



TEST REPORT

No. 2010TAR350

for

Sony Ericsson Mobile Communications AB

GSM quad bands and TD-SCDMA dual bands mobile phone

Type: AAK-7880001-BV

FCC ID: PY7A7880001

IC No.: 4170B- A7880001

with

Hardware Version: A

Software Version: R1AC002

Issued Date: Sep 17th, 2010

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

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1. Test Laboratory

1.1. Testing Location

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT
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Postal Code: 100191
Telephone: +86-10-62304633
Fax: +86-10-62304793

1.2. Testing Environment

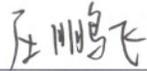
Normal Temperature: 15-35°C
Relative Humidity: 20-75%
Air pressure 990 - 1040 hPa

The climatic requirements above are general exclude the special requirements for dedicated test environments listed in section 5 and some specific test cases in other parts of this report.

1.3. Project data

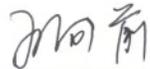
Testing Start Date: Aug 18th, 2010
Testing End Date: Aug 30th, 2010

1.4. Signature



Qu Pengfei

(Prepared this test report)



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(Reviewed this test report)



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Deputy Director of the laboratory

(Approved this test report)

2. Client Information

2.1. Applicant Information

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Telephone: +86-10-58656312
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2.2. Manufacturer Information

Company Name: Sony Ericsson Mobile Communications AB
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City: Lund
Postal Code: 22188
Country: Sweden
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3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	GSM 850/900/1800/1900, GPRS, EDGE, TD-SCDMA 1880-1920MHz, 2010-2025MHz, BT EDR2.0, WLAN, CMMB TV receiver, GPS receiver and FM-receiver mobile phone
Type	AAK-7880001-BV
FCC ID	PY7A7880001
IC No	4170B-A7880001
Frequency range	GSM 850: 824.2MHz-848.8MHz PCS 1900: 1850.2MHz-1909.8MHz
Antenna	Internal
Power supply	Battery or Charger (AC Adaptor)
Output power	28.35 dBm maximum ERP measured for GSM850 27.29 dBm maximum EIRP measured for PCS1900
Extreme vol. Limits	3.6VDC to 4.2VDC (nominal: 3.8VDC)
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	IMEI	HW Version	SW Version
N17	CT5SB0004F	004402140218748	A	R1AC002
N18	CT5SB00074	004402140222872	A	R1AC002

*EUT ID: is used to identify the test sample in the lab internally.
N17 is for radiated test and N18 is for conducted test.

3.3. Internal Identification of AE used during the test

AE ID*	Description	SN	Revision
AE1	Battery	/	3
17526	Travel Charger	1109W50501037	AP
17517	USB Cable	09510D2E034045A	/

AE1

Type Number	CBA-0002012
Manufacturer	Sony Ericsson
Capacitance	1500mAh
Nominal Voltage	3.6V

17526

Type Number	CAA-0002016-BV
Manufacturer	Salcomp

17517

Type Number	EC700
Manufacturer	Sony Ericsson
Length of Cable	141cm

3.4. General Description

Equipment Under Test (EUT) is a model of GSM 850/900/1800/1900 quad bands and TD-SCDMA dual bands (1880-1920/2010-2025MHz) mobile phone with integrated antenna. It has MP3, Camera, FM radio, USB memory, CMMB TV receiver, GPS receiver, Bluetooth (EDR) and WLAN (Wi-Fi and WAPI) functions. It also supports GPRS function with multi-slots class 10 and EGPRS function with multi-slots class 10 too.

It consists of normal options: Lithium Battery and Travel Charger. Since subscribers often use MS during charging, EUT is to be test in accordance with "Base Station and ancillary equipment for fixed use" besides in accordance with "Portable and ancillary equipment for portable use".

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 10.1.09
FCC Part 22	PUBLIC MOBILE SERVICES	V 10.1.09
RSS-132	Cellular Telephones Employing New Technologies Operating in the Bands 824-849 MHz and 869-894 MHz	Issue 2, 2005
RSS-133	2 GHz Personal Communications Services	Issue 5, 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	2009

5. LABORATORY ENVIRONMENT

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

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

Fully-anechoic chamber 1 (6.8 meters×3.08 meters×3.53 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
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 3000 MHz

Fully-anechoic chamber 2 (6.8 meters×4.0 meters×3.67 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
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 3000 MHz

6. SUMMARY OF TEST RESULTS

6.1. Summary of test results

Abbreviations used in this clause:

P	Pass
NA	Not applicable
F	Fail

GSM 850

Items	Test Name	Clause in FCC rules	Clause in IC rules	Section in this report	Verdict
1	Output Power	22.913(a)	4.4	A.1	P
2	Emission Limit	22.917, 2.1051	4.4	A.2	P
3	Conducted Emission	15.107/207	/	A.3	P
4	Frequency Stability	22.235, 2.1055	4.3	A.4	P
5	Occupied Bandwidth	2.1049(h)(i)	4.1.1	A.5	P
6	Emission Bandwidth	22.917(b)	4.1.1	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	Section in this report	Verdict
1	Output Power	24.232(b)	6.2	A.1	P
2	Emission Limit	24.238, 2.1051	6.2	A.2	P
3	Conducted Emission	15.107/207	/	A.3	P
4	Frequency Stability	24.235, 2.1055	6.3	A.4	P
5	Occupied Bandwidth	2.1049(h)(i)	5.6	A.5	P
6	Emission Bandwidth	24.238(b)	5.6	A.6	P
7	Band Edge Compliance	24.238(b)	6.3	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
1	Receiver Radiated Emissions	15.109 , 2.1053	4.6, 6.6	A.9	P

6.2. Statements

The test cases listed in section 6.1 of this report for the EUT specified in section 3 were performed by TMC according to the standards or reference documents in section 4.1

The EUT met all applicable requirements of the standards or reference documents in section 4.1. This report only deals with the GSM/GPRS/EGPRS functions among the features described in section 3. TD-SCDMA and CMMB TV receiver functions are not within the scope of FCC certification.

7. Test Equipments Utilized

NO.	NAME	TYPE	SERIES NUMBER	PRODUCER	CAL DUE DATE
1.	Test Receiver	ESCI	100344	R&S	2011-03-11
2	Test Receiver	ESI40	831564/002	R&S	2011-02-12
4	BiLog Antenna	VULB 9163	9163 301	Schwarzbeck	2011-04-29
5	BiLog Antenna	VULB 9163	9163 235	Schwarzbeck	2010-09-19
6	Signal Generator	SMP04	100070	R&S	2011-04-19
7	LISN	ESH2-Z5	829991/012	R&S	2011-04-20
8	Spectrum Analyzer	FSU26	200030	R&S	2011-06-17
9	Universal Radio Communication Tester	CMU200	116455	R&S	2010-09-06
10	Dual-Ridge Waveguide Horn Antenna	3115	9906-5827	EMCO	2013-08-13
11	Dual-Ridge Waveguide Horn Antenna	3115	9906-5831	EMCO	2011-03-01
12	Dual-Ridge Waveguide Horn Antenna	3116	2663	EMCO	2011-03-01
13	Dual-Ridge Waveguide Horn Antenna	3116	2661	EMCO	2011-03-01
14	Climatic chamber	PL-2G	343074	ESPEC	2011-05-13

ANNEX A: MEASUREMENT RESULTS

A.1 OUTPUT POWER

Reference

FCC: CFR Part 22.913(a), 24.232(b)

IC: RSS 132, Issue 2, Section 4.4. RSS 133, Issue 5, Section 6.2

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 Rohde & 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).

GSM850

Limit

	Power step	Nominal Peak output power (dBm)	Tolerance (dB)	Target (dBm)
GSM	5	33dBm(2W)	± 2	33±1
GPRS	3	33dBm(2W)	± 2	33±1
EGPRS(GMSK)	6	33dBm(2W)	± 2	33±1

Measurement result

GSM

Frequency(MHz)	Power Step	Peak output power(dBm)
824.2	5	32.66
836.6	5	32.83
848.8	5	32.73

GPRS

Frequency(MHz)	Power Step	Peak output power(dBm)
824.2	3	32.65
836.6	3	32.82
848.8	3	32.72

EGPRS

Frequency(MHz)	Power Step	Peak output power(dBm)
824.2	6	27.16
836.6	6	27.21
848.8	6	26.85

Note: Expanded measurement uncertainty for GSM850 is $U = 0.52\text{dB}$, $k=2$.

PCS1900

Limit

	Power step	Nominal Peak output power (dBm)	Tolerance (dB)	Target (dBm)
GSM	0	30dBm(1W)	± 2	30 ± 1
GPRS	3	30dBm(1W)	± 2	30 ± 1
EGPRS(GMSK)	5	30dBm(1W)	± 2	30 ± 1

Measurement result

GSM

Frequency(MHz)	Power Step	Peak output power(dBm)
1850.2	0	29.30
1880.0	0	29.72
1909.8	0	29.68

GPRS

Frequency(MHz)	Power Step	Peak output power(dBm)
1850.2	3	29.27
1880.0	3	29.71
1909.8	3	29.49

EGPRS

Frequency(MHz)	Power Step	Peak output power(dBm)
1850.2	5	25.59
1880.0	5	25.27
1909.8	5	25.25

Note: Expanded measurement uncertainty for PCS1900 is $U = 0.83\text{dB}$, $k=2$.

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 "Maximum ERP. The effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts."

A.1.3.2 Method of Measurement

The measurement is performed in an anechoic antenna test chamber. A spectrum analyzer is used. The peak detector of spectrum analyzer is used and the mode is positive. The bandwidth setting of spectrum analyzer is 3 MHz for both RBW and VBW.

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

1. In fully-anechoic chamber 2, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power (P_{in}) is applied to the input of the dipole, and the power received (P_r) at the chamber's probe antenna is recorded.
2. The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established as $A_{Rpl}=P_{in} - P_r$. The A_{Rpl} is the attenuation of "reference path loss", and including the gain of receive antenna, the cable loss and the air loss.

The measurement results are obtained as described below:

$$\text{Power(EIRP)}=P_{Mea}+A_{Rpl}$$

3. The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.
4. From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.
5. The EUT is then put into continuously transmitting mode at its maximum power level.
6. Power mode measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 24.232 (b) and (c). The "reference path loss" from Step1 is added to this result.
7. This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.15 dBi) and known input power (P_{in}).
8. ERP can be calculated from EIRP by subtracting the gain of the dipole, $ERP = EIRP - 2.15dBi$.
9. The test system should be checked before test by a standard comb signal source. The signal source put on the position, instead of the EUT. The test result should be compared with the test result before. If the test result is similar with the initial one, then the test system can work stably.

For test layout photo, please refer to Pic.1 in Annex B.

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)	Power Step	Peak ERP(dBm)	A _{Rpl} (dB)	Correction (dB)	P _{Mea} (dBm)	Polarization
824.2	5	25.78	45.95	2.15	-18.02	Horizontal
836.6	5	27.15	45.98	2.15	-16.68	Horizontal
848.8	5	28.35	45.82	2.15	-15.32	Horizontal

GPRS

Frequency(MHz)	Power Step	Peak ERP(dBm)	A _{Rpl} (dB)	Correction (dB)	P _{Mea} (dBm)	Polarization
824.2	3	25.73	45.95	2.15	-18.07	Horizontal
836.6	3	27.10	45.98	2.15	-16.73	Horizontal
848.8	3	28.30	45.82	2.15	-15.37	Horizontal

EGPRS

Frequency(MHz)	Power Step	Peak ERP(dBm)	A _{Rpl} (dB)	Correction (dB)	P _{Mea} (dBm)	Polarization
824.2	6	18.80	45.95	2.15	-25.00	Horizontal
836.6	6	19.11	45.98	2.15	-24.72	Horizontal
848.8	6	20.24	45.82	2.15	-23.43	Horizontal

Frequency: 848.8MHz

Peak ERP(dBm)= P_{Mea}(-15.32dBm)+ A_{Rpl}(45.82dB)-2.15dB= 28.35 dBm

ANALYZER SETTINGS: RBW = VBW = 3MHz

Note: Expanded measurement uncertainty for GSM850 is $U = 0.96\text{dB}$, $k=2$.

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)	Power Step	Peak EIRP(dBm)	A _{Rpl} (dB)	P _{Mea} (dBm)	Polarization
1850.2	0	27.28	47.11	-19.83	Horizontal
1880.0	0	27.29	47.37	-20.08	Horizontal
1909.8	0	27.06	47.54	-20.48	Vertical

GPRS

Frequency(MHz)	Power Step	Peak EIRP(dBm)	A _{Rpl} (dB)	P _{Mea} (dBm)	Polarization
1850.2	3	27.28	47.11	-19.83	Horizontal
1880.0	3	27.29	47.37	-20.08	Horizontal
1909.8	3	27.07	47.54	-20.47	Vertical

EGPRS

Frequency(MHz)	Power Step	Peak EIRP(dBm)	A _{Rpl} (dB)	P _{Mea} (dBm)	Polarization
1850.2	5	21.94	47.11	-25.17	Horizontal
1880.0	5	21.38	47.37	-25.99	Vertical
1909.8	5	21.35	47.54	-26.19	Vertical

Frequency: 1880MHz

$$\text{Peak EIRP(dBm)} = P_{\text{Mea}}(-20.08\text{dBm}) + A_{\text{Rpl}}(47.37\text{dB}) = 27.29 \text{ dBm}$$

ANALYZER SETTINGS: RBW = VBW = 3MHz

Note: Expanded measurement uncertainty for PCS1900 is $U = 1.07\text{dB}$, $k=2$.

A.2 EMISSION LIMIT

Reference

FCC: CFR Part 22.917(a), 2.1051, 24.238(b)

IC: RSS 132, Issue 2, Section 4.4. RSS 133, Issue 5, Section 6.2

A.2.1 Measurement Method

The measurements procedures in TIA-603C-2004 are used. This measurement is carried out in both fully-anechoic chamber 1 and fully-anechoic chamber 2.

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 1MHz as outlined in Part 24.238. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the PCS1900 band, GSM850 band.

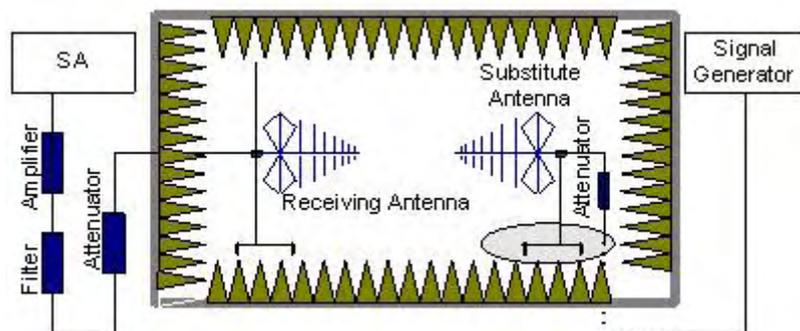
The procedure of radiated spurious emissions is as follows:

a) Pre-calibration

With pre-calibration method, the Radiated Spurious Emissions(RSE) is calculated as,

$$RSE = Rx \text{ (dBuV)} + CL \text{ (dB)} + SA \text{ (dB)} + Gain \text{ (dBi)} - 107 \text{ (dBuV to dBm)}$$

The SA is calibrated using following setup.

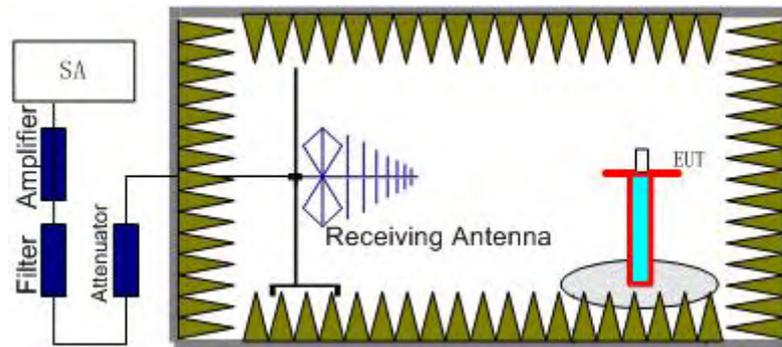


b) System check

The test system was checked before test by a standard comb signal source. The signal source put on the position, instead of the EUT. The test result should be compared with the test result before. If the test result is similar with the initial one, then the test system can work stably.

c) EUT test

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 test item 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 test item 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 and 1MHz bandwidth.



A.2.2 Measurement Limit

Sec. 24.238 Emission Limits.

(a) On any frequency outside a licensee's frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P , in Watts) by 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 the PCS band (1850.2 MHz, 1880 MHz and 1909.8 MHz), GSM850 band (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, 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.

The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established and the A_{Rpl} is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable loss and the air loss.

The measurement results are obtained as described below:

$$\text{Power} = P_{\text{Mea}} + A_{\text{Rpl}}$$

GSM Mode Channel 128/824.2MHz

Frequency(MHz)	Power(dBm)	A _{Rpl} (dB)	P _{Mea} (dBm)	Limit (dBm)	Polarity
1648.35	-53.38	-0.75	-52.63	-13	Horizontal
2472.30	-53.41	3.10	-56.51	-13	Vertical
7400.20	-48.17	9.21	-57.38	-13	Horizontal
9640.00	-47.73	14.37	-62.10	-13	Vertical

GSM Mode Channel 190/836.6MHz

Frequency(MHz)	Power(dBm)	A _{Rpl} (dB)	P _{Mea} (dBm)	Limit (dBm)	Polarity
1672.95	-52.75	0.23	-52.98	-13	Vertical
2509.80	-52.59	3.21	-55.80	-13	Vertical
7400.20	-48.48	9.21	-57.69	-13	Horizontal
9733.60	-45.34	14.70	-60.04	-13	Vertical

GSM Mode Channel 251/848.8MHz

Frequency(MHz)	Power(dBm)	A _{Rpl} (dB)	P _{Mea} (dBm)	Limit (dBm)	Polarity
1697.70	-52.14	0.55	-52.69	-13	Vertical
2545.80	-53.79	3.32	-57.13	-13	Vertical
7147.60	-48.38	9.67	-58.05	-13	Horizontal
9784.60	-45.54	14.86	-60.40	-13	Horizontal

GSM Mode Channel 512/1850.2MHz

Frequency(MHz)	Power(dBm)	A _{Rpl} (dB)	P _{Mea} (dBm)	Limit (dBm)	Polarity
3700.20	-46.07	7.08	-53.15	-13	Horizontal
5550.80	-47.35	8.72	-56.07	-13	Vertical
15713.20	-39.13	23.94	-63.07	-13	Vertical
17700.00	-34.90	33.07	-67.97	-13	Vertical

GSM Mode Channel 661/1880.0MHz

Frequency(MHz)	Power(dBm)	A _{Rpl} (dB)	P _{Mea} (dBm)	Limit (dBm)	Polarity
3759.80	-45.74	6.86	-52.60	-13	Horizontal
5639.90	-44.91	9.00	-53.91	-13	Horizontal
7403.00	-45.93	11.32	-57.25	-13	Horizontal
9707.90	-44.99	15.47	-60.46	-13	Vertical
12983.60	-42.59	18.39	-60.98	-13	Vertical
17628.00	-36.52	33.07	-69.59	-13	Vertical

GSM Mode Channel 810/1909.8MHz

Frequency(MHz)	Power(dBm)	A _{Rpl} (dB)	P _{Mea} (dBm)	Limit (dBm)	Polarity
3820.40	-48.85	6.61	-55.46	-13	Vertical
9703.70	-45.43	15.41	-60.84	-13	Vertical
15019.20	-39.63	23.24	-62.87	-13	Horizontal
17421.60	-32.58	32.64	-65.22	-13	Vertical

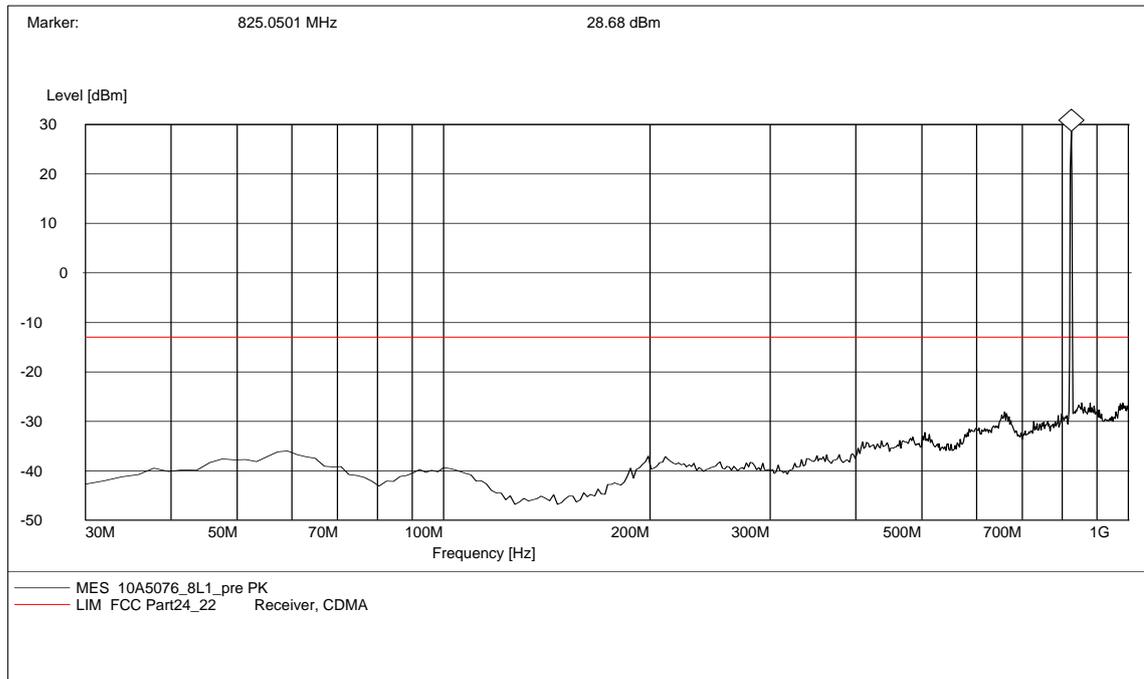
Note: Expanded measurement uncertainty for this test item is $U = 4.21\text{dB}$, $k=2$.

GSM 850

A.2.3.1 RADIATED SPURIOUS EMISSIONS-Channel 128: 30MHz –1GHz

Radiated spurious emission limit :-13dBm.

NOTE: peak above the limit line is the Carrier frequency @ ch-128

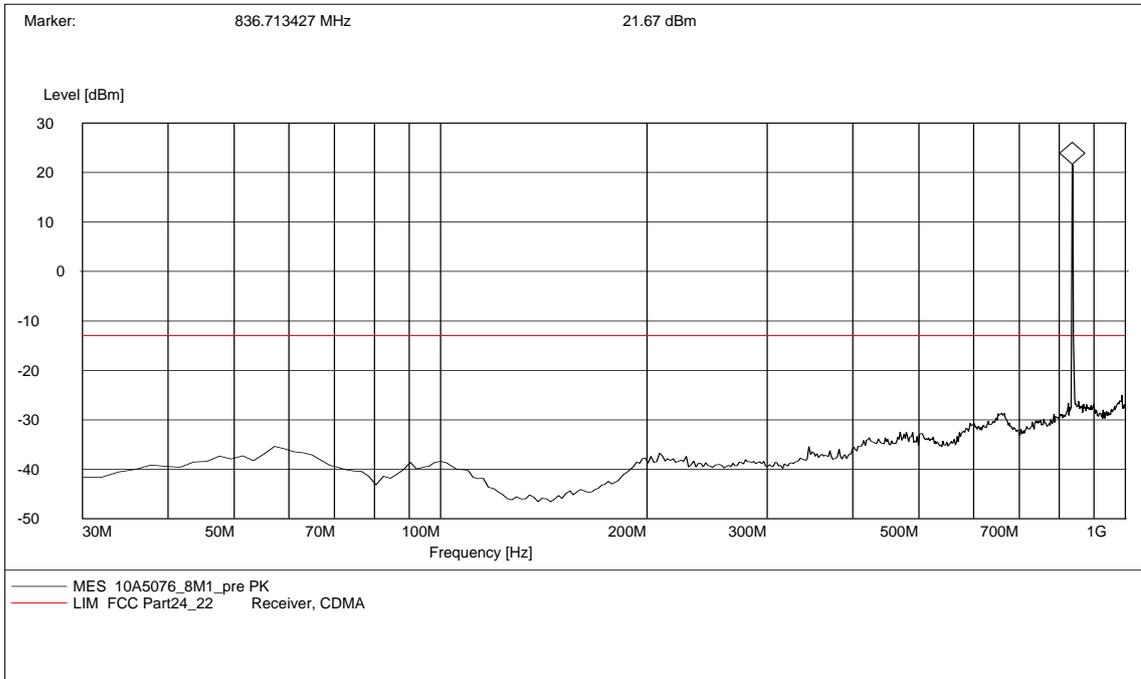


RBW / VBW 1MHz

A.2.3.2 RADIATED SPURIOUS EMISSIONS-Channel 190: 30MHz – 1GHz

Radiated spurious emission limit :-13dBm.

