TEST REPORT

REPORT NUMBER: I12GWD761-RF-2G

ON

Type of Equipment: GSM QUAD Band and UMTS 850/1900 mobile phone

Model of Equipment: C8660

Marketing Name: C8660, C8660CA, C8660EN, C8660CP, C8660TL, C8660NZ, C8660AR, C8660AF

Applicant: Cellon Communications Technology(ShenZhen)Co., Ltd.

China Telecommunication Technology Labs

Month date, year

Nov 15th, 2012

Signature

Ma Xin

Vice Director

FCC ID: T38C8660

Report Date: 2012-11-15

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 the following specifications.

FCC PART 2	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS	10-1-10 Edition
FCC Part 22	PUBLIC MOBILE SERVICES	10-1-10 Edition
FCC Part 24	PERSONAL COMMUNICATIONS SERVICES	10-1-10 Edition
ANSI/TIA-603-C	Land Mobile FM or PM Communications Equipment Measurement and Performance standards	2004
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40 GHz	2003

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 Peng

Position: Engineer

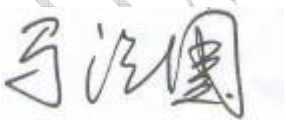
Signature: 

Technical responsibility for area of testing:

Name: Ma Zhiguo

Position: Manager

Date: 2012-11-15

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

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:	Cellon Communications Technology (ShenZhen) Co., Ltd
Address:	13/F, Skyworth Building C Gaoxin S. Ave. 1st, High-Tech industrial Park Nanshan, Shenzhen
Country:	China
Telephone:	0755-86365704
Fax:	0755-86365686
Contact:	maggie.xu
Email:	Maggie.xu@cellon.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:	--

2 Test Item

2.1 General Information

Manufacturer:	Cellon Communications Technology (ShenZhen) Co., Ltd
Name:	GSM QUAD Band and UMTS 850/1900 mobile phone
Model Number:	C8660
Serial Number:	--
Production Status:	Product
Receipt date of test item:	2012-5-21
Transmitter Frequency range:	GSM850: 824.2-848.8 MHz, PCS1900: 1850.2-1909.8MHz
Receiver Frequency Range:	GSM850: 869.2-893.8 MHz, PCS1900: 1930.2-1989.8MHz
Bluetooth Frequency Range:	2400MHz~2480MHz
High Voltage Level:	4.2 V
Nominal Voltage Level:	3.7 V
Low Voltage Level:	3.5 V

2.2 Outline of EUT

E.U.T. is a GSM QUAD Band and UMTS 850/1900 mobile 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	Cellon Communications Technology (ShenZhen) Co., Ltd	C8660	--	None
B	adapter	DVE	SPS-015757	--	None
C	battery	BAK	Li-ion	--	None

2.5 Other Information

(a) Modulation is GMSK for GSM and GPRS, and GMSK for EGPRS.

(b) Version of hardware and software

HW Version: A8660 MainPCB P2C

SW Version: ADR21_Claro_CA_2.7

(c) Battery information:

Nominal Voltage: 3.7 V

Capacity: 1200 mAh

3 Summary of Test Results

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

GSM mode:		
FCC Specification Clause	**Name of Test**	**Result**
2.1051, 24.238, 22.917	Radiated Spurious Emission	Pass
22.913, 24.232	Output Power	Pass
15.107, 15.207	Conducted Emission	Pass
2.1049,22.917(b), 24.238(b)	Occupied Bandwidth	Pass
22.917(b), 24.238(b)	Emission Bandwidth	Pass
2.1055,22.355, 24.235	Frequency Stability	Pass
2.1057,22.917, 24.238	Conducted spurious emissions	Pass
22.917(b), 24.238(b)	Band Edge Compliance	Pass

GPRS mode:		
FCC Specification Clause	**Name of Test**	**Result**
2.1051, 24.238, 22.917	Radiated Spurious Emission	Pass
22.913, 24.232	Conducted Emission	Pass
15.107, 15.207	Occupied Bandwidth	Pass
2.1049,22.917(b), 24.238(b)	Emission Bandwidth	Pass
22.917(b), 24.238(b)	Frequency Stability	Pass
2.1055,22.355, 24.235	Conducted spurious emissions	Pass
2.1057,22.917, 24.238	Band Edge Compliance	Pass

EGPRS mode:		
FCC Specification Clause	**Name of Test**	**Result**
2.1051, 24.238, 22.917	Radiated Spurious Emission	Pass
22.913, 24.232	Conducted Emission	Pass
15.107, 15.207	Occupied Bandwidth	Pass
2.1049,22.917(b), 24.238(b)	Emission Bandwidth	Pass
22.917(b), 24.238(b)	Frequency Stability	Pass
2.1055,22.355, 24.235	Conducted spurious emissions	Pass
2.1057,22.917, 24.238	Band Edge Compliance	Pass

4 Test Results of mode

4.1 Radiated Spurious Emission

Specifications:	2.1051, 24.238, 22.917
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

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.

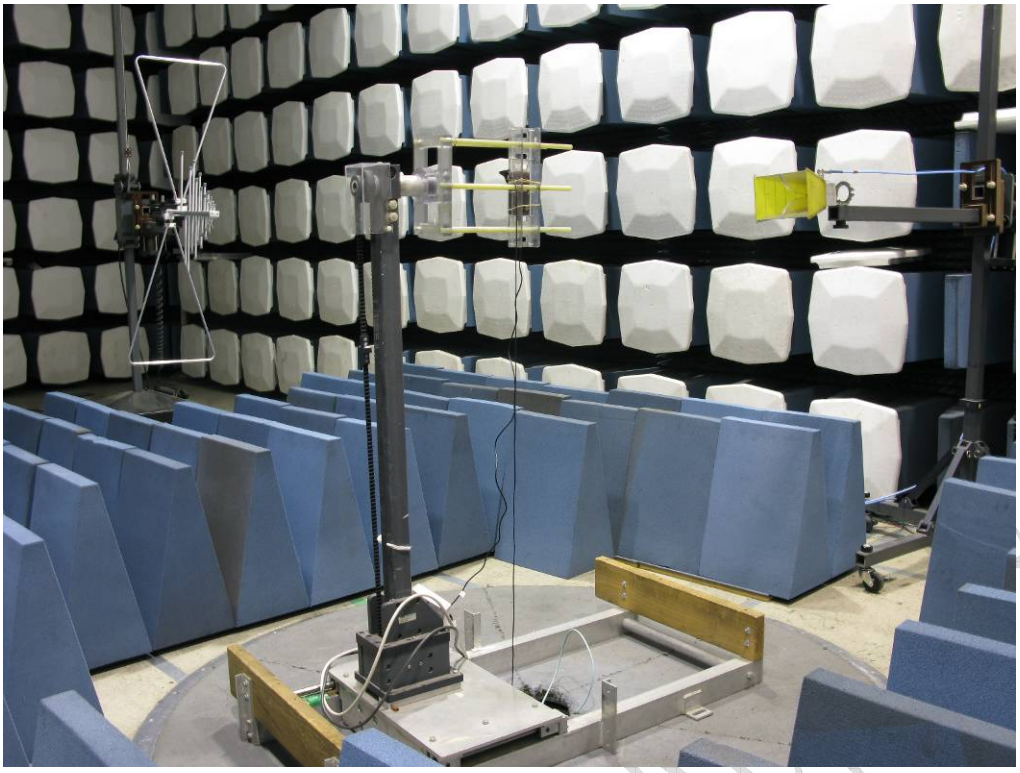


Figure SP

Test Method:

The measurement was performed accordance with section 2.2.12 of TIA-603-C-2004: *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.

4 The corrected values of radiated spurious emissions indicated as EIRP are reported.

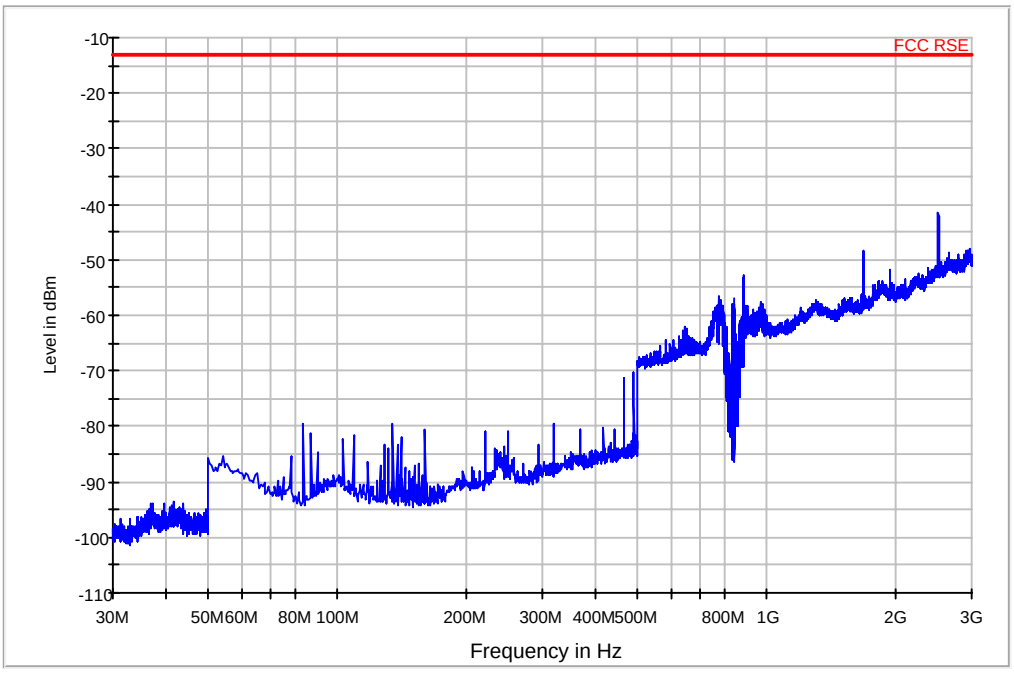
Note:

1 The investigated ARFCNs are 190 (836.6 MHz) and 661 (1880.0 MHz).

2 The investigated frequency range is 30 MHz to the 10th harmonic of the highest Frequency generated within the equipment.

Test Results for GSM mode:

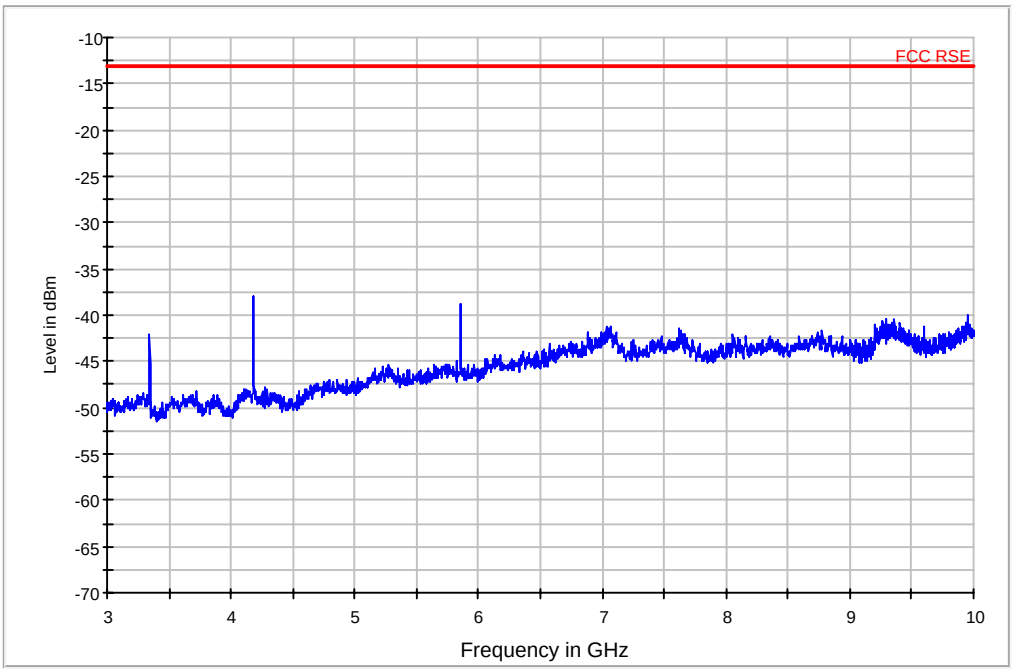
GSM850 Tx 30-3GHz-FCC Test



FCC RSE.LimitLine Preview Result 1 Data Reduction 1 [1]

Channel 190 for 850MHz – 30MHz to 3GHz

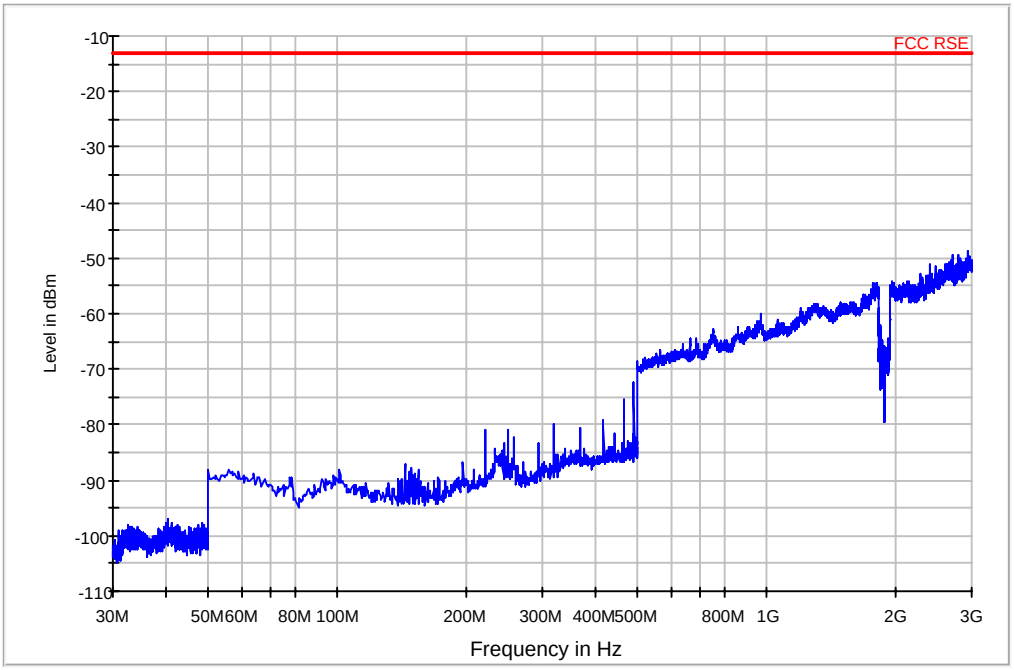
GSM850 Tx 3-12.75GHz-FCC Test



FCC RSE.LimitLine Preview Result 1

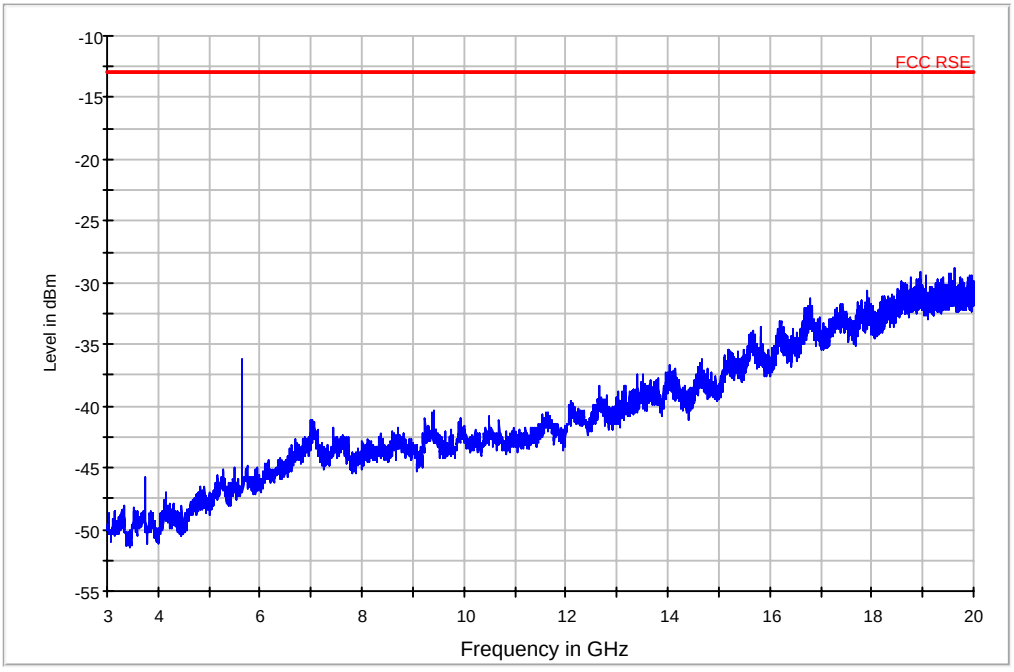
Channel 190 for 850MHz – 3GHz to 12.75GHz

GSM1900 Tx 30-3GHz-FCC Test



Channel 661 for 1900MHz– 30MHz to 3GHz

GSM1900 Tx 3-20GHz-FCC Test



Channel 661 for 1900MHz– 3GHz to 20GHz

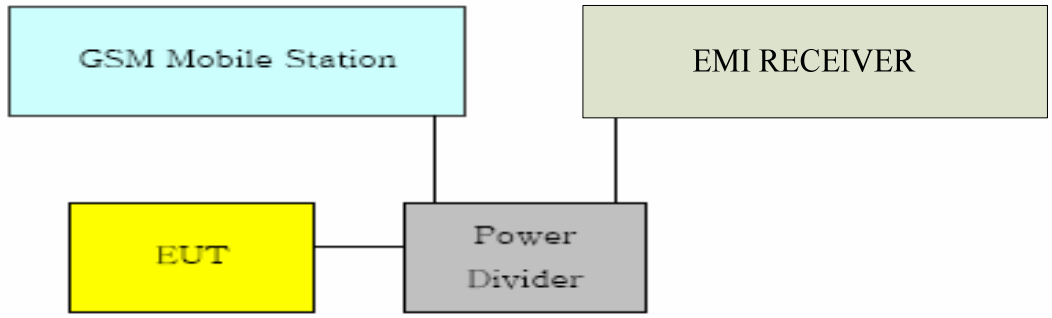
4.2 Output Power

4.2.1. Conducted Output Power

Specifications:	22.913, 24.232
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 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 Max-peak Detector function and Maximum hold mode.

3) The resolution bandwidth of the spectrum analyzer was comparable to the emission bandwidth.

Note: --

Test Result for GSM mode:

GSM 850 band:

GSM

ARFCN	Output Power [dBm]
128	32.60
190	32.58
251	32.54

GPRS

ARFCN	Output Power [dBm]
128	32.60
190	32.55
251	32.52

EGPRS

ARFCN	Output Power [dBm]
128	32.57
190	32.52
251	32.50

GSM 1900 band:

GSM

ARFCN	Output Power [dBm]
512	29.83
661	29.88
810	29.88

GPRS

ARFCN	Output Power [dBm]
512	29.79
661	29.83
810	29.84

EGPRS

ARFCN	Output Power [dBm]
512	29.78
661	29.81
810	29.83

4.2.2. Radiated Output Power

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-C-2004: *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:

Limits

	Burst Peak ERP (dBm)
GSM	≤ 38.45 (7W)
GPRS	≤ 38.45 (7W)
EGPRS	≤ 38.45 (7W)

GSM

ARFCN	Frequency [MHz]	ERP [dBm]
128	824.228	29.37
190	836.553	30.09
251	848.777	30.49

GPRS

ARFCN	Frequency [MHz]	ERP [dBm]
128	824.128	24.68
190	836.553	25.11
251	848.777	25.04

EGPRS

ARFCN	Frequency [MHz]	ERP [dBm]
128	824.128	24.42
190	836.553	23.69
251	848.877	24.05

EIRP Value for GSM 1900 band mode:

Limits

	Burst Peak EIRP (dBm)
GSM	≤ 33 (2W)
GPRS	≤ 33 (2W)
EGPRS	≤ 33 (2W)

GSM

ARFCN	Frequency [MHz]	EIRP [dBm]
512	1850.100	31.26
661	1880.080	31.41
810	1909.739	30.32

GPRS

ARFCN	Frequency [MHz]	EIRP [dBm]
512	1850.100	26.24
661	1880.080	26.10
810	1909.899	25.82

EGPRS

ARFCN	Frequency [MHz]	EIRP [dBm]
512	1850.100	30.62
661	1879.919	29.90
810	1909.739	30.05

4.3 Conducted Emission

Specifications:	15.107, 15.207
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 Method

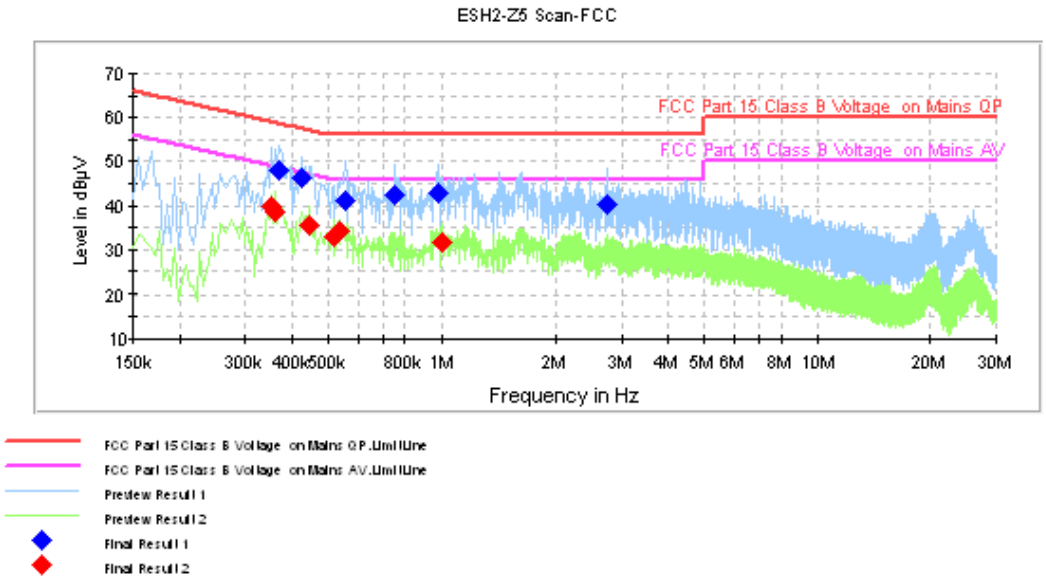
The Measure procedure is ANSI C63.4 is used. Conducted Emission is measured with travel charger.

