

TEST REPORT

REPORT NUMBER: I10GC0232-FCC-IC

ON

Type of Equipment: GSM Module
Type of Designation: WMP150 Embedded SIM
Manufacturer: Sierra Wireless

ACCORDING TO

FCC CFR PART 2, April 24, 2009
FCC CFR PART 15, April 24, 2009
FCC CFR PART 22, April 24, 2009
FCC CFR PART 24, April 24, 2009

RSS-Gen Issue 2, June 2007
RSS-132 Issue 2 September 2005
RSS-133 Issue 5 February 2009

China Telecommunication Technology Labs.

Month date, year
Sep, 09, 2010

Signature



He Guili
Director

Equipment: WMP150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC

FCC ID: N7NWMP100

Report Date: 2010-5-20

Test Firm Name: China Telecommunication Technology Labs

Registration Number: 840587

Statement

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported tests were carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Parts 2, 22, and 24. The sample tested was found to comply with the requirements defined in the applied rules.

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1 General Information

1.1 Notes

All reported tests were carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Parts 2, 22 and 24, RSS Gen, 132 and 133..

The test results of this test report relate exclusively to the item(s) tested as specified in section 2.

The following deviation from, additions to, or exclusions from the test specifications have been made. See Annex B.

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Equipment: WMP 150 Embedded SIM

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1.2 Testers

Name: Yuan Yuan
Position: Engineer
Department: Department of EMC test
Signature: 

Editor of this test report:

Name: Yuan Yuan
Position: Engineer
Department: Department of EMC test
Date: 2010-09-09
Signature: 

Technical responsibility for area of testing:

Name: Zhang Xia
Position: Manager
Department: Department of EMC test
Date: 2010-09-09
Signature: 

Equipment: WMP 150 Embedded SIM

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1.3 Testing Laboratory information

1.3.1 Location

Name: China Telecommunication Technology Labs.
Address: No. 11, Yue Tan Nan Jie, Xi Cheng District
BEIJING
P. R. CHINA, 100045
Tel: +86 10 68094053
Fax: +86 10 68011404
Email: emc@chinattl.com

1.3.2 Details of accreditation status

Accredited by: China National Accreditation Service for Conformity
Assessment (CNAS)
Registration number: CNAS Registration No. CNAS L0570
Standard: ISO/IEC 17025:2005

1.3.3 Test location, where different from section 1.3.1

Name: -----
Street: -----
City: -----
Country: -----
Telephone: -----
Fax: -----
Postcode: -----

Equipment: WMP 150 Embedded SIM

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1.4 Details of applicant or manufacturer

1.4.1 Applicant

Name: Sierra Wireless
Address: Unit 201-207, 2nd Floor, Bio-Informatics Center,
No. 2 Science Park West Avenue
Hong Kong Science Park, Shatin,
New Territories, Hong Kong
Country: People's Republic of China
Telephone: +852 2824 5222
Fax: +852 2824 0523
Contact: Denis CHABOT
Telephone: +852 2824 5222
Email: dchabot@sierrawireless.com

1.4.2 Manufacturer (if different from applicant in section 1.4.1)

Name: ----
Address: ----

1.4.3 Manufactory (if different from applicant in section 1.4.1)

Name: ----
Address: ----

Equipment: WMP 150 Embedded SIM

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2 Test Item

2.1 General Information

Manufacturer: Sierra Wireless
 Name: GSM Module
 Model Number: WMP150 Embedded SIM
 Serial Number: --
 Production Status: Product
 Receipt date of test item: 2010-05-20

2.2 Outline of EUT

EUT is a GSM/GPRS/EGPRS module.

2.3 Modifications Incorporated in EUT

The EUT has not been modified from what is described by the brand name and unique type identification stated above.

2.4 Equipment Configuration

Equipment configuration list:

Item	Generic Description	Manufacturer	Type	Serial No.	Remarks
A	GSM Module	Sierra Wireless	WMP150 Embedded SIM	--	None

Cables:

Item	Cable Type	Manufacturer	Length	Shield	Quantity	Remarks
1	--	--	--	--	--	None

Note: the EUT has no adaptor, battery, earphone and cable.

Equipment: WMP 150 Embedded SIM

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2.5 Other Information

- (a) Adaptor information:
The EUT has no adaptor.

- (b) Battery information:
The EUT has no battery.

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3 Summary of Test Results

A brief summary of the tests carried out is shown as following.

GSM mode:	
Radiated Spurious Emission	Pass
Receiver Spurious Emission	Pass
Occupied Bandwidth	*Note 1
Frequency Stability over Temperature Variation	Pass
Frequency Stability over Voltage Variation	Pass
Conducted RF Power Output	Pass
Conducted spurious emissions	Pass
Note 3: No applicable performance criteria.	

GPRS mode:	
Radiated Spurious Emission	Pass
Receiver Spurious Emission	Pass
Occupied Bandwidth	*Note 2
Frequency Stability over Temperature Variation	Pass
Frequency Stability over Voltage Variation	Pass
Conducted RF Power Output	Pass
Conducted spurious emissions	Pass
Note 2: No applicable performance criteria.	

EGPRS mode:	
Radiated Spurious Emission	Pass
Receiver Spurious Emission	Pass
Occupied Bandwidth	*Note 3
Frequency Stability over Temperature Variation	Pass
Frequency Stability over Voltage Variation	Pass
Conducted RF Power Output	Pass
Conducted spurious emissions	Pass
Note 3: No applicable performance criteria.	

4 Test Results of mode

4.1 Radiated Spurious Emission

Specifications:	FCC 2.1051, 24.238, 2.1053, 22.917 RSS-132 4.5 RSS-133 6.5					
Date of Tests	2010-05-31~2010-06-3					
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa					
Operation Mode	TX on, channel 190 and 661 for GSM, GPRS and EGPRS mode 850 and 1900 band respectively.					
Test Results:	Pass					
Test equipment Used:						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2011-01-11	Normal
7330	Ultra Broadband Antenna	SCHWARZBECK	VULB 9160	--	2010-10-26	Normal
7330	Double-Ridged Horn Antenna	R/S	HF906	100037	2010-11-17	Normal
713	Fully-Anechoic Chamber	ETS	11.8m×6.5m×6.3m	--	2010-11-16	Normal
111835	Wireless Communications Test Set	R&S	CMU200	1100000802	2011-06-08	Normal

Limit Level Construction:

According to Part 24.238 (a), i.e., Out of band emissions. 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, so the limit level is:
 $P(\text{dBm}) - (43 + 10 \log(P)) \text{ dB} = -13\text{dBm}$

Limits for Radiated spurious emissions(UE)

Frequency range	Limit Level /Resolution Bandwidth
30 MHz to 20000 MHz	-13dBm/1MHz

Test Setup:

The EUT was placed in an anechoic chamber, see figure SP. The Wireless Communications Test Set was used to set the TX channel and power level and modulate the TX signal with different bit patterns. The test was done using an automated test system, where all test equipments were controlled by a computer.



Figure SP

Test Method:

Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

- 1 The maximum spurious emissions were searched by turning the azimuth of the turntable, shifting the polarization of the measuring antenna and changing the pose of the EUT.
- 2 Levels of EUT's transmitter harmonics and suspicious signals were recorded.
- 3 The recorded levels were corrected in the automated test system with the correction factors given by a substitution calibration made before the measurement. The calibration was made separately for vertical and horizontal polarization and the system uses different correction factors depending on the measuring antenna polarization.
- 4 The corrected values of radiated spurious emissions indicated as EIRP are reported.

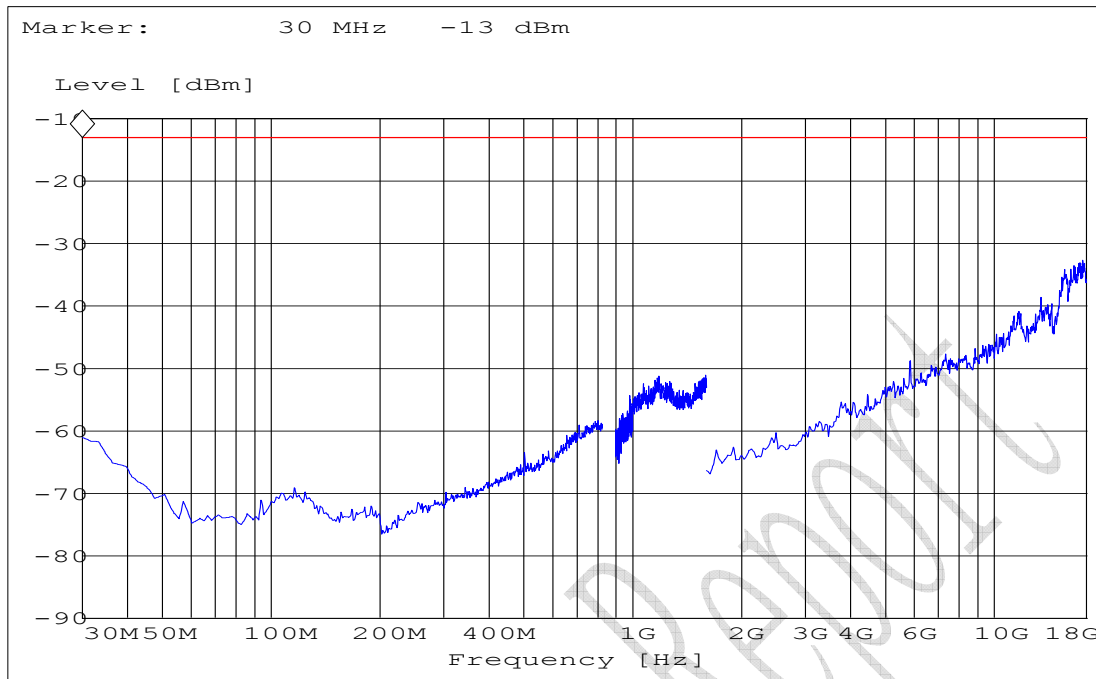
Note:

--

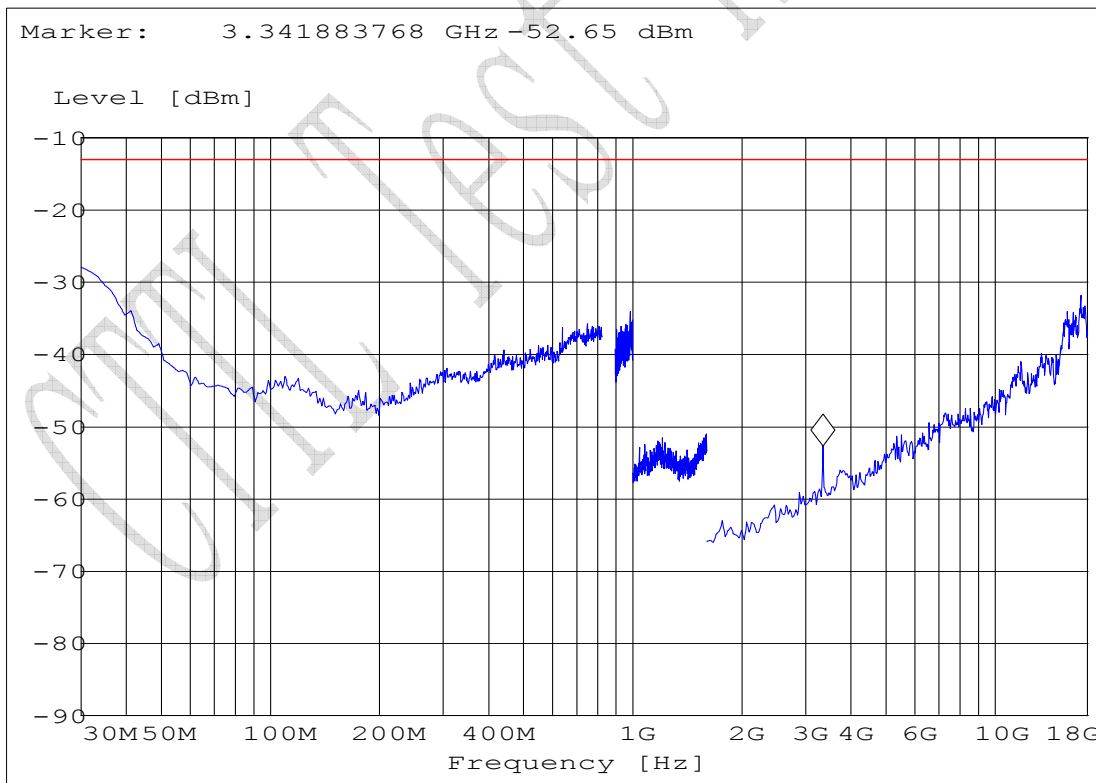
Equipment: WMP 150 Embedded SIM

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Test Results for GSM mode:



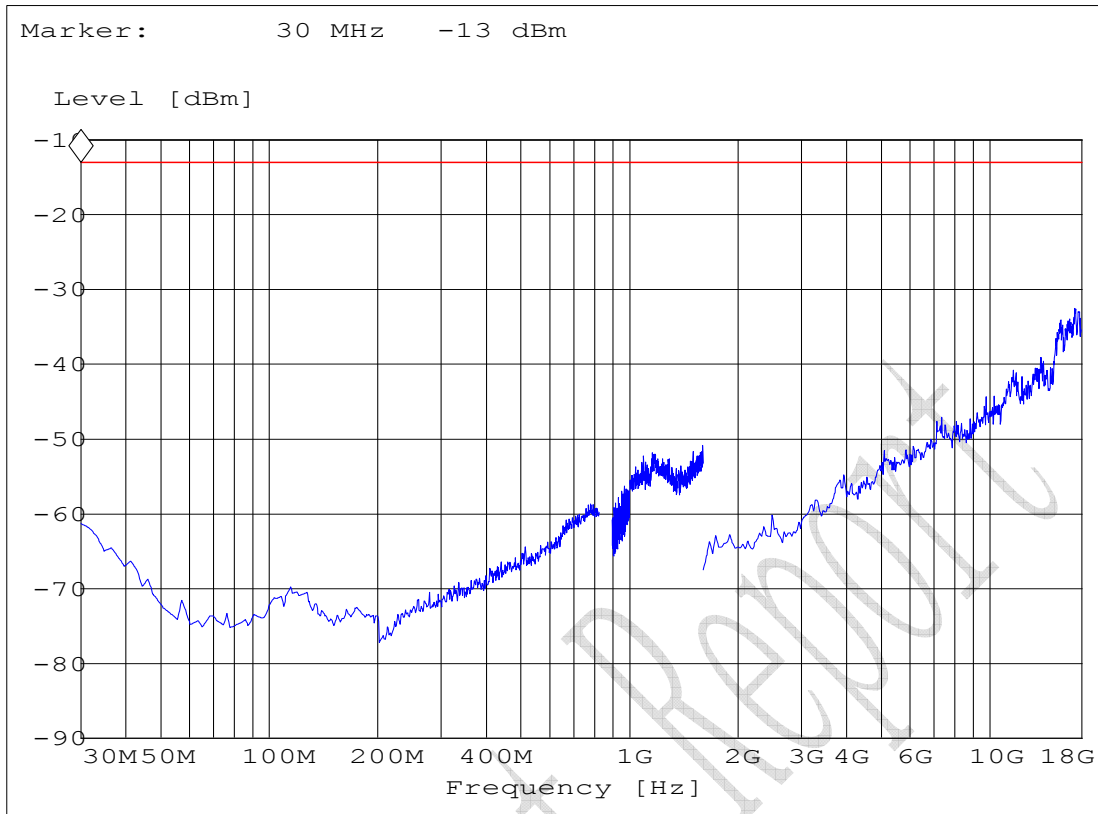
S190VF for GSM mode



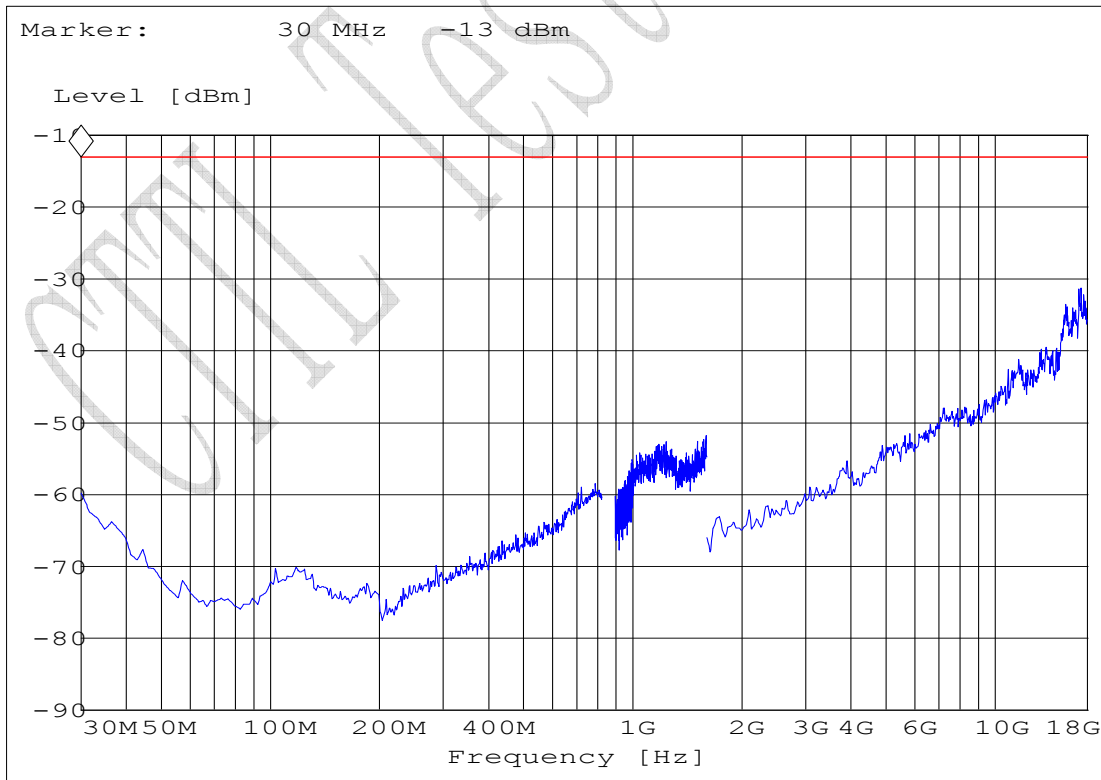
S190HF for GSM mode

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



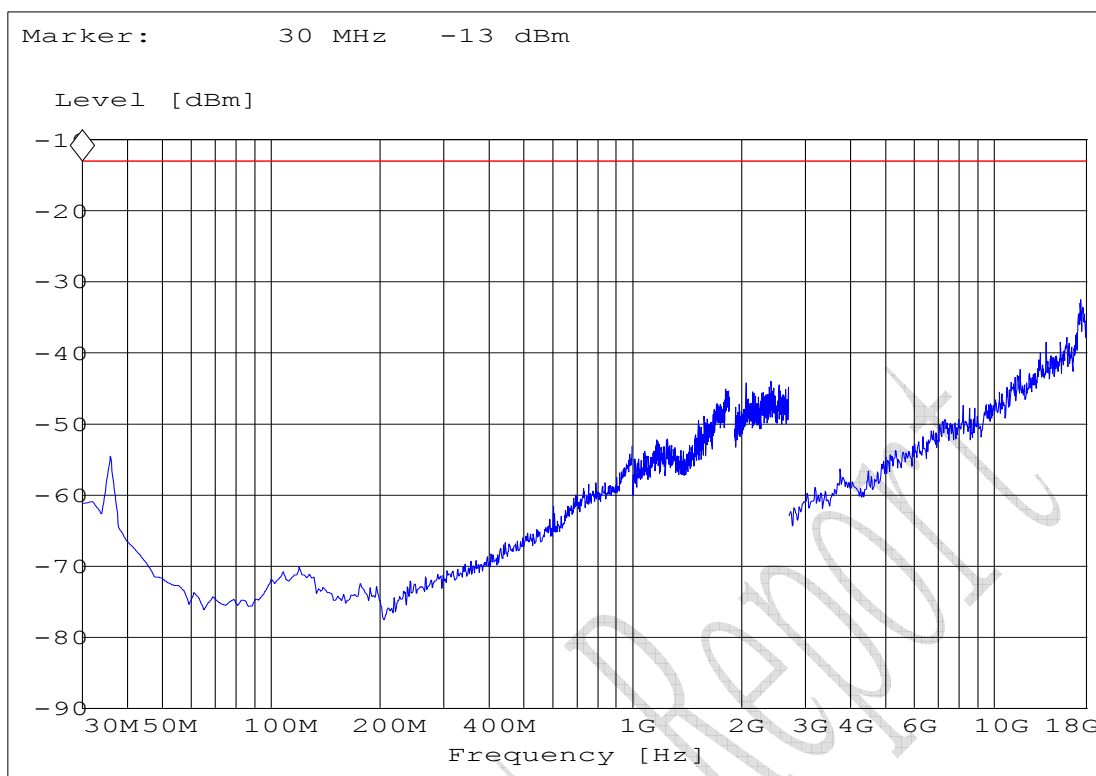
S190VT for GSM mode



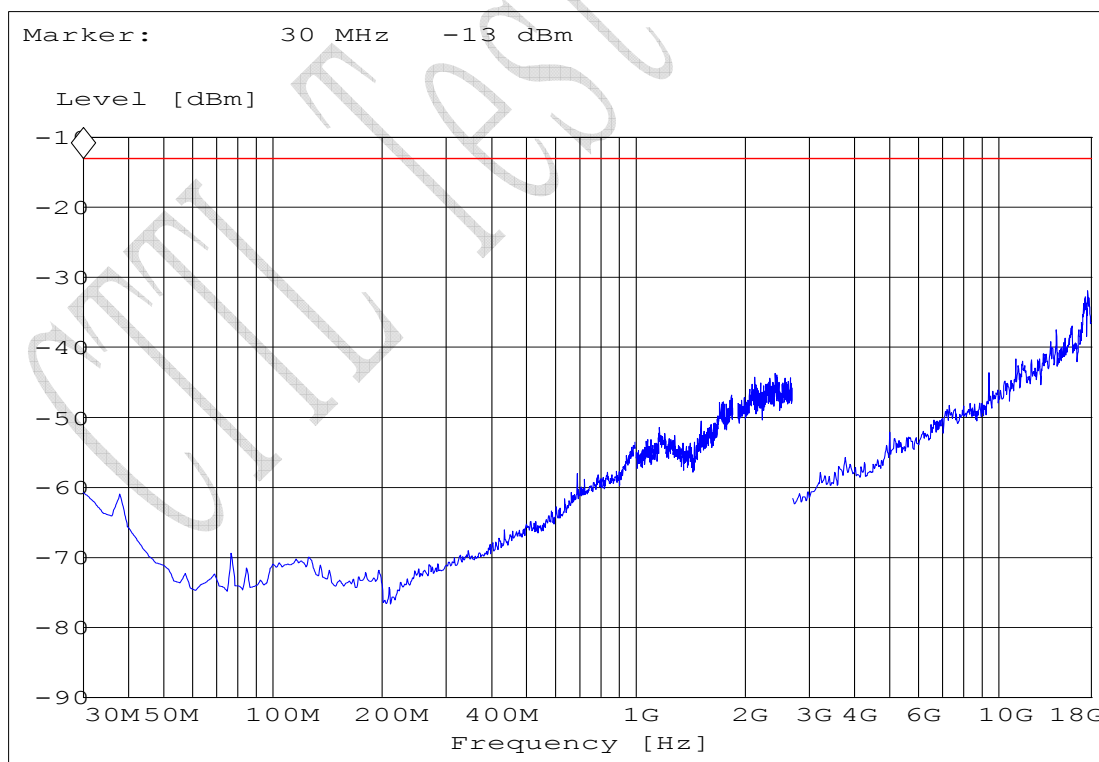
S190HT for GSM mode

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



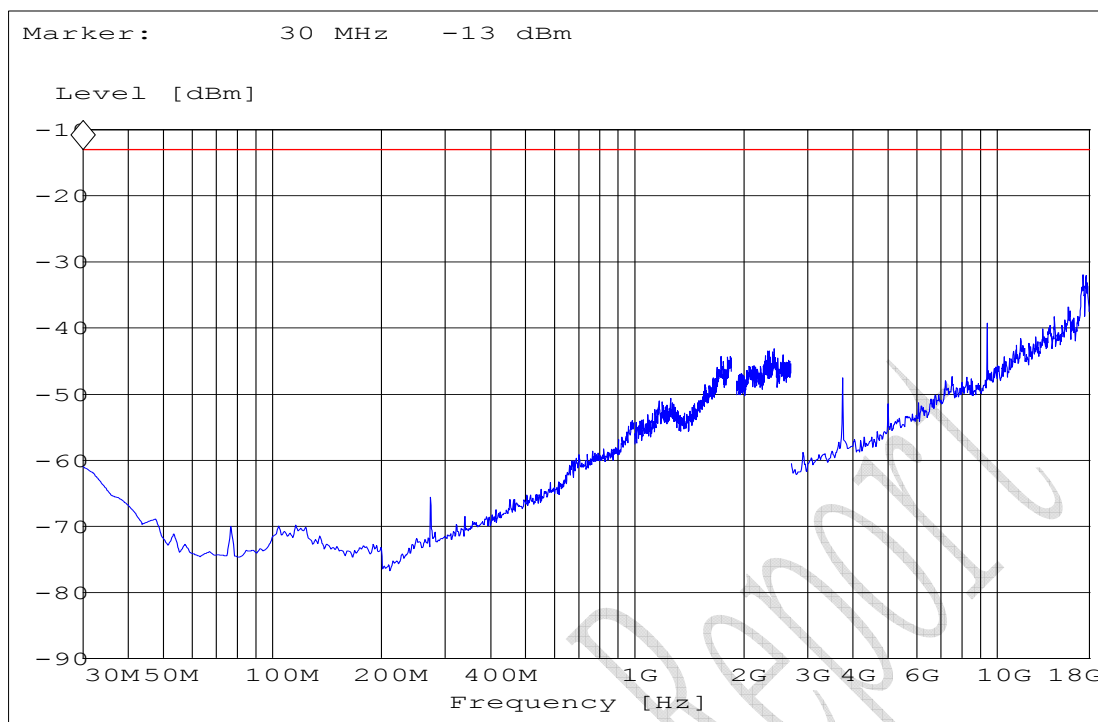
S661VF for GSM mode



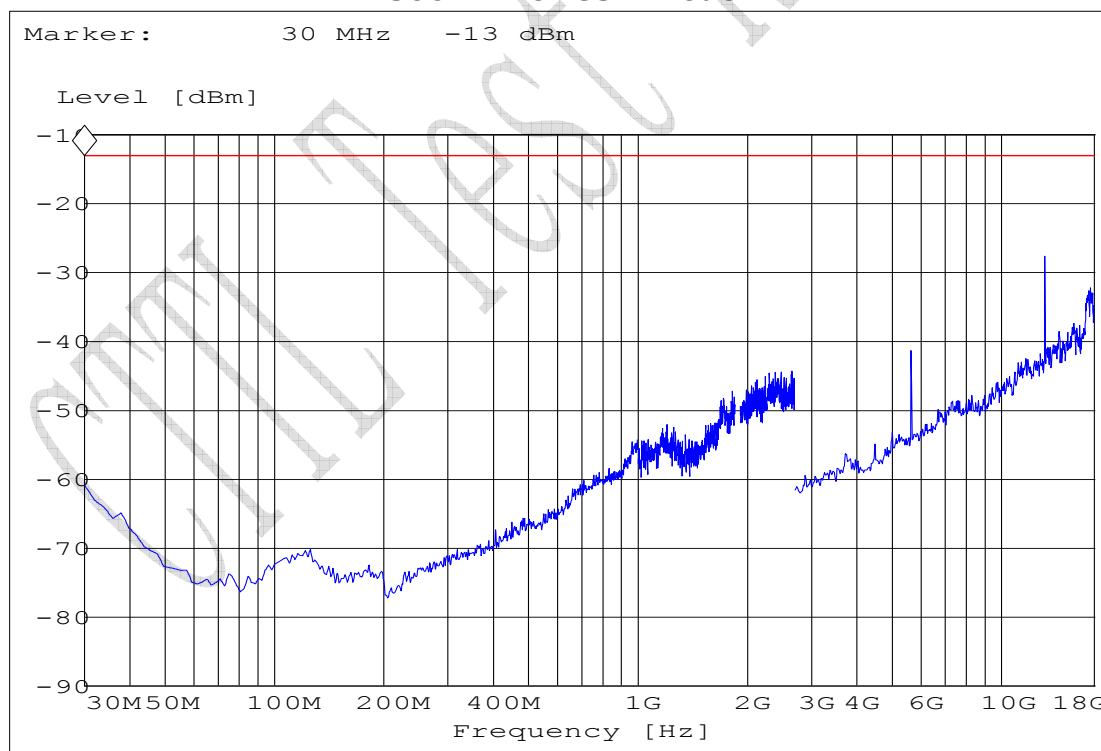
S661HF for GSM mode

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC

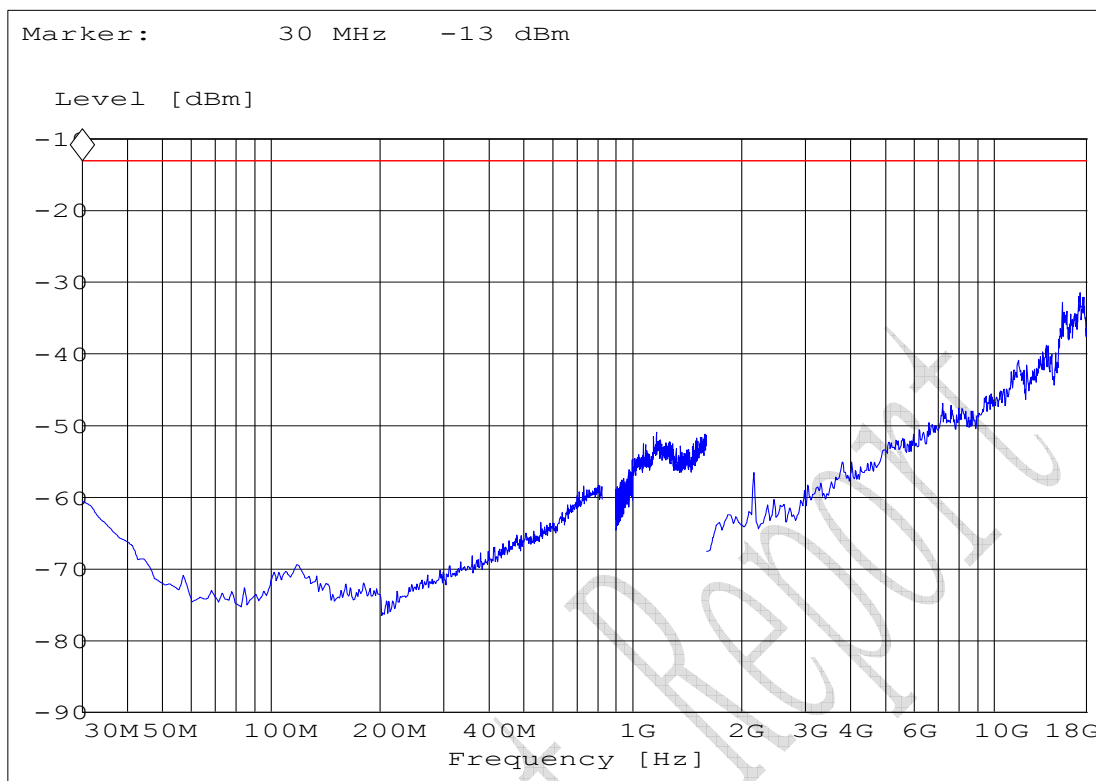


S661VT for GSM mode

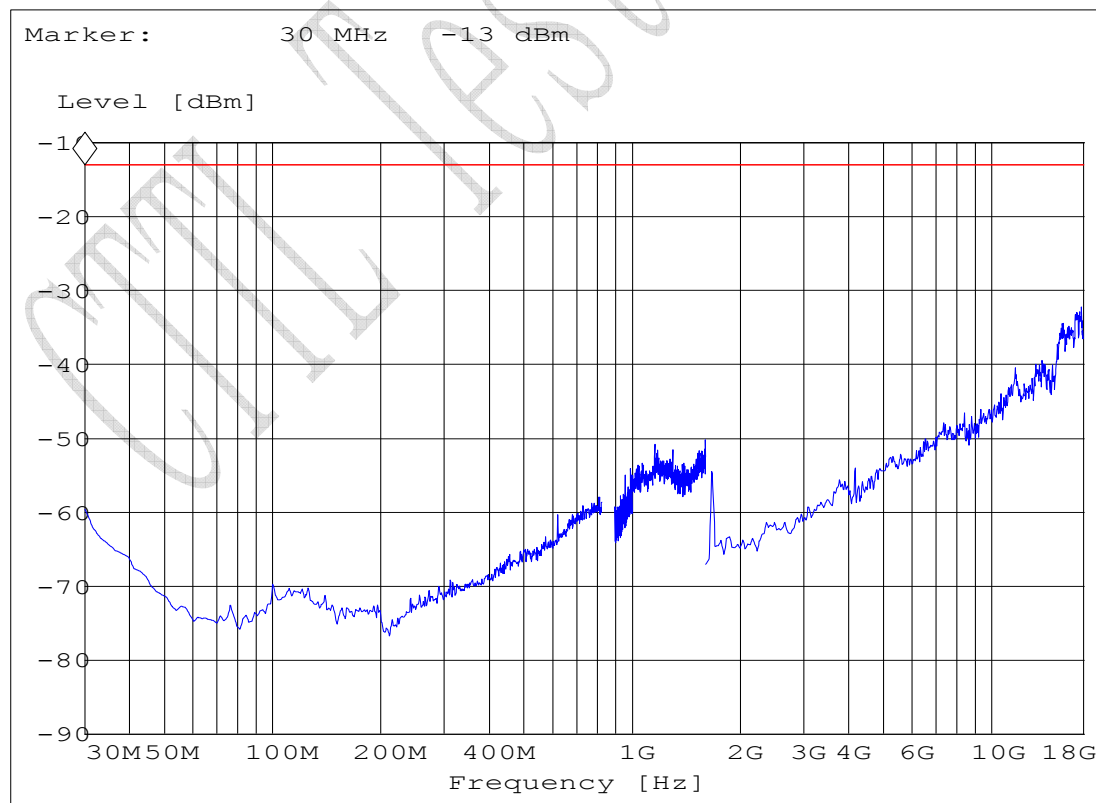


S661HT for GSM mode

Test Results for GPRS mode:



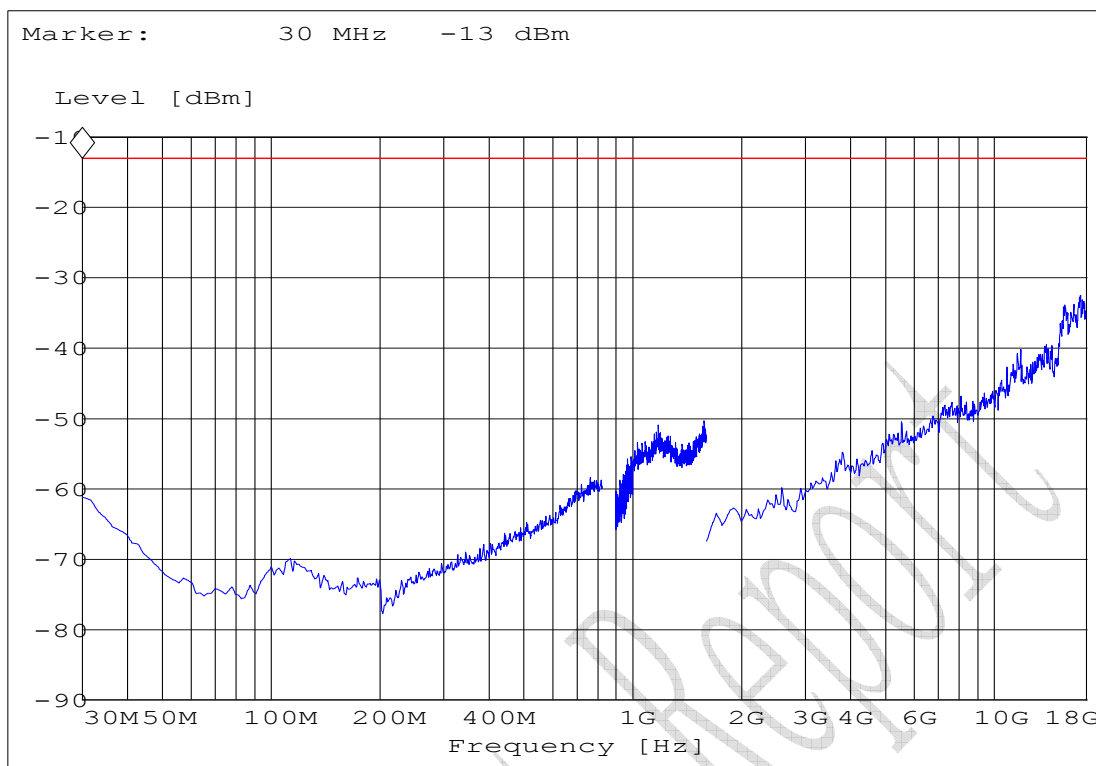
S190VF for GPRS mode



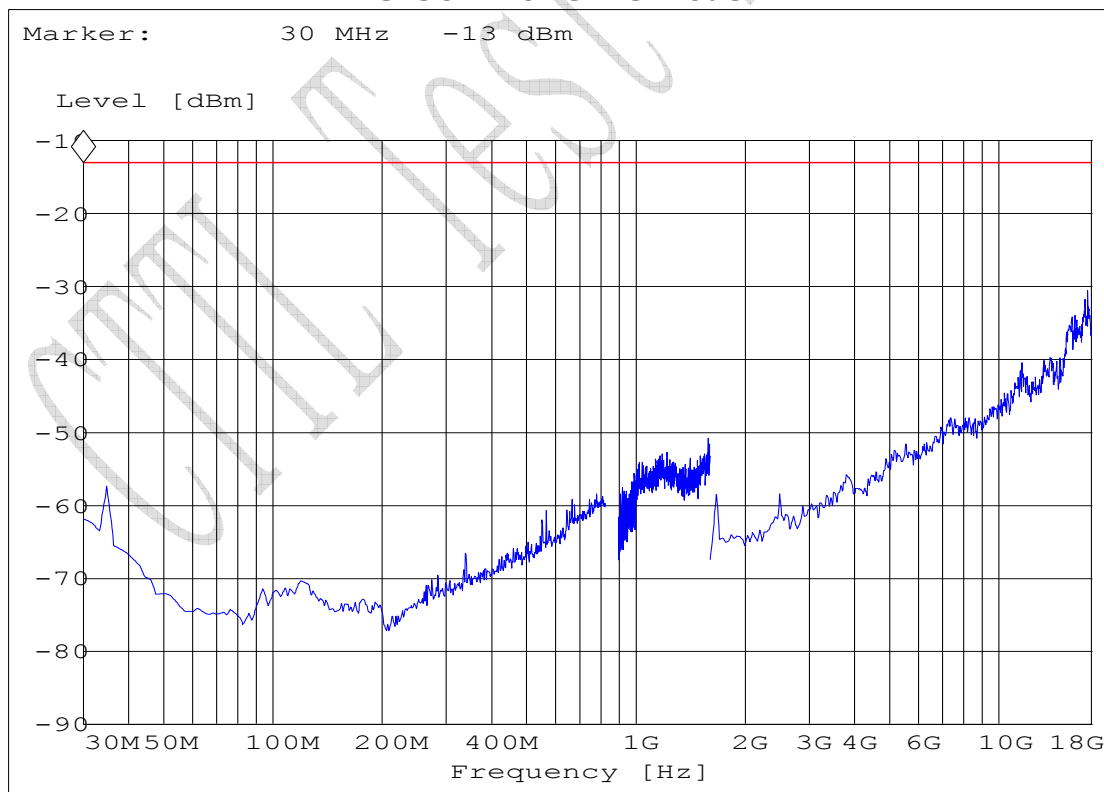
S190HF for GPRS mode

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



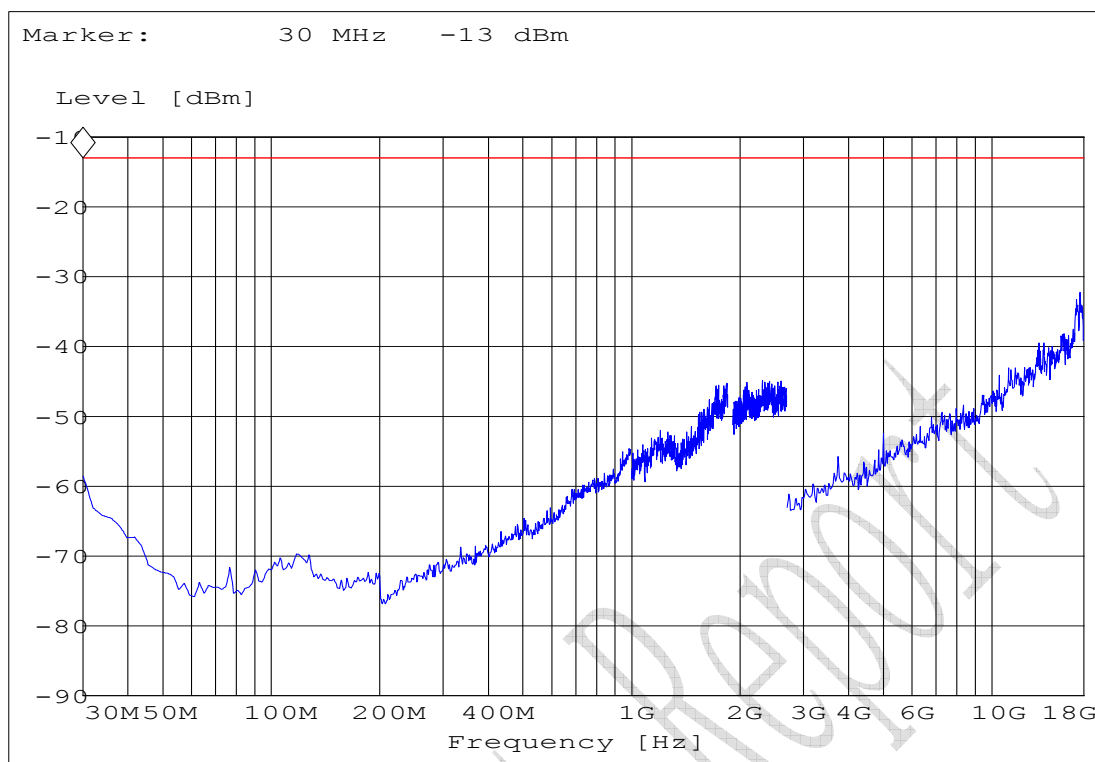
S190VT for GPRS mode



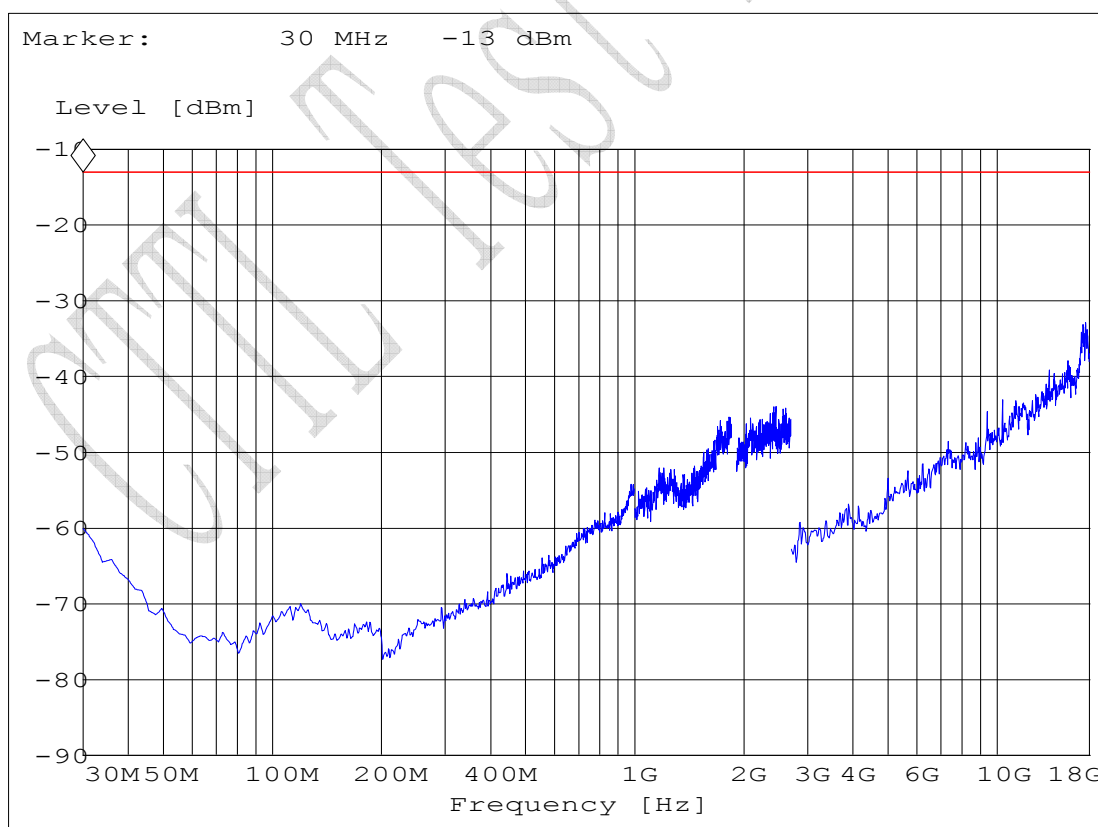
S190HT for GPRS mode

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



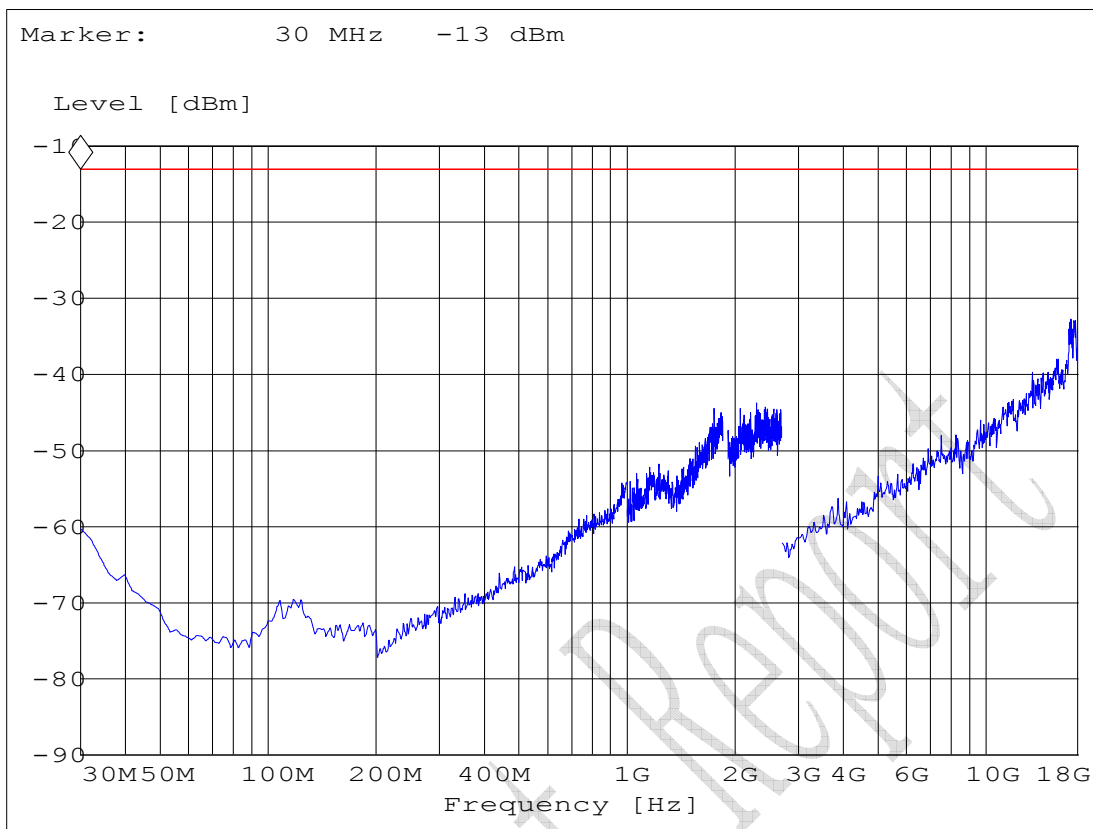
S661VF for GPRS mode



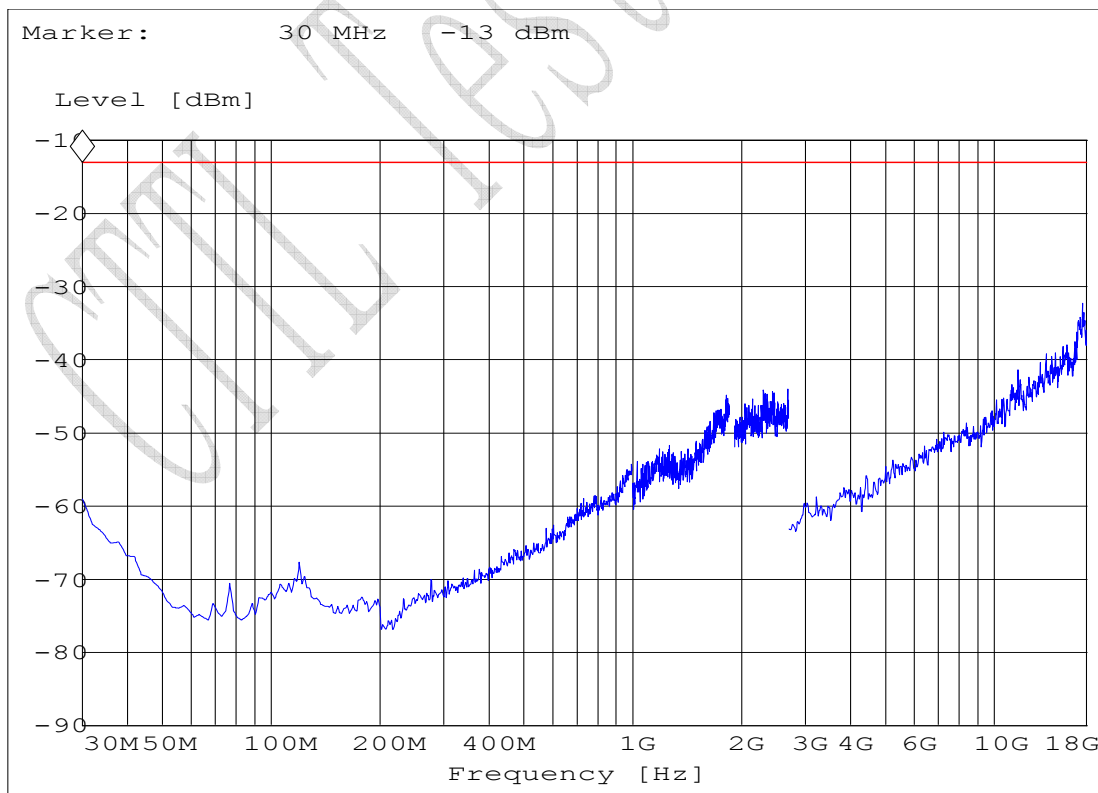
S661HF for GPRS mode

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC

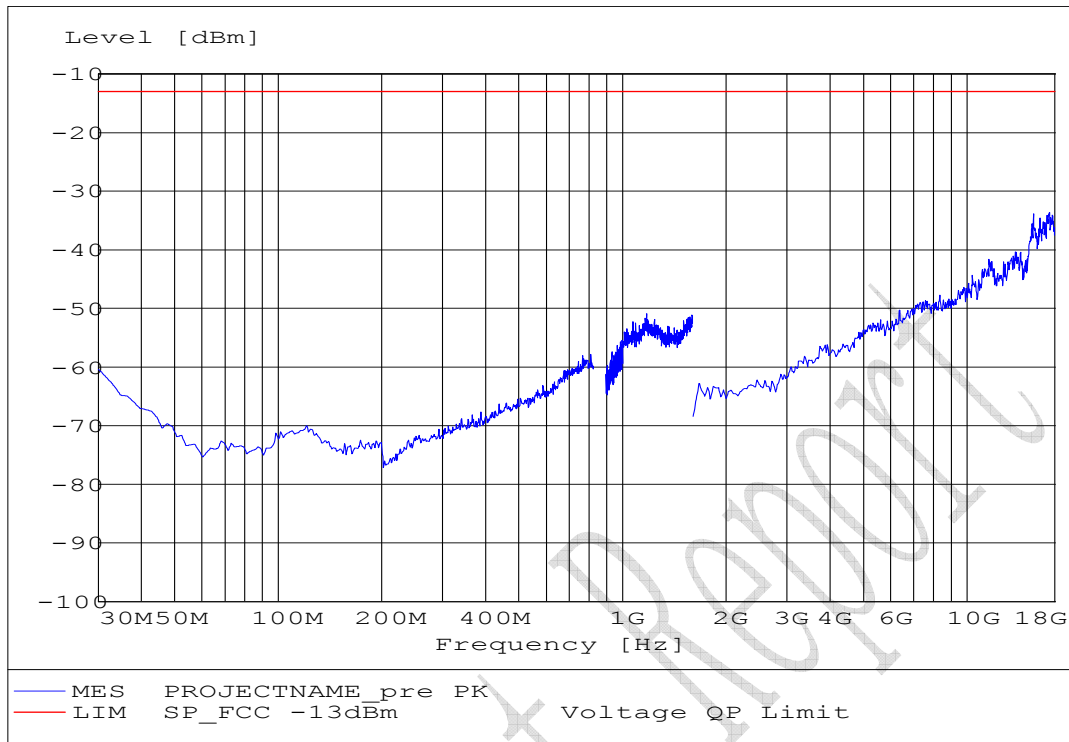


S661VT for GPRS mode

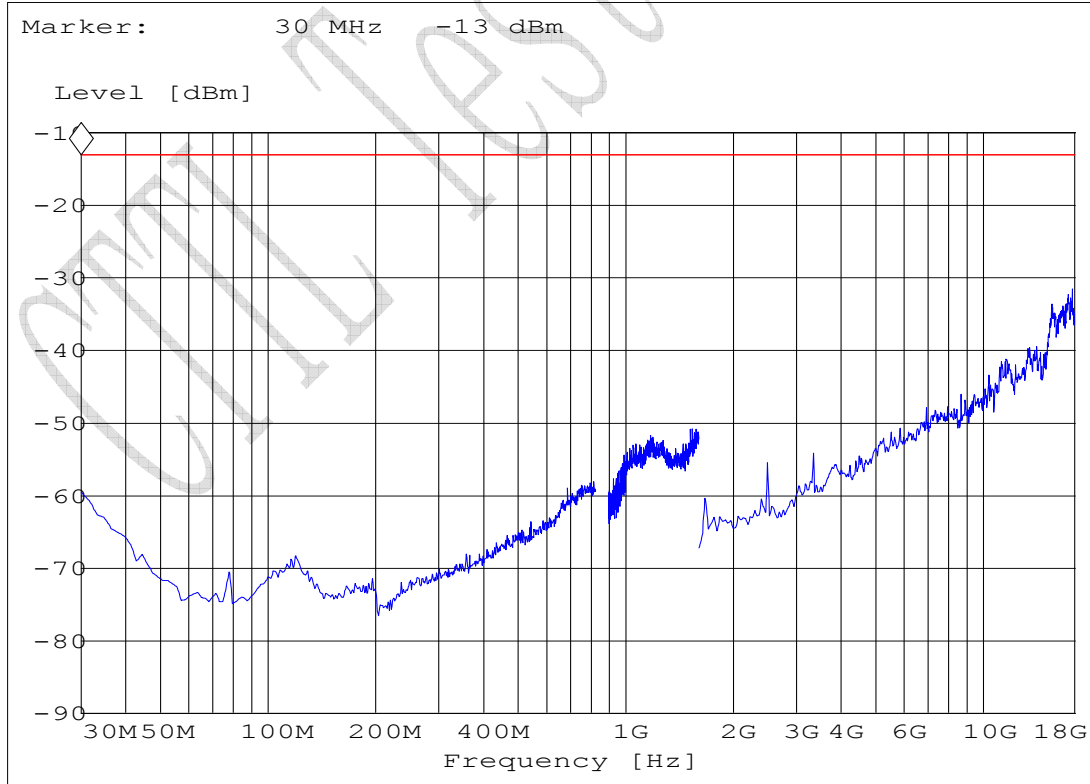


S661HT for GPRS mode

Test Results for EGPRS mode:



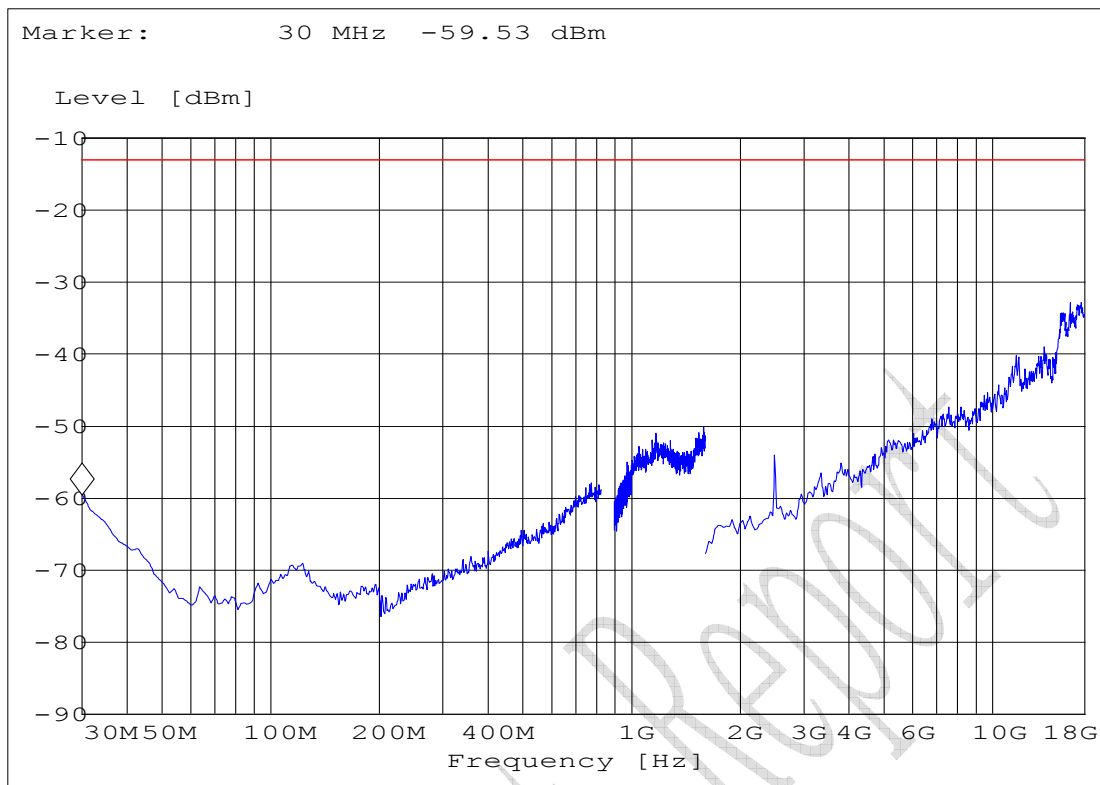
S190VF for EGPRS mode



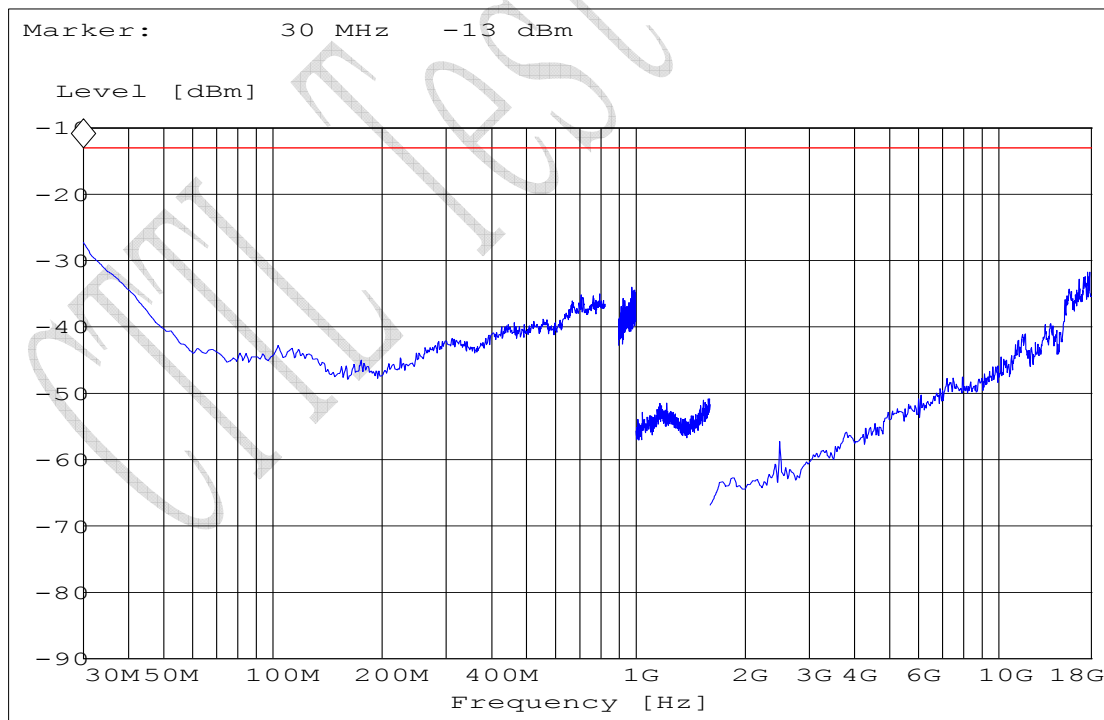
S190HF for EGPRS mode

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



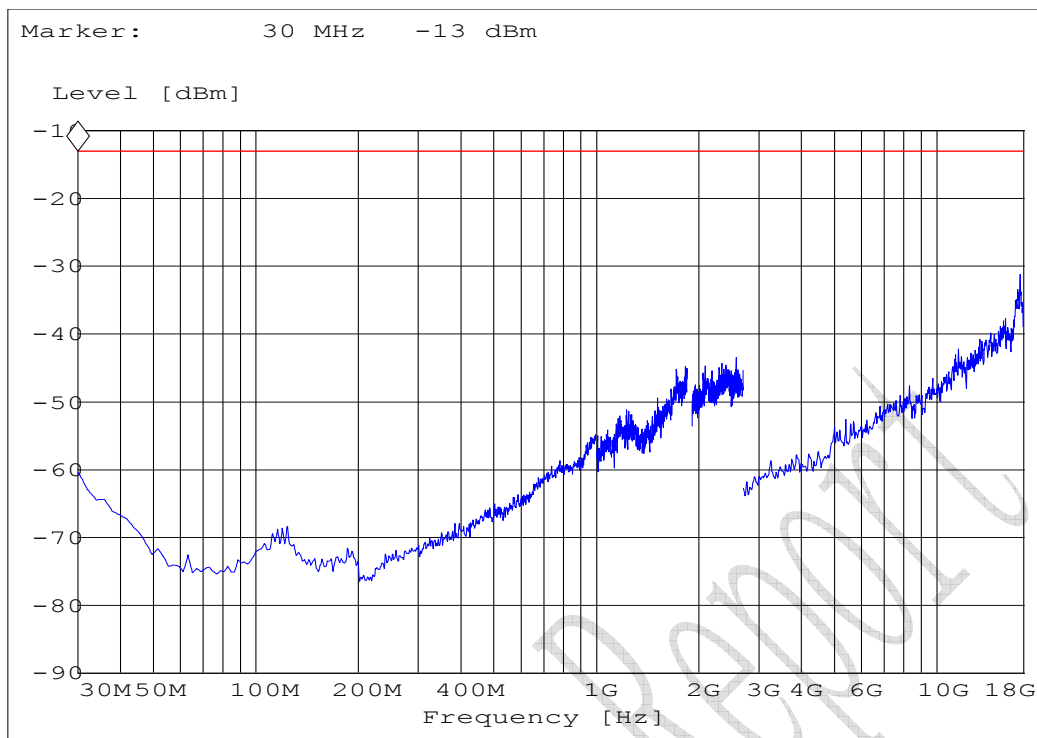
S190VT for EGPRS mode



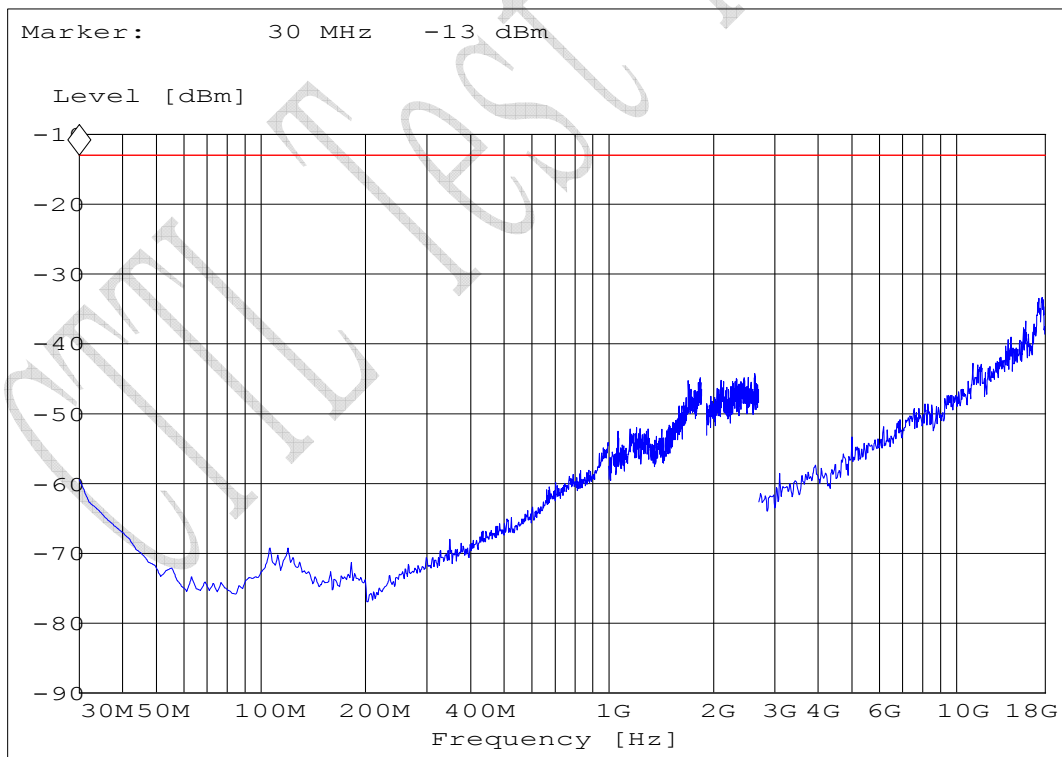
S190HT for EGPRS mode

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



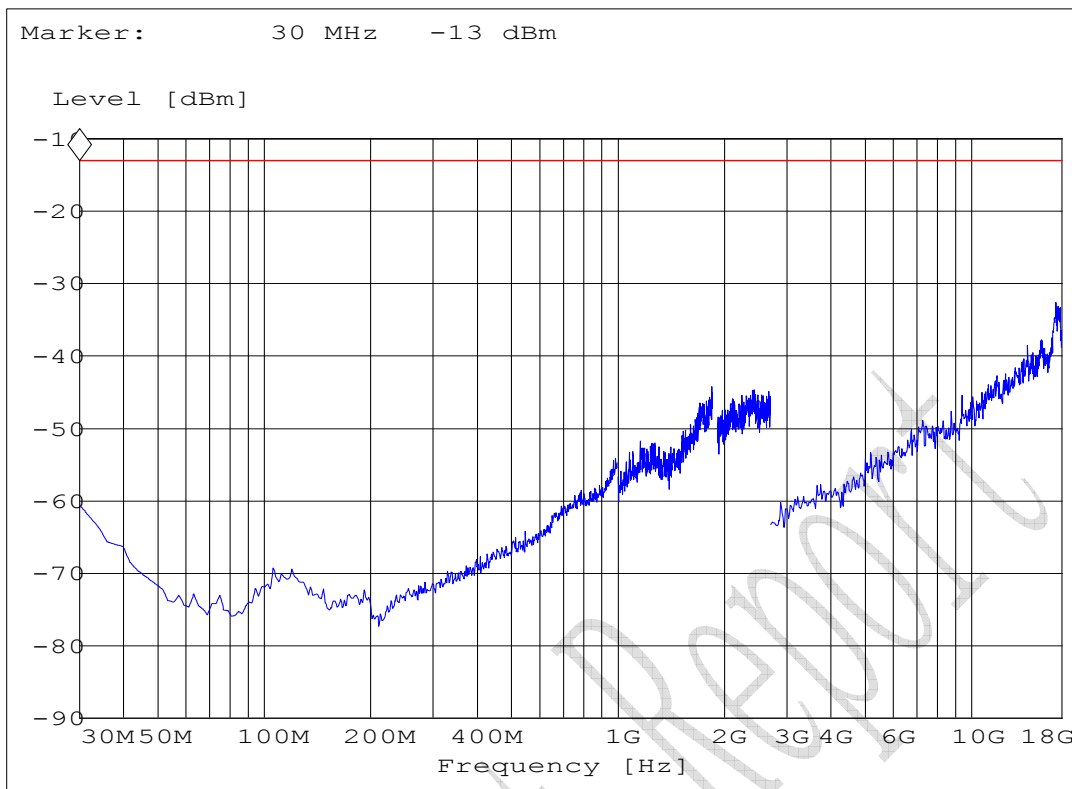
S661VF for EGPRS mode



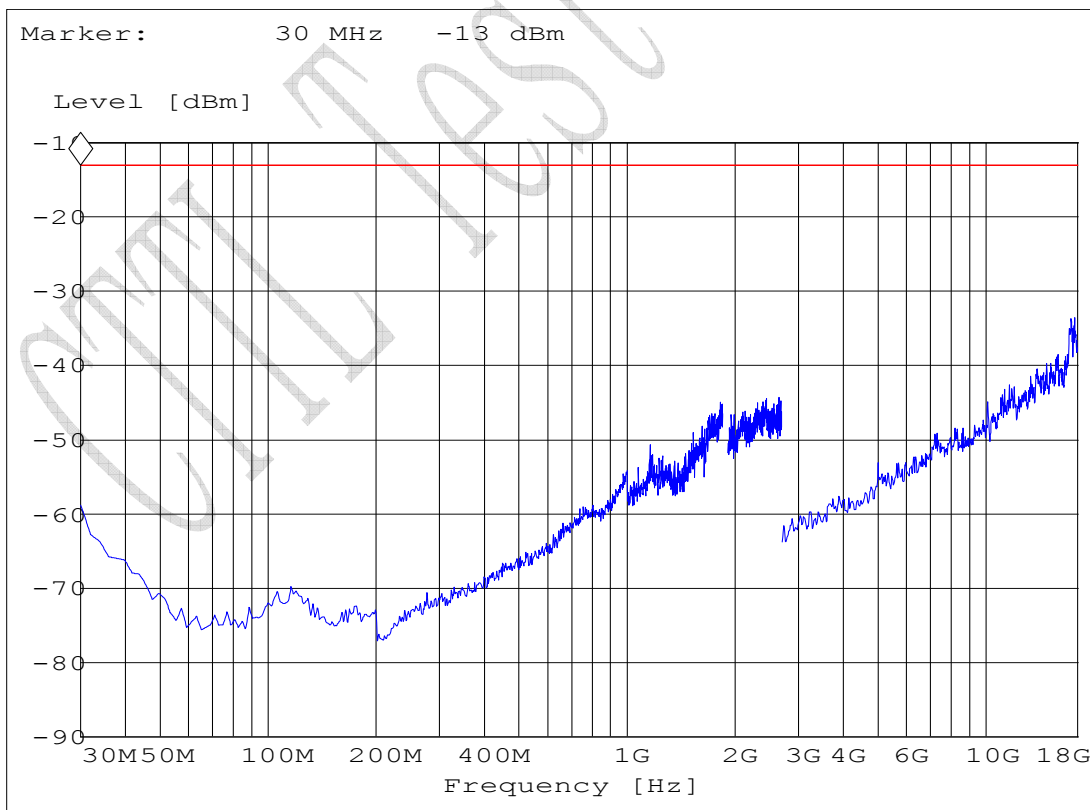
S661HF for EGPRS mode

Equipment: WMP 150 Embedded SIM

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S661VT for EGPRS mode



S661HT for EGPRS mode

4.2 Receiver Spurious Emission

Specifications:	FCC Part 15.109 RSS-Gen 6, RSS 133/6.6 , RSS 132/4.6					
Date of Tests	2010-06-03					
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa					
Operation Mode	TX off, idle mode for GSM, GPRS and EGPRS.					
Test Results:	Pass					
Test equipment Used:						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2011-01-11	Normal
7330	Ultra Broadband Antenna	SCHWARZBECK	VULB 9160	--	2010-10-26	Normal
7330	Double-Ridged Horn Antenna	R/S	HF906	100037	2010-10-26	Normal
713	Fully-Anechoic Chamber	ETS	11.8m×6.5m×6.3m	--	2010-11-16	Normal
111835	Wireless Communications Test Set	R&S	CMU200	1100000802	2011-06-08	Normal

Limits

Frequency (MHz)	Limits (dB uV/m)	Measured distance (m)
30~88	QP: 40	3
88~216	QP: 43.5	
216~960	QP: 46	
960~1000	QP: 54	
Above 1000	PK: 74 AV:54	

Test Setup:

The EUT was set in an anechoic chamber, which is connected to the Wireless Communications Test Set located outside the chamber over the air. The test was done using an automated test system, where all test equipments were controlled by a computer.

Test Method

According to description of ANSI C63.4-2003 sec.13.1.4 and RSS-Gen sec.4.10, the preliminary radiated emissions measurement were carried out. The preliminary radiated measurements were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT. The EUT configuration (in X, Y and Z axis), cable configuration and mode of operation were determined for producing the maximum level of emissions. These configurations were used for the final radiated emissions

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measurements. The measurement is carried out using a spectrum analyzer or receiver. The Quasi-peak detector is used and RBW is set to 120kHz for 30MHz-1GHz. The spectrum analyzer scans from 1GHz to 12GHz(higher than the 5th harmonic of the carrier) with an average detector. RBW is set to 1MHz ,VBW \geq 3RBW.The antenna height and turn table rotation is adjusted until the maximum power value is founded on spectrum analyzer or receiver.

Test result for GSM 850 band mode(30M~1000MHz):

Frequency (MHz)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Polarization
37.680000	30.52	40	H
78.060000	34.67	40	H
117.840000	27.14	43.5	H
792.600000	34.46	46	V

Test result for GSM 1900 band mode(30M~1000MHz):

Frequency (MHz)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Polarization
77.940000	35.28	40	H
117.360000	27.85	43.5	H
121.500000	26.78	43.5	H
938.340000	36.46	46	H

Test result for GPRS 850 band mode(30M~1000MHz):

Frequency (MHz)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Polarization
77.940000	35.28	40	H
117.420000	27.86	43.5	H
120.420000	26.99	43.5	H
997.980000	37.01	54	H

Test result for GPRS 1900 band mode(30M~1000MHz):

Frequency (MHz)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Polarization
37.440000	29.00	40	H
78.660000	35.67	40	H
116.88000	29.39	43.5	H
985.86000	37.35	54	V

Test result for EGPRS 850 band mode(30M~1000MHz):

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Frequency (MHz)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Polarization
78.12000	30.70	40	H
116.70000	28.30	43.5	H
468.000000	31.13	43.5	H
874.08000	38.43	46	H

Test result for EGPRS 1900 band mode(30M~1000MHz):

Frequency (MHz)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Polarization
37.860000	29.53	40	H
78.060000	35.80	40	H
117.600000	26.77	43.5	H
874.080000	38.43	46	H

Test result for GSM 850 band mode(Above 1000MHz):

Frequency (GHz)	Emission Level (dB μ V/m)		Limit (dB μ V/m)		Polarization
	PK	AV	PK	AV	
2.6540	45.88	32.94	74	54	V
6.9895	42.25	32.49	74	54	V

Test result for GSM 1900 band mode(Above 1000MHz):

Frequency (GHz)	Emission Level (dB μ V/m)		Limit (dB μ V/m)		Polarization
	PK	AV	PK	AV	
2.6985	44.13	33.47	74	54	V
6.9895	44.62	31.96	74	54	V

Test result for GPRS 850 band mode(Above 1000MHz):

Frequency (GHz)	Emission Level (dB μ V/m)		Limit (dB μ V/m)		Polarization
	PK	AV	PK	AV	
2.0735	43.93	31.05	74	54	V
6.3515	45.08	31.12	74	54	V

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Test result for GPRS 1900 band mode(Above 1000MHz):

Frequency (GHz)	Emission Level (dB μ V/m)		Limit (dB μ V/m)		Polarization
	PK	AV	PK	AV	
2.6860	46.08	33.13	74	54	V
6.6335	43.07	31.94	74	54	V

Test result for EGPRS 850 band mode(Above 1000MHz):

Frequency (GHz)	Emission Level (dB μ V/m)		Limit (dB μ V/m)		Polarization
	PK	AV	PK	AV	
2.574	45.41	32.29	74	54	V
6.9135	45.42	31.61	74	54	V

Test result for EGPRS 1900 band mode(Above 1000MHz):

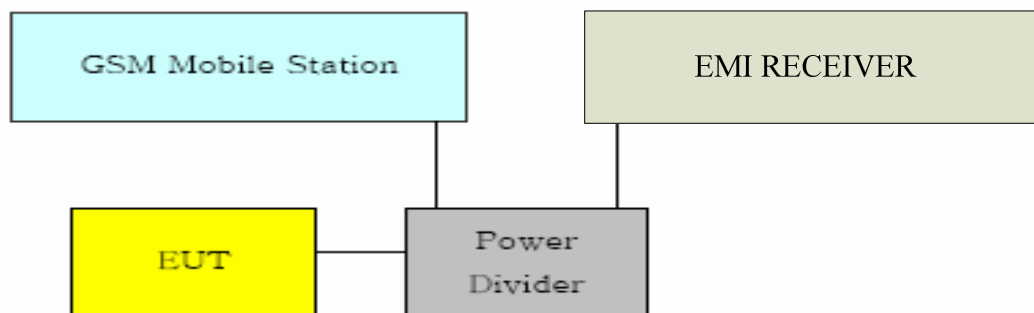
Frequency (GHz)	Emission Level (dB μ V/m)		Limit (dB μ V/m)		Polarization
	PK	AV	PK	AV	
2.6675	45.65	33.08	74	54	V
6.9865	44.37	32.44	74	54	V

4.3 Occupied bandwidth

Specifications:	FCC 2.1049, 22.917(b), 24.238(b) RSS-132 4.5, RSS-133 6.5					
Date of Test	2010-06-01					
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa					
Operation Mode	TX on, channel128, 190, 251, 512, 661 and 810 for GSM, GPRS and EGPRS.					
Test Results:	--					
Test equipment Used:						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2011-01-11	Normal
7330	Ultra Broadband Antenna	SCHWARZBECK	VULB 9160	--	2010-10-26	Normal
7330	Double-Ridged Horn Antenna	R/S	HF906	100037	2010-10-26	Normal
713	Fully-Anechoic Chamber	ETS	11.8m×6.5m×6.3m	--	2010-11-16	Normal
111835	Wireless Communications Test Set	R&S	CMU200	1100000802	2010-11-17	Normal

Test Setup

During the process of testing, the EUT was controlled via Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by Rhode & Schwarz EMI test receiver (ESI26)



Test Method

The 99% occupied bandwidth was calculated from the spectrum analyzer. Markers in the spectrum analyzer were then placed between the calculated frequencies to show the calculated 99% power band.

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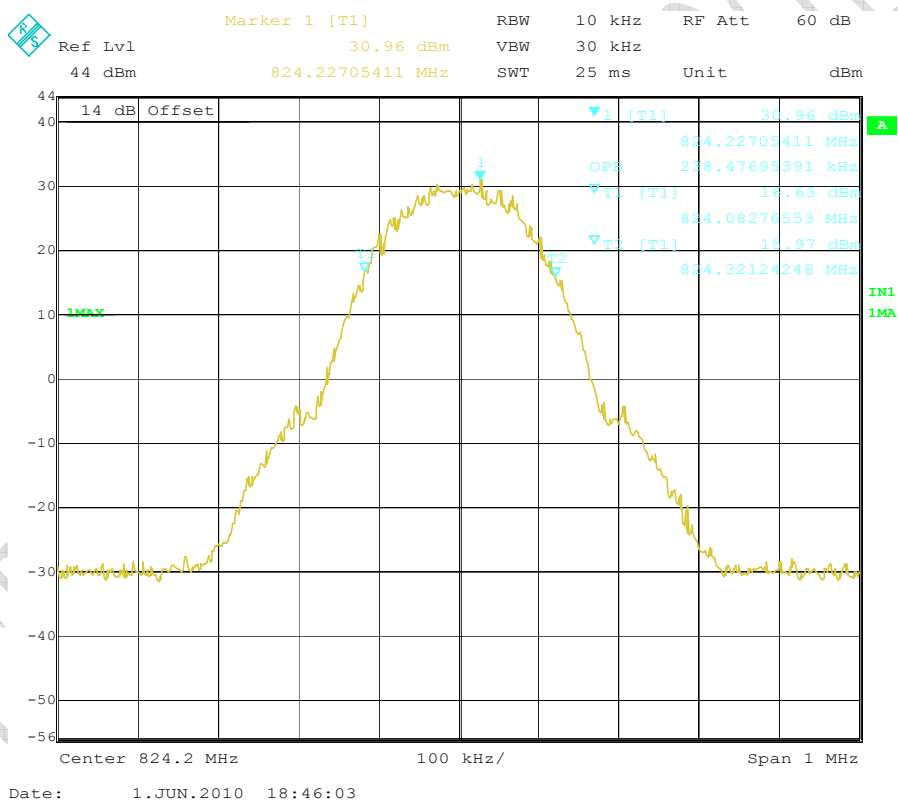
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Note: --

Results data of GSM mode:

EUT channel	99% occupied bandwidth [kHz]
128	238.48
190	238.48
251	240.48
512	238.48
661	238.48
810	238.48