NOTE: peak above the limit line is the Carrier frequency @ ch-190

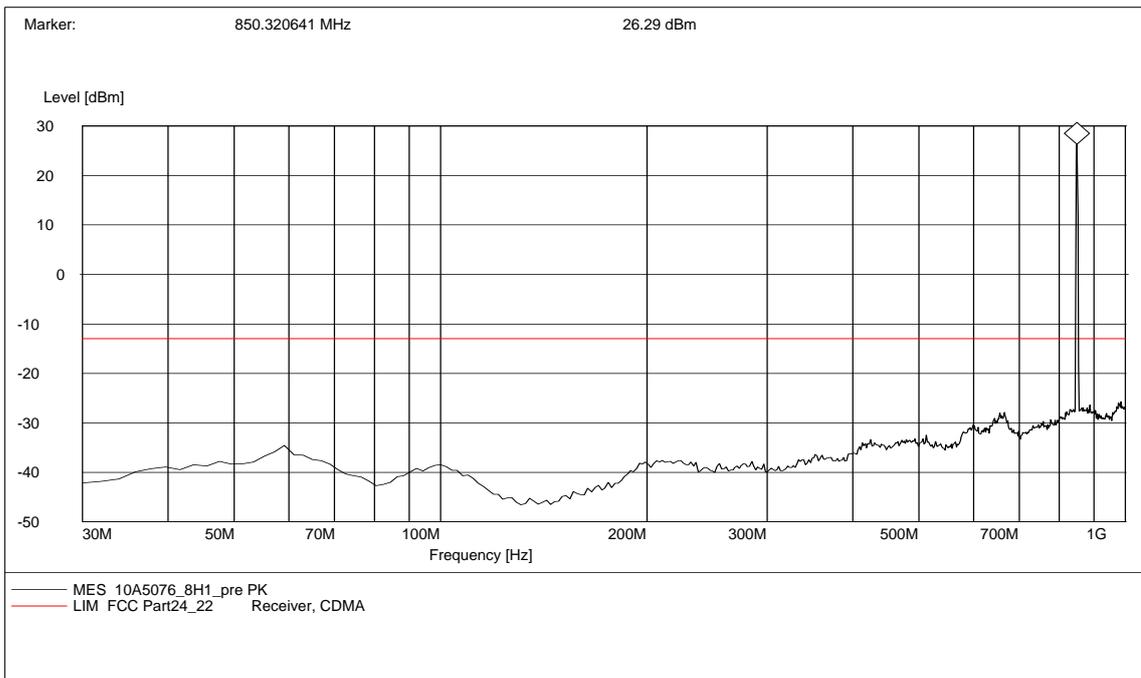


RBW / VBW 1MHz

A.2.3.3 RADIATED SPURIOUS EMISSIONS-Channel 251: 30MHz – 1GHz

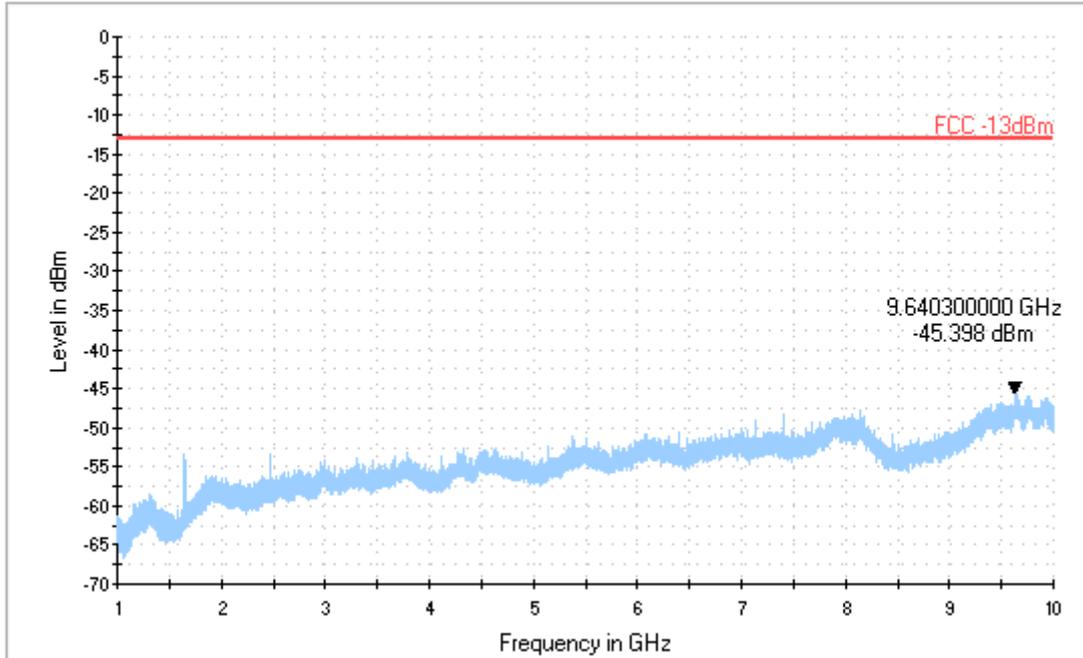
Radiated spurious emission limit :-13dBm.

NOTE: peak above the limit line is the Carrier frequency @ ch-251



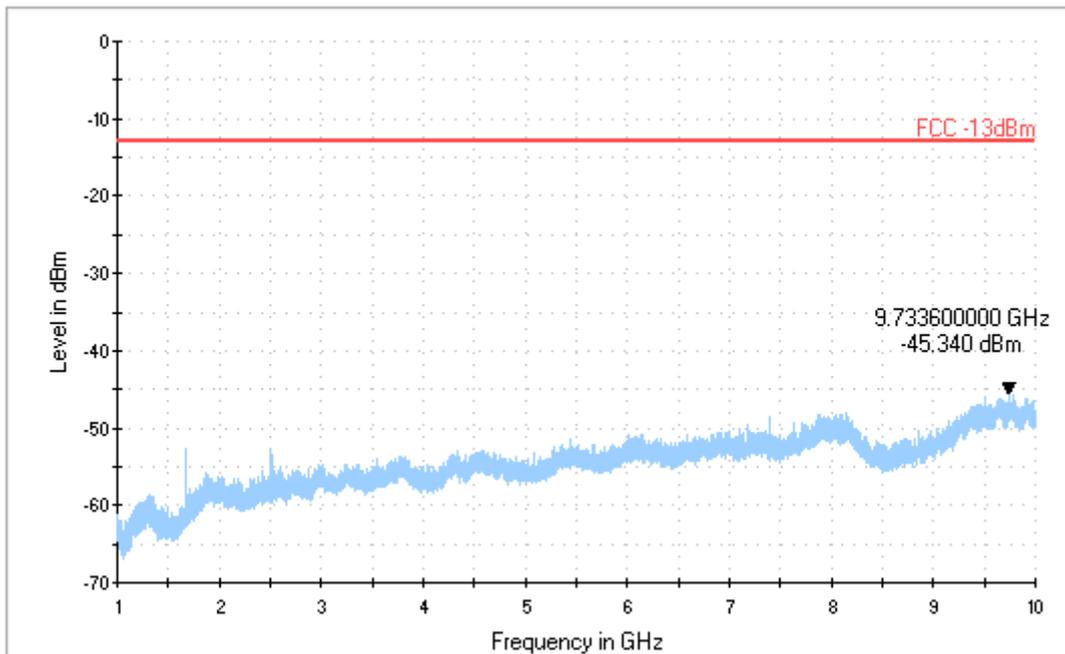
RBW / VBW 1MHz

A.2.3.4 RADIATED SPURIOUS EMISSIONS-Channel 128: 1GHz – 10GHz
Radiated spurious emission limit :-13dBm.



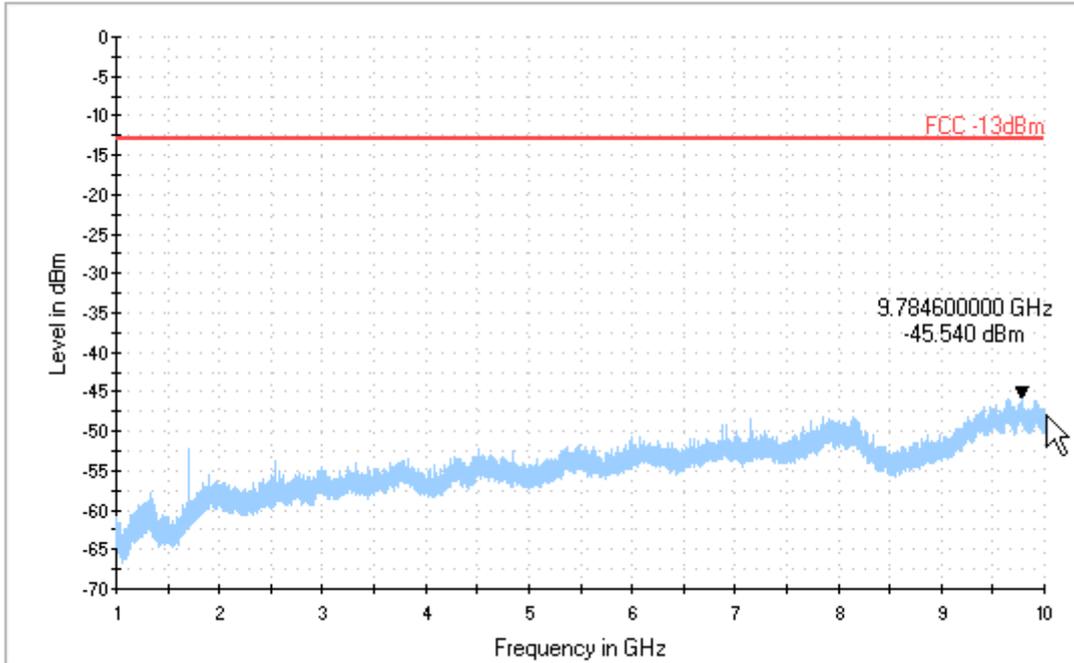
RBW / VBW 1 MHz

A.2.3.5 RADIATED SPURIOUS EMISSIONS-Channel 190: 1GHz – 10GHz
Radiated spurious emission limit :-13dBm.



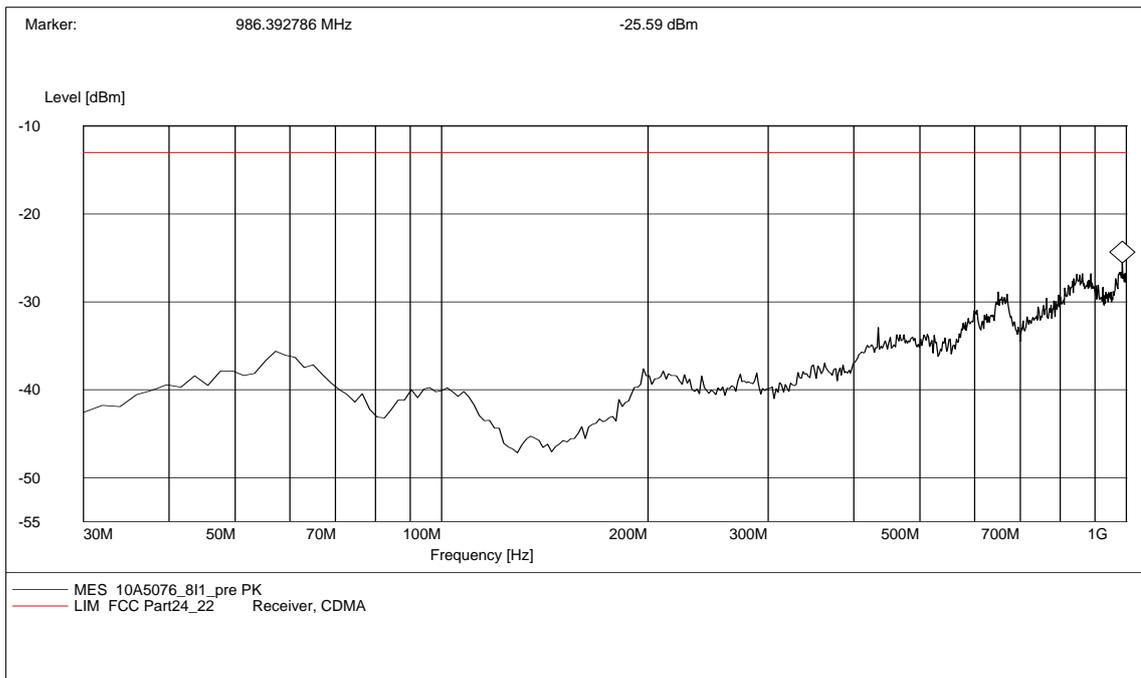
RBW / VBW 1 MHz

A.2.3.6 RADIATED SPURIOUS EMISSIONS-Channel 251: 1GHz – 10GHz
Radiated spurious emission limit :-13dBm.



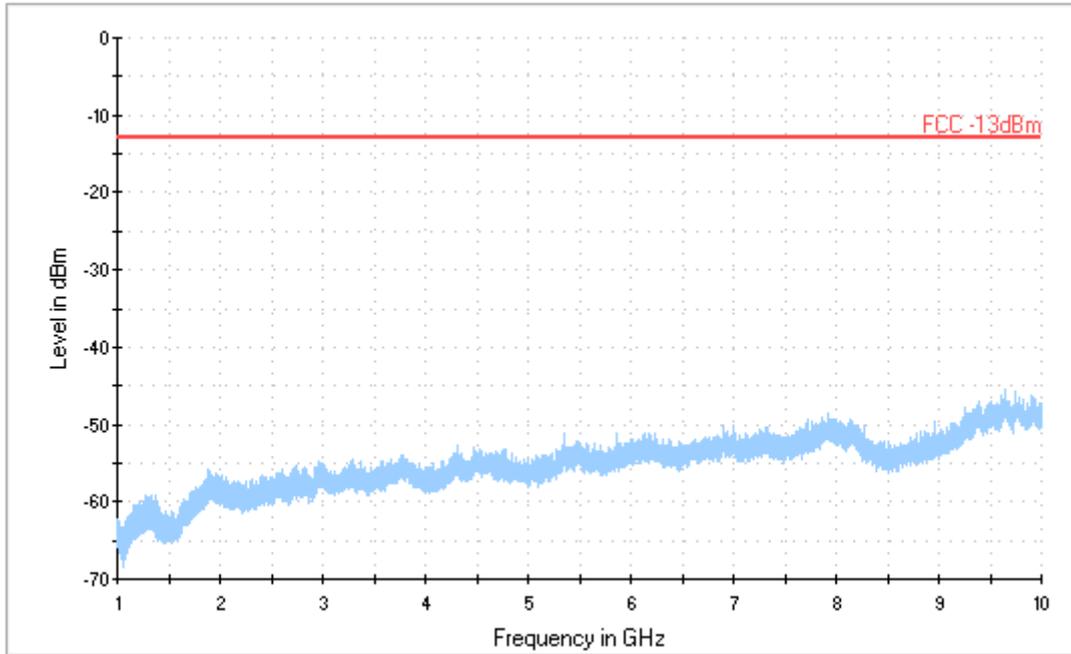
RBW / VBW 1 MHz

A.2.3.7 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 30MHz – 1GHz
Radiated spurious emission limit :-13dBm.



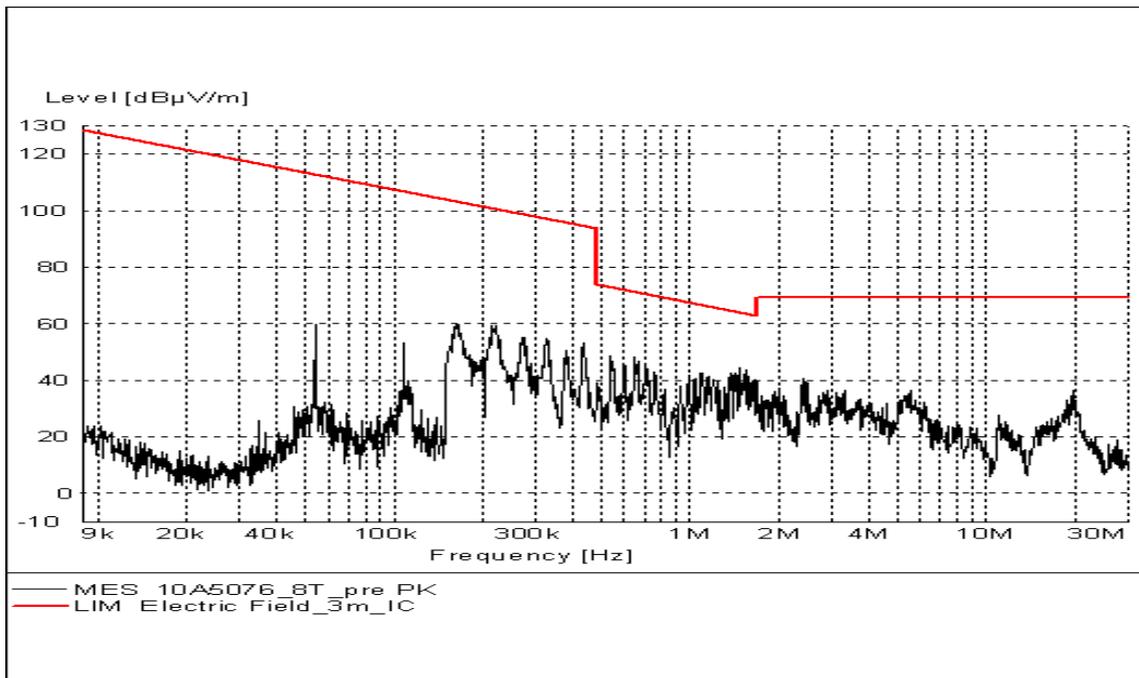
RBW / VBW 1MHz

A.2.3.8 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 1GHz – 10GHz
Radiated spurious emission limit :-13dBm.

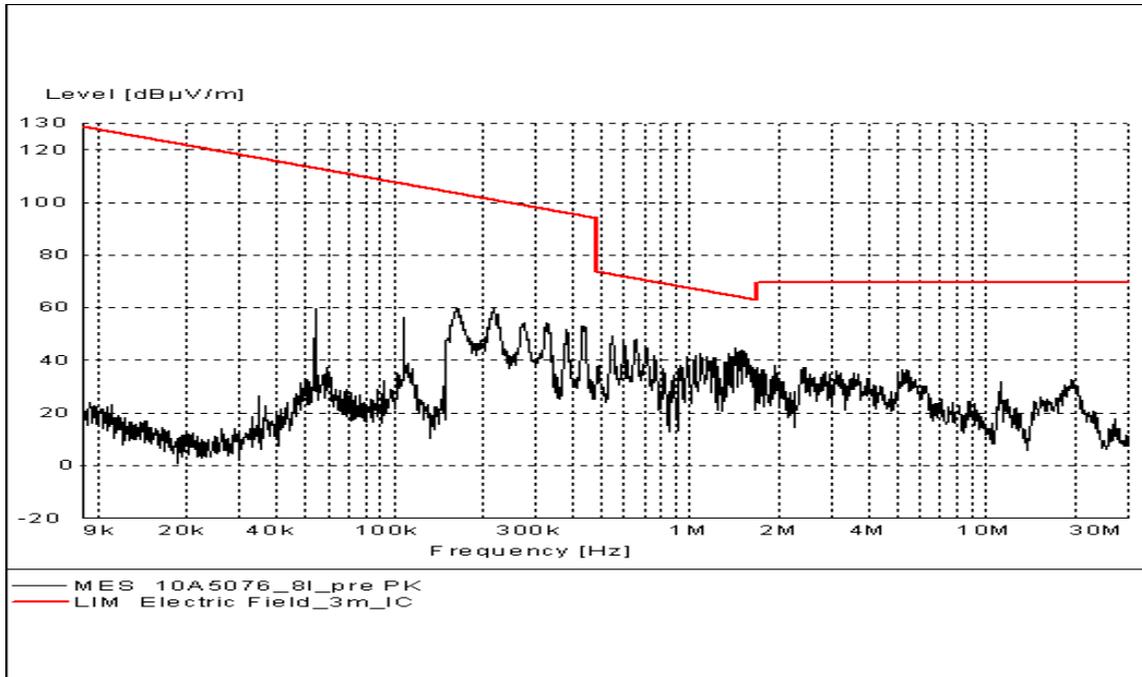


RBW / VBW 1 MHz

A.2.3.9 RADIATED SPURIOUS EMISSIONS-EUT in Traffic Mode: 9 kHz – 30 MHz (Valid for 3 channels)



A.2.3.10 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 9 kHz – 30 MHz (Valid for 3 channels)

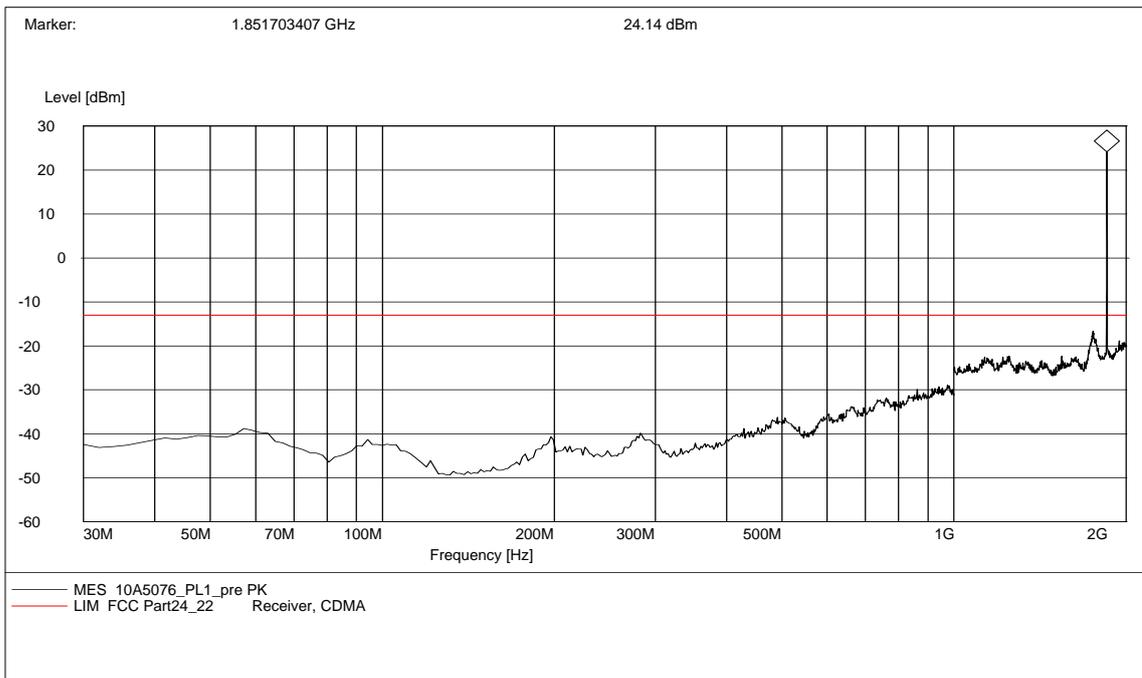


PCS 1900

A.2.3.11 RADIATED SPURIOUS EMISSIONS-Channel 512: 30MHz – 2GHz

Radiated spurious emission limit :-13dBm.