Limit

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

Test Result

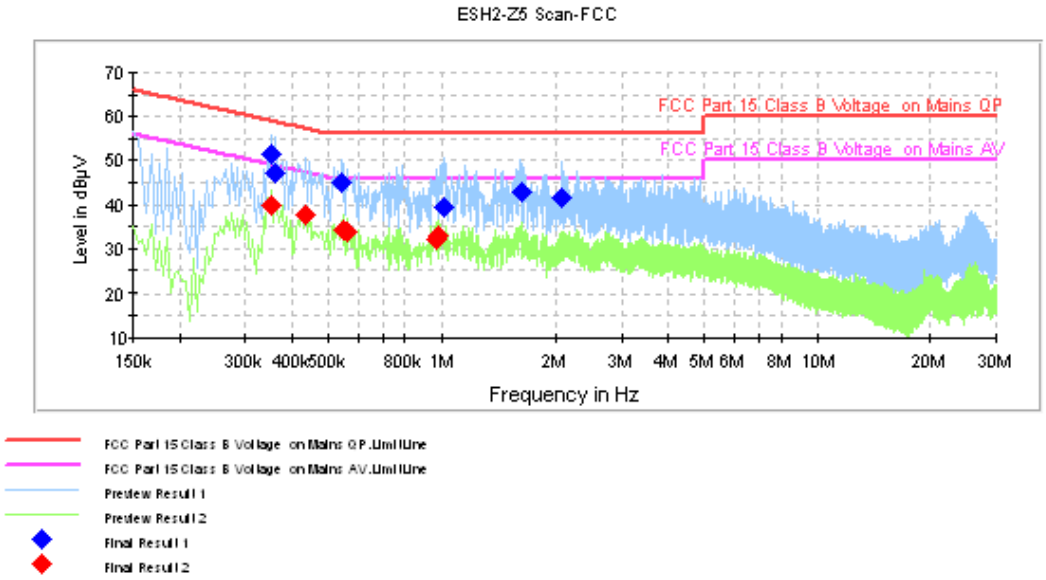
GSM 850MHz



Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.370500	48.1	FLO	L1	10.0	10.4	58.5
0.424500	46.1	FLO	L1	10.0	11.3	57.4
0.555000	41.3	FLO	N	10.1	14.7	56.0
0.753000	42.2	FLO	L1	10.1	13.8	56.0
0.987000	43.0	FLO	L1	10.1	13.0	56.0
2.751000	40.3	FLO	L1	10.1	15.7	56.0

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.352500	39.6	FLO	N	10.1	9.3	48.9
0.361500	38.6	FLO	N	10.1	10.1	48.7
0.442500	35.7	FLO	L1	10.0	11.3	47.0
0.519000	33.1	FLO	N	10.1	12.9	46.0
0.537000	34.1	FLO	L1	10.1	11.9	46.0
1.000500	31.7	FLO	N	10.1	14.3	46.0

GSM 1900MHz



Frequency (MHz)	QuasiPeak (dB μV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.352500	51.5	FLO	L1	10.0	7.4	58.9
0.361500	47.2	FLO	N	10.1	11.5	58.7
0.541500	45.1	FLO	L1	10.1	10.9	56.0
1.018500	39.3	FLO	N	10.0	16.7	56.0
1.626000	42.8	FLO	L1	10.1	13.2	56.0
2.080500	41.6	FLO	L1	10.1	14.4	56.0

Frequency (MHz)	CAverage (dB μV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.352500	39.9	FLO	N	10.1	9.0	48.9
0.433500	37.6	FLO	L1	10.0	9.6	47.2
0.550500	34.0	FLO	L1	10.1	12.0	46.0
0.559500	33.6	FLO	L1	10.1	12.4	46.0
0.973500	32.0	FLO	N	10.1	14.0	46.0
0.982500	32.9	FLO	L1	10.1	13.1	46.0

4.4 Occupied bandwidth

Specifications:	2.1049,22.917(b),24.238(b)
Operation Mode	TX on, channel 128, 190, 251, 512, 661 and 810
Test Results:	Pass

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

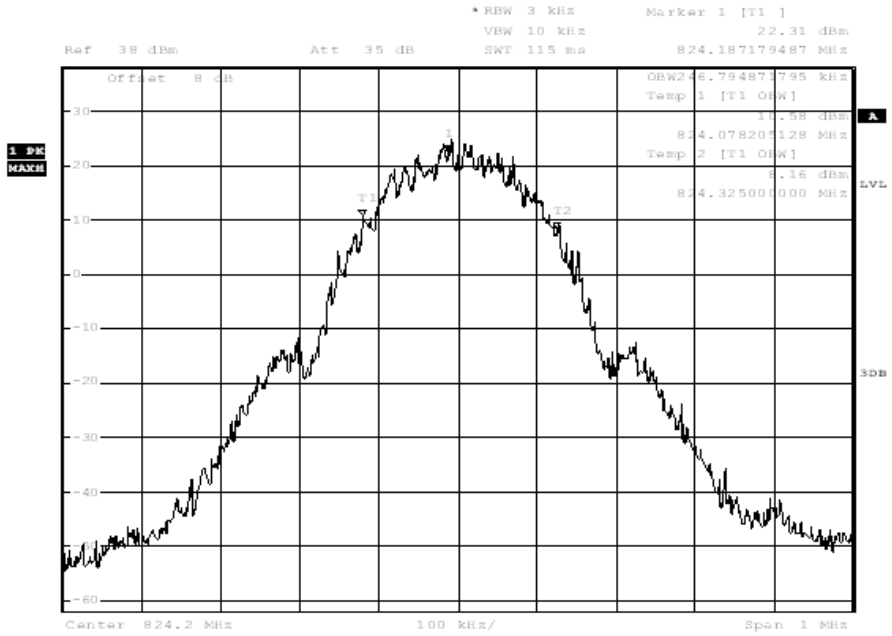
The 99% occupied bandwidth was calculated form the spectrum analyzer. Markers in the spectrum analyzer were then placed between the calculated frequencies to show the calculated 99% power band.

Note: --

Results data of GSM mode:

EUT channel	99% occupied bandwidth [kHz]
128	246.79
190	245.19
251	245.19
512	245.19
661	245.19
810	246.79

Graphical results for GSM mode:



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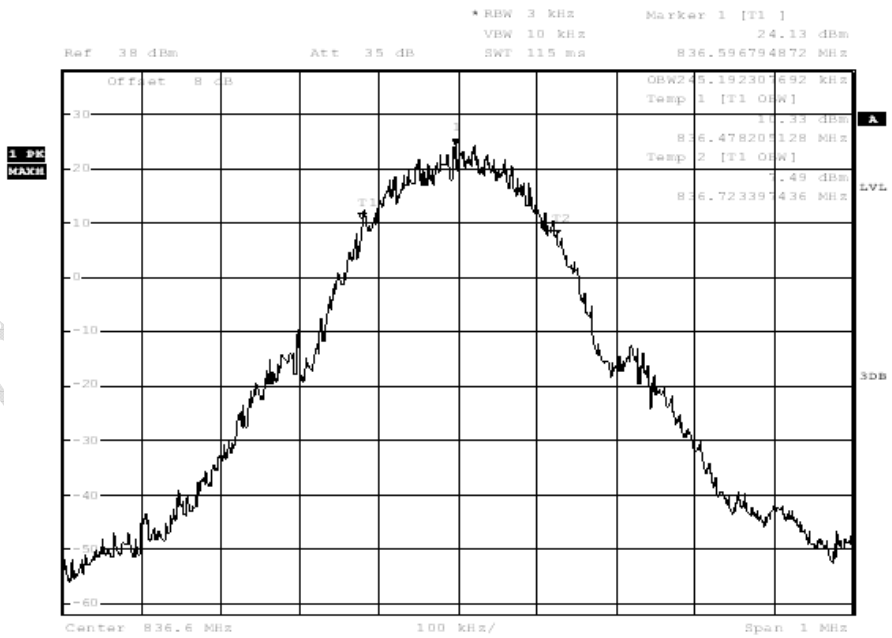
Channel 128



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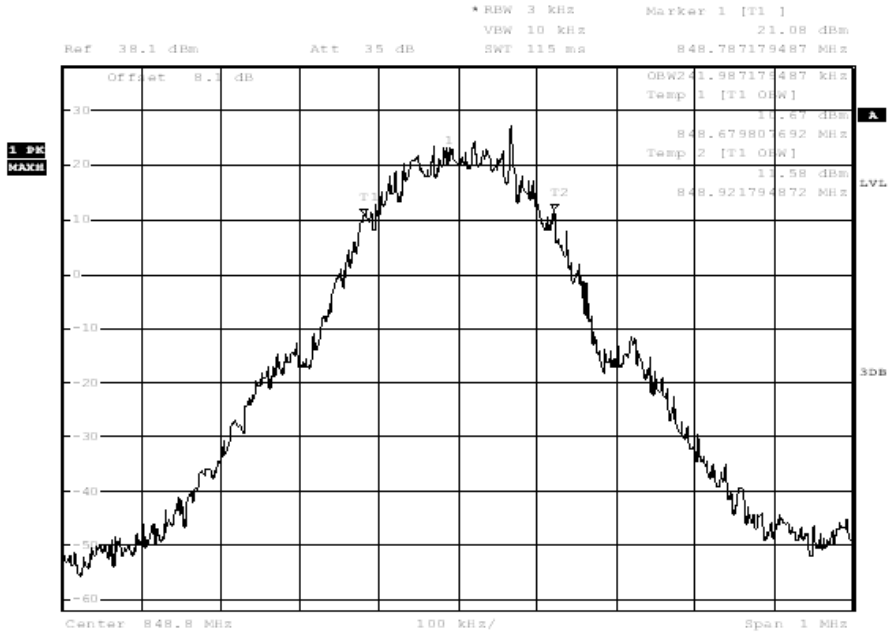
Channel 190



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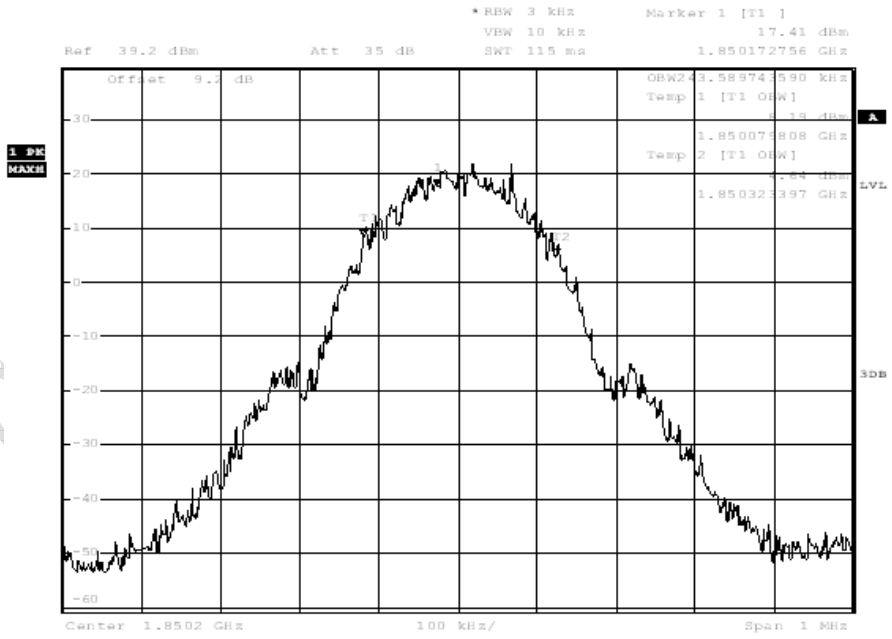
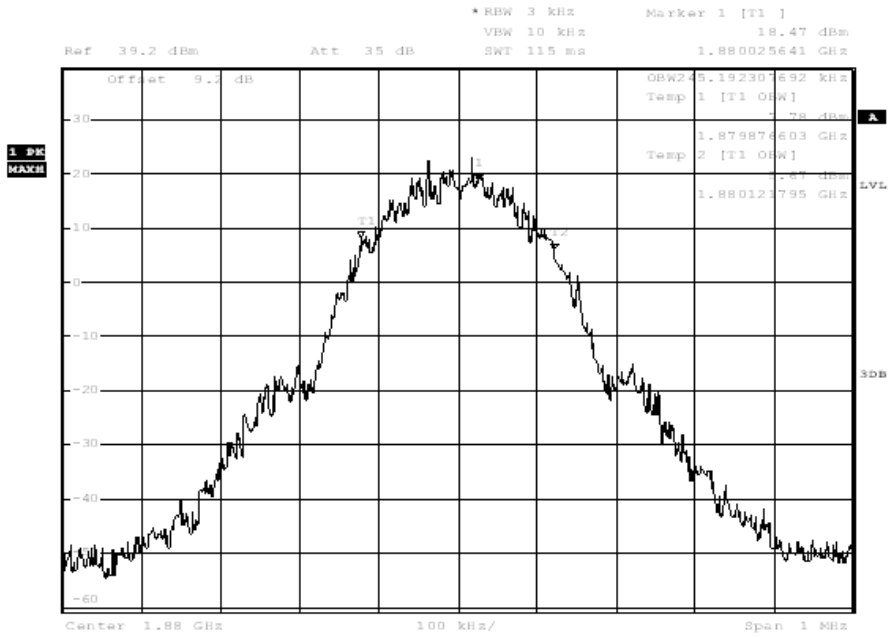
Channel 251



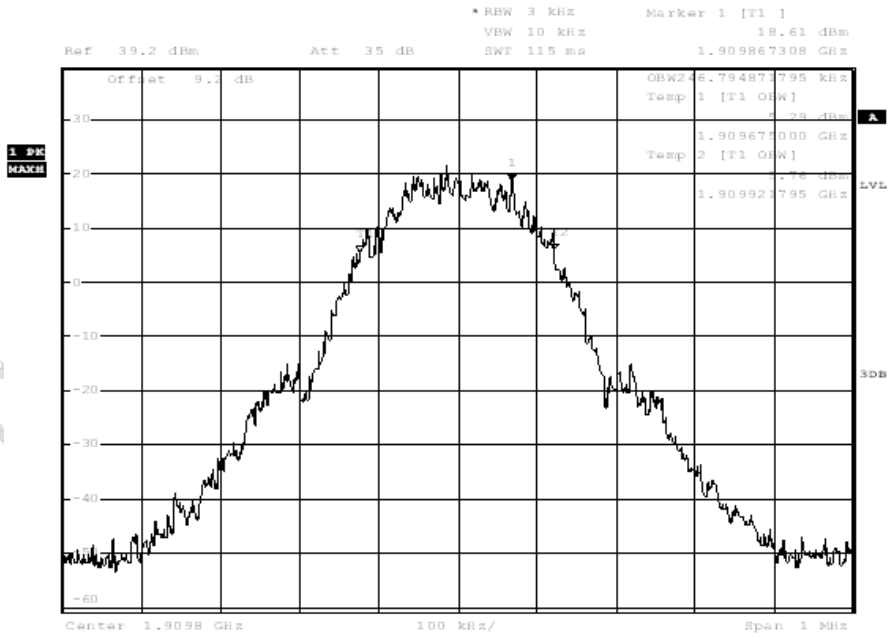
Date: 23.MAY.2012 19:12:02

Channel 512



Date: 23.MAY.2012 19:12:48

Channel 661



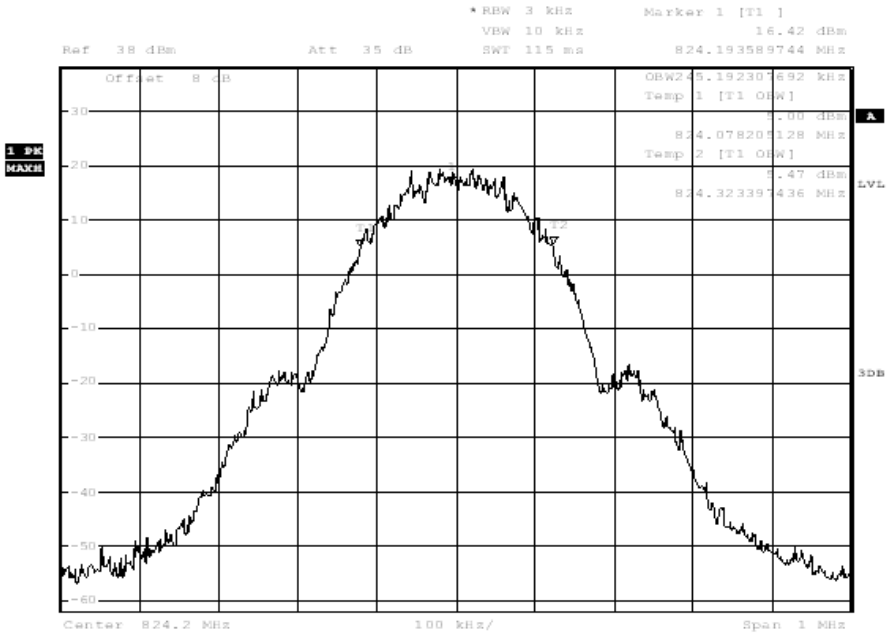
Date: 23.MAY.2012 19:13:35

Channel 810

Results data of GPRS mode:

EUT channel	99% occupied bandwidth [kHz]
128	245.19
190	243.59
251	248.40
512	243.59
661	243.59
810	246.79

Graphical results for GPRS mode:



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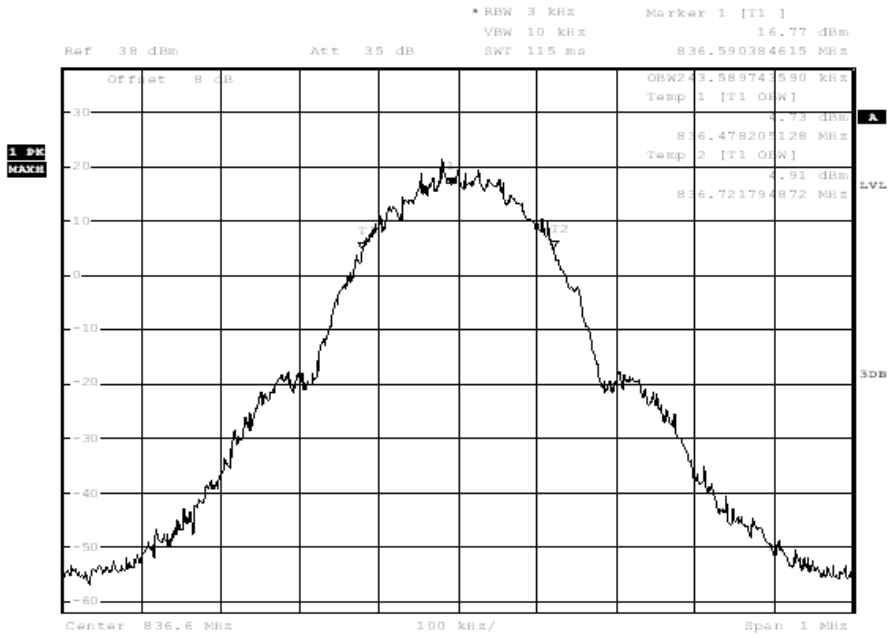
Channel 128



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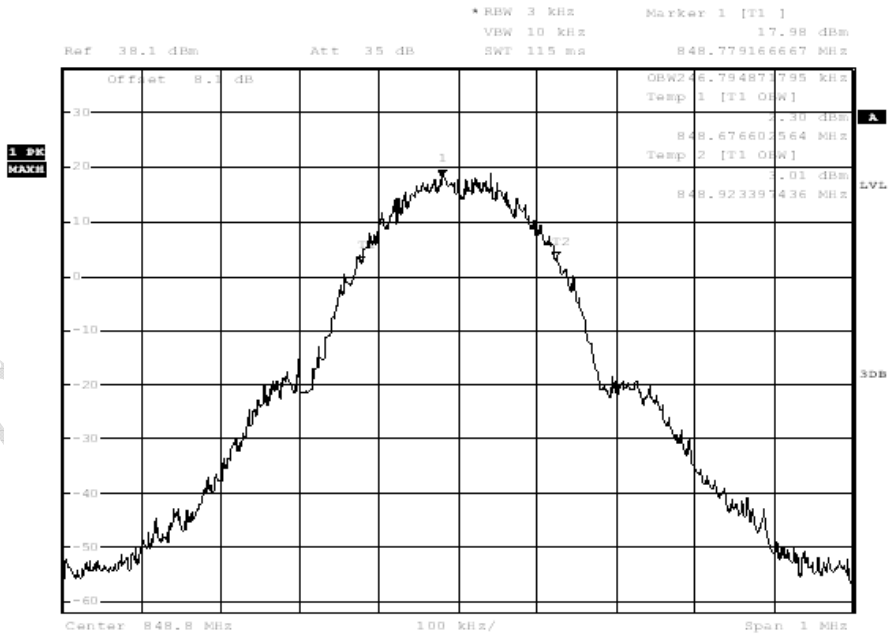
Channel 190



