TEST REPORT

REPORT NUMBER: I09GE4084-FCC-EMC

ON

Type of Equipment:	Mobile Phone
Type of Designation:	Sonim XP3.20-A Quest / Land Rover S1-A by Sonim
Type Number:	P23C001AA
Manufacturer:	SONIM TECHNOLOGIES INC.

ACCORDING TO

FCC CFR Part 2, FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS; e-CFR, March 23, 2006

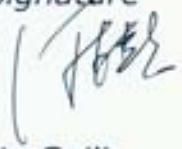
PART 22, PUBLIC MOBILE SERVICES (Oct 1, 02 Edition)

PART 24, PERSONAL COMMUNICATIONS SERVICES (Oct 1, 97 Edition)

China Telecommunication Technology Labs.

Month date, year
Mar, 30, 2009

Signature



He Guili
Director

FCC ID: WYPP23C001AA

Report Date: 2009-3-30

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.

CONTENTS

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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1.2 Testers

Name: Li Dongjin

Position: Engineer

Department: Department of EMC test

Signature:

Name: Yuan Yuan

Position: Engineer

Department: Department of EMC test

Signature:

Editor of this test report:

Name: Li Guoqing

Position: Engineer

Department: Department of EMC test

Date: 2009-3-30

Signature:

Technical responsibility for area of testing:

Name: Zou Dongyi

Position: Manager

Department: Department of EMC test

Date: 2009-3-30

Signature:

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, 100083
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:	------

1.4 Details of applicant or manufacturer

1.4.1 Applicant

Name:	SONIM TECHNOLOGIES INC.
Address:	1875 S.GRANT STREET
	SAN MATEO, CA 94402, USA
Country:	USA
Telephone:	+1 650 704 4926
Fax:	+1 650 378 8109
Contact:	JASEN KOLEV
Telephone:	+1 650 704 4926
Email:	jasen@sonimtech.com

1.4.2 Manufacturer (if different from applicant in section 1.4.1)

Name:	SONIM TECHNOLOGIES INC.
Address:	1875 S.GRANT STREET
	SAN MATEO, CA 94402, USA

1.4.3 Manufactory (if different from applicant in section 1.4.1)

Name:	Flextonics Industrial (Zhuhai)
Address:	Xin Qing Science & Technology Industrial Park, Jing An Town, DouMen,ZhuHai City,GuangDong,P.R. China, Zip Code: 519180

2 Test Item

2.1 General Information

Manufacturer: SONIM TECHNOLOGIES INC.
Name: Mobile Phone
Model Number: Sonim XP3.20-A Quest / Land Rover S1-A by Sonim
Type Number: P23C001AA
Serial Number: --
Production Status: Product
Receipt date of test item: 2008-01-13

2.2 Outline of EUT

E.U.T. is a GSM 850 and 1900 band Mobile phone supporting GSM GPRS and EGPRS.

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	SONIM TECHNOLOGIES INC.	Sonim XP3.20-A Quest / Land Rover S1-A by Sonim	--	None
B	adapter	SONIM TECHNOLOGIES INC.	DSA-0051-05C FUS 51055F	--	None
C	battery	SONIM TECHNOLOGIES INC.	XP3.20-0001100	--	None
D	Earphone	SONIM TECHNOLOGIES INC.	ME-848B14	--	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.

(b) Emission Designator is 285KGXW.

(c) Version of hardware and software

HW Version: A

SW Version: 05.0.0-18.2-2

(d) Adaptor information:

Input: 100-240VAC 50/60Hz 0.2A

Output: 5.1VDC 0.55A

(e) Battery information:

3.7VDC 1850mAh

3 Summary of Test Results

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

GSM mode:		
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.		

GPRS mode:		
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.		

EGPRS mode:		
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.		

4 Test Results of mode

4.1 Radiated Spurious Emission

Specifications:	2.1051, 24.238, 2.1053, 22.917
Date of Tests	2009-3-5/6
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Operation Mode	TX on, channel 190 and 661
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	2010-01-11	Normal
7330	Ultra Broadband Antenna	SCHWARZBECK	VULB 9160	--	2010-10-26	Normal
7330	Double-Ridged Horn Antenna	R/S	HF906	100037	2010-01-09	Normal
713	Fully-Anechoic Chamber	ETS	11.8m×6.5m×6.3m	--	2010-11-16	Normal
023	Wireless Communications Test Set	Agilent	8960(E5515C)	GB41450323	2009-06-13	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(dBm) – (43 + 10 log(P)) dB= -13dBm

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.

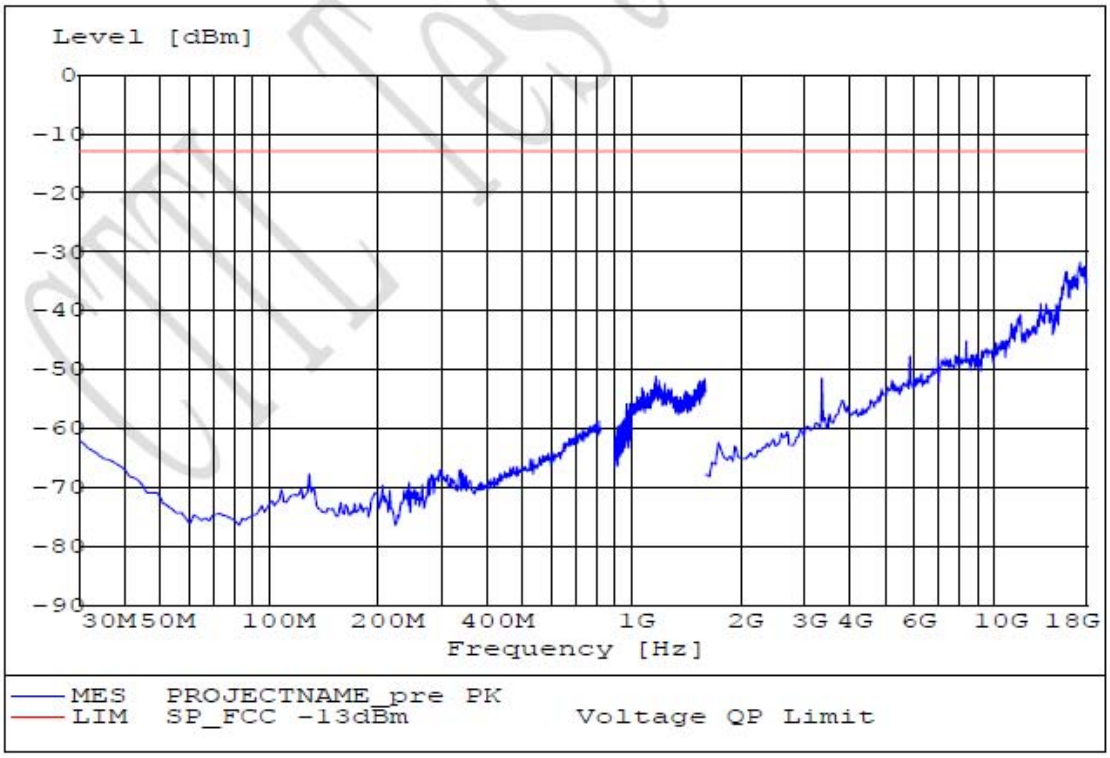
Note:

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



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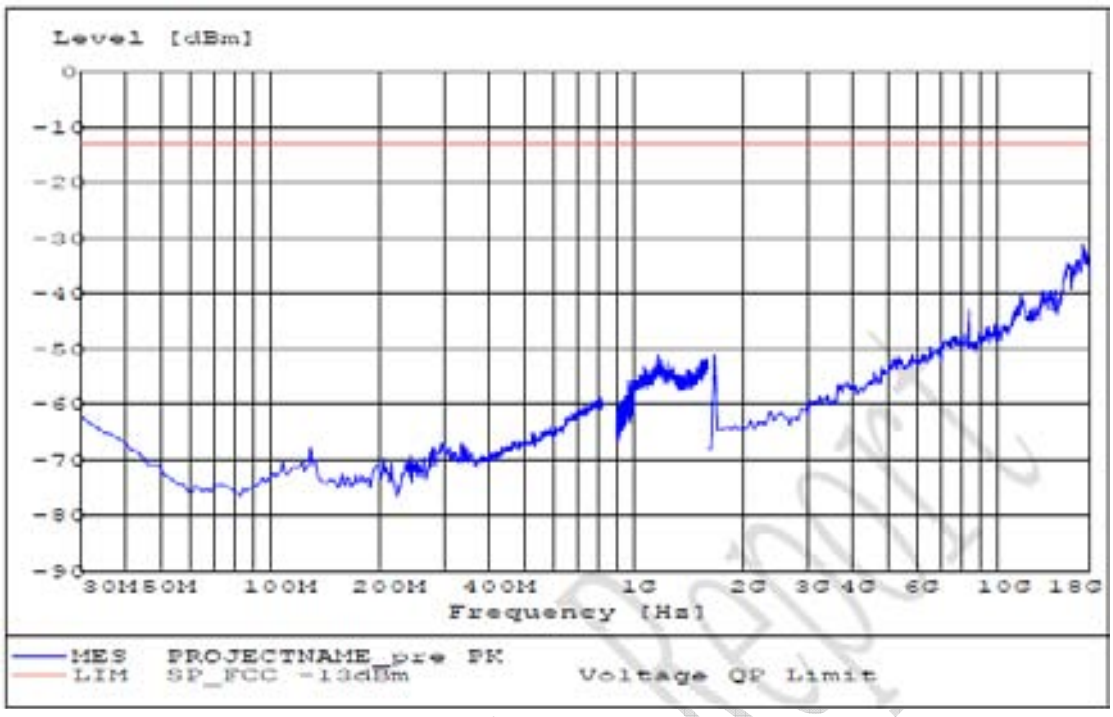
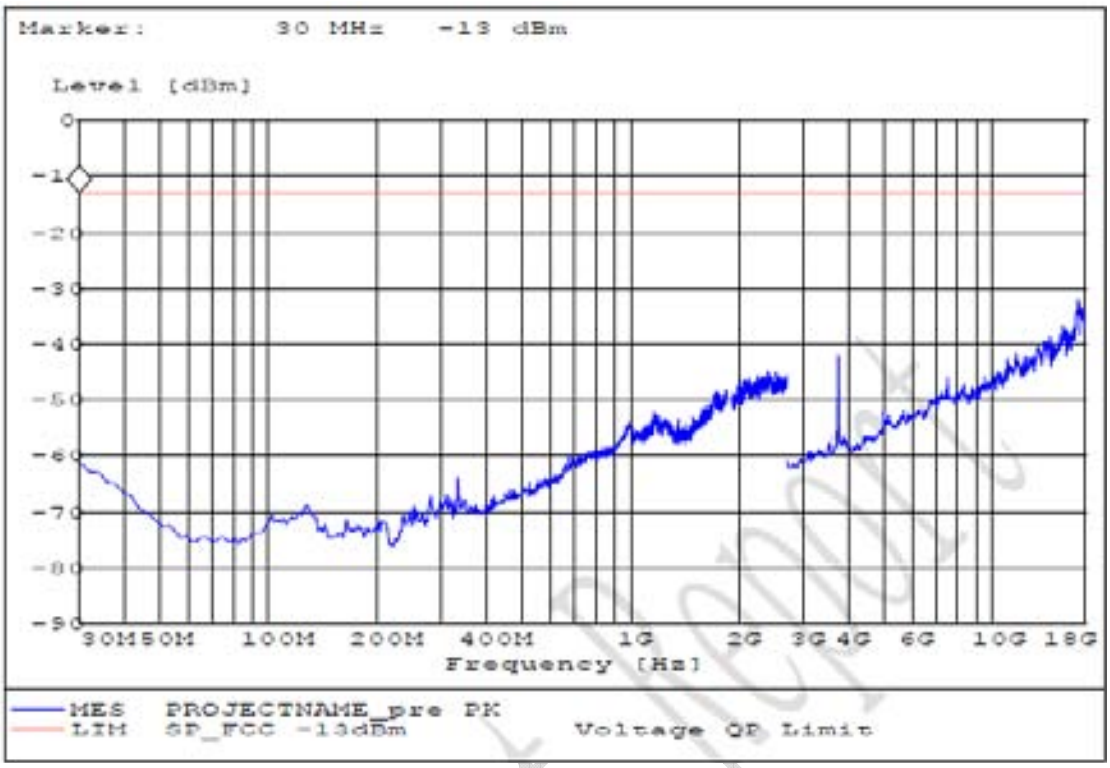
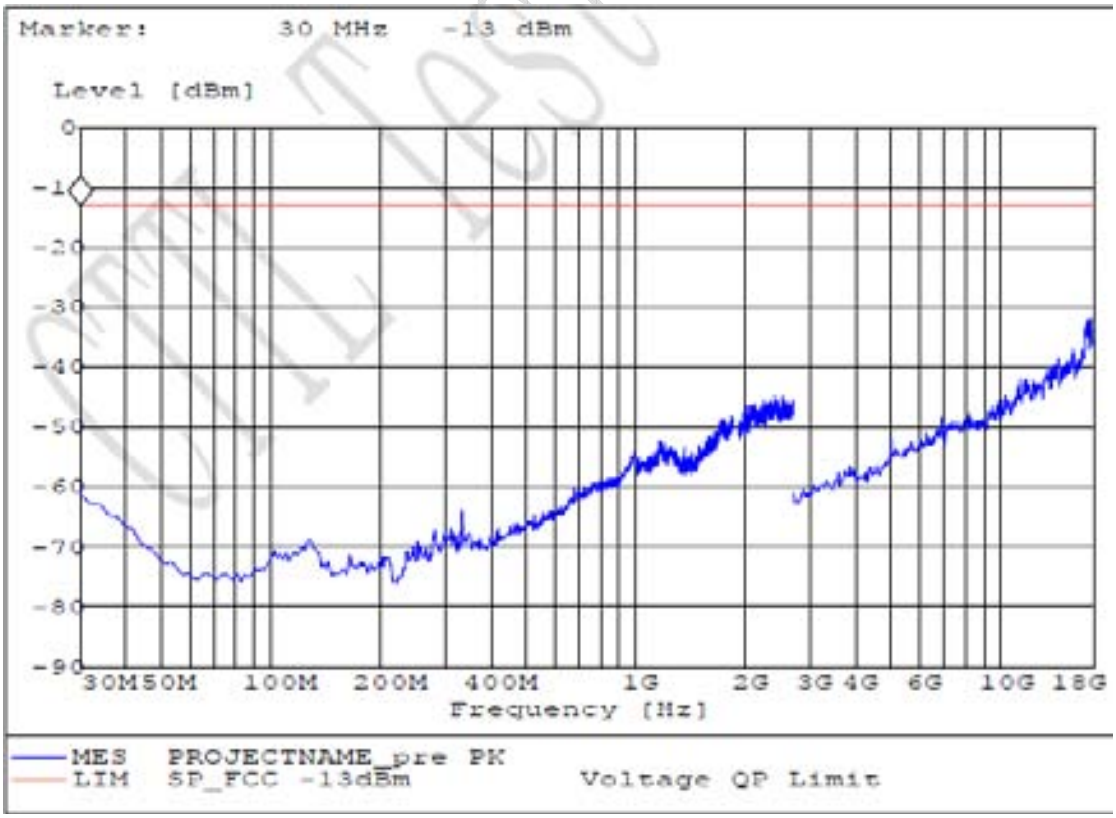


S190VT for GSM mode

S190HT for GSM mode



S661VF for GSM mode



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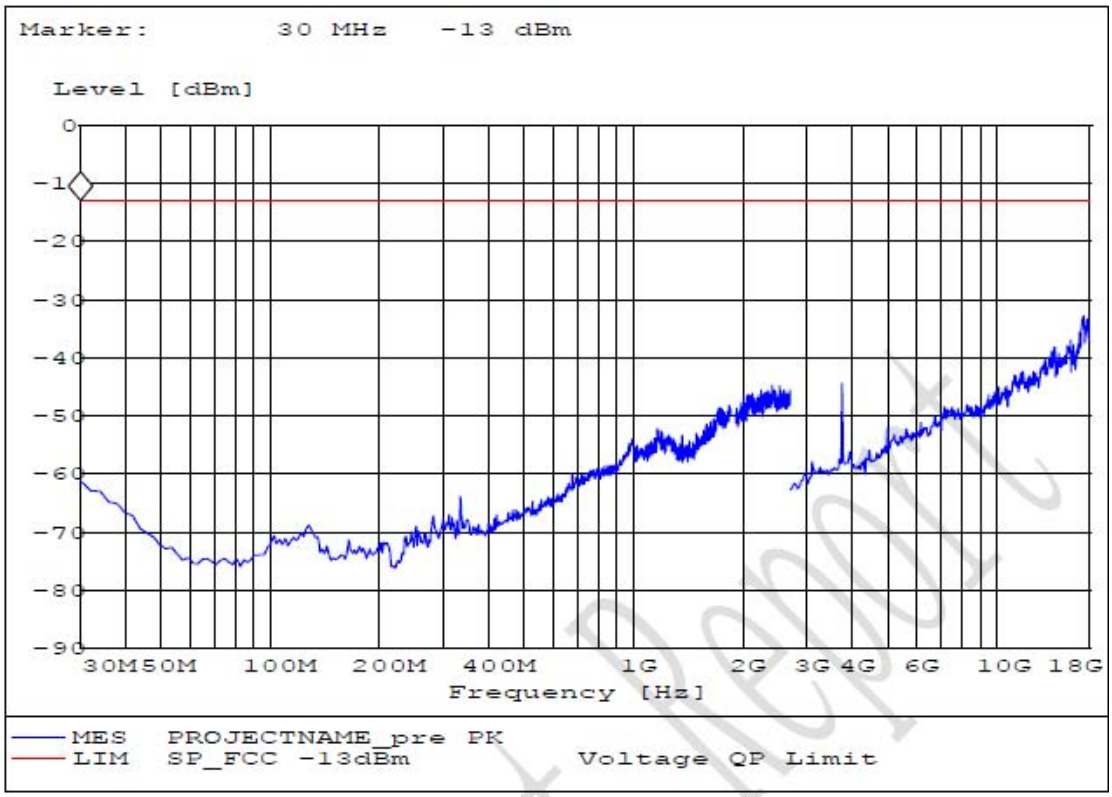

