

FCC REPORT

Applicant: B mobile HK Limited

Address of Applicant: Ground floor, 144 Un Chau Street, Sham Shui Po, Hong Kong

Equipment Under Test (EUT)

Product Name: B-MOBILE

Model No.: QW120,QW130,QW140

FCC ID: ZSW-QW120-130-140

FCC CFR Title 47 Part 2: 2011

Applicable standards: FCC CFR Title 47 Part22 Subpart H: 2011
FCC CFR Title 47 Part24 Subpart E: 2011

Date of sample receipt: 03 Apr., 2013

Date of Test: 04 Apr., to 22 Apr.,2013

Date of report issued: 23 Apr.,2013

Test Result : PASS *

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

Authorized Signature:



Bruce Zhang
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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2. Version

Version No.	Date	Description
00	23 Apr.,2013	Original

Prepared by:

Lisa chen

Report Clerk

Date:

23 Apr.,2013

Reviewed by:

Wimer Zhang

Project Engineer

Date:

23 Apr.,2013

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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:	B mobile HK Limited
Address of Applicant:	Ground floor, 144 Un Chau Street, Sham Shui Po, Hong Kong
Manufacturer:	FORTUNE SHIP TECHNOLOGY (HK) LIMITED
Address of Manufacturer:	ROOM A 11/F, HO LEE COMMERCIAL BUILDING, 38-44 D'AGUILAR STREET, CENTRAL, HONG KONG
Factory:	SHENZHEN EASIECOM ELECTRONIC CO.,LTD
Address of Factory:	Floor3,Building A,Sailian Industrial Park,Fourth Industrial Zone,Shuitian Community,Shiyan Street,Baoan District,Shenzhen.

5.2 General Description of E.U.T.

Product Name:	B-MOBILE
Model No.:	QW120,QW130,QW140
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, EGPRS:8PSK, UMTS:QPSK
Antenna type:	Internal Antenna
Antenna gain:	Cellular Band : -1 dBi PCS Band: -0.6 dBi
AC adapter:	Input:100-240V AC,50/60Hz 0.2A Output:5.0V DC MAX500mA
Power supply:	Rechargeable Li-ion Battery DC3.7V/1450mAh
Remark:	The model No. QW120, QW130 and QW140 are identical in the same PCB layout, electrical circuit design and components used. The differences between them are model name, appearance of color and QW120 and QW130 have an additional volume key. We selected QW120 to perform the full tests.

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 mode

Communicate mode (GSM850)	Keep the EUT in communicating mode on GSM850 band.
Data mode (GPRS850)	Keep the EUT in data communicating mode on GPRS850 band.
Data mode (EGPRS850)	Keep the EUT in data communicating mode on EGPRS850 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 (RMC UMTS 850)	Keep the EUT in data communicating mode on RMC in UMTS850 (12.2kbps).
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 (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 HSUPA in UMTS 850(Sub-test 1~Sub-test 5).
Communicate mode (RMC UMTS 1900)	Keep the EUT in data communicating mode on RMC in UMTS850 (12.2kbps).
Data mode (HSDPA UMTS 850)	Keep the EUT in data communicating mode on HSDPA in UMTS 1900. (Sub-test 1~Sub-test 4).
Data mode (HSUPA UMTS 850)	Keep the EUT in data communicating mode on HSUPA in UMTS 1900. (Sub-test 1~Sub-test 5).
Remark :	Pre-test output power of all modes, and found GSM 900, PCS 1900, UMTS 850 12.2k RMC & UMTS 1900 12.2k 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: 0755-23118282
Fax: 0755-23116366

5.8 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
1	3m Semi- Anechoic Chamber	SAEMC	9(L)*6(W)* 6(H)	CCIS0001	June 09 2012	June 08 2013
2	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	CCIS0005	June 04 2012	June 03 2013
3	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	CCIS0006	May 30 2012	May 29 2013
4	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
5	Coaxial Cable	CCIS	N/A	CCIS0016	Apr. 01 2013	Mar. 31 2014
6	Coaxial Cable	CCIS	N/A	CCIS0017	Apr. 01 2013	Mar. 31 2014
7	Coaxial cable	CCIS	N/A	CCIS0018	Apr. 01 2013	Mar. 31 2014
8	Coaxial Cable	CCIS	N/A	CCIS0019	Apr. 01 2013	Mar. 31 2014
9	Coaxial Cable	CCIS	N/A	CCIS0087	Apr. 01 2013	Mar. 31 2014
10	Amplifier(10kHz-1.3GHz)	HP	8447D	CCIS0003	Apr. 01 2013	Mar. 31 2014
11	Amplifier(1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	June 09 2012	June 08 2013
12	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	Apr. 01 2013	Mar. 31 2014
13	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 30 2013	Mar. 29 2014
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	CCIS0023	May. 29 2012	May. 28 2013
17	EMI Test Receiver	Rohde & Schwarz	ESPI	CCIS0022	Apr 01 2013	Mar. 31 2014
18	Loop antenna	Laplace instrument	RF300	EMC0701	Aug. 12 2012	Aug. 11 2013
19	Universal radio communication tester	Rhode & Schwarz	CMU200	CCIS0069	May. 29 2012	May. 28 2013
20	Signal Analyzer	Rhode & Schwarz	FSIQ3	CCIS0088	May. 29 2012	May. 28 2013

6. System test configuration

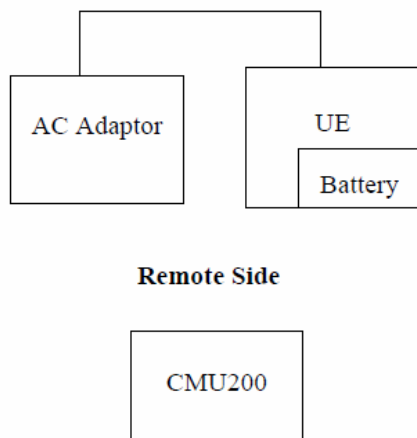
6.1 EUT Configuration

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

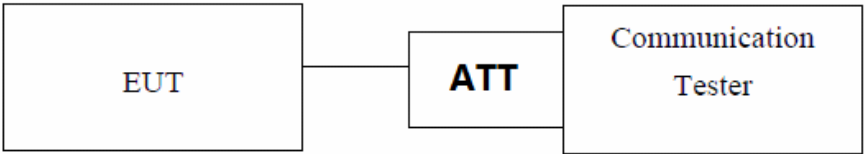


6.4 Description of Test Mode

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, WCDMA Band V and WCDMA Band II.

7. Test result and measurement data

7.1 Conducted Output Power

Test Requirement:	FCC part 22.913(a) and FCC part 24.232(b)
Test Method:	FCC part 2.1046
Limit:	GSM850:7W PCS1900: 2W WCDMA Band V:7W WCDMA Band II:2W
Test setup:	 <i>Note: Measurement setup for testing on Antenna connector</i>
Test Procedure:	The transmitter output was connected to a calibrated attenuator, the other end of which was connected to the CMU200. Transmitter output was read off the CMU200 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	32.00	38.45	Pass
	190	836.60	31.90		
	251	848.80	32.10		
GPRS 850 (1 Uplink slot)	128	824.20	31.99		
	190	836.60	31.89		
	251	848.80	32.09		
GPRS 850 (2 Uplink slots)	128	824.20	31.27		
	190	836.60	31.15		
	251	848.80	31.37		
GPRS 850 (3 Uplink slots)	128	824.20	29.57		
	190	836.60	29.46		
	251	848.80	29.68		
GPRS 850 (4 Uplink slots)	128	824.20	28.57		
	190	836.60	28.47		
	251	848.80	28.70		
EGPRS 850 (1 Uplink slot)	128	824.20	28.39		
	190	836.60	28.46		
	251	848.80	28.44		
EGPRS 850 (2 Uplink slots)	128	824.20	27.05		
	190	836.60	27.14		
	251	848.80	27.07		

PCS 1900	512	1850.20	29.80	33.00	Pass
	661	1880.00	29.50		
	810	1909.80	29.60		
GPRS 1900 (1 Uplink slot)	512	1850.20	29.78		
	661	1880.00	29.50		
	810	1909.80	29.64		
GPRS 1900 (2 Uplink slots)	512	1850.20	29.09		
	661	1880.00	28.81		
	810	1909.80	28.95		
GPRS 1900 (3 Uplink slots)	512	1850.20	27.40		
	661	1880.00	27.09		
	810	1909.80	27.19		
GPRS 1900 (4 Uplink slots)	512	1850.20	26.37		
	661	1880.00	26.08		
	810	1909.80	26.17		
EGPRS 1900 (1 Uplink slot)	512	1850.20	23.88		
	661	1880.00	23.49		
	810	1909.80	22.91		
EGPRS 1900 (2 Uplink slots)	512	1850.20	22.59		
	661	1880.00	22.20		
	810	1909.80	22.61		

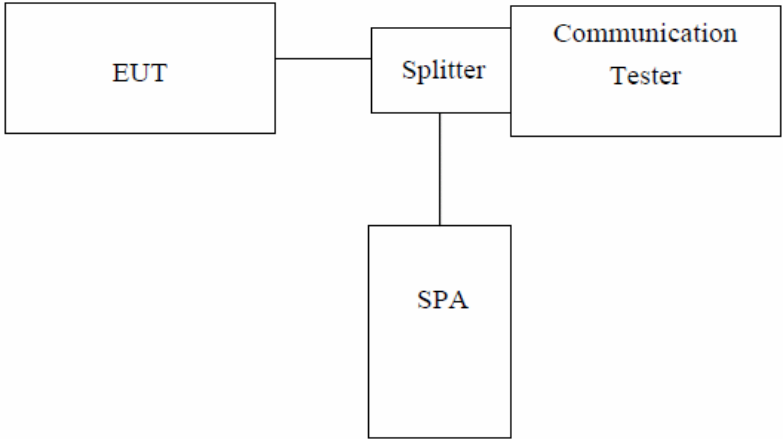
EUT Mode		Channel	Frequency (MHz)	Burst Average power (dBm)	Limit(dBm)	Result
UMTS 850 HSDPA	Subtest 1	4132	826.40	22.43	38.45	Pass
		4183	836.00	22.54		
		4233	846.60	22.12		
	Subtest 2	4132	826.40	22.39		
		4183	836.00	22.53		
		4233	846.60	22.05		
	Subtest 3	4132	826.40	22.37		
		4183	836.00	22.05		
		4233	846.60	22.14		
	Subtest 4	4132	826.40	22.36		
		4183	836.00	22.46		
		4233	846.60	22.06		
UMTS 850 HSUPA	Subtest 1	4132	826.40	22.20		
		4183	836.00	22.42		
		4233	846.60	22.03		
	Subtest 2	4132	826.40	22.26		
		4183	836.00	22.37		
		4233	846.60	22.07		
	Subtest 3	4132	826.40	22.14		
		4183	836.00	22.42		
		4233	846.60	22.09		
	Subtest 4	4132	826.40	22.36		
		4183	836.00	22.51		
		4233	846.60	22.34		
	Subtest 5	4132	826.40	22.27		
		4183	836.00	22.43		
		4233	846.60	22.09		

UMTS 850 RMC	12.2kbps	4132	826.40	22.81	38.45	Pass
		4183	836.00	22.92		
		4233	846.60	22.47		
UMTS850 AMR	/	4132	826.40	21.46		
		4183	836.00	21.25		
		4233	846.60	21.07		

EUT Mode		Channel	Frequency (MHz)	Burst Average power (dBm)	Limit(dBm)	Result
UMTS1900 HSDPA	Subtest 1	9262	1852.40	22.45	33.00	Pass
		9400	1880.00	22.18		
		9538	1907.60	22.17		
	Subtest 2	9262	1852.40	21.67		
		9400	1880.00	21.24		
		9538	1907.60	21.46		
	Subtest 3	9262	1852.40	21.68		
		9400	1880.00	21.26		
		9538	1907.60	21.56		
	Subtest 4	9262	1852.40	21.71		
		9400	1880.00	21.22		
		9538	1907.60	21.45		
UMTS1900 HSUPA	Subtest 1	9262	1852.40	22.12		
		9400	1880.00	22.08		
		9538	1907.60	22.10		
	Subtest 2	9262	1852.40	22.04		
		9400	1880.00	21.77		
		9538	1907.60	22.09		
	Subtest 3	9262	1852.40	21.65		
		9400	1880.00	21.27		
		9538	1907.60	21.58		
	Subtest 4	9262	1852.40	22.33		
		9400	1880.00	22.26		
		9538	1907.60	22.20		
	Subtest 5	9262	1852.40	21.74		
		9400	1880.00	21.38		
		9538	1907.60	21.59		

UMTS1900 RMC	12.2kbps	9262	1852.40	22.87	33.00	Pass
		9400	1880.00	22.36		
		9538	1907.60	22.29		
UMTS1900 AMR	/	9262	1852.40	21.59		
		9400	1880.00	21.32		
		9538	1907.60	21.49		

7.2 Occupy Bandwidth

Test Requirement:	FCC part22.913(a) and FCC part24.232(b)
Test Method:	FCC part2.1049
Test setup:	 <i>Note: Measurement setup for testing on Antenna connector</i>
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

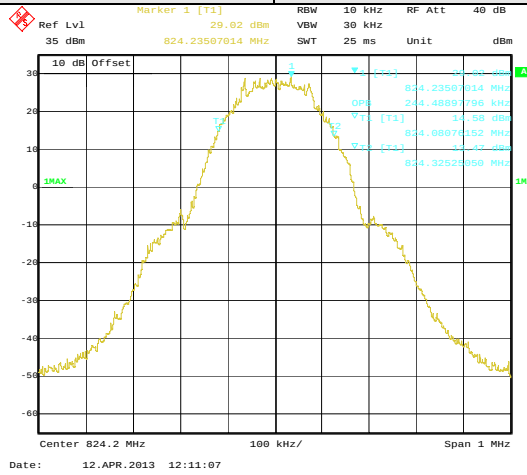
Measurement Data

EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (kHz)	-26dB bandwidth (kHz)
GSM 850	128	824.2	244	322
	190	836.6	244	322
	251	848.8	244	322
EGPRS 850	128	824.2	246	310
	190	836.6	242	308
	251	848.8	244	314
PCS 1900	512	1850.2	246	314
	661	1880.0	244	320
	810	1909.8	246	316
EGPRS 1900	512	1850.2	244	318
	661	1880.0	248	316
	810	1909.8	244	320
UMTS850 12.2k RMC	4132	824.40	4168	4709
	4183	836.00	4168	4689
	4233	846.60	4168	4689
UMTS1900 12.2k RMC	9262	1852.40	4188	4709
	9400	1880.00	4188	4709
	9538	1907.60	4168	4689
UMTS850 HSDPA	4132	824.40	4168	4709
	4183	836.00	4168	4689
	4233	846.60	4168	4689
UMTS1900 HSDPA	9262	1852.40	4168	4709
	9400	1880.00	4168	4689
	9538	1907.60	4168	4689
UMTS850 HSUPA	4132	824.40	4168	4689
	4183	836.00	4188	4709
	4233	846.60	4188	4709
UMTS1900 HSUPA	9262	1852.40	4168	4689
	9400	1880.00	4208	429
	9538	1907.60	4148	4689

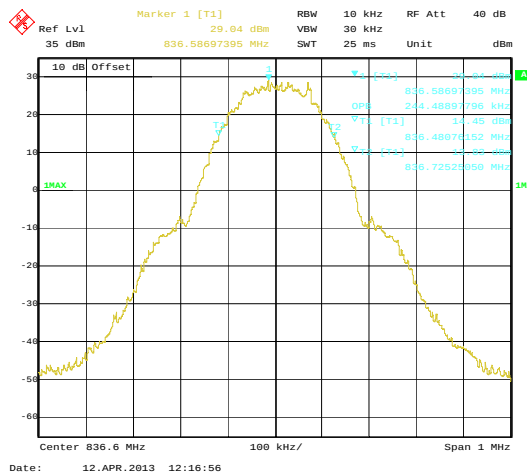
Note: GSM & GPRS use the same modulation technical (GMSK), and with the same channels, so the 99% OBW and the -26dB of GPRS not performed.

Test plot as follows:

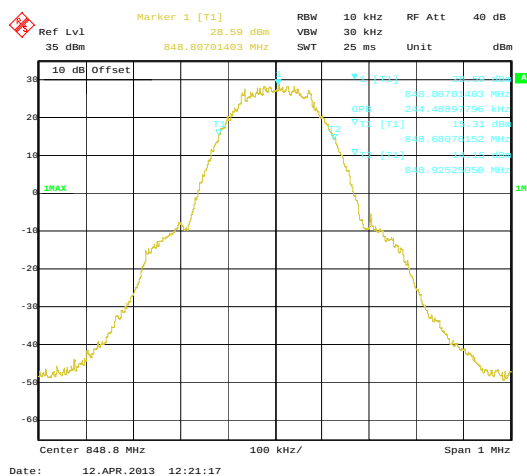
Test Item:	99% Occupy bandwidth	Test Mode:	GSM850
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Lowest channel

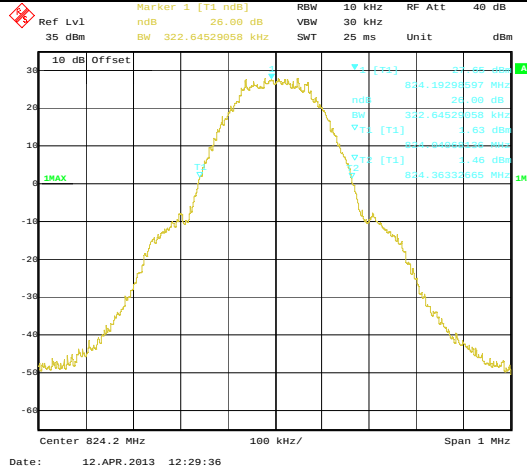


Middle channel

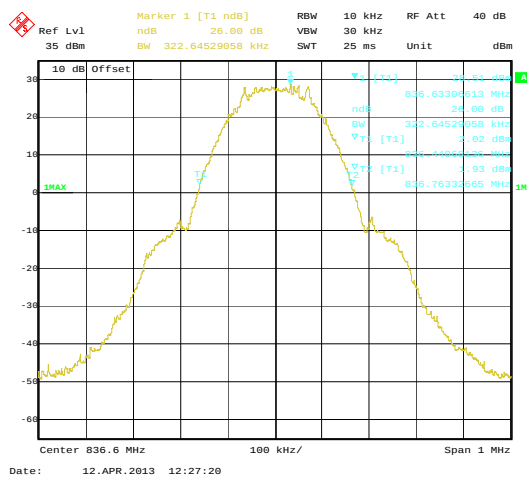


Highest channel

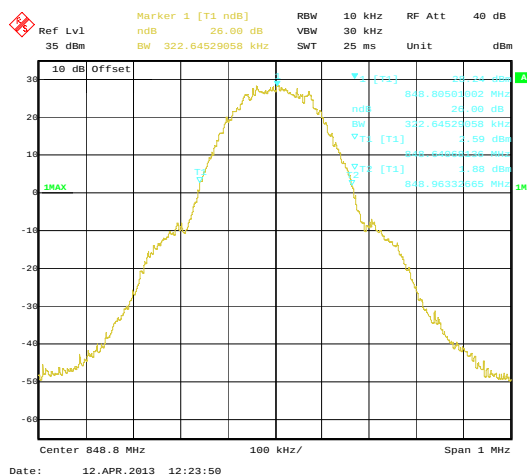
Test Item:	-26dB bandwidth	Test Mode:	GSM850
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Lowest channel

