FCC REPORT

Applicant:	SENWA MEXICO,S.A.DE C.V
Address of Applicant:	Av. Javier Barros Sierra 540, Torre I, Planta 5; COL. LOMAS DE SANTA FE DELEGACION ALVARO OBREGON C.P. 01210 MEXICO, DISTRITO FEDERAL

Equipment Under Test (EUT)

Product Name:	Smart Phone
Model No.:	S970
Trade mark:	SENWA
FCC ID:	2AAA6-S970
Applicable standards:	FCC CFR Title 47 Part 2 FCC CFR Title 47 Part22 Subpart H FCC CFR Title 47 Part24 Subpart E
Date of sample receipt:	29 Oct., 2014
Date of Test:	29 Oct., to 04 Dec., 2014
Date of report issued:	05 Dec., 2014
Test Result:	PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Bruce Zhang
Laboratory Manager

2. Version

Version No.	Date	Description
00	*05 Dec., 2014*	*Original*

Prepared by:  ***Date:*** *05 Dec., 2014*

Report Clerk

Reviewed by:  ***Date:*** *05 Dec., 2014*

Project Engineer

3. Contents

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4. Test Summary

Test Item	Section in CFR 47	Result
RF Exposure (SAR)	Part 1.1307 Part 2.1093	Passed* (Please refer to SAR Report)
RF Output Power	Part 2.1046 Part 22.913 (a)(2) Part 24.232 (c)	Pass
Modulation Characteristics	Part 2.1047	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 22.917 Part 24.238	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 22.917 (a) Part 24.238 (a)	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 22.917 (a) Part 24.238 (a)	Pass
Out of band emission, Band Edge	Part 22.917 (a) Part 24.238 (a)	Pass
Frequency stability vs. temperature	Part 2.1055(a)(1)(b)	Pass
Frequency stability vs. voltage	Part 2.1055(d)(1)(2)	Pass

Pass: The EUT complies with the essential requirements in the standard.

5. General Information

5.1 Client Information

Applicant:	SENWA MEXICO,S.A.DE C.V
Address of Applicant:	Av. Javier Barros Sierra 540, Torre I, Planta 5; COL. LOMAS DE SANTA FE DELEGACION ALVARO OBREGON C.P. 01210 MEXICO, DISTRITO FEDERAL
Manufacturer:	Sumer Technology LTD.
Address of Manufacturer:	Room 903, A8 Music Building, Road Binhai & Keyuan, High-tech Park, Nanshan District, Shenzhen, China

5.2 General Description of E.U.T.

Product Name:	Smart Phone
Model No.:	S970
Operation Frequency range:	GSM 850: 824.20MHz-848.80MHz PCS1900: 1850.20MHz-1909.80MHz WCDMA Band V:826.4MHz-846.6MHz WCDMA Band II:1852.4 MHz -1907.6 MHz
Modulation type:	GSM/GPRS:GMSK, UMTS:QPSK, EGPRS: 8PSK
Antenna type:	Integral Antenna
Antenna gain:	GSM 850: -0.19 dBi PCS 1900: 1.35dBi WCDMA 850: 0.36dBi WCDMA 1900: 1.52dBi
AC adapter:	Input:100-240V AC,50/60Hz 0.3A Output:5V DC MAX 1A
Power supply:	Rechargeable Li-ion Battery DC3.8V-2100mAh

Operation Frequency List:

GSM 850		PCS1900	
Channel:	Frequency (MHz)	Channel:	Frequency (MHz)
128	824.20	512	1850.20
129	824.40	513	1850.40
….	….	….	….
189	836.40	660	1879.80
190	836.60	661	1880.00
191	836.80	662	1880.20
…	…	…	…
250	848.60	809	1909.60
251	848.80	810	1909.80
WCDMA Band V		WCDMA Band II	
Channel:	Frequency (MHz)	Channel:	Frequency (MHz)
4132	826.40	9262	1852.40
4133	826.60	9263	1852.60
….	….	….	….
4182	836.40	9399	1879.80
4183	836.60	9400	1880.00
4184	836.80	9401	1880.20
…	…	…	…
4232	846.40	9537	1907.40
4233	846.60	9538	1907.60

Regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

GSM850			PCS1900		
	Channel	Frequency(MHz)		Channel	Frequency(MHz)
Lowest channel	128	824.20	Lowest channel	512	1850.20
Middle channel	190	836.60	Middle channel	661	1880.00
Highest channel	251	848.80	Highest channel	810	1909.80
WCDMA Band V			WCDMA Band II		
	Channel	Frequency(MHz)		Channel	Frequency(MHz)
Lowest channel	4132	826.40	Lowest channel	9262	1852.40
Middle channel	4183	836.60	Middle channel	9400	1880.00
Highest channel	4233	846.60	Highest channel	9538	1907.60

5.3 Test modes

Communicate mode (GSM850)	Keep the EUT in communicating mode on GSM 850 band.
Data mode (GPRS850)	Keep the EUT in data communicating mode on GPRS 850 band.
Data mode (EGPRS850)	Keep the EUT in data communicating mode on EGPRS 850 band.
Communicate mode (PCS1900)	Keep the EUT in communicating mode on PCS1900 band.
Data mode (GPRS1900)	Keep the EUT in data communicating mode on GPRS1900 band.
Data mode (EGPRS1900)	Keep the EUT in data communicating mode on EGPRS1900 band.
Communicate mode (UMTS 850)	Keep the EUT in communicating mode on UMTS 850 band.
Communicate mode (UMTS 1900)	Keep the EUT in communicating mode on UMTS 1900 band.
Data mode (RMC UMTS 850)	Keep the EUT in data communicating mode on RMC in UMTS 850 (12.2 kbps, 64 kbps, 144 kbps & 384 kbps).
Data mode (HSDPA UMTS 850)	Keep the EUT in data communicating mode on HSDPA in UMTS 850(Sub-test 1~Sub-test 4).
Data mode (HSUPA UMTS 850)	Keep the EUT in data communicating mode on HSDPA in UMTS 850(Sub-test 1~Sub-test 5).
Data mode (RMC UMTS 1900)	Keep the EUT in data communicating mode on RMC in UMTS 850 (12.2 kbps, 64 kbps, 144 kbps & 384 kbps).
Data mode (HSDPA UMTS 1900)	Keep the EUT in data communicating mode on HSDPA in UMTS 1900. (Sub-test 1~Sub-test 4).
Data mode (HSUPA UMTS 1900)	Keep the EUT in data communicating mode on HSDPA in UMTS 1900. (Sub-test 1~Sub-test 5).
Remark :	Pre-test output power of all modes, and found GSM 850, PCS 1900, UMTS 850 12.2 kbps RMC & UMTS 1900 12.2 kbps RMC were the worst case. The details please refer to section 6.5.

5.4 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is filing to comply with Section Part 22 subpart H and Part 24 subpart E of the FCC CFR 47 Rules.

5.5 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on TIA/EIA 603 and FCC CFR 47.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057

5.6 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC - Registration No.: 817957**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in out files. Registration 817957, February 27, 2012.

- **IC - Registration No.: 10106A-1**

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **CNAS - Registration No.: CNAS L6048**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

5.7 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.
Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,
Bao'an District, Shenzhen, Guangdong, China
Tel: +86-755-23118282
Fax: +86-755-23116366

5.8 Test Instruments list

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
1	3m Semi- Anechoic Chamber	SAEMC	9(L)*6(W)* 6(H)	CCIS0001	08-23-2014	08-22-2017
2	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	CCIS0005	04-19-2014	04-19-2015
3	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	CCIS0006	04-19-2014	04-19-2015
4	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
5	Coaxial Cable	CCIS	N/A	CCIS0016	04-01-2014	03-31-2015
6	Coaxial Cable	CCIS	N/A	CCIS0017	04-01-2014	03-31-2015
7	Coaxial cable	CCIS	N/A	CCIS0018	04-01-2014	03-31-2015
8	Coaxial Cable	CCIS	N/A	CCIS0019	04-01-2014	03-31-2015
9	Coaxial Cable	CCIS	N/A	CCIS0087	04-01-2014	03-31-2015
10	Amplifier(10kHz-1.3GHz)	HP	8447D	CCIS0003	04-01-2014	03-31-2015
11	Amplifier(1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	06-09-2014	06-08-2015
12	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	04-01-2014	03-31-2015
13	Horn Antenna	ETS-LINDGREN	3160	GTS217	03-30-2014	03-29-2015
14	Printer	HP	HP LaserJet P1007	N/A	N/A	N/A
15	Positioning Controller	UC	UC3000	CCIS0015	N/A	N/A
16	Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP 30	CCIS0023	04-19-2014	04-19-2015
17	EMI Test Receiver	Rohde & Schwarz	ESPI	CCIS0022	04-01-2014	03-31-2015
18	Loop antenna	Laplace instrument	RF300	EMC0701	04-01-2014	03-31-2015
19	Universal radio communication tester	Rhode & Schwarz	CMU200	CCIS0069	05-29-2014	05-28-2015
20	Signal Analyzer	Rohde & Schwarz	FSIQ3	CCIS0088	04-19-2014	04-19-2015

6. System test configuration

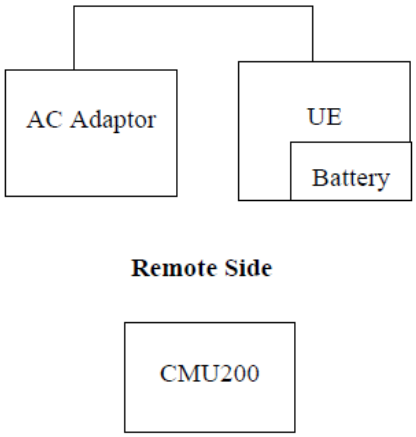
6.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

6.2 EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency which was for the purpose of the measurements.

6.3 Configuration of Tested System

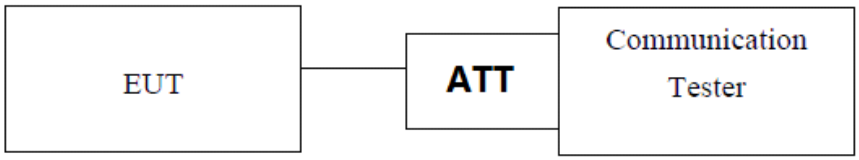


Remote Side

6.4 Description of Test Modes

The EUT has been tested under operating condition.
EUT staying in continuous transmitting mode. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing.
The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for three modes (GSM850, PCS1900, WCDMA Band V and WCDMA Band II) with power adaptor, earphone and Data cable. The worst-case H mode for GSM850, PCS1900, UMTS 850 and UMTS 1900.

6.5 Conducted Output Power

Test Requirement:	FCC part 22.913(a) and FCC part 24.232(b)
Test Method:	FCC part 2.1046
Limit:	GSM 850 7W PCS 1900 2W WCDMA Band V: 7W WCDMA Band II: 2W
Test setup:	 *Note: Measurement setup for testing on Antenna connector*
Test Procedure:	The transmitter output was connected to a calibrated attenuator, the other end of which was connected to the CMU200. Transmitter output power was read off in dBm.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data

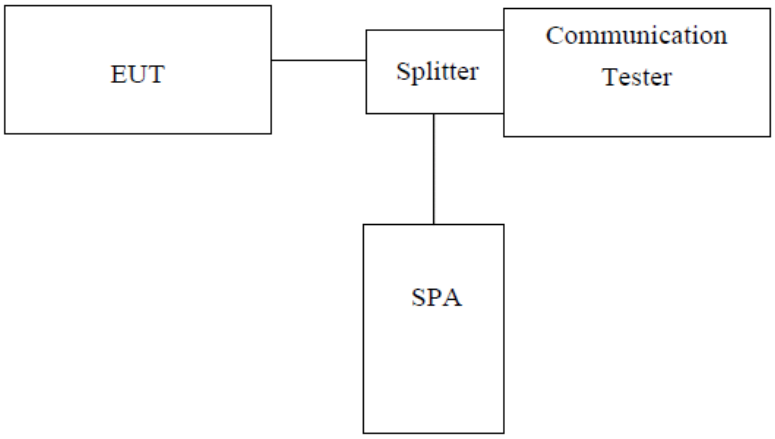
EUT Mode	Channel	Frequency (MHz)	Burst Average power (dBm)	Limit(dBm)	Result
GSM 850	128	824.20	33.21	38.45	Pass
	190	836.60	33.31		
	251	848.80	33.32		
GPRS 850 (1 Uplink slot)	128	824.20	33.07		
	190	836.60	33.23		
	251	848.80	33.25		
GPRS 850 (2 Uplink slots)	128	824.20	32.37		
	190	836.60	32.49		
	251	848.80	32.50		
GPRS 850 (3 Uplink slots)	128	824.20	30.65		
	190	836.60	30.77		
	251	848.80	30.75		
GPRS 850 (4 Uplink slots)	128	824.20	29.52		
	190	836.60	29.58		
	251	848.80	29.62		
EGPRS 850 (1 Uplink slot)	128	824.20	30.16		
	190	836.60	30.01		
	251	848.80	29.89		
EGPRS 850 (2 Uplink slots)	128	824.20	29.33		
	190	836.60	28.99		
	251	848.80	28.98		
EGPRS 850 (3 Uplink slot)	128	824.20	27.46		
	190	836.60	27.30		
	251	848.80	27.07		
EGPRS 850 (4 Uplink slot)	128	824.20	26.27		
	190	836.60	26.01		
	251	848.80	25.85		