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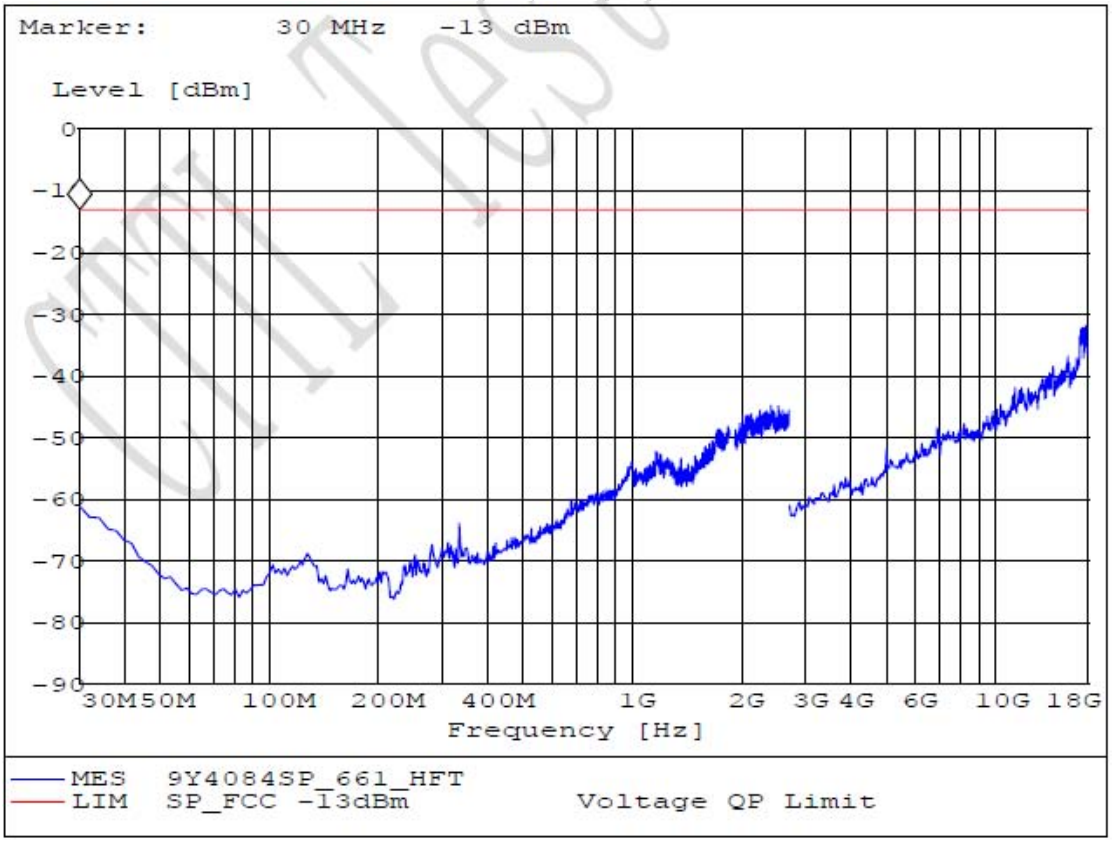
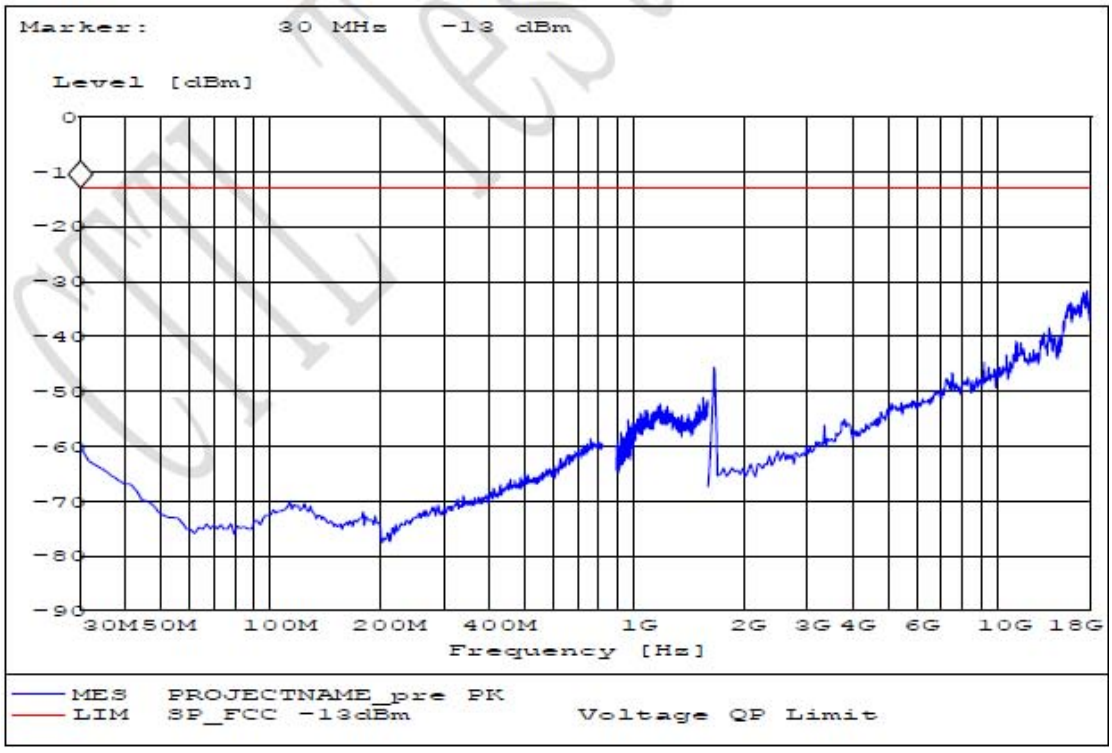


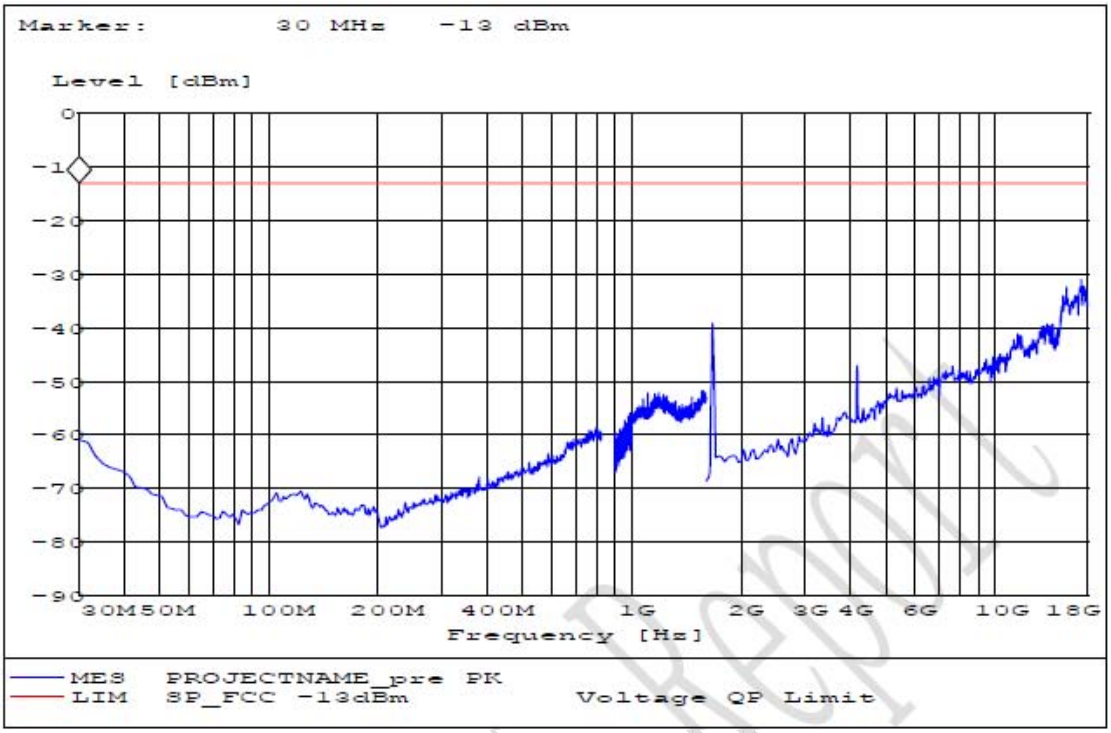
S661HT for GSM mode

Test Results for GPRS mode:

S190VF for GPRS mode



S190HF for GPRS mode



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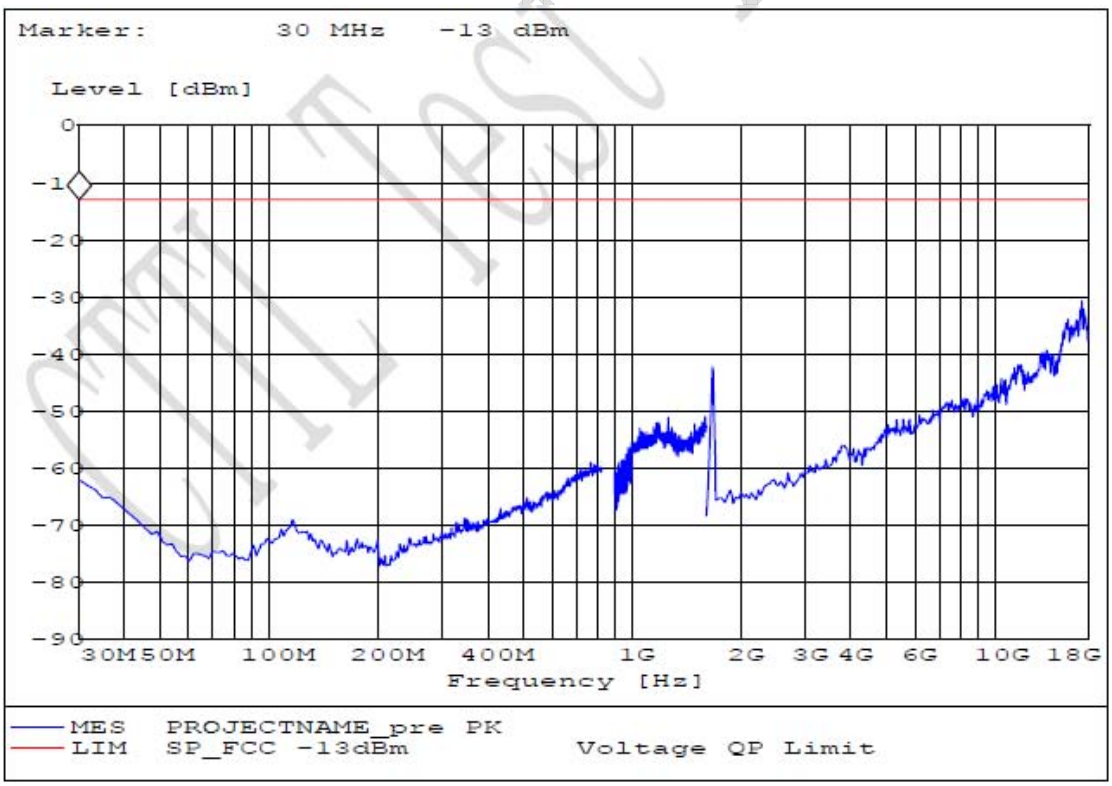

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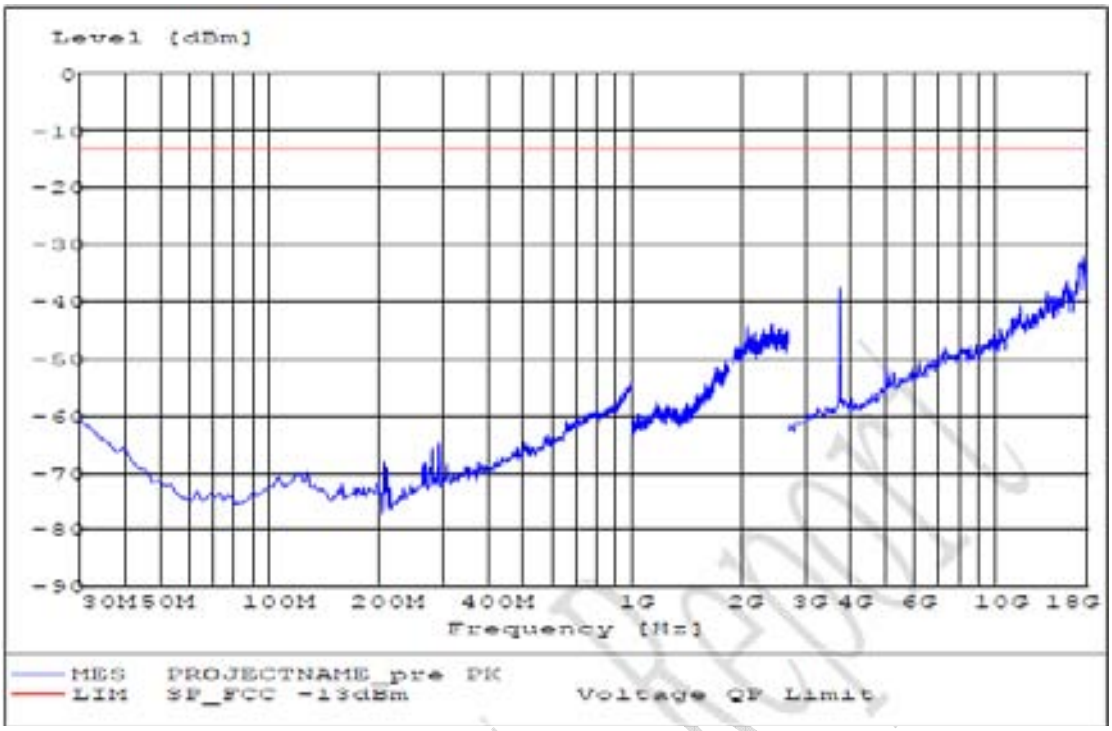
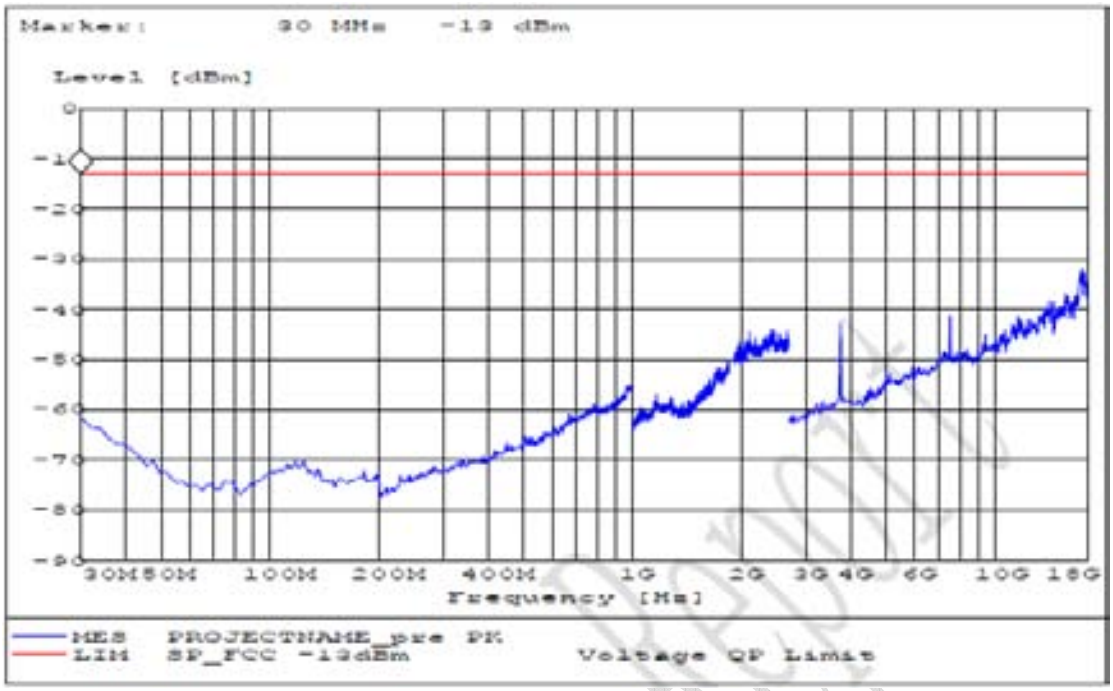
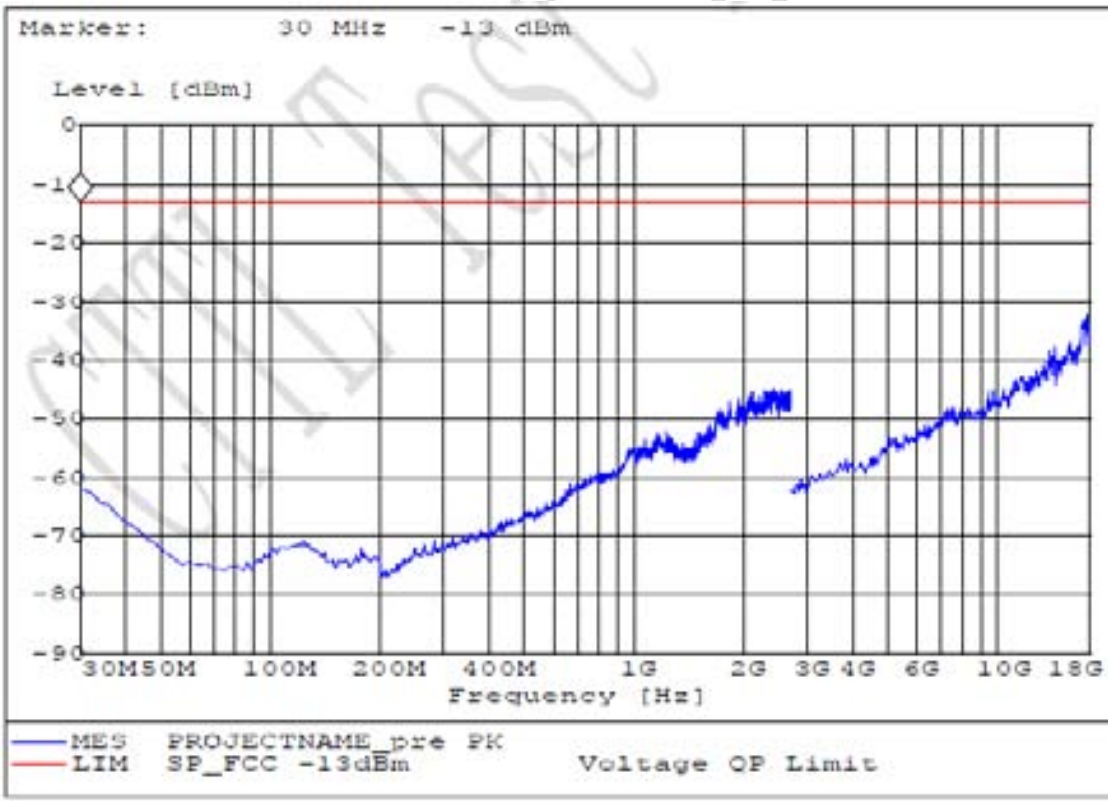


S661VF for GPRS mode

S661HF for GPRS mode

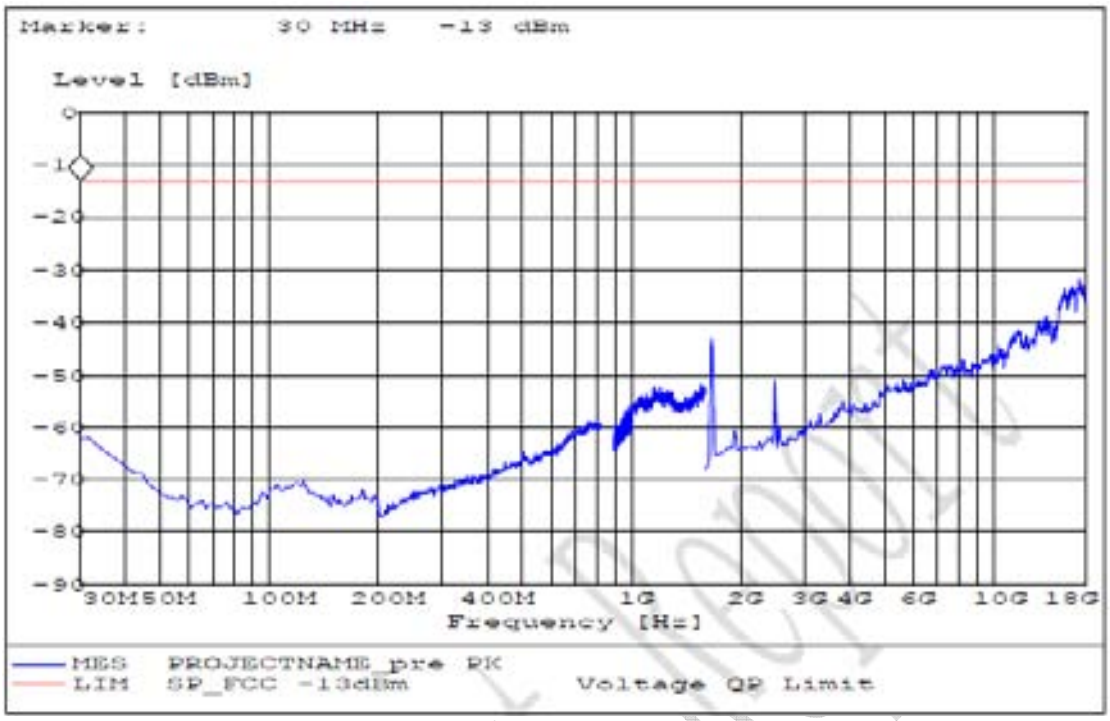


S661VT for GPRS mode



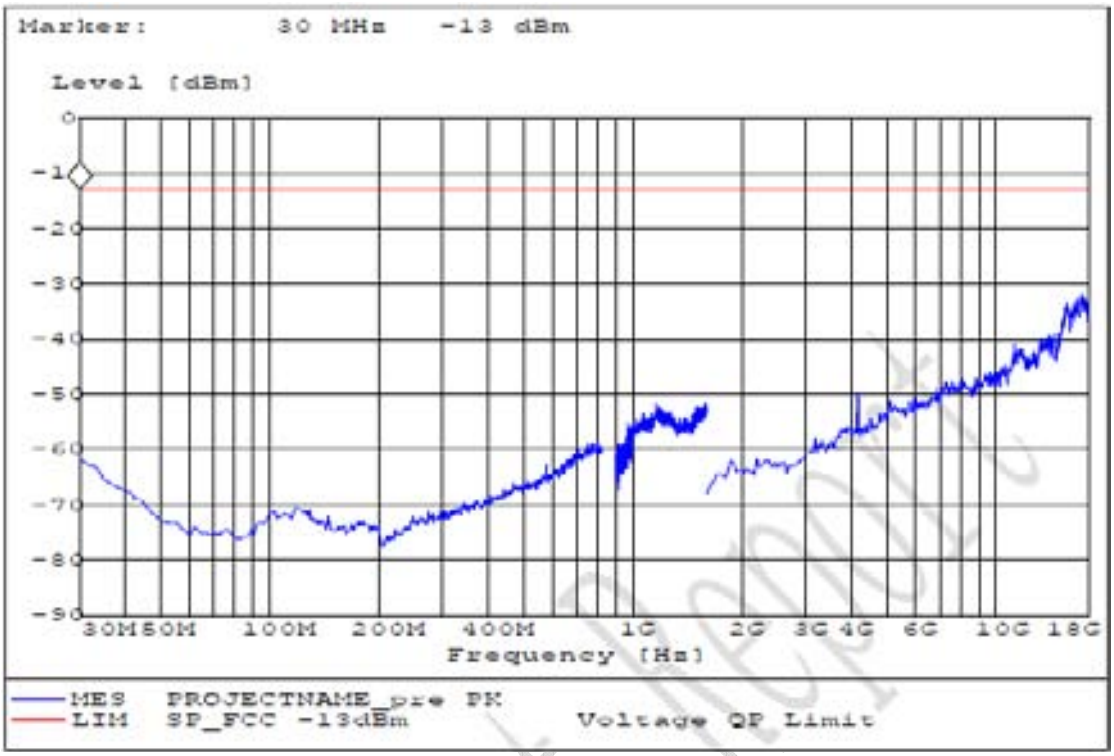
S661HT for GPRS mode

Test Results for EGPRS mode:

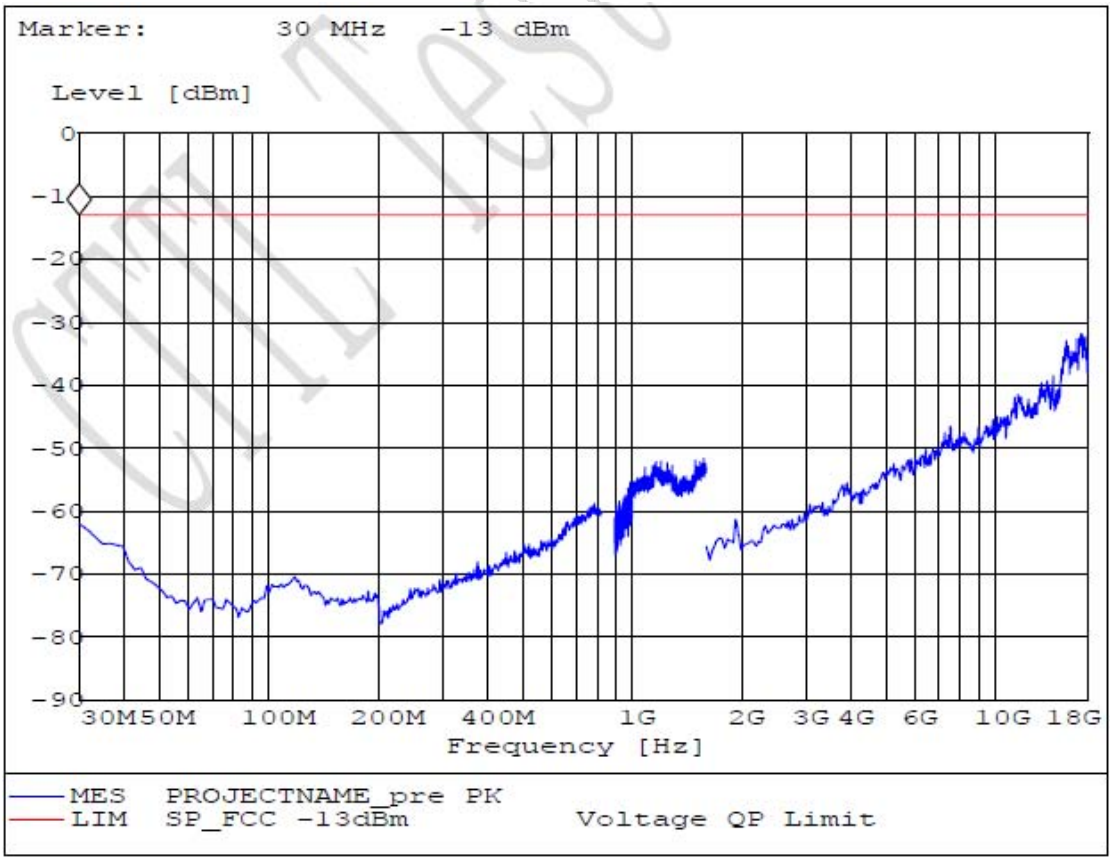


S190VF for EGPRS mode

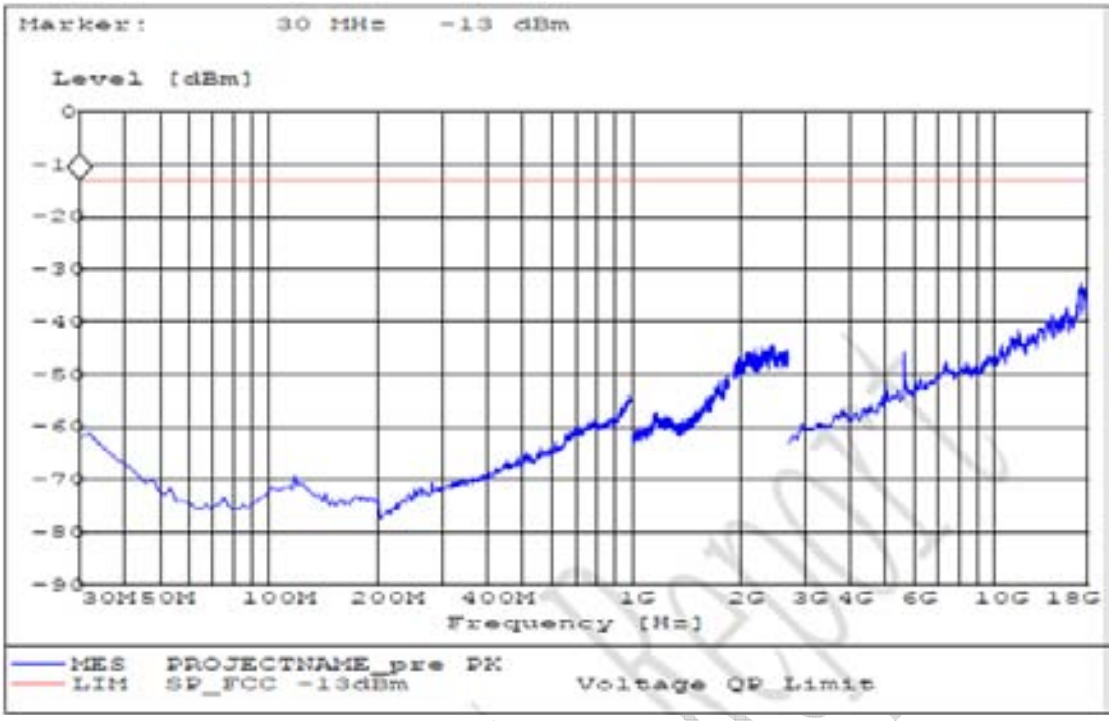
S190HF for EGPRS mode



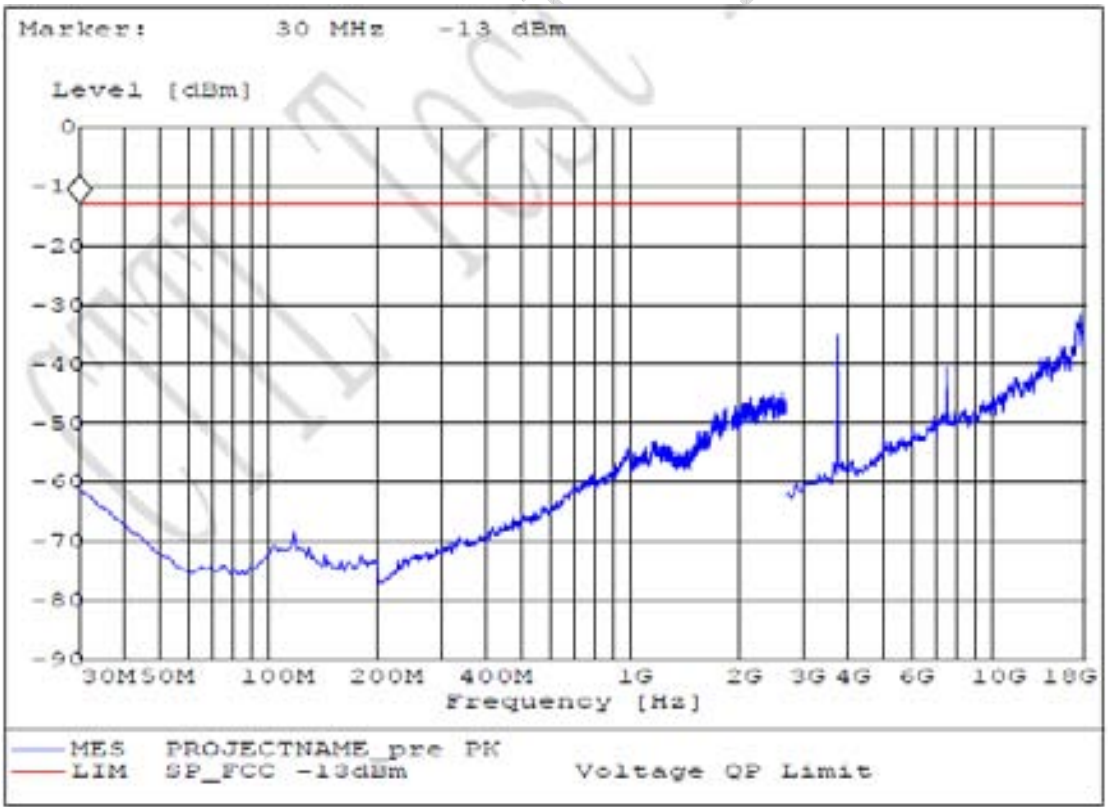
S190VT for EGPRS mode



S190HT for EGPRS mode

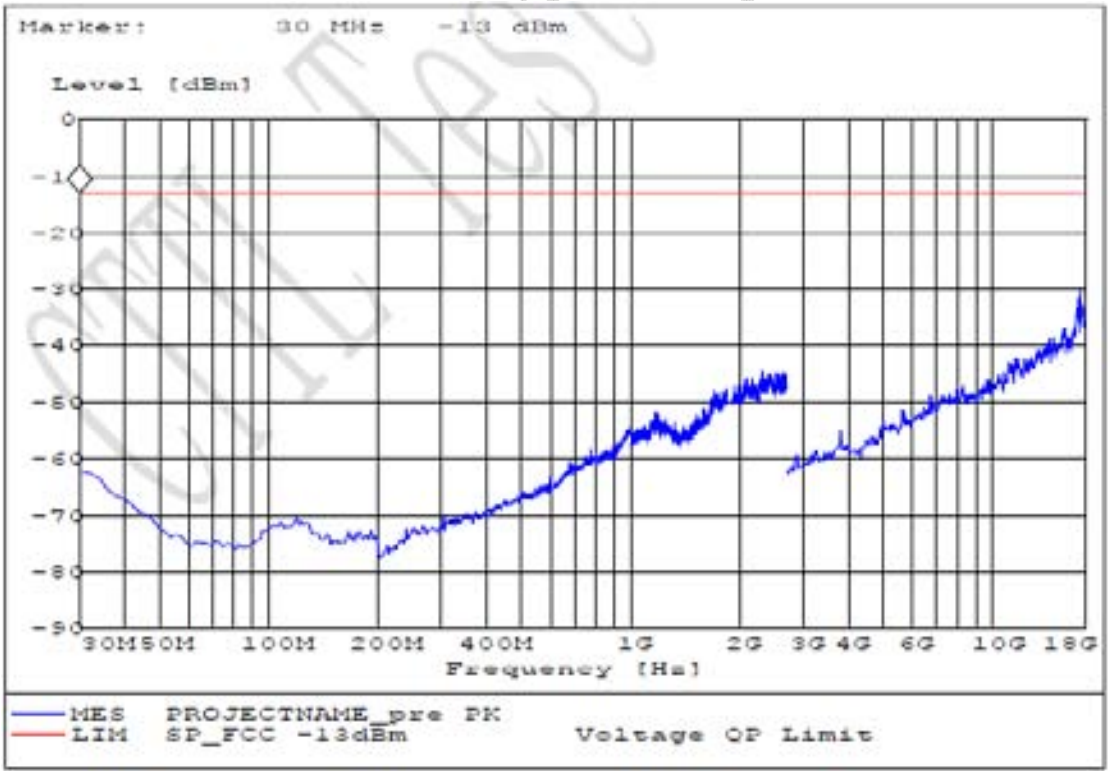


S661VF for EGPRS mode



S661HF for EGPRS mode

S661VT for EGPRS mode



S661HT for EGPRS mode

4.2 Radiated RF Power Output and ERP

Specifications:	2.1046,24.232,22.913(a)
Date of Tests	2009-3-5
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Operation Mode	TX on, channel 128, 190, 251, 512, 661 and 810
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	2010-01-11	Normal
7330	Ultra Broadband Antenna	SCHWARZBECK	VULB 9160	--	2010-10-26	Normal
7330	Double-Ridged Horn Antenna	R/S	HF906	100037	2010-01-09	Normal
713	Fully-Anechoic Chamber	ETS	11.8m×6.5m×6.3m	--	2010-11-16	Normal
023	Wireless Communications Test Set	Agilent	8960(E5515C)	GB41450323	2009-06-13	Normal
111835	Wireless Communications Test Set	R&S	CMU200	1100000802	--	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:

None.

EIRP Value for GSM mode:

ARFCN	Frequency [MHz]	EIRP [dBm]
128	824.228457	27.79
190	836.553106	28.15
251	848.877756	28.40
512	1850.1002	29.62
661	1880.08016	28.17
810	1909.8998	26.95

EIRP Value for GPRS mode:

ARFCN	Frequency [MHz]	EIRP [dBm]
128	824.228457	31.23
190	836.653307	32.18
251	848.777555	32.19
512	1850.260521	29.62
661	1880.08016	28.19
810	1909.8998	26.74

EIRP Value for EGPRS mode:

ARFCN	Frequency [MHz]	EIRP [dBm]
128	824.228457	31.22
190	836.653307	30.6
251	848.777555	30.42
512	1850.1002	27.13
661	1880.08016	27.81
810	1909.8998	26.66

4.3 Occupied bandwidth

Specifications:	2.1049,22.917(b),24.238(b)
Date of Test	2009-3-3/4
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Operation Mode	TX on, channel 128, 190, 251, 512, 661 and 810
Test Results:	--

Test equipment Used:

Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2010-01-11	Normal
7330	Ultra Broadband Antenna	SCHWARZBECK	VULB 9160	--	2010-10-26	Normal
7330	Double-Ridged Horn Antenna	R/S	HF906	100037	2010-01-09	Normal
713	Fully-Anechoic Chamber	ETS	11.8m×6.5m×6.3m	--	2010-11-16	Normal
023	Wireless Communications Test Set	Agilent	8960(E5515C)	GB41450323	2009-06-13	Normal
111835	Wireless Communications Test Set	R&S	CMU200	1100000802	--	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

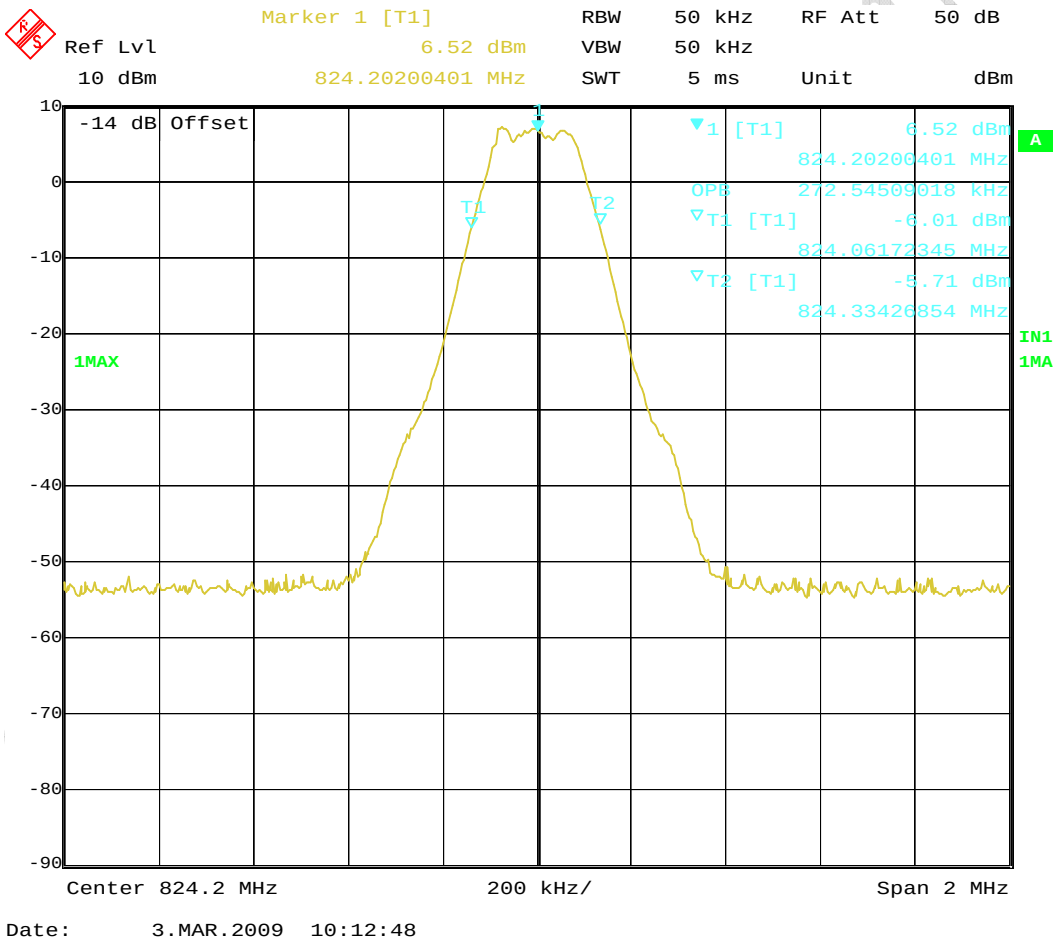
The 99% occupied bandwidth was calculated form the spectrum analyzer. Markers in the spectrum analyzer were then placed between the calculated frequencies to show the calculated 99% power band.

