FCC RF Test Report

APPLICANT	:	CT Asia
EQUIPMENT	:	Smartphone
BRAND NAME	:	BLU
MODEL NAME	:	Studio 5.0
FCC ID	:	YHLBLUSTUDIO50
STANDARD	:	FCC 47 CFR Part 2, 22(H), 24(E)
CLASSIFICATION	:	PCS Licensed Transmitter Held to Ear (PCE)

The product was received on Apr. 17, 2013 and completely tested on May 01, 2013. We, SPORTON INTERNATIONAL (SHENZHEN) 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 (SHENZHEN) INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai / Manager

Testing Laboratory
2353

SPORTON INTERNATIONAL (SHENZHEN) INC.
No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P.R.C.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG341702	Rev. 01	Initial issue of report	May 24, 2013

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	N/A	PASS	-
3.2	§24.232(d)	Peak-to-Average Ratio	< 13 dB	PASS	-
3.3	§22.913(a)(2)	Effective Radiated Power	< 7 Watts	PASS	-
3.3	§24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
3.4	§2.1049 §22.917(b) §24.238(b)	99% Occupied Bandwidth and 26dB Bandwidth	N/A	PASS	-
3.5	§2.1051 §22.917(a) §24.238(a)	Band Edge Measurement	< $43+10\log_{10}$(P[Watts])	PASS	-
3.6	§2.1051 §22.917(a) §24.238(a)	Conducted Spurious Emission	< $43+10\log_{10}$(P[Watts])	PASS	-
3.7	§2.1053 §22.917(a) §24.238(a)	Field Strength of Spurious Radiated	< $43+10\log_{10}$(P[Watts])	PASS	Under limit 19.58 dB at 1672.000 MHz
3.8	§2.1055 §22.355 §24.235	Frequency Stability for Temperature and Voltage	< 2.5 ppm	PASS	-

1 General Description

1.1 Applicant

CT Asia

Unit 01, 15/F, Seaview Centre, 139-141 Hoi bun road, Kwun Tong, Kowloon, Hongkong

1.2 Manufacturer

Tinno Mobile Technology Corp.

4/F., H-3 Building, OCT Eastern Industrial Park. NO.1 XiangShan East Road., Nan Shan District, Shenzhen, P.R.China.

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Smartphone
Brand Name	BLU
Model Name	Studio 5.0
FCC ID	YHLBLUSTUDIO50
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/WLAN 11bgn/Bluetooth EDR/ Bluetooth 4.0 - LE
HW Version	V1.0
SW Version	BLU_D530_V04_GENERIC
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. There are two different types of EUT. They are single SIM card mobile and dual SIM cards mobile. The others are the same including circuit design, PCB board, structure and all components. It is special to declare. After pre-scan two types of EUT, we found test result of the sample that dual SIM was the worst, so we choose dual SIM card mobile to perform all test. For the dual SIM card mobile, after pre-scan two SIM cards, we found test result with SIM1 card was the worst, so we choose SIM1 card to perform all tests.

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx Frequency	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz
Rx Frequency	GSM850: 869.2 MHz ~ 893.8 MHz GSM1900: 1930.2 MHz ~ 1989.8 MHz WCDMA Band V: 871.4 MHz ~ 891.6 MHz WCDMA Band II: 1932.4 MHz ~ 1987.6 MHz
Maximum Output Power to Antenna	GSM850 : 32.37 dBm GSM1900 : 29.33 dBm WCDMA Band V : 23.35 dBm WCDMA Band II : 22.89 dBm
Antenna Type	Fixed Internal Antenna
Type of Modulation	GSM/GPRS: GMSK EDGE: GMSK / 8PSK WCDMA: QPSK (Uplink) HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink)

1.5 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

FCC Rule	System	Type of Modulation	Maximum ERP/EIRP (W)	Frequency Tolerance (%, Hz, ppm)	Emission Designator
Part 22	GSM850 GSM	GMSK	0.8776	0.03 ppm	246KGXW
Part 22	GSM850 EDGE 8	8PSK	0.2917	0.03 ppm	243KG7W
Part 22	WCDMA Band V RMC 12.2Kbps	QPSK	0.1225	0.01 ppm	4M18F9W
Part 24	GSM1900 GSM	GMSK	1.4464	0.03 ppm	247KGXW
Part 24	GSM1900 EDGE 8	8PSK	0.6891	0.03 ppm	246KG7W
Part 24	WCDMA Band II RMC 12.2Kbps	QPSK	0.3714	0.01 ppm	4M19F9W

1.6 Testing Site

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.		
Test Site Location	No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P.R.C. TEL: +86-755- 3320-2398		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	TH01-SZ	03CH01-SZ	831040/4086F-1

1.7 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

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.

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	■ GSM Link ■ EDGE 8 Link	■ GSM Link ■ EDGE 8 Link
GSM 1900	■ GSM Link ■ EDGE 8 Link	■ GSM Link ■ EDGE 8 Link
WCDMA Band V	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link
WCDMA Band II	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link

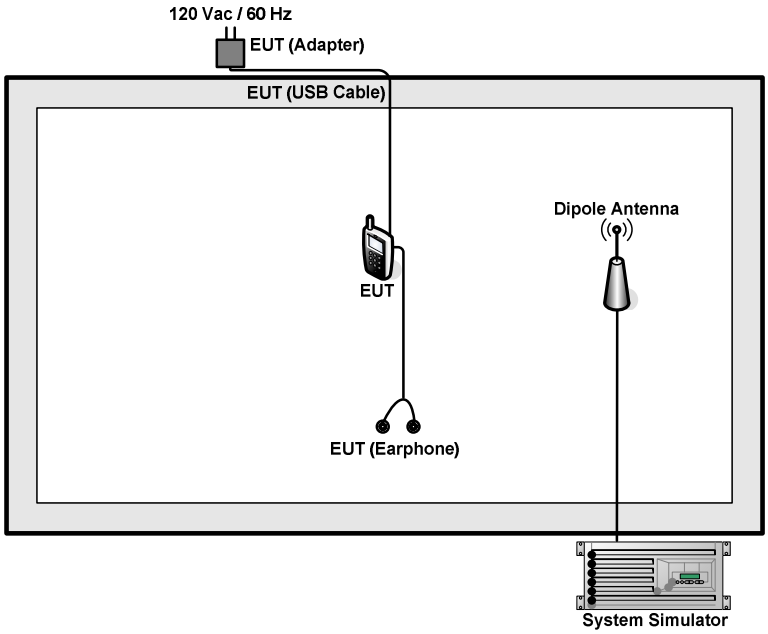
Note: The maximum power levels are GSM mode for GMSK link, EDGE multi-slot class 8 mode for 8PSK link, RMC 12.2Kbps mode for WCDMA band V, and RMC 12.2Kbps mode for WCDMA band II, only these modes were used for all tests.

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
GSM (GMSK, 1 Tx slot)	32.13	32.28	32.37	29.33	29.22	29.10
GPRS (GMSK, 1 Tx slot) – CS1	32.13	32.27	32.35	29.32	29.23	29.08
GPRS (GMSK, 2 Tx slots) – CS1	31.31	31.47	31.58	28.52	28.42	28.27
GPRS (GMSK, 3 Tx slots) – CS1	29.93	30.08	30.19	27.13	27.03	26.88
GPRS (GMSK, 4 Tx slots) – CS1	28.56	28.73	28.80	25.73	25.65	25.53
EDGE (GMSK, 1 Tx slot) – MCS1	32.12	32.28	32.36	29.31	29.22	29.08
EDGE (GMSK, 2 Tx slots) – MCS1	31.31	31.46	31.57	28.52	28.42	28.27
EDGE (GMSK, 3 Tx slots) – MCS1	29.93	30.09	30.18	27.12	27.02	26.87
EDGE (GMSK, 4 Tx slots) – MCS1	28.55	28.70	28.79	25.72	25.65	25.52
EDGE (8PSK, 1 Tx slot) – MCS5	26.91	26.76	26.60	25.83	26.20	26.31
EDGE (8PSK, 2 Tx slot) – MCS5	25.64	25.51	25.42	24.78	25.16	25.29
EDGE (8PSK, 3 Tx slot) – MCS5	23.25	23.16	23.03	22.73	23.10	23.20
EDGE (8PSK, 4 Tx slot) – MCS5	22.07	21.98	21.85	21.62	22.02	22.13

