emission limit –13dBm.
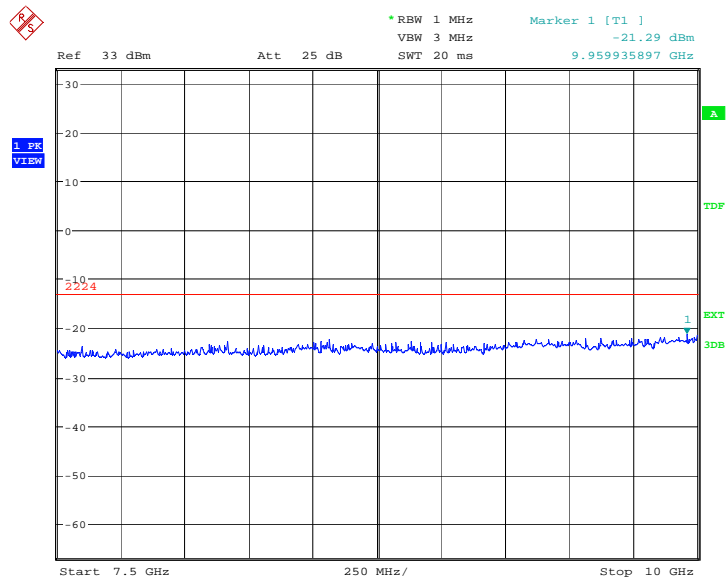
Date: 5.DEC.2011 07:29:37

PCS1900

A.8.3.17 Channel 512: 30MHz – 1GHz
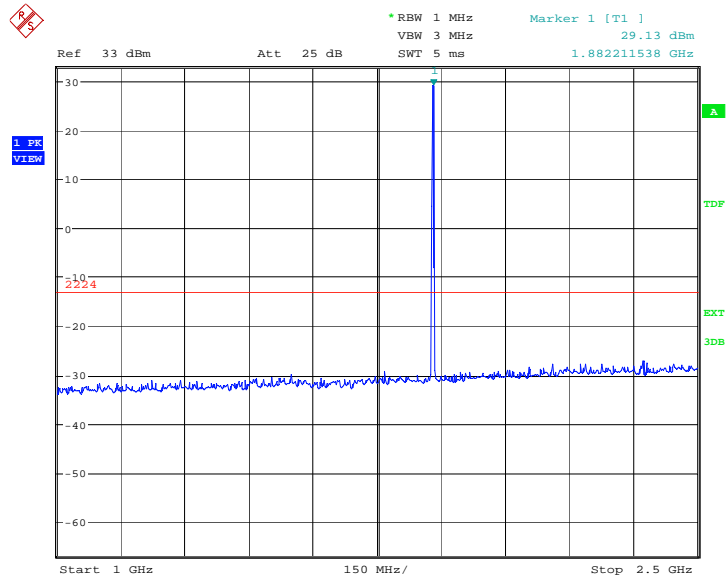
Spurious emission limit –13dBm.

Date: 6.DEC.2011 08:45:18

A.8.3.18 Channel 512: 1GHz – 2.5GHz
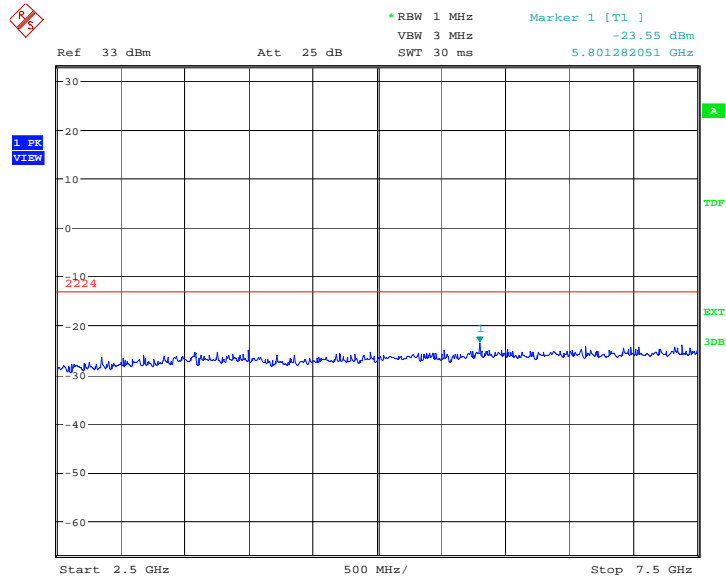
Spurious emission limit –13dBm.

NOTE: peak above the limit line is the carrier frequency.