Note: --

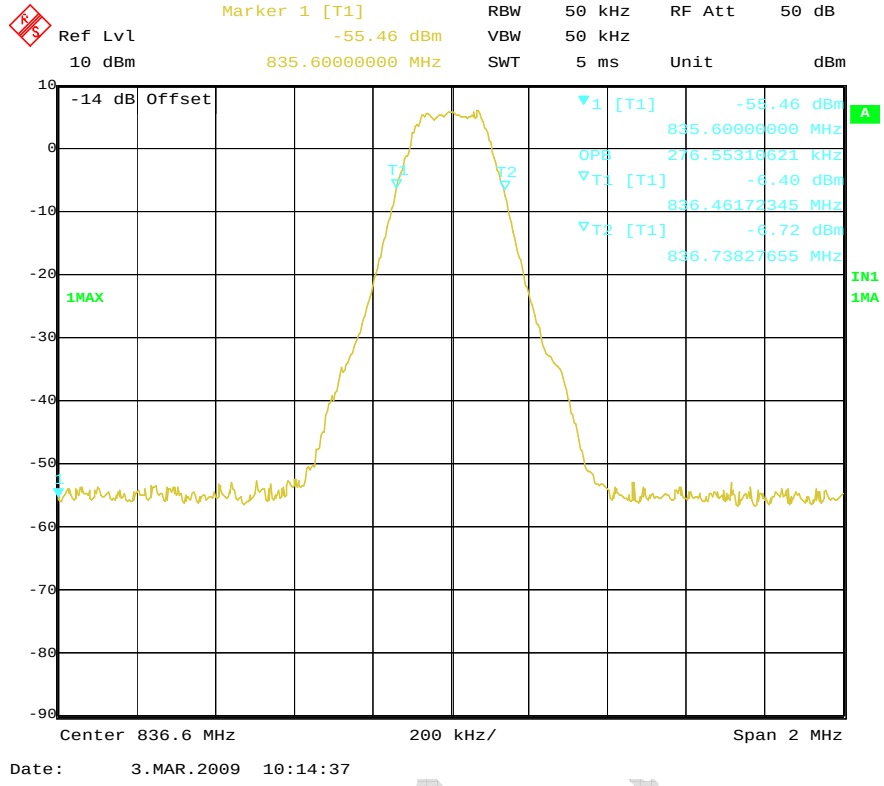
Results data of GSM mode:

EUT channel	99% occupied bandwidth [kHz]
128	273
190	277
251	281
512	285
661	285
810	285

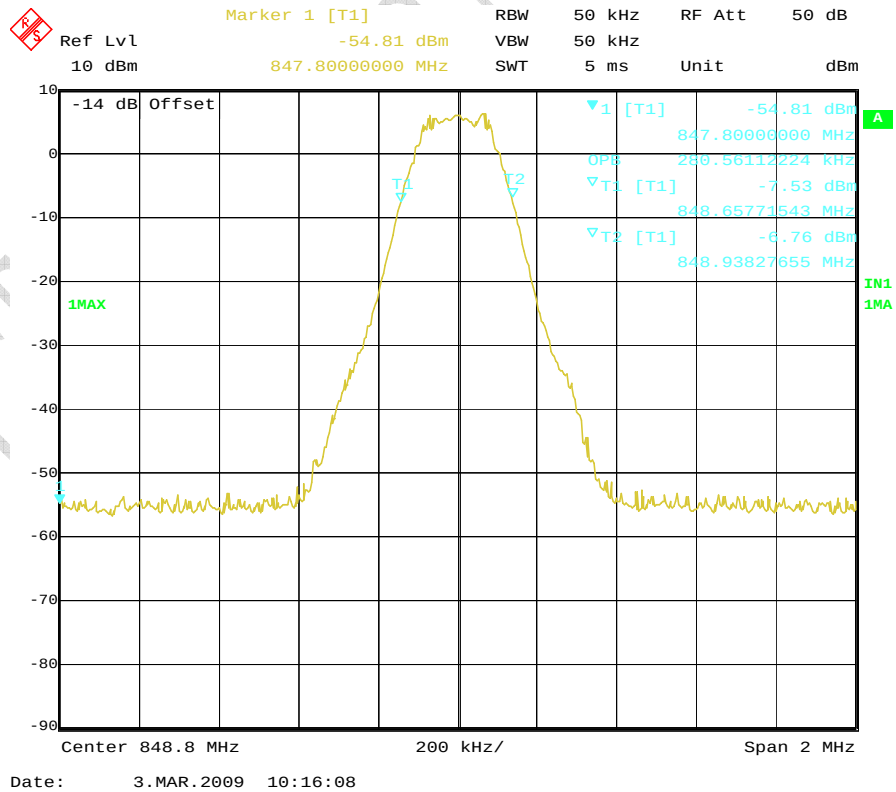
Graphical results for GSM mode:



Channel 128



Channel 190



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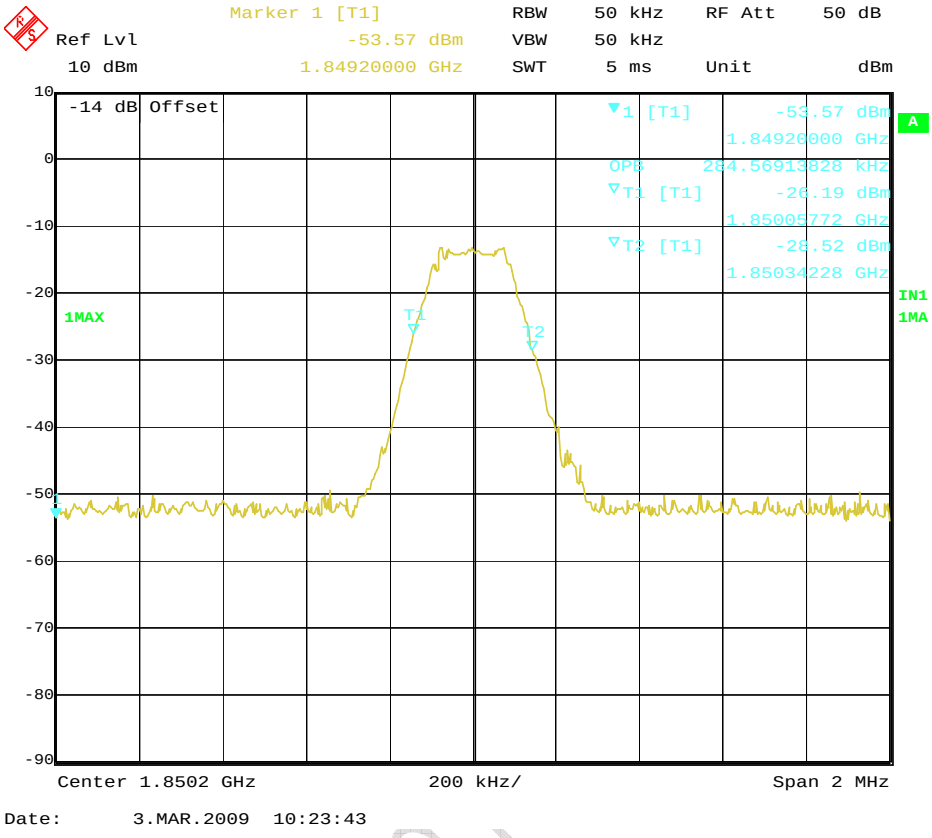

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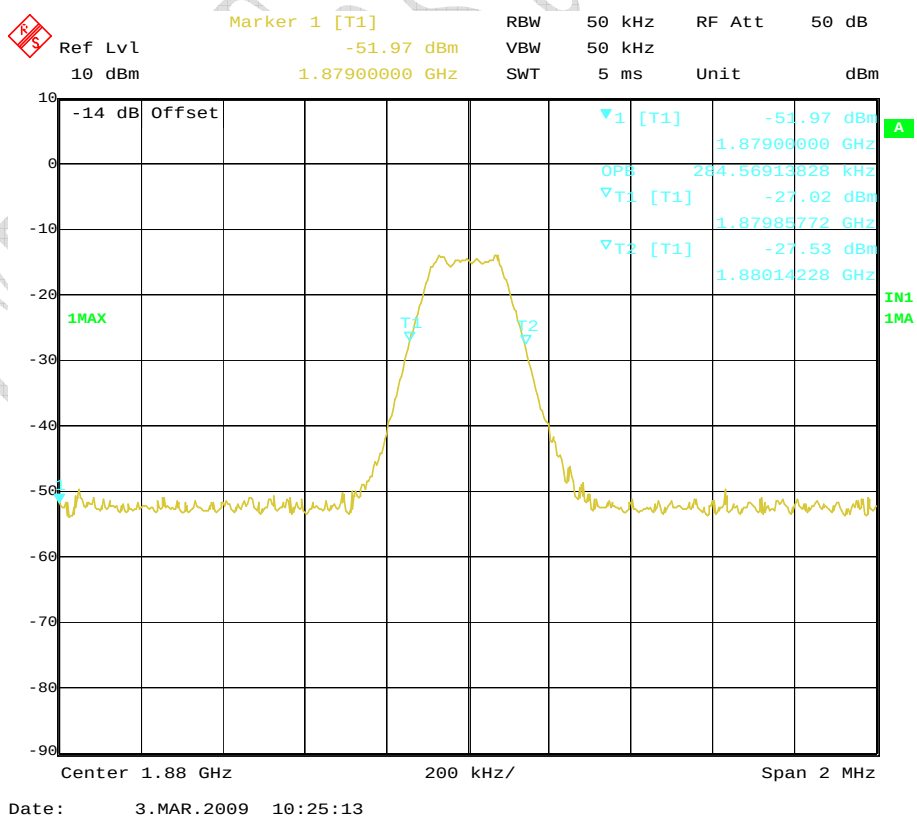
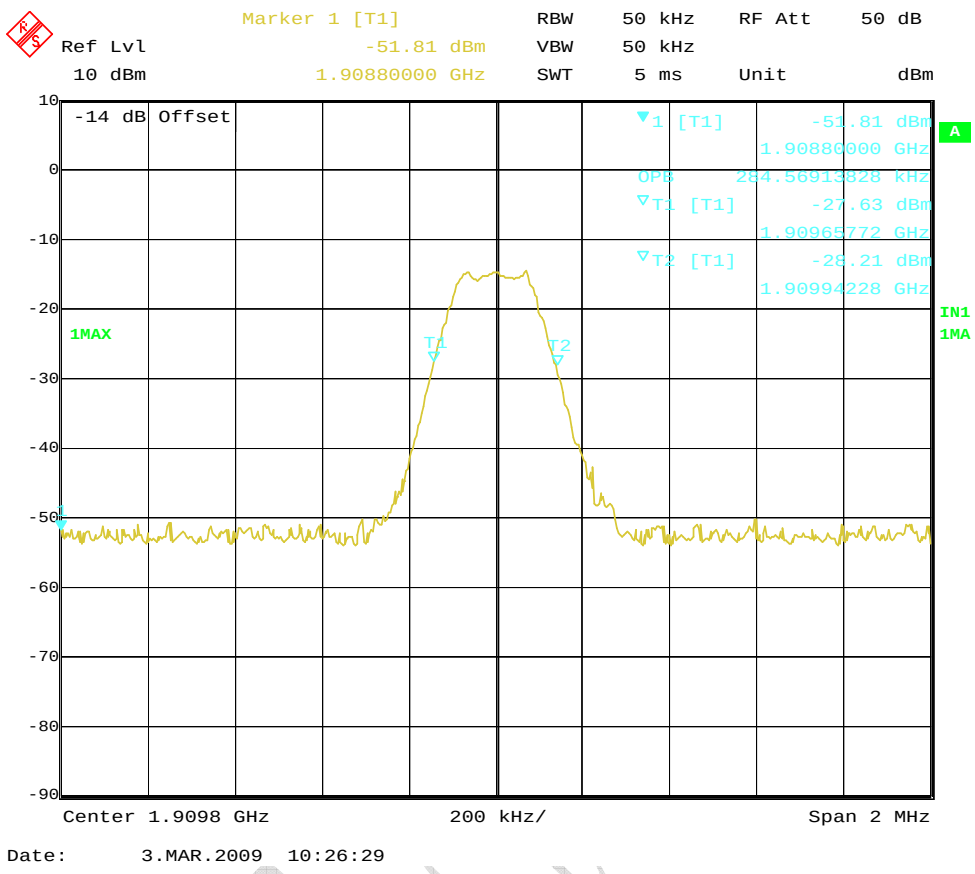


Channel 661

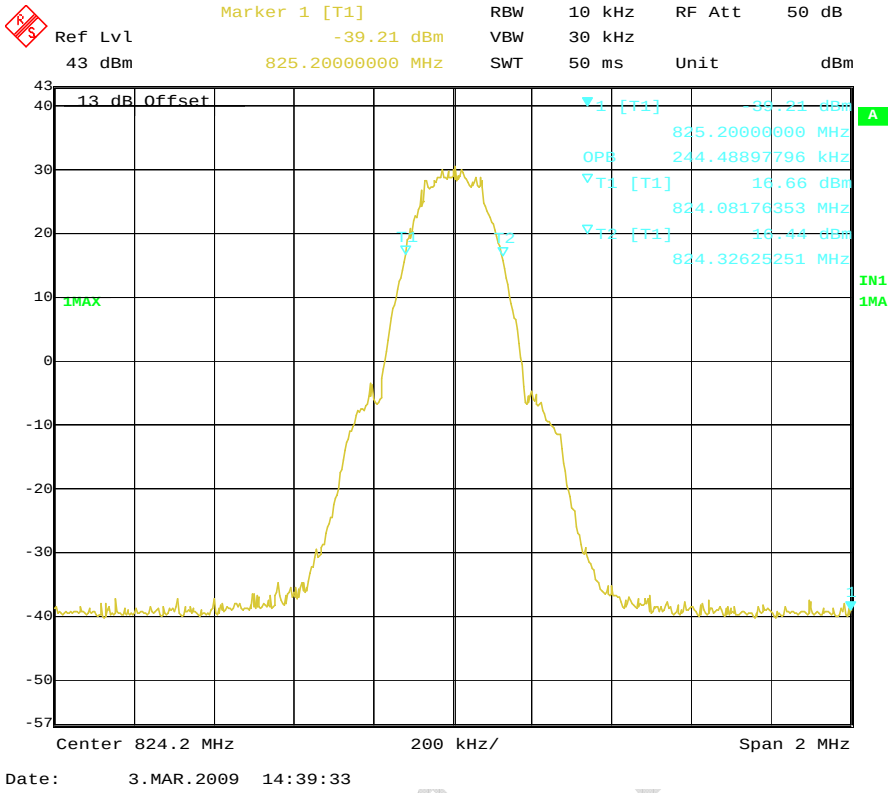


Channel 810

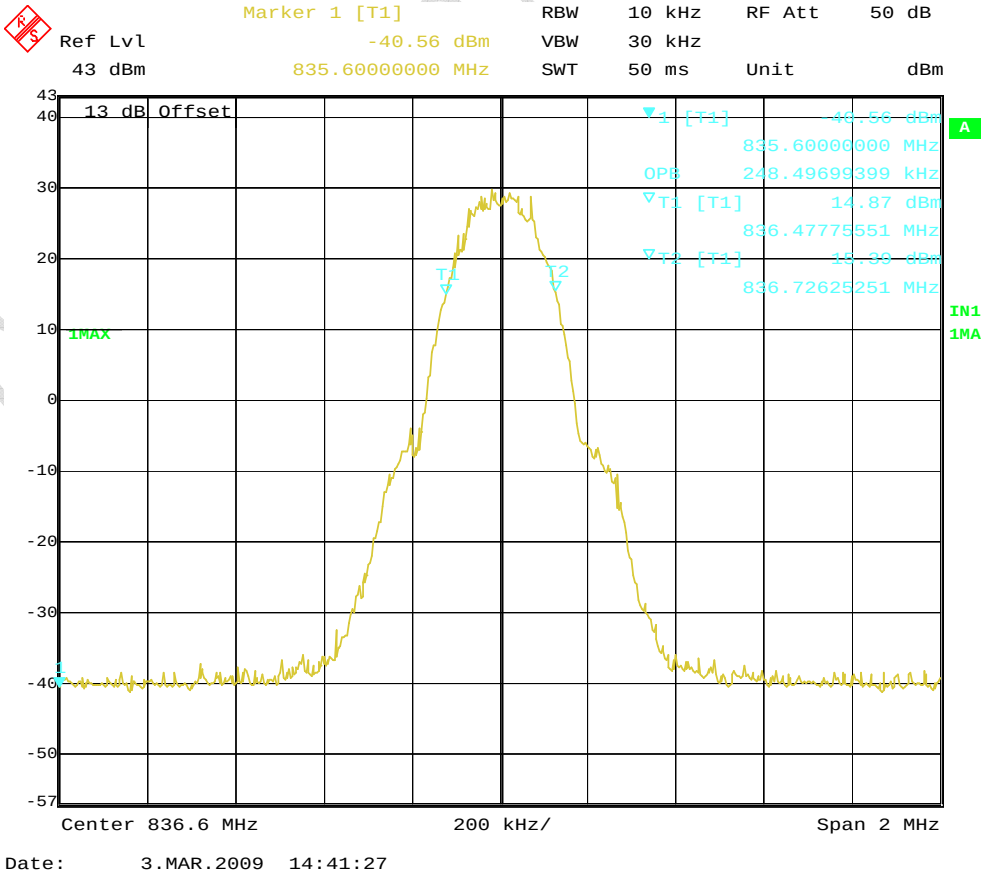
Results data of GPRS mode:

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

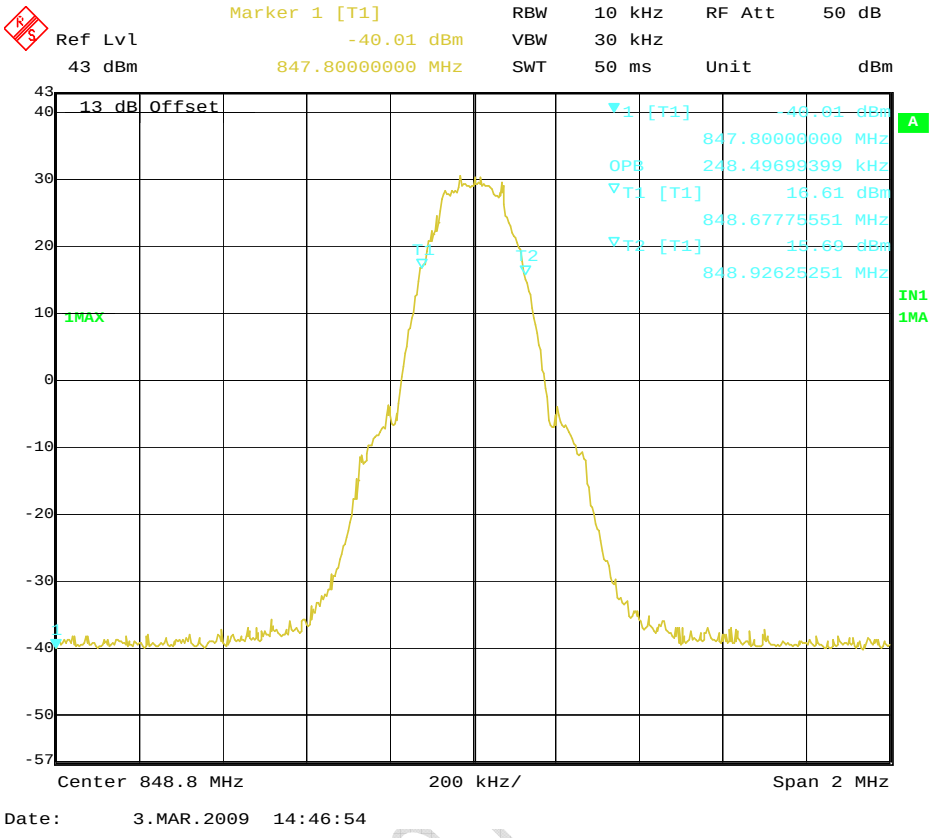
Graphical results for GPRS mode:



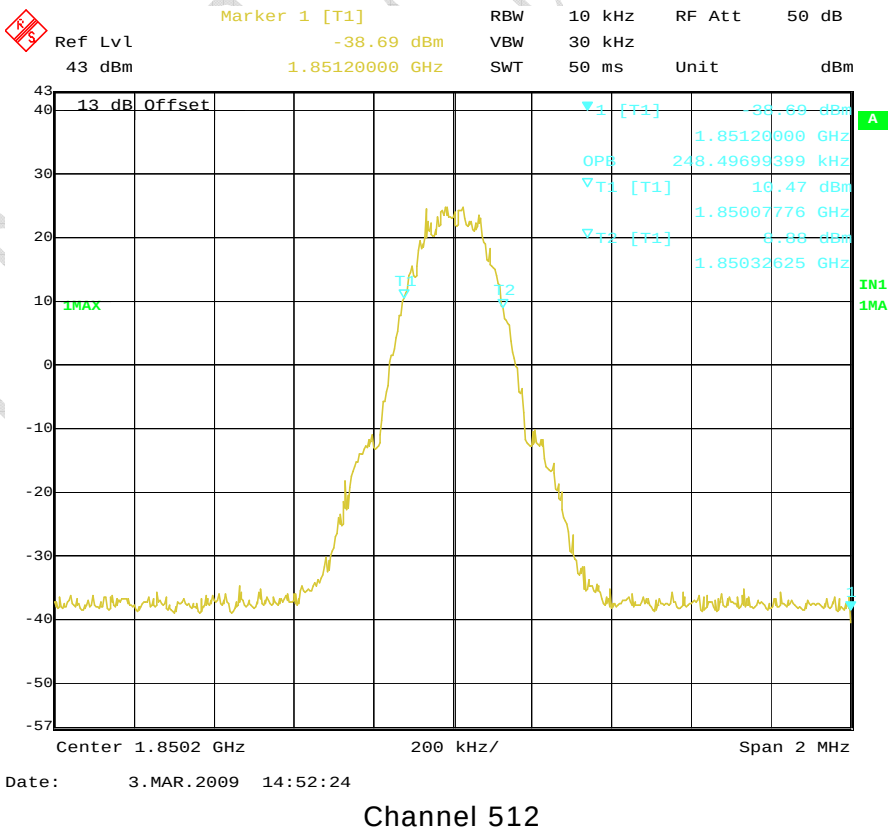
Channel 128



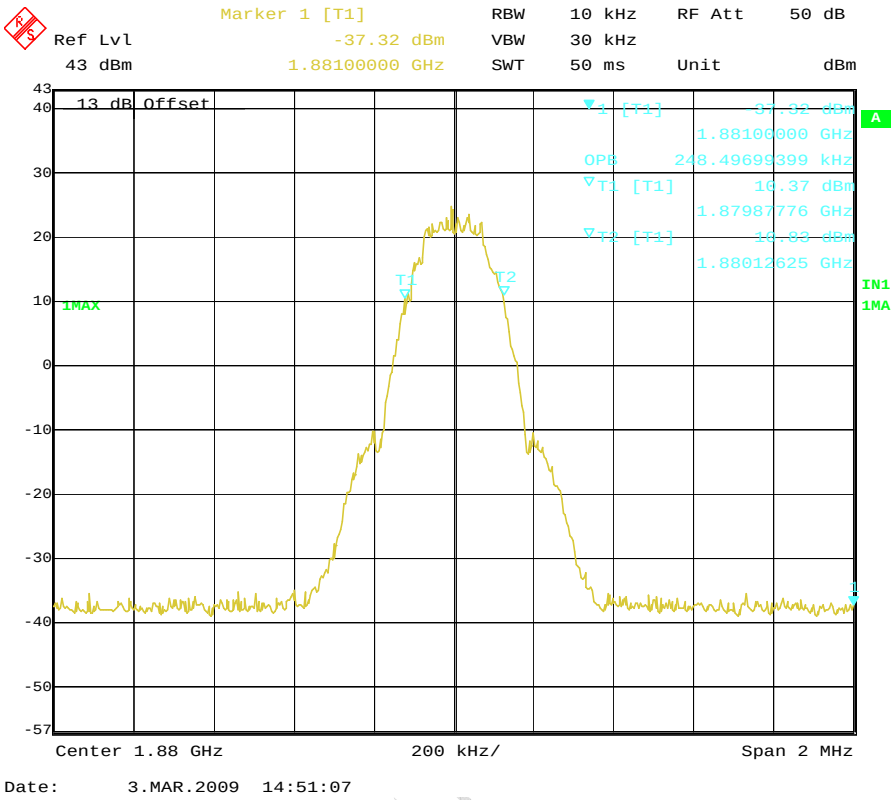
Channel 190



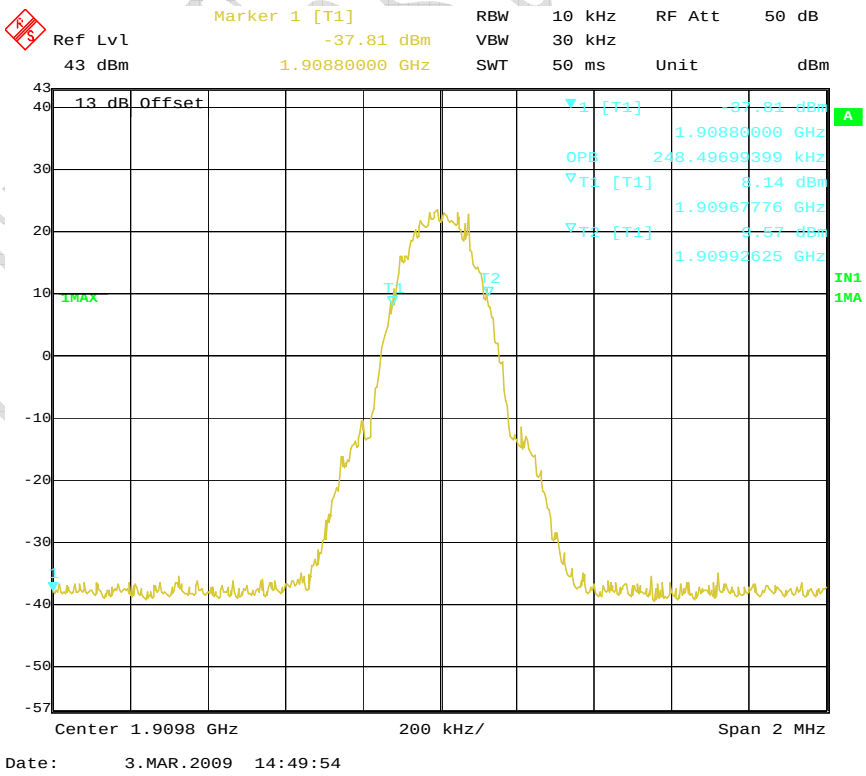
Channel 251



Channel 512



Channel 661

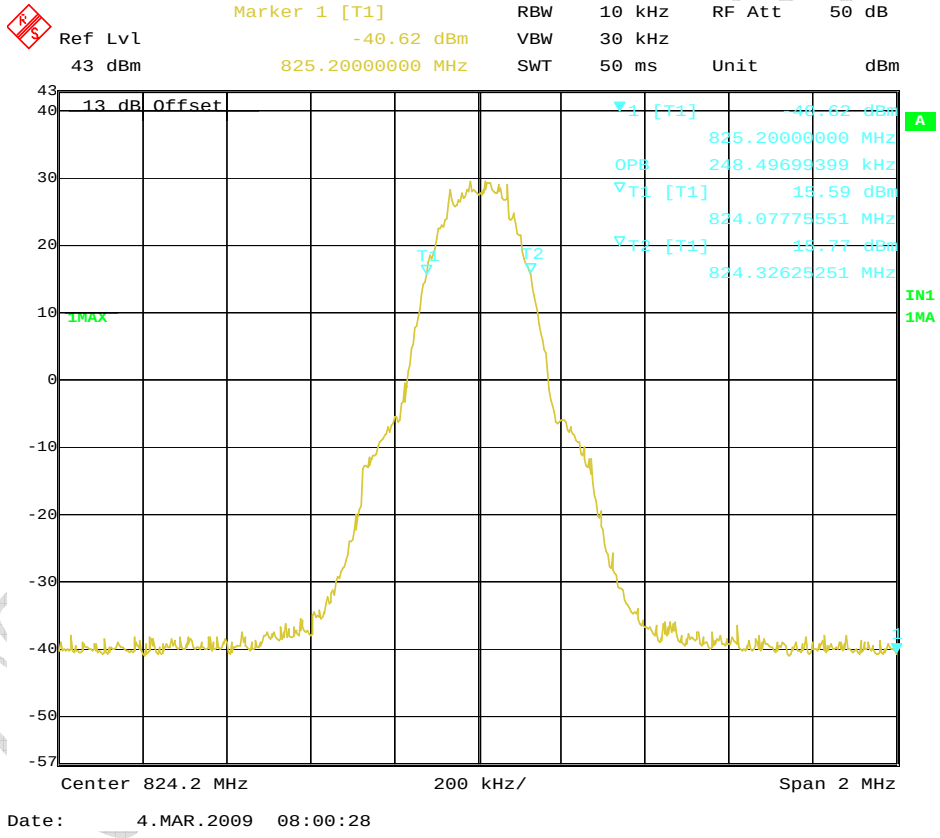


Channel 810

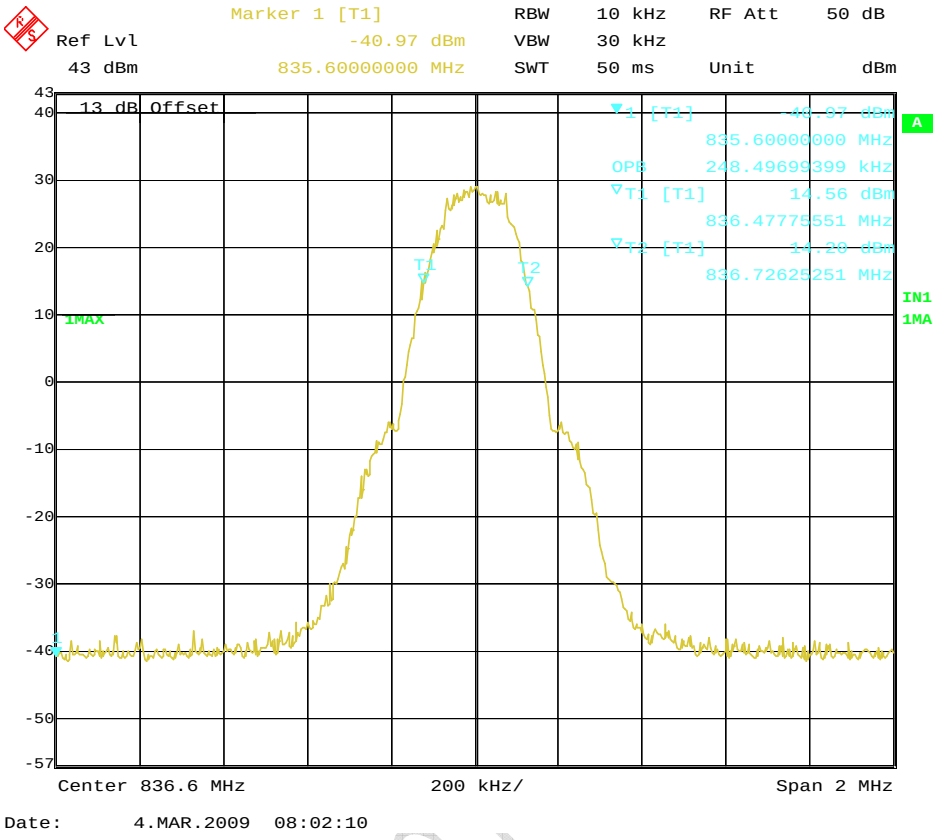
Results data of EGPRS mode:

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

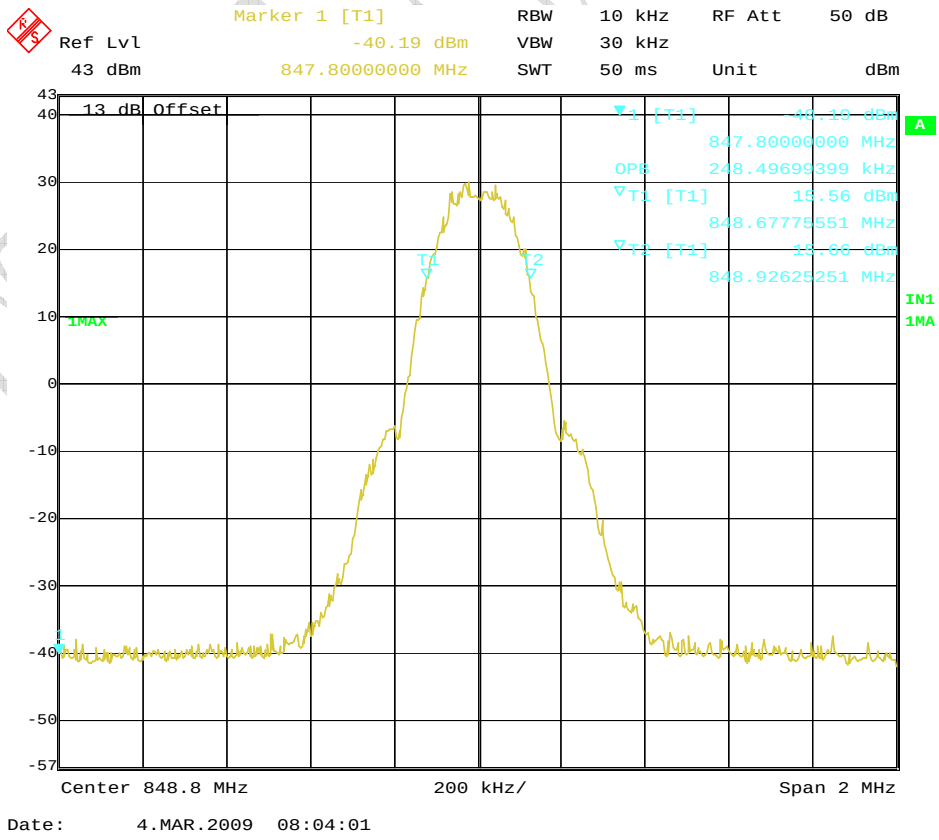
Graphical results for EGPRS mode:



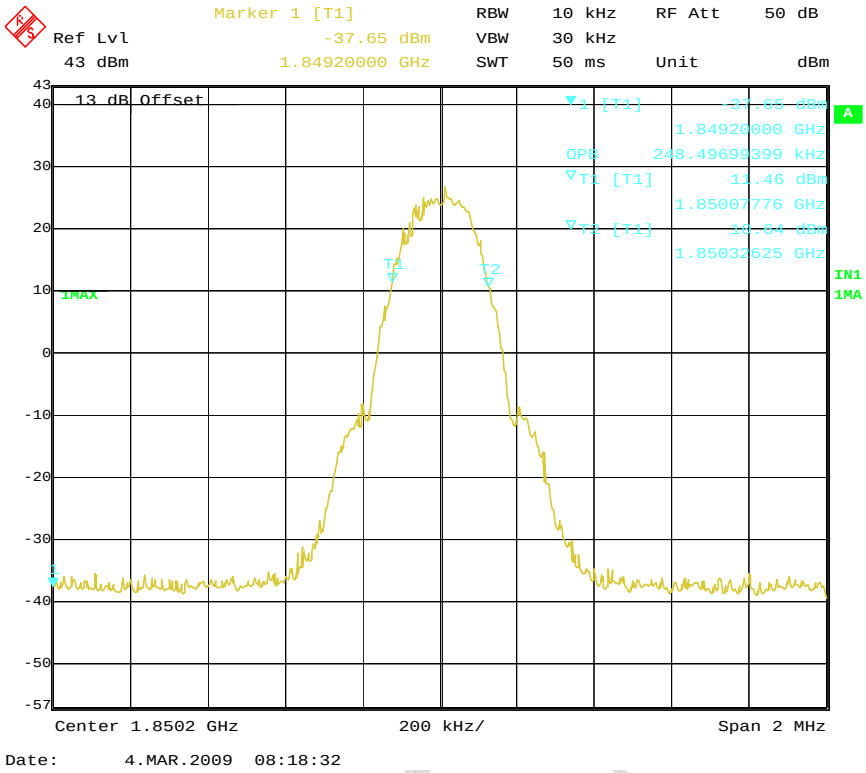
Channel 128



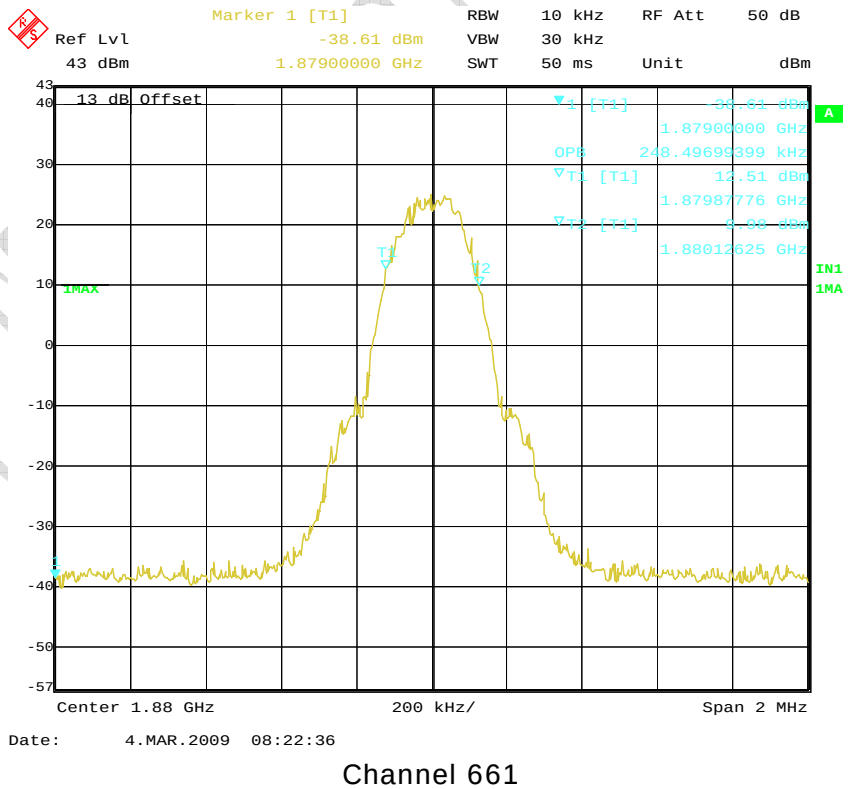
Channel 190



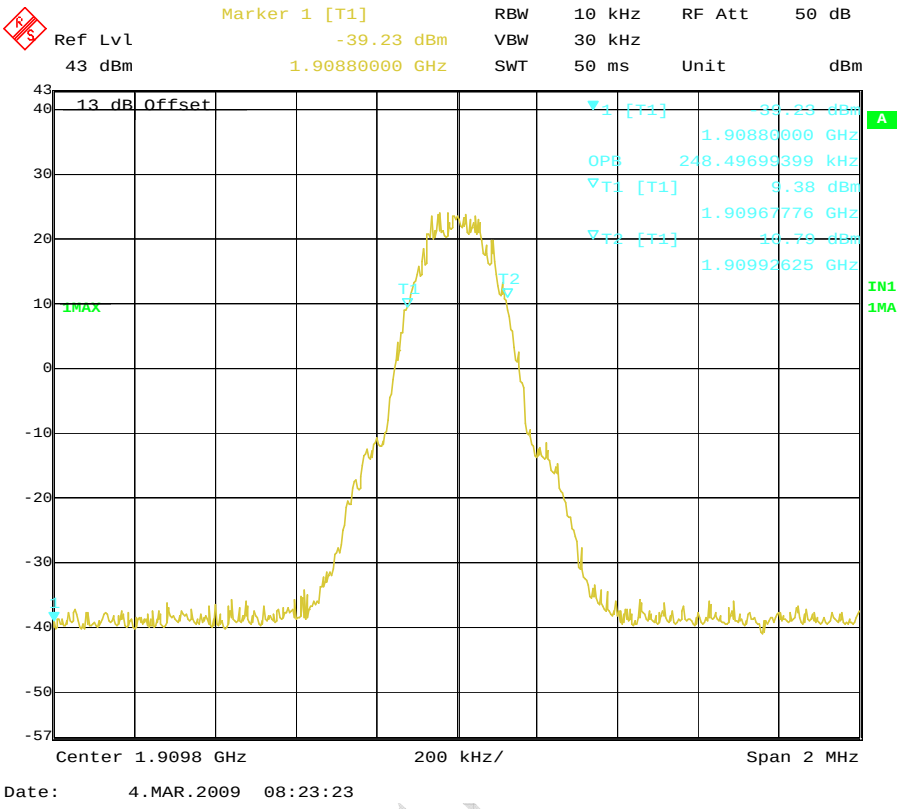
Channel 251



Channel 512



Channel 661


Marker 1 [T1]
RBW 10 kHz
RF Att 50 dB
Ref Lvl
-39.23 dBm
VBW 30 kHz
43 dBm
1.90880000 GHz
SWT 50 ms
Unit dBm
13 dB Offset
T1 [T1] -39.23 dBm
1.90880000 GHz
OPB 248.49699399 kHz
T1 [T1] 9.38 dBm
1.90967776 GHz
T2 [T1] 10.79 dBm
1.90992625 GHz
A
IN1
1MA
1MAX
T1
T2
43
40
30
20
10
0
-10
-20
-30
-40
-50
-57
Center 1.9098 GHz
200 kHz/
Span 2 MHz
Date: 4.MAR.2009 08:23:23

Channel 810

4.4 Frequency Stability over Temperature Variation

Specifications:	2.1055,22.355,24.235
Date of Test	2009-3-4
Test conditions:	Ambient Temperature:-30℃-50℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Operation Mode	TX on, channel 190 and 661
Test Results:	Pass

Test equipment Used:

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

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.

