

FCC RF Test Report

APPLICANT : Elk LLC
EQUIPMENT : Tablet PC
MODEL NAME : 3HT7G
FCC ID : ZHT-1013
STANDARD : FCC 47 CFR Part 2, 22(H), 24(E)
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 II : 1852.4 ~ 1907.6 MHz /
1932.4 ~ 1987.6 MHz
MAX. ERP/EIRP POWER : GSM850 (GPRS 8) : 0.8710 W
GSM850 (EDGE 8) : 0.2421 W
GSM1900 (GPRS 8) : 1.0447 W
GSM1900 (EDGE 10) : 0.4775 W
WCDMA Band V (RMC 12.2Kbps) : 0.0891 W
WCDMA Band II (RMC 12.2Kbps) : 0.3170 W

The product was completely tested on Aug. 21, 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.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG240709A	Rev.01	Initial issue of report	Aug.24, 2012
FG240709A	Rev. 02	1. Updated the PAR descriptions for GSM/EDGE. 2. Updated the EIRP/ERP description.	Sep. 10, 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	§24.232(d)	N/A	Peak-to-Average Ratio	< 13 dB	PASS	-
3.3	§22.913(a)(2)	RSS-132(4.4) SRSP-503(5.1.3)	Effective Radiated Power	< 7 Watts	PASS	-
3.3	§24.232(c)	RSS-133 (6.4) SRSP-510(5.1.2)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
3.4	§2.1049 §22.917(a) §24.238(a)	N/A	Occupied Bandwidth	N/A	PASS	-
3.5	§2.1051 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Band Edge Measurement	< 43+10log ₁₀ (P[Watts])	PASS	-
3.6	§2.1051 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Conducted Emission	< 43+10log ₁₀ (P[Watts])	PASS	-
3.7	§2.1053 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Field Strength of Spurious Radiation	< 43+10log ₁₀ (P[Watts])	PASS	Under limit 14.29 dB at 1672.000 MHz
3.8	§2.1055 §22.355 §24.235	RSS-132(4.3) RSS-133(6.3)	Frequency Stability for Temperature & Voltage	< 2.5 ppm	PASS	-

1 General Description

1.1 Applicant

Elk LLC

Suite 100, 2730 Gateway Oaks Drive Sacramento, CA 95833

1.2 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Tablet PC
Model Name	3HT7G
FCC ID	ZHT-1013
Tx Frequency	GSM850 : 824.2 ~ 848.8 MHz GSM1900 : 1850.2 ~ 1909.8 MHz WCDMA Band V : 826.4 ~ 846.6 MHz WCDMA Band II : 1852.4 ~ 1907.6 MHz
Rx Frequency	GSM850 : 869.2 ~ 893.8 MHz GSM1900 : 1930.2 ~ 1989.8 MHz WCDMA Band V : 871.4 ~ 891.6 MHz WCDMA Band II : 1932.4 ~ 1987.6 MHz
Maximum Output Power to Antenna	GSM850 : 31.82 dBm GSM1900 : 29.28 dBm WCDMA Band V : 23.05 dBm WCDMA Band II : 23.39 dBm
Antenna Type	Fixed Internal Antenna
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK WCDMA: QPSK (Uplink) HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink)
EUT Stage	Production Unit

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

1.3 Emission Designator and Maximum ERP/EIRP Power

FCC Rule	System	Type of Modulation	Emission Designator	Maximum ERP/EIRP
Part 22	GSM850 GPRS 8	GMSK	250KGXW	0.8710 W
Part 22	GSM850 EDGE 8	8PSK	252KG7W	0.2421 W
Part 22	WCDMA Band V RMC 12.2Kbps	QPSK	4M20F9W	0.0891 W
Part 24	GSM1900 GPRS 8	GMSK	246KGXW	1.0447 W
Part 24	GSM1900 EDGE 10	8PSK	252KG7W	0.4775 W
Part 24	WCDMA Band II RMC 12.2Kbps	QPSK	4M20F9W	0.3170 W

1.4 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	03CH07-HY	722060/4086B-1

1.5 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)
- ♦ 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

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.

1.6 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 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, and EUT is rotated on three test planes to find out the worst emission.

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 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 10 Link	■ GPRS 8 Link ■ EDGE 10 Link
WCDMA Band V	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link
WCDMA Band II	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link

Note:

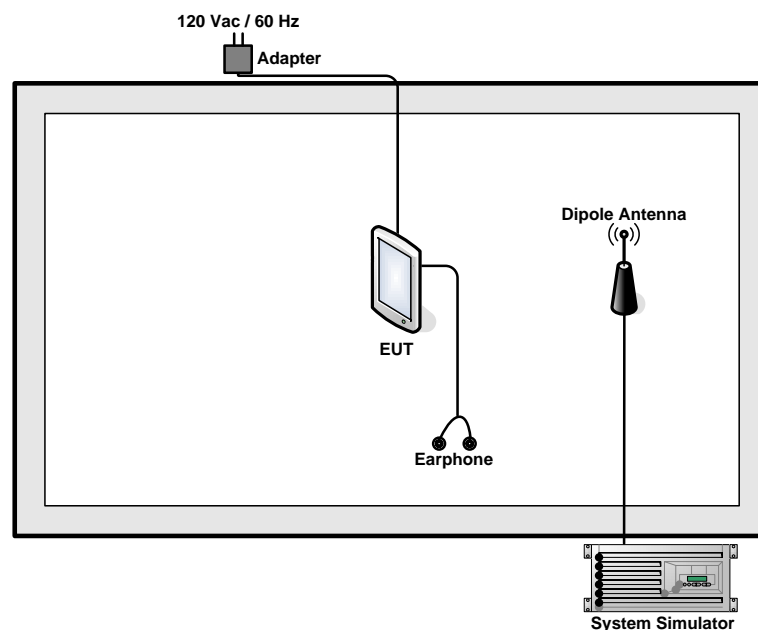
1. The maximum power levels are GSM or GPRS multi-slot class 8 mode for GMSK link, EDGE multi-slot class 8 or 10 mode for 8PSK link, RMC 12.2Kbps mode for WCDMA band V, and RMC 12.2Kbps mode for WCDMA band II, only these modes were used for all tests.
2. Because there are individual antennas for each WWAN, and Bluetooth, 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	1880.0	1909.8
GPRS 8	31.71	31.82	31.80	29.21	29.05	29.28
GPRS 10	31.37	31.48	31.47	28.81	28.73	28.88
EGPRS 8	26.05	26.10	26.07	25.02	25.03	25.08
EGPRS 10	25.95	26.05	26.03	25.05	25.01	25.09

Conducted Power (*Unit: dBm)						
Band	WCDMA Band V			WCDMA Band II		
Channel	4132	4182	4233	9262	9400	9538
Frequency	826.4	836.4	846.6	1852.4	1880.0	1907.6
RMC 12.2K	22.99	22.98	23.05	23.39	23.32	23.38
HSDPA Subtest-1	22.11	22.23	22.21	22.54	22.40	22.55
HSDPA Subtest-2	22.10	22.22	22.15	22.40	22.33	22.34
HSDPA Subtest-3	21.62	21.73	21.75	22.13	21.89	22.03
HSDPA Subtest-4	21.64	21.74	21.69	21.90	21.89	21.86
HSUPA Subtest-1	21.41	22.10	22.06	22.40	21.84	21.82
HSUPA Subtest-2	19.15	19.38	19.22	19.63	19.70	19.77
HSUPA Subtest-3	20.52	20.85	20.88	20.63	20.90	20.89
HSUPA Subtest-4	20.88	20.90	21.14	21.32	21.37	21.41
HSUPA Subtest-5	21.22	21.88	21.78	22.32	22.38	22.41

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.

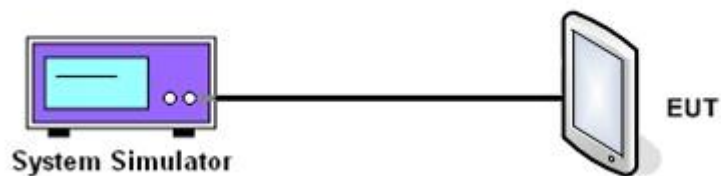
3.1.2 Measuring Instruments

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.
4. Measure the maximum burst average power for GSM and maximum average power for other modulation signal.

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)	31.71	31.82	31.80	26.05	26.10	26.07	22.99	22.98	23.05
Conducted Power (Watts)	1.4825	1.5205	1.5136	0.4027	0.4074	0.4046	0.1991	0.1986	0.2018

PCS Band									
Modes	GSM1900 (GPRS 8)			GSM1900 (EDGE 10)			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)	29.21	29.05	29.28	25.05	25.01	25.09	23.39	23.32	23.38
Conducted Power (Watts)	0.8337	0.8035	0.8472	0.3199	0.3170	0.3228	0.2183	0.2148	0.2178

Note: maximum burst average power for GSM, and maximum average power for WCDMA.

3.2 Peak-to-Average Ratio

3.2.1 Description of the PAR Measurement

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. The following guidelines are offered for performing a CCDF measurement.

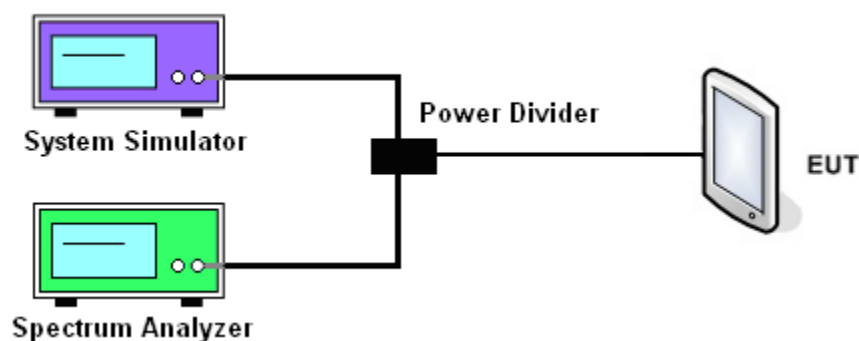
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. For GSM/EGPRS operating modes:
 - a. Set the RBW = 1MHz, VBW = 1MHz, Peak detector in spectrum analyzer.
 - b. Set EUT in maximum power output, and triggered the burst signal.
 - c. Measured respectively the Peak level and Mean level, and the deviation was recorded as Peak to Average Ratio.
3. For UMTS operating modes:
 - a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
 - b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.

3.2.4 Test Setup



3.2.5 Test Result of Peak-to-Average Ratio

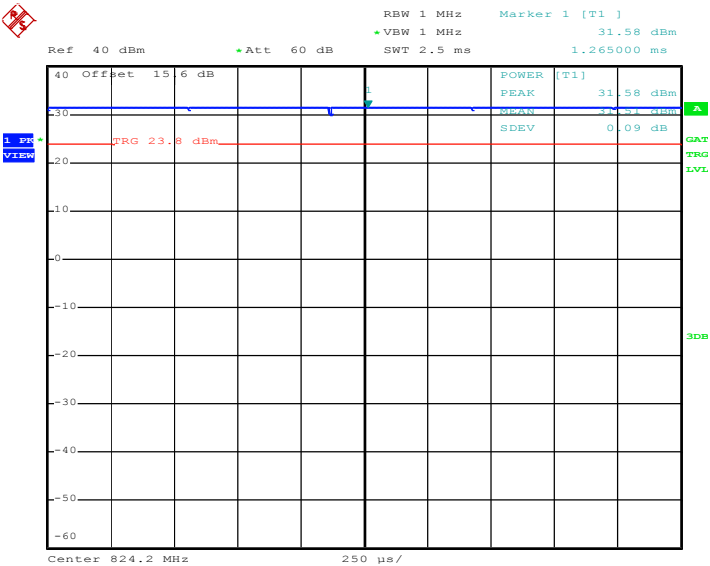
Cellular Band									
Modes	GSM850 (GPRS 8)			GSM850 (EDGE 8)			WCDMA Band V (RMC 12.2Kbps)		
Channel	128 (Low)	189 (Mid)	251 (High)	128 (Low)	189 (Mid)	251 (High)	4132 (Low)	4182 (Mid)	4233 (High)
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8	826.4	836.4	846.6
Peak-to-Average Ratio (dB)	0.07	0.05	0.07	0.41	0.49	0.50	3.16	3.36	3.36

PCS Band									
Modes	GSM1900 (GPRS 8)			GSM1900 (EDGE 10)			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
Peak-to-Average Ratio (dB)	0.07	0.08	0.08	0.45	0.41	0.70	3.56	3.76	3.56

3.2.6 Test Result (Plots) of Peak-to-Average Ratio

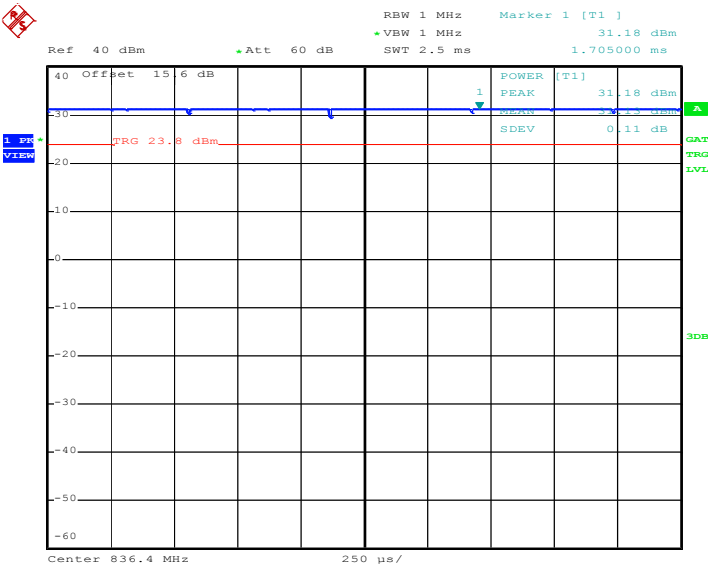
Band :	GSM 850	Test Mode :	GPRS 8 Link
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Peak-to-Average Ratio on Channel 128



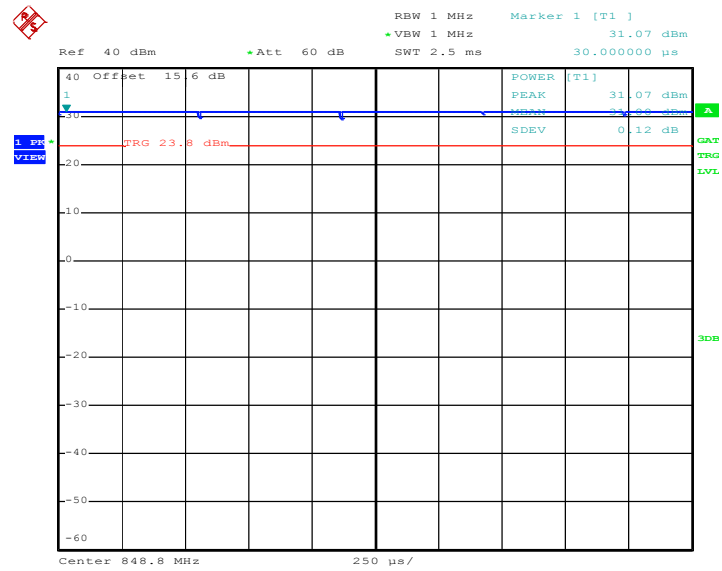
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Peak-to-Average Ratio on Channel 189



Date: 6.JUN.2012 16:23:55

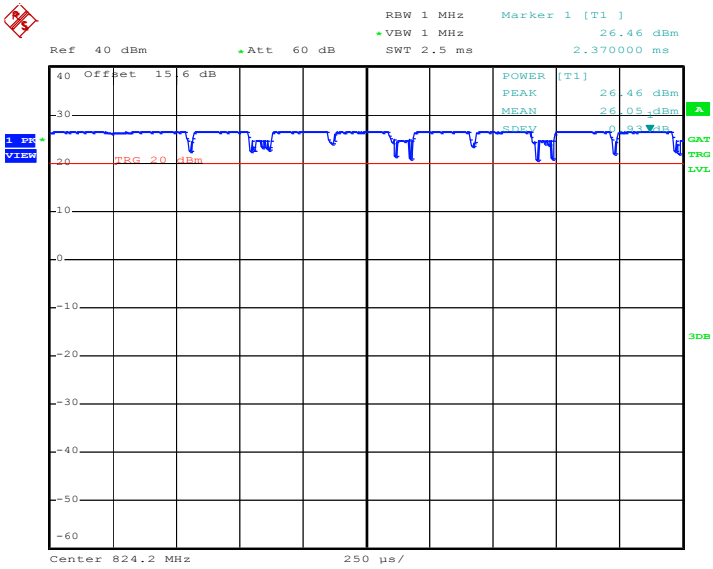
Peak-to-Average Ratio on Channel 251



Date: 6.JUN.2012 16:20:50

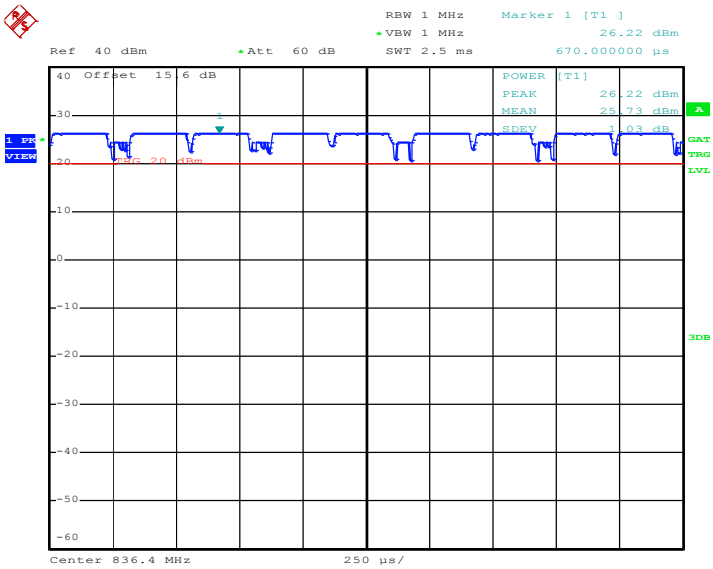
Band :	GSM 850	Test Mode :	EDGE 8 Link
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Peak-to-Average Ratio on Channel 128



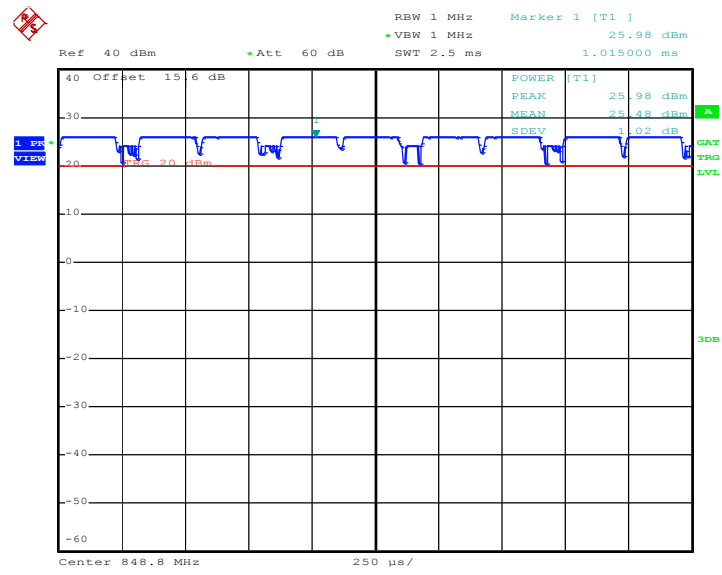
Date: 6.JUN.2012 17:05:57

Peak-to-Average Ratio on Channel 189



Date: 6.JUN.2012 17:06:29

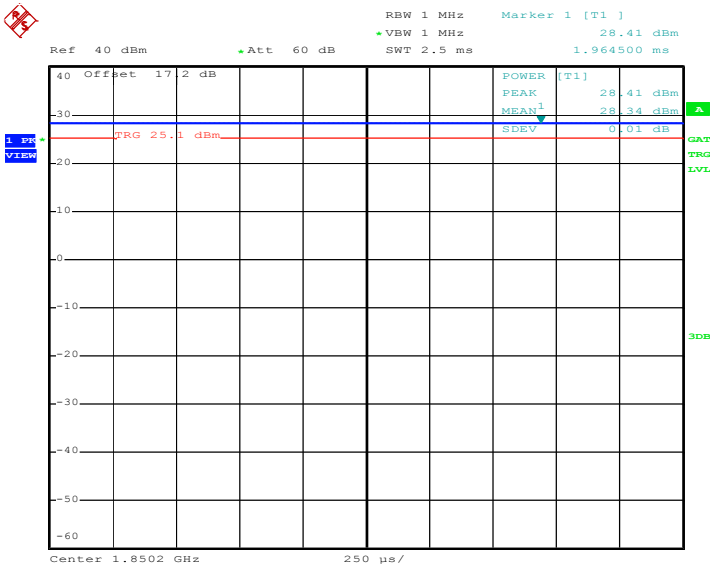
Peak-to-Average Ratio on Channel 251



Date: 6.JUN.2012 17:07:10

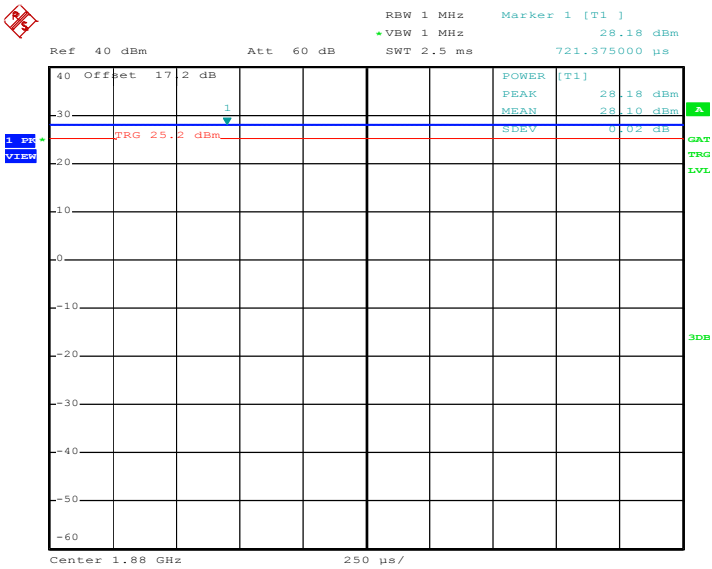
Band :	GSM 1900	Test Mode :	GPRS 8 Link
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Peak-to-Average Ratio on Channel 512



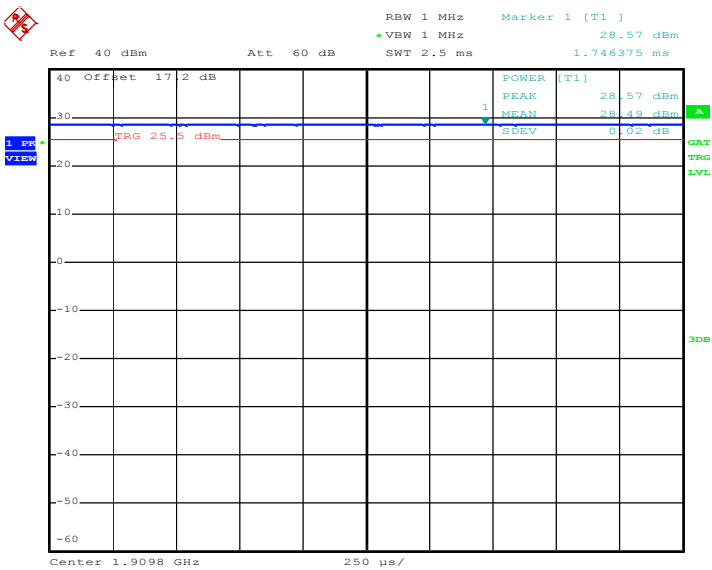
Date: 6.JUN.2012 22:09:31

Peak-to-Average Ratio on Channel 661



Date: 6.JUN.2012 22:08:40

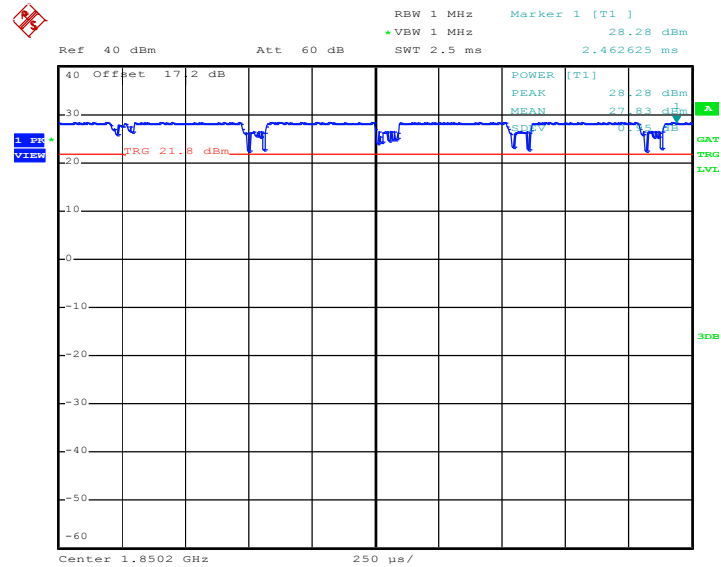
Peak-to-Average Ratio on Channel 810



Date: 6.JUN.2012 22:10:13

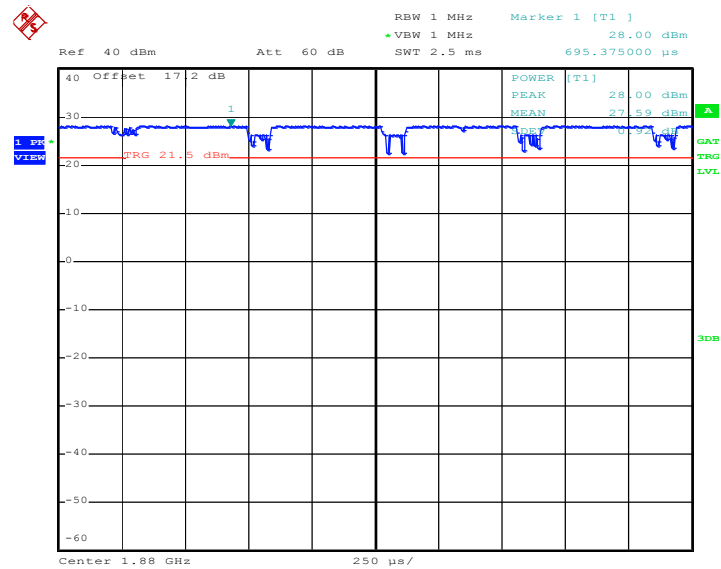
Band :	GSM 1900	Test Mode :	EDGE 10 Link
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Peak-to-Average Ratio on Channel 512