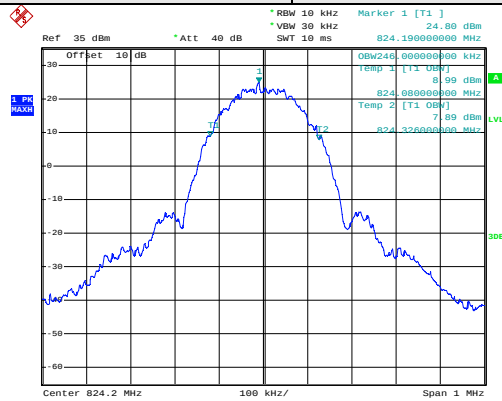


Middle channel



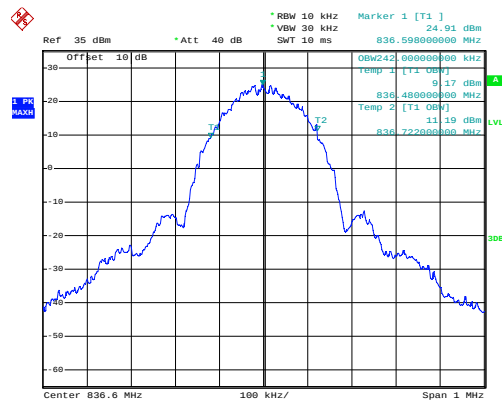
Highest channel

Test Item:	99% Occupy bandwidth	Test Mode:	EGPRS 850
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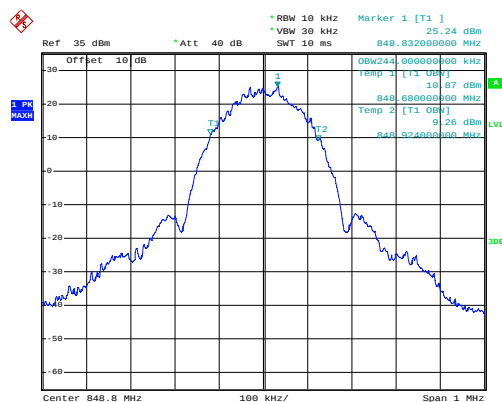
Date: 22.APR.2013 19:45:55

Lowest channel



Date: 22.APR.2013 19:44:55

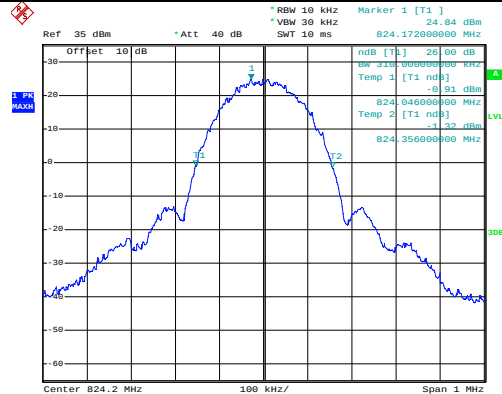
Middle channel



Date: 22.APR.2013 19:43:12

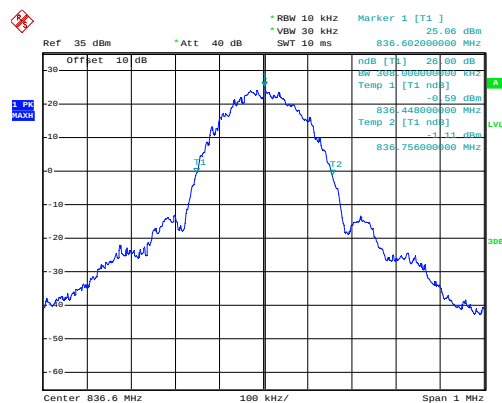
Highest channel

Test Item:	-26dB bandwidth	Test Mode:	EGPRS 850
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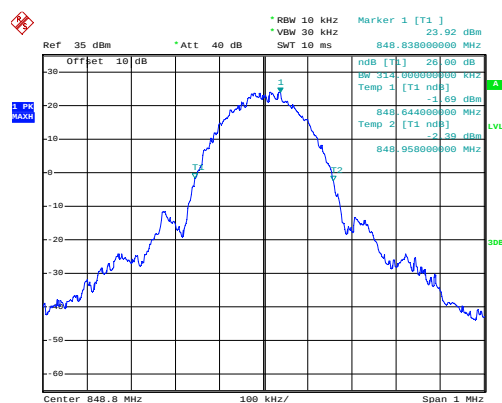
Date: 22.APR.2013 19:38:26

Lowest channel



Date: 22.APR.2013 19:39:52

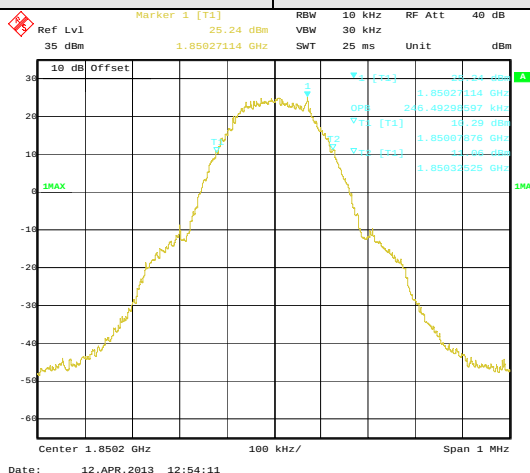
Middle channel



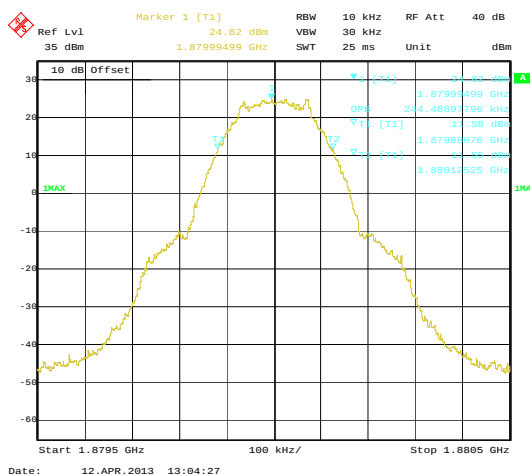
Date: 22.APR.2013 19:41:16

Highest channel

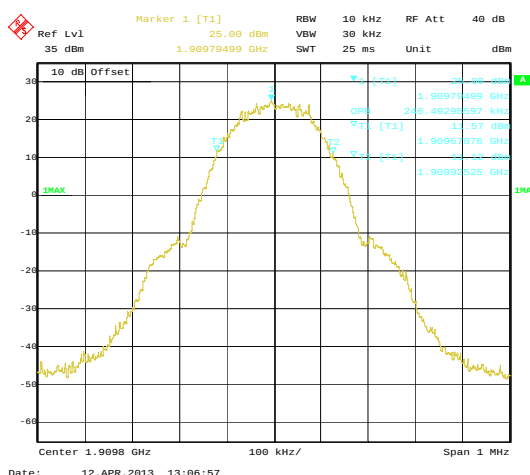
Test Item:	99% Occupy bandwidth	Test Mode:	PCS 1900
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Lowest channel

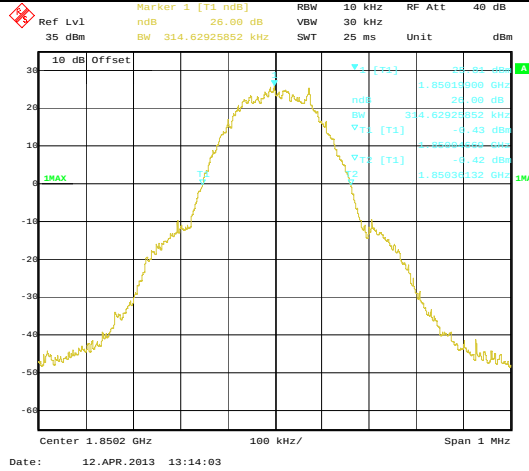


Middle channel

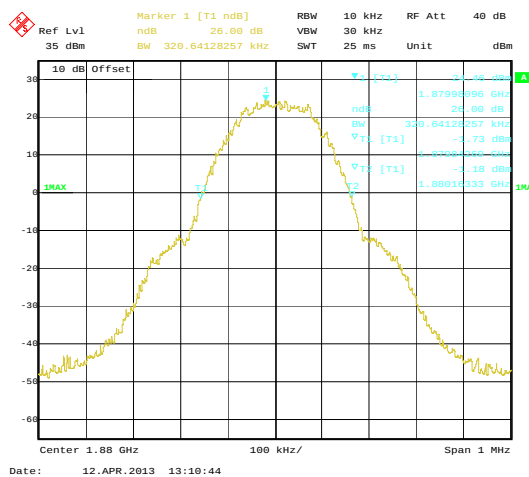


Highest channel

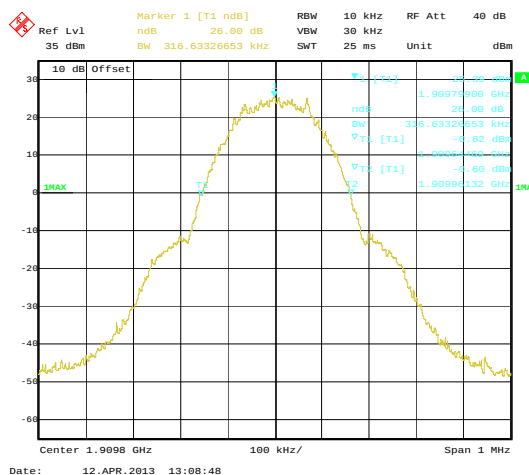
Test Item:	-26dB bandwidth	Test Mode:	PCS 1900
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Lowest channel

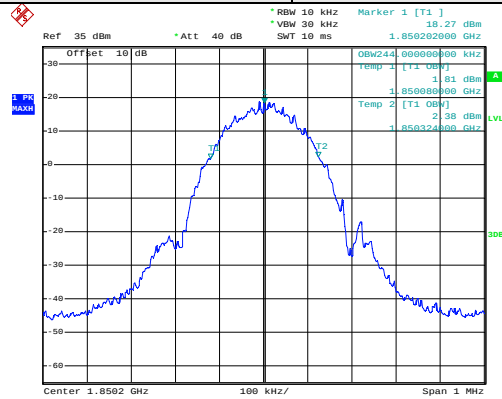


Middle channel



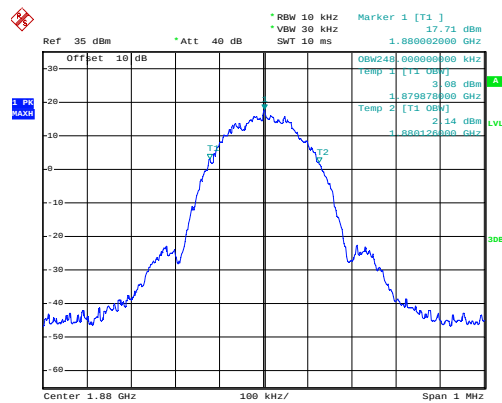
Highest channel

Test Item:	99% Occupy bandwidth	Test Mode:	PCS 1900
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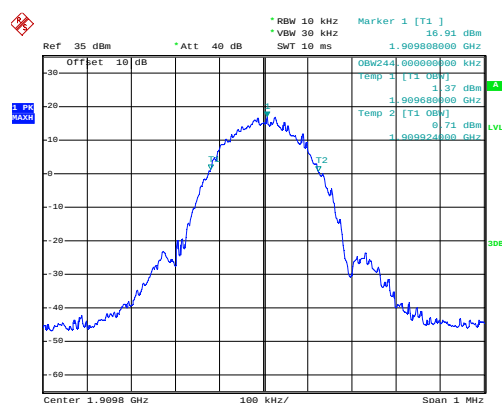
Date: 22.APR.2013 20:06:01

Lowest channel



Date: 22.APR.2013 20:04:25

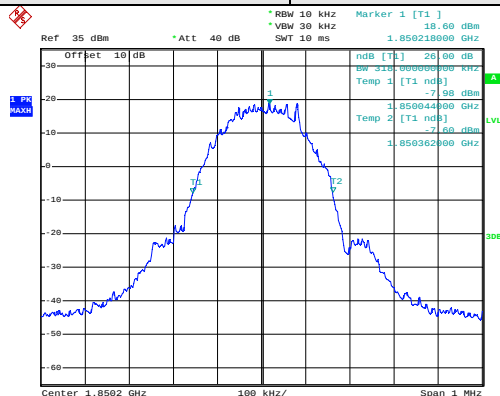
Middle channel



Date: 22.APR.2013 20:02:09

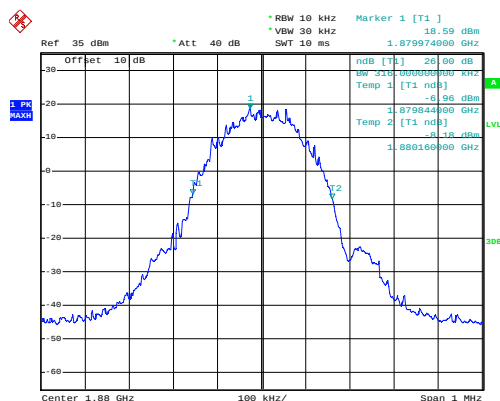
Highest channel

Test Item:	-26dB bandwidth	Test Mode:	PCS 1900
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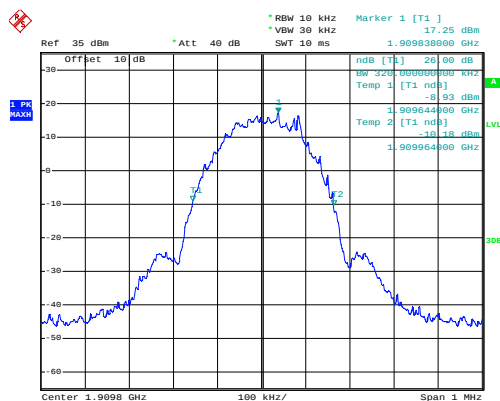
Date: 22.APR.2013 19:58:11

Lowest channel



Date: 22.APR.2013 19:59:24

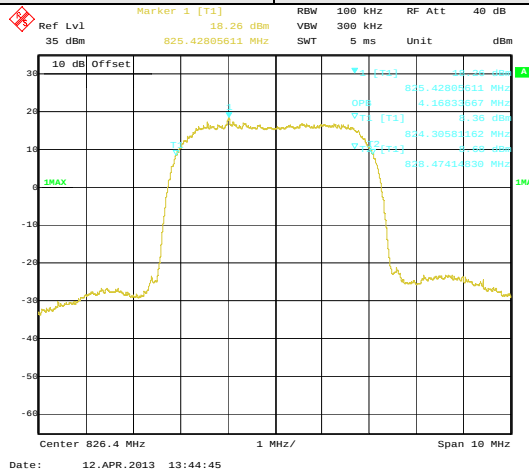
Middle channel



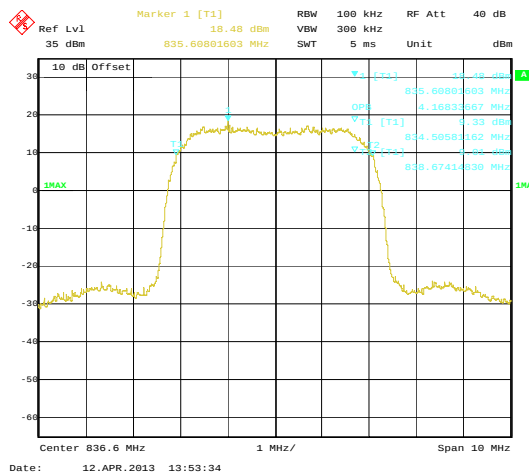
Date: 22.APR.2013 20:01:04

Highest channel

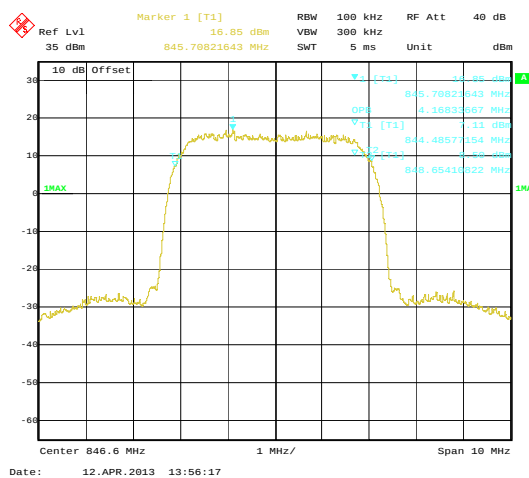
Test Item:	99% Occupy bandwidth	Test Mode:	UMTS 850 12.2k RMC
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Lowest channel

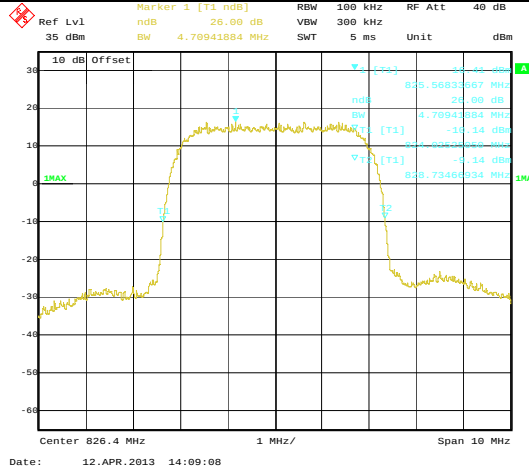


Middle channel

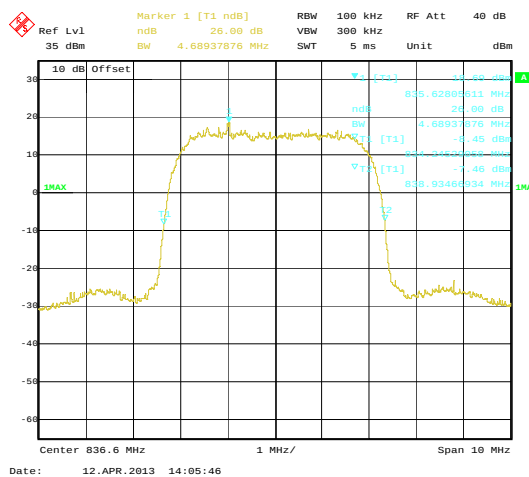


Highest channel

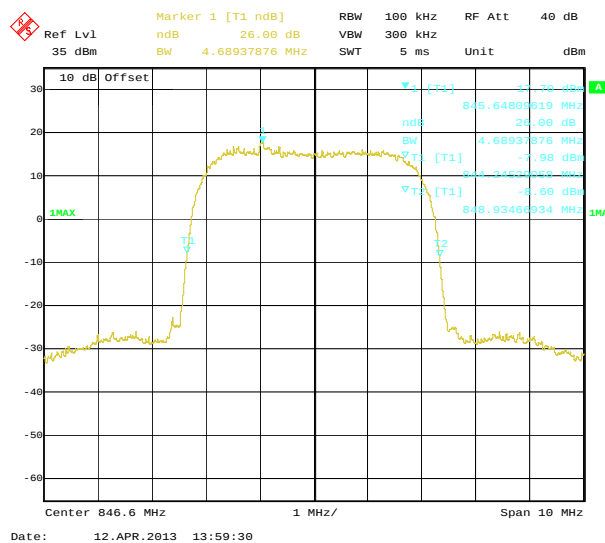
Test Item:	-26dB bandwidth	Test Mode:	UMTS 850 12.2k RMC
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Lowest channel