Date: 6.DEC.2011 08:45:46

A.8.3.19 Channel 512: 2.5GHz – 7.5GHz

Spurious emission limit –13dBm.


```
                                        *RBW  1 MHz        Marker 1 [T1 ]
                                         VBW  3 MHz               -23.76 dBm
        Ref  33 dBm        Att  25 dB    SWT 30 ms         7.387820513 GHz
```

Date: 6.DEC.2011 08:46:15

A.8.3.20 Channel 512: 7.5GHz –10GHz

Spurious emission limit –13dBm.


```
                                        *RBW  1 MHz        Marker 1 [T1 ]
                                         VBW  3 MHz               -22.10 dBm
        Ref  33 dBm        Att  25 dB    SWT 20 ms         9.491185897 GHz
```

Date: 6.DEC.2011 08:46:43

A.8.3.21 Channel 512: 10GHz –15GHz

Spurious emission limit –13dBm.

```
                                    * RBW 1 MHz        Marker 1 [T1 ]
                                      VBW 3 MHz              -18.42 dBm
        Ref  33 dBm        Att  25 dB  SWT 30 ms       12.419871795 GHz
```

Date: 6.DEC.2011 08:47:11

A.8.3.22 Channel 512: 15GHz –20GHz

Spurious emission limit –13dBm.

```
                                    * RBW 1 MHz        Marker 1 [T1 ]
                                      VBW 3 MHz              -15.89 dBm
        Ref  33 dBm        Att  25 dB  SWT 30 ms       18.381410256 GHz
```

Date: 6.DEC.2011 08:47:39

A.8.3.23 Channel 661: 30MHz – 1GHz

Spurious emission limit –13dBm
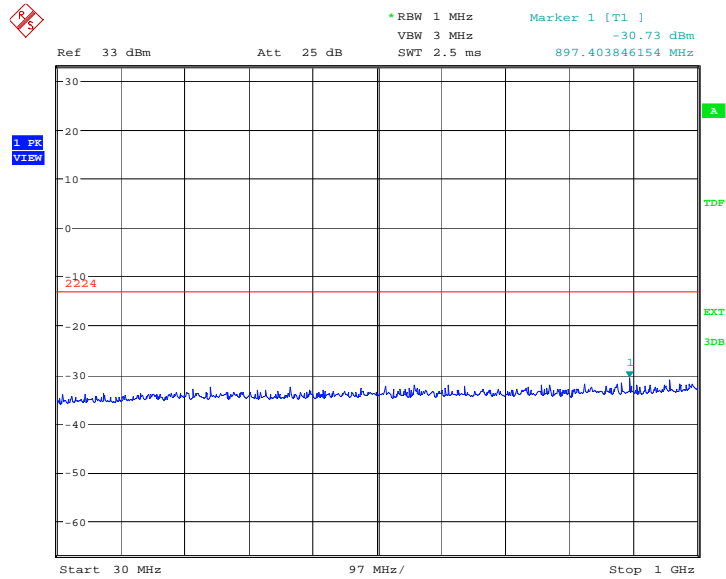
Date: 6.DEC.2011 08:48:08

A.8.3.24 Channel 661: 1GHz –2.5GHz

Spurious emission limit –13dBm

NOTE: peak above the limit line is the carrier frequency.