PCS 1900	512	1850.20	28.97	33.00	Pass
	661	1880.00	28.92		
	810	1909.80	28.75		
GPRS 1900 (1 Uplink slot)	512	1850.20	28.98		
	661	1880.00	28.96		
	810	1909.80	28.77		
GPRS 1900 (2 Uplink slots)	512	1850.20	28.41		
	661	1880.00	28.39		
	810	1909.80	28.20		
GPRS 1900 (3 Uplink slots)	512	1850.20	27.04		
	661	1880.00	27.00		
	810	1909.80	26.78		
GPRS 1900 (4 Uplink slots)	512	1850.20	26.13		
	661	1880.00	26.04		
	810	1909.80	25.78		
EGPRS 1900 (1 Uplink slot)	512	1850.20	27.60		
	661	1880.00	27.30		
	810	1909.80	26.92		
EGPRS 1900 (2 Uplink slots)	512	1850.20	26.55		
	661	1880.00	26.25		
	810	1909.80	25.88		
EGPRS 1900 (3 Uplink slot)	512	1850.20	24.58		
	661	1880.00	24.22		
	810	1909.80	23.65		
EGPRS 1900 (4 Uplink slots)	512	1850.20	23.17		
	661	1880.00	22.80		
	810	1909.80	22.23		

EUT Mode		Channel	Frequency (MHz)	Burst Average power (dBm)	Limit(dBm)	Result
UMTS 850 HSDPA	Subtest 1	4132	826.40	22.65	38.45	Pass
		4183	836.00	22.45		
		4233	846.60	22.66		
	Subtest 2	4132	826.40	22.21		
		4183	836.00	21.92		
		4233	846.60	22.26		
	Subtest 3	4132	826.40	20.64		
		4183	836.00	20.37		
		4233	846.60	20.74		
	Subtest 4	4132	826.40	20.66		
		4183	836.00	20.27		
		4233	846.60	20.69		
UMTS 850 HSUPA	Subtest 1	4132	826.40	22.60		
		4183	836.00	22.37		
		4233	846.60	22.60		
	Subtest 2	4132	826.40	22.59		
		4183	836.00	22.46		
		4233	846.60	22.64		
	Subtest 3	4132	826.40	20.58		
		4183	836.00	20.27		
		4233	846.60	20.67		
	Subtest 4	4132	826.40	22.63		
		4183	836.00	22.48		
		4233	846.60	22.68		
	Subtest 5	4132	826.40	21.73		
		4183	836.00	21.37		
		4233	846.60	21.72		
UMTS 850 RMC	12.2kbps	4132	826.40	23.64		
		4183	836.00	23.41		
		4233	846.60	23.68		
UMTS 850 AMR	12.2kbps	4132	826.40	23.63		
		4183	836.00	23.30		
		4233	846.60	23.53		

EUT Mode		Channel	Frequency (MHz)	Burst Average power (dBm)	Limit(dBm)	Result
UMTS1900 HSDPA	Subtest 1	9262	1852.40	22.28	33.00	Pass
		9400	1880.00	22.49		
		9538	1907.60	22.65		
	Subtest 2	9262	1852.40	21.89		
		9400	1880.00	22.11		
		9538	1907.60	22.19		
	Subtest 3	9262	1852.40	20.47		
		9400	1880.00	20.39		
		9538	1907.60	20.50		
	Subtest 4	9262	1852.40	20.36		
		9400	1880.00	20.48		
		9538	1907.60	20.58		
UMTS1900 HSUPA	Subtest 1	9262	1852.40	22.20		
		9400	1880.00	22.47		
		9538	1907.60	22.49		
	Subtest 2	9262	1852.40	22.36		
		9400	1880.00	22.50		
		9538	1907.60	22.61		
	Subtest 3	9262	1852.40	20.44		
		9400	1880.00	19.98		
		9538	1907.60	20.64		
	Subtest 4	9262	1852.40	22.40		
		9400	1880.00	22.54		
		9538	1907.60	22.68		
	Subtest 5	9262	1852.40	21.33		
		9400	1880.00	21.63		
		9538	1907.60	21.65		
UMTS1900 RMC	12.2kbps	9262	1852.40	23.42		
		9400	1880.00	23.52		
		9538	1907.60	23.66		
UMTS1900 AMR	12.2kbps	9262	1852.40	23.39		
		9400	1880.00	23.51		
		9538	1907.60	23.60		

6.6 Occupy Bandwidth

Test Requirement:	FCC part 22.913(a) and FCC part 24.232(b)
Test Method:	FCC part 2.1049
Test setup:	 *Note: Measurement setup for testing on Antenna connector*
Test Procedure:	1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer 2. RBW was set to about 1% of emission BW, VBW= 3 times RBW. 3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data

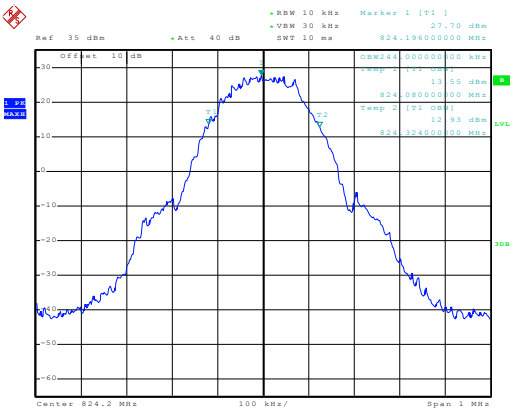
EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (kHz)	-26dB bandwidth (kHz)
GSM 850	128	824.2	244	316
	190	836.6	244	320
	251	848.8	244	322
EGPRS850	128	824.2	258	330
	190	836.6	260	338
	251	848.8	248	328
PCS 1900	512	1850.2	244	310
	661	1880.0	248	316
	810	1909.8	244	318
EGPRS1900	512	1850.2	260	350
	661	1880.0	254	332
	810	1909.8	248	322
UMTS850 12.2k RMC	4132	824.40	4180	4700
	4183	836.00	4180	4720
	4233	846.60	4160	4800
UMTS1900 12.2k RMC	9262	1852.40	4180	4760
	9400	1880.00	4200	4760
	9538	1907.60	4280	4940

Note: GSM & GPRS use the same modulation technical (GMSK), and with the same channels, so the 99% OBW and the -26dB of GPRS not performed.

Test plot as follows:

99% Occupy bandwidth

GSM850



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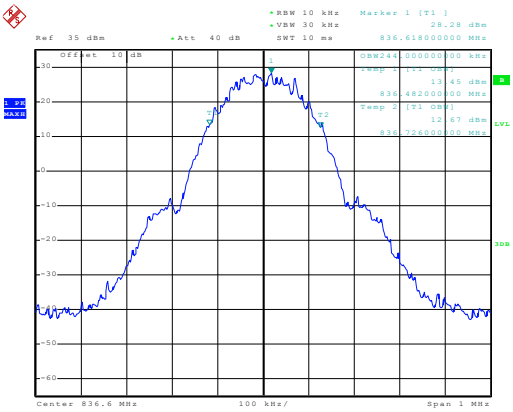
Lowest channel



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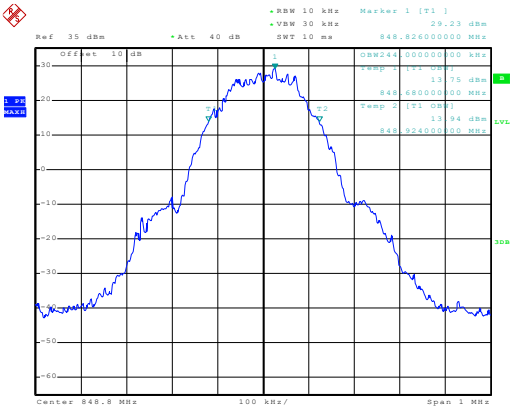
Middle channel



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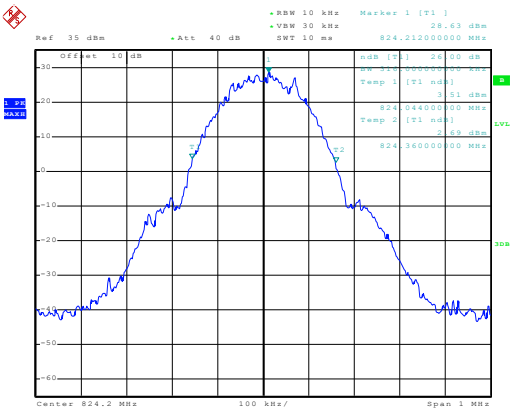
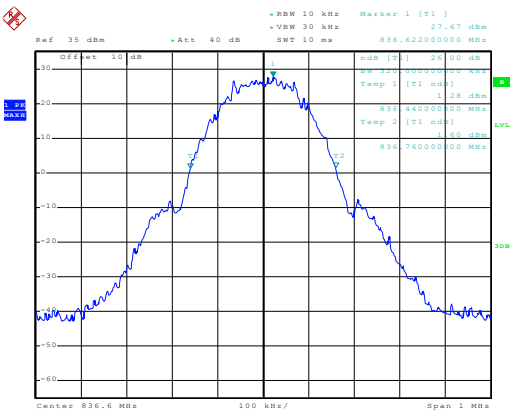
Highest channel