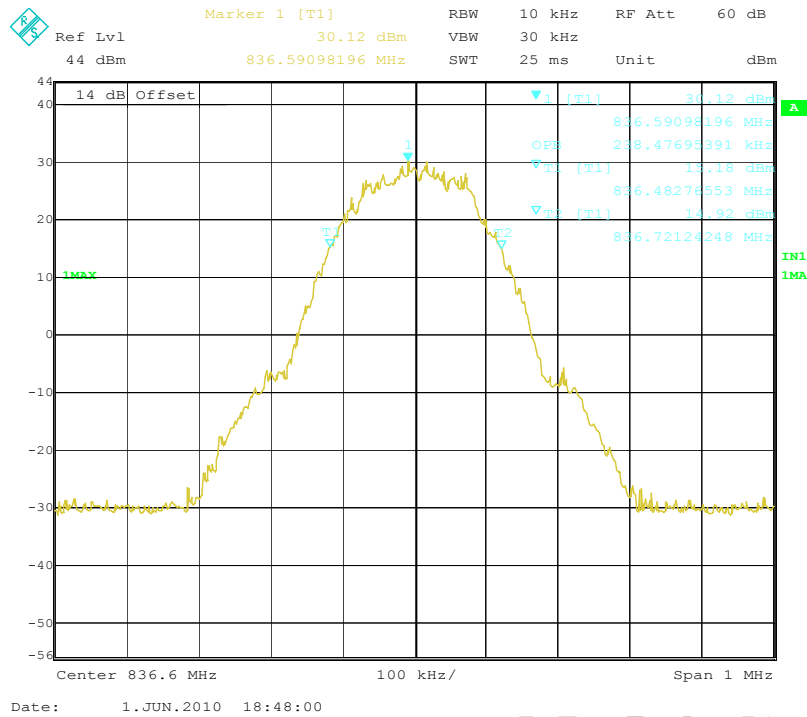
Graphical results for GSM mode:



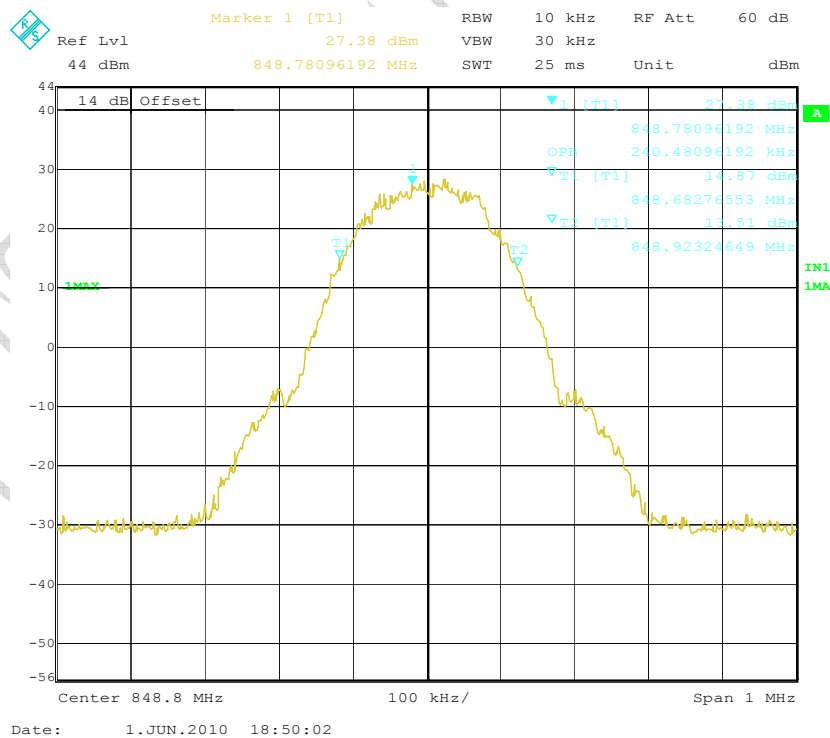
Channel 128

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



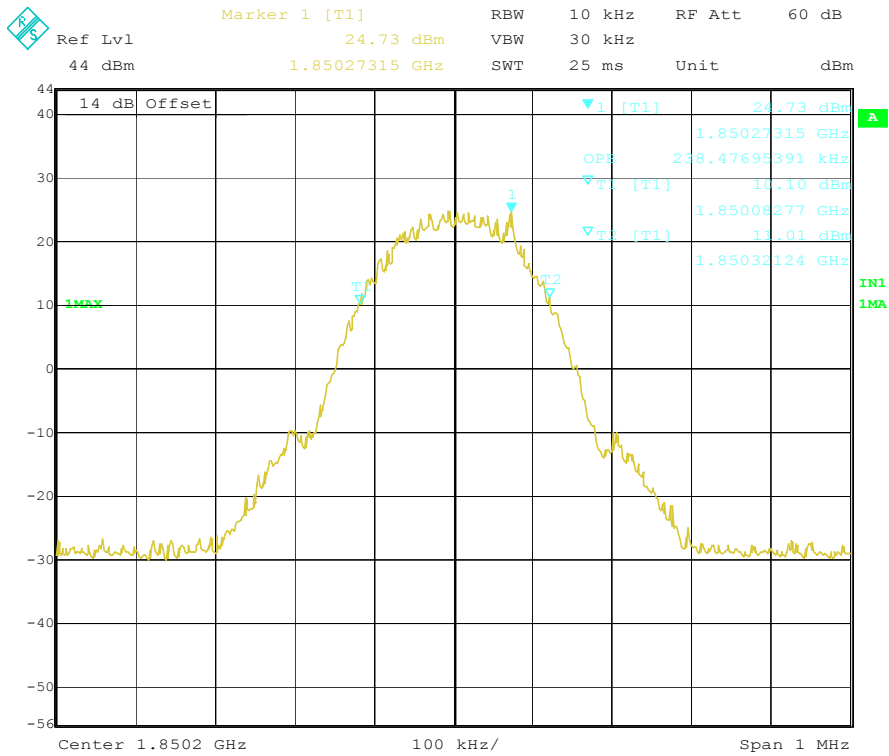
Channel 190



Channel 251

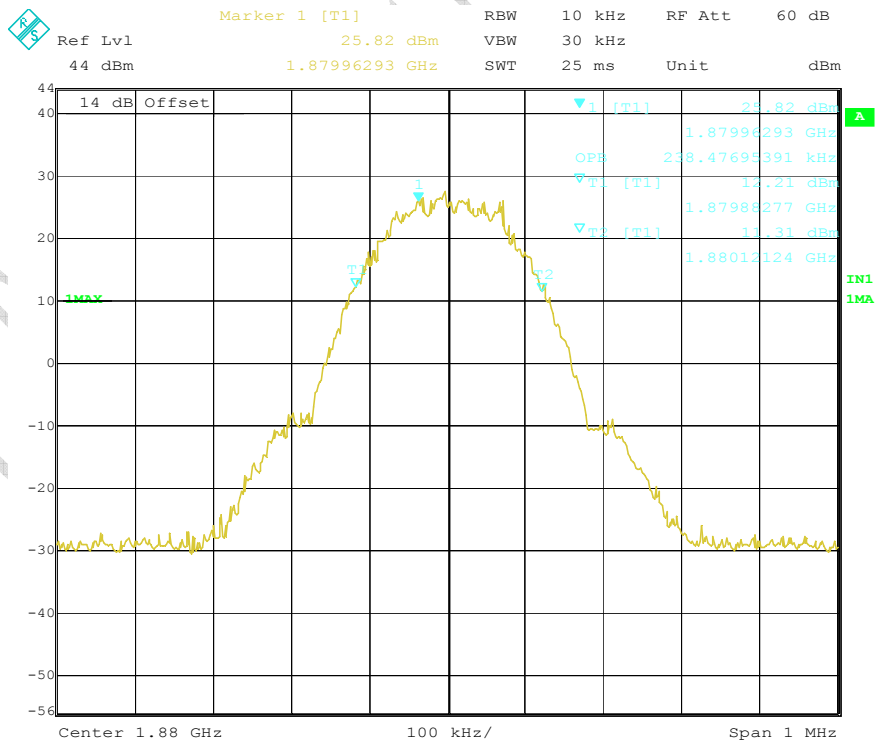
Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



Date: 1.JUN.2010 18:56:16

Channel 512

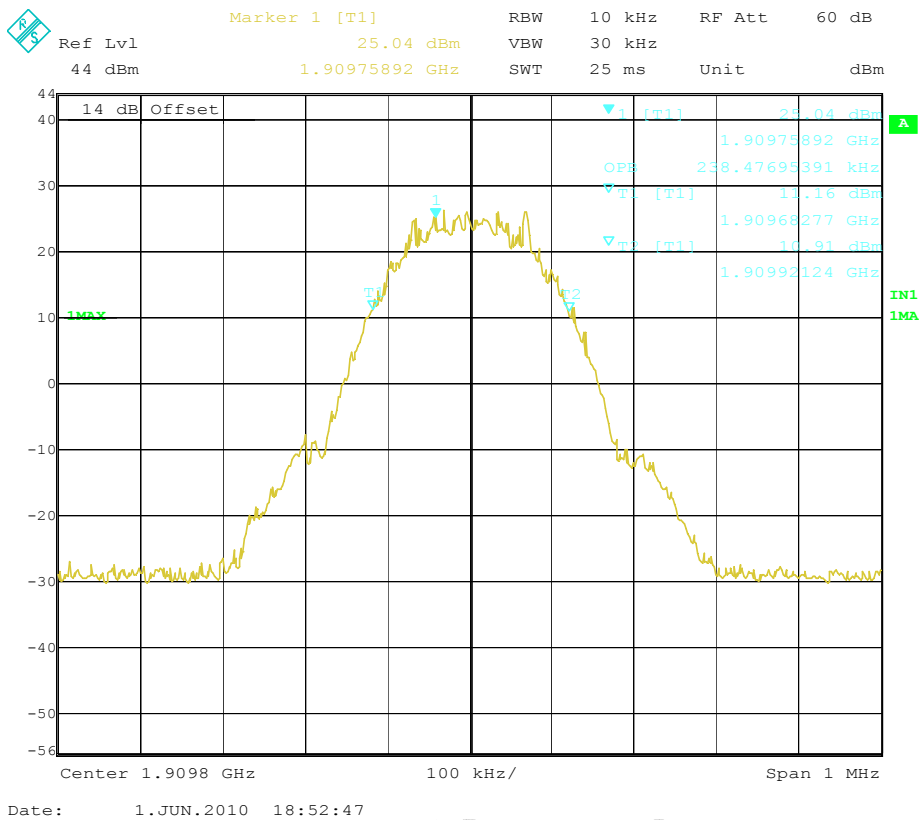


Date: 1.JUN.2010 18:54:30

Channel 661

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



Channel 810

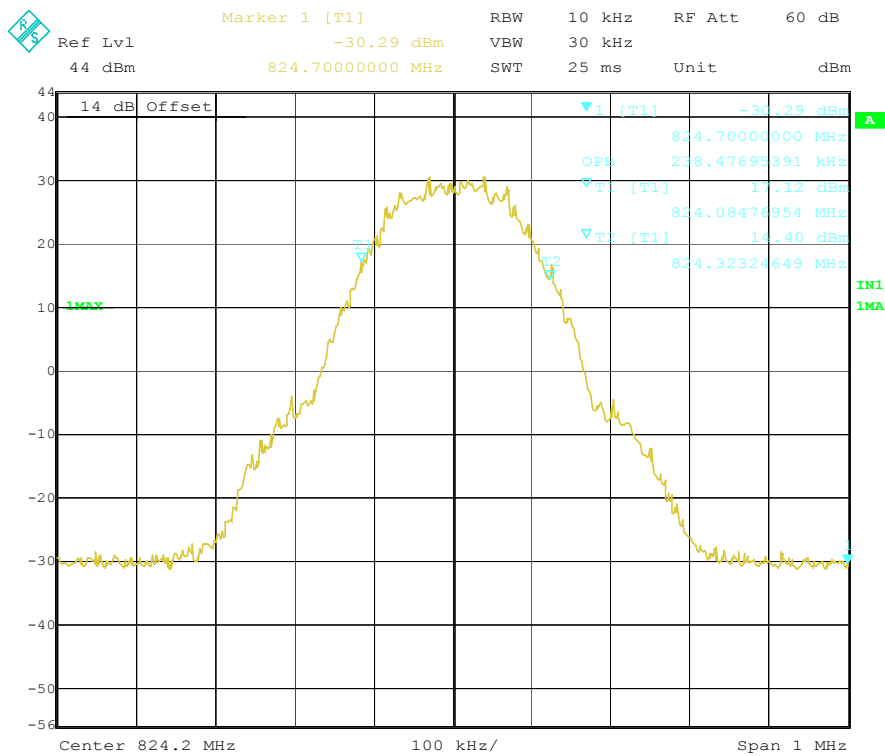
Results data of GPRS mode:

EUT channel	99% occupied bandwidth [kHz]
128	238.48
190	236.48
251	240.48
512	238.48
661	236.48
810	236.48

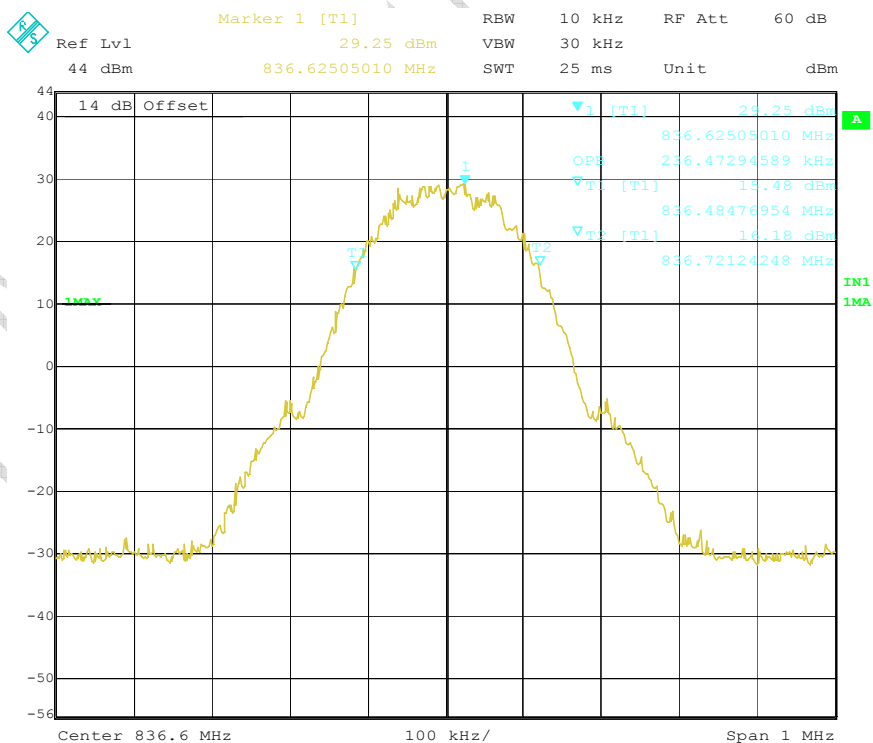
Graphical results for GPRS mode:

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



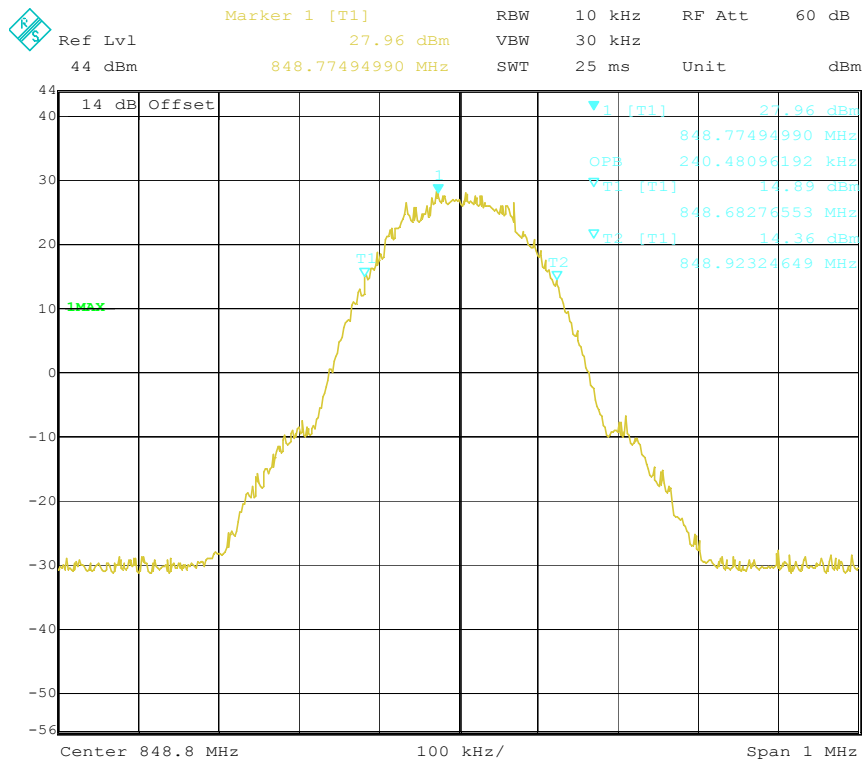
Channel 128



Channel 190

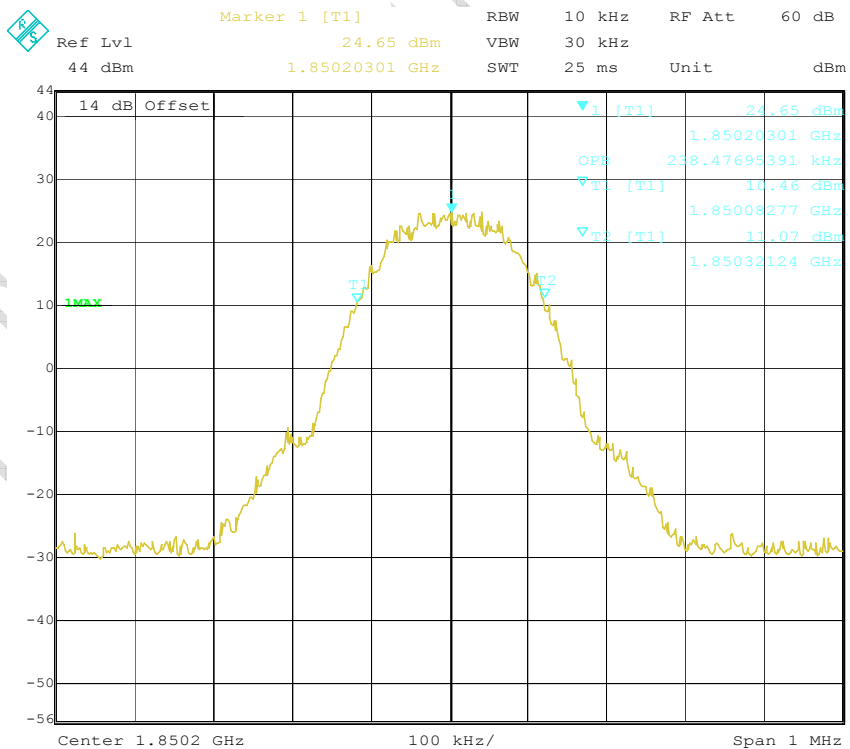
Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



Date: 1.JUN.2010 19:14:16

Channel 251

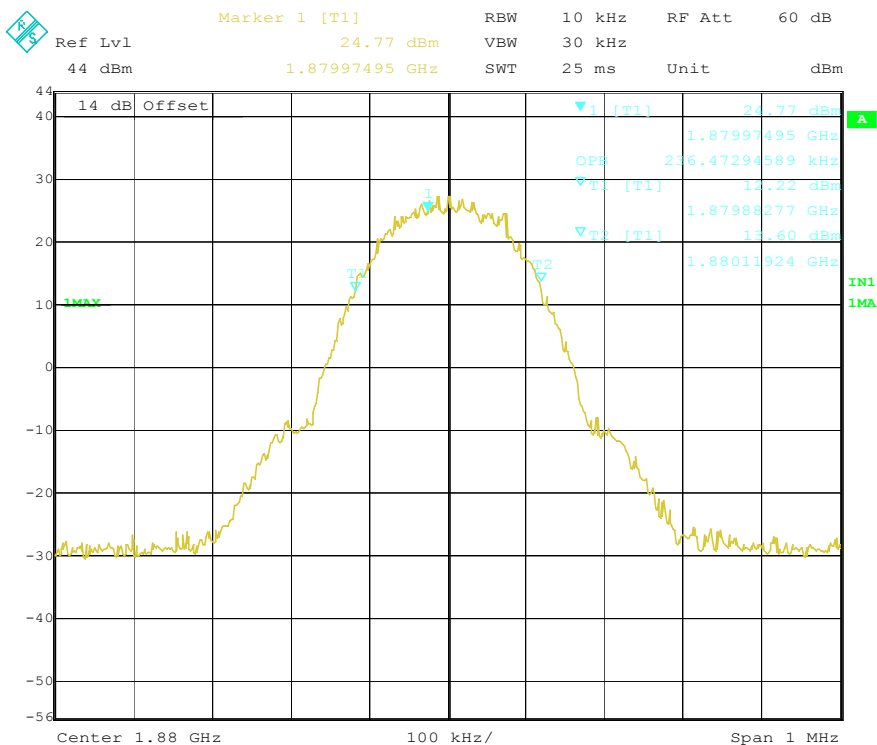


Date: 1.JUN.2010 19:19:32

Channel 512

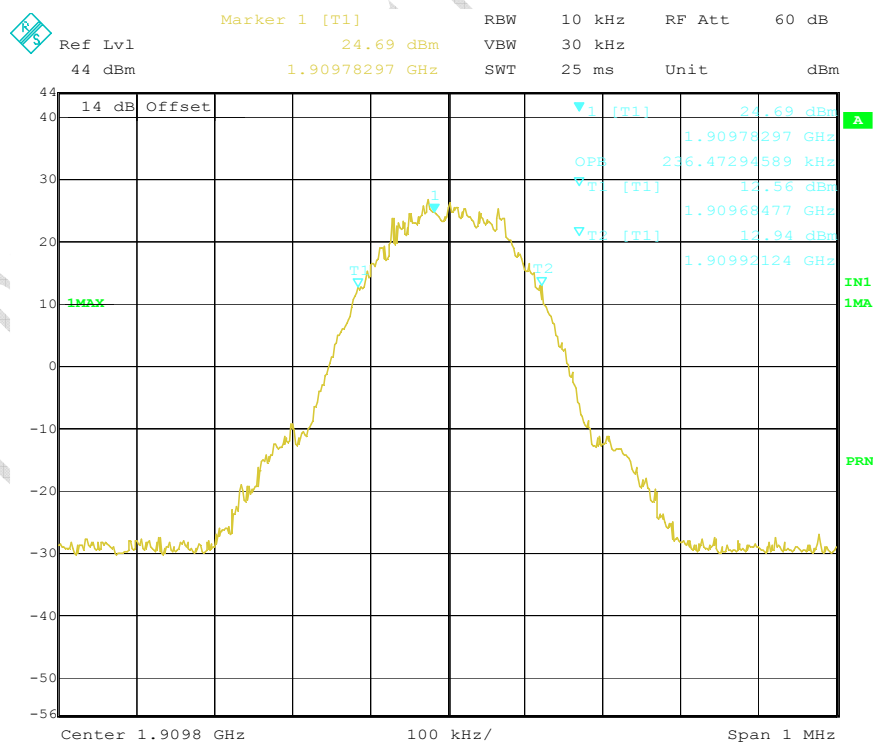
Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



