

FCC RF Test Report

APPLICANT : D-Link Corporation
EQUIPMENT : Le Petit HSPA+ router
BRAND NAME : D-Link
MODEL NAME : DWR-710
FCC ID : KA2WR710A1
STANDARD : FCC 47 CFR Part 2, 22(H), 24(E), 27(L)
CLASSIFICATION : PCS Licensed Transmitter (PCB)
Tx/Rx FREQUENCY RANGE : GSM850 : 824.2 ~ 848.8 MHz /
869.2 ~ 893.8 MHz
GSM1900 : 1850.2 ~ 1909.8 MHz /
1930.2 ~ 1989.8 MHz
WCDMA Band V : 826.4 ~ 846.6 MHz /
871.4 ~ 891.6 MHz
WCDMA Band IV : 1712.4 MHz ~ 1752.6 MHz
2112.4 MHz ~ 2152.6 MHz
WCDMA Band II : 1852.4 ~ 1907.6 MHz /
1932.4 ~ 1987.6 MHz
MAX. ERP/EIRP POWER : GSM850 (GPRS 8) : 1.7458 W
GSM850 (EDGE 8) : 0.4406 W
GSM1900 (GPRS 8) : 0.8570 W
GSM1900 (EDGE 8) : 0.5794 W
WCDMA Band V (RMC 12.2Kbps) : 0.1542 W
WCDMA Band IV (RMC 12.2Kbps) : 0.1445 W
WCDMA Band II (RMC 12.2Kbps) : 0.1422 W

The product was received on Feb. 09, 2012 and completely tested on May 20, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI / TIA / EIA-603-C-2004 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

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FCC ID : KA2WR710A1

Page Number : 1 of 105

Report Issued Date : May 25, 2012

Report Version : Rev. 01

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG220933-01	Rev. 01	Initial issue of report	May 25, 2012

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	§2.1046	N/A	Conducted Output Power	N/A	PASS	-
3.2	§22.913(a)(2)	RSS-132(4.4) SRSP-503(5.1.3)	Effective Radiated Power	< 7 Watts	PASS	-
3.2	§24.232(c)	RSS-133 (6.4) SRSP-510(5.1.2)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
3.2	§27.50(d)(4)	RSS-139 (6.4) SRSP-513(5.1.2)	Equivalent Isotropic Radiated Power	< 1 Watts	PASS	-
3.2	§24.232(d) §27.50(d)(5)	N/A	Peak-to-Average Ratio	< 13 dB	PASS	-
3.3	§2.1049 §22.917(a) §24.238(a) §27.53(g)	N/A	Occupied Bandwidth	N/A	PASS	-
3.4	§2.1051 §22.917(a) §24.238(a) §27.53(g)	RSS-132 (4.5.1) RSS-133 (6.5.1) RSS-139 (6.5)	Band Edge Measurement	< 43+10log10(P[Watts])	PASS	-
3.5	§2.1051 §22.917(a) §24.238(a) §27.53(g)	RSS-132 (4.5.1) RSS-133 (6.5.1) RSS-139 (6.5)	Conducted Emission	< 43+10log10(P[Watts])	PASS	-
3.6	§2.1053 §22.917(a) §24.238(a) §27.53(g)	RSS-132 (4.5.1) RSS-133 (6.5.1) RSS-139 (6.5)	Field Strength of Spurious Radiation	< 43+10log10(P[Watts])	PASS	Under limit 15.00 dB at 15040.000 MHz
3.7	§2.1055 §22.355 §24.235 §27.54	RSS-132 (4.3) RSS-133 (6.3) RSS-139 (6.3)	Frequency Stability for Temperature & Voltage	< 2.5 ppm	PASS	-



1 General Description

1.1 Applicant

D-Link Corporation

No. 289, Sinhu 3rd Rd., Neihu District, Taipei City 114, Taiwan

1.2 Manufacturer

AzureWave Technologies, Inc.

8F., No. 94, Baozhong Rd., Xindian, Taipei Taiwan 231

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Le Petit HSPA+ router
Brand Name	D-Link
Model Name	DWR-710
FCC ID	KA2WR710A1
Tx Frequency	GSM850 : 824 MHz ~ 849 MHz GSM1900 : 1850 MHz ~ 1910 MHz WCDMA Band V : 824 MHz ~ 849 MHz WCDMA Band IV : 1710 MHz ~ 1755 MHz WCDMA Band II : 1850 MHz ~ 1910 MHz
Rx Frequency	GSM850 : 869 MHz ~ 894 MHz GSM1900 : 1930 MHz ~ 1990 MHz WCDMA Band V : 869 MHz ~ 894 MHz WCDMA Band IV : 2110 MHz ~ 2155 MHz WCDMA Band II : 1930 MHz ~ 1990 MHz
Maximum Output Power to Antenna	GSM850 : 32.73 dBm GSM1900 : 29.27 dBm WCDMA Band V : 22.50 dBm WCDMA Band IV : 21.37 dBm WCDMA Band II : 22.40 dBm
Antenna Type	Fixed Internal Antenna
HW Version	A1
SW Version	v1.00
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK WCDMA: QPSK (Uplink) HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink)
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Emission Designator and Maximum ERP/EIRP Power

FCC Rule	System	Type of Modulation	Emission Designator	Maximum ERP/EIRP
Part 22	GSM850 GPRS 8	GMSK	248KGXW	1.7458 W
Part 22	GSM850 EDGE 8	GMSK / 8PSK	250KG7W	0.4406 W
Part 22	WCDMA Band V RMC 12.2Kbps	QPSK	4M18F9W	0.1542 W
Part 24	GSM1900 GPRS 8	GMSK	250KGXW	0.8570 W
Part 24	GSM1900 EDGE 8	GMSK / 8PSK	246KG7W	0.5794 W
Part 24	WCDMA Band II RMC 12.2Kbps	QPSK	4M20F9W	0.1422 W
Part 27	WCDMA Band IV RMC 12.2Kbps	QPSK	4M20F9W	0.1445 W

1.5 Testing Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	TH02-HY	03CH05-HY	722060/4086B-1

1.6 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ Preliminary Guidance for Receiving Applications for Certification of 3G Device. May 9, 2006.
- ♦ FCC 47 CFR Part 2, 22(H), 24(E), 27(L)
- ♦ ANSI / TIA / EIA-603-C-2004
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v01
- ♦ IC RSS-132 Issue 2
- ♦ IC RSS-133 Issue 5
- ♦ IC RSS-139 Issue 2

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

1.7 Ancillary Equipment List

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU200	N/A	N/A	Unshielded, 1.8 m
2.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

2 Test Configuration of Equipment Under Test

2.1 Test Mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range.

Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 9000 MHz for GSM850 and WCDMA Band V.
2. 30 MHz to 18000 MHz for WCDMA Band IV.
3. 30 MHz to 19000 MHz for GSM1900 and WCDMA Band II.

Test Modes		
Band	Radiated TCs	Conducted TCs
GSM 850	■ GPRS 8 Link ■ EDGE 8 Link	■ GPRS 8 Link ■ EDGE 8 Link
GSM 1900	■ GPRS 8 Link ■ EDGE 8 Link	■ GPRS 8 Link ■ EDGE 8 Link
WCDMA Band V	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link
WCDMA Band IV	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link
WCDMA Band II	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link

Note:

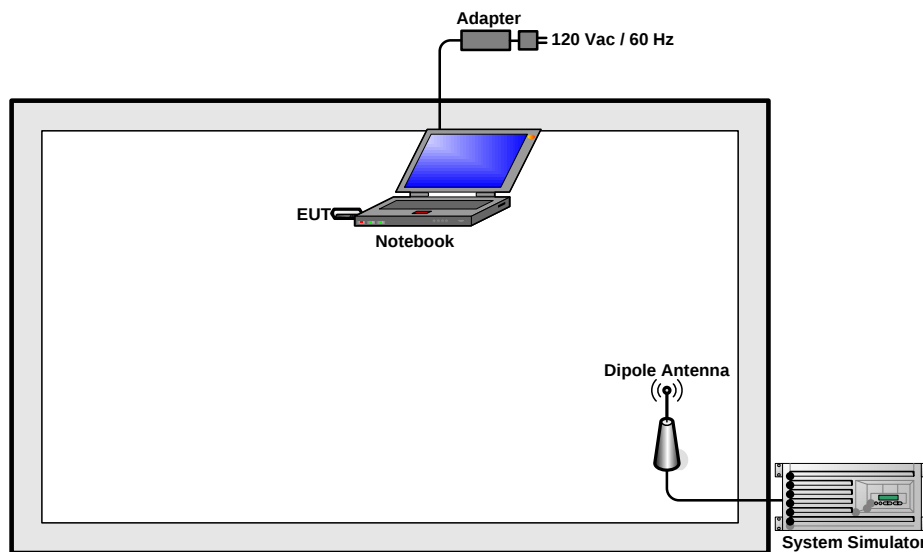
1. The maximum power levels are GPRS multi-slot class 8 mode for GMSK link, EDGE multi-slot class 8 mode for 8PSK link, RMC 12.2Kbps mode for WCDMA band V, RMC 12.2Kbps mode for WCDMA band IV, and RMC 12.2Kbps mode for WCDMA band II, only these modes were used for all tests.
2. Because there are individual antennas for each WWAN, and WLAN, the co-location test modes are not required.

The conducted power tables are as follows:

Conducted Power (*Unit: dBm)						
Band	GSM850			GSM1900		
Channel	128	189	251	512	661	810
Frequency	824.2	836.4	848.8	1850.2	1880	1909.8
GPRS 8	32.73	32.64	32.67	29.16	29.27	29.23
GPRS 10	31.09	31.00	31.04	26.14	26.23	26.32
GPRS 12	28.12	28.04	28.04	23.08	23.16	23.28
EGPRS 8	26.72	26.65	26.69	27.06	27.03	27.05
EGPRS 10	26.72	26.65	26.68	25.17	25.27	25.37
EGPRS 12	24.74	24.68	24.71	21.26	21.39	21.45

Conducted Power (*Unit: dBm)									
Band	WCDMA Band V			WCDMA Band II			WCDMA Band IV		
Tx Channel	4132	4182	4233	9262	9400	9538	1312	1413	1513
Rx Channel	4357	4408	4458	9662	9800	9938	1537	1638	1738
Frequency	826.4	836.4	846.6	1852.4	1880	1907.6	1712.4	1732.6	1752.6
RMC 12.2K	22.27	22.24	22.50	21.25	21.37	21.32	22.16	22.40	22.38
HSDPA Subtest-1	21.63	21.67	21.73	20.95	21.14	21.10	21.11	21.55	21.47
HSDPA Subtest-2	21.53	21.61	21.64	21.04	21.19	21.13	21.21	21.52	21.47
HSDPA Subtest-3	21.03	21.14	21.16	20.53	20.70	20.63	20.72	21.04	20.97
HSDPA Subtest-4	21.01	21.14	21.18	20.54	20.69	20.62	20.71	21.05	20.98
HSUPA Subtest-1	21.52	21.47	21.70	21.06	21.23	21.16	21.47	21.96	21.68
HSUPA Subtest-2	19.41	19.35	19.50	19.00	19.25	19.18	19.47	20.02	19.82
HSUPA Subtest-3	20.36	20.23	20.47	20.15	20.27	20.24	20.53	21.02	20.86
HSUPA Subtest-4	19.31	19.28	19.46	19.10	19.13	19.18	19.53	20.01	19.80
HSUPA Subtest-5	21.36	21.34	21.41	20.98	20.72	20.99	20.94	21.43	21.33

2.2 Connection Diagram of Test System



3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals shall be reported.

3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The transmitter output port was connected to base station.
2. Set EUT at maximum power through base station.
3. Select lowest, middle, and highest channels for each band and different modulation.

3.1.4 Test Setup



3.1.5 Test Result of Conducted Output Power

Cellular Band									
Modes	GSM850 (GPRS 8)			GSM850 (EDGE 8)			WCDMA Band V (RMC 12.2Kbps)		
Channel	128 (Low)	189 (Mid)	251 (High)	128 (Low)	189 (Mid)	251 (High)	4132 (Low)	4182 (Mid)	4233 (High)
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8	826.4	836.4	846.6
Conducted Power (dBm)	32.73	32.64	32.67	26.72	26.65	26.69	22.27	22.24	22.50
Conducted Power (Watts)	1.87	1.84	1.85	0.47	0.46	0.47	0.17	0.17	0.18

PCS Band									
Modes	GSM1900 (GPRS 8)			GSM1900 (EDGE 8)			WCDMA Band II (RMC 12.2Kbps)		
Channel	512 (Low)	661 (Mid)	810 (High)	512 (Low)	661 (Mid)	810 (High)	9262 (Low)	9400 (Mid)	9538 (High)
Frequency (MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8	1852.4	1880	1907.6
Conducted Power (dBm)	29.16	29.27	29.23	27.06	27.03	27.05	21.25	21.37	21.32
Conducted Power (Watts)	0.82	0.85	0.84	0.51	0.50	0.51	0.13	0.14	0.14

AWS Band			
Modes	WCDMA Band IV (RMC 12.2Kbps)		
Channel	1312(Low)	1413 (Mid)	1513 (High)
Frequency (MHz)	1712.4	1732.6	1752.6
Conducted Power (dBm)	22.16	22.40	22.38
Conducted Power (Watts)	0.16	0.17	0.17

3.2 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

3.2.1 Description of the ERP/EIRP Measurement

The substitution method, in ANSI / TIA / EIA-603-C-2004, was used for ERP/EIRP measurement, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v01. The ERP of mobile transmitters must not exceed 7 Watts and the EIRP of mobile transmitters are limited to 2 Watts.

3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The EUT was placed on a turntable with 1.0 meter height in a fully anechoic chamber.
2. The EUT was set at 1.2 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiated power.
4. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
5. Taking the record of maximum ERP/EIRP.
6. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
7. The conducted power at the terminal of the dipole antenna is measured.
8. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
9. $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$

P_s (dBm) : Input power to substitution antenna.

G_s (dBi or dBd) : Substitution antenna Gain.

$E_t = R_t + AF$

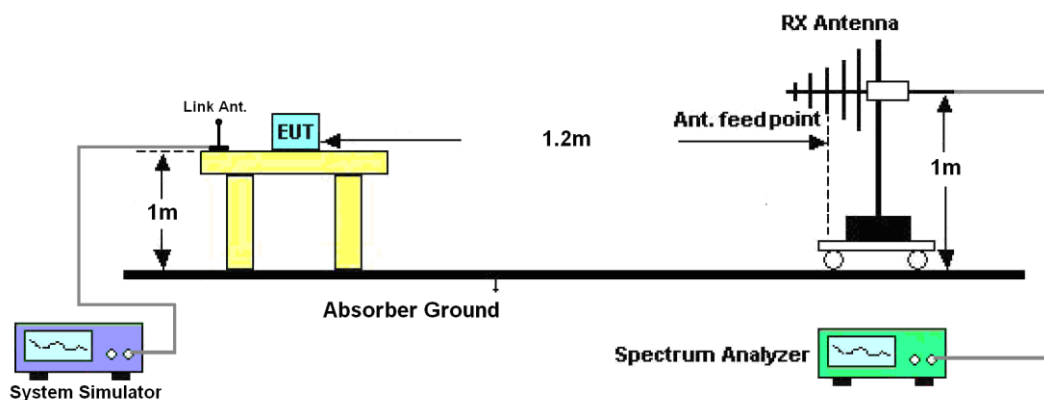
$E_s = R_s + AF$

AF (dB/m) : Receive antenna factor

R_t : The highest received signal in spectrum analyzer for EUT.

R_s : The highest received signal in spectrum analyzer for substitution antenna.

3.2.4 Test Setup



3.2.5 Test Result of ERP

GSM850 (GPRS 8) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-14.62	-48.12	0.00	-1.08	32.42	1.7458
836.40	-16.12	-48.28	0.00	-0.93	31.23	1.3274
848.80	-16.26	-48.35	0.00	-0.76	31.33	1.3583
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-15.98	-47.97	0.00	-1.08	30.91	1.2331
836.40	-16.52	-48.01	0.00	-0.93	30.56	1.1376
848.80	-16.97	-48.05	0.00	-0.76	30.32	1.0765

GSM850 (EDGE 8) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-21.02	-48.12	0.00	-1.08	26.02	0.3999
836.40	-20.91	-48.28	0.00	-0.93	26.44	0.4406
848.80	-21.26	-48.35	0.00	-0.76	26.33	0.4295
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-22.15	-47.97	0.00	-1.08	24.74	0.2979
836.40	-22.10	-48.01	0.00	-0.93	24.98	0.3148
848.80	-22.58	-48.05	0.00	-0.76	24.71	0.2958



WCDMA Band V (RMC 12.2Kbps) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
826.40	-25.87	-48.12	0.00	-1.08	21.17	0.1309
836.40	-25.47	-48.28	0.00	-0.93	21.88	0.1542
846.60	-25.83	-48.35	0.00	-0.76	21.76	0.1500
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
826.40	-26.92	-47.97	0.00	-1.08	19.97	0.0993
836.40	-26.68	-48.01	0.00	-0.93	20.40	0.1096
846.60	-26.97	-48.05	0.00	-0.76	20.32	0.1076

3.2.6 Test Result of EIRP

GSM1900 (GPRS 8) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-26.02	-51.88	0.00	1.96	27.82	0.6053
1880.00	-27.77	-52.99	0.00	2.00	27.22	0.5272
1909.80	-29.75	-54.28	0.00	1.98	26.51	0.4477
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-25.02	-52.13	0.00	1.96	29.07	0.8072
1880.00	-25.84	-53.17	0.00	2.00	29.33	0.8570
1909.80	-27.32	-54.13	0.00	1.98	28.79	0.7568

GSM1900 (EDGE 8) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-28.11	-51.88	0.00	1.96	25.73	0.3741
1880.00	-29.77	-52.99	0.00	2.00	25.22	0.3327
1909.80	-31.35	-54.28	0.00	1.98	24.91	0.3097
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-26.91	-52.13	0.00	1.96	27.18	0.5224
1880.00	-27.54	-53.17	0.00	2.00	27.63	0.5794
1909.80	-28.98	-54.13	0.00	1.98	27.13	0.5164

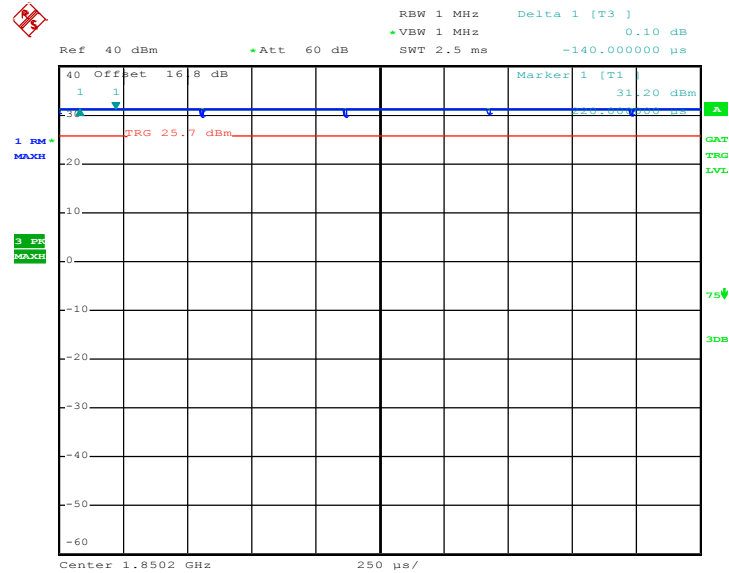
WCDMA Band IV (RMC 12.2Kbps) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1712.4	-34.60	-51.88	0.00	1.96	19.24	0.0839
1732.6	-35.98	-52.99	0.00	2.00	19.01	0.0796
1752.6	-35.63	-54.28	0.00	1.98	20.63	0.1156
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1712.4	-33.74	-52.13	0.00	1.96	20.35	0.1084
1732.6	-34.87	-53.17	0.00	2.00	20.30	0.1072
1752.6	-34.51	-54.13	0.00	1.98	21.60	0.1445

WCDMA Band II (RMC 12.2Kbps) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1852.40	-34.54	-51.88	0.00	1.96	19.30	0.0851
1880.00	-35.77	-52.99	0.00	2.00	19.22	0.0836
1907.60	-37.06	-54.28	0.00	1.98	19.20	0.0832
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1852.40	-33.39	-52.13	0.00	1.96	20.70	0.1175
1880.00	-33.64	-53.17	0.00	2.00	21.53	0.1422
1907.60	-34.59	-54.13	0.00	1.98	21.52	0.1419

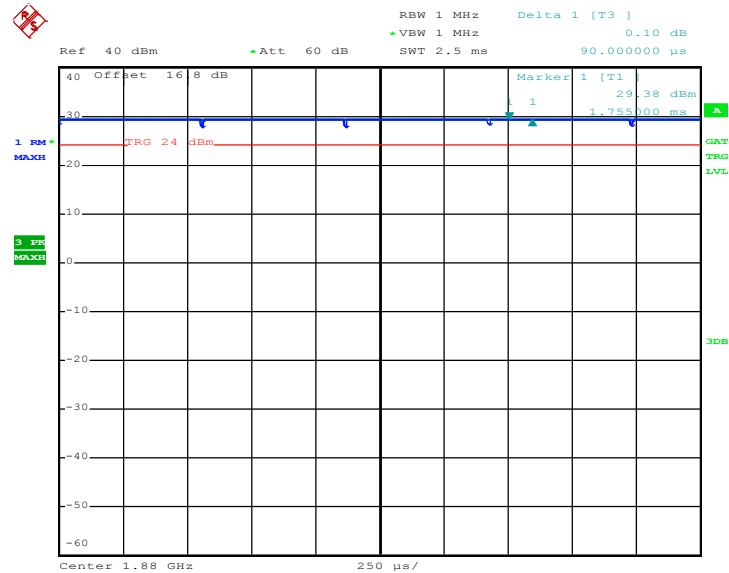


3.2.7 Peak to Average Power Ratio

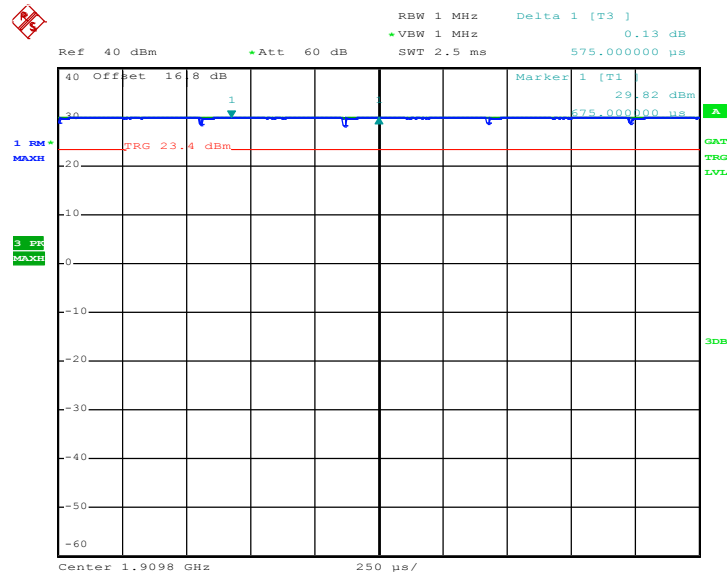
GSM1900 (GPRS 8) C.C.D.F.



Date: 29.FEB.2012 20:02:07

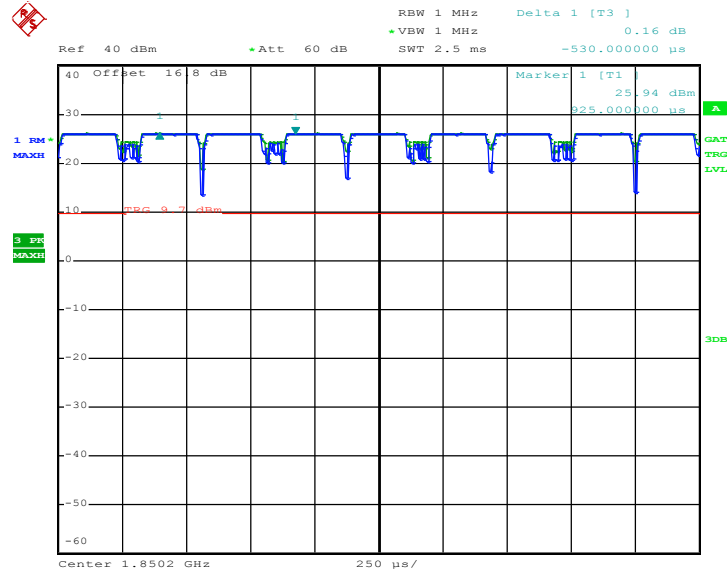


Date: 29.FEB.2012 19:53:36

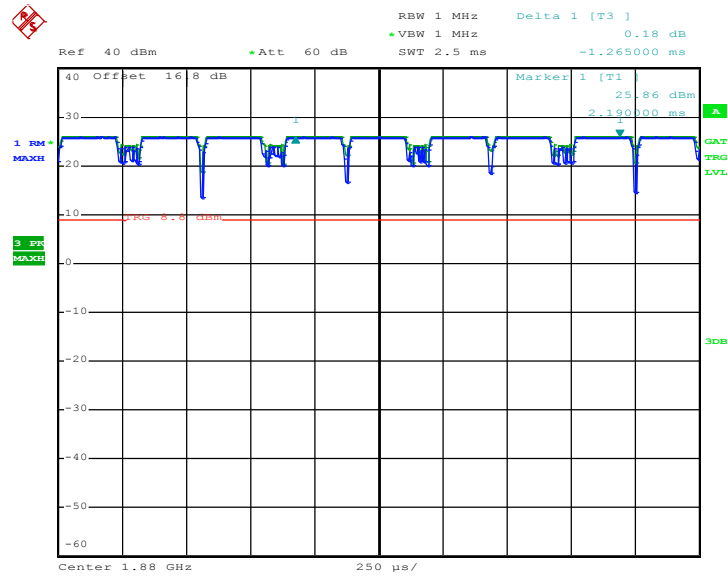


Date: 29.FEB.2012 20:07:16

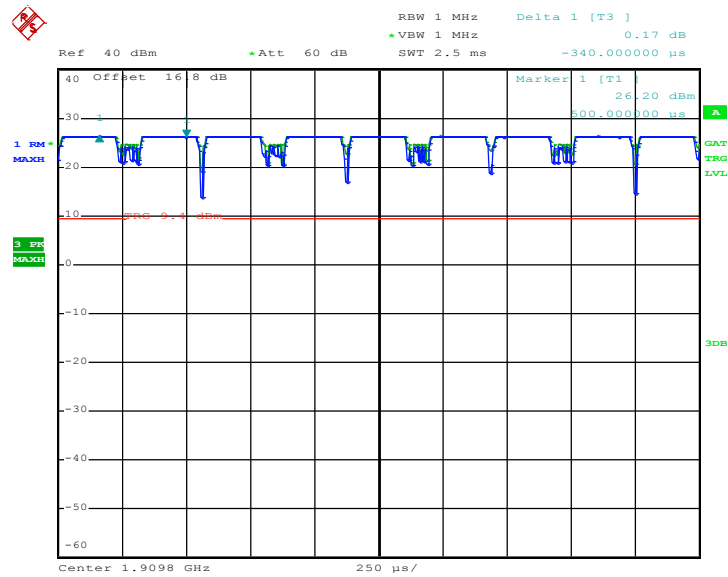
GSM1900 (EDGE 8) C.C.D.F.