26dB Emission Bandwidth

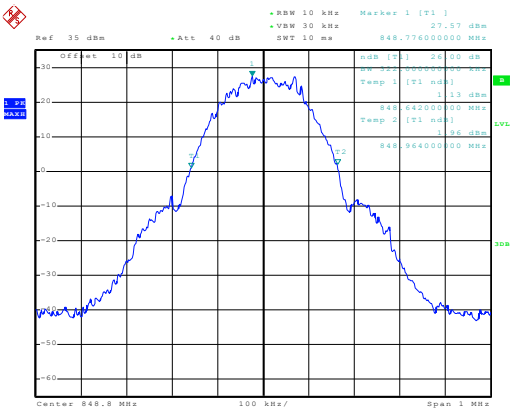
GSM850



Lowest channel



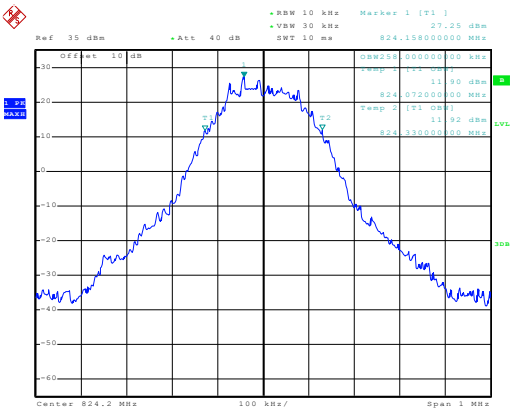
Middle channel



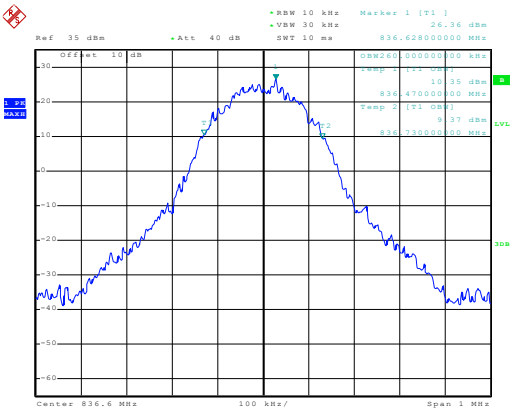
Highest channel

99% Occupy bandwidth

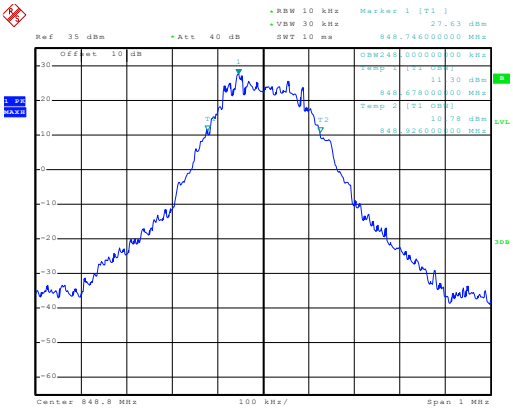
EGPRS850



Lowest channel



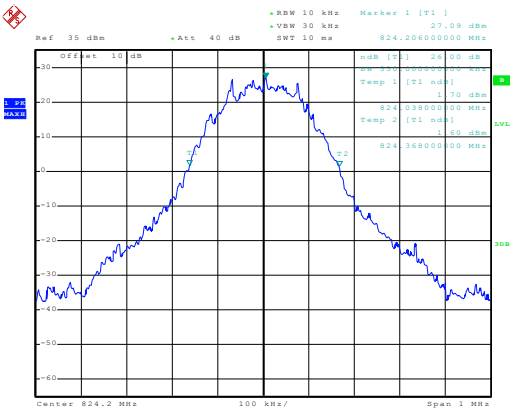
Middle channel



Highest channel

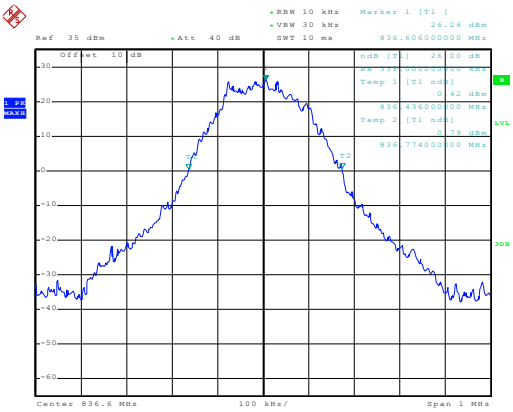
26dB Emission Bandwidth

EGPRS850



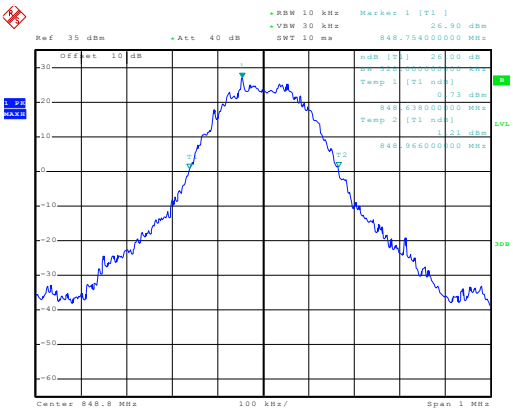
Date: 4.NOV.2014 08:24:11

Lowest channel



Date: 4.NOV.2014 08:23:39

Middle channel

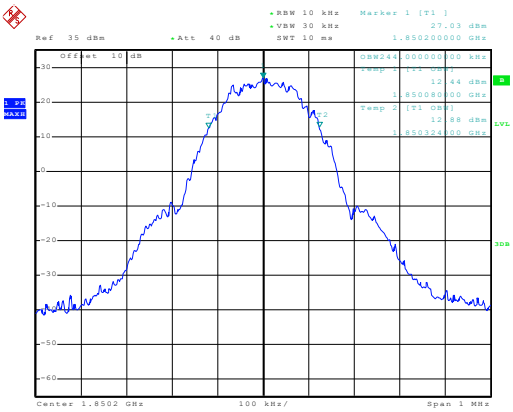


Date: 4.NOV.2014 08:23:06

Highest channel

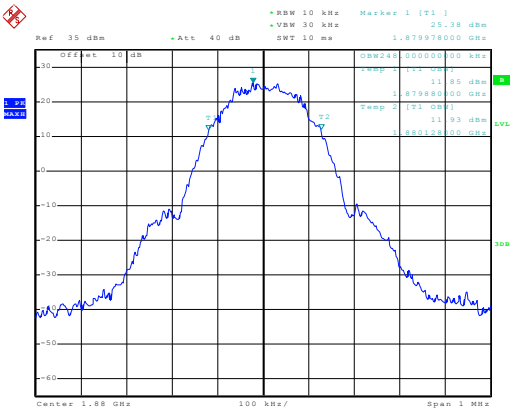
99% Occupy bandwidth

PCS 1900



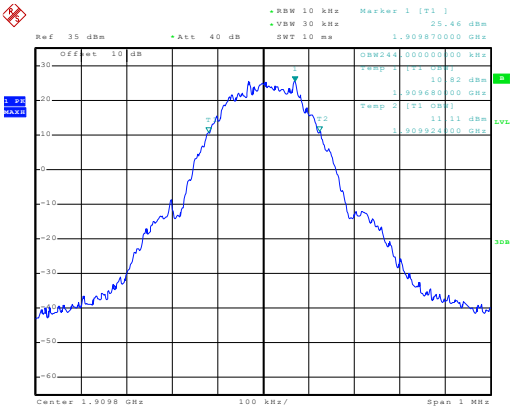
Date: 4.NOV.2014 07:57:28

Lowest channel



Date: 4.NOV.2014 07:58:05

Middle channel

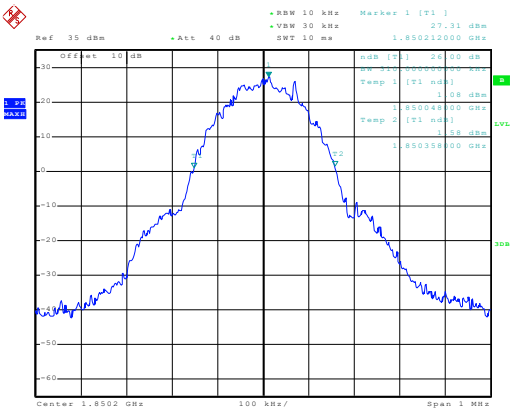


Date: 4.NOV.2014 07:58:34

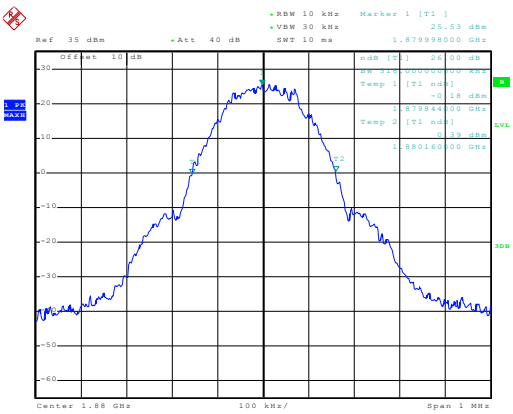
Highest channel

26dB Emission Bandwidth

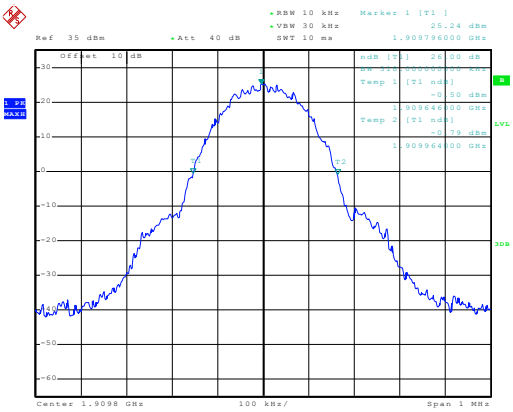
PCS 1900



Lowest channel



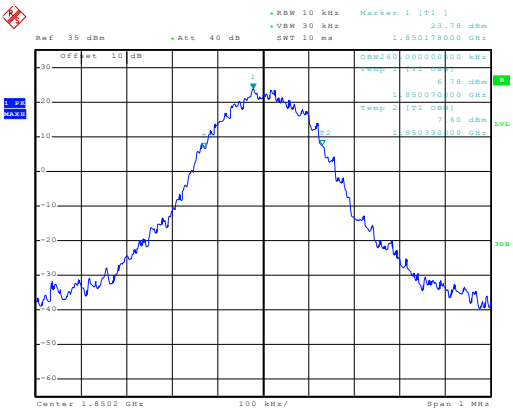
Middle channel



Highest channel

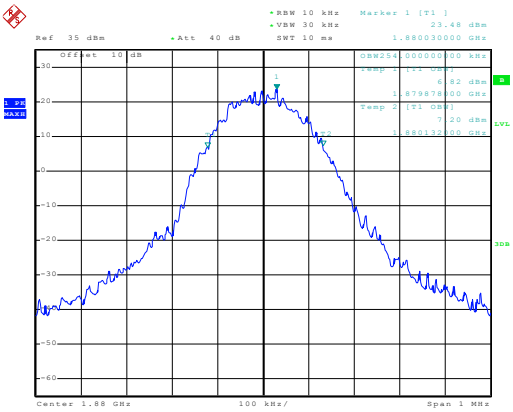
99% Occupy bandwidth

EGPRS 1900



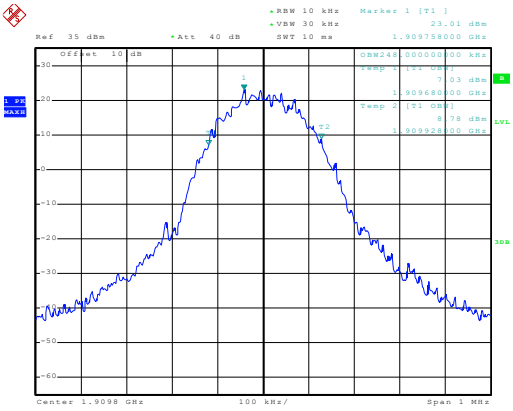
Date: 4.NOV.2014 08:12:05

Lowest channel



Date: 4.NOV.2014 08:11:48

Middle channel

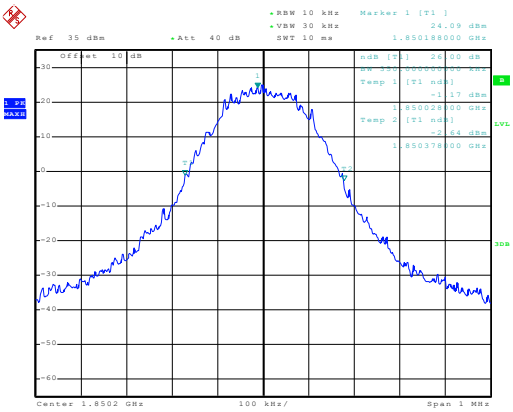


Date: 4.NOV.2014 08:11:28

Highest channel

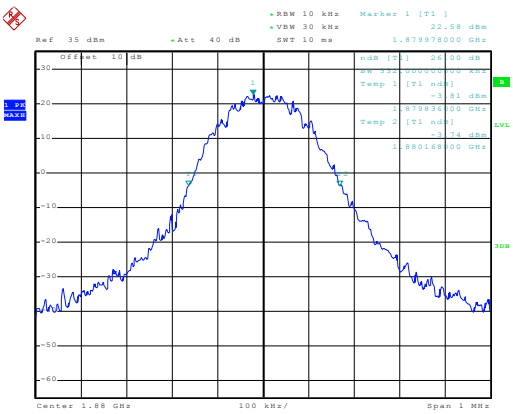
26dB Emission Bandwidth

EGPRS 1900



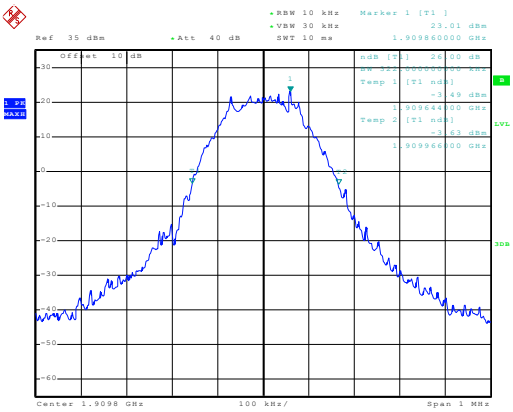
Date: 4.NOV.2014 08:10:20

Lowest channel



Date: 4.NOV.2014 08:10:41

Middle channel

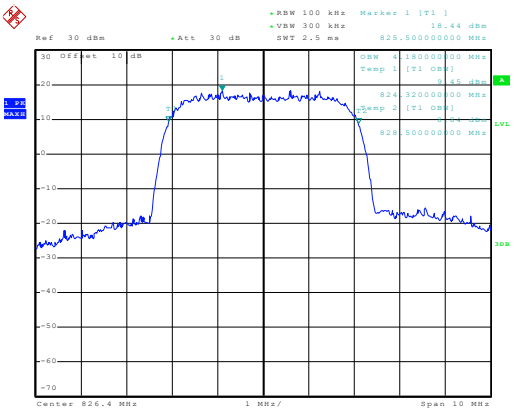


Date: 4.NOV.2014 08:11:08

Highest channel

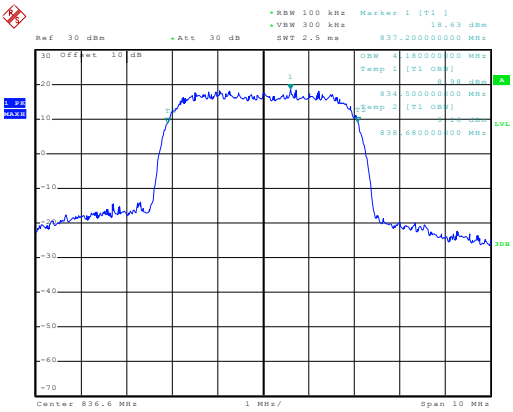
99% Occupy bandwidth