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	23.35	23.05	23.25	22.85	22.89	22.82
HSDPA Subtest-1	23.10	22.80	23.02	22.69	22.78	22.68
HSDPA Subtest-2	22.52	22.23	22.47	22.12	22.20	22.11
HSDPA Subtest-3	22.25	21.96	22.21	21.84	21.93	21.82
HSDPA Subtest-4	22.19	21.89	22.18	21.78	21.86	21.79
HSUPA Subtest-1	21.75	21.45	21.70	21.34	21.42	21.31
HSUPA Subtest-2	20.62	20.35	20.60	20.11	20.20	20.10
HSUPA Subtest-3	20.71	20.42	20.69	20.39	20.45	20.40
HSUPA Subtest-4	20.65	20.35	20.59	20.24	20.34	20.21
HSUPA Subtest-5	22.10	21.82	22.01	21.66	21.78	21.63

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	System Simulator	Agilent	E5515C	N/A	N/A	Unshielded, 1.8 m
3.	DC Power Supply	GWINSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Example :

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.2 + 10 = 14.2 (dB)

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.

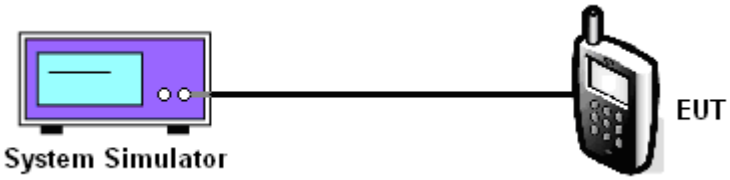
3.1.2 Measuring Instruments

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. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set EUT at maximum power through base station.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. 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 (GSM)			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)	32.13	32.28	32.37	26.91	26.76	26.60	23.35	23.05	23.25
Conducted Power (Watts)	1.63	1.69	1.73	0.49	0.47	0.46	0.22	0.20	0.21

PCS Band									
Modes	GSM1900 (GSM)			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)	29.33	29.22	29.10	25.83	26.20	26.31	22.85	22.89	22.82
Conducted Power (Watts)	0.86	0.84	0.81	0.38	0.42	0.43	0.19	0.19	0.19

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

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

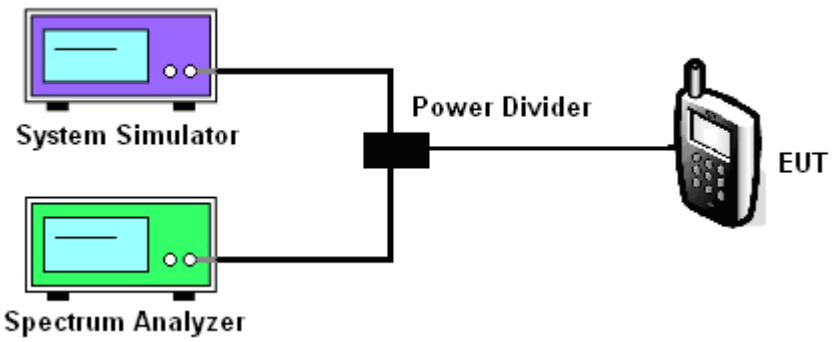
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and System Simulator via power divider.
2. For GSM/EGPRS operating modes:
   a. Set EUT in maximum power output.
   b. Set the RBW = 1MHz, VBW = 3MHz, Peak detector in spectrum analyzer for first trace.
   c. Set the RBW = 1MHz, VBW = 3MHz, RMS detector in spectrum analyzer for second trace.
   d. The wanted burst signal is triggered by spectrum analyzer, and measured respectively the peak level and Mean level without burst-off time, after system simulator synchronized with the spectrum analyzer.
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 %.
4. Record the deviation as Peak to Average Ratio.

3.2.4 Test Setup



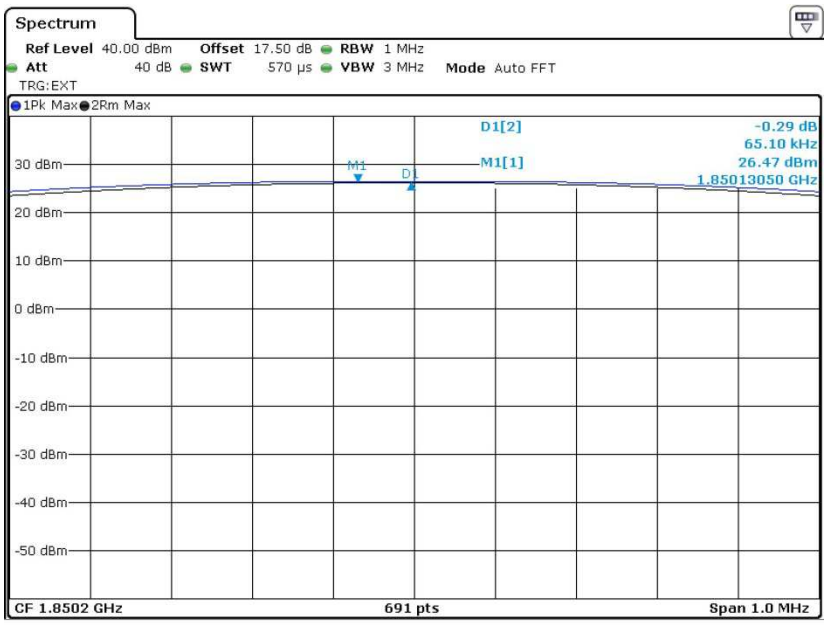
3.2.5 Test Result of Peak-to-Average Ratio

PCS Band									
Modes	GSM1900 (GSM)			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
Peak-to-Average Ratio (dB)	0.29	0.30	0.29	2.59	2.55	2.67	2.41	2.29	2.29

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

Band :	GSM 1900	Test Mode :	GSM Link

Peak-to-Average Ratio on Channel 512 (1850.2 MHz)



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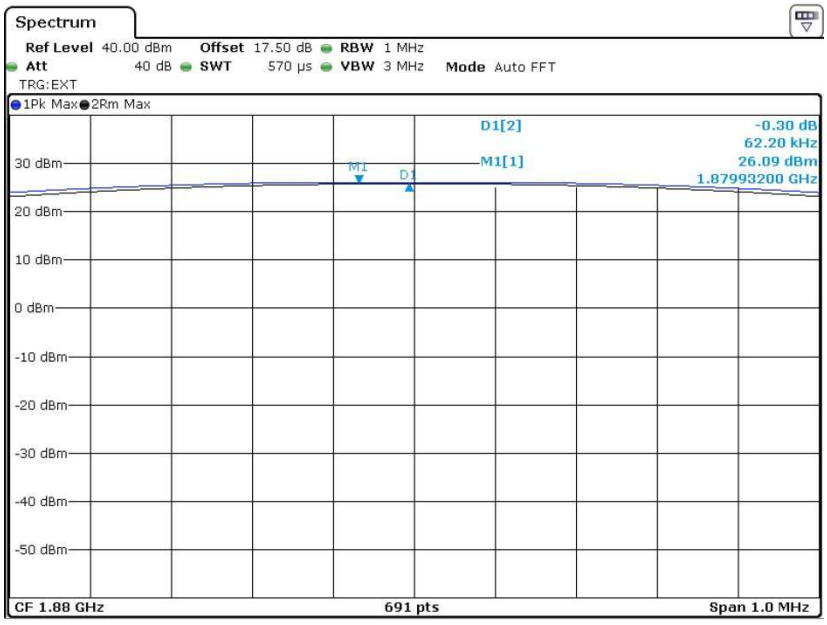
Peak-to-Average Ratio on Channel 661 (1880.0 MHz)