Date: 6.JUN.2012 22:20:15

Peak-to-Average Ratio on Channel 661



Date: 6.JUN.2012 22:19:33

RBW 1 MHz Marker 1 [T1]
 VBW 1 MHz 28.23 dBm
 SWT 2.5 ms 939.500000 μ s

Ref 40 dBm Att 60 dB

40 Offset 17.2 dB

1

POWER [T1]
 PEAK 28.23 dBm
 MEAN 27.53 dBm
 SLEV 19.46 dB

RG 22.3 dBm

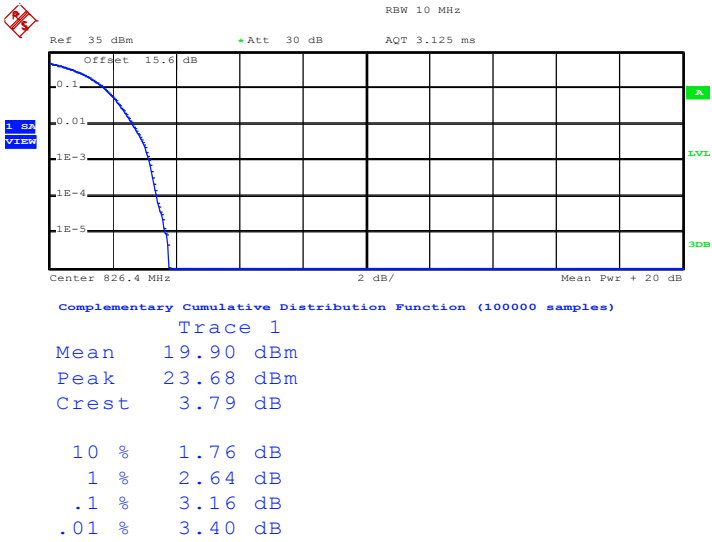
1.9098 GHz 250 MHz

Center 1.9098 GHz 250 MHz

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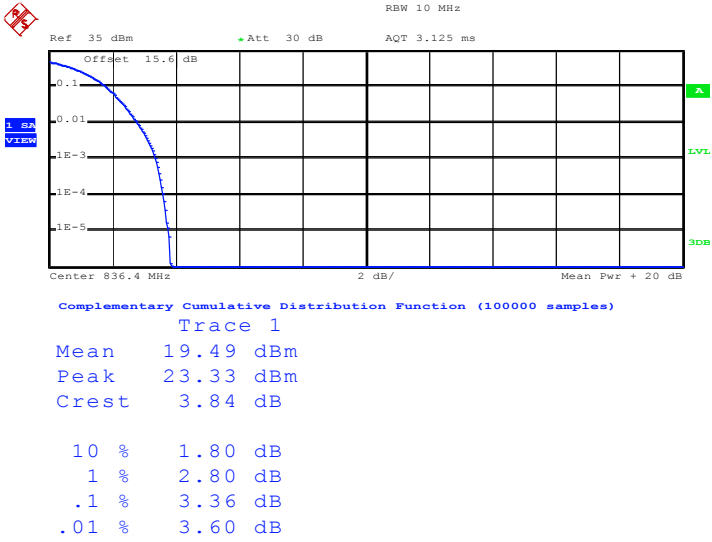
Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link
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Peak-to-Average Ratio on Channel 4132



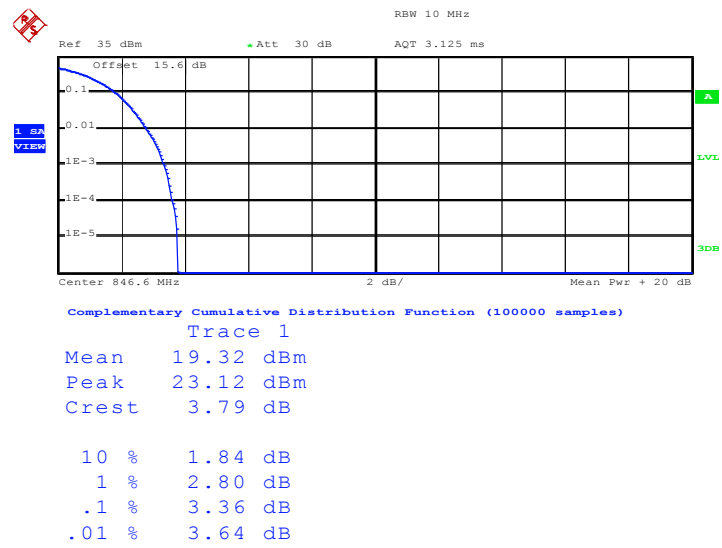
Date: 6.JUN.2012 11:54:27

Peak-to-Average Ratio on Channel 4182



Date: 6.JUN.2012 11:54:57

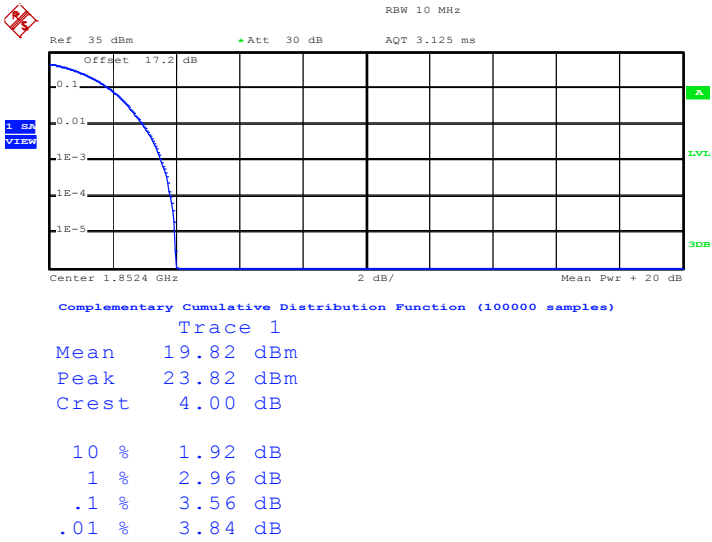
Peak-to-Average Ratio on Channel 4233



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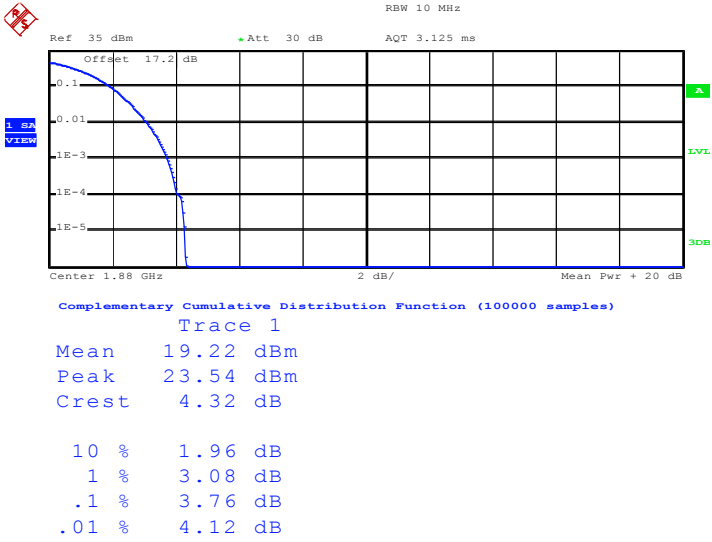
Band :	WCDMA Band II	Test Mode :	RMC 12.2Kbps Link
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Peak-to-Average Ratio on Channel 9262



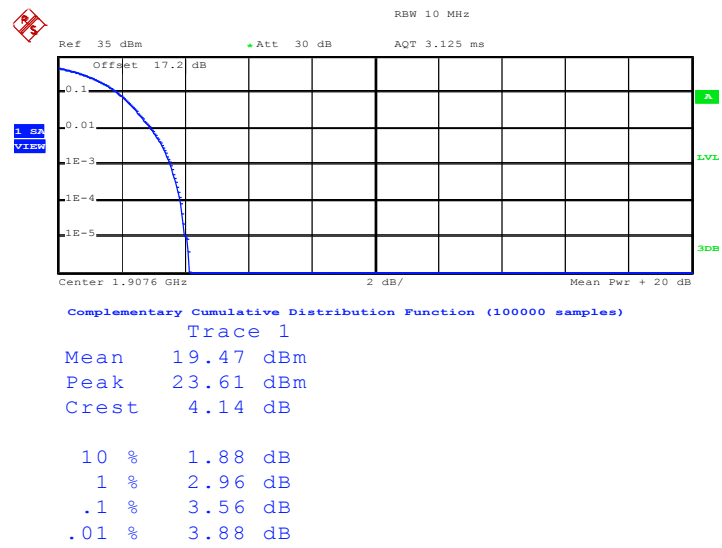
Date: 6.JUN.2012 22:36:06

Peak-to-Average Ratio on Channel 9400



Date: 6.JUN.2012 22:35:38

Peak-to-Average Ratio on Channel 9538



Date: 6.JUN.2012 22:36:35

3.3 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

3.3.1 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.

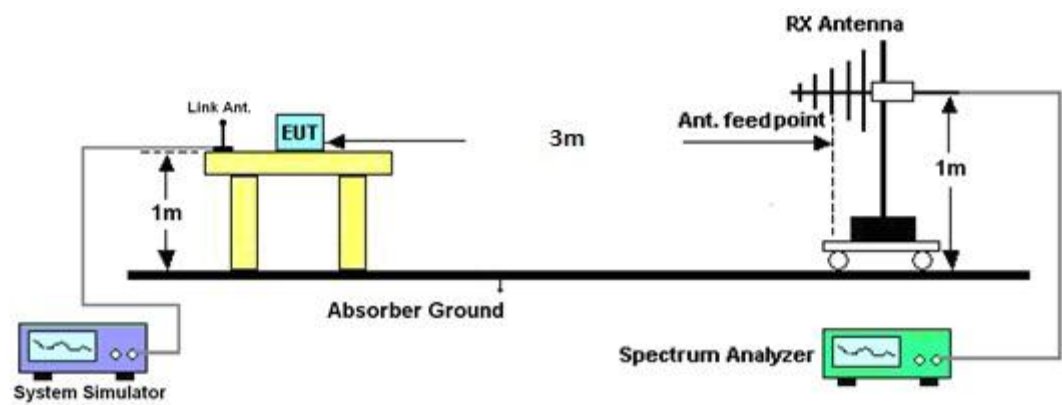
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 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 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. GSM operating modes: Set RBW= 1MHz, VBW= 3MHz, RMS detector over burst;
UMTS operating modes: Set RBW= 100 KHz, VBW= 300 KHz, RMS detector over frame, and use channel power option with bandwidth=5MHz, per section 4.0 of KDB 971168 D01.
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
10. $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$
 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.

3.3.4 Test Setup



3.3.5 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	-17.98	-48.12	0.00	-1.08	29.06	0.8054
836.40	-18.71	-48.28	0.00	-0.93	28.64	0.7311
848.80	-19.81	-48.35	0.00	-0.76	27.78	0.5998
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-17.49	-47.97	0.00	-1.08	29.40	0.8710
836.40	-18.21	-48.01	0.00	-0.93	28.87	0.7709
848.80	-19.21	-48.05	0.00	-0.76	28.08	0.6427

GSM850 (EDGE 8) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-24.31	-48.12	0.00	-1.08	22.73	0.1875
836.40	-24.07	-48.28	0.00	-0.93	23.28	0.2128
848.80	-25.19	-48.35	0.00	-0.76	22.40	0.1738
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-23.05	-47.97	0.00	-1.08	23.84	0.2421
836.40	-23.48	-48.01	0.00	-0.93	23.60	0.2291
848.80	-24.57	-48.05	0.00	-0.76	22.72	0.1871

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	-28.47	-48.12	0.00	-1.08	18.57	0.0719
836.40	-28.80	-48.28	0.00	-0.93	18.55	0.0716
846.60	-29.21	-48.35	0.00	-0.76	18.38	0.0689
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
826.40	-27.39	-47.97	0.00	-1.08	19.50	0.0891
836.40	-27.66	-48.01	0.00	-0.93	19.42	0.0875
846.60	-28.19	-48.05	0.00	-0.76	19.10	0.0813

3.3.6 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	-24.52	-51.88	0.00	1.96	29.32	0.8551
1880.00	-25.45	-52.99	0.00	2.00	29.54	0.8995
1909.80	-26.07	-54.28	0.00	1.98	30.19	1.0447
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-25.40	-52.13	0.00	1.96	28.69	0.7396
1880.00	-26.06	-53.17	0.00	2.00	29.11	0.8147
1909.80	-26.60	-54.13	0.00	1.98	29.51	0.8933

GSM1900 (EDGE 10) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-28.29	-51.88	0.00	1.96	25.55	0.3589
1880.00	-29.08	-52.99	0.00	2.00	25.91	0.3899
1909.80	-29.47	-54.28	0.00	1.98	26.79	0.4775
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-28.95	-52.13	0.00	1.96	25.14	0.3266
1880.00	-29.65	-53.17	0.00	2.00	25.52	0.3565
1909.80	-30.29	-54.13	0.00	1.98	25.82	0.3819

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	-29.52	-51.88	0.00	1.96	24.32	0.2704
1880.00	-30.21	-52.99	0.00	2.00	24.78	0.3006
1907.60	-31.25	-54.28	0.00	1.98	25.01	0.3170
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1852.40	-30.46	-52.13	0.00	1.96	23.63	0.2307
1880.00	-30.95	-53.17	0.00	2.00	24.22	0.2642
1907.60	-32.17	-54.13	0.00	1.98	23.94	0.2477

3.4 Occupied Bandwidth and 26dB Bandwidth Measurement

3.4.1 Description of Occupied Bandwidth and 26dB Bandwidth Measurement

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

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.

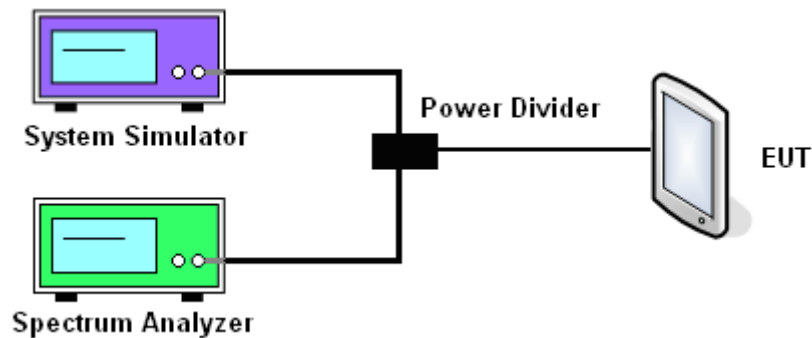
3.4.2 Measuring Instruments

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 99% occupied bandwidth and 26 dB bandwidth of the middle channel for the highest RF powers were measured.

3.4.4 Test Setup



3.4.5 Test Result (Plots) of Occupied Bandwidth and 26dB Bandwidth

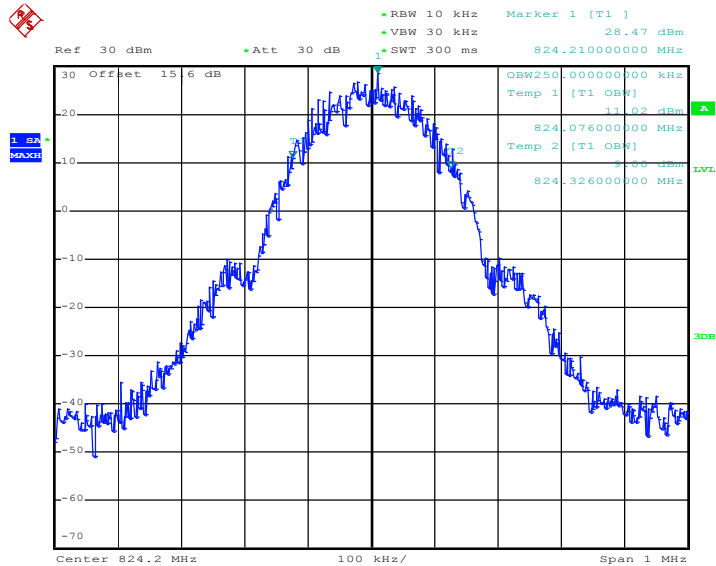
Cellular Band									
Modes	GSM850 (GPRS 8)			GSM850 (EDGE 8)			WCDMA Band V (RMC 12.2Kbps)		
Channel	128 (Low)	189 (Mid)	251 (High)	128 (Low)	189 (Mid)	251 (High)	4132 (Low)	4182 (Mid)	4233 (High)
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8	826.4	836.4	846.6
99% Bandwidth(MHz)	0.250	0.246	0.244	0.246	0.250	0.252	4.18	4.18	4.20
26dB Bandwidth(MHz)	0.312	0.292	0.304	0.302	0.312	0.308	4.68	4.66	4.68

PCS Band									
Modes	GSM1900 (GPRS 8)			GSM1900 (EDGE 10)			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
99% Bandwidth(MHz)	0.244	0.244	0.246	0.248	0.252	0.244	4.18	4.16	4.20
26dB Bandwidth(MHz)	0.318	0.314	0.308	0.296	0.306	0.308	4.68	4.68	4.68

3.4.6 Test Result (Plots) of Occupied Bandwidth and 26dB Bandwidth

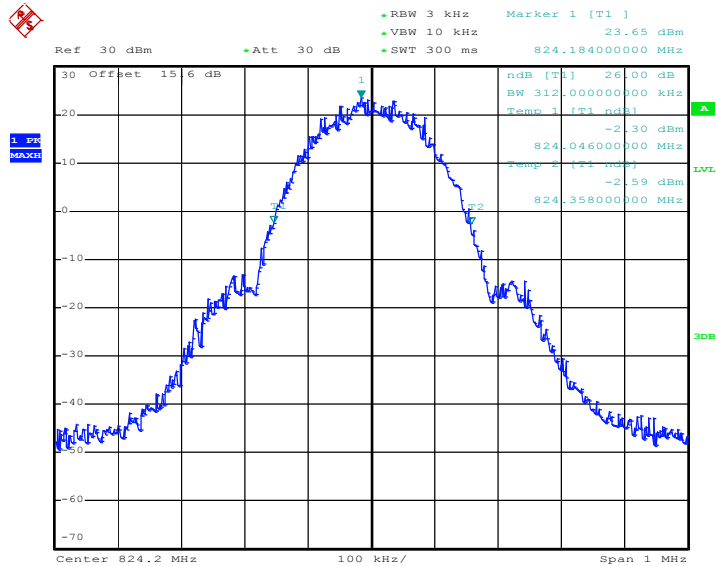
Band :	GSM 850	Test Mode :	GPRS 8 Link
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99% Occupied Bandwidth Plot on Channel 128



