

# TEST REPORT

REPORT NUMBER: I08GE7399-FCC-EMC

ON

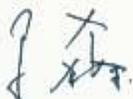
**Type of Equipment:** Windows Mobile Smart Phone  
**Type of Designation:** Vodafone 1231+  
**Manufacturer:** ZTE CORPORATION

**ACCORDING TO**  
**FCC CFR Part 2, FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS; e-CFR, March 23, 2006**  
**PART 22, PUBLIC MOBILE SERVICES (Oct 1, 02 Edition)**  
**PART 24, PERSONAL COMMUNICATIONS SERVICES (Oct 1, 97 Edition)**

**China Telecommunication Technology Labs.**

*Month date, year*  
Nov, 19, 2008

*Signature*



Ma Xin  
**Deputy Director**

**FCC ID:** Q78-VDF1231PLUS

**Report Date:** 2008-11-19

**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.

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 C.

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CTTL Test Report

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Editor of this test report:

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Position: Engineer  
Department: Department of EMC test  
Date: 2008-11-19  
Signature: 李国庆

Technical responsibility for area of testing:

Name: Zou Dongyi  
Position: Manager  
Department: Department of EMC test  
Date: 2008-11-19  
Signature: 邹东屹

### 1.3 Testing Laboratory information

#### 1.3.1 Location

Name: China Telecommunication Technology Labs.  
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Email: [emc@chinattl.com](mailto: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: -----

## 1.4 Details of applicant or manufacturer

### 1.4.1 Applicant

Name: ZTE CORPORATION  
Address: ZTE Plaza, Keji Road South, Hi-Tech Industrial  
Park, Nanshan District, Shenzhen, Guangdong,  
518057, P.R.China  
Country: China  
Telephone: +86-21-68896840  
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### 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: --

## 2 Test Item

### 2.1 General Information

Manufacturer: ZTE CORPORATION  
 Name: Windows Mobile Smart Phone  
 Model Number: Vodafone 1231+  
 Serial Number: --  
 Production Status: Product  
 Receipt date of test item: 2008-09-02

### 2.2 Outline of EUT

E.U.T. is a Windows Mobile Smart Phone.

### 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	handset	ZTE CORPORATION	Vodafone 1231+	--	None
B	adapter	ZTE CORPORATION	STC-A22O50U5-A	--	None
C	battery	ZTE CORPORATION	Li3711T42P3h51 3857	--	None
D	Earphone	Merry Electronics Ltd Full-Sound Electrical Products.Ltd	HMZ3-C4-OMTP	--	None

Cables:

Item	Cable Type	Manufacturer	Length	Shield	Quantity	Remarks
1	DC cable on Adapter	Unknown	1.0 m	No	1	None

## 2.5 Other Information

- (a) Modulation is GMSK for GSM and GPRS, and 8PSK for EGPRS.
- (b) Emission Designator is 251KGXW for GSM, 248KGXW for GPRS and 248KG7W for EGPRS.
- (c) Version of hardware and software
- HW Version: g5hC
  - SW Version: P180A1V1.0.3
- (d) Adaptor information:
- Input: 100-240VAC 200mA
  - Output: 5.0V 700mA
- (e) Battery information:
- 3.7VDC

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### 3 Summary of Test Results

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

<b>GSM mode:</b>		
Specification Clause	Name of Test	Result
2.1051, 24.238, 2.1053,22.917	Radiated Spurious Emission	Pass
2.1046,24.232	Radiated RF Power Output	Pass
22.913(a)	Effective Radiated Power (ERP)	Pass
2.1049,22.917(b), 24.238(b)	Occupied Bandwidth	*Note 1
2.1055,22.355, 24.235	Frequency Stability over Temperature Variation	Pass
2.1055,22.355, 24.235	Frequency Stability over Voltage Variation	Pass
2.1046,22.913(a), 24.232(c)	Conducted RF Power Output	Pass
2.1051,22.917,24. 238	Conducted spurious emissions	Pass
Note 1: No applicable performance criteria.		

<b>GPRS mode:</b>		
2.1051, 24.238, 2.1053,22.917	Radiated Spurious Emission	Pass
2.1046,24.232	Radiated RF Power Output	Pass
22.913(a)	Effective Radiated Power (ERP)	Pass
2.1049,22.917(b), 24.238(b)	Occupied Bandwidth	*Note 2
2.1055,22.355, 24.235	Frequency Stability over Temperature Variation	Pass
2.1055,22.355, 24.235	Frequency Stability over Voltage Variation	Pass
2.1046,22.913(a), 24.232(c)	Conducted RF Power Output	Pass
2.1051,22.917,24. 238	Conducted spurious emissions	Pass
Note 2: No applicable performance criteria.		

<b>EGPRS mode:</b>		
2.1051, 24.238, 2.1053,22.917	Radiated Spurious Emission	Pass
2.1046,24.232	Radiated RF Power Output	Pass
22.913(a)	Effective Radiated Power (ERP)	Pass
2.1049,22.917(b), 24.238(b)	Occupied Bandwidth	*Note 3
2.1055,22.355, 24.235	Frequency Stability over Temperature Variation	Pass
2.1055,22.355, 24.235	Frequency Stability over Voltage Variation	Pass
2.1046,22.913(a), 24.232(c)	Conducted RF Power Output	Pass
2.1051,22.917,24. 238	Conducted spurious emissions	Pass
Note 3: No applicable performance criteria.		

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## 4 Test Results of mode

### 4.1 Radiated Spurious Emission

<b>Specifications:</b>	2.1051, 24.238, 2.1053, 22.917					
<b>Date of Tests</b>	2008-09-19					
<b>Test conditions:</b>	Ambient Temperature: 15°C-35°C Relative Humidity: 30%-60% Air pressure: 86-106kPa					
<b>Operation Mode</b>	TX on, channel 190 and 661					
<b>Test Results:</b>	Pass					
<b>Test equipment Used:</b>						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2009-01-03	Normal
7330	Ultra Broadband Antenna	R/S	HL562	100013	2009-07-24	Normal
7330	Double-Ridged Horn Antenna	R/S	HF906	100037	2009-01-14	Normal
713	Fully-Anechoic Chamber	ETS	11.8m×6.5m×6.3 m	--	2010-11-17	Normal
023	Wireless Communications Test Set	Agilent	8960(E5515C)	GB41450323	2009-06-13	Normal
111835	Wireless Communications Test Set	R&S	CMU200	1100000802	2009-11-25	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:**

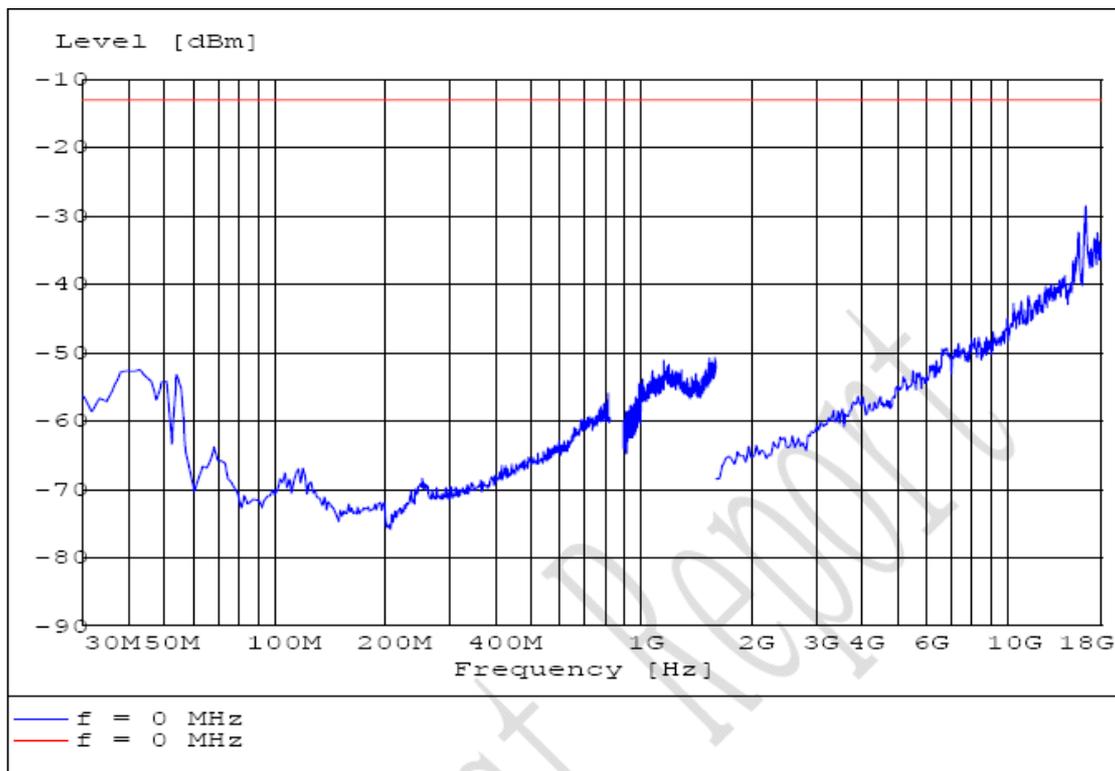
The measurement was performed accordance with section 2.2.12 of ANSI/TIA-603-B-2002: *Land Mobile FM or PM Communications Equipment Measurement and Performance Standards*.

- 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.

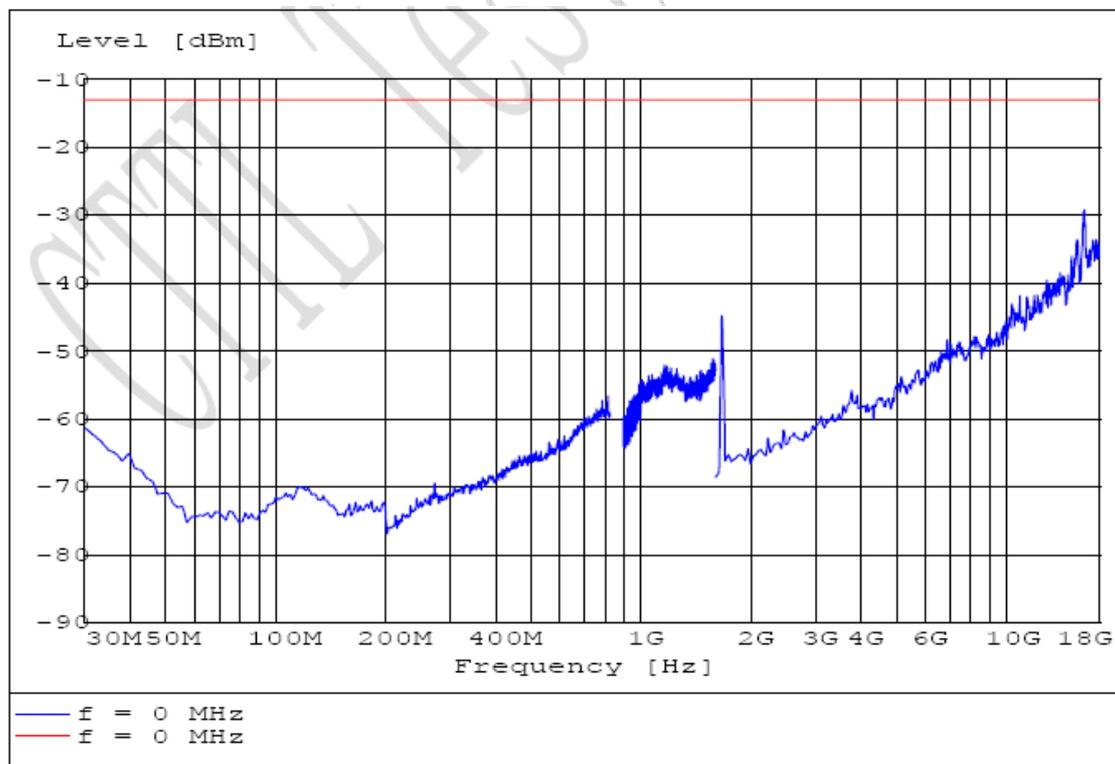
**Note:**

- 1 The investigated ARFCNs are 190 (836.6 MHz) and 661 (1880.0 MHz).
- 2 The investigated frequency range is 30 MHz ~ 18 GHz.