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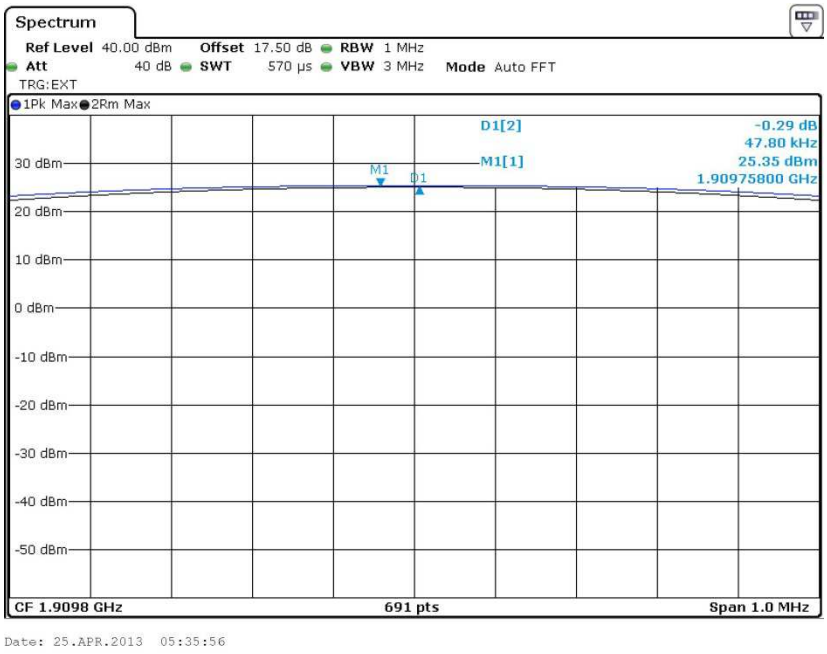
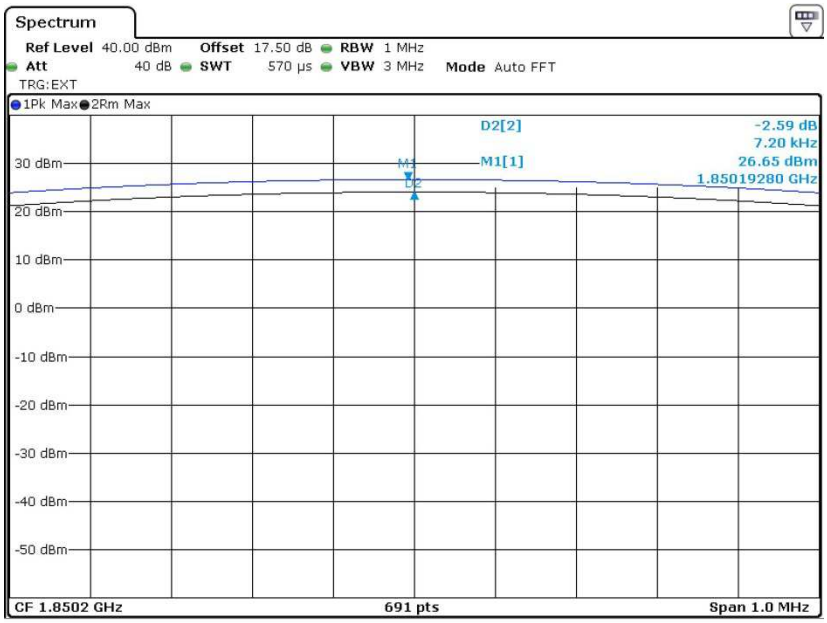
Peak-to-Average Ratio on Channel 810 (1909.8 MHz)



Band :	GSM 1900	Test Mode :	EDGE 8 Link

Peak-to-Average Ratio on Channel 512 (1850.2 MHz)



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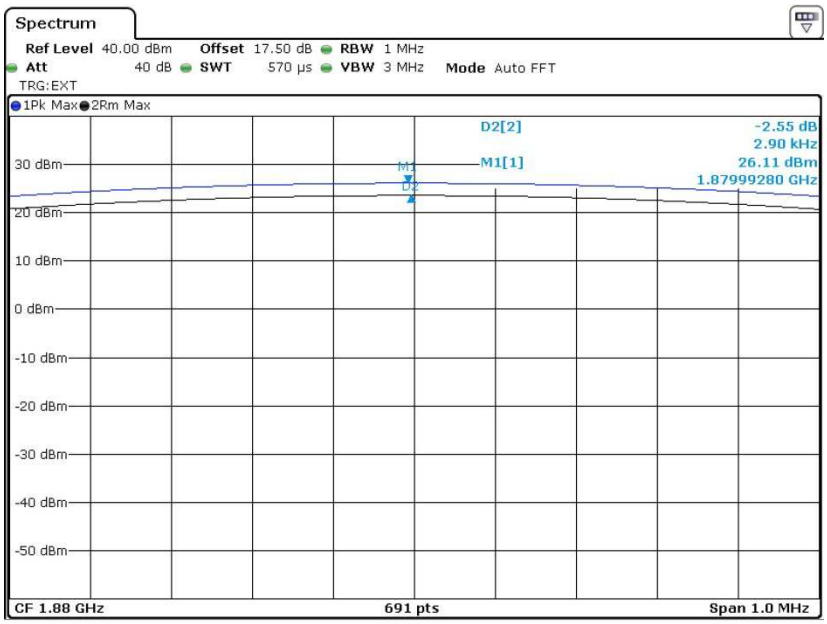
Peak-to-Average Ratio on Channel 661 (1880.0 MHz)



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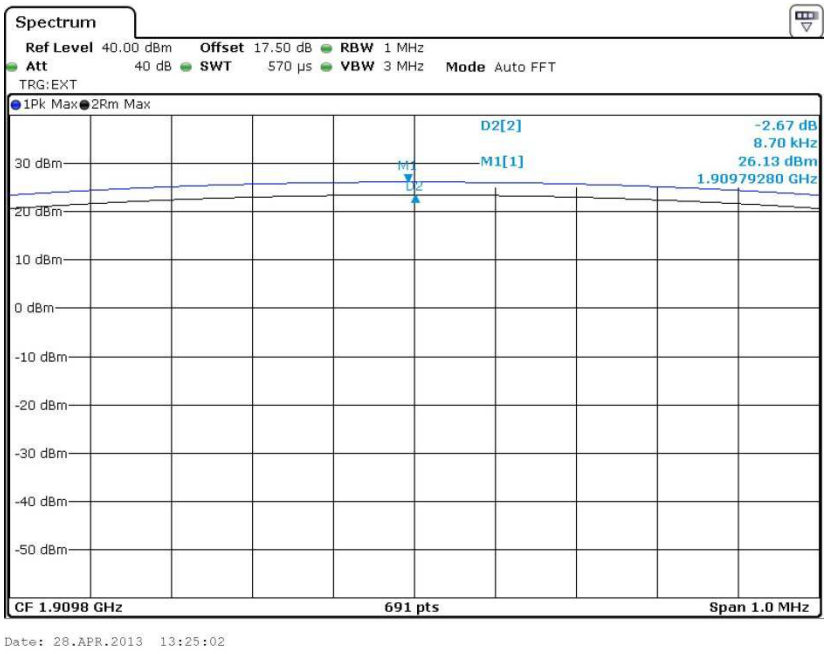
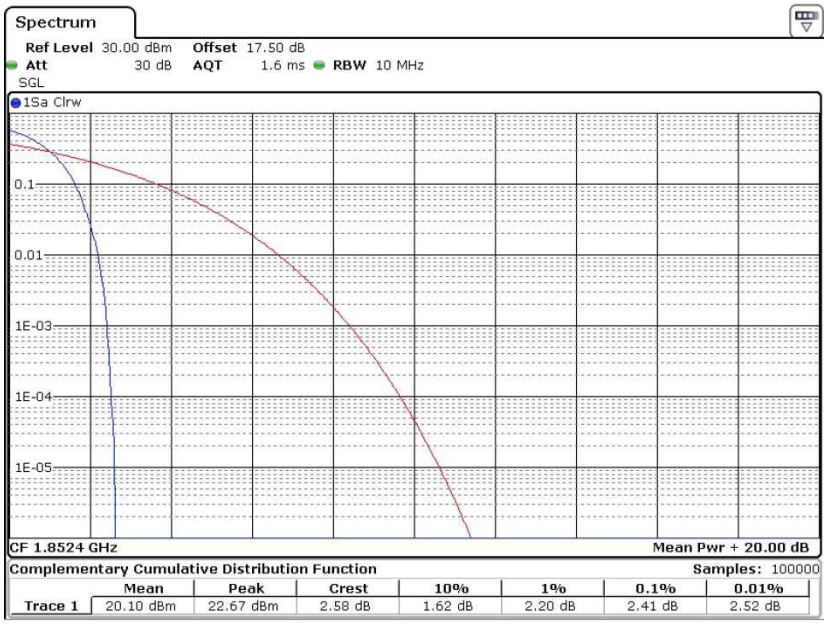
Peak-to-Average Ratio on Channel 810 (1909.8 MHz)