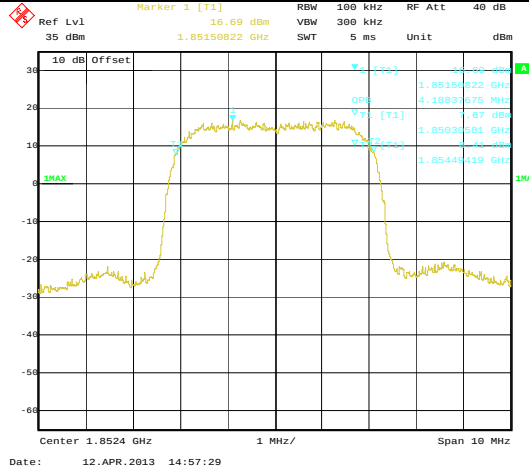


Middle channel

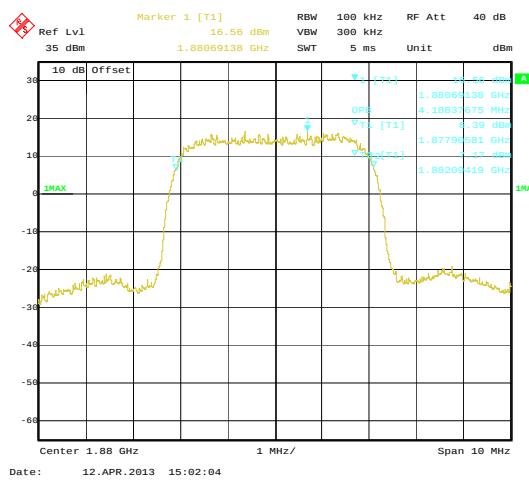


Highest channel

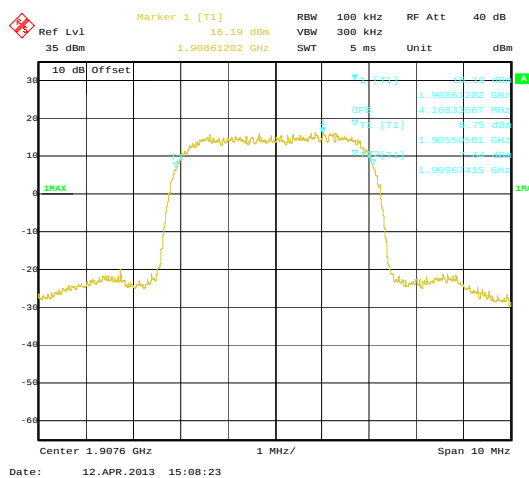
Test Item:	99% Occupy bandwidth	Test Mode:	UMTS 1900 12.2k RMC
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Lowest channel

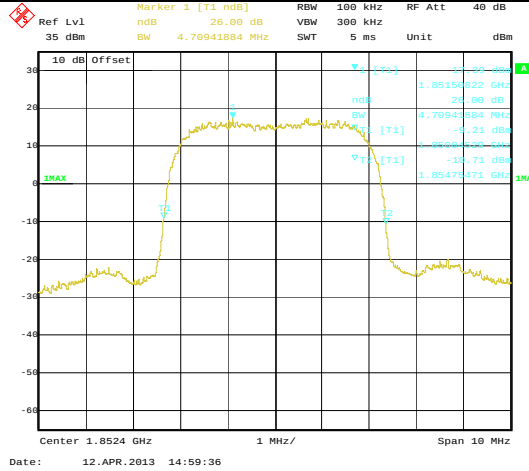


Middle channel

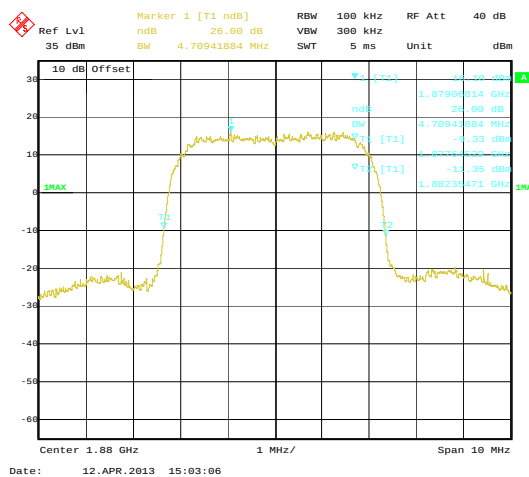


Highest channel

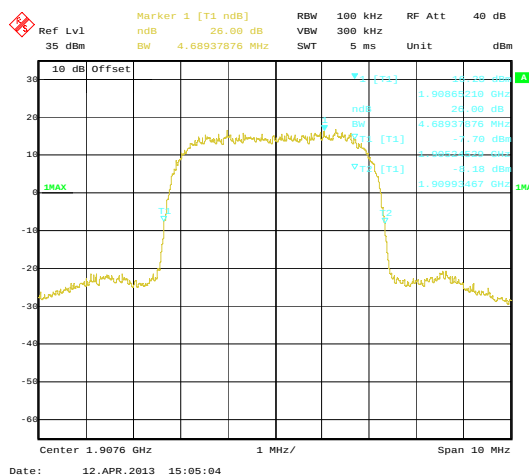
Test Item:	-26dB bandwidth	Test Mode:	UMTS 1900 12.2k RMC
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Lowest channel

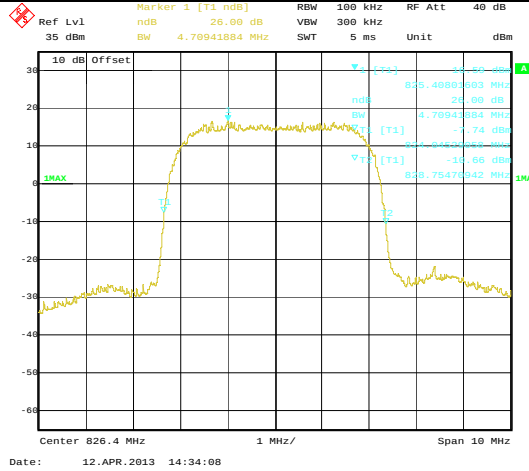


Middle channel

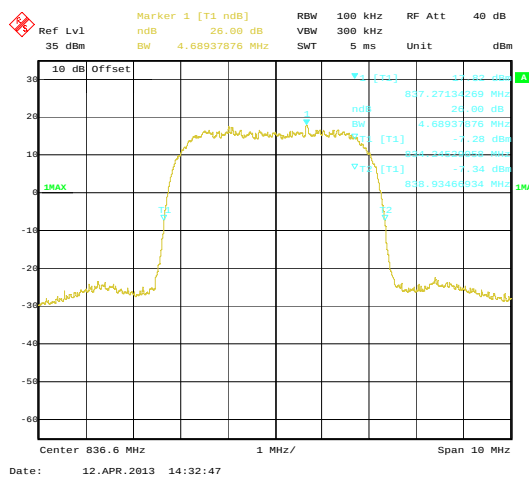


Highest channel

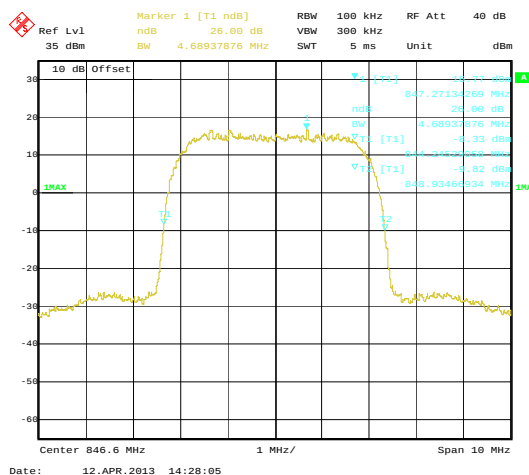
Test Item:	-26dB bandwidth	Test Mode:	UMTS 850 HSDPA
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Lowest channel

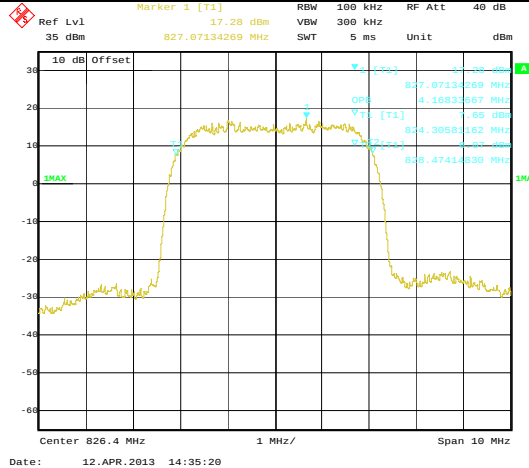


Middle channel

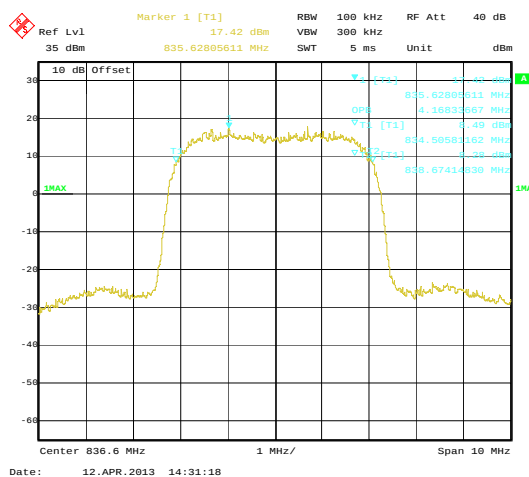


Highest channel

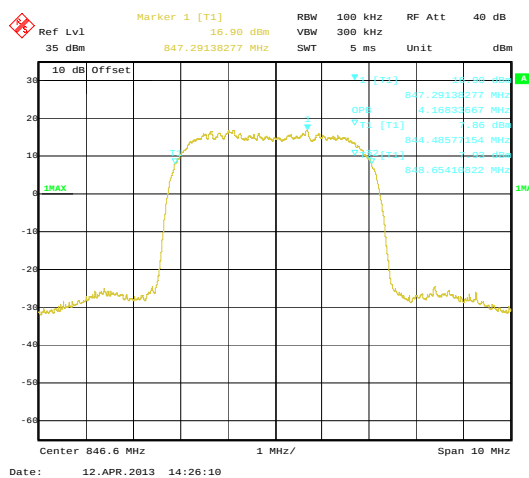
Test Item:	99% Occupy bandwidth	Test Mode:	UMTS 850 HSDPA
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Lowest channel

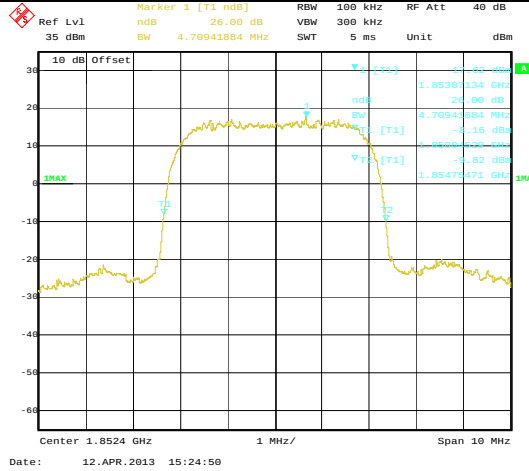


Middle channel

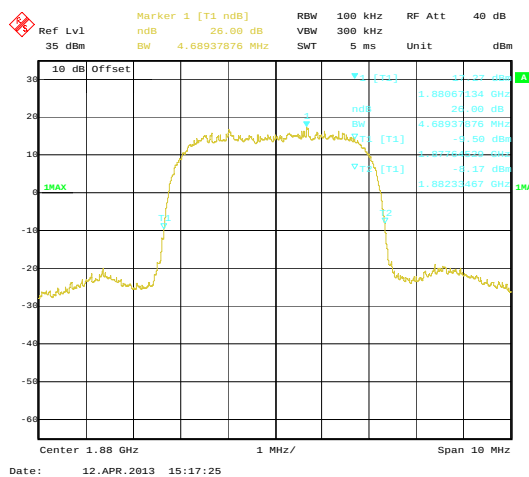


Highest channel

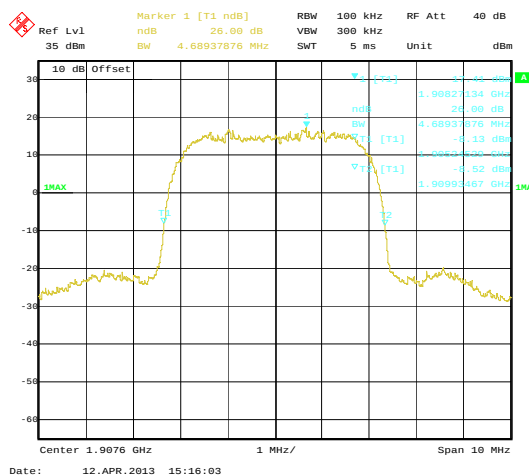
Test Item:	-26dB bandwidth	Test Mode:	UMTS 1900 HSDPA
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Lowest channel

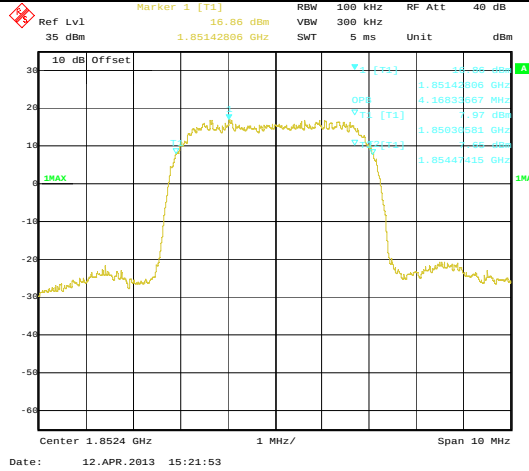


Middle channel

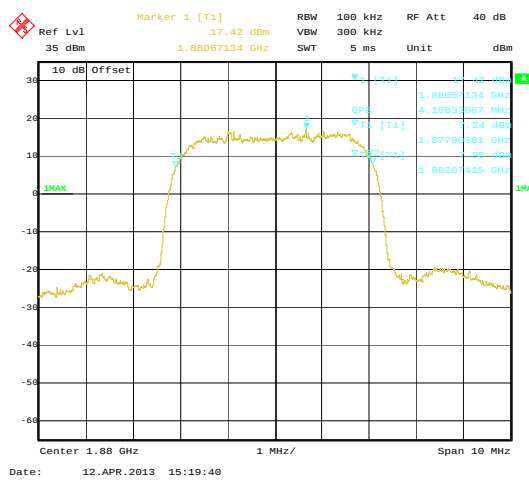


Highest channel

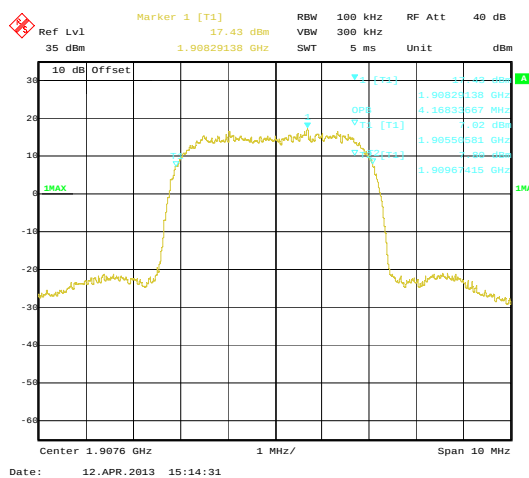
Test Item:	99% Occupy bandwidth	Test Mode:	UMTS 1900 HSDPA
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Lowest channel

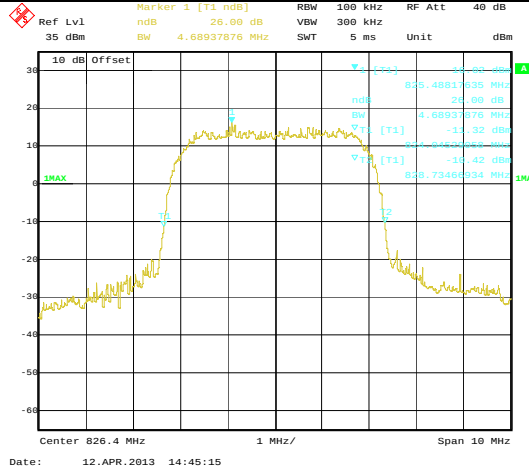


Middle channel

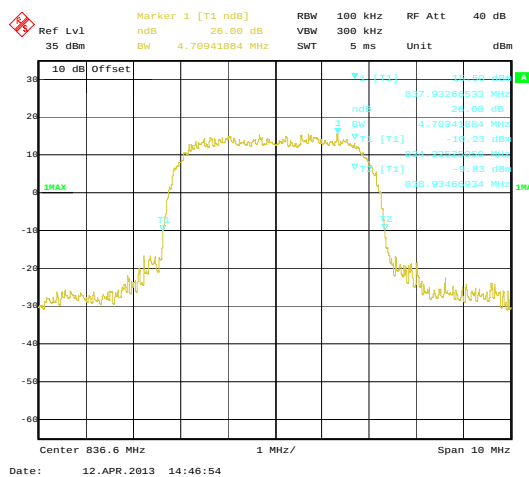


Highest channel

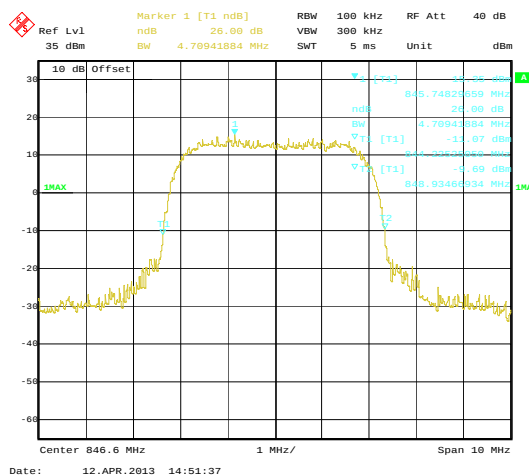
Test Item:	-26dB bandwidth	Test Mode:	UMTS 850 HSUPA
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Lowest channel

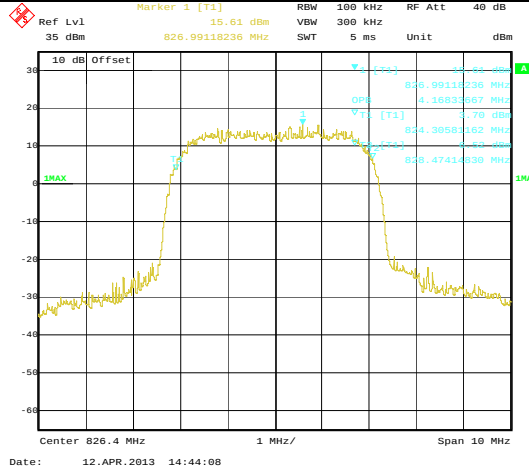


Middle channel

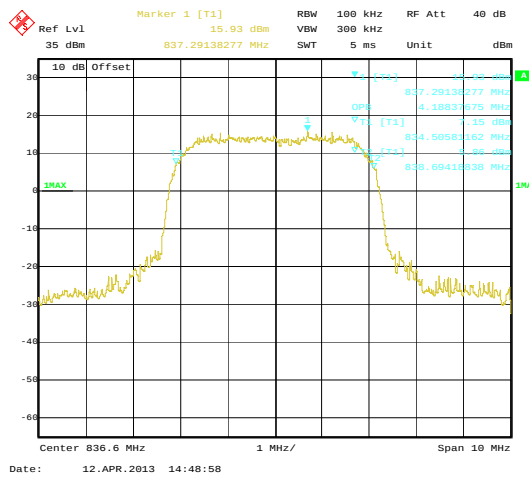


Highest channel

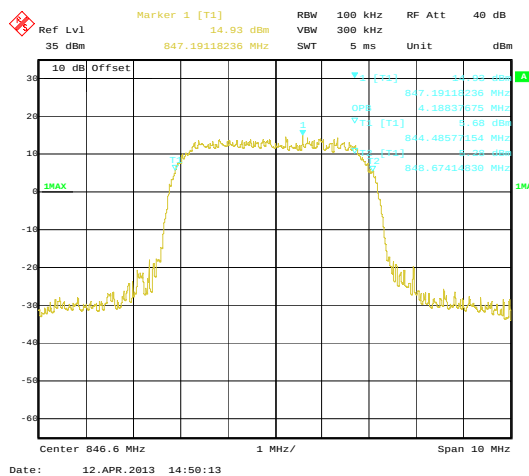
Test Item:	99% Occupy bandwidth	Test Mode:	UMTS 850 HSUPA
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Lowest channel