NOTE: peak above the limit line is the Carrier frequency @ ch-512

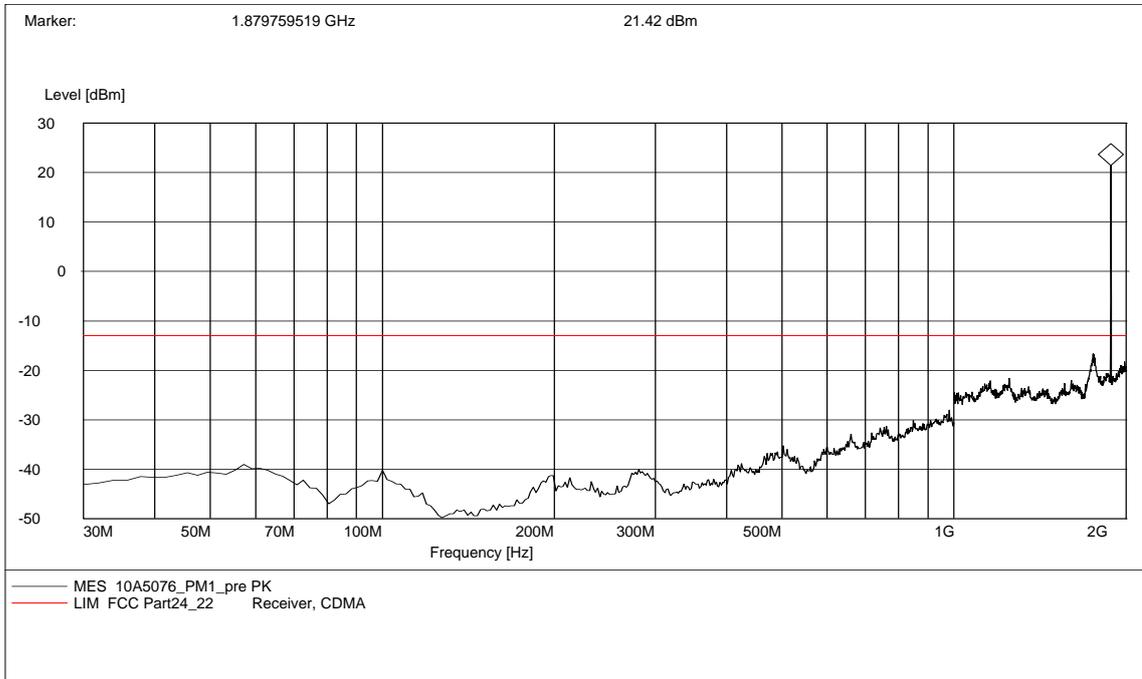


RBW / VBW 1MHz

A.2.3.12 RADIATED SPURIOUS EMISSIONS-Channel 661: 30MHz – 2GHz

Radiated spurious emission limit :-13dBm.

NOTE: peak above the limit line is the Carrier frequency @ ch-661

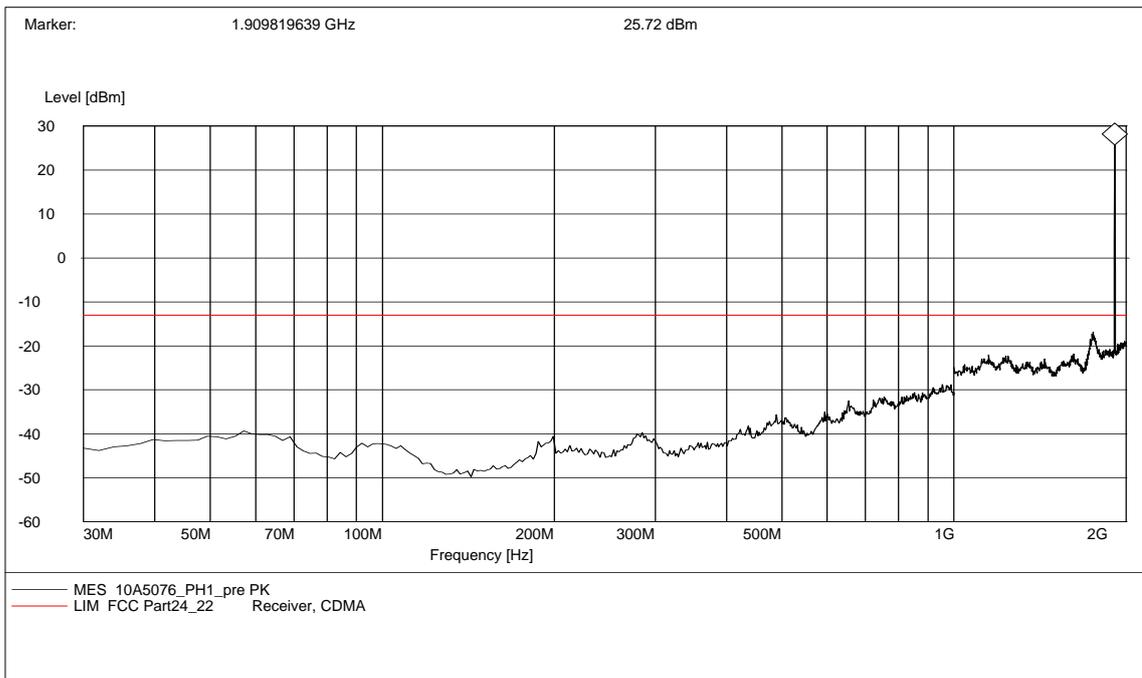


RBW / VBW 1MHz

A.2.3.13 RADIATED SPURIOUS EMISSIONS-Channel 810: 30MHz – 2GHz

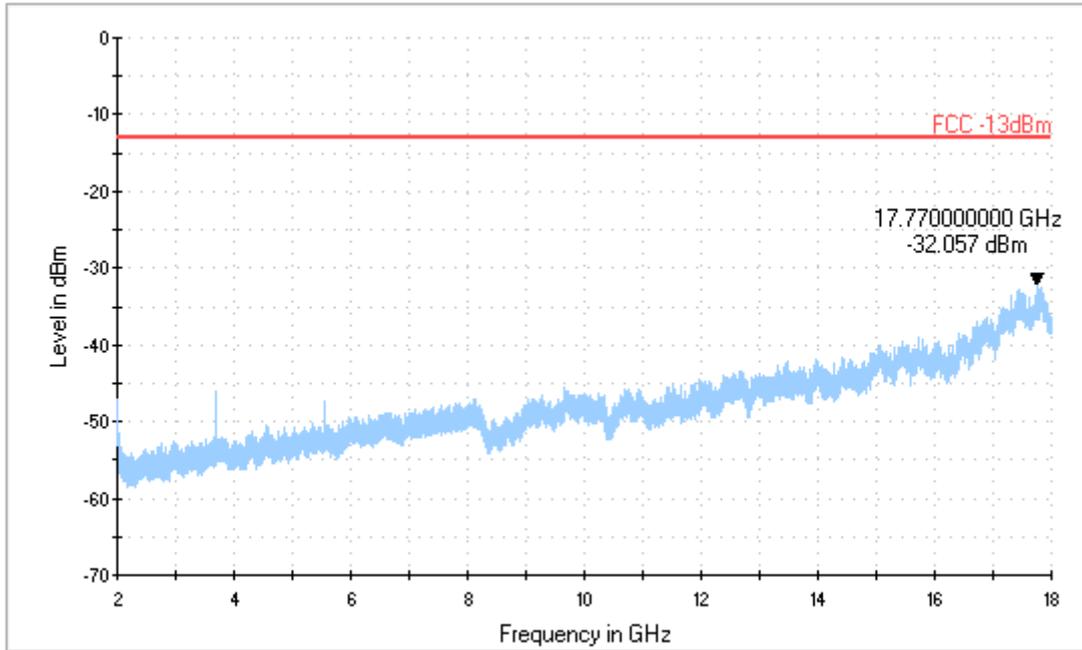
Radiated spurious emission limit :-13dBm.

NOTE: peak above the limit line is the Carrier frequency @ ch-810



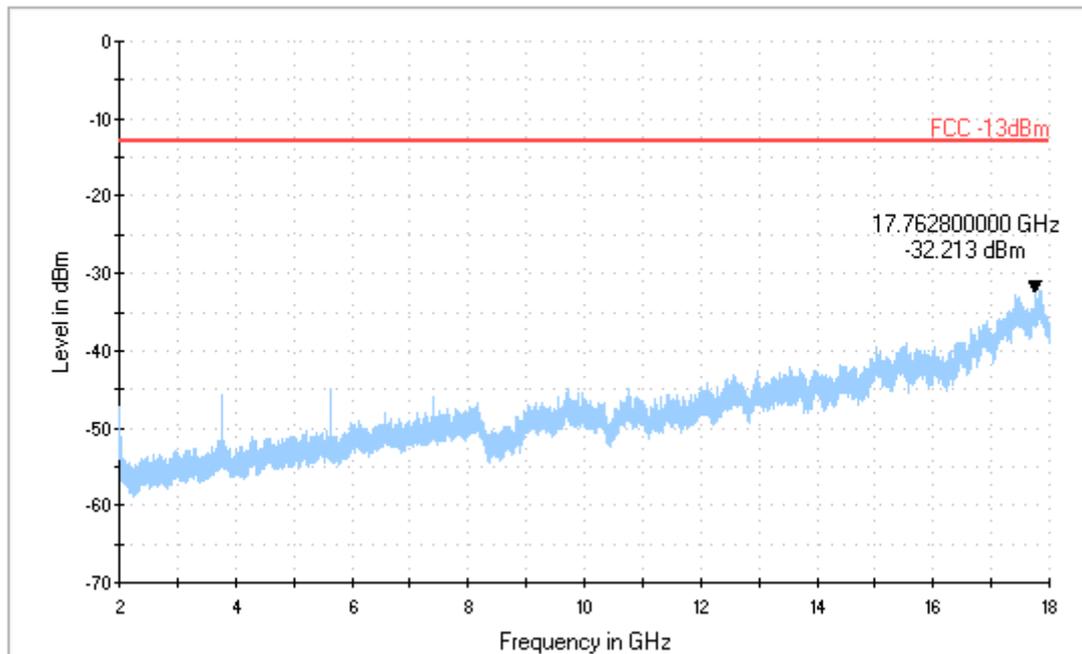
RBW / VBW 1MHz

A.2.3.14 RADIATED SPURIOUS EMISSIONS-Channel 512: 2GHz – 18GHz
Radiated spurious emission limit :-13dBm.



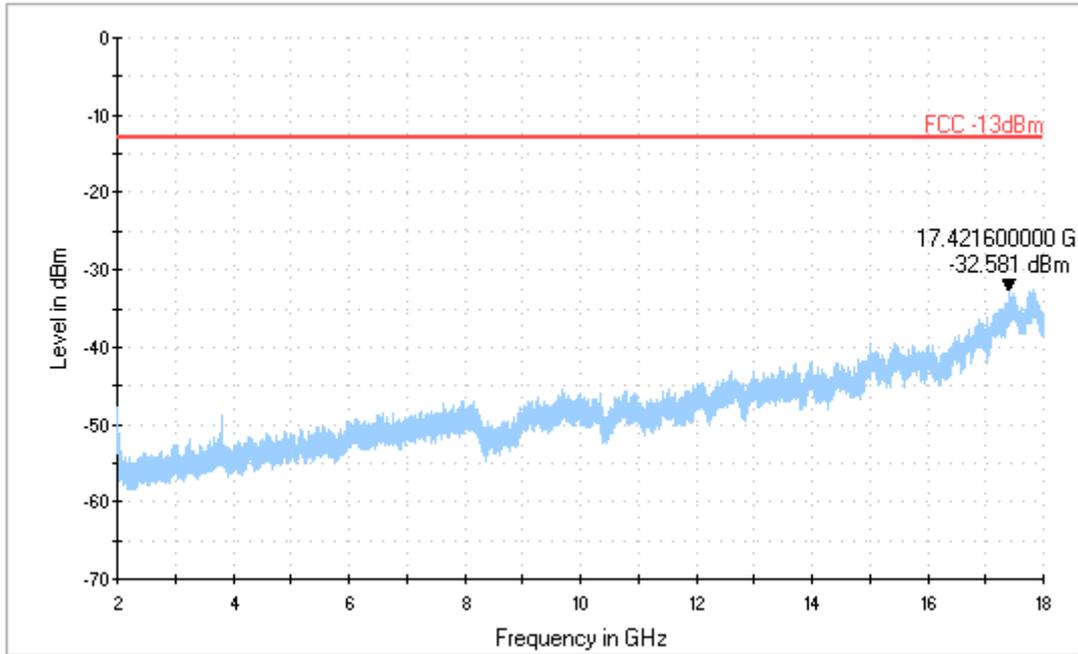
RBW / VBW 1 MHz

A.2.3.15 RADIATED SPURIOUS EMISSIONS-Channel 661: 2GHz – 18GHz
Radiated spurious emission limit :-13dBm.



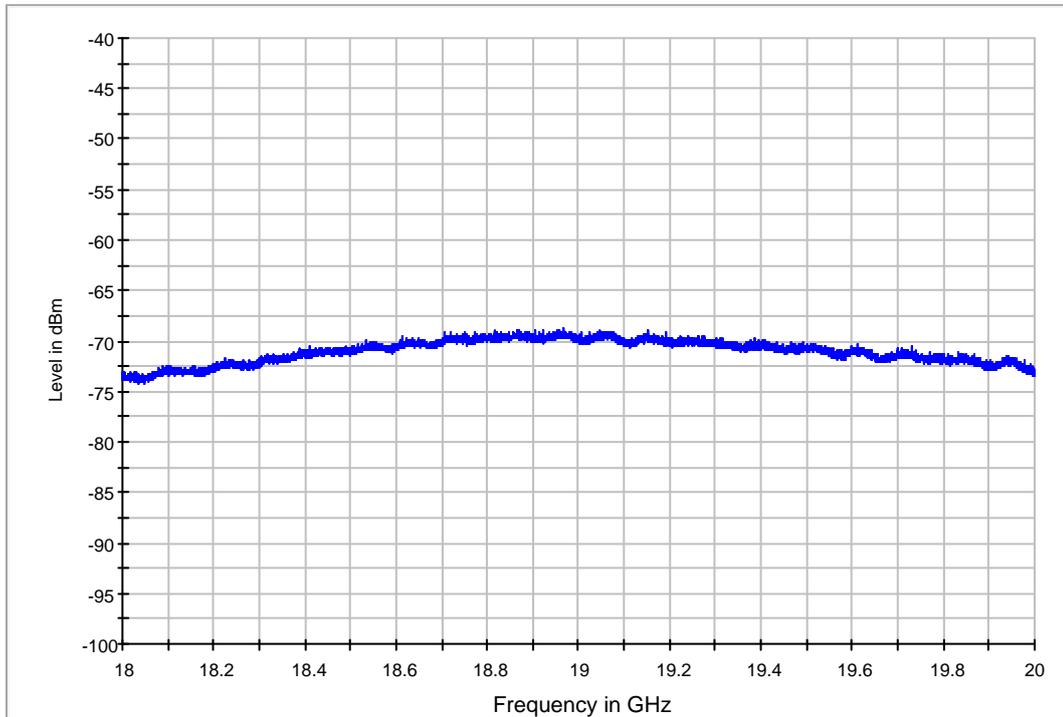
RBW / VBW 1 MHz

A.2.3.16 RADIATED SPURIOUS EMISSIONS-Channel 810: 2GHz – 18GHz
Radiated spurious emission limit :-13dBm.



RBW / VBW 1 MHz

A.2.3.17 Radiated spurious emission (18GHz-20GHz)
Radiated spurious emission limit :-13dBm.

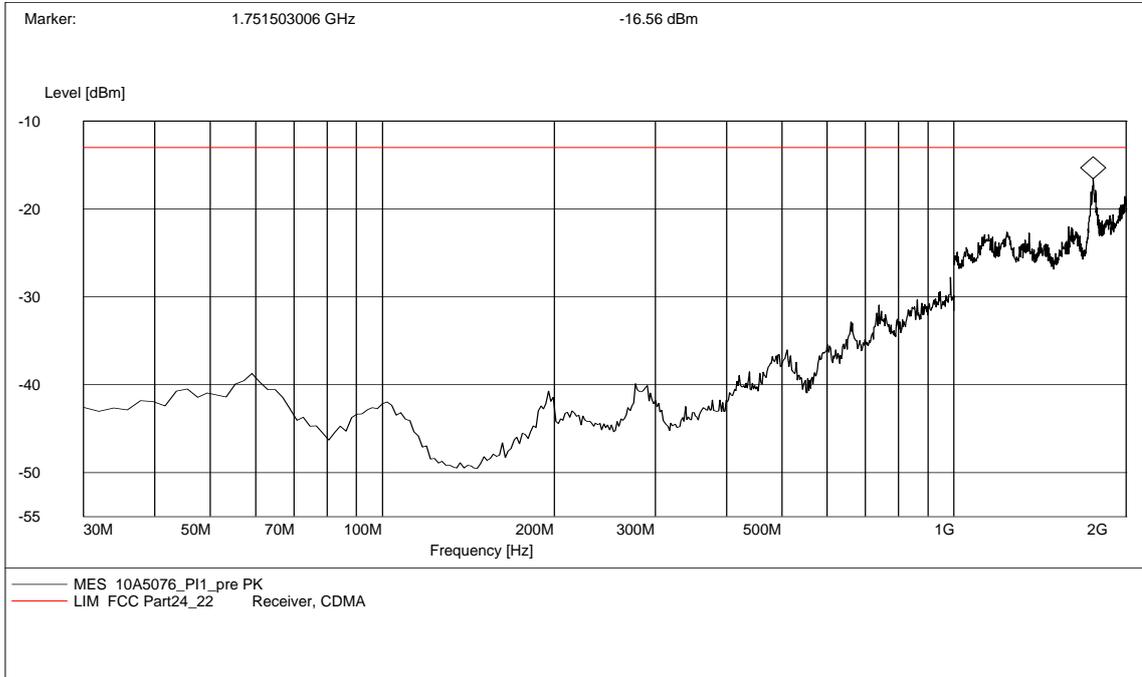


RBW / VBW 1 MHz

Note:

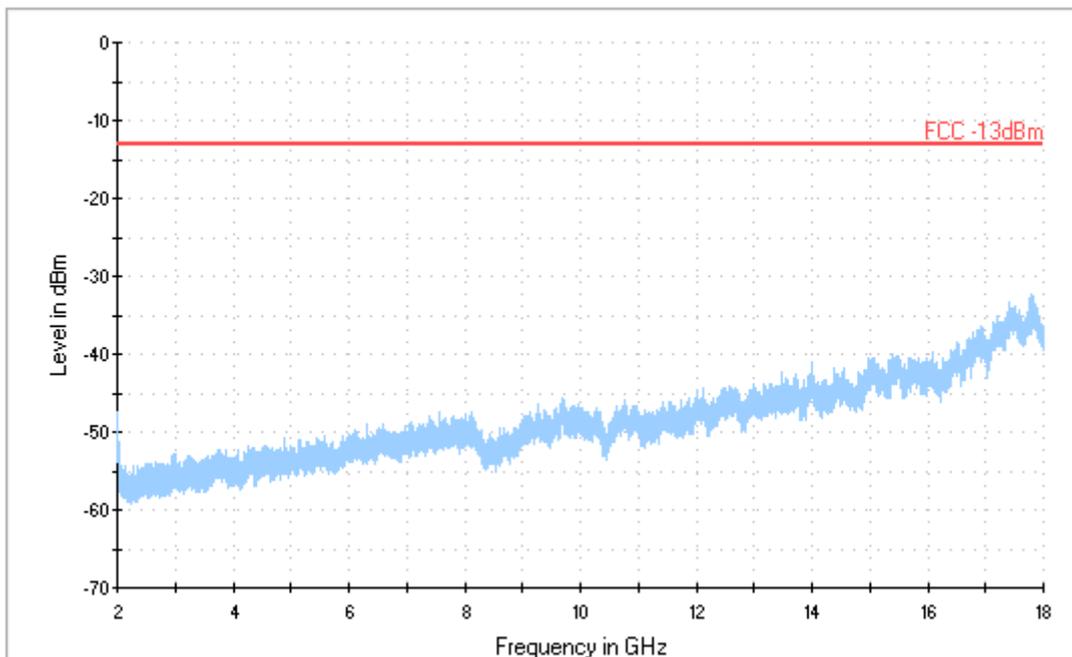
- 1) A pre-amplifier with 40dB gain is used behind the receive antenna, which make the test system capable to measure ERP/EIRP below -33dBm. The measurement result is same as the noise floor of the pre-amplifier output. No peak is detected, so it's valid for low, middle and high channels.
- 2) The purpose of corresponding measurement is finding the maximum readings as the first step of the substitution method. So there is no limit line displayed in the plot above.

A.2.3.18 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 30MHz – 2GHz
Radiated spurious emission limit :-13dBm.



RBW / VBW 1MHz

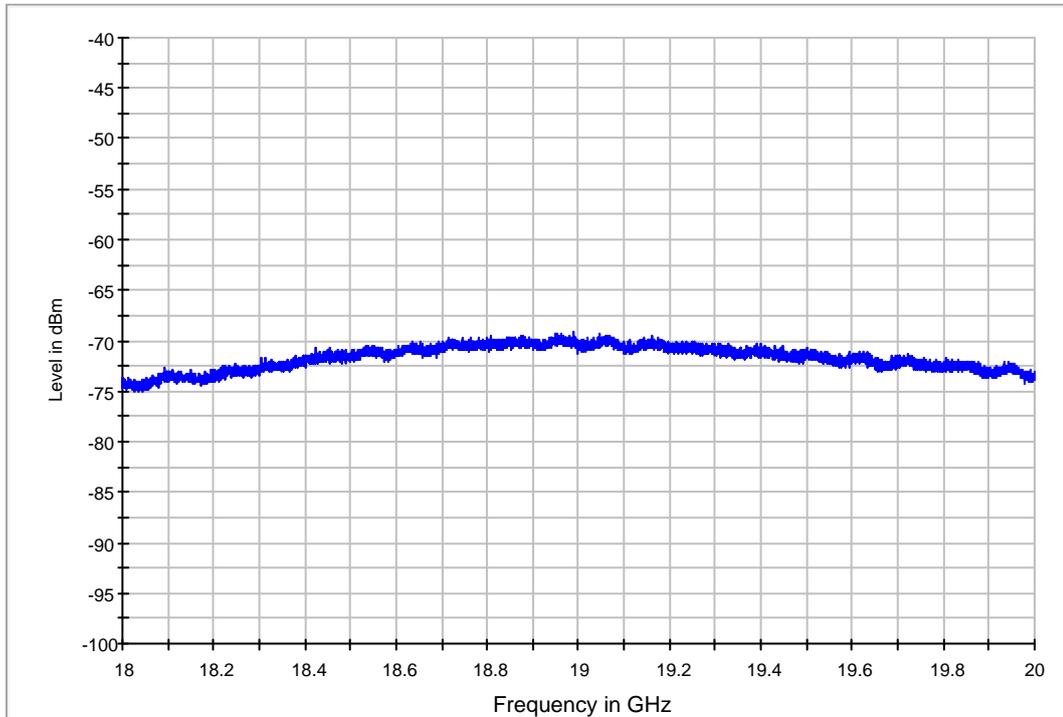
A.2.3.19 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 2GHz – 18GHz
Radiated spurious emission limit :-13dBm.



RBW / VBW 1 MHz

A.2.3.20 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 18GHz – 20GHz
Radiated spurious emission limit :-13dBm.