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

Peak-to-Average Ratio on Channel 9262 (1852.4 MHz)



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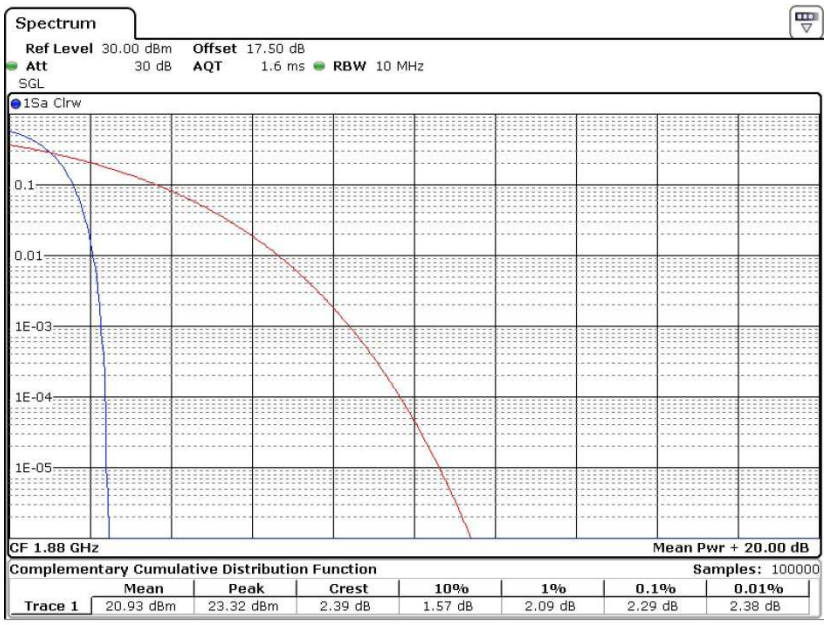
Peak-to-Average Ratio on Channel 9400 (1880.0 MHz)



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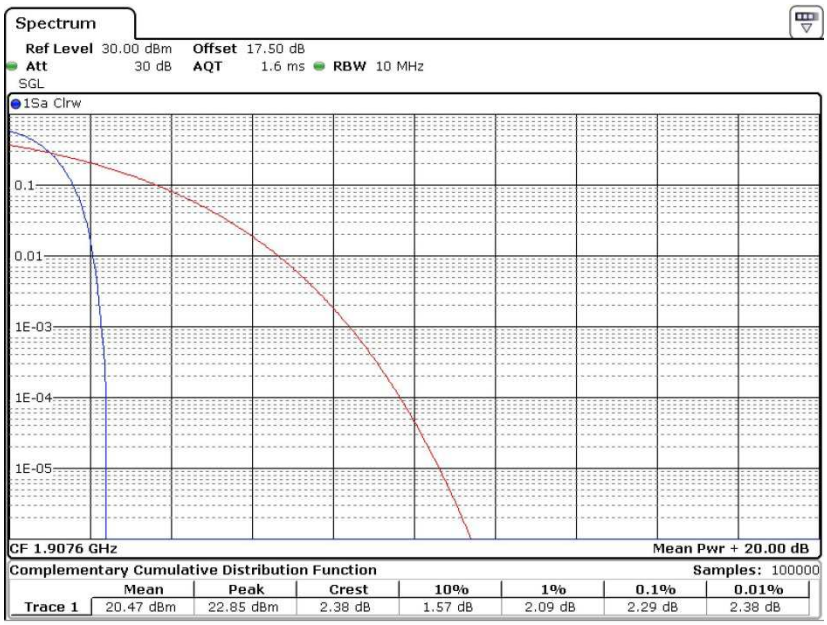
Peak-to-Average Ratio on Channel 9538 (1907.6 MHz)



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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.

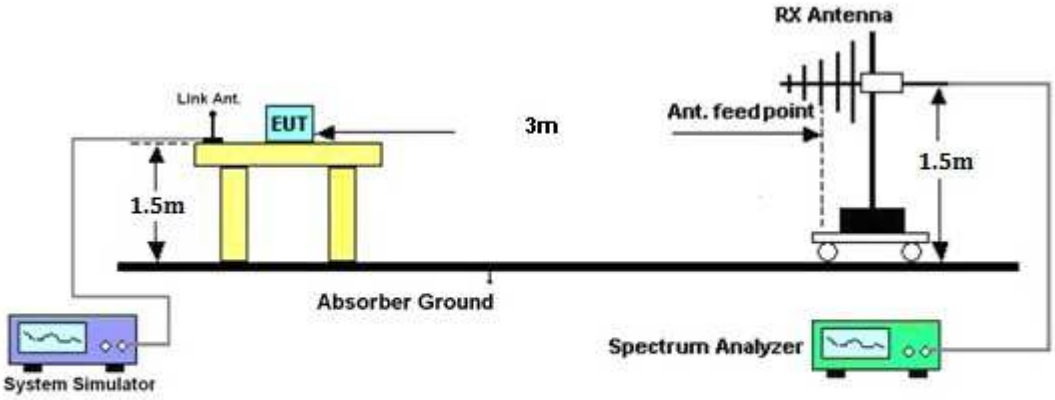
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The EUT was placed on a turntable with 1.5 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 = Ps + Et – Es + Gs = Ps + Rt – Rs + Gs
    Ps (dBm)：Input power to substitution antenna.
    Gs (dBi or dBd)：Substitution antenna Gain.
    Et = Rt + AF
    Es = Rs + AF
    AF (dB/m)：Receive antenna factor
    Rt：The highest received signal in spectrum analyzer for EUT.
    Rs：The highest received signal in spectrum analyzer for substitution antenna.

3.3.4 Test Setup



3.3.5 Test Result of ERP

GSM850 (GSM) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
824.20	-17.67	-48.12	0.00	-1.08	29.37	0.8657
836.40	-17.92	-48.28	0.00	-0.93	29.43	0.8776
848.80	-18.38	-48.35	0.00	-0.76	29.21	0.8330
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
824.20	-27.58	-47.97	0.00	-1.08	19.31	0.0854
836.40	-28.23	-48.01	0.00	-0.93	18.85	0.0768
848.80	-28.10	-48.05	0.00	-0.76	19.19	0.0830

GSM850 (EDGE 8) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
824.20	-22.66	-48.12	0.00	-1.08	24.38	0.2741
836.40	-22.70	-48.28	0.00	-0.93	24.65	0.2917
848.80	-22.98	-48.35	0.00	-0.76	24.61	0.2889
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
824.20	-32.59	-47.97	0.00	-1.08	14.30	0.0269
836.40	-33.03	-48.01	0.00	-0.93	14.05	0.0254
848.80	-32.64	-48.05	0.00	-0.76	14.65	0.0291

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	-26.16	-48.12	0.00	-1.08	20.88	0.1225
836.40	-27.17	-48.28	0.00	-0.93	20.18	0.1042
846.60	-26.71	-48.35	0.00	-0.76	20.88	0.1224
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
826.40	-36.04	-47.97	0.00	-1.08	10.85	0.0122
836.40	-37.39	-48.01	0.00	-0.93	9.69	0.0093
846.60	-36.64	-48.05	0.00	-0.76	10.65	0.0116