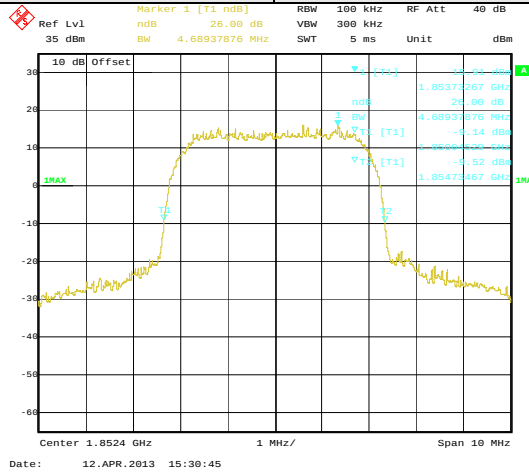


Middle channel

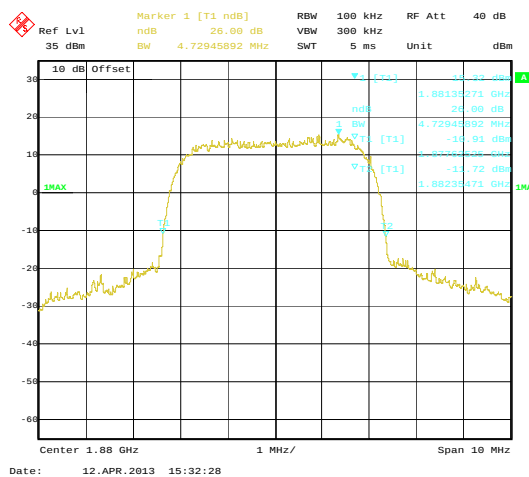


Highest channel

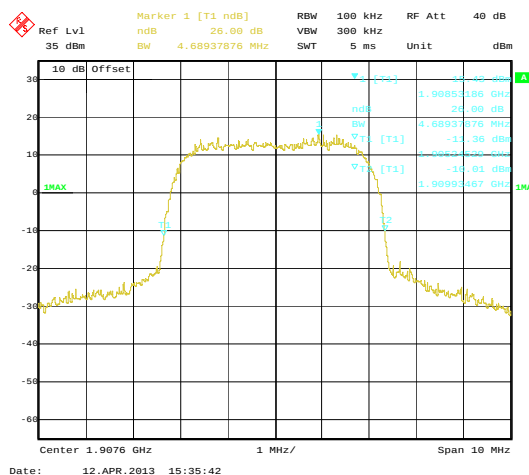
Test Item:	-26dB bandwidth	Test Mode:	UMTS 1900 HSUPA
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Lowest channel

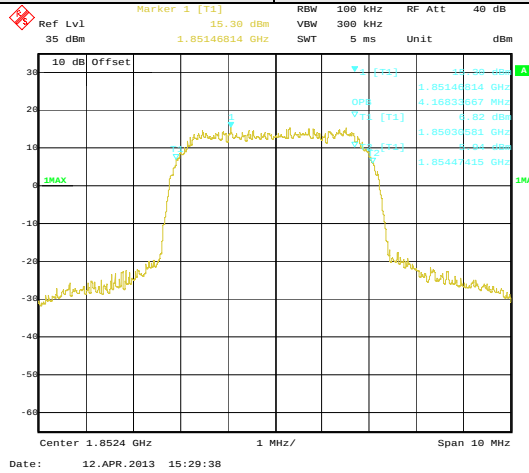


Middle channel

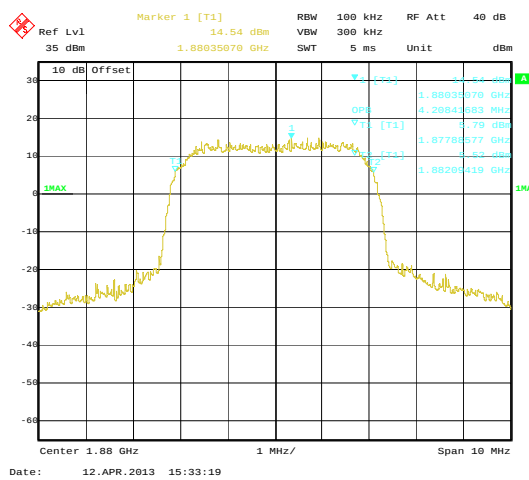


Highest channel

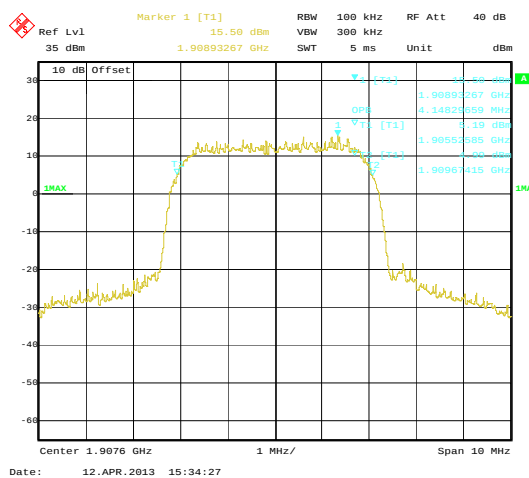
Test Item:	99% Occupy bandwidth	Test Mode:	UMTS 1900 HSUPA
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Lowest channel



Middle channel

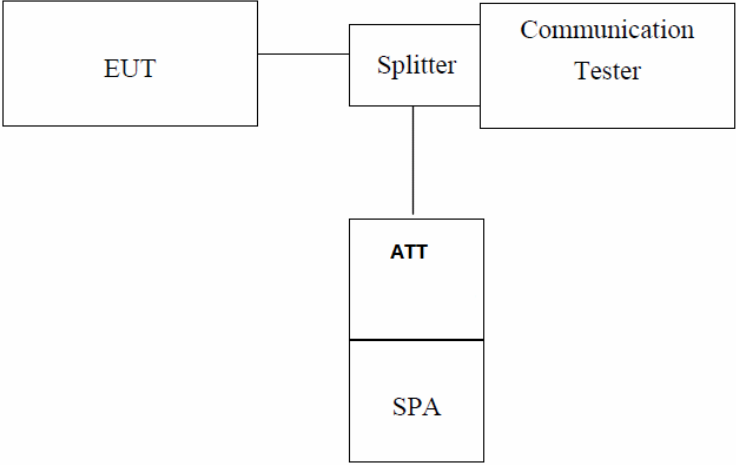


Highest channel

7.3 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.

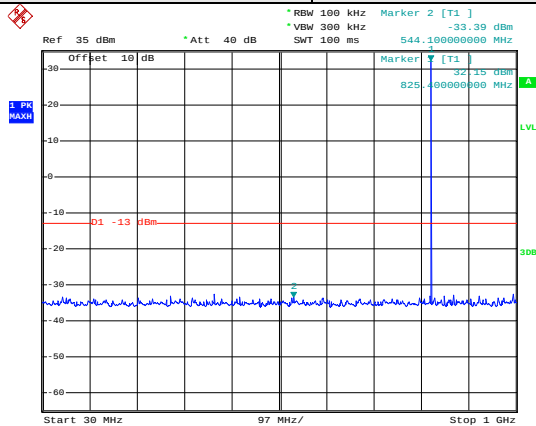
7.4 Out of band emission at antenna terminals

Test Requirement:	FCC part22.917(a) and FCC part24.238(a)
Test Method:	FCC part2.1051
Limit:	-13dBm
Test setup:	 <i>Note: Measurement setup for testing on Antenna connector</i>
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:

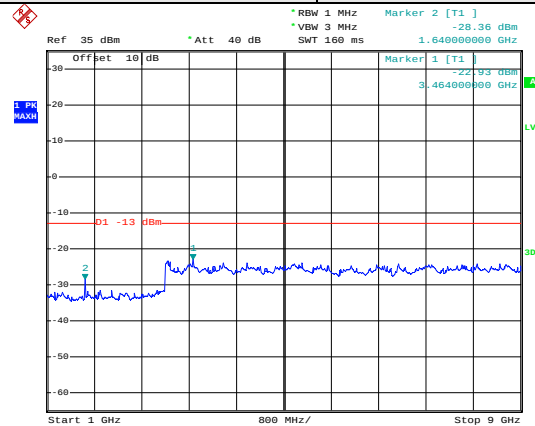
Spurious emission

Test Mode:	GSM850	Test Channel:	Lowest channel
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Date: 15.APR.2013 19:06:04

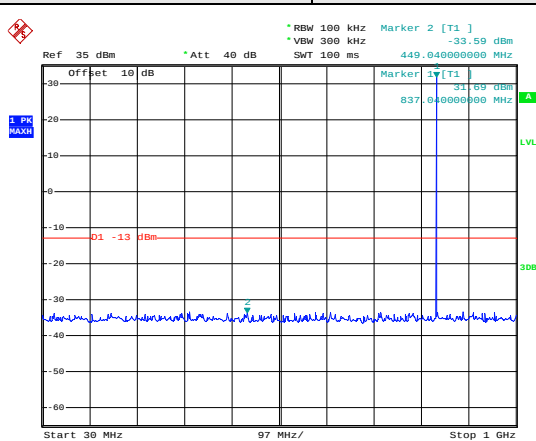
30MHz~1GHz



Date: 15.APR.2013 19:07:00

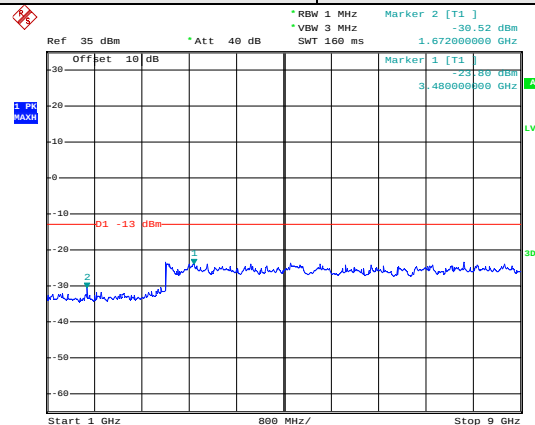
1GHz~9GHz

Test Mode:	GSM850	Test Channel:	Middle channel
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Date: 15.APR.2013 19:08:29

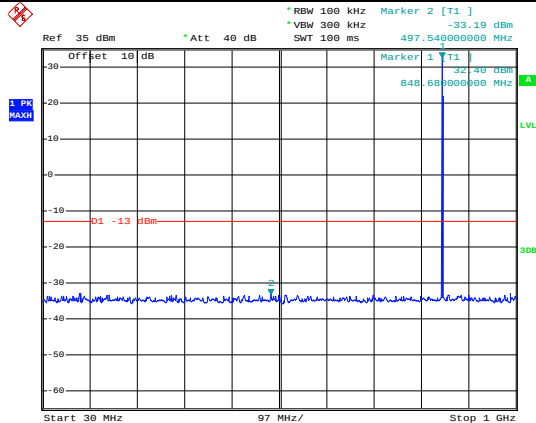
30MHz~1GHz



Date: 15.APR.2013 19:07:47

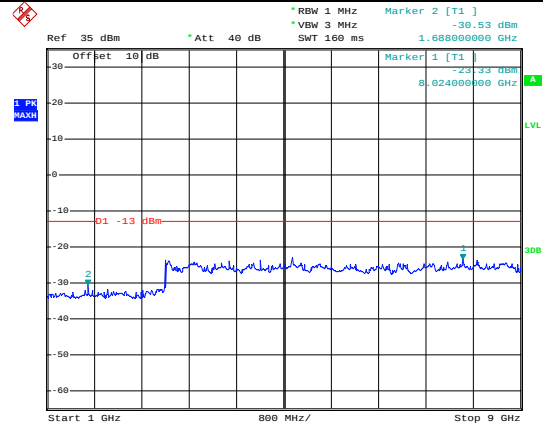
1GHz~9GHz

Test Mode:	GSM850	Test Channel:	Highest channel
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Date: 15.APR.2013 19:09:53

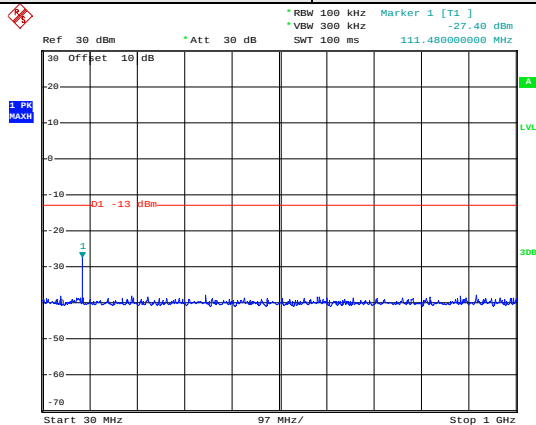
30MHz~1GHz



Date: 15.APR.2013 19:10:34

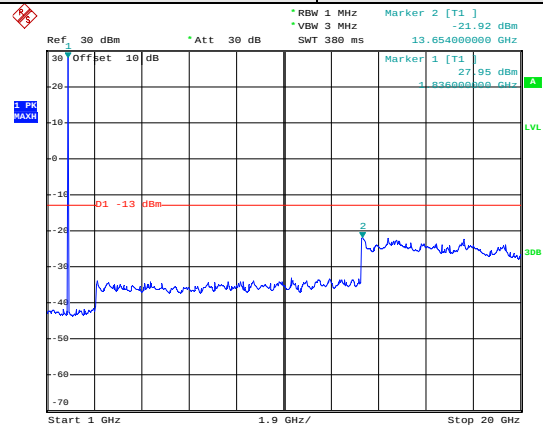
1GHz~9GHz

Test Mode:	PCS1900	Test Channel:	Lowest channel
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Date: 15.APR.2013 19:23:27

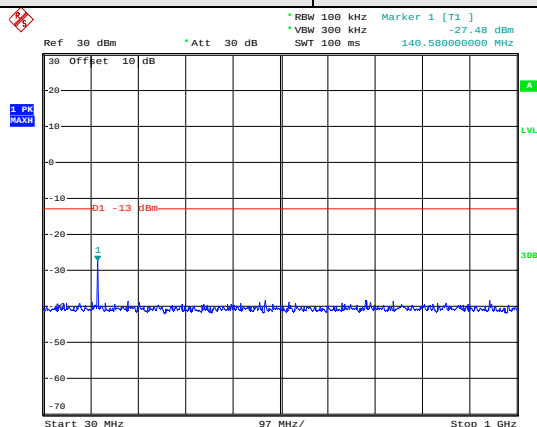
30MHz~1GHz



Date: 15.APR.2013 19:24:03

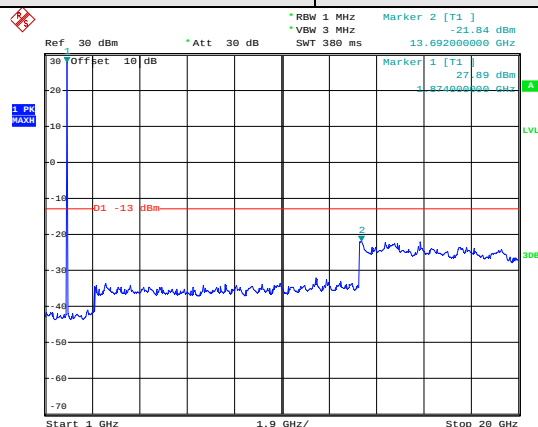
1GHz~20GHz

Test Mode:	PCS1900	Test Channel:	Middle channel
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Date: 15.APR.2013 19:25:15

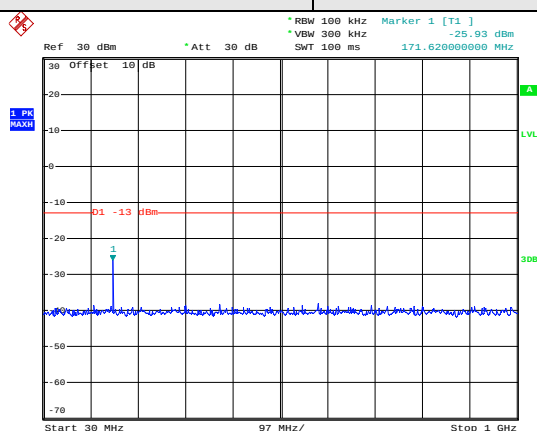
30MHz~1GHz



Date: 15.APR.2013 19:24:35

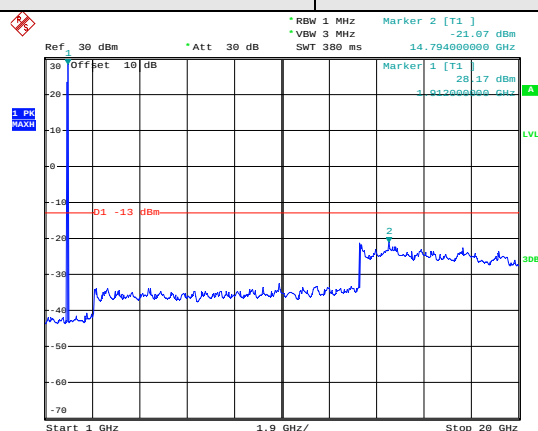
1GHz~20GHz

Test Mode:	PCS1900	Test Channel:	Highest channel
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Date: 15.APR.2013 19:25:53

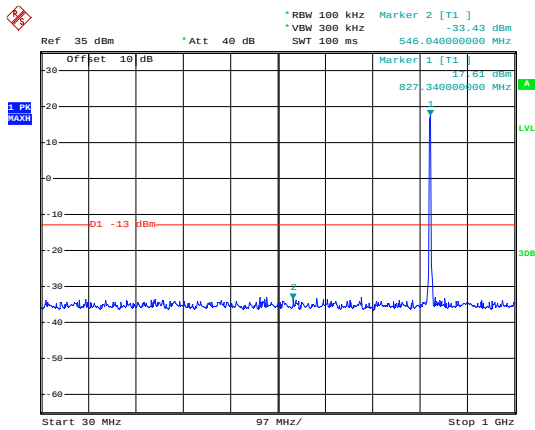
30MHz~1GHz



Date: 15.APR.2013 19:26:30

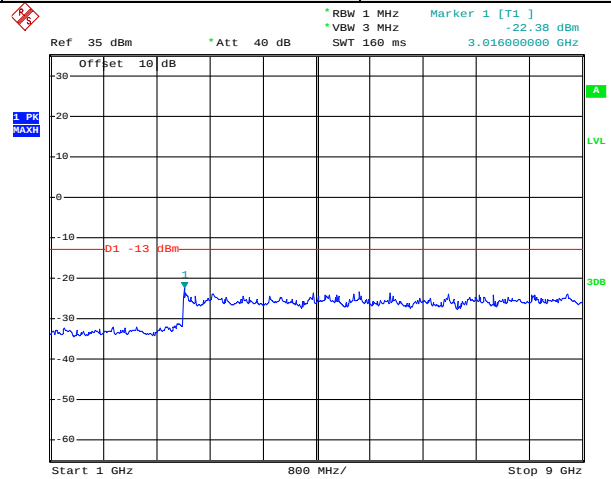
1GHz~20GHz

Test Mode:	UMTS 850 12.2k RMC	Test Channel:	Lowest channel
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Date: 15.APR.2013 18:19:17

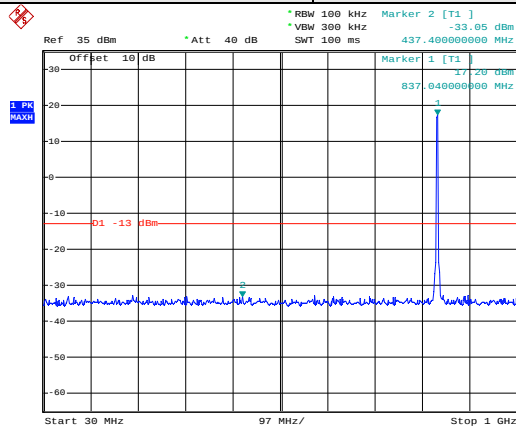
30MHz~1GHz



Date: 15.APR.2013 18:19:54

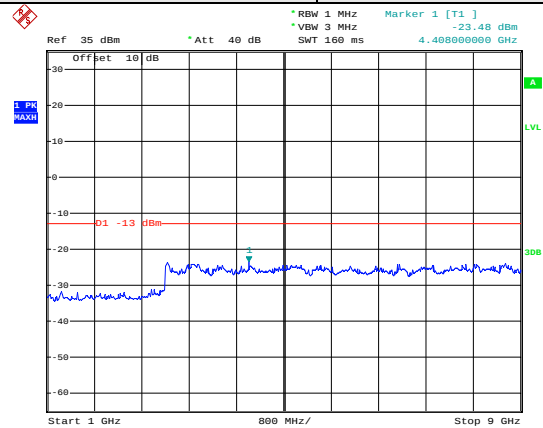
1GHz~9GHz

Test Mode:	UMTS 850 12.2k RMC	Test Channel:	Middle channel
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Date: 15.APR.2013 18:22:02