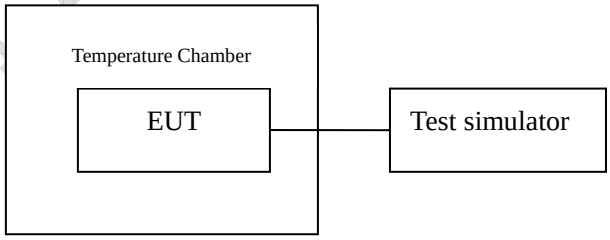


Figure T: setup for measurement of frequency stability over temperature variation

Test Method

1. The EUT was turned off and placed in the temperature chamber.
2. The temperature of the chamber was set to -30℃ 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℃, -10℃, 0℃, 10℃, 20℃, 30℃, 40℃ and 50℃.

Test results data for GSM mode:

Channel 190: Compliance windows: 2091.5Hz

Temperature[℃]	Deviation[Hz]	Remarks
-30	-18	Pass
-20	-11	Pass
-10	-9	Pass
0	-12	Pass
10	-19	Pass
20	-13	Pass
30	-20	Pass
40	-26	Pass
50	-31	Pass

Channel 661: Compliance windows: 4700Hz

Temperature[℃]	Deviation[Hz]	Remarks
-30	21	Pass
-20	18	Pass
-10	11	Pass
0	7	Pass
10	16	Pass
20	20	Pass
30	-11	Pass
40	-21	Pass
50	-17	Pass

Test results data for GPRS mode:

Channel 190: Compliance windows: 2091.5Hz

Temperature[℃]	Deviation[Hz]	Remarks
-30	-21	Pass
-20	-12	Pass
-10	-6	Pass
0	-13	Pass
10	-16	Pass
20	-20	Pass
30	-18	Pass
40	-11	Pass
50	-24	Pass

Channel 661: Compliance windows: 4700Hz

Temperature[℃]	Deviation[Hz]	Remarks
-30	18	Pass
-20	16	Pass
-10	11	Pass
0	13	Pass
10	17	Pass
20	-5	Pass
30	-26	Pass
40	-21	Pass
50	-30	Pass

Test results data for EGPRS mode:

Channel 190: Compliance windows: 2091.5Hz

Temperature[℃]	Deviation[Hz]	Remarks
-30	-20	Pass
-20	-7	Pass
-10	-11	Pass
0	-13	Pass
10	-15	Pass
20	-17	Pass
30	-13	Pass
40	-21	Pass
50	-20	Pass

Channel 661: Compliance windows: 4700Hz

Temperature[℃]	Deviation[Hz]	Remarks
-30	15	Pass
-20	13	Pass
-10	17	Pass
0	11	Pass
10	14	Pass
20	20	Pass
30	-28	Pass
40	-42	Pass
50	-34	Pass

4.5 Frequency Stability over Voltage Variation

Specifications:	2.1055,22.355,24.235
Date of Test	2009-3-4
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Operation Mode	TX on, channel 190 and 661
Test Results:	Pass

Test equipment Used:

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

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.

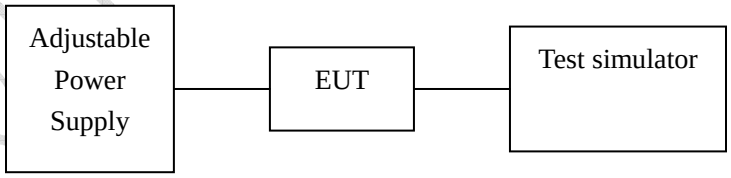


Figure V: test setup for measurement of frequency stability over voltage variation

Test Results data for GSM mode:

Channel 190: Compliance windows: 2091.5Hz

Level	Voltage[V]	Deviation[Hz]	Remarks
Nominal	4.2	-21	Pass
Cut-off point	3.4	-11	Pass

Channel 661: Compliance windows: 4700Hz

Level	Voltage[V]	Deviation[Hz]	Remarks
Nominal	4.2	-26	Pass
Cut-off point	3.4	-15	Pass

Test Results data for GPRS mode:

Channel 190: Compliance windows: 2091.5Hz

Level	Voltage[V]	Deviation[Hz]	Remarks
Nominal	4.2	-19	Pass
Cut-off point	3.4	-8	Pass

Channel 661: Compliance windows: 4700Hz

Level	Voltage[V]	Deviation[Hz]	Remarks
Nominal	4.2	-19	Pass
Cut-off point	3.4	-10	Pass

Test Results data for EGPRS mode:

Channel 190: Compliance windows: 2091.5Hz

Level	Voltage[V]	Deviation[Hz]	Remarks
Nominal	4.2	-27	Pass
Cut-off point	3.4	-9	Pass

Channel 661: Compliance windows: 4700Hz

Level	Voltage[V]	Deviation[Hz]	Remarks
Nominal	4.2	-28	Pass
Cut-off point	3.4	-6	Pass

4.6 Conducted RF Power Output

Specifications:	2.1046,22.913(a),24.232(c)
Date of Tests	2009-3-3
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Operation Mode	TX on, channel 128, 190, 251, 512, 661 and 810
Test Results:	Pass

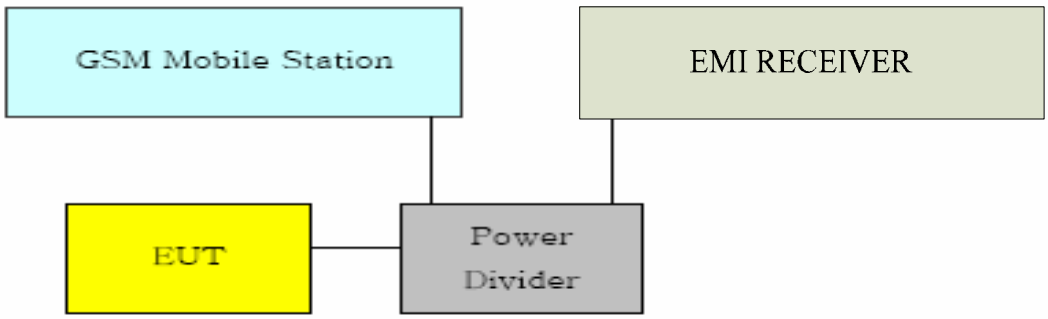
Test equipment Used:

Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2010-01-11	Normal
023	Wireless Communications Test Set	Agilent	8960(E5515C)	GB41450323	2009-06-13	Normal
---	Power spliter	Jie sai	---	1000132	2010-01-04	Normal
111835	Wireless Communications Test Set	R&S	CMU200	1100000802	--	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 lost 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	Peak output power [dBm]
128	32.60
190	32.49
251	32.73
512	29.99
661	28.99
810	28.89

Test Results for GPRS mode:

ARFCN	Peak output power [dBm]
128	32.44
190	32.36
251	32.57
512	28.95
661	27.90
810	27.75

Test Results for EGPRS mode:

ARFCN	Peak output power [dBm]
128	31.96
190	31.93
251	32.11
512	29.86
661	29.15
810	28.73

4.7 Conducted Spurious Emission

Specifications:	2.1051,22.917,24.238
Date of Tests	2009-3-3
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Operation Mode	TX on, channel 190 and 661
Test Results:	Pass

Test equipment Used:

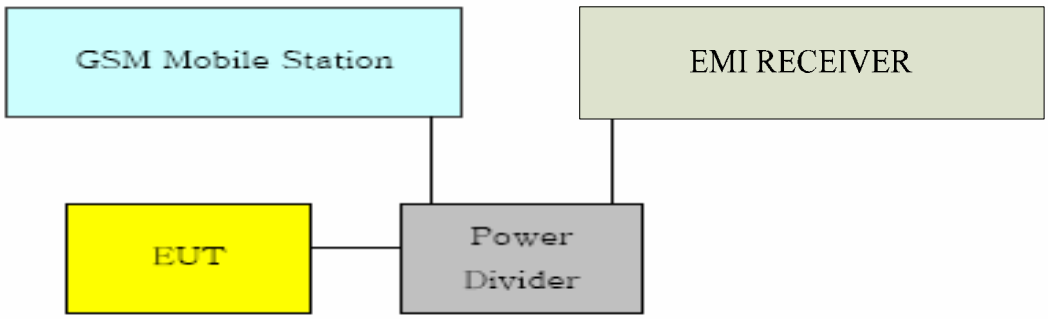
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2010-01-11	Normal
023	Wireless Communications Test Set	Agilent	8960(E5515C)	GB41450323	2009-06-13	Normal
---	Power spliter	Jie sai	---	1000132	2010-01-04	Normal
111835	Wireless Communications 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(dBm) – (43 + 10 log(P)) dB= -13dBm

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

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.

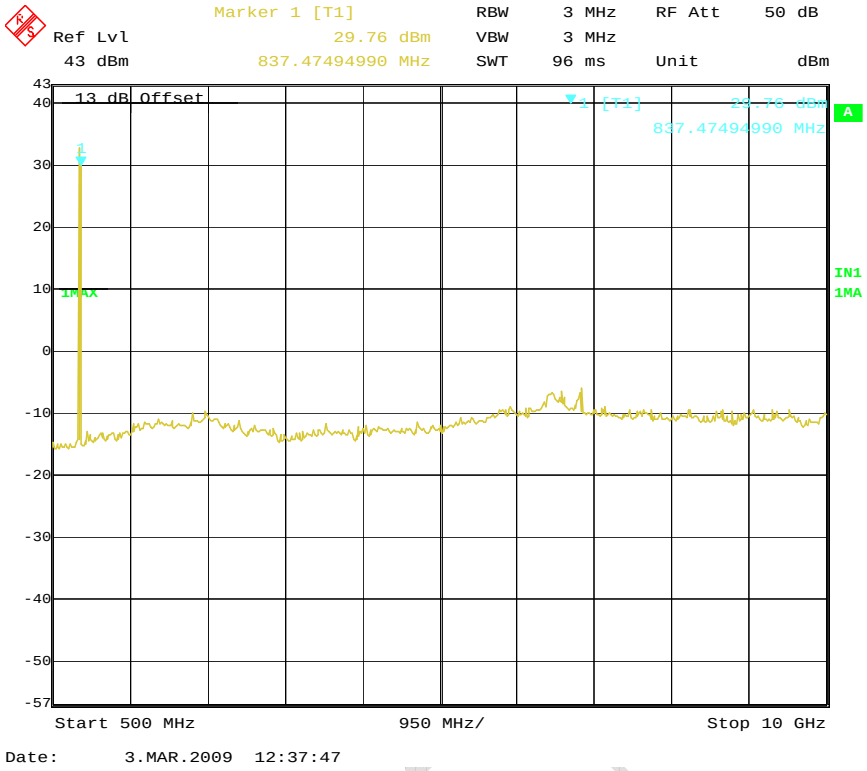
1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment under test, this equates to a frequency range of 30 MHz to 19.1 GHz,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

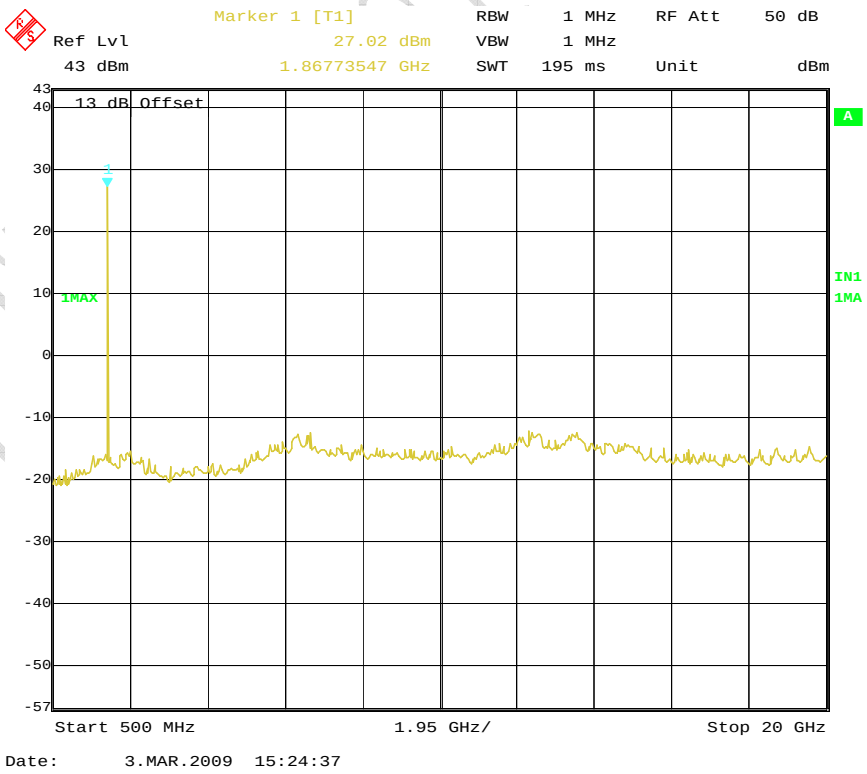
Test Results for GSM mode:

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

Graphical results for GSM mode:



Channel 190

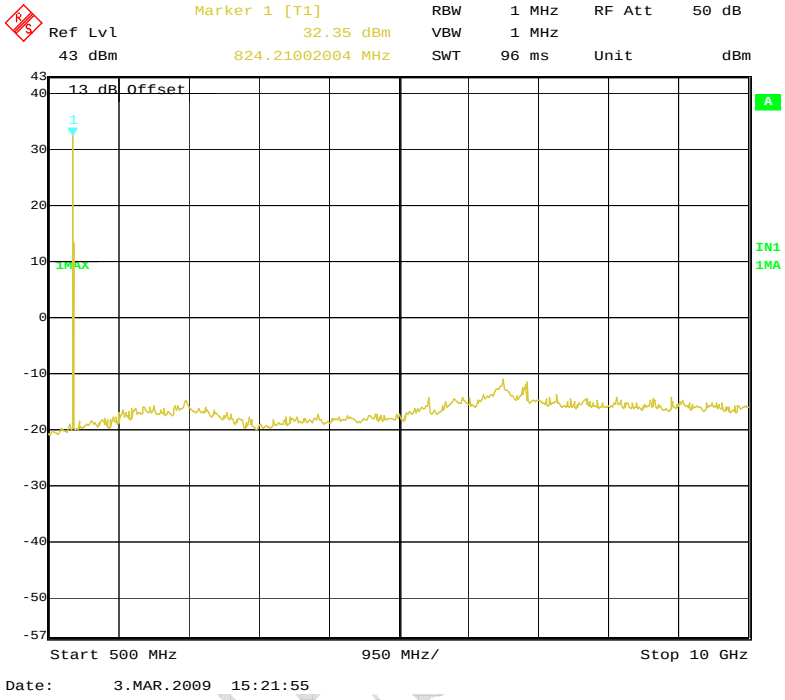


Channel 661

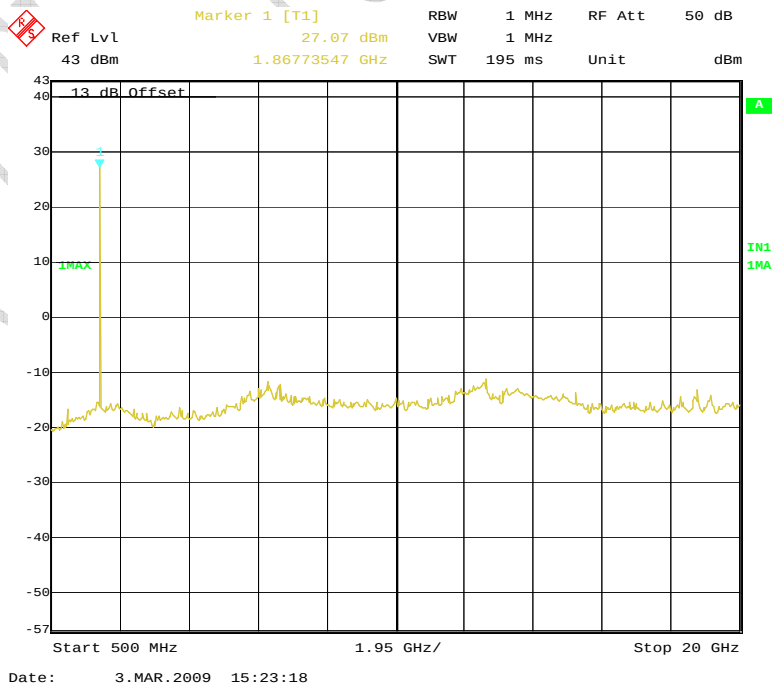
Test Results for GPRS mode:

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

Graphical results for GPRS mode:



Channel 190

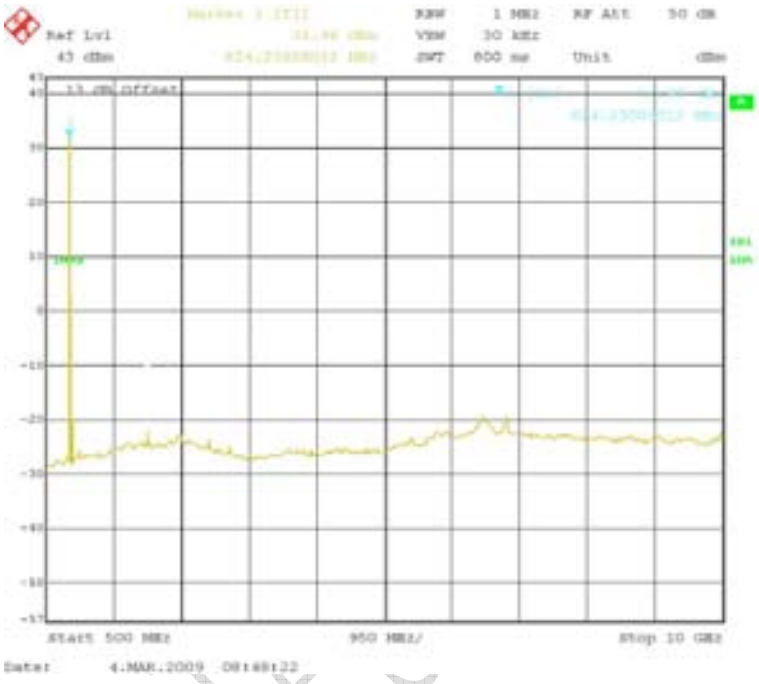


Channel 661

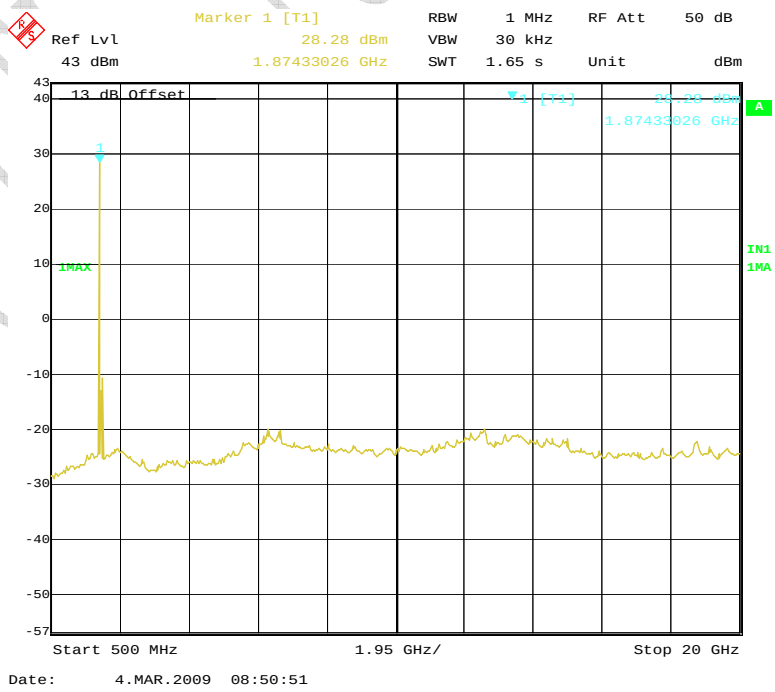
Test Results for EGPRS mode:

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

Graphical results for EGPRS mode:



Channel 190



Channel 661

4.8 Band Edge

Specifications:	2.1051, 24.238, 2.1053, 22.917
Date of Tests	2009-3-3
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Operation Mode	TX on, channel 128, 251, 512 and 810
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	2010-01-11	Normal
023	Wireless Communications Test Set	Agilent	8960(E5515C)	GB41450323	2009-06-13	Normal
---	Power spliter	Jie sai	---	1000132	2010-01-04	Normal
111835	Wireless Communications Test Set	R&S	CMU200	1100000802	--	Normal

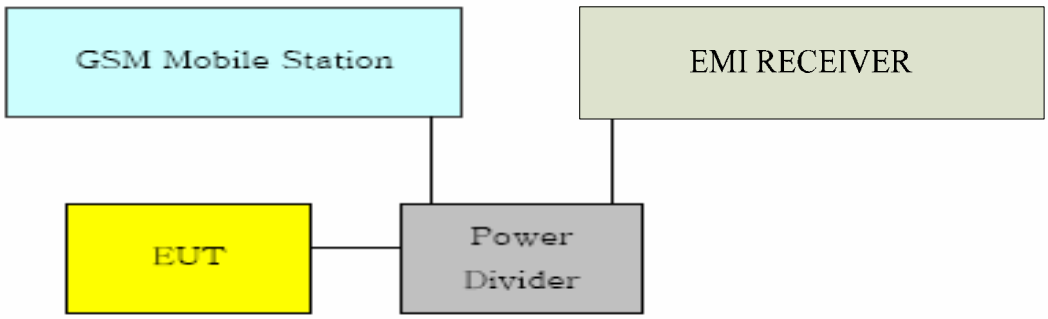
Limit Level Construction:
According to Part 24.238 (a), i.e., Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB, so the limit level is:
P(dBm) – (43 + 10 log(P))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

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 lost 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:

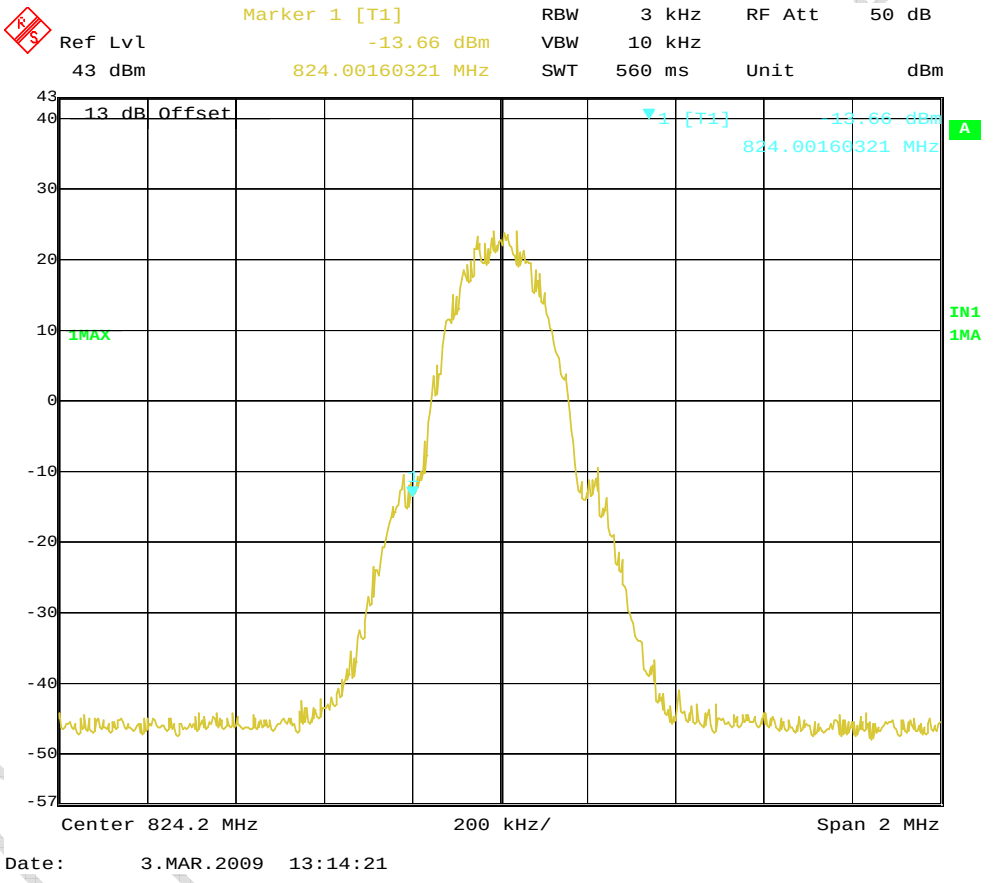
Band-edge emission		
EUT Channel	Frequency [MHz]	Level [dBm]
128 Left band edge	824.00160321	-13.66
251 Right band edge	849.00240481	-14.94
512 Left band edge	1849.99760	-16.05
810 Right band edge	1910.00240	-13.28

GPRS mode:

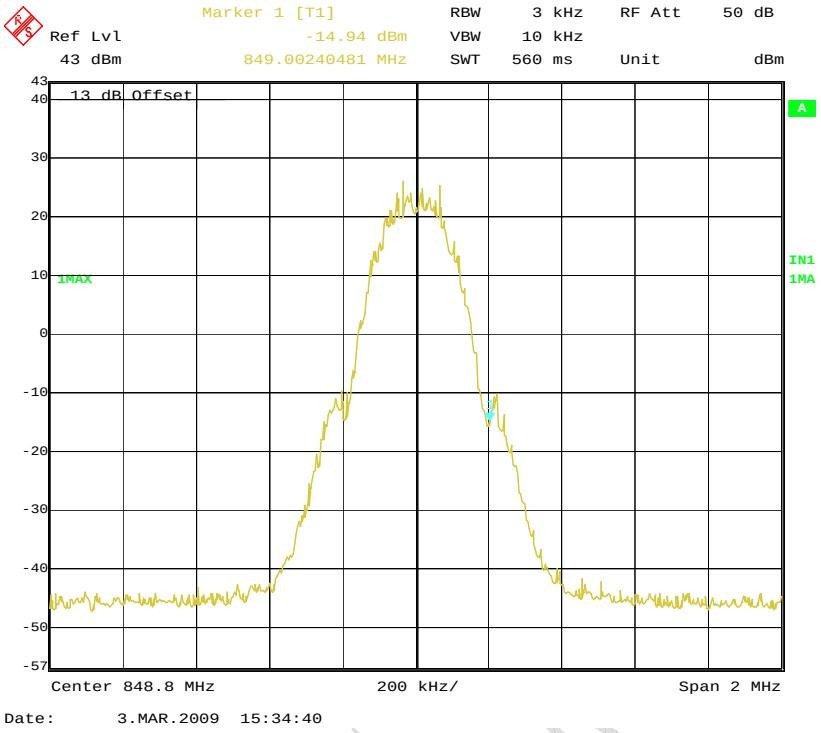
Band-edge emission		
EUT Channel	Frequency [MHz]	Level [dBm]
128 Left band edge	824.00160321	-13.66
251 Right band edge	849.00240481	-14.94
512 Left band edge	1850.00561	-18.64
810 Right band edge	1910.00641	-17.25

EGPRS mode:

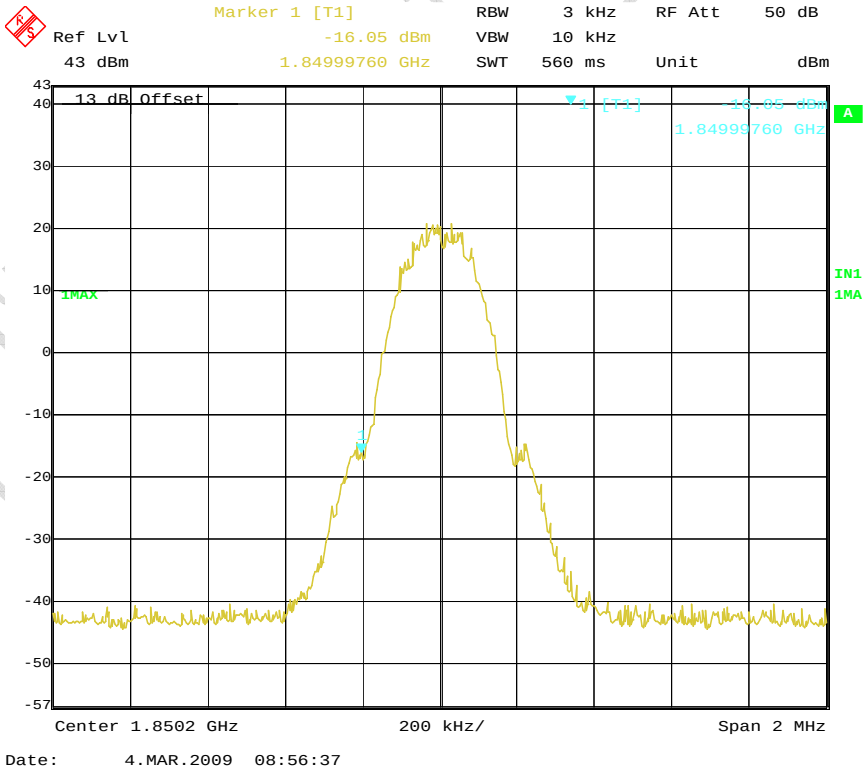
Band-edge emission		
EUT Channel	Frequency [MHz]	Level [dBm]
128 Left band edge	824.00160321	-13.66
251 Right band edge	849.00240481	-14.94
512 Left band edge	1849.99760	-16.05
810 Right band edge	1910.00240	-16.94