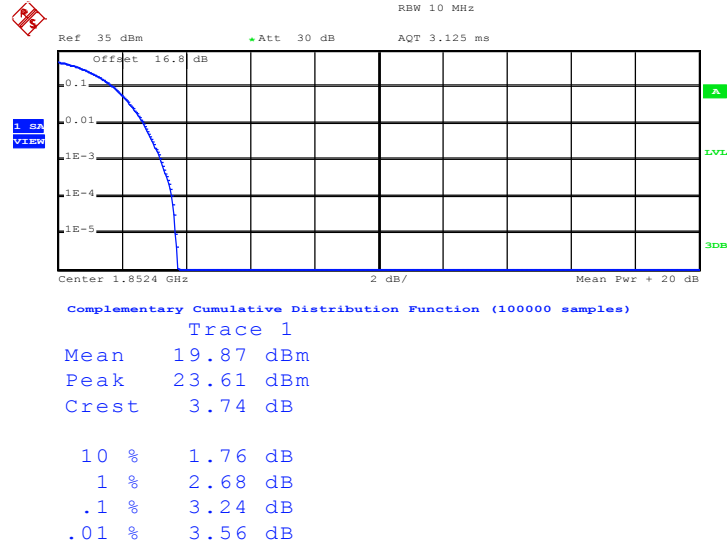
Date: 29.FEB.2012 19:24:11



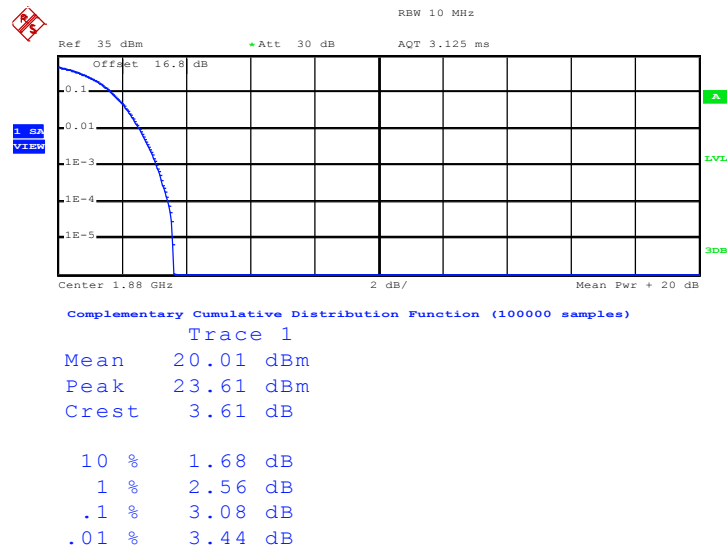
Date: 29.FEB.2012 19:17:51



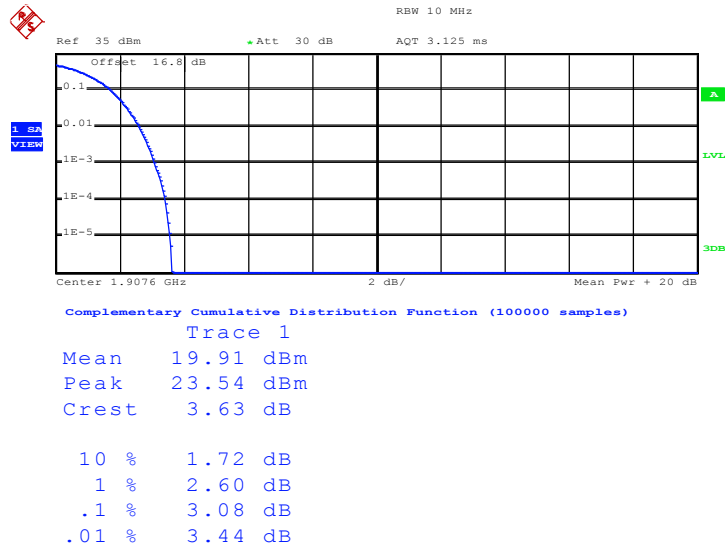
Date: 29.FEB.2012 19:36:48

WCDMA Band II (RMC 12.2Kbps) C.C.D.F.


Date: 29.FEB.2012 20:42:00

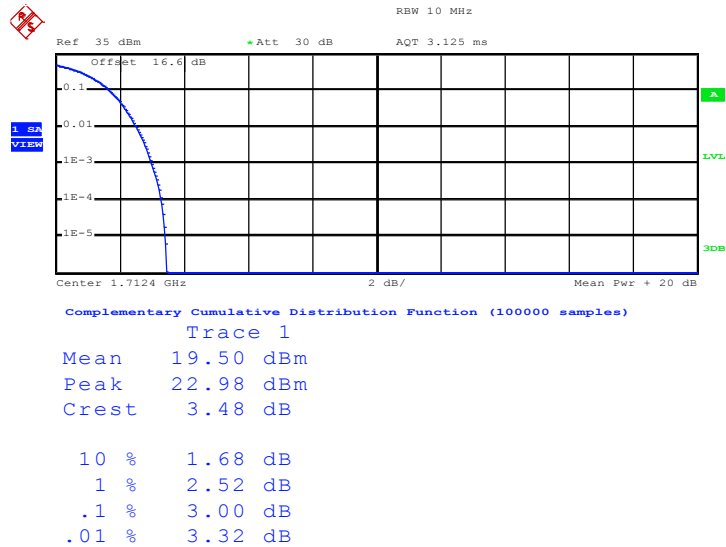


Date: 29.FEB.2012 20:41:10

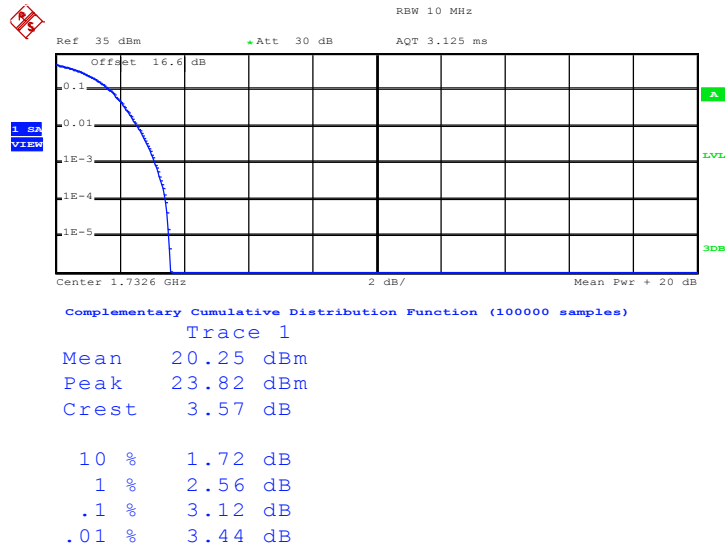


Date: 29.FEB.2012 20:40:44

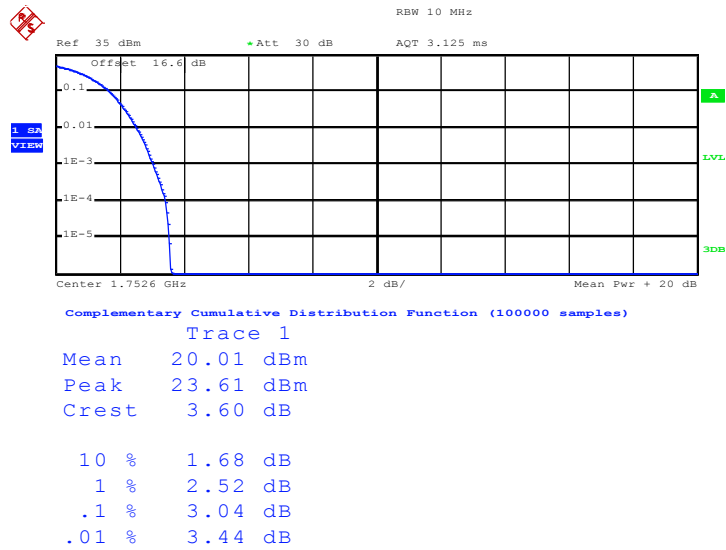
WCDMA Band IV (RMC 12.2Kbps) C.C.D.F.



Date: 29.FEB.2012 20:56:10



Date: 29.FEB.2012 20:56:44



Date: 29.FEB.2012 20:57:18

3.3 Occupied Bandwidth Measurement

3.3.1 Description of Occupied Bandwidth Measurement

The emission bandwidth is defined as the width of the signal between two points, located at the 2 sides of the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

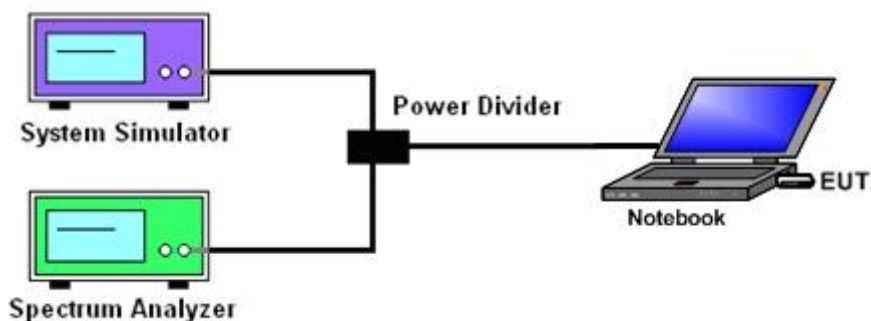
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

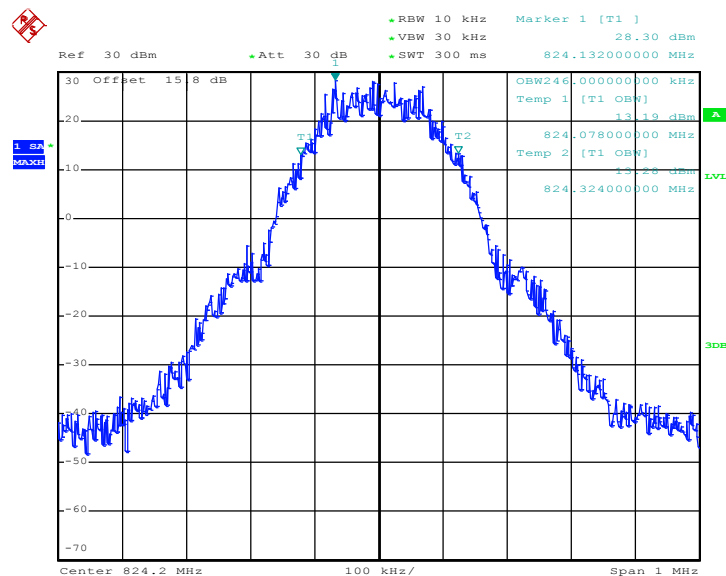
1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers were measured.

3.3.4 Test Setup

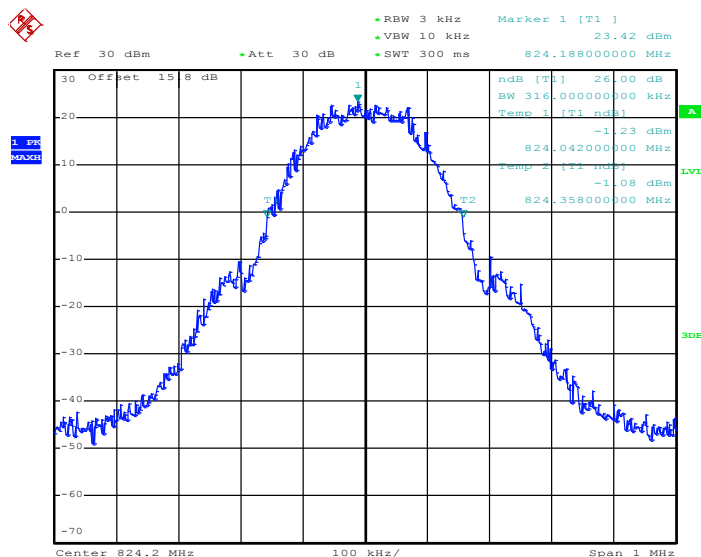


3.3.5 Test Result (Plots) of Occupied Bandwidth

Band :	GSM 850	Power Stage :	High
Test Mode :	GPRS 8 Link		

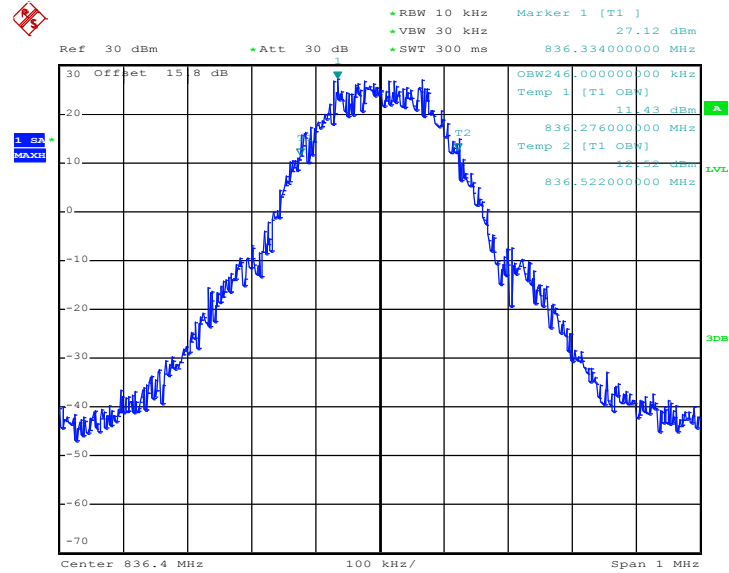
99% Occupied Bandwidth Plot on Channel 128


Date: 29.FEB.2012 17:10:40

26dB Bandwidth Plot on Channel 128


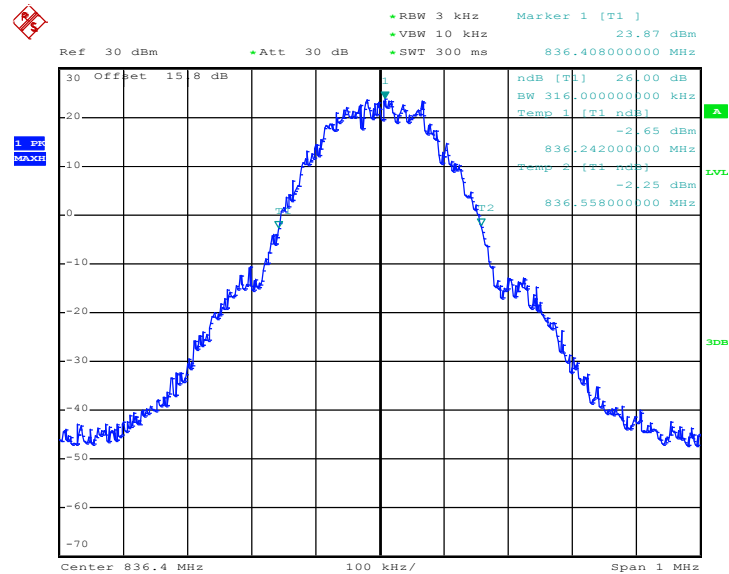
Date: 29.FEB.2012 17:09:21

99% Occupied Bandwidth Plot on Channel 189



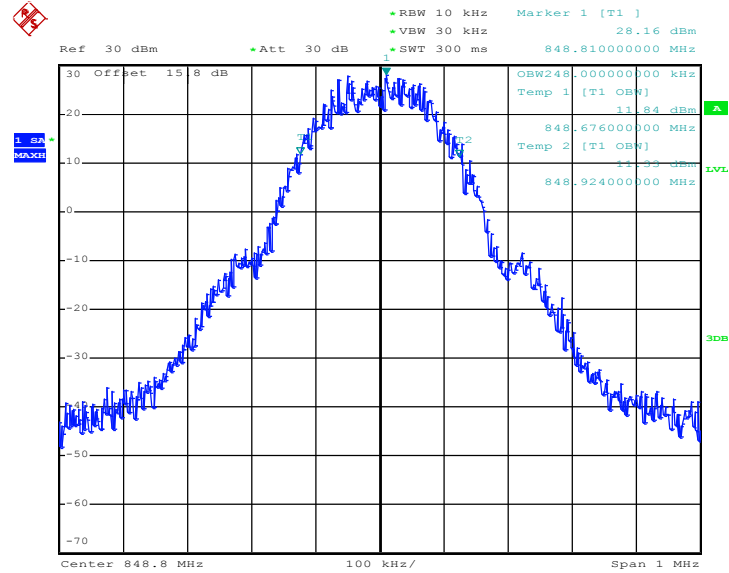
Date: 29.FEB.2012 17:11:06

26dB Bandwidth Plot on Channel 189



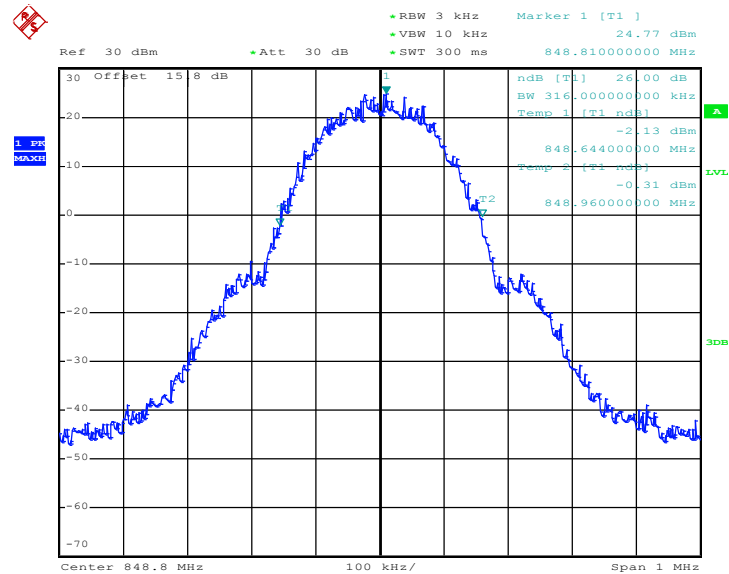
Date: 29.FEB.2012 17:09:47

99% Occupied Bandwidth Plot on Channel 251



Date: 29.FEB.2012 17:11:32

26dB Bandwidth Plot on Channel 251

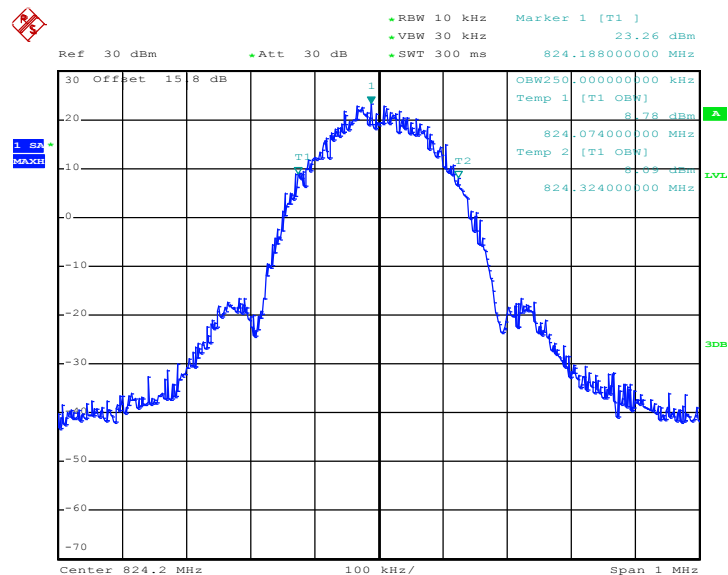


Date: 29.FEB.2012 17:10:13



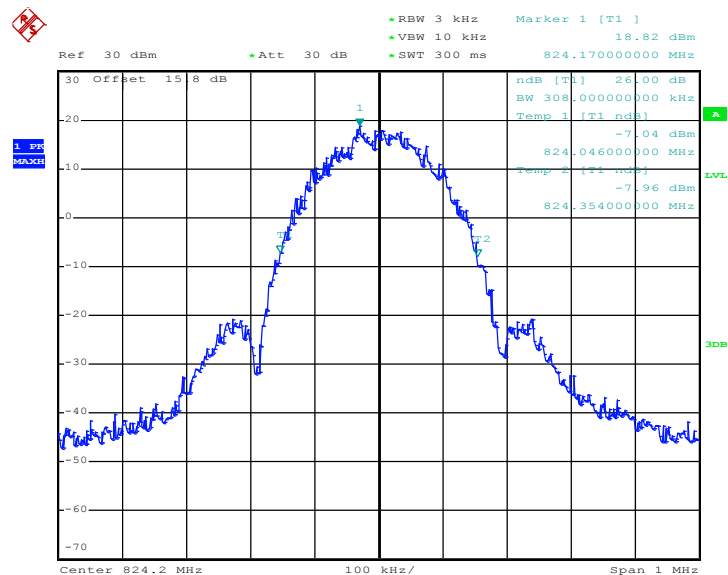
Band :	GSM 850	Power Stage :	High
Test Mode :	EDGE 8 Link		

99% Occupied Bandwidth Plot on Channel 128



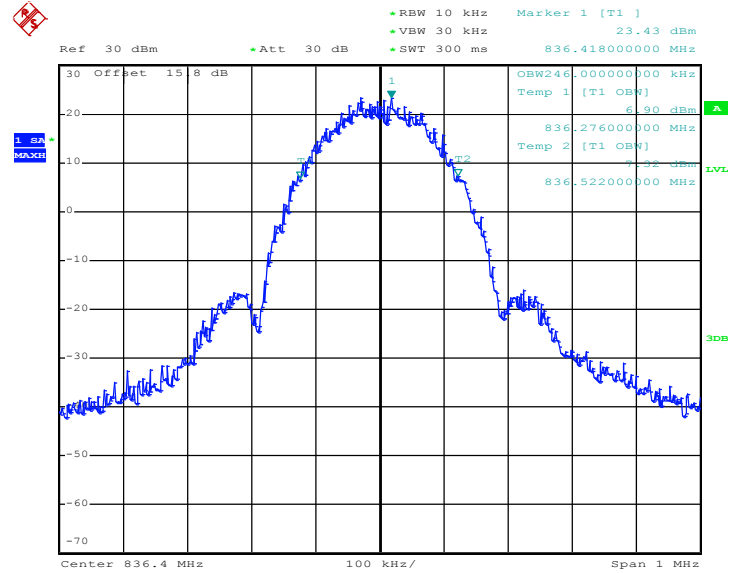
Date: 29.FEB.2012 18:58:03

26dB Bandwidth Plot on Channel 128



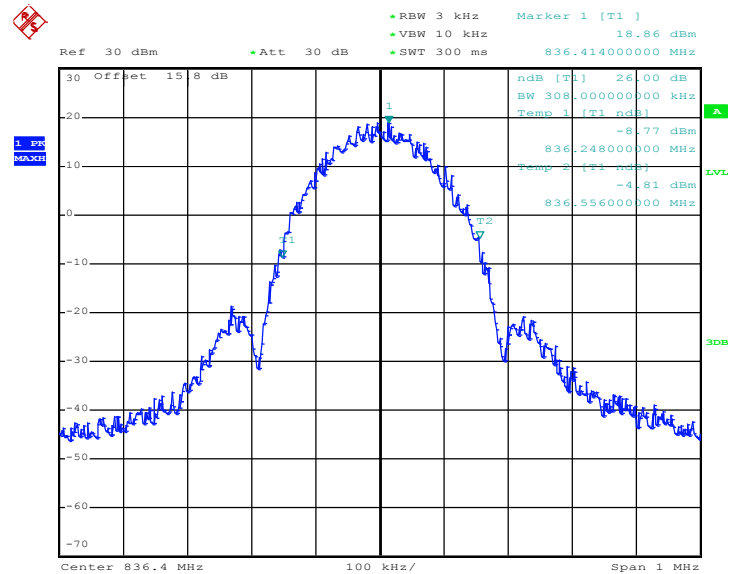
Date: 29.FEB.2012 18:55:51

99% Occupied Bandwidth Plot on Channel 189



Date: 29.FEB.2012 19:03:27

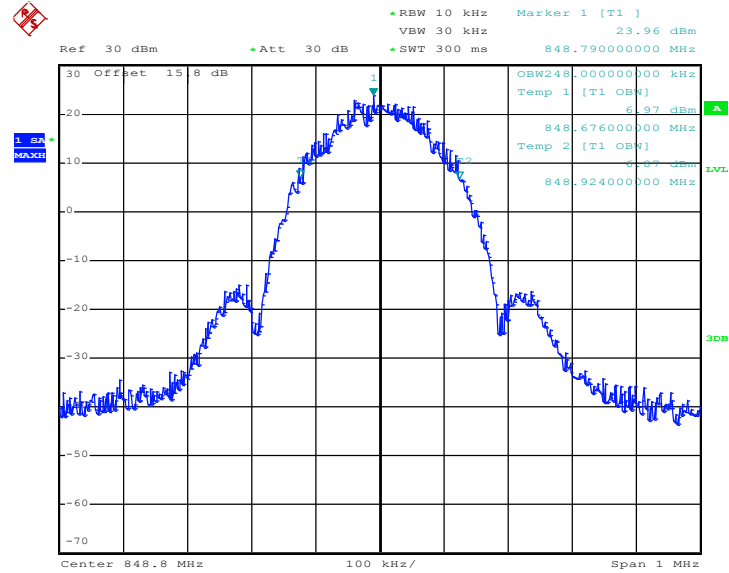
26dB Bandwidth Plot on Channel 189



Date: 29.FEB.2012 19:04:40

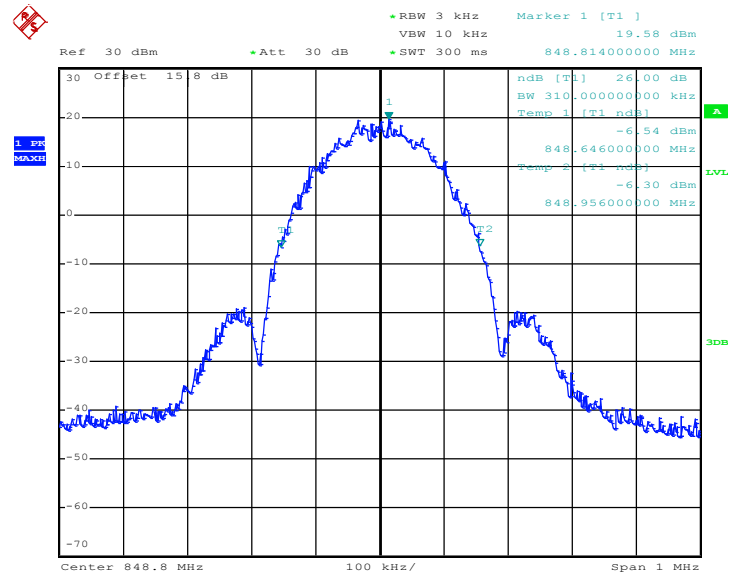


99% Occupied Bandwidth Plot on Channel 251



Date: 29.FEB.2012 18:08:41

26dB Bandwidth Plot on Channel 251

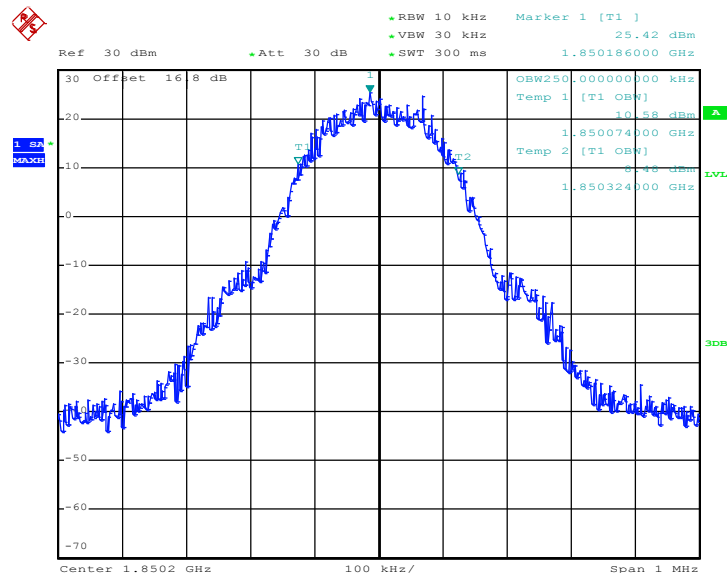


Date: 29.FEB.2012 18:06:45



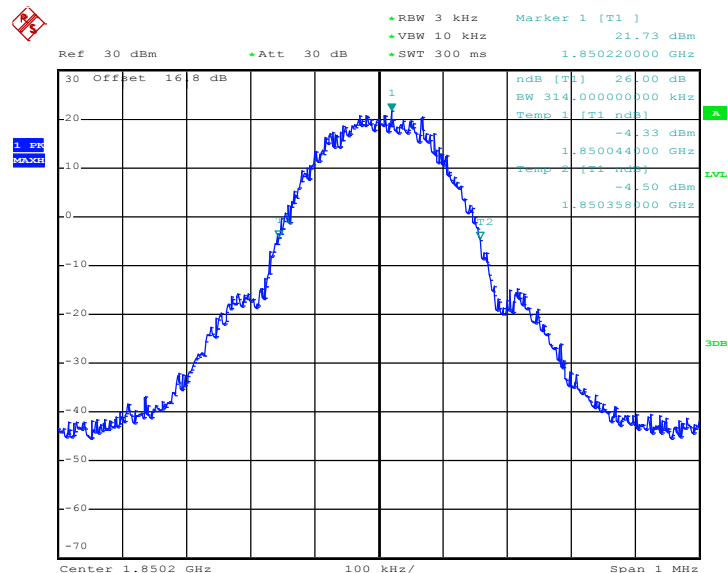
Band :	GSM 1900	Power Stage :	High
Test Mode :	GPRS 8 Link		