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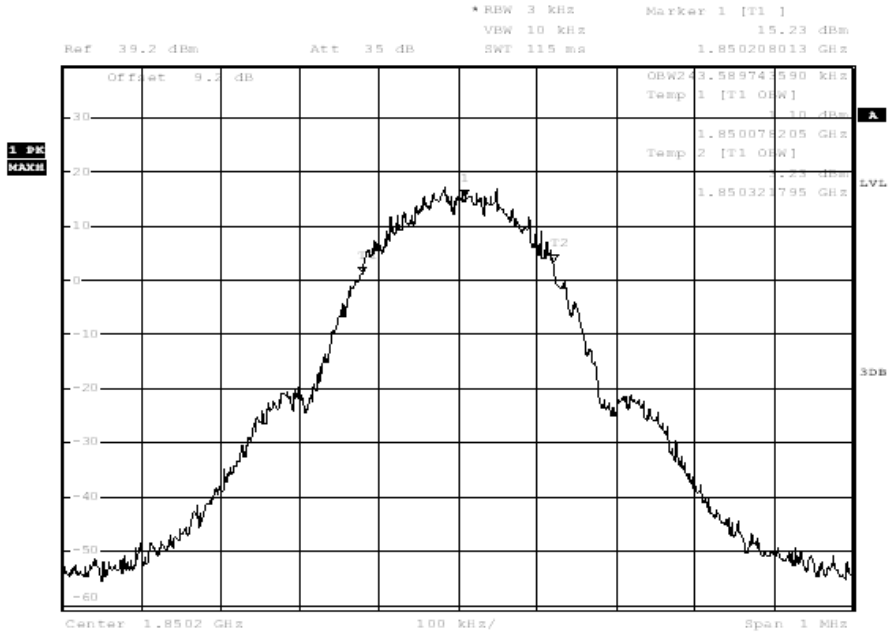
Channel 251



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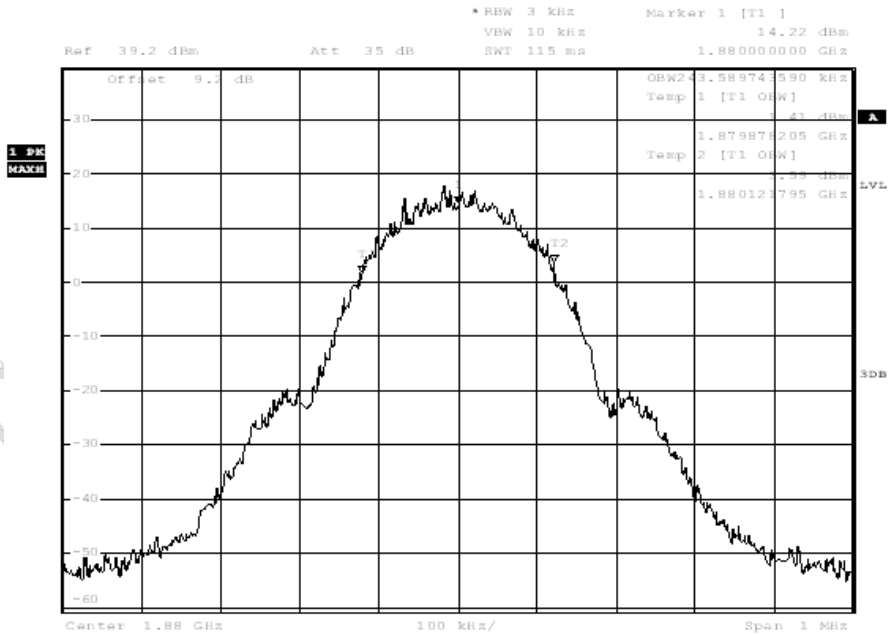
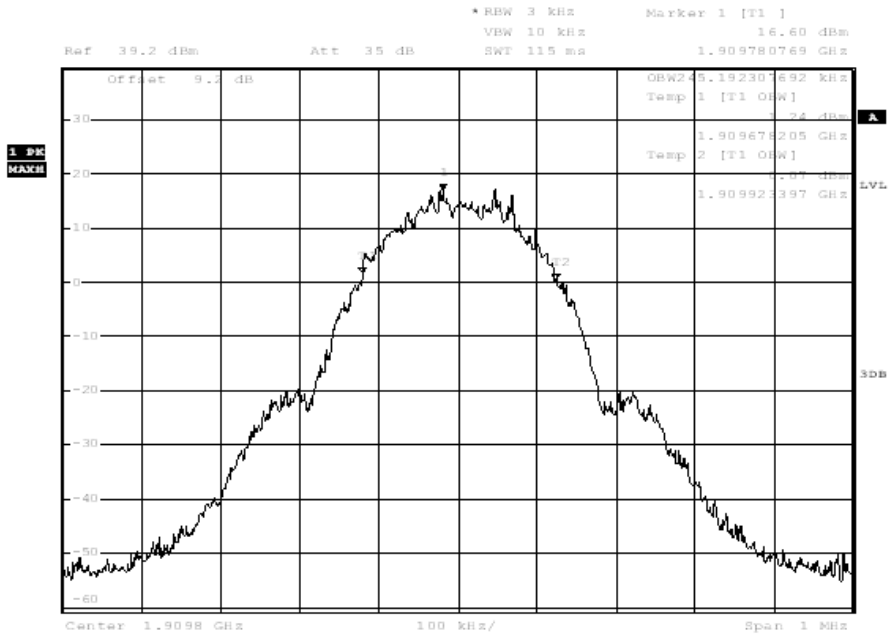
Channel 512



Date: 23.MAY.2012 19:23:41

Channel 661



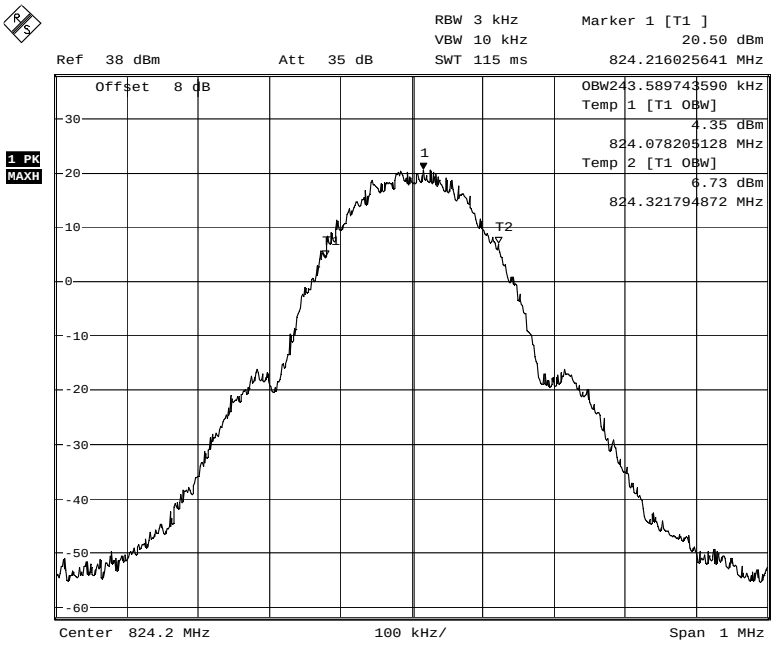
Date: 23.MAY.2012 19:24:32

Channel 810

Results data of EGPRS mode:

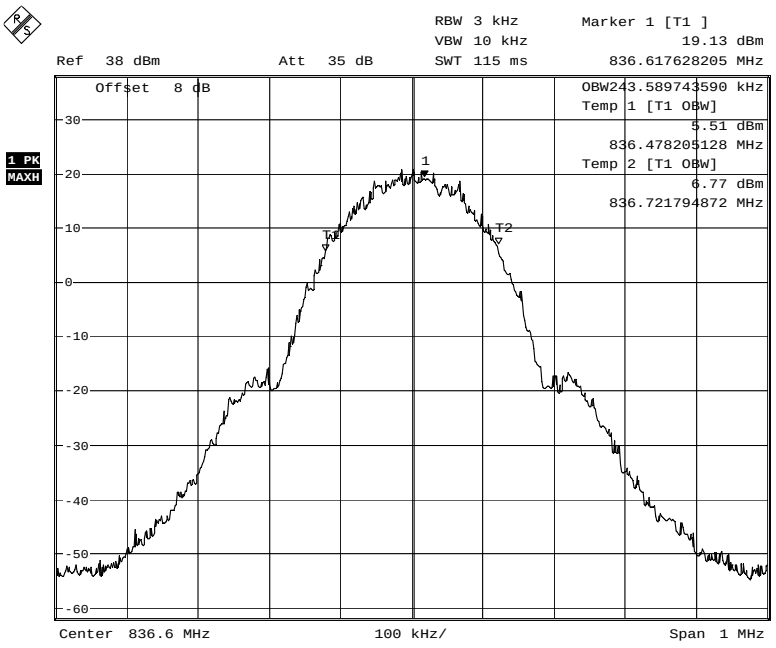
EUT channel	99% occupied bandwidth [kHz]
128	243.59
190	243.59
251	243.59
512	246.79
661	245.19
810	245.19

Graphical results for EGPRS mode:



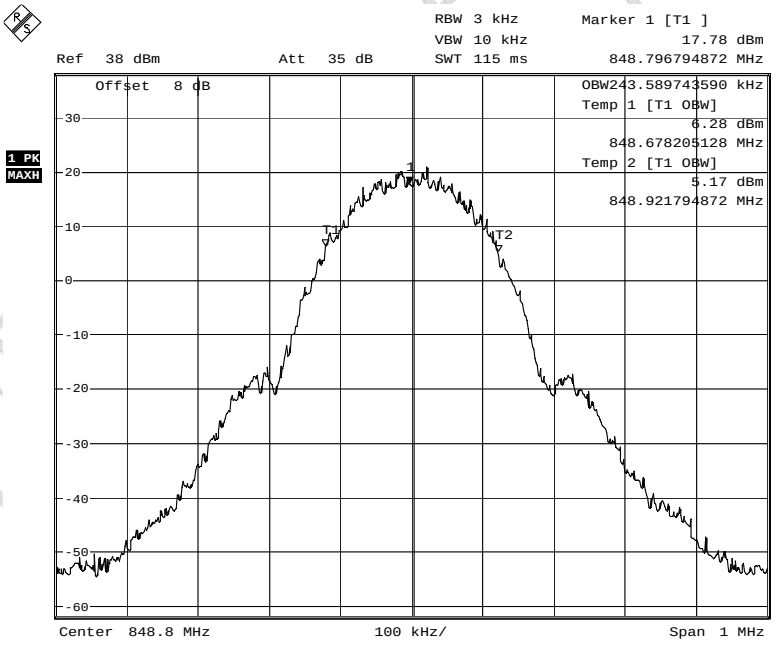
Date: 30.MAY.2012 19:33:14

Channel 128



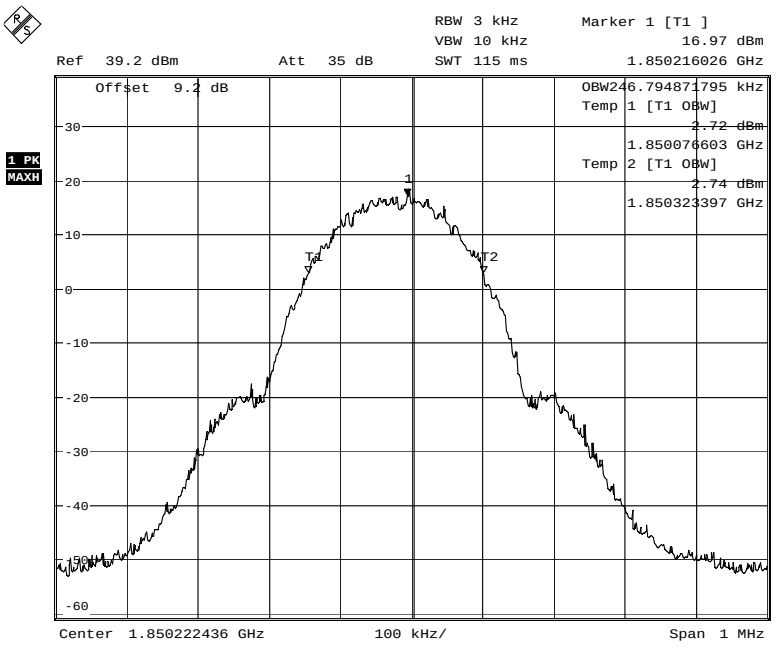
Date: 30.MAY.2012 19:36:46

Channel 190



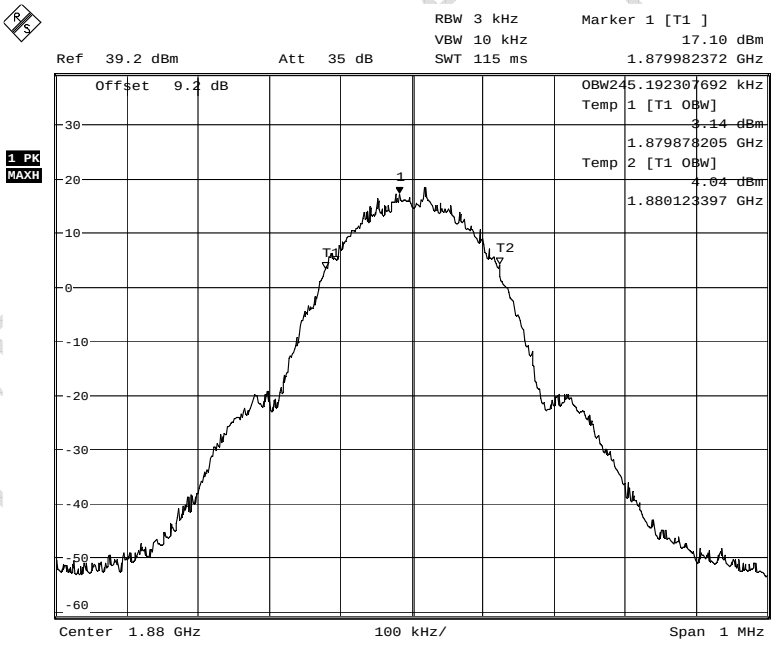
Date: 30.MAY.2012 19:39:02

Channel 251



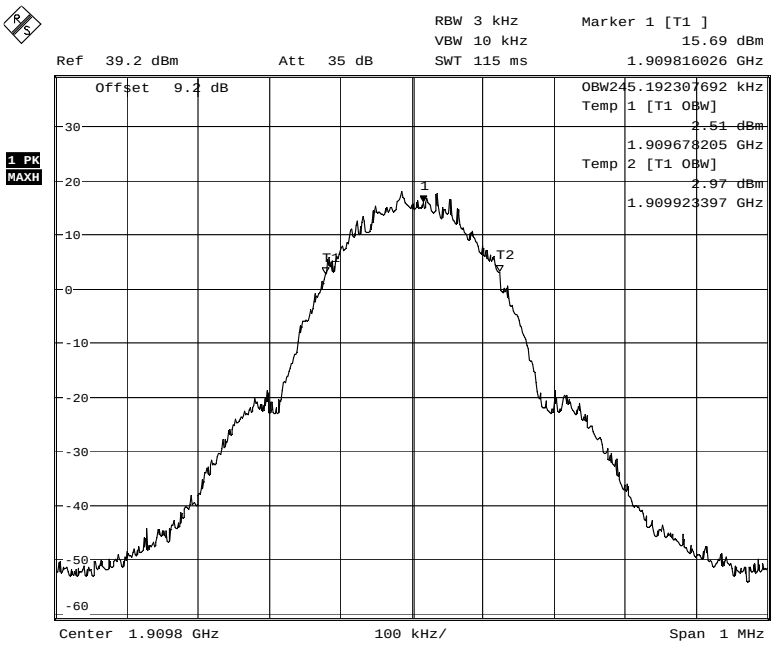
Date: 30.MAY.2012 18:29:30

Channel 512



Date: 30.MAY.2012 18:36:27

Channel 661



Date: 30.MAY.2012 18:45:30

Channel 810

4.5 Emission bandwidth

Specifications:	22.917(b), 24.238(b)
Operation Mode	TX on, channel 128, 190, 251, 512, 661 and 810
Test Results:	Pass

Test Setup

The setup of emission bandwidth is similar to conducted emissions.

Test Method

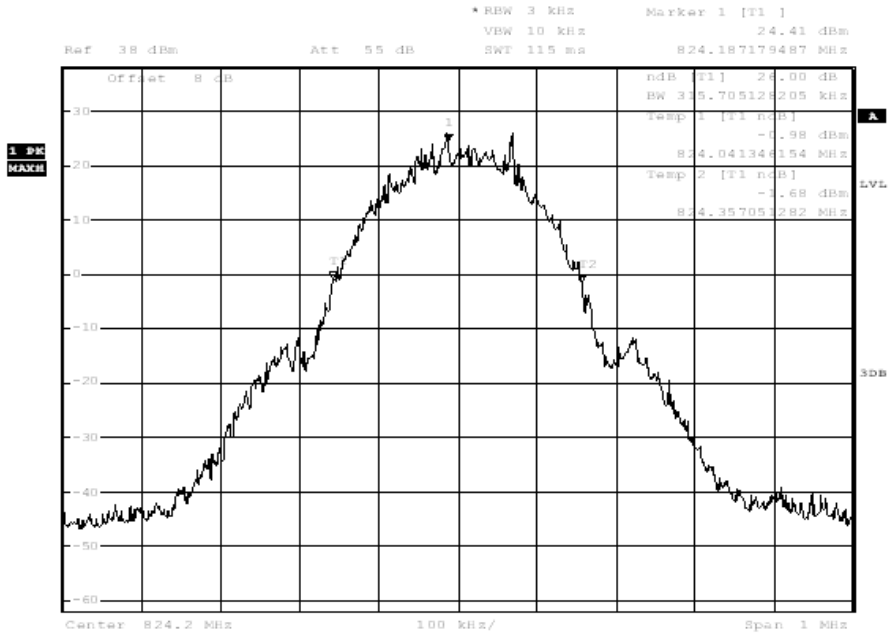
The emission bandwidth measures -26dBc Spectrum analyzer plots from frequencies of PCS 1900 band and GSM 850 band.