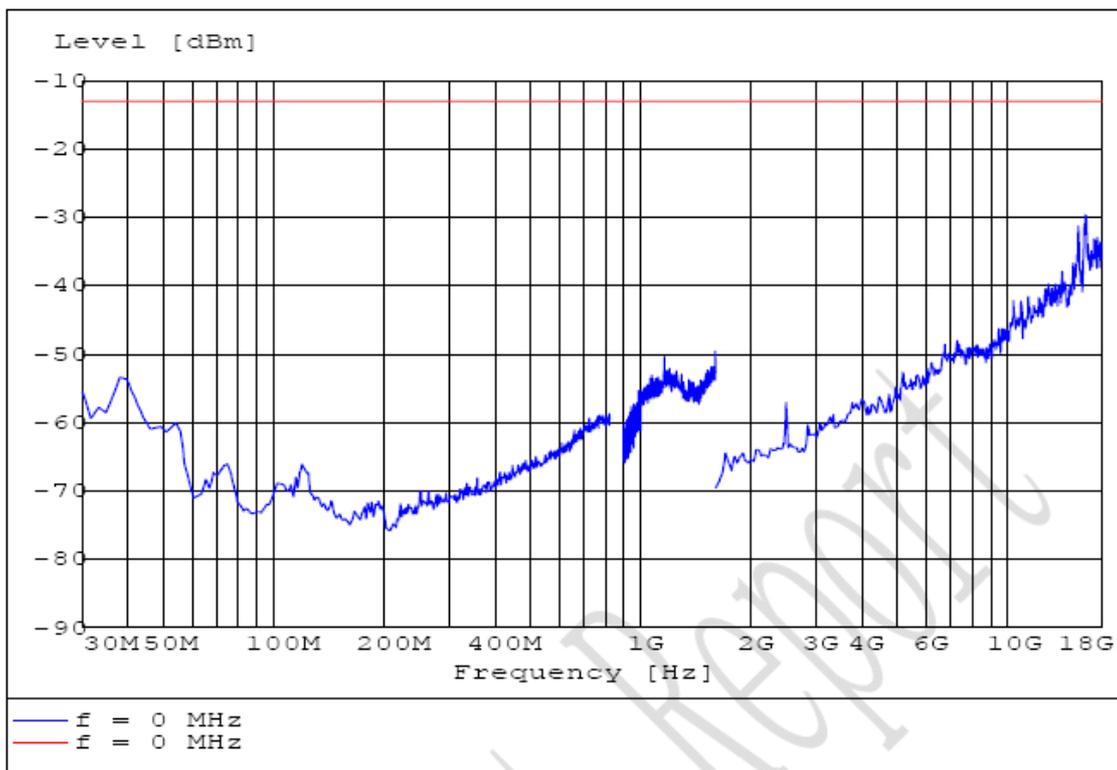
**Test Results for GSM mode:**



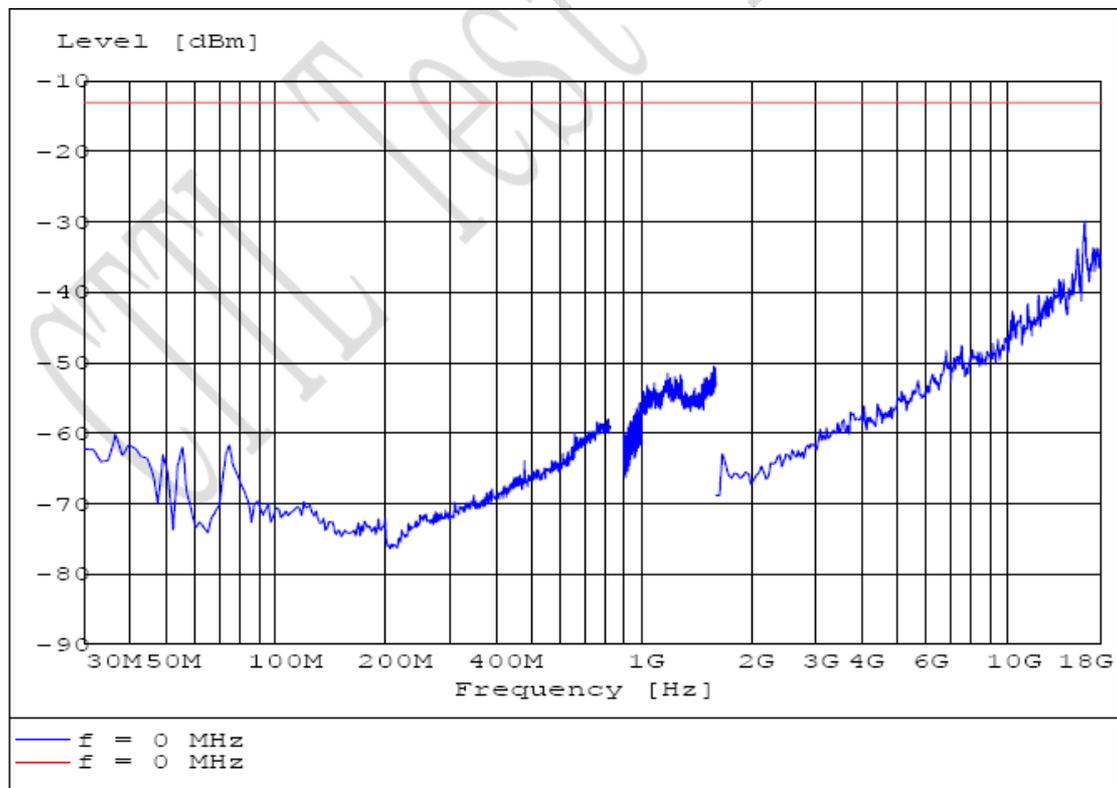
**S190VF for GSM mode**



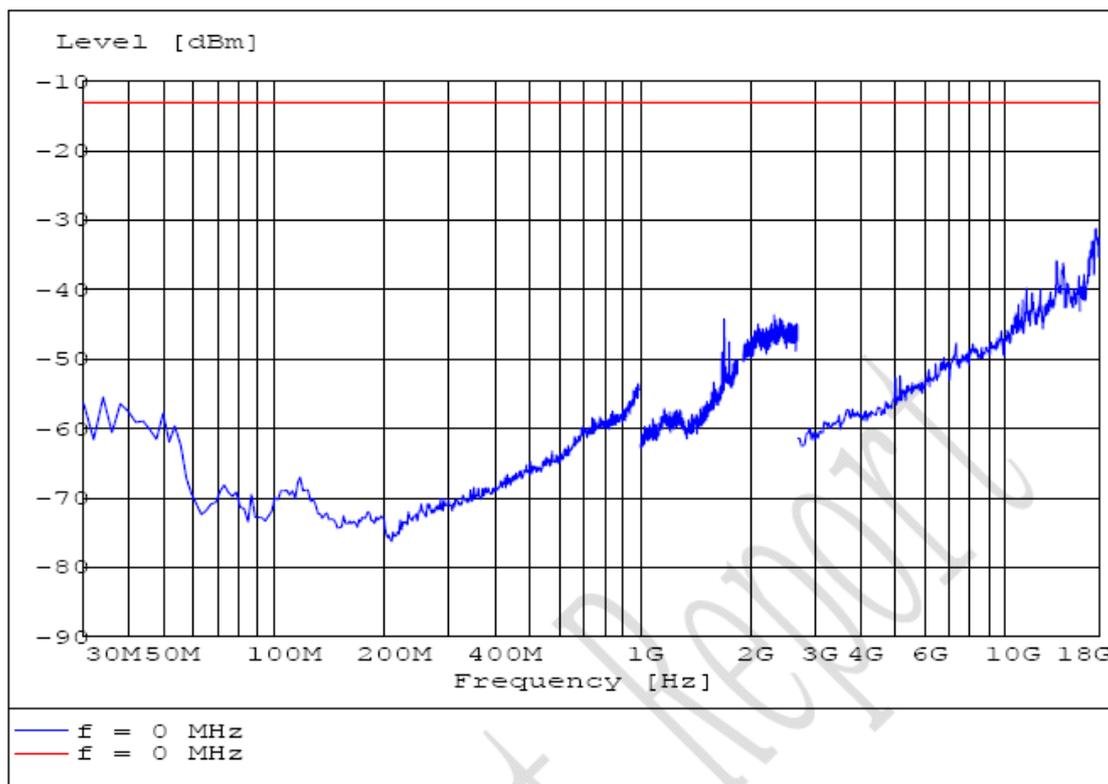
**S190HF for GSM mode**



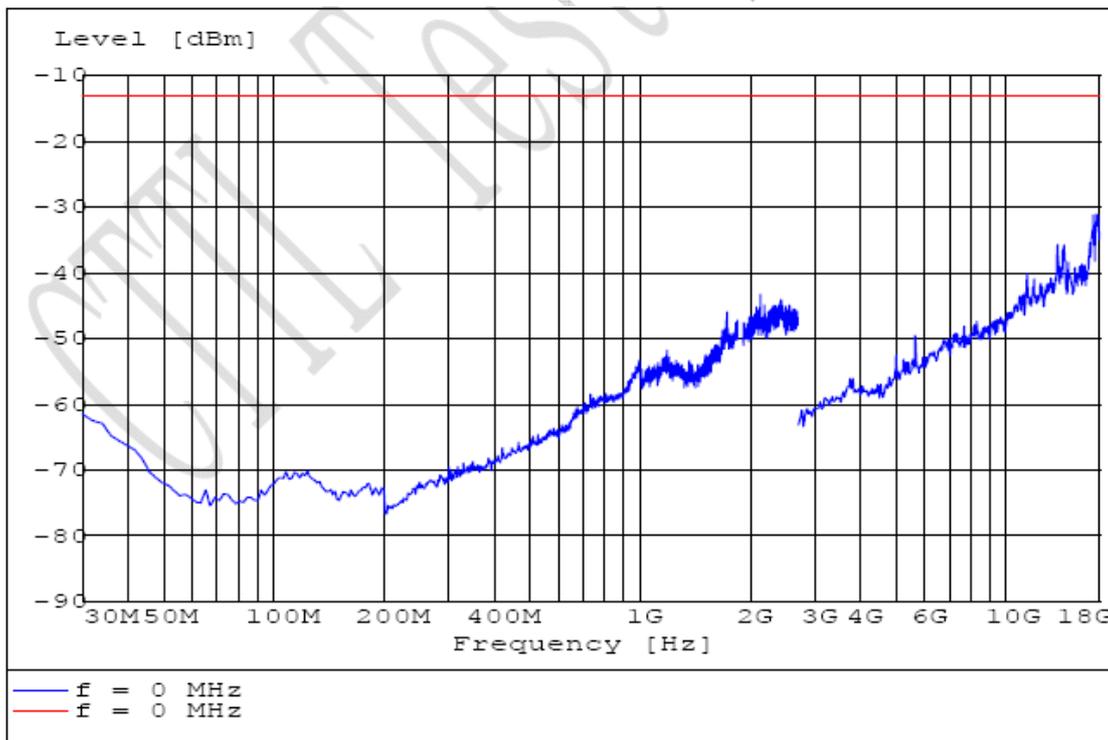
S190VT for GSM mode



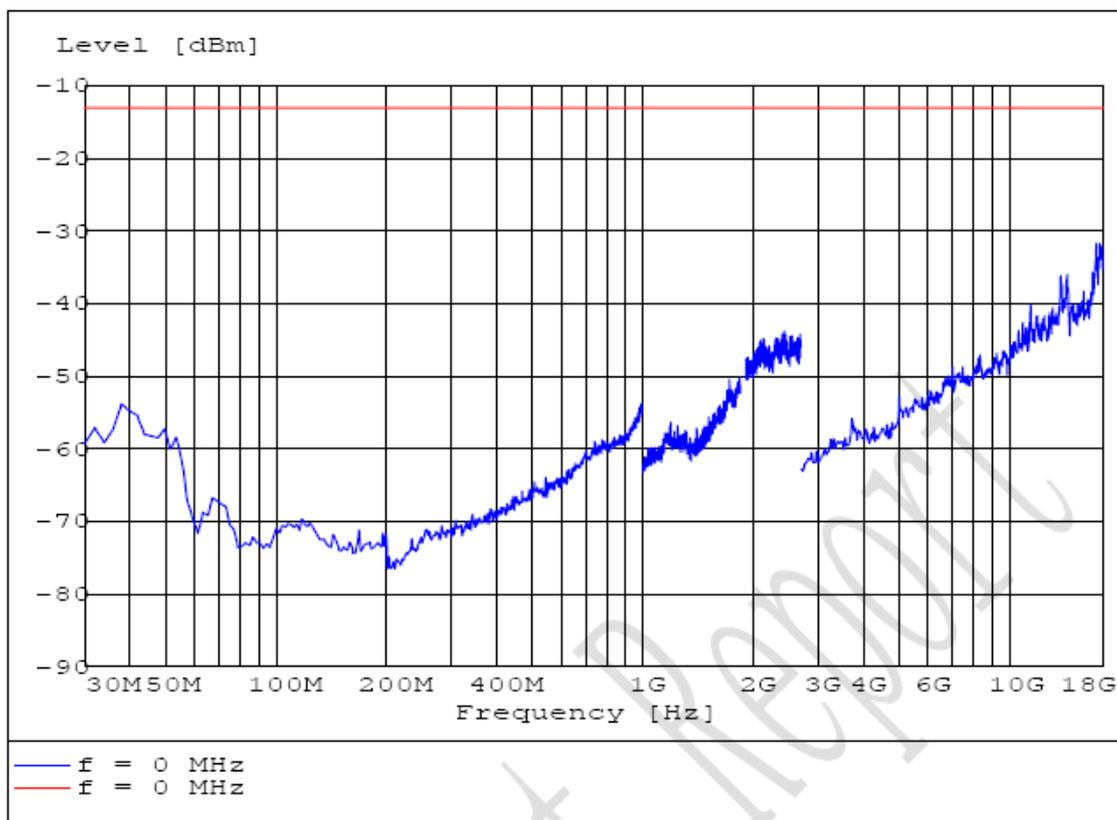
S190HT for GSM mode



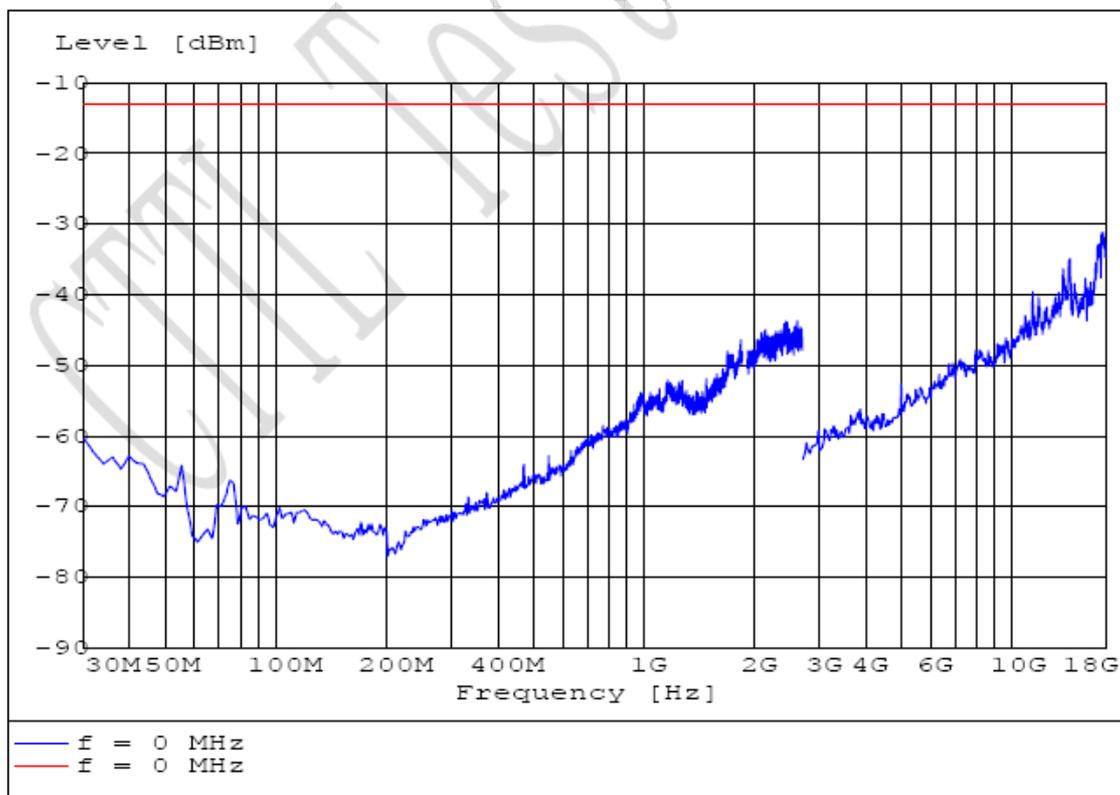
S661VF for GSM mode



S661HF for GSM mode

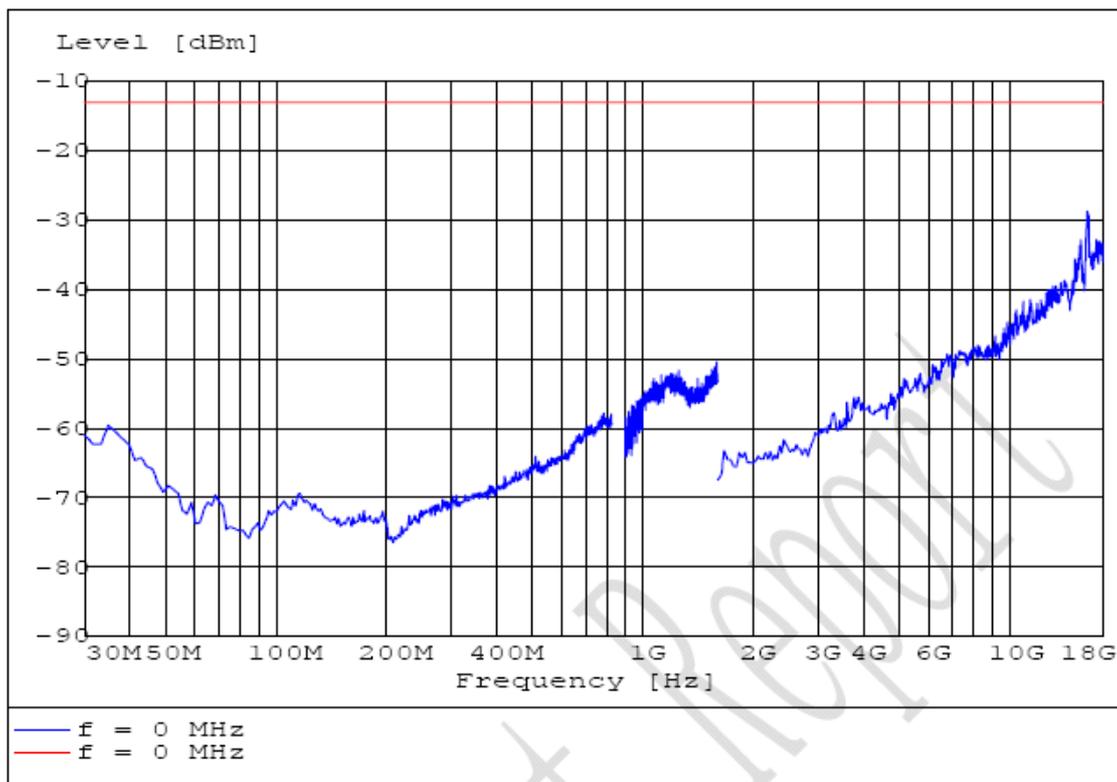


S661VT for GSM mode

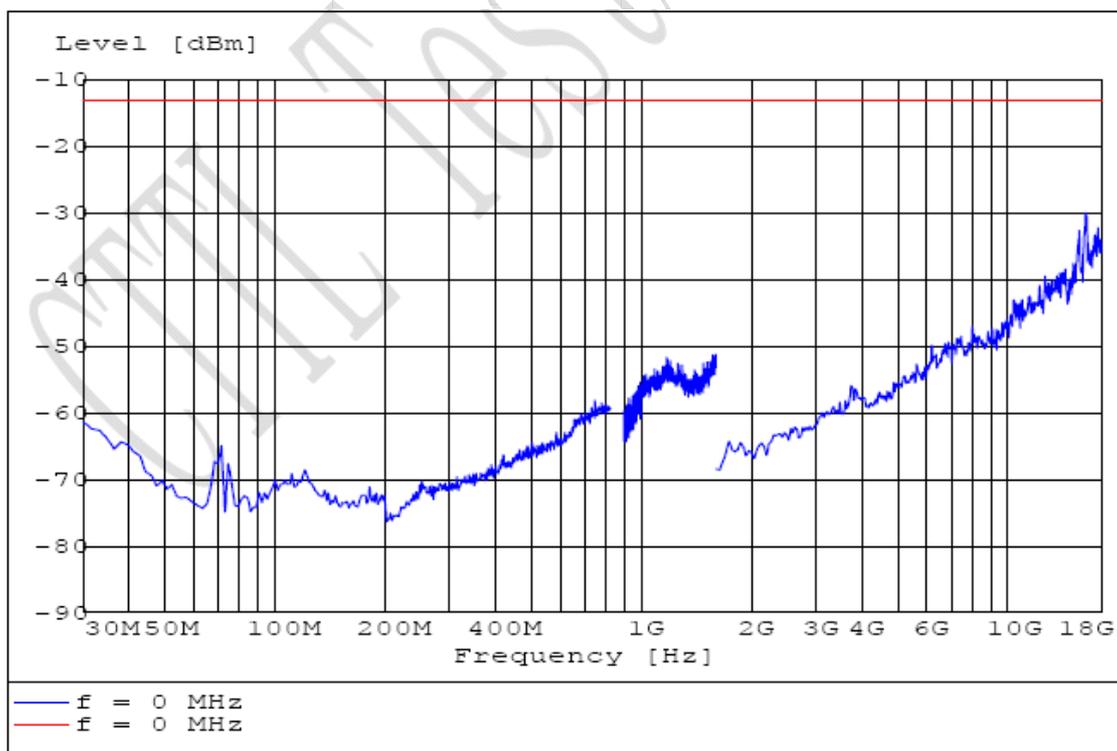


S661HT for GSM mode

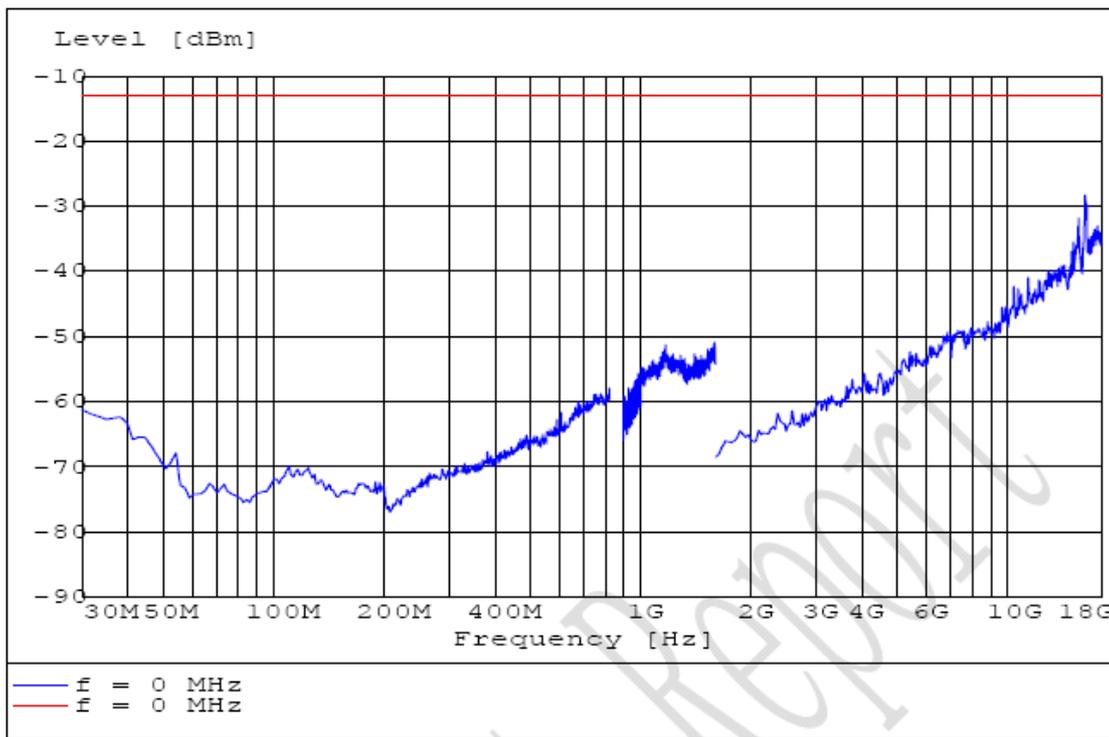
Test Results for GPRS mode:



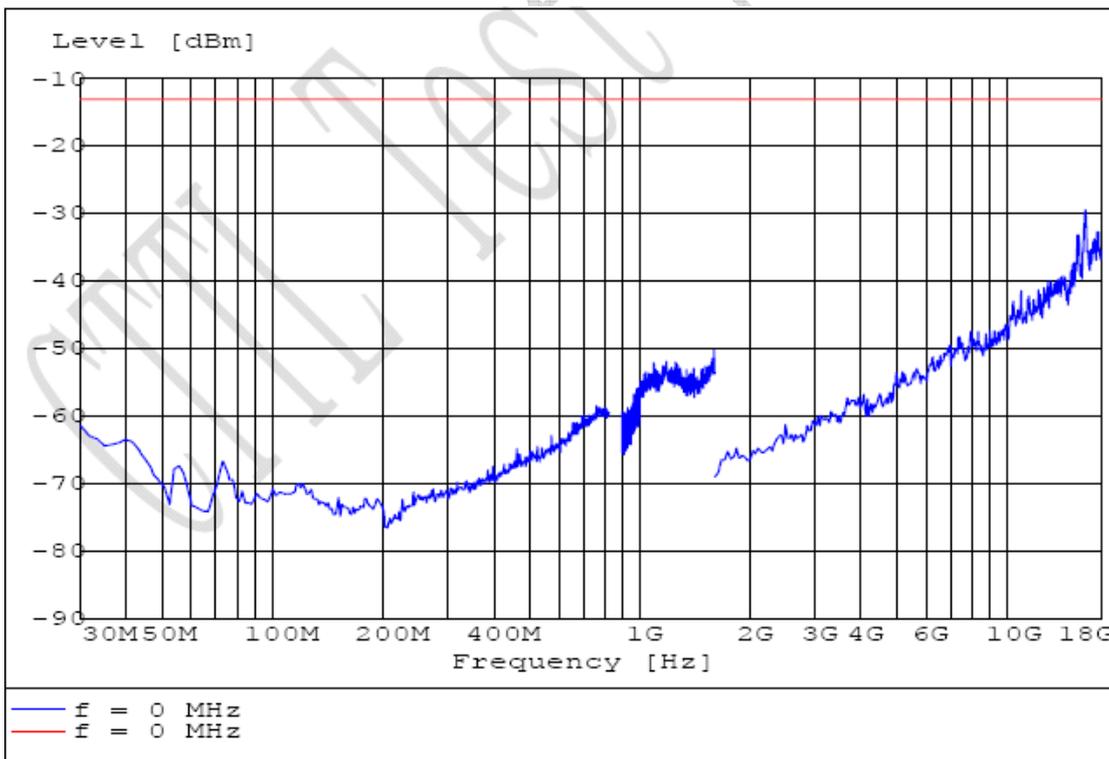
S190VF for GPRS mode



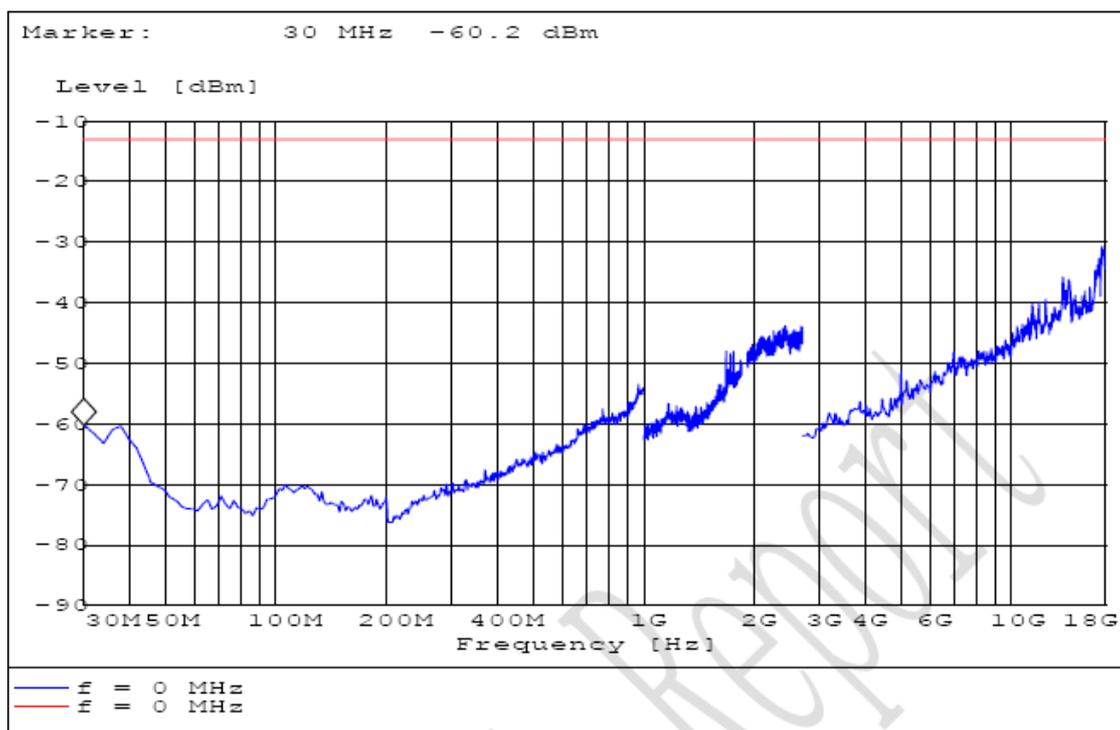
S190HF for GPRS mode



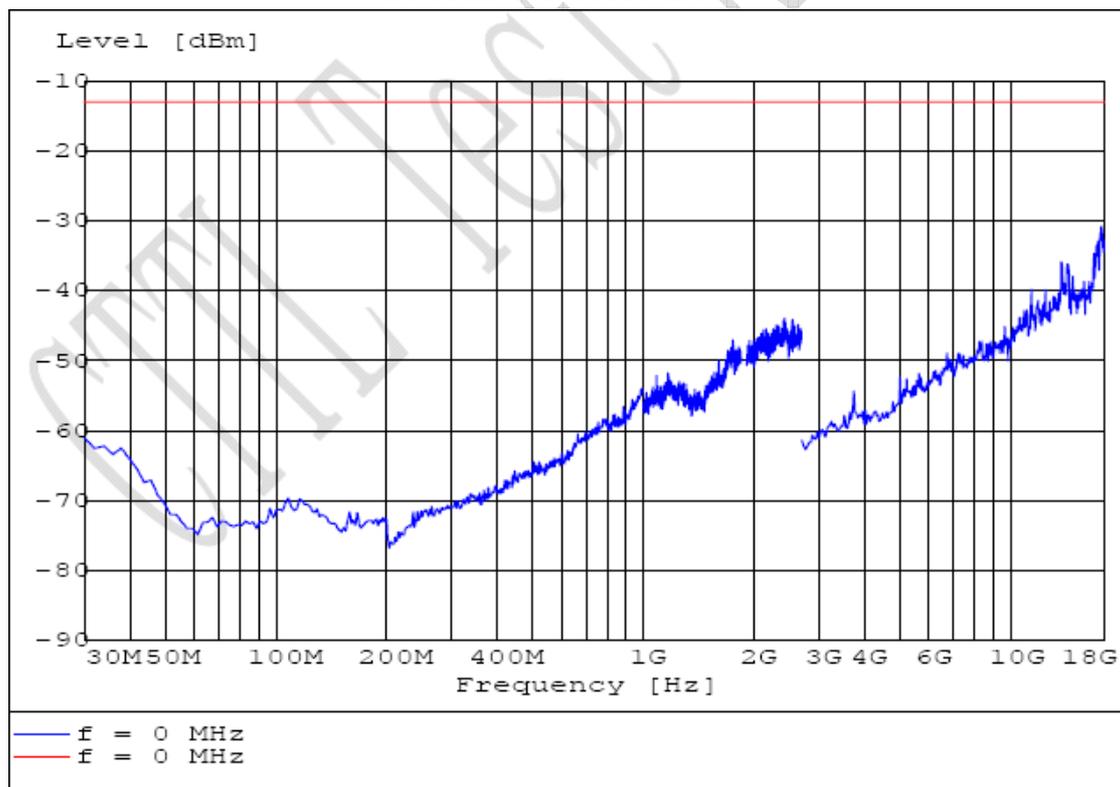
S190VT for GPRS mode



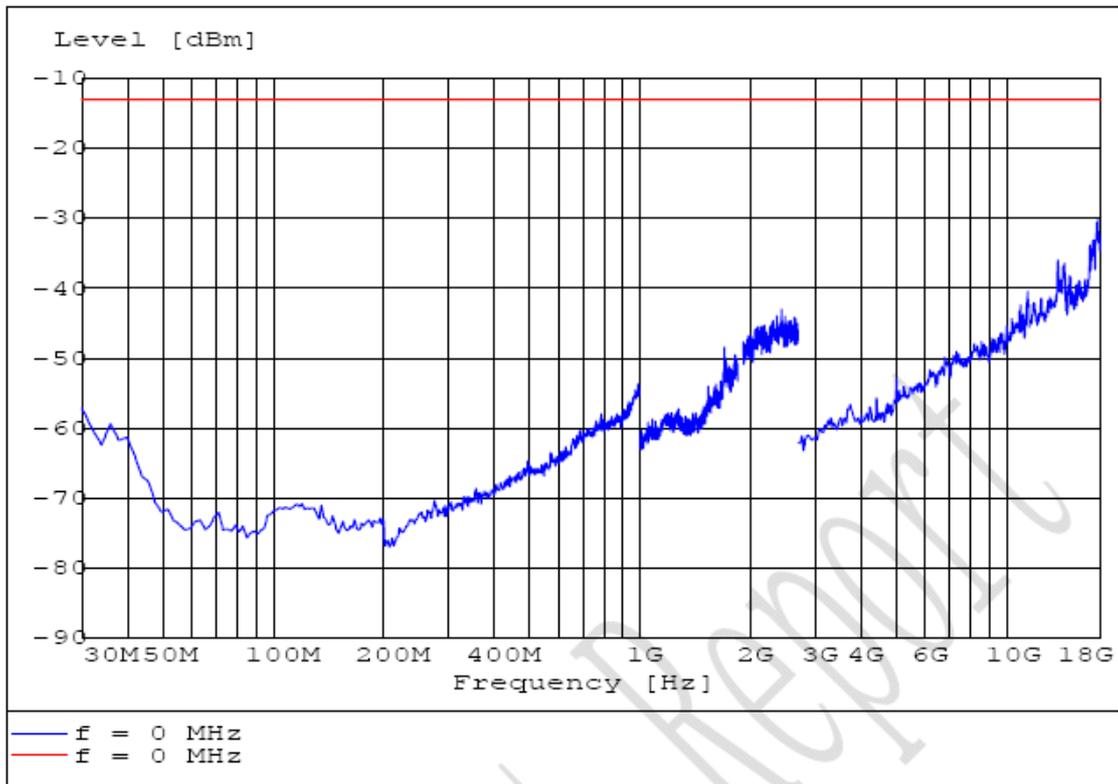
S190HT for GPRS mode



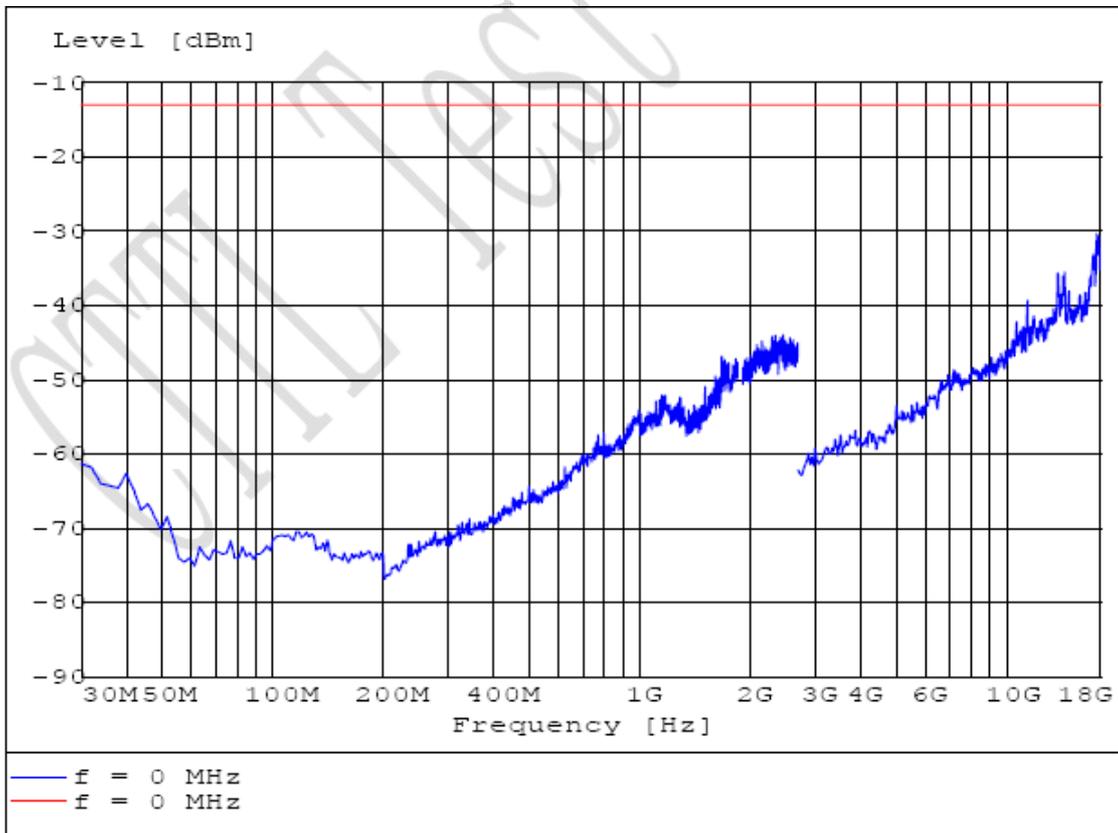
S661VF for GPRS mode



S661HF for GPRS mode

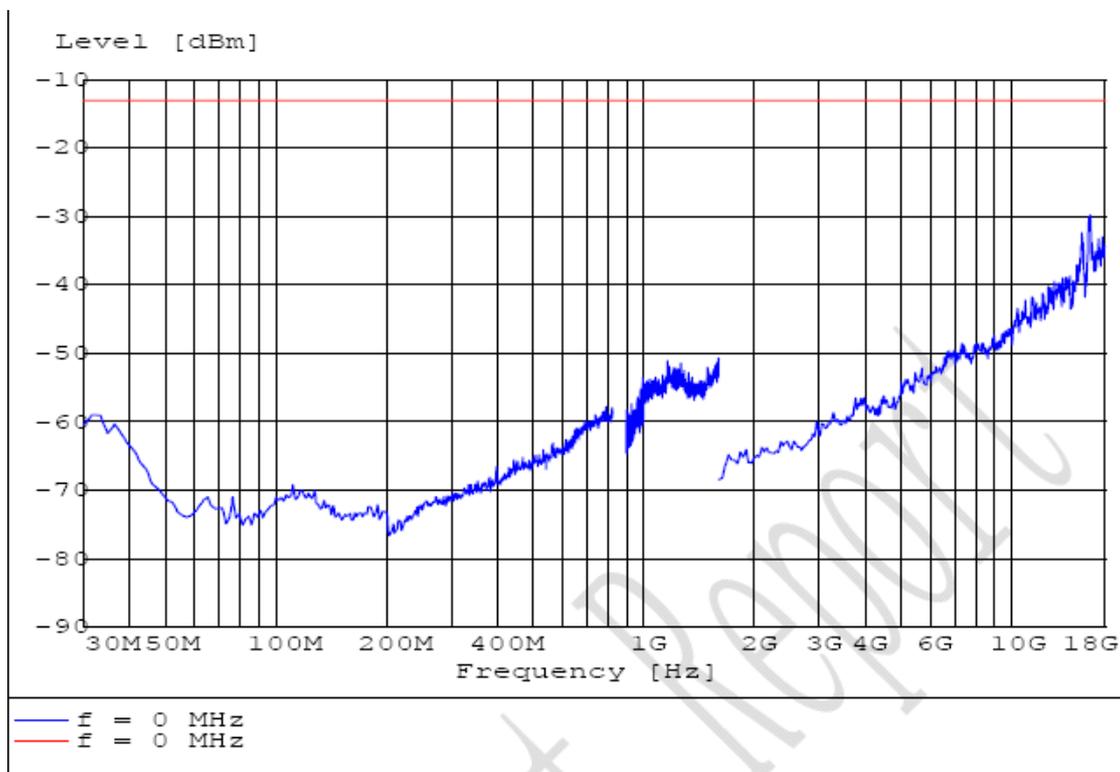


S661VT for GPRS mode

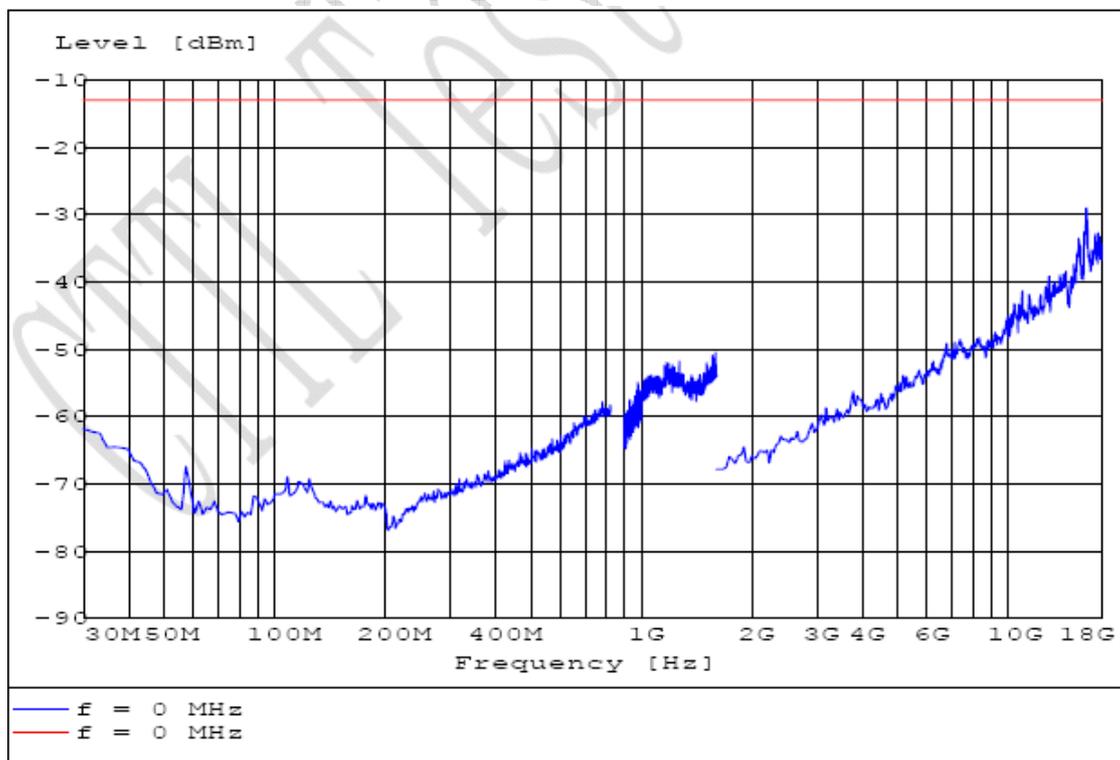


S661HT for GPRS mode

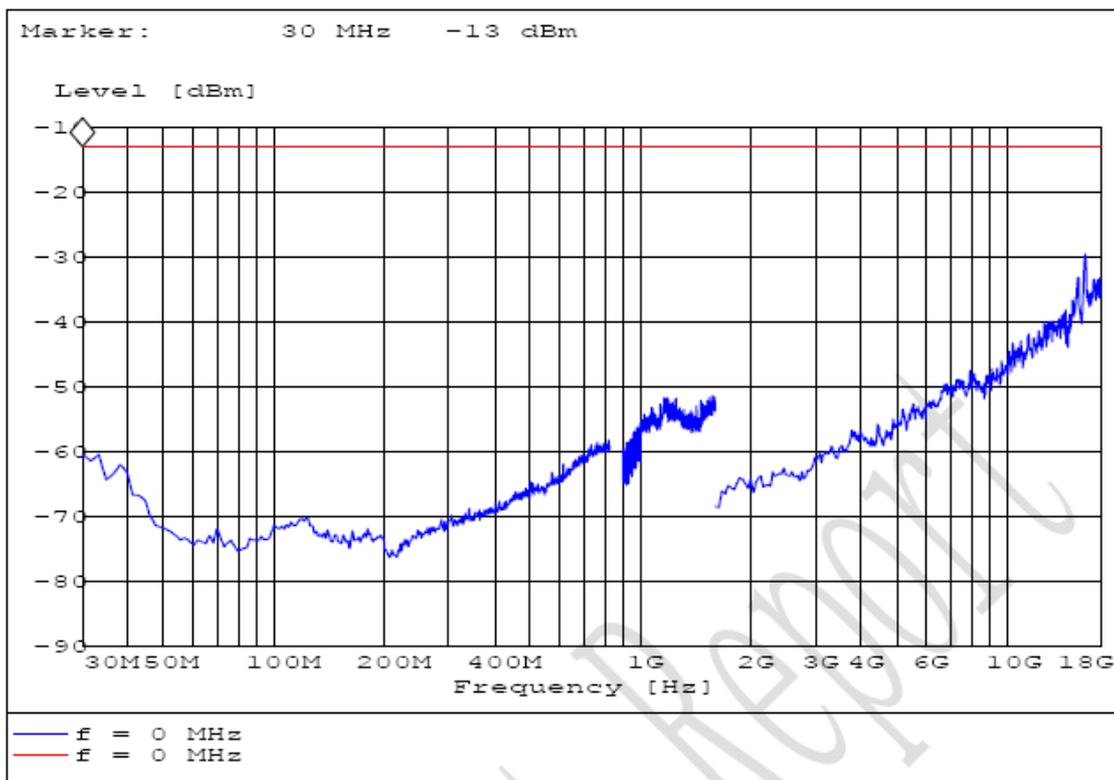
Test Results for EGPRS mode:



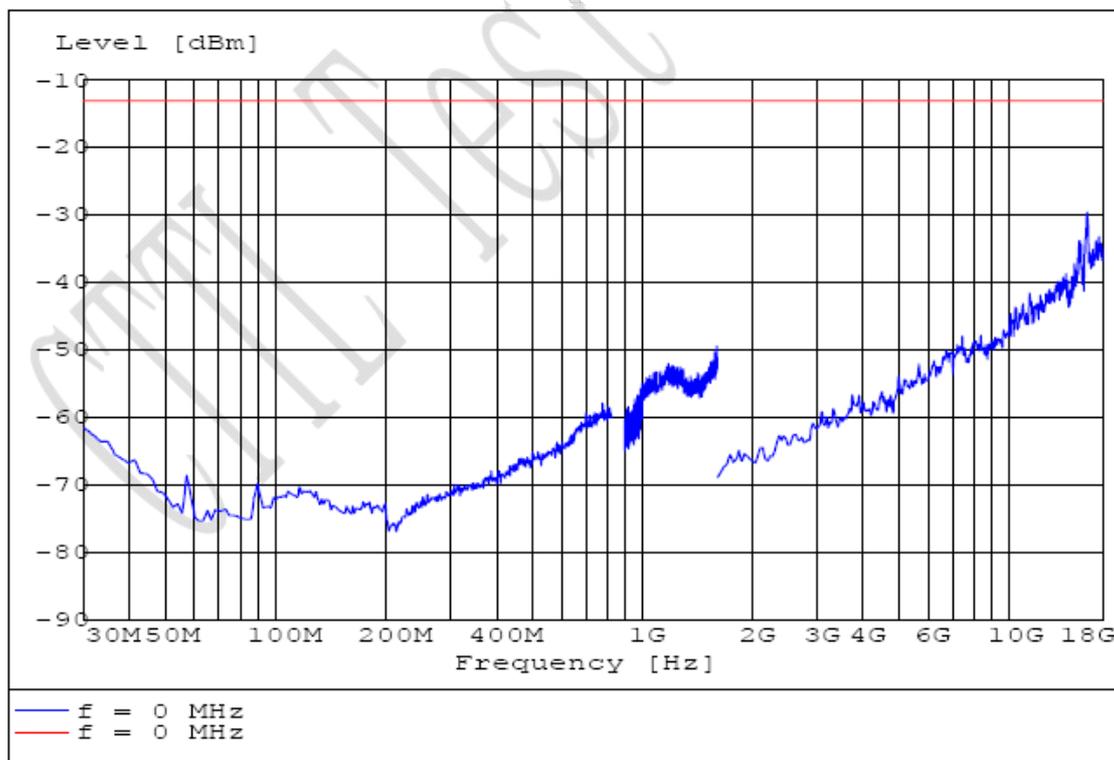
S190VF for EGPRS mode



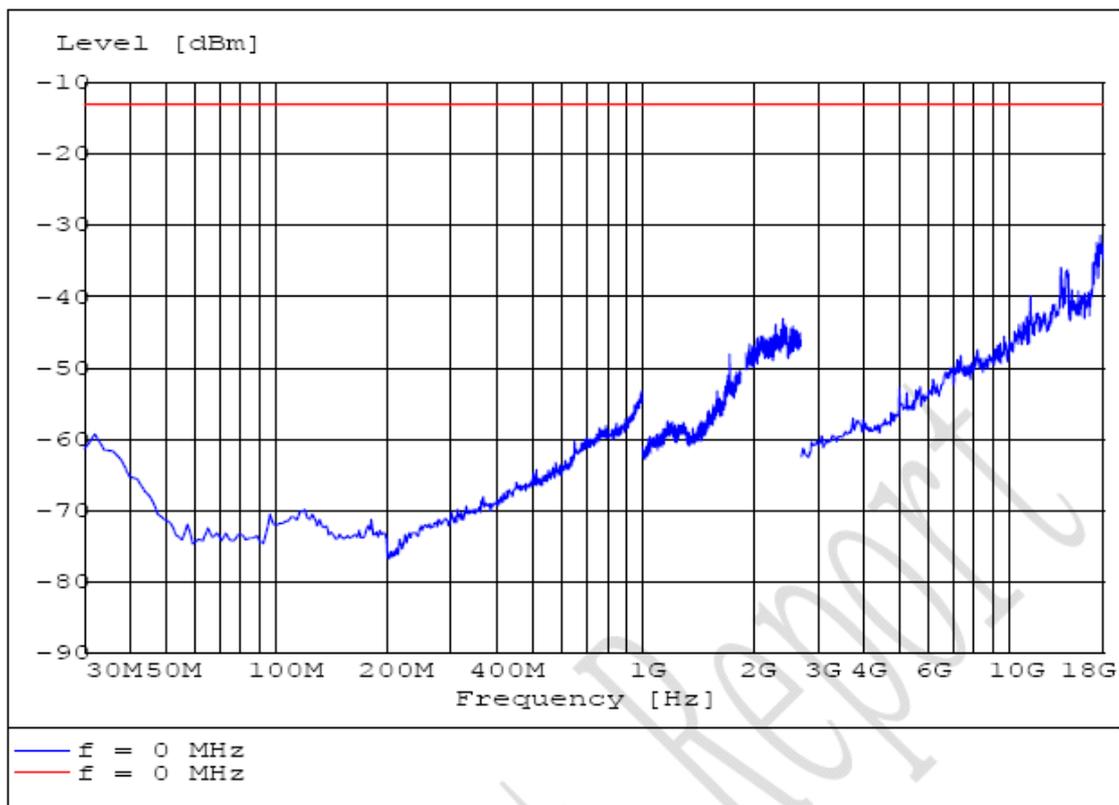
S190HF for EGPRS mode



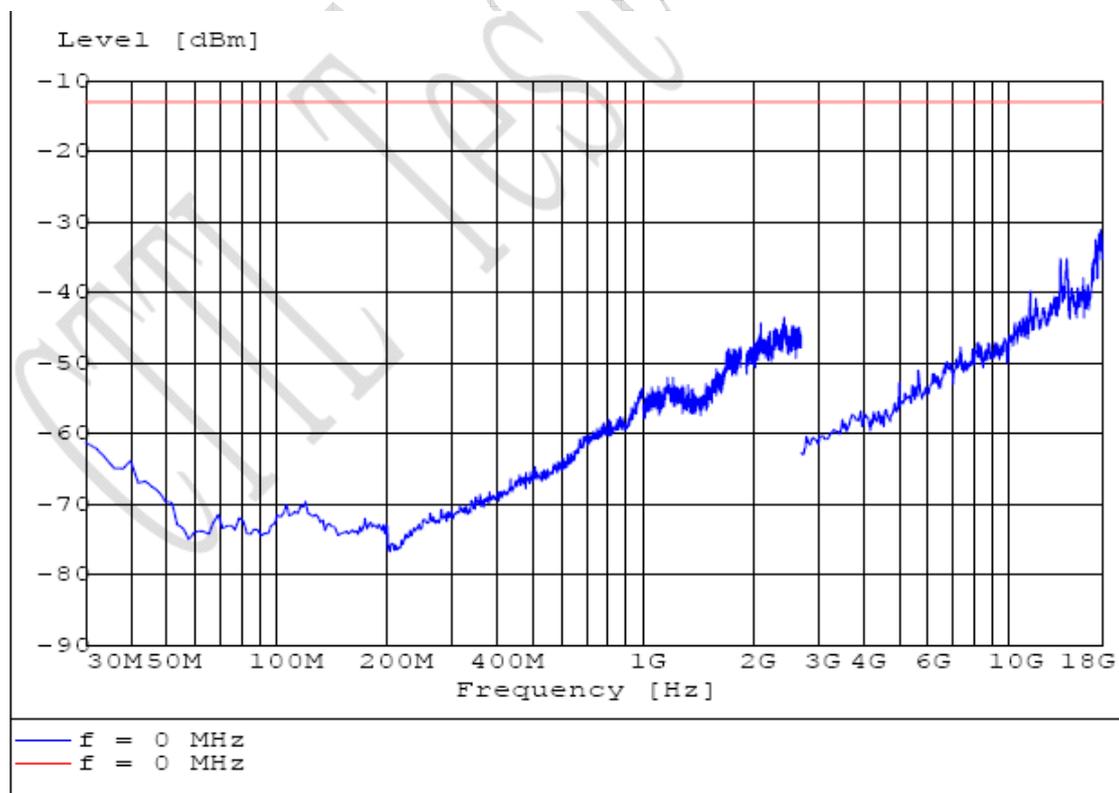
S190VT for EGPRS mode



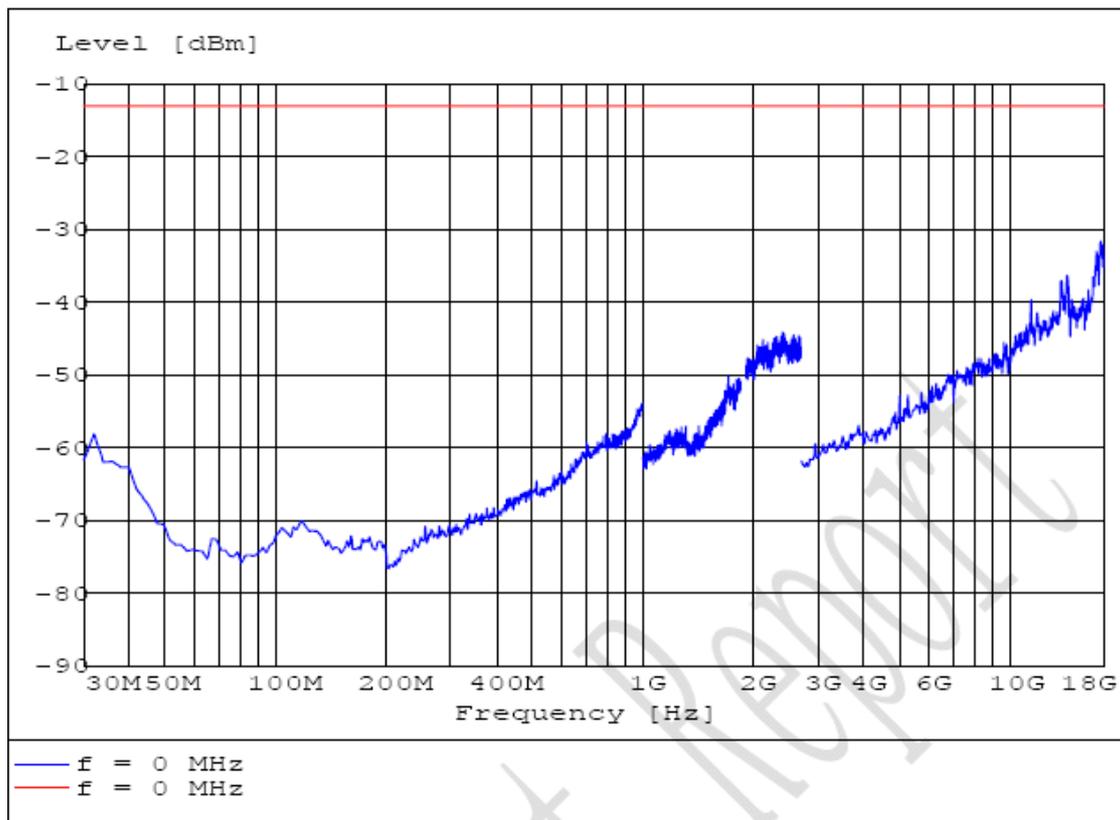
S190HT for EGPRS mode



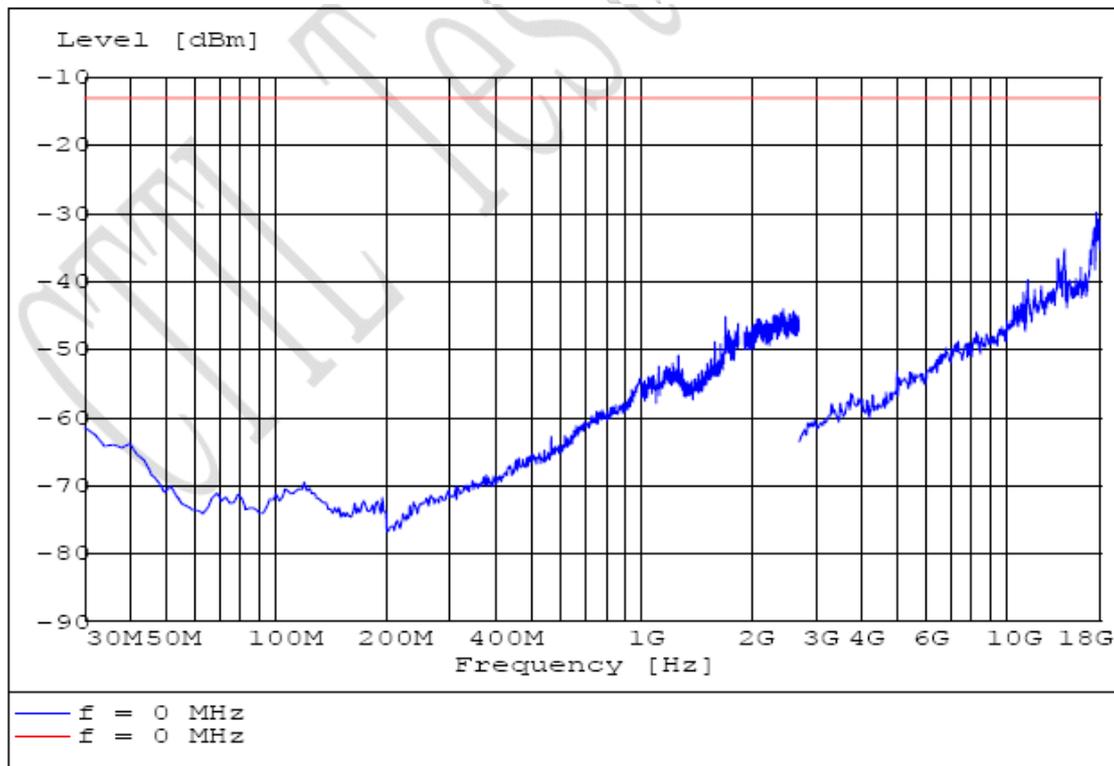
**S661VF for EGPRS mode**



**S661HF for EGPRS mode**



S661VT for EGPRS mode



S661HT for EGPRS mode

### 4.2 Radiated RF Power Output and ERP

<b>Specifications:</b>	2.1046,24.232,22.913(a)					
<b>Date of Tests</b>	2008-09-18					
<b>Test conditions:</b>	Ambient Temperature: 15°C -35°C Relative Humidity: 30%-60% Air pressure: 86-106kPa					
<b>Operation Mode</b>	TX on, channel 128, 190, 251, 512, 661 and 810					
<b>Test Results:</b>	Pass					
<b>Test equipment Used:</b>						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2009-01-04	Normal
7330	Ultra Broadband Antenna	R/S	HL562	100013	2009-07-24	Normal
7330	Double-Ridged Horn Antenna	R/S	HF906	100037	2009-01-14	Normal
713	Fully-Anechoic Chamber	ETS	11.8m×6.5m×6.3m	--	2010-11-17	Normal
023	Wireless Communications Test Set	Agilent	8960(E5515C)	GB41450323	2009-06-13	Normal
111835	Wireless Communications Test Set	R&S	CMU200	1100000802	2009-11-25	Normal