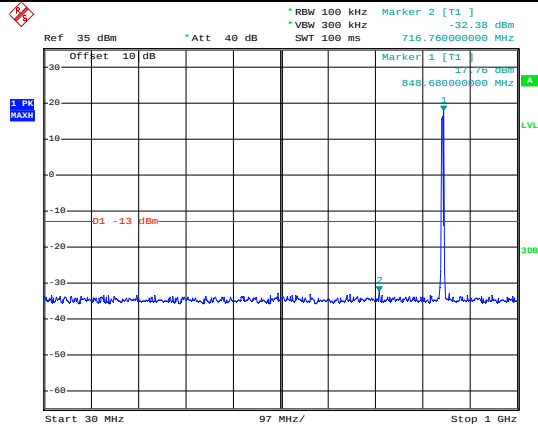
30MHz~1GHz



Date: 15.APR.2013 18:20:33

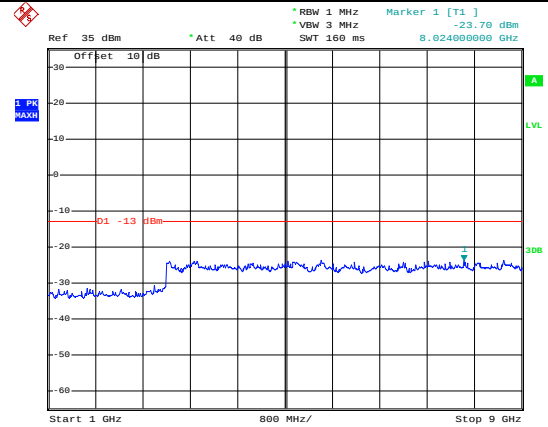
1GHz~10GHz

Test Mode:	UMTS 850 12.2k RMC	Test Channel:	Highest channel
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Date: 15.APR.2013 18:25:38

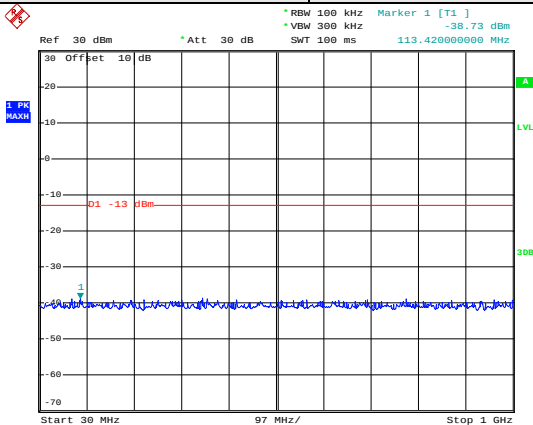
30MHz~1GHz



Date: 15.APR.2013 18:26:36

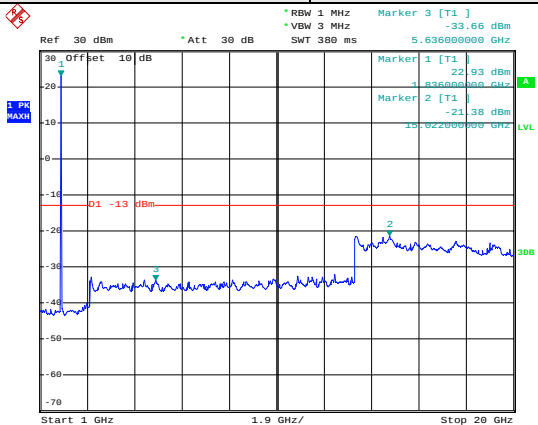
1GHz~9GHz

Test Mode:	UMTS 1900 12.2k RMC	Test Channel:	Lowest channel
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Date: 15.APR.2013 18:49:15

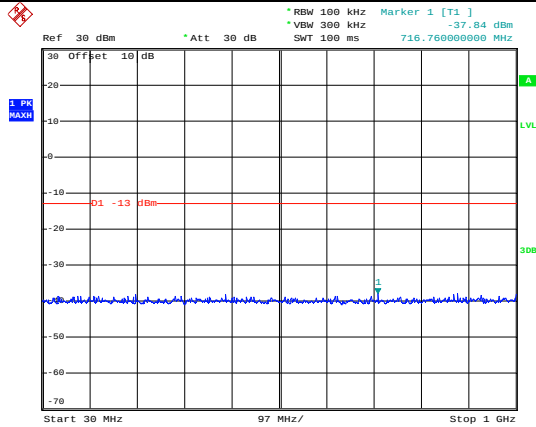
30MHz~1GHz



Date: 15.APR.2013 18:48:40

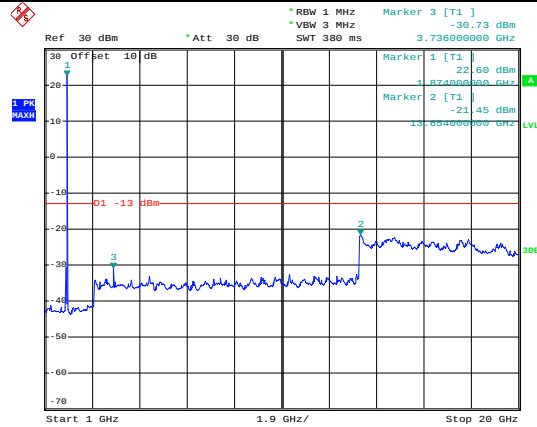
1GHz~20GHz

Test Mode:	UMTS 1900 12.2k RMC	Test Channel:	Middle channel
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Date: 15.APR.2013 18:46:46

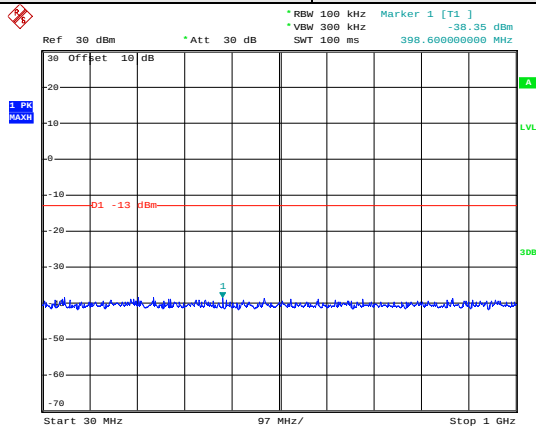
30MHz~1GHz



Date: 15.APR.2013 18:47:34

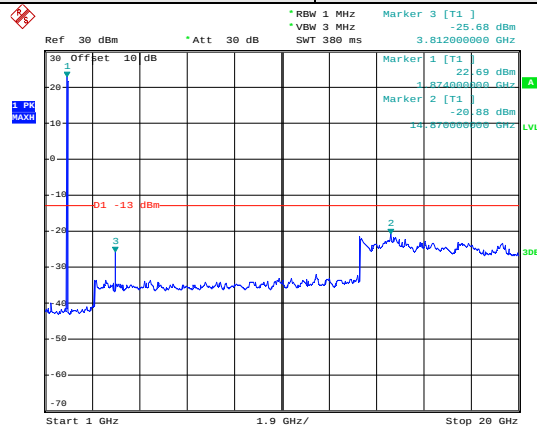
1GHz~20GHz

Test Mode:	UMTS 1900 12.2k RMC	Test Channel:	Highest channel
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Date: 15.APR.2013 18:45:23

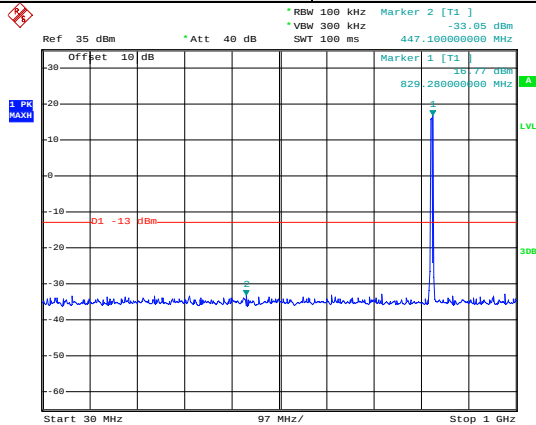
30MHz~1GHz



Date: 15.APR.2013 18:44:32

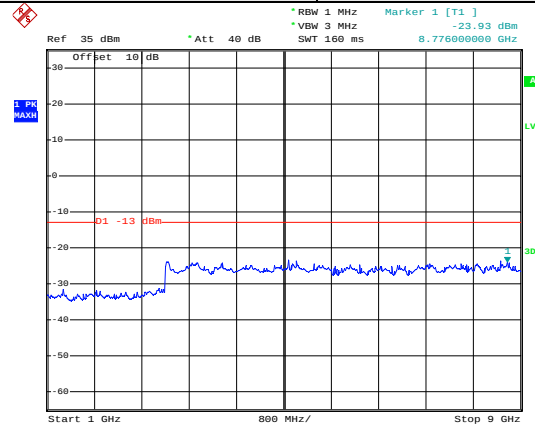
1GHz~20GHz

Test Mode:	UMTS 850 HSDPA	Test Channel:	Lowest channel
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Date: 15.APR.2013 18:33:56

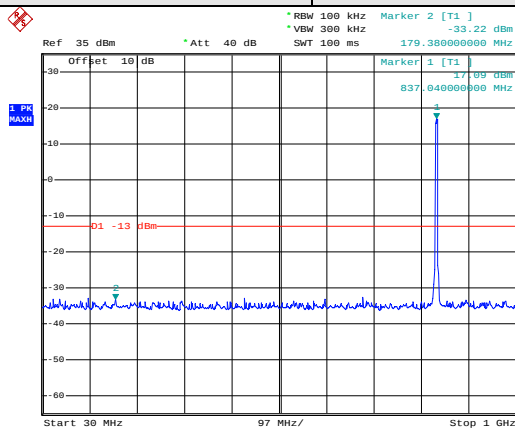
30MHz~1GHz



Date: 15.APR.2013 18:33:02

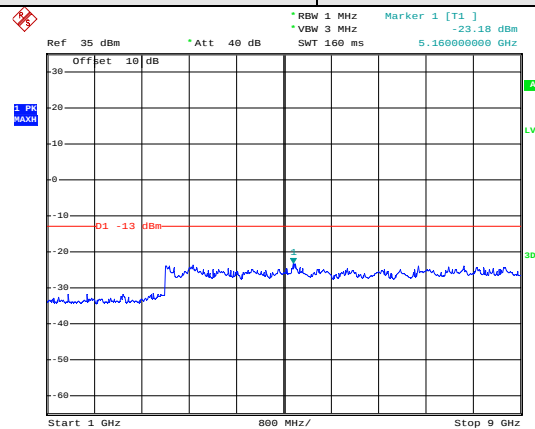
1GHz~9GHz

Test Mode:	UMTS 850 HSDPA	Test Channel:	Middle channel
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Date: 15.APR.2013 18:31:45

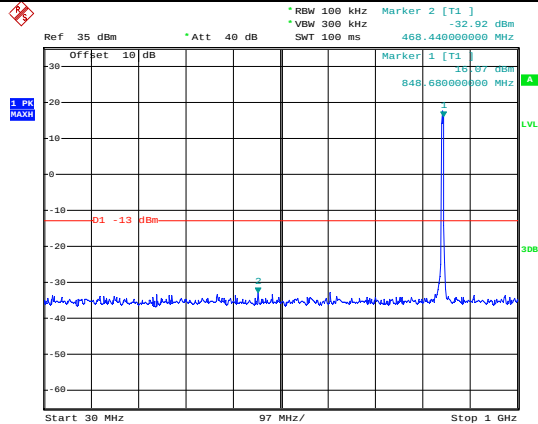
30MHz~1GHz



Date: 15.APR.2013 18:32:24

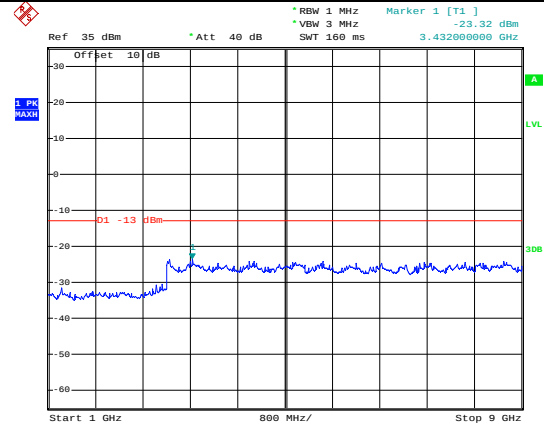
1GHz~9GHz

Test Mode:	UMTS 850 HSDPA	Test Channel:	Highest channel
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Date: 15.APR.2013 18:30:58

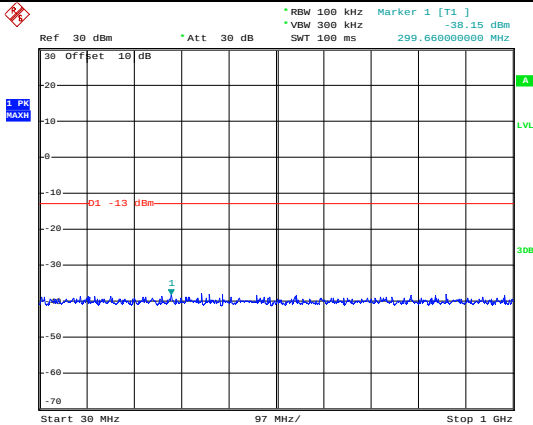
30MHz~1GHz



Date: 15.APR.2013 18:30:18

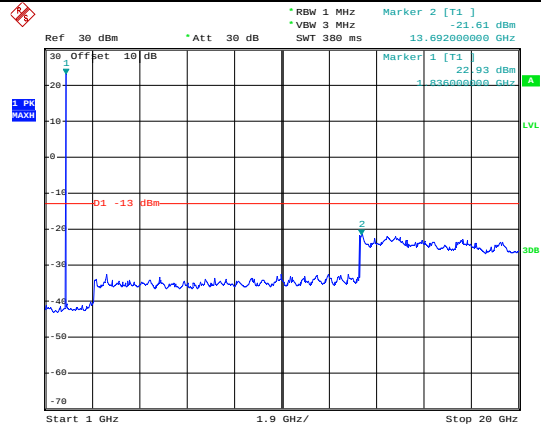
1GHz~9GHz

Test Mode:	UMTS 1900 HSDPA	Test Channel:	Lowest channel
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Date: 15.APR.2013 18:50:57

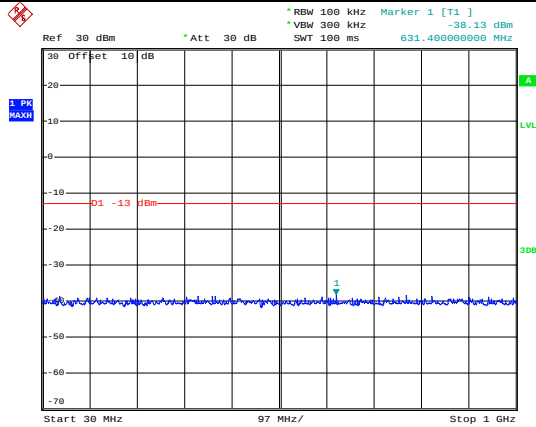
30MHz~1GHz



Date: 15.APR.2013 18:52:25

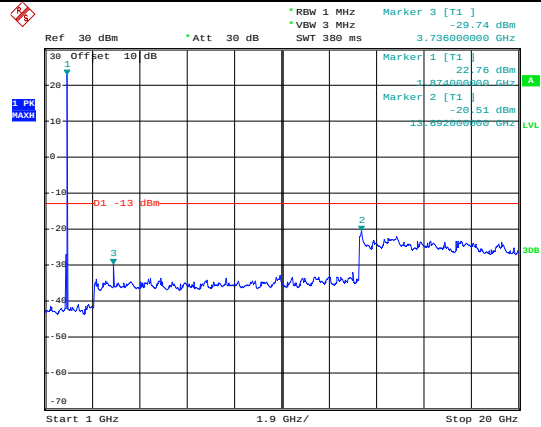
1GHz~20GHz

Test Mode:	UMTS 1900 HSDPA	Test Channel:	Middle channel
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Date: 15.APR.2013 18:54:44

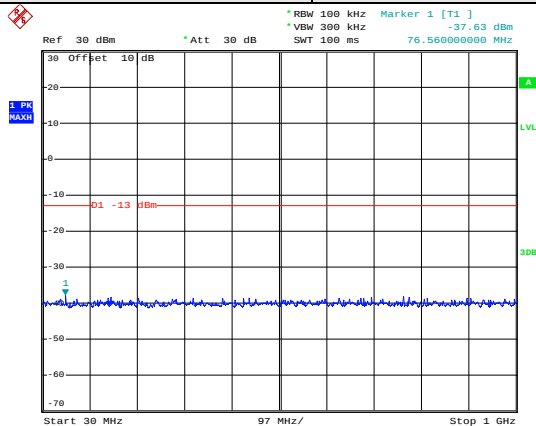
30MHz~1GHz



Date: 15.APR.2013 18:53:46

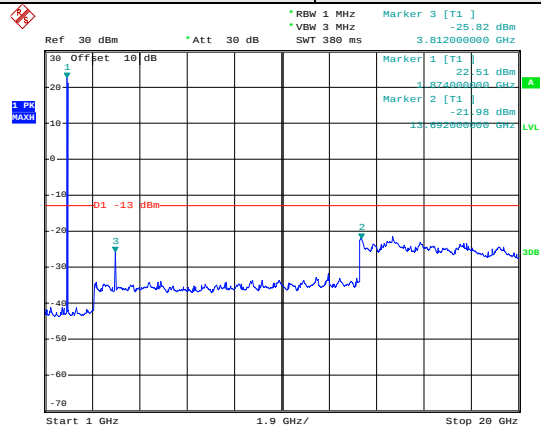
1GHz~20GHz

Test Mode:	UMTS 1900 HSDPA	Test Channel:	Highest channel
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Date: 15.APR.2013 18:55:59

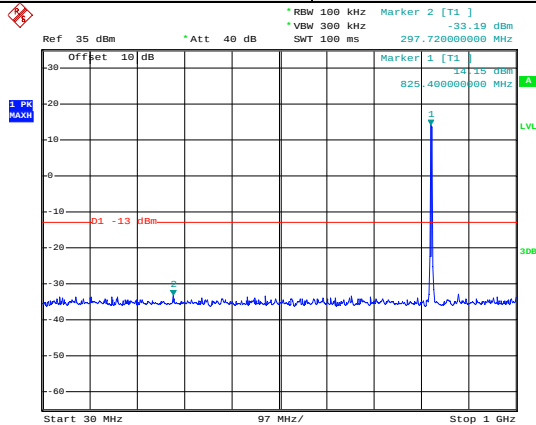
30MHz~1GHz



Date: 15.APR.2013 18:56:31

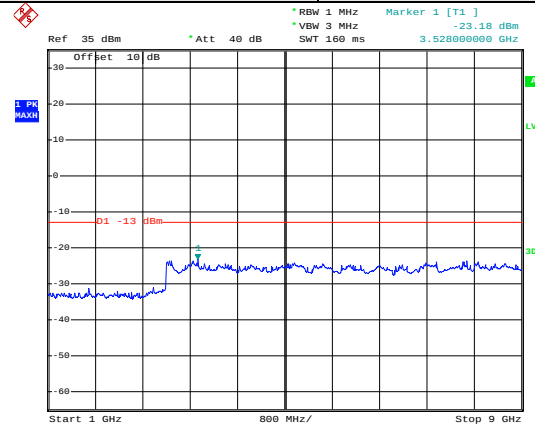
1GHz~20GHz

Test Mode:	UMTS 850 HSUPA	Test Channel:	Lowest channel
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Date: 15.APR.2013 18:36:11