3.3.6 Test Result of EIRP

GSM1900 (GSM) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBi)**	**EIRP (dBm)**	**EIRP (W)**
1850.20	-22.77	-51.88	0.00	1.96	31.07	1.2807
1880.00	-24.71	-52.99	0.00	2.00	30.28	1.0670
1909.80	-26.14	-54.28	0.00	1.98	30.12	1.0272
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBi)**	**EIRP (dBm)**	**EIRP (W)**
1850.20	-22.49	-52.13	0.00	1.96	31.60	1.4464
1880.00	-24.39	-53.17	0.00	2.00	30.78	1.1964
1909.80	-25.43	-54.13	0.00	1.98	30.68	1.1698

GSM1900 (EDGE 8) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBi)**	**EIRP (dBm)**	**EIRP (W)**
1850.20	-25.85	-51.88	0.00	1.96	27.99	0.6299
1880.00	-27.49	-52.99	0.00	2.00	27.50	0.5625
1909.80	-29.07	-54.28	0.00	1.98	27.19	0.5232
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBi)**	**EIRP (dBm)**	**EIRP (W)**
1850.20	-25.71	-52.13	0.00	1.96	28.38	0.6891
1880.00	-27.31	-53.17	0.00	2.00	27.86	0.6113
1909.80	-28.30	-54.13	0.00	1.98	27.81	0.6035

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	-28.83	-51.88	0.00	1.96	25.01	0.3167
1880.00	-30.24	-52.99	0.00	2.00	24.75	0.2985
1907.60	-31.14	-54.28	0.00	1.98	25.12	0.3249
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBi)**	**EIRP (dBm)**	**EIRP (W)**
1852.40	-28.59	-52.13	0.00	1.96	25.50	0.3548
1880.00	-29.77	-53.17	0.00	2.00	25.40	0.3464
1907.60	-30.41	-54.13	0.00	1.98	25.70	0.3714

3.4 99% Occupied Bandwidth and 26dB Bandwidth Measurement

3.4.1 Description of 99% Occupied Bandwidth and 26dB Bandwidth Measurement

The 99% 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.

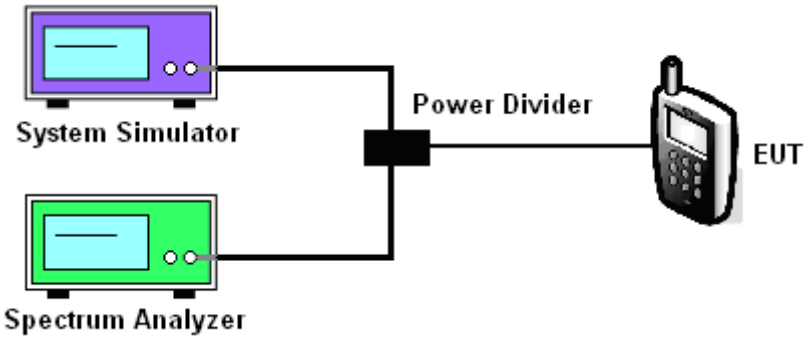
3.4.2 Measuring Instruments

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 RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. 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 of 99% Occupied Bandwidth and 26dB Bandwidth

Cellular Band						
Modes	GSM850 (GSM)			GSM850 (EDGE 8)		
Channel	128 (Low)	189 (Mid)	251 (High)	128 (Low)	189 (Mid)	251 (High)
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8
99% OBW (KHz)	246.00	246.00	246.00	241.68	241.68	243.13
26dB BW (KHz)	312.00	312.00	314.00	303.90	306.80	302.50

PCS Band						
Modes	GSM1900 (GSM)			GSM1900 (EDGE 8)		
Channel	512 (Low)	661 (Mid)	810 (High)	512 (Low)	661 (Mid)	810 (High)
Frequency (MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8
99% OBW (KHz)	247.47	247.47	246.02	246.02	243.13	246.02
26dB BW (KHz)	316.90	319.80	316.90	318.40	316.90	315.50

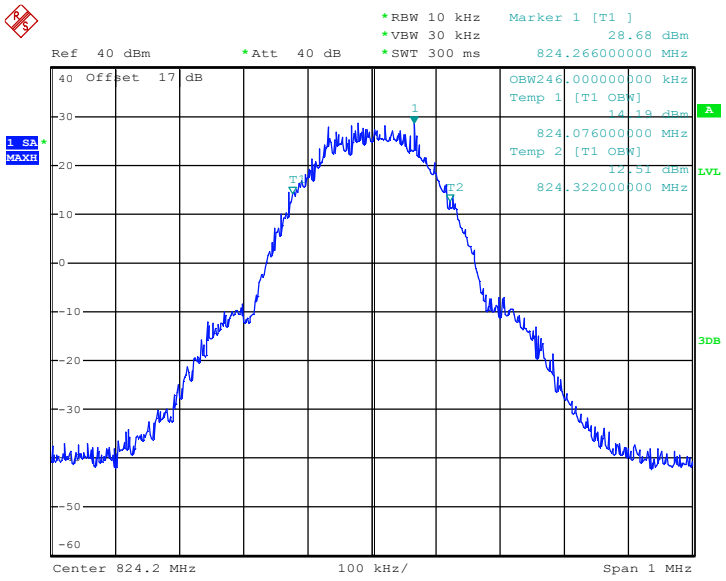
Cellular Band			
Modes	WCDMA Band V (RMC 12.2Kbps)		
Channel	4132 (Low)	4182 (Mid)	4233 (High)
Frequency (MHz)	826.4	836.4	846.6
99% OBW (MHz)	4.17	4.15	4.18
26dB BW (MHz)	4.67	4.69	4.69

PCS Band			
Modes	WCDMA Band II (RMC 12.2Kbps)		
Channel	9262 (Low)	9400 (Mid)	9538 (High)
Frequency (MHz)	1852.4	1880	1907.6
99% OBW (MHz)	4.17	4.19	4.17
26dB BW (MHz)	4.71	4.71	4.71

3.4.6 Test Result (Plots) of 99% Occupied Bandwidth and 26dB Bandwidth

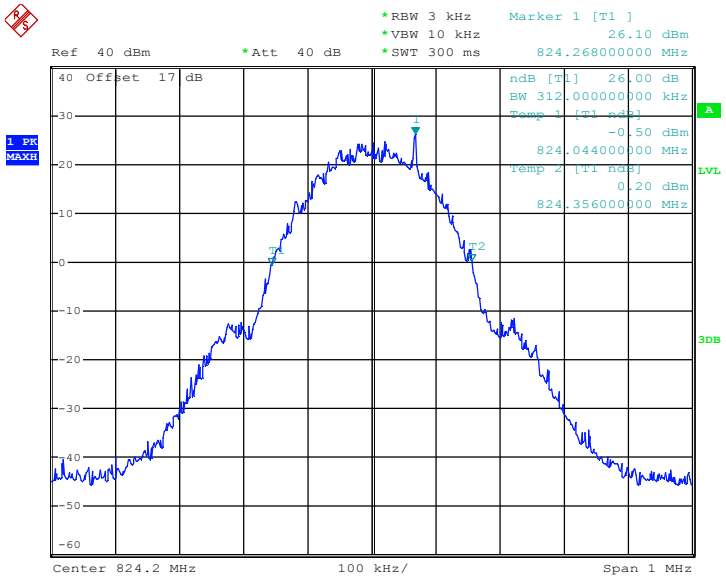
Band :	GSM 850	Test Mode :	GSM Link

99% Occupied Bandwidth Plot on Channel 128 (824.2 MHz)



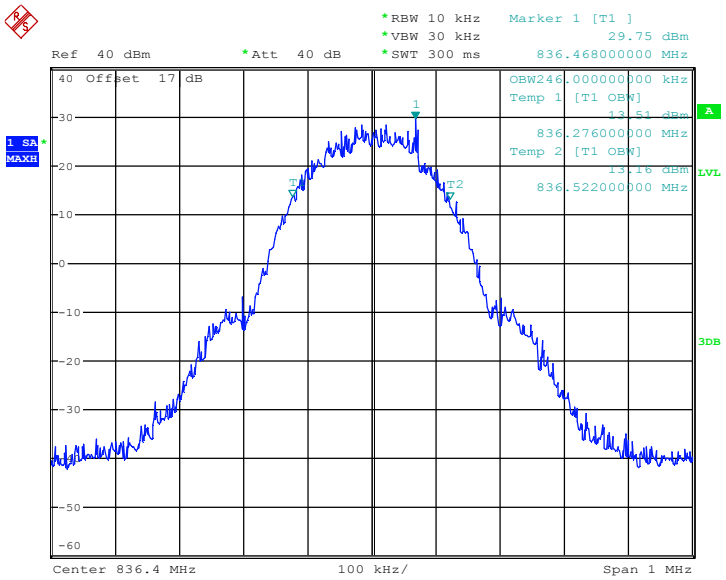
Date: 25.APR.2013 02:23:55

26dB Bandwidth Plot on Channel 128 (824.2 MHz)