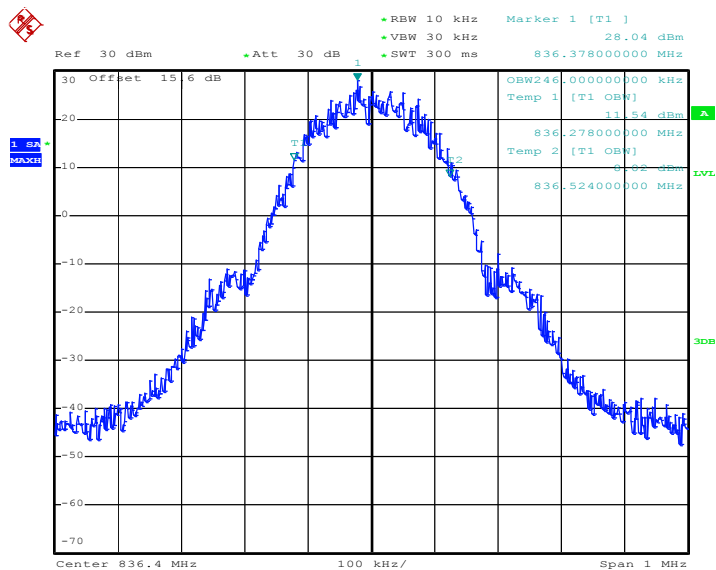
Date: 6.JUN.2012 16:15:16

26dB Bandwidth Plot on Channel 128



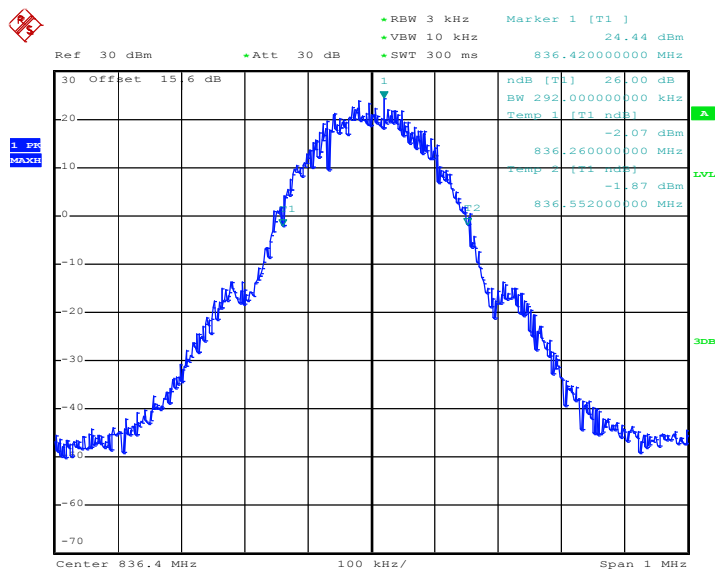
Date: 6.JUN.2012 16:13:56

99% Occupied Bandwidth Plot on Channel 189



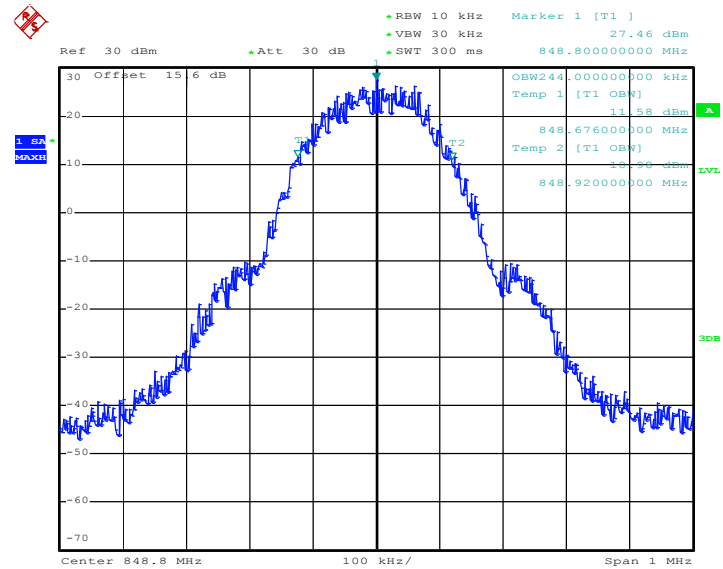
Date: 6.JUN.2012 16:15:42

26dB Bandwidth Plot on Channel 189



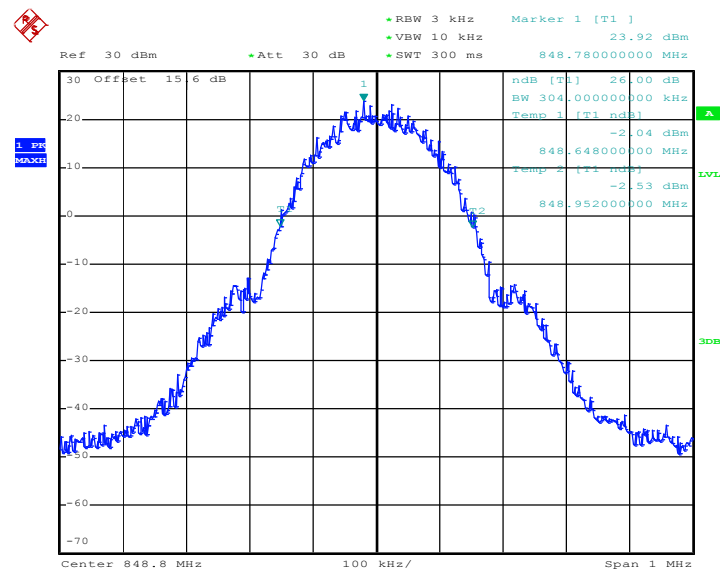
Date: 6.JUN.2012 16:14:22

99% Occupied Bandwidth Plot on Channel 251



Date: 6.JUN.2012 22:52:38

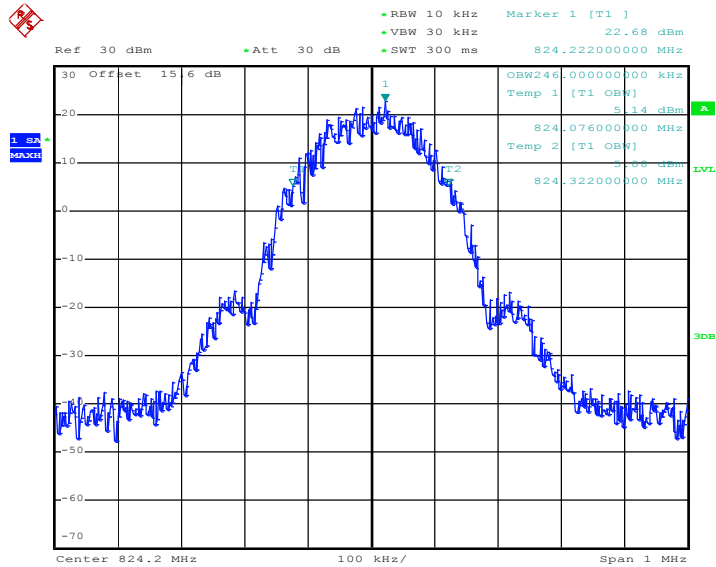
26dB Bandwidth Plot on Channel 251



Date: 6.JUN.2012 16:14:49

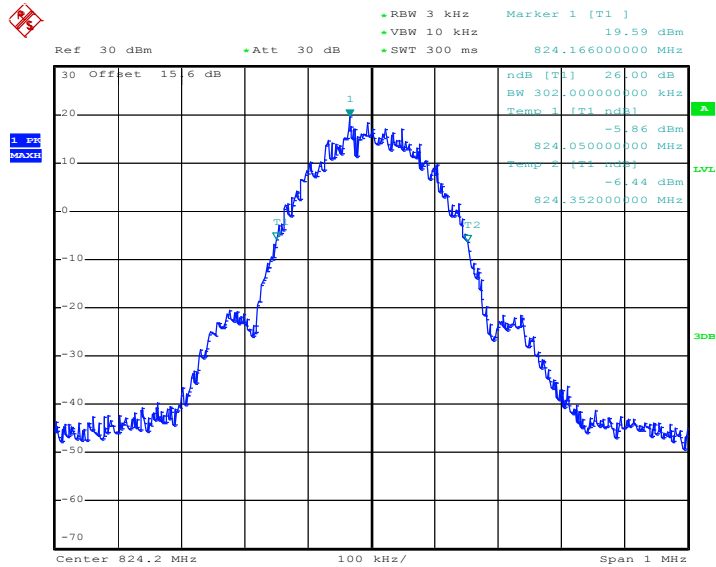
Band :	GSM 850	Test Mode :	EDGE 8 Link
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99% Occupied Bandwidth Plot on Channel 128



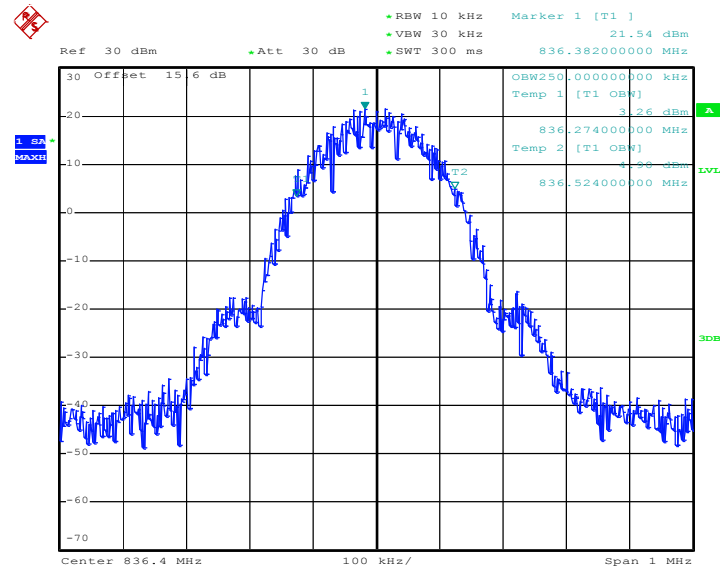
Date: 6.JUN.2012 16:48:47

26dB Bandwidth Plot on Channel 128



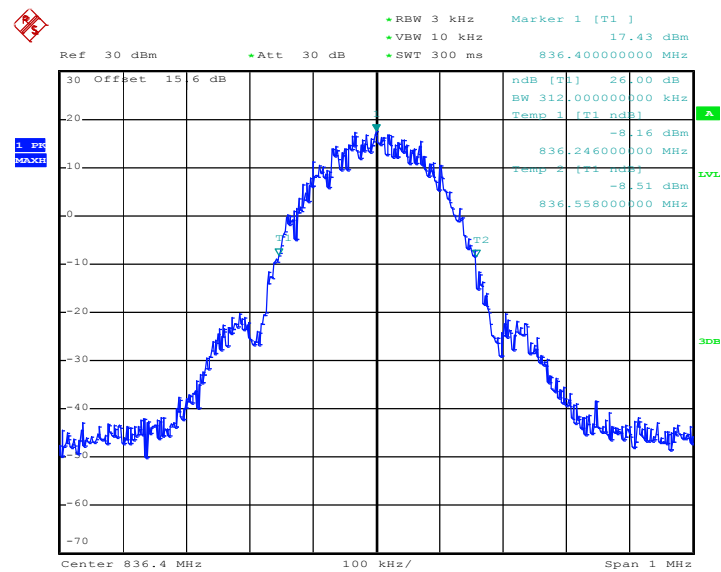
Date: 6.JUN.2012 16:47:27

99% Occupied Bandwidth Plot on Channel 189



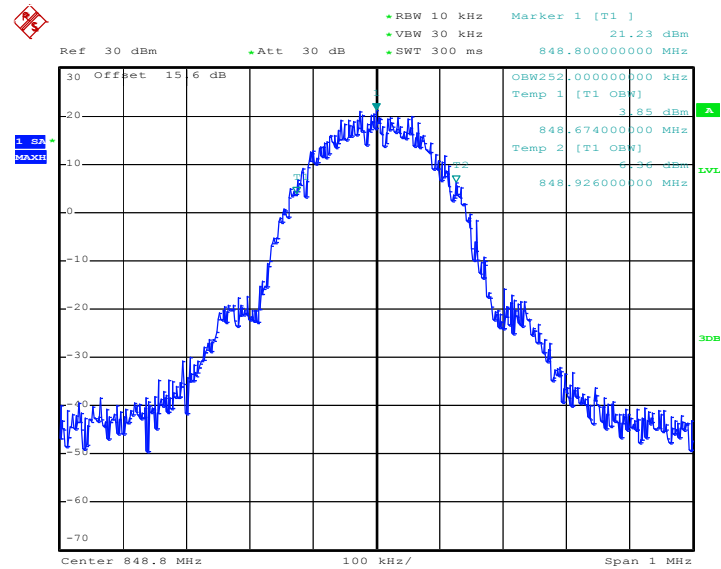
Date: 6.JUN.2012 16:49:13

26dB Bandwidth Plot on Channel 189



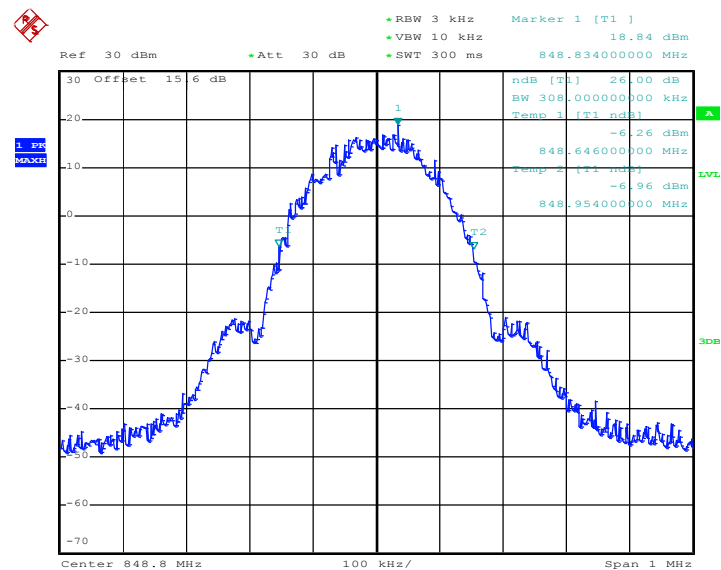
Date: 6.JUN.2012 16:47:53

99% Occupied Bandwidth Plot on Channel 251



Date: 6.JUN.2012 22:53:45

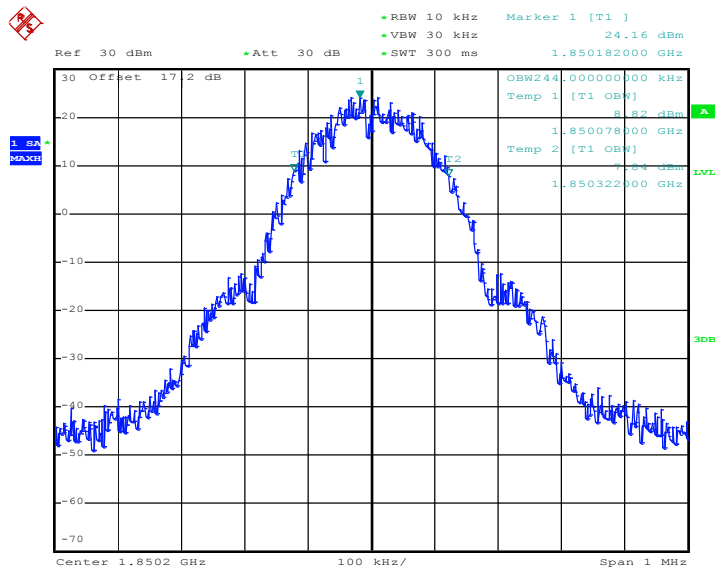
26dB Bandwidth Plot on Channel 251



Date: 6.JUN.2012 16:48:20

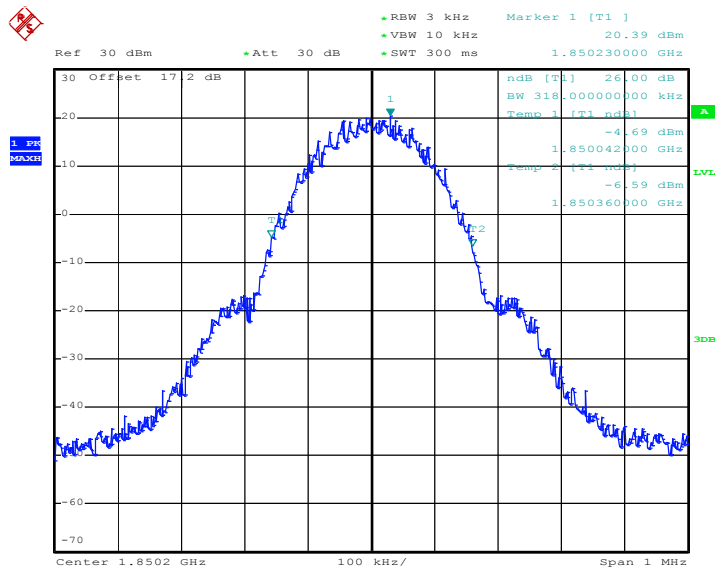
Band :	GSM 1900	Test Mode :	GPRS 8 Link
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99% Occupied Bandwidth Plot on Channel 512



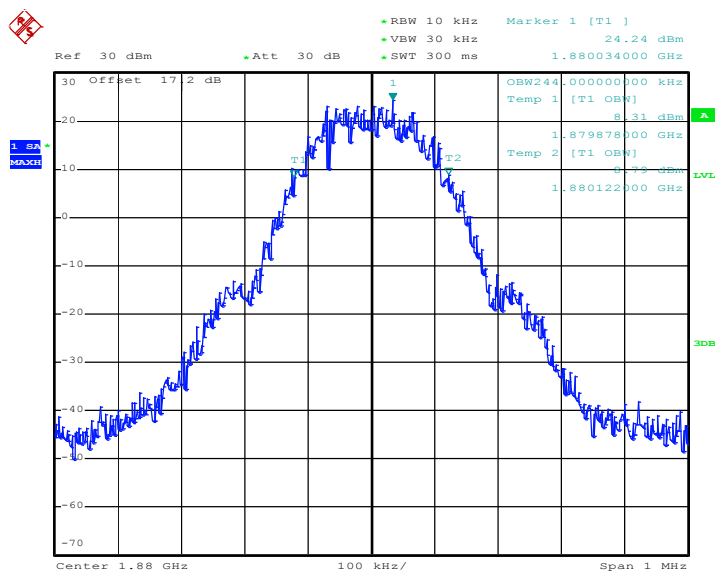
Date: 6.JUN.2012 22:12:25

26dB Bandwidth Plot on Channel 512



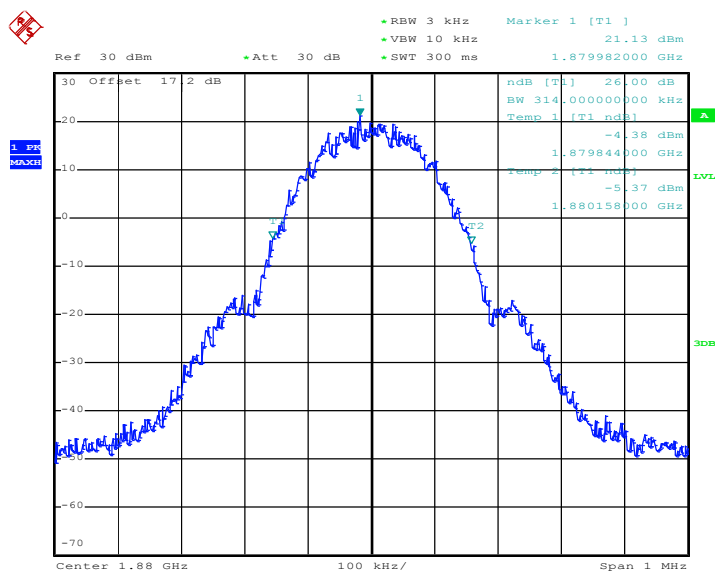
Date: 6.JUN.2012 22:11:05

99% Occupied Bandwidth Plot on Channel 661



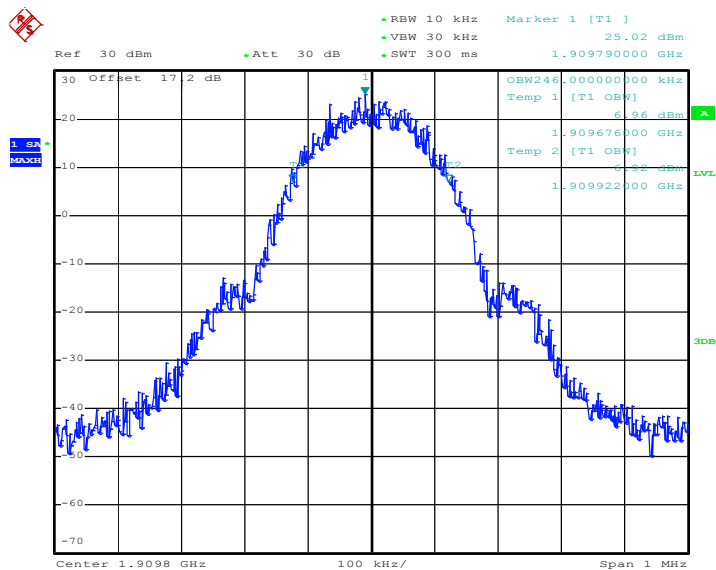
Date: 6.JUN.2012 22:12:51

26dB Bandwidth Plot on Channel 661



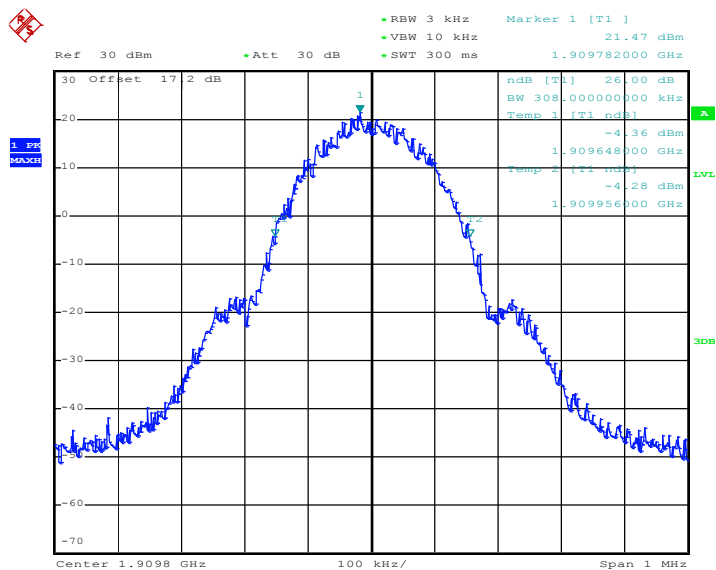
Date: 6.JUN.2012 22:11:31

99% Occupied Bandwidth Plot on Channel 810



Date: 6.JUN.2012 22:13:17

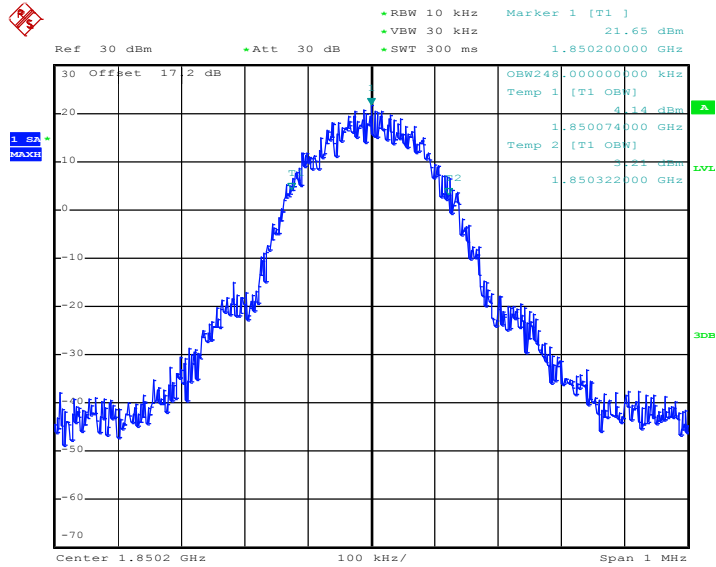
26dB Bandwidth Plot on Channel 810



Date: 6.JUN.2012 22:11:58

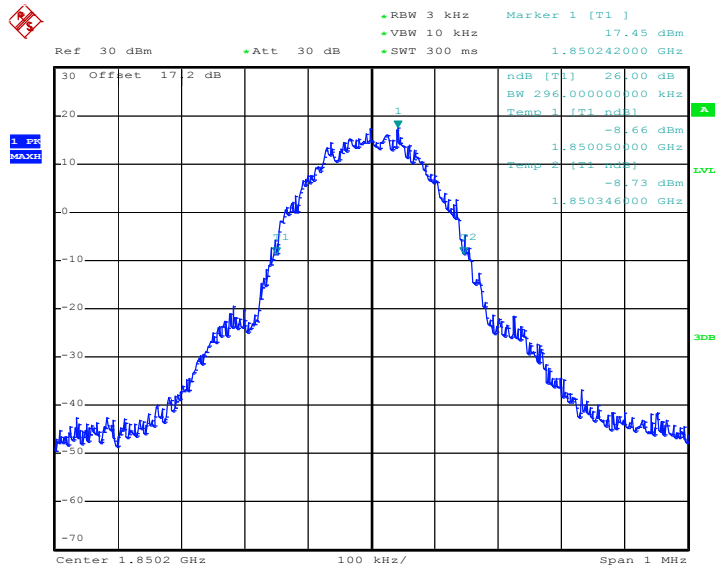
Band :	GSM 1900	Test Mode :	EDGE 10 Link
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99% Occupied Bandwidth Plot on Channel 512