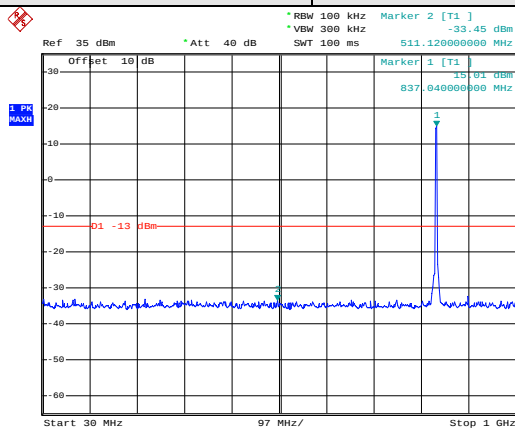
30MHz~1GHz



Date: 15.APR.2013 18:37:05

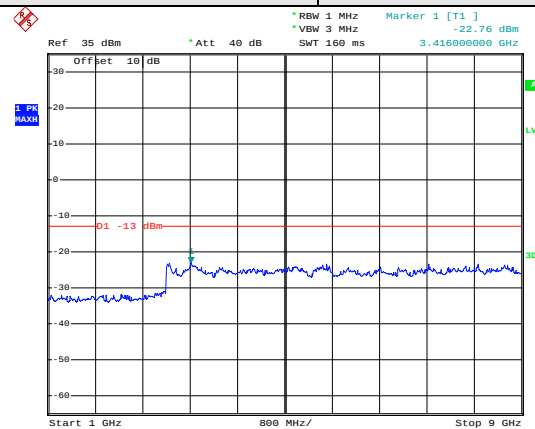
1GHz~9GHz

Test Mode:	UMTS 850 HSUPA	Test Channel:	Middle channel
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Date: 15.APR.2013 18:39:34

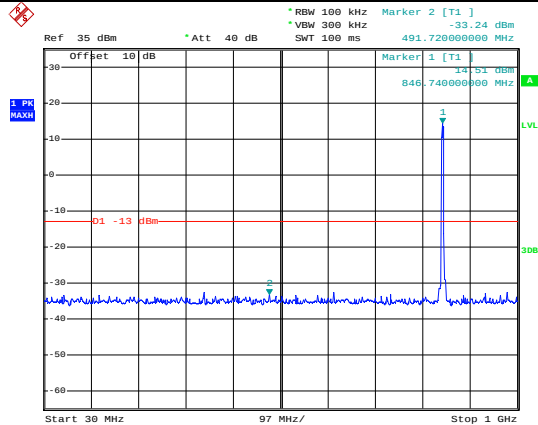
30MHz~1GHz



Date: 15.APR.2013 18:38:35

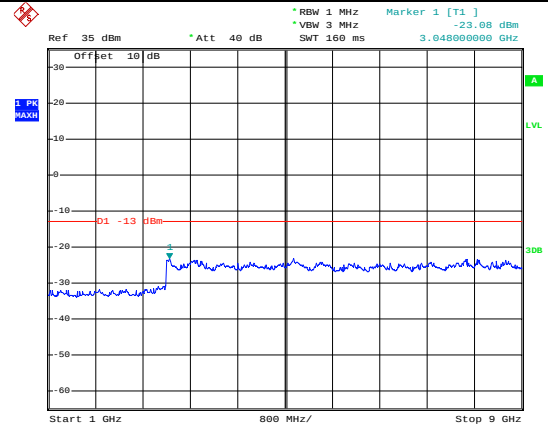
1GHz~9GHz

Test Mode:	UMTS 850 HSUPA	Test Channel:	Highest channel
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Date: 15.APR.2013 18:40:26

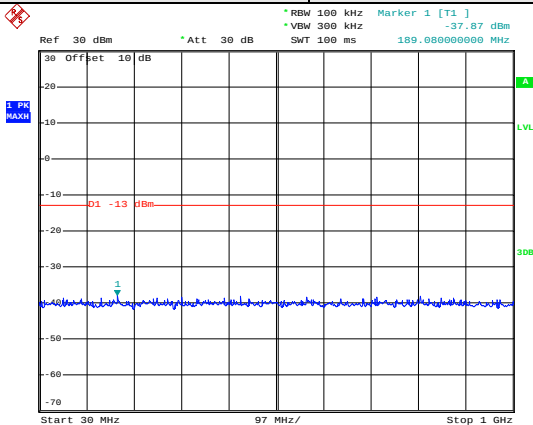
30MHz~1GHz



Date: 15.APR.2013 18:41:53

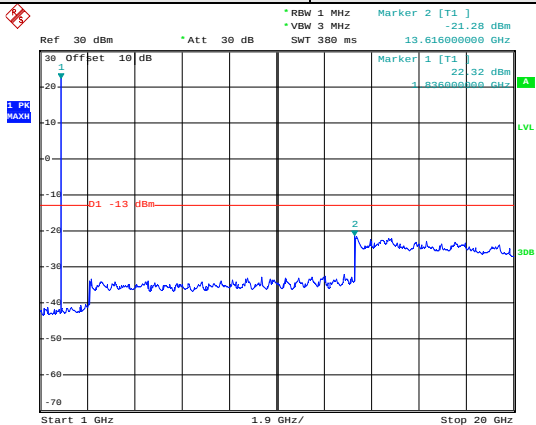
1GHz~9GHz

Test Mode:	UMTS 1900 HSUPA	Test Channel:	Lowest channel
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Date: 15.APR.2013 19:01:36

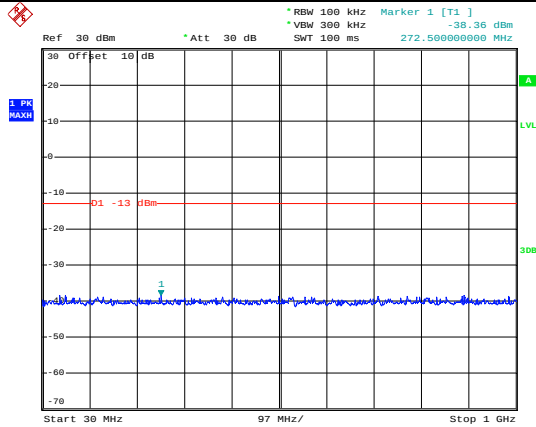
30MHz~1GHz



Date: 15.APR.2013 19:00:39

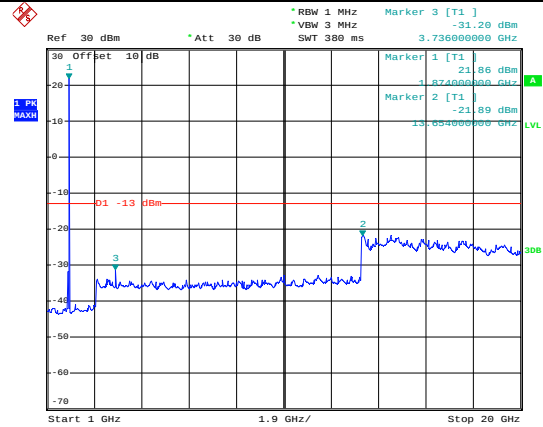
1GHz~20GHz

Test Mode:	UMTS 1900 HSUPA	Test Channel:	Middle channel
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Date: 15.APR.2013 18:58:50

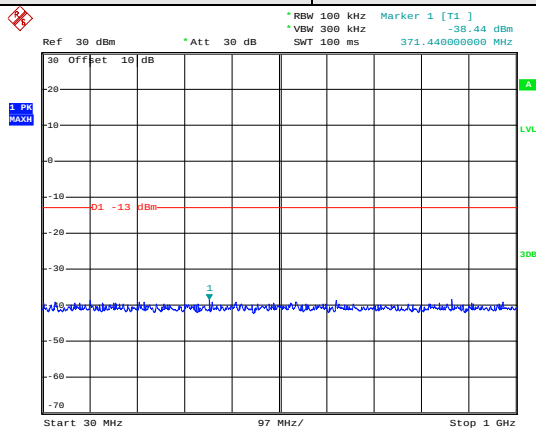
30MHz~1GHz



Date: 15.APR.2013 18:59:35

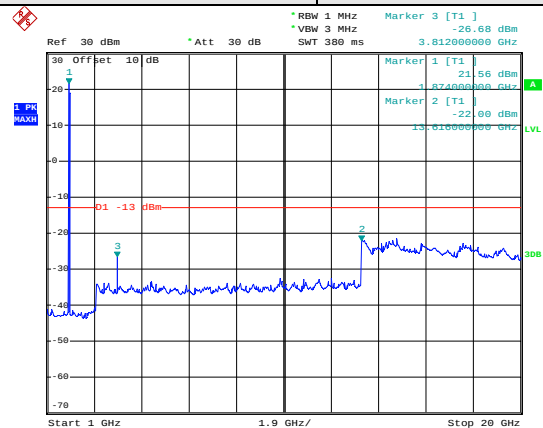
1GHz~20GHz

Test Mode:	UMTS 1900 HSUPA	Test Channel:	Highest channel
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Date: 15.APR.2013 18:58:05

30MHz~1GHz

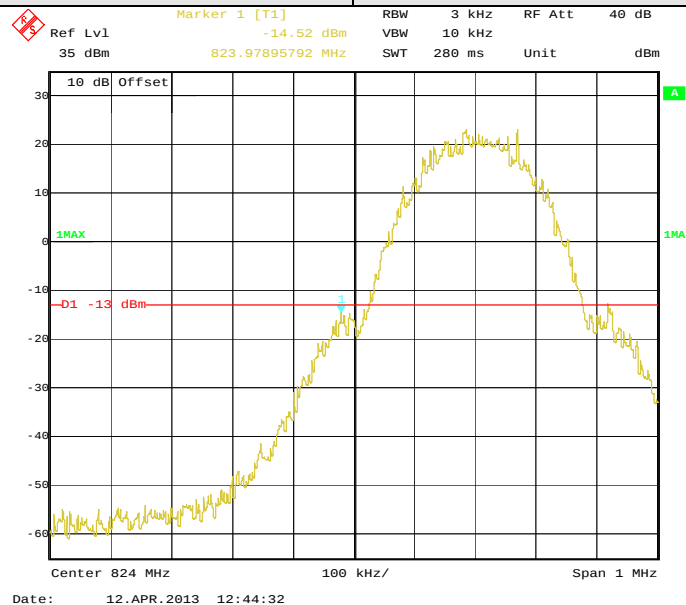


Date: 15.APR.2013 18:57:33

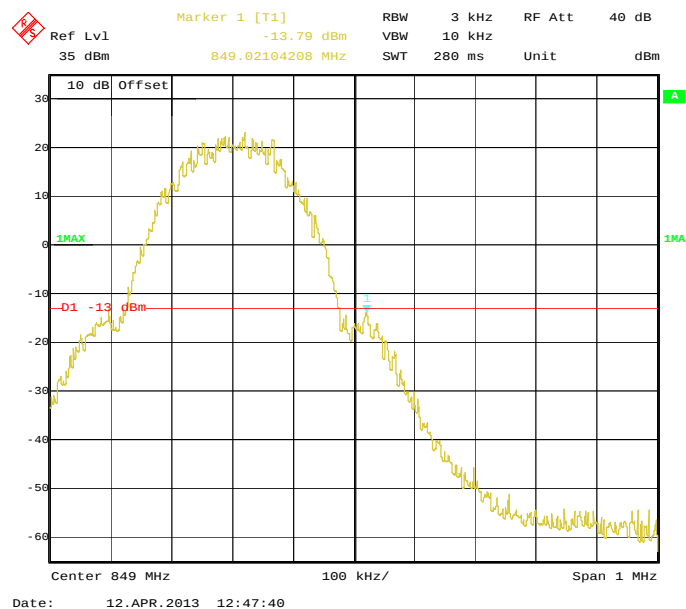
1GHz~20GHz

Band edge emission:

Test Mode:	GSM850
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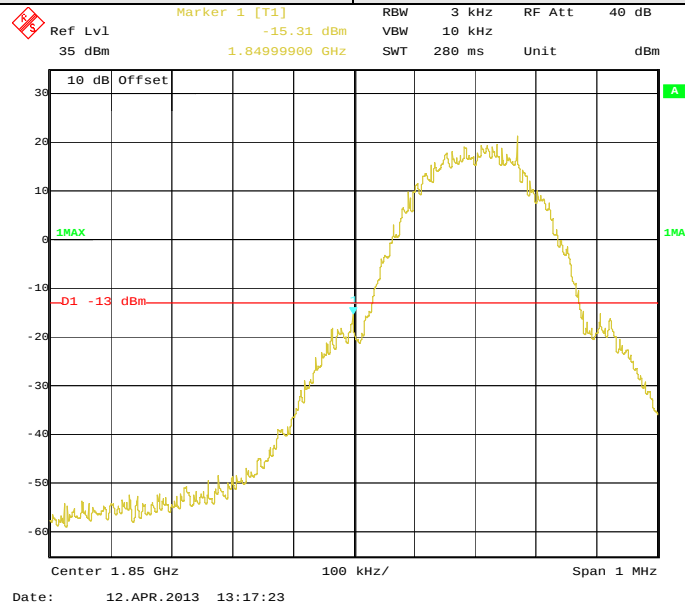


Lowest channel

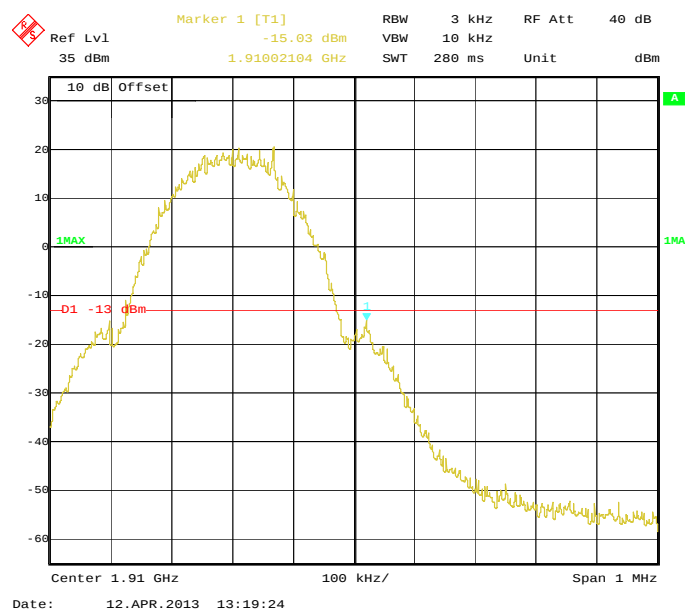


Highest channel

Test Mode:	PCS1900
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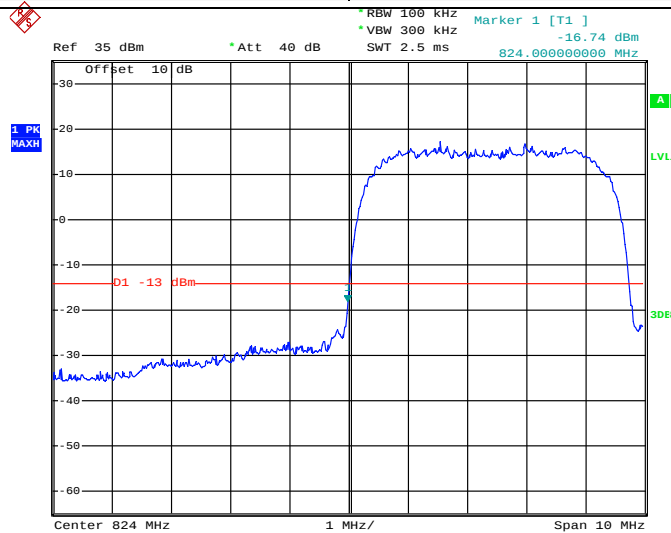


Lowest channel



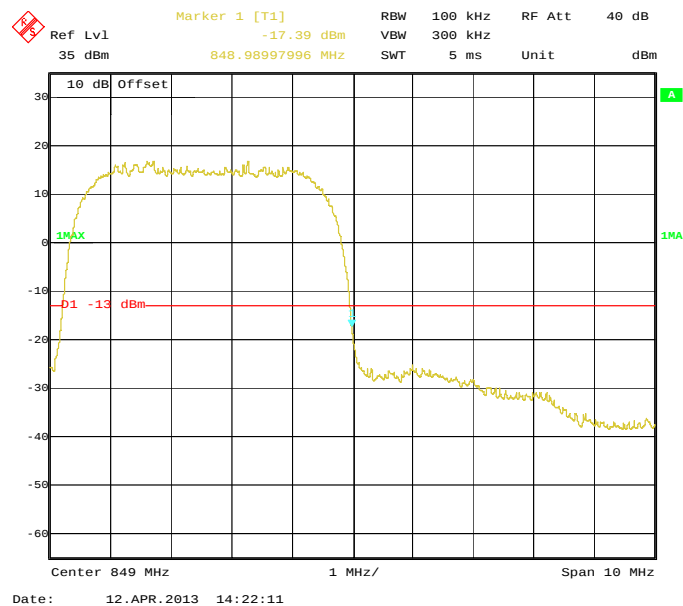
Highest channel

Test Mode:	UMTS850 12.2k RMC
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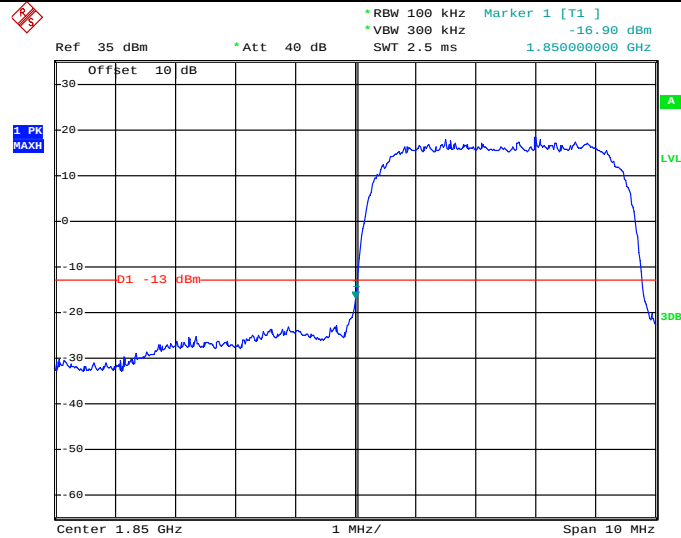
Date: 25.APR.2013 11:25:43

Lowest channel



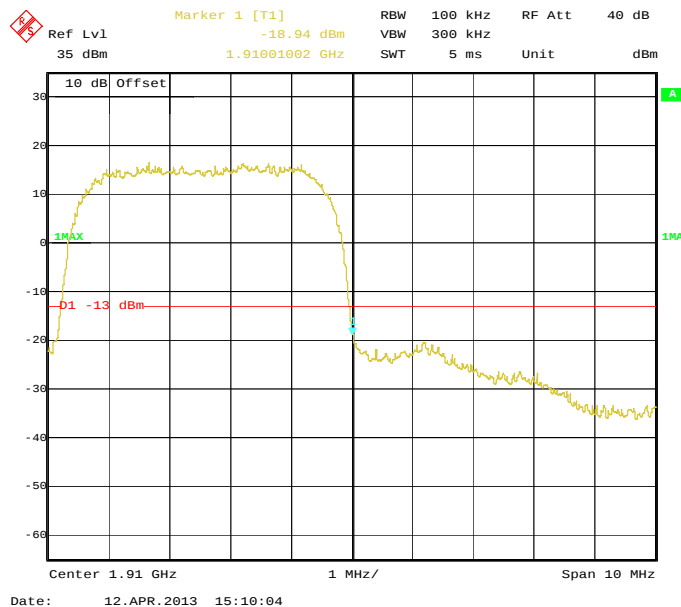
Highest channel

Test Mode:	UMTS 1900 12.2k RMC
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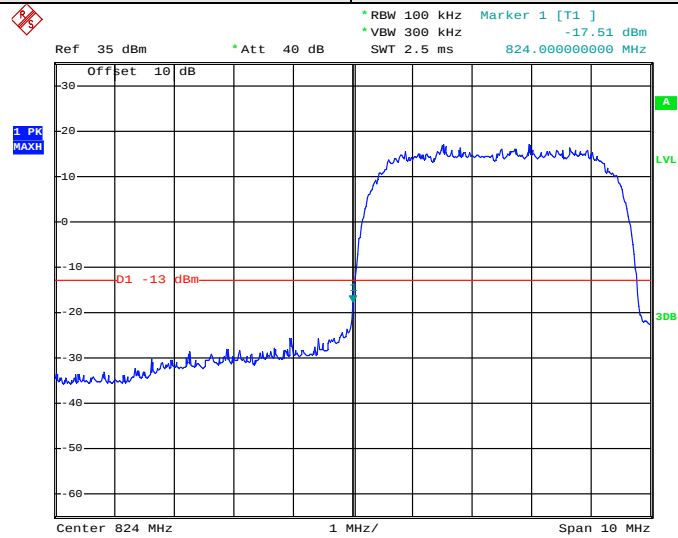
Date: 25.APR.2013 11:33:13