99% Occupied Bandwidth Plot on Channel 512



Date: 29.FEB.2012 20:03:55

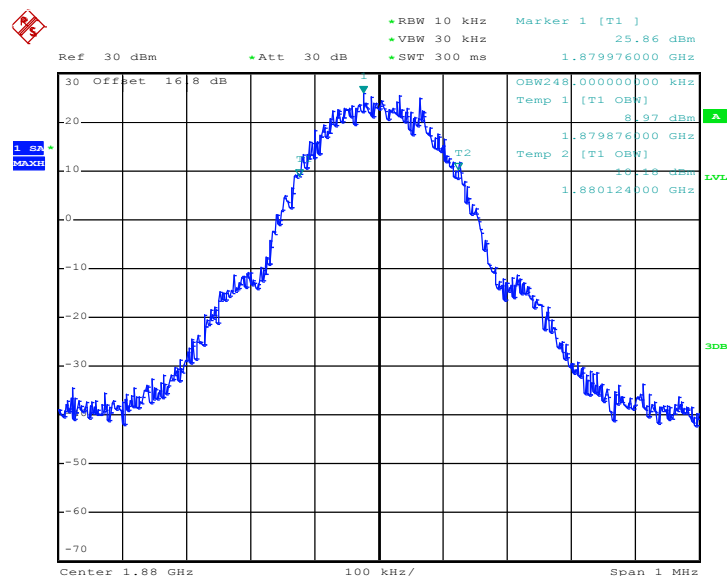
26dB Bandwidth Plot on Channel 512



Date: 29.FEB.2012 20:03:09

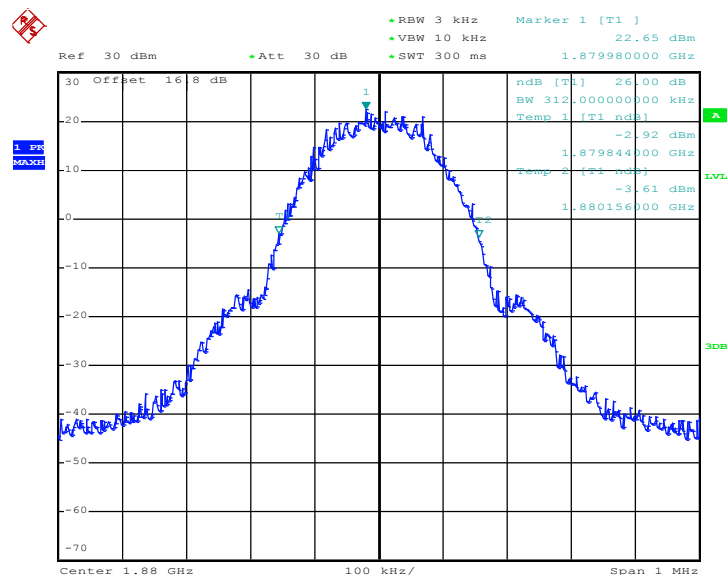


99% Occupied Bandwidth Plot on Channel 661



Date: 29.FEB.2012 19:57:17

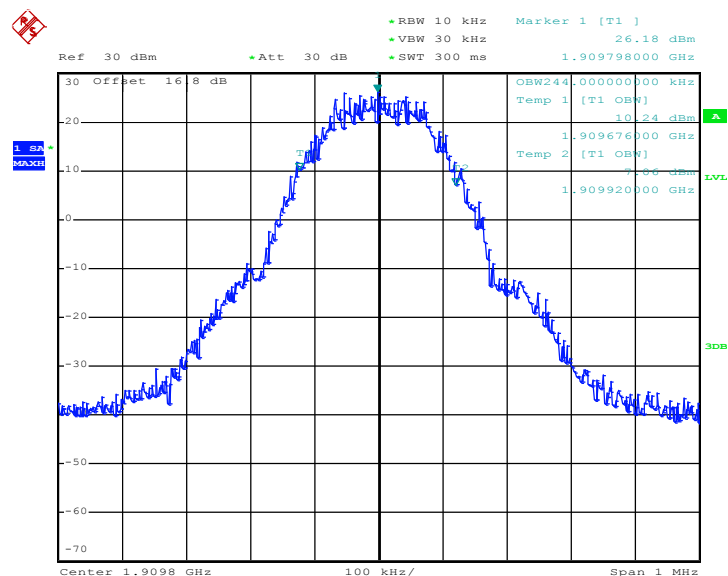
26dB Bandwidth Plot on Channel 661



Date: 29.FEB.2012 19:55:23

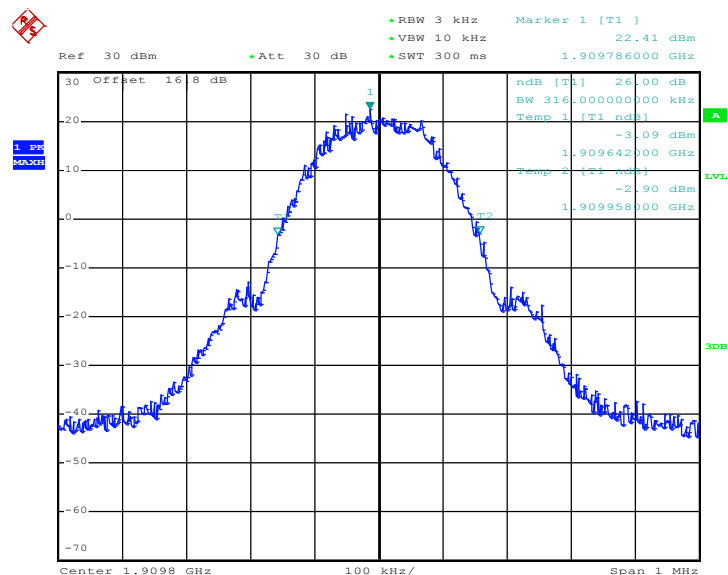


99% Occupied Bandwidth Plot on Channel 810



Date: 29.FEB.2012 21:11:05

26dB Bandwidth Plot on Channel 810

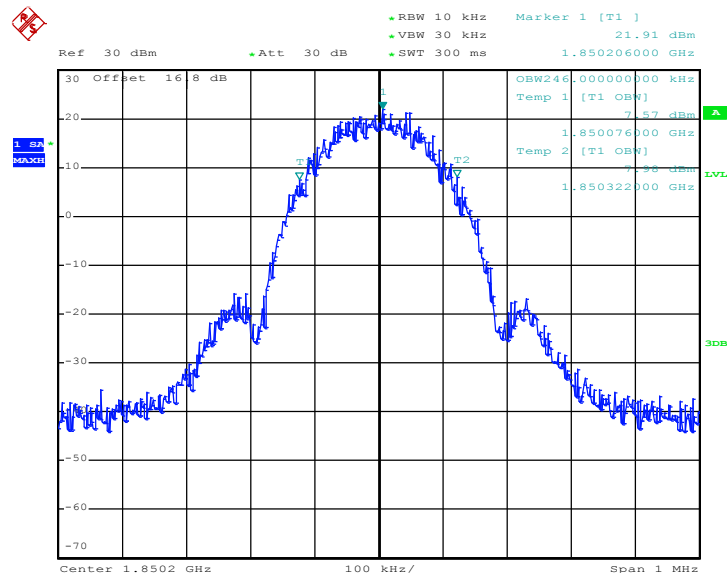


Date: 29.FEB.2012 20:08:26



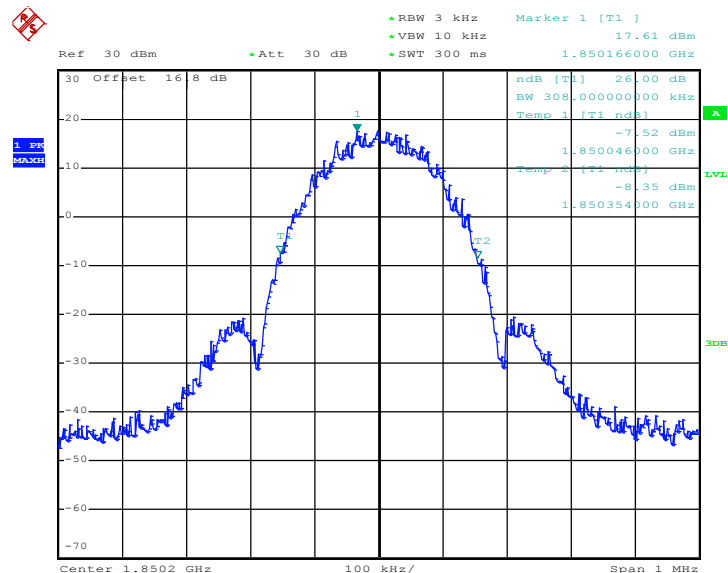
Band :	GSM 1900	Power Stage :	High
Test Mode :	EDGE 8 Link		

99% Occupied Bandwidth Plot on Channel 512



Date: 29.FEB.2012 19:26:50

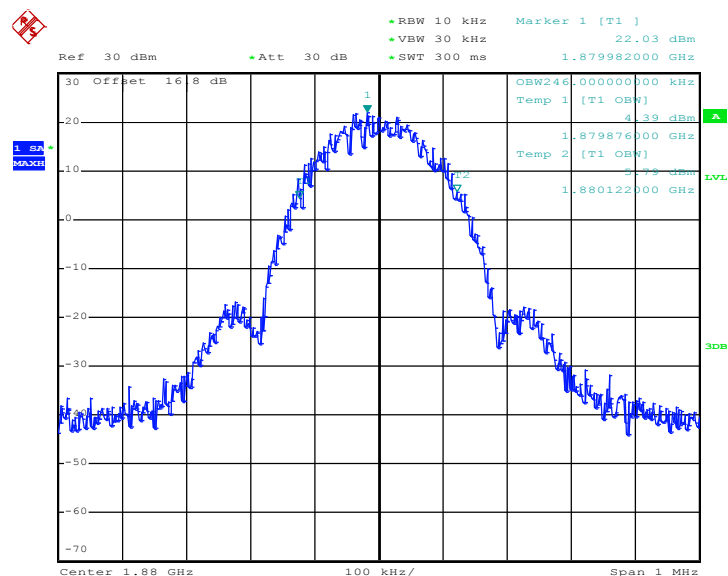
26dB Bandwidth Plot on Channel 512



Date: 29.FEB.2012 19:25:50

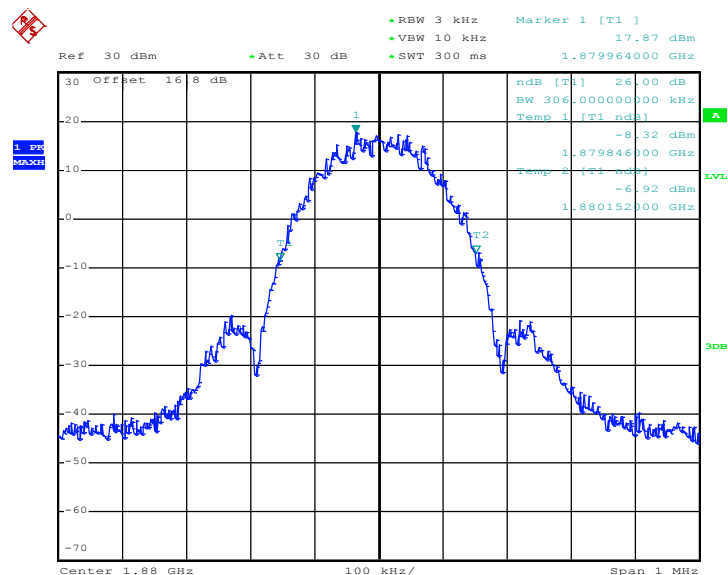


99% Occupied Bandwidth Plot on Channel 661



Date: 29.FEB.2012 19:21:00

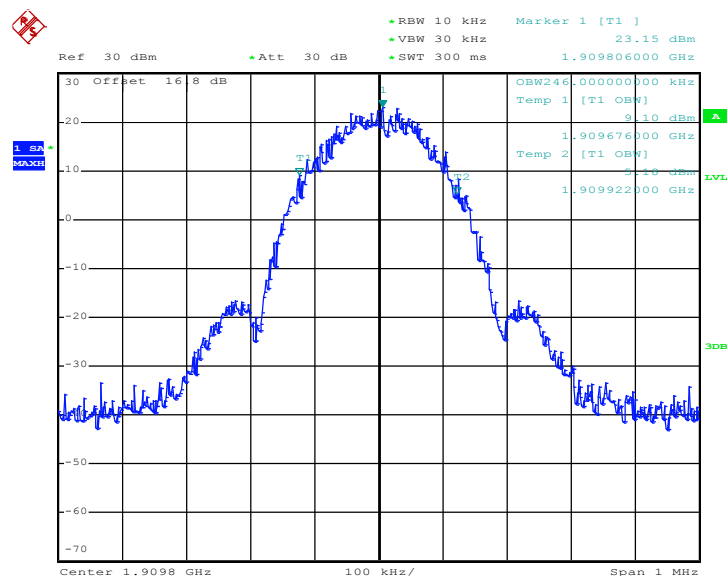
26dB Bandwidth Plot on Channel 661



Date: 29.FEB.2012 19:19:34

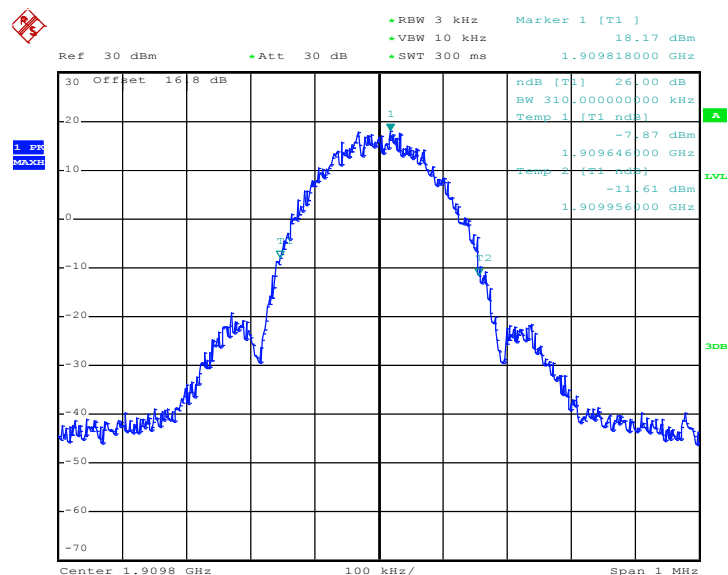


99% Occupied Bandwidth Plot on Channel 810



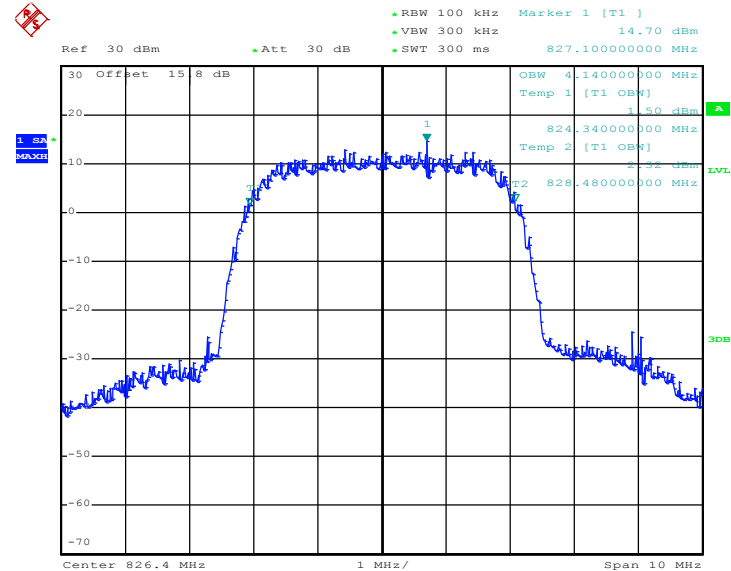
Date: 29.FEB.2012 19:41:37

26dB Bandwidth Plot on Channel 810

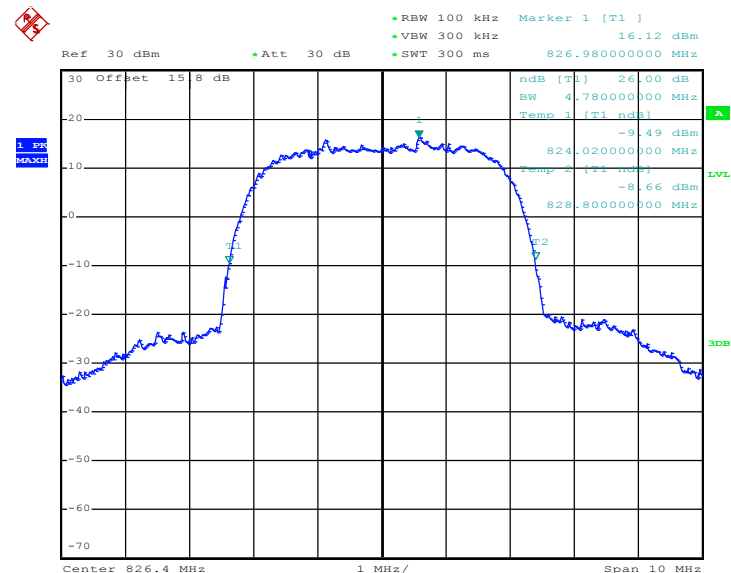


Date: 29.FEB.2012 19:39:16

Band :	WCDMA Band V	Power Stage :	High
Test Mode :	RMC 12.2Kbps Link		

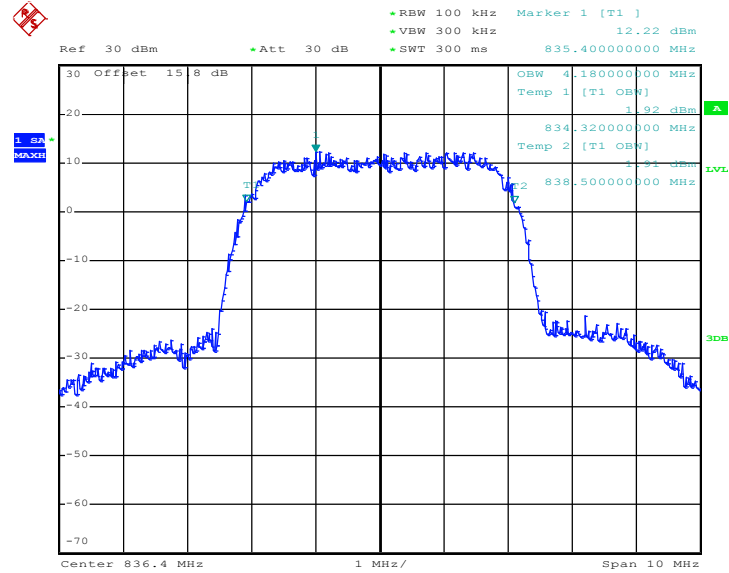
99% Occupied Bandwidth Plot on Channel 4132


Date: 29.FEB.2012 20:49:29

26dB Bandwidth Plot on Channel 4132


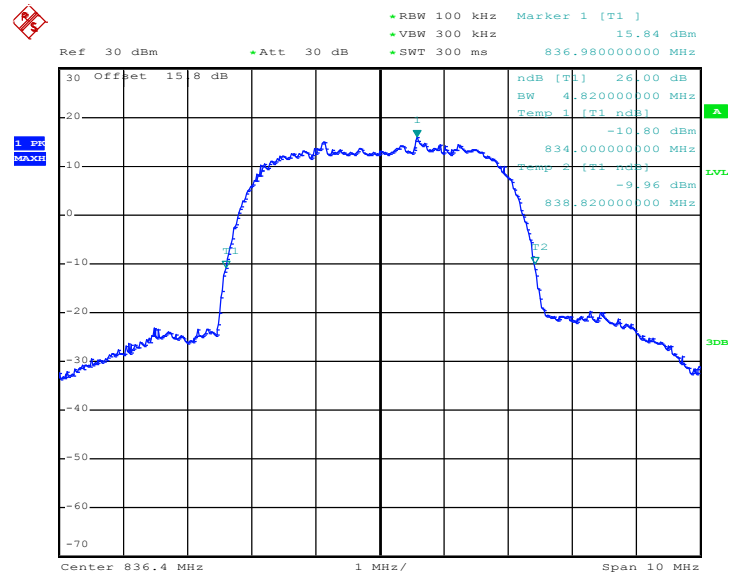
Date: 29.FEB.2012 20:48:10

99% Occupied Bandwidth Plot on Channel 4182

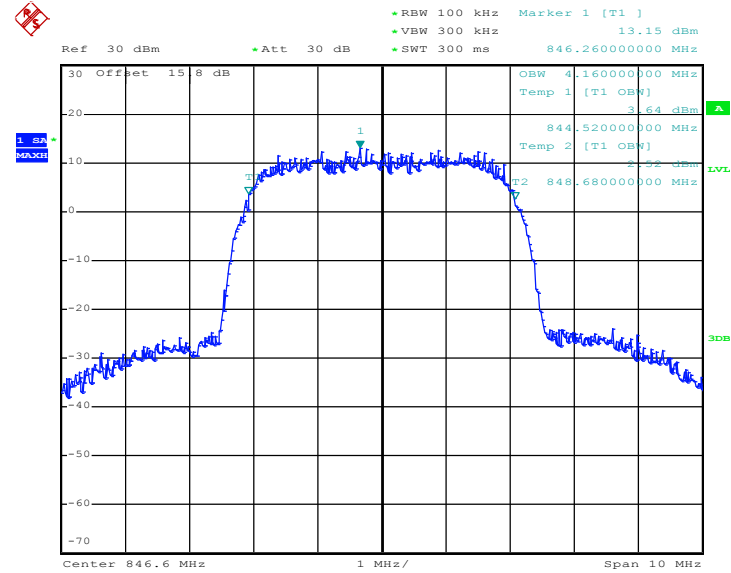


Date: 29.FEB.2012 20:49:55

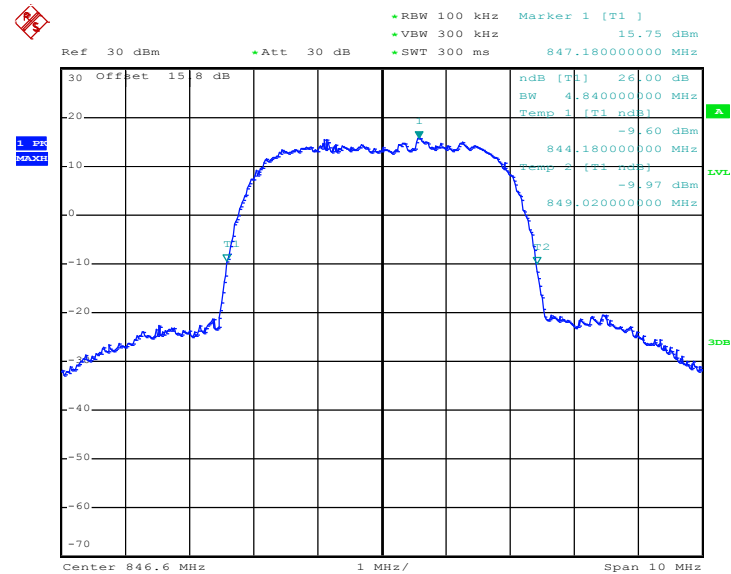
26dB Bandwidth Plot on Channel 4182



Date: 29.FEB.2012 20:48:36

99% Occupied Bandwidth Plot on Channel 4233


Date: 29.FEB.2012 20:50:21

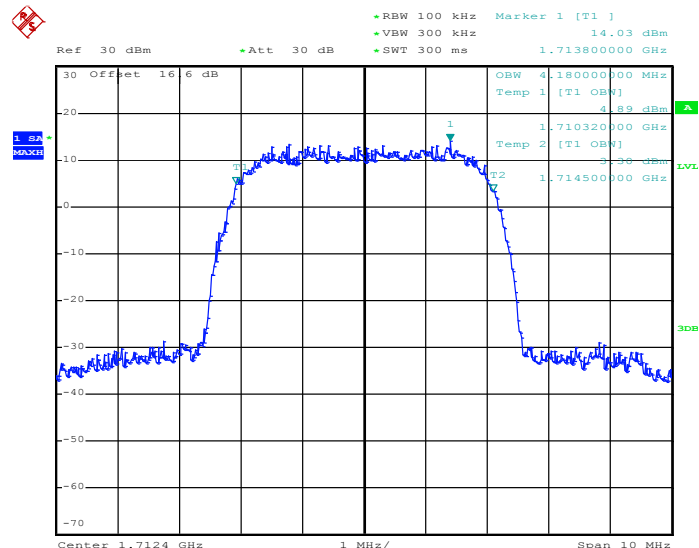
26dB Bandwidth Plot on Channel 4233


Date: 29.FEB.2012 20:49:03



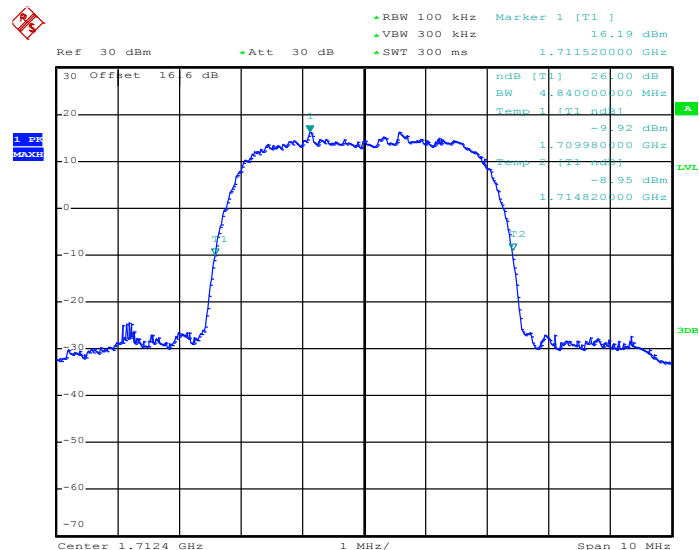
Band :	WCDMA Band IV	Power Stage :	High
Test Mode :	RMC 12.2Kbps Link		