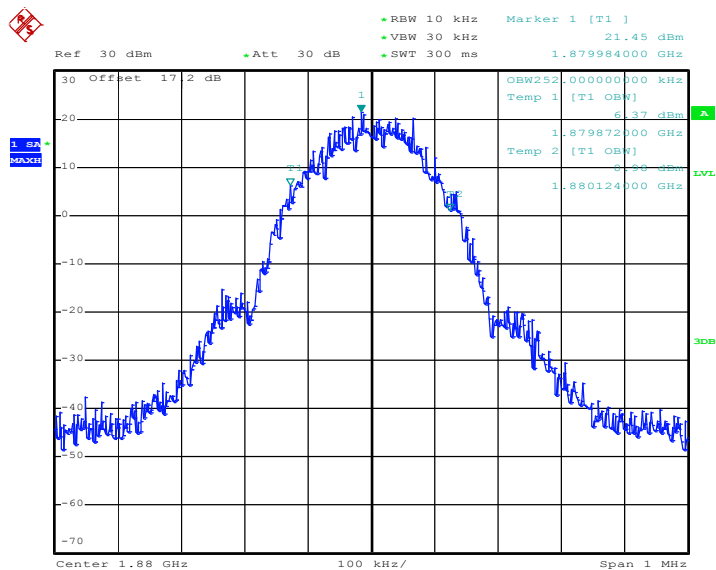
Date: 6.JUN.2012 22:23:35

26dB Bandwidth Plot on Channel 512



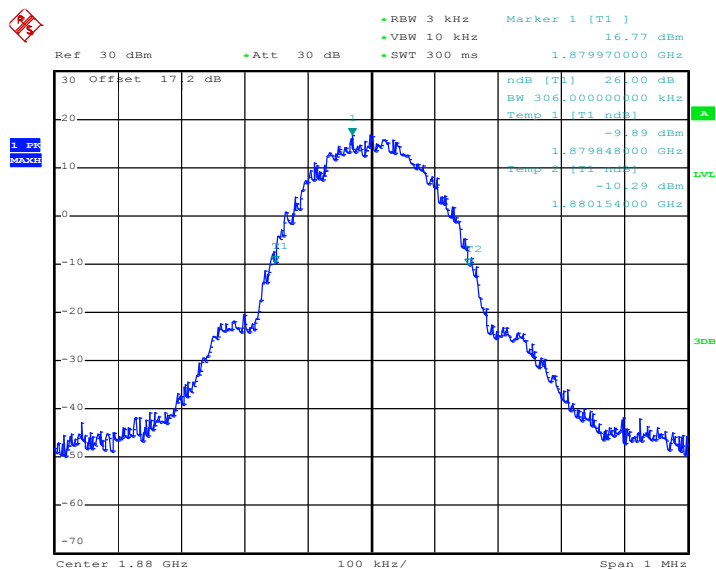
Date: 6.JUN.2012 22:22:15

99% Occupied Bandwidth Plot on Channel 661



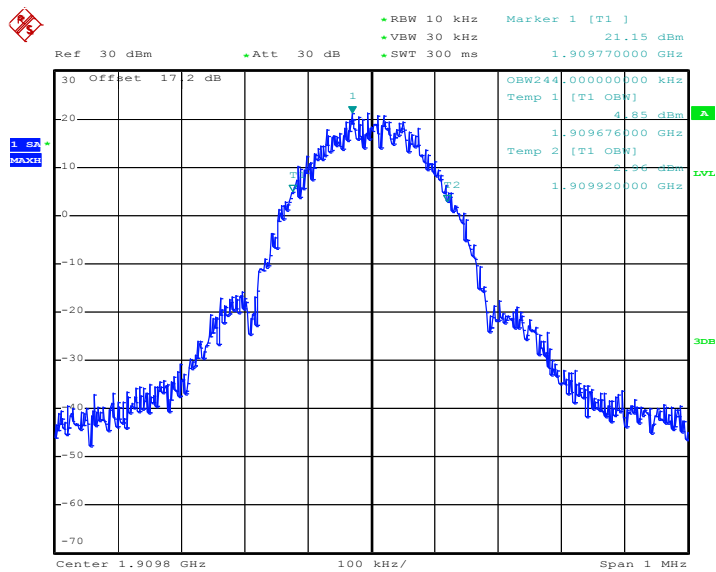
Date: 6.JUN.2012 22:24:01

26dB Bandwidth Plot on Channel 661



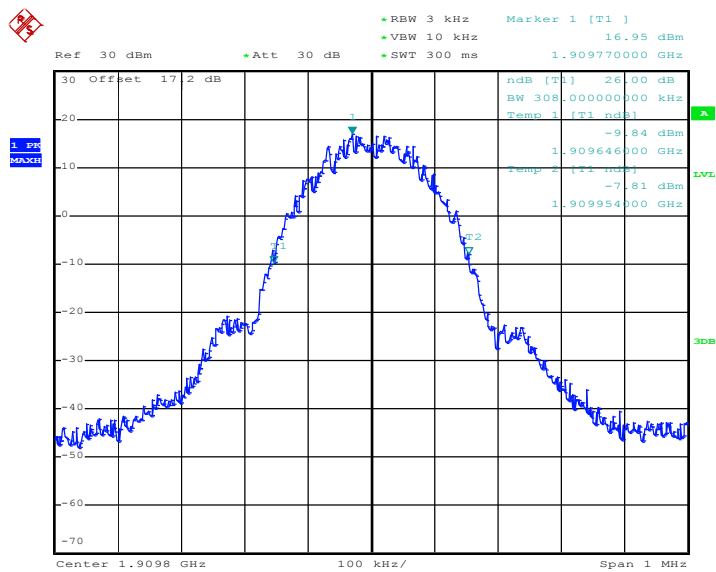
Date: 6.JUN.2012 22:22:41

99% Occupied Bandwidth Plot on Channel 810



Date: 6.JUN.2012 22:24:27

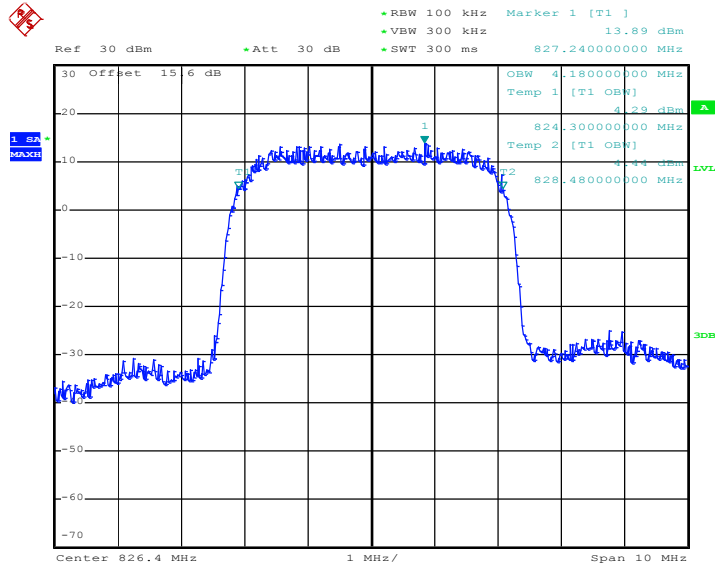
26dB Bandwidth Plot on Channel 810



Date: 6.JUN.2012 22:23:08

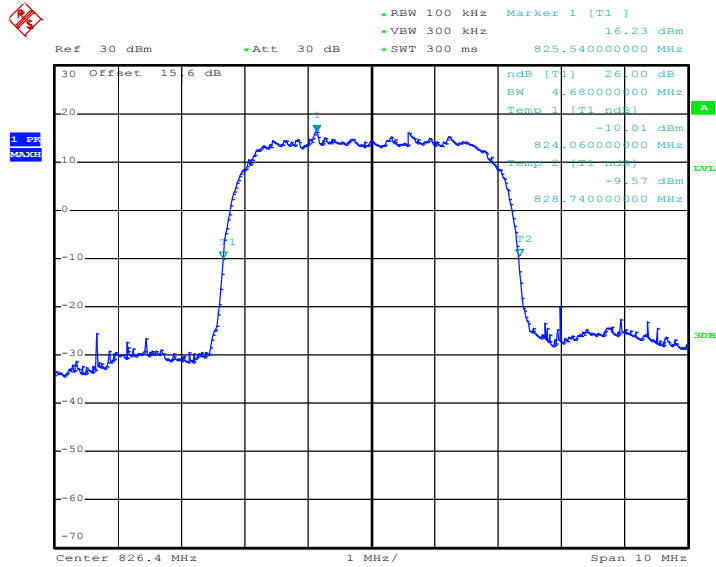
Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link
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99% Occupied Bandwidth Plot on Channel 4132



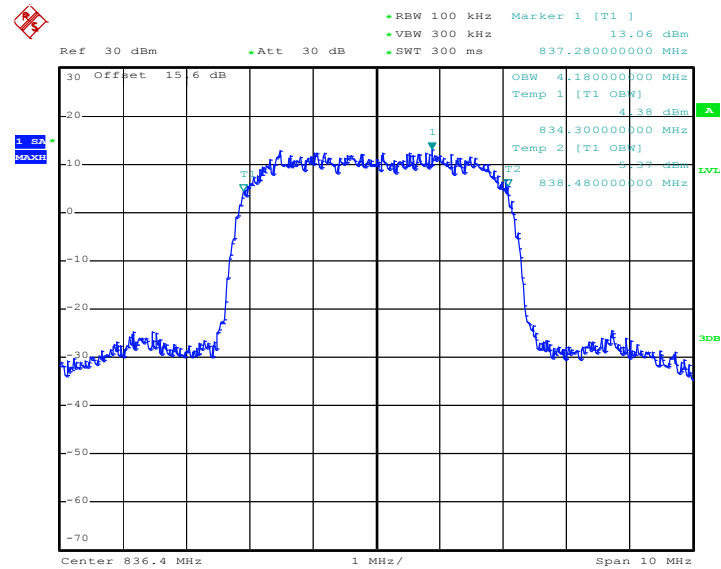
Date: 6.JUN.2012 11:44:57

26dB Bandwidth Plot on Channel 4132



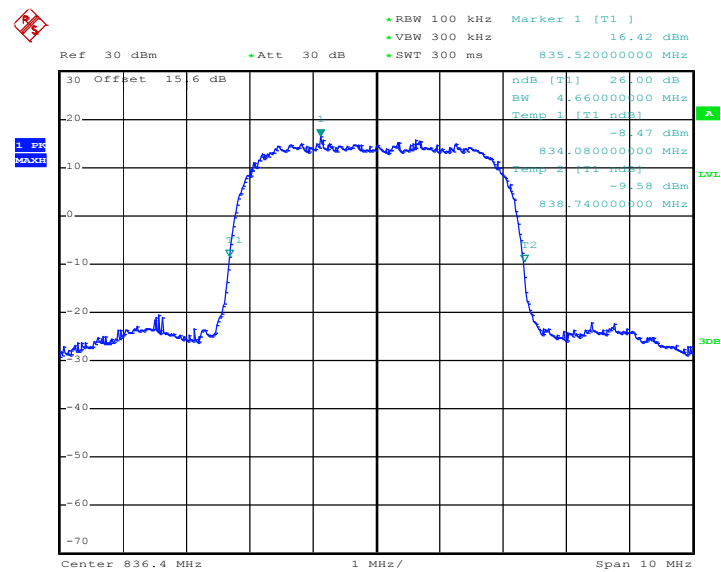
Date: 6.JUN.2012 11:43:37

99% Occupied Bandwidth Plot on Channel 4182



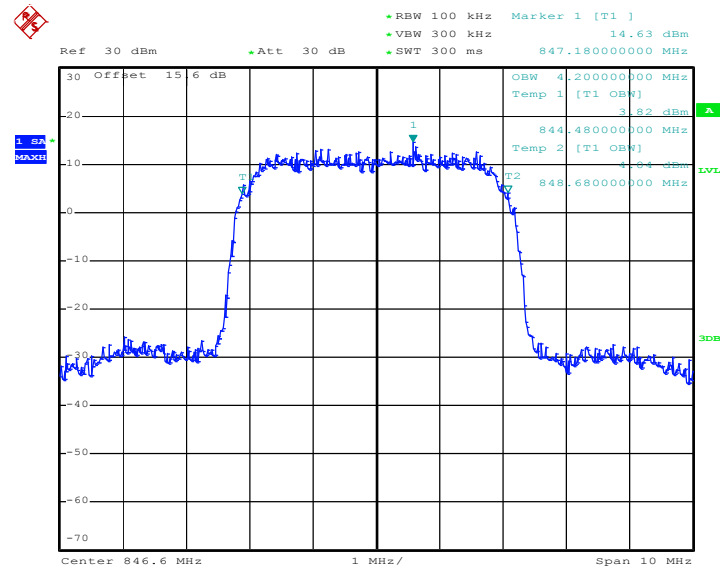
Date: 6.JUN.2012 11:45:23

26dB Bandwidth Plot on Channel 4182



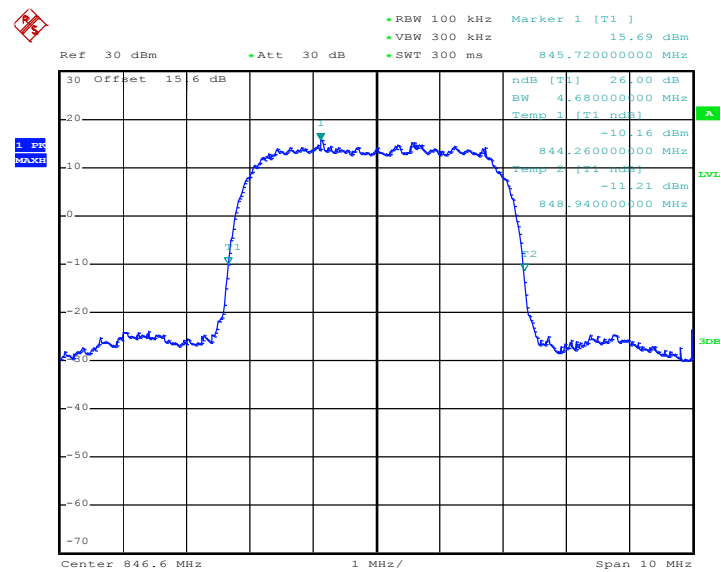
Date: 6.JUN.2012 11:44:04

99% Occupied Bandwidth Plot on Channel 4233



Date: 6.JUN.2012 11:45:50

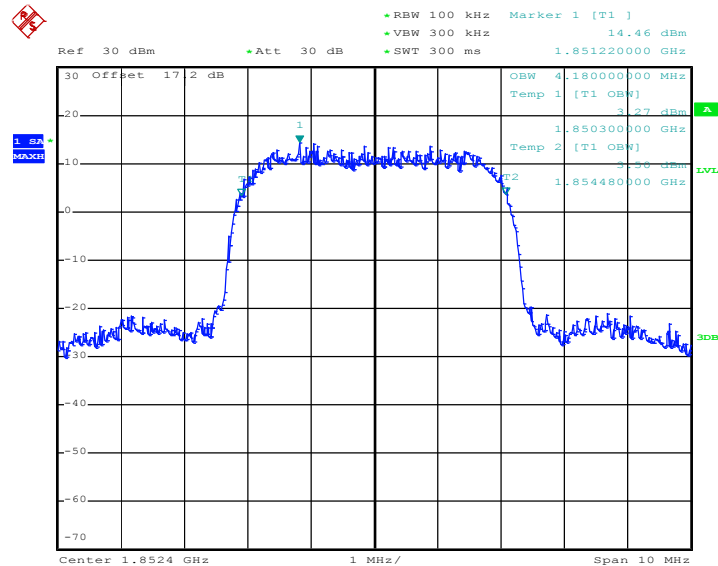
26dB Bandwidth Plot on Channel 4233



Date: 6.JUN.2012 11:44:30

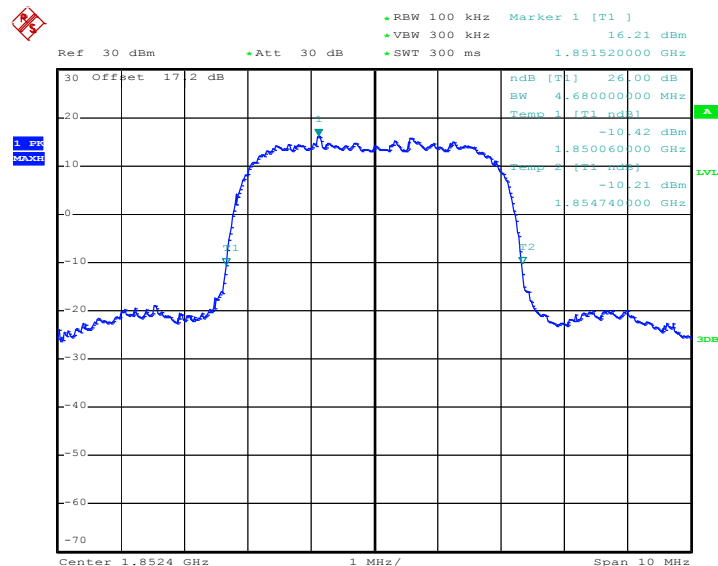
Band :	WCDMA Band II	Test Mode :	RMC 12.2Kbps Link
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99% Occupied Bandwidth Plot on Channel 9262



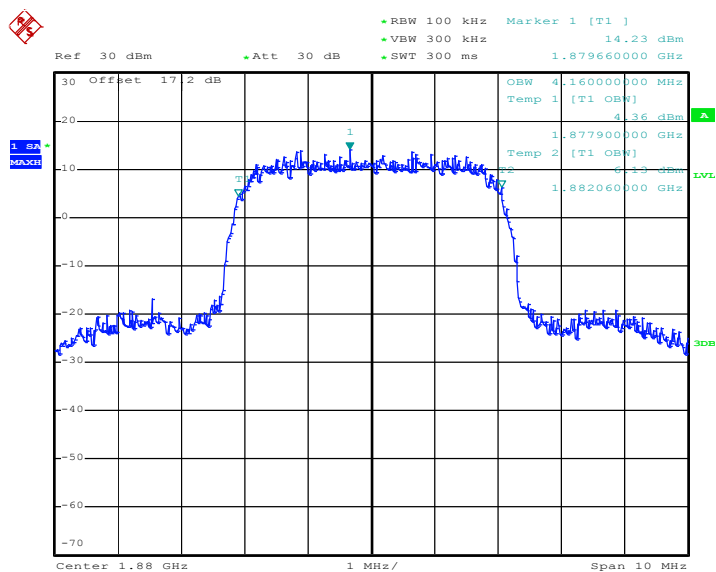
Date: 6.JUN.2012 22:38:55

26dB Bandwidth Plot on Channel 9262



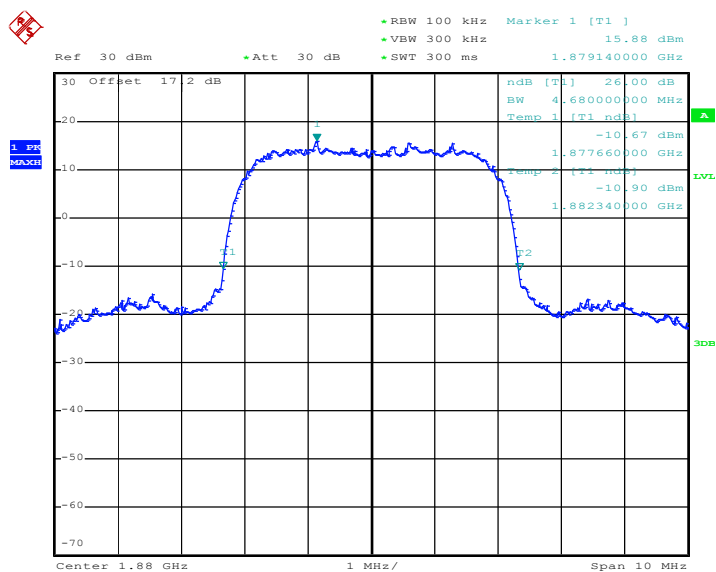
Date: 6.JUN.2012 22:37:36

99% Occupied Bandwidth Plot on Channel 9400



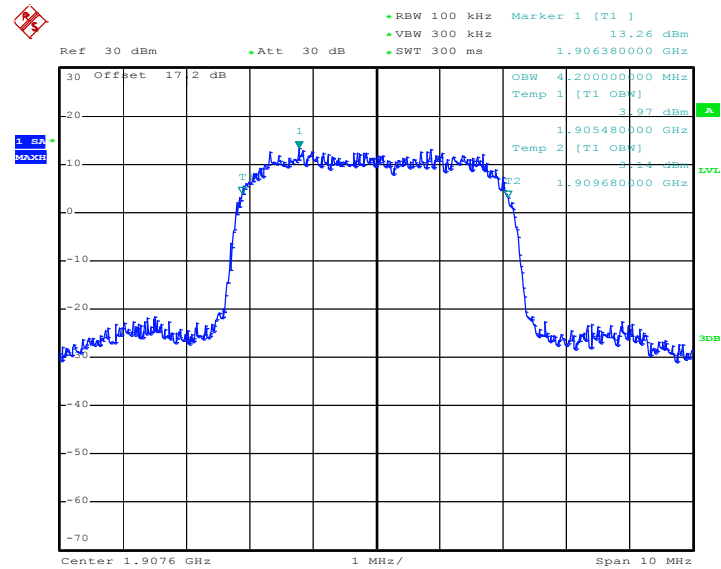
Date: 6.JUN.2012 22:39:22

26dB Bandwidth Plot on Channel 9400



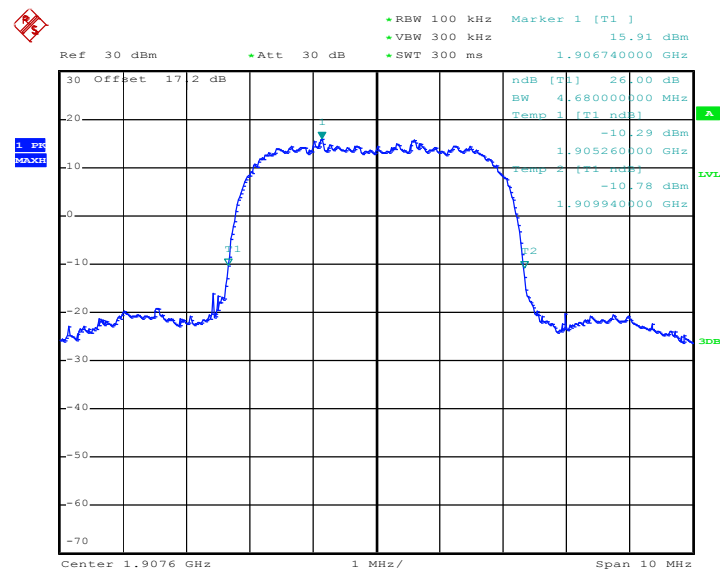
Date: 6.JUN.2012 22:38:02

99% Occupied Bandwidth Plot on Channel 9538



Date: 6.JUN.2012 22:39:48

26dB Bandwidth Plot on Channel 9538



Date: 6.JUN.2012 22:38:28

3.5 Band Edge Measurement

3.5.1 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.

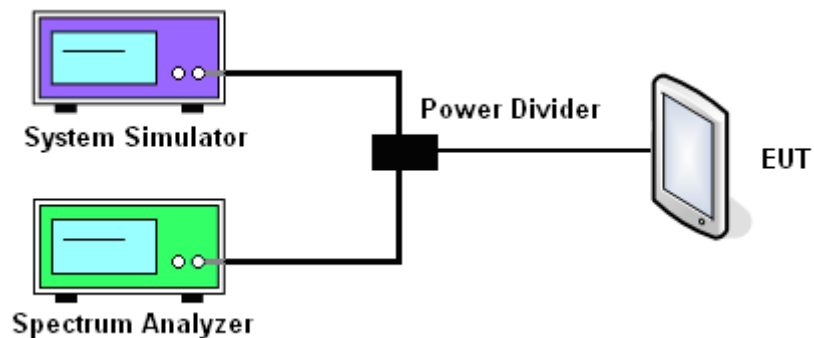
3.5.2 Measuring Instruments

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 band edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly $BW/100$.

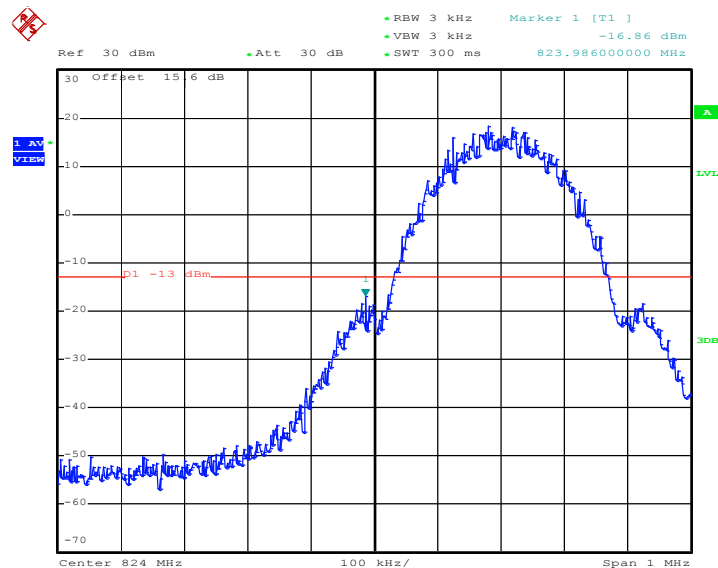
3.5.4 Test Setup



3.5.5 Test Result (Plots) of Conducted Band Edge

Band :	GSM850	Test Mode :	GPRS 8 Link
Correction Factor :	0.17dB	Maximum 26dB Bandwidth :	0.312MHz
Band Edge :	-16.69dBm	Measurement Value :	-16.86dBm

Lower Band Edge Plot on Channel 128

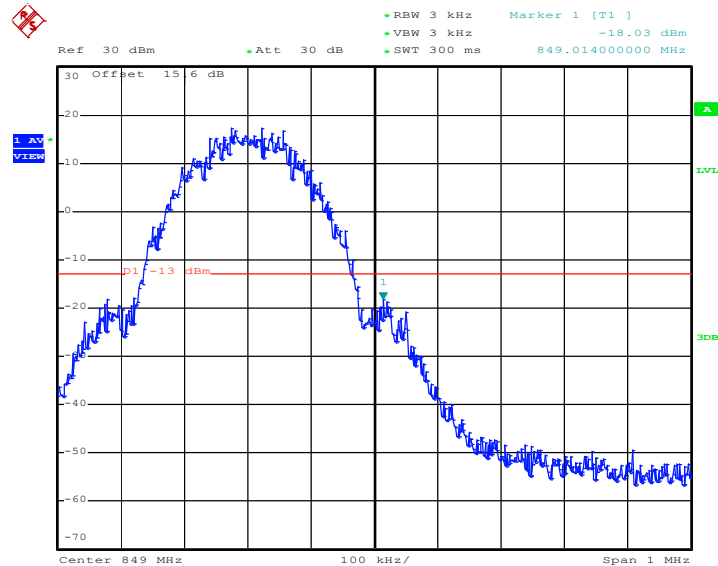


Date: 6.JUN.2012 16:17:35

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

Band :	GSM850	Test Mode :	GPRS 8 Link
Correction Factor :	0.17dB	Maximum 26dB Bandwidth :	0.312MHz
Band Edge :	-17.86dBm	Measurement Value :	-18.03dBm

Higher Band Edge Plot on Channel 251

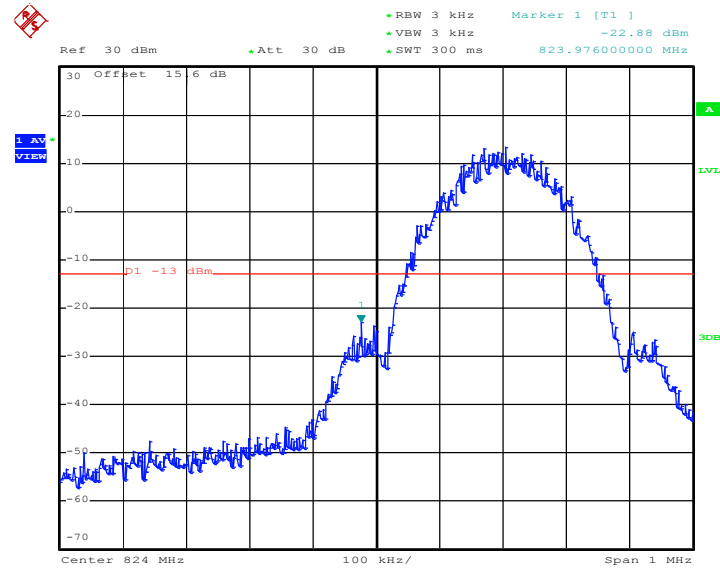


Date: 6.JUN.2012 16:18:02

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

Band :	GSM850	Test Mode :	EDGE 8 Link
Correction Factor :	0.17dB	Maximum 26dB Bandwidth :	0.312MHz
Band Edge :	-22.71dBm	Measurement Value :	-22.88dBm