Lowest channel



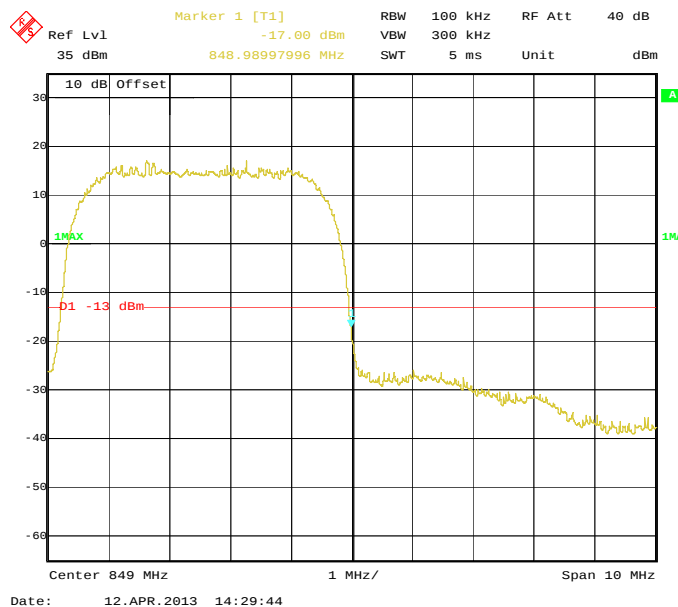
Highest channel

Test Mode:	UMTS850 HSDPA
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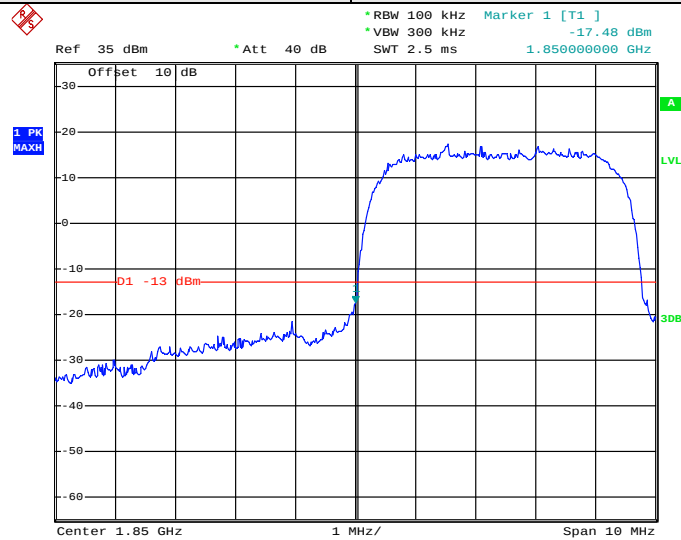
Date: 25.APR.2013 11:30:01

Lowest channel



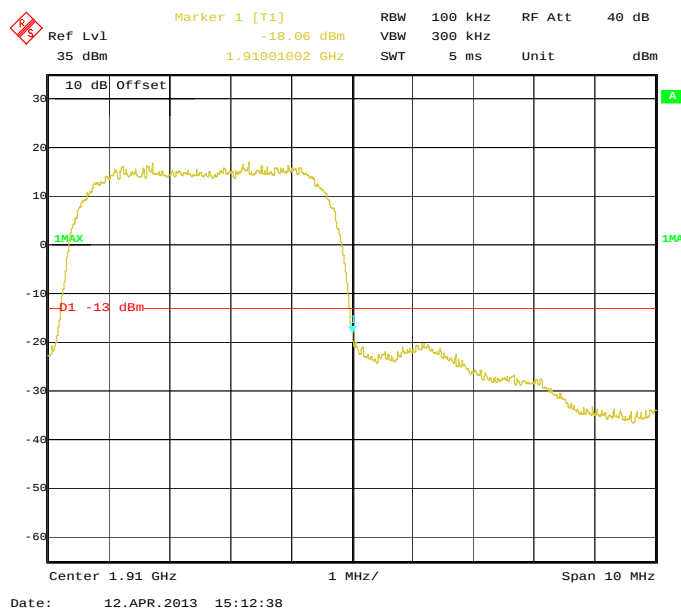
Highest channel

Test Mode:	UMTS 1900 HSDPA
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Date: 25.APR.2013 11:34:04

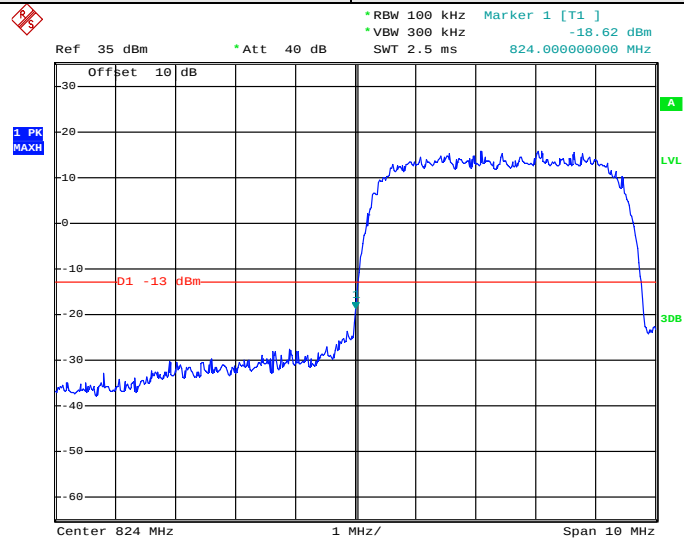
Lowest channel



Date: 12.APR.2013 15:12:38

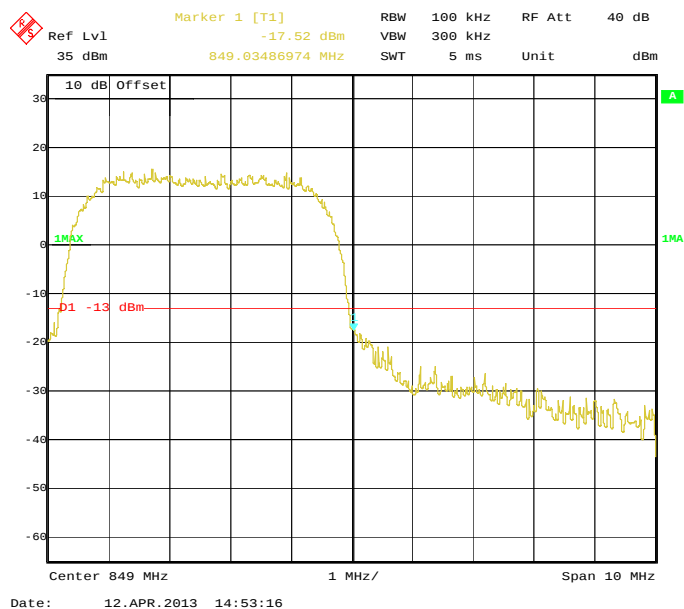
Highest channel

Test Mode:	UMTS850 HSUPA
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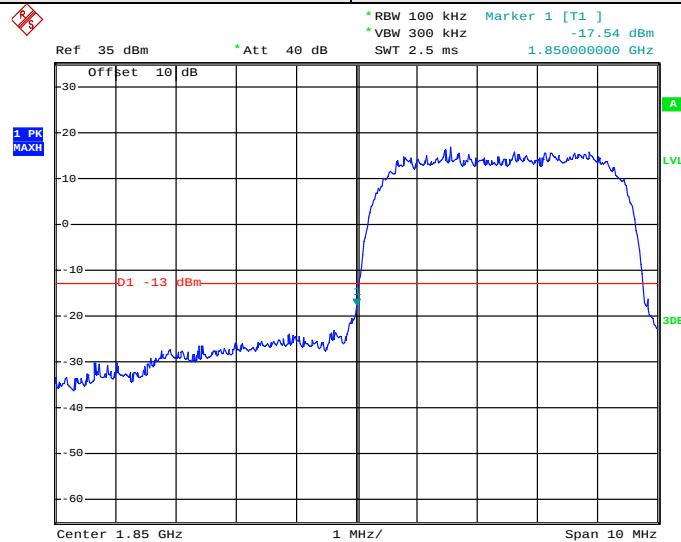
Date: 25.APR.2013 11:31:13

Lowest channel



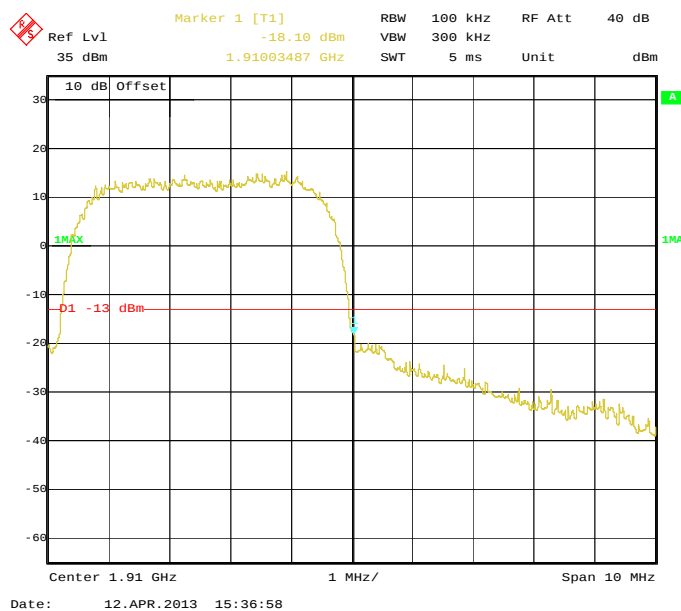
Highest channel

Test Mode:	UMTS 1900 HSUPA
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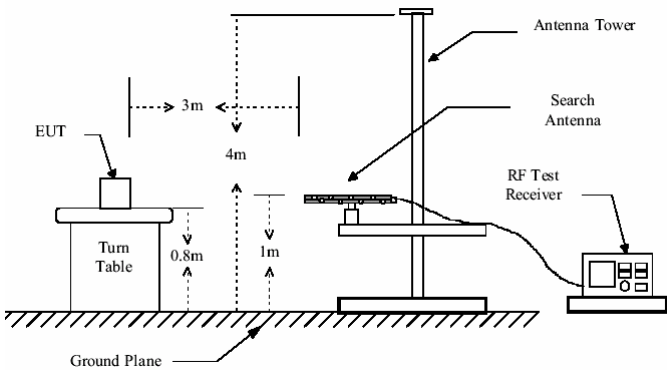
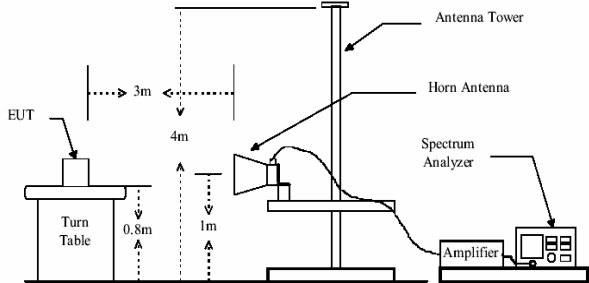
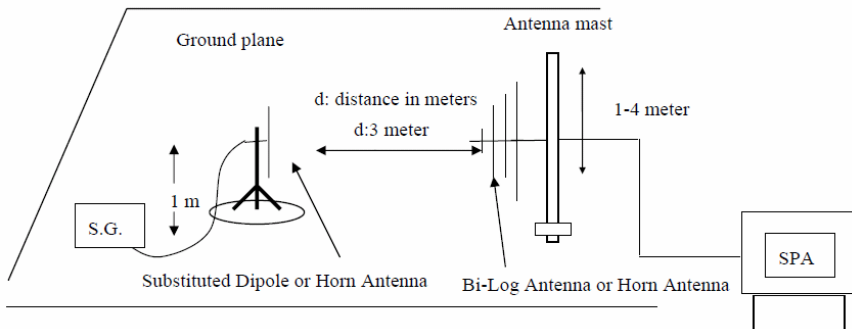
Date: 25.APR.2013 11:34:36

Lowest channel



Highest channel

7.5 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: $\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss (dB)}$ 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: $\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}$ 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)

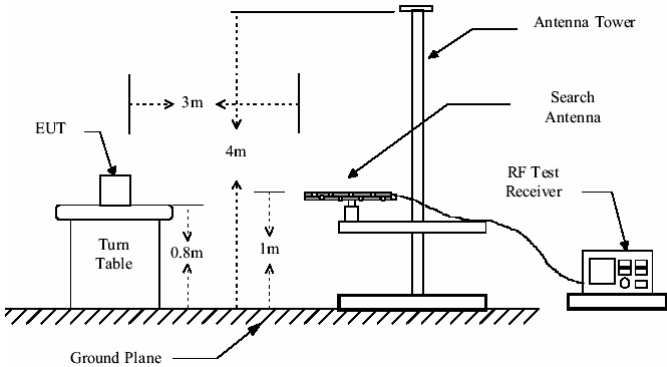
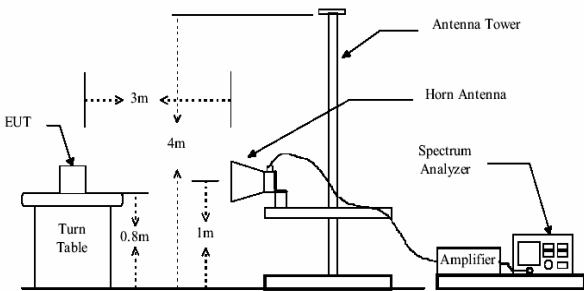
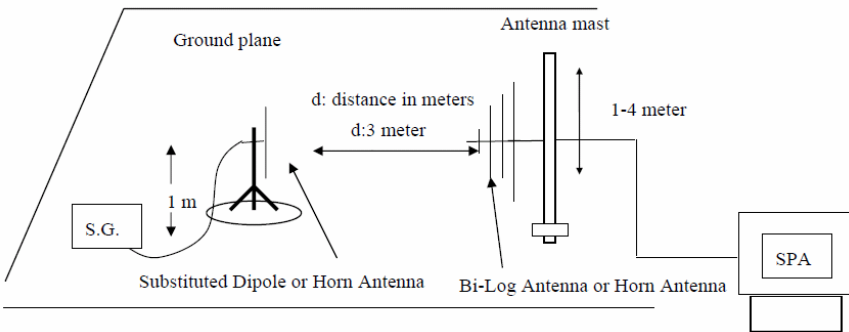
EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
GSM850	251	H	V	27.39	38.45	Pass
			H	31.01		
		E1	V	27.21		
			H	30.84		
		E2	V	27.18		
			H	30.73		
GPRS850	251	H	H	30.98	38.45	Pass
EGPRS850	190	H	H	27.23		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP(dBm)	Limit (dBm)	Result
PCS1900	512	H	V	24.62	33.00	Pass
			H	27.36		
		E1	V	24.58		
			H	27.27		
		E2	V	24.43		
			H	27.18		
GPRS1900	512	H	H	27.33	33.00	Pass
EGPRS1900	512	H	H	23.45		

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
UMTS 850 12.2k RMC	4183	H	V	19.75	38.45	Pass
			H	22.52		
		E1	V	19.68		
			H	22.45		
		E2	V	19.53		
			H	22.37		
HSDPA 850 Sub-test 1	4183	H	H	22.32	38.45	Pass
HSUPA 850 Sub-test 4	4183	H	H	22.14		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP(dBm)	Limit (dBm)	Result
UMTS 1900 12.2k RMC	9262	H	V	20.95	33.00	Pass
			H	19.48		
		E1	V	20.84		
			H	19.36		
		E2	V	20.71		
			H	19.27		
HSDPA 1900 Sub-test 1	9262	H	V	20.81	33.00	Pass
HSUPA 1900 Sub-test 4	9262	H	V	20.68		

7.6 Field strength of spurious radiation measurement

Test Requirement:	FCC part22.917(a) and FCC part24.238(a)
Test Method:	FCC part2.1053
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; HSDPA and GPRS mode 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)		
1648.40	Vertical	-43.37	-13.00	Pass
2472.60	V	-49.99		
3296.80	V	-50.36		
4121.00	V	-51.26		
4945.20	V	-52.65		
5769.40	V	-53.69		
1648.40	Horizontal	-48.87	-13.00	Pass
2472.60	H	-41.83		
3296.80	H	-49.87		
4121.00	H	-50.25		
4945.20	H	-51.66		
5769.40	H	-52.68		
Test mode:	GSM850		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1673.20	Vertical	-48.05	-13.00	Pass
2509.80	V	-45.39		
3346.40	V	-48.51		
4183.00	V	-49.68		
5019.60	V	-50.68		
5856.20	V	-51.22		
1673.20	Horizontal	-46.73	-13.00	Pass
2509.80	H	-40.54		
3346.40	H	-49.68		
4183.00	H	-50.29		
5019.60	H	-51.36		
5856.20	H	-52.87		

Remark :

1. The emission behavior belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

Test mode:	GSM850		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1697.60	Vertical	-41.60	-13.00	Pass
2546.40	V	-43.83		
3395.20	V	-48.55		
4244.00	V	-50.24		
5092.80	V	-51.68		
5941.60	V	-52.01		
1697.60	Horizontal	-44.98	-13.00	Pass
2546.40	H	-38.95		
3395.20	H	-49.66		
4244.00	H	-50.27		
5092.80	H	-51.28		
5941.60	H	-52.61		
Test mode:	PCS1900		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3700.40	Vertical	-46.84	-13.00	Pass
5550.60	V	-49.87		
7400.80	V	-50.45		
9251.00	V	-52.65		
11101.20	V	-52.69		
12951.40	V	-53.99		
3700.40	Horizontal	-43.89	-13.00	Pass
5550.60	H	-49.99		
7400.80	H	-50.65		
9251.00	H	-51.54		
11101.20	H	-52.65		
12951.40	H	-53.47		

Remark :

1. The emission behavior belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

Test mode:	PCS1900		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3760.00	Vertical	-49.47	-13.00	Pass
5640.00	V	-41.57		
7520.00	V	-49.88		
9400.00	V	-50.15		
11280.00	V	-51.68		
13160.00	V	-52.35		
3760.00	Horizontal	-41.49	-13.00	Pass
5640.00	H	-40.86		
7520.00	H	-49.66		
9400.00	H	-50.87		
11280.00	H	-51.97		
13160.00	H	-52.15		
Test mode:	PCS1900		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3819.60	Vertical	-46.15	-13.00	Pass
5729.40	V	-42.43		
7639.20	V	-49.88		
9549.00	V	-50.24		
11458.80	V	-51.99		
13368.60	V	-52.68		
3819.60	Horizontal	-45.19	-13.00	Pass
5729.40	H	-42.12		
7639.20	H	-49.57		
9549.00	H	-50.48		
11458.80	H	-51.29		
13368.60	H	-52.07		