**Limit Level Construction:**

(a) Radiated RF Power Output

According to Part 24.232(b), i.e., Mobile/portable stations are limited to 2 watts EIRP peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications, so the limit level is 2 W or 33 dBm.

(b) ERP

According to Part 22.913(a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

**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:

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

The measurement was performed accordance with section 2.2.17 of ANSI/TIA-603-B-2002: *Land Mobile FM or PM Communications Equipment Measurement and Performance Standards*.

1 The maximum power was searched by turning the azimuth of the turntable, shifting the polarization of the measuring antenna and changing the pose of the EUT.

2 The measured levels are EIRP values corrected in the automated test system with the correction factors given by a substitution calibration made before the measurement. The calibration is made separately for vertical and horizontal polarization and the system uses different correction factors depending on the measuring antenna polarization.

3 The corrected maximum levels were reported for EIRP values, and ERP values can be calculated from EIRP values.

### Note:

ERP dBm = EIRP dBm – 2.15dB.

### ERP Value for GSM 850 band mode:

ARFCN	Frequency [MHz]	ERP [dBm]
128	824.228	20.78
190	836.553	20.78
251	848.777	20.76

### EIRP Value for GSM 1900 band mode:

ARFCN	Frequency [MHz]	EIRP [dBm]
512	1850.100	23.71
661	1880.080	24.07
810	1909.739	24.35

ERP Value for GPRS 850 band mode:

ARFCN	Frequency [MHz]	ERP [dBm]
512	824.128	19.06
661	836.553	18.21
810	848.777	17.68

EIRP Value for GPRS 1900 band mode:

ARFCN	Frequency [MHz]	EIRP [dBm]
128	1850.100	24.16
190	1880.080	24.35
251	1909.899	24.62

ERP Value for EGPRS 850 band mode:

ARFCN	Frequency [MHz]	ERP [dBm]
512	824.128	19.18
661	836.553	19.29
810	848.877	20.75

EIRP Value for EGPRS 1900 band mode:

ARFCN	Frequency [MHz]	EIRP [dBm]
128	1850.100	24.14
190	1879.919	24.37
251	1909.739	24.57

### 4.3 Occupied bandwidth

<b>Specifications:</b>	2.1049,22.917(b),24.238(b)					
<b>Date of Test</b>	2008-09-04 and 2008-09-08					
<b>Test conditions:</b>	Ambient Temperature: 15°C-35°C Relative Humidity: 30%-60% Air pressure: 86-106kPa					
<b>Operation Mode</b>	TX on, channel 128, 190, 251, 512, 661 and 810					
<b>Test Results:</b>	--					
<b>Test equipment Used:</b>						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2009-01-03	Normal
7330	Ultra Broadband Antenna	R/S	HL562	100013	2009-07-24	Normal
7330	Double-Ridged Horn Antenna	R/S	HF906	100037	2009-01-14	Normal
713	Fully-Anechoic Chamber	ETS	11.8m×6.5m×6.3 m	--	2010-11-17	Normal
023	Wireless Communications Test Set	Agilent	8960(E5515C)	GB41450323	2009-06-13	Normal
111835	Wireless Communications Test Set	R&S	CMU200	1100000802	2009-11-25	Normal

### Test Setup

The situation under which maximum EIRP values were found in the measurement of the radiated RF power output was used to determine the 99% occupied bandwidth. The Wireless Communications Test Set was used to set the TX channel, power level and modulation.

### Test Method

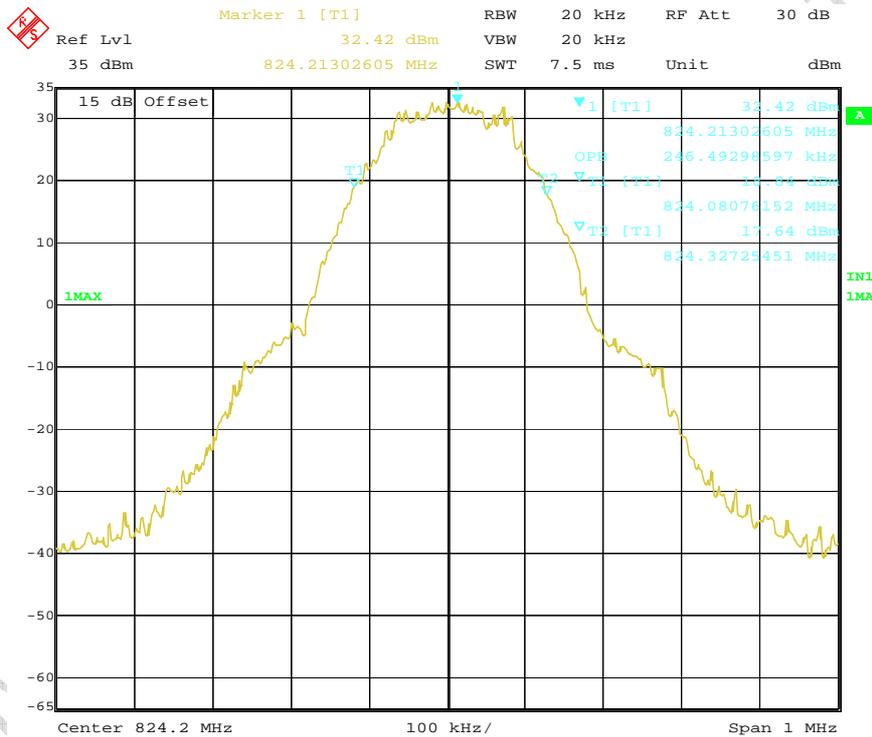
The 99% occupied bandwidth was calculated from the spectrum analyzer. Markers in the spectrum analyzer were then placed between the calculated frequencies to show the calculated 99% power band.

Note: --

Results data of GSM mode:

EUT channel	99% occupied bandwidth [kHz]
128	247
190	251
251	249
512	247
661	251
810	249

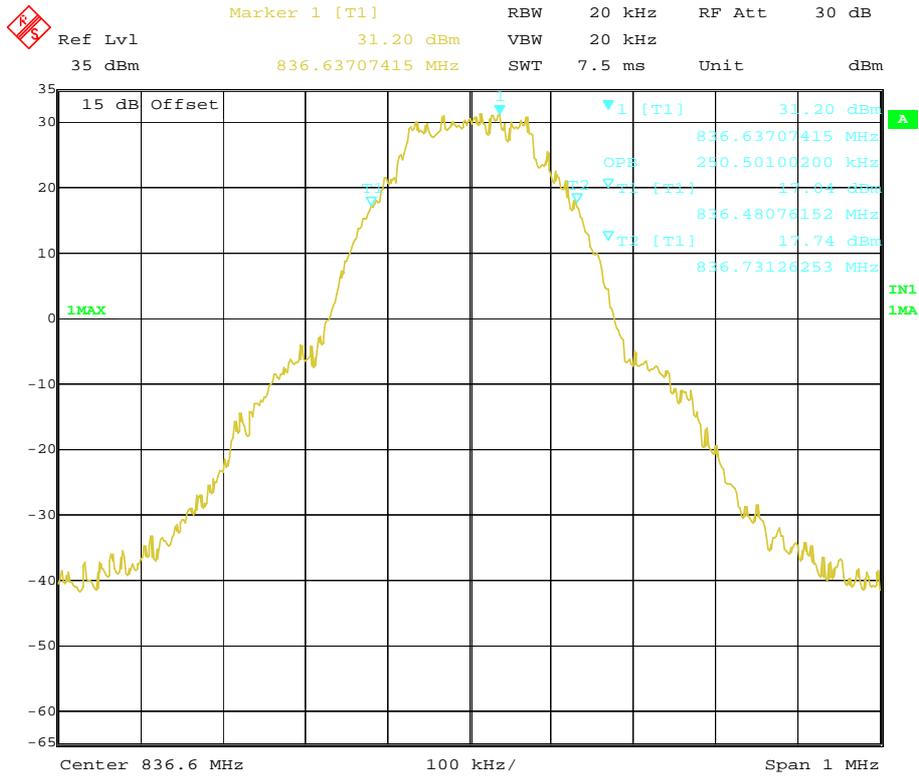
Graphical results for GSM mode:



Channel 128

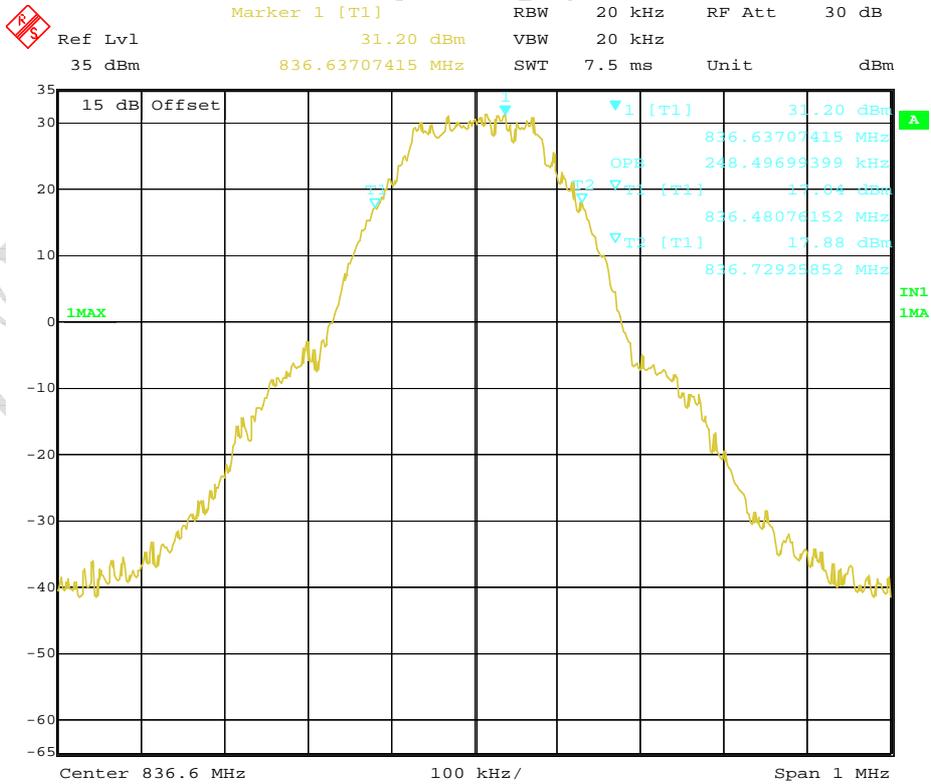
FCC Parts 2, 22, 24  
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-EMC



Date: 4.SEP.2008 22:09:38

Channel 190

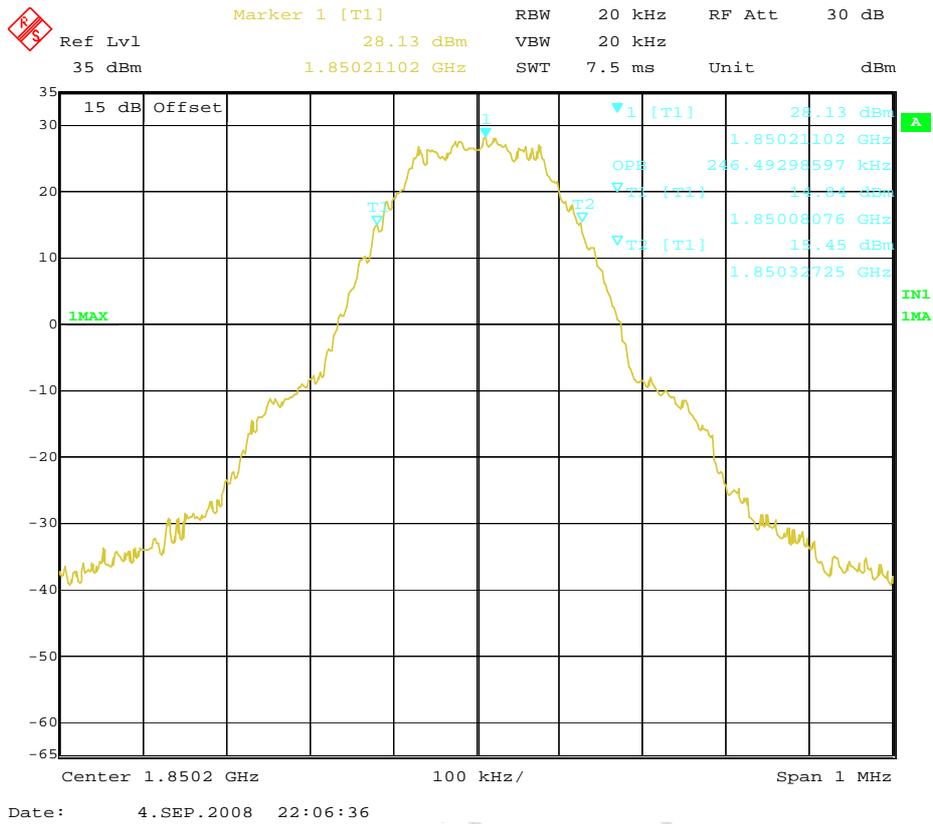


Date: 4.SEP.2008 22:12:21

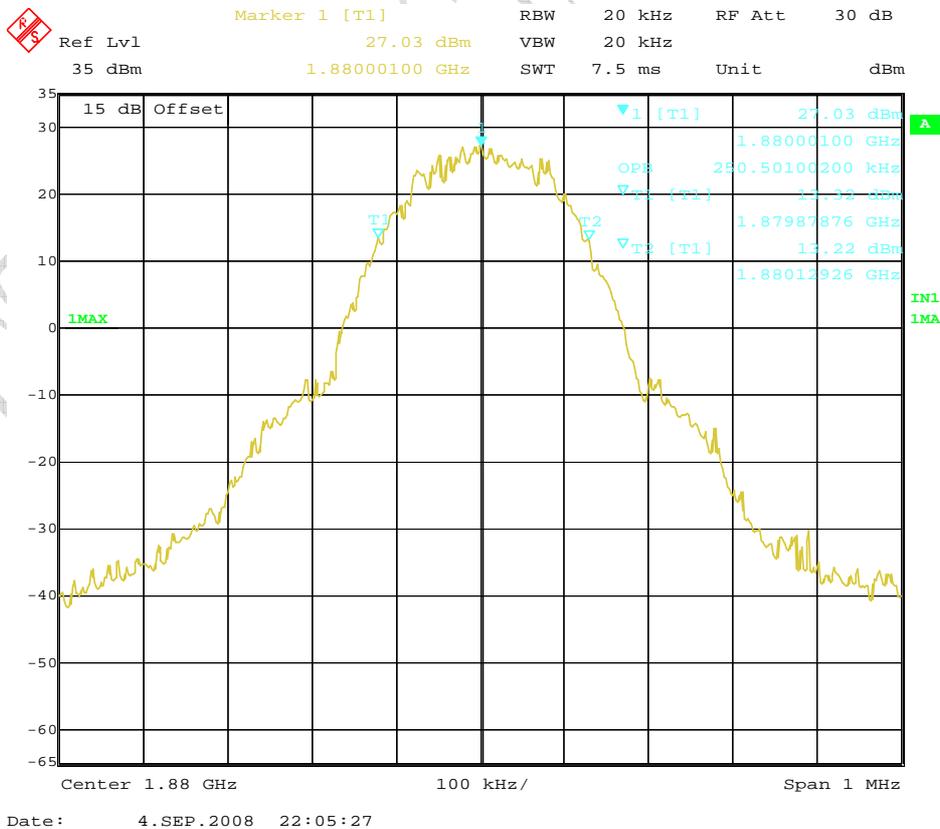
Channel 251

FCC Parts 2, 22, 24  
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-EMC



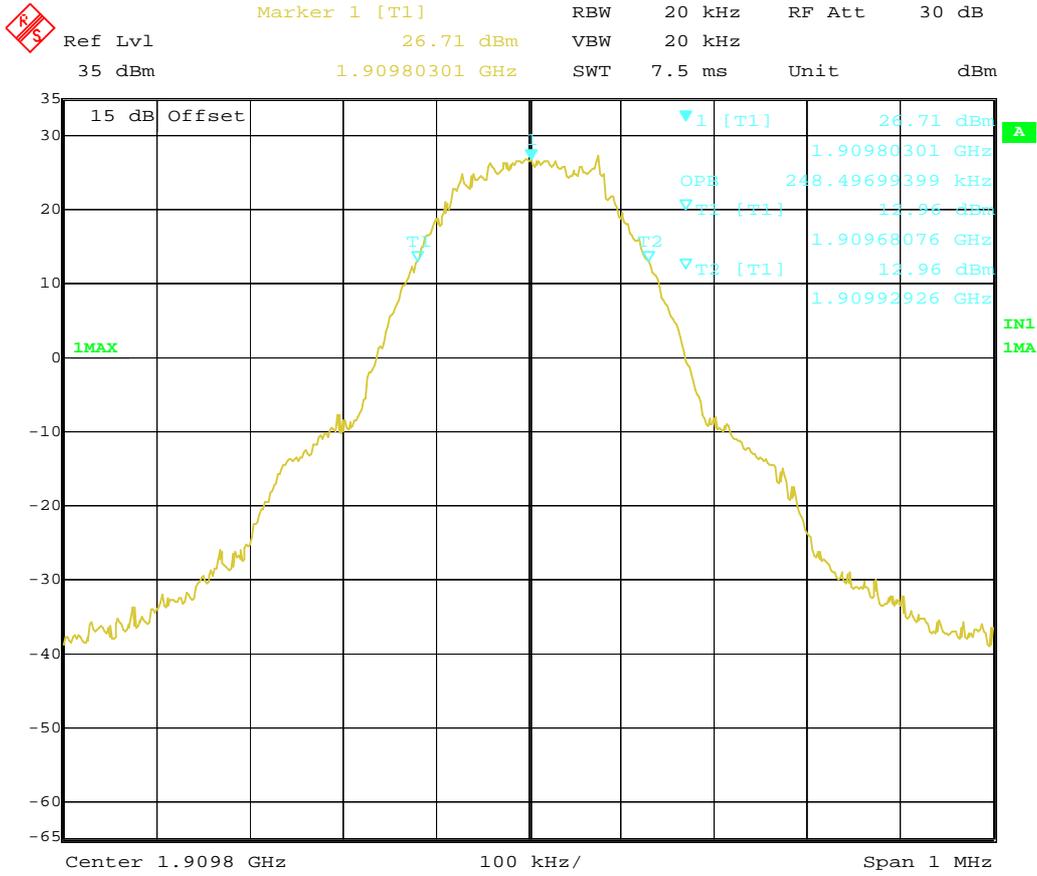
Channel 512



Channel 661

FCC Parts 2, 22, 24  
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-EMC



Date: 4.SEP.2008 22:04:35

Channel 810

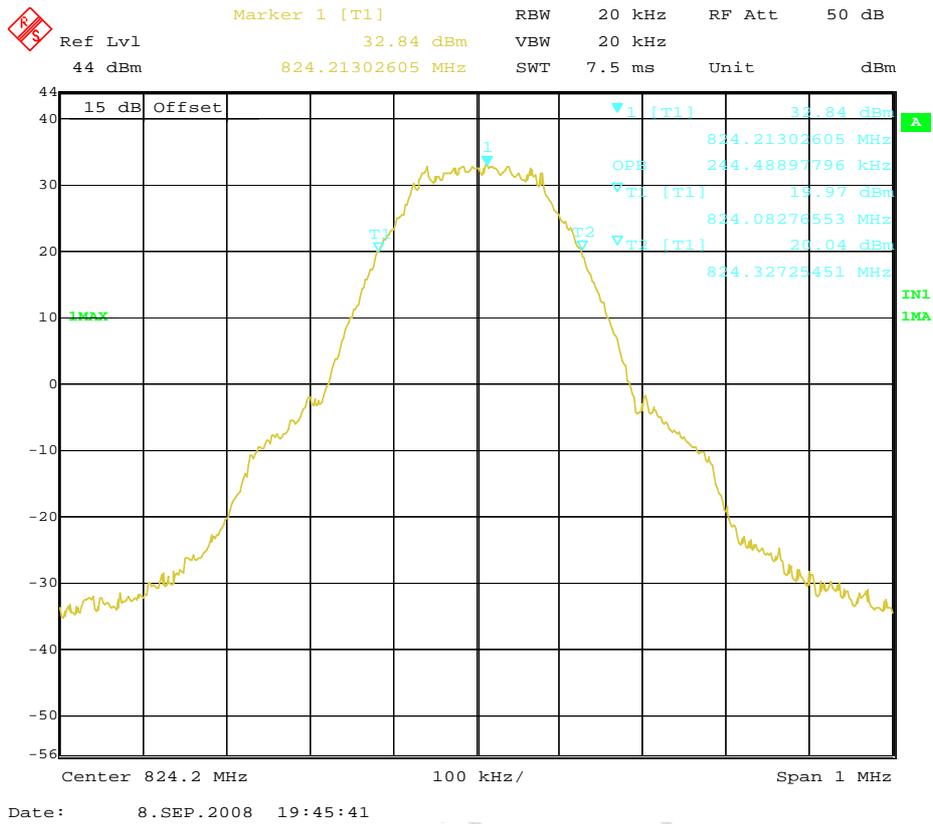
Results data of GPRS mode:

EUT channel	99% occupied bandwidth [kHz]
128	244
190	248
251	244
512	248
661	246
810	244

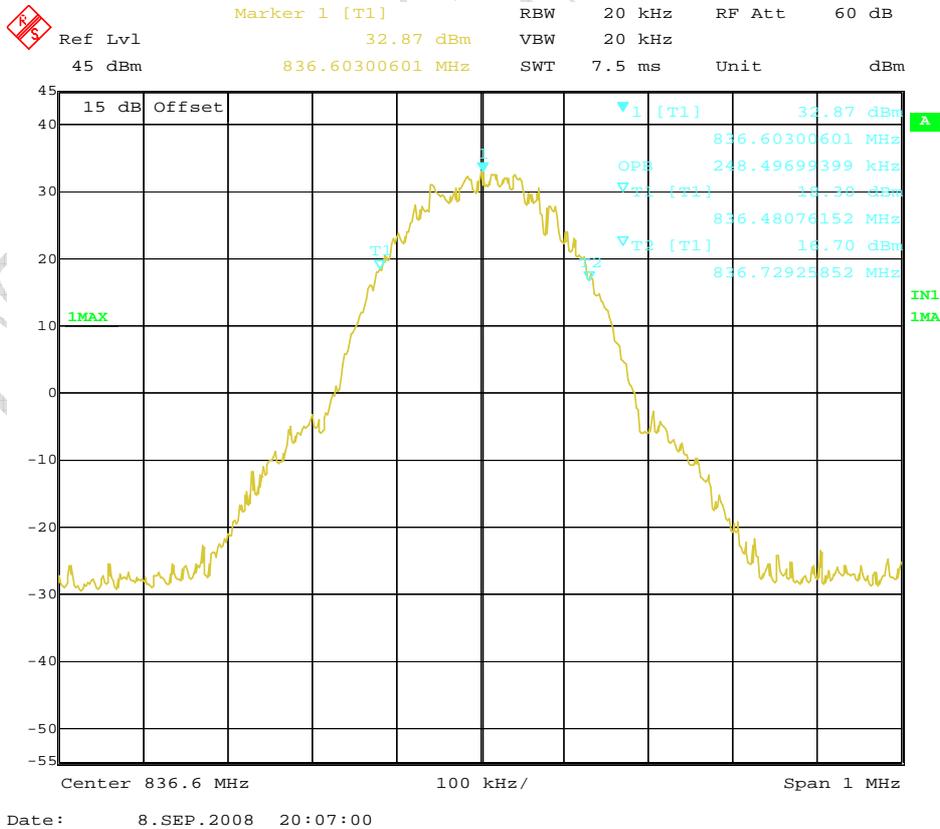
Graphical results for GPRS mode:

FCC Parts 2, 22, 24  
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-EMC



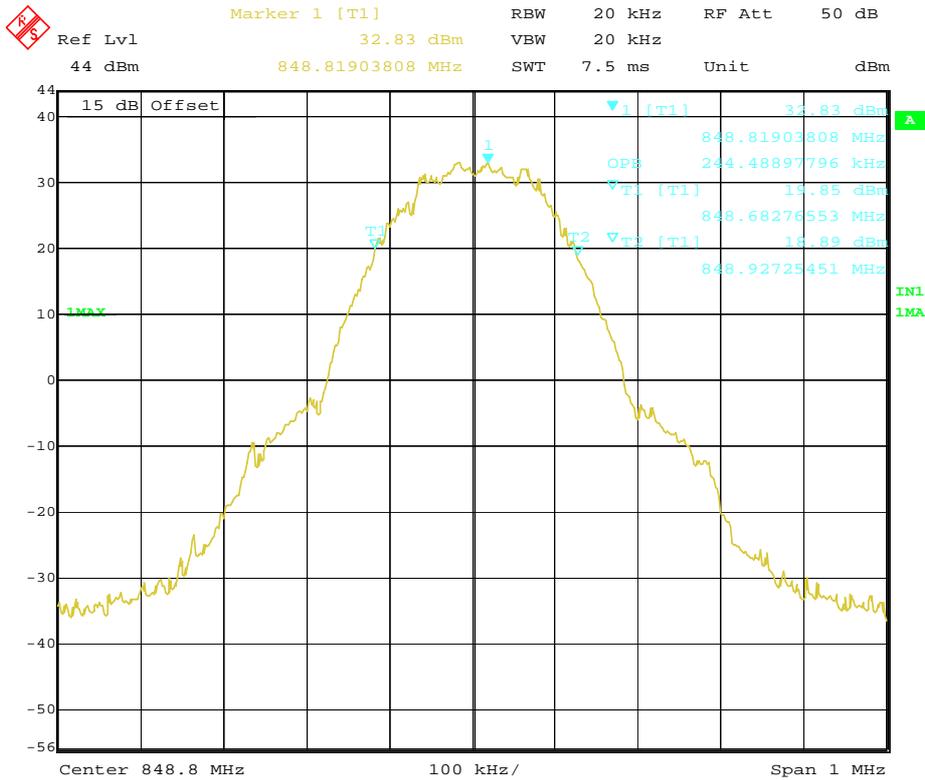
Channel 128



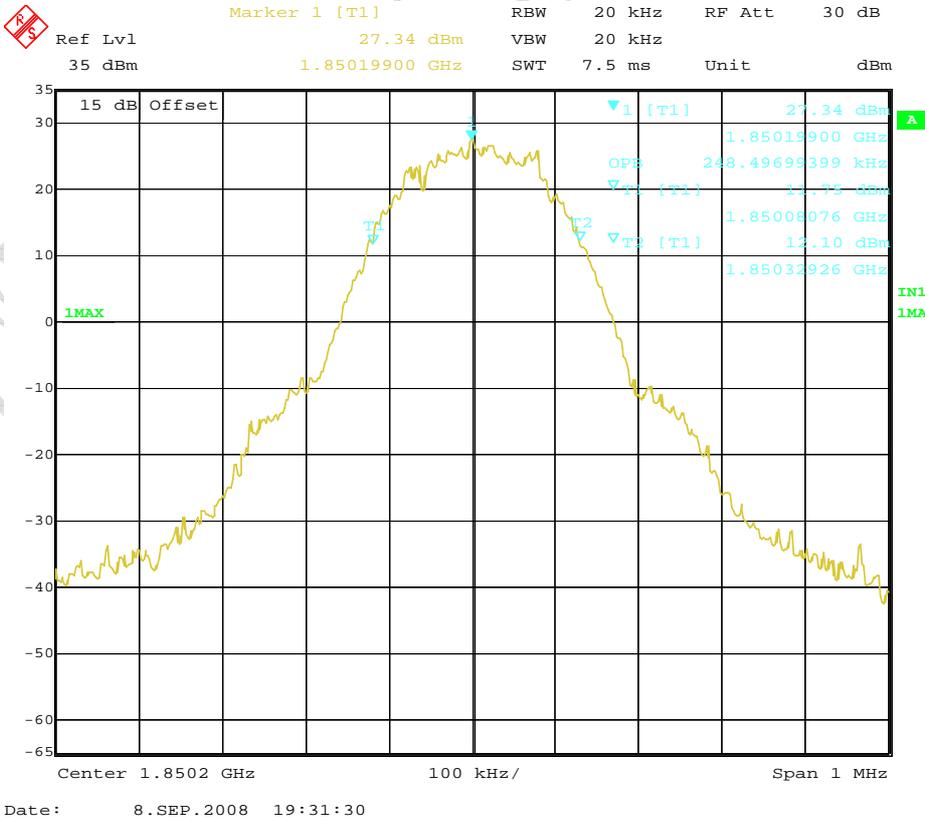
Channel 190

FCC Parts 2, 22, 24  
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-EMC



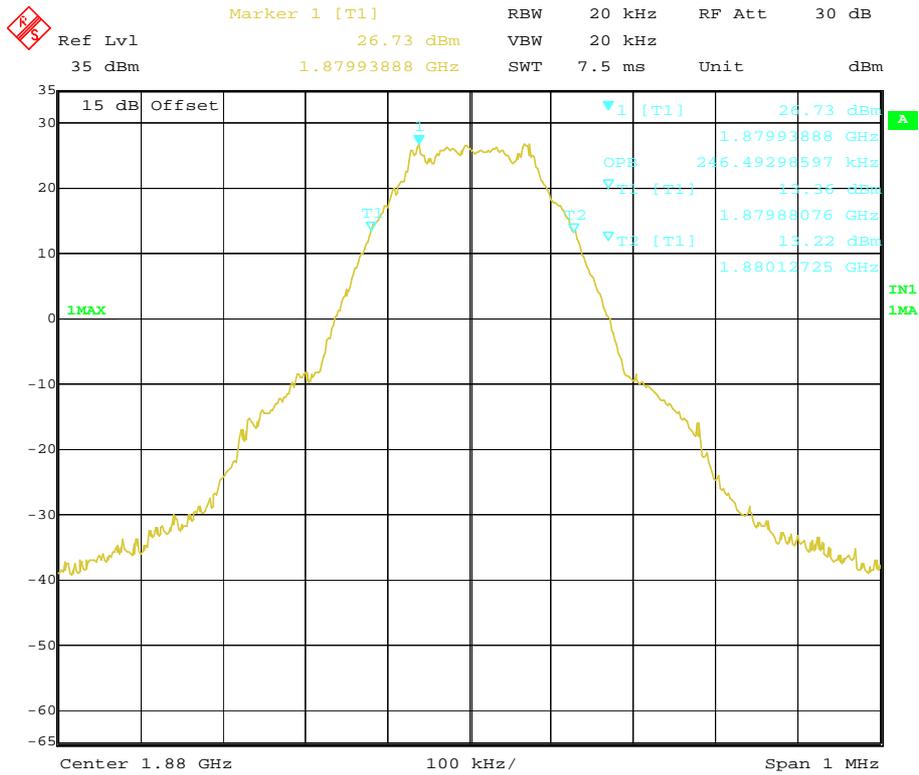
Channel 251



Channel 512

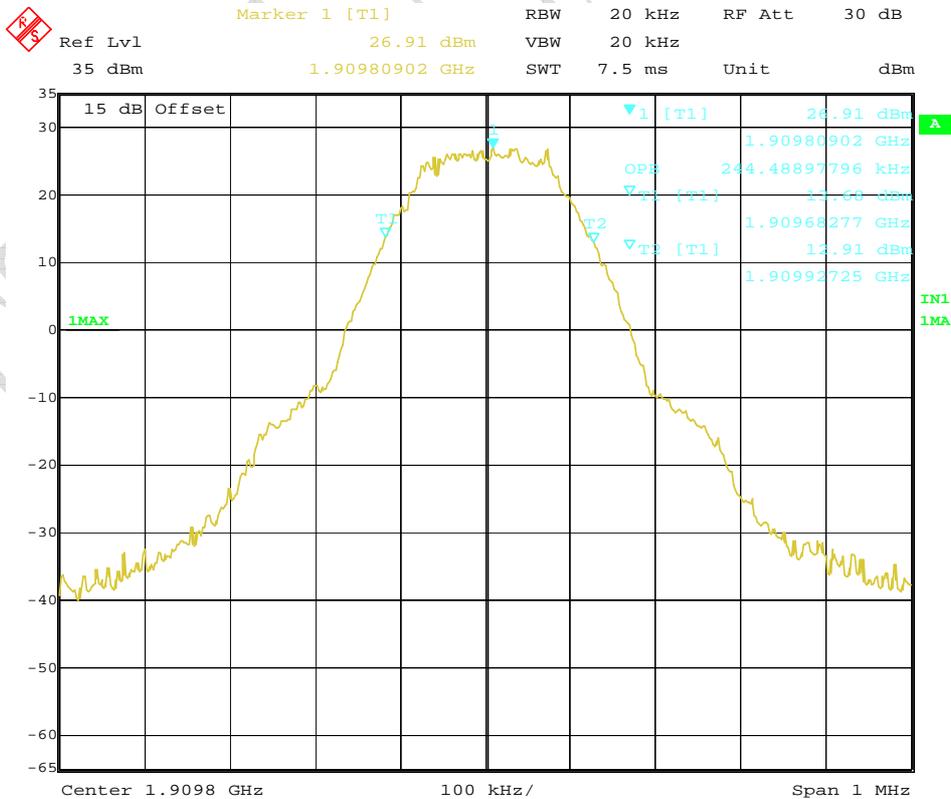
FCC Parts 2, 22, 24  
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-EMC



Date: 8.SEP.2008 19:28:28

Channel 661



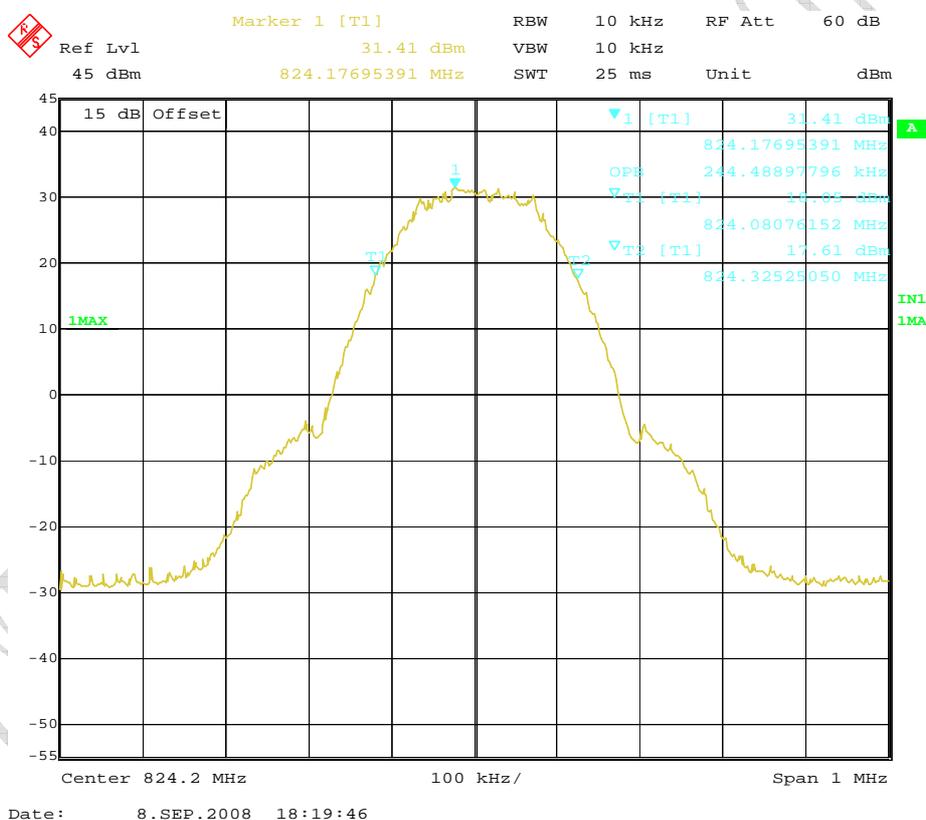
Date: 8.SEP.2008 19:24:40

Channel 810

Results data of EGPRS mode:

EUT channel	99% occupied bandwidth [kHz]
128	244
190	244
251	242
512	244
661	248
810	244

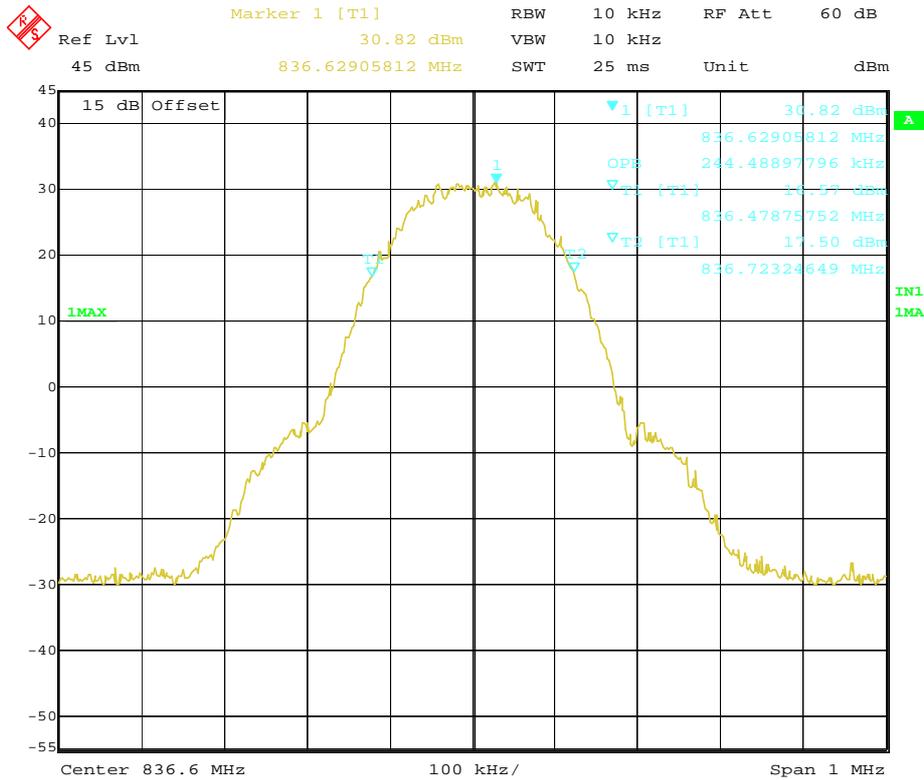
Graphical results for EGPRS mode:



Channel 128

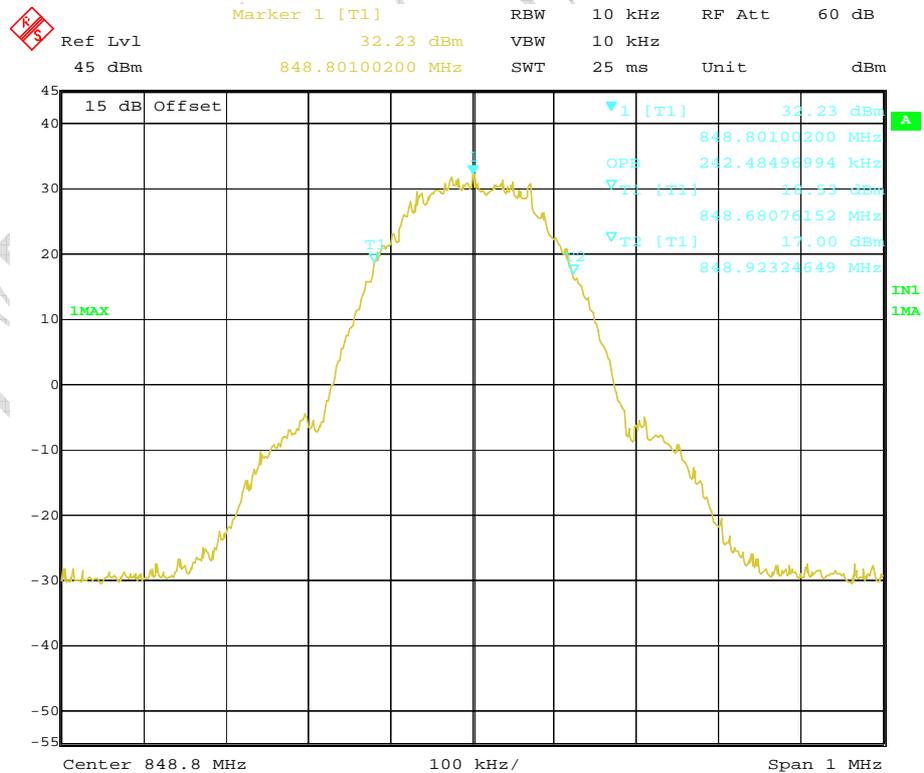
FCC Parts 2, 22, 24  
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-EMC