Date: 6.DEC.2011 08:48:36

A.8.3.25 Channel 661: 2.5GHz –7.5GHz

Spurious emission limit –13dBm

Date: 6.DEC.2011 08:49:04

A.8.3.26 Channel 661: 7.5GHz –10GHz
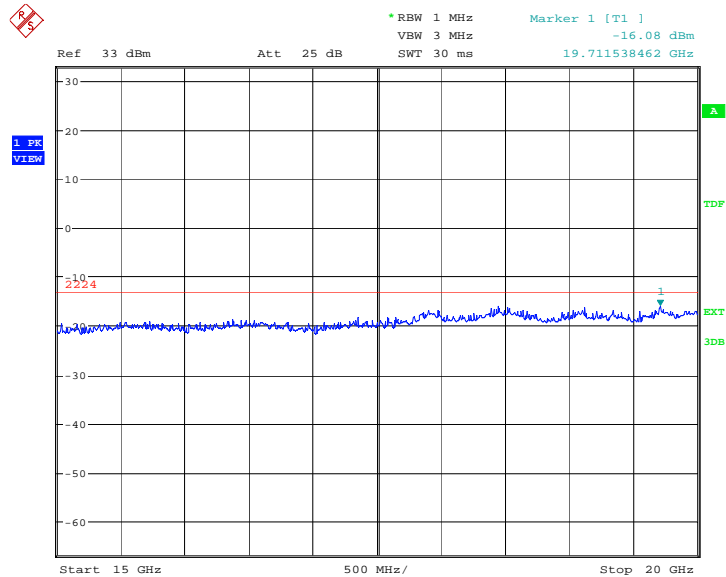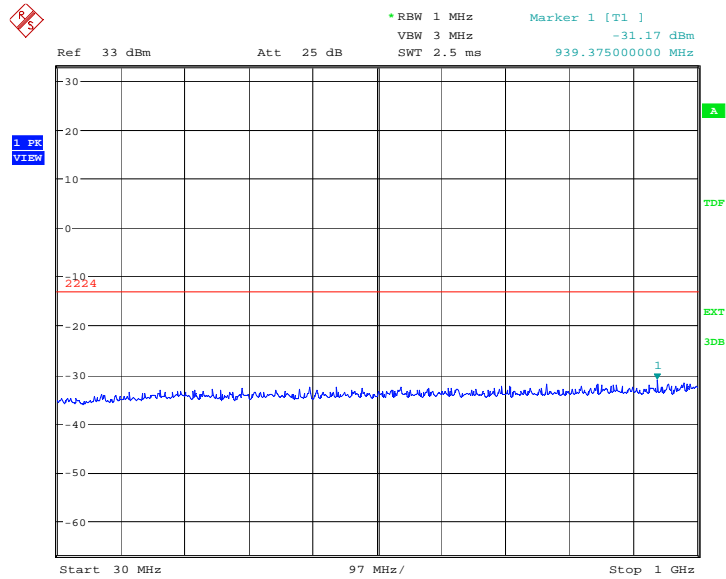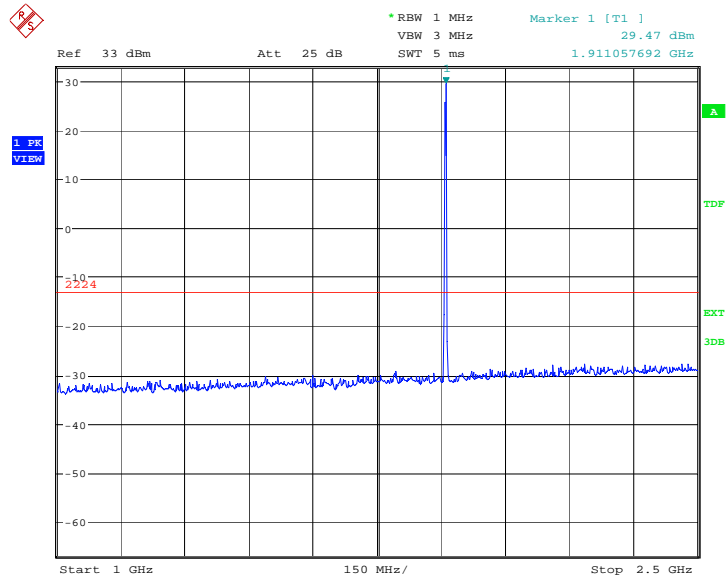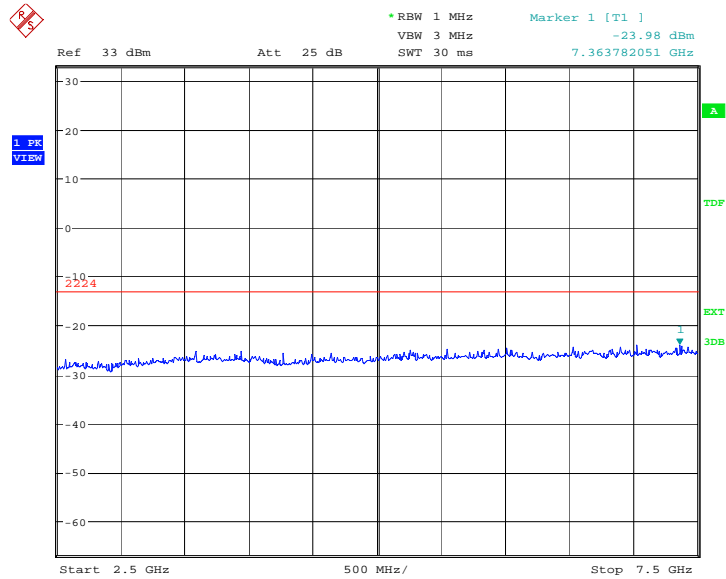
Spurious emission limit –13dBm
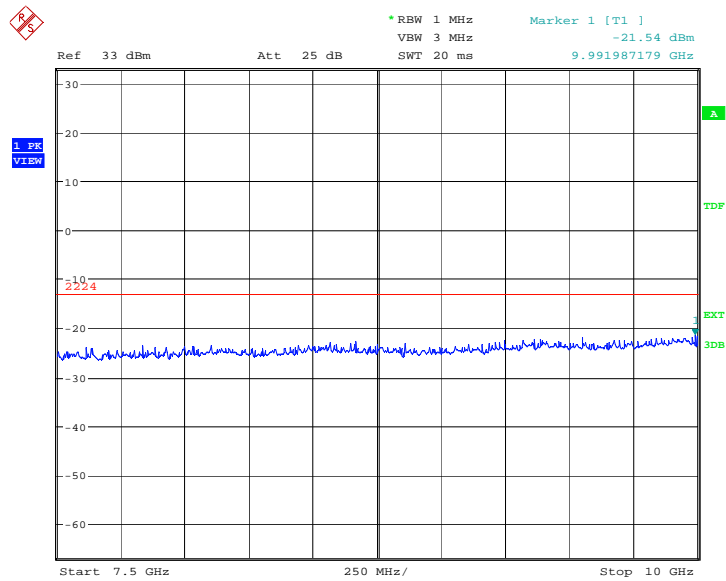
Date: 6.DEC.2011 08:49:33