UMTS 850 12.2k RMC



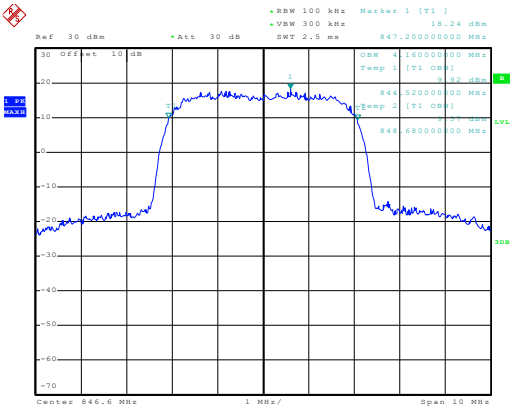
Date: 3.NOV.2014 16:40:02

Lowest channel



Date: 3.NOV.2014 16:40:31

Middle channel

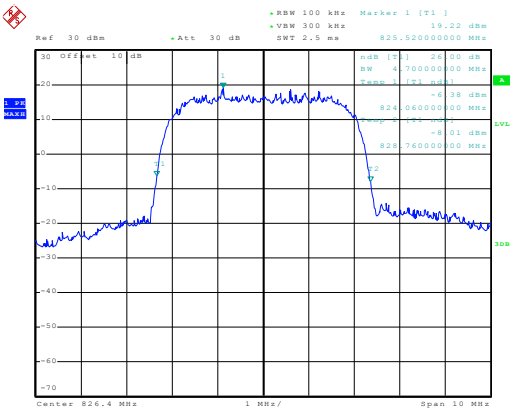


Date: 4.NOV.2014 07:27:58

Highest channel

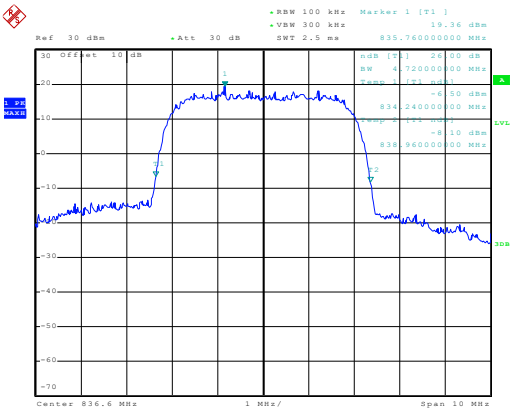
26dB Emission Bandwidth

UMTS 850 12.2k RMC



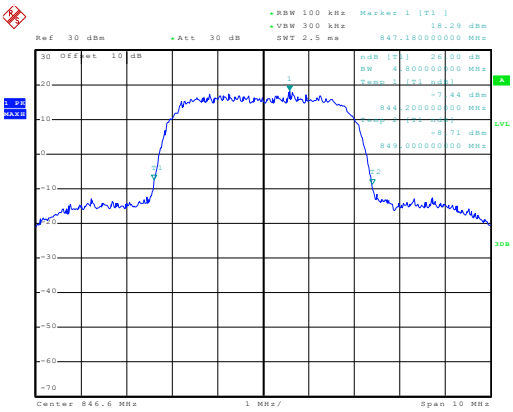
Date: 3.NOV.2014 16:39:34

Lowest channel



Date: 3.NOV.2014 16:39:03

Middle channel

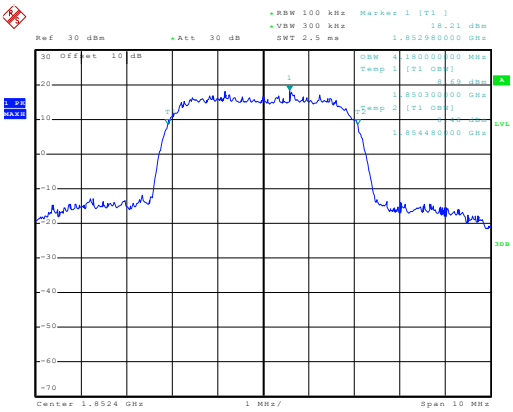


Date: 3.NOV.2014 16:38:33

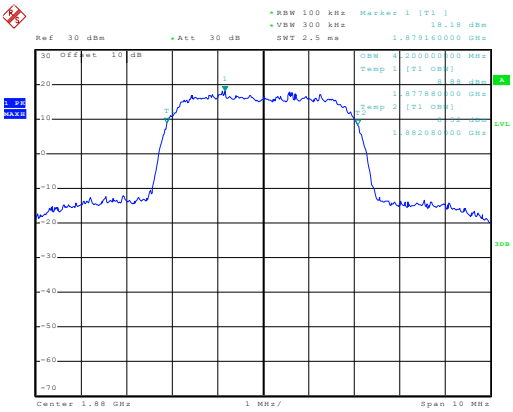
Highest channel

99% Occupy bandwidth

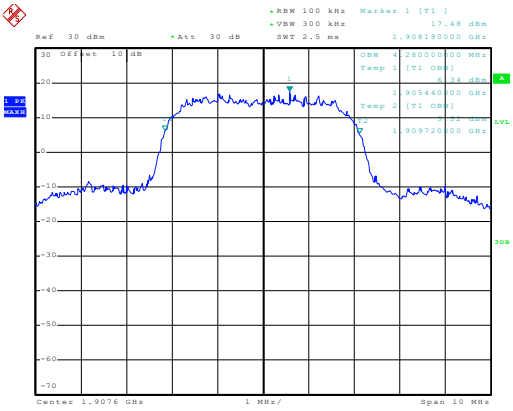
UMTS 1900 12.2k RMC



Lowest channel



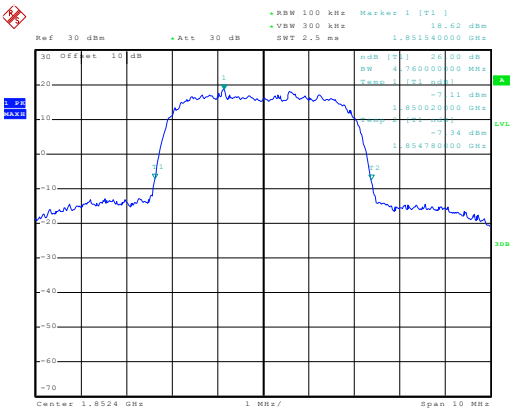
Middle channel



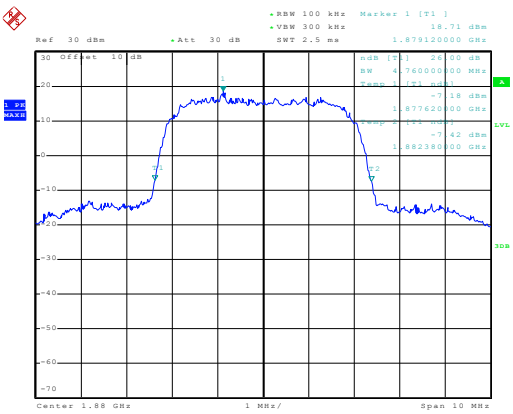
Highest channel

26dB Emission Bandwidth

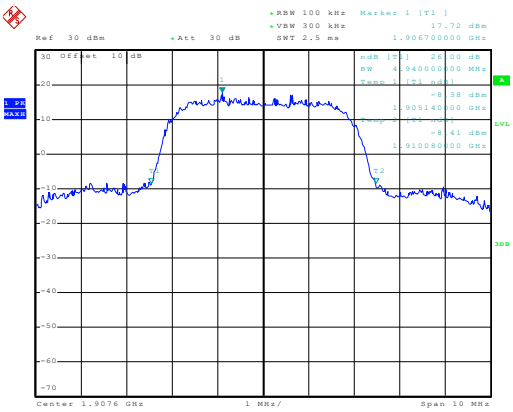
UMTS 1900 12.2k RMC



Lowest channel



Middle channel

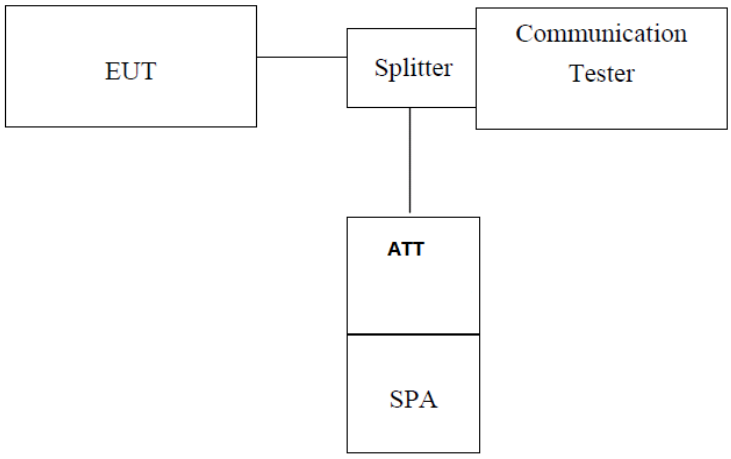


Highest channel

6.7 Modulation Characteristic

According to FCC § 2.1047(d), Part 22H & 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

6.8 Out of band emission at antenna terminals

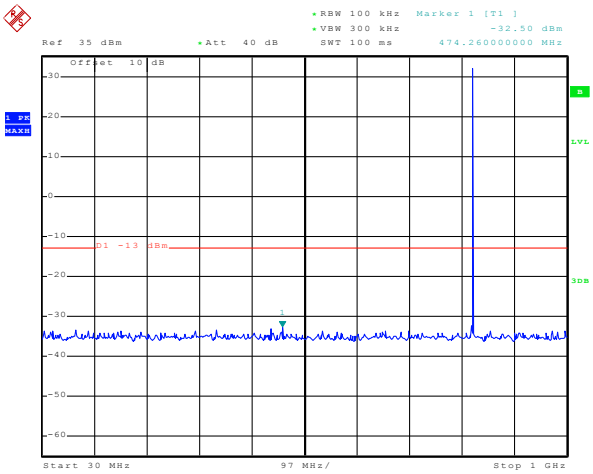
Test Requirement:	FCC part 22.917(a) and FCC part 24.238(a)
Test Method:	FCC part 2.1051
Limit:	-13dBm
Test setup:	 *Note: Measurement setup for testing on Antenna connector*
Test Procedure:	1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 The resolution bandwidth of the spectrum analyzer was set at 100 kHz when below 1GHz, 1MHz when above 1 GHz; sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic. 3 For the out of band: Set the RBW=100 kHz, VBW=300 kHz when below 1 GHz, RBW =1 MHz, VBW=3 MHz when above 1 GHz, Start=30MHz, Stop= 10th harmonic. 4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Test plots as follows:

Spurious emission

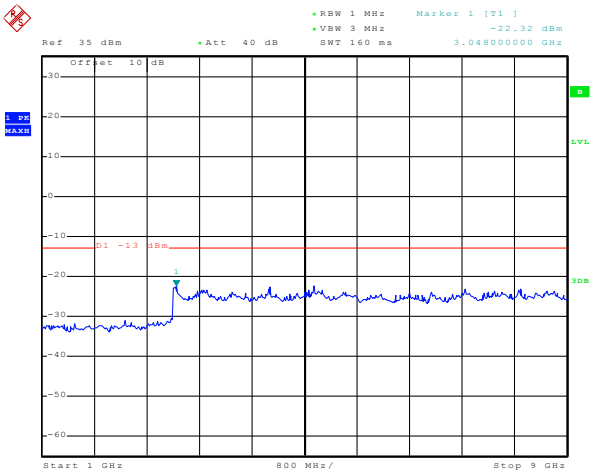
GSM 850

Lowest Channel



Date: 4.NOV.2014 07:32:48

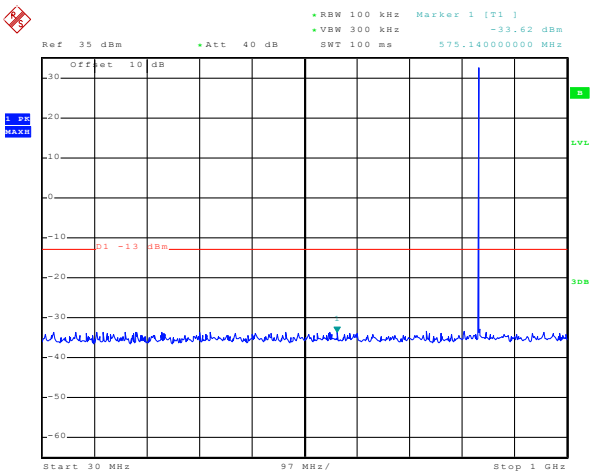
30MHz~1GHz



Date: 4.NOV.2014 07:51:19

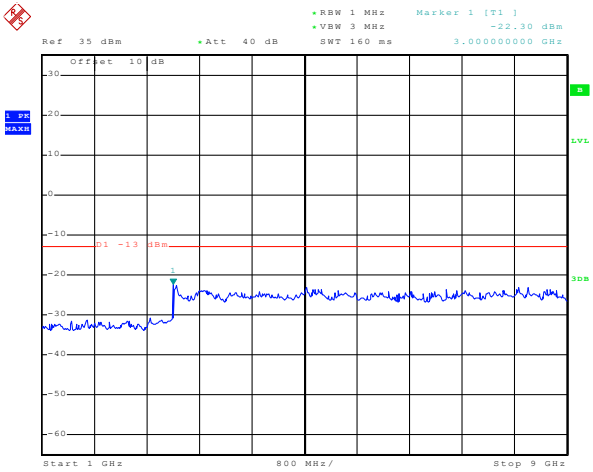
1GHz~9GHz

Middle channel



Date: 4.NOV.2014 07:33:14

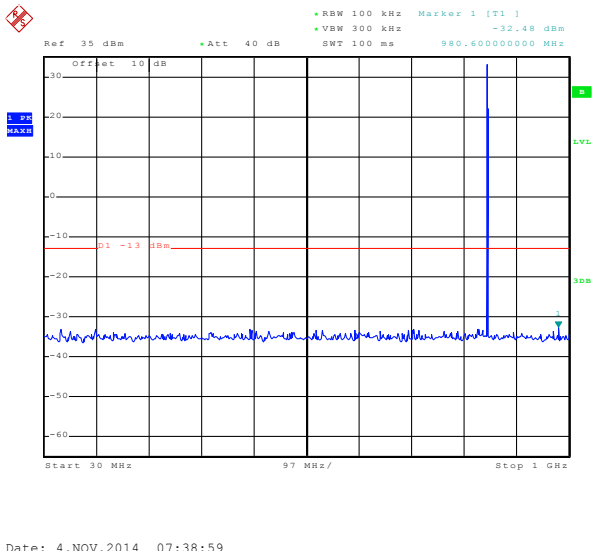
30MHz~1GHz



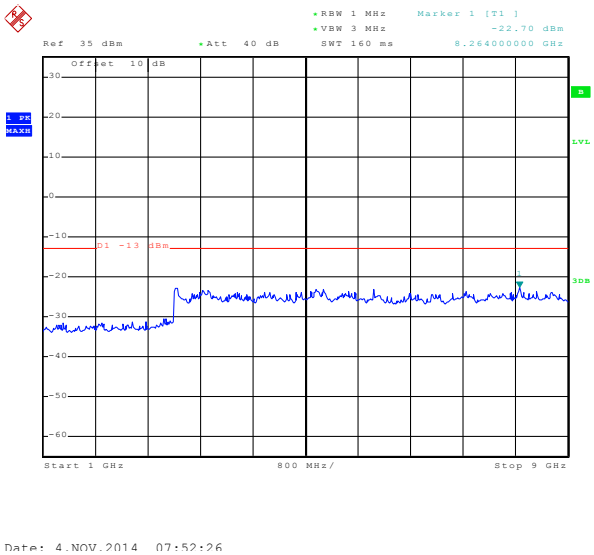
Date: 4.NOV.2014 07:52:02

1GHz~9GHz

Highest Channel



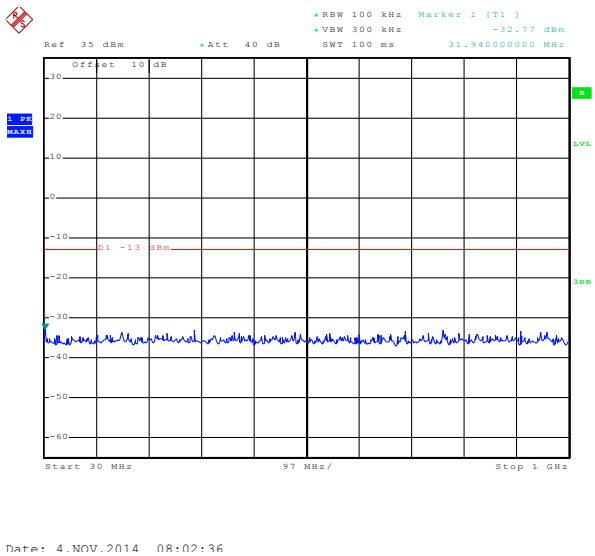
30MHz~1GHz



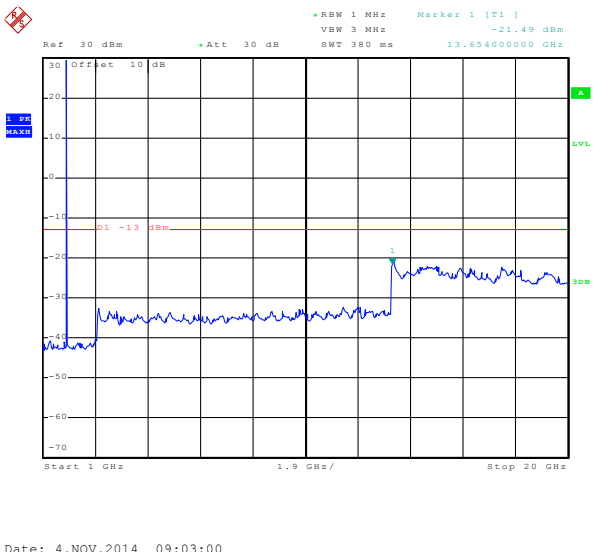
1GHz~9GHz

PCS 1900

Lowest Channel

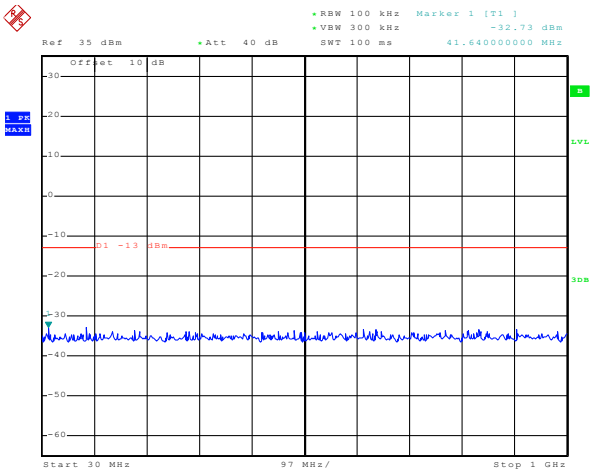


30MHz~1GHz



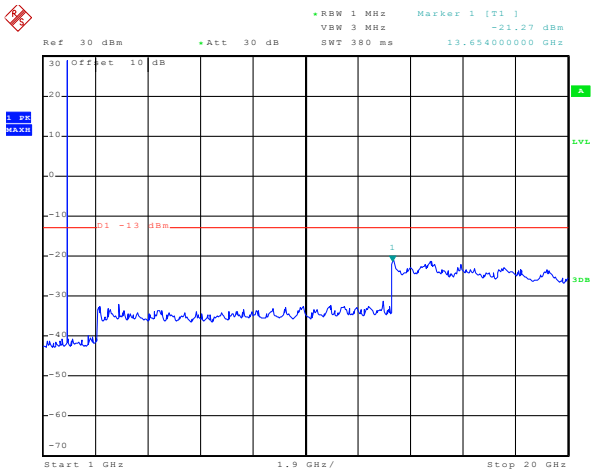
1GHz~20GHz

Middle Channel



Date: 4.NOV.2014 08:02:25

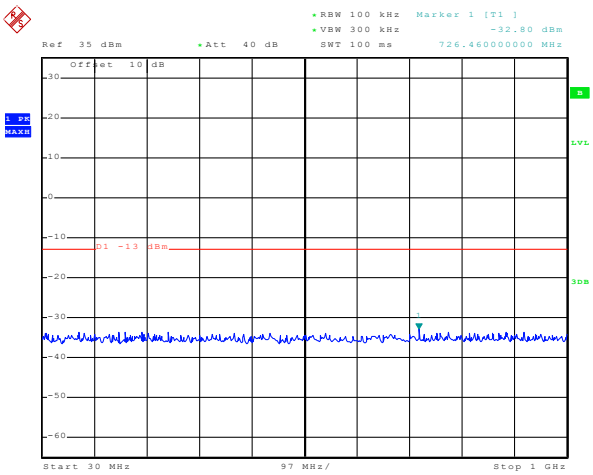
30MHz~1GHz



Date: 4.NOV.2014 09:03:33

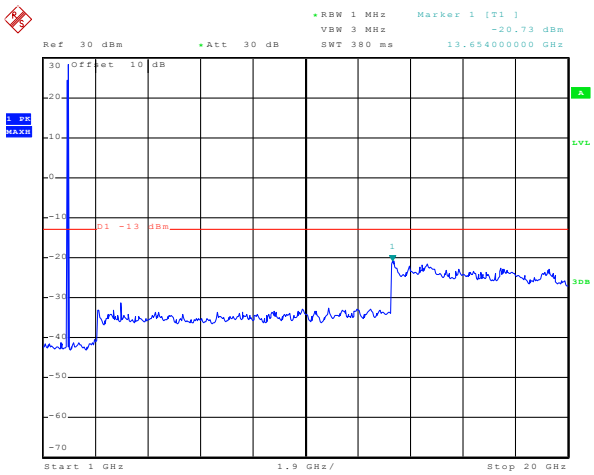
1GHz~20GHz

Highest Channel



Date: 4.NOV.2014 08:02:08

30MHz~1GHz

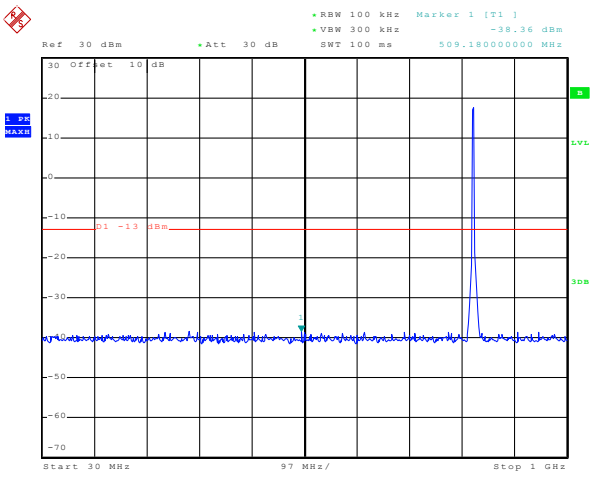


Date: 4.NOV.2014 09:03:57

1GHz~20GHz

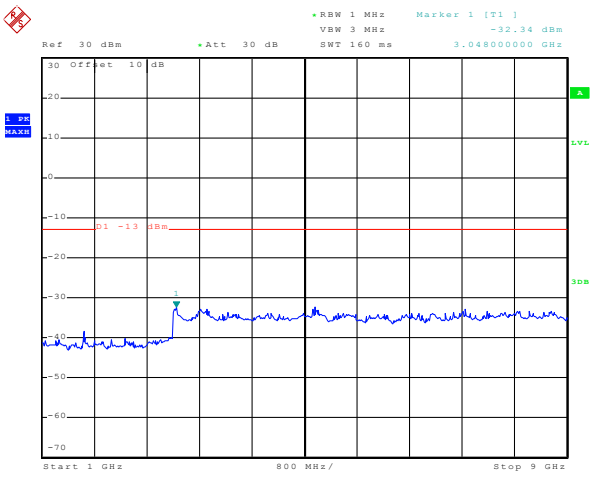
UMTS 850 12.2k RMC

Lowest Channel



Date: 4.NOV.2014 07:29:25

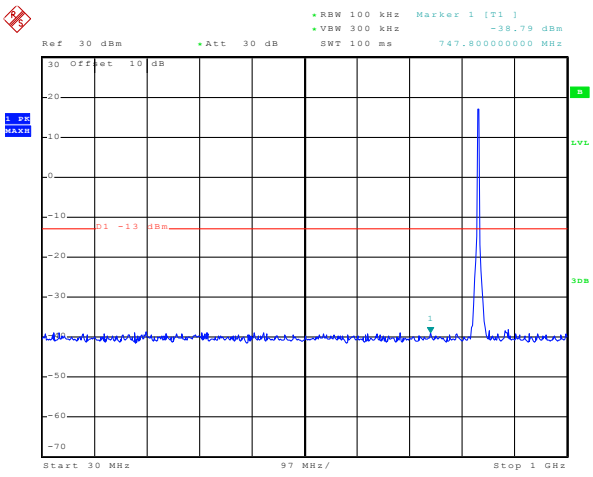
30MHz~1GHz



Date: 4.NOV.2014 09:07:35

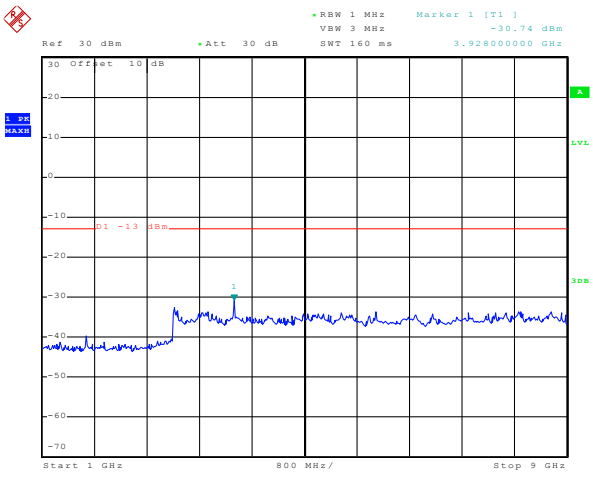
1GHz~9GHz

Middle Channel



Date: 4.NOV.2014 07:30:04

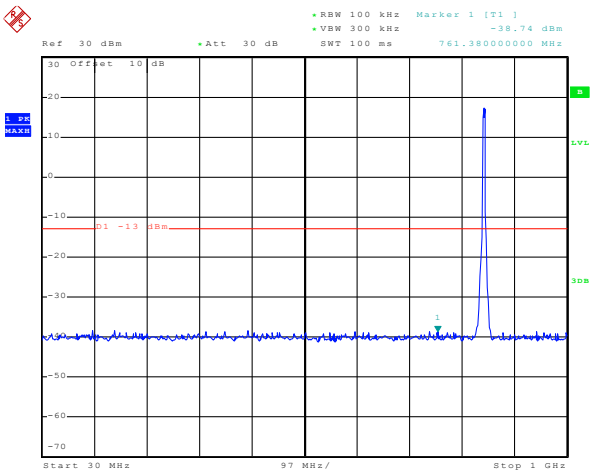