99% Occupied Bandwidth Plot on Channel 1312



Date: 29.FEB.2012 21:00:56

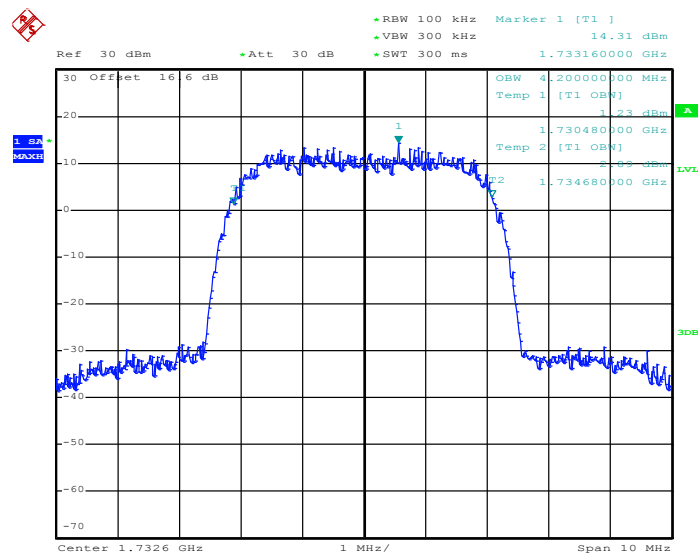
26dB Bandwidth Plot on Channel 1312



Date: 29.FEB.2012 20:59:36

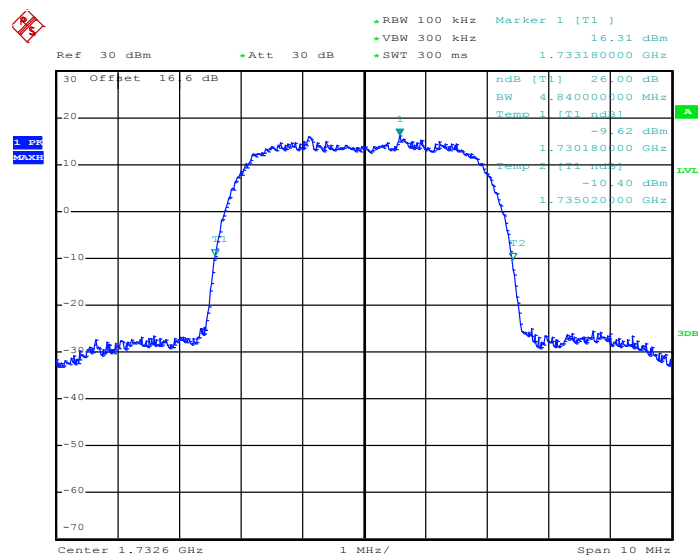


99% Occupied Bandwidth Plot on Channel 1413



Date: 29.FEB.2012 21:01:22

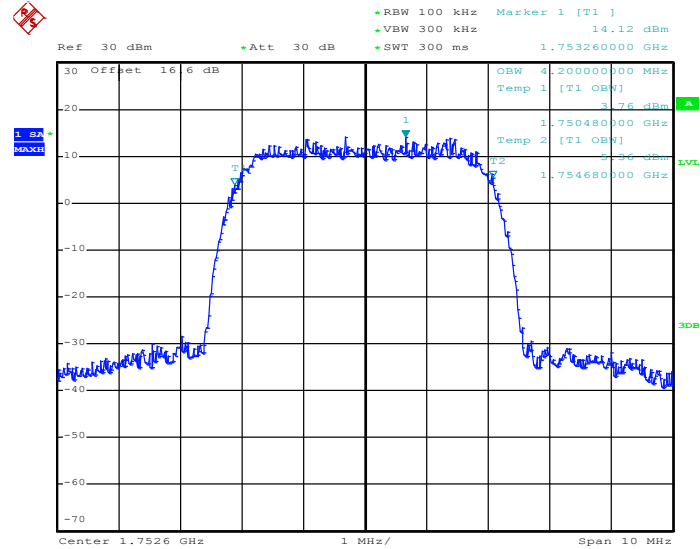
26dB Bandwidth Plot on Channel 1413



Date: 29.FEB.2012 21:00:03

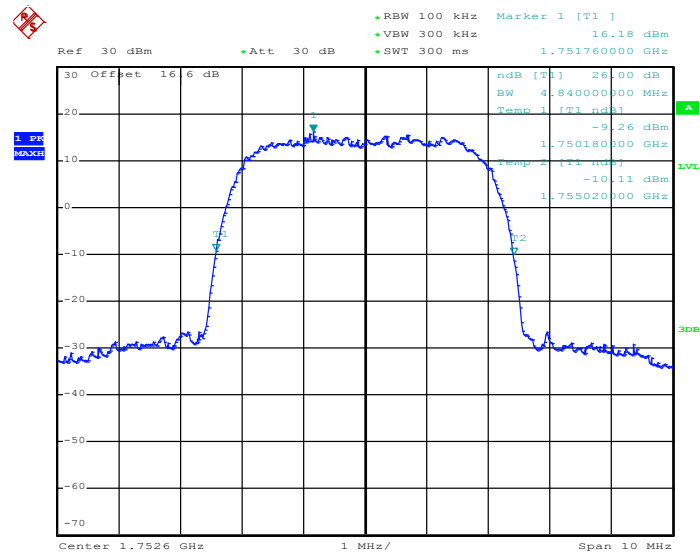


99% Occupied Bandwidth Plot on Channel 1513



Date: 29.FEB.2012 21:01:48

26dB Bandwidth Plot on Channel 1513

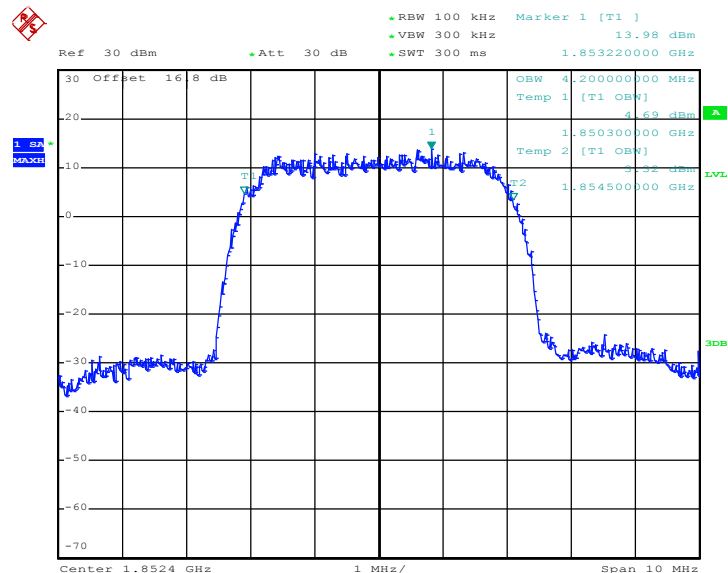


Date: 29.FEB.2012 21:00:29



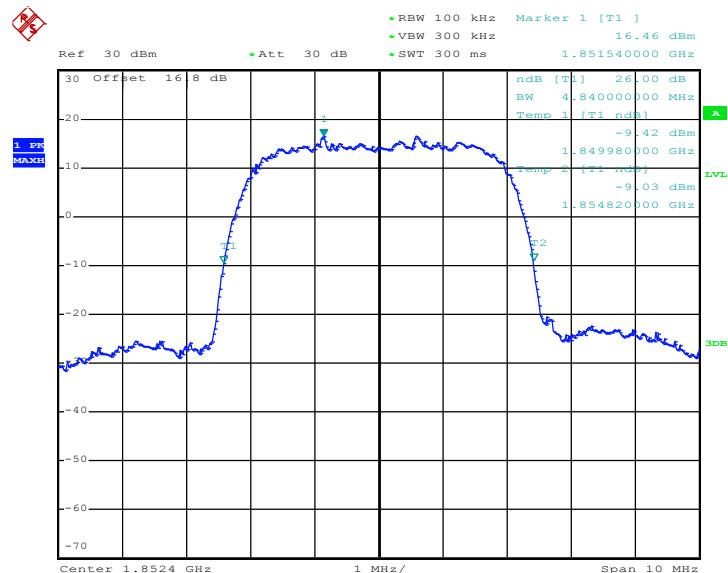
Band :	WCDMA Band II	Power Stage :	High
Test Mode :	RMC 12.2Kbps Link		

99% Occupied Bandwidth Plot on Channel 9262



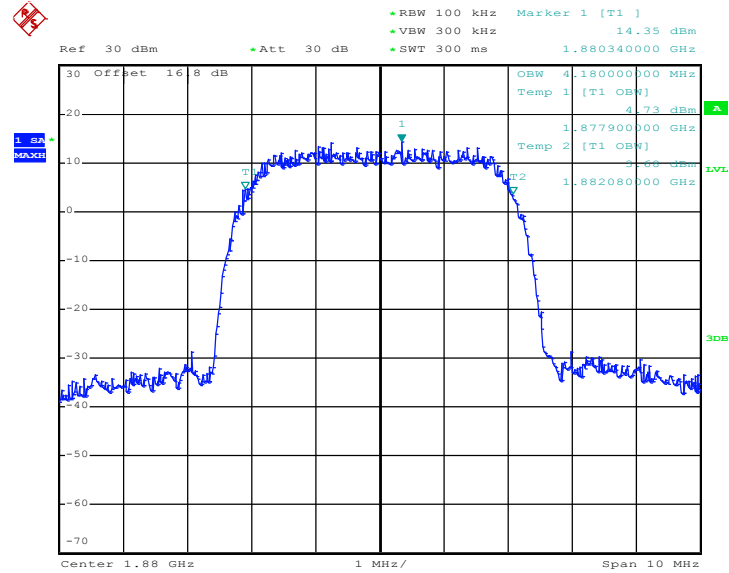
Date: 29.FEB.2012 20:35:44

26dB Bandwidth Plot on Channel 9262



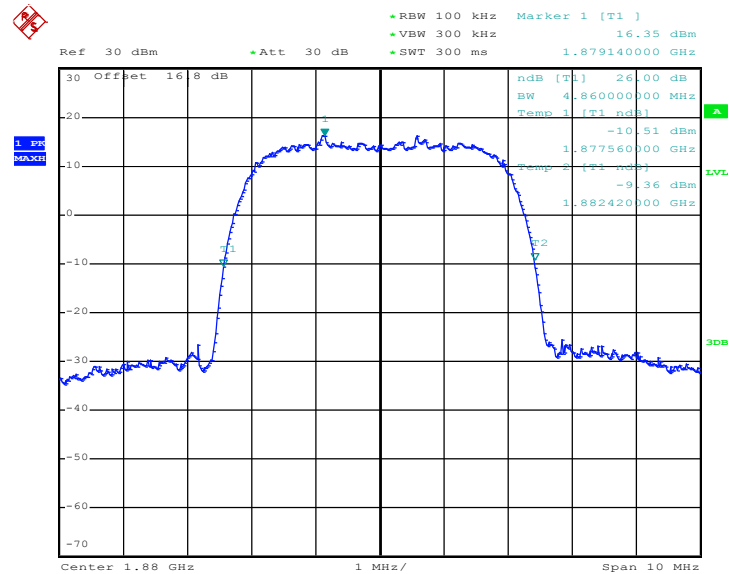
Date: 29.FEB.2012 20:34:25

99% Occupied Bandwidth Plot on Channel 9400



Date: 29.FEB.2012 20:36:10

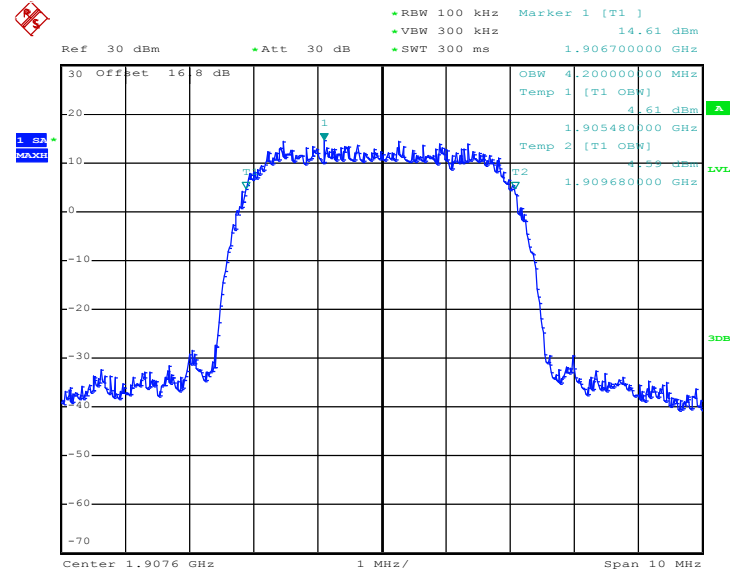
26dB Bandwidth Plot on Channel 9400



Date: 29.FEB.2012 20:34:51

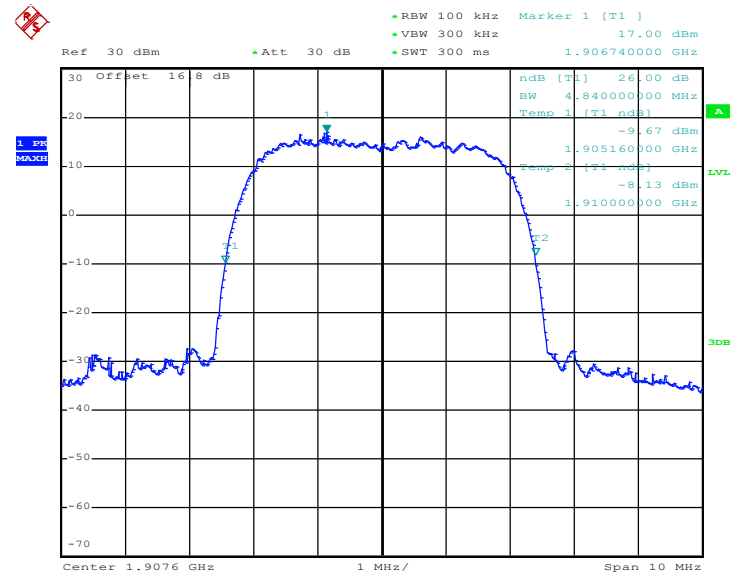


99% Occupied Bandwidth Plot on Channel 9538



Date: 29.FEB.2012 20:36:36

26dB Bandwidth Plot on Channel 9538



Date: 29.FEB.2012 20:35:18

3.4 Band Edge Measurement

3.4.1 Description of Band Edge Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

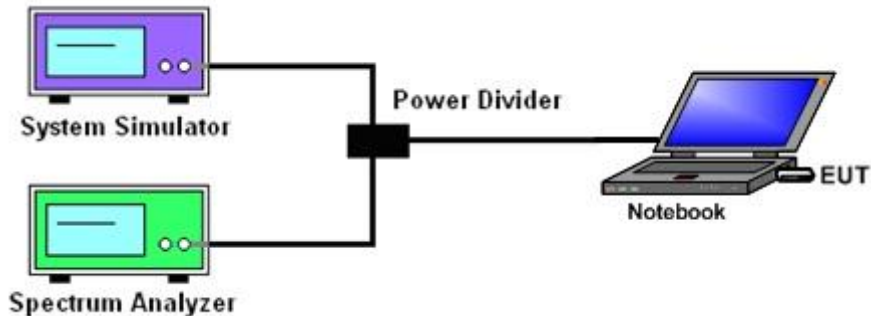
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The band edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.

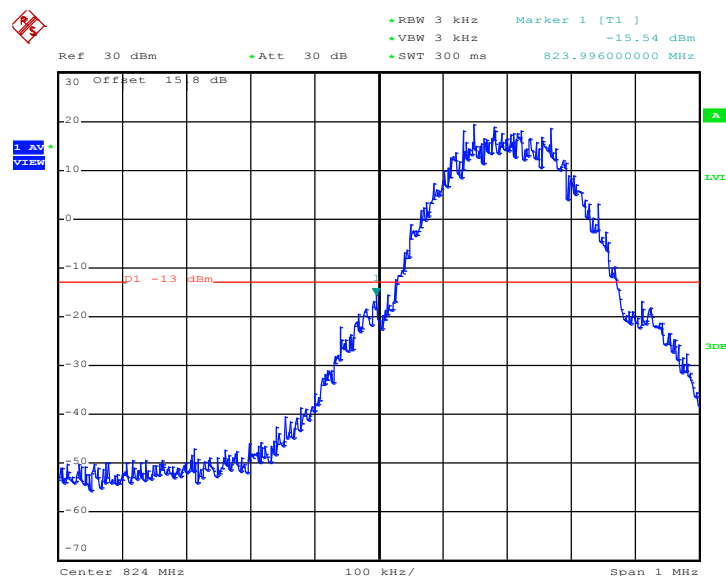
3.4.4 Test Setup



3.4.5 Test Result (Plots) of Conducted Band Edge

Band :	GSM850	Power Stage :	High
Test Mode :	GPRS 8 Link	Maximum 26dB Bandwidth :	0.316 MHz
Correction Factor :	0.23 dB	Measurement Value :	-15.54 dBm
Band Edge :	-15.31 dBm		

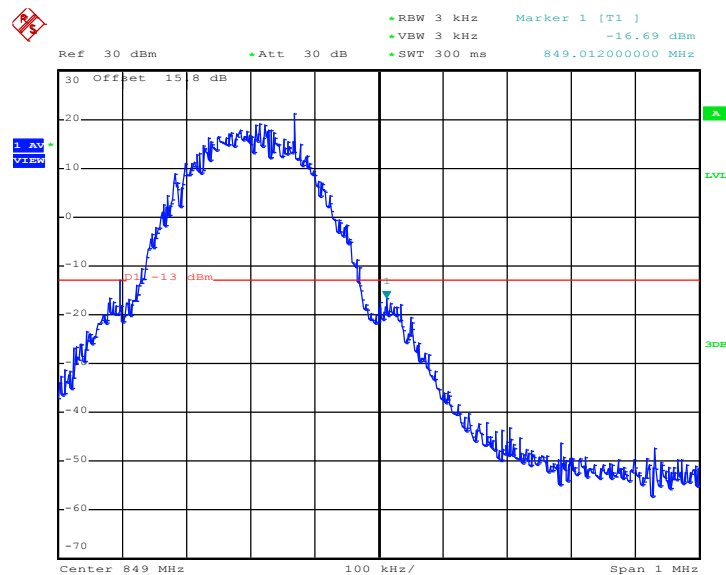
Lower Band Edge Plot on Channel 128



Date: 29.FEB.2012 17:12:58

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

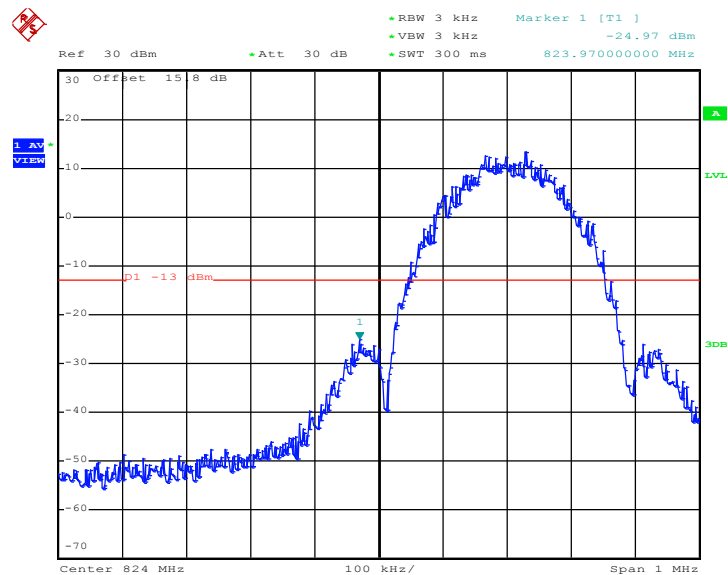
Band :	GSM850	Power Stage :	High
Test Mode :	GPRS 8 Link	Maximum 26dB Bandwidth :	0.316 MHz
Correction Factor :	0.23 dB	Measurement Value :	-16.69d Bm
Band Edge :	--16.46 dBm		

Higher Band Edge Plot on Channel 251


Date: 29.FEB.2012 17:13:24

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

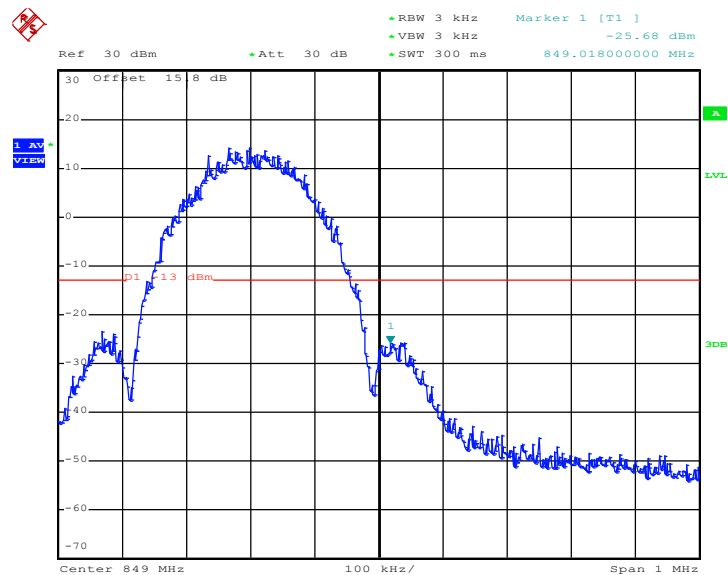
Band :	GSM850	Power Stage :	High
Test Mode :	EDGE 8 Link	Maximum 26dB Bandwidth :	0.310 MHz
Correction Factor :	0.14 dB	Measurement Value :	-24.97 dBm
Band Edge :	-24.83 dBm		

Lower Band Edge Plot on Channel 128


Date: 29.FEB.2012 18:17:07

1. Correction Factor(dB)= 10log(1% Emission BW/RBW)
2. Band Edge= Measurement Value + Correction Factor(dB)

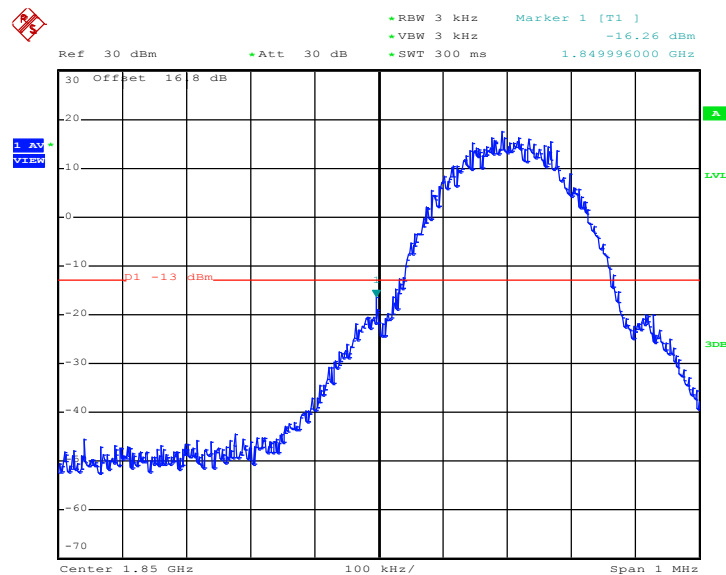
Band :	GSM850	Power Stage :	High
Test Mode :	EDGE 8 Link	Maximum 26dB Bandwidth :	0.310 MHz
Correction Factor :	0.14 dB	Measurement Value :	-25.68 dBm
Band Edge :	-25.54 dBm		

Higher Band Edge Plot on Channel 251


Date: 29.FEB.2012 18:13:08

1. Correction Factor(dB)= 10log(1% Emission BW/RBW)
2. Band Edge= Measurement Value + Correction Factor(dB)

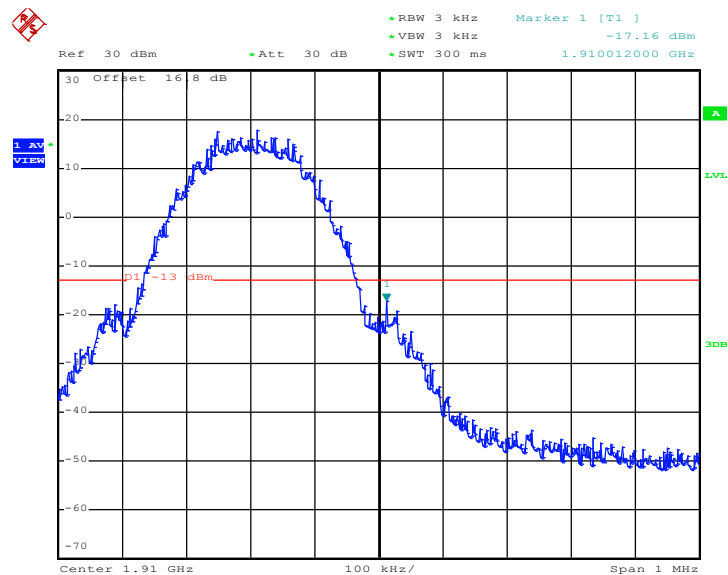
Band :	GSM1900	Power Stage :	High
Test Mode :	GPRS 8 Link	Maximum 26dB Bandwidth :	0.316 MHz
Correction Factor :	0.23 dB	Measurement Value :	-16.26 dBm
Band Edge :	-16.03 dBm		

Lower Band Edge Plot on Channel 512


Date: 29.FEB.2012 20:14:56

1. Correction Factor(dB)= 10log(1% Emission BW/RBW)
2. Band Edge= Measurement Value + Correction Factor(dB)

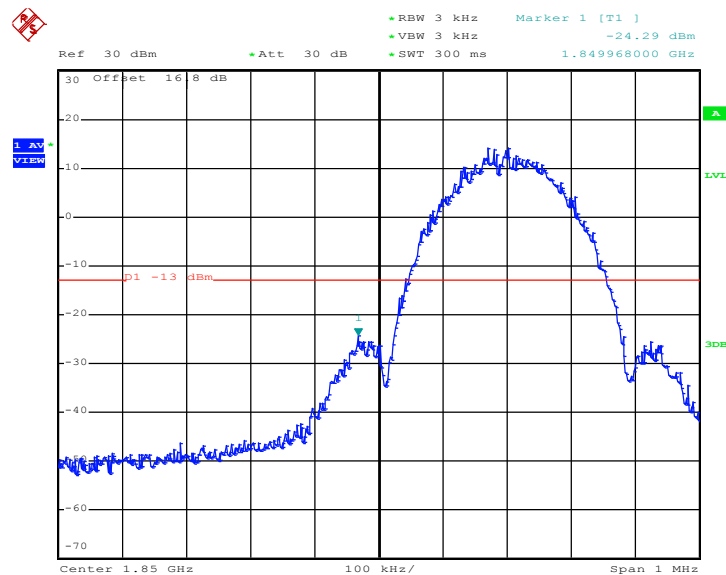
Band :	GSM1900	Power Stage :	High
Test Mode :	GPRS 8 Link	Maximum 26dB Bandwidth :	0.316 MHz
Correction Factor :	0.23 dB	Measurement Value :	-17.16 dBm
Band Edge :	-16.93 dBm		