FCC Part 24 18-20G

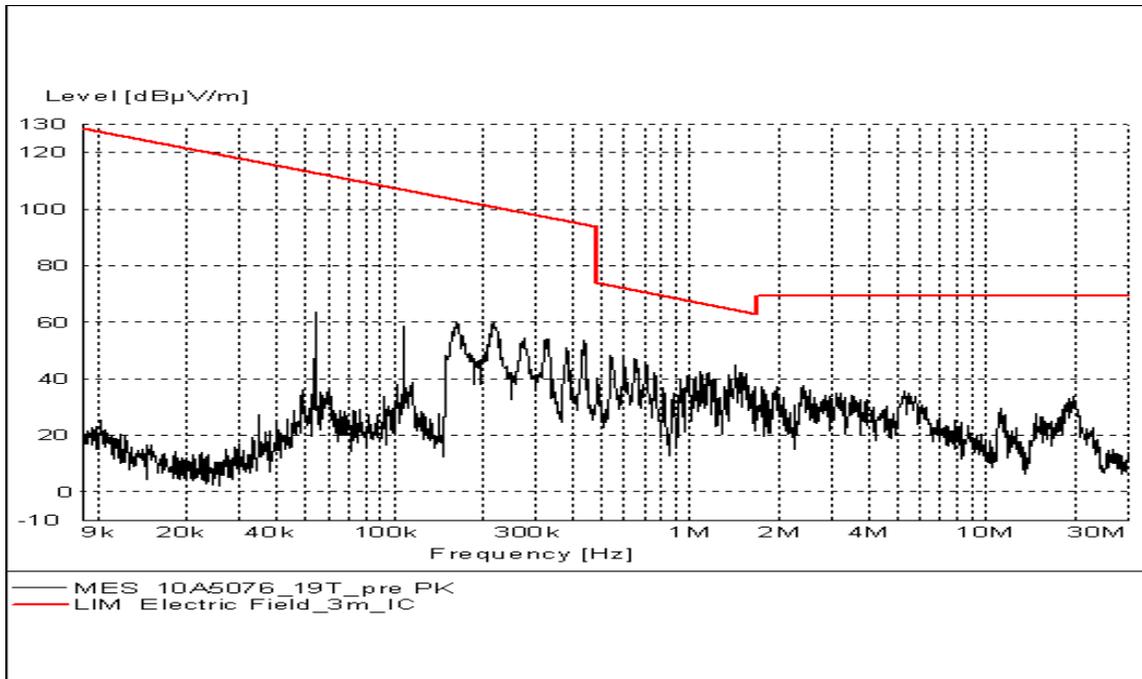


RBW / VBW 1 MHz

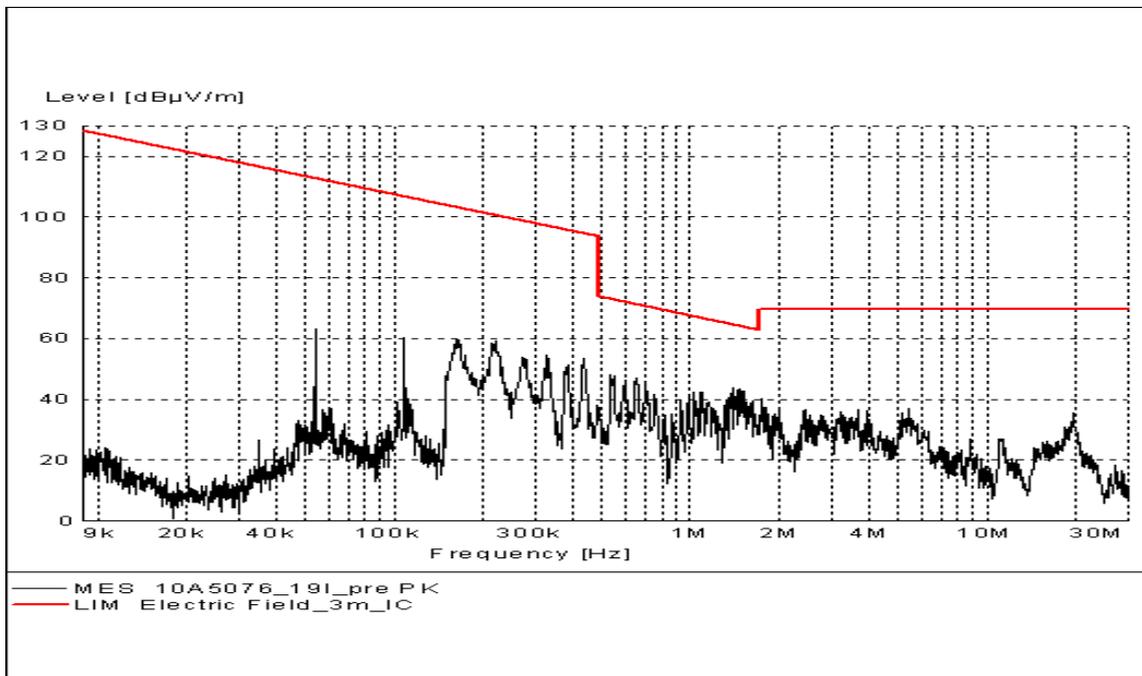
Note:

- 1) A pre-amplifier with 40dB gain is used behind the receive antenna, which make the test system capable to measure ERP/EIRP below -33dBm. The measurement result is same as the noise floor of the pre-amplifier output. No peak is detected, so it's valid for low, middle and high channels.
- 2) The purpose of corresponding measurement is finding the maximum readings as the first step of the substitution method. So there is no limit line displayed in the plot above.

A.2.3.21 RADIATED SPURIOUS EMISSIONS-EUT in Traffic Mode: 9 kHz – 30 MHz (Valid for 3 channels)



A.2.3.22 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 9 kHz – 30 MHz(Valid for 3 channels)



A.3 CONDUCTED EMISSION

Reference

FCC: CFR Part 15.107/207

The measurement procedure in ANSI C63.4-2009 is used. Conducted Emission is measured with travel charger. For test layout photo, please refer to Pic.2 in Annex B.

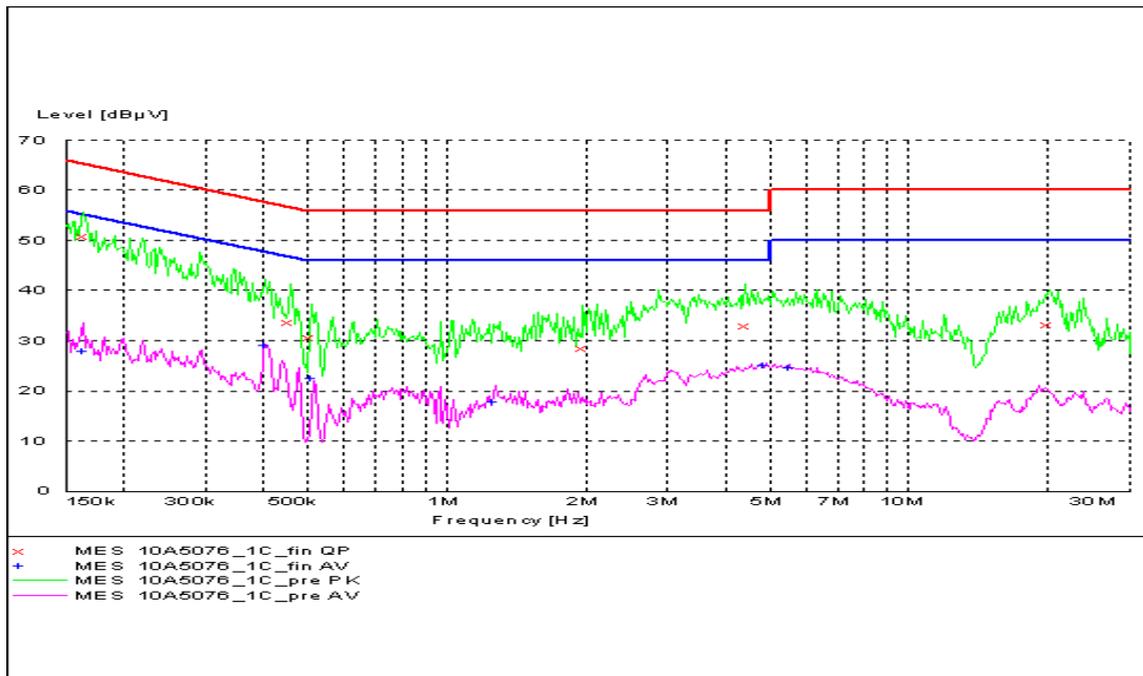
A.3.1 Limit

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	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



IF bandwidth 9 kHz

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

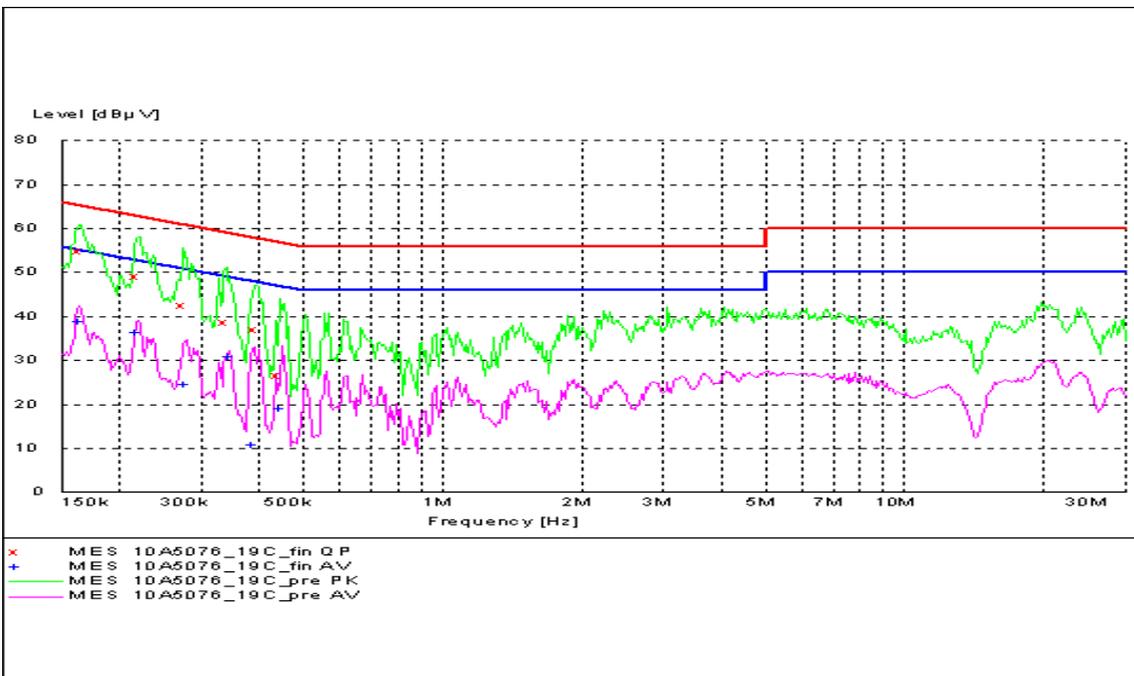
MEASUREMENT RESULT: "10A5076_1C_fin QP"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.164053	50.80	10.1	65	14.4	N	FLO
0.457178	33.80	10.1	57	22.9	N	GND
0.510059	30.60	10.1	56	25.4	N	FLO
1.973909	28.50	10.1	56	27.5	L1	GND
4.433430	33.00	10.2	56	23.0	L1	FLO
20.118181	33.20	10.2	60	26.8	L1	GND

MEASUREMENT RESULT: "10A5076_1C_fin AV"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.164053	27.90	10.1	55	27.3	L1	GND
0.405722	28.90	10.1	48	18.8	L1	FLO
0.515159	22.50	10.1	46	23.5	L1	FLO
1.274050	17.80	10.1	46	28.2	L1	FLO
4.897265	25.00	10.2	46	21.0	L1	GND
5.518361	24.40	10.2	50	25.6	L1	FLO

PCS 1900MHz



IF bandwidth 9 kHz

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

MEASUREMENT RESULT: "10A5076_19C_fin QP"

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
0.164053	54.70	10.1	65	10.5	N	FLO
0.218929	49.10	10.1	63	13.8	N	GND
0.275230	42.40	10.1	61	18.6	L1	GND
0.339191	38.50	10.1	59	20.8	N	FLO
0.393790	36.80	10.1	58	21.2	L1	FLO
0.443732	26.40	10.1	57	30.6	L1	FLO

MEASUREMENT RESULT: "10A5076_19C_fin AV"

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
0.164053	38.90	10.1	55	16.4	L1	GND
0.218929	36.30	10.1	53	16.6	L1	GND
0.277982	24.40	10.1	51	26.5	L1	GND
0.346008	30.70	10.1	49	18.3	L1	FLO
0.389891	10.80	10.1	48	37.2	N	GND
0.448170	19.00	10.1	47	27.9	L1	GND

A.4 FREQUENCY STABILITY

Reference

FCC: CFR Part 22.235, 2.1055, 24.235

IC: RSS 132, Issue 2, Section 4.3. RSS 133, Issue 5, Section 6.3

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°C.
3. With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on channel 661 for PCS 1900 , 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°C increments from -30°C to +50°C. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
5. Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring 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°C.
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°C to -30°C. 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°C 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 3.4VDC and 4.2VDC, with a nominal voltage of 3.8VDC. 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)
3.6	15	0.018
3.8	10	0.012
4.2	13	0.016

Frequency Error vs Temperature

temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-30	14	0.017
-20	14	0.017
-10	13	0.016
0	11	0.013
10	11	0.013
20	10	0.012
30	10	0.012
40	12	0.014
50	13	0.016

Expanded measurement uncertainty for this test item is 10Hz, k=2

PCS 1900

Frequency Error vs Voltage

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.6	20	0.011
3.8	17	0.009
4.2	22	0.012

Frequency Error vs Temperature

temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-30	23	0.012
-20	22	0.012
-10	21	0.011
0	19	0.010
10	18	0.010
20	17	0.009
30	17	0.009
40	18	0.010
50	20	0.011

Expanded measurement uncertainty for this test item is 10Hz, k=2

A.5 OCCUPIED BANDWIDTH

Reference

FCC: CFR Part 2.1049(h)(i)

IC: RSS 132, Issue 2, Section 4.1.1. RSS 133, Issue 5, Section 5.6.

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 the US PCS frequency band. The table below lists the measured -20dBc BW (99%). Spectrum analyzer plots are included on the following pages.

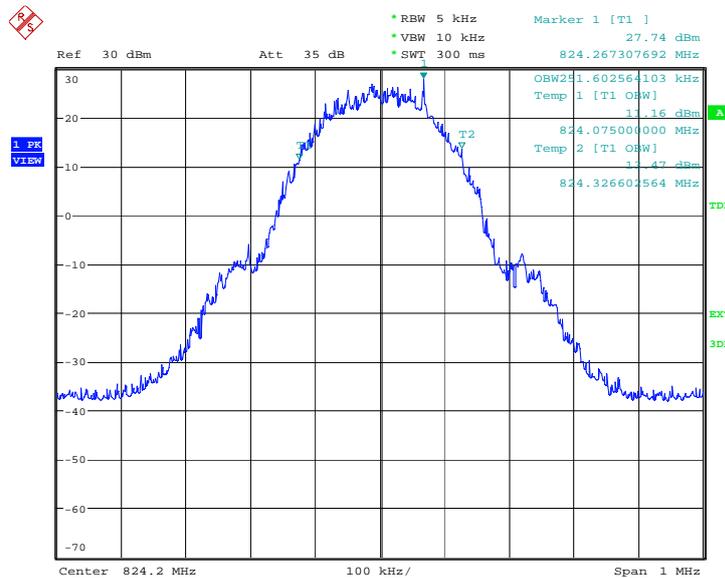
GSM 850(99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
824.2	251.603
836.6	250.000
848.8	250.000

Expanded measurement uncertainty for this test item is 1.1 kHz, k=2

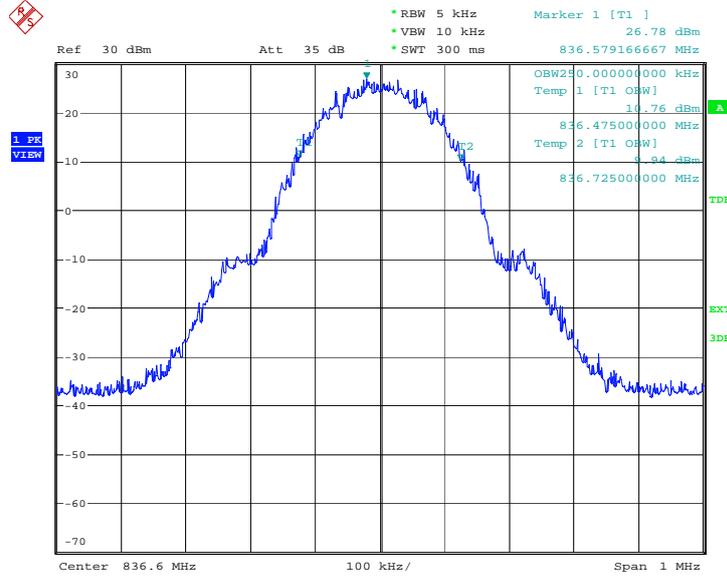
GSM 850

Channel 128-Occupied Bandwidth (99%)



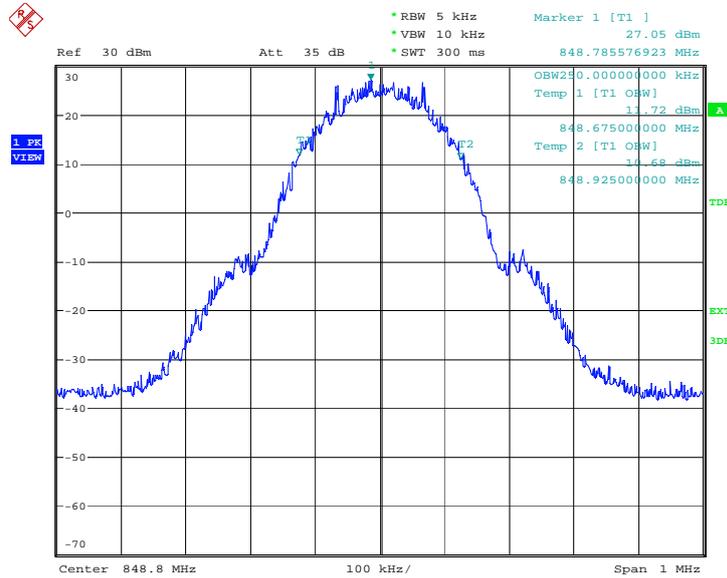
Date: 25.AUG.2010 06:52:21

Channel 190-Occupied Bandwidth (99%)



Date: 25.AUG.2010 06:52:48

Channel 251-Occupied Bandwidth (99%)



Date: 25.AUG.2010 06:53:15

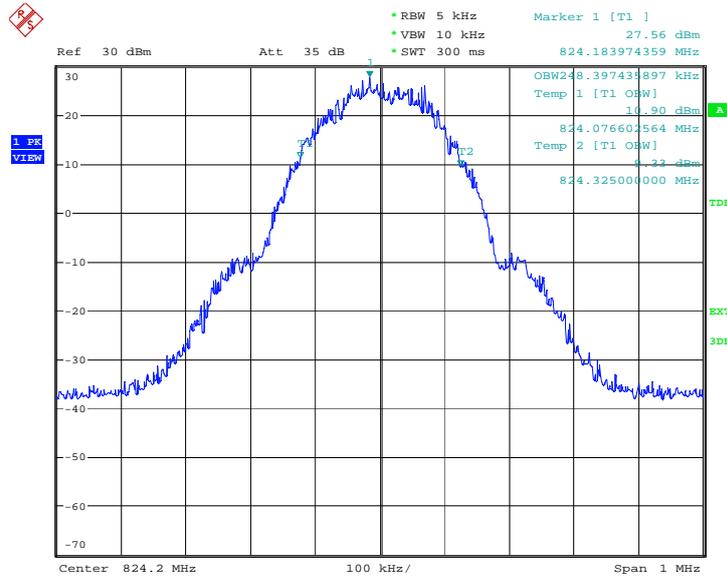
GPRS 850(99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
824.2	248.397
836.6	248.397
848.8	250.000

Expanded measurement uncertainty for this test item is 1.1 kHz, k=2

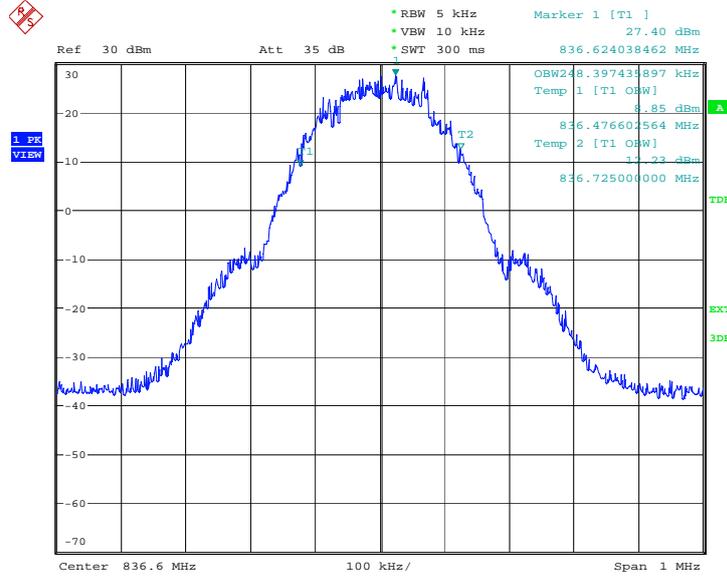
GPRS 850

Channel 128-Occupied Bandwidth (99%)



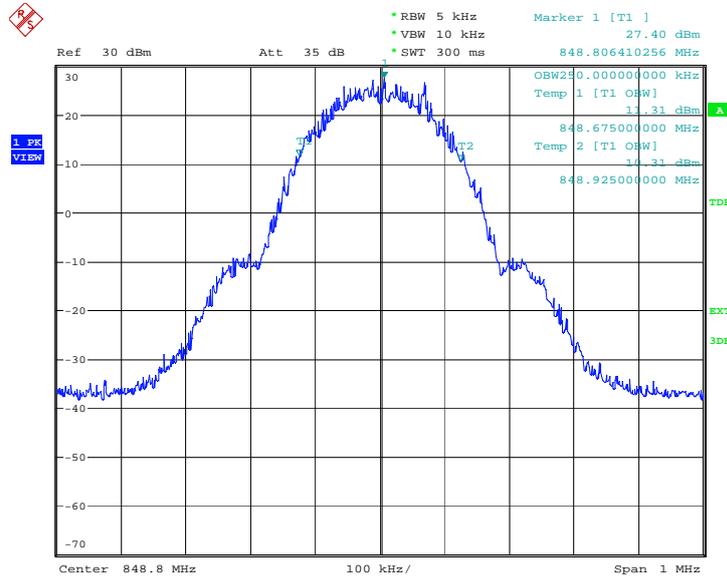
Date: 25.AUG.2010 07:16:11

Channel 190-Occupied Bandwidth (99%)



Date: 25.AUG.2010 07:16:38

Channel 251-Occupied Bandwidth (99%)



Date: 25.AUG.2010 07:17:06

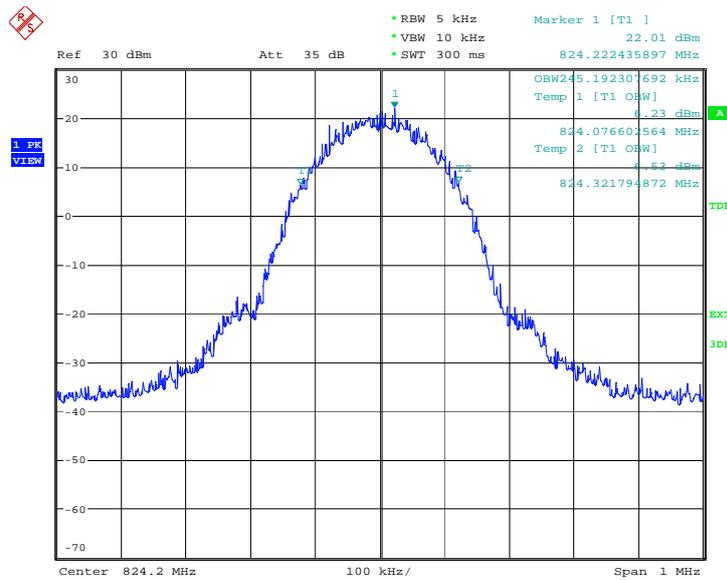
EGPRS 850(99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
824.2	245.192
836.6	248.397
848.8	243.590

Expanded measurement uncertainty for this test item is 1.1 kHz, k=2

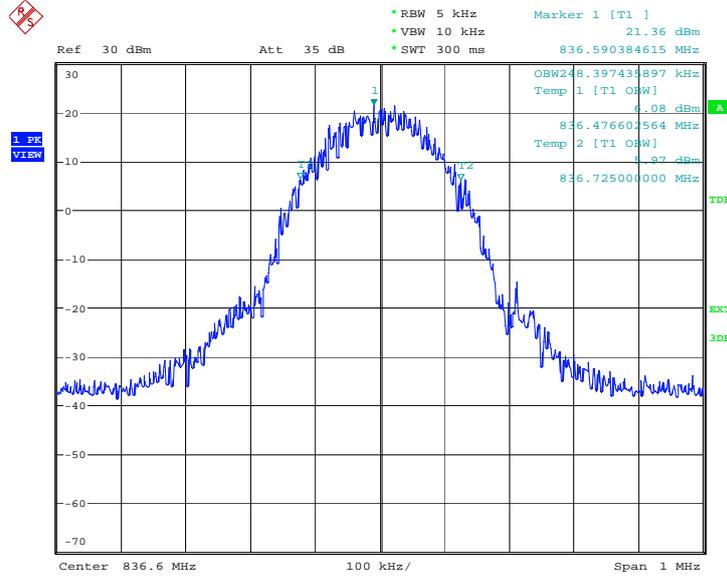
EGPRS 850

Channel 128-Occupied Bandwidth (99%)