30MHz~1GHz



Date: 4.NOV.2014 09:07:51

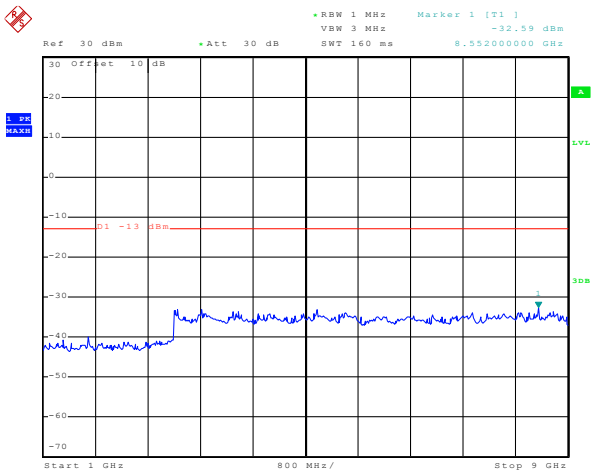
1GHz~9GHz

Highest Channel



Date: 4.NOV.2014 07:30:54

30MHz~1GHz

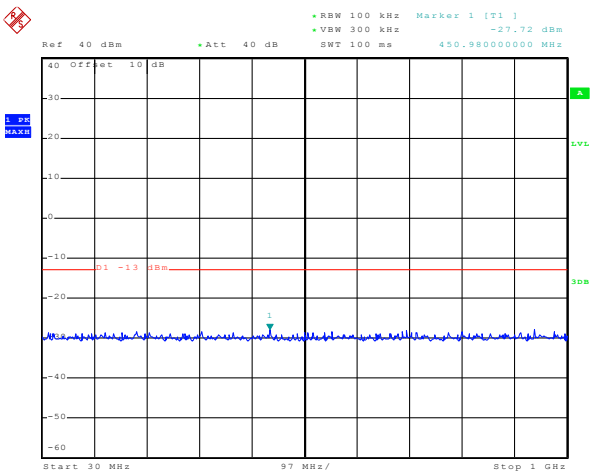


Date: 4.NOV.2014 09:08:11

1GHz~9GHz

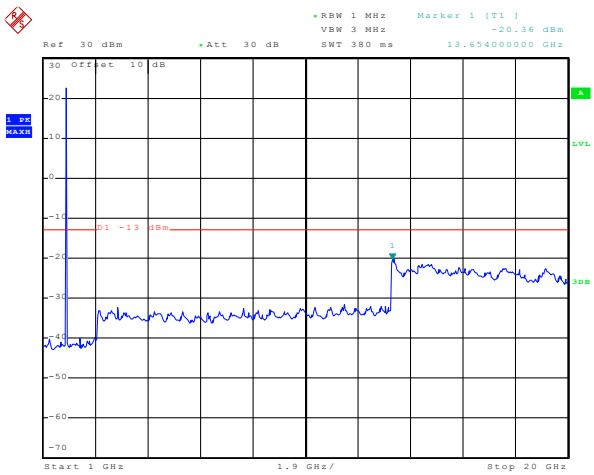
UMTS 1900 12.2k RMC

Lowest Channel



Date: 3.NOV.2014 16:28:06

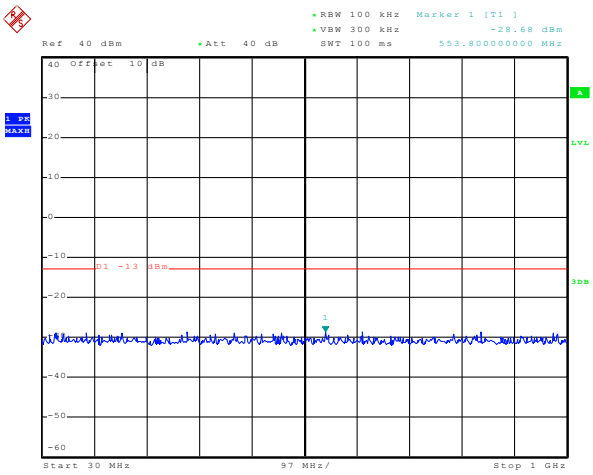
30MHz~1GHz



Date: 4.NOV.2014 08:59:27

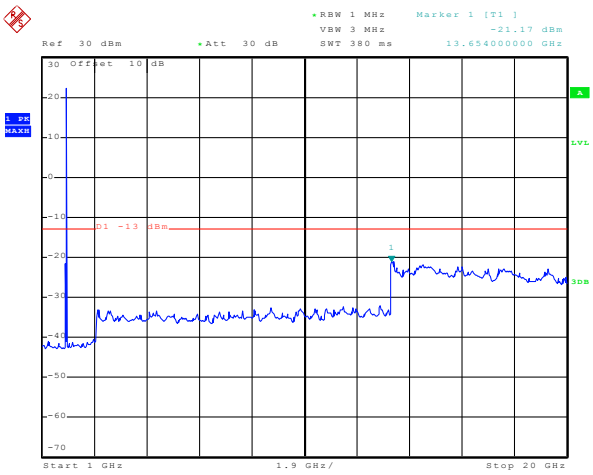
1GHz~20GHz

Middle Channel



Date: 3.NOV.2014 16:28:29

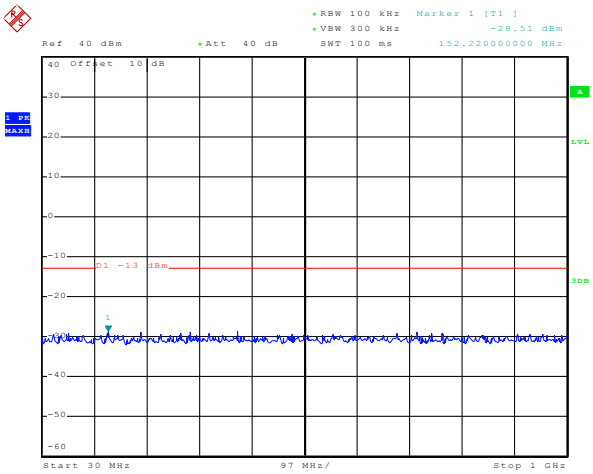
30MHz~1GHz



Date: 4.NOV.2014 09:00:03

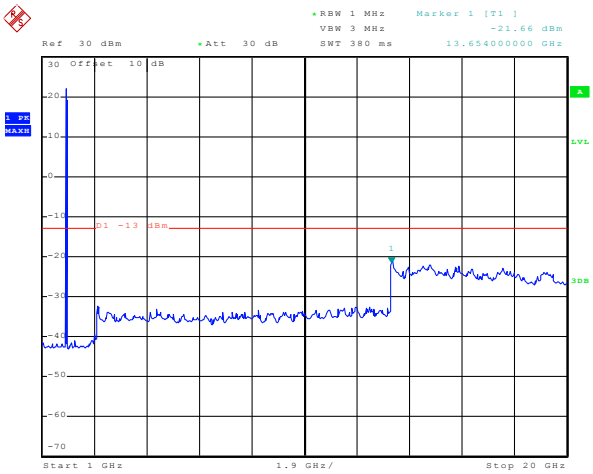
1GHz~20GHz

Highest Channel



Date: 3.NOV.2014 16:28:45

30MHz~1GHz

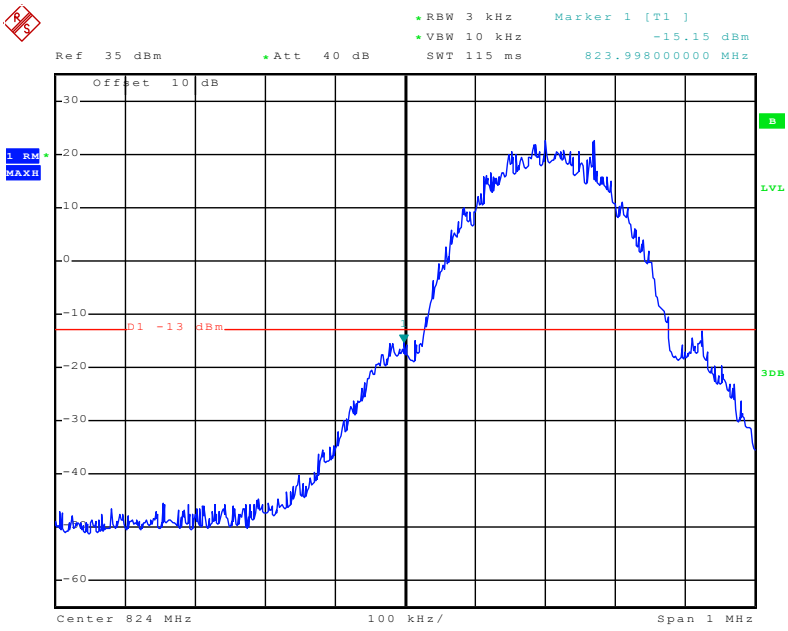


Date: 4.NOV.2014 09:00:27

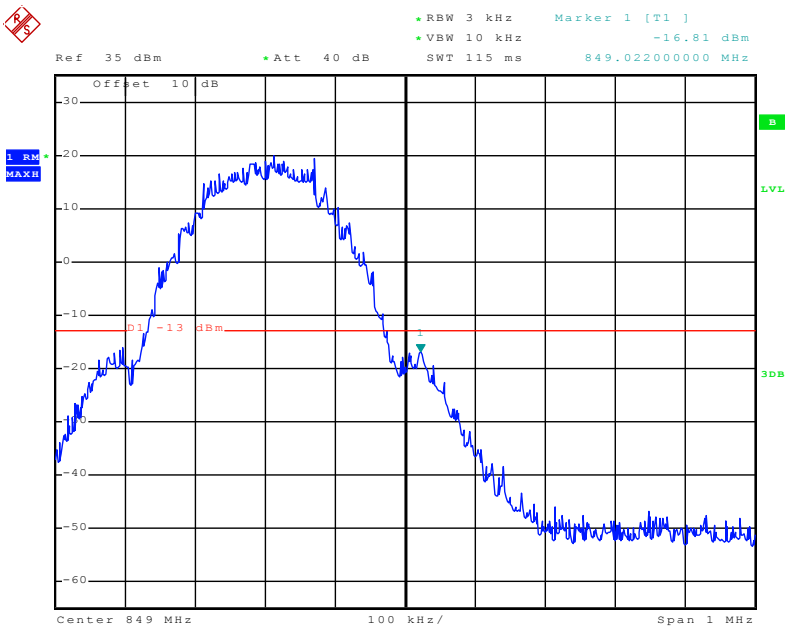
1GHz~20GHz

Band edge emission

GSM850

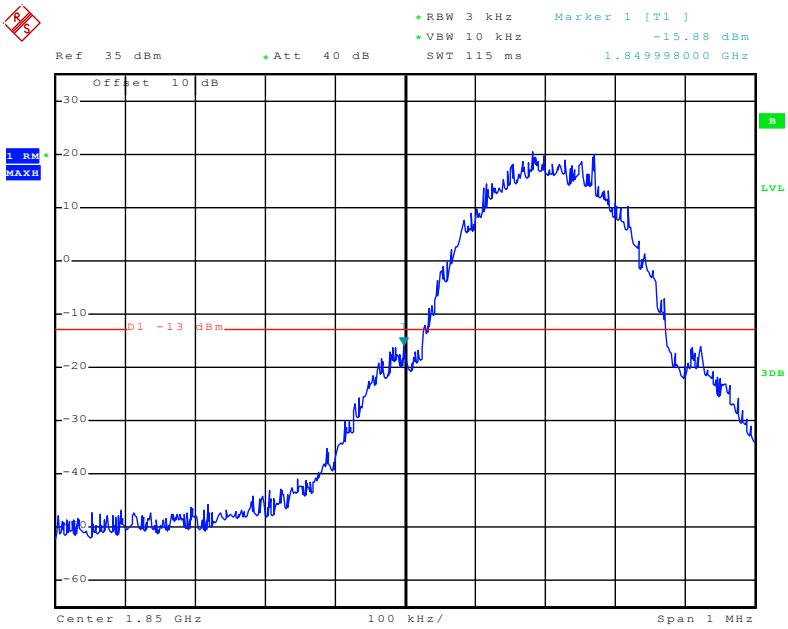


Lowest channel

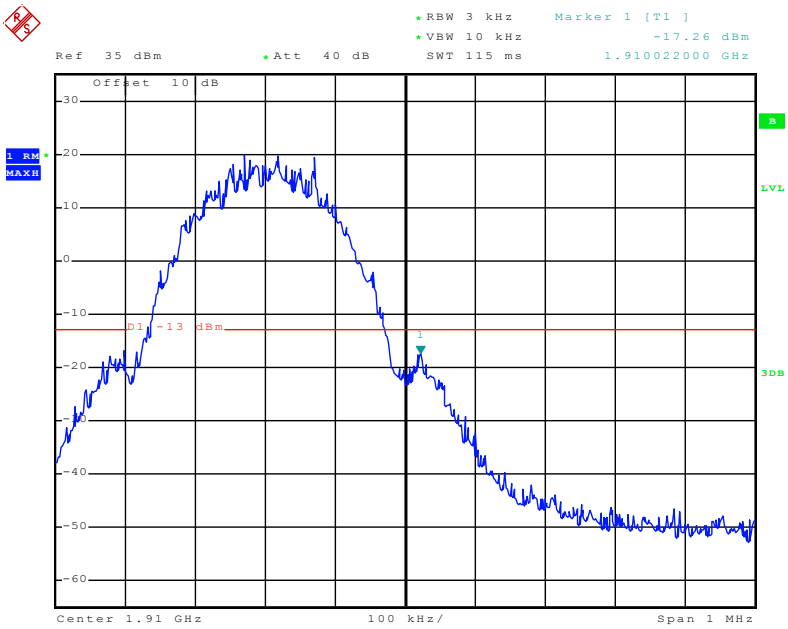


Highest channel

PCS1900

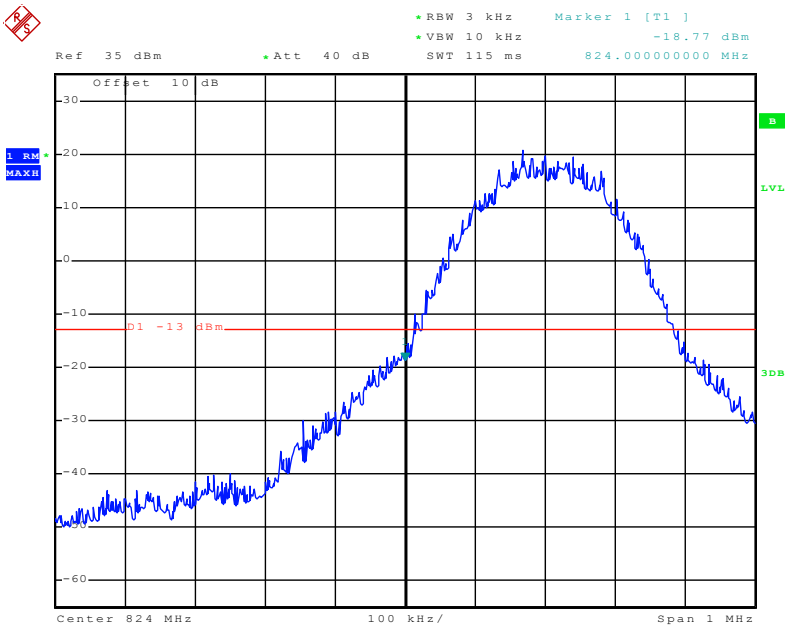


Lowest channel



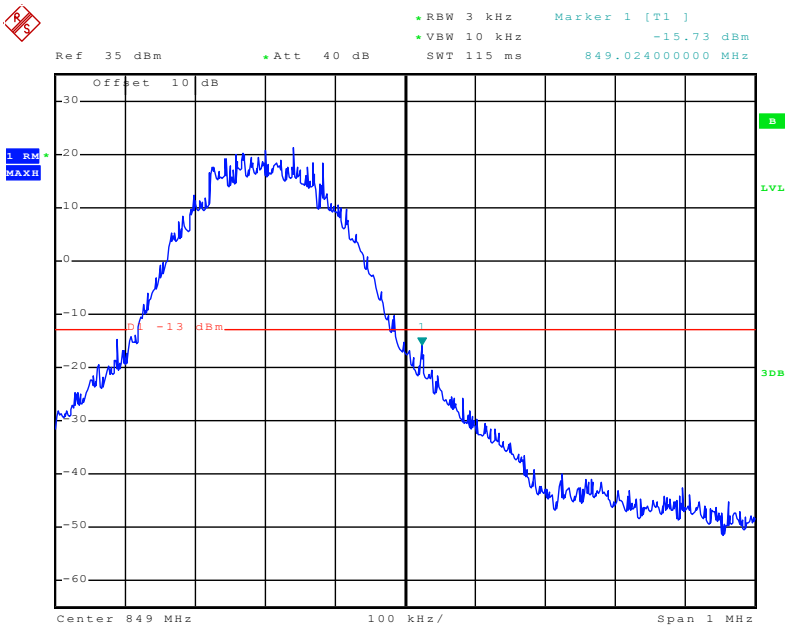
Highest channel

EGPRS850



Date: 4.NOV.2014 08:19:29

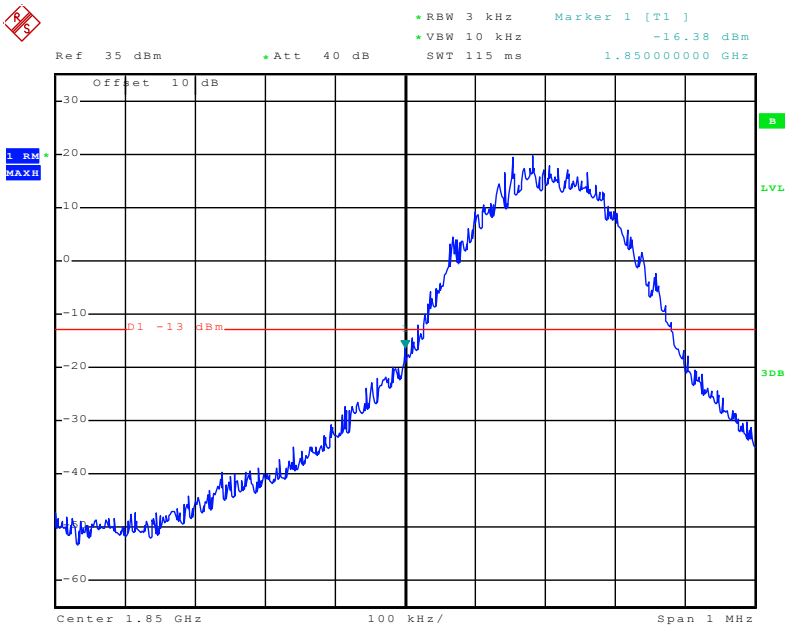
Lowest channel



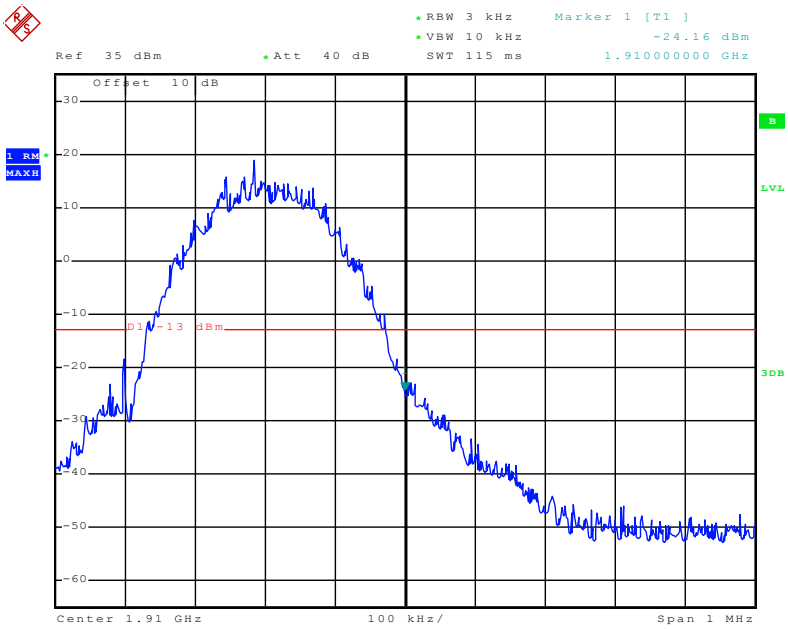
Date: 4.NOV.2014 08:20:58

Highest channel

EGPRS1900