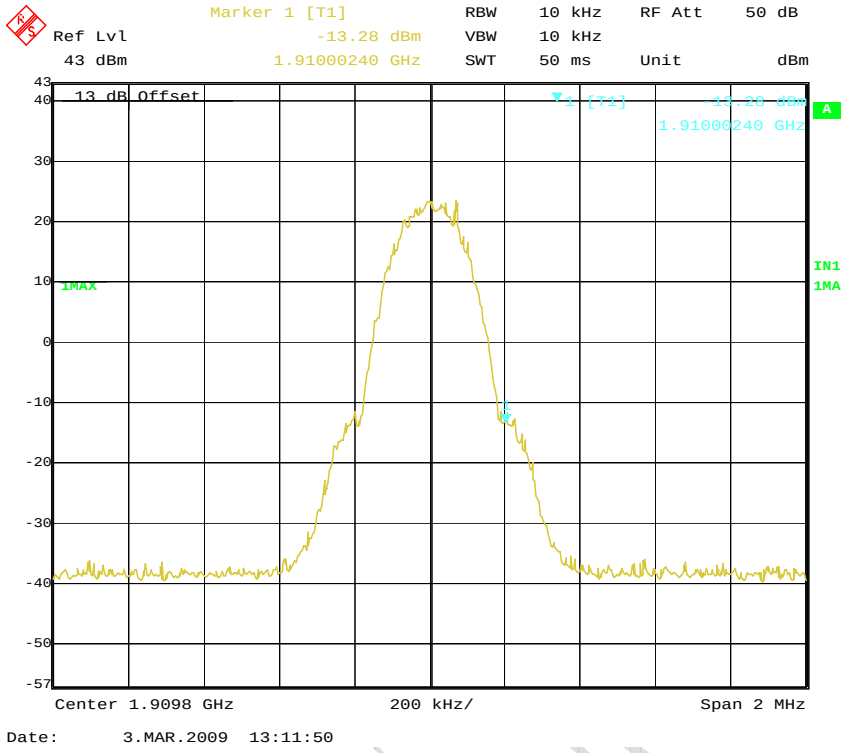
GSM channel 128 Left band edge



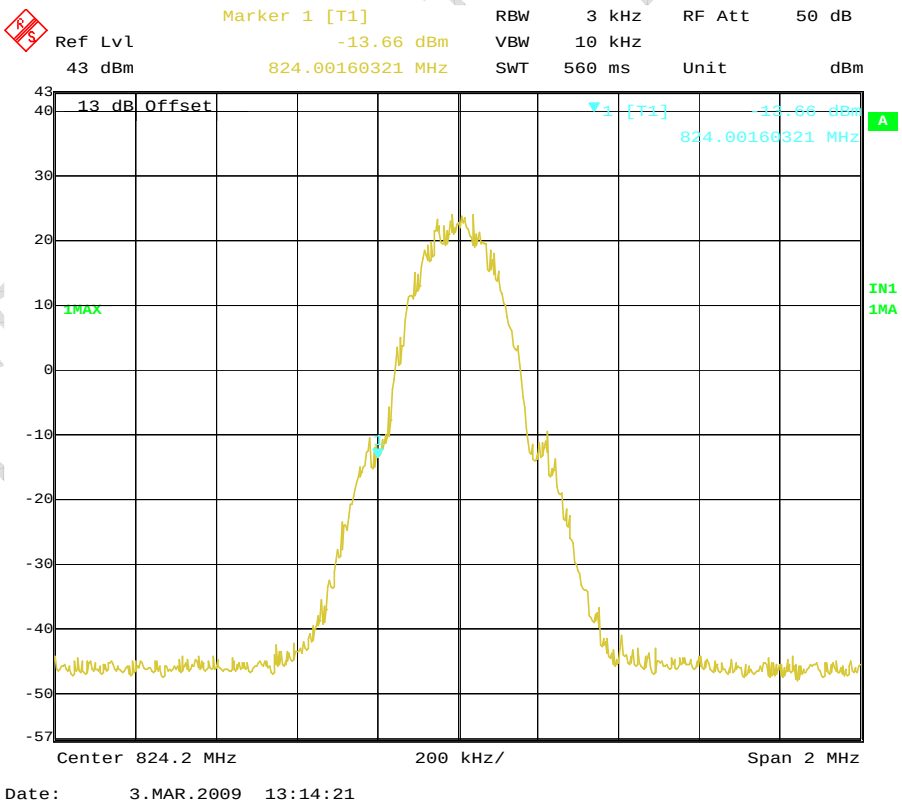
GSM channel 251 Right band edge



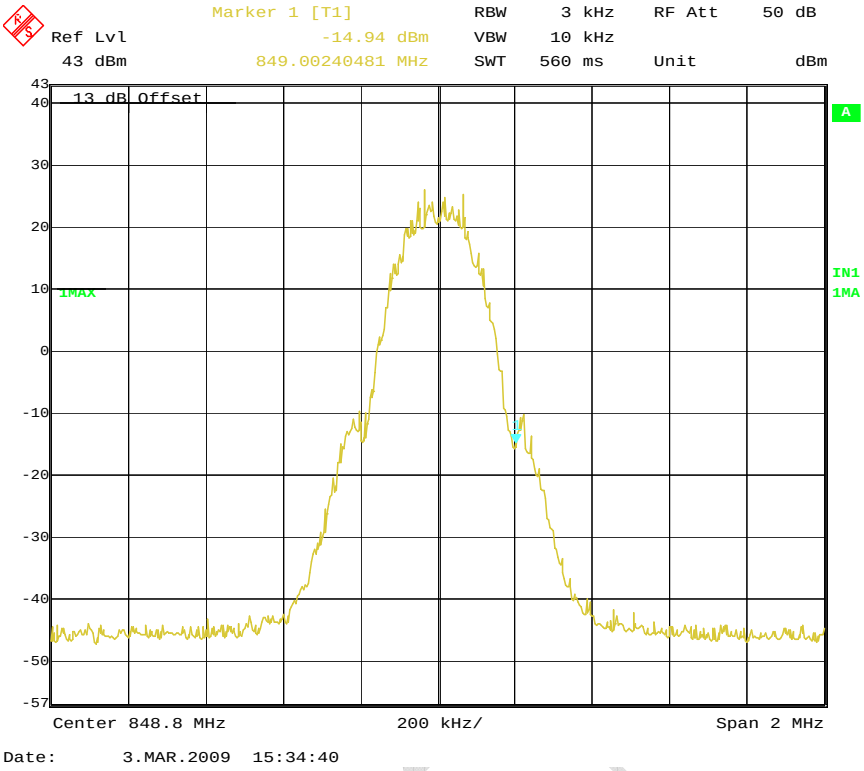
GSM channel 512 Left band edge



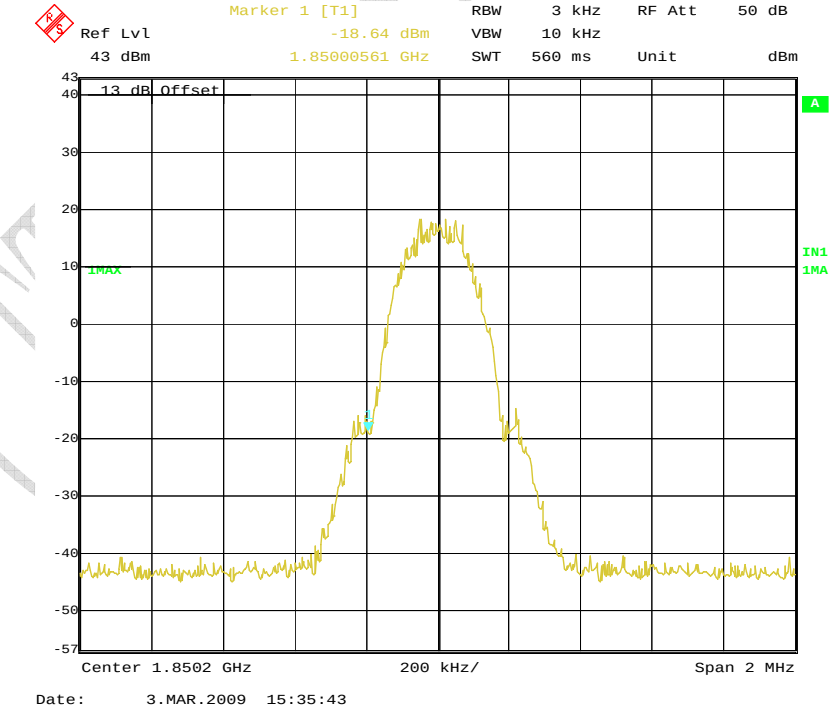
GSM channel 810 Right band edge



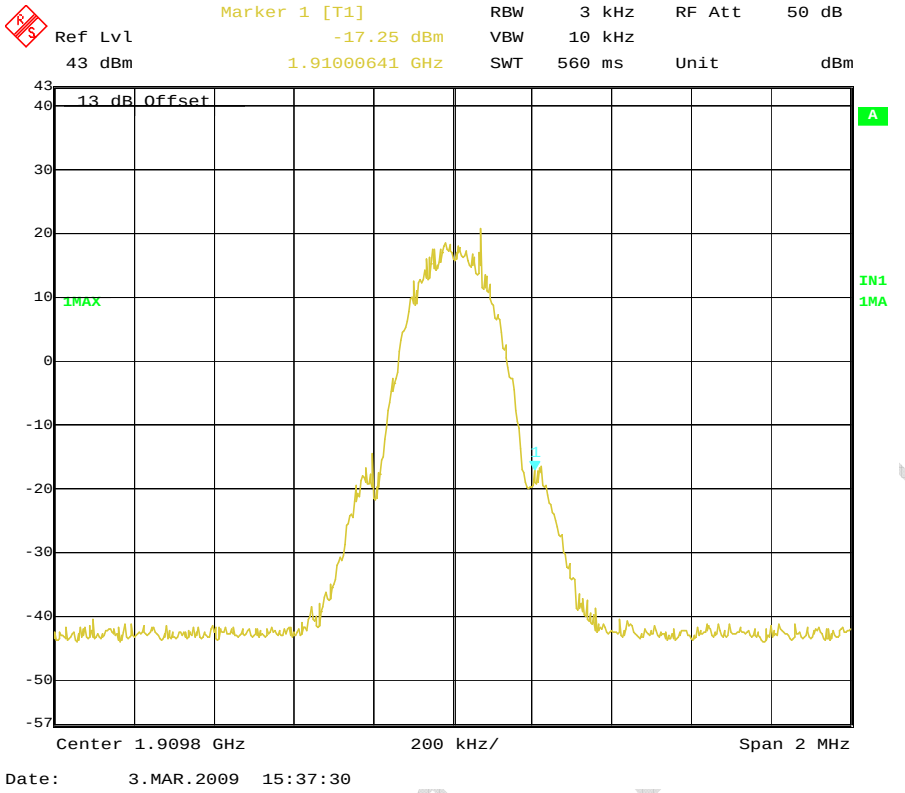
GPRS channel 128 Left band edge



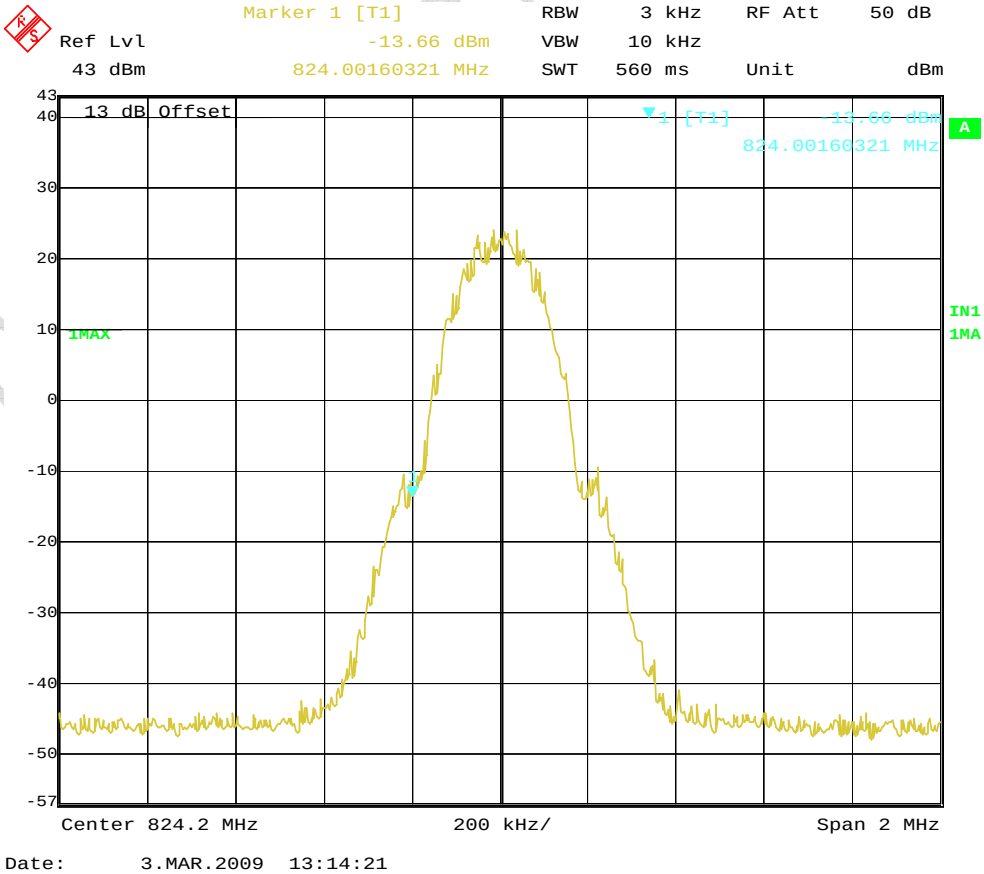
GPRS channel 251 Right band edge



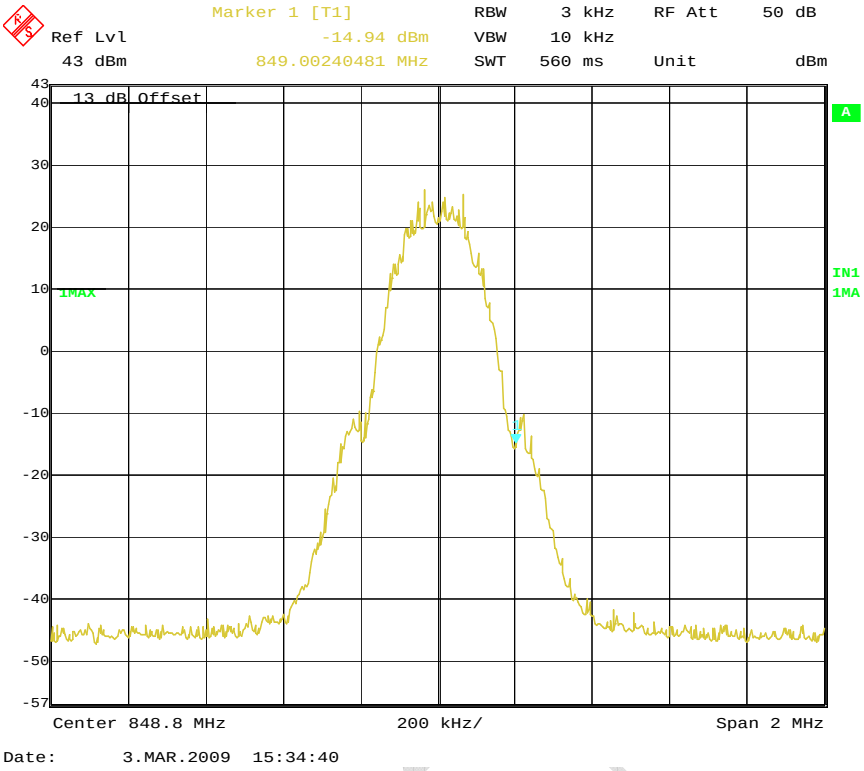
GPRS channel 512 Left band edge



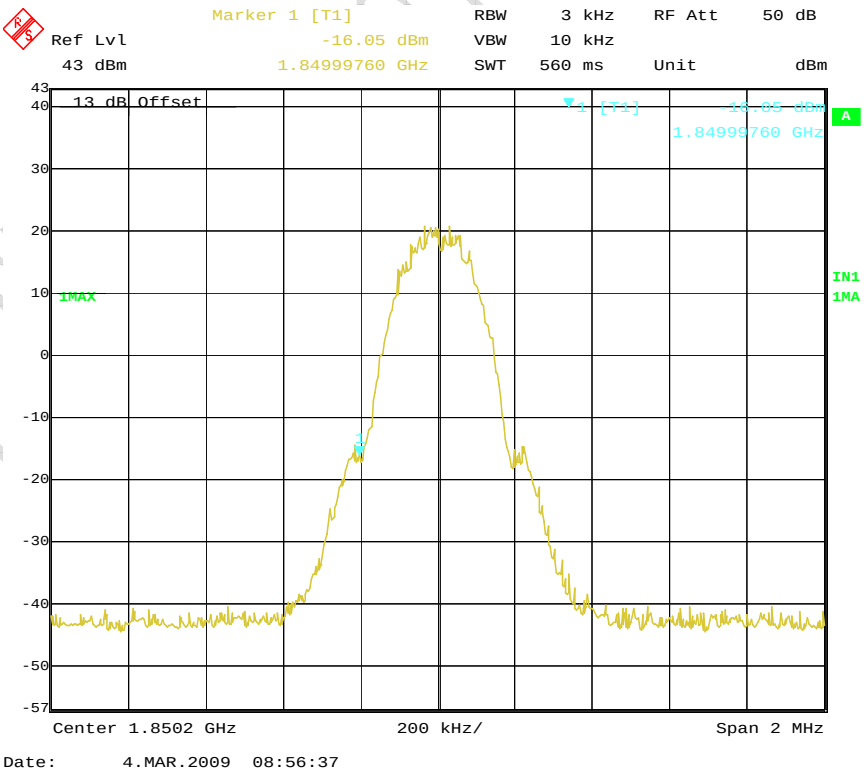
GPRS channel 810 Right band edge



EGPRS channel 128 Left band edge

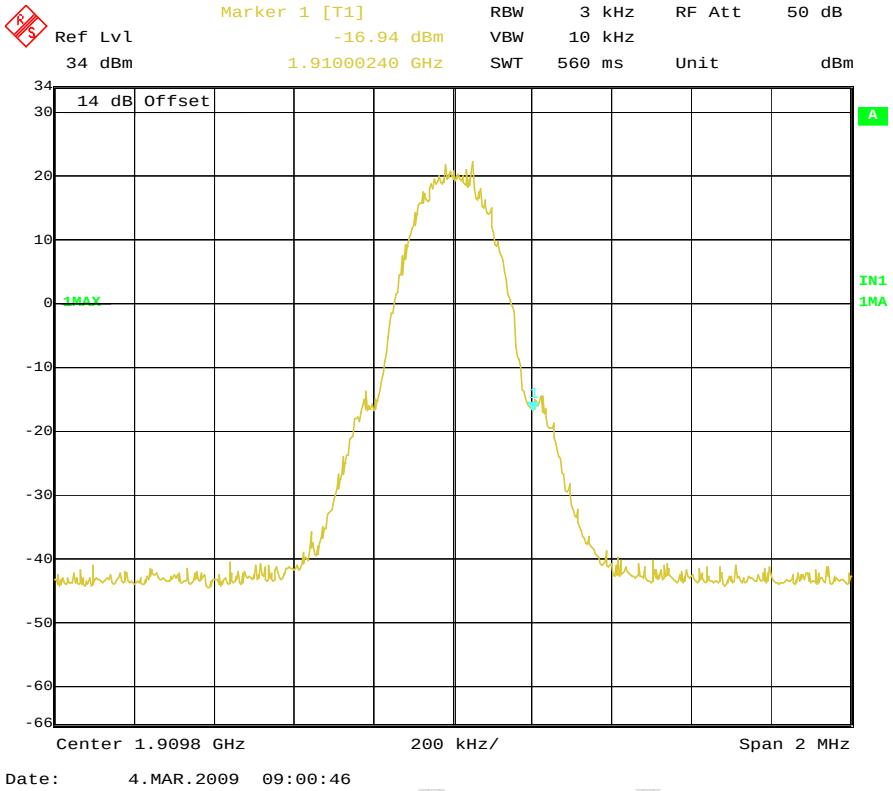


EGPRS channel 251 Right band edge



EGPRS channel 512 Left band edge

FCC Parts 2, 22, 24
Equipment: Sonim XP3.20-A Quest / Land Rover S1-A by Sonim **REPORT NO.: I09GE4084-FCC-EMC**



EGPRS channel 810 Right band edge

Annex A External Photos

Front view

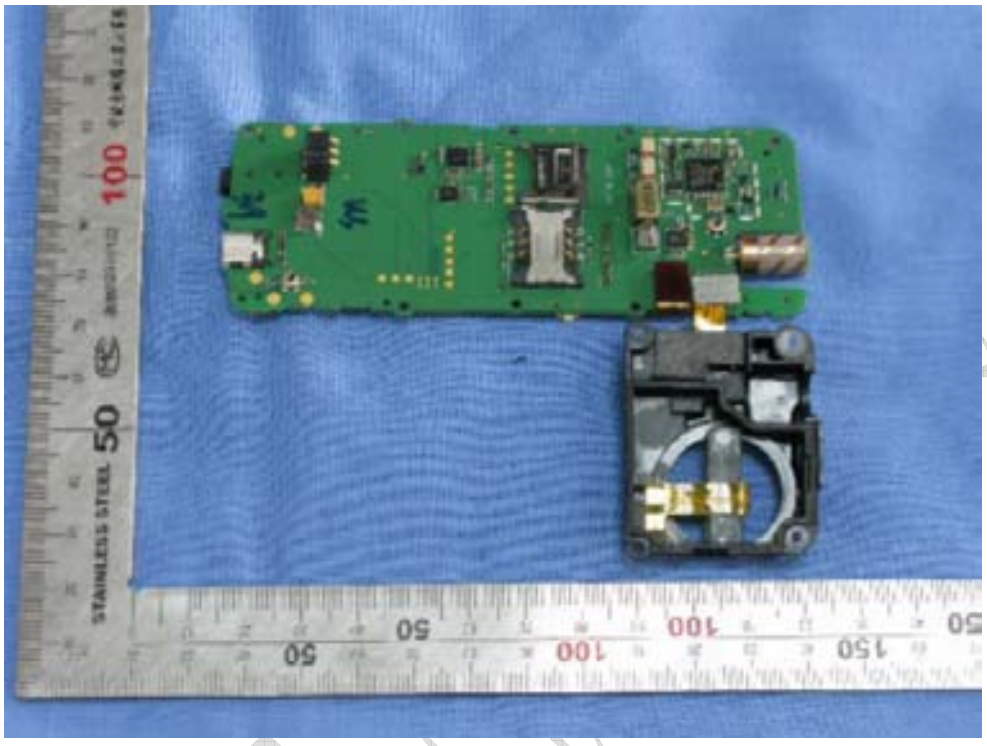
Back view

Adaptor and Cable

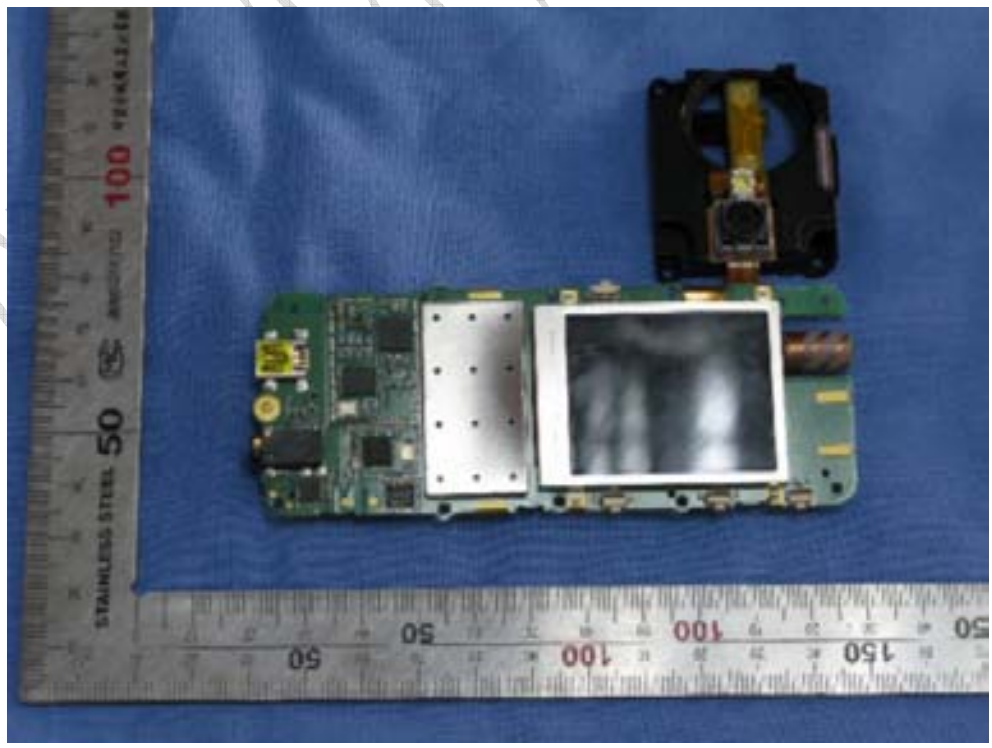
Battery

Earphone

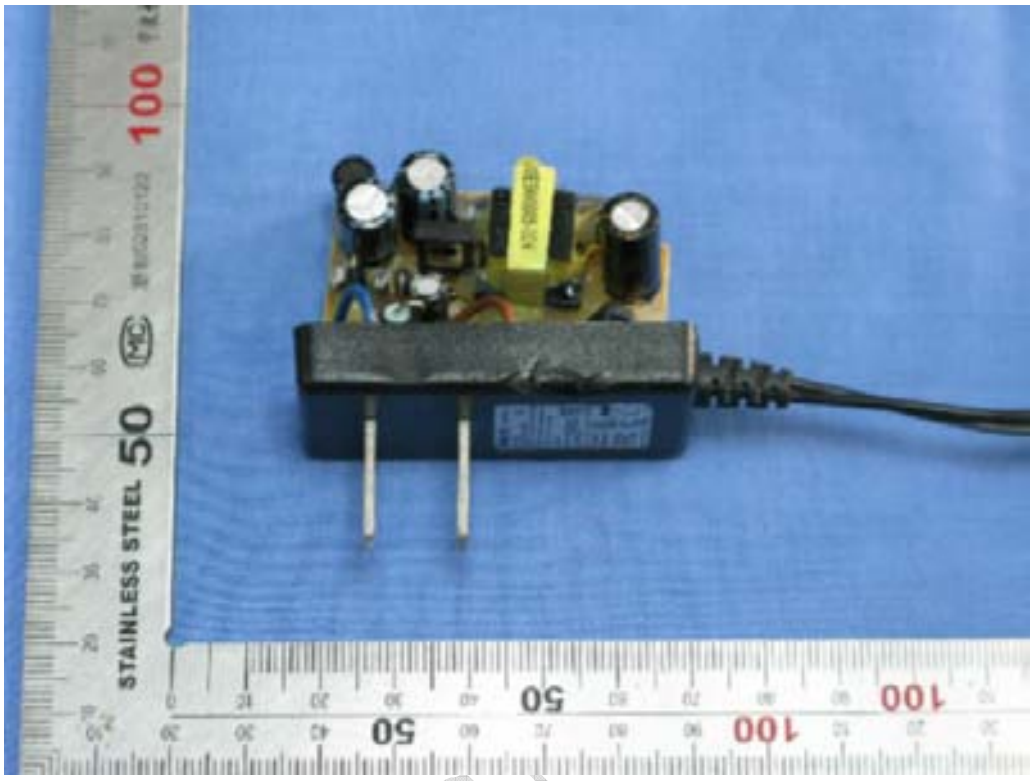
Annex B Internal Photos



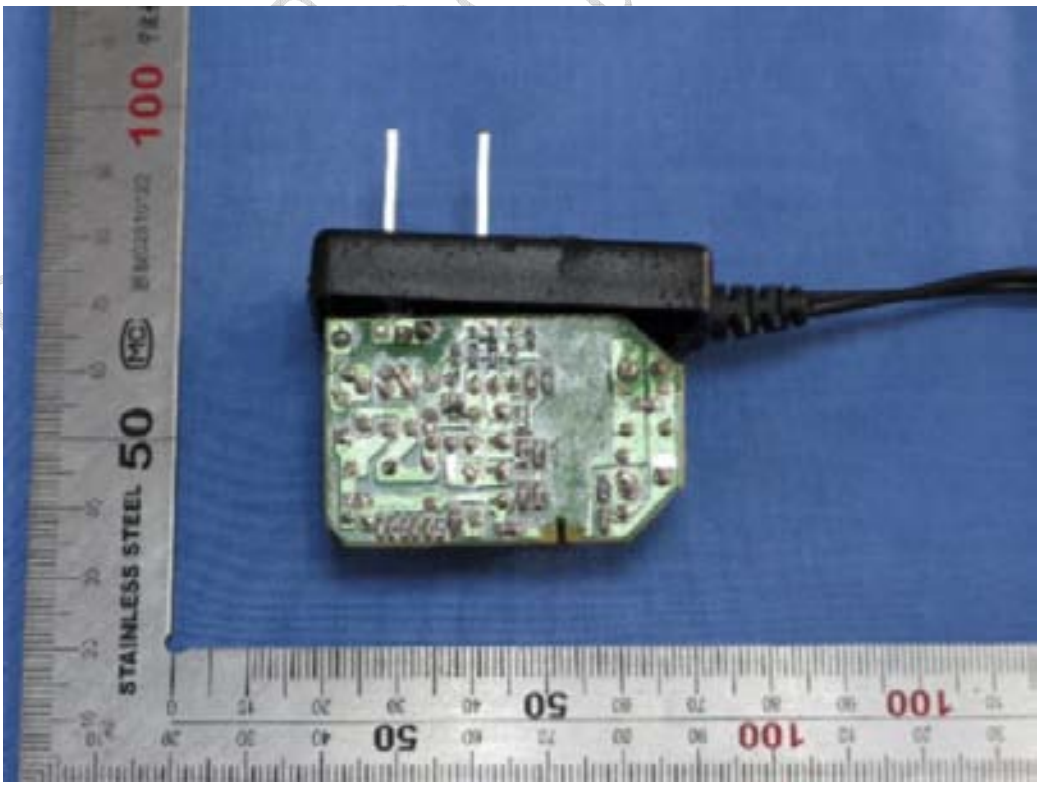
Main board (face)



Main board (back)



Adaptor（face）



Adaptor（back）

ANNEX C Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

The End of this Report