Lower Band Edge Plot on Channel 128

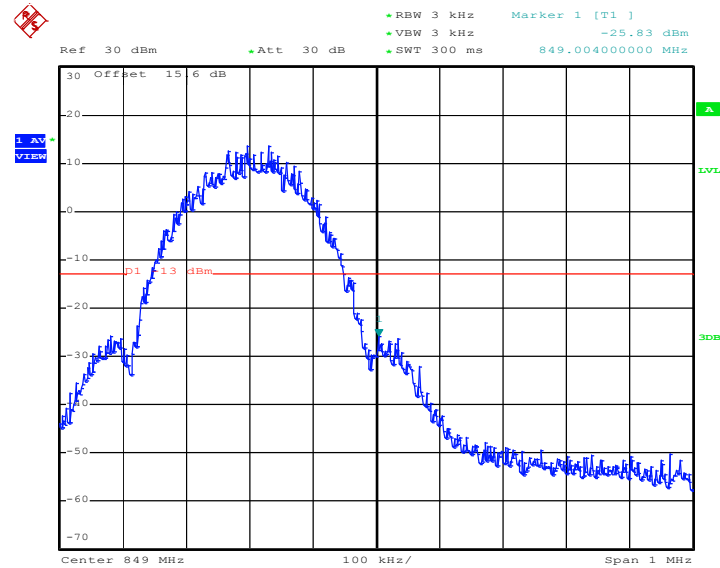


Date: 6.JUN.2012 16:51:06

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

Band :	GSM850	Test Mode :	EDGE 8 Link
Correction Factor :	0.17dB	Maximum 26dB Bandwidth :	0.312MHz
Band Edge :	-25.66dBm	Measurement Value :	-25.83dBm

Higher Band Edge Plot on Channel 251

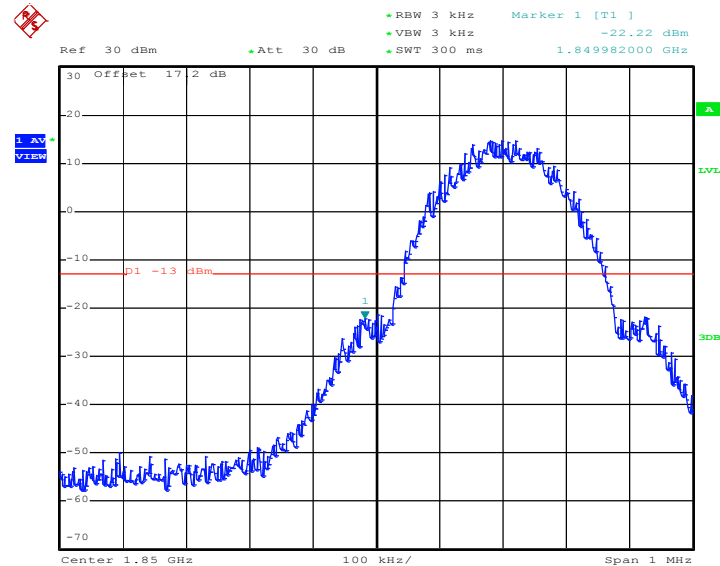


Date: 6.JUN.2012 16:51:33

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

Band :	GSM1900	Test Mode :	GPRS 8 Link
Correction Factor :	0.25dB	Maximum 26dB Bandwidth :	0.318MHz
Band Edge :	-21.97dBm	Measurement Value :	-22.22dBm

Lower Band Edge Plot on Channel 512

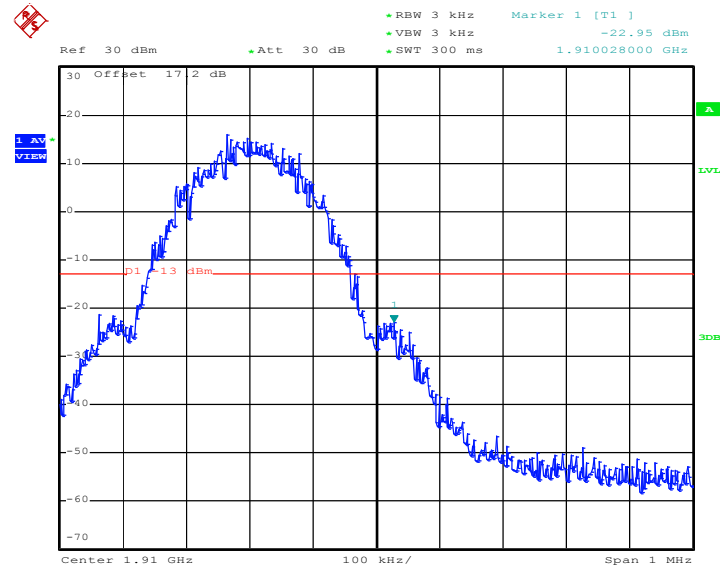


Date: 6.JUN.2012 22:14:44

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

Band :	GSM1900	Test Mode :	GPRS 8 Link
Correction Factor :	0.25dB	Maximum 26dB Bandwidth :	0.318MHz
Band Edge :	-22.70dBm	Measurement Value :	-22.95dBm

Higher Band Edge Plot on Channel 810

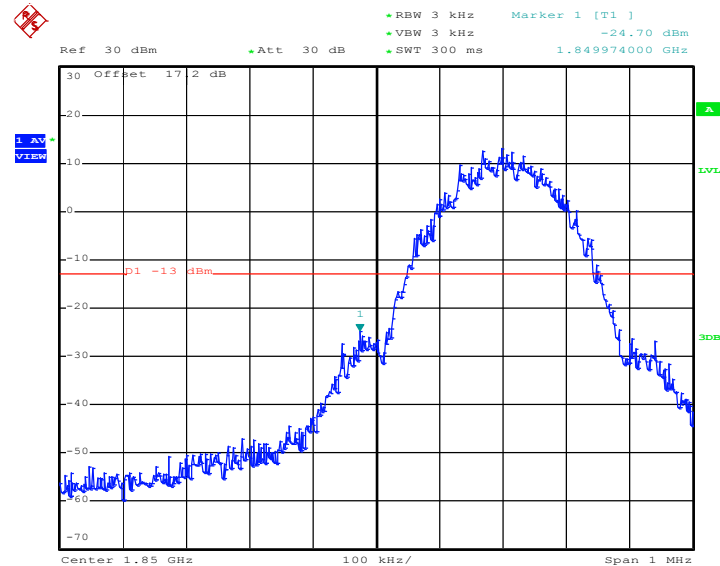


Date: 6.JUN.2012 22:15:11

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

Band :	GSM1900	Test Mode :	EDGE 10 Link
Correction Factor :	0.11dB	Maximum 26dB Bandwidth :	0.308MHz
Band Edge :	-24.59dBm	Measurement Value :	-24.70dBm

Lower Band Edge Plot on Channel 512

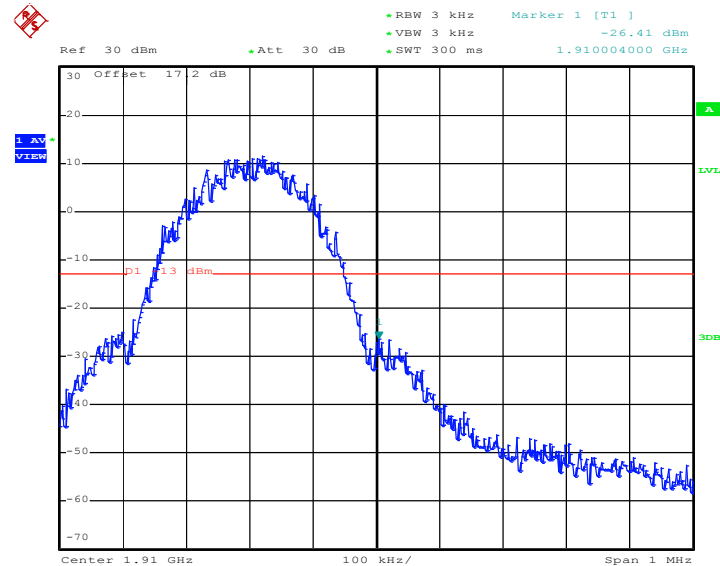


Date: 6.JUN.2012 22:25:54

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

Band :	GSM1900	Test Mode :	EDGE 10 Link
Correction Factor :	0.11dB	Maximum 26dB Bandwidth :	0.308MHz
Band Edge :	-26.30dBm	Measurement Value :	-26.41dBm

Higher Band Edge Plot on Channel 810

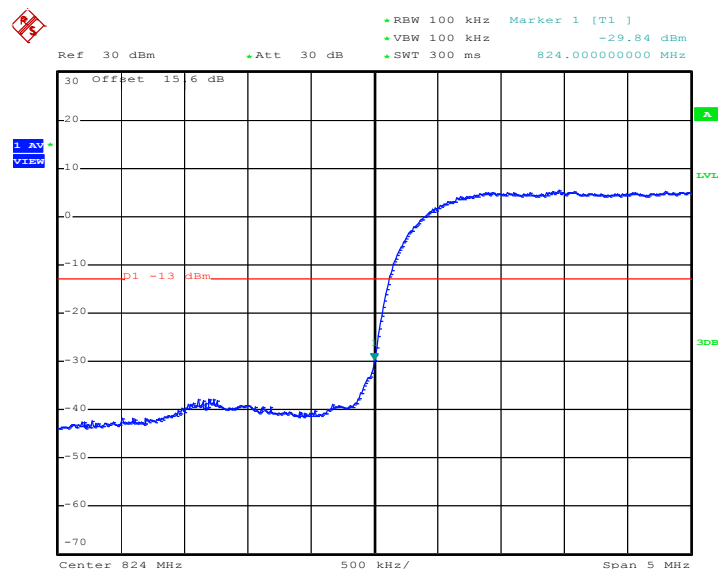


Date: 6.JUN.2012 22:26:20

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

Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link
Correction Factor :	-3.30dB	Maximum 26dB Bandwidth :	4.680MHz
Band Edge :	-33.14dBm	Measurement Value :	-29.84dBm

Lower Band Edge Plot on Channel 4132

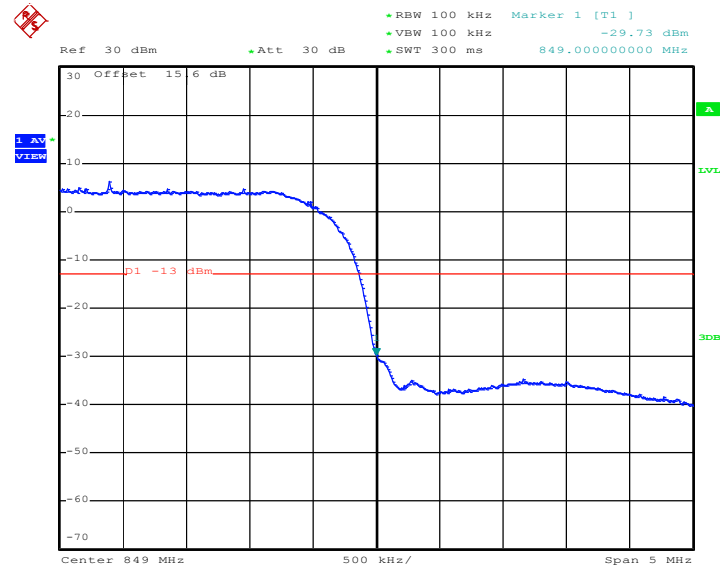


Date: 6.JUN.2012 11:47:19

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

Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link
Correction Factor :	-3.30dB	Maximum 26dB Bandwidth :	4.680MHz
Band Edge :	-33.03dBm	Measurement Value :	-29.73dBm

Higher Band Edge Plot on Channel 4233

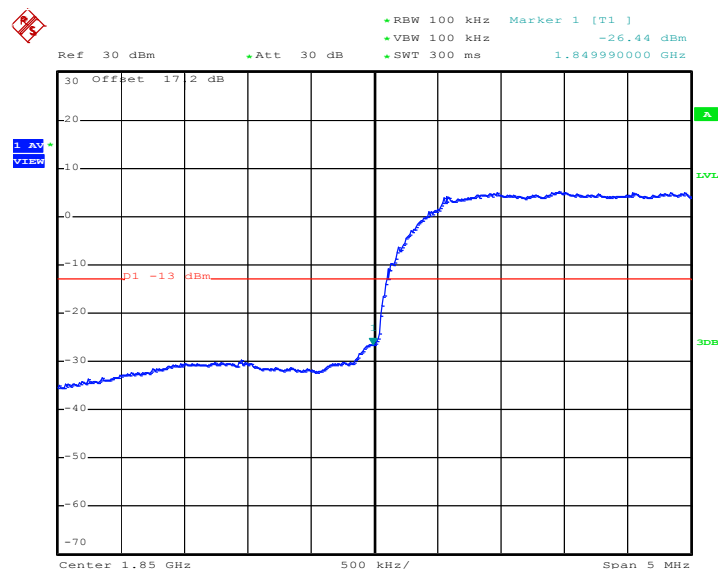


Date: 6.JUN.2012 11:47:45

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

Band :	WCDMA Band II	Test Mode :	RMC 12.2Kbps Link
Correction Factor :	-3.30dB	Maximum 26dB Bandwidth :	4.680MHz
Band Edge :	-29.74dBm	Measurement Value :	-26.44dBm

Lower Band Edge Plot on Channel 9262

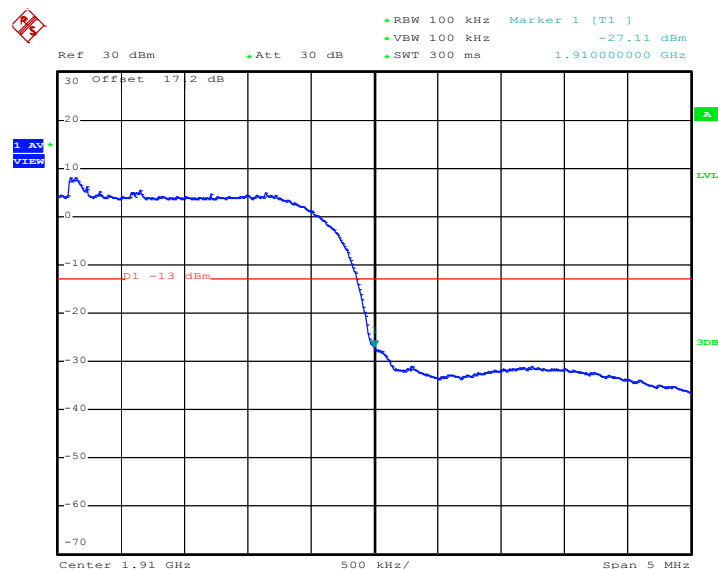


Date: 6.JUN.2012 22:41:17

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

Band :	WCDMA Band II	Test Mode :	RMC 12.2Kbps Link
Correction Factor :	-3.30dB	Maximum 26dB Bandwidth :	4.680MHz
Band Edge :	-30.41dBm	Measurement Value :	-27.11dBm

Higher Band Edge Plot on Channel 9538



Date: 6.JUN.2012 22:41:44

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

3.6 Conducted Emission Measurement

3.6.1 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.

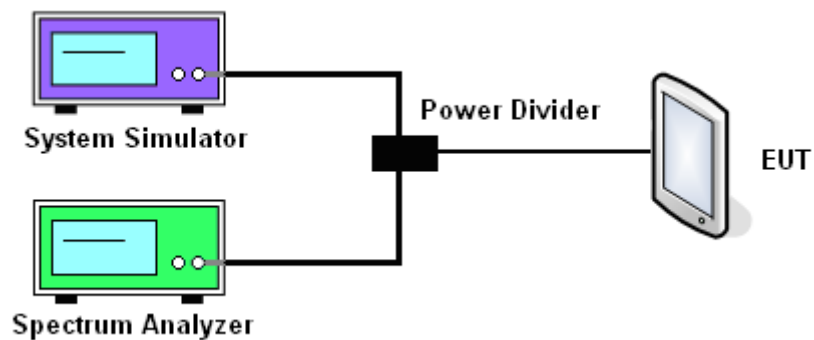
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 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.

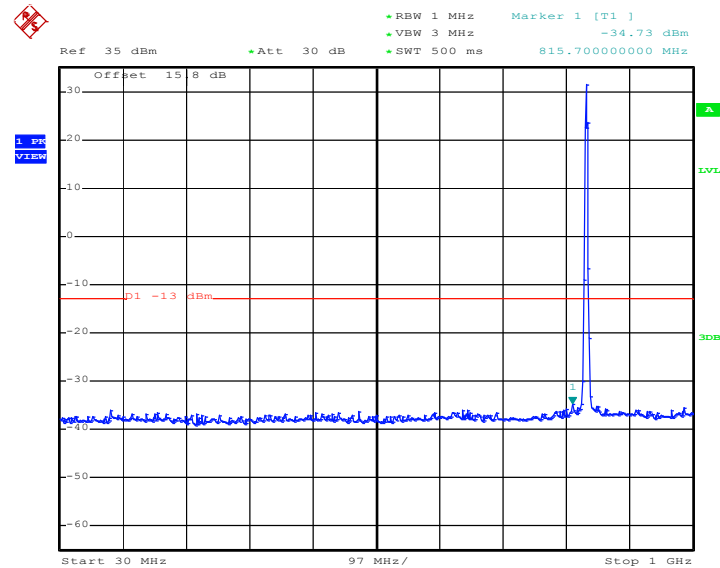
3.6.4 Test Setup



3.6.5 Test Result (Plots) of Conducted Emission

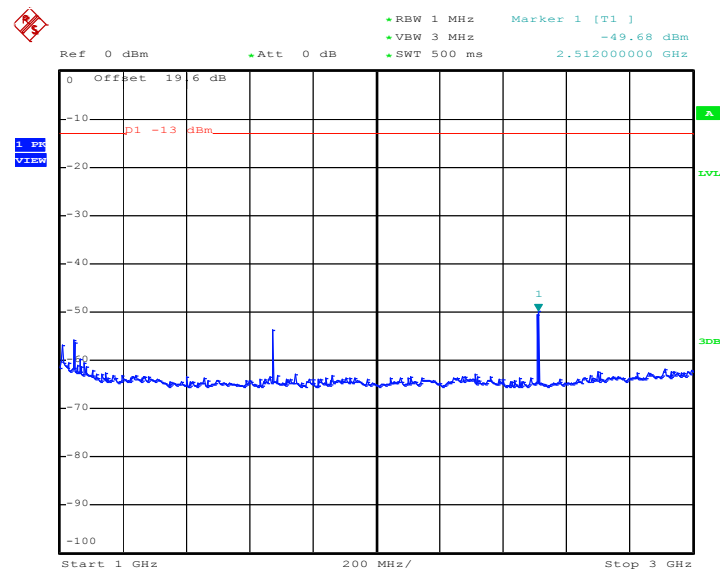
Band :	GSM850	Channel :	CH189
Test Mode :	GPRS 8 Link		

Conducted Emission Plot between 30MHz ~ 1GHz



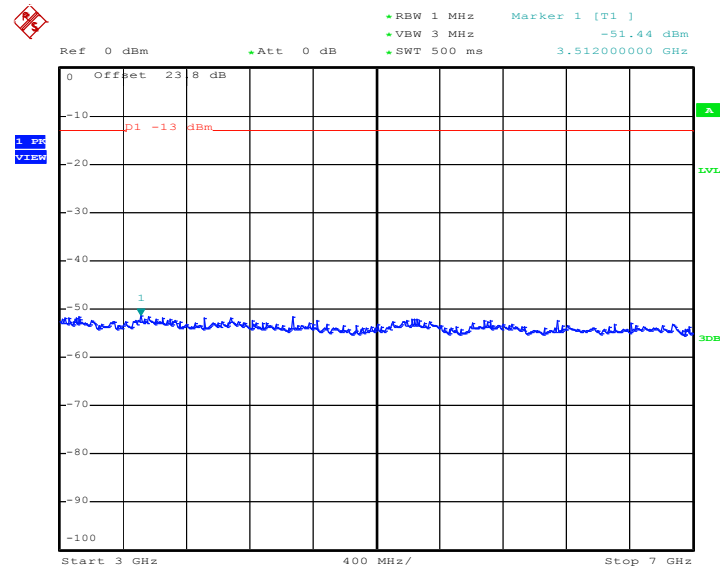
Date: 13.JUN.2012 09:24:08

Conducted Emission Plot between 1GHz ~ 3GHz



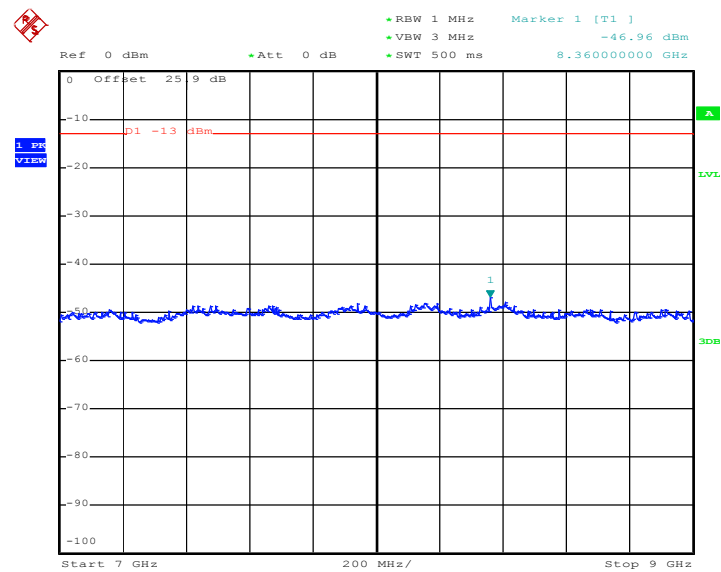
Date: 13.JUN.2012 09:24:27

Conducted Emission Plot between 3GHz ~ 7GHz



Date: 13.JUN.2012 09:24:40

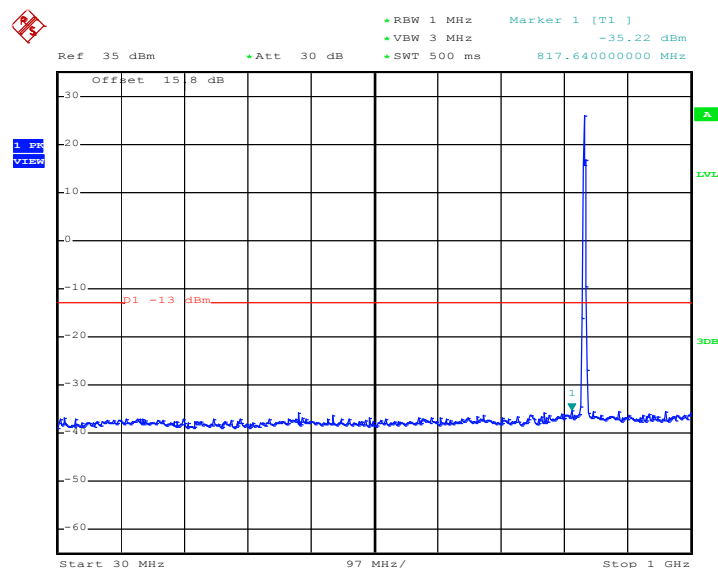
Conducted Emission Plot between 7GHz ~ 9GHz



Date: 13.JUN.2012 09:24:52

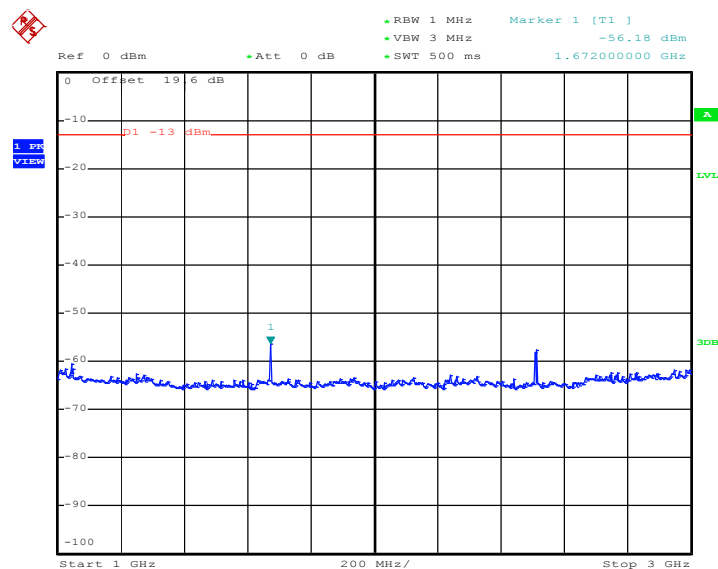
Band :	GSM850	Channel :	CH189
Test Mode :	EDGE 8 Link		