A.8.3.27 Channel 661: 10GHz –15GHz

Spurious emission limit –13dBm.
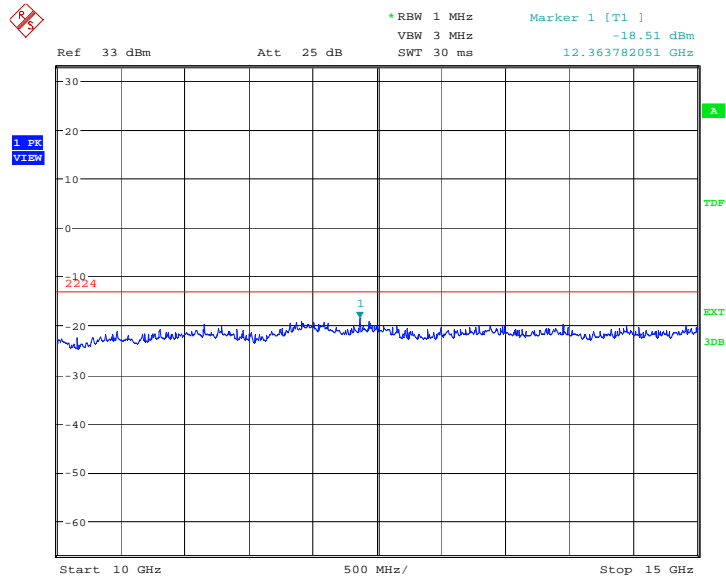
Date: 6.DEC.2011 08:50:01

A.8.3.28 Channel 661: 15GHz –20GHz

Spurious emission limit –13dBm.

Date: 6.DEC.2011 08:50:29

A.8.3.29 Channel 810: 30MHz – 1GHz

Spurious emission limit –13dBm.

Date: 6.DEC.2011 08:50:58

A.8.3.30 Channel 810: 1GHz – 2.5GHz

Spurious emission limit –13dBm.
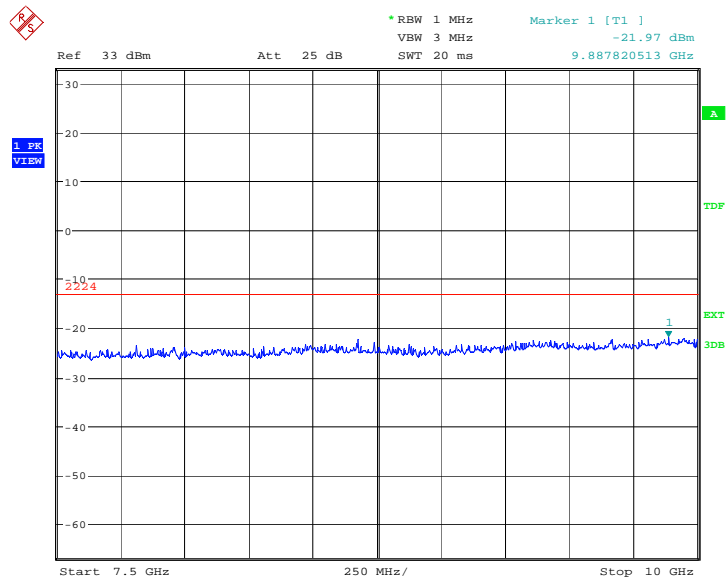
NOTE: peak above the limit line is the carrier frequency.