Higher Band Edge Plot on Channel 810


Date: 29.FEB.2012 20:11:07

1. Correction Factor(dB)= 10log(1% Emission BW/RBW)
2. Band Edge= Measurement Value + Correction Factor(dB)

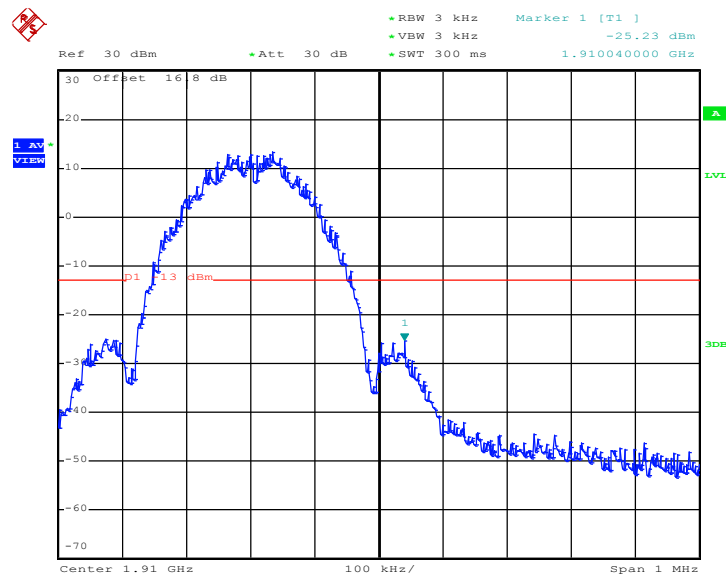
Band :	GSM1900	Power Stage :	High
Test Mode :	EDGE 8 Link	Maximum 26dB Bandwidth :	0.310 MHz
Correction Factor :	0.14 dB	Measurement Value :	-24.29 dBm
Band Edge :	-24.15 dBm		

Lower Band Edge Plot on Channel 512


Date: 29.FEB.2012 21:20:11

1. Correction Factor(dB)= 10log(1% Emission BW/RBW)
2. Band Edge= Measurement Value + Correction Factor(dB)

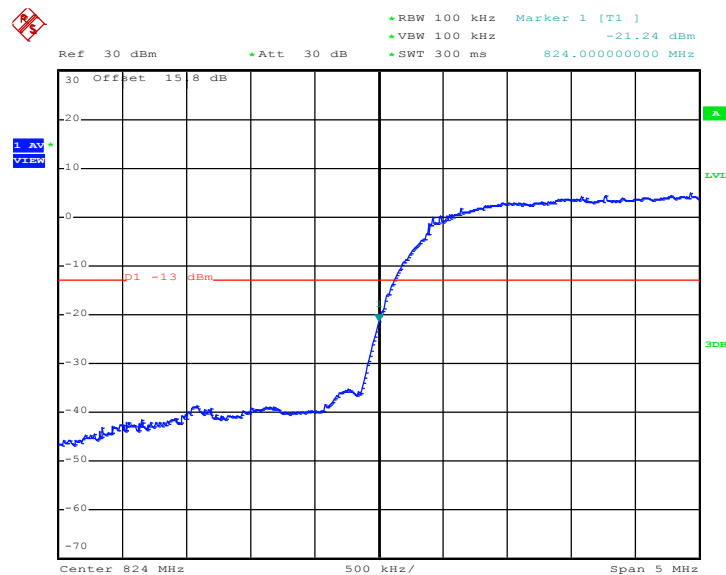
Band :	GSM1900	Power Stage :	High
Test Mode :	EDGE 8 Link	Maximum 26dB Bandwidth :	0.310 MHz
Correction Factor :	0.14 dB	Measurement Value :	-25.23 dBm
Band Edge :	-25.09 dBm		

Higher Band Edge Plot on Channel 810


Date: 29.FEB.2012 19:44:19

1. Correction Factor(dB)= 10log(1% Emission BW/RBW)
2. Band Edge= Measurement Value + Correction Factor(dB)

Band :	WCDMA Band V	Power Stage :	High
Test Mode :	RMC 12.2Kbps Link	Maximum 26dB Bandwidth :	4.84 MHz
Correction Factor :	-3.15 dB	Measurement Value :	-21.24 dBm
Band Edge :	-24.39 dBm		

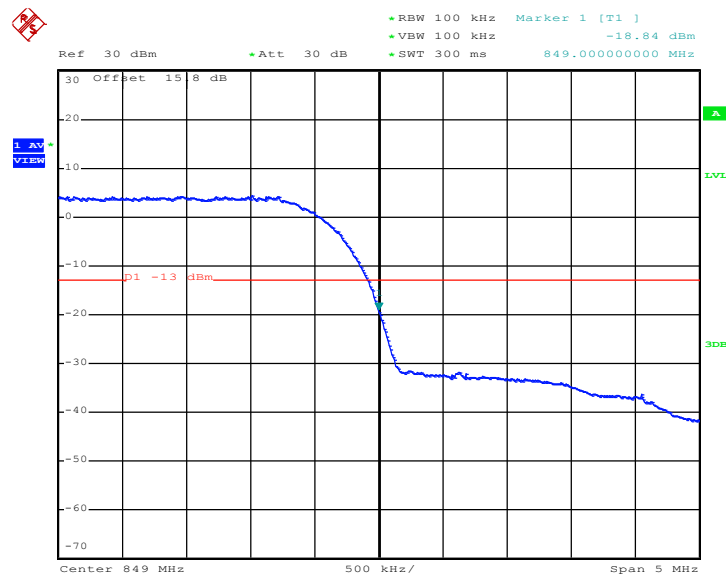
Lower Band Edge Plot on Channel 4132


Date: 29.FEB.2012 20:51:50

1. Correction Factor(dB)= 10log(1% Emission BW/RBW)
2. Band Edge= Measurement Value + Correction Factor(dB)

Band :	WCDMA Band V	Power Stage :	High
Test Mode :	RMC 12.2Kbps Link	Maximum 26dB Bandwidth :	4.84 MHz
Correction Factor :	-3.15 dB	Measurement Value :	-18.84 dBm
Band Edge :	-21.99 dBm		

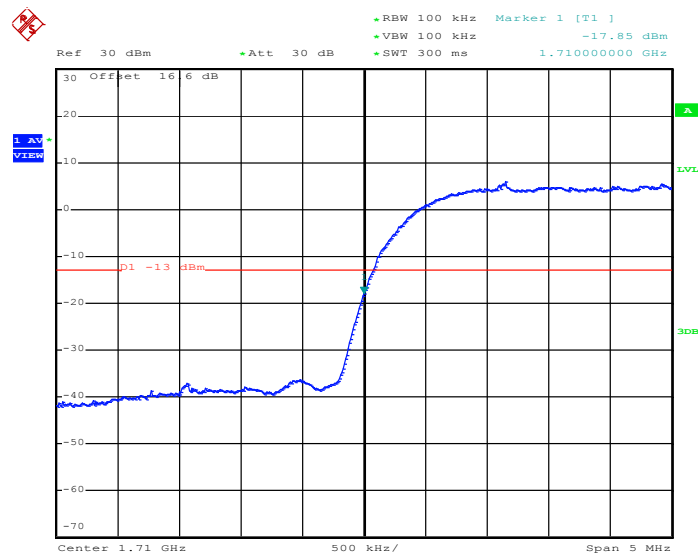
Higher Band Edge Plot on Channel 4233



Date: 29.FEB.2012 20:52:16

1. Correction Factor(dB)= 10log(1% Emission BW/RBW)
2. Band Edge= Measurement Value + Correction Factor(dB)

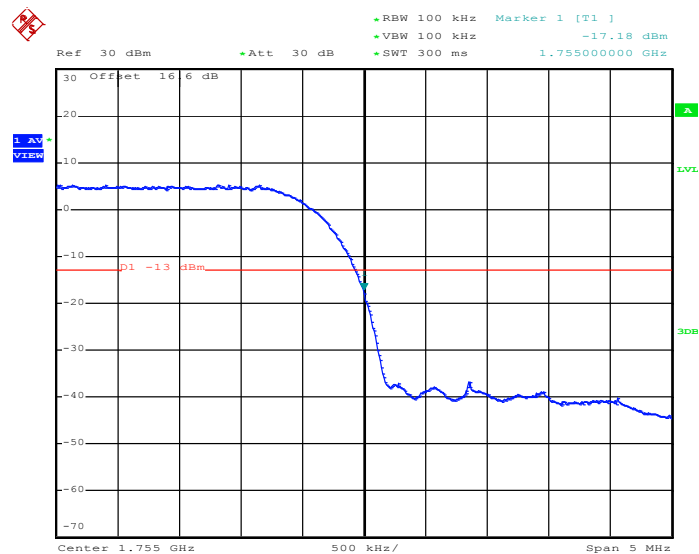
Band :	WCDMA Band IV	Power Stage :	High
Test Mode :	RMC 12.2Kbps Link	Maximum 26dB Bandwidth :	4.84 MHz
Correction Factor :	-3.15 dB	Measurement Value :	-17.85 dBm
Band Edge :	-21.00 dBm		

Lower Band Edge Plot on Channel 1312


Date: 29.FEB.2012 21:03:16

1. Correction Factor(dB)= 10log(1% Emission BW/RBW)
2. Band Edge= Measurement Value + Correction Factor(dB)

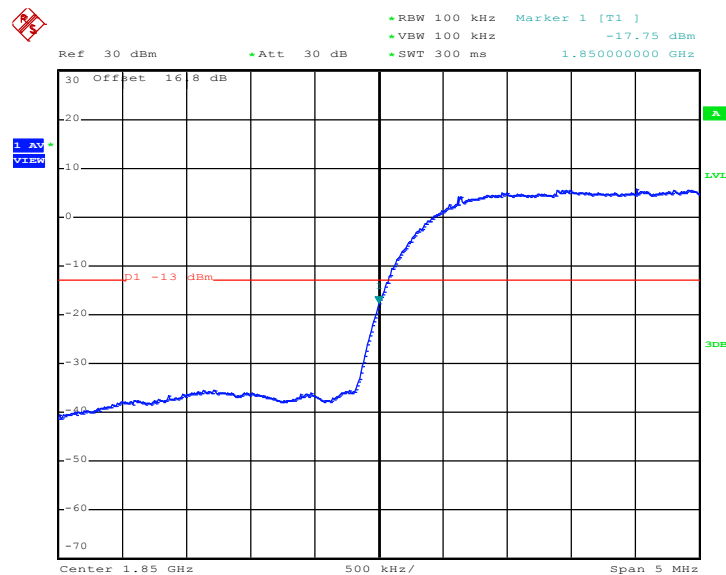
Band :	WCDMA Band IV	Power Stage :	High
Test Mode :	RMC 12.2Kbps Link	Maximum 26dB Bandwidth :	4.84 MHz
Correction Factor :	-3.15 dB	Measurement Value :	-17.18 dBm
Band Edge :	-20.33 dBm		

Higher Band Edge Plot on Channel 1513


Date: 29.FEB.2012 21:03:42

1. Correction Factor(dB)= 10log(1% Emission BW/RBW)
2. Band Edge= Measurement Value + Correction Factor(dB)

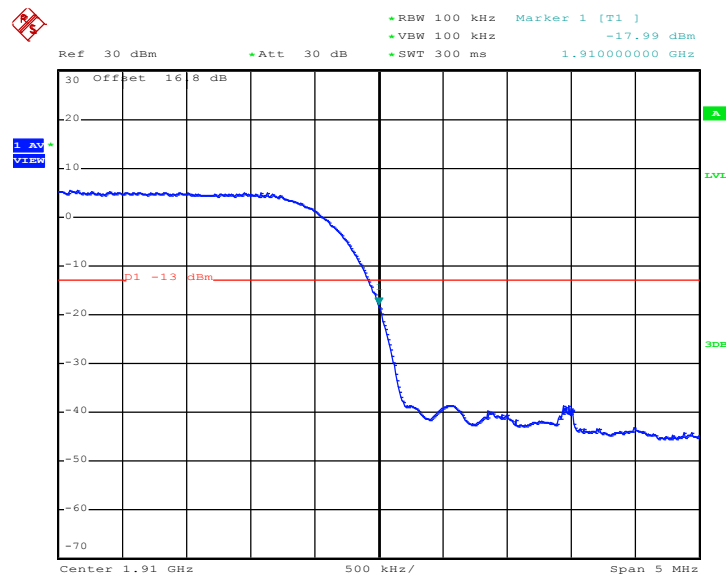
Band :	WCDMA Band II	Power Stage :	High
Test Mode :	RMC 12.2Kbps Link	Maximum 26dB Bandwidth :	4.86 MHz
Correction Factor :	-3.13 dB	Measurement Value :	-17.75 dBm
Band Edge :	-20.88 dBm		

Lower Band Edge Plot on Channel 9262


Date: 29.FEB.2012 20:38:05

1. Correction Factor(dB)= 10log(1% Emission BW/RBW)
2. Band Edge= Measurement Value + Correction Factor(dB)

Band :	WCDMA Band II	Power Stage :	High
Test Mode :	RMC 12.2Kbps Link	Maximum 26dB Bandwidth :	4.86 MHz
Correction Factor :	-3.13 dB	Measurement Value :	-17.99 dBm
Band Edge :	-21.12 dBm		

Higher Band Edge Plot on Channel 9538


Date: 29.FEB.2012 20:38:31

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW/RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

3.5 Conducted Emission Measurement

3.5.1 Description of Conducted Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

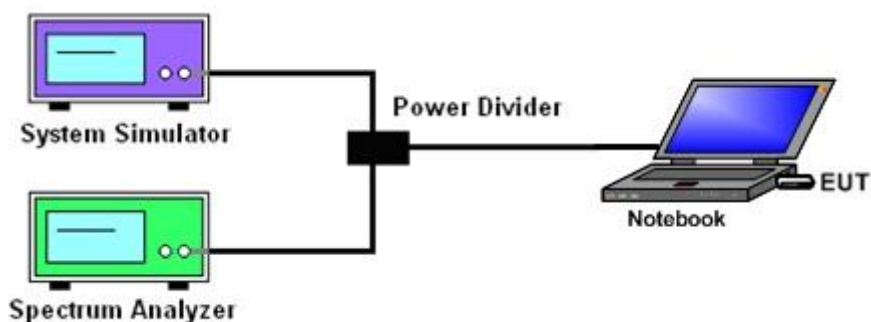
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

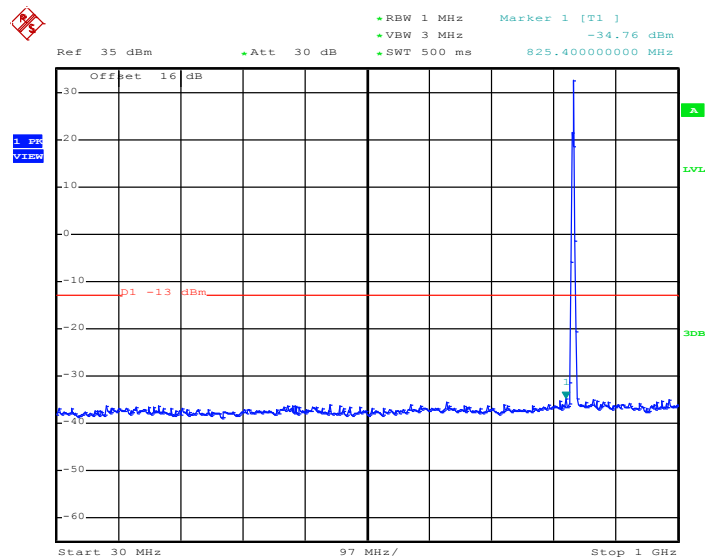
1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The middle channel for the highest RF power within the transmitting frequency was measured.
3. The conducted spurious emission for the whole frequency range was taken.

3.5.4 Test Setup

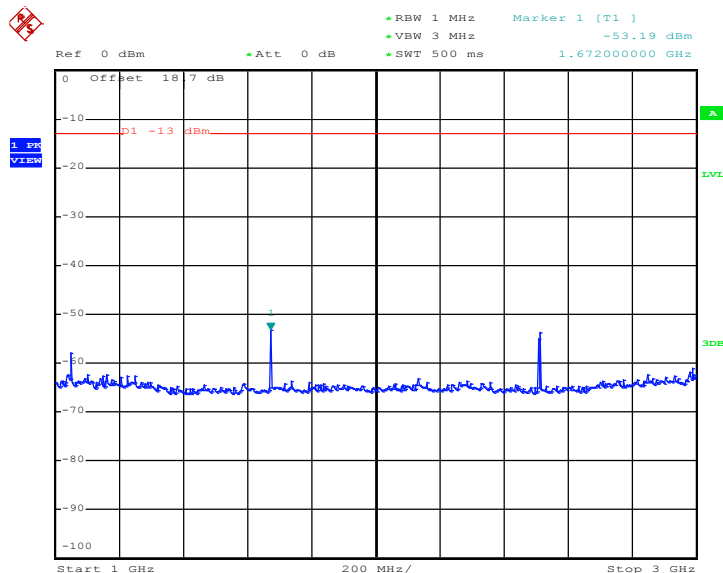


3.5.5 Test Result (Plots) of Conducted Emission

Band :	GSM850	Channel :	CH189
Test Mode :	GPRS 8 Link		

Conducted Emission Plot between 30MHz ~ 1GHz


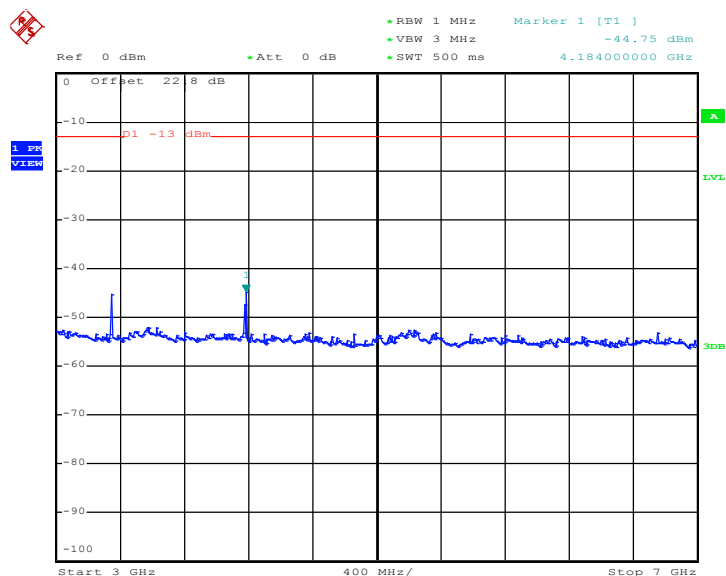
Date: 29.FEB.2012 16:59:54

Conducted Emission Plot between 1GHz ~ 3GHz


Date: 29.FEB.2012 17:00:09

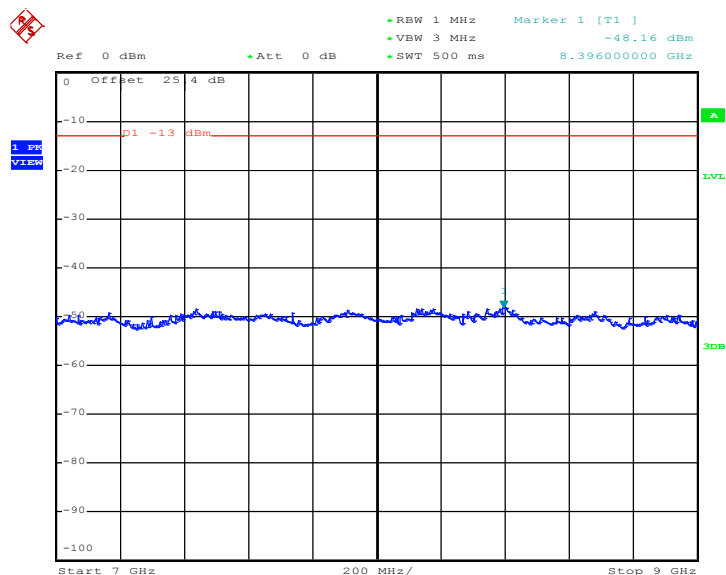


Conducted Emission Plot between 3GHz ~ 7GHz



Date: 29.FEB.2012 17:00:22

Conducted Emission Plot between 7GHz ~ 9GHz

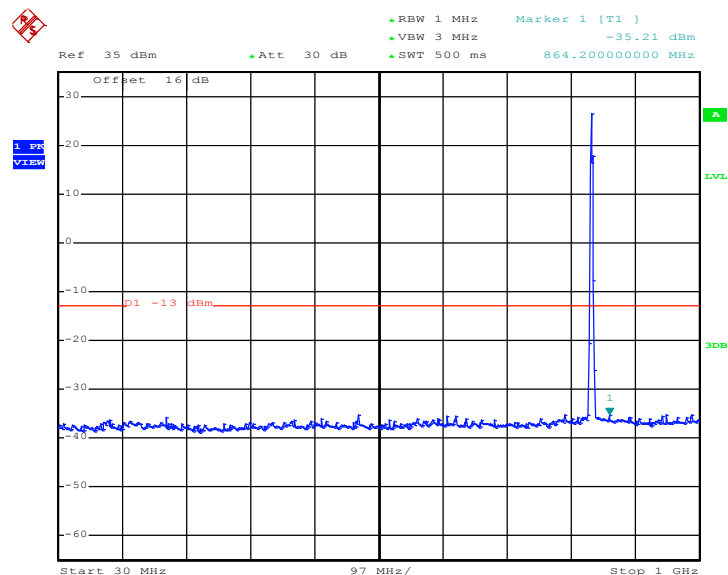


Date: 29.FEB.2012 17:00:34



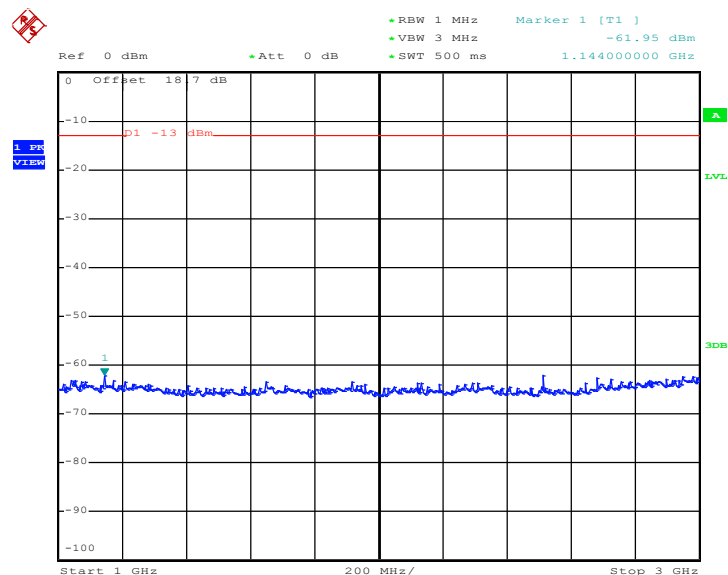
Band :	GSM850	Channel :	CH189
Test Mode :	EDGE 8 Link		

Conducted Emission Plot between 30MHz ~ 1GHz



Date: 29.FEB.2012 17:22:56

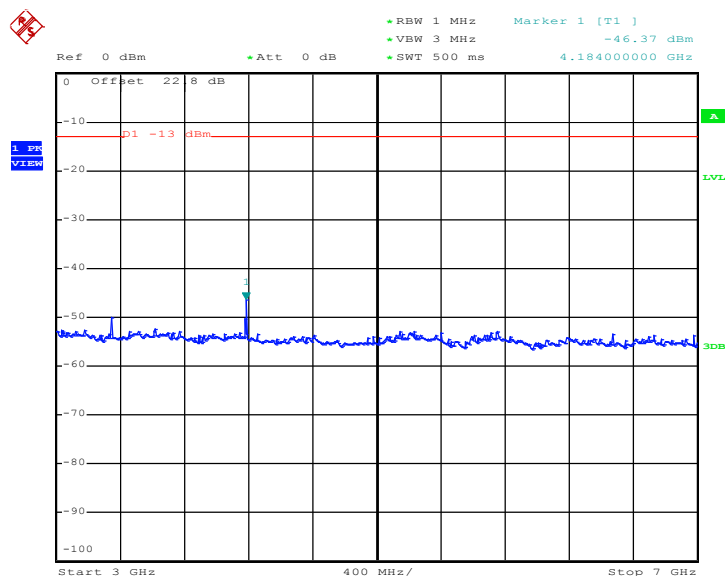
Conducted Emission Plot between 1GHz ~ 3GHz



Date: 29.FEB.2012 17:23:30

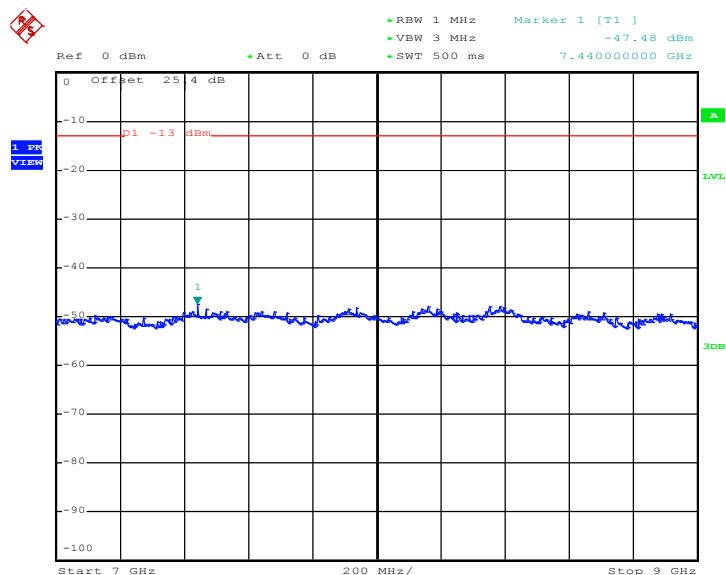


Conducted Emission Plot between 3GHz ~ 7GHz



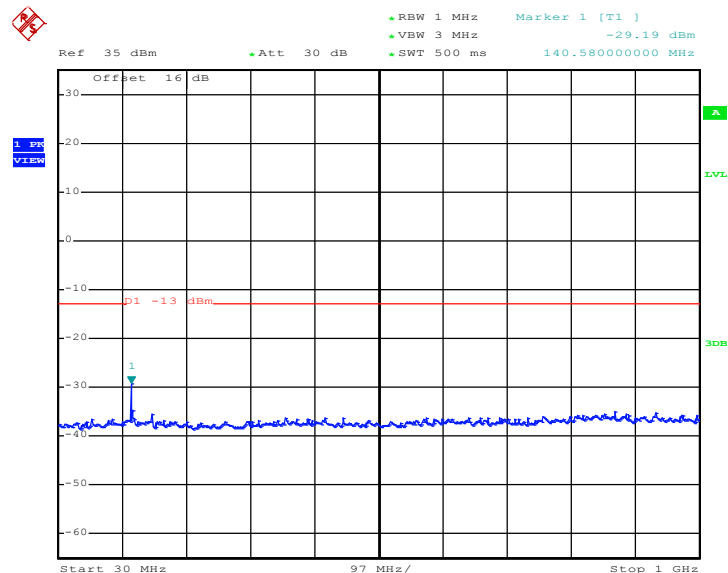
Date: 29.FEB.2012 17:23:43

Conducted Emission Plot between 7GHz ~ 9GHz

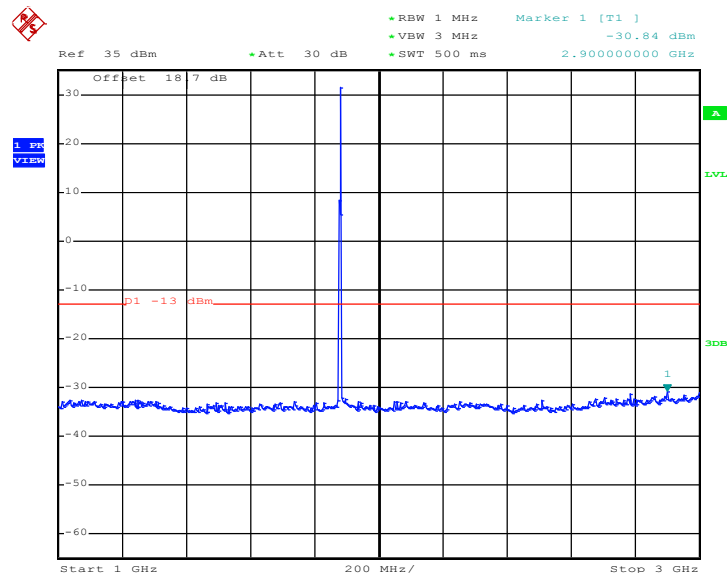


Date: 29.FEB.2012 17:23:55

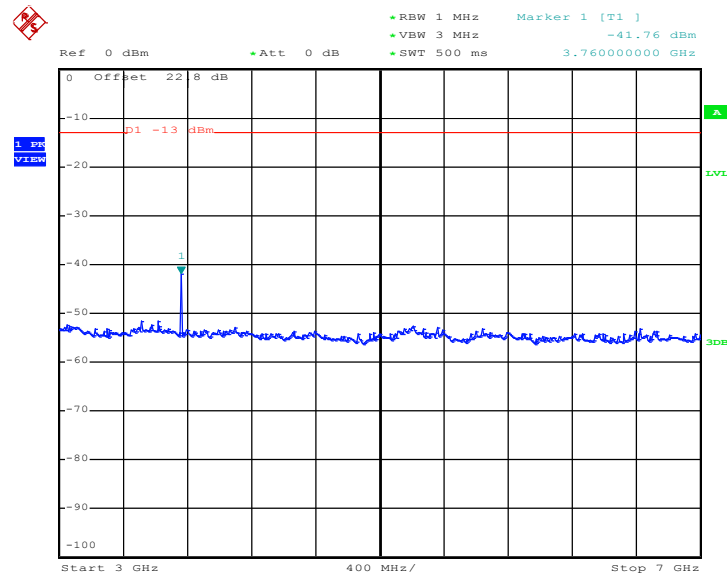
Band :	GSM1900	Channel :	CH661
Test Mode :	GPRS 8 Link		