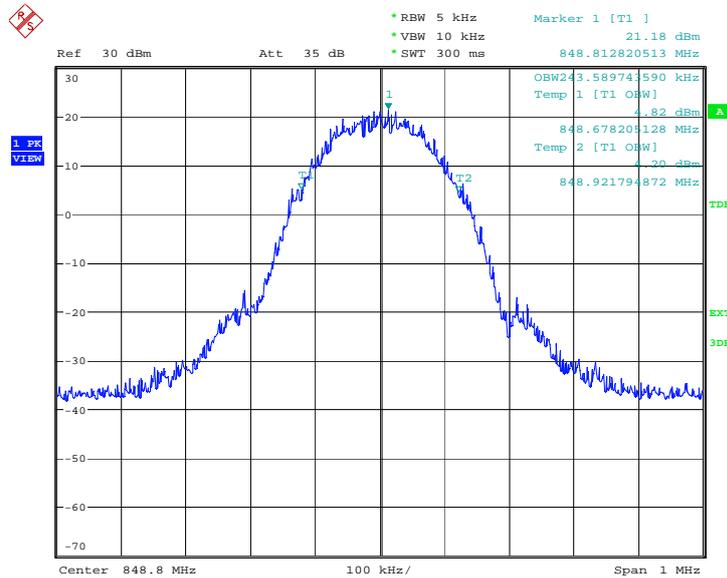
Date: 25.AUG.2010 08:03:09

Channel 190-Occupied Bandwidth (99%)



Date: 25.AUG.2010 08:03:36

Channel 251-Occupied Bandwidth (99%)



Date: 25.AUG.2010 08:04:04

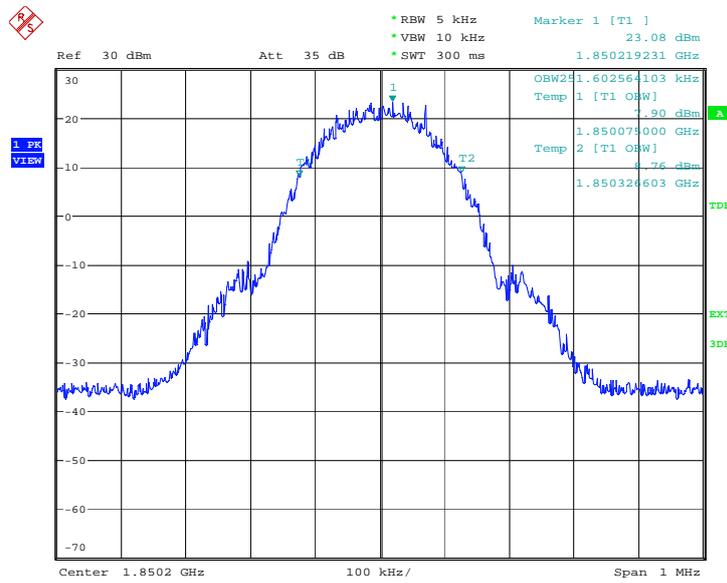
PCS 1900(99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
1850.2	251.603
1880.0	250.000
1909.8	250.000

Expanded measurement uncertainty for this test item is 1.1 kHz, k=2

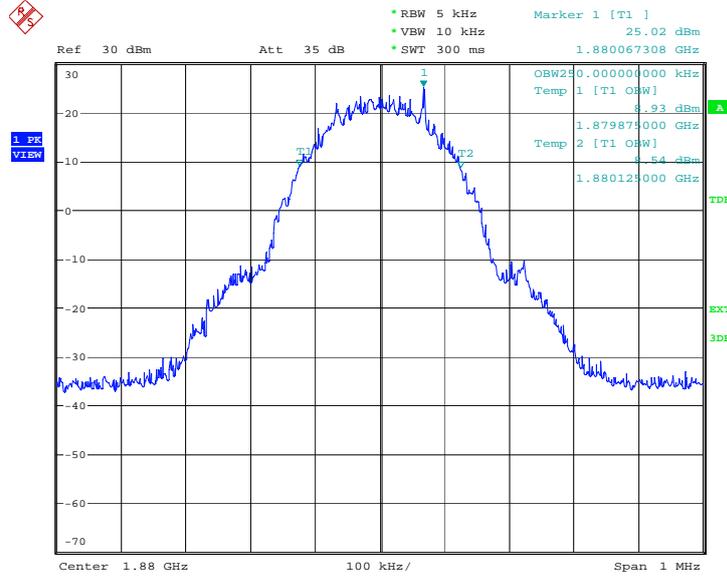
PCS 1900

Channel 512-Occupied Bandwidth (99%)



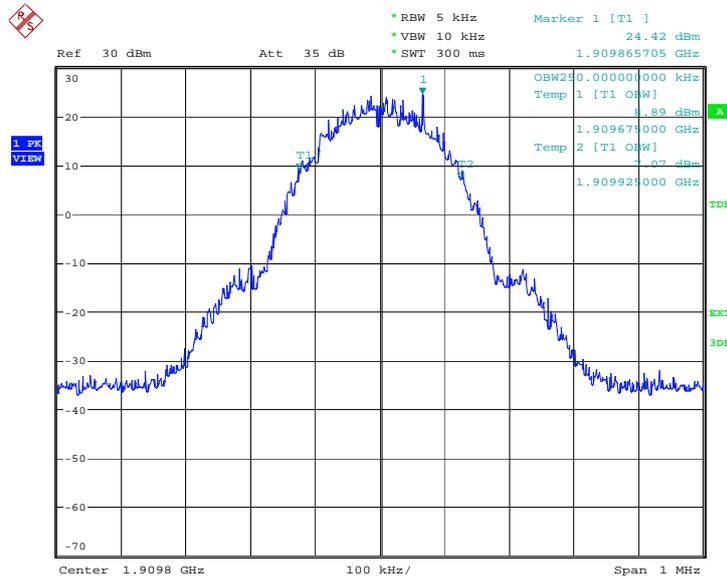
Date: 25.AUG.2010 07:04:37

Channel 661-Occupied Bandwidth (99%)



Date: 25.AUG.2010 07:05:04

Channel 810-Occupied Bandwidth (99%)



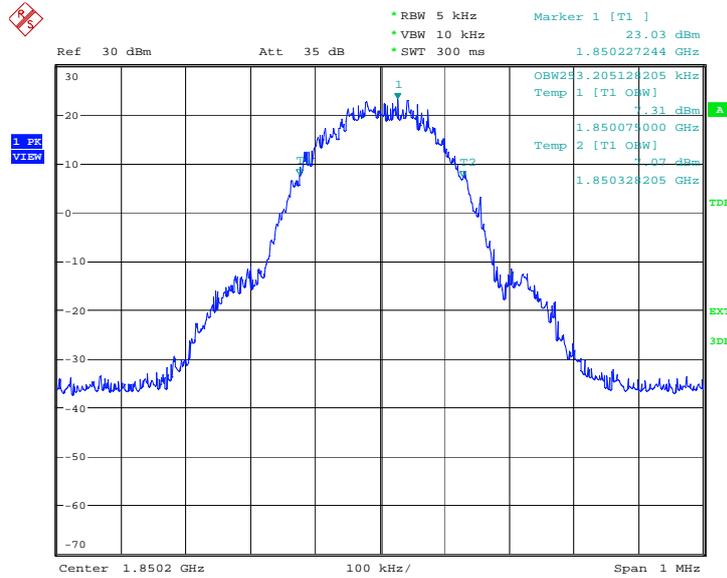
Date: 25.AUG.2010 07:05:31

GPRS 1900(99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
1850.2	253.205
1880.0	245.192
1909.8	250.000

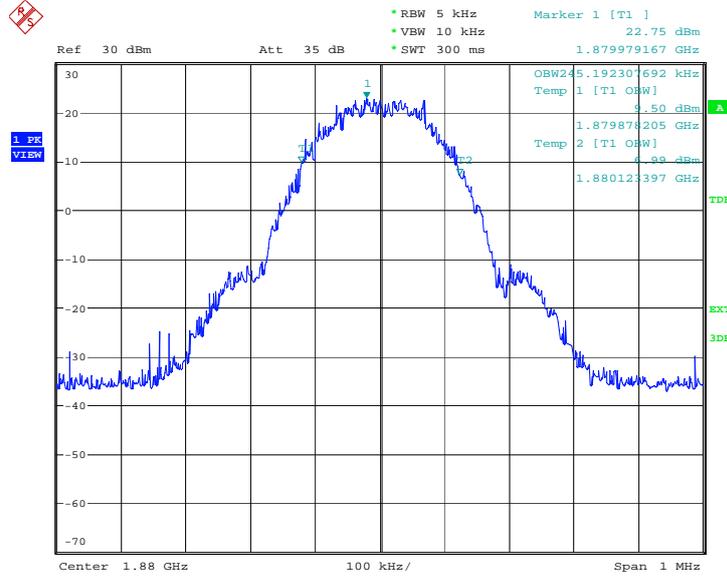
Expanded measurement uncertainty for this test item is 1.1 kHz, k=2

**GPRS 1900
Channel 512-Occupied Bandwidth (99%)**



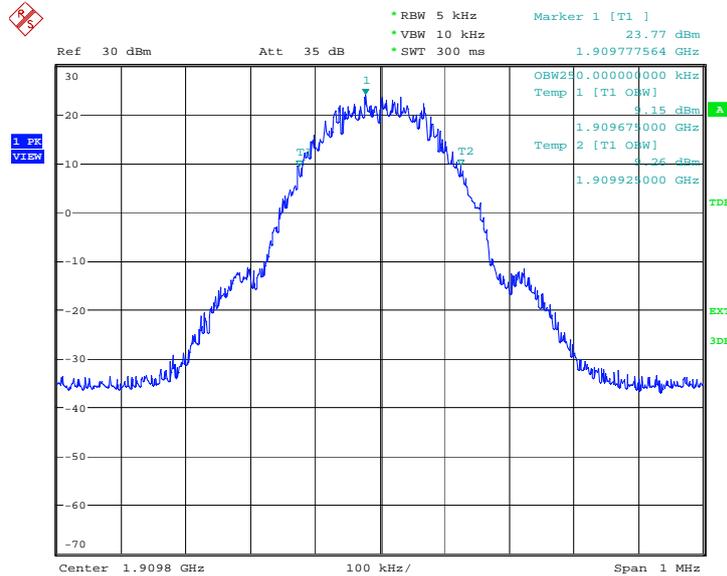
Date: 25.AUG.2010 07:54:24

Channel 661-Occupied Bandwidth (99%)



Date: 25.AUG.2010 07:54:51

Channel 810-Occupied Bandwidth (99%)



Date: 25.AUG.2010 07:55:18

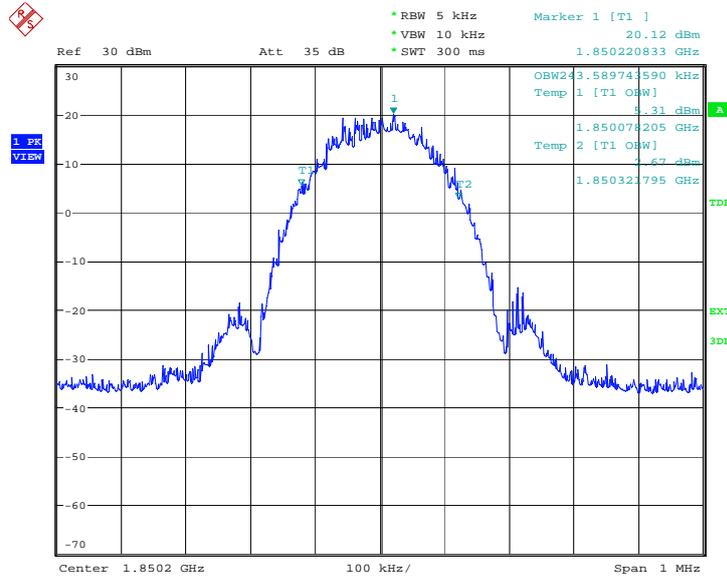
EGPRS 1900(99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
1850.2	243.590
1880.0	243.590
1909.8	243.590

Expanded measurement uncertainty for this test item is 1.1 kHz, k=2

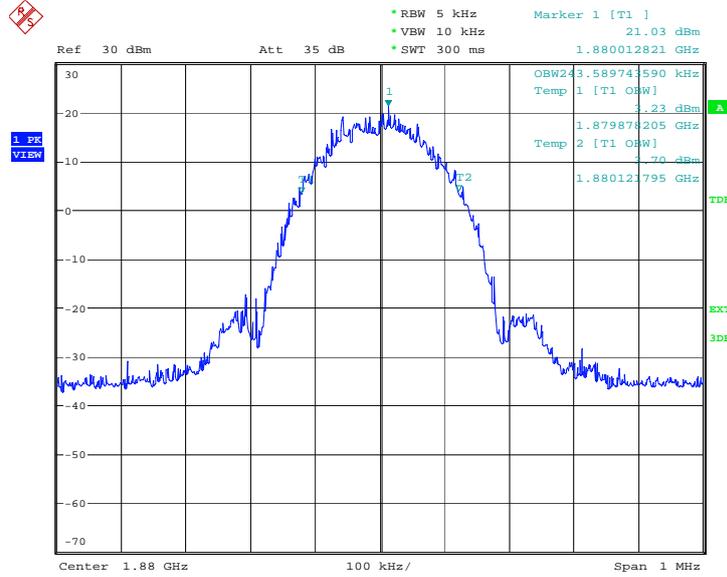
EGPRS 1900

Channel 512-Occupied Bandwidth (99%)



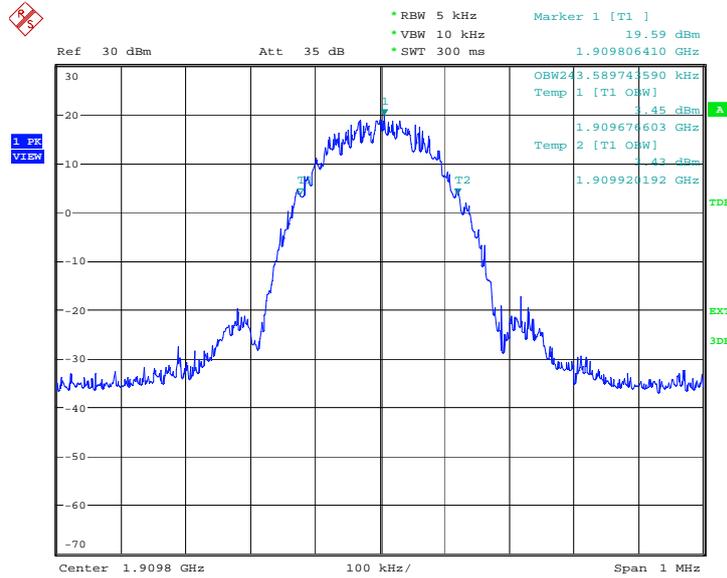
Date: 25.AUG.2010 08:13:07

Channel 661-Occupied Bandwidth (99%)



Date: 25.AUG.2010 08:13:34

Channel 810-Occupied Bandwidth (99%)



Date: 25.AUG.2010 08:14:02

A.6 EMISSION BANDWIDTH

Reference

FCC: CFR Part 22.917(b), 24.238(b)

IC: RSS 132, Issue 2, Section 4.1.1. RSS 133, Issue 5, Section 5.6

A.6.1 Emission 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 the PCS1900 band and GSM850 band. Table below lists the measured -26dBc BW. Spectrum analyzer plots are included on the following pages.

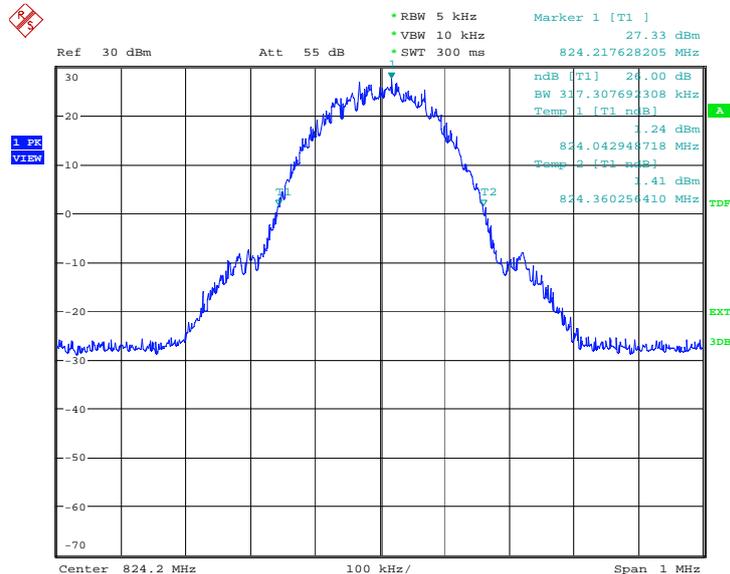
GSM 850(-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc BW)(kHz)
824.2	317.308
836.6	318.910
848.8	315.705

Expanded measurement uncertainty for this test item is 1.1 kHz, k=2

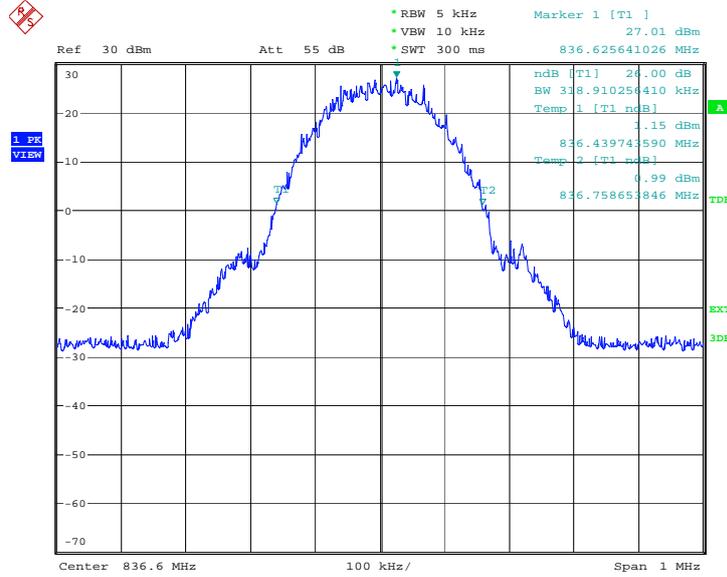
GSM 850

Channel 128-Occupied Bandwidth (-26dBc BW)



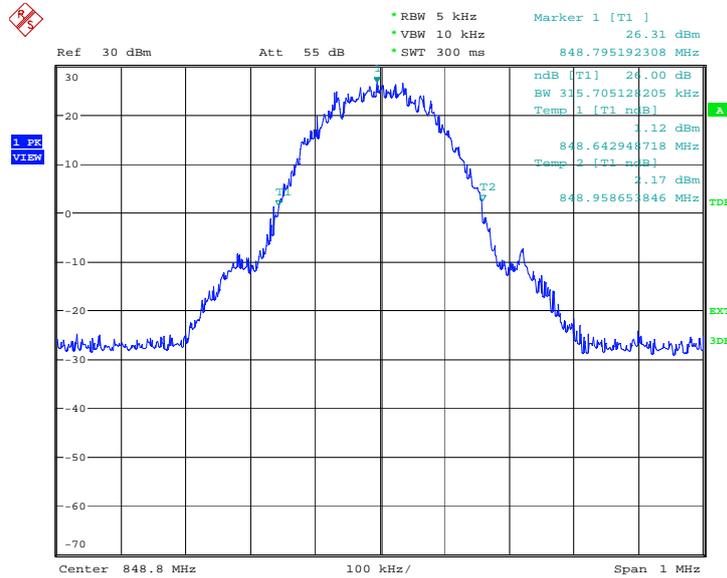
Date: 25.AUG.2010 06:56:31

Channel 190-Occupied Bandwidth (-26dBc BW)



Date: 25.AUG.2010 06:56:59

Channel 251-Occupied Bandwidth (-26dBc BW)



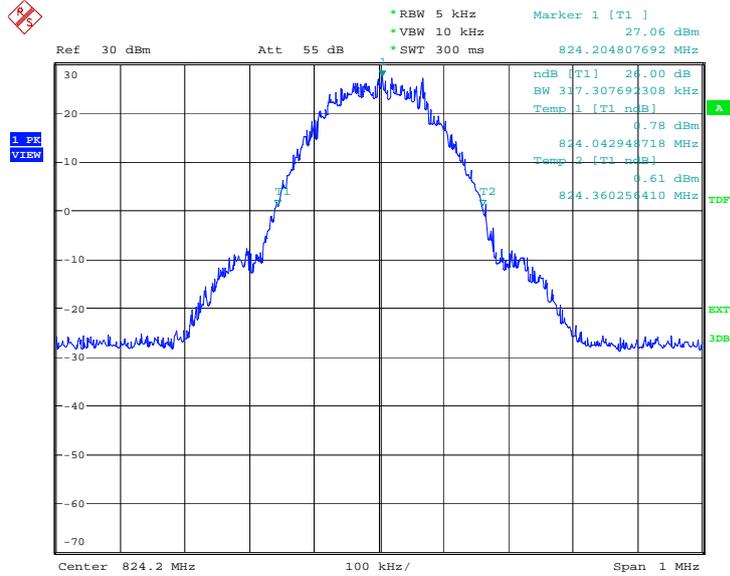
Date: 25.AUG.2010 06:57:26

GPRS 850(-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc BW)(kHz)
824.2	317.308
836.6	314.103
848.8	318.910

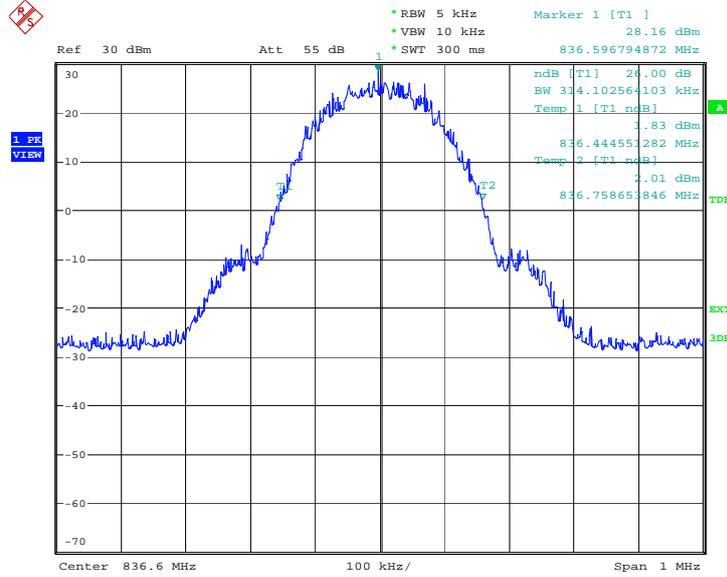
GPRS 850

Channel 128-Occupied Bandwidth (-26dBc BW)



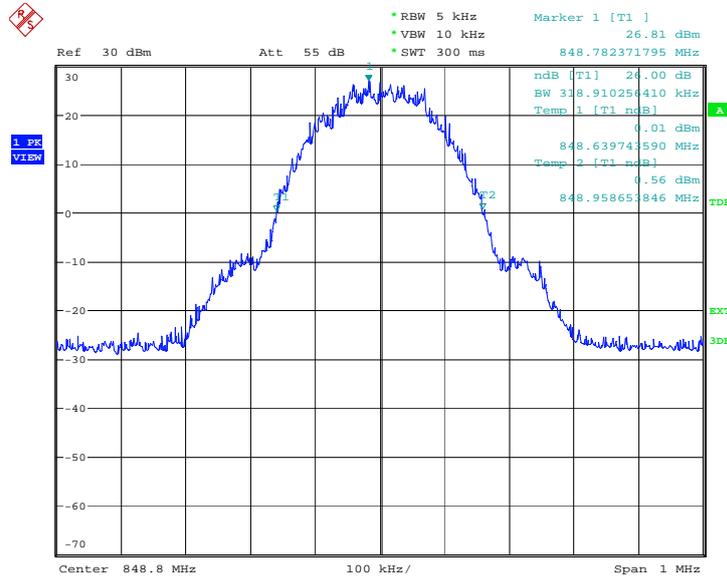
Date: 25.AUG.2010 07:20:22

Channel 190-Occupied Bandwidth (-26dBc BW)