Date: 6.DEC.2011 08:51:26

A.8.3.31 Channel 810:2.5GHz – 7.5GHz
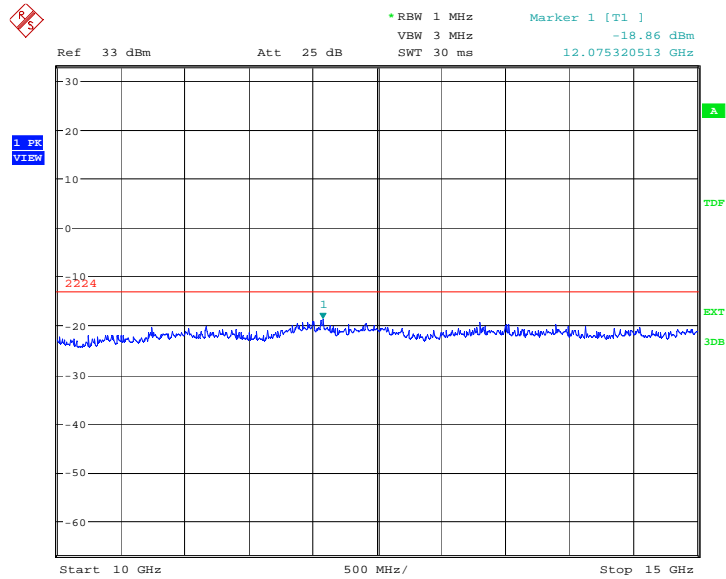
Spurious emission limit –13dBm.

Date: 6.DEC.2011 08:51:54

A.8.3.32 Channel 810: 7.5GHz – 10GHz
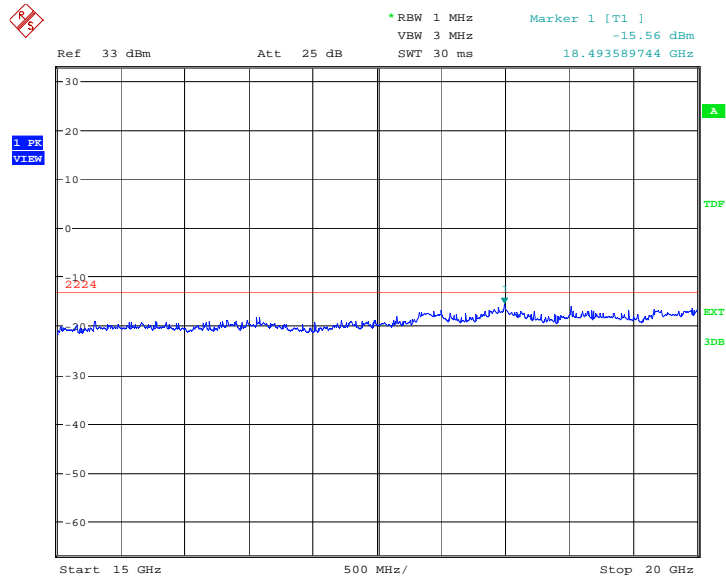
Spurious emission limit –13dBm.

Date: 6.DEC.2011 08:52:23

A.8.3.33 Channel 810: 10GHz –15GHz
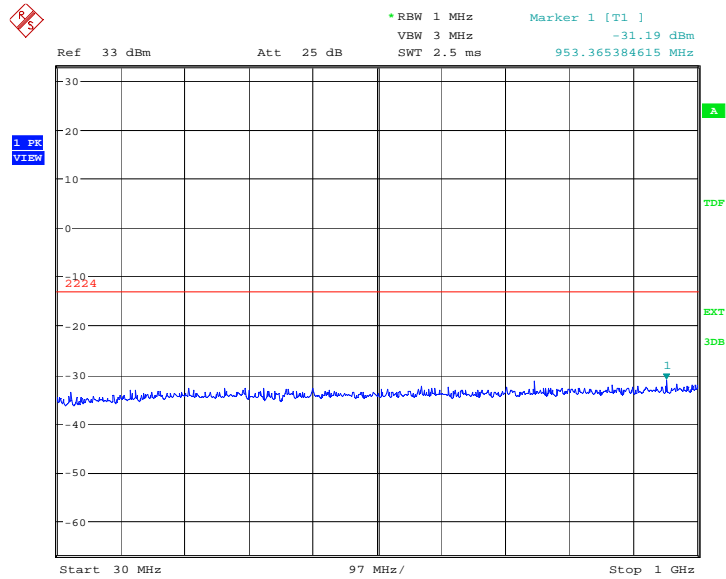
Spurious emission limit –13dBm.

Date: 6.DEC.2011 08:52:51

A.8.3.34 Channel 810: 15GHz –20GHz

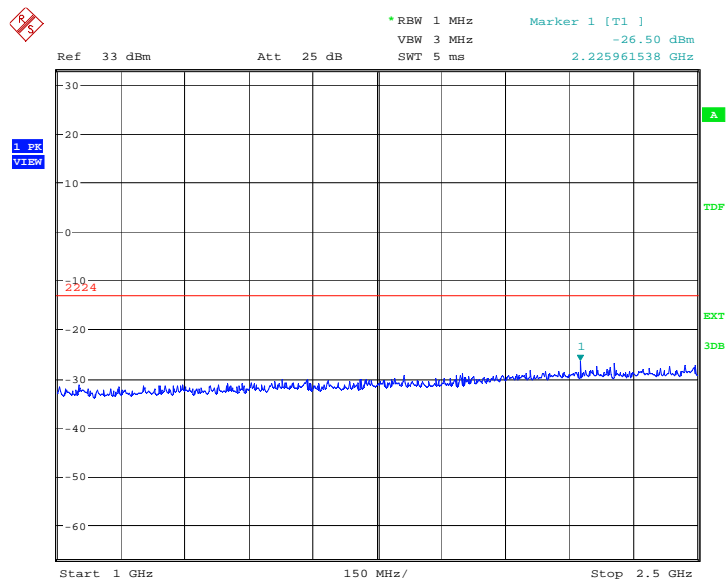Spurious emission limit –13dBm.