Date: 1.JUN.2010 19:29:44

Channel 661



Date: 1.JUN.2010 19:25:43

Channel 810

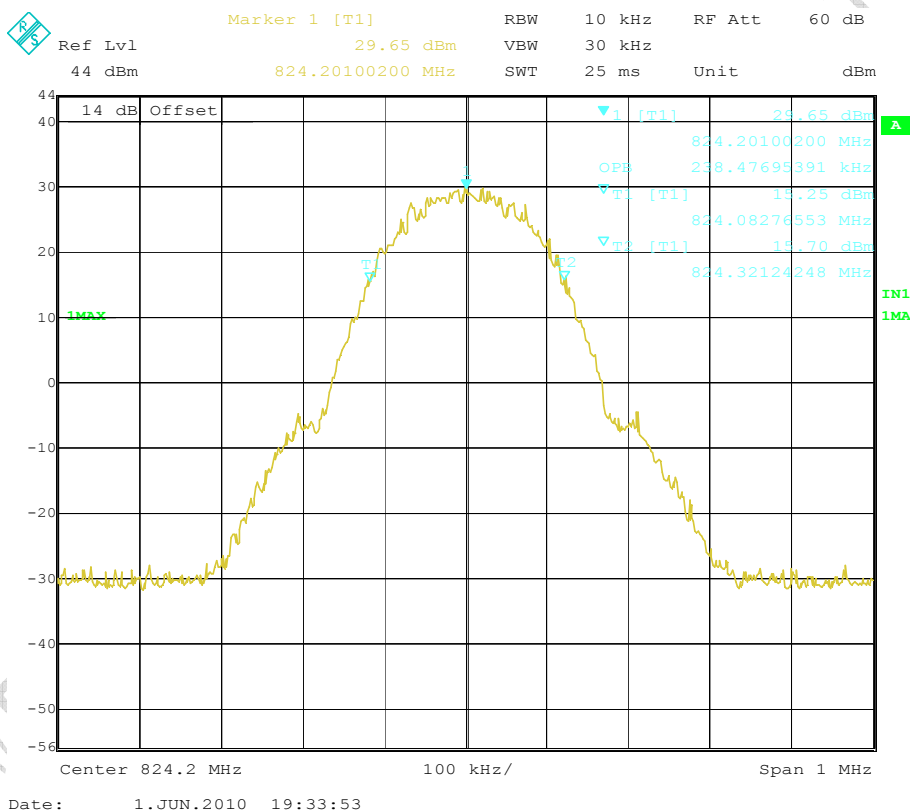
Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC

Results data of EGPRS mode:

EUT channel	99% occupied bandwidth [kHz]
128	238.48
190	240.48
251	242.48
512	238.48
661	240.48
810	236.48

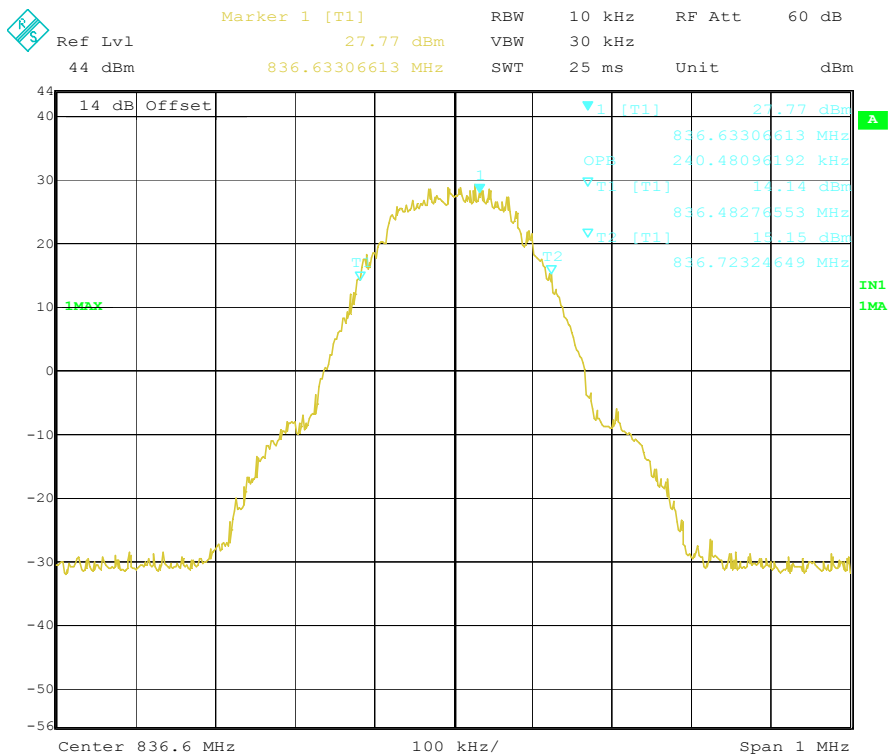
Graphical results for EGPRS mode:



Channel 128

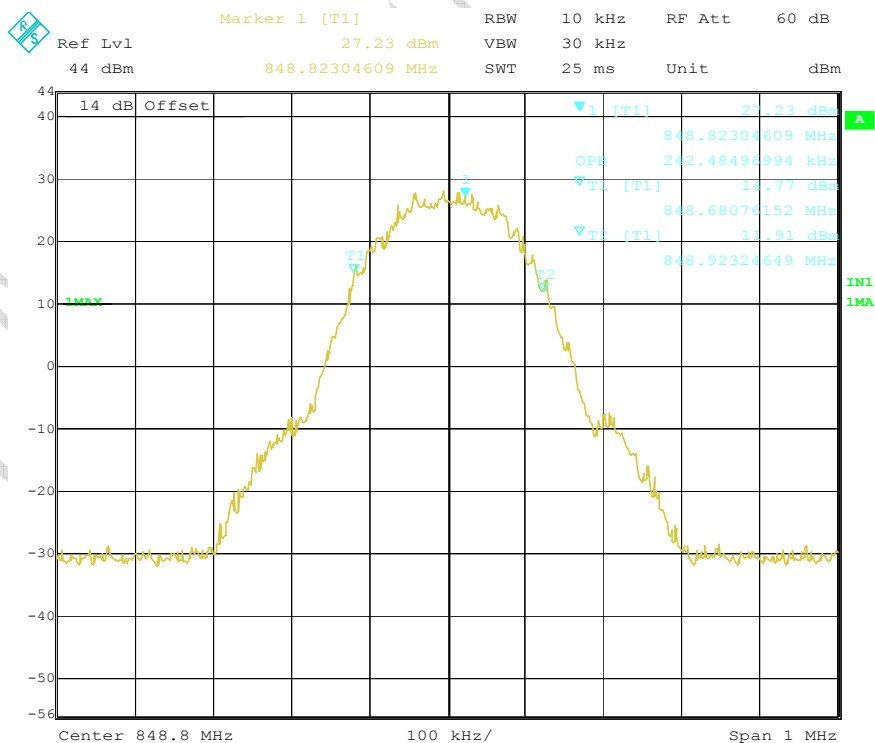
Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



Date: 1.JUN.2010 19:35:12

Channel 190

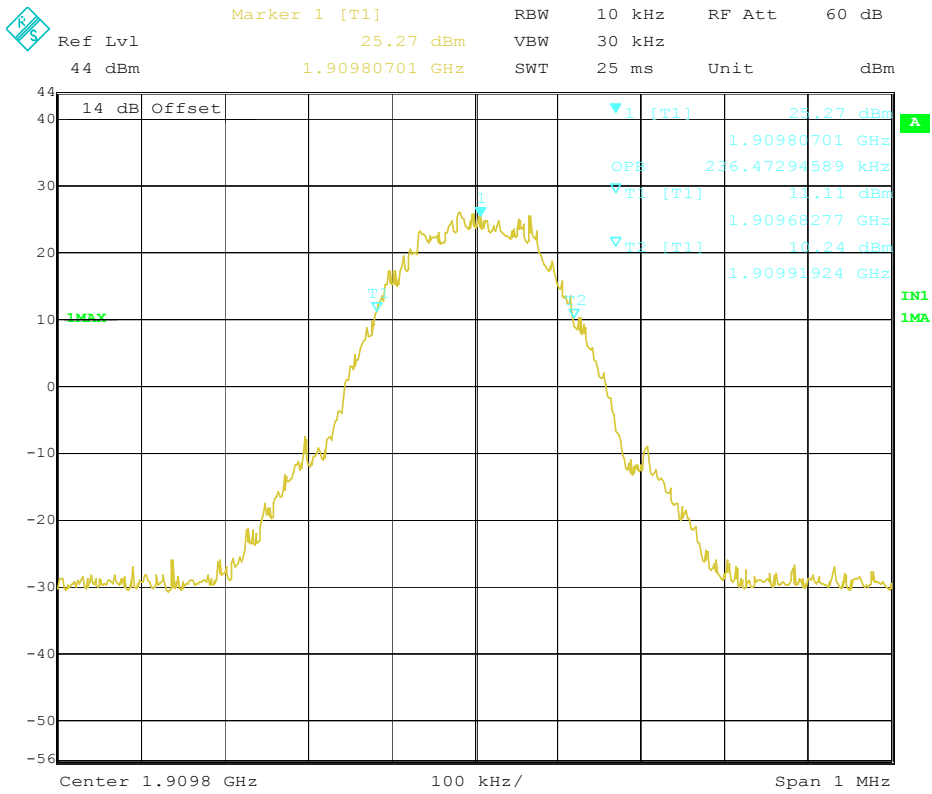


Date: 1.JUN.2010 19:36:15

Channel 251

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



Date: 1.JUN.2010 19:40:22

Channel 810

TTL TEST

4.4 Frequency Stability over Temperature Variation

Specifications:	FCC 2.1055,22.355,24.235 RSS-132 4.3, RSS-133 6.3					
Date of Test	2010-06-02					
Test conditions:	Ambient Temperature: -30°C-50°C Relative Humidity: 30%-60% Air pressure: 86-106kPa					
Operation Mode	TX on, channel 190 and 661 for GSM, GPRS and EGPRS.					
Test Results:	Pass					
Test equipment Used:						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
561	Temperature Chamber	Terchy Environmental Technology LTD.	MHU-800SR	84121202	2011-01-06	Normal
111835	Wireless Communications Test Set	R&S	CMU200	1100000802	2010-11-17	Normal
Limit						
Frequency deviation [ppm]	±2.5					

Test Setup

The EUT was placed in a temperature chamber, demonstrated as figure T. The wireless communications test set (test simulator) was used to set the TX channel and power levels, modulate the TX signal with different bit patterns and measure the frequency of TX.

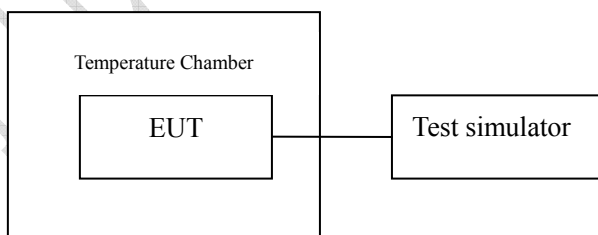


Figure T: setup for measurement of frequency stability over temperature variation

Test Method

1. The EUT was turned off and placed in the temperature chamber.
2. The temperature of the chamber was set to -30°C and allowed to stabilize.
3. The EUT temperature was allowed to stabilize for 45 minutes.
4. The EUT was turned on and set to transmit with 8960.

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC

5. The maximum transmit frequency deviation during one minute period was measured by Wireless Communications Test Set.
6. The steps 3-5 were repeated for -20°C, -10°C, 0°C, 10°C, 20°C, 30°C, 40°C and 50°C.

Test results data for GSM mode:

Channel 190: Compliance windows: 2091.5Hz

Temperature[°C]	Deviation[Hz]	Remarks
-30	27	Pass
-20	-31	Pass
-10	-29	Pass
0	21	Pass
10	28	Pass
20	30	Pass
30	-59	Pass
40	37	Pass
50	31	Pass

Channel 661: Compliance windows: 4700Hz

Temperature[°C]	Deviation[Hz]	Remarks
-30	-55	Pass
-20	-37	Pass
-10	-26	Pass
0	-29	Pass
10	-36	Pass
20	-28	Pass
30	-29	Pass
40	-36	Pass
50	-35	Pass

Test results data for GPRS mode:

Channel 190: Compliance windows: 2091.5Hz

Temperature[°C]	Deviation[Hz]	Remarks
-30	-19	Pass
-20	28	Pass
-10	24	Pass
0	-25	Pass
10	-39	Pass
20	-34	Pass
30	28	Pass
40	-36	Pass

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC

50	-40	Pass
----	-----	------

Channel 661: Compliance windows: 4700Hz

Temperature[°C]	Deviation[Hz]	Remarks
-30	39	Pass
-20	-30	Pass
-10	-45	Pass
0	51	Pass
10	-37	Pass
20	-29	Pass
30	37	Pass
40	36	Pass
50	-40	Pass

Test results data for EGPRS mode:

Channel 190: Compliance windows: 2091.5Hz

Temperature[°C]	Deviation[Hz]	Remarks
-30	20	Pass
-20	24	Pass
-10	25	Pass
0	-25	Pass
10	-24	Pass
20	-28	Pass
30	-27	Pass
40	-19	Pass
50	-31	Pass

Channel 661: Compliance windows: 4700Hz

Temperature[°C]	Deviation[Hz]	Remarks
-30	-31	Pass
-20	-19	Pass
-10	-25	Pass
0	-17	Pass
10	19	Pass
20	-32	Pass
30	38	Pass
40	-30	Pass
50	-23	Pass

4.5 Frequency Stability over Voltage Variation

Specifications:	FCC 2.1055, 22.355, 24.235 RSS-132 4.3, RSS-133 6.3					
Date of Test	2010-06-02					
Test conditions:	Ambient Temperature: 15°C-35°C Relative Humidity: 30%-60% Air pressure: 86-106kPa					
Operation Mode	TX on, channel 190 and 661 for GSM, GPRS and EGPRS.					
Test Results:	Pass					
Test equipment Used:						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
111835	Wireless Communications Test Set	R&S	CMU200	1100000802	2010-11-17	Normal
7982	DC Power Source	4NIC	DH1715A-3	004224	--	Normal
Limit						
Frequency deviation [ppm]	±2.5					

Test Setup

The EUT was placed in a shielding chamber and powered by the dummy battery which is connected to a DC power source, demonstrated as figure V. The wireless communications test set was used to set the TX channel and power level, modulate the TX signal with different bit patterns and measure the frequency of TX.

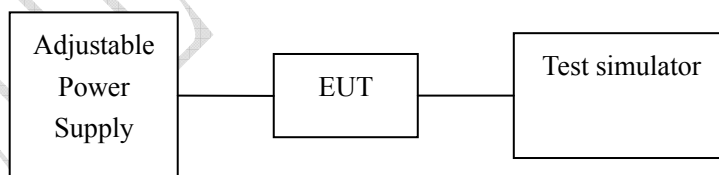


Figure V: test setup for measurement of frequency stability over voltage variation

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC

Test Results data for GSM mode:

Channel 190: Compliance windows: 2091.5Hz

Level	Voltage[V]	Deviation[Hz]	Remarks
Nominal	3.3	167	Pass
Cut-off point	3.0	128	Pass

Channel 661: Compliance windows: 4700Hz

Level	Voltage[V]	Deviation[Hz]	Remarks
Nominal	3.3	195	Pass
Cut-off point	3.0	198	Pass

Test Results data for GPRS mode:

Channel 190: Compliance windows: 2091.5Hz

Level	Voltage[V]	Deviation[Hz]	Remarks
Nominal	3.3	95	Pass
Cut-off point	3.0	143	Pass

Channel 661: Compliance windows: 4700Hz

Level	Voltage[V]	Deviation[Hz]	Remarks
Nominal	3.3	126	Pass
Cut-off point	3.0	110	Pass

Test Results data for EGPRS mode:

Channel 190: Compliance windows: 2091.5Hz

Level	Voltage[V]	Deviation[Hz]	Remarks
Nominal	3.3	177	Pass
Cut-off point	3.0	191	Pass

Channel 661: Compliance windows: 4700Hz

Level	Voltage[V]	Deviation[Hz]	Remarks
Nominal	3.3	106	Pass
Cut-off point	3.0	143	Pass

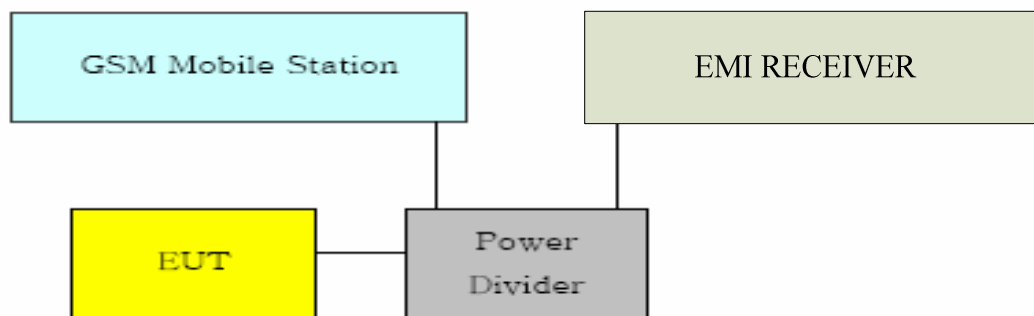
4.6 Conducted RF Power Output

Specifications:	FCC 2.1046,22.913(a),24.232(c) RSS-132 4.4, RSS-133 4.1/6.4					
Date of Tests	2010-09-08					
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa					
Operation Mode	TX on, channel128, 190, 251, 512, 661 and 810 for GSM, GPRS and EGPRS.					
Test Results:	Pass					
Test equipment Used:						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2011-01-11	Normal
---	Power splitter	Jie sai	---	1000132	2011-01-04	Normal
111835	Wireless Communications Test Set	R&S	CMU200	1100000802	2010-11-17	Normal

Limits for Radiated RF Power Output	
Frequency range	Limit Level (EIRP)/Resolution Bandwidth
TX channel	33dBm/1MHz
Limits for ERP	
Frequency range	Limit Level (ERP)
TX channel	7W

Test Setup:

During the process of testing, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by Rhode & Schwarz EMI test receiver (ESI26).



Test Method

- 1) The EUT was coupled to the EMI test receiver analyzer mode and the base station simulator through a power divider. The radio frequency load attached to the EUT antenna terminal was 50 Ohm. The loss of the cables the test system is calibrated to correct the readings.
- 2) The spectrum analyzer was set to Maxpeak Detector function and Maximum hold mode.
- 3) The resolution bandwidth of the spectrum analyzer was comparable to the emission bandwidth.