Date: 8.SEP.2008 18:24:29

Channel 190

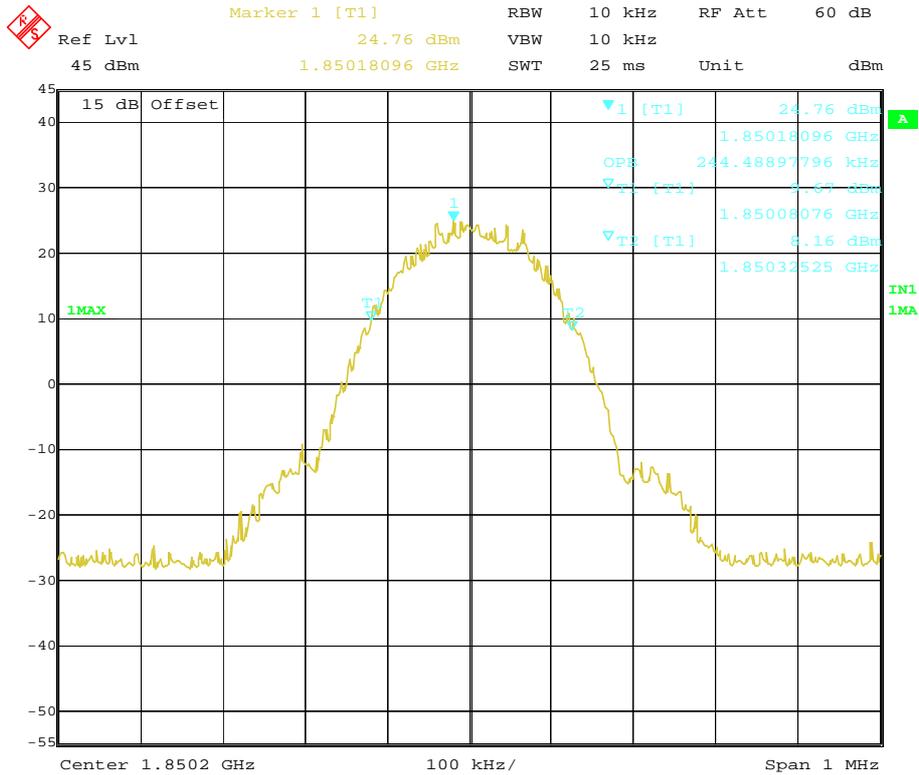


Date: 8.SEP.2008 18:28:18

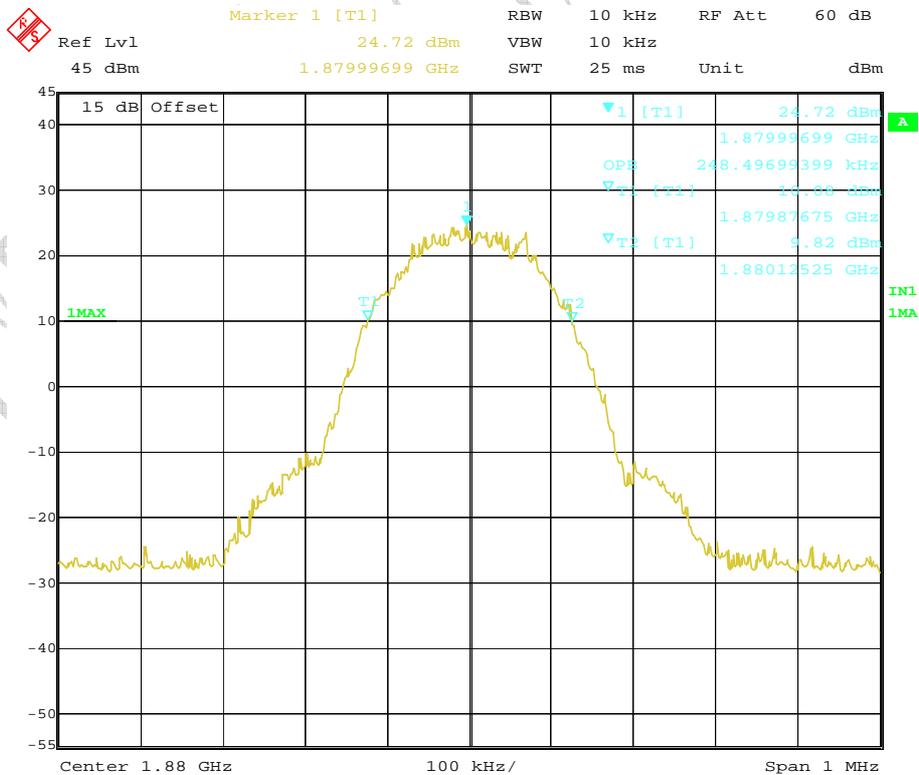
Channel 251

FCC Parts 2, 22, 24  
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-EMC



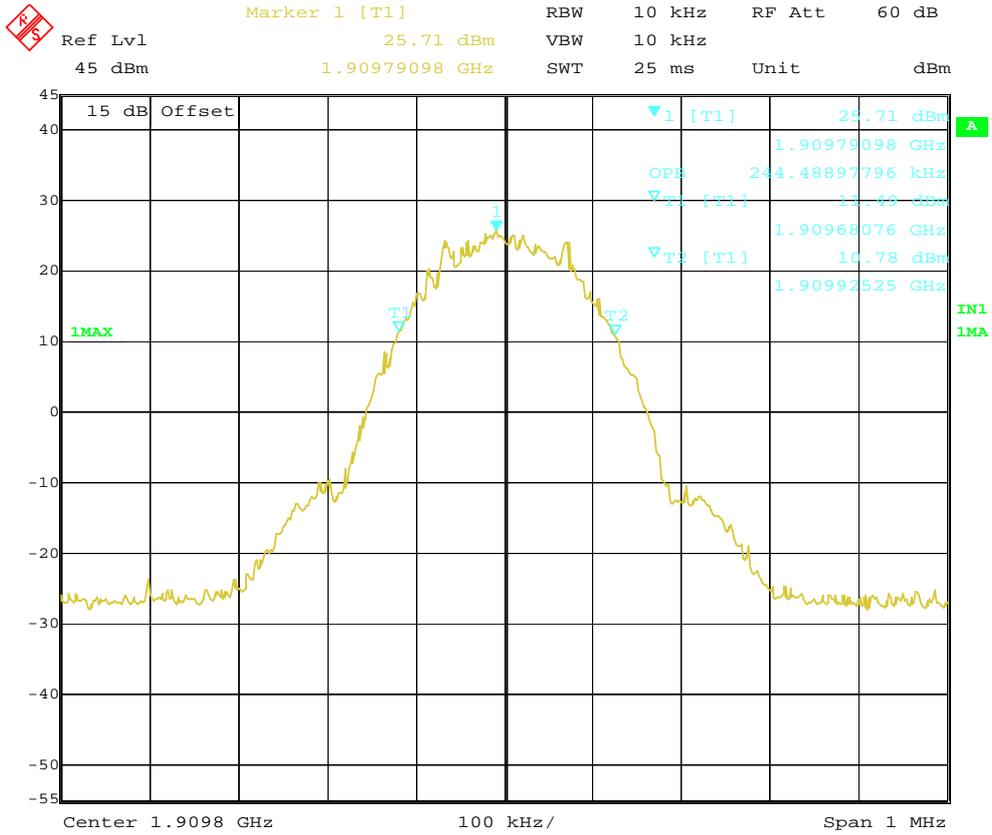
Channel 512



Channel 661

FCC Parts 2, 22, 24  
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-EMC



Date: 8.SEP.2008 18:34:31

Channel 810

TTL LAB

### 4.4 Frequency Stability over Temperature Variation

<b>Specifications:</b>	2.1055,22.355,24.235					
<b>Date of Test</b>	2008-09-10					
<b>Test conditions:</b>	Ambient Temperature: -30°C-50°C Relative Humidity: 30%-60% Air pressure: 86-106kPa					
<b>Operation Mode</b>	TX on, channel 190 and 661					
<b>Test Results:</b>	Pass					
<b>Test equipment Used:</b>						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
023	Wireless Communications Test Set	Agilent	8960(E5515C)	GB41450323	2009-06-13	Normal
561	Temperature Chamber	Terchy Environmental Technology LTD.	MHU-800SR	84121202	2009-05-06	Normal
111835	Wireless Communications Test Set	R&S	CMU200	1100000802	--	Normal
<b>Limit</b>						
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.

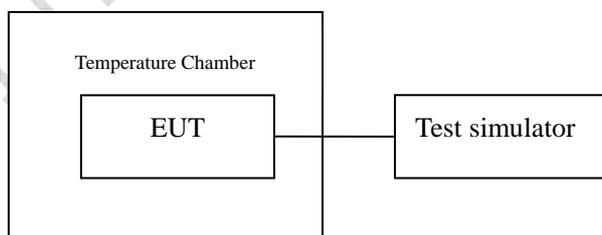


Figure T: setup for measurement of frequency stability over temperature variation

## 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.
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:

Temperature[°C]	Deviation[Hz]	Remarks
-30	46	Pass
-20	49	Pass
-10	45	Pass
0	33	Pass
10	27	Pass
20	18	Pass
30	26	Pass
40	67	Pass
50	37	Pass

Channel 661:

Temperature[°C]	Deviation[Hz]	Remarks
-30	37	Pass
-20	34	Pass
-10	25	Pass
0	20	Pass
10	22	Pass
20	28	Pass
30	44	Pass
40	52	Pass
50	62	Pass

Test results data for GPRS mode:

Channel 190:

Temperature[°C]	Deviation[Hz]	Remarks
-30	37	Pass
-20	34	Pass
-10	19	Pass
0	24	Pass
10	22	Pass
20	20	Pass
30	28	Pass
40	25	Pass
50	33	Pass

Channel 661:

Temperature[°C]	Deviation[Hz]	Remarks
-30	60	Pass
-20	56	Pass
-10	52	Pass
0	51	Pass
10	57	Pass
20	59	Pass
30	64	Pass
40	54	Pass
50	66	Pass

Test results data for EGPRS mode:

Channel 190:

Temperature[°C]	Deviation[Hz]	Remarks
-30	34	Pass
-20	29	Pass
-10	33	Pass
0	28	Pass
10	27	Pass
20	30	Pass
30	35	Pass
40	29	Pass
50	34	Pass

Channel 661:

Temperature[°C]	Deviation[Hz]	Remarks
-30	58	Pass
-20	60	Pass
-10	53	Pass
0	58	Pass
10	54	Pass
20	60	Pass
30	57	Pass
40	63	Pass
50	69	Pass

### 4.5 Frequency Stability over Voltage Variation

<b>Specifications:</b>	2.1055,22.355,24.235					
<b>Date of Test</b>	2008-09-07					
<b>Test conditions:</b>	Ambient Temperature: 15°C -35°C Relative Humidity: 30%-60% Air pressure: 86-106kPa					
<b>Operation Mode</b>	TX on, channel 190 and 661					
<b>Test Results:</b>	Pass					
<b>Test equipment Used:</b>						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
023	Wireless Communications Test Set	Agilent	8960(E5515C)	GB41450323	2009-06-13	Normal
111835	Wireless Communications Test Set	R&S	CMU200	1100000802	--	Normal
7982	DC Power Source	4NIC	DH1715A-3	004224	--	Normal
<b>Limit</b>						
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.

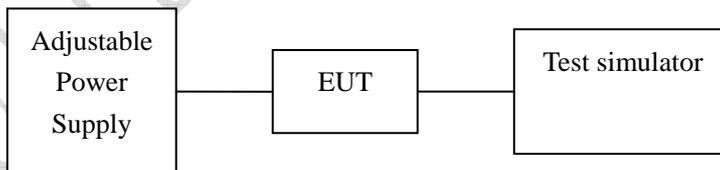


Figure V: test setup for measurement of frequency stability over voltage variation

Test Results data for GSM mode:

Channel 190:

Level	Voltage[V]	Deviation[Hz]	Remarks
Nominal	3.7	12	Pass
Cut-off point	3.3	15	Pass

Channel 661:

Level	Voltage[V]	Deviation[Hz]	Remarks
Nominal	3.7	21	Pass
Cut-off point	3.3	23	Pass

Test Results data for GPRS mode:

Channel 190:

Level	Voltage[V]	Deviation[Hz]	Remarks
Nominal	3.7	-16	Pass
Cut-off point	3.3	-20	Pass

Channel 661:

Level	Voltage[V]	Deviation[Hz]	Remarks
Nominal	3.7	-17	Pass
Cut-off point	3.3	-19	Pass

Test Results data for EGPRS mode:

Channel 190:

Level	Voltage[V]	Deviation[Hz]	Remarks
Nominal	3.7	-18	Pass
Cut-off point	3.3	-19	Pass

Channel 661:

Level	Voltage[V]	Deviation[Hz]	Remarks
Nominal	3.7	-19	Pass
Cut-off point	3.3	-21	Pass

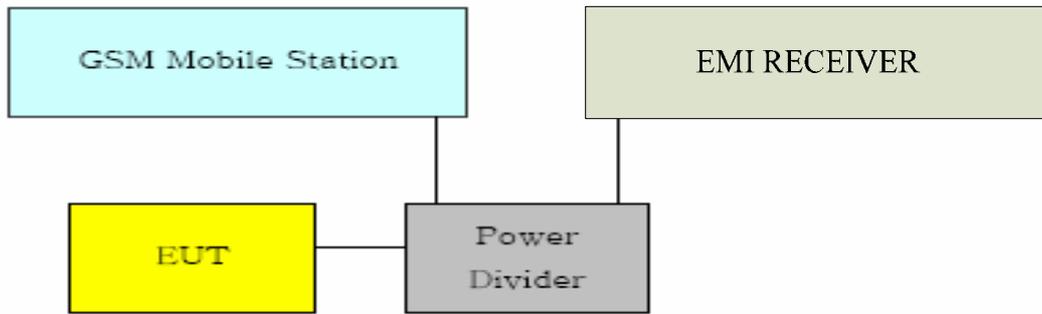
### 4.6 Conducted RF Power Output

<b>Specifications:</b>	2.1046,22.913(a),24.232(c)					
<b>Date of Tests</b>	2008-09-04					
<b>Test conditions:</b>	Ambient Temperature: 15°C-35°C Relative Humidity: 30%-60% Air pressure: 86-106kPa					
<b>Operation Mode</b>	TX on, channel 128, 190, 251, 512, 661 and 810					
<b>Test Results:</b>	Pass					
<b>Test equipment Used:</b>						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2009-01-04	Normal
023	Wireless Communications Test Set	Agilent	8960(E5515C)	GB41450323	2009-06-13	Normal
---	Power splitter	Jie sai	---	1000132	2009-01-04	Normal
111835	Wireless Communications Test Set	R&S	CMU200	1100000802	--	Normal

<b>Limits for Radiated RF Power Output</b>	
Frequency range	Limit Level (EIRP)/Resolution Bandwidth
TX channel	33dBm/1MHz
<b>Limits for ERP</b>	
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:

EIRP Value for GSM 850 band:

ARFCN	Peak output power [dBm]
128	32.42
190	31.2
251	31.2

EIRP Value for GSM 1900 band:

ARFCN	Peak output power [dBm]
512	28.97
661	29.03
810	29.97

### Test Results for GPRS mode:

ERP Value for GPRS 850 band:

ARFCN	Peak output power [dBm]
128	30.69
190	30.72
251	30.68

EIRP Value for GPRS 1900 band:

ARFCN	Peak output power [dBm]
512	27.34
661	26.73
810	26.91

### Test Results for EGPRS mode:

ERP Value for EGPRS 850 band:

ARFCN	Peak output power [dBm]
128	29.26
190	28.67
251	30.08

EIRP Value for EGPRS 1900 band:

ARFCN	Peak output power [dBm]
512	24.76
661	24.72
810	25.71

### 4.7 Conducted Spurious Emission

<b>Specifications:</b>	2.1051,22.917,24.238					
<b>Date of Tests</b>	2008-09-04					
<b>Test conditions:</b>	Ambient Temperature: 15°C -35°C Relative Humidity: 30%-60% Air pressure: 86-106kPa					
<b>Operation Mode</b>	TX on, channel 190 and 661					
<b>Test Results:</b>	Pass					
<b>Test equipment Used:</b>						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ES126	100211	2009-01-04	Normal
023	Wireless Communications Test Set	Agilent	8960(E5515C)	GB41450323	2009-06-13	Normal
---	Power splitter	Jie sai	---	1000132	2009-01-04	Normal
111835	Wireless Communications Test Set	R&S	CMU200	1100000802	--	Normal

**Limit Level Construction:**

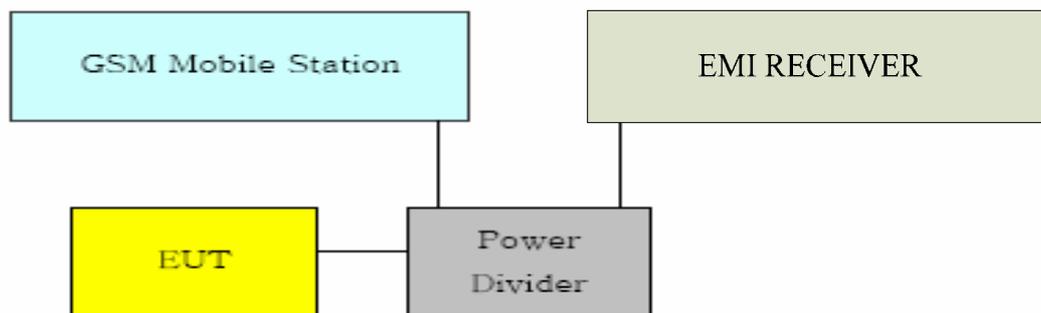
According to Part 24.238 (a), i.e., Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB, so the limit level is:  
 $P(\text{dBm}) - (43 + 10 \log(P)) \text{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

**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 Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by Rhode & Schwarz EMI test receiver (ES126)



### Test Method

The measurement was performed accordance with section 2.2.13 of ANSI/TIA-603-B-2002: *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.

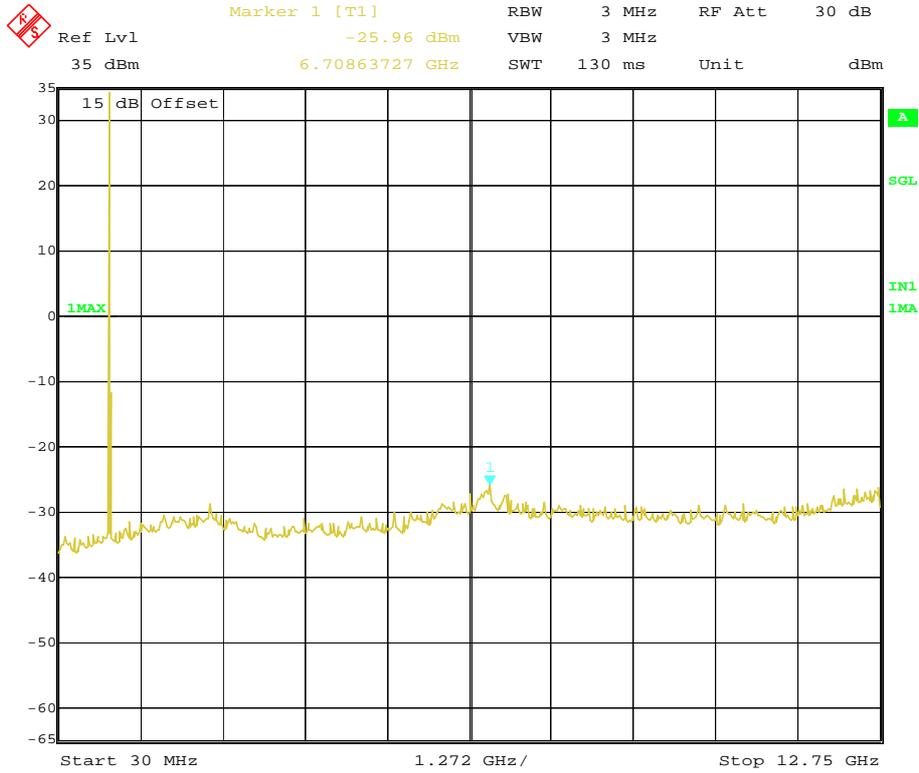
1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment under test, this equates to a frequency range of 30 MHz to 19.1 GHz,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

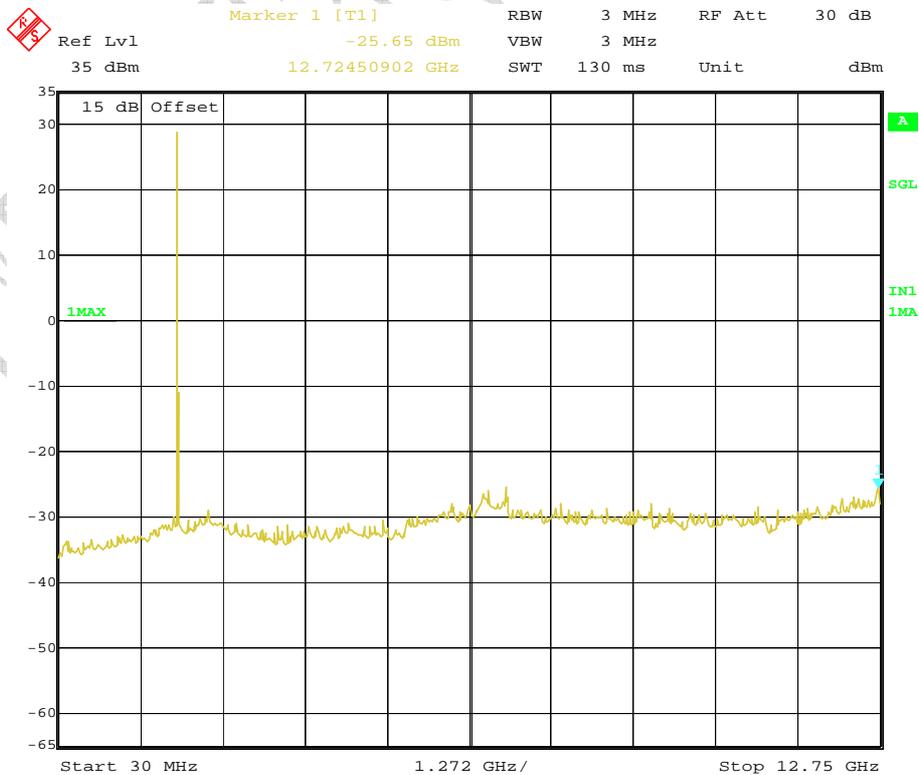
Out of band emission	
Frequency [MHz]	Level (dBm)
--	--

Graphical results for GSM mode:



Date: 4.SEP.2008 21:50:40

Channel 190



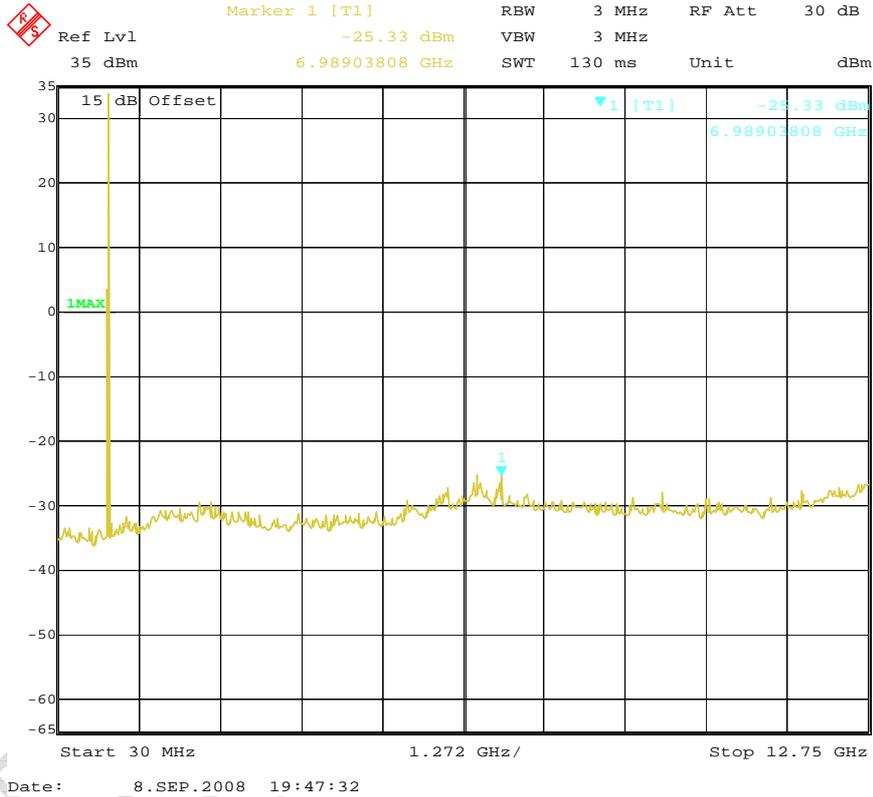
Date: 4.SEP.2008 21:52:06

Channel 661

**Test Results for GPRS mode:**

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

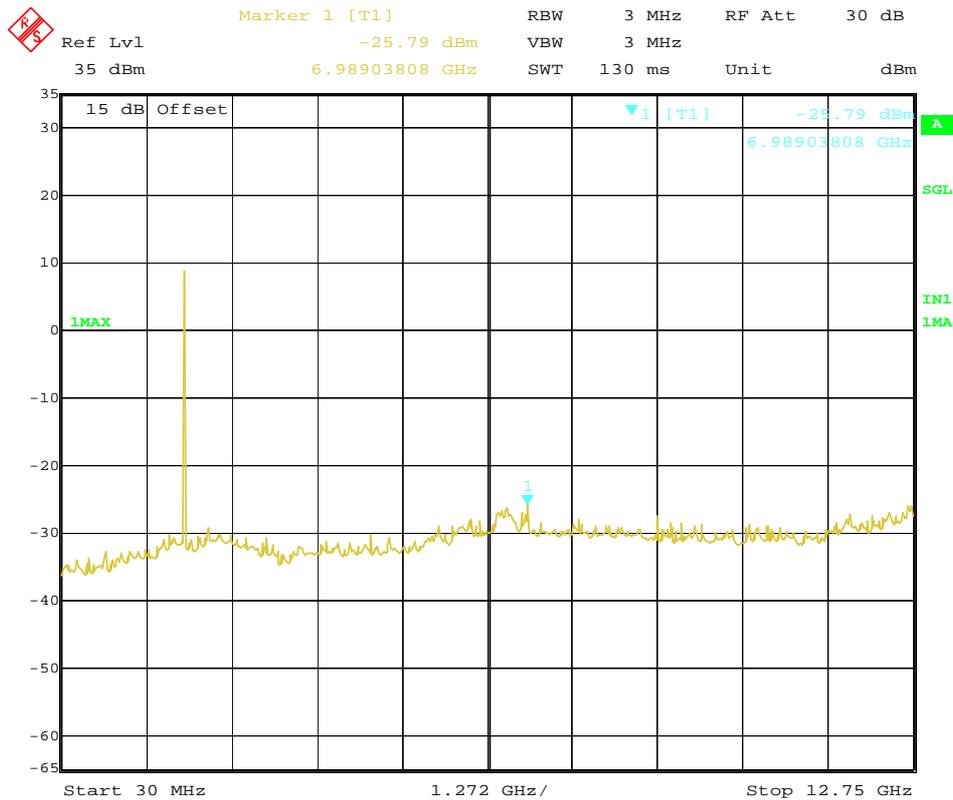
**Graphical results for GPRS mode:**



Channel 190

FCC Parts 2, 22, 24  
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-EMC



Date: 8.SEP.2008 19:50:03

Channel 661

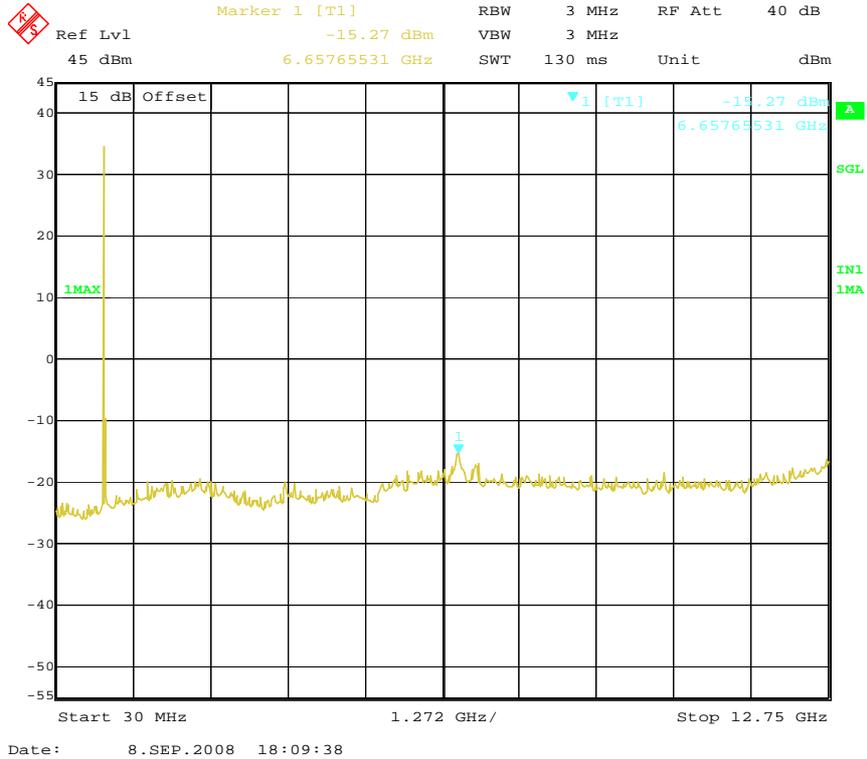
**Test Results for EGPRS mode:**

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

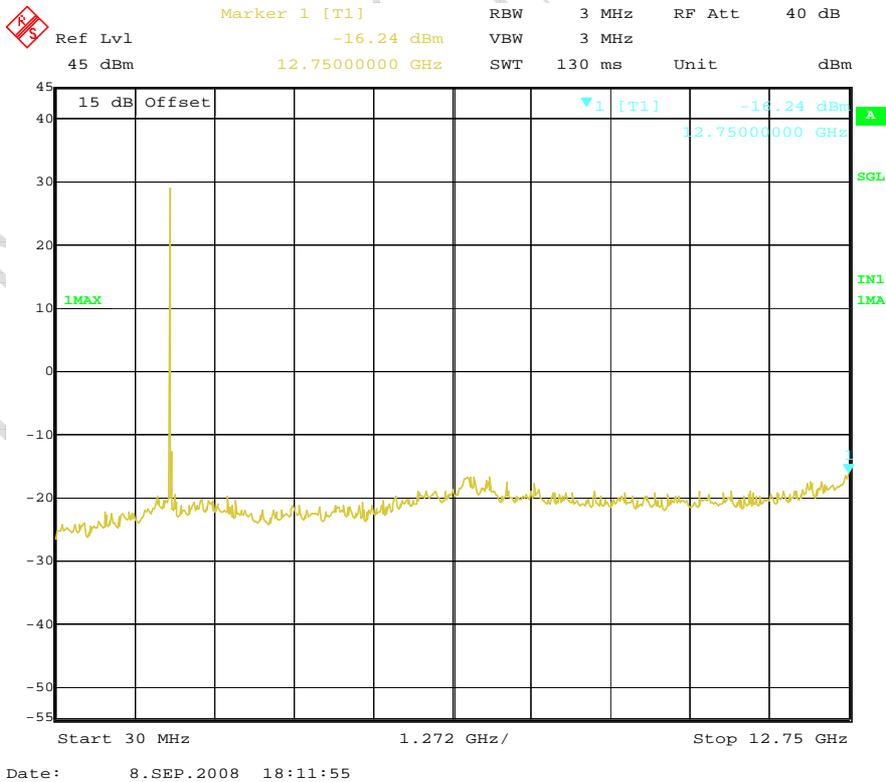
FCC Parts 2, 22, 24  
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-EMC

Graphical results for EGPRS mode:



Channel 190



Channel 661

### 4.8 Band Edge

<b>Specifications:</b>	2.1051, 24.238, 2.1053, 22.917					
<b>Date of Tests</b>	2008-09-04					
<b>Test conditions:</b>	Ambient Temperature: 15°C-35°C Relative Humidity: 30%-60% Air pressure: 86-106kPa					
<b>Operation Mode</b>	TX on, channel 128, 251, 512 and 810					
<b>Test Results:</b>	Pass					
<b>Test equipment Used:</b>						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2009-01-04	Normal
023	Wireless Communications Test Set	Agilent	8960(E5515C)	GB41450323	2009-06-13	Normal
---	Power splitter	Jie sai	---	1000132	2009-01-04	Normal
111835	Wireless Communications Test Set	R&S	CMU200	1100000802	--	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:  

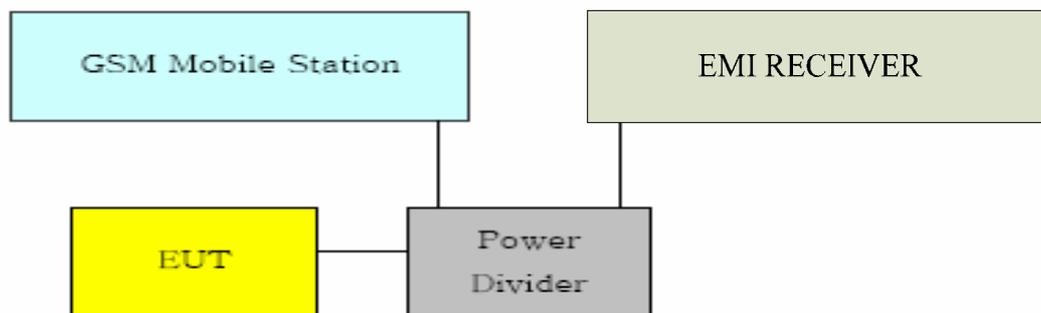
$$P(\text{dBm}) - (43 + 10 \log(P)) \text{ dB} = -13\text{dBm}$$

#### 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:

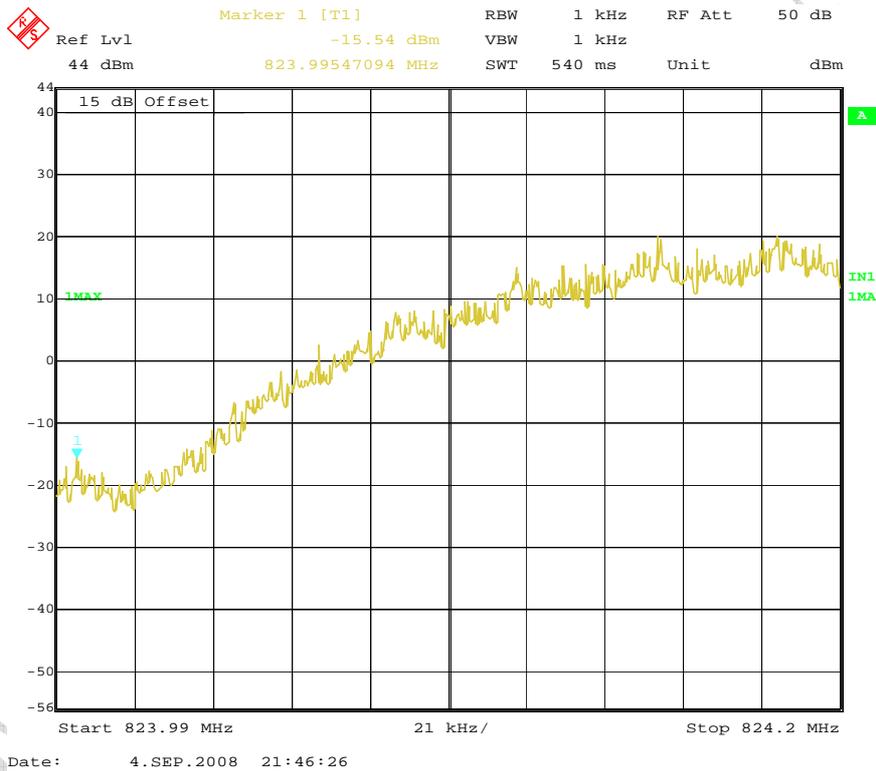
Band-edge emission		
EUT Channel	Frequency [MHz]	Level [dBm]
128 Left band edge	824.000	-15.54
251 Right band edge	849.000	-17.03
512 Left band edge	1850.000	-21.92
810 Right band edge	1910.000	-34.99

#### GPRS mode:

Band-edge emission		
EUT Channel	Frequency [MHz]	Level [dBm]
128 Left band edge	824.000	-16.08
251 Right band edge	849.000	-17.45
512 Left band edge	1850.000	-21.64
810 Right band edge	1910.000	-23.39

**EGPRS mode:**

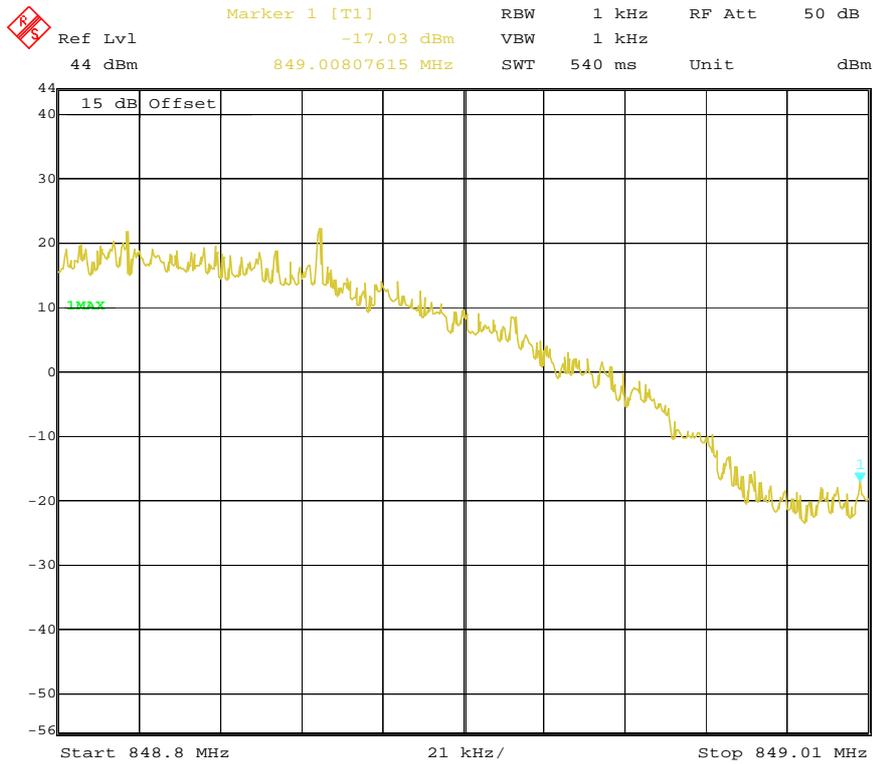
Band-edge emission		
EUT Channel	Frequency [MHz]	Level [dBm]
128 Left band edge	824.000	-16.61
251 Right band edge	849.000	-18.36
512 Left band edge	1850.000	-22.15
810 Right band edge	1910.000	-13.75



GSM channel 128 Left band edge

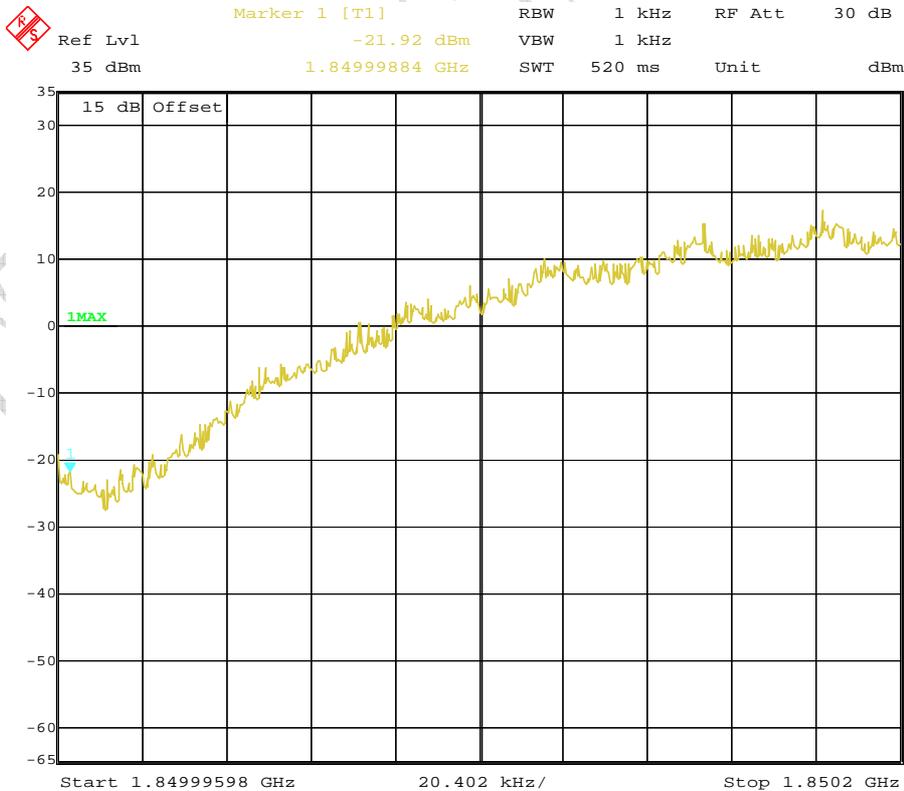
FCC Parts 2, 22, 24  
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-EMC



Date: 4.SEP.2008 21:49:35

GSM channel 251 Right band edge

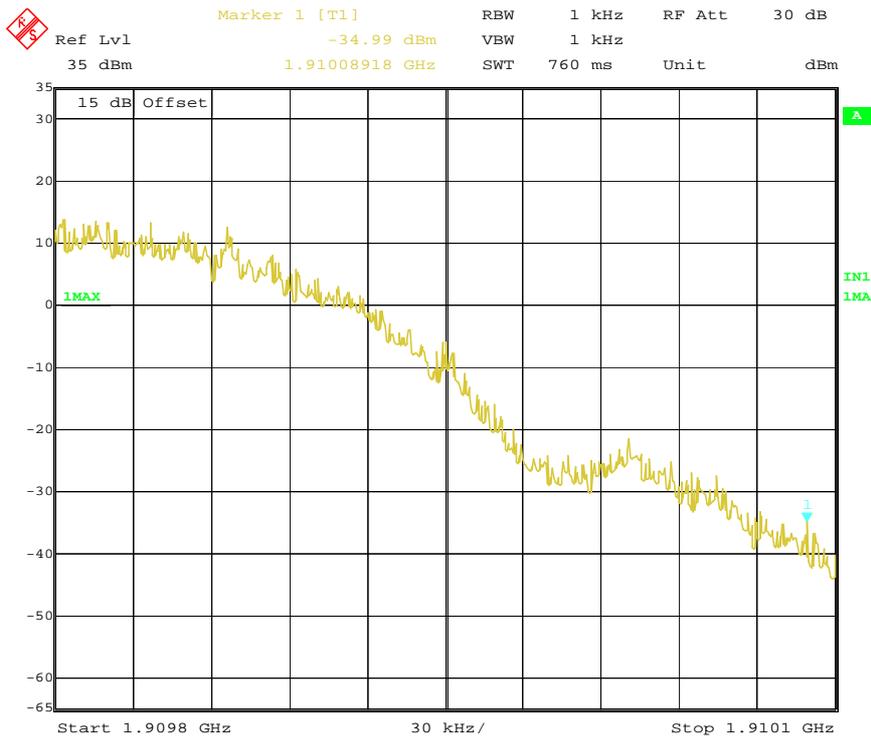


Date: 4.SEP.2008 21:59:40

GSM channel 512 Left band edge

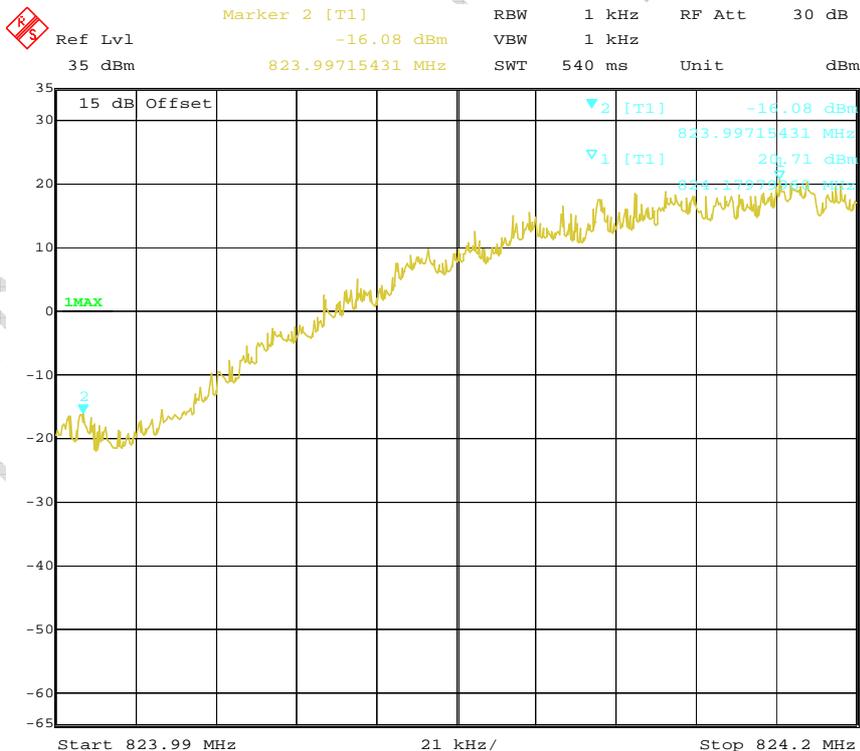
FCC Parts 2, 22, 24  
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-EMC



Date: 4.SEP.2008 21:56:38

GSM channel 810 Right band edge

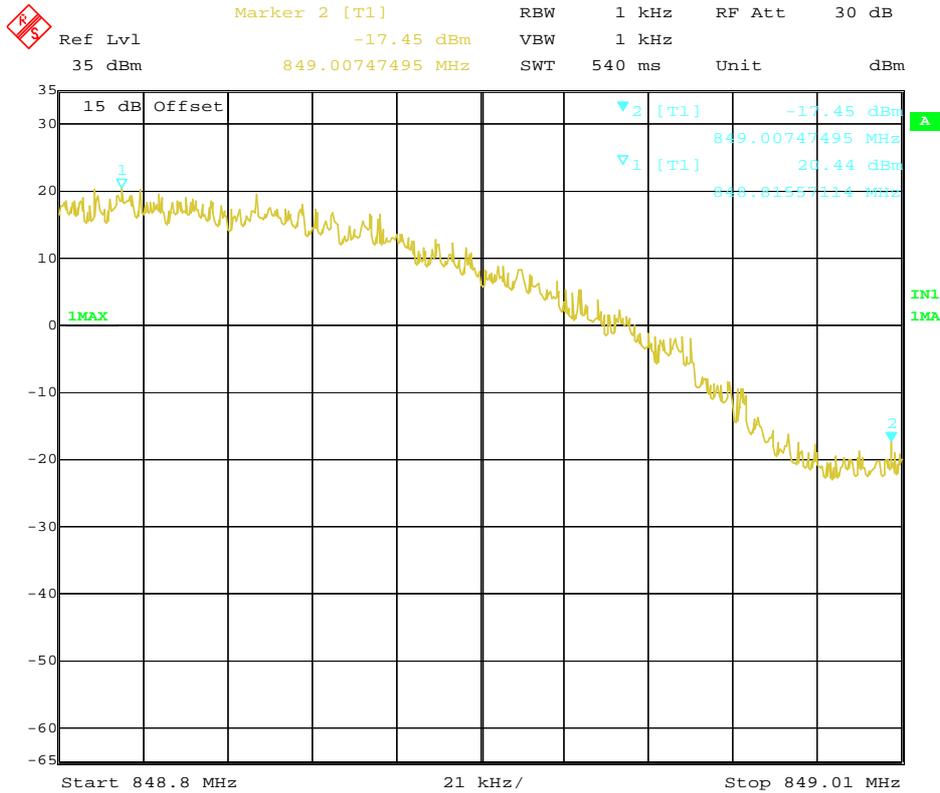


Date: 8.SEP.2008 19:17:52

GPRS channel 128 Left band edge

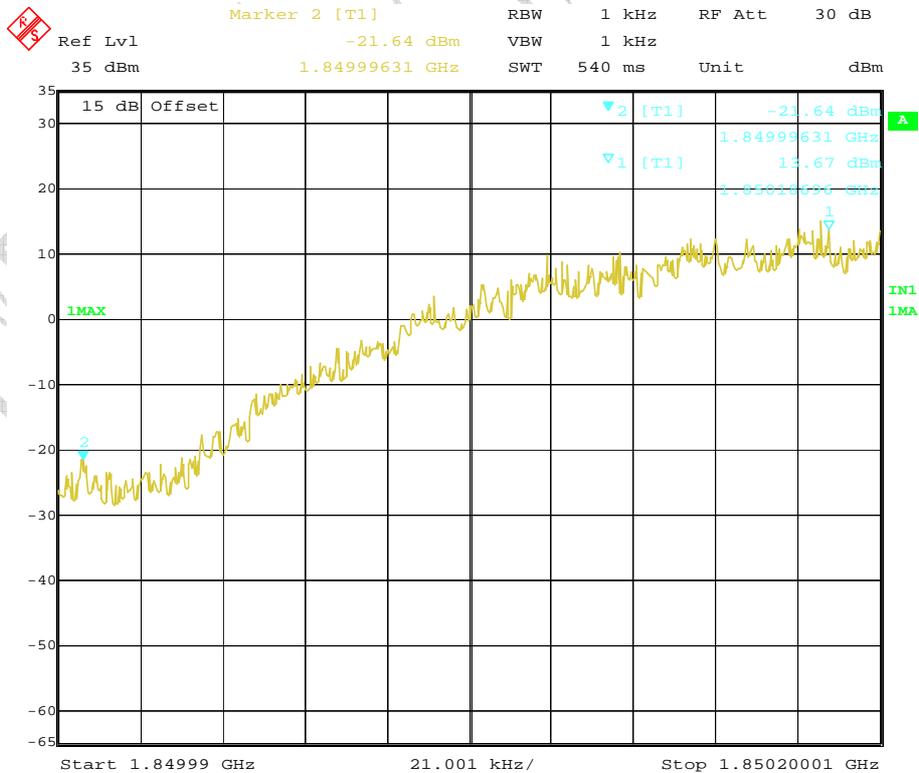
FCC Parts 2, 22, 24  
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-EMC