Date: 25.AUG.2010 07:20:49

Channel 251-Occupied Bandwidth (-26dBc BW)



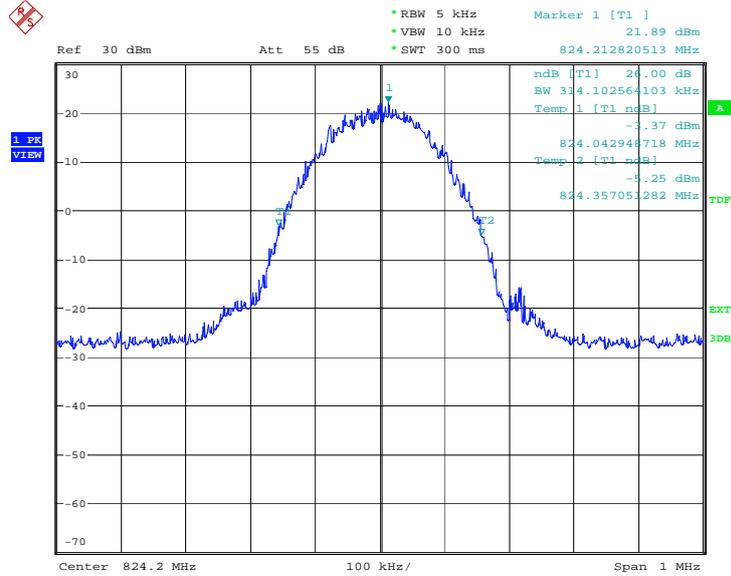
Date: 25.AUG.2010 07:21:16

EGPRS 850(-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc BW)(kHz)
824.2	314.103
836.6	307.692
848.8	310.897

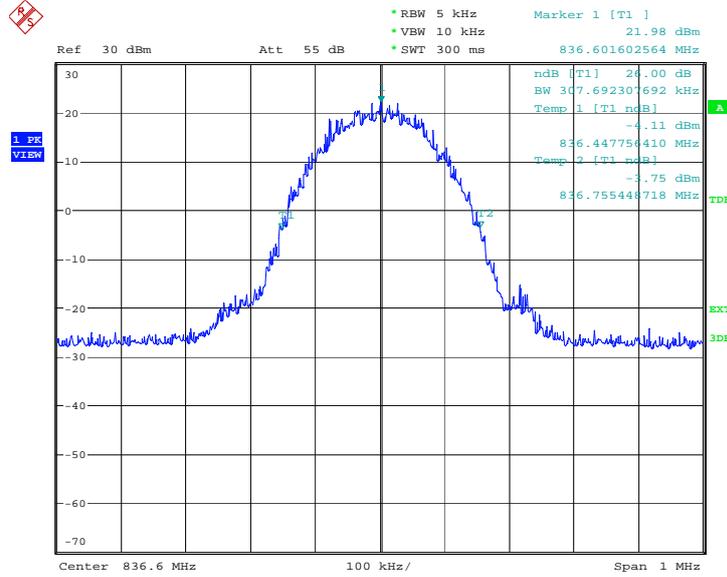
EGPRS 850

Channel 128-Occupied Bandwidth (-26dBc BW)



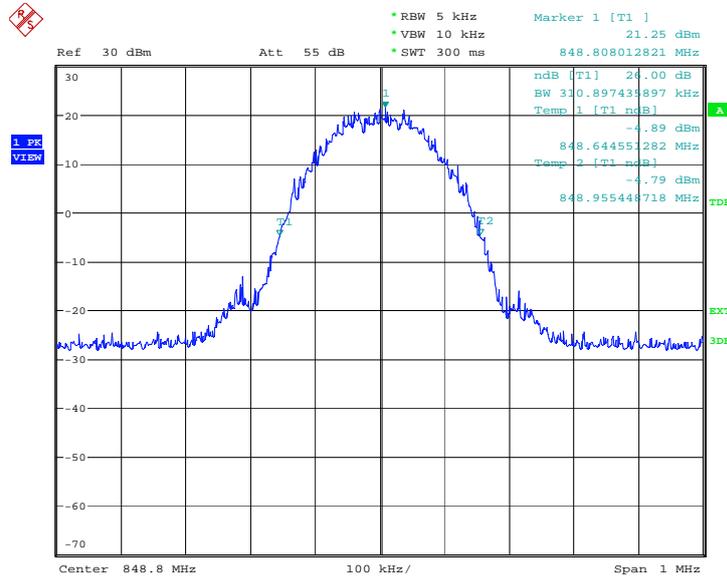
Date: 25.AUG.2010 08:37:48

Channel 190-Occupied Bandwidth (-26dBc BW)



Date: 25.AUG.2010 08:38:30

Channel 251-Occupied Bandwidth (-26dBc BW)



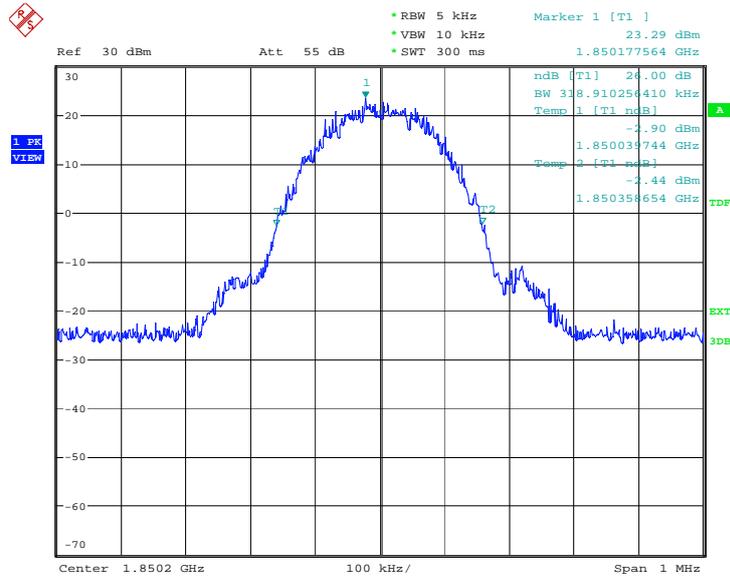
Date: 25.AUG.2010 08:39:13

PCS 1900(-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc BW)(kHz)
1850.2	318.910
1880.0	318.910
1909.8	317.308

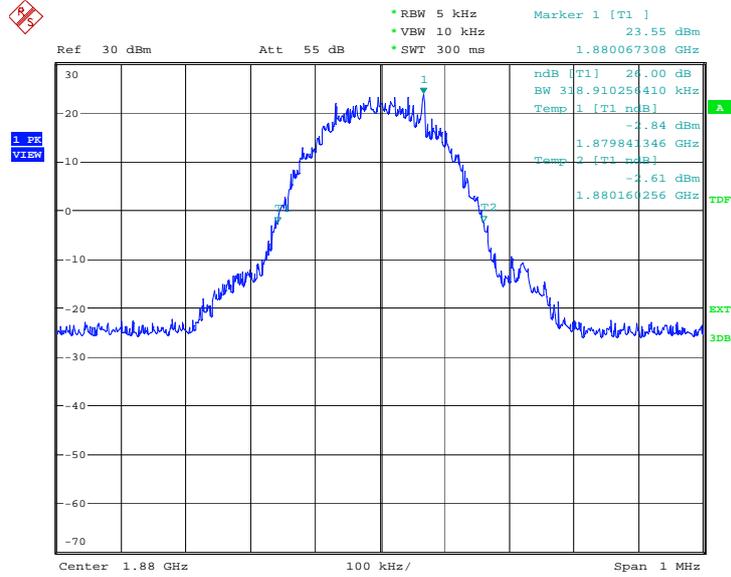
PCS 1900

Channel 512-Occupied Bandwidth (-26dBc BW)



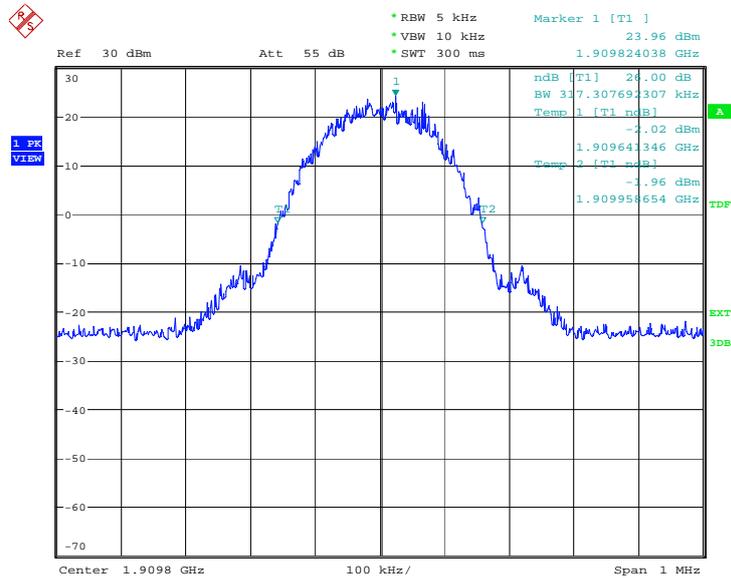
Date: 25.AUG.2010 07:08:48

Channel 661-Occupied Bandwidth (-26dBc BW)



Date: 25.AUG.2010 07:09:15

Channel 810-Occupied Bandwidth (-26dBc BW)



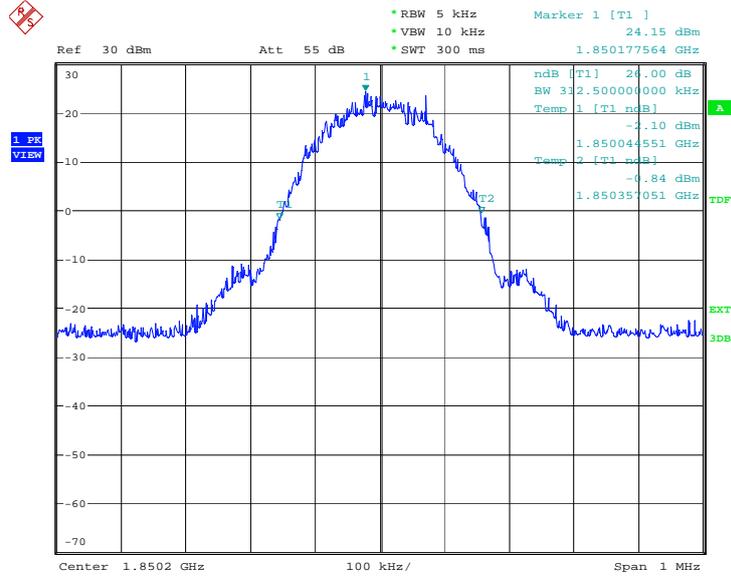
Date: 25.AUG.2010 07:09:43

GPRS 1900(-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc BW)(kHz)
1850.2	312.500
1880.0	315.705
1909.8	315.705

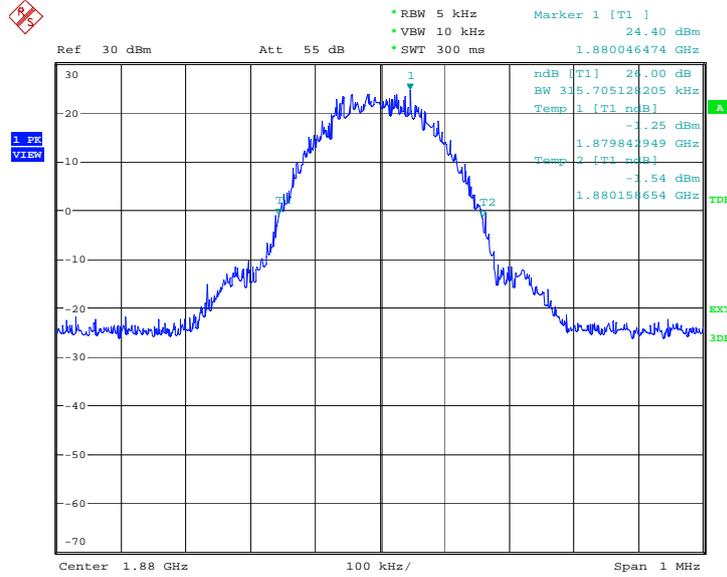
GPRS 1900

Channel 512-Occupied Bandwidth (-26dBc BW)



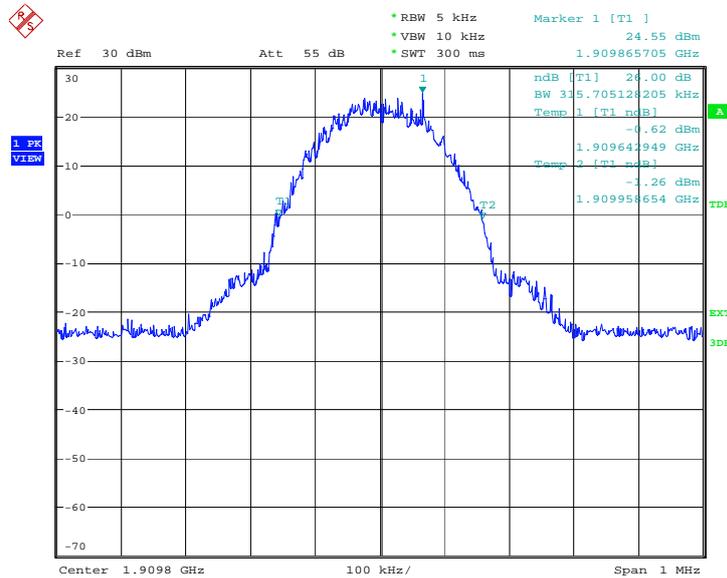
Date: 25.AUG.2010 07:58:33

Channel 661-Occupied Bandwidth (-26dBc BW)



Date: 25.AUG.2010 07:59:01

Channel 810-Occupied Bandwidth (-26dBc BW)



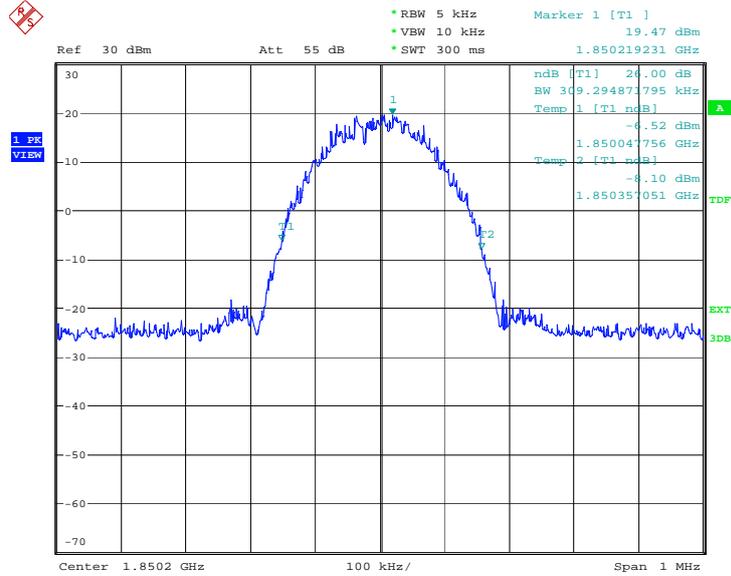
Date: 25.AUG.2010 07:59:28

EGPRS 1900(-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc BW)(kHz)
1850.2	309.295
1880.0	304.487
1909.8	307.692

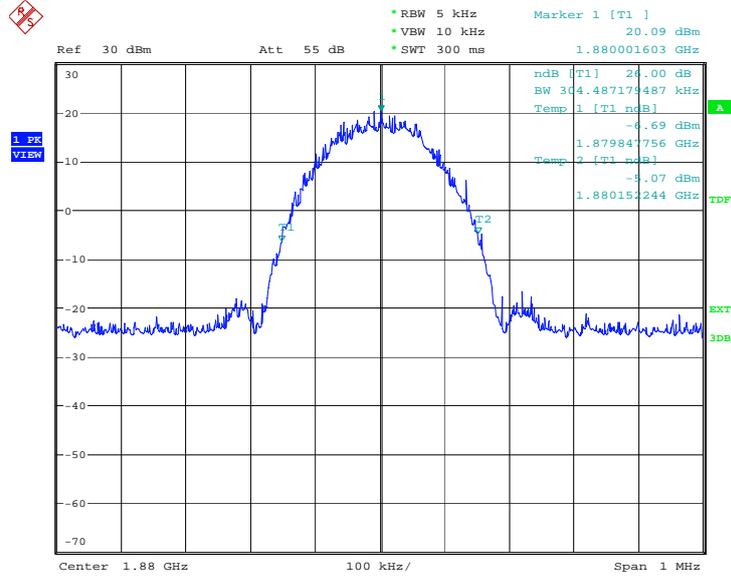
EGPRS 1900

Channel 512-Occupied Bandwidth (-26dBc BW)



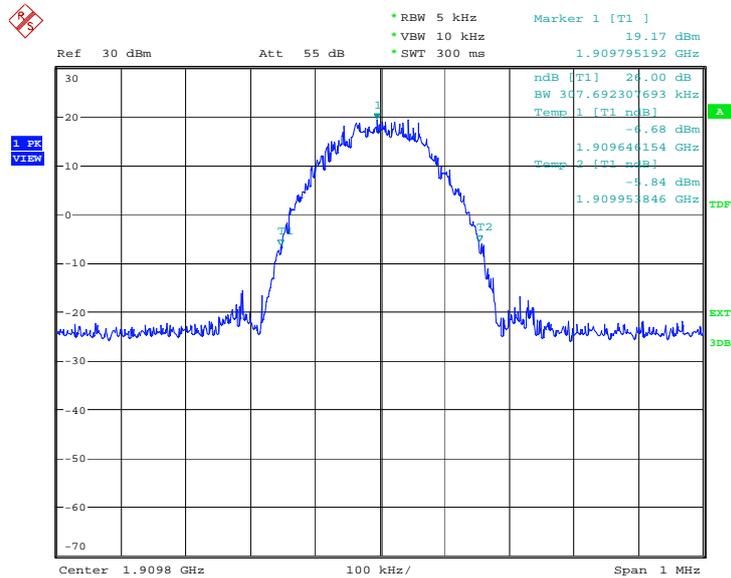
Date: 25.AUG.2010 08:24:56

Channel 661-Occupied Bandwidth (-26dBc BW)



Date: 25.AUG.2010 08:25:24

Channel 810-Occupied Bandwidth (-26dBc BW)



Date: 25.AUG.2010 08:25:51

A.7 BAND EDGE COMPLIANCE

Reference

FCC: CFR Part 22.917(b), 24.238(b)

IC: RSS 132, Issue 2, Section 4.5. RSS 133, Issue 5, Section 6.3

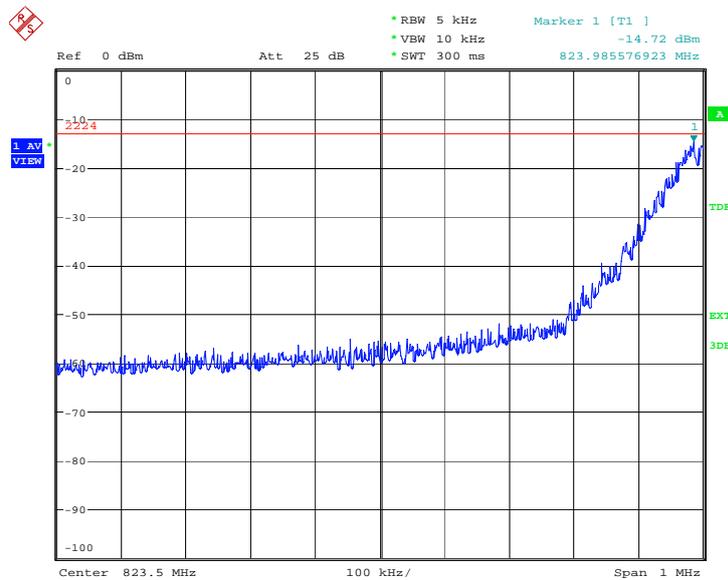
A.7.1 Measurement limit

On any frequency outside frequency band of the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least $43+10\text{Log}(P)$ dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