Date: 6.DEC.2011 08:53:19

A.8.3.35 Idle mode: 30MHz – 1GHz

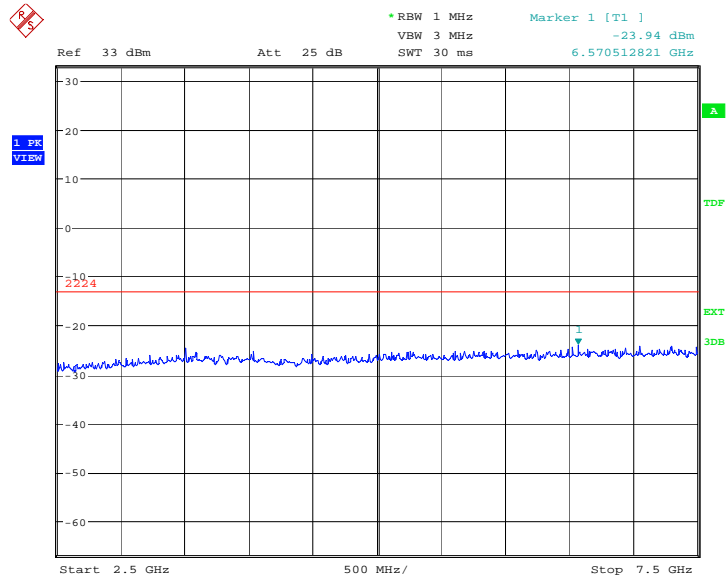Spurious emission limit –13dBm.

Date: 6.DEC.2011 08:53:48

A.8.3.36 Idle mode: 1GHz – 2.5GHz

Spurious emission limit –13dBm.
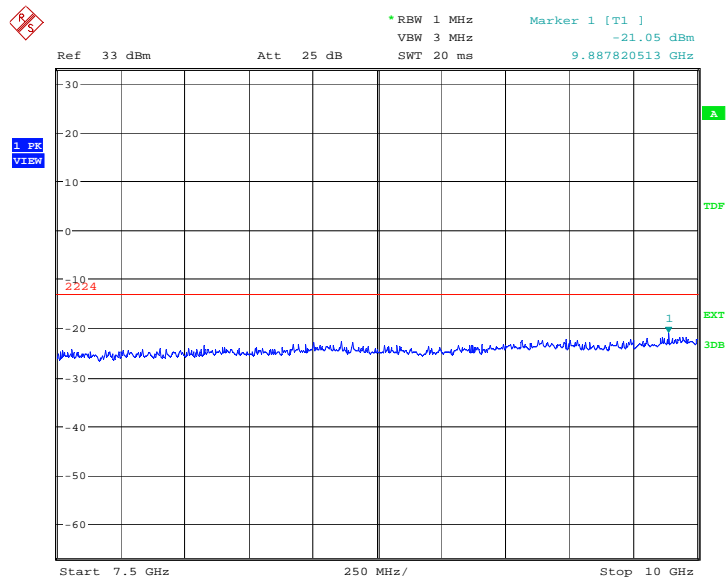

Date: 6.DEC.2011 08:54:16

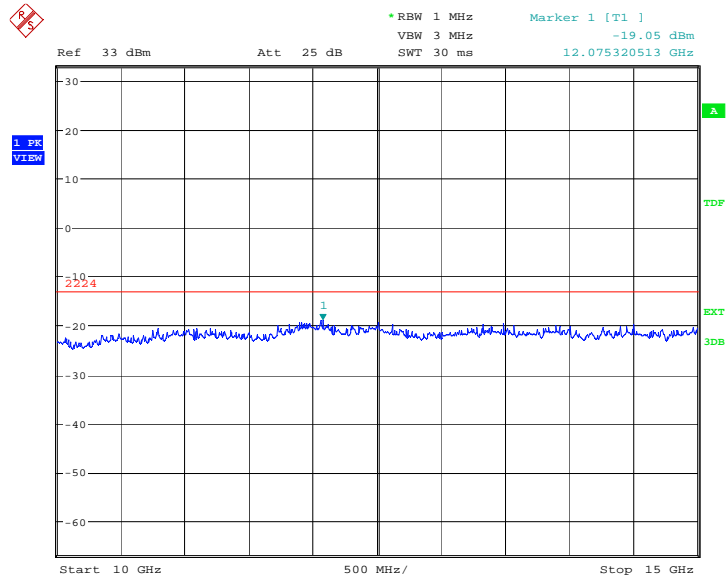### A.8.3.37 Idle mode: 2.5GHz – 7.5GHz

Spurious emission limit –13dBm.