Conducted Emission Plot between 30MHz ~ 1GHz


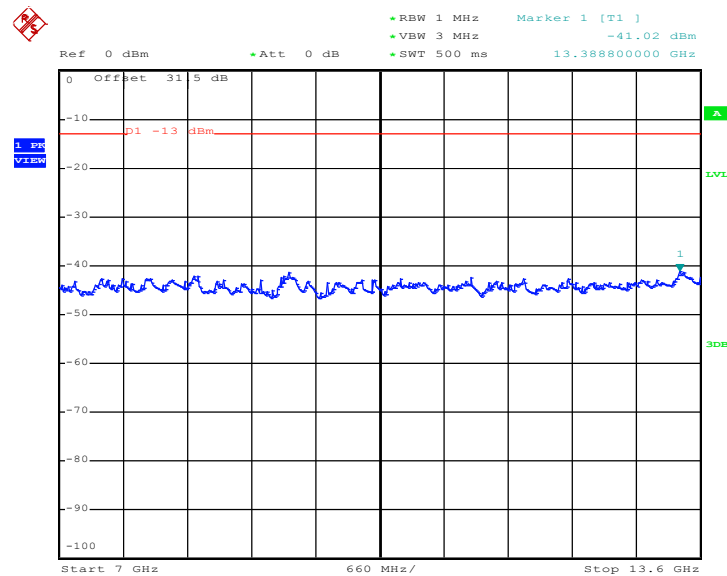
Date: 29.FEB.2012 20:15:47

Conducted Emission Plot between 1GHz ~ 3GHz


Date: 29.FEB.2012 20:16:00

Conducted Emission Plot between 3GHz ~ 7GHz


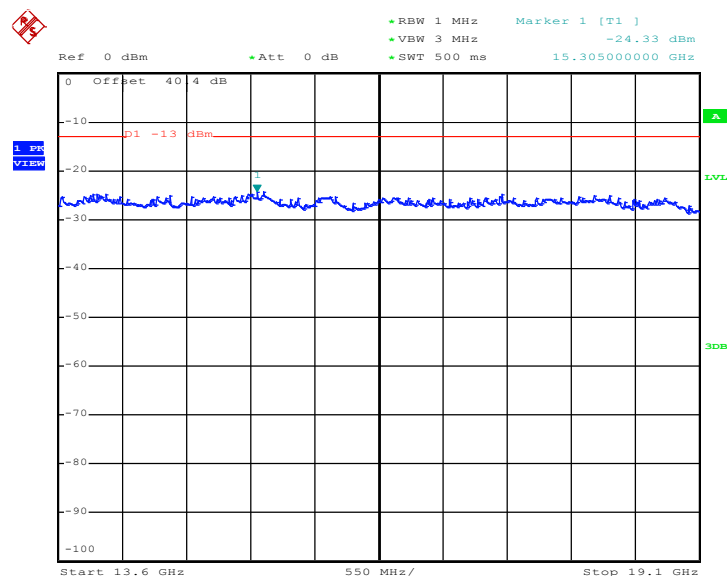
Date: 29.FEB.2012 20:16:21

Conducted Emission Plot between 7GHz ~ 13.6G


Date: 29.FEB.2012 20:16:34

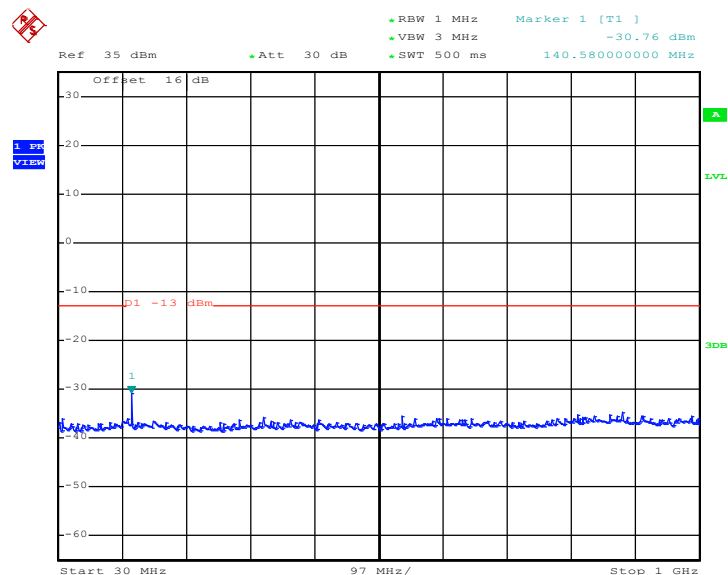


Conducted Emission Plot between 13.6GHz ~ 19.1GHz

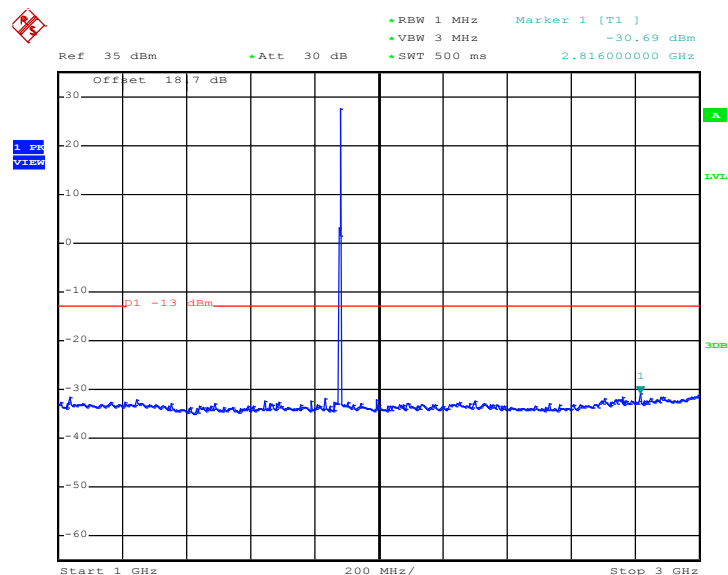


Date: 29.FEB.2012 20:16:46

Band :	GSM1900	Channel :	CH661
Test Mode :	EDGE 8 Link		

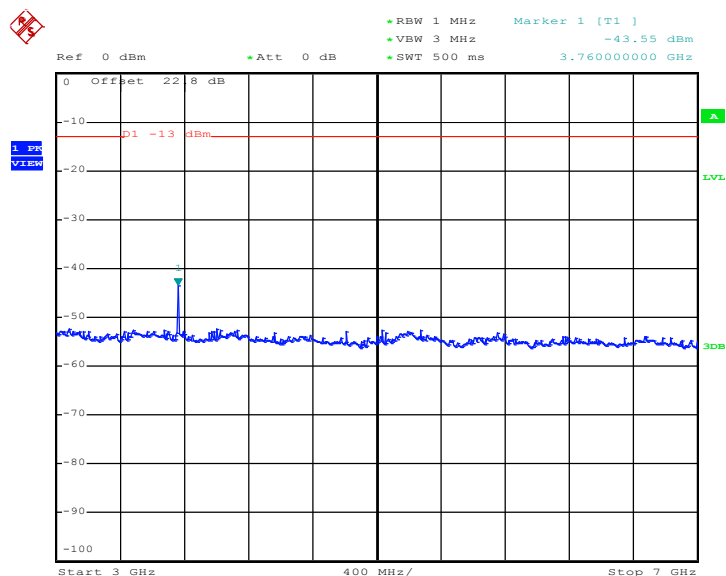
Conducted Emission Plot between 30MHz ~ 1GHz


Date: 29.FEB.2012 19:11:07

Conducted Emission Plot between 1GHz ~ 3GHz


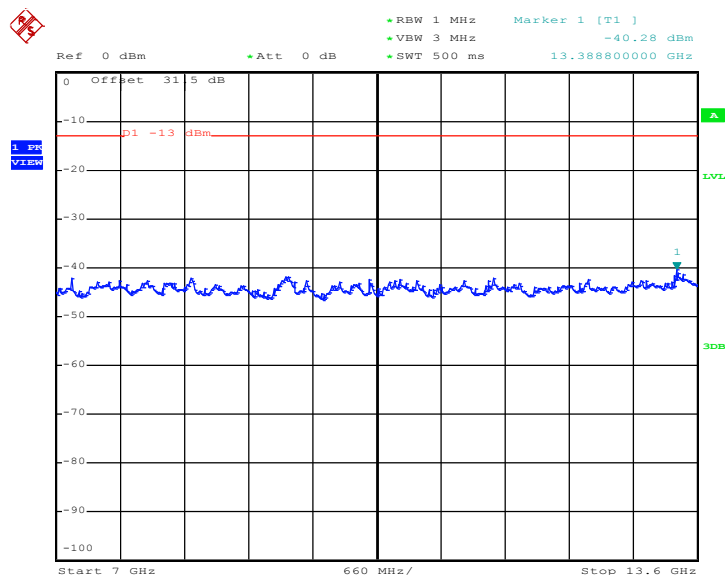
Date: 29.FEB.2012 19:13:31

Conducted Emission Plot between 3GHz ~ 7GHz



Date: 29.FEB.2012 19:14:07

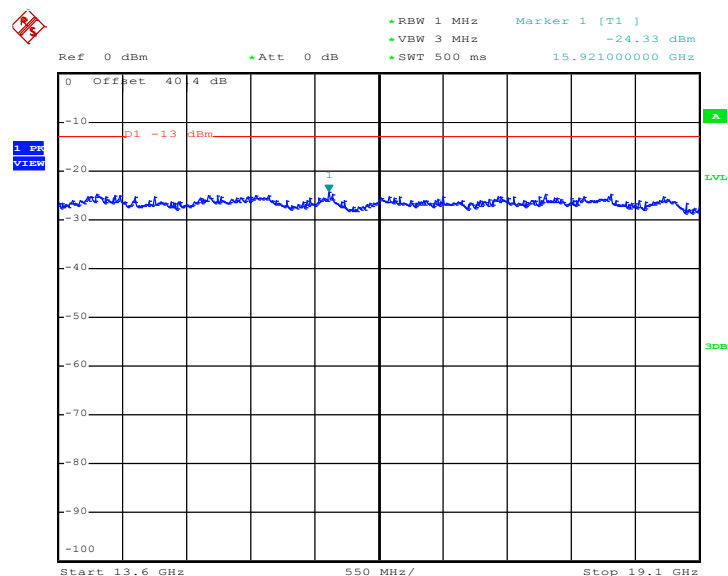
Conducted Emission Plot between 7GHz ~ 13.6GHz



Date: 29.FEB.2012 19:14:19

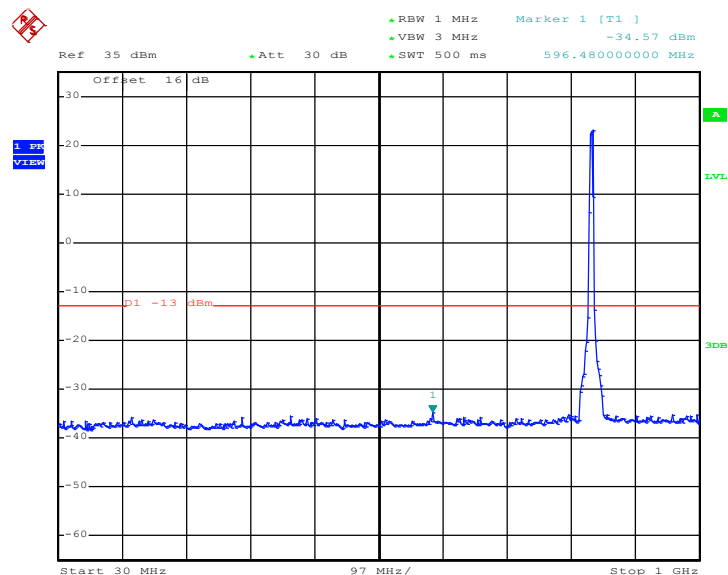


Conducted Emission Plot between 13.6GHz ~ 19.1GHz

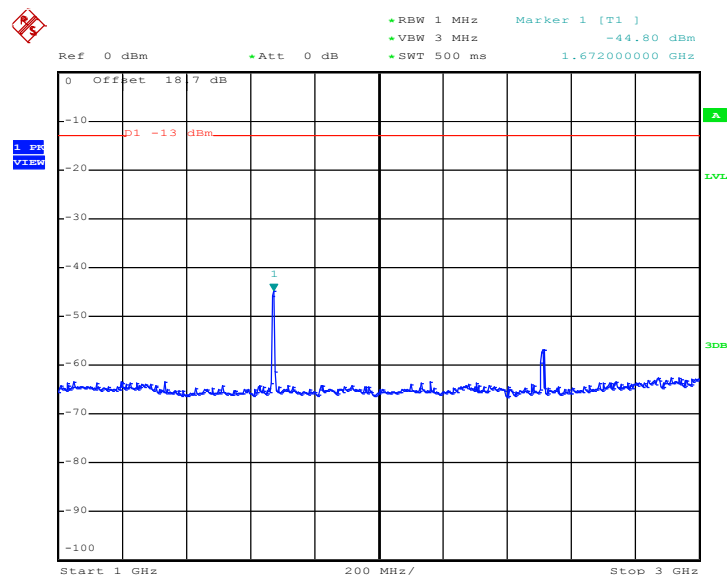


Date: 29.FEB.2012 19:14:32

Band :	WCDMA Band V	Channel :	CH4182
Test Mode :	RMC 12.2Kbps Link		

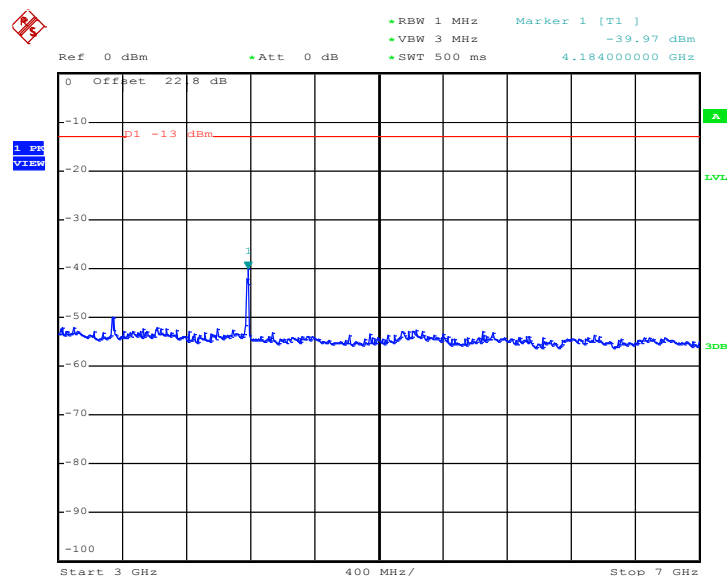
Conducted Emission Plot between 30MHz ~ 1GHz


Date: 29.FEB.2012 20:46:47

Conducted Emission Plot between 1GHz ~ 3GHz


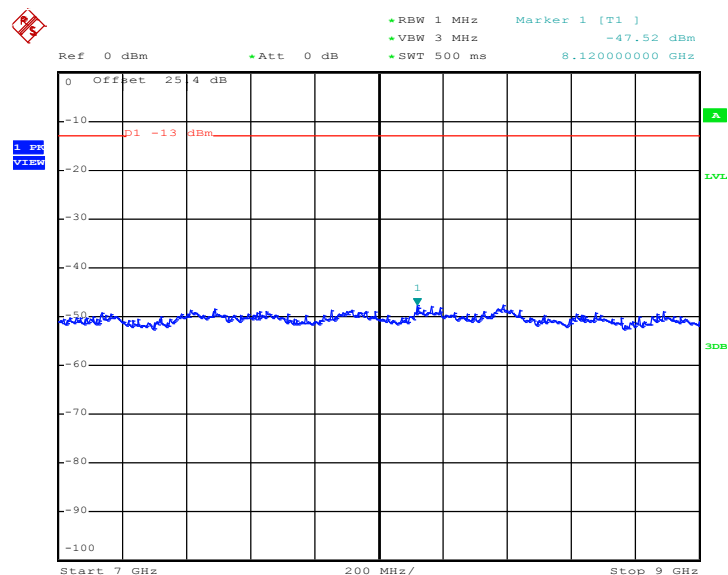
Date: 29.FEB.2012 20:47:06

Conducted Emission Plot between 3GHz ~ 7GHz



Date: 29.FEB.2012 20:47:18

Conducted Emission Plot between 7GHz ~ 9GHz

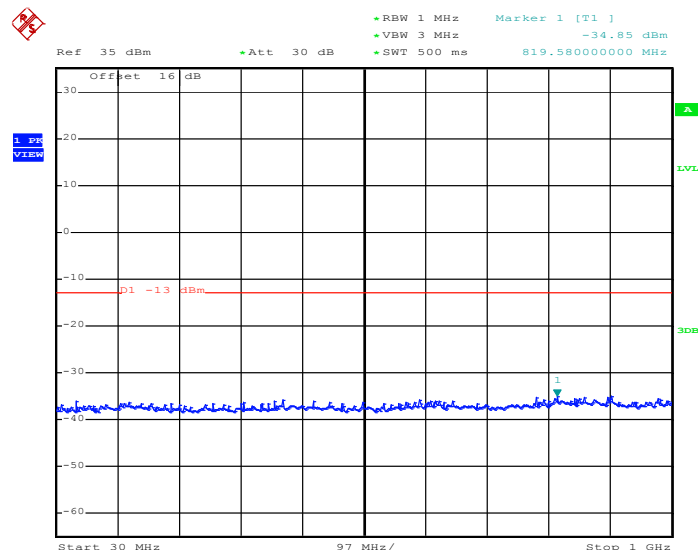


Date: 29.FEB.2012 20:47:31



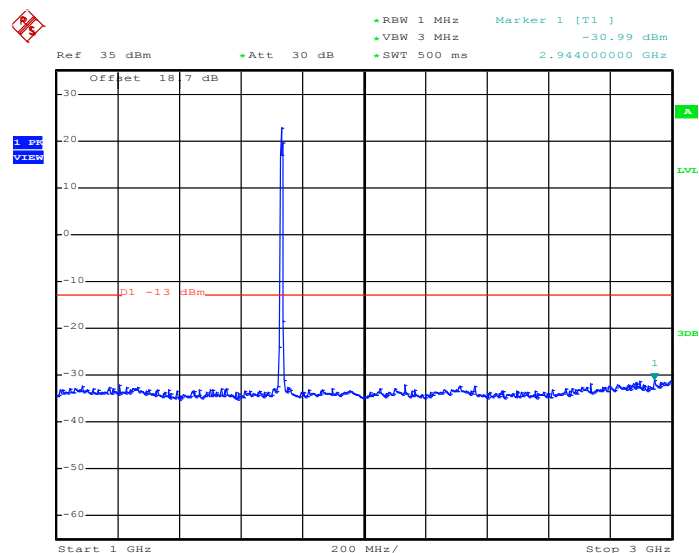
Band :	WCDMA Band IV	Channel :	CH1413
Test Mode :	RMC 12.2Kbps Link		

Conducted Emission Plot between 30MHz ~ 1GHz



Date: 29.FEB.2012 20:57:59

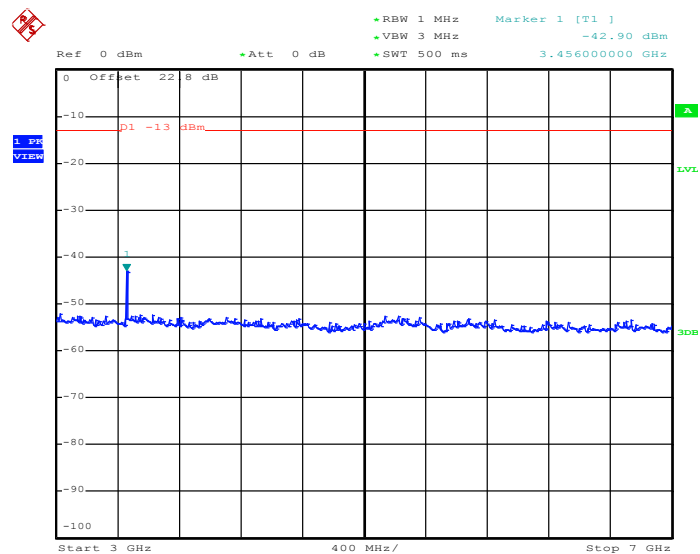
Conducted Emission Plot between 1GHz ~ 3GHz



Date: 29.FEB.2012 20:58:12

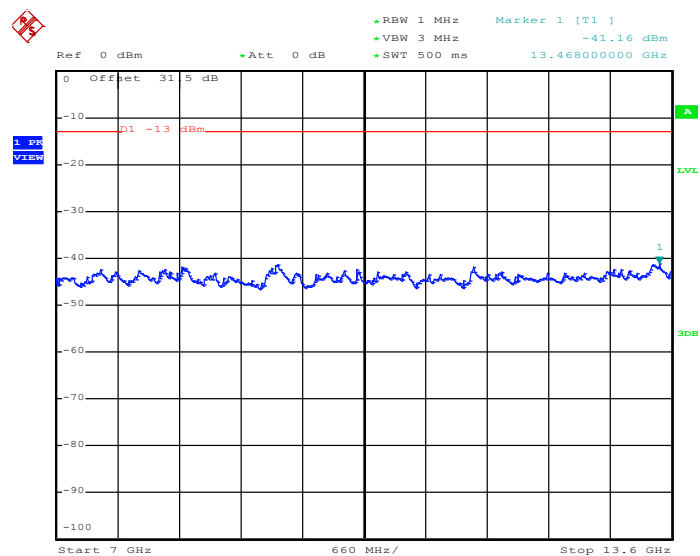


Conducted Emission Plot between 3GHz ~ 7GHz



Date: 29.FEB.2012 20:58:28

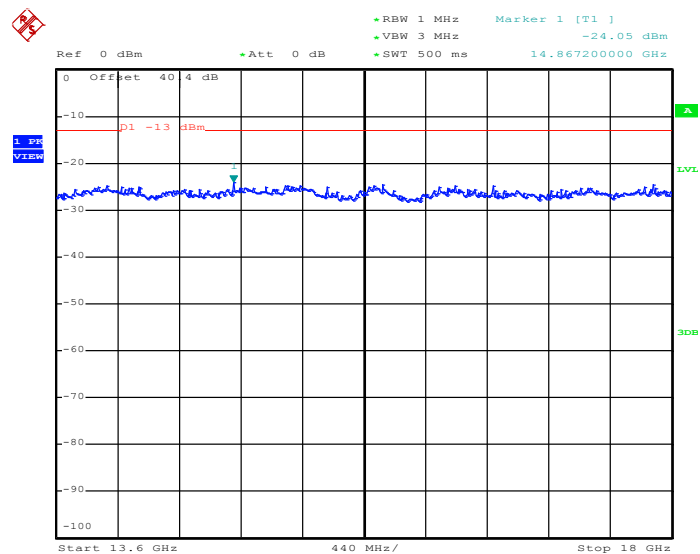
Conducted Emission Plot between 7GHz ~ 13.6GHz