Conducted Emission Plot between 30MHz ~ 1GHz



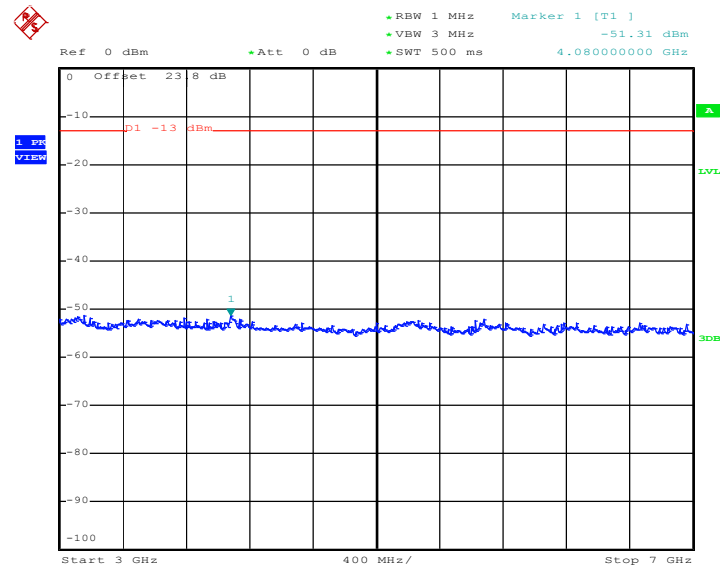
Date: 13.JUN.2012 10:06:03

Conducted Emission Plot between 1GHz ~ 3GHz



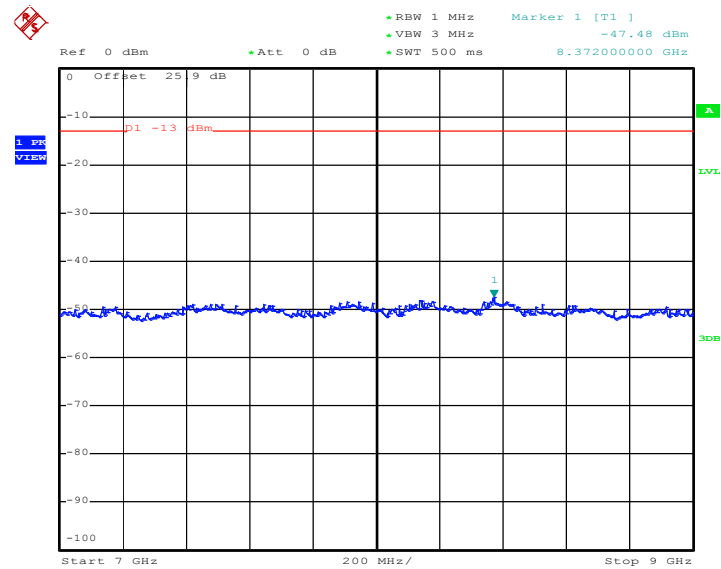
Date: 13.JUN.2012 10:06:21

Conducted Emission Plot between 3GHz ~ 7GHz



Date: 13.JUN.2012 10:06:34

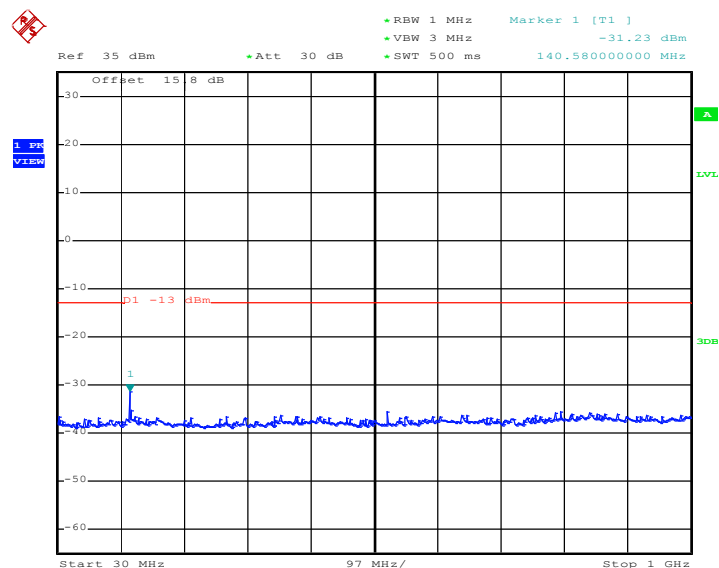
Conducted Emission Plot between 7GHz ~ 9GHz



Date: 13.JUN.2012 10:06:46

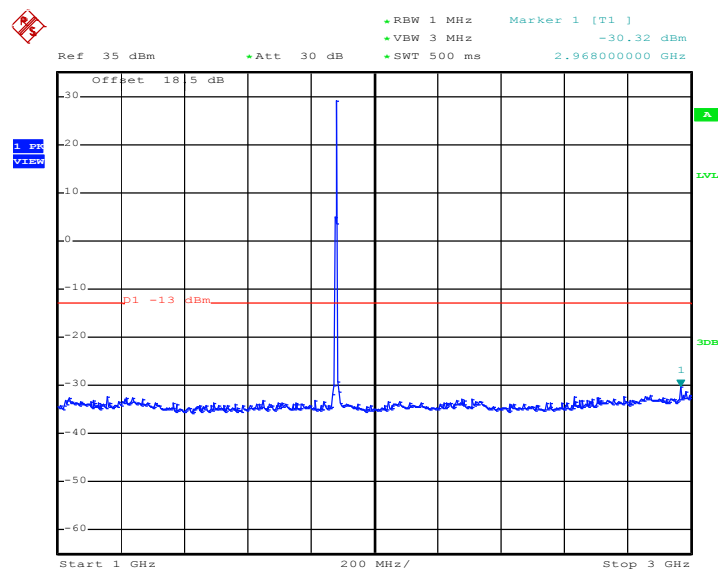
Band :	GSM1900	Channel :	CH661
Test Mode :	GPRS 8 Link		

Conducted Emission Plot between 30MHz ~ 1GHz



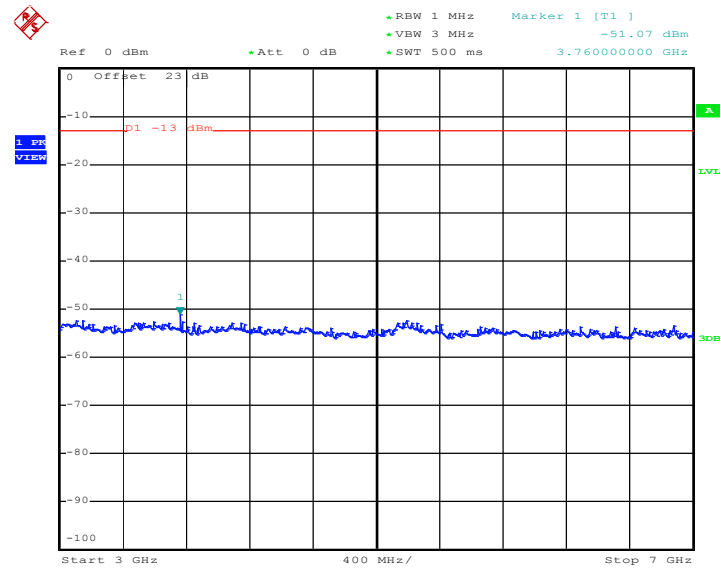
Date: 13.JUN.2012 10:23:55

Conducted Emission Plot between 1GHz ~ 3GHz



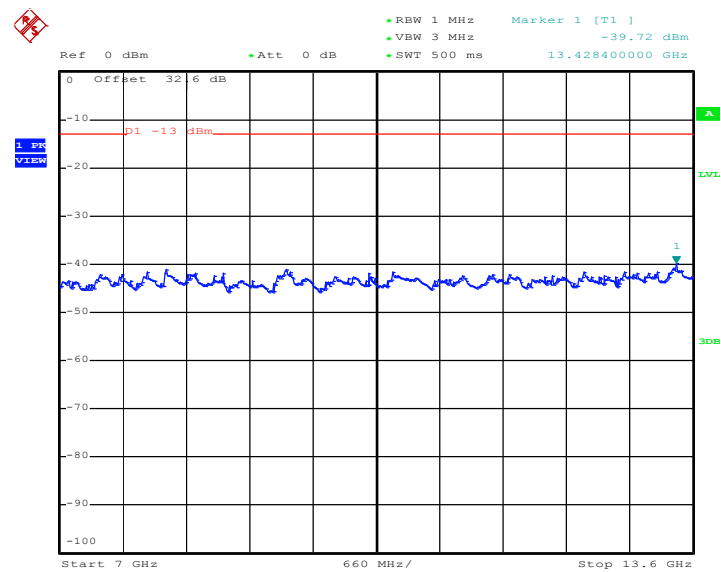
Date: 13.JUN.2012 10:24:07

Conducted Emission Plot between 3GHz ~ 7GHz



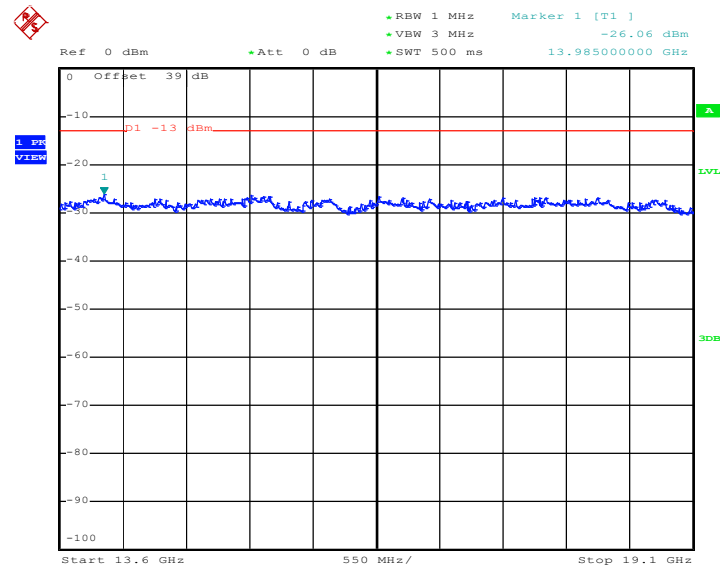
Date: 13.JUN.2012 10:24:24

Conducted Emission Plot between 7GHz ~ 13.6GHz



Date: 13.JUN.2012 10:24:36

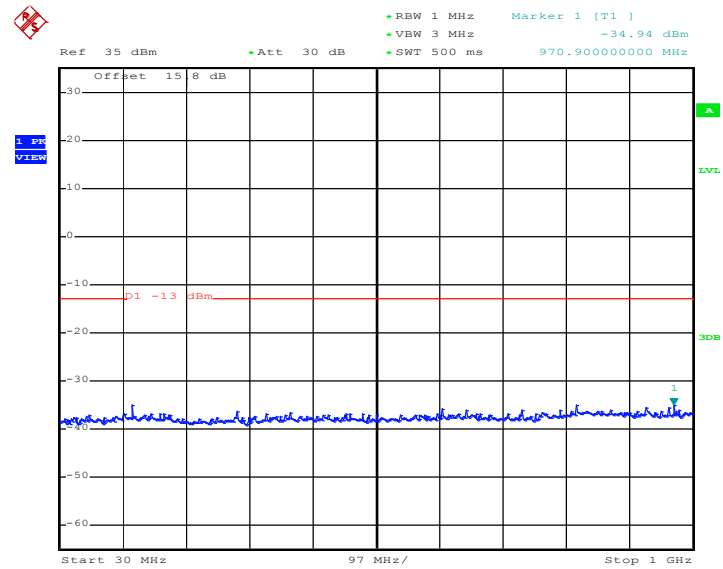
Conducted Emission Plot between 13.6GHz ~ 19.1GHz



Date: 13.JUN.2012 10:24:48

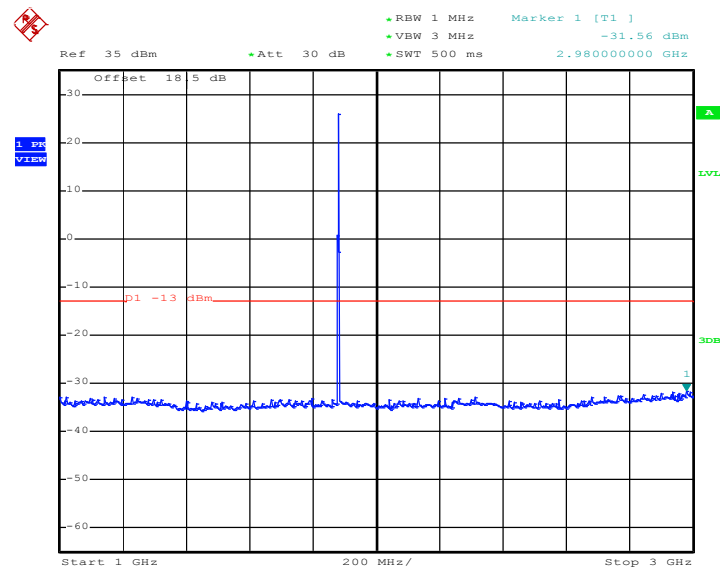
Band :	GSM1900	Channel :	CH661
Test Mode :	EDGE 10 Link		

Conducted Emission Plot between 30MHz ~ 1GHz



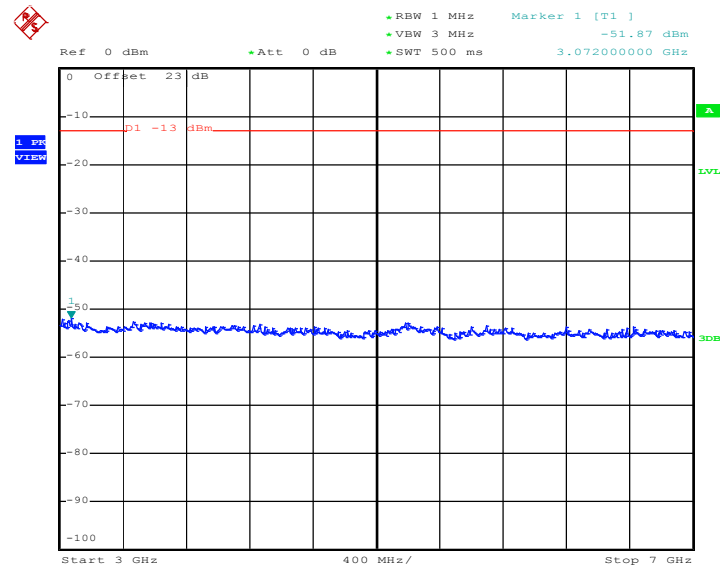
Date: 13.JUN.2012 10:17:43

Conducted Emission Plot between 1GHz ~ 3GHz



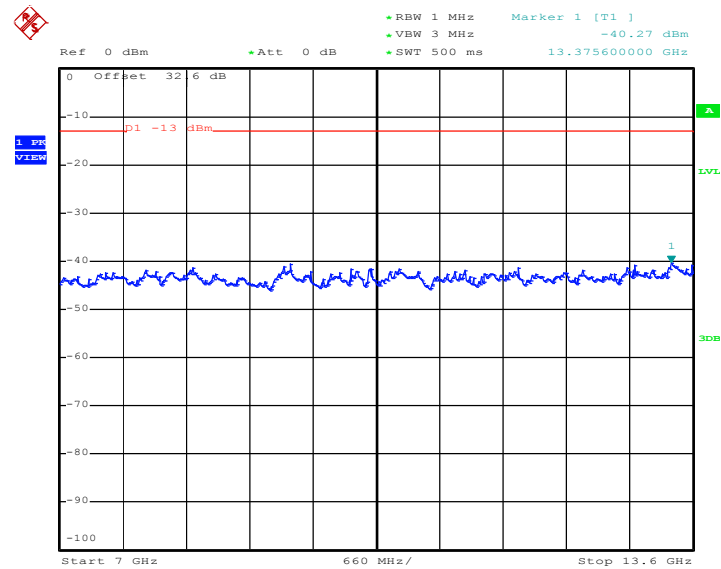
Date: 13.JUN.2012 10:17:55

Conducted Emission Plot between 3GHz ~ 7GHz



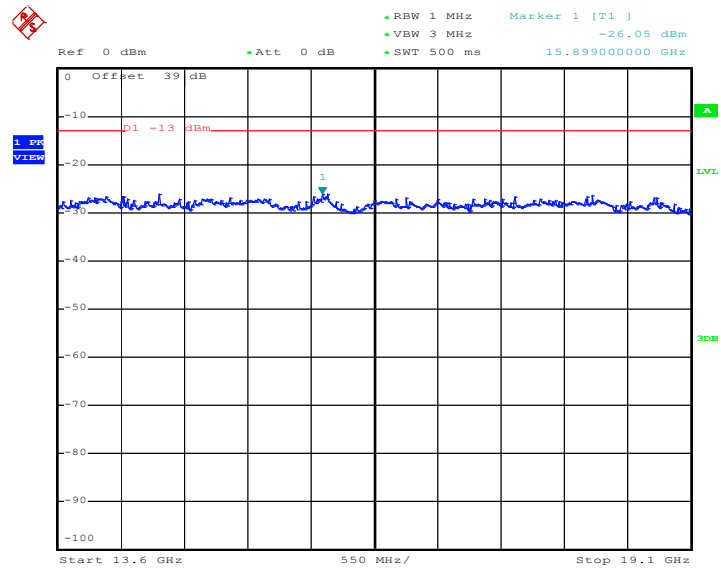
Date: 13.JUN.2012 10:18:13

Conducted Emission Plot between 7GHz ~ 13.6GHz



Date: 13.JUN.2012 10:18:25

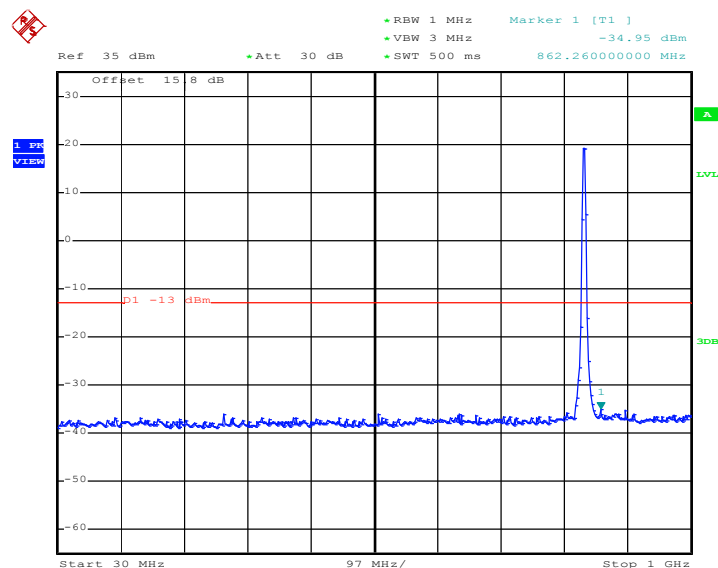
Conducted Emission Plot between 13.6GHz ~ 19.1GHz



Date: 13.JUN.2012 10:18:38

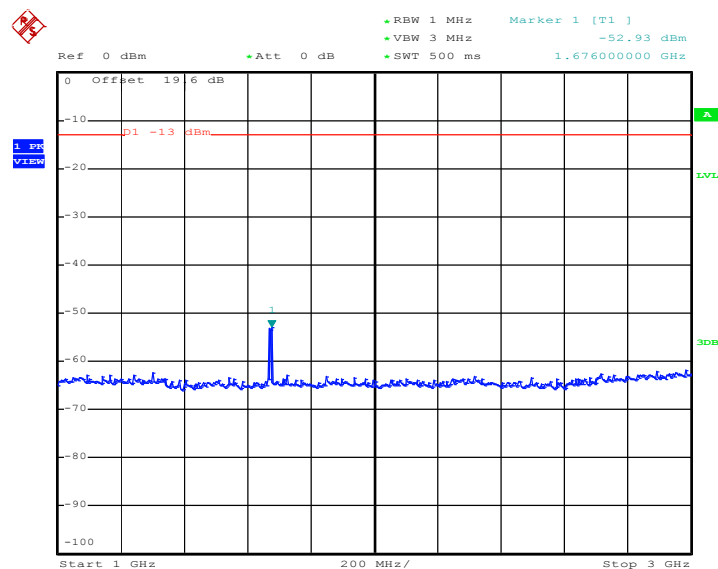
Band :	WCDMA Band V	Channel :	CH4182
Test Mode :	RMC 12.2Kbps Link		

Conducted Emission Plot between 30MHz ~ 1GHz



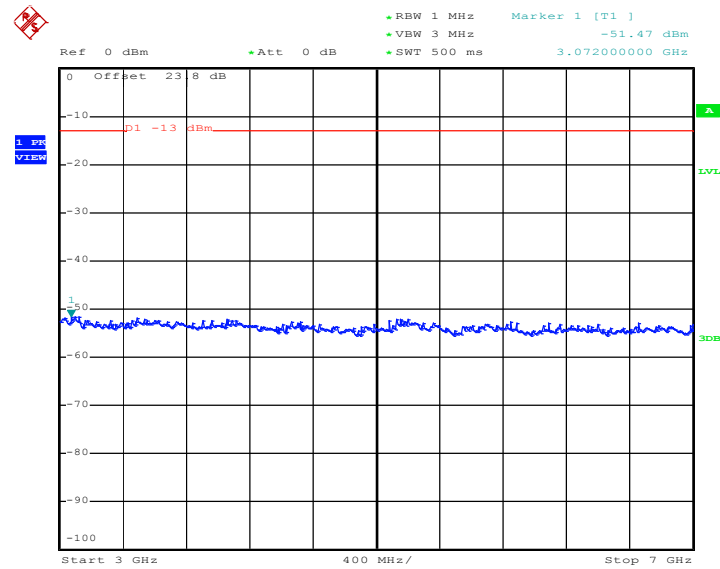
Date: 13.JUN.2012 09:52:51

Conducted Emission Plot between 1GHz ~ 3GHz



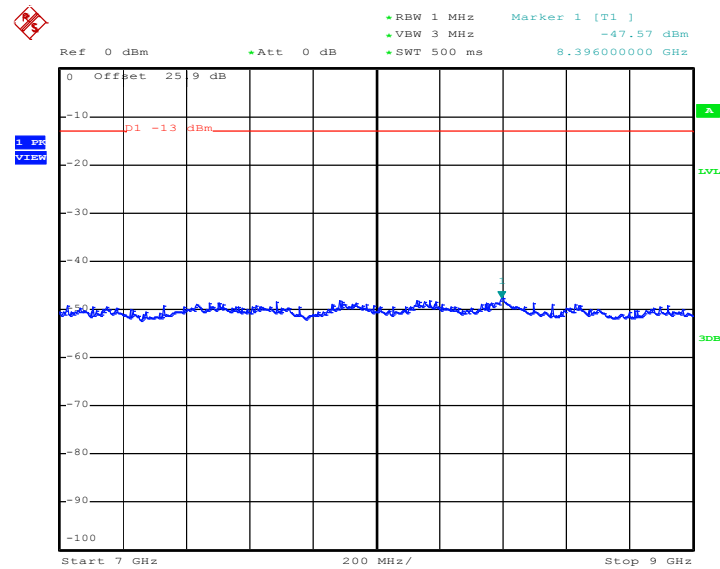
Date: 13.JUN.2012 09:53:38

Conducted Emission Plot between 3GHz ~ 7GHz



Date: 13.JUN.2012 09:53:50

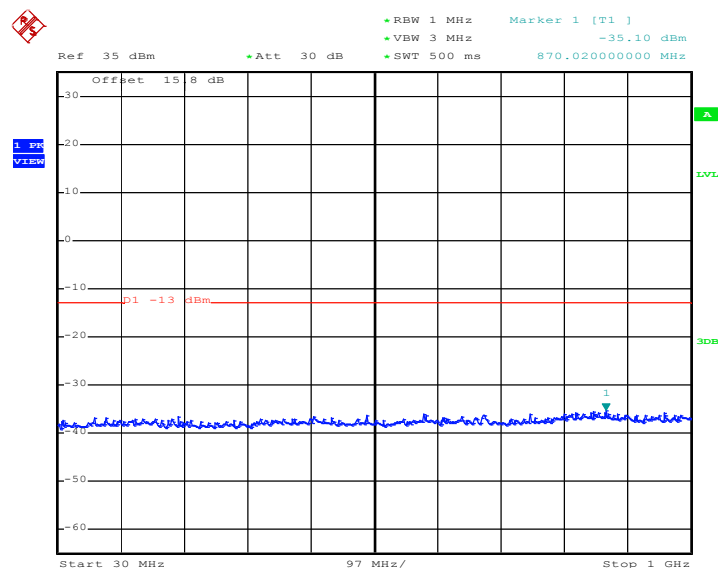
Conducted Emission Plot between 7GHz ~ 9GHz