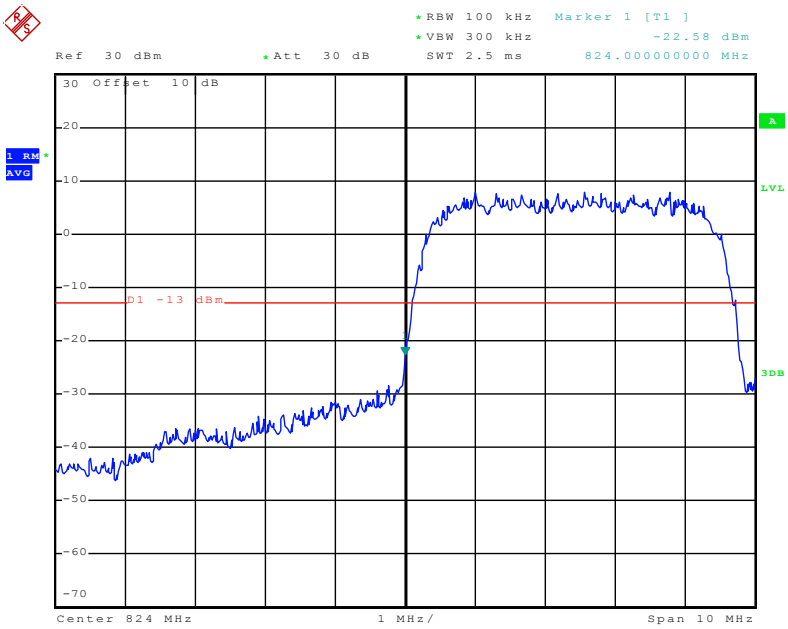


Lowest channel

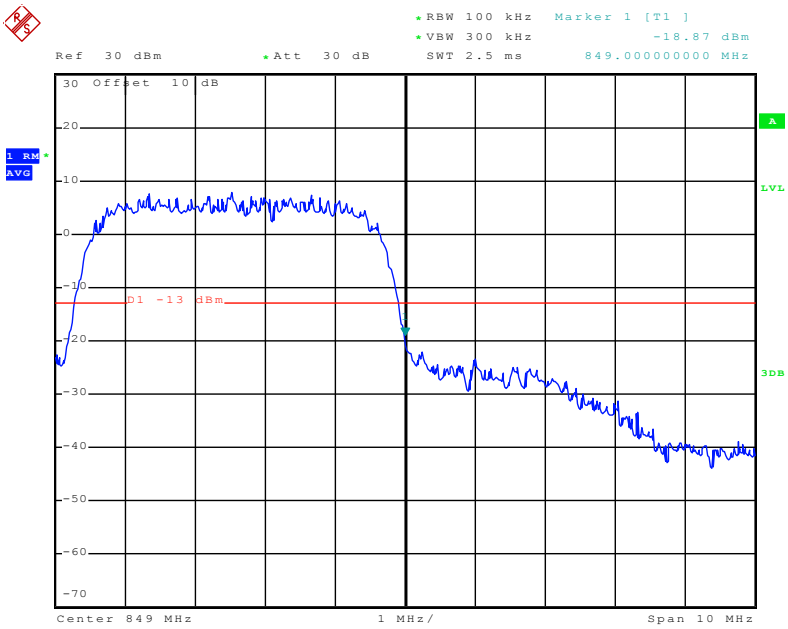


Highest channel

UMTS850 12.2k RMC

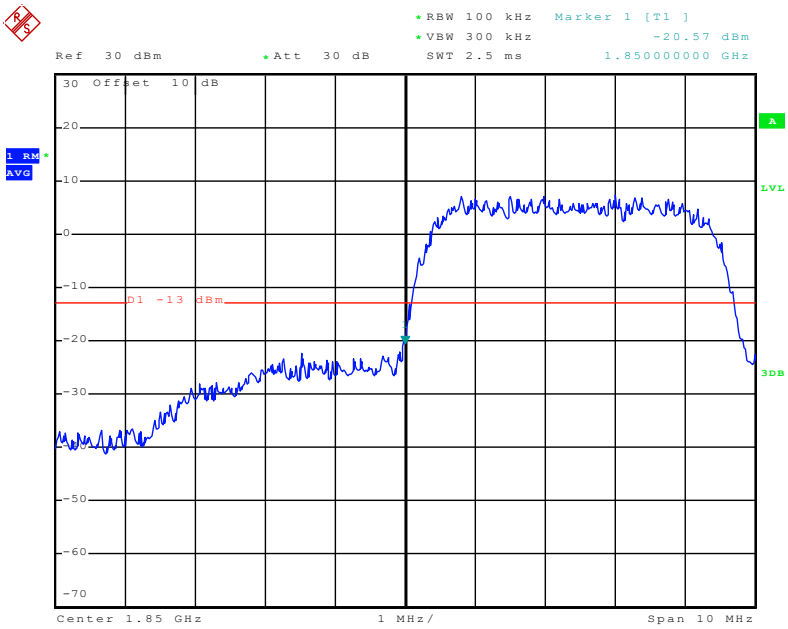


Lowest channel

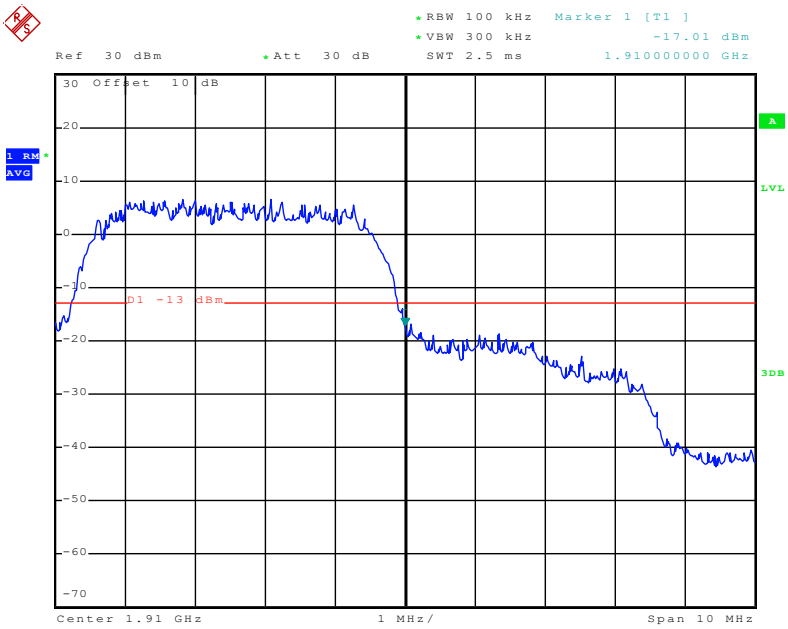


Highest channel

UMTS 1900 12.2k RMC

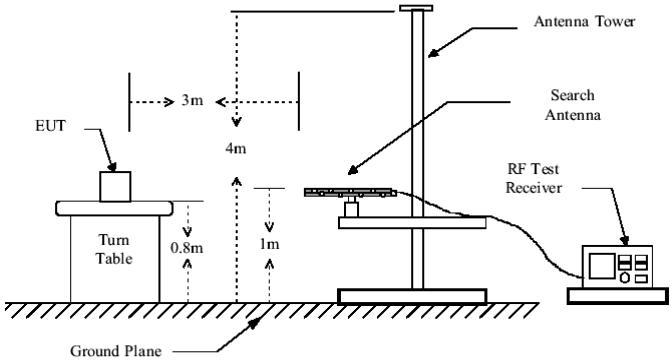
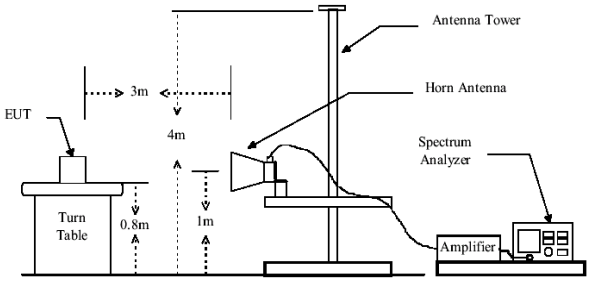
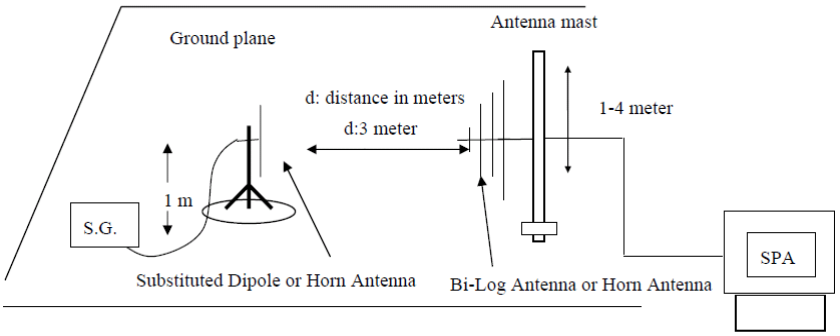


Lowest channel



Highest channel

6.9 ERP, EIRP Measurement

Test Requirement:	FCC part 22.913(a) and FCC part 24.232(b)
Test Method:	FCC part 2.1046
Limit:	GSM850 7W ERP PCS1900 2W EIRP WCDMA Band V: 7W ERP WCDMA Band II: 2W EIRP
Test setup:	Below 1GHz  Above 1GHz  Substituted method: 

Test Procedure:	1. The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. 2. During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated. 3. ERP in frequency band 824.2 –848.80.8MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows: ERP = S.G. output (dBm) + Antenna Gain (dBd) – Cable Loss (dB) 4. EIRP in frequency band 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by or horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows: EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable Loss (dB) 5. The worse case was relating to the conducted output power.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data (worst case)