Date: 29.FEB.2012 20:58:40

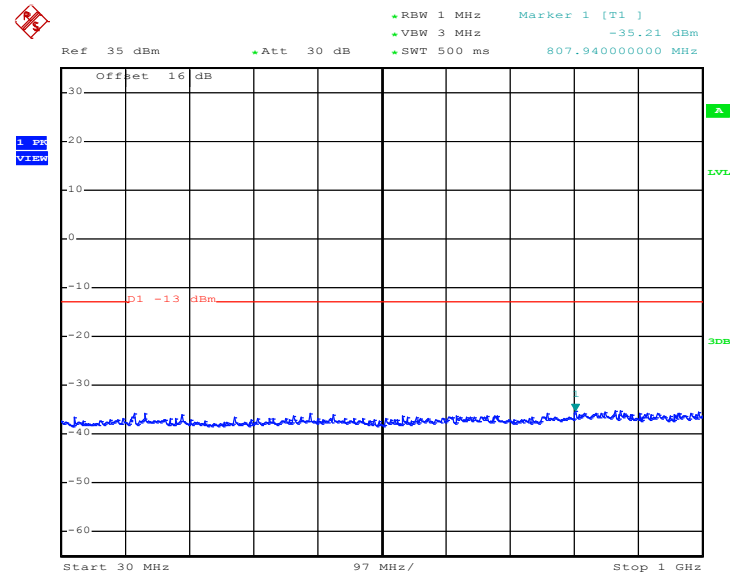


Conducted Emission Plot between 13.6GHz ~ 18GHz

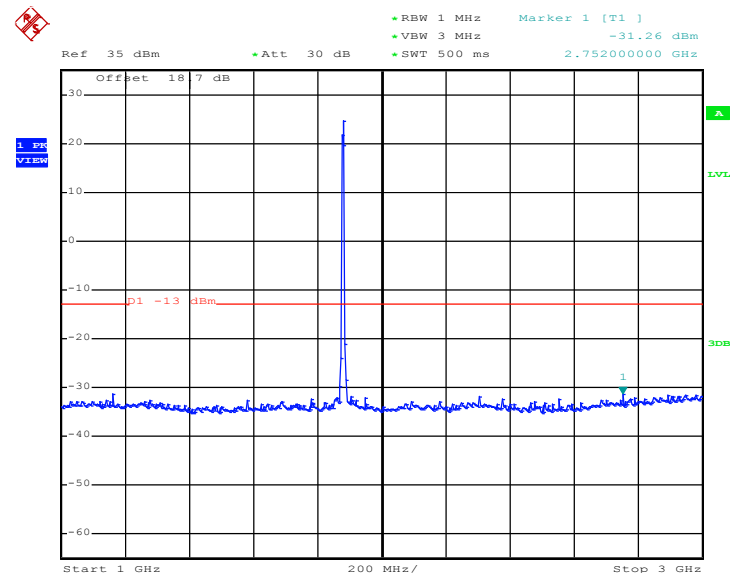


Date: 29.FEB.2012 20:58:53

Band :	WCDMA Band II	Channel :	CH9400
Test Mode :	RMC 12.2Kbps Link		

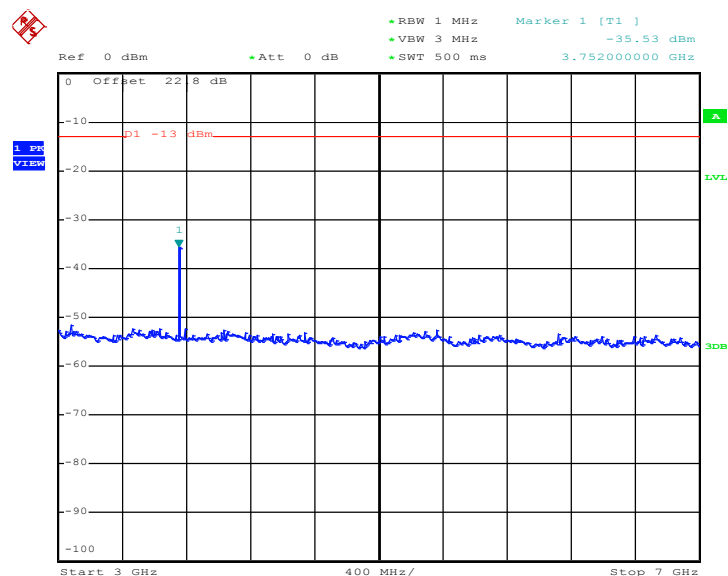
Conducted Emission Plot between 30MHz ~ 1GHz


Date: 29.FEB.2012 20:29:51

Conducted Emission Plot between 1GHz ~ 3GHz


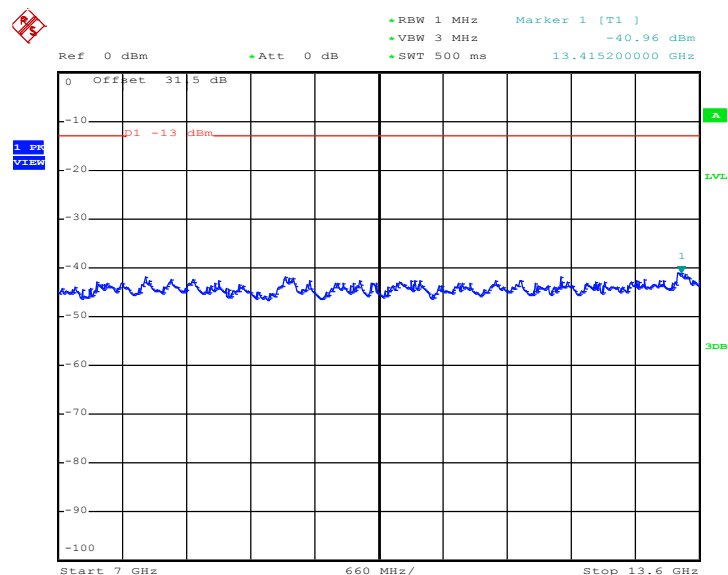
Date: 29.FEB.2012 20:30:03

Conducted Emission Plot between 3GHz ~ 7GHz



Date: 29.FEB.2012 20:30:26

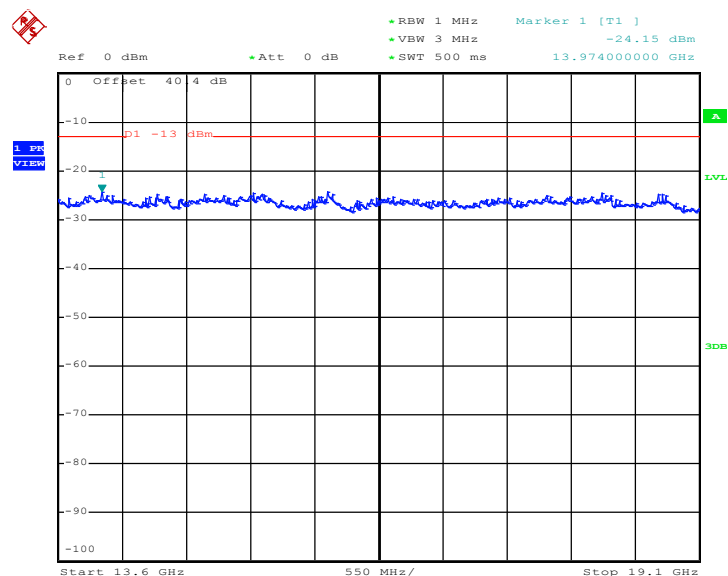
Conducted Emission Plot between 7GHz ~ 13.6GHz



Date: 29.FEB.2012 20:30:38



Conducted Emission Plot between 13.6GHz ~ 19.1GHz



Date: 29.FEB.2012 20:30:51

3.6 Field Strength of Spurious Radiation Measurement

3.6.1 Description of Field Strength of Spurious Radiated Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

3.6.2 Measuring Instruments

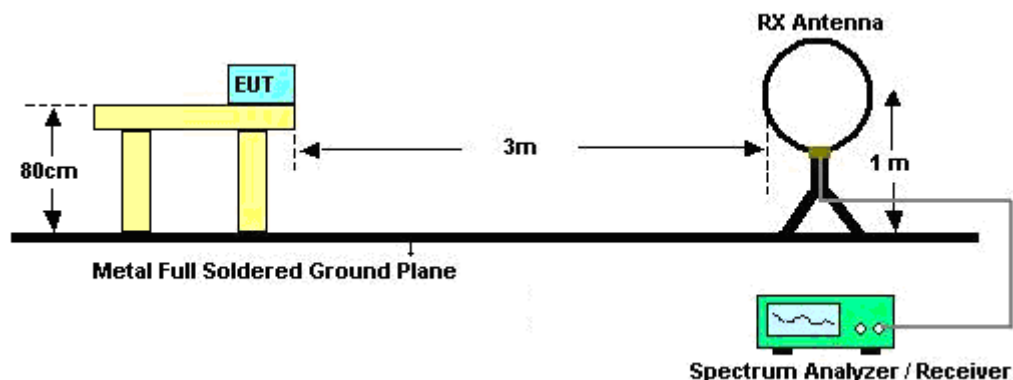
See list of measuring instruments of this test report.

3.6.3 Test Procedures

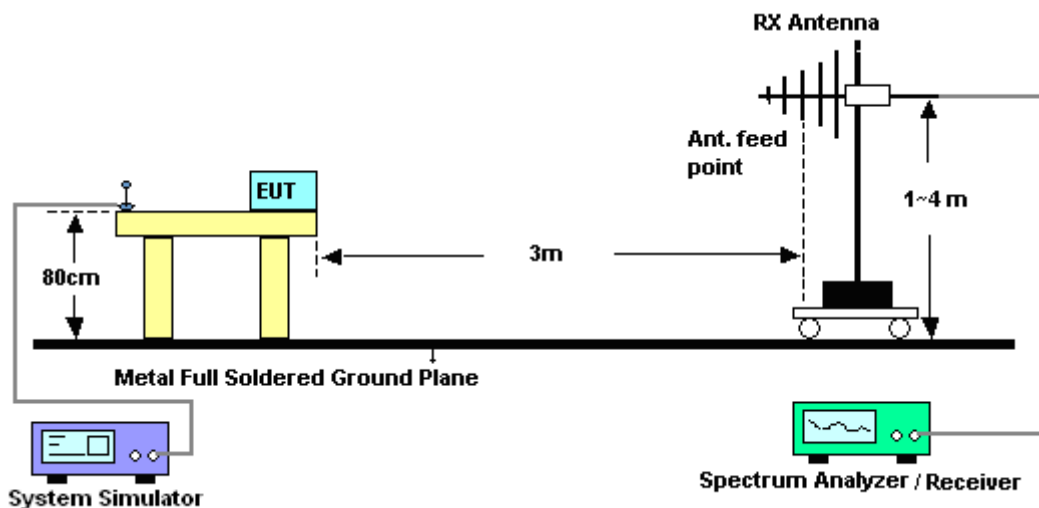
1. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
11. $ERP \text{ (dBm)} = EIRP - 2.15$

3.6.4 Test Setup

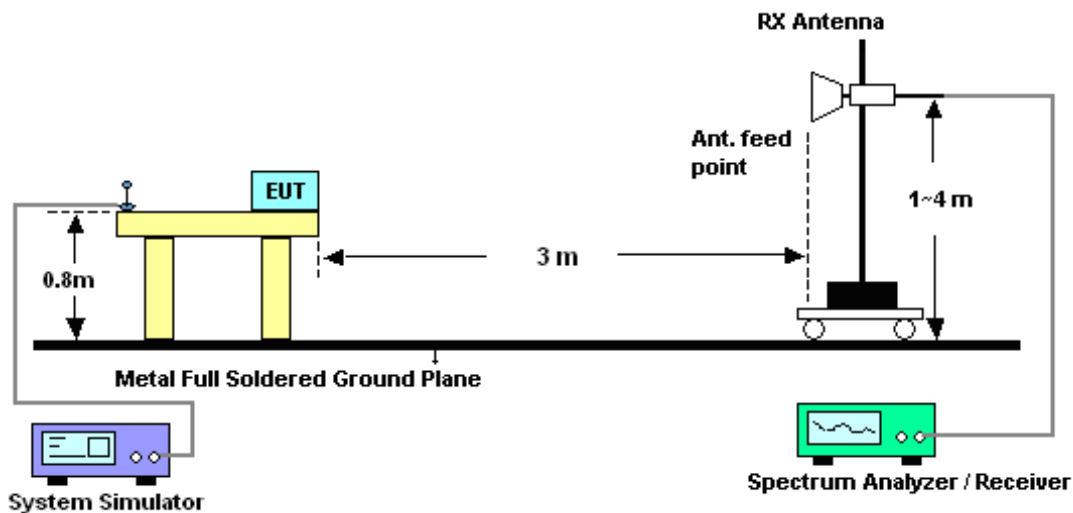
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

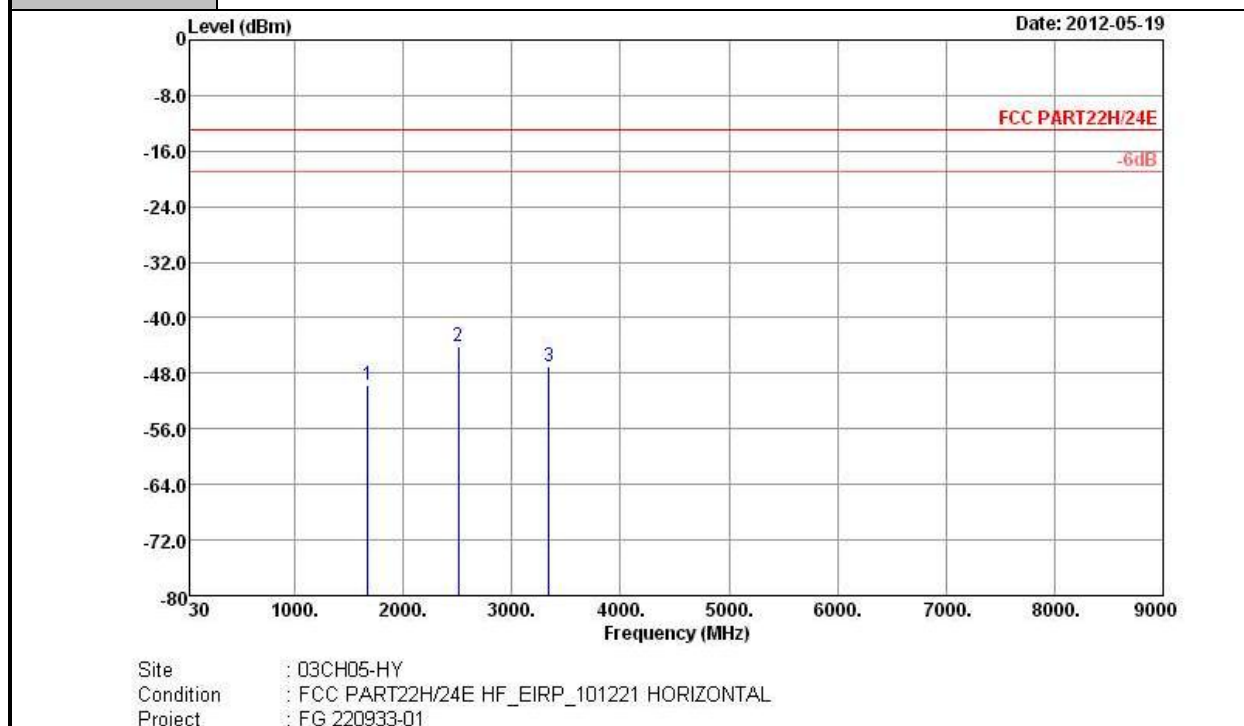


3.6.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

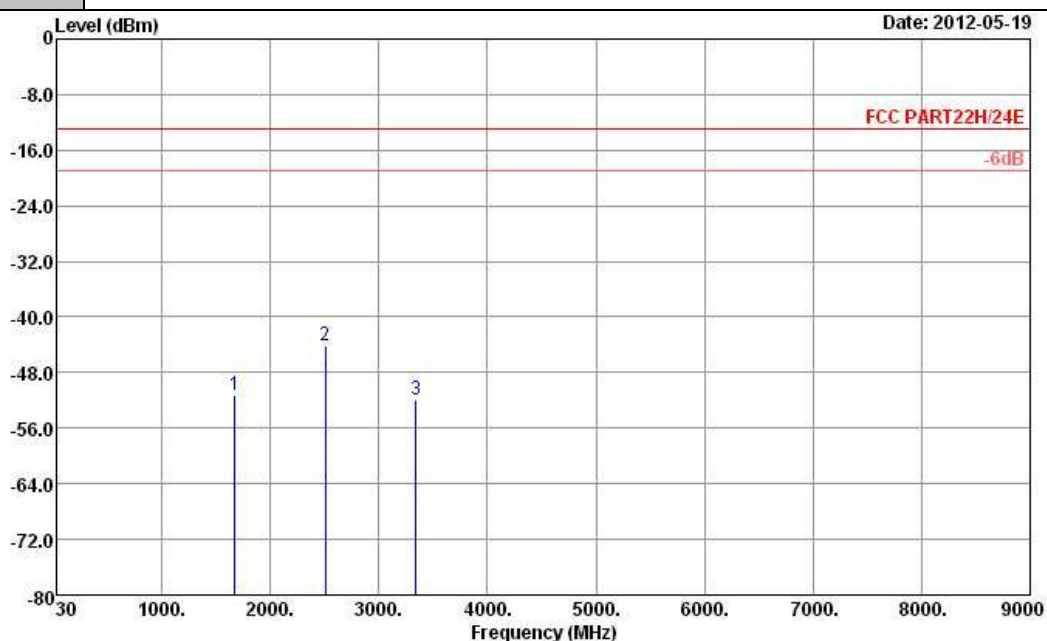
3.6.6 Test Result of Field Strength of Spurious Radiated

Band :	GSM850	Temperature :	20~22°C
Test Mode :	GPRS 8 Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-49.65	-13	-36.65	-55.71	-50.84	2.15	5.49	H	Pass
2509	-44.22	-13	-31.22	-53.62	-46.11	2.38	6.41	H	Pass
3345	-47.00	-13	-34.00	-58.49	-50.33	2.86	8.34	H	Pass

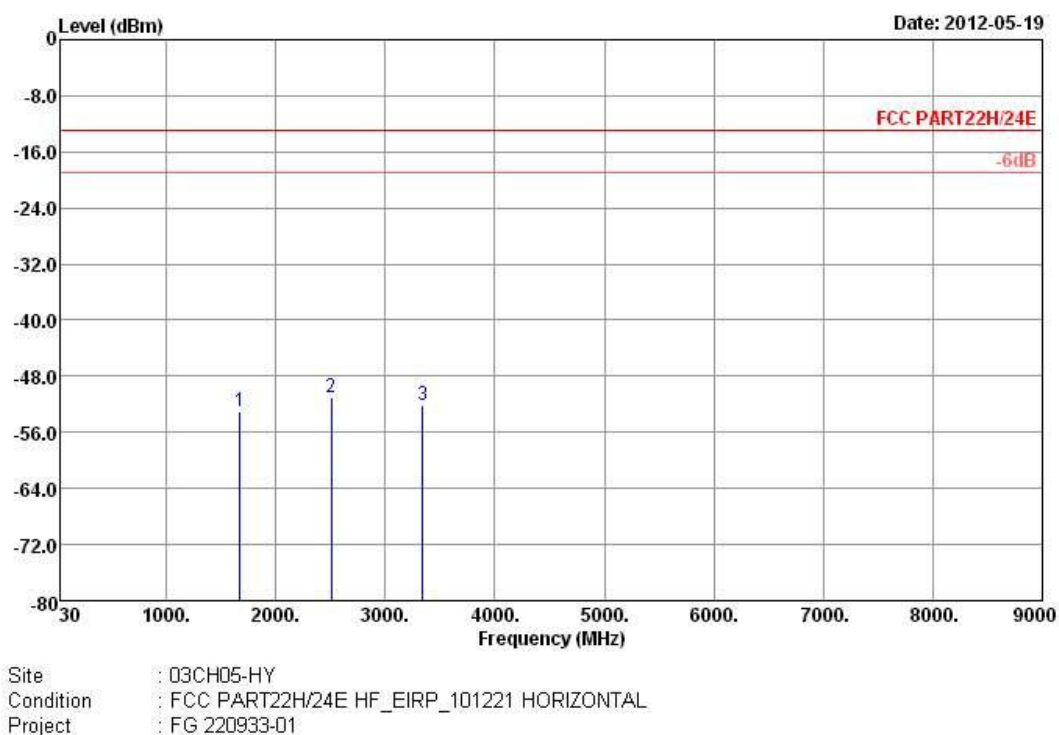
Band :	GSM850	Temperature :	20~22°C
Test Mode :	GPRS 8 Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 VERTICAL
Project : FG 220933-01

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-51.22	-13	-38.22	-57.24	-52.41	2.15	5.49	V	Pass
2509	-44.11	-13	-31.11	-53.59	-46	2.38	6.41	V	Pass
3345	-52.00	-13	-39.00	-63.48	-55.33	2.86	8.34	V	Pass

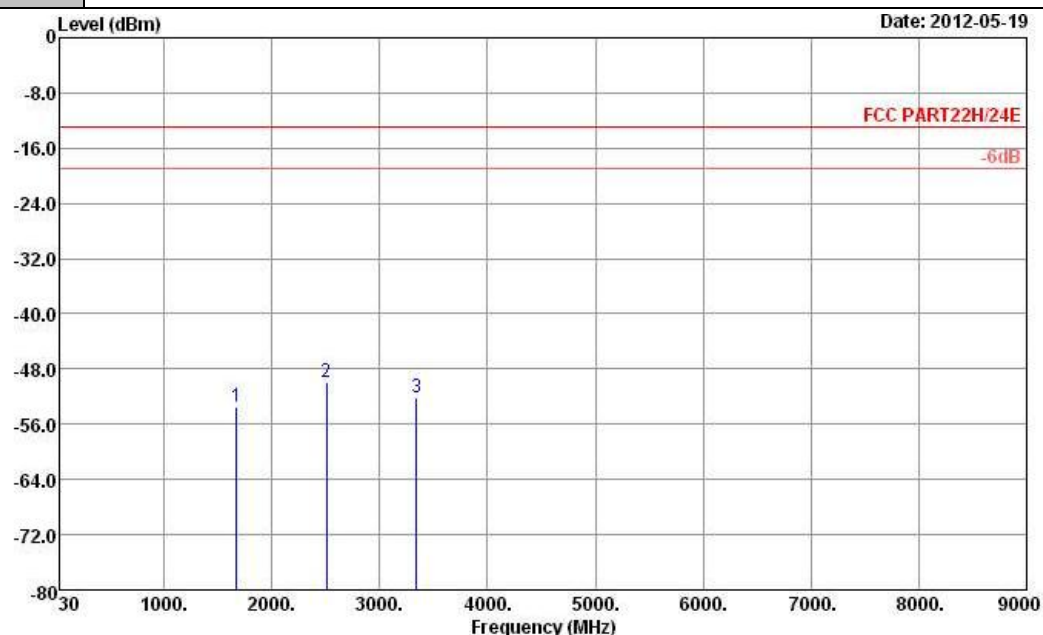
Band :	GSM850	Temperature :	20~22°C
Test Mode :	EDGE 8 Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-53.00	-13	-40.00	-58.93	-54.19	2.15	5.49	H	Pass
2509	-51.05	-13	-38.05	-60.33	-52.94	2.38	6.41	H	Pass
3345	-52.08	-13	-39.08	-63.62	-55.41	2.86	8.34	H	Pass



Band :	GSM850	Temperature :	20~22°C
Test Mode :	EDGE 8 Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

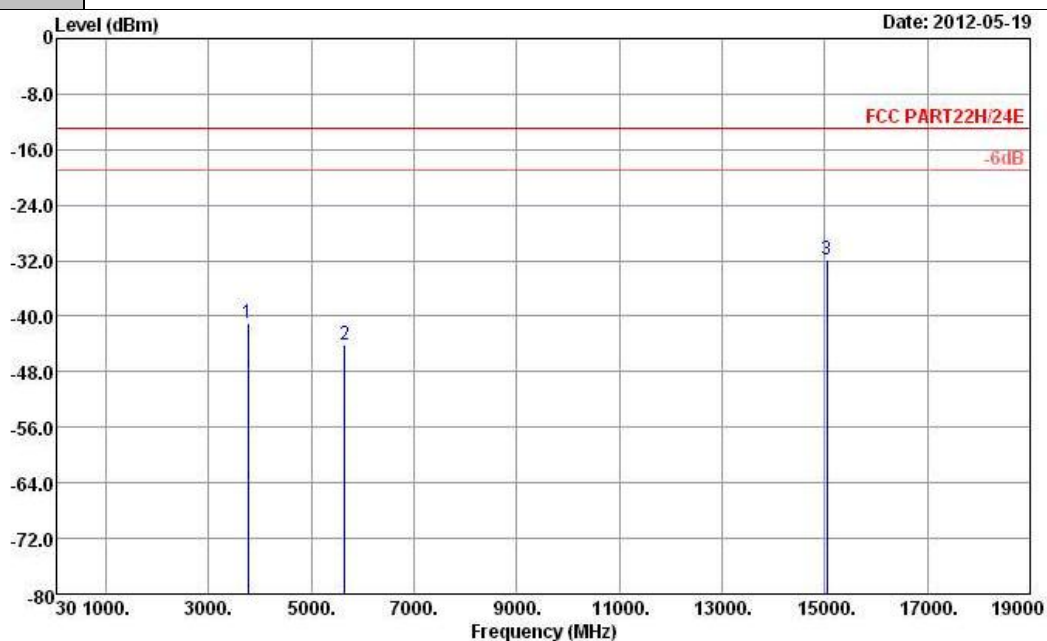


Site : 03CH05-HY
 Condition : FCC PART22H/24E HF_EIRP_101221 VERTICAL
 Project : FG 220933-01

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-53.42	-13	-40.42	-59.35	-54.61	2.15	5.49	V	Pass
2509	-50.02	-13	-37.02	-59.28	-51.91	2.38	6.41	V	Pass
3345	-52.21	-13	-39.21	-64.09	-55.54	2.86	8.34	V	Pass



Band :	GSM1900	Temperature :	20~22°C
Test Mode :	GPRS 8 Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

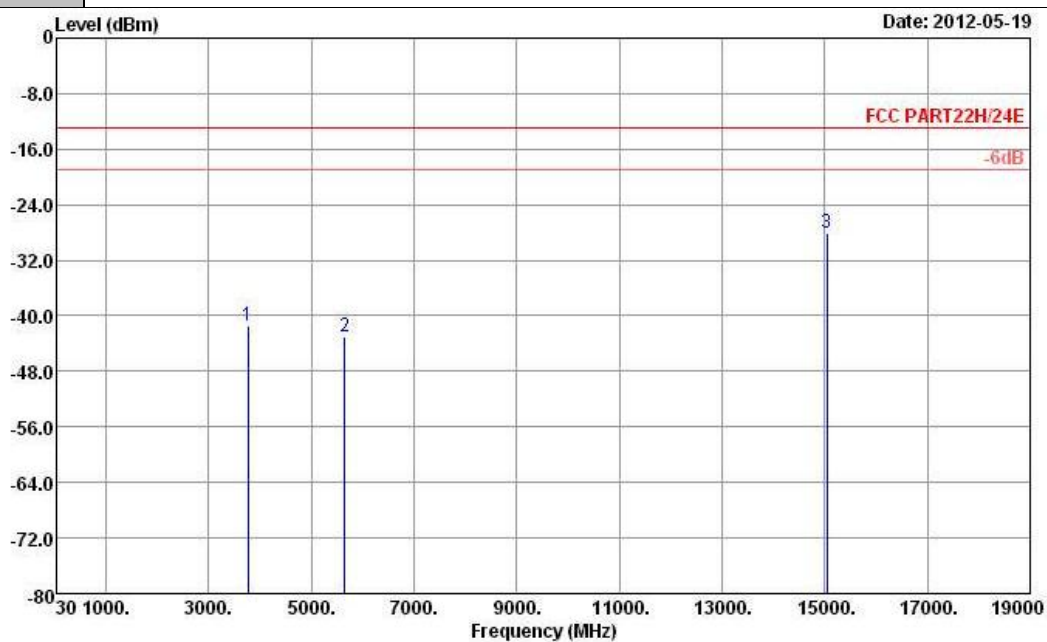


Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 HORIZONTAL
Project : FG 220933-01

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-41.01	-13	-28.01	-54.42	-47.14	2.9292	9.06	H	Pass
5640	-44.11	-13	-31.11	-63.03	-51.03	3.9072	10.83	H	Pass
15040	-31.81	-13	-18.81	-62.91	-39.12	6.6704	13.98	H	Pass



Band :	GSM1900	Temperature :	20~22°C
Test Mode :	GPRS 8 Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