Date: 13.JUN.2012 09:54:03

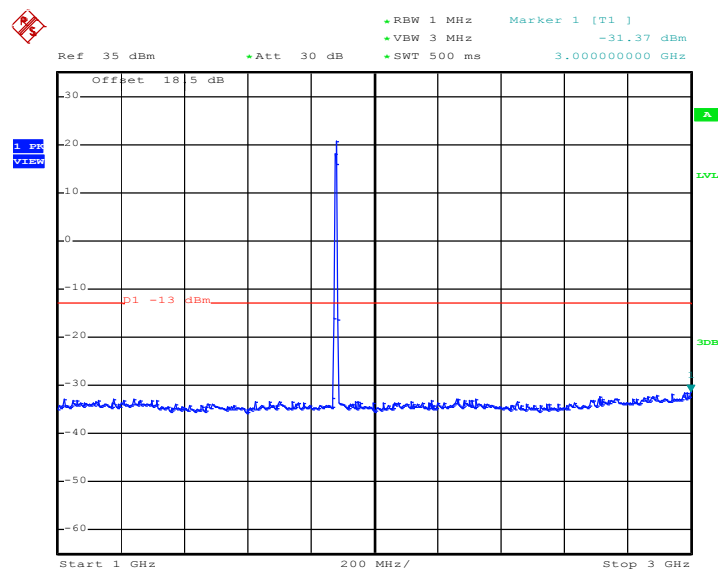
Band :	WCDMA Band II	Channel :	CH9400
Test Mode :	RMC 12.2Kbps Link		

Conducted Emission Plot between 30MHz ~ 1GHz



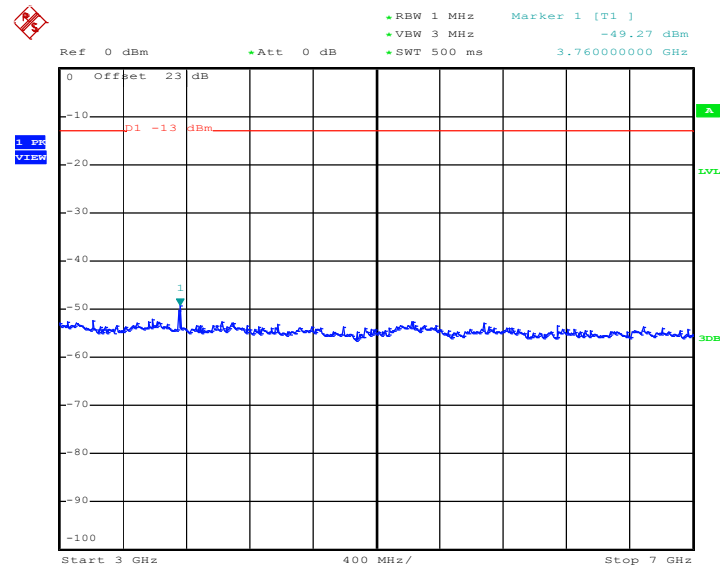
Date: 13.JUN.2012 09:46:01

Conducted Emission Plot between 1GHz ~ 3GHz



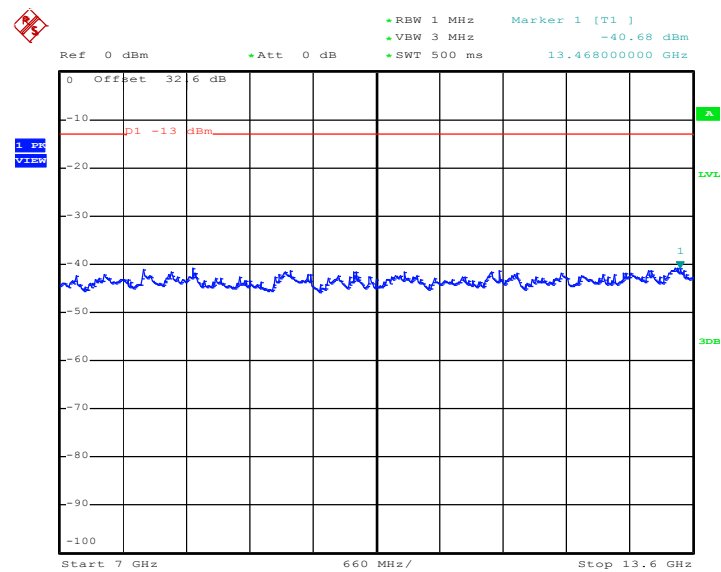
Date: 13.JUN.2012 09:46:13

Conducted Emission Plot between 3GHz ~ 7GHz



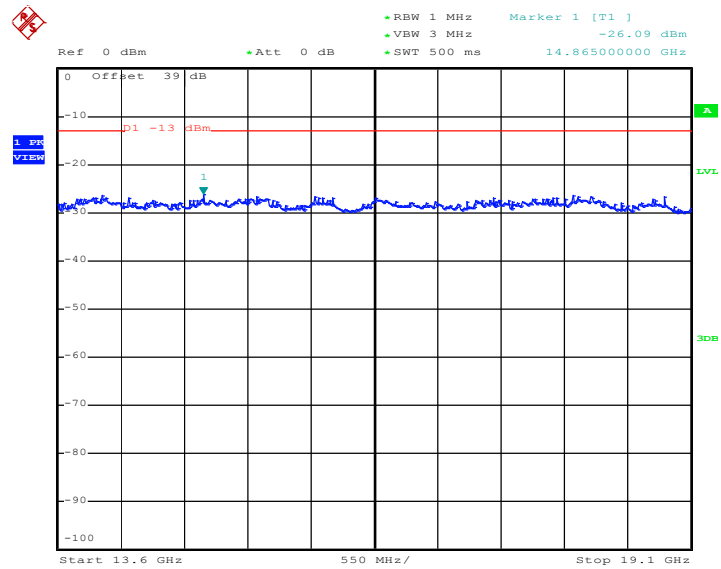
Date: 13.JUN.2012 09:47:03

Conducted Emission Plot between 7GHz ~ 13.6GHz



Date: 13.JUN.2012 09:47:15

Conducted Emission Plot between 13.6GHz ~ 19.1GHz



Date: 13.JUN.2012 09:47:28

3.7 Field Strength of Spurious Radiation Measurement

3.7.1 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.

3.7.2 Measuring Instruments

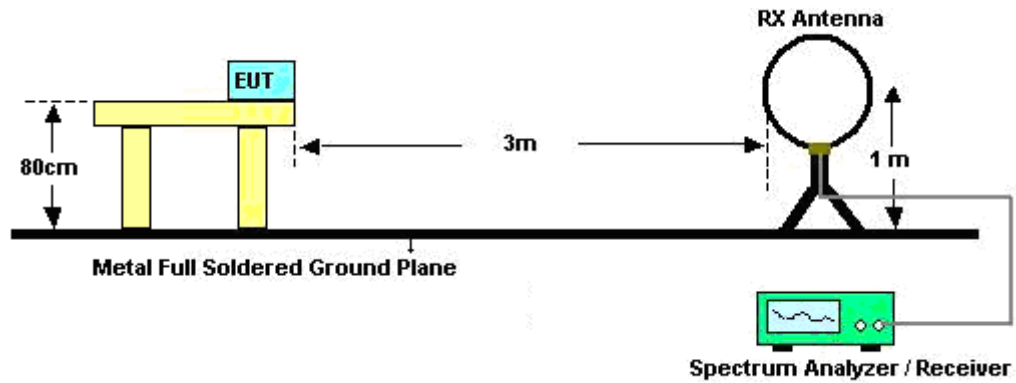
See list of measuring instruments of this test report.

3.7.3 Test Procedures

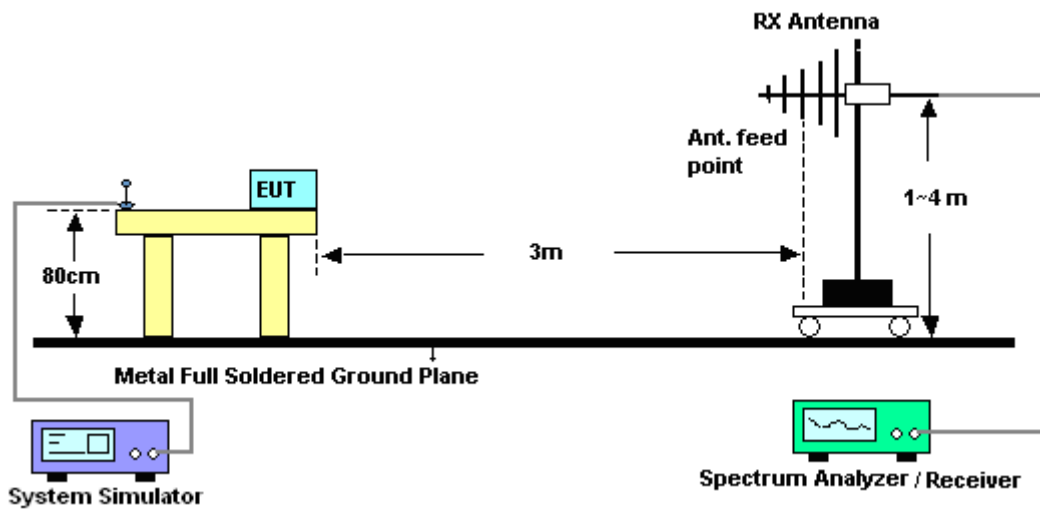
1. The EUT was placed on a rotatable turntable with 0.8 meter about ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, 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. $ERP \text{ (dBm)} = EIRP - 2.15$

3.7.4 Test Setup

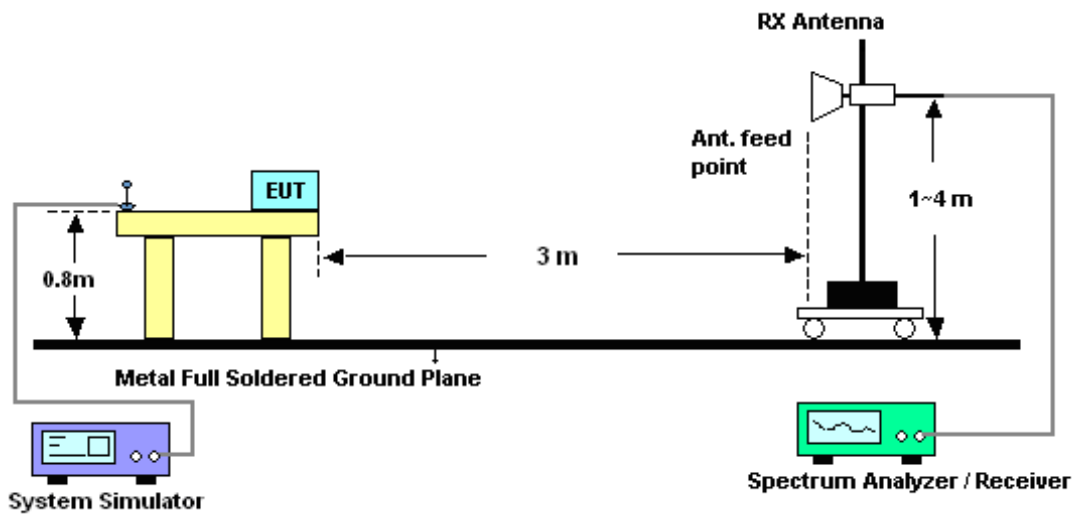
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

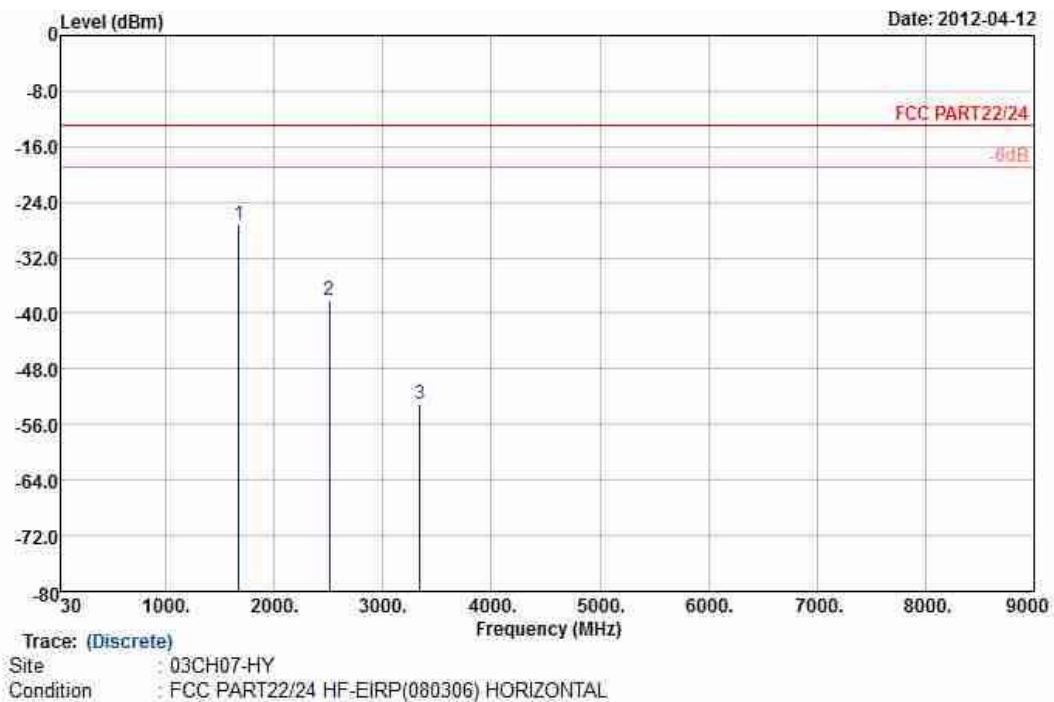


3.7.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

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.

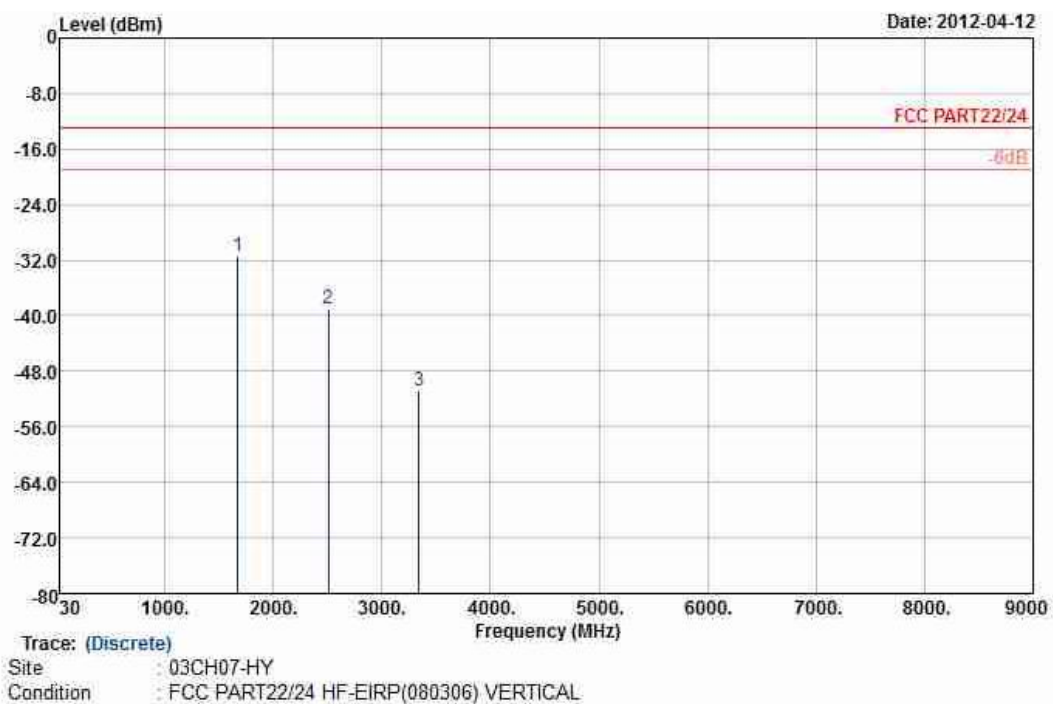
3.7.6 Test Result of Field Strength of Spurious Radiated

Band :	GSM850	Temperature :	25~27°C
Test Mode :	GPRS 8 Link	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



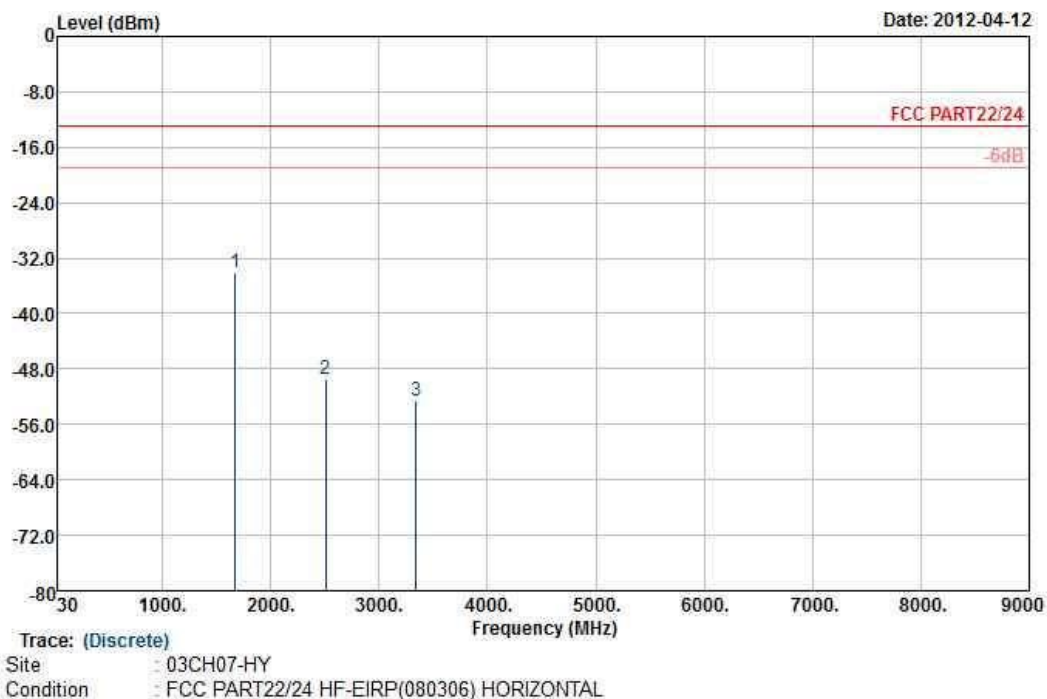
Frequency (MHz)	LEVEL (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-25.14	-13	-12.14	-36.3	-29.01	1.62	5.49	H	Pass
2509	-36.06	-13	-23.06	-51.98	-40.18	2.1	6.22	H	Pass
3345	-50.82	-13	-37.82	-67.19	-55.86	3.03	8.07	H	Pass

Band :	GSM850	Temperature :	25~27°C
Test Mode :	GPRS 8 Link	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



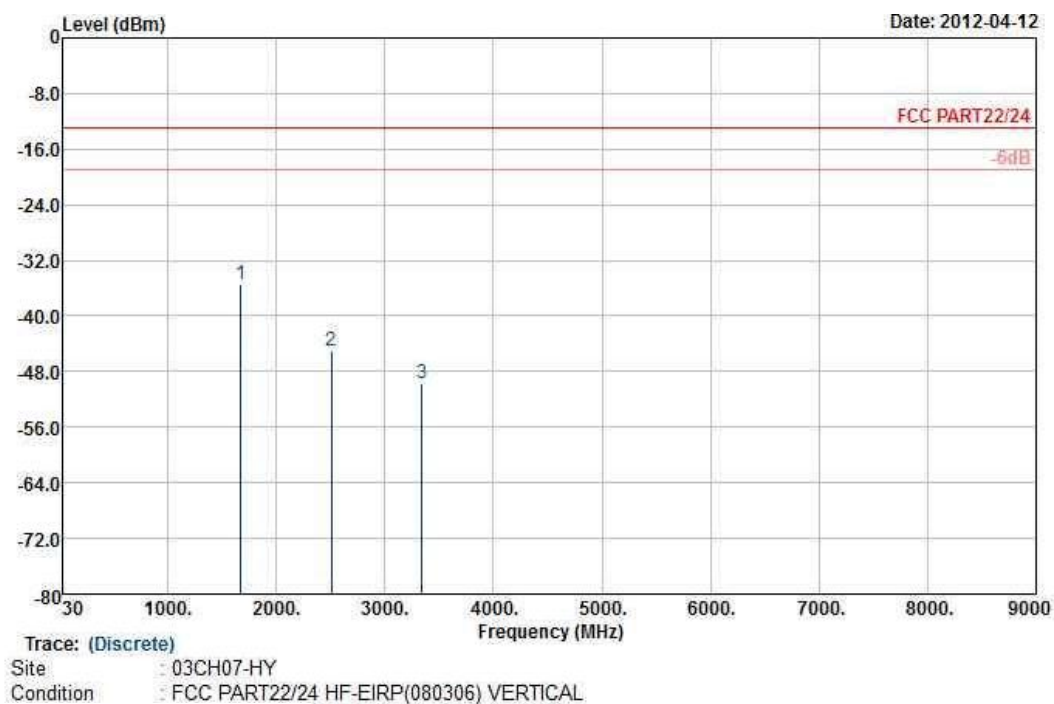
Frequency (MHz)	LEVEL (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-29.23	-13	-16.23	-42.64	-33.1	1.62	5.49	V	Pass
2509	-36.91	-13	-23.91	-53.07	-41.03	2.1	6.22	V	Pass
3345	-48.61	-13	-35.61	-66.62	-53.65	3.03	8.07	V	Pass

Band :	GSM850	Temperature :	25~27°C
Test Mode :	EDGE 8 Link	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



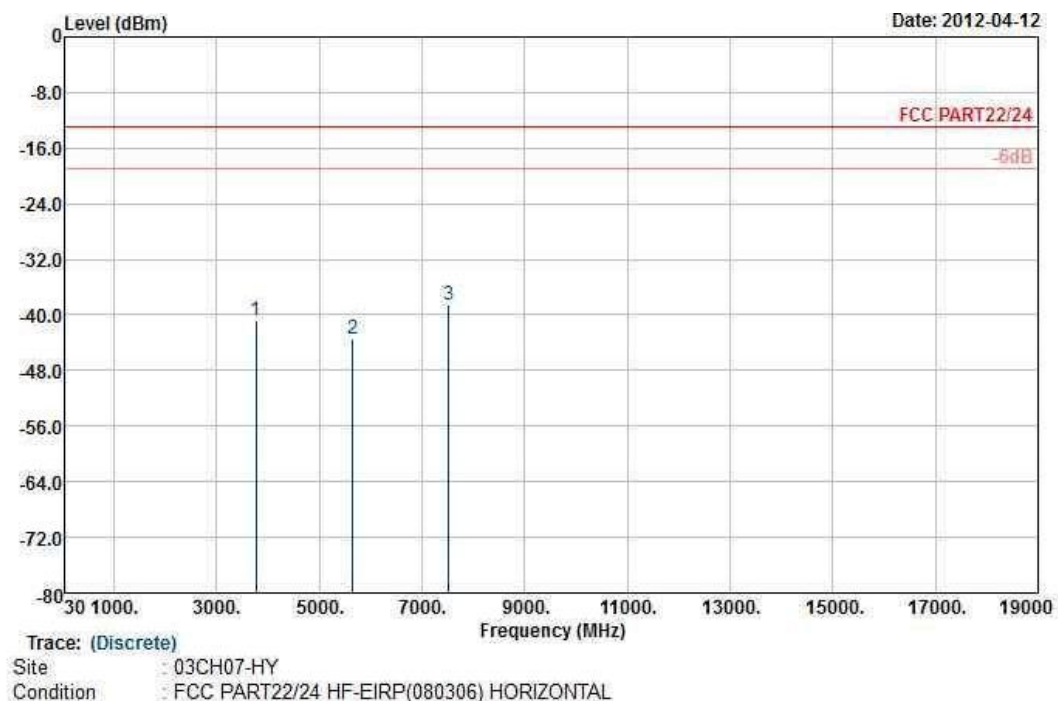
Frequency (MHz)	LEVEL (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-32.01	-13	-19.01	-43.25	-35.88	1.62	5.49	H	Pass
2509	-47.43	-13	-34.43	-63.25	-51.55	2.1	6.22	H	Pass
3345	-50.53	-13	-37.53	-66.96	-55.57	3.03	8.07	H	Pass

Band :	GSM850	Temperature :	25~27°C
Test Mode :	EDGE 8 Link	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