Date: 6.DEC.2011 08:54:44

A.8.3.38 Idle mode: 7.5GHz – 10GHz
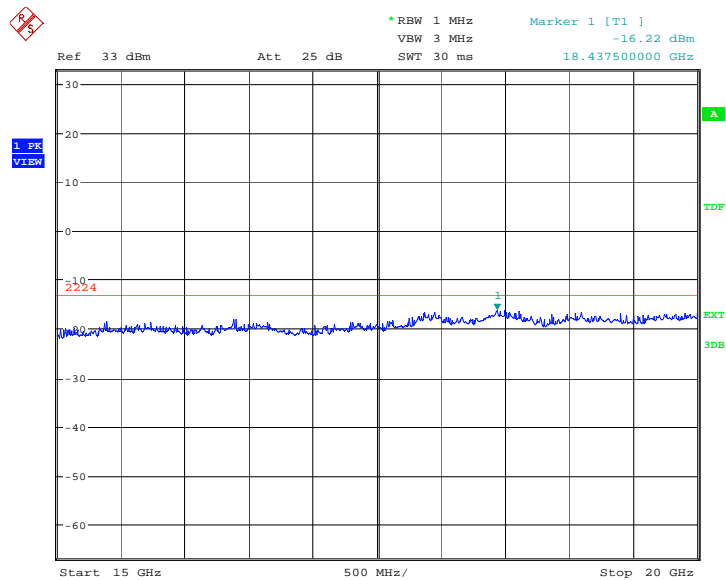
Spurious emission limit –13dBm.

Date: 6.DEC.2011 08:55:12

A.8.3.39 Idle mode: 10GHz –15GHz

Spurious emission limit –13dBm.

```
                                    * RBW  1 MHz        Marker 1 [T1 ]
                                      VBW  3 MHz              -19.05 dBm
        Ref  33 dBm      Att  25 dB    SWT 30 ms        12.075320513 GHz

        -30                                                              A

1 PK    -20
VIEW
        -10                                                              TDF

          0

        -10                                                              EXT
        2224
        -20                                                              3DB

        -30

        -40

        -50

        -60

        Start 10 GHz          500 MHz/               Stop 15 GHz
```

Date: 6.DEC.2011 08:55:40

A.8.3.40 IDLE mode: 15GHz –20GHz

Spurious emission limit –13dBm.

```
                                    * RBW  1 MHz        Marker 1 [T1 ]
                                      VBW  3 MHz              -16.22 dBm
        Ref  33 dBm      Att  25 dB    SWT 30 ms        18.437500000 GHz

        -30                                                              A

1 PK    -20
VIEW
        -10                                                              TDF

          0

        -10                                                              EXT
        2224
        -20                                                              3DB

        -30

        -40

        -50

        -60

        Start 15 GHz          500 MHz/               Stop 20 GHz
```

Date: 6.DEC.2011 08:56:09

A.9   RECEIVER RADIATION EMISSION

Reference

FCC: CFR Part 15.109, 2.1053

IC: RSS 132, Issue 2, Section 4.6. RSS 133, Issue 5, Section 6.6

A.9.1 Method of Measurement

The measurement procedure in ANSI C64.4-2003 is used. The EUT is placed on a 80cm height non-conductive table locating on the center of turntable. From 30MHz-1GHz, the measurement distance is 10m. For frequency range above 1GHz, the measurement distance is 3m.