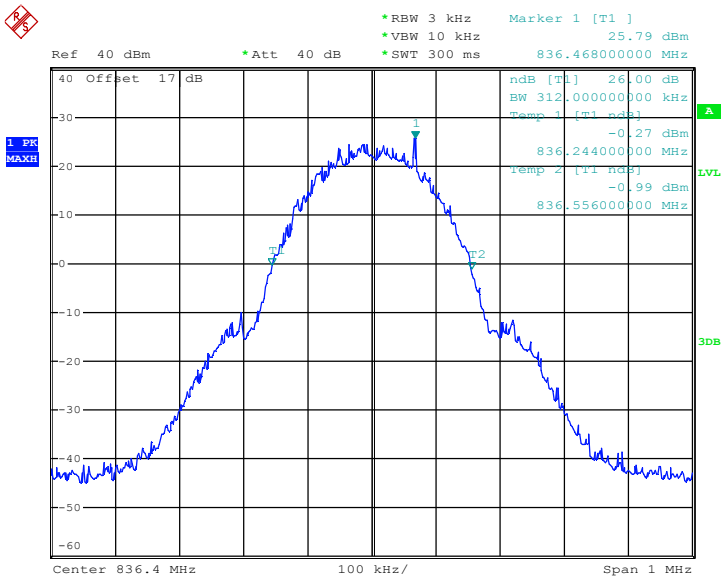
Date: 25.APR.2013 02:08:10

99% Occupied Bandwidth Plot on Channel 189 (836.4 MHz)



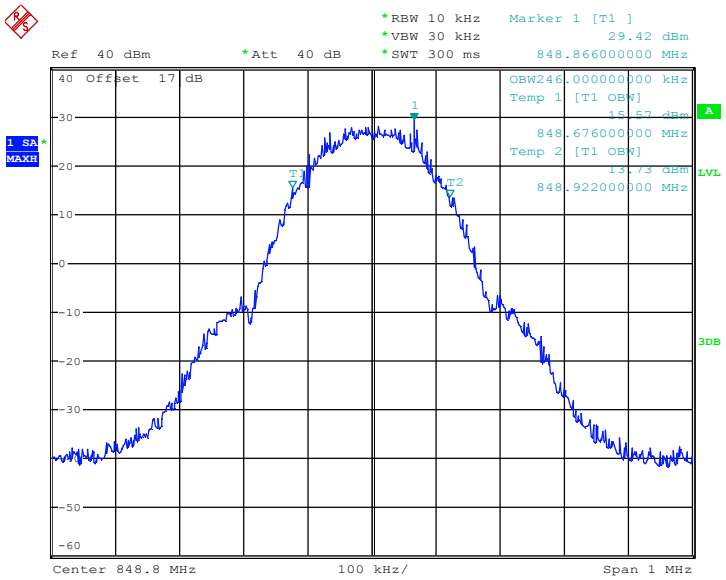
Date: 25.APR.2013 02:21:38

26dB Bandwidth Plot on Channel 189 (836.4 MHz)



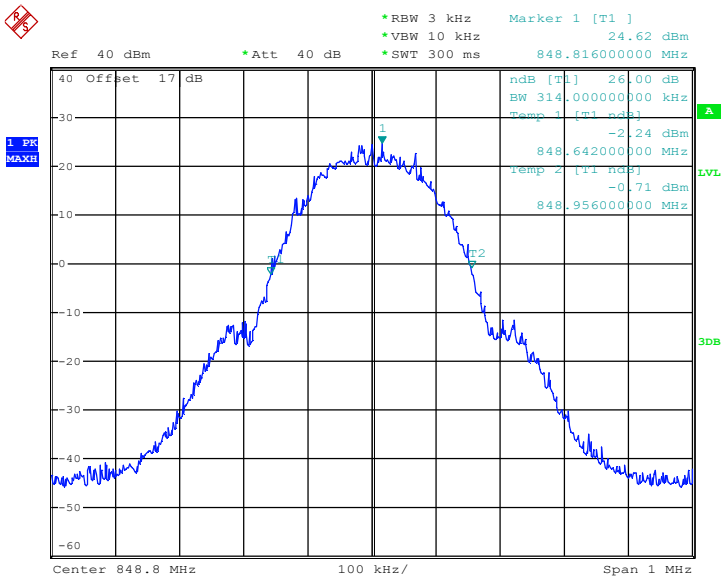
Date: 25.APR.2013 02:04:00

99% Occupied Bandwidth Plot on Channel 251 (848.8 MHz)



Date: 25.APR.2013 02:48:37

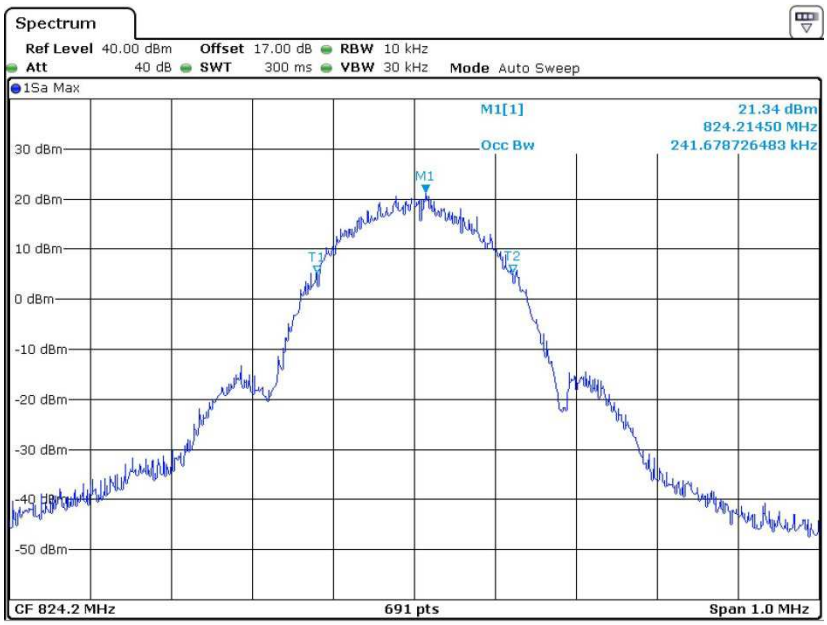
26dB Bandwidth Plot on Channel 251 (848.8 MHz)



Date: 25.APR.2013 02:10:55

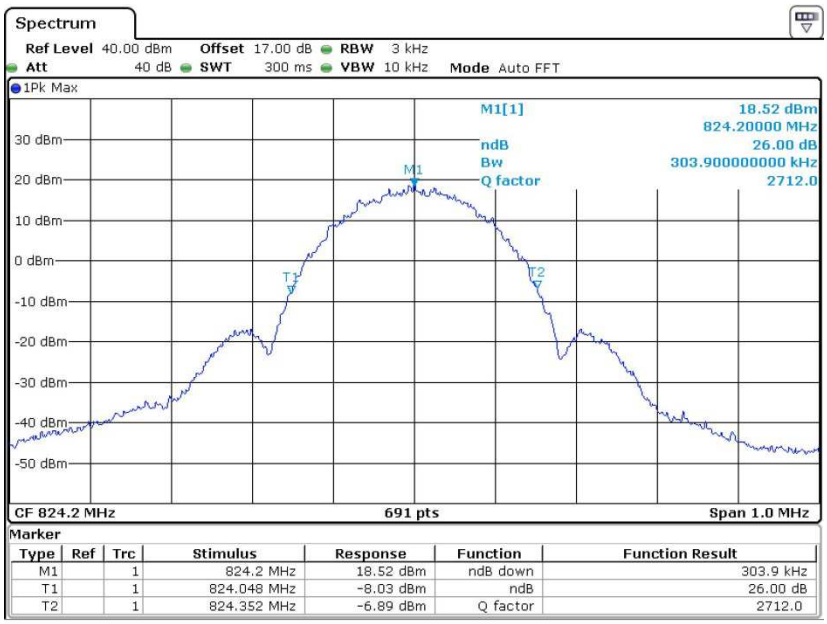
Band :	GSM 850	Test Mode :	EDGE 8 Link

99% Occupied Bandwidth Plot on Channel 128 (824.2 MHz)