Note: --

Test Results for GSM mode:

ARFCN	AV output power 1 slot [dBm]	Peak output power 1 slot [dBm]
128	32.13	32.28
190	31.78	31.82
251	31.62	31.67
512	29.07	29.19
661	29.33	29.48
810	29.03	29.04

Test Results for GPRS mode:

ARFCN	AV output power 1 slot [dBm]	Peak output power 1 slot [dBm]	AV output power 2 slot [dBm]	Peak output power 2 slot [dBm]
128	32.09	32.19	32.10	32.12
190	31.78	31.79	31.63	31.63
251	31.56	31.64	31.42	31.48
512	29.03	29.18	29.05	29.17
661	29.37	29.46	29.32	29.46
810	29.03	29.11	29.02	29.10

4.7 Conducted Spurious Emission

Specifications:	FCC 2.1051,22.917,24.238 RSS-Gen 7.2.2					
Date of Tests	2010-06-01					
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa					
Operation Mode	TX on, channel 190 and 661 for GSM, GPRS and EGPRS.					
Test Results:	Pass					
Test equipment Used:						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2011-01-11	Normal
---	Power splitter	Jie sai	---	1000132	2011-01-04	Normal
111835	Wireless Communications Test Set	R&S	CMU200	1100000802	2010-11-17	Normal

Limit Level Construction:

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, so the limit level is:

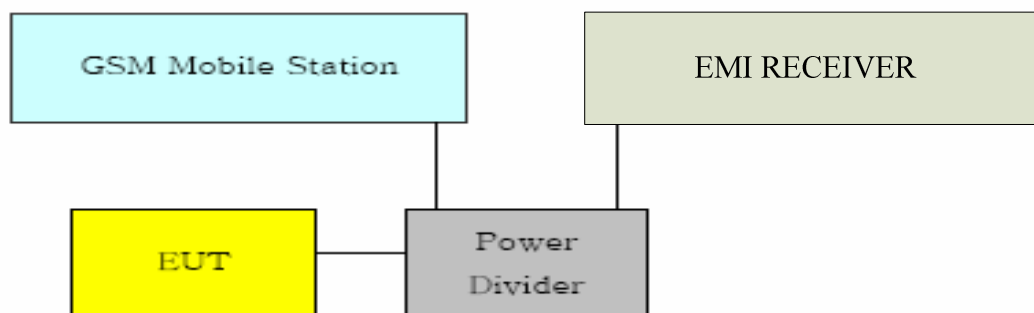
$$P(\text{dBm}) - (43 + 10 \log(P)) \text{ dB} = -13\text{dBm}$$

Limits for Radiated spurious emissions(UE)

Frequency range	Limit Level /Resolution Bandwidth
30 MHz to 20000 MHz	-13dBm/1MHz

Test Setup:

During the process of testing, the EUT was controlled via Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by Rhode & Schwarz EMI test receiver (ESI26)



Test Method

Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

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

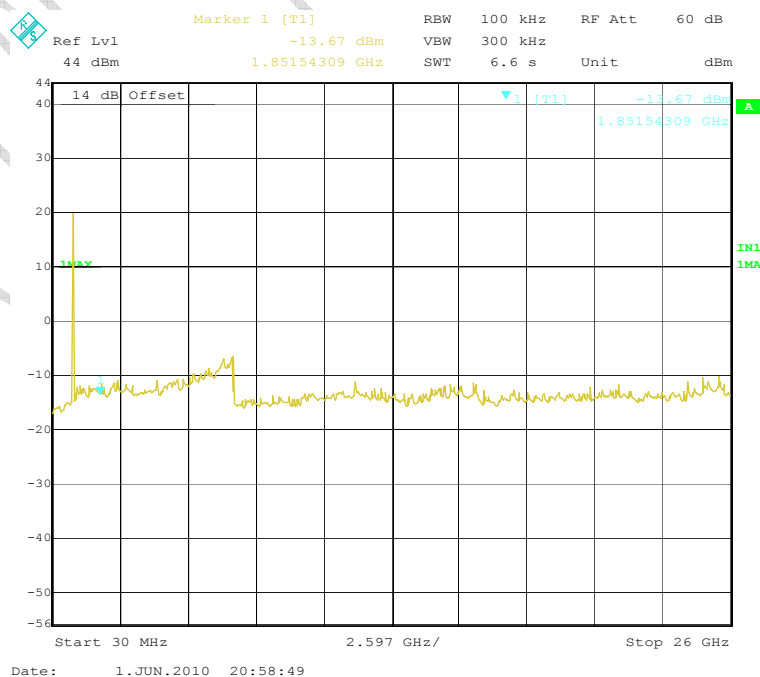
1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment under test, this equates to a frequency range of 30 MHz to 19.1 GHz, data taken from 30 MHz to 20 GHz.
2. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.

Note: --

Test Results for GSM mode:

Out of band emission	
Frequency [MHz]	Level (dBm)
--	--

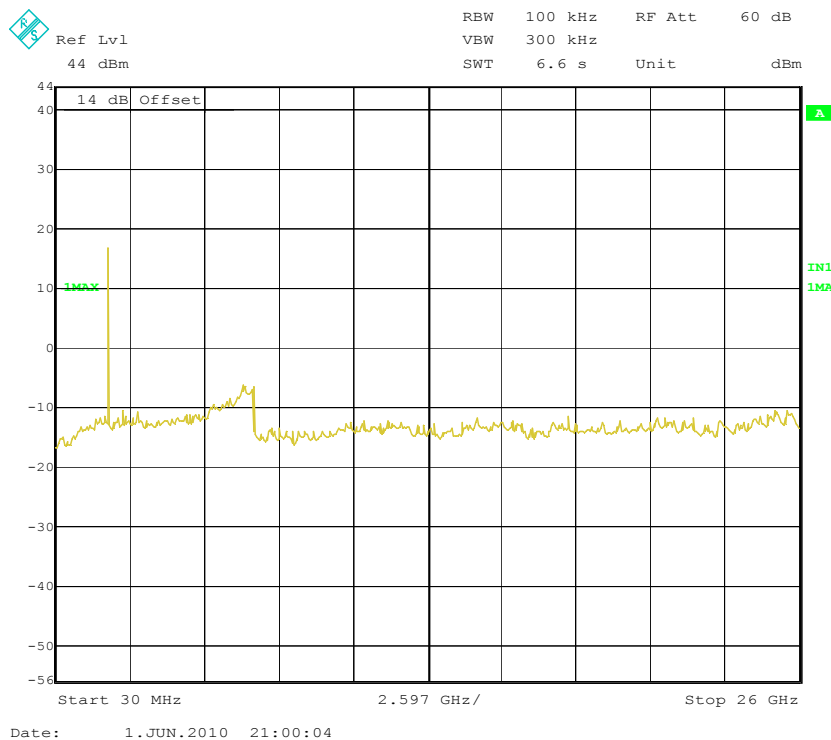
Graphical results for GSM mode:



Channel 190

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC

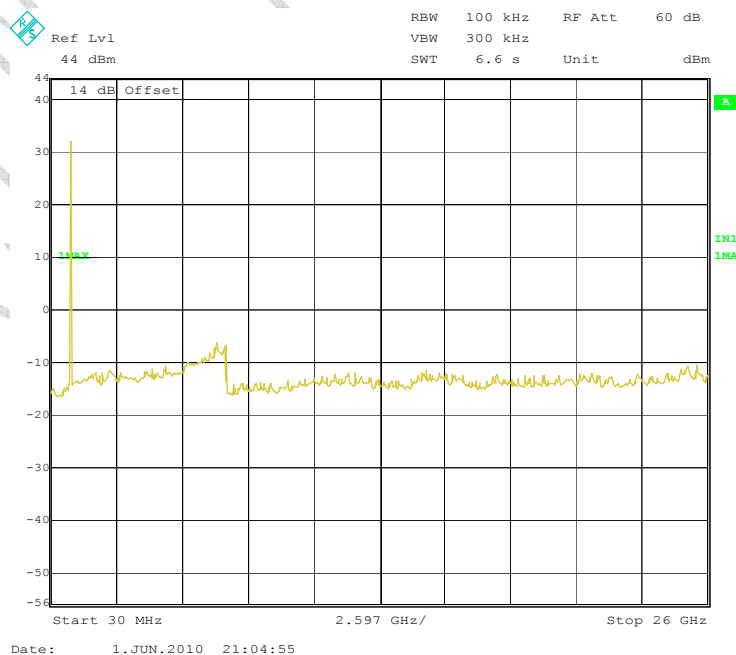


Channel 661

Test Results for GPRS mode:

Out of band emission	
Frequency [MHz]	Level (dBm)
--	--

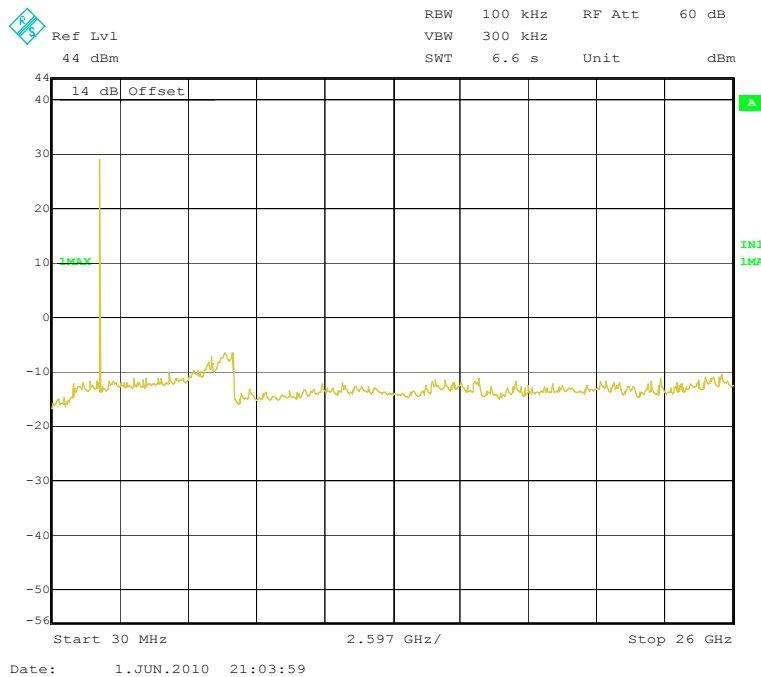
Graphical results for GPRS mode:



Channel 190

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC

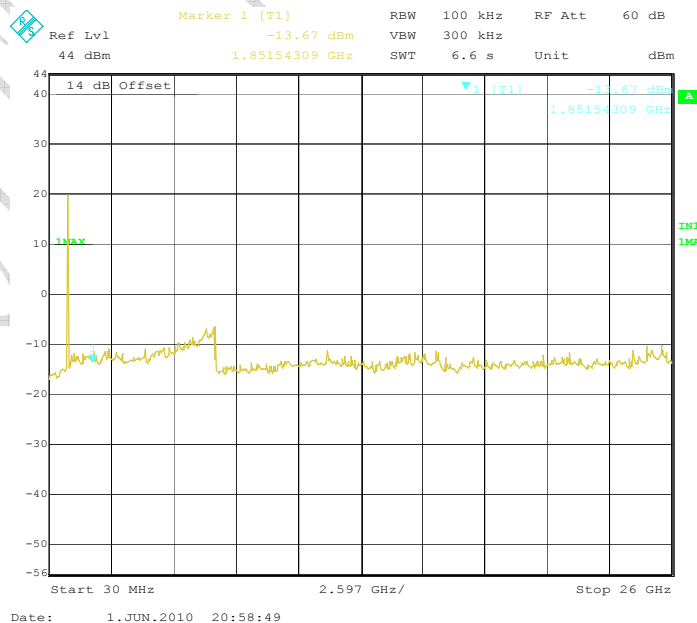


Channel 661

Test Results for EGPRS mode:

Out of band emission	
Frequency [MHz]	Level (dBm)
--	--

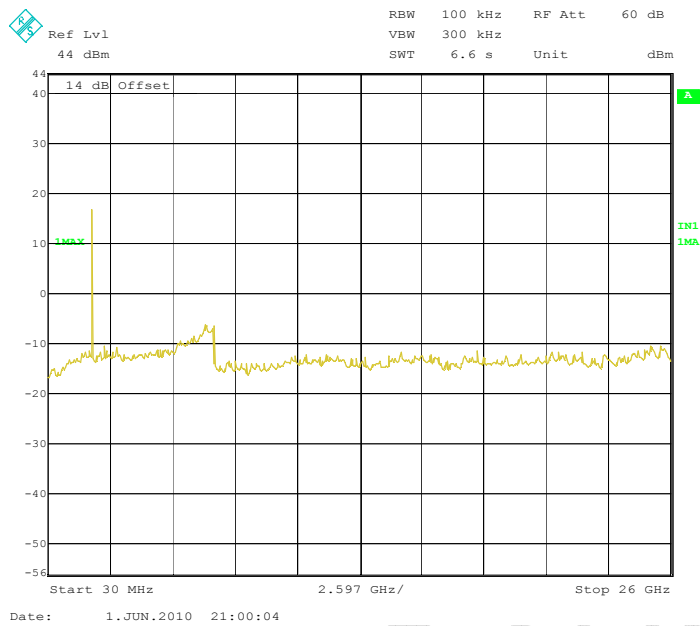
Graphical results for EGPRS mode:



Channel 190

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



Channel 661

CITL Test Report

4.8 Band Edge

Specifications:	FCC 2.1051, 24.238, 2.1053, 22.917 RSS-132 4.5, RSS-133 4.4/6.5
Date of Tests	2010-06-01
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Operation Mode	TX on, channel128, 251, 512 and 810 for GSM, GPRS and EGPRS.
Test Results:	Pass

Test equipment Used:

Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2011-01-11	Normal
---	Power splitter	Jie sai	---	1000132	2011-01-04	Normal
111835	Wireless Communications Test Set	R&S	CMU200	1100000802	2010-11-17	Normal

Limit Level Construction:

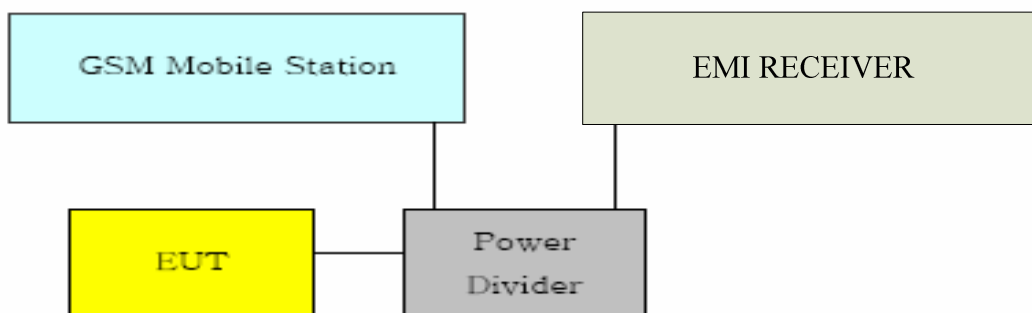
According to Part 24.238 (a), i.e., Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB, so the limit level is:
 $P(\text{dBm}) - (43 + 10 \log(P)) \text{ dB} = -13\text{dBm}$

Limits for Radiated spurious emissions(UE)

Frequency range	Limit Level /Resolution Bandwidth
30 MHz to 20000 MHz	-13dBm/1MHz

Test Setup:

During the process of testing, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by Rhode & Schwarz EMI test receiver (ESI26).



Test Method

- 1) The EUT was coupled to the EMI test receiver analyzer mode and the base station simulator through a power divider. The radio frequency load attached to the EUT antenna terminal was 50 Ohm. The loss of the cables the test system is calibrated to correct the readings.
- 2) The spectrum analyzer was set to Maxpeak Detector function and Maximum hold mode.
- 3) The resolution bandwidth of the spectrum analyzer was comparable to the emission bandwidth.

Note: --

Test Results:

GSM mode:

Band-edge emission		
EUT Channel	Frequency [MHz]	Level [dBm]
128 Left band edge	823.99849699	-13.10
251 Right band edge	849.00450902	-13.59
512 Left band edge	1849.99749	-13.57
810 Right band edge	1910.00251	-14.45

GPRS mode:

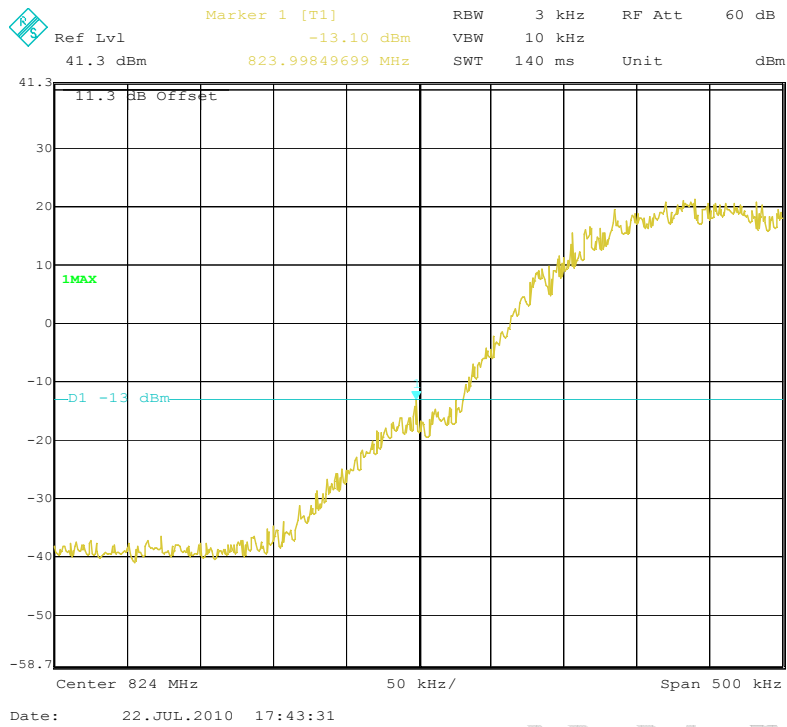
Band-edge emission		
EUT Channel	Frequency [MHz]	Level [dBm]
128 Left band edge	823.99949900	-13.52
251 Right band edge	849.00289047	-13.98
512 Left band edge	1849.99850	-13.19
810 Right band edge	1910.00351	-15.58

EGPRS mode:

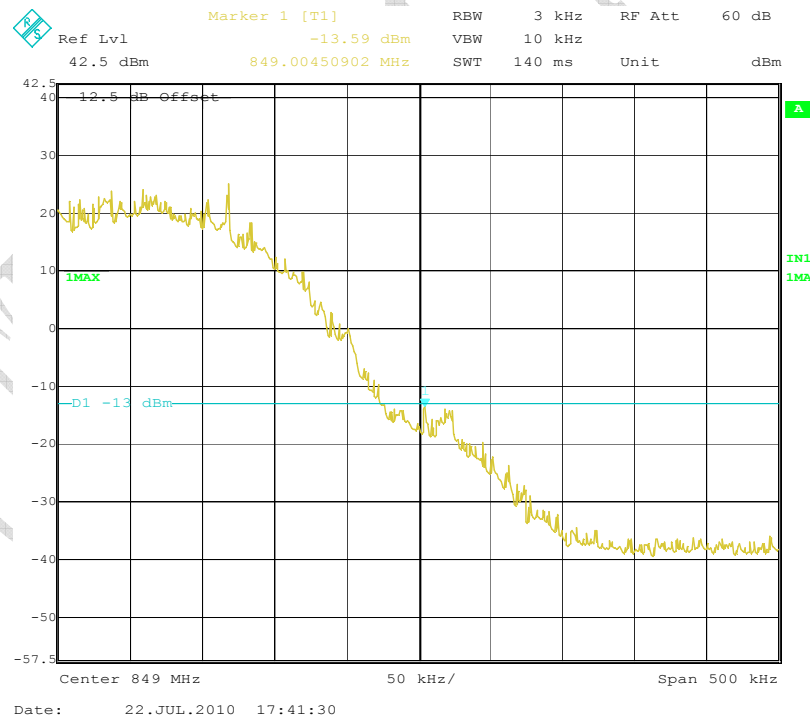
Band-edge emission		
EUT Channel	Frequency [MHz]	Level [dBm]
128 Left band edge	823.99849699	-13.83
251 Right band edge	849.00350701	-13.57
512 Left band edge	1849.99850	-14.24
810 Right band edge	1910.00150	-14.35