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
GSM850	251	H	V	24.52	38.45	Pass
			H	20.41		
		E1	V	24.26		
			H	20.14		
		E2	V	24.22		
			H	20.23		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP(dBm)	Limit (dBm)	Result
PCS1900	512	H	V	26.17	33.00	Pass
			H	24.84		
		E1	V	26.11		
			H	24.51		
		E2	V	26.04		
			H	24.69		

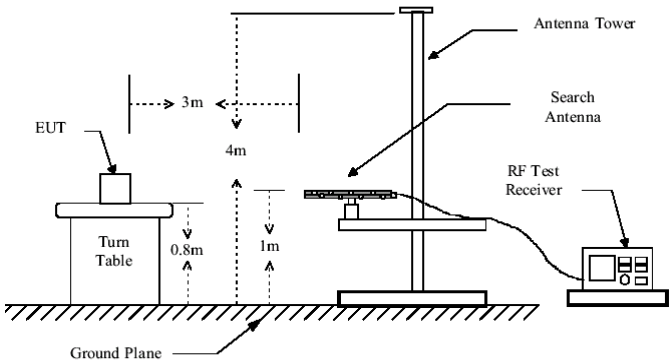
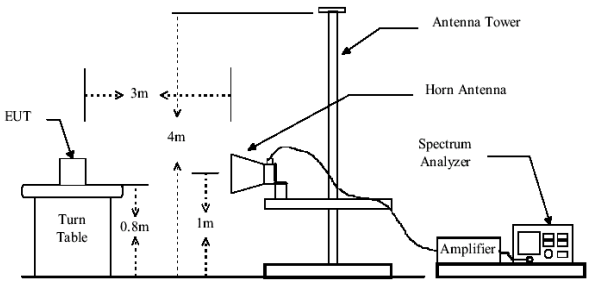
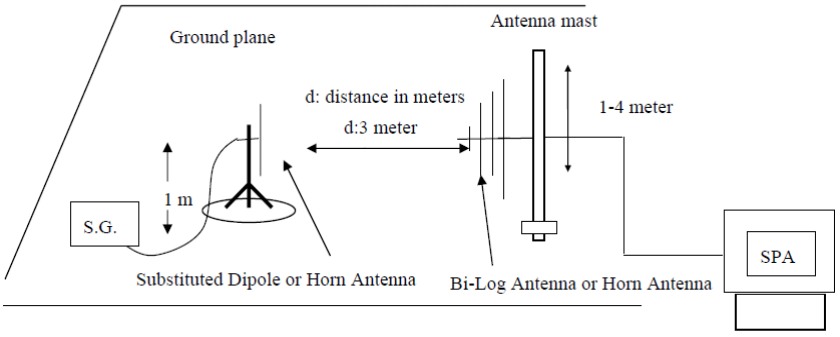
EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
EGPRS850	251	H	V	21.02	38.45	Pass
			H	18.54		
		E1	V	20.85		
			H	18.24		
		E2	V	20.98		
			H	18.31		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP(dBm)	Limit (dBm)	Result
EGPRS1900	661	H	V	24.51	33.00	Pass
			H	21.85		
		E1	V	24.25		
			H	21.56		
		E2	V	24.11		
			H	21.21		

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
UMTS 850 12.2k RMC	4233	H	V	11.97	38.45	Pass
			H	12.00		
		E1	V	11.55		
			H	11.83		
		E2	V	11.88		
			H	11.96		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP(dBm)	Limit (dBm)	Result
UMTS 1900 12.2k RMC	9538	H	V	20.46	33.00	Pass
			H	16.50		
		E1	V	20.14		
			H	16.25		
		E2	V	20.33		
			H	16.24		

6.10 Field strength of spurious radiation measurement

Test Requirement:	FCC part 22.917(a) and FCC part 24.238(a)
Test Method:	FCC part 2.1053
Limit:	-13dBm
Test setup:	Below 1GHz  Above 1GHz  Substituted method: 
Test Procedure:	1. The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. 2. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations. 3. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission

	was determined using the substitution method. 4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency. ERP / EIRP = S.G. output (dBm) + Antenna Gain(dB/dBi) – Cable Loss (dB)
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details. Based on the ERP/EIRP results, we selected GSM850, PCS1900, UMTS RMC 850 and UMTS RMC 1900 for Radiated spurious emission test, other modes were not test.
Test results:	Passed

Measurement Data (worst case)

Test mode:	GSM850		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1646.70	Vertical	-48.68	-13.00	Pass
3297.26	V	-40.81		
4125.59	V	-40.39		
4950.95	V	-37.79		
5774.12	V	-40.12		
1646.70	Horizontal	-52.61	-13.00	Pass
3297.26	H	-45.72		
4125.59	H	-42.64		
4950.95	H	-35.67		
5774.12	H	-39.10		
Test mode:	**GSM850**		**Test channel:**	**Middle**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1672.22	Vertical	-48.39	-13.00	Pass
3348.37	V	-40.07		
4180.34	V	-37.76		
5027.69	V	-38.85		
1672.22	Horizontal	-51.05	-13.00	Pass
3348.37	H	-40.86		
4180.34	H	-40.54		
5027.69	H	-36.14		
Test mode:	**GSM850**		**Test channel:**	**Highest**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1698.14	Vertical	-45.08	-13.00	Pass
3392.80	V	-39.35		
4245.14	V	-42.71		
5094.41	V	-39.59		
1698.14	Horizontal	-52.45	-13.00	Pass
3392.80	H	-41.82		
4245.14	H	-42.85		
5094.41	H	-40.73		

Remark:

1. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

Test mode:	PCS1900		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3704.49	Vertical	-45.31	-13.00	Pass
5550.21	V	-41.79		
7401.42	V	-37.57		
3704.49	Horizontal	-45.31	-13.00	Pass
5550.21	H	-43.25		
7401.42	H	-32.31		
Test mode:	**PCS1900**		**Test channel:**	**Middle**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3761.91	Vertical	-37.26	-13.00	Pass
5648.63	V	-36.92		
7532.63	V	-33.29		
3761.91	Horizontal	-42.24	-13.00	Pass
5648.63	H	-43.68		
7532.63	H	-33.01		
Test mode:	**PCS1900**		**Test channel:**	**Highest**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3761.91	Vertical	-36.37	-13.00	Pass
5648.63	V	-22.96		
7532.67	V	-33.69		
3820.22	Horizontal	-40.83	-13.00	Pass
5736.18	H	-26.15		
7649.42	H	-35.59		

Remark:

1. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

Test mode:	UMTS850 12.2k RMC		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1639.47	Vertical	-52.56	-13.00	Pass
2472.57	V	-41.52		
1639.47	Horizontal	-58.33	-13.00	Pass
2472.57	H	-46.03		
Test mode:	**UMTS850 12.2k RMC**		**Test channel:**	**Middle**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1673.20	Vertical	-53.85	-13.00	Pass
2509.80	V	-42.69		
1673.20	Horizontal	-59.62	-13.00	Pass
2509.80	H	-46.55		
Test mode:	**UMTS850 12.2k RMC**		**Test channel:**	**Highest**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1693.20	Vertical	-54.65	-13.00	Pass
2539.80	V	-43.33		
1693.20	Horizontal	-60.84	-13.00	Pass
2539.80	H	-47.69		

Remark:

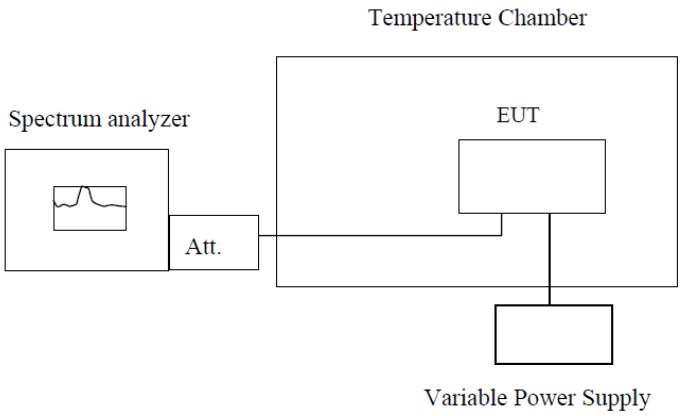
1. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

Test mode:	UMTS 1900 12.2k RMC		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3704.49	Vertical	-43.69	-13.00	Pass
3704.49	Horizontal	-38.66	-13.00	Pass
Test mode:	**UMTS 1900 12.2k RMC**		**Test channel:**	**Middle**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3761.91	Vertical	-43.58	-13.00	Pass
3761.91	Horizontal	-40.60	-13.00	Pass
Test mode:	**UMTS 1900 12.2k RMC**		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3811.83	Vertical	-43.17	-13.00	Pass
3811.83	Horizontal	-40.24	-13.00	Pass

Remark:

1. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

6.11 Frequency stability V.S. Temperature measurement

Test Requirement:	FCC Part 2.1055(a)(1)(b)
Test Method:	FCC Part 2.1055(a)(1)(b)
Limit:	2.5 ppm
Test setup:	 **Note :** Measurement setup for testing on Antenna connector
Test procedure:	1. The equipment under test was connected to an external DC power supply and input rated voltage. 2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. 3. The EUT was placed inside the temperature chamber. 4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25℃ operating frequency as reference frequency. 5. Turn EUT off and set the chamber temperature to –30℃. After the temperature stabilized for approximately 30 minutes recorded the frequency. 6. Repeat step measure with 10℃ increased per stage until the highest temperature of +50℃ reached
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed
Remark:	All three channels of all modulations have been tested, but only the worst channel and the worst modulation show in this test item.

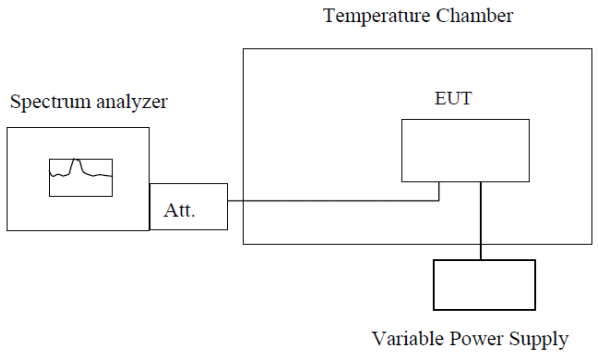
Measurement Data:

Reference Frequency: GSM850 Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	163	0.210375	2.5	Pass
	-20	150	0.153000		
	-10	147	0.155391		
	0	130	0.115945		
	10	97	0.109969		
	20	92	0.129094		
	30	105	0.150610		
	40	118	0.125508		
	50	135	0.100406		
Reference Frequency: PCS1900 Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	174	0.098936	2.5	Pass
	-20	97	0.040426		
	-10	158	0.048936		
	0	152	0.065426		
	10	130	0.056915		
	20	140	0.050532		
	30	96	0.039894		
	40	107	0.066489		
	50	105	0.067021		

Reference Frequency: EGPRS850 Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	150	0.173321	2.5	Pass
	-20	120	0.143438		
	-10	134	0.121922		
	0	108	0.117141		
	10	97	0.107578		
	20	103	0.103992		
	30	98	0.101602		
	40	67	0.089649		
	50	75	0.114750		
Reference Frequency: EGPRS 1900 Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error			Result
		Hz	ppm		
3.70	-30	136	0.052128	2.5	Pass
	-20	75	0.039894		
	-10	98	0.045745		
	0	74	0.030319		
	10	105	0.051064		
	20	97	0.046809		
	30	85	0.047872		
	40	67	0.045213		
	50	66	0.035638		

Reference Frequency: UMTS850 12.2k RMC Middle channel=4183 channel=836.6MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	148	0.181688	2.5	Pass
	-20	130	0.167344		
	-10	107	0.145828		
	0	96	0.115945		
	10	78	0.102797		
	20	106	0.127899		
	30	103	0.148219		
	40	85	0.114750		
	50	87	0.103992		
Reference Frequency: UMTS1900 12.2k RMC Middle channel=9400 channel=1880MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	136	0.069149	2.5	Pass
	-20	74	0.035638		
	-10	98	0.044681		
	0	75	0.036170		
	10	85	0.047872		
	20	63	0.043617		
	30	95	0.042021		
	40	78	0.065426		
	50	90	0.062766		

6.12 Frequency stability V.S. Voltage measurement

Test Requirement:	FCC Part 2.1055(d)(1)(2)
Test Method:	FCC Part 2.1055(d)(1)(2)
Limit:	2.5ppm
Test setup:	 **Note :** Measurement setup for testing on Antenna connector
Test procedure:	1. Set chamber temperature to 25℃. Use a variable DC power source to power the EUT and set the voltage to rated voltage. 2. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. 3. Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details, and all channels have been tested, only shows the worst channel data in this report.
Test results:	Passed

Measurement Data (the worst channel):

Reference Frequency: GSM850 Middle channel=190 channel=836.6MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	105	0.115945	2.5	Pass
	3.70	63	0.089649		
	3.40	97	0.081281		
Reference Frequency: PCS1900 Middle channel=661 channel=1880MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	97	0.046277	2.5	Pass
	3.70	58	0.036170		
	3.40	67	0.043617		
Reference Frequency: EGPRS 850 Middle channel= 190 channel=836.6MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	82	0.094430	2.5	Pass
	3.70	63	0.083672		
	3.40	47	0.089649		
Reference Frequency: EGPRS 1900 Middle channel= 661 channel=1880MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	87	0.047872	2.5	Pass
	3.70	69	0.034043		
	3.40	75	0.030851		

Reference Frequency: UMTS 850 12.2k RMC Middle channel=4183 channel=836.6MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	98	0.117141	2.5	Pass
	3.70	76	0.089649		
	3.40	58	0.081281		
Reference Frequency: UMTS 1900 12.2k RMC Middle channel=9400 channel=1880MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	95	0.046277	2.5	Pass
	3.70	79	0.033511		
	3.40	80	0.039894		