Date: 28.APR.2013 09:56:32

26dB Bandwidth Plot on Channel 128 (824.2 MHz)

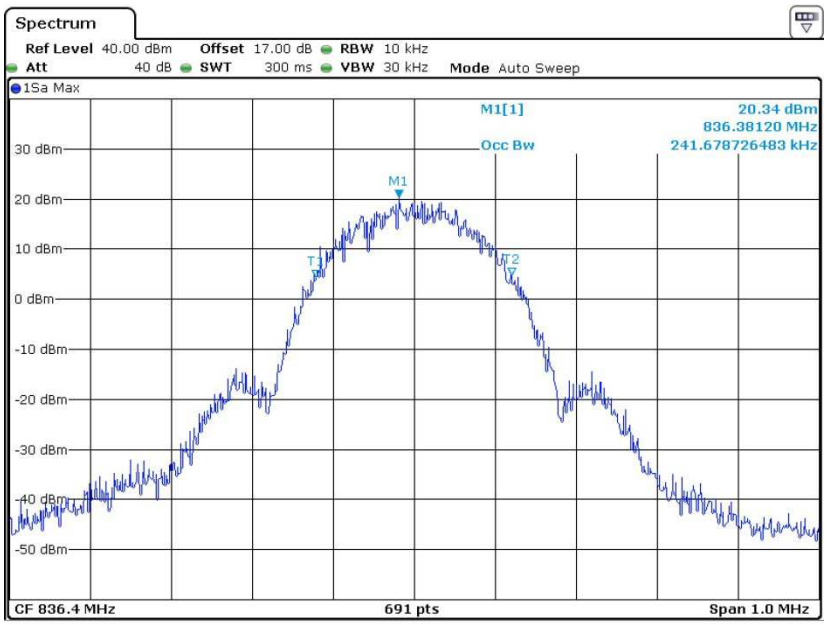


Marker

Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	824.2 MHz	18.52 dBm	ndB down	303.9 kHz
T1		1	824.048 MHz	-8.03 dBm	ndB	26.00 dB
T2		1	824.352 MHz	-6.89 dBm	Q factor	2712.0

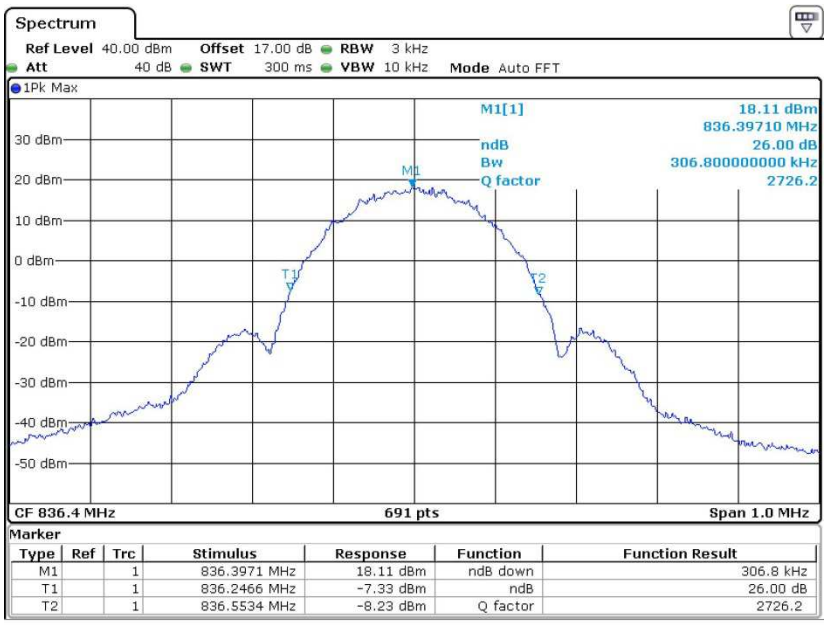
Date: 28.APR.2013 09:48:29

99% Occupied Bandwidth Plot on Channel 189 (836.4 MHz)



Date: 28.APR.2013 09:53:40

26dB Bandwidth Plot on Channel 189 (836.4 MHz)

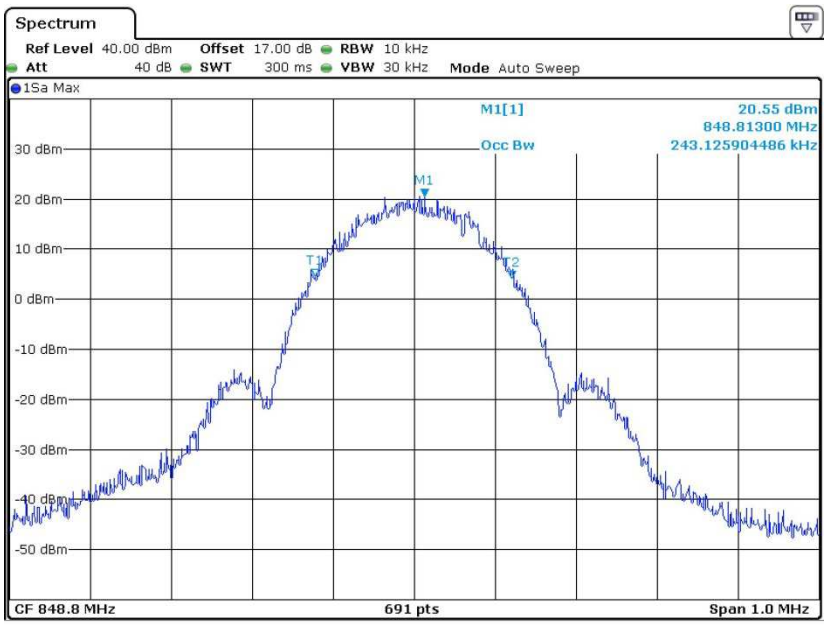


Marker

Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	836.3971 MHz	18.11 dBm	ndB down	306.8 kHz
T1		1	836.2466 MHz	-7.33 dBm	ndB	26.00 dB
T2		1	836.5534 MHz	-8.23 dBm	Q factor	2726.2

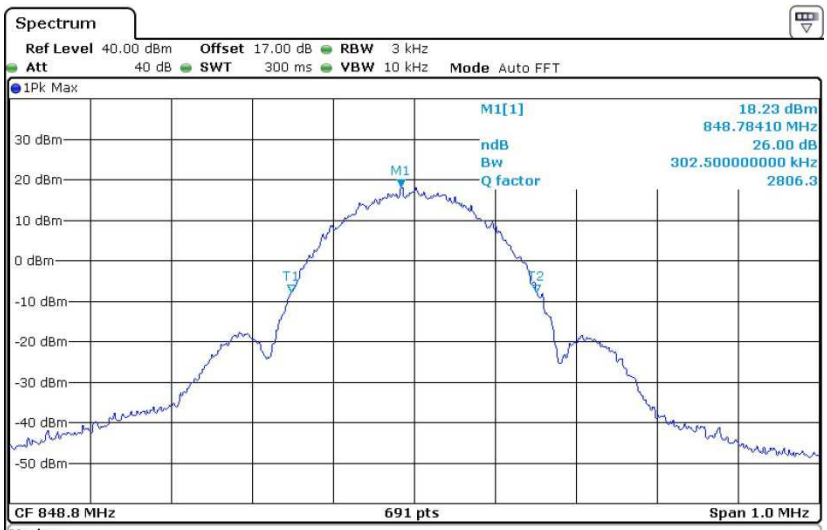
Date: 28.APR.2013 09:47:01

99% Occupied Bandwidth Plot on Channel 251 (848.8 MHz)