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



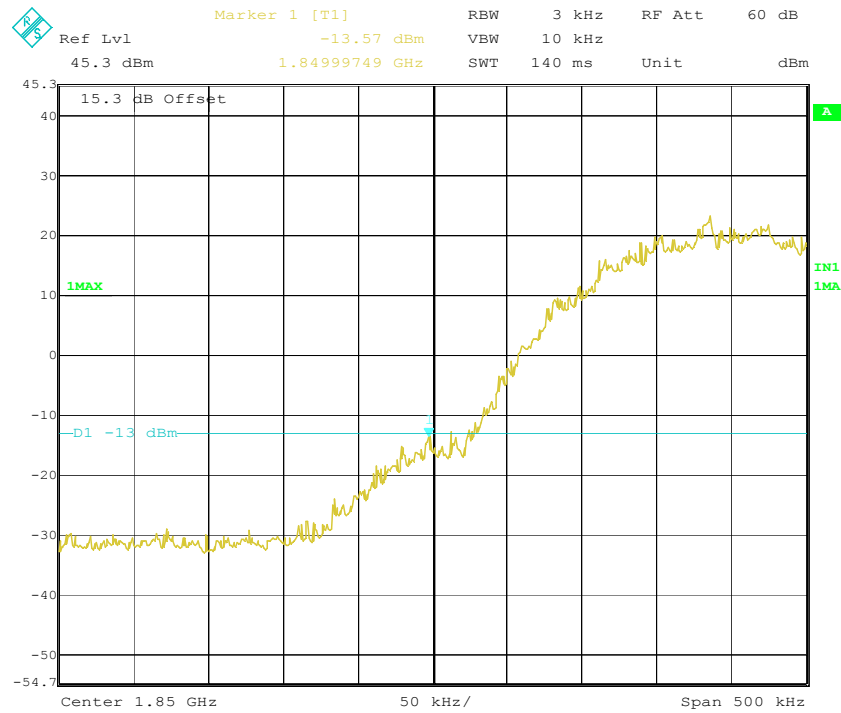
GSM channel 128 Left band edge



GSM channel 251 Right band edge

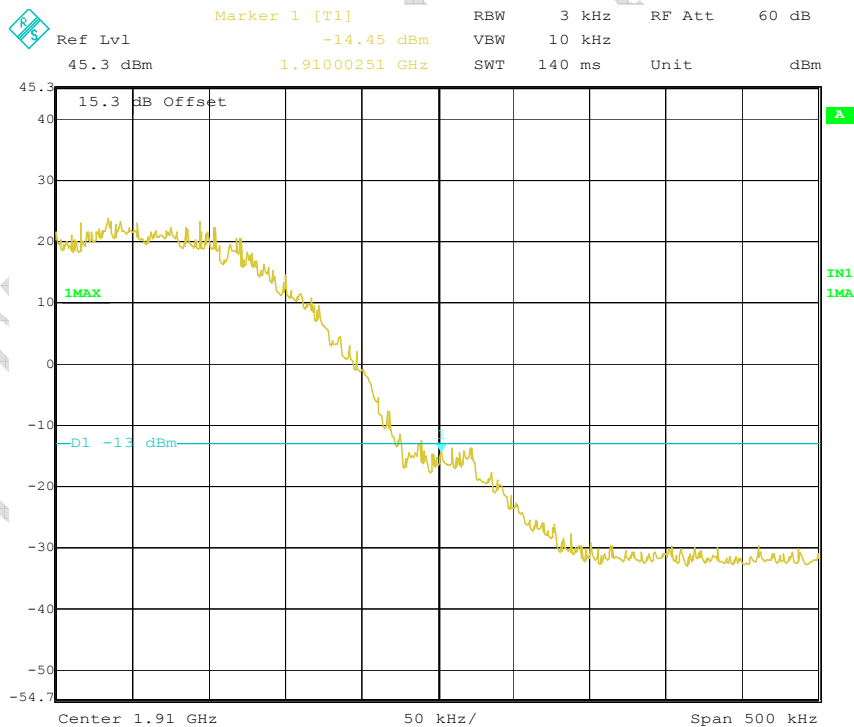
Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



Date: 22.JUL.2010 17:45:52

GSM channel 512 Left band edge

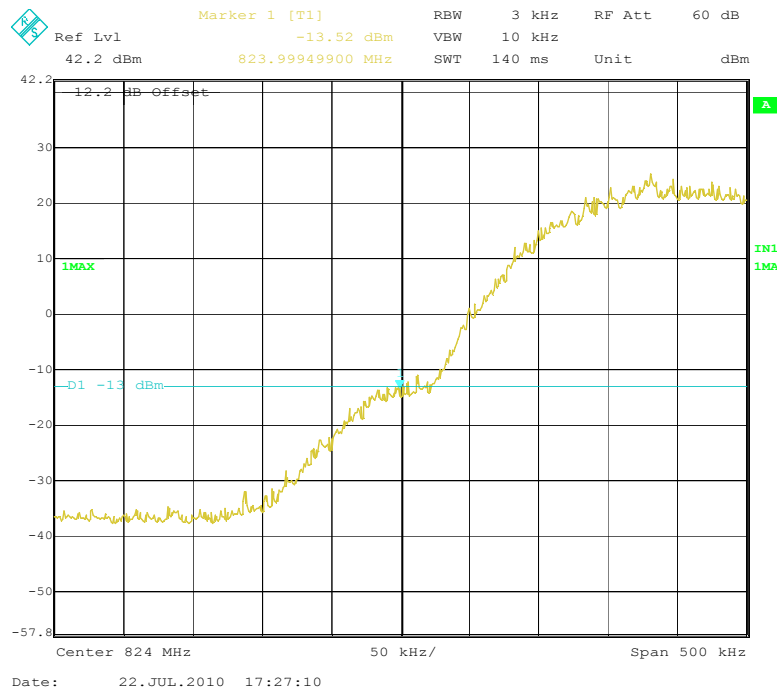


Date: 22.JUL.2010 17:48:21

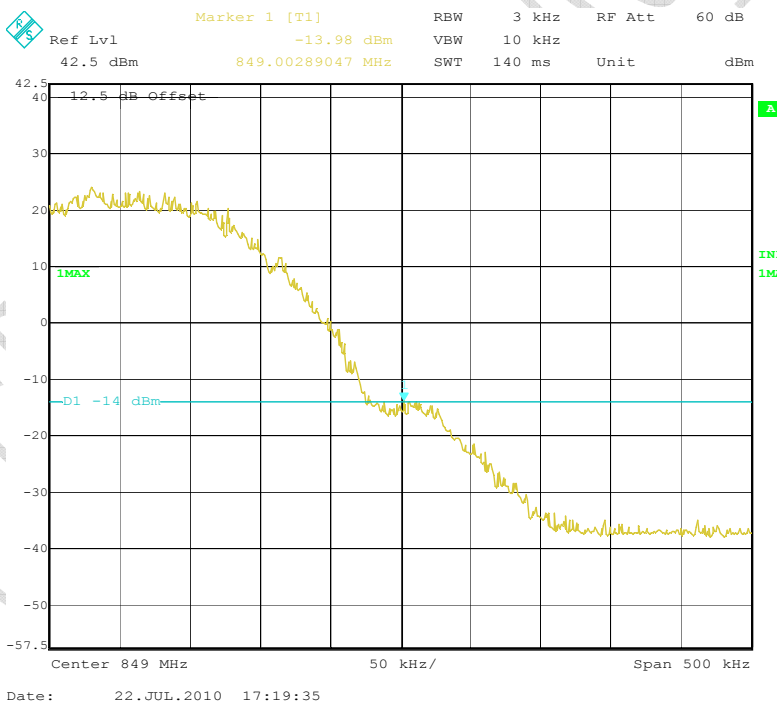
GSM channel 810 Right band edge

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



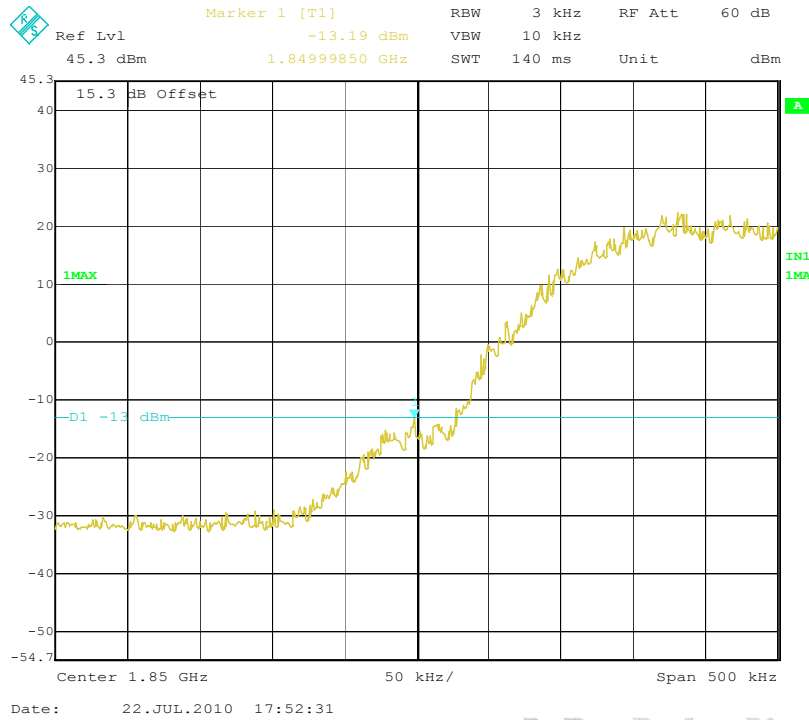
GPRS channel 128 Left band edge



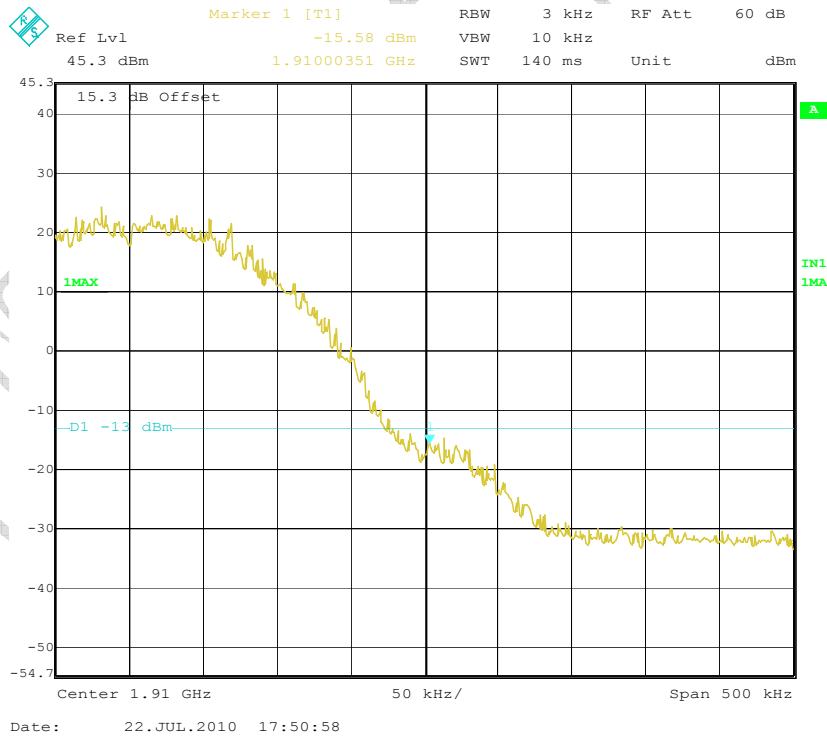
GPRS channel 251 Right band edge

Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



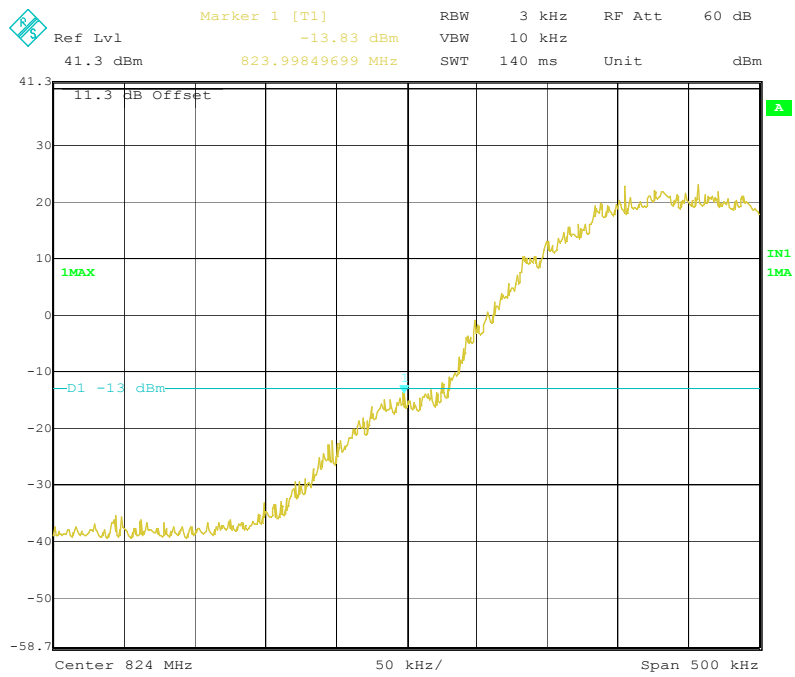
GPRS channel 512 Left band edge



GPRS channel 810 Right band edge

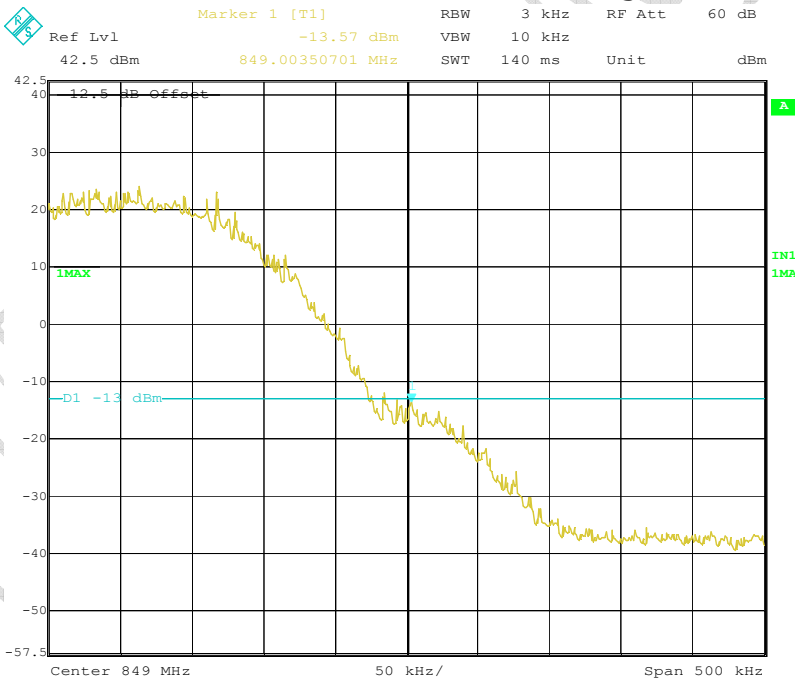
Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



Date: 22.JUL.2010 17:36:34

EGPRS channel 128 Left band edge

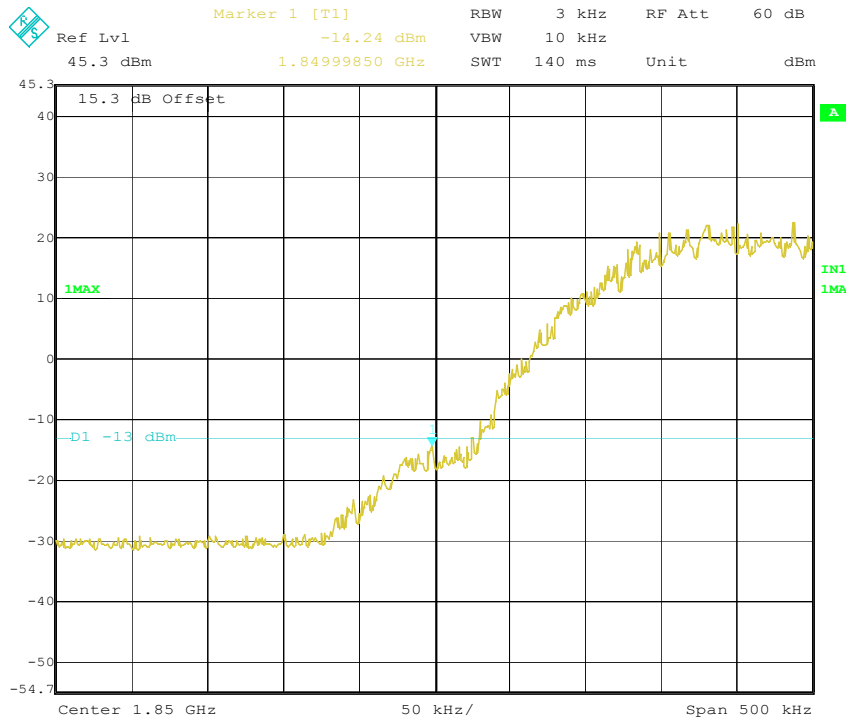


Date: 22.JUL.2010 17:38:26

EGPRS channel 251 Right band edge

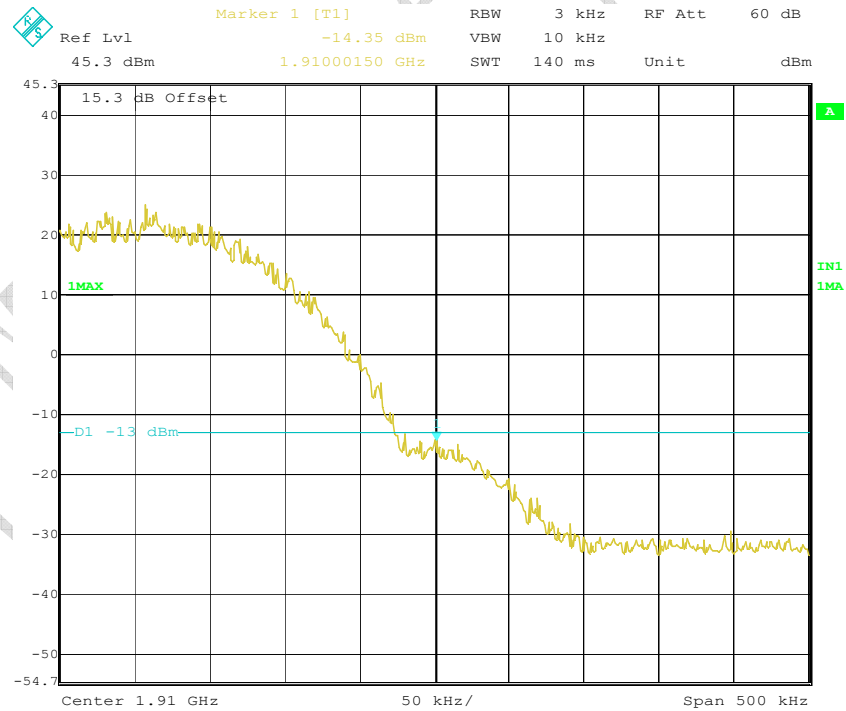
Equipment: WMP 150 Embedded SIM

REPORT NO.: I10GC0232-FCC-EMC



Date: 22.JUL.2010 17:57:20

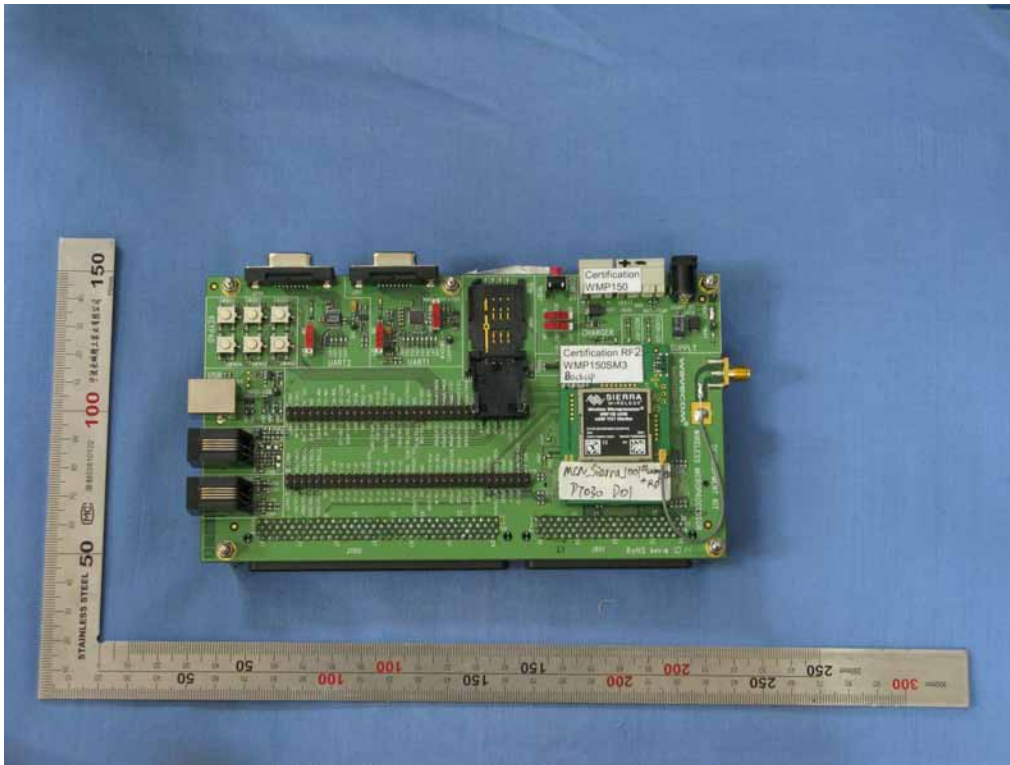
EGPRS channel 512 Left band edge



Date: 22.JUL.2010 17:58:33

EGPRS channel 810 Right band edge

Annex A EUT Photos



Main board (face)



Main board (back)

ANNEX B Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

————— **The End of this Report** —————

TTL Test Report