Date: 8.SEP.2008 19:20:18

GPRS channel 251 Right band edge

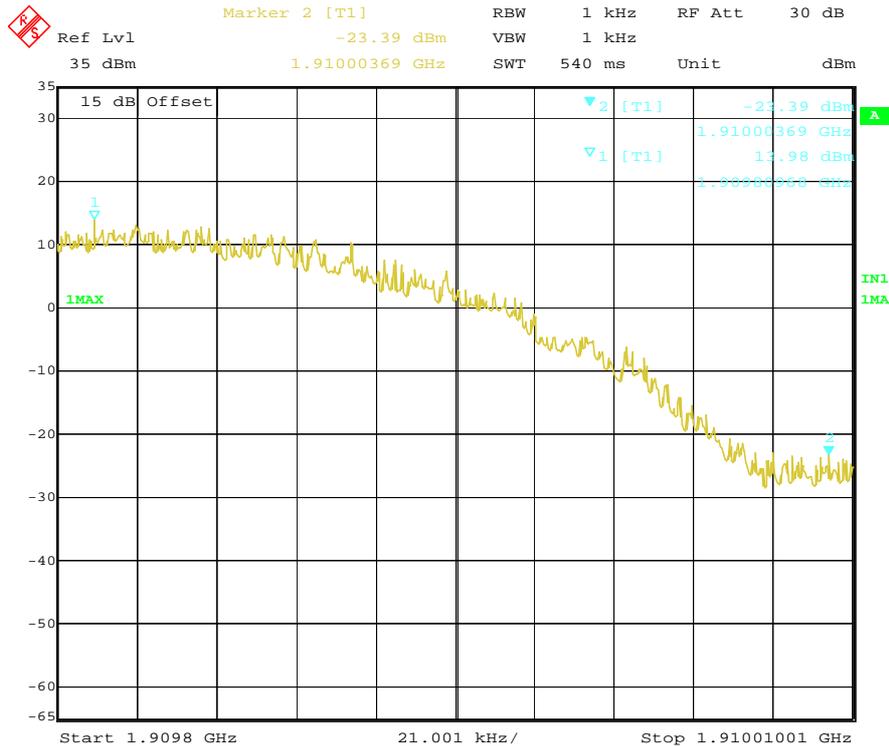


Date: 8.SEP.2008 19:14:59

GPRS channel 512 Left band edge

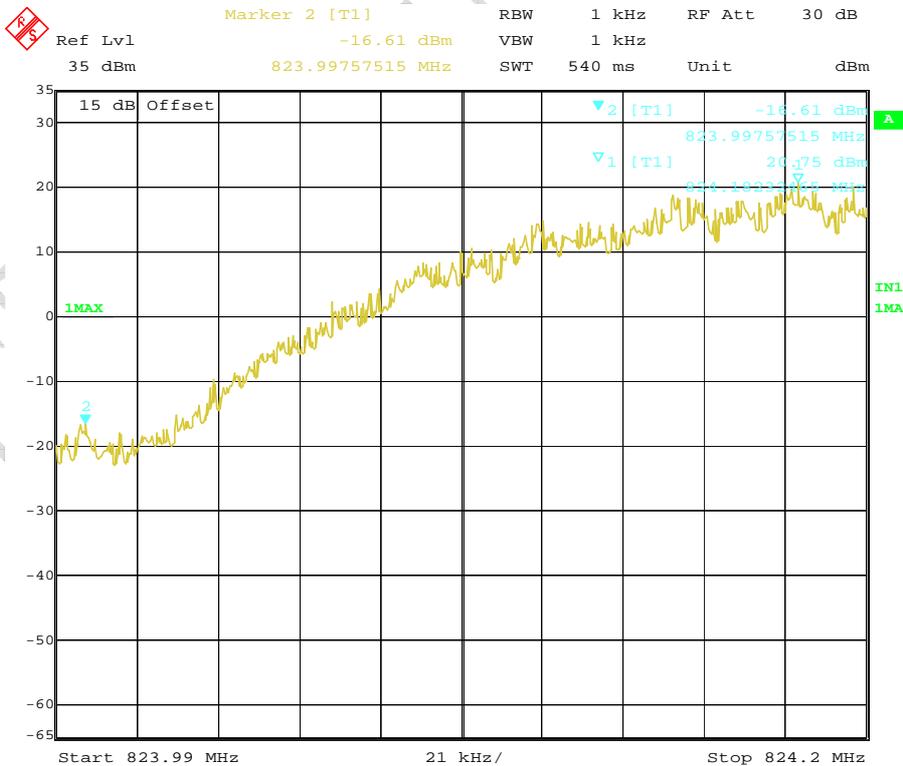
FCC Parts 2, 22, 24  
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-EMC



Date: 8.SEP.2008 19:22:30

GPRS channel 810 Right band edge

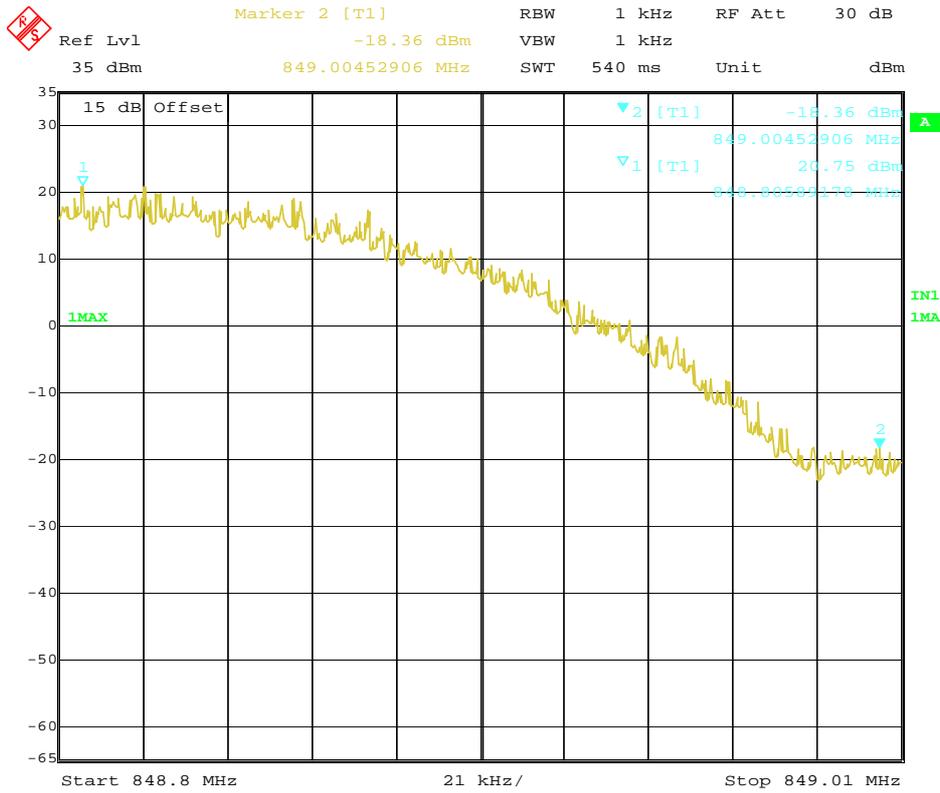


Date: 8.SEP.2008 19:02:07

EGPRS channel 128 Left band edge

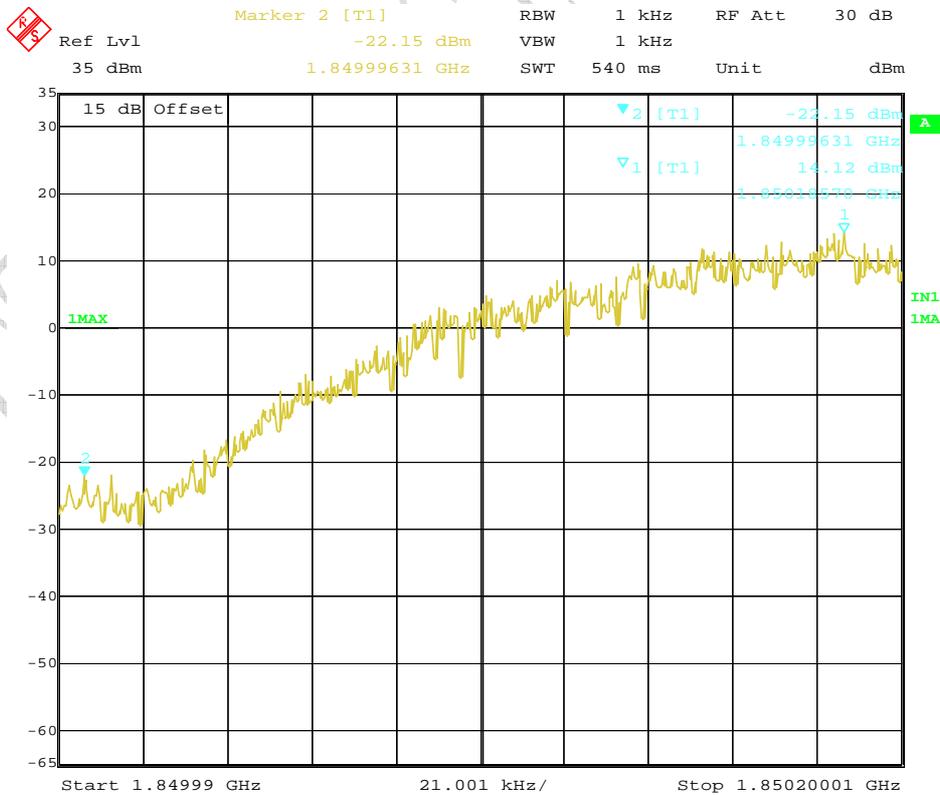
FCC Parts 2, 22, 24  
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-EMC



Date: 8.SEP.2008 18:59:30

EGPRS channel 251 Right band edge

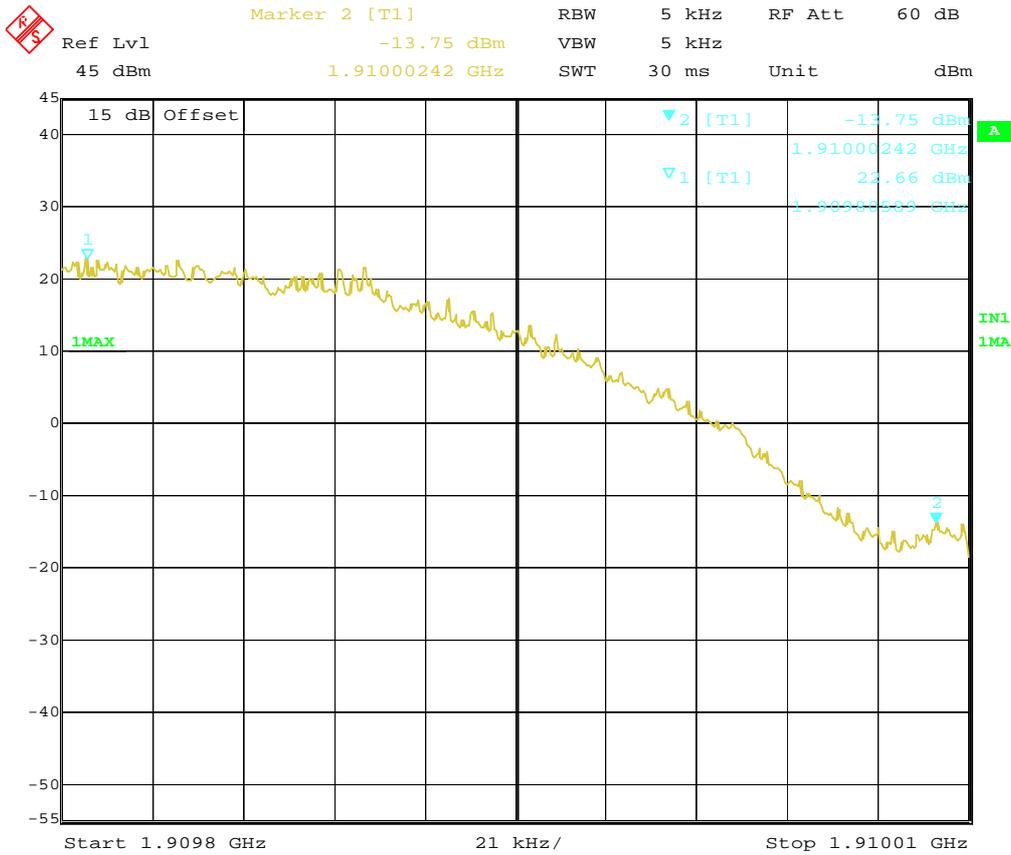


Date: 8.SEP.2008 19:04:42

EGPRS channel 512 Left band edge

FCC Parts 2, 22, 24  
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-EMC



Date: 8.SEP.2008 18:56:59

EGPRS channel 810 Right band edge

TTL

## Annex A External Photos



Front view



Back view



Adaptor and cable



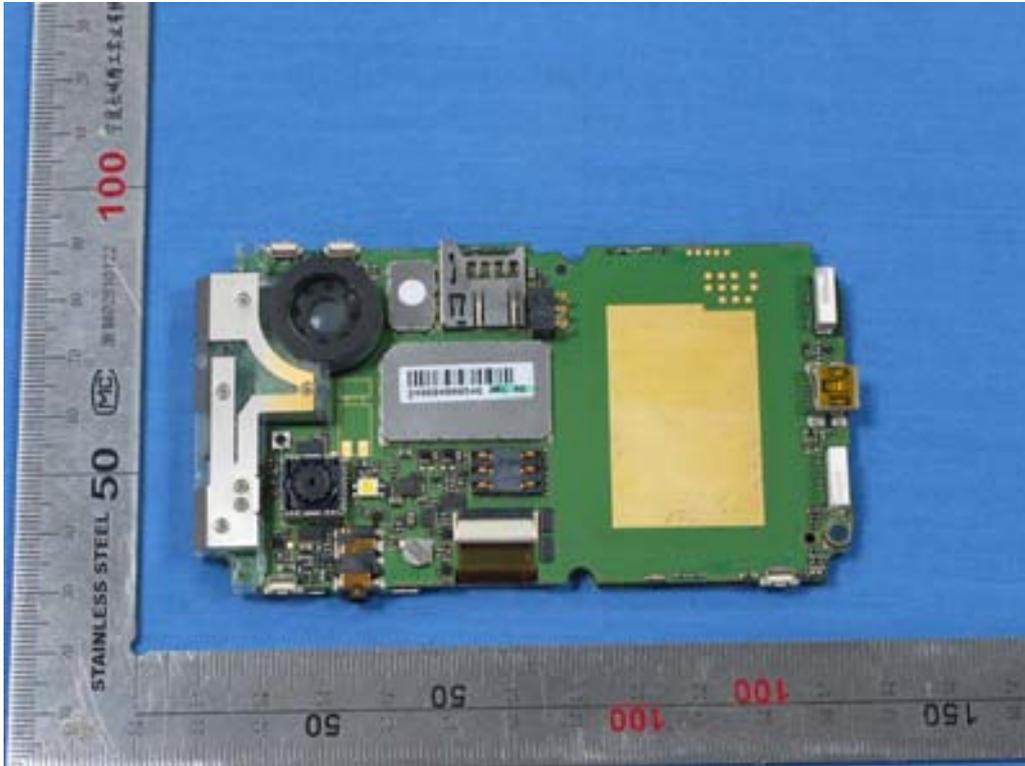
Headset



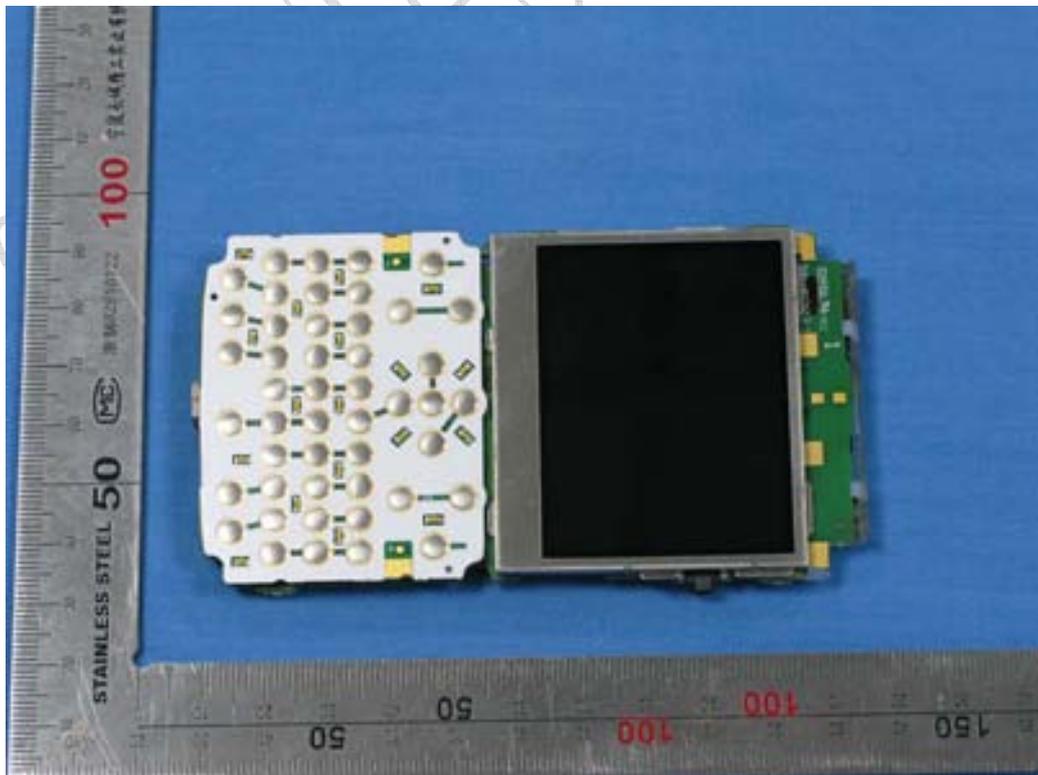
battery

CITL TEST

## Annex B Internal Photos



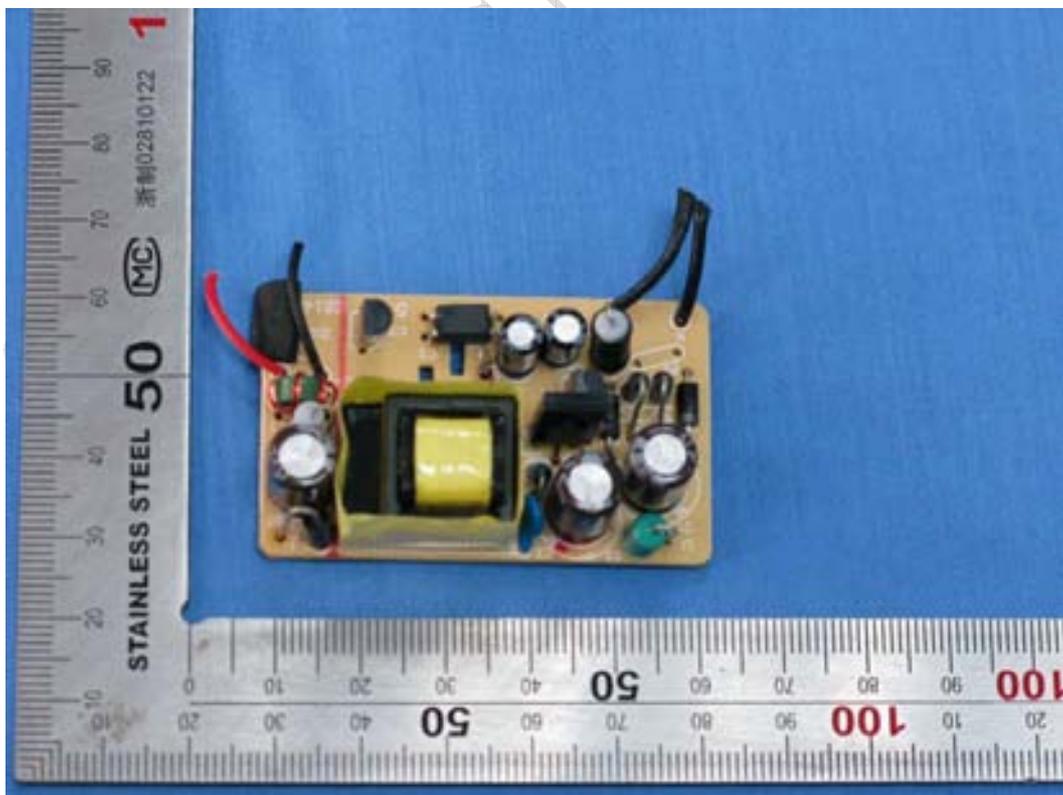
Main board (face)



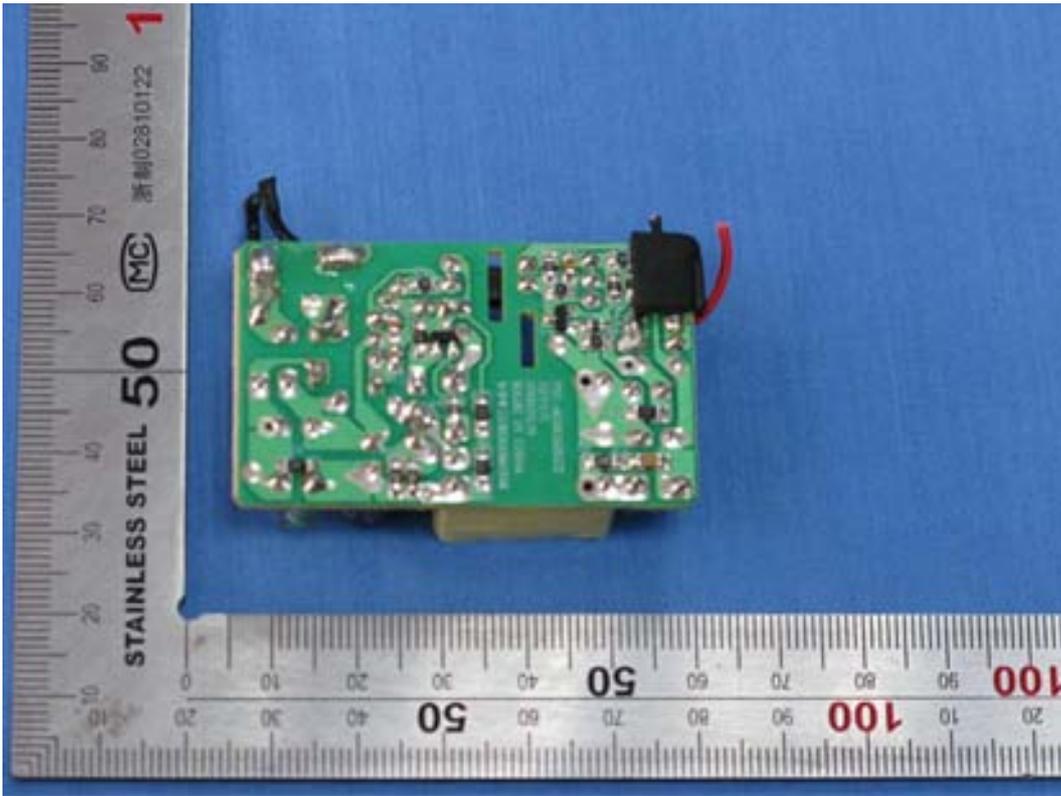
Main board (back)



keyboard



Adaptor face



Adaptor back

TTL TEST

## ANNEX C Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

————— The End of this Report —————

*ATTN Test Report*