A.7.2 Measurement result

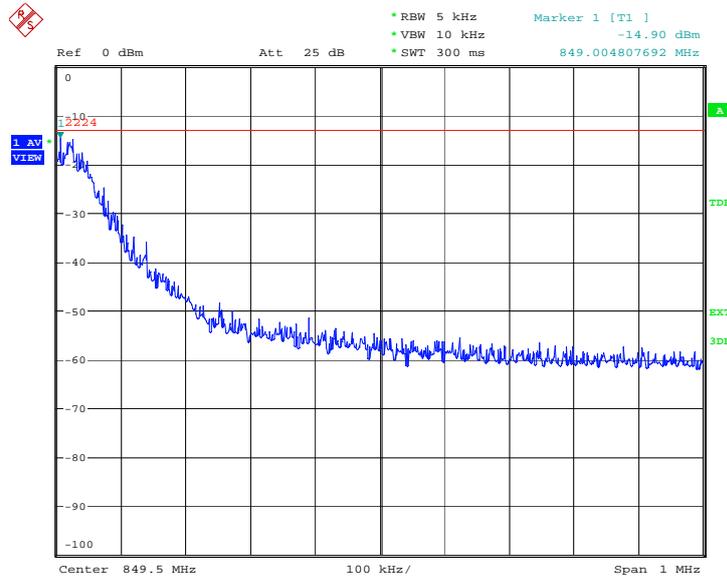
GSM 850

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



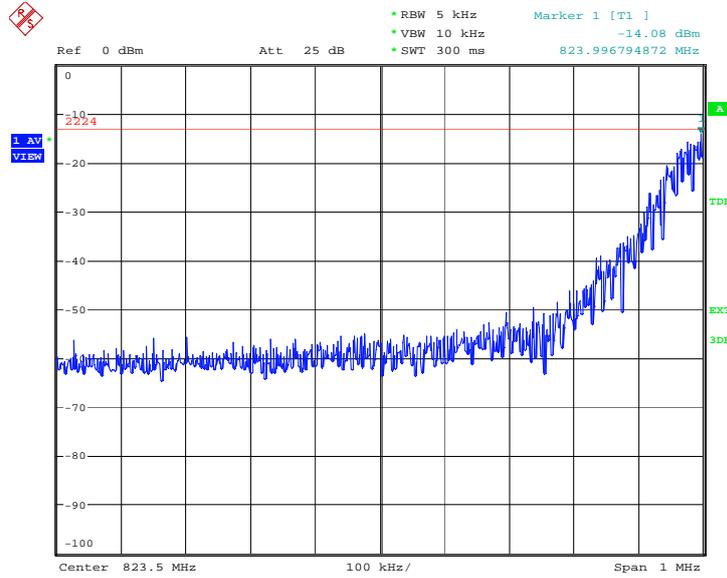
Date: 25.AUG.2010 08:44:16

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



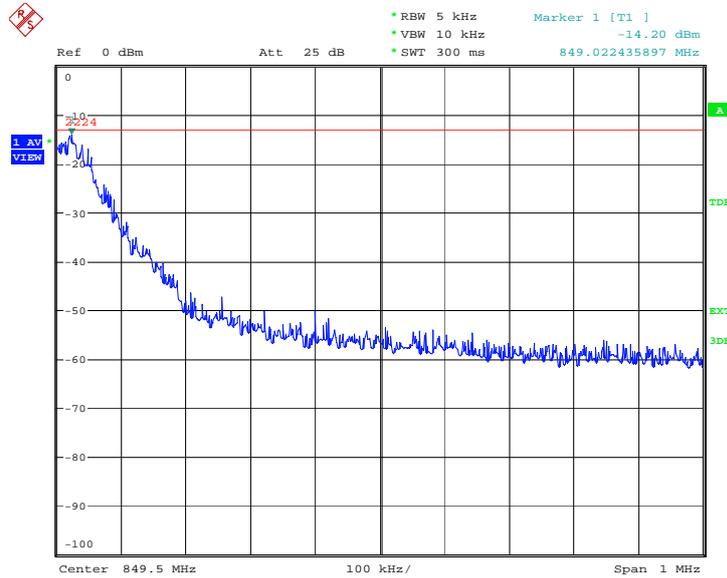
Date: 25.AUG.2010 08:44:45

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



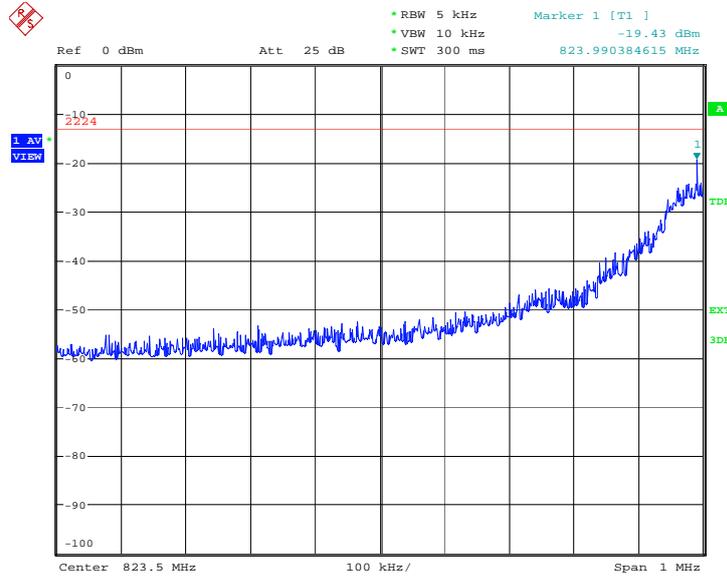
Date: 26.AUG.2010 09:28:43

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



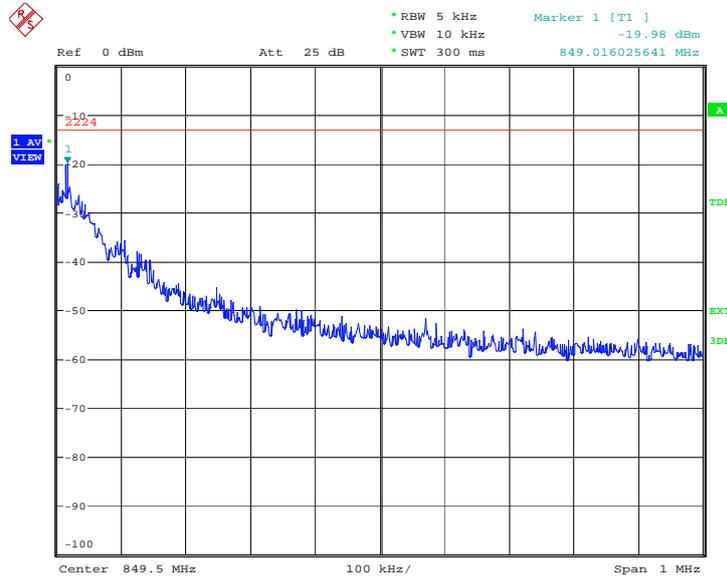
Date: 26.AUG.2010 09:25:42

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



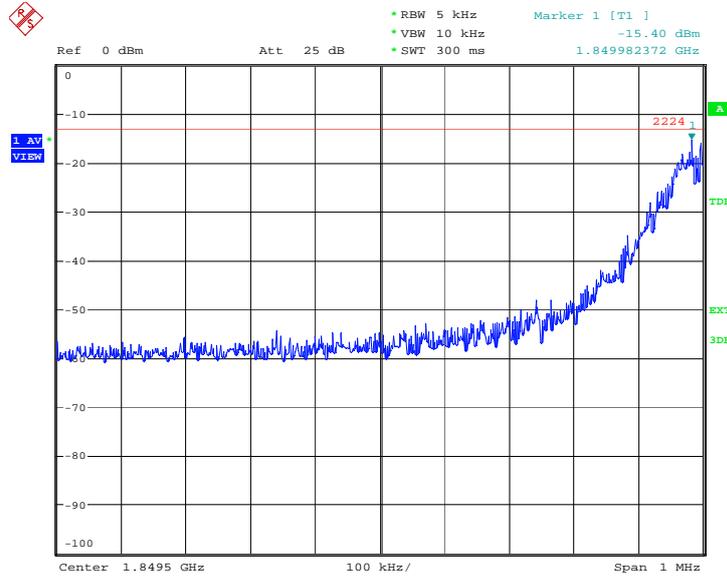
Date: 25.AUG.2010 08:08:42

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



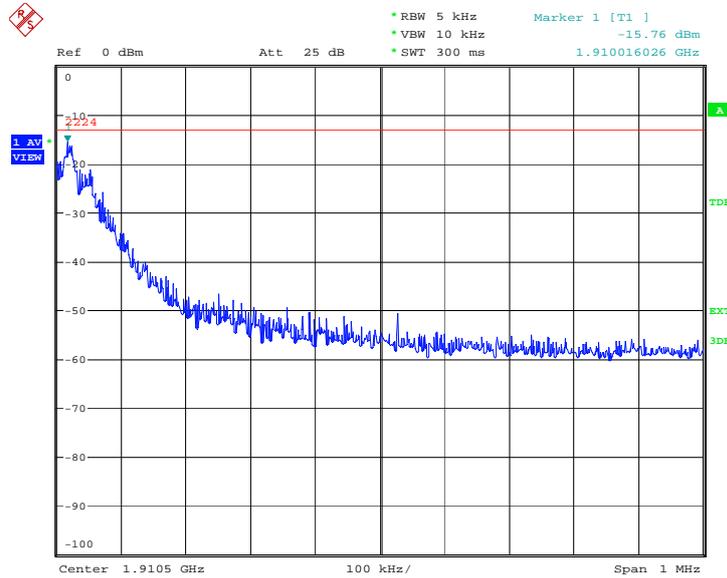
Date: 25.AUG.2010 08:09:11

PCS 1900
LOW BAND EDGE BLOCK-A (PCS-1900)-Channel 512



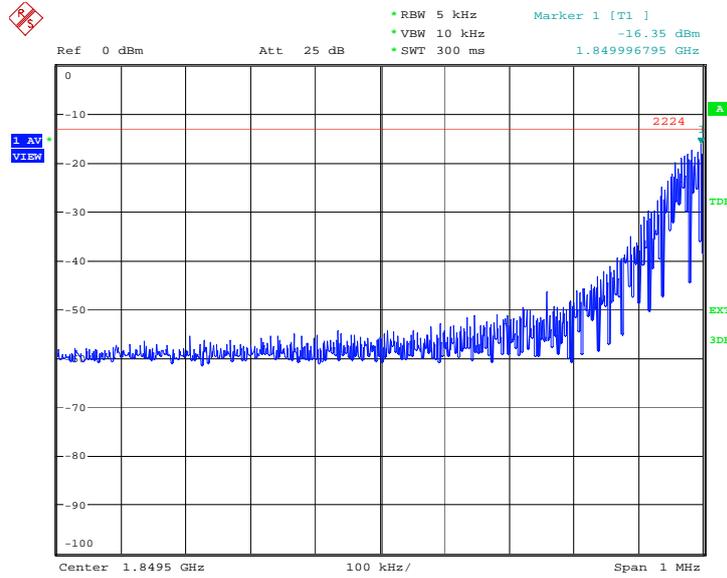
Date: 25.AUG.2010 07:10:12

HIGH BAND EDGE BLOCK-C (PCS-1900) -Channel 810



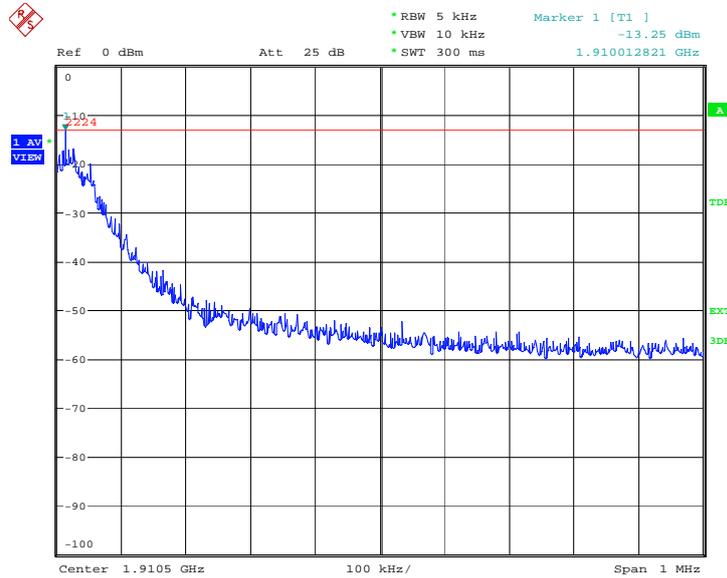
Date: 25.AUG.2010 07:10:41

GPRS 1900
LOW BAND EDGE BLOCK-A (PCS-1900)-Channel 512



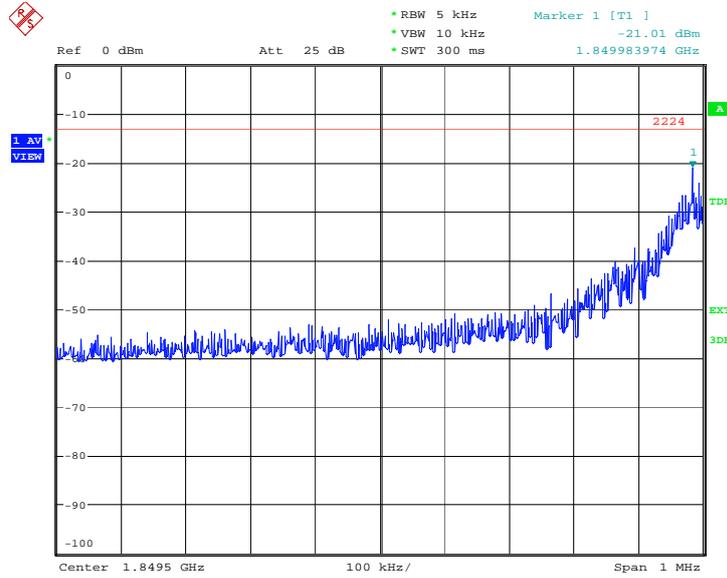
Date: 25.AUG.2010 07:59:57

HIGH BAND EDGE BLOCK-C (PCS-1900) -Channel 810



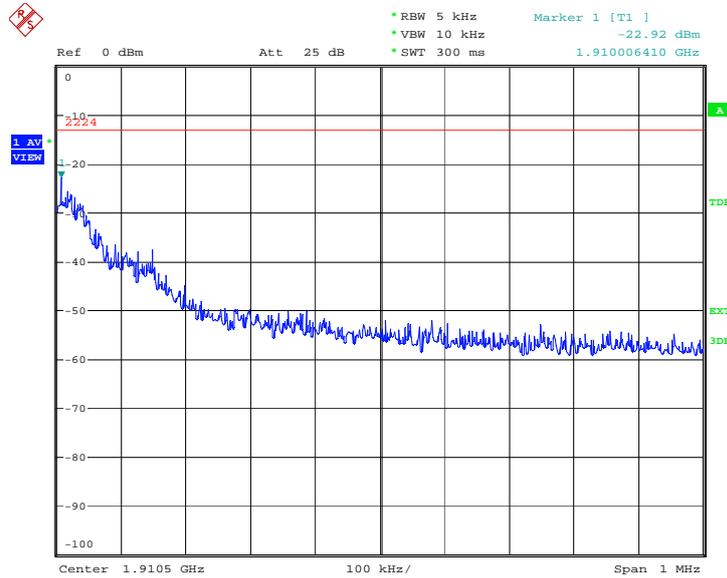
Date: 25.AUG.2010 08:00:26

EGPRS 1900
LOW BAND EDGE BLOCK-A (PCS-1900)-Channel 512



Date: 25.AUG.2010 08:18:40

HIGH BAND EDGE BLOCK-C (PCS-1900) -Channel 810



Date: 25.AUG.2010 08:19:09

A.8 CONDUCTED SPURIOUS EMISSION

Reference

FCC: CFR Part 22.917, 2.1057, 24.238

IC: RSS 132, Issue 2, Section 4.5. RSS 133, Issue 5, Section 6.5

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 9 GHz.
2. 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

Sec. 24.238 Emission Limits.

(a) On any frequency outside frequency band of the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least $43+10\log(P)$ dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

A. 8.3 Measurement result
GSM850

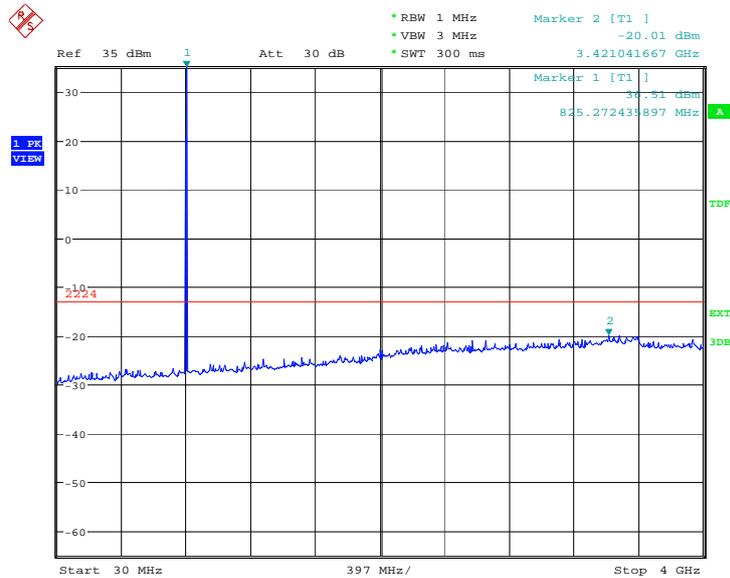
Harmonic	Tx ch. 128 Freq. (MHz)	Level (dBm)	Tx ch. 190 Freq. (MHz)	Level (dBm)	Tx ch. Freq. (MHz) 251	Level (dBm)
2	1648.4	nf	1673.2	nf	1697.6	nf
3	2472.6	nf	2509.8	nf	2546.4	nf
4	3296.8	nf	3346.4	nf	3395.2	nf
5	4121	nf	4183	nf	4244	nf
6	4945.2	nf	5019.6	nf	5092.8	nf
7	5769.4	nf	5856.2	nf	5941.6	nf
8	6593.6	nf	6692.8	nf	6790.4	nf
9	7417.8	nf	7529.4	nf	7639.2	nf
10	8242	nf	8366	nf	8488	nf

nf: Noise floor

A.8.3.1 Channel 128: 30MHz – 4GHz

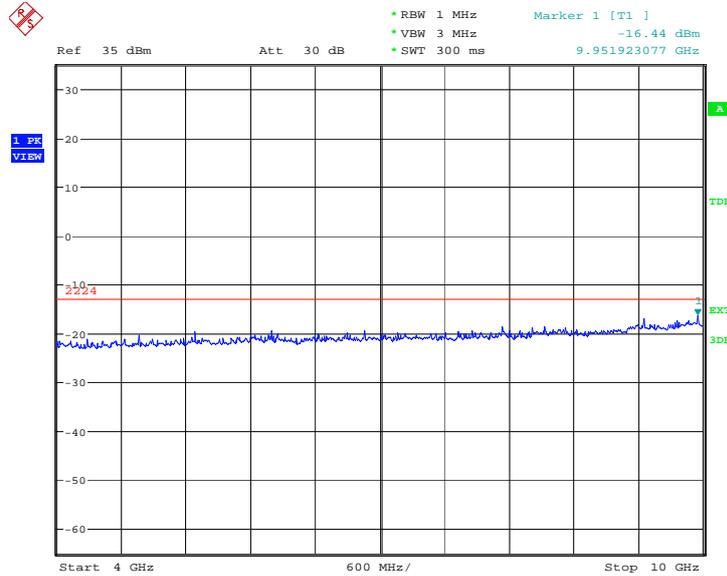
Spurious emission limit –13dBm.

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



Date: 26.AUG.2010 09:19:07

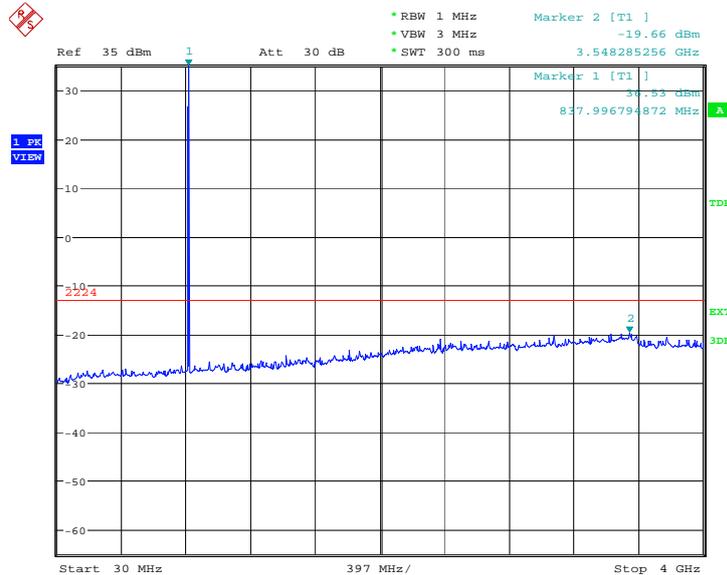
A.8.3.2 Channel 128: 4GHz – 10GHz
Spurious emission limit –13dBm.



Date: 26.AUG.2010 09:19:35

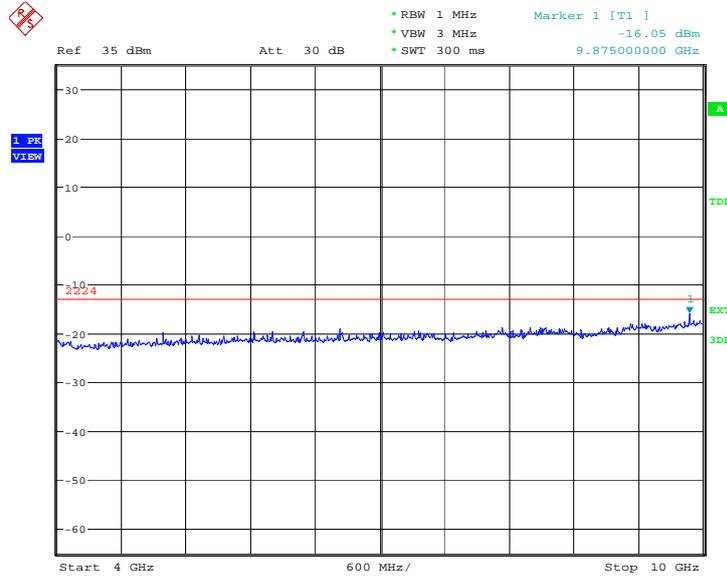
A.8.3.3 Channel 190: 30MHz – 4GHz
Spurious emission limit –13dBm

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



Date: 26.AUG.2010 09:20:04

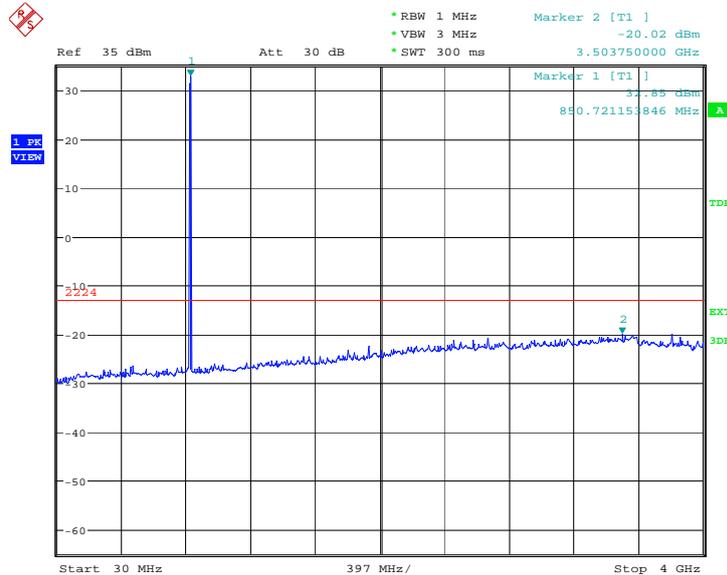
A.8.3.4 Channel 190: 4GHz –10GHz
Spurious emission limit –13dBm



Date: 26.AUG.2010 09:20:32

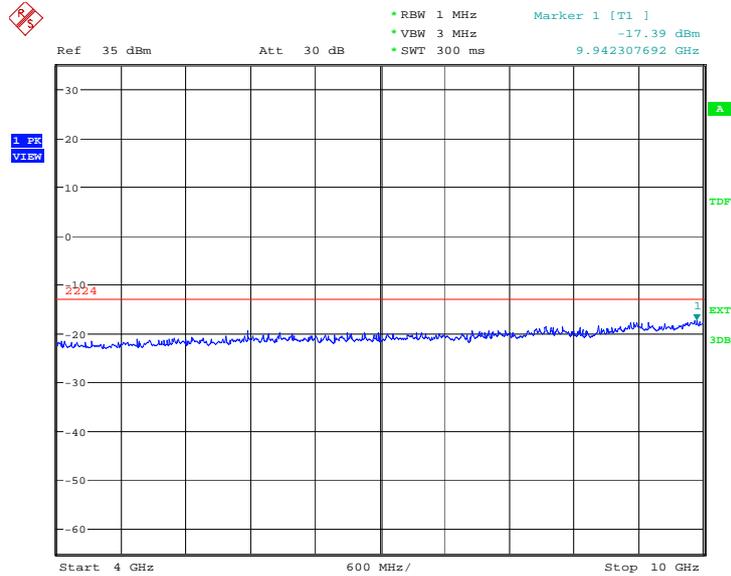
A.8.3.5 Channel 251: 30MHz – 4GHz
Spurious emission limit –13dBm.

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



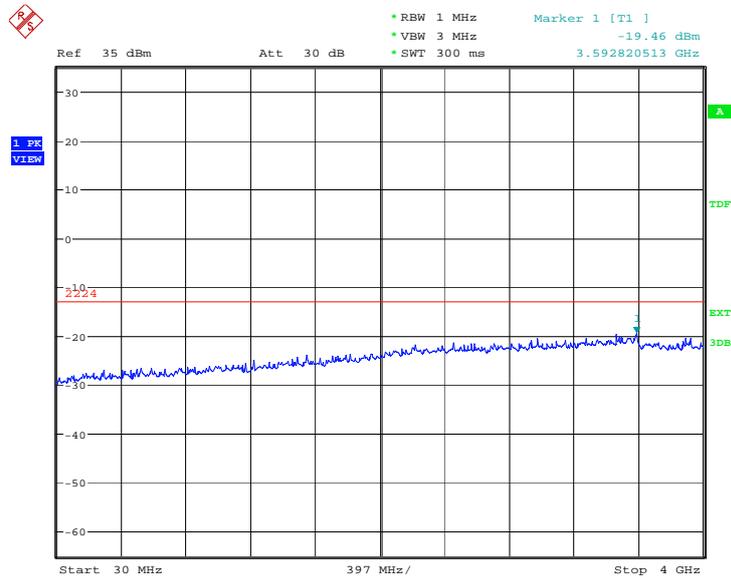
Date: 26.AUG.2010 09:21:01

A.8.3.6 Channel 251: 4GHz – 10GHz
Spurious emission limit –13dBm.



Date: 26.AUG.2010 09:21:30

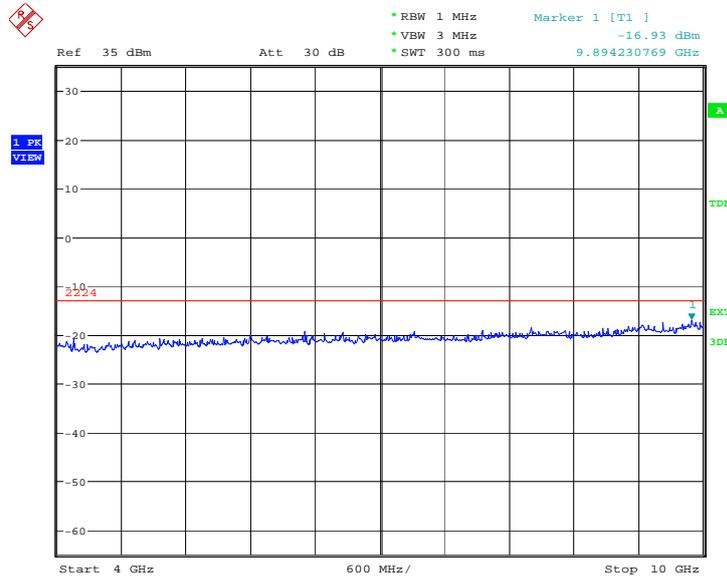
A.8.3.7 Idle mode: 30MHz – 4GHz
Spurious emission limit –13dBm.