Remark :

1. The emission behavior belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. 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)		
1652.80	Vertical	-57.22	-13.00	Pass
2479.20	V	-44.45		
3305.60	V	-48.45		
4132.00	V	-52.68		
4958.40	V	-53.66		
5784.80	V	-54.87		
1652.80	Horizontal	-58.44	-13.00	Pass
2479.20	H	-59.68		
3305.60	H	-50.79		
4132.00	H	-51.87		
4958.40	H	-52.98		
5784.80	H	-53.61		
Test mode:	UMTS850 12.2k RMC		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1673.20	Vertical	-54.80	-13.00	Pass
2509.80	V	-43.15		
3346.40	V	-50.25		
4183.00	V	-52.65		
5019.60	V	-53.98		
5856.20	V	-54.78		
1673.20	Horizontal	-52.19	-13.00	Pass
2509.80	H	-50.94		
3346.40	H	-52.69		
4183.00	H	-53.84		
5019.60	H	-54.58		
5856.20	H	-55.67		

Test mode:	UMTS850 12.2k RMC		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1693.20	Vertical	-54.09	-13.00	Pass
2539.80	V	-42.90		
3386.40	V	-51.87		
4233.00	V	-52.60		
5079.60	V	-53.45		
5926.20	V	-54.87		
1693.20	Horizontal	-58.15	-13.00	Pass
2539.80	H	-48.84		
3386.40	H	-51.66		
4233.00	H	-52.31		
5079.60	H	-53.98		
5926.20	H	-54.80		

Remark :

1. The emission behavior belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

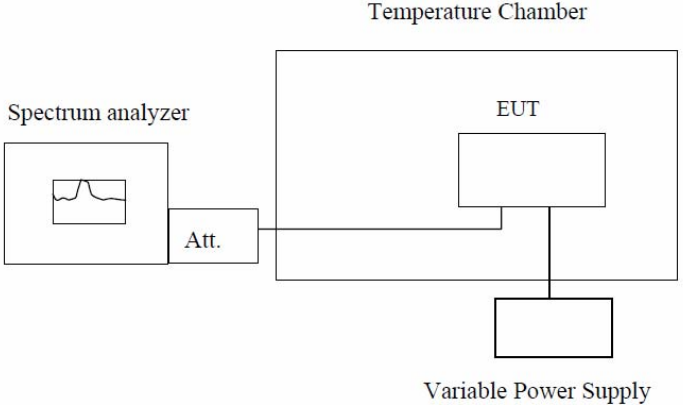
Test mode:	UMTS 1900 12.2k RMC		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3704.80	Vertical	-36.65	-13.00	Pass
5557.20	V	-49.68		
7409.60	V	-50.12		
9262.00	V	-51.65		
11114.40	V	-52.99		
12966.80	V	-53.87		
3704.80	Horizontal	-37.17	-13.00	Pass
5557.20	H	-48.74		
7409.60	H	-49.66		
9262.00	H	-51.47		
11114.40	H	-52.69		
12966.80	H	-53.74		
Test mode:	UMTS 1900 12.2k RMC		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3760.00	Vertical	-33.09	-13.00	Pass
5640.00	V	-49.66		
7520.00	V	-50.24		
9400.00	V	-51.02		
11280.00	V	-52.60		
13160.00	V	-53.08		
3760.00	Horizontal	-34.10	-13.00	Pass
5640.00	H	-41.61		
7520.00	H	-49.68		
9400.00	H	-50.14		
11280.00	H	-51.67		
13160.00	H	-52.77		

Test mode:	UMTS 1900 12.2k RMC		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3815.20	Vertical	-32.57	-13.00	Pass
5722.80	V	-48.57		
7630.40	V	-49.87		
9538.00	V	-50.24		
11445.60	V	-51.02		
13353.20	V	-52.09		
3815.20	Horizontal	-31.89	-13.00	Pass
5722.80	H	-49.65		
7630.40	H	-50.27		
9538.00	H	-51.78		
11445.60	H	-52.68		
13353.20	H	-53.98		

Remark :

1. The emission behavior belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

7.7 Frequency stability V.S. Temperature measurement

Test Requirement:	FCC Part2.1055(a)(1)(b)
Test Method:	FCC Part2.1055(a)(1)(b)
Limit:	2.5ppm
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°C operating frequency as reference frequency. 5. Turn EUT off and set the chamber temperature to –30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. 6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data

Reference Frequency: GSM850 Lowest channel=128 channel=824.2MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	44	0.053385	2.5	Pass
	-20	56	0.067945		
	-10	45	0.054598		
	0	38	0.046105		
	10	43	0.052172		
	20	35	0.042465		
	30	50	0.060665		
	40	38	0.046105		
	50	42	0.050959		
Reference Frequency: PCS1900 Lowest channel=512 channel=1850.2MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error			Result
		Hz	ppm		
3.70	-30	36	0.019457	2.5	Pass
	-20	47	0.025403		
	-10	55	0.029727		
	0	36	0.019457		
	10	42	0.022700		
	20	34	0.018376		
	30	40	0.021619		
	40	46	0.024862		
	50	45	0.024322		

Reference Frequency: EGPRS850 Lowest channel=128 channel=824.2MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	43	0.052172	2.5	Pass
	-20	51	0.061878		
	-10	44	0.053385		
	0	37	0.044892		
	10	40	0.048532		
	20	34	0.041252		
	30	47	0.057025		
	40	34	0.041252		
	50	41	0.049745		
Reference Frequency: EGPRS1900 Lowest channel=512 channel=1850.2MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error			Result
		Hz	ppm		
3.70	-30	34	0.018376	2.5	Pass
	-20	45	0.024322		
	-10	52	0.028105		
	0	34	0.018376		
	10	41	0.022160		
	20	32	0.017295		
	30	36	0.019457		
	40	42	0.022700		
	50	42	0.022700		

Reference Frequency: UMTS850 12.2k RMC Lowest channel=4132 channel=826.4MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	35	0.042352	2.5	Pass
	-20	57	0.068974		
	-10	28	0.033882		
	0	34	0.041142		
	10	47	0.056873		
	20	43	0.052033		
	30	39	0.047193		
	40	44	0.053243		
	50	46	0.055663		
Reference Frequency: UMTS1900 12.2k RMC Lowest channel=9262 channel=1852.4MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	38	0.020514	2.5	Pass
	-20	50	0.026992		
	-10	26	0.014036		
	0	37	0.019974		
	10	45	0.024293		
	20	43	0.023213		
	30	37	0.019974		
	40	45	0.024293		
	50	42	0.022673		

Reference Frequency: UMTS850 HSDPA Lowest channel=4132 channel=826.4MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	33	0.039932	2.5	Pass
	-20	44	0.053243		
	-10	29	0.035092		
	0	37	0.044773		
	10	40	0.048403		
	20	42	0.050823		
	30	34	0.041142		
	40	43	0.052033		
	50	40	0.048403		
Reference Frequency: UMTS1900 HSDPA Lowest channel=9262 channel=1852.4MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	38	0.020514	2.5	Pass
	-20	52	0.028072		
	-10	33	0.017815		
	0	35	0.018894		
	10	42	0.022673		
	20	44	0.023753		
	30	40	0.021594		
	40	41	0.022133		
	50	42	0.022673		

Reference Frequency: UMTS850 HSUPA Lowest channel=4132 channel=826.4MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	39	0.047193	2.5	Pass
	-20	48	0.058083		
	-10	32	0.038722		
	0	36	0.043562		
	10	41	0.049613		
	20	46	0.055663		
	30	37	0.044773		
	40	43	0.052033		
	50	44	0.053243		
Reference Frequency: UMTS1900 HSUPA Lowest channel=9262 channel=1852.4MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	32	0.017275	2.5	Pass
	-20	47	0.025372		
	-10	32	0.017275		
	0	31	0.016735		
	10	44	0.023753		
	20	42	0.022673		
	30	30	0.016195		
	40	44	0.023753		
	50	43	0.023213		

Reference Frequency: GSM850 Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	42	0.050203	2.5	Pass
	-20	53	0.063352		
	-10	37	0.044227		
	0	45	0.053789		
	10	43	0.051399		
	20	40	0.047813		
	30	42	0.050203		
	40	40	0.047813		
	50	43	0.051399		
Reference Frequency: PCS1900 Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error			Result
		Hz	ppm		
3.70	-30	43	0.022872	2.5	Pass
	-20	47	0.025000		
	-10	40	0.021277		
	0	35	0.018617		
	10	32	0.017021		
	20	36	0.019149		
	30	34	0.018085		
	40	41	0.021809		
	50	44	0.023404		

Reference Frequency: EGPRS850 Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	41	0.049008	2.5	Pass
	-20	52	0.062156		
	-10	36	0.043031		
	0	43	0.051399		
	10	41	0.049008		
	20	42	0.050203		
	30	43	0.051399		
	40	44	0.052594		
	50	41	0.049008		
Reference Frequency: EGPRS 1900 Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error			Result
		Hz	ppm		
3.70	-30	45	0.023936	2.5	Pass
	-20	43	0.022872		
	-10	42	0.022340		
	0	36	0.019149		
	10	33	0.017553		
	20	34	0.018085		
	30	36	0.019149		
	40	40	0.021277		
	50	43	0.022872		

Reference Frequency: UMTS850 12.2k RMC Middle channel=4183 channel=836MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	45	0.053828	2.5	Pass
	-20	42	0.050239		
	-10	41	0.049043		
	0	40	0.047847		
	10	48	0.057416		
	20	46	0.055024		
	30	38	0.045455		
	40	45	0.053828		
	50	41	0.049043		
Reference Frequency: UMTS1900 12.2k RMC Middle channel=9400 channel=1880MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	42	0.022340	2.5	Pass
	-20	51	0.027128		
	-10	42	0.022340		
	0	41	0.021809		
	10	50	0.026596		
	20	44	0.023404		
	30	30	0.015957		
	40	43	0.022872		
	50	40	0.021277		

Reference Frequency: UMTS850 HSDPA Middle channel=4183 channel=836MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	41	0.049043	2.5	Pass
	-20	49	0.058612		
	-10	43	0.051435		
	0	44	0.052632		
	10	51	0.061005		
	20	46	0.055024		
	30	37	0.044258		
	40	42	0.050239		
	50	42	0.050239		
Reference Frequency: UMTS1900 HSDPA Middle channel=9400 channel=1880MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	47	0.025000	2.5	Pass
	-20	51	0.027128		
	-10	42	0.022340		
	0	45	0.023936		
	10	56	0.029787		
	20	42	0.022340		
	30	41	0.021809		
	40	40	0.021277		
	50	43	0.022872		

Reference Frequency: UMTS850 HSUPA Middle channel=4183 channel=836MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	43	0.051435	2.5	Pass
	-20	51	0.061005		
	-10	42	0.050239		
	0	40	0.047847		
	10	51	0.061005		
	20	42	0.050239		
	30	32	0.038278		
	40	41	0.049043		
	50	40	0.047847		
Reference Frequency: UMTS1900 HSUPA Middle channel=9400 channel=1880MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	46	0.024468	2.5	Pass
	-20	41	0.021809		
	-10	42	0.022340		
	0	44	0.023404		
	10	48	0.025532		
	20	40	0.021277		
	30	34	0.018085		
	40	40	0.021277		
	50	41	0.021809		

Reference Frequency: GSM850 Highest channel=251 channel=848.8 MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	35	0.041235	2.5	Pass
	-20	57	0.067154		
	-10	30	0.035344		
	0	42	0.049482		
	10	39	0.045947		
	20	37	0.043591		
	30	33	0.038878		
	40	36	0.042413		
	50	29	0.034166		
Reference Frequency: PCS1900 Highest channel=810 channel=1909.8MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error			Result
		Hz	ppm		
3.70	-30	35	0.018327	2.5	Pass
	-20	44	0.023039		
	-10	45	0.023563		
	0	44	0.023039		
	10	38	0.019897		
	20	35	0.018327		
	30	33	0.017279		
	40	27	0.014138		
	50	32	0.016756		

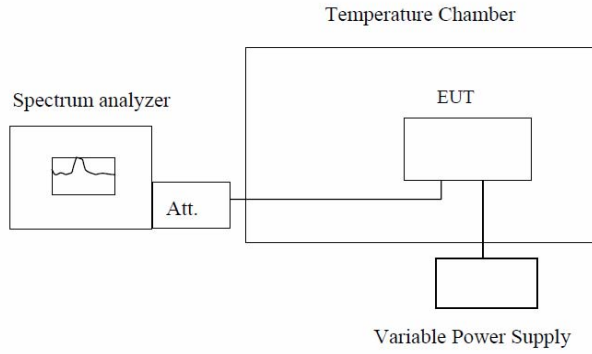
Reference Frequency: EGPRS850 Highest channel=251 channel=848.8 MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	31	0.036522	2.5	Pass
	-20	51	0.060085		
	-10	34	0.040057		
	0	43	0.050660		
	10	40	0.047125		
	20	38	0.044769		
	30	32	0.037700		
	40	37	0.043591		
	50	30	0.035344		
Reference Frequency: EGPRS1900 Highest channel=810 channel=1909.8MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error			Result
		Hz	ppm		
3.70	-30	32	0.016756	2.5	Pass
	-20	44	0.023039		
	-10	43	0.022515		
	0	41	0.021468		
	10	39	0.020421		
	20	34	0.017803		
	30	31	0.016232		
	40	28	0.014661		
	50	33	0.017279		

Reference Frequency: UMTS 850 12.2k RMC Highest channel=4233 channel=846.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	38	0.044885	2.5	Pass
	-20	47	0.055516		
	-10	43	0.050791		
	0	47	0.055516		
	10	45	0.053154		
	20	42	0.049610		
	30	36	0.042523		
	40	40	0.047248		
	50	35	0.041342		
Reference Frequency: UMTS 190012.2k RMC Highest channel=9538 channel=1907.60MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	34	0.017823	2.5	Pass
	-20	42	0.022017		
	-10	43	0.022541		
	0	40	0.020969		
	10	40	0.020969		
	20	44	0.023066		
	30	37	0.019396		
	40	42	0.022017		
	50	36	0.018872		

Reference Frequency: UMTS 850 HSDPA Highest channel=4233 channel=846.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	33	0.038979	2.5	Pass
	-20	44	0.051973		
	-10	44	0.051973		
	0	44	0.051973		
	10	42	0.049610		
	20	45	0.053154		
	30	35	0.041342		
	40	42	0.049610		
	50	31	0.036617		
Reference Frequency: UMTS 1900 HSDPA Highest channel=9538 channel=1907.60MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	31	0.016251	2.5	Pass
	-20	42	0.022017		
	-10	41	0.021493		
	0	42	0.022017		
	10	42	0.022017		
	20	40	0.020969		
	30	35	0.018348		
	40	44	0.023066		
	50	38	0.019920		

Reference Frequency: UMTS 850 HSUPA Highest channel=4233 channel=846.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	31	0.036617	2.5	Pass
	-20	42	0.049610		
	-10	45	0.053154		
	0	43	0.050791		
	10	45	0.053154		
	20	42	0.049610		
	30	38	0.044885		
	40	42	0.049610		
	50	37	0.043704		
Reference Frequency: UMTS 1900 HSUPA Highest channel=9538 channel=1907.60MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.70	-30	33	0.017299	2.5	Pass
	-20	40	0.020969		
	-10	42	0.022017		
	0	40	0.020969		
	10	41	0.021493		
	20	40	0.020969		
	30	36	0.018872		
	40	42	0.022017		
	50	38	0.019920		

7.8 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°C. 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
Test results:	Passed

Measurement Data

Reference Frequency: GSM850 Lowest channel=128 channel=824.2MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	39	0.047319	2.5	Pass
	3.70	38	0.046105		
	3.40	40	0.048532		
Reference Frequency: PCS1900 Lowest channel=512 channel=1850.2MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	50	0.027024	2.5	Pass
	3.70	36	0.019457		
	3.40	37	0.019998		
Reference Frequency: UMTS 850 12.2k RMC Lowest channel=4132 channel=826.4MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	44	0.053243	2.5	Pass
	3.70	35	0.042352		
	3.40	36	0.043562		
Reference Frequency: UMTS 1900 12.2k RMC Lowest channel=9262 channel=1852.40MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	44	0.023753	2.5	Pass
	3.70	33	0.017815		
	3.40	39	0.021054		

Reference Frequency: UMTS 850 HSDPA Lowest channel=4132 channel=826.4MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	45	0.054453	2.5	Pass
	3.70	37	0.044773		
	3.40	36	0.043562		
Reference Frequency: UMTS 1900 HSDPA Lowest channel=9262 channel=1852.40MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	50	0.026992	2.5	Pass
	3.70	34	0.018355		
	3.40	33	0.017815		
Reference Frequency: UMTS 850 HSUPA Lowest channel=4132 channel=826.4MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	47	0.056873	2.5	Pass
	3.70	35	0.042352		
	3.40	36	0.043562		
Reference Frequency: UMTS 1900 HSUPA Lowest channel=9262 channel=1852.40MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	47	0.025372	2.5	Pass
	3.70	30	0.016195		
	3.40	35	0.018894		

Reference Frequency: GSM850 Middle channel=190 channel=836.6MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	36	0.043031	2.5	Pass
	3.70	37	0.044227		
	3.40	46	0.054984		
Reference Frequency: PCS1900 Middle channel=661 channel=1880MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	42	0.022340	2.5	Pass
	3.70	51	0.027128		
	3.40	45	0.023936		
Reference Frequency: UMTS 850 12.2k RMC Middle channel=4183 channel=836MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	33	0.039474	2.5	Pass
	3.70	46	0.055024		
	3.40	34	0.040670		
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	44	0.023404	2.5	Pass
	3.70	45	0.023936		
	3.40	34	0.018085		

Reference Frequency: UMTS 850 HSDPA Middle channel=4183 channel=836MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	37	0.044258	2.5	Pass
	3.70	44	0.052632		
	3.40	30	0.035885		
Reference Frequency: UMTS 1900 HSDPA Middle channel=9400 channel=1880MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	41	0.021809	2.5	Pass
	3.70	46	0.024468		
	3.40	35	0.018617		
Reference Frequency: UMTS 850 HSUPA Middle channel=4183 channel=836MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	33	0.039474	2.5	Pass
	3.70	46	0.055024		
	3.40	35	0.041866		
Reference Frequency: UMTS 1900 HSUPA Middle channel=9400 channel=1880MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	41	0.021809	2.5	Pass
	3.70	45	0.023936		
	3.40	33	0.017553		

Reference Frequency: GSM850 Highest channel=251 channel=848.8MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	35	0.041235	2.5	Pass
	3.70	37	0.043591		
	3.40	33	0.038878		
Reference Frequency: PCS1900 Highest channel=810 channel=1909.8MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	32	0.016756	2.5	Pass
	3.70	49	0.025657		
	3.40	45	0.023563		
Reference Frequency: 12.2k RMC UMTS 850 12.2k RMC Highest channel=4233 channel=846.6MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	41	0.048429	2.5	Pass
	3.70	35	0.041342		
	3.40	40	0.047248		
Reference Frequency: UMTS 1900 12.2k RMC Highest channel=9538 channel=1907.60MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	36	0.018872	2.5	Pass
	3.70	37	0.019396		
	3.40	40	0.020969		

Reference Frequency: UMTS 850 HSDPA Highest channel=4233 channel=846.6MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	39	0.046067	2.5	Pass
	3.70	44	0.051973		
	3.40	40	0.047248		
Reference Frequency: UMTS 1900 HSDPA Highest channel=9538 channel=1907.60MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	37	0.019396	2.5	Pass
	3.70	36	0.018872		
	3.40	41	0.021493		
Reference Frequency: UMTS 850 HSUPA Highest channel=4233 channel=846.6MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	40	0.047248	2.5	Pass
	3.70	44	0.051973		
	3.40	47	0.055516		
Reference Frequency: UMTS 1900 HSUPA Highest channel=9538 channel=1907.60MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.25	36	0.018872	2.5	Pass
	3.70	32	0.016775		
	3.40	44	0.023066		