Note: --

Results data of GSM mode:

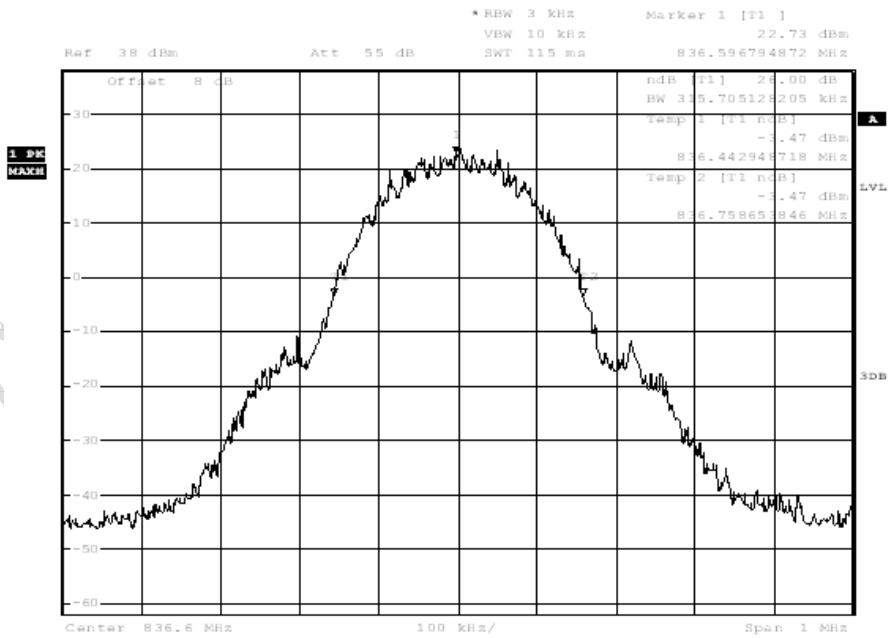
EUT channel	-26dBc Emission bandwidth [kHz]
128	315.71
190	315.71
251	315.71
512	315.71
661	315.71
810	314.10

Graphical results for GSM mode:



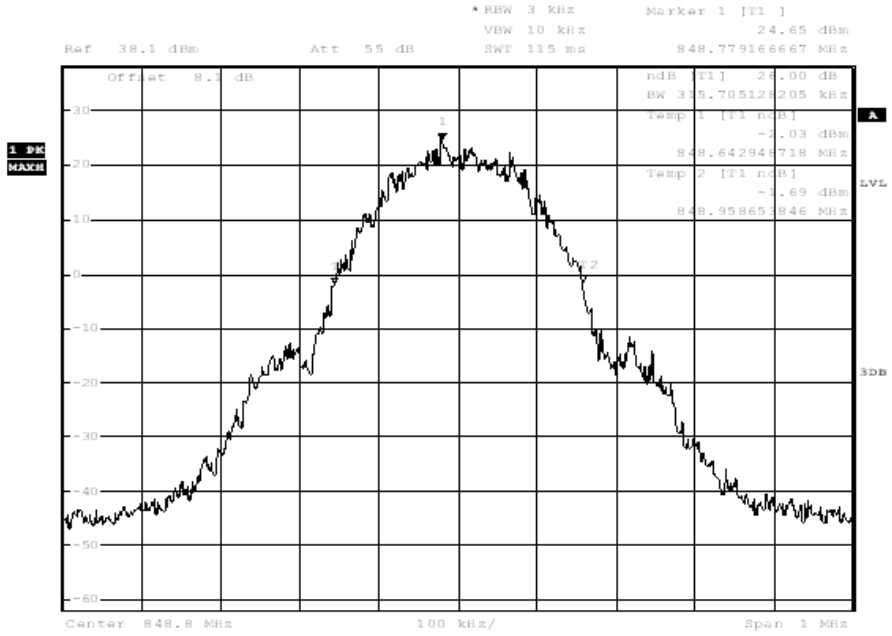
Date: 22.MAY.2012 17:41:21

Channel 128



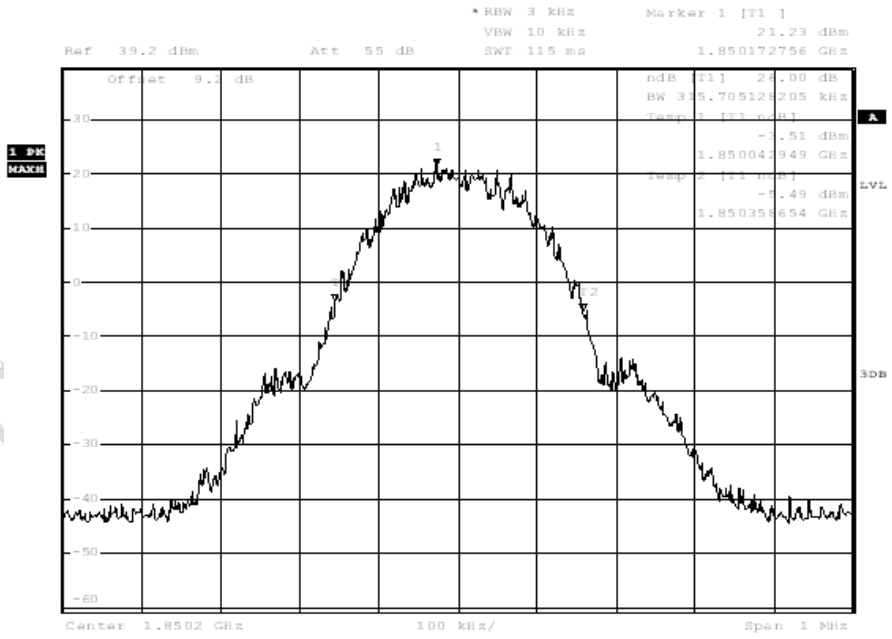
Date: 22.MAY.2012 17:42:08

Channel 190



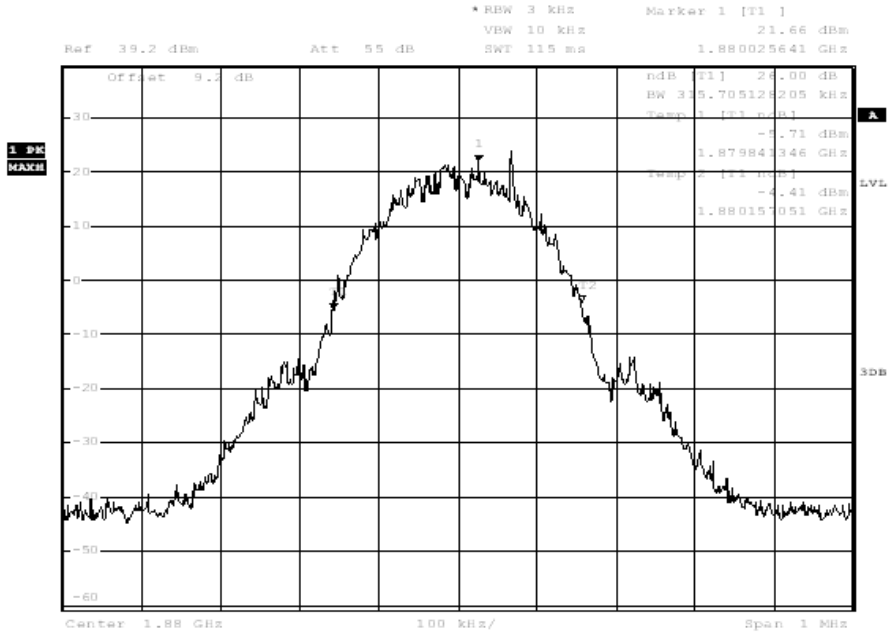
Date: 29.FEB.2012 23:48:15

Channel 251



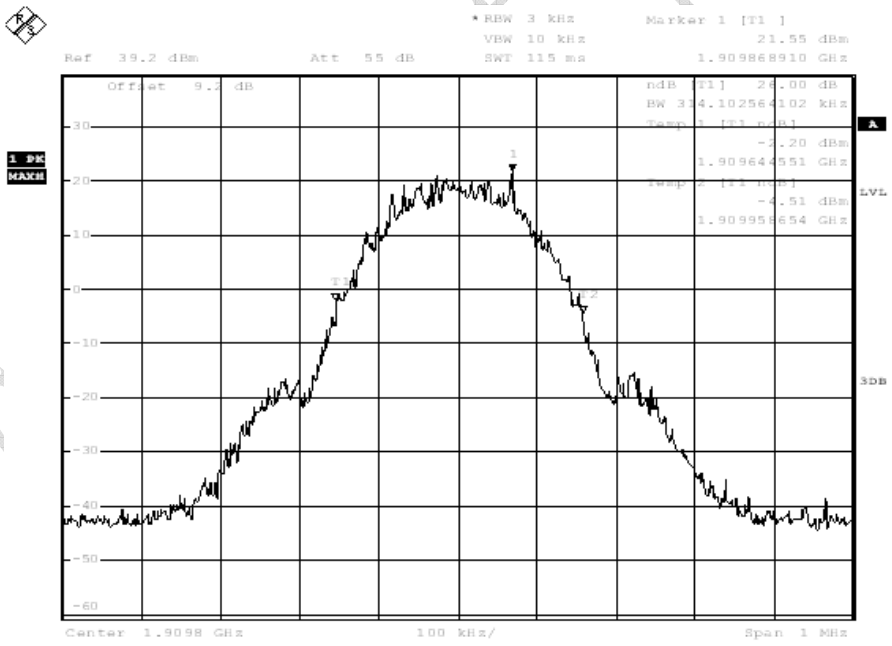
Date: 23.MAY.2012 19:11:40

Channel 512



Date: 23.MAY.2012 19:12:27

Channel 661



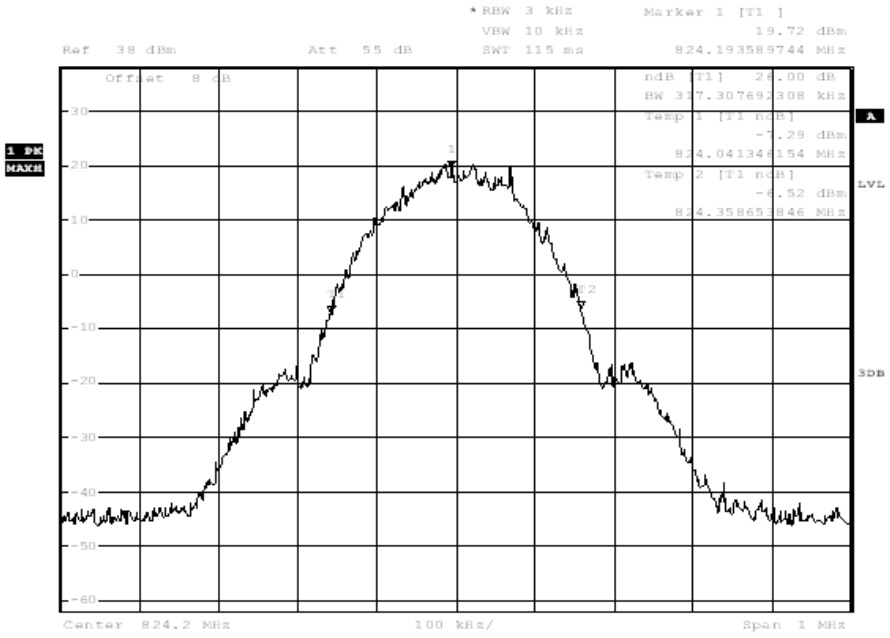
Date: 30.MAY.2012 23:30:41

Channel 810

Results data of GPRS mode:

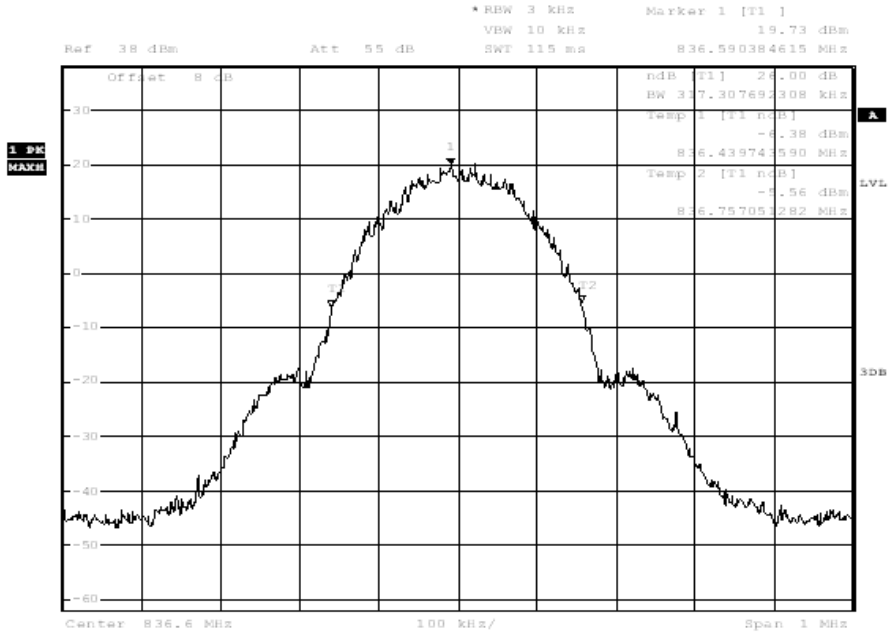
EUT channel	-26dBc Emission bandwidth [kHz]
128	317.31
190	317.31
251	317.31
512	314.10
661	317.31
810	315.71

Graphical results for GPRS mode:



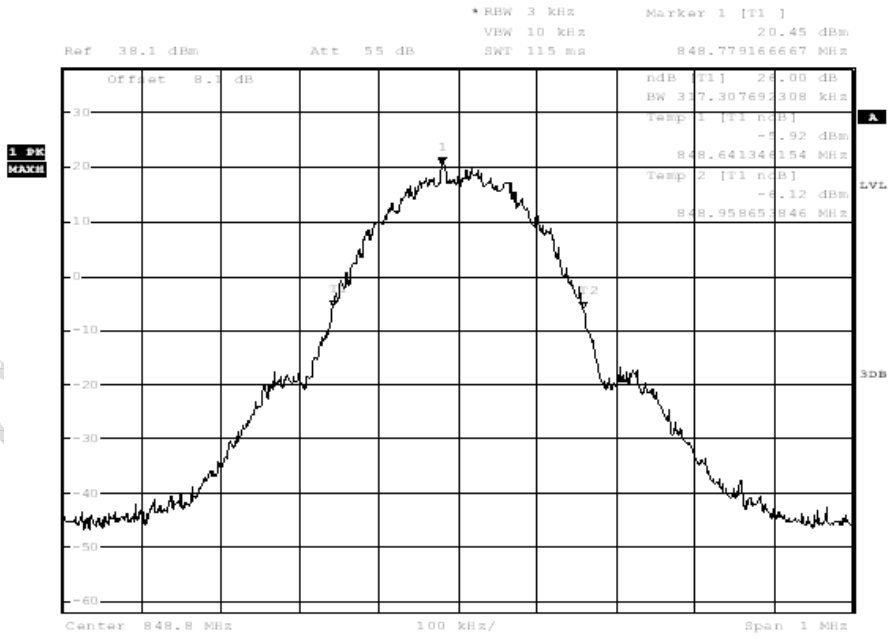
Date: 22.MAY.2012 23:31:21

Channel 128



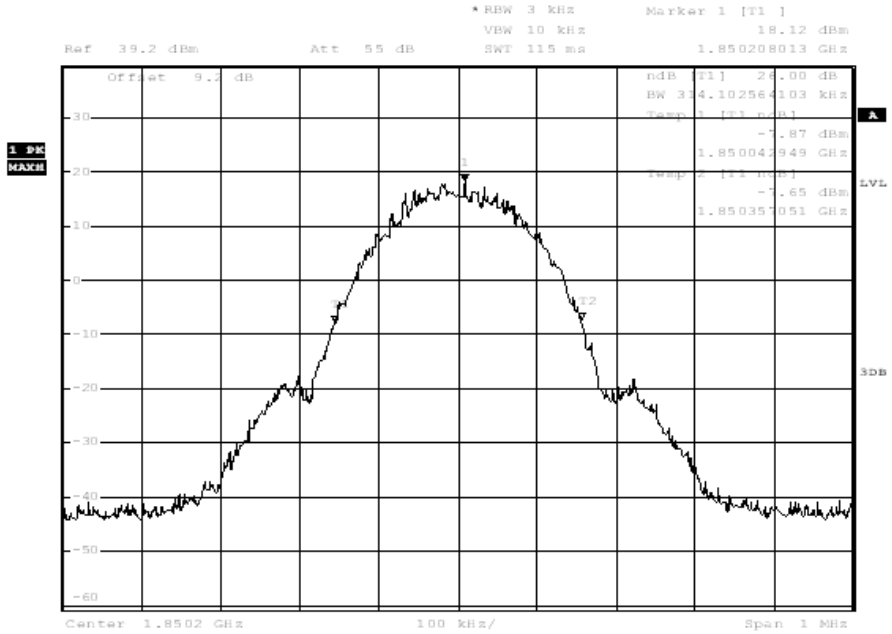
Date: 22.MAY.2012 23:32:13

Channel 190



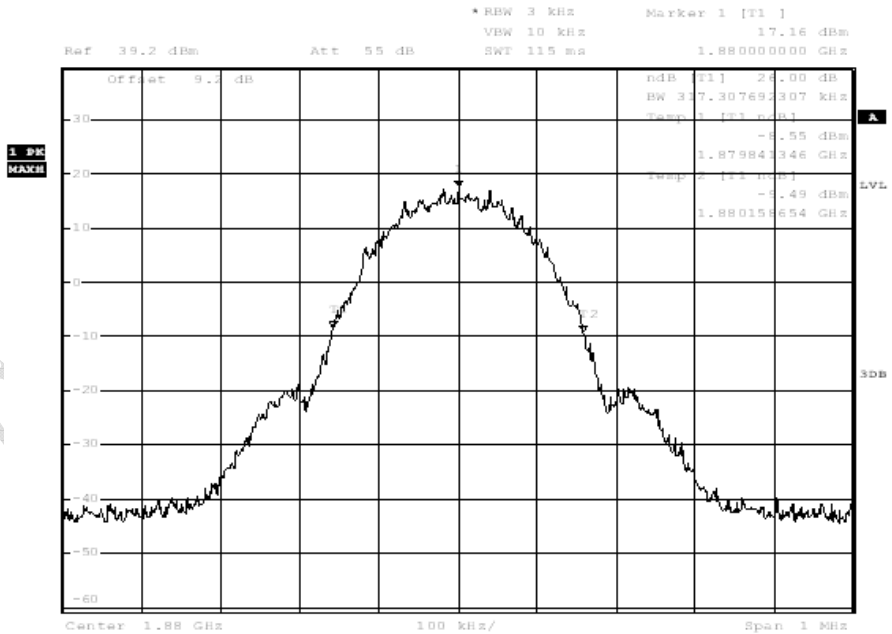
Date: 22.MAY.2012 23:33:04

Channel 251



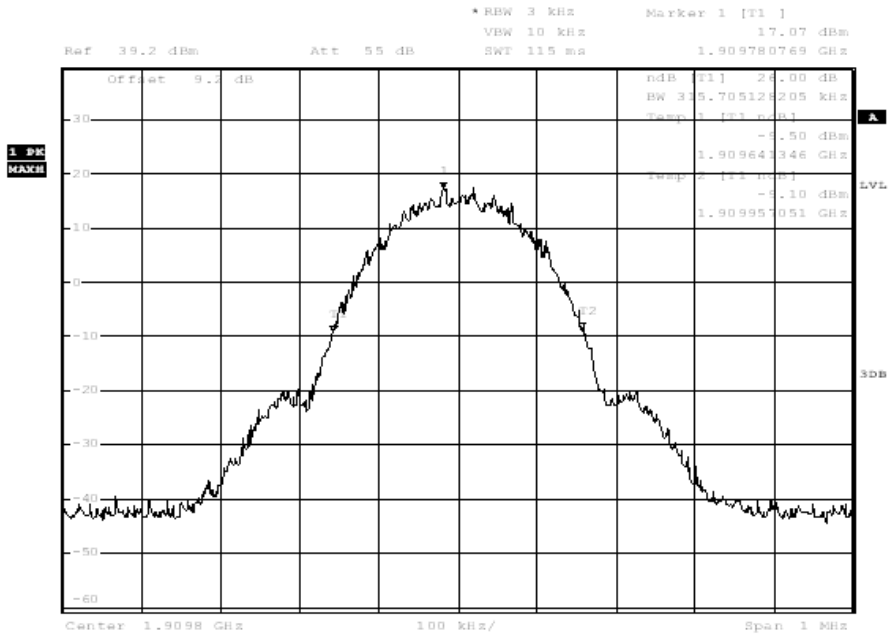
Date: 23.MAY.2012 19:22:28

Channel 512



Date: 23.MAY.2012 19:23:19

Channel 661



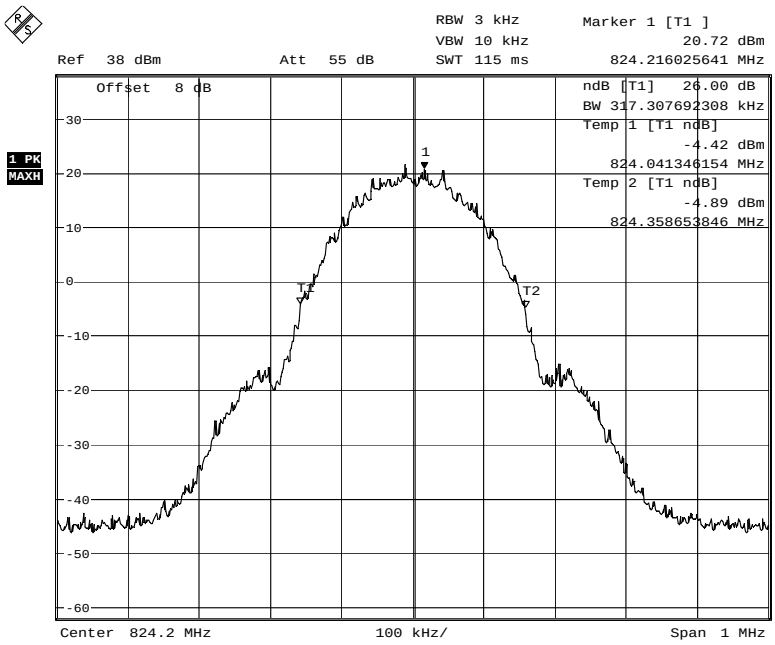
Date: 23.MAY.2012 19:24:10

Channel 810

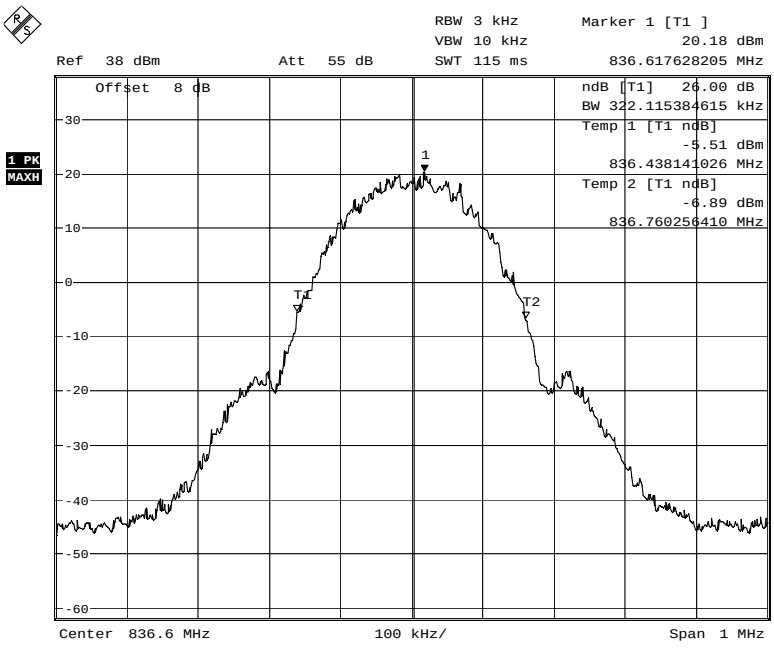
Results data of EGPRS mode:

EUT channel	-26dBc Emission bandwidth [kHz]
128	317.31
190	322.12
251	320.51
512	318.91
661	318.91
810	320.51

Graphical results for EGPRS mode:

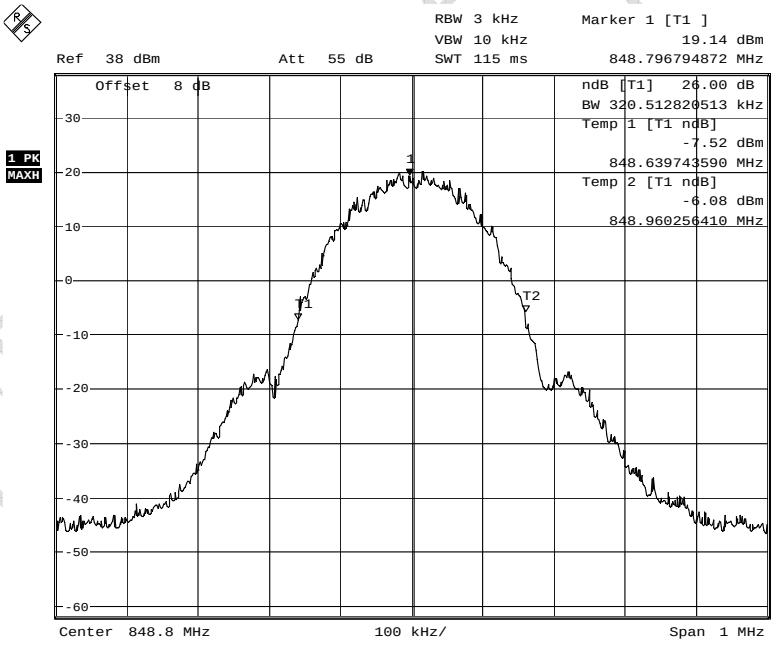


Channel 128



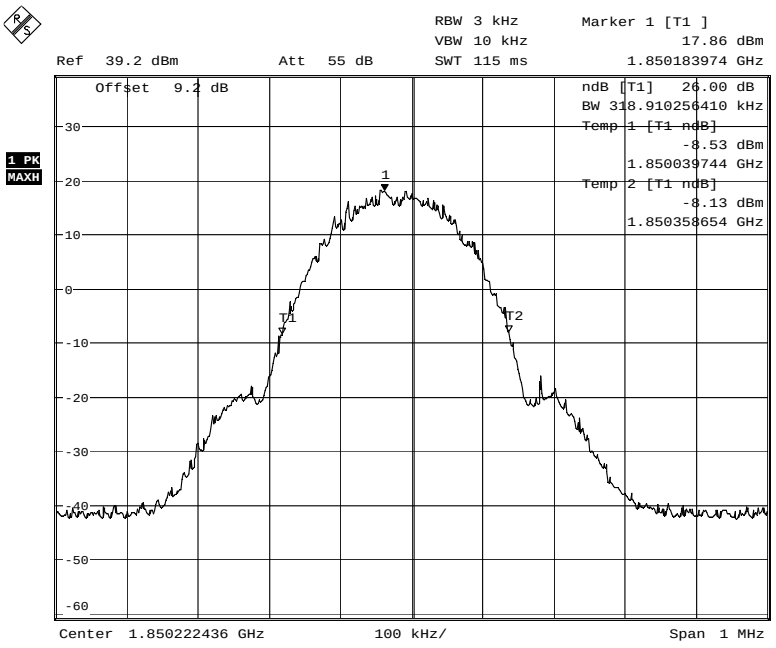
Date: 30.MAY.2012 19:35:21

Channel 190



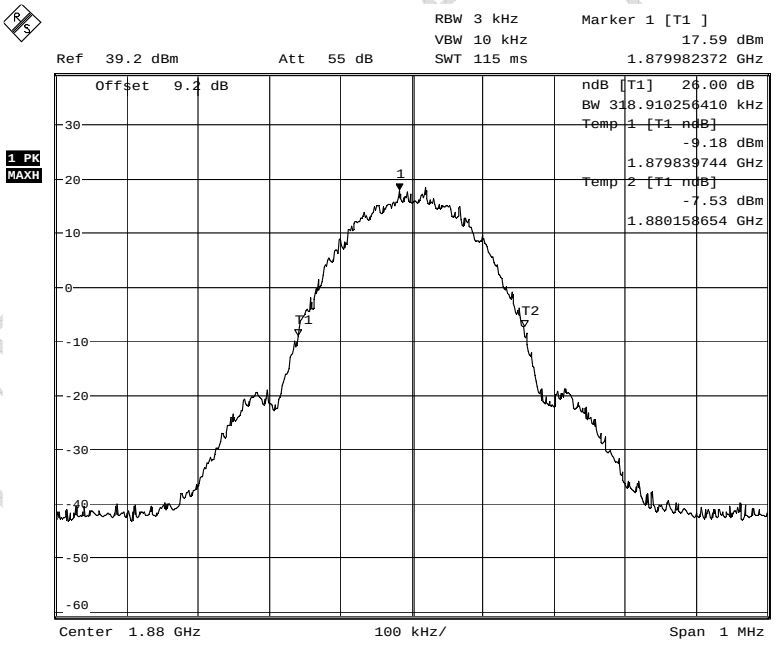
Date: 30.MAY.2012 19:38:24

Channel 251



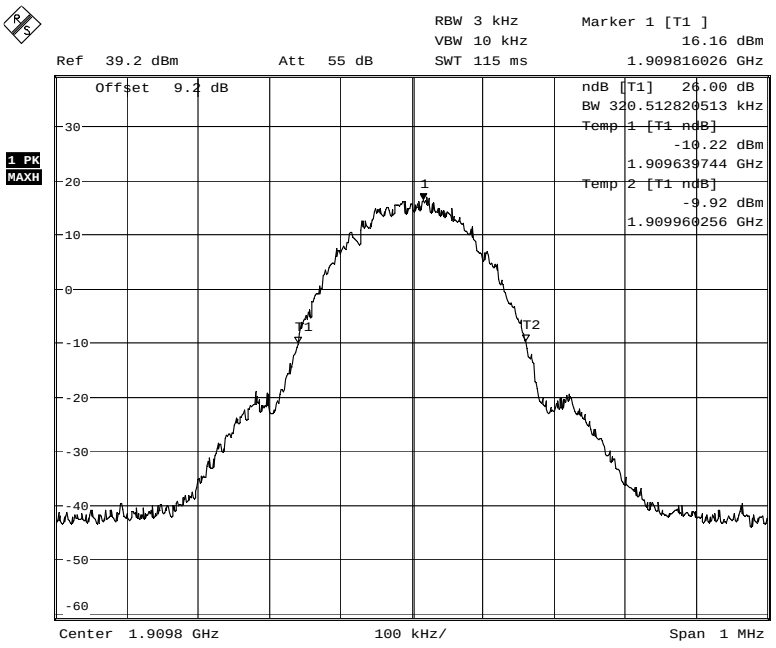
Date: 30.MAY.2012 18:27:49

Channel 512



Date: 30.MAY.2012 18:35:23

Channel 661



Date: 30.MAY.2012 18:44:35

Channel 810

4.6 Frequency Stability

Specifications:	2.1055,22.355, 24.235
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
Limit	
Frequency deviation [ppm]	±2.5

4.6.1 Frequency stability over temperature variation

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.

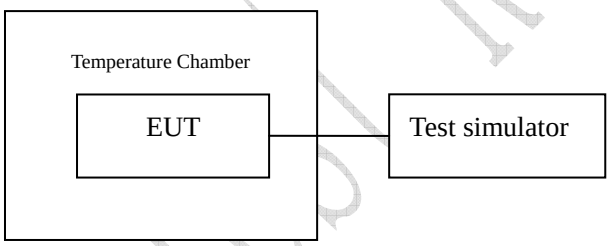


Figure T: setup for measurement of frequency stability over temperature variation

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 CMU200.
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:

Temperature[℃]	Deviation[Hz]	Remarks
-30	-39	Pass
-20	-45	Pass
-10	-42	Pass
0	-46	Pass
10	-42	Pass
20	-43	Pass
30	-38	Pass
40	-45	Pass
50	-43	Pass

Channel 661:

Temperature[℃]	Deviation[Hz]	Remarks
-30	-59	Pass
-20	-62	Pass
-10	-41	Pass
0	-45	Pass
10	-53	Pass
20	-47	Pass
30	-46	Pass
40	-42	Pass
50	-52	Pass

Test results data for GPRS mode:

Channel 190:

Temperature[℃]	Deviation[Hz]	Remarks
-30	-37	Pass
-20	-34	Pass
-10	-22	Pass
0	-31	Pass
10	-18	Pass
20	-23	Pass
30	-21	Pass
40	-20	Pass
50	-19	Pass

Channel 661:

Temperature[℃]	Deviation[Hz]	Remarks
-30	-37	Pass
-20	-29	Pass
-10	-42	Pass
0	-51	Pass
10	-27	Pass
20	-36	Pass
30	-34	Pass
40	-36	Pass
50	-28	Pass

Test results data for EGPRS mode:

Channel 190:

Temperature[℃]	Deviation[Hz]	Remarks
-30	-28	Pass
-20	-27	Pass
-10	-25	Pass
0	-27	Pass
10	-30	Pass
20	-22	Pass
30	-25	Pass
40	-21	Pass
50	-16	Pass

Channel 661:

Temperature[℃]	Deviation[Hz]	Remarks
-30	-41	Pass
-20	-30	Pass
-10	-47	Pass
0	-48	Pass
10	-50	Pass
20	-29	Pass
30	-21	Pass
40	-29	Pass
50	-36	Pass

4.6.2 Frequency Stability over Voltage Variation

Specifications:	2.1055,22.355,24.235
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
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.

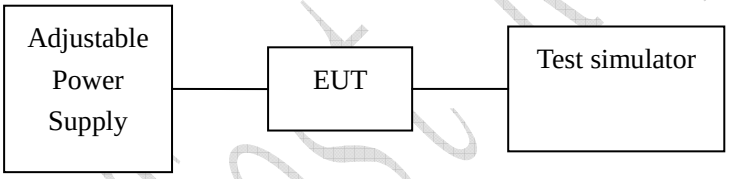


Figure V: test setup for measurement of frequency stability over voltage variation

Test Results data for GSM mode:

Channel 190:

Level	Voltage[V]	Deviation[Hz]	Remarks
Maximum	4.2	-30	Pass
Nominal	3.7	-38	Pass
Minimum	3.5	-25	Pass

Channel 661:

Level	Voltage[V]	Deviation[Hz]	Remarks
Maximum	4.2	-51	Pass
Nominal	3.7	-57	Pass
Minimum	3.5	-56	Pass

Test Results data for GPRS mode:

Channel 190:

Level	Voltage[V]	Deviation[Hz]	Remarks
Maximum	4.2	-20	Pass
Nominal	3.7	-22	Pass
Minimum	3.5	-27	Pass

Channel 661:

Level	Voltage[V]	Deviation[Hz]	Remarks
Maximum	4.2	-32	Pass
Nominal	3.7	-24	Pass
Minimum	3.5	-32	Pass

Test Results data for EGPRS mode:

Channel 190:

Level	Voltage[V]	Deviation[Hz]	Remarks
Maximum	4.2	-28	Pass
Nominal	3.7	-20	Pass
Minimum	3.5	-30	Pass

Channel 661:

Level	Voltage[V]	Deviation[Hz]	Remarks
Maximum	4.2	-32	Pass
Nominal	3.7	-24	Pass
Minimum	3.5	-32	Pass

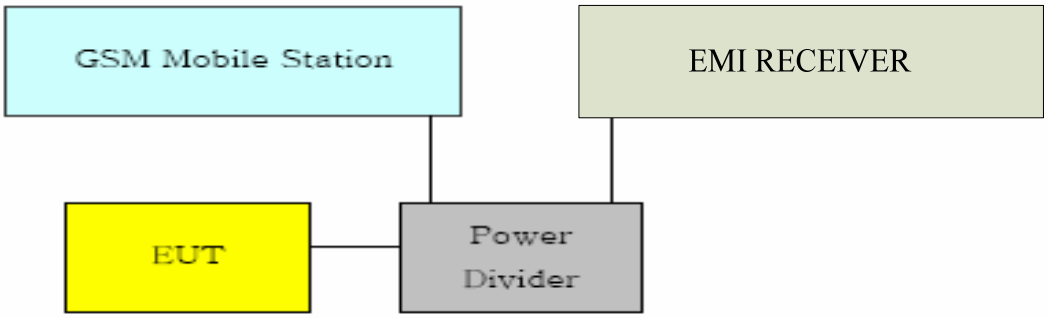
4.7 Conducted Spurious Emission

Specifications:	2.1051,22.917,24.238
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

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)



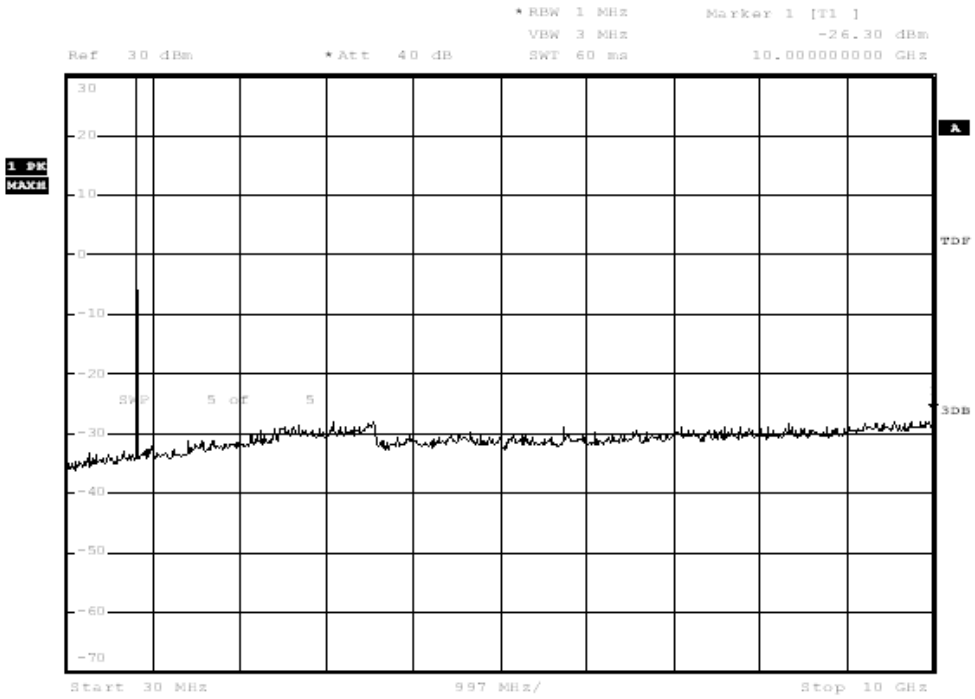
Test Method
The measurement was performed accordance with section 2.2.13 of ANSI/TIA-603-C-2004: *Land Mobile FM or PM Communications Equipment Measurement and Performance Standards*.
The following steps outline the procedure used to measure the conducted emissions from the EUT.
1. Determine frequency 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.

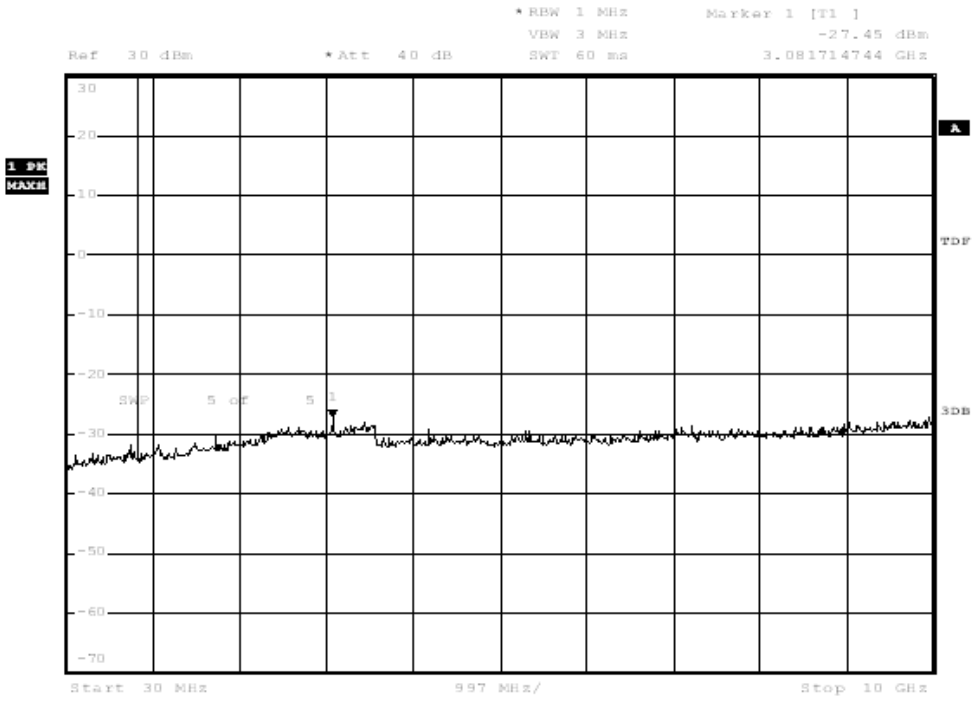
Note: --

Graphical results for GSM mode:



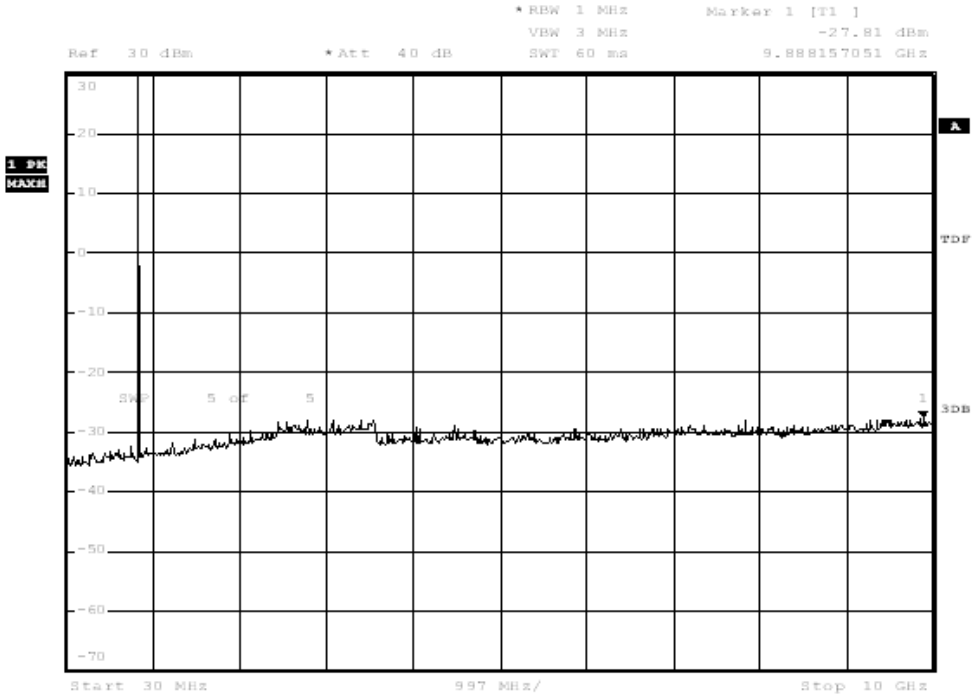
Date: 22.MAY.2012 17:43:38

Channel 128



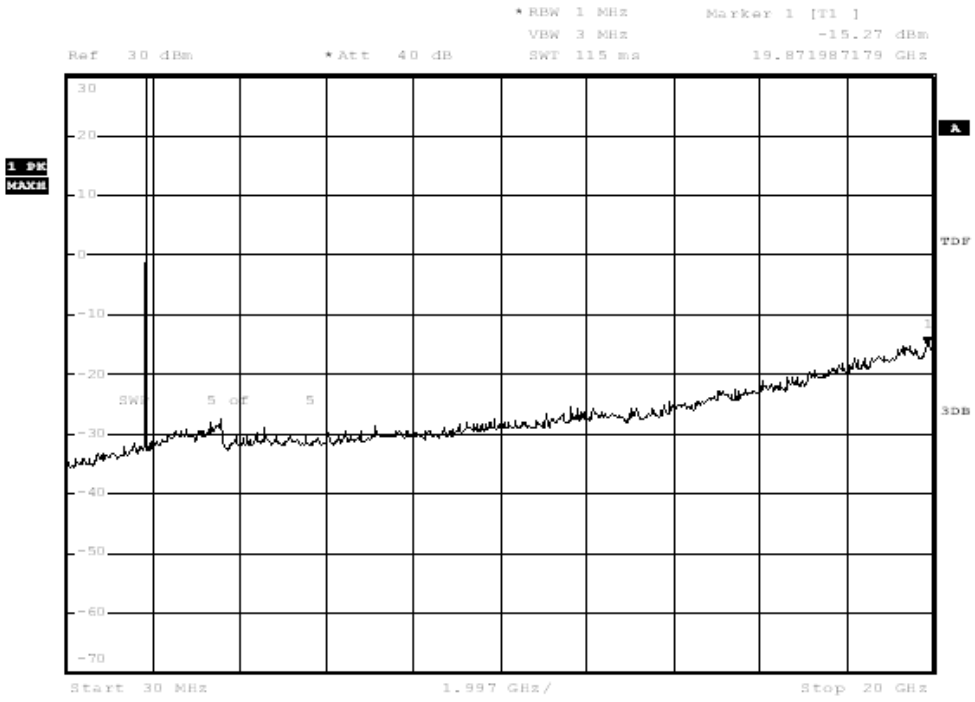
Date: 22.MAY.2012 17:43:59

Channel 190



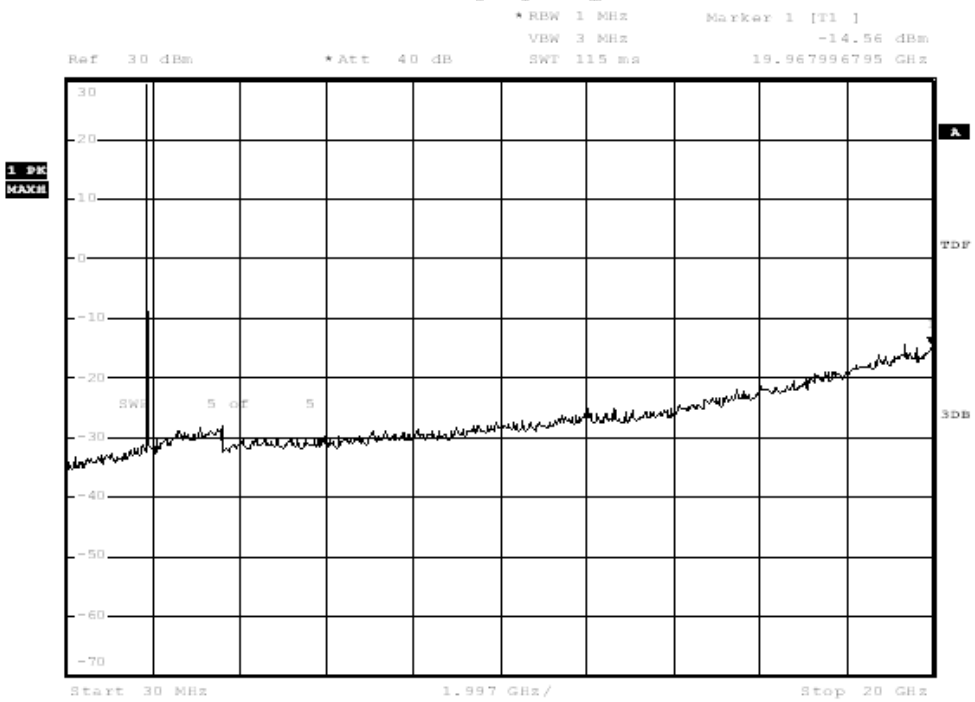
Date: 22.MAY.2012 17:44:19

Channel 251



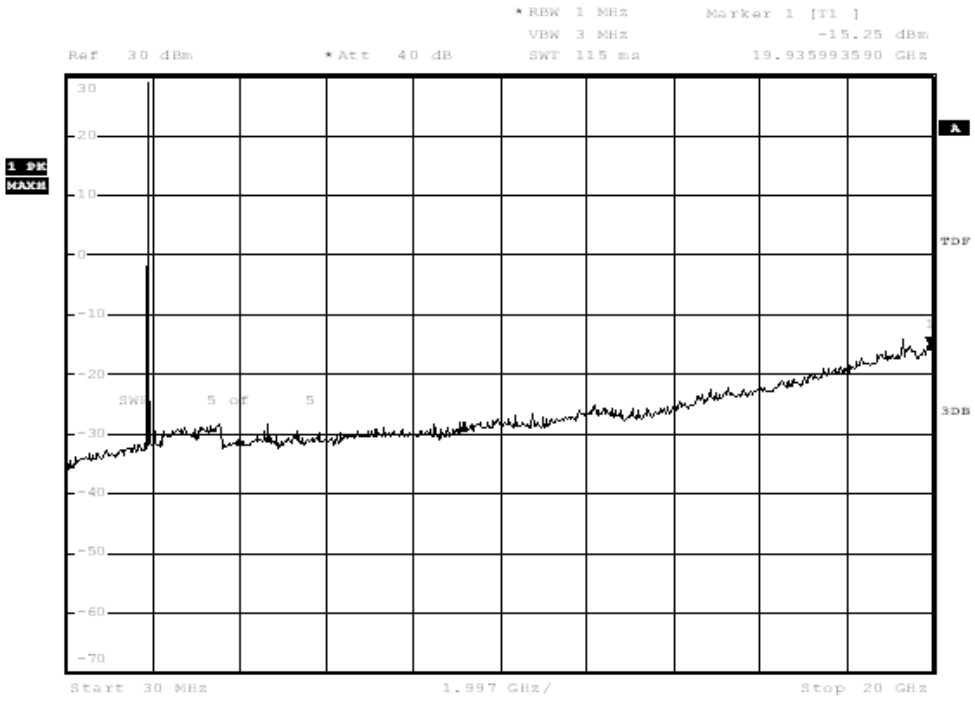
Date: 23.MAY.2012 19:13:57

Channel 512



Date: 23.MAY.2012 19:14:17

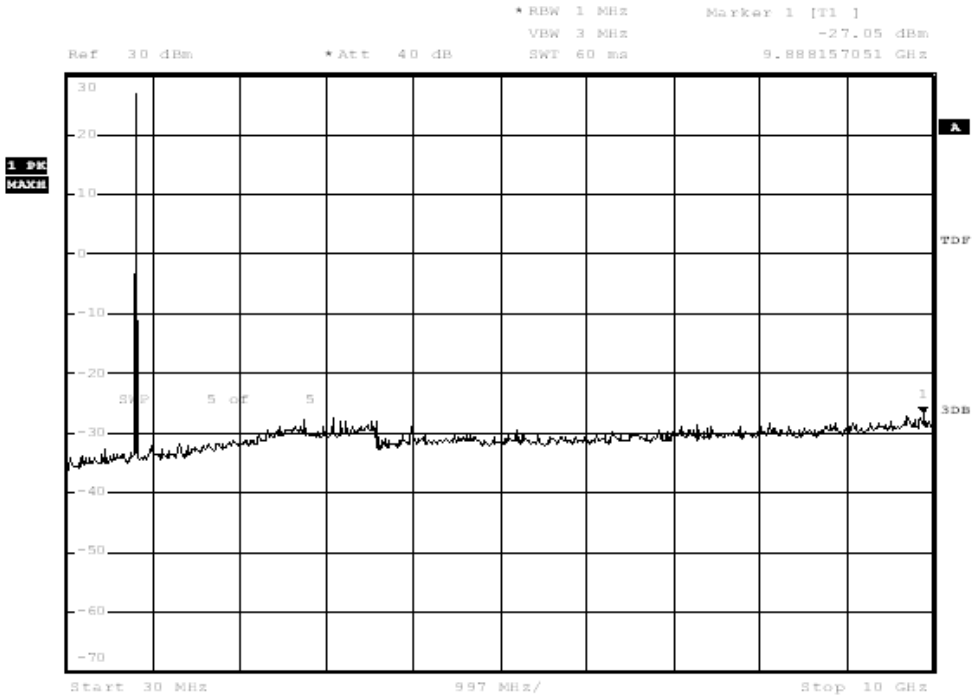
Channel 661



Date: 23.MAY.2012 19:14:38

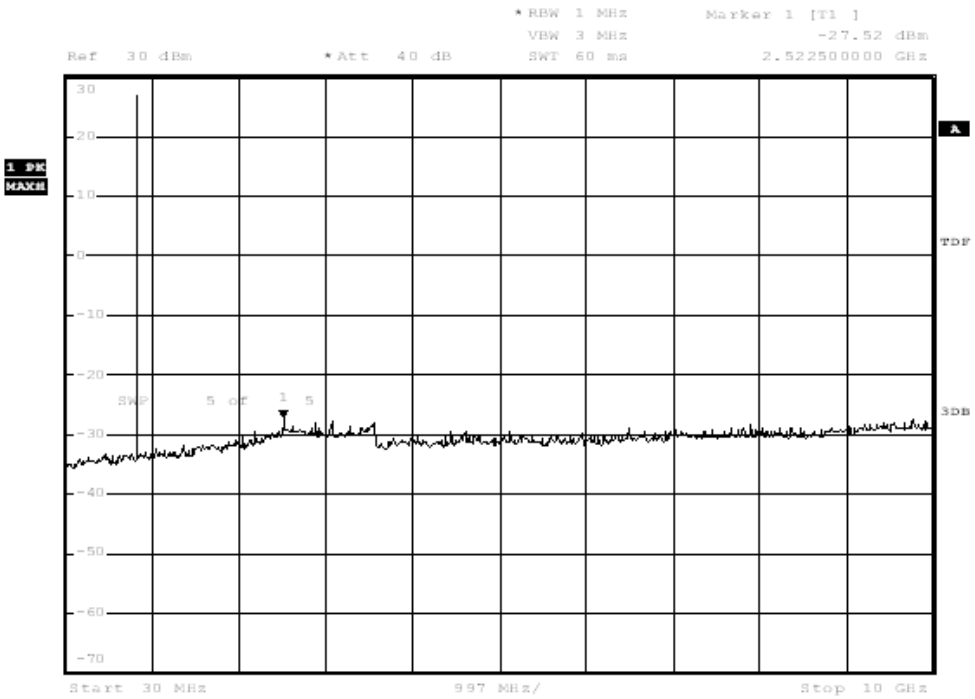
Channel 810

Graphical results for GPRS mode:



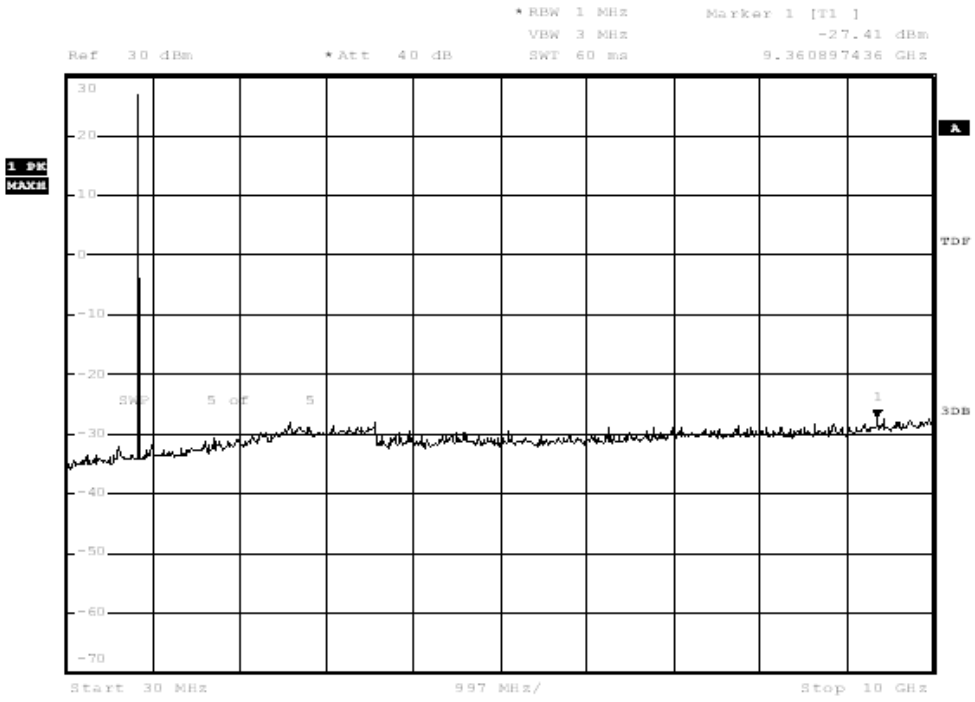
Date: 22.MAY.2012 23:33:47

Channel 128

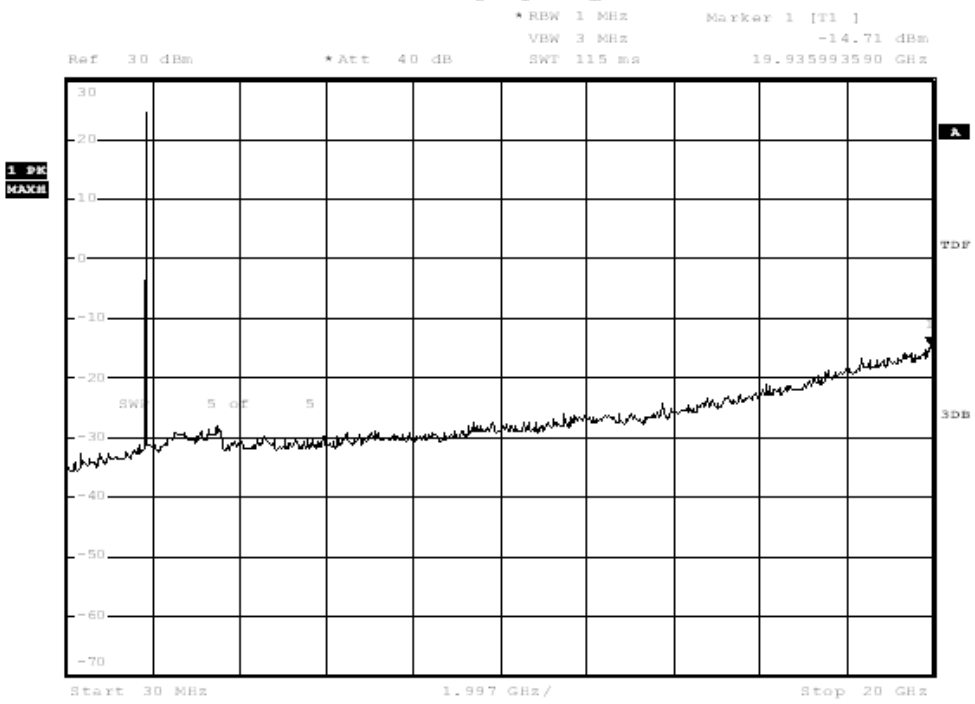


Date: 22.MAY.2012 23:34:07

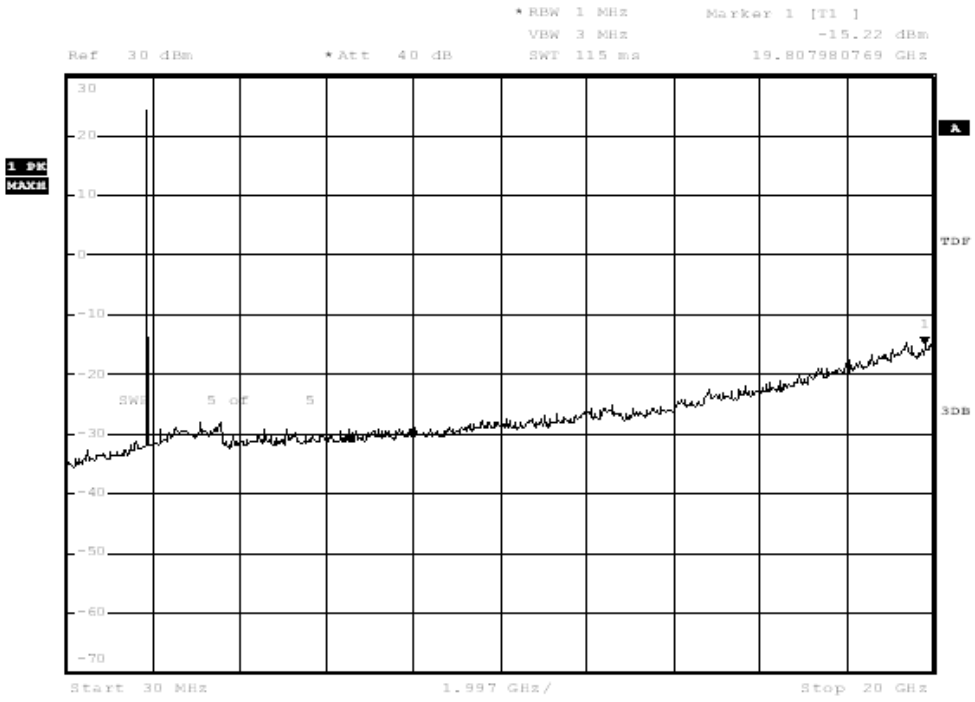
Channel 190



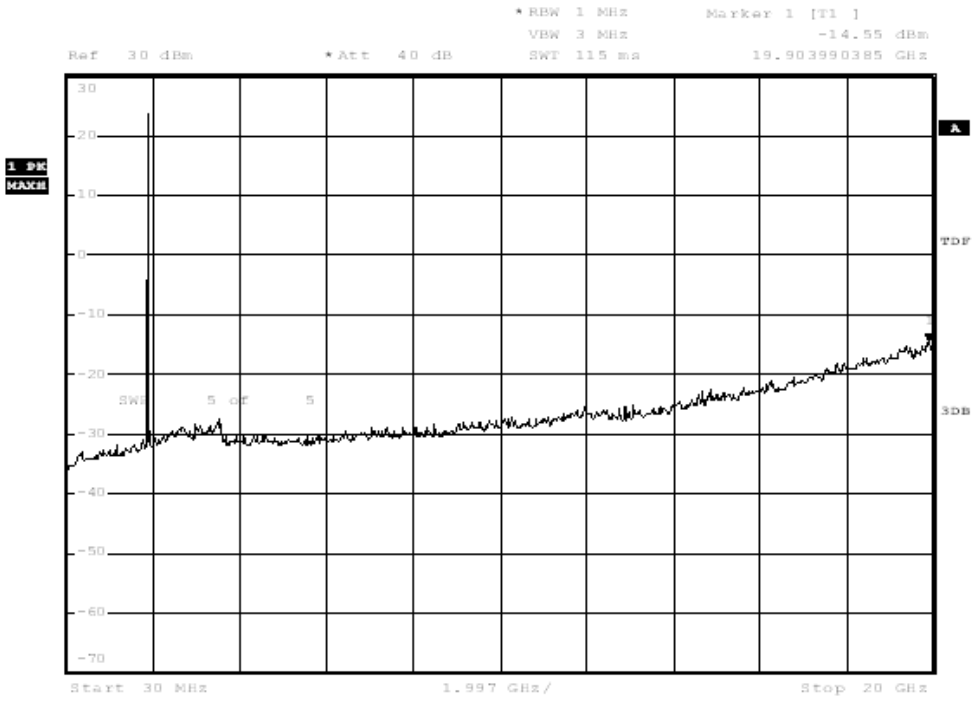
Channel 251



Channel 512

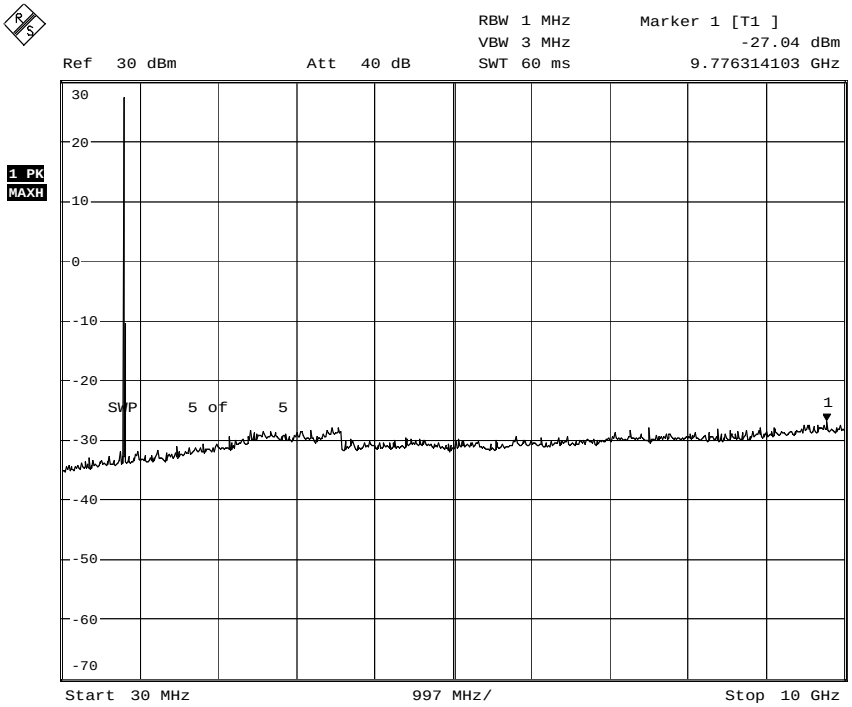


Channel 661



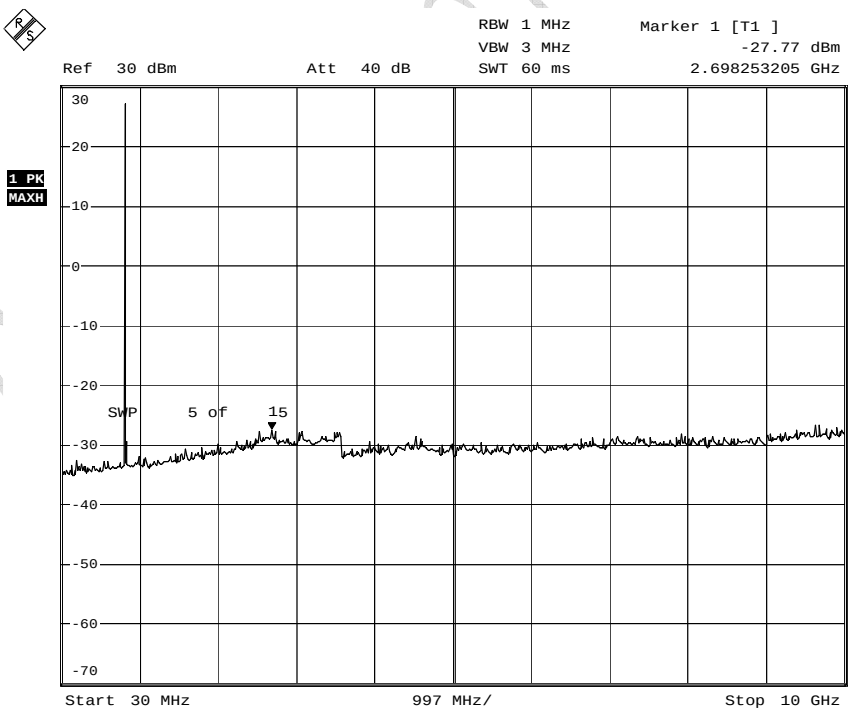
Channel 810

Graphical results for EGPRS mode:



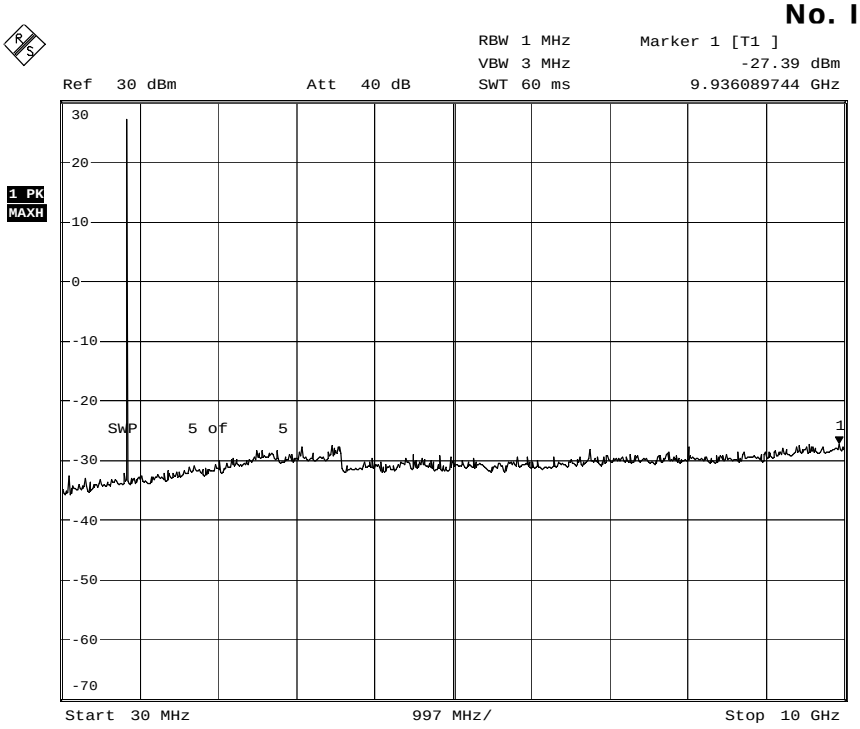
Date: 30.MAY.2012 19:42:57

Channel 128

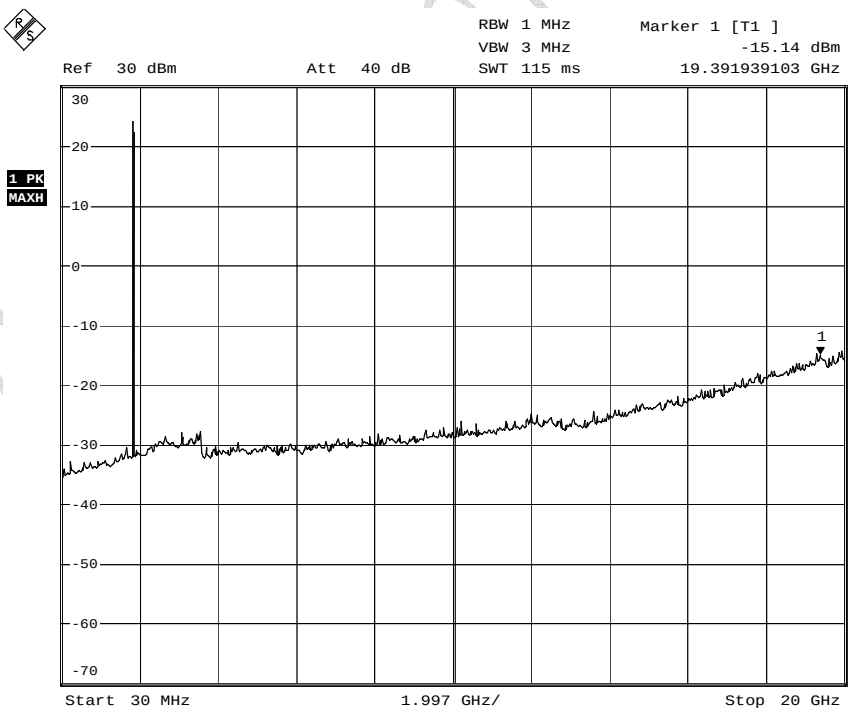


Date: 30.MAY.2012 19:44:04

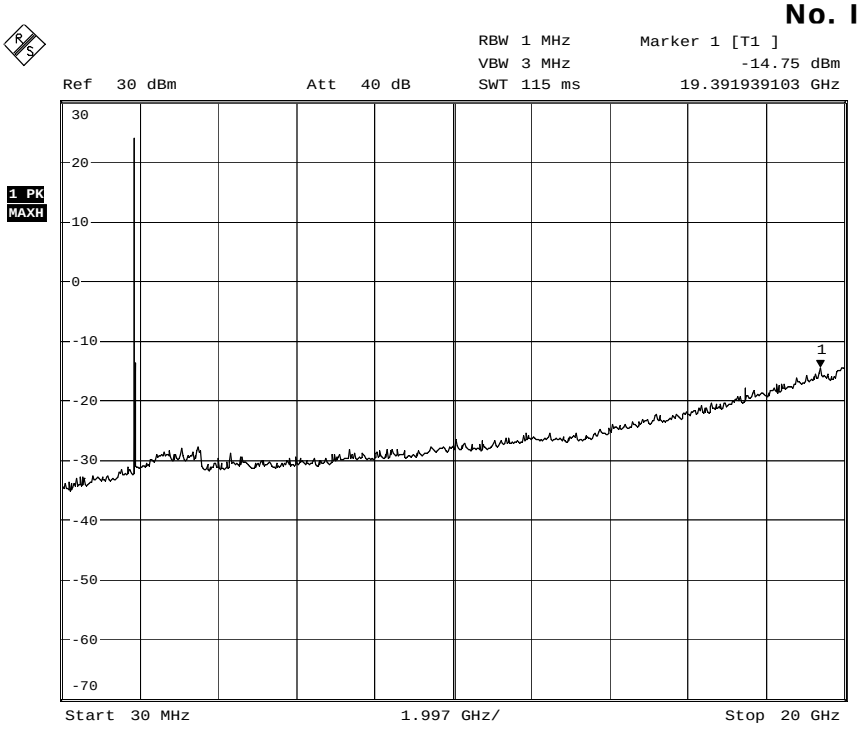
Channel 190



Channel 251

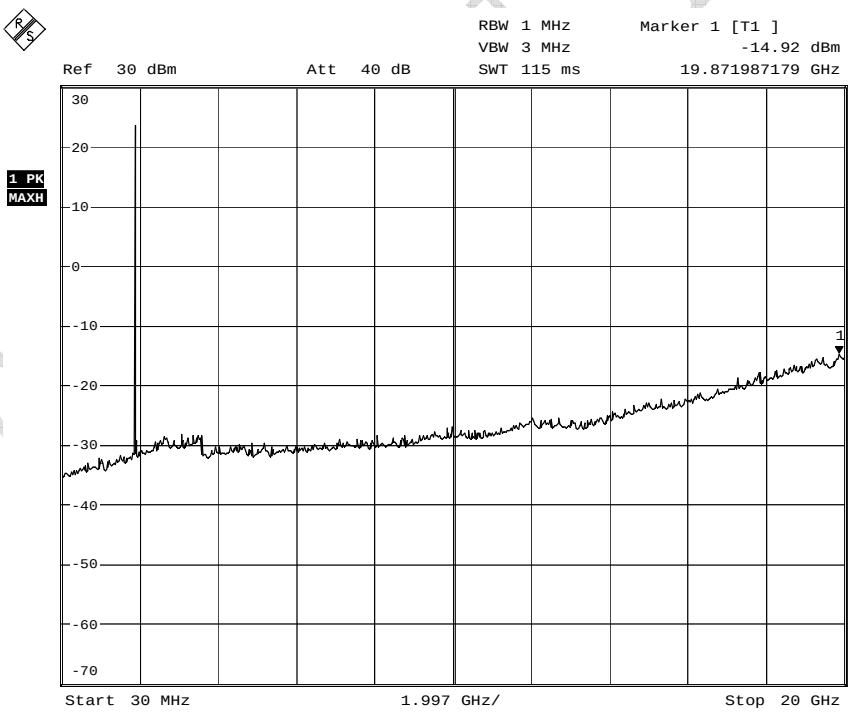


Channel 512



Date: 30.MAY.2012 19:08:05

Channel 661



Date: 30.MAY.2012 19:09:50

Channel 810

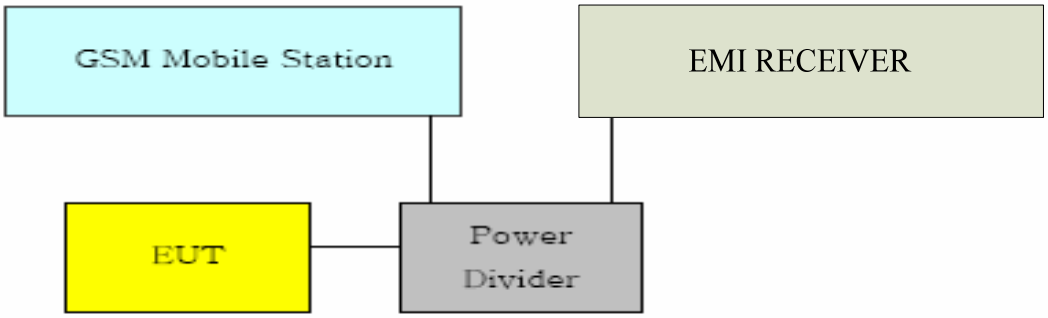
4.8 Band Edge Compliance

Specifications:	22.917(b), 24.238(b)
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

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 attenuation of every cables of the test system is being taken into account by calibration to ensure measurement accuracy
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	-21.34
251 Right band edge	849.000	-19.61
512 Left band edge	1850.000	-23.74
810 Right band edge	1910.000	-23.22

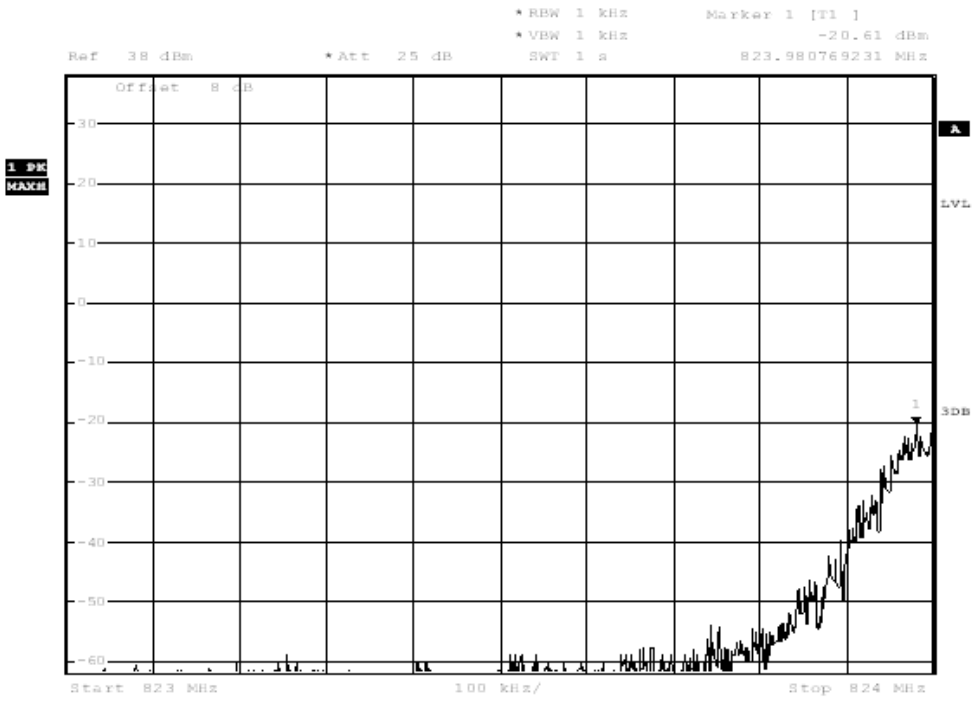
GPRS mode:

Band-edge emission		
EUT Channel	Frequency [MHz]	Level [dBm]
128 Left band edge	824.000	-13.00
251 Right band edge	849.000	-13.08
512 Left band edge	1850.000	-16.96
810 Right band edge	1910.000	-15.63

EGPRS mode:

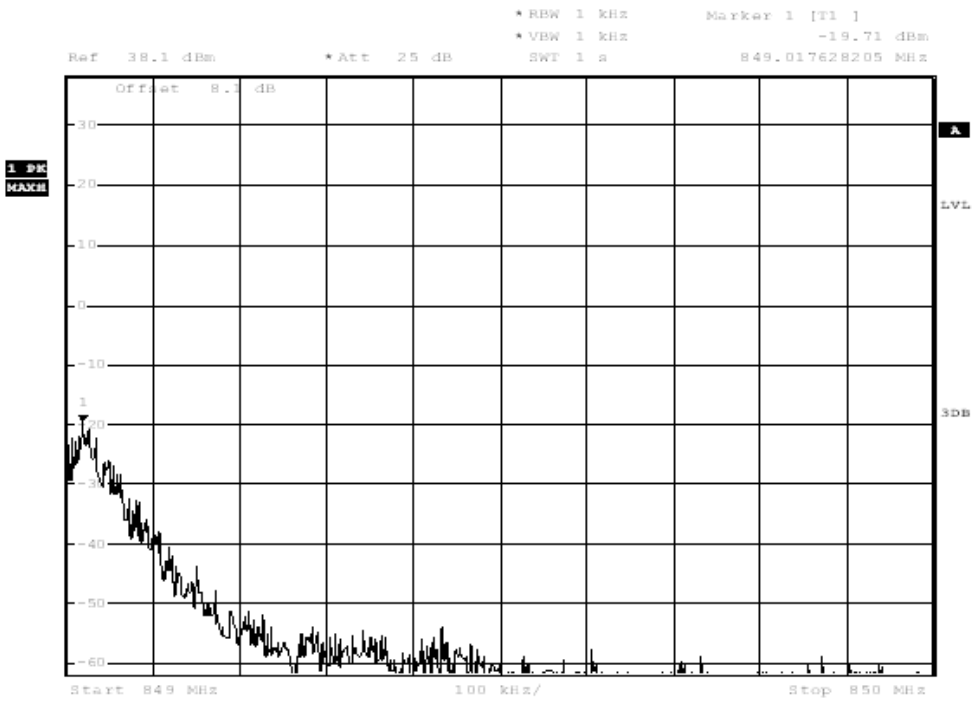
Band-edge emission		
EUT Channel	Frequency [MHz]	Level [dBm]
128 Left band edge	824.000	-26.18
251 Right band edge	849.000	-26.99
512 Left band edge	1850.000	-23.52
810 Right band edge	1910.000	-27.26

Graphical results:



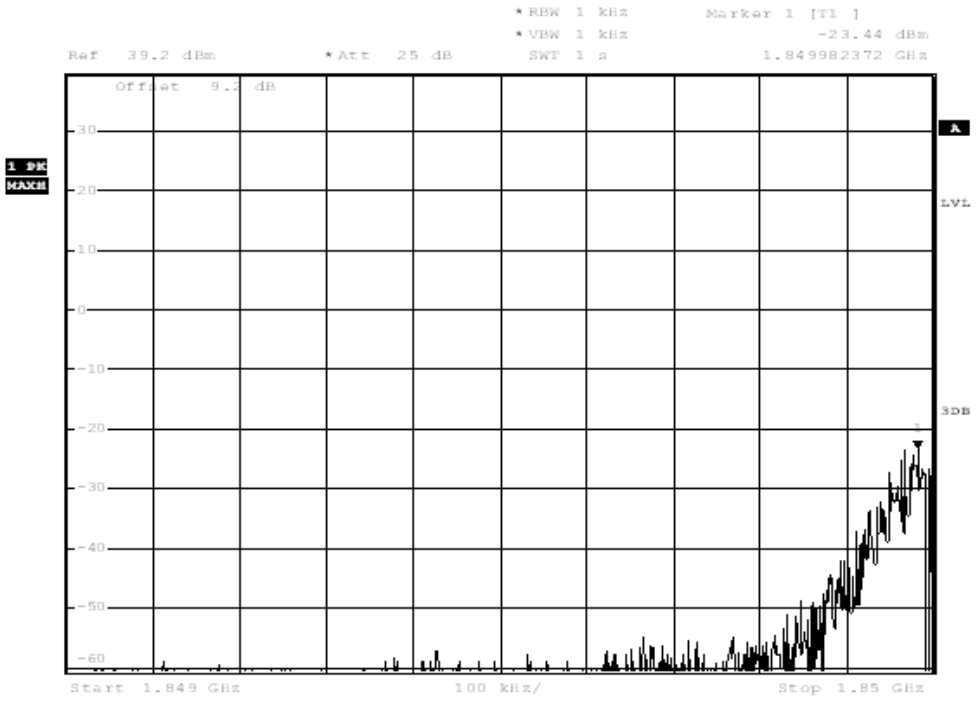
Date: 22.MAY.2012 17:45:05

GSM channel 128 Left band edge



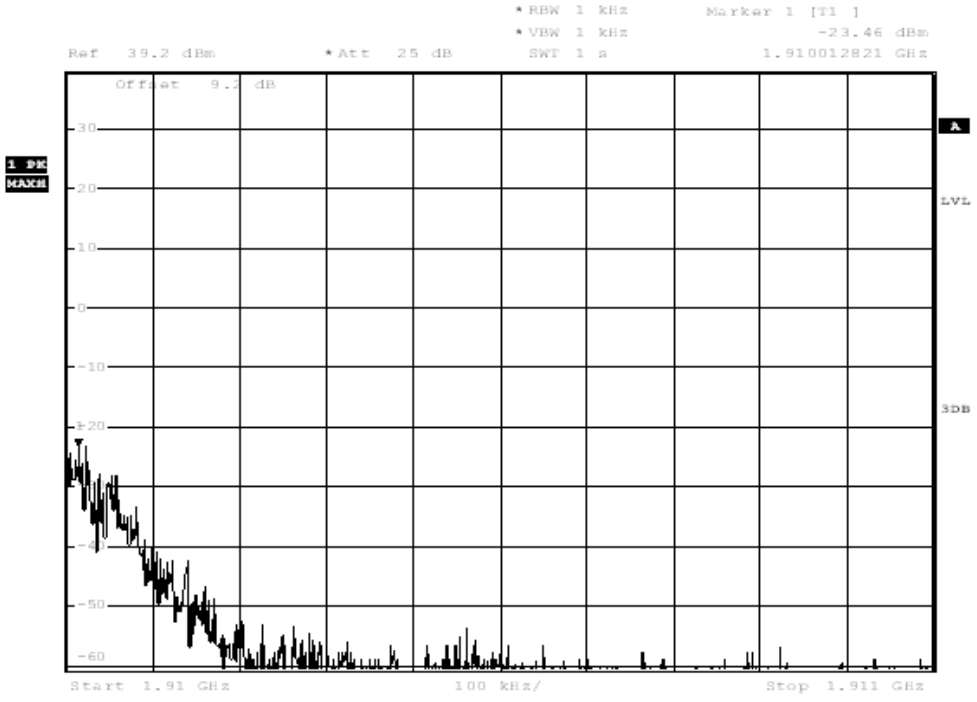
Date: 22.MAY.2012 17:45:20

GSM channel 251 Right band edge



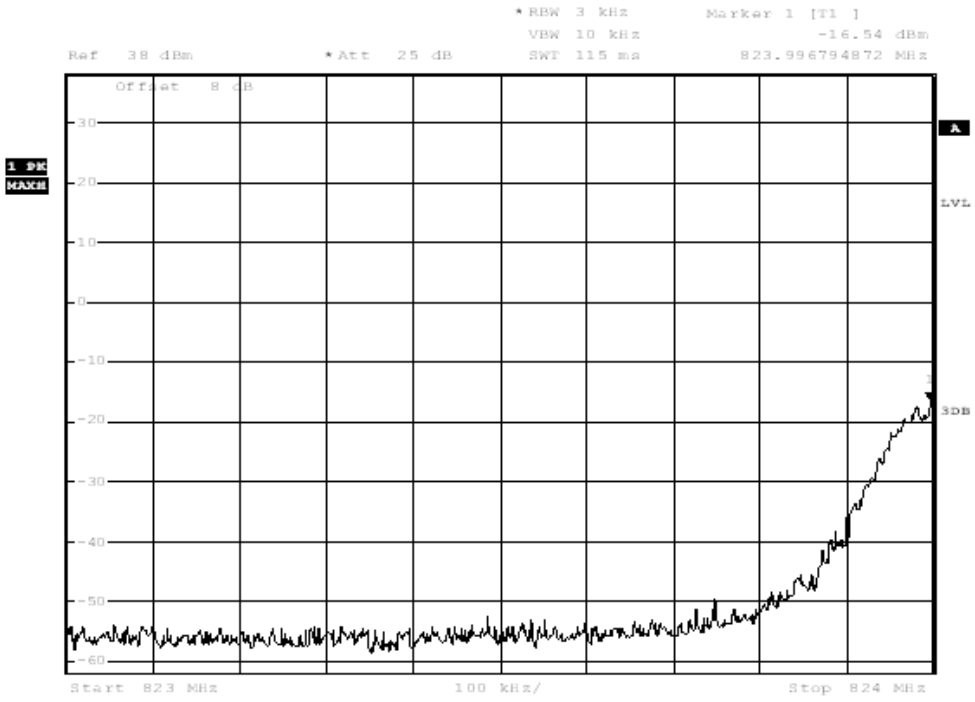
Date: 23.MAY.2012 19:15:23

GSM channel 512 Left band edge



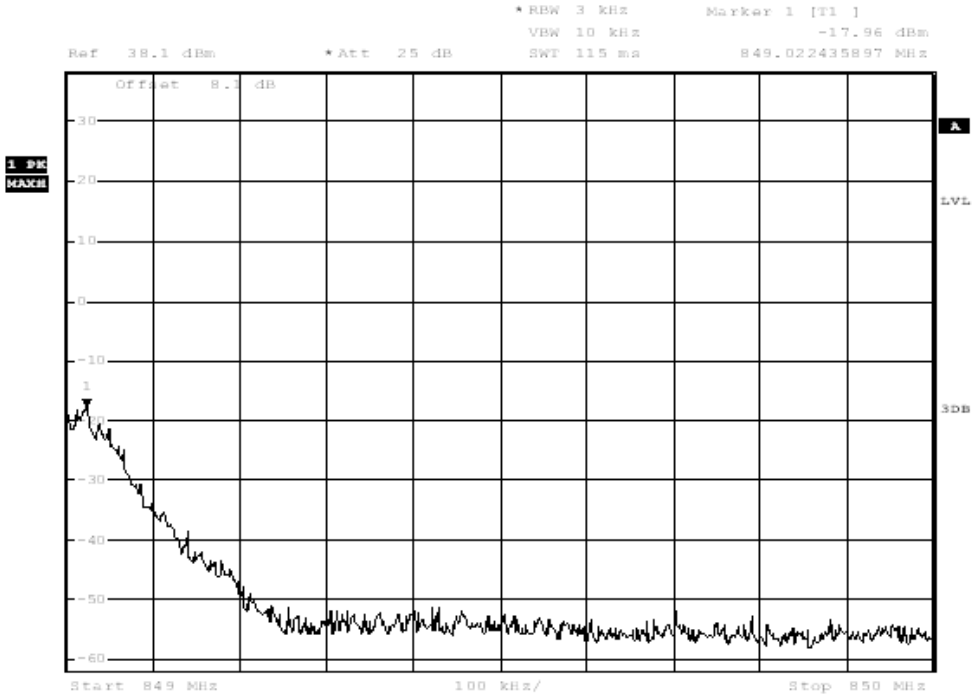
Date: 23.MAY.2012 19:15:38

GSM channel 810 Right band edge



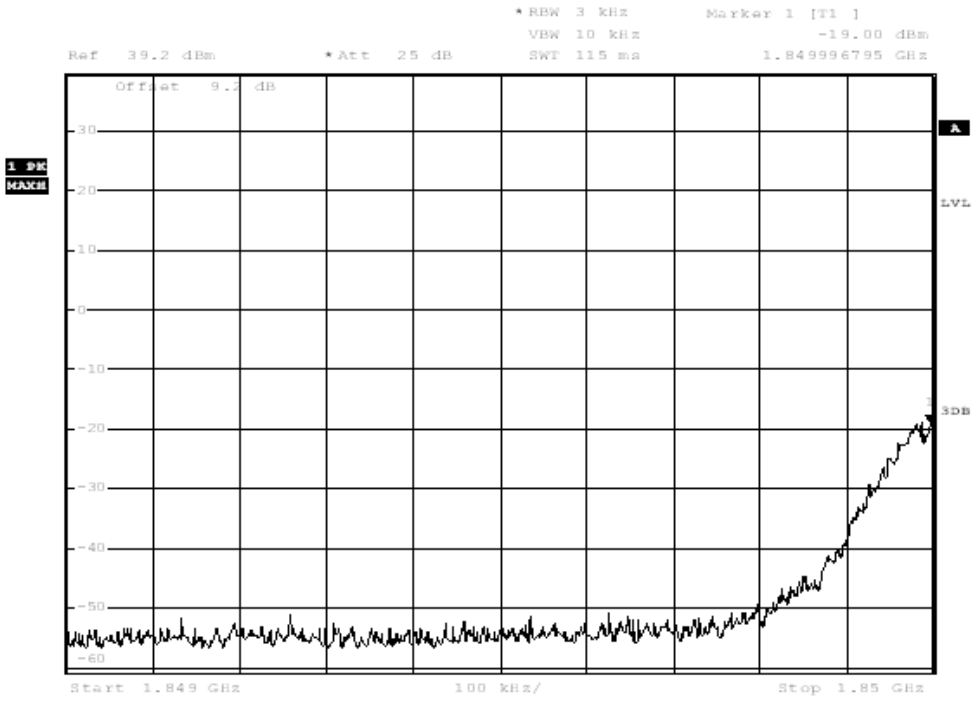
Date: 22.MAY.2012 23:36:39

GPRS channel 128 Left band edge



Date: 22.MAY.2012 23:36:53

GPRS channel 251 Right band edge



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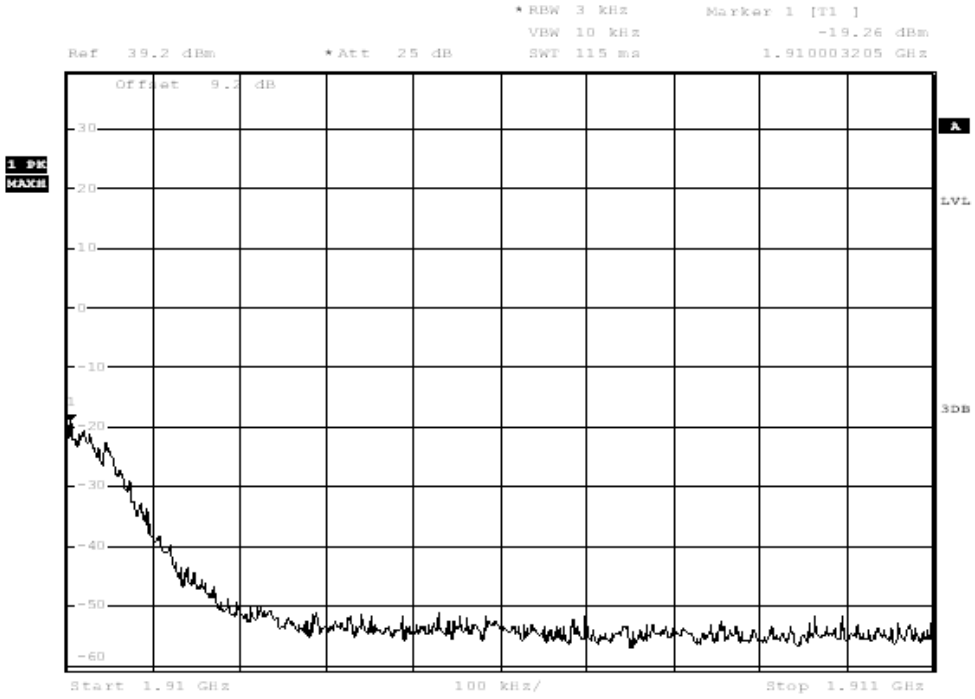
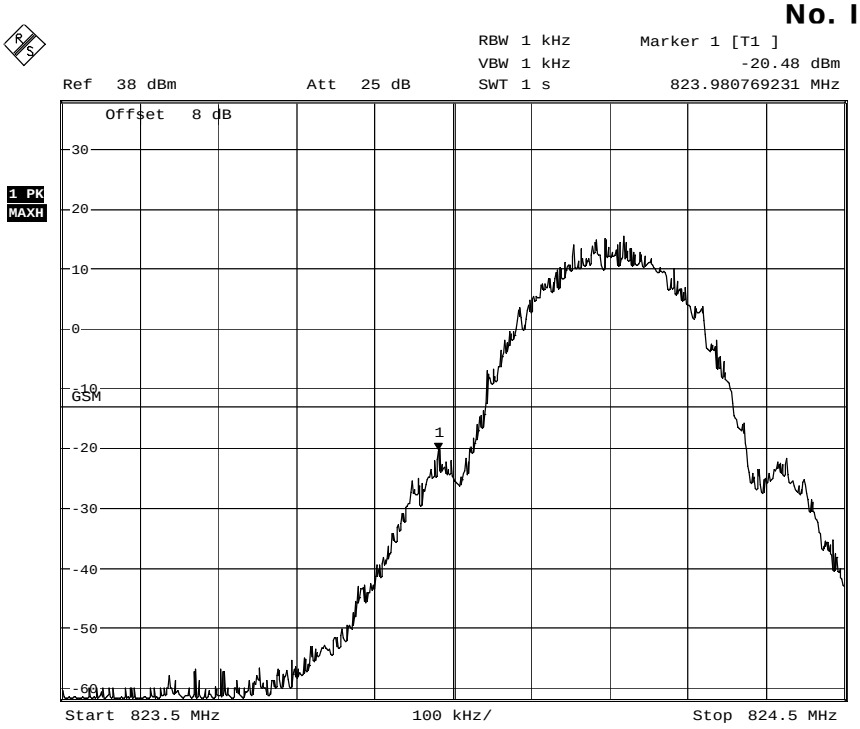
GPRS channel 512 Left band edge



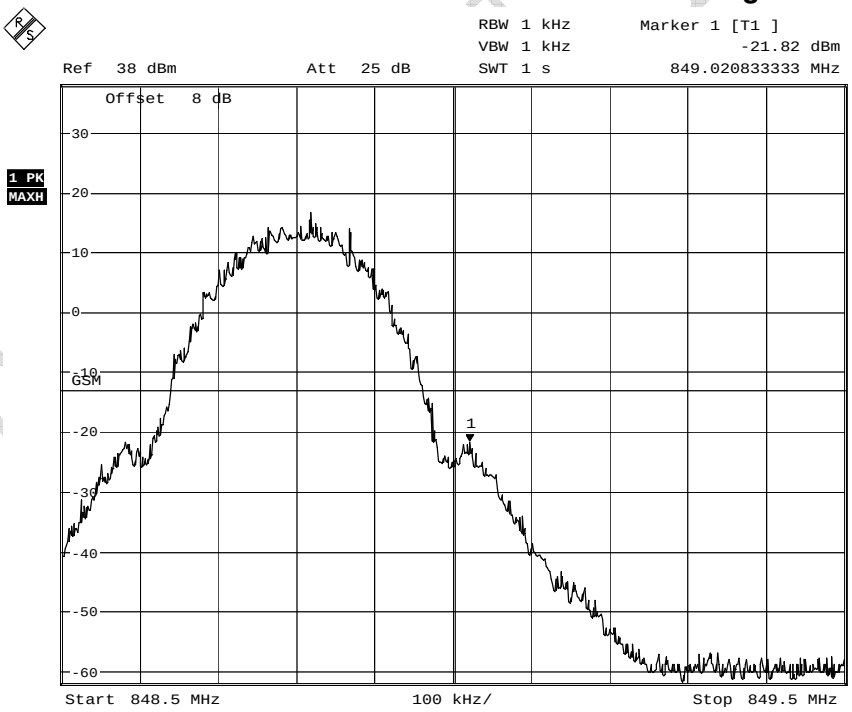
Date: 23.MAY.2012 19:26:45

GPRS channel 810 Right band edge



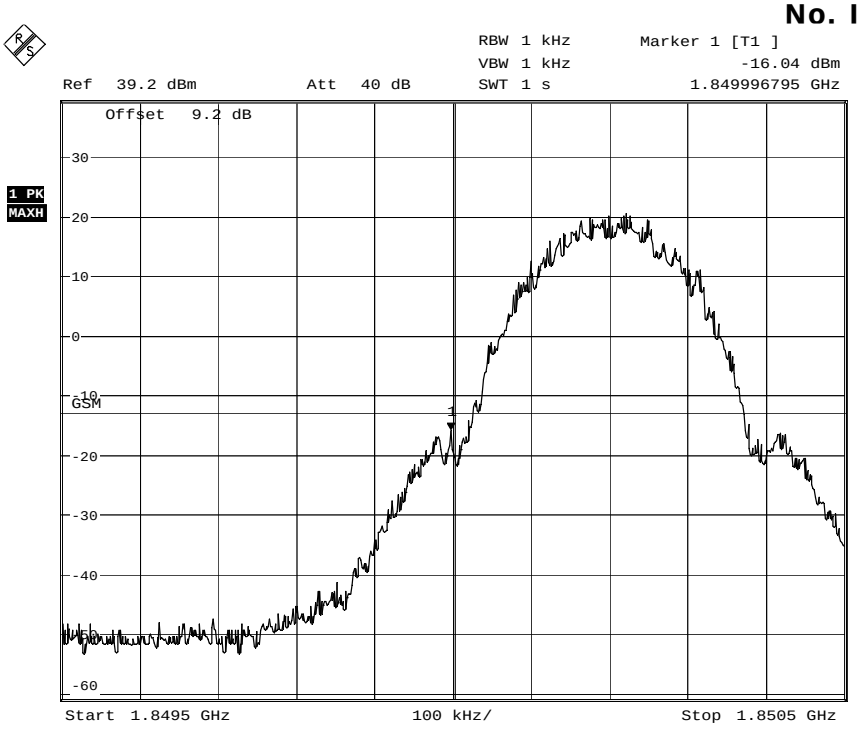
Date: 30.MAY.2012 19:52:15

EGPRS channel 128 Left band edge



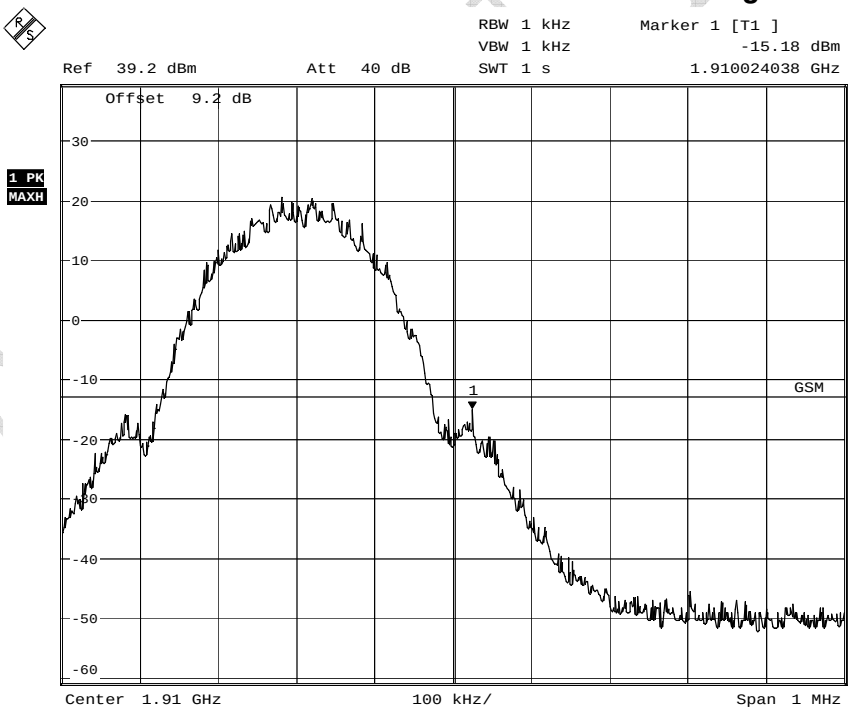
Date: 30.MAY.2012 19:55:40

EGPRS channel 251 Right band edge



Date: 30.MAY.2012 19:18:04

EGPRS channel 512 Left band edge



Date: 30.MAY.2012 19:16:36

EGPRS channel 810 Right band edge

5 Test Equipments and Ancillaries Used For Tests

The test equipments and ancillaries used are as follows.

5.1 Test Equipments for RF Test

Ref No.	Instrument/ Ancillary	Type	Manufacturer	Serial No.	Cal Due Date
1	Universal Radio Communication Tester	CMU200	Rohde&Schwarz	114828	2013.01.19
2	Spectrum Analyzer	FSU	Rohde&Schwarz	200679	2013.01.18
3	Temperature Chamber	SH-241	ESPEC	92007516	2013.02.24
4	DC Power Supply	U3606A	Agilent Technologies	MY50450012	2013.11.15
5	RF Switch Matrix	OSP130	Rohde&Schwarz	100086	2013.03.28
6	Vector Signal Generator	SMU200A	Rohde&Schwarz	104072	2013.03.28
7	MXG Analog Signal Generator	N5183A	Agilent Technologies	MY50140012	2013.11.15

5.2 Test Equiments for RSE Test

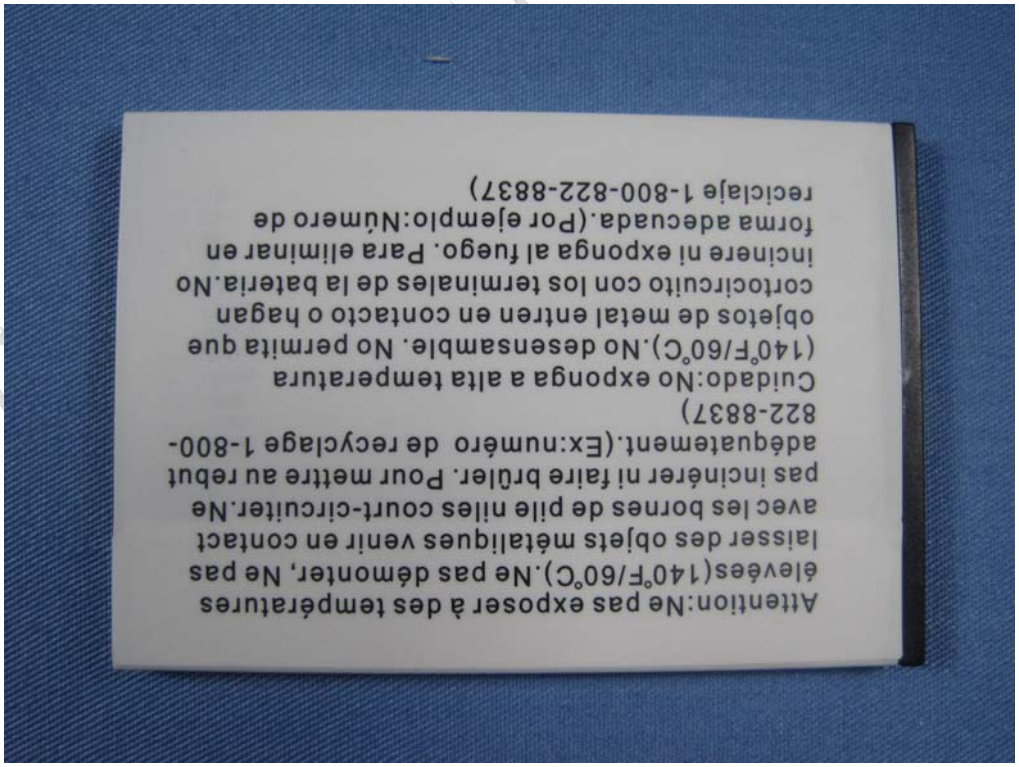
Ref No.	Instrument / Ancillary	Type	Manufacturer	Serial No.	Cal Due Date
1	Universal Radio Communication	CMU200	Rohde&Schwarz	114545	2013.03.23
2	Test Receiver	ESCI	Rohde&Schwarz	100701	2013.12.30
3	BiLog Antenna	9163	Schwarzbeck	9163-330	2014.03.02
4	Double-Ridged Waveguide Horn Antenna	3164-05	ETS-Lindgren	00085724	2014.02.18
5	Spectrum Analyzer	FSP40	Rohde&Schwarz	100378	2013.12.23
6	Fully Anechoic Chamber	n/a	ETS-Lindgren	n/a	2013.05.17

Annex A External Photos

Front view

Back view

Adaptor and cable



battery

ANNEX B Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

The End of this Report