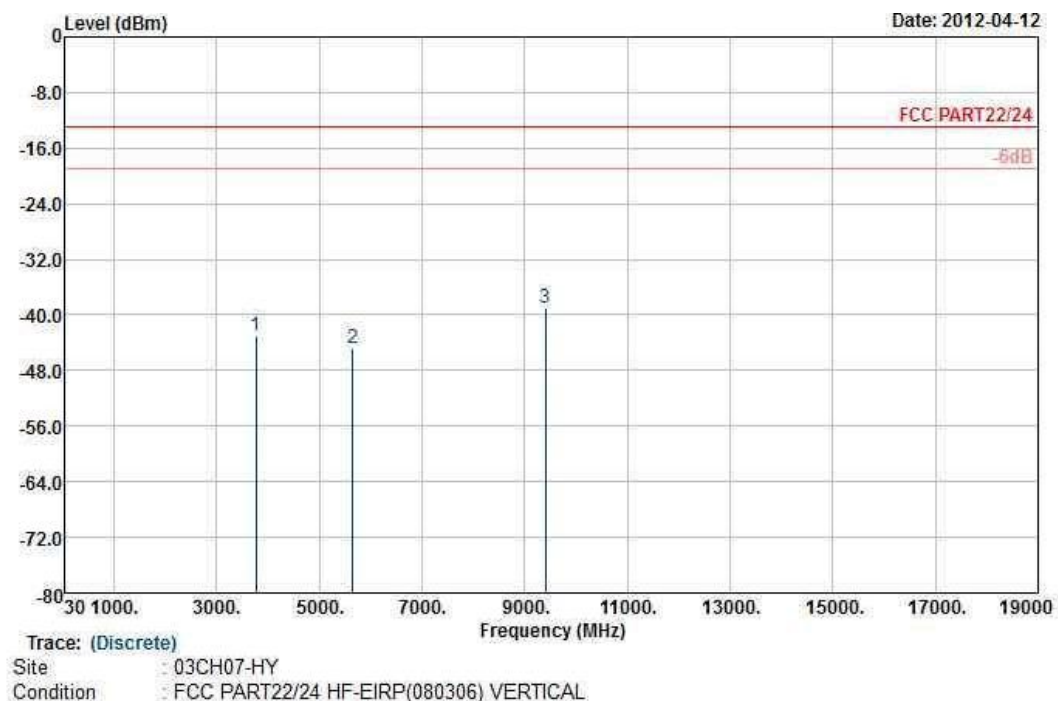
Frequency (MHz)	LEVEL (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-33.26	-13	-20.26	-46.64	-37.13	1.62	5.49	V	Pass
2509	-42.94	-13	-29.94	-59.11	-47.06	2.1	6.22	V	Pass
3345	-47.65	-13	-34.65	-65.62	-52.69	3.03	8.07	V	Pass

Band :	GSM1900	Temperature :	25~27°C
Test Mode :	GPRS 8 Link	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



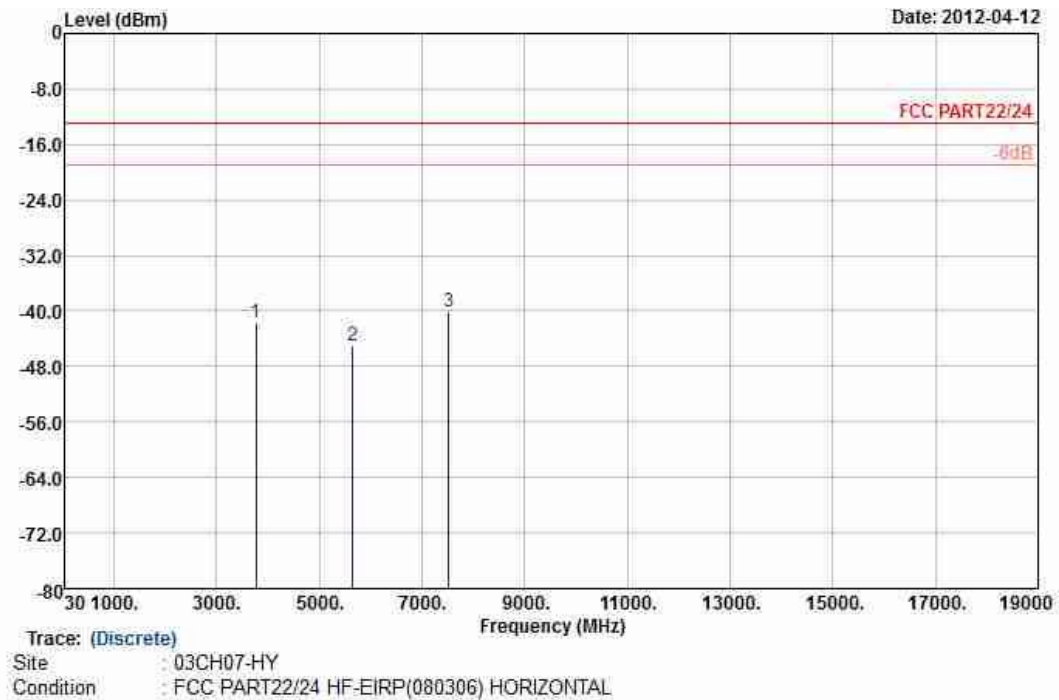
Frequency (MHz)	LEVEL (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-40.75	-13	-27.75	-56.37	-47.05	2.51	8.81	H	Pass
5636	-43.43	-13	-30.43	-64.32	-51.14	2.99	10.70	H	Pass
7520	-38.48	-13	-25.48	-65.79	-47.01	3.59	12.12	H	Pass

Band :	GSM1900	Temperature :	25~27°C
Test Mode :	GPRS 8 Link	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



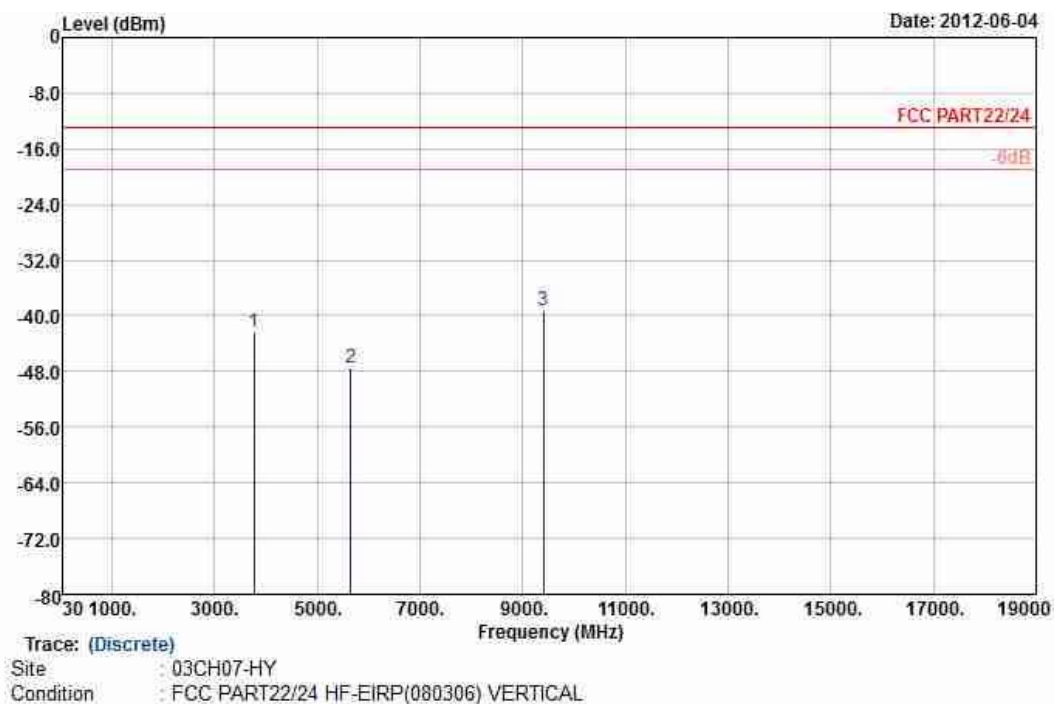
Frequency (MHz)	LEVEL (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-43.01	-13	-30.01	-59.52	-49.31	2.51	8.81	V	Pass
5636	-44.70	-13	-31.70	-65.41	-52.41	2.99	10.70	V	Pass
9396	-39.01	-13	-26.01	-65.48	-48.11	4.1	13.20	V	Pass

Band :	GSM1900	Temperature :	25~27°C
Test Mode :	EDGE 10 Link	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



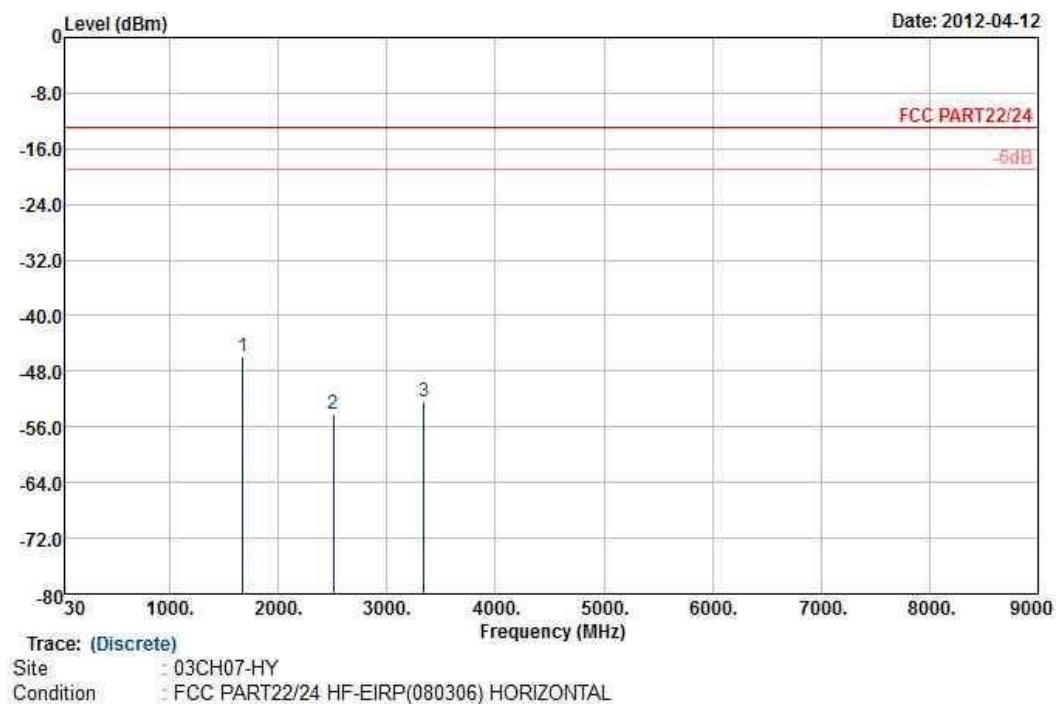
Frequency (MHz)	LEVEL (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-41.67	-13	-28.67	-57.13	-47.97	2.51	8.81	H	Pass
5636	-45.01	-13	-32.01	-65.86	-52.72	2.99	10.70	H	Pass
7520	-40.18	-13	-27.18	-67.64	-48.71	3.59	12.12	H	Pass

Band :	GSM1900	Temperature :	25~27°C
Test Mode :	EDGE 10 Link	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



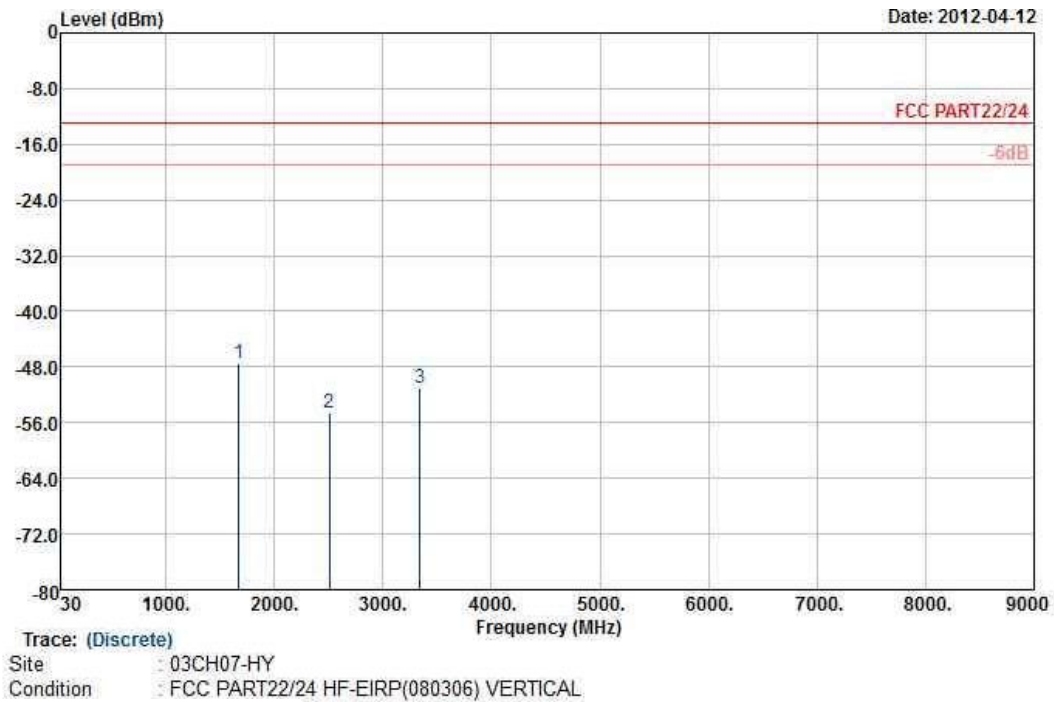
Frequency (MHz)	LEVEL (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-42.32	-13	-29.32	-58.74	-48.62	2.51	8.81	V	Pass
5636	-47.57	-13	-34.57	-68.34	-55.28	2.99	10.70	V	Pass
9396	-39.27	-13	-26.27	-65.85	-48.37	4.1	13.20	V	Pass

Band :	WCDMA Band V	Temperature :	25~27°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



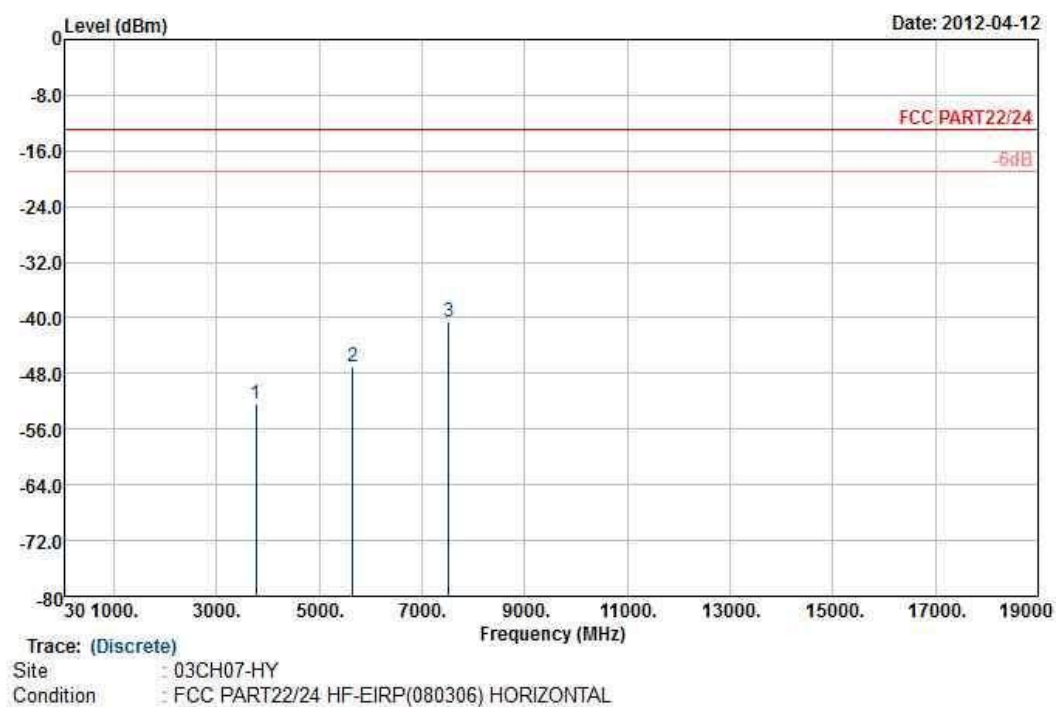
Frequency (MHz)	LEVEL (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-43.84	-13	-30.84	-54.96	-47.71	1.62	5.49	H	Pass
2509	-51.99	-13	-38.99	-67.62	-56.11	2.1	6.22	H	Pass
3345	-50.27	-13	-37.27	-66.75	-55.31	3.03	8.07	H	Pass

Band :	WCDMA Band V	Temperature :	25~27°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



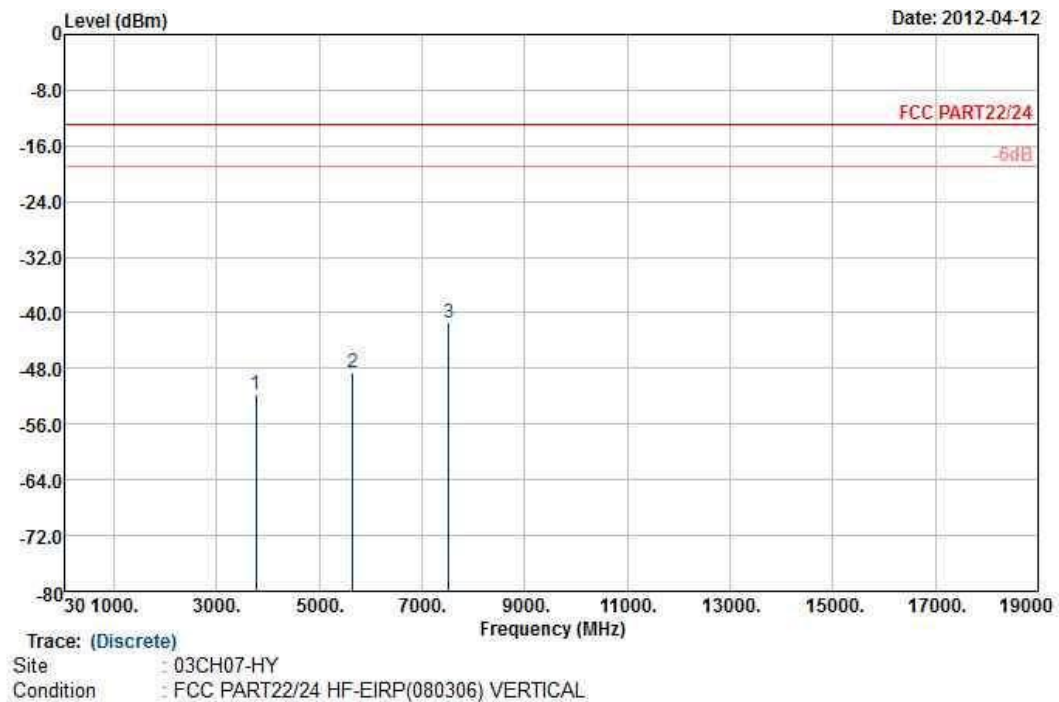
Frequency (MHz)	LEVEL (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-45.23	-13	-32.23	-58.5	-49.1	1.62	5.49	V	Pass
2509	-52.46	-13	-39.46	-68.51	-56.58	2.1	6.22	V	Pass
3345	-48.87	-13	-35.87	-66.8	-53.91	3.03	8.07	V	Pass

Band :	WCDMA Band II	Temperature :	25~27°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	LEVEL (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	-52.41	-13	-39.41	-68.05	-58.71	2.51	8.81	H	Pass
5636	-47.01	-13	-34.01	-67.76	-54.72	2.99	10.70	H	Pass
7520	-40.60	-13	-27.60	-67.97	-49.13	3.59	12.12	H	Pass

Band :	WCDMA Band II	Temperature :	25~27°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	LEVEL (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	-51.75	-13	-38.75	-68.16	-58.05	2.51	8.81	V	Pass
5636	-48.53	-13	-35.53	-69.22	-56.24	2.99	10.70	V	Pass
7520	-41.49	-13	-28.49	-68.61	-50.02	3.59	12.12	V	Pass

3.8 Frequency Stability Measurement

3.8.1 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.

3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

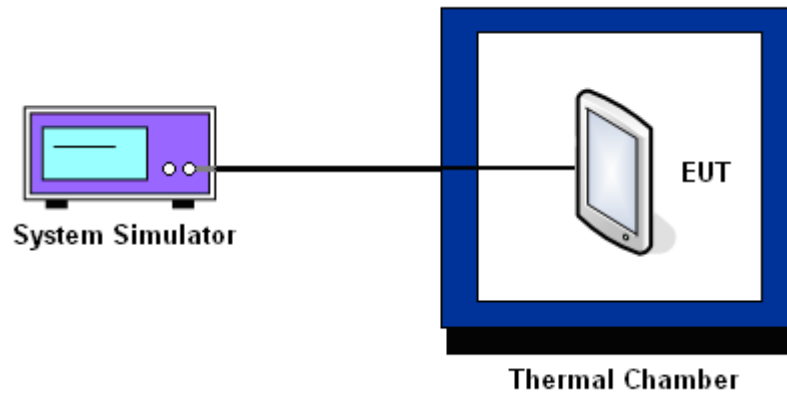
3.8.3 Test Procedures for Temperature Variation

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.

3.8.4 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.

3.8.5 Test Setup



3.8.6 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	36	0.04	-34	-0.04	PASS
-20	54	0.06	50	0.06	
-10	30	0.04	41	0.05	
0	38	0.04	-42	-0.05	
10	42	0.05	39	0.05	
20	31	0.04	45	0.05	
30	51	0.06	51	0.06	
40	60	0.07	68	0.08	
50	65	0.08	38	0.04	

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

Temperature (°C)	GPRS 8		EDGE 10		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	22	0.01	-60	-0.03	PASS
-20	23	0.01	49	0.03	
-10	26	0.01	-55	-0.03	
0	20	0.01	51	0.03	
10	29	0.02	45	0.02	
20	36	0.02	-54	-0.03	
30	38	0.02	-49	-0.03	
40	21	0.01	59	0.03	
50	45	0.02	61	0.03	

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

Temperature (°C)	RMC 12.2Kbps		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	7	0.01	PASS
-20	6	0.01	
-10	-7	-0.01	
0	-5	-0.01	
10	8	0.01	
20	9	0.01	
30	5	0.01	
40	7	0.01	
50	-9	-0.01	

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

Temperature (°C)	RMC 12.2Kbps		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-9	0.00	PASS
-20	-15	-0.01	
-10	-7	0.00	
0	-16	-0.01	
10	-11	-0.01	
20	-18	-0.01	
30	-12	-0.01	
40	-21	-0.01	
50	-28	-0.01	

3.8.7 Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
GSM 850 CH189	GPRS 8	3.7	-13	-0.02	2.5	PASS
		BEP	-15	-0.02		
		4.2	-10	-0.01		
	EDGE 8	3.7	22	0.03		
		BEP	-19	-0.02		
		4.2	-30	-0.04		
GSM 1900 CH661	GPRS 8	3.7	23	0.01		
		BEP	17	0.01		
		4.2	31	0.02		
	EDGE 10	3.7	44	0.02		
		BEP	47	0.02		
		4.2	24	0.01		
WCDMA Band V CH4182	RMC 12.2Kbps	3.7	-5	-0.01		
		BEP	5	0.01		
		4.2	-6	-0.01		
WCDMA Band II CH9400	RMC 12.2Kbps	3.7	-12	-0.01		
		BEP	-11	-0.01		
		4.2	-13	-0.01		

Note:

1. Normal Voltage = 3.7V.
2. Battery End Point (BEP) = 3.4 V.

4 List of Measuring Equipment

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	Jun. 06, 2012~ Jul. 27, 2012	Jul. 27, 2012	Conducted (TH02-HY)
System Simulator	R&S	CMU200	117995	N/A	Jul. 30, 2012	Jul. 30, 2012~ Aug. 21, 2012	Jul. 29, 2013	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 06, 2012	Jun. 06, 2012~ Aug. 21, 2012	Jun. 05, 2013	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D35P	TBN-930701	N/A	Jul. 27, 2011	Jun. 06, 2012~ Jul. 23, 2012	Jul. 26, 2012	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D3SP	TBN-930701	N/A	Jul. 23, 2012	Jul. 23, 2012~ Aug. 21, 2012	Jul. 22, 2013	Conducted (TH02-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 22, 2011	Apr. 12, 2012	Oct. 21, 2012	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP30	101067	9KHz ~ 30GHz	Dec. 06, 2011	Apr. 12, 2012	Dec. 05, 2012	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 10, 2011	Apr. 12, 2012	Aug. 09, 2012	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1GHz ~ 26.5GHz	Dec. 05, 2011	Apr. 12, 2012	Dec. 04, 2012	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32dB. GAIN	Feb. 27, 2012	Apr. 12, 2012	Feb. 26, 2013	Radiation (03CH07-HY)
EMI TEST RECEIVER	R&S	ESCI 7	100724	9kHz ~ 7GHz	Aug. 22, 2011	Apr. 12, 2012	Aug. 21, 2012	Radiation (03CH07-HY)
Pre Amplifier	MITEQ	AMF-7D-00 101800-30-1	159088	1GHz ~ 18GHz	Mar. 10, 2012	Apr. 12, 2012	Mar. 09, 2013	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Apr. 12, 2012	Jul. 28, 2012	Radiation (03CH07-HY)
System Simulator	R&S	CMU200	117995	N/A	Jul. 28, 2011	Apr. 12, 2012	Jul. 27, 2013	Radiation (03CH07-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 = $20\text{Log}(1-\Gamma_1*\Gamma_2)$	+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				