The EUT is measured with travel charger and the operating mode is idle without CMU200's signaling.
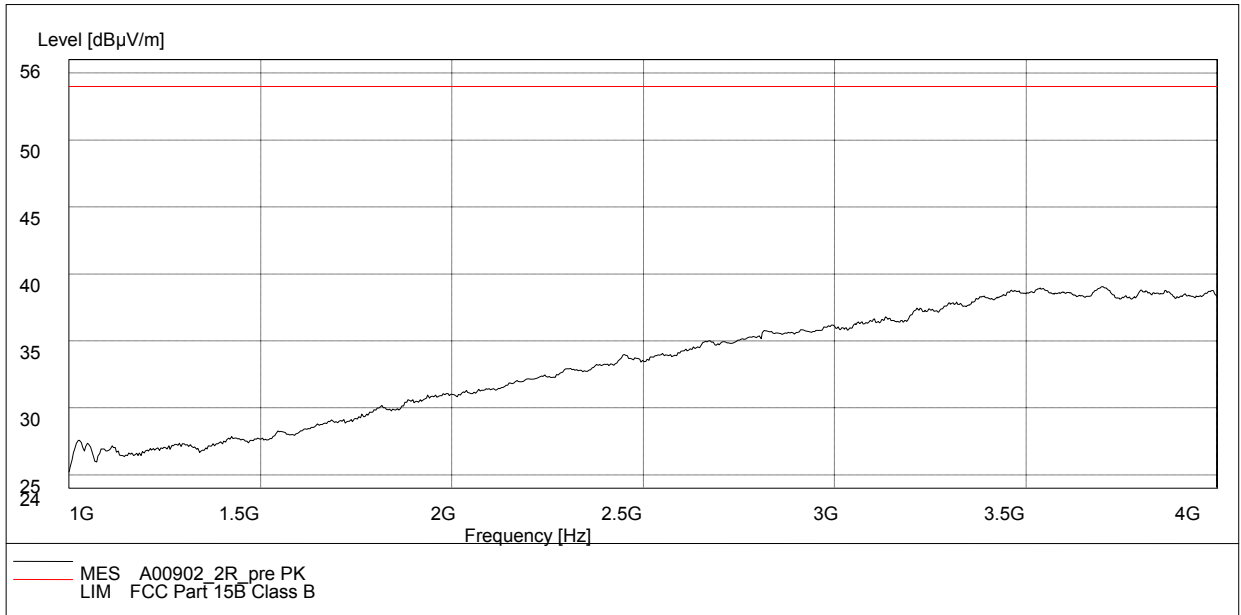
A.9.2 Method of Measurement

Frequency of Emission (MHz)	Limit (dBµV/m)	Measurement Distance (m)
30-88	30	10
88-216	33.5	10
216-960	36	10
960-1000	44	10
>1000	54	3

A. 9.3 Measurement results
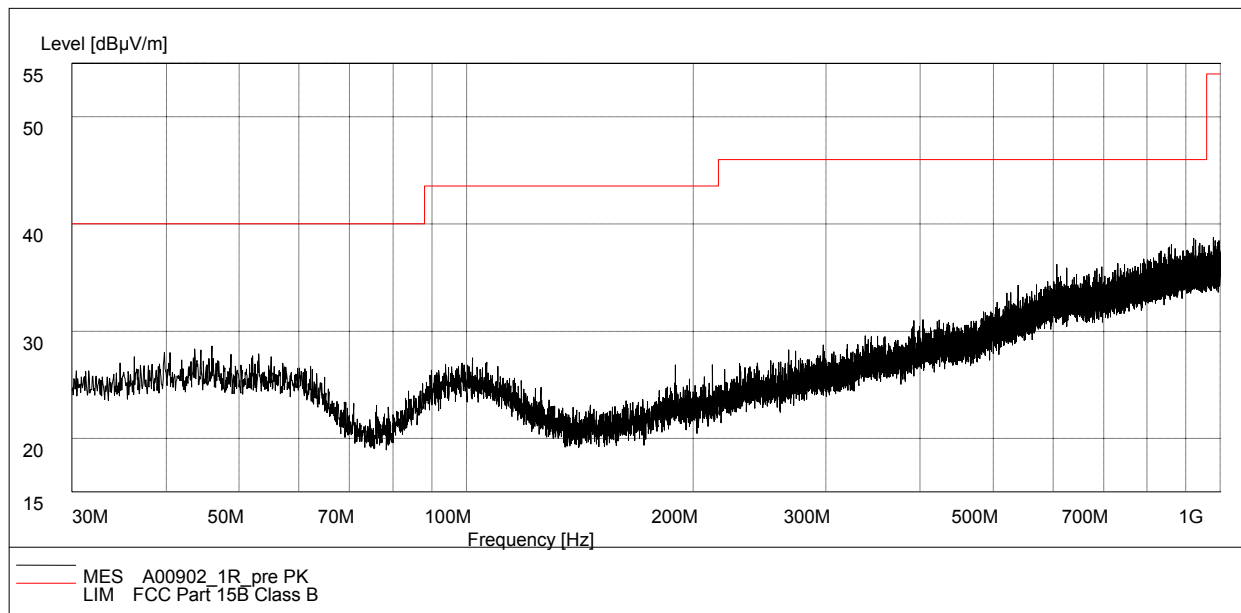
IF bandwidth: 120 kHz

Idle Mode: 30MHz-1GHz

Level [dBµV/m]

Idle Mode: 1GHz-4GHz

RBW / VBW 1 MHz

FCC 4-18G

Idle Mode: 4GHz-18GHz

RBW / VBW 1 MHz

END OF REPORT