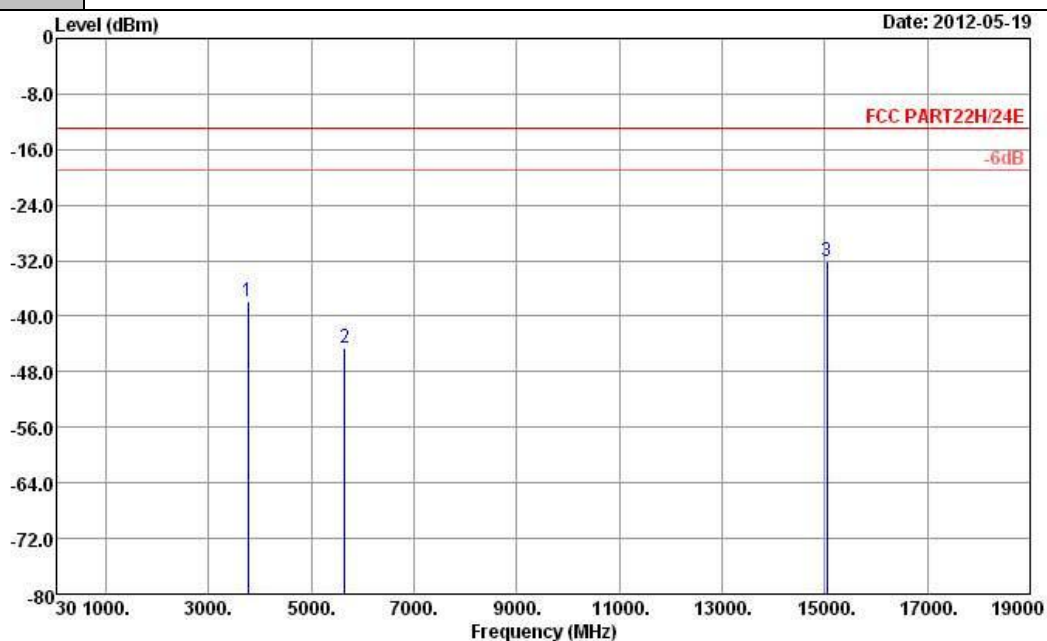


Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 VERTICAL
Project : FG 220933-01

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-41.51	-13	-28.51	-55	-47.64	2.9292	9.06	V	Pass
5640	-43.10	-13	-30.10	-61.97	-50.02	3.9072	10.83	V	Pass
15040	-28.00	-13	-15.00	-59.08	-35.31	6.6704	13.98	V	Pass



Band :	GSM1900	Temperature :	20~22°C
Test Mode :	EDGE 8 Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

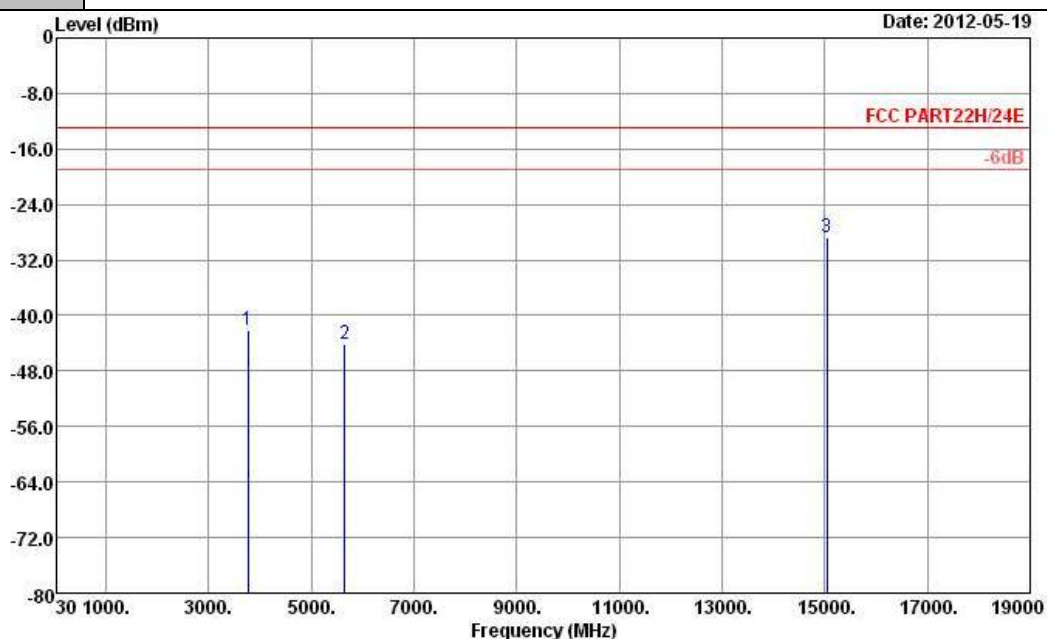


Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 HORIZONTAL
Project : FG 220933-01

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-37.88	-13	-24.88	-51.3	-44.01	2.9292	9.06	H	Pass
5640	-44.59	-13	-31.59	-63.57	-51.51	3.9072	10.83	H	Pass
15040	-32.10	-13	-19.10	-63.28	-39.41	6.6704	13.98	H	Pass



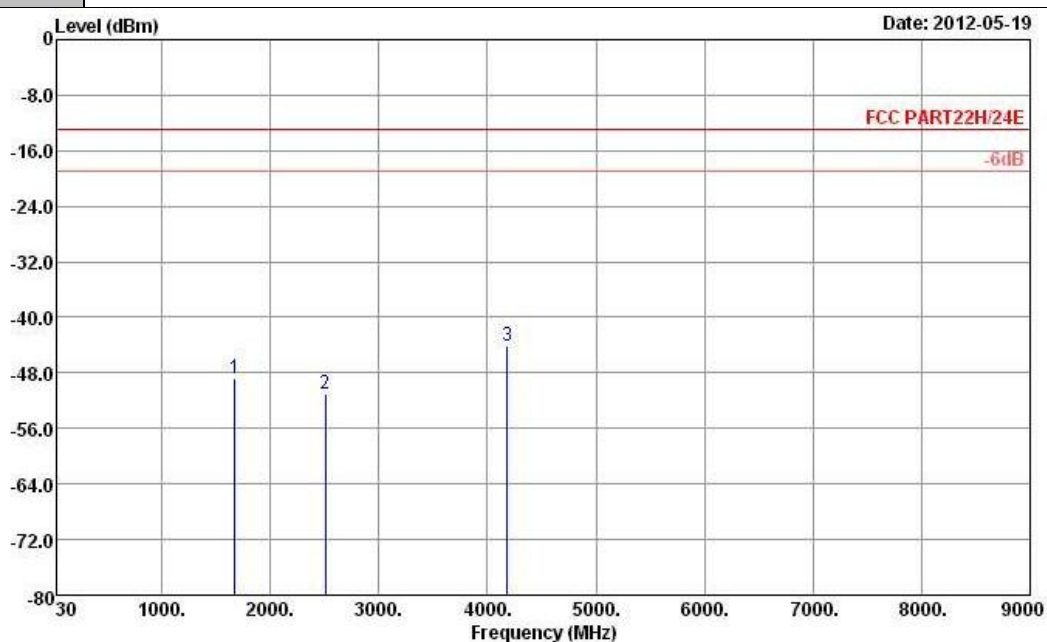
Band :	GSM1900	Temperature :	20~22°C
Test Mode :	EDGE 8 Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 VERTICAL
Project : FG 220933-01

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-42.08	-13	-29.08	-55.7	-48.21	2.9292	9.06	V	Pass
5640	-44.18	-13	-31.18	-63.14	-51.1	3.9072	10.83	V	Pass
15040	-28.69	-13	-15.69	-59.91	-36	6.6704	13.98	V	Pass

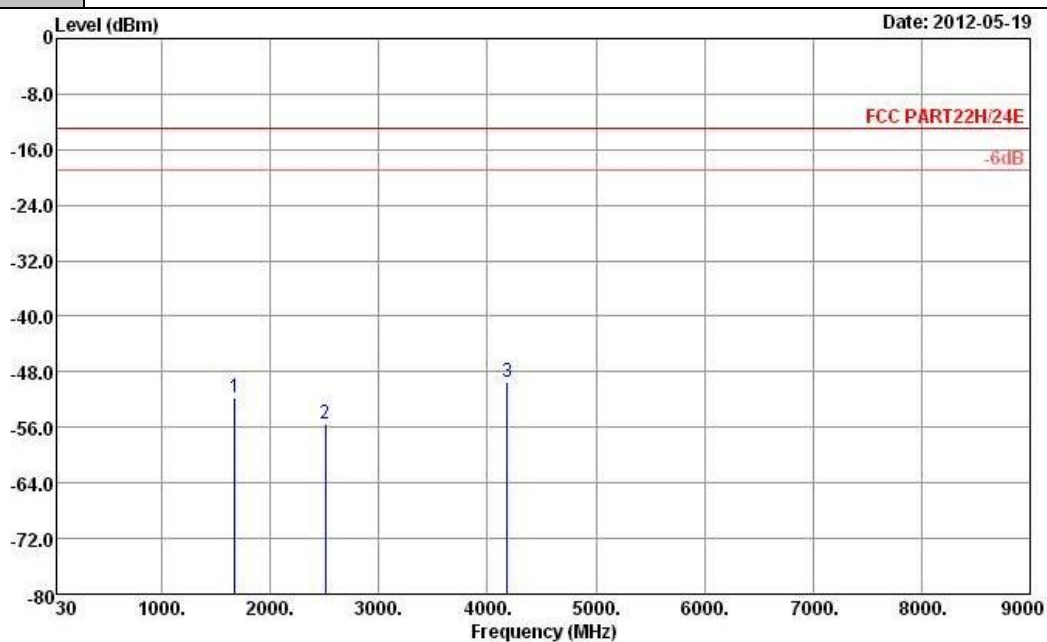
Band :	WCDMA Band V	Temperature :	20~22°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-48.81	-13	-35.81	-54.9	-50	2.15	5.49	H	Pass
2509	-50.95	-13	-37.95	-59.23	-52.84	2.38	6.41	H	Pass
4182	-44.06	-13	-31.06	-59.32	-48	3.26	9.35	H	Pass

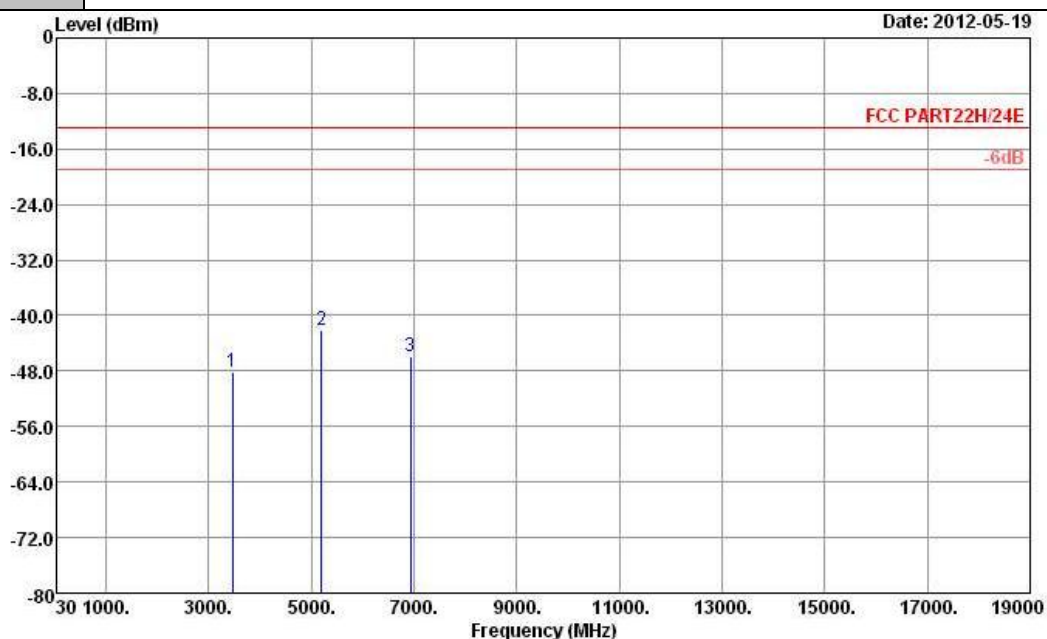


Band :	WCDMA Band V	Temperature :	20~22°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-51.75	-13	-38.75	-57.71	-52.94	2.15	5.49	V	Pass
2509	-55.42	-13	-42.42	-64.74	-57.31	2.38	6.41	V	Pass
4182	-49.37	-13	-36.37	-64.63	-53.31	3.26	9.35	V	Pass

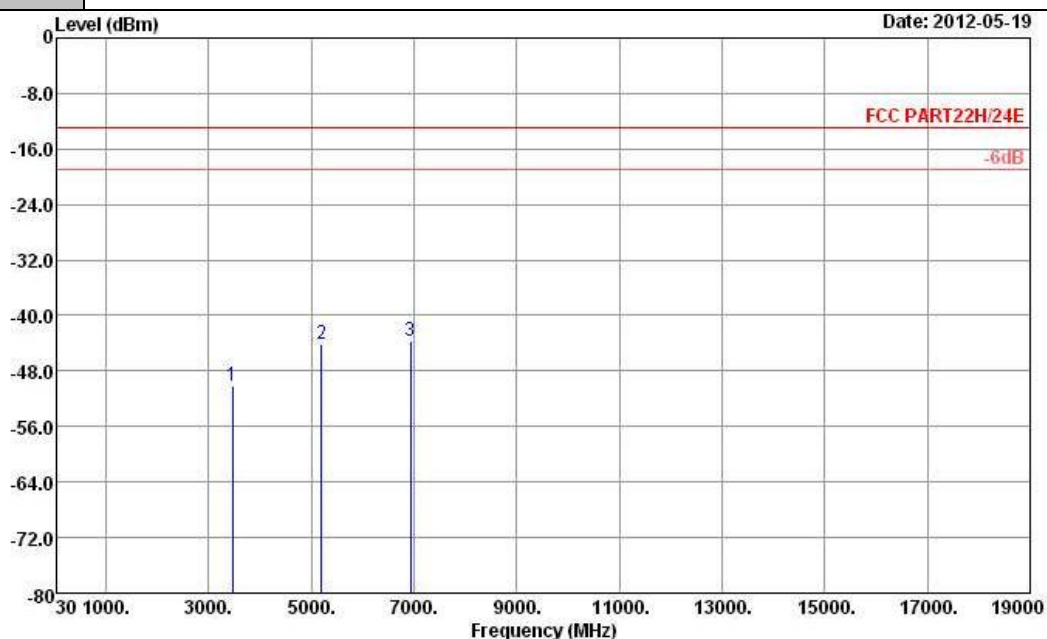
Band :	WCDMA Band IV	Temperature :	20~22°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 HORIZONTAL
Project : FG 220933-01

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3465.2	-48.15	-13	-35.15	-60.06	-54.41	2.58	8.84	H	Pass
5197.8	-42.08	-13	-29.08	-59.84	-49.02	3.78	10.72	H	Pass
6930.4	-45.87	-13	-32.87	-67.12	-53.62	4.3	12.05	H	Pass

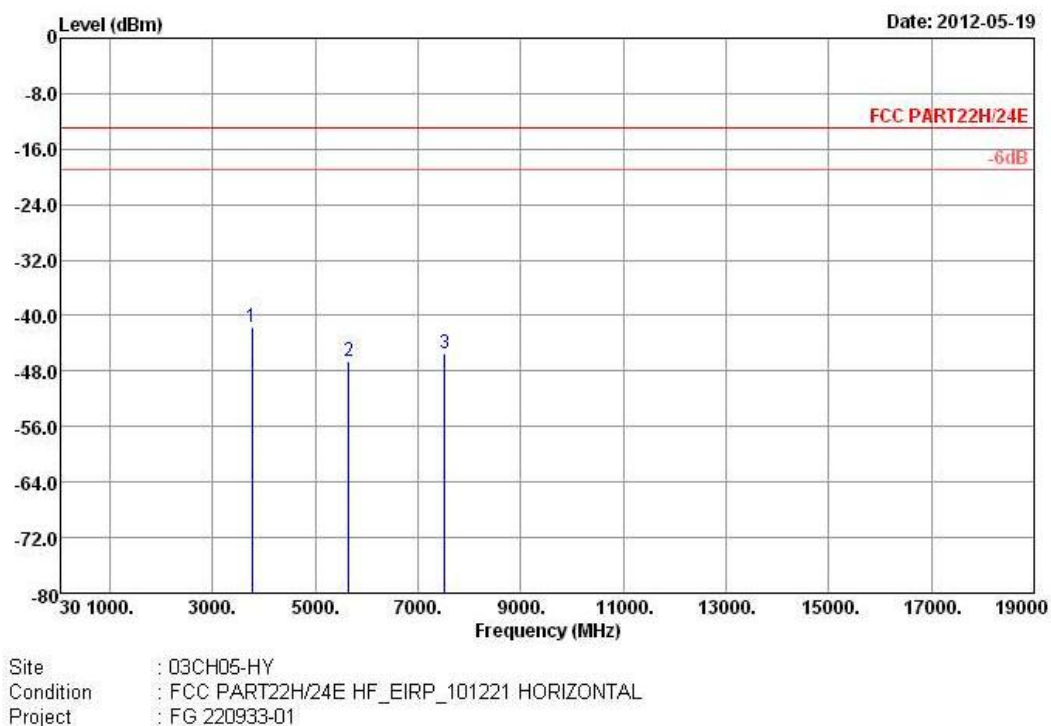
Band :	WCDMA Band IV	Temperature :	20~22°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 VERTICAL
Project : FG 220933-01

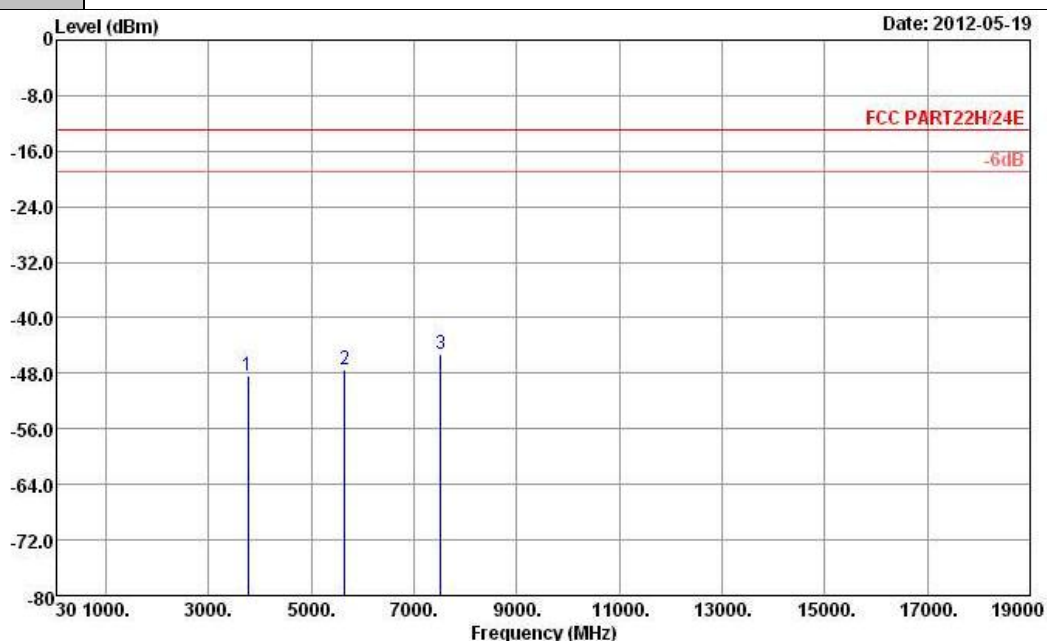
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3465.2	-50.05	-13	-37.05	-61.89	-56.31	2.58	8.84	V	Pass
5197.8	-44.15	-13	-31.15	-62.03	-51.09	3.78	10.72	V	Pass
6930.4	-43.67	-13	-30.67	-64.99	-51.42	4.3	12.05	V	Pass

Band :	WCDMA Band II	Temperature :	20~22°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-41.68	-13	-28.68	-55.26	-47.81	2.9292	9.06	H	Pass
5640	-46.49	-13	-33.49	-65.36	-53.41	3.9072	10.83	H	Pass
7520	-45.39	-13	-32.39	-67.33	-53.41	4.5988	12.62	H	Pass

Band :	WCDMA Band II	Temperature :	20~22°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 VERTICAL
Project : FG 220933-01

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-48.38	-13	-35.38	-61.93	-54.51	2.9292	9.06	V	Pass
5640	-47.45	-13	-34.45	-66.55	-54.37	3.9072	10.83	V	Pass
7520	-45.19	-13	-32.19	-67.09	-53.21	4.5988	12.62	V	Pass

3.7 Frequency Stability Measurement

3.7.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.

3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

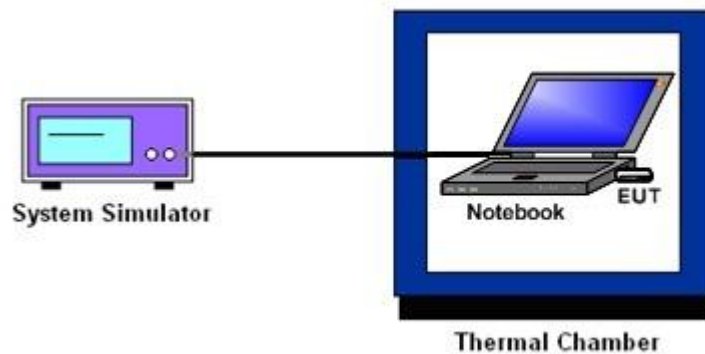
3.7.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.
4. If the EUT cannot be turned on at -30°C , the testing lowest temperature will be raised in 10°C step until the EUT can be turned on.

3.7.4 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at $25\pm 5^{\circ}\text{C}$ and connected with the base station.
2. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

3.7.5 Test Setup



3.7.6 Test Result of Temperature Variation

Band :	GSM 850	Channel :	189
Limit (ppm) :	2.5		

Temperature (°C)	GPRS 8		EDGE 8		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-68	-0.08	-63	-0.07	PASS
-20	-60	-0.07	45	0.05	
-10	49	0.06	39	0.05	
0	-31	-0.04	40	0.05	
10	-27	-0.03	58	0.07	
20	-34	-0.04	51	0.06	
30	36	0.04	50	0.06	
40	-24	-0.03	53	0.06	
50	-37	-0.04	56	0.07	
55	38	0.04	57	0.07	

Band :	GSM 1900	Channel :	661
Limit (ppm) :	2.5		

Temperature (°C)	GPRS 8		EDGE 8		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-109	-0.06	-93	-0.05	PASS
-20	-92	-0.05	84	0.04	
-10	82	0.04	-78	-0.04	
0	-80	-0.04	-71	-0.04	
10	80	0.04	64	0.03	
20	-83	-0.04	-74	-0.04	
30	86	0.05	77	0.04	
40	-44	-0.02	86	0.05	
50	83	0.04	-60	-0.03	
55	69	0.04	-84	-0.04	

Band :	WCDMA Band V	Channel :	4182
Limit (ppm) :	2.5		

Temperature (°C)	RMC 12.2Kbps		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-24	-0.03	PASS
-20	21	0.02	
-10	-23	-0.03	
0	10	0.01	
10	-13	-0.02	
20	-15	-0.02	
30	-14	-0.02	
40	-8	-0.01	
50	17	0.02	
55	-13	-0.02	

Band :	WCDMA Band IV	Channel :	1413
Limit (ppm) :	2.5		

Temperature (°C)	RMC 12.2Kbps		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	15	0.01	PASS
-20	12	0.01	
-10	-10	-0.01	
0	-12	-0.01	
10	-15	-0.01	
20	-12	-0.01	
30	-14	-0.01	
40	-10	-0.01	
50	-14	-0.01	
55	11	0.01	

Band :	WCDMA Band II	Channel :	9400
Limit (ppm) :	2.5		

Temperature (°C)	RMC 12.2Kbps		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	22	0.01	PASS
-20	28	0.01	
-10	-38	-0.02	
0	-15	-0.01	
10	-36	-0.02	
20	-14	-0.01	
30	14	0.01	
40	-17	-0.01	
50	-16	-0.01	
55	-14	-0.01	

3.7.7 Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
GSM 850 CH189	GPRS 8	5.0	51	0.06	2.5	PASS
		4.5	43	0.05		
		5.5	59	0.07		
	EDGE 8	5.0	47	0.06		
		4.5	53	0.06		
		5.5	61	0.07		
GSM 1900 CH661	GPRS 8	5.0	71	0.04		
		4.5	61	0.03		
		5.5	83	0.04		
	EDGE 8	5.0	63	0.03		
		4.5	72	0.04		
		5.5	85	0.04		
WCDMA Band V CH4182	RMC 12.2Kbps	5.0	16	0.02		
		4.5	-15	-0.02		
		5.5	21	0.02		
WCDMA Band IV CH1413	RMC 12.2Kbps	5.0	-19	-0.01		
		4.5	-14	-0.01		
		5.5	-21	-0.01		
WCDMA Band II CH9400	RMC 12.2Kbps	5.0	37	0.02		
		4.5	-26	-0.01		
		5.5	34	0.02		

Note: Normal Voltage = 5.0V.

4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
System Simulator	R&S	CMU200	117995	N/A	Jul. 28, 2011	Feb. 29, 2012	Jul. 27, 2012	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 13, 2011	Feb. 29, 2012	Jun. 12, 2012	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D35P	TBN-930701	N/A	Jul. 27, 2011	Feb. 29, 2012	Jul. 26, 2012	Conducted (TH02-HY)
Spectrum Analyzer	R&S	ESU26	100390	20Hz ~ 26.5GHz	Dec. 22, 2011	May 19, 2012~ May 20, 2012	Dec. 21, 2012	Radiation (03CH05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2725	30MHz ~ 2GHz	Oct. 22, 2011	May 19, 2012~ May 20, 2012	Oct. 21, 2012	Radiation (03CH05-HY)
Turn Table	HD	Deis HD 2000	420/611	0 ~ 360 degree	N/A	May 19, 2012~ May 20, 2012	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	MA 240	240/666	1 m ~ 4 m	N/A	May 19, 2012~ May 20, 2012	N/A	Radiation (03CH05-HY)
Horn Antenna	ESCO	3117	66584	1GHz ~ 18GHz	Aug. 04, 2011	May 19, 2012~ May 20, 2012	Aug. 03, 2012	Radiation (03CH05-HY)
Pre Amplifier	COM-POWER	PA-103A	161075	10Hz ~ 1000MHz Gain:32dB	Feb. 27, 2012	May 19, 2012~ May 20, 2012	Feb. 26, 2013	Radiation (03CH05-HY)
Pre Amplifier	MITEQ	AMF-7D-00 101800-30-1	159087	1GHz~18GHz	Feb. 27, 2012	May 19, 2012~ May 20, 2012	Feb. 26, 2013	Radiation (03CH05-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz~26.5GHz	Aug. 30, 2011	May 19, 2012~ May 20, 2012	Aug. 29, 2012	Radiation (03CH05-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	May 19, 2012~ May 20, 2012	Jul. 28, 2012	Radiation (03CH05-HY)
System Simulator	R&S	CMU200	117591	N/A	Oct. 21, 2011	May 19, 2012~ May 20, 2012	Oct. 20, 2013	Radiation (03CH05-HY)

5 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.41	Normal (k=2)	0.21
Antenna Factor Calibration	0.83	Normal (k=2)	0.42
Cable Loss Calibration	0.25	Normal (k=2)	0.13
Pre-Amplifier Gain Calibration	0.27	Normal (k=2)	0.14
RCV/SPA Specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site Imperfection	1.43	Rectangular	0.83
Mismatch	+0.39 / -0.41	U-Shape	0.28
Combined Standard Uncertainty $U_c(y)$	1.27		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.54		

Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Contribution	Uncertainty of X_i		$u(X_i)$	C_i	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	± 0.10	Normal (k=2)	0.10	1	0.10
Antenna Factor Calibration	± 1.70	Normal (k=2)	0.85	1	0.85
Cable Loss Calibration	± 0.50	Normal (k=2)	0.25	1	0.25
Receiver Correction	± 2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	± 1.50	Rectangular	0.87	1	0.87
Site Imperfection	± 2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20\log(1-\Gamma_1\Gamma_2)$	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty $U_c(y)$	2.36				
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.72				



Appendix A. Photographs of EUT

Please refer to Sporton report number EP220933-01 as below.