Date: 28.APR.2013 09:52:14

26dB Bandwidth Plot on Channel 251 (848.8 MHz)



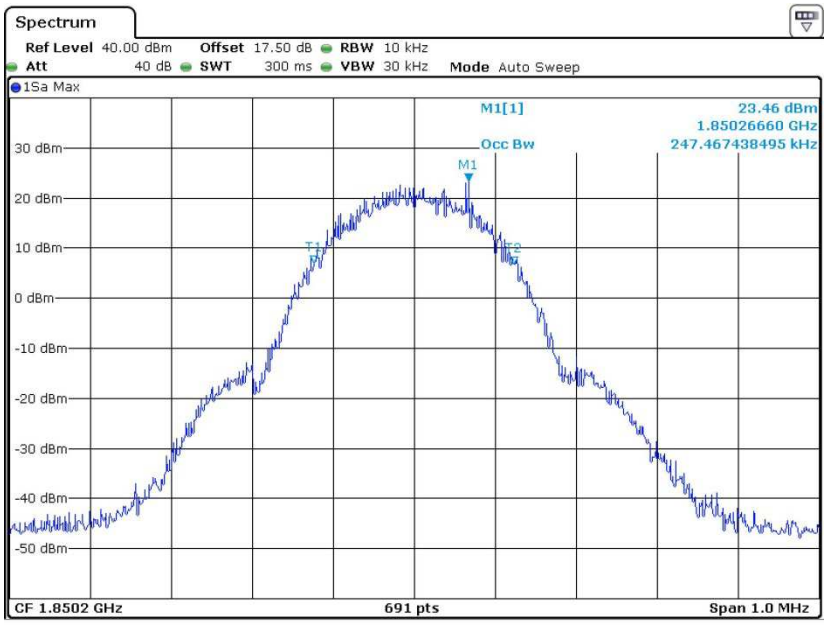
Marker

Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	848.7841 MHz	18.23 dBm	ndB down	302.5 kHz
T1		1	848.648 MHz	-7.91 dBm	ndB	26.00 dB
T2		1	848.9505 MHz	-7.73 dBm	Q factor	2806.3

Date: 28.APR.2013 09:49:03

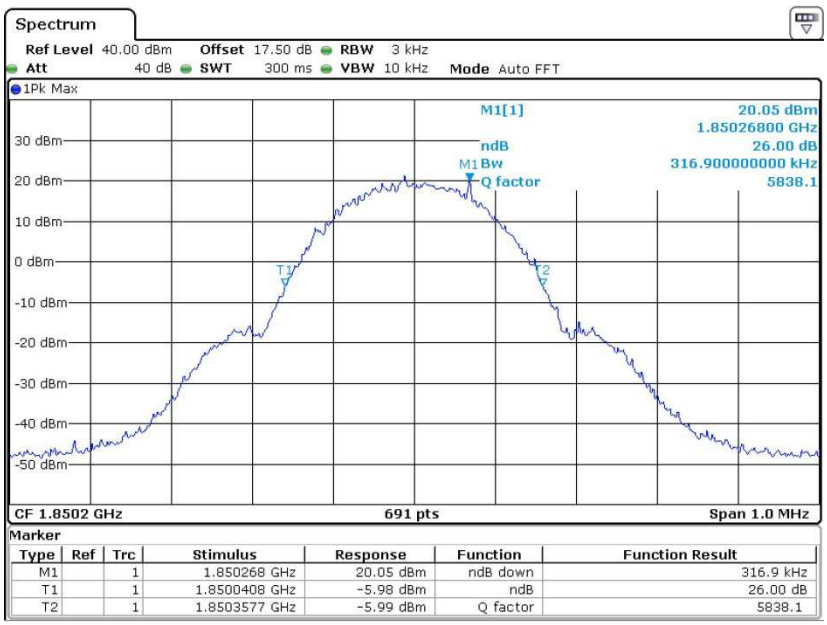
Band :	GSM 1900	Test Mode :	GSM Link

99% Occupied Bandwidth Plot on Channel 512 (1850.2 MHz)



Date: 26.APR.2013 04:02:54

26dB Bandwidth Plot on Channel 512 (1850.2 MHz)

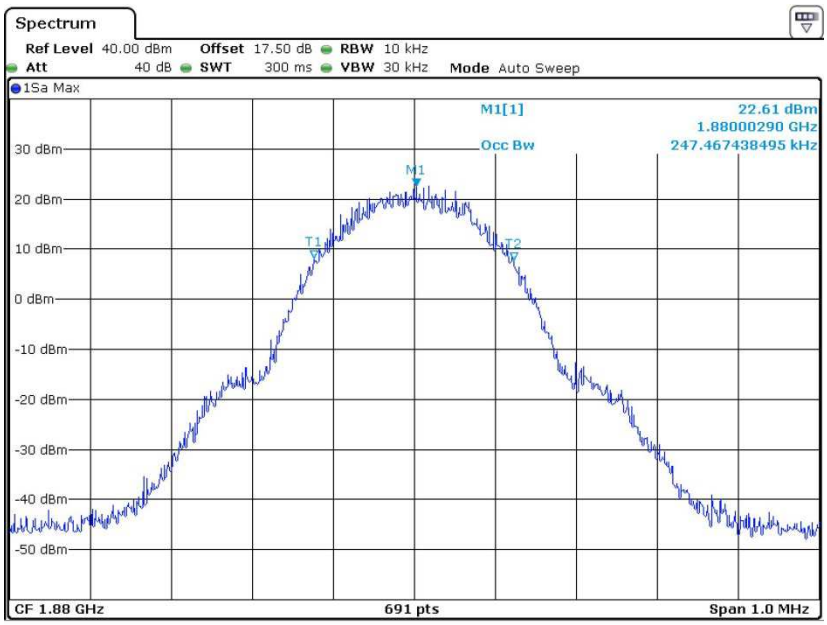


Marker

Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	1.850268 GHz	20.05 dBm	ndB down	316.9 kHz
T1		1	1.8500408 GHz	-5.98 dBm	ndB	26.00 dB
T2		1	1.8503577 GHz	-5.99 dBm	Q factor	5838.1

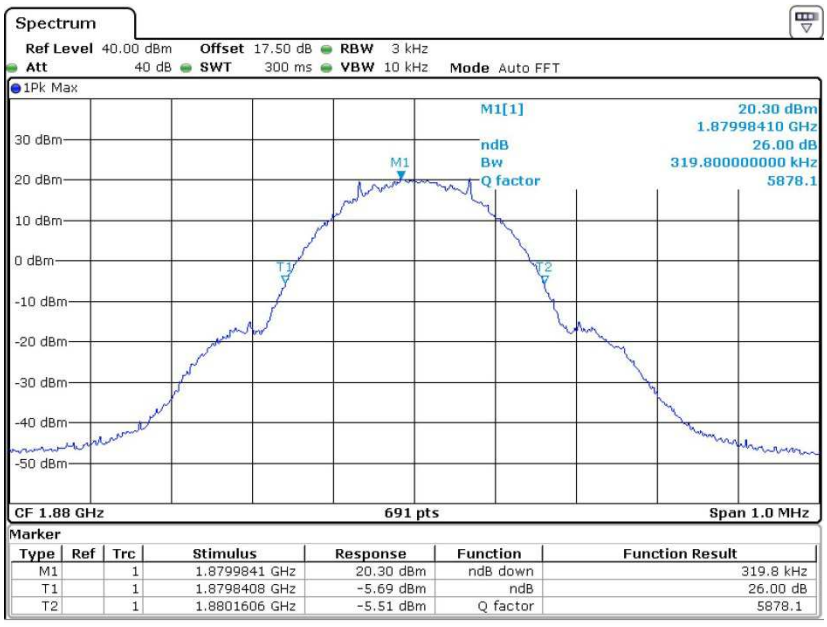
Date: 26.APR.2013 03:51:38

99% Occupied Bandwidth Plot