Date: 26.AUG.2010 09:21:58

A.8.3.8 Idle mode: 4GHz – 10GHz

Spurious emission limit –13dBm.



Date: 26.AUG.2010 09:22:27

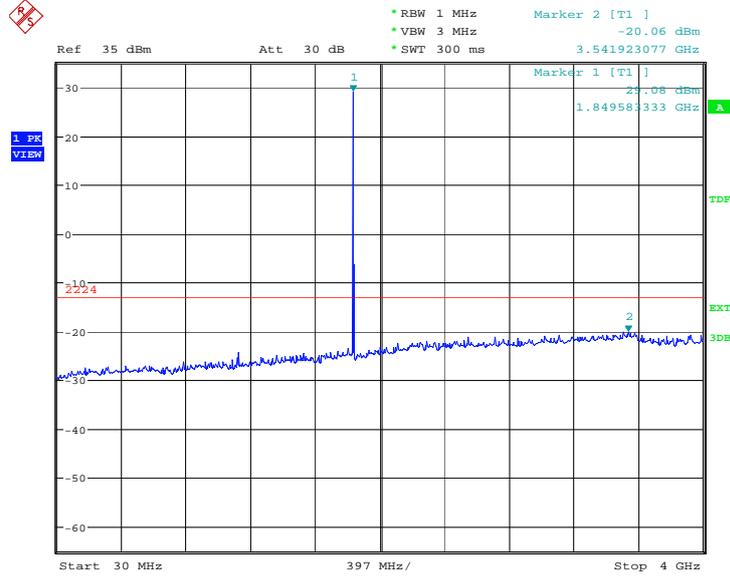
PCS1900

Harmonic	Tx ch. 512 Freq. (MHz)	Level (dBm)	Tx ch. 661 Freq. (MHz)	Level (dBm)	Tx ch. 810 Freq. (MHz)	Level (dBm)
2	3700.4	nf	3760	nf	3819.6	nf
3	5550.6	nf	5640	nf	5729.4	nf
4	7400.8	nf	7520	nf	7639.2	nf
5	9251.0	nf	9400	nf	9549.0	nf
6	11101.2	nf	11280	nf	11458.8	nf
7	12951.4	nf	13160	nf	13368.6	nf
8	14801.6	nf	15040	nf	15278.4	nf
9	16651.8	nf	16920	nf	17188.2	nf
10	18502.0	nf	18800	nf	19098.0	nf
nf: Noise floor						

A. 8.3.9 Channel 512: 30MHz – 4GHz

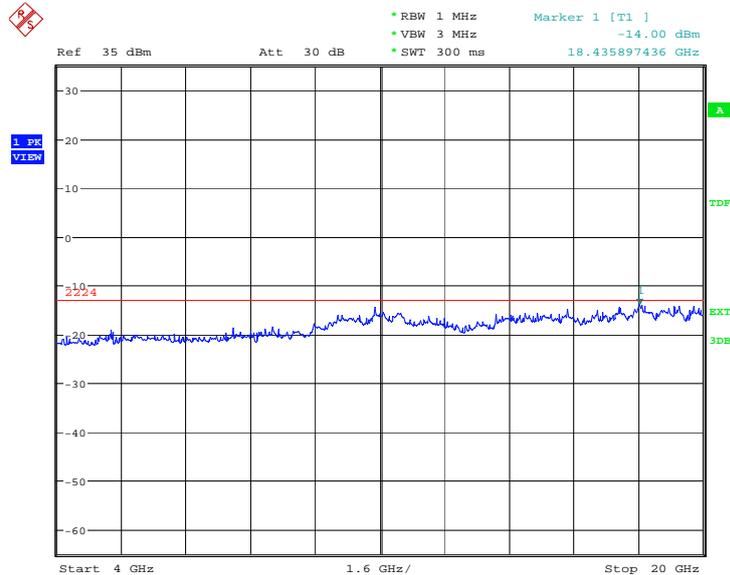
Spurious emission limit -13dBm.

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



A. 8.3.10 Channel 512: 4GHz – 20GHz

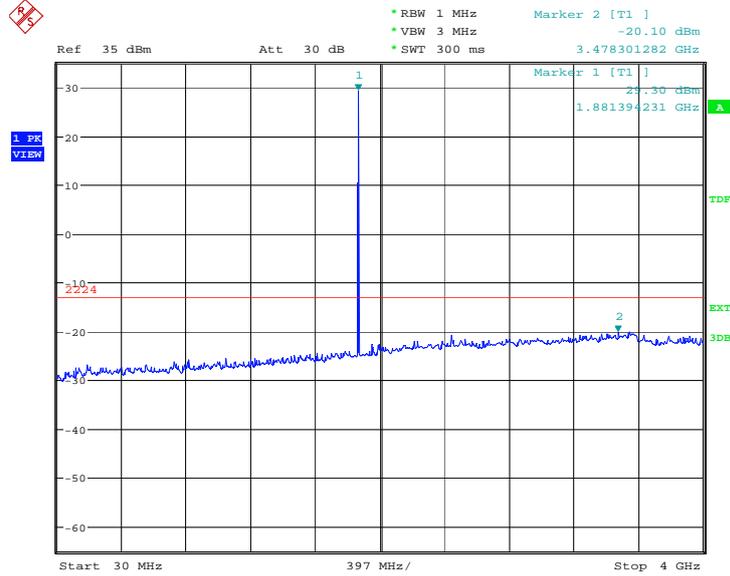
Spurious emission limit -13dBm.



A. 8.3.11 Channel 661: 30MHz – 4GHz

Spurious emission limit -13dBm

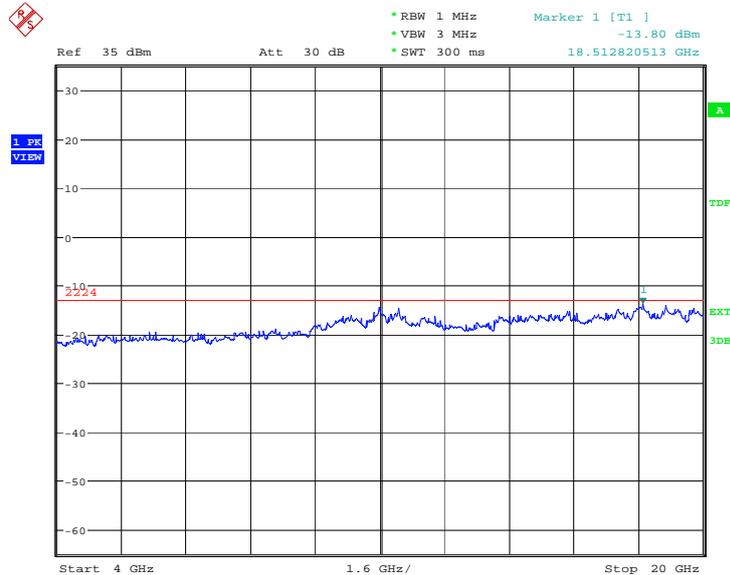
NOTE: peak above the limit line is the carrier frequency.



Date: 26.AUG.2010 09:15:08

A. 8.3.12 Channel 661: 4GHz –20GHz

Spurious emission limit -13dBm

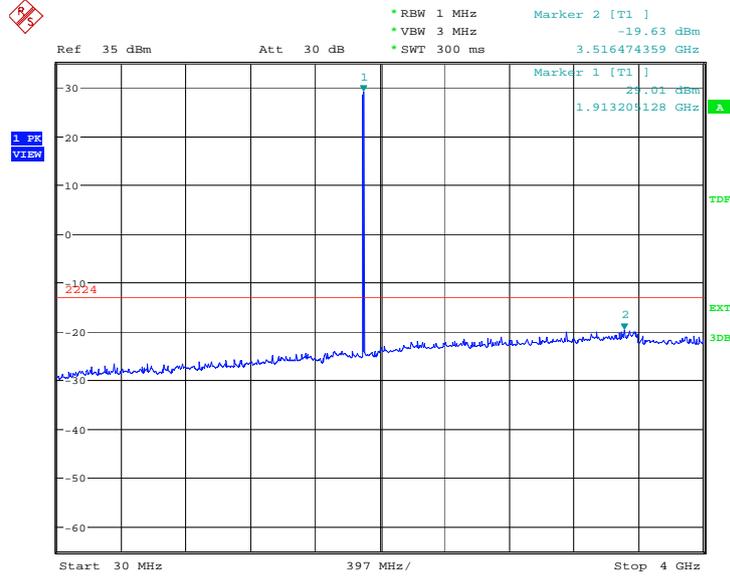


Date: 25.AUG.2010 09:56:01

A. 8.3.13 Channel 810: 30MHz – 4GHz

Spurious emission limit -13dBm.

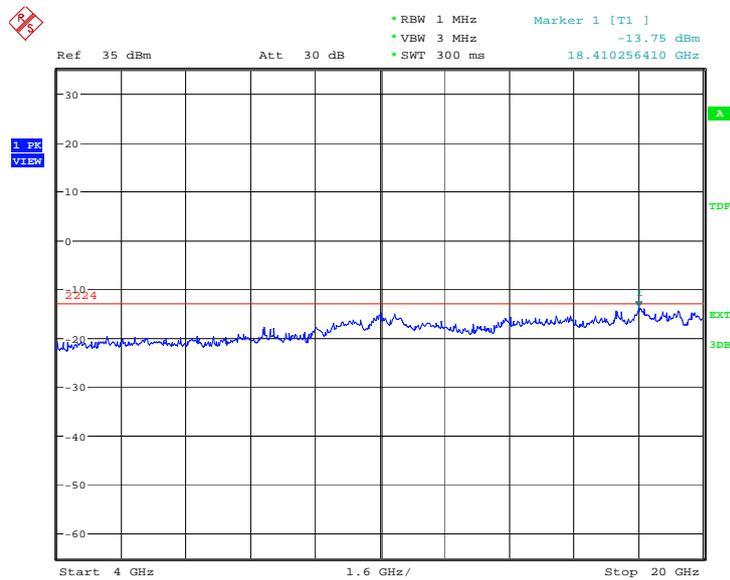
NOTE: peak above the limit line is the carrier frequency.



Date: 26.AUG.2010 09:16:05

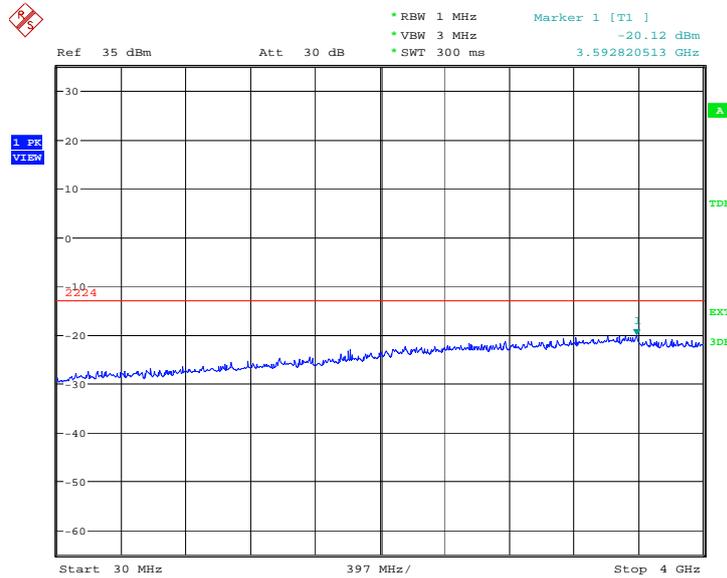
A. 8.3.14 Channel 810: 4GHz – 20GHz

Spurious emission limit -13dBm.



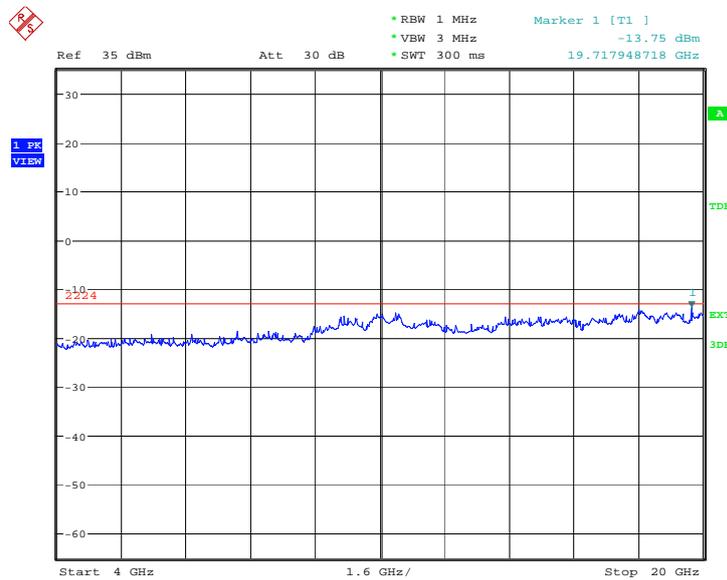
Date: 25.AUG.2010 09:56:58

A. 8.3.15 Idle mode: 30MHz – 4GHz
Spurious emission limit -13dBm.



Date: 26.AUG.2010 09:17:02

A. 8.3.16 Idle mode: 4GHz – 20GHz
Spurious emission limit -13dBm.



Date: 25.AUG.2010 09:57:55

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

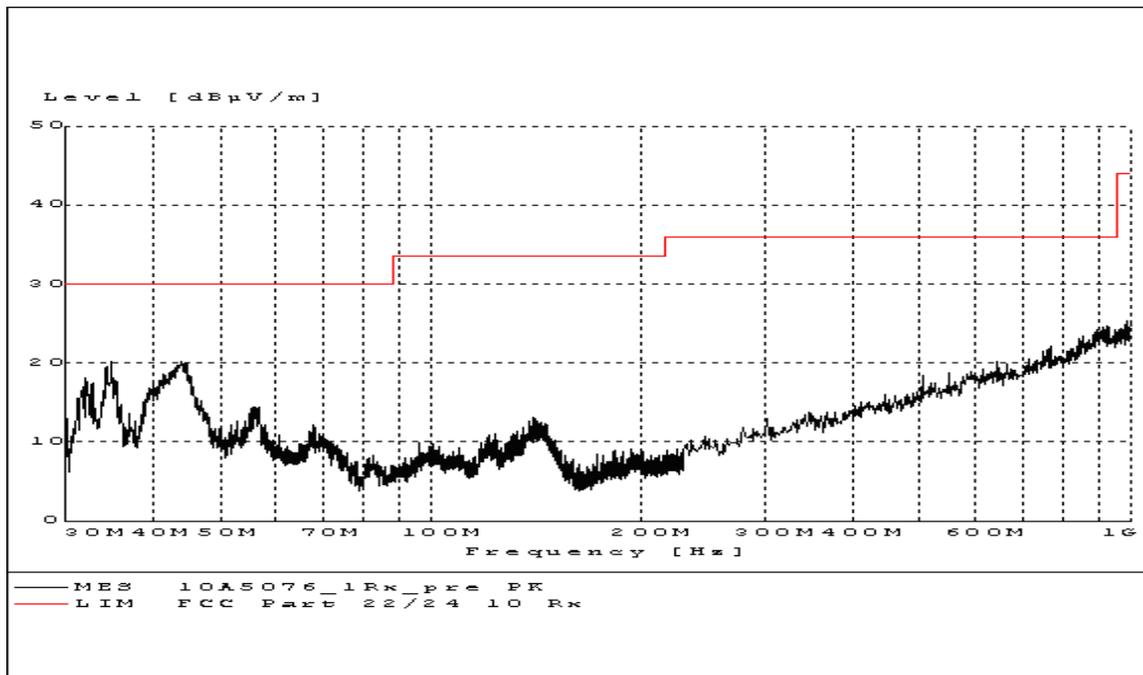
The measurement procedure in ANSI C64.4-2003 is used. The EUT is placed on a 80cm height non-conductive table locating on the center of turntable. From 30MHz-1GHz, the measurement distance is 10m. For frequency range above 1GHz, the measurement distance is 3m.

The EUT is measured with travel charger and the operating mode is idle without CMU200's signaling.

A.9.2 Method of Measurement

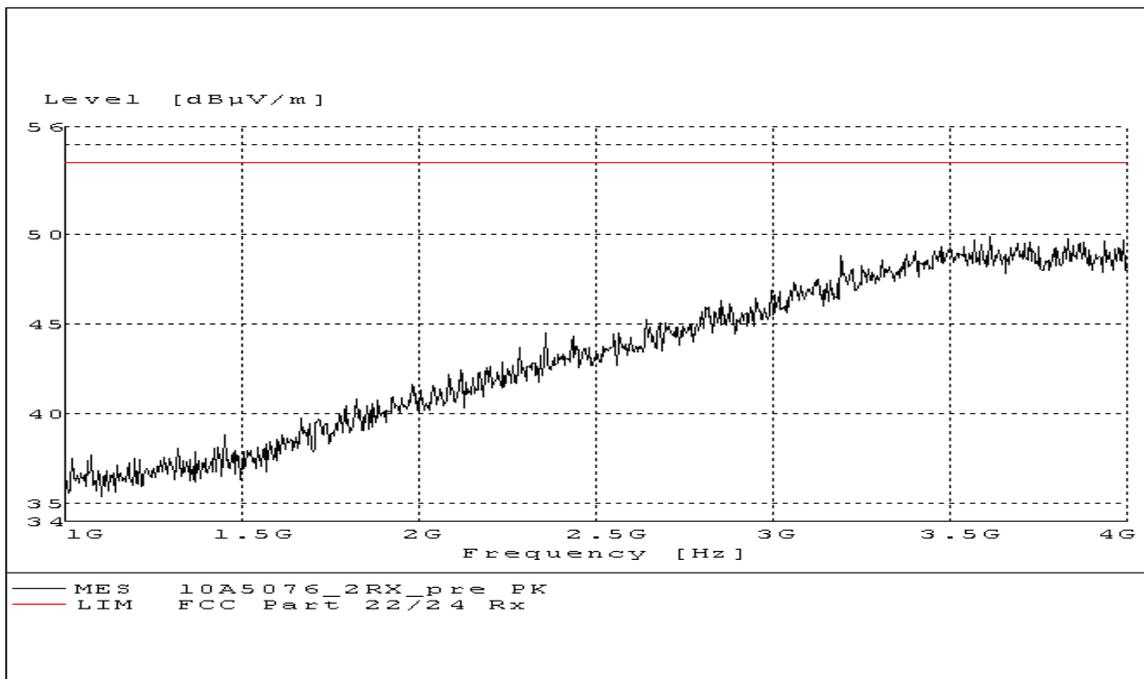
Frequency of Emission (MHz)	Limit (dB μ V/m)	Measurement Distance (m)
30-88	30	10
88-216	33.5	10
216-960	36	10
960-1000	44	10
>1000	54	3

A. 9.3 Measurement results



IF bandwidth: 120 kHz

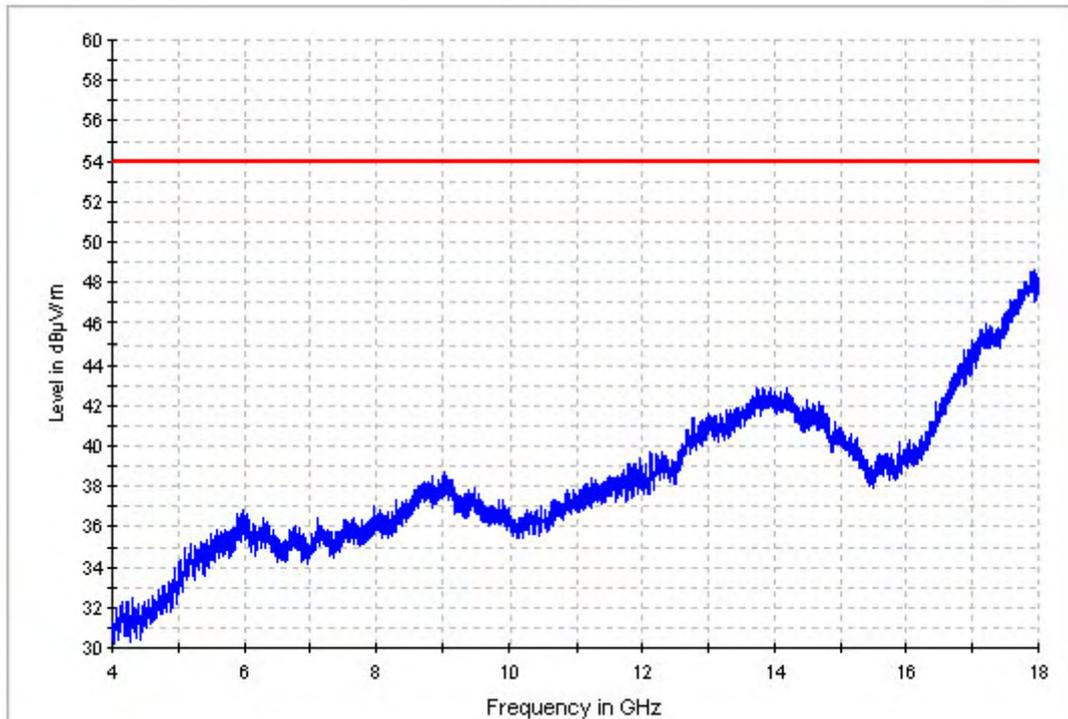
Idle Mode: 30MHz-1GHz



RBW / VBW 1 MHz

Idle Mode: 1GHz-4GHz

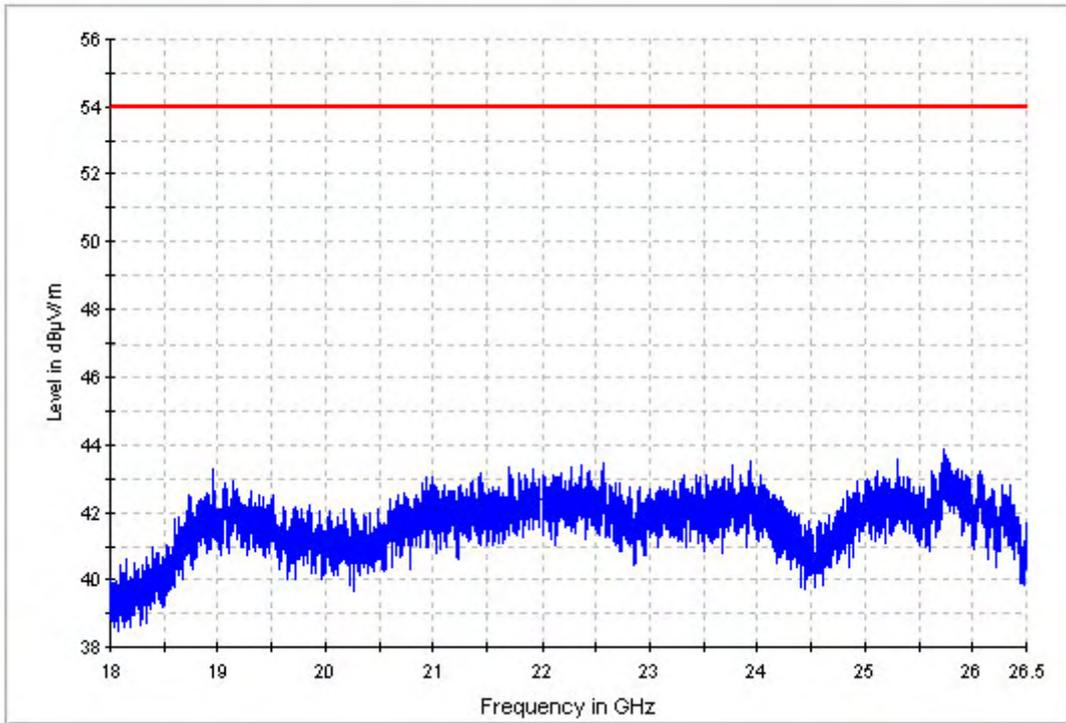
FCC 4-18G



RBW / VBW 1 MHz

Idle Mode: 4GHz-18GHz

FCC 18-26.5G



RBW / VBW 1 MHz

Idle Mode: 18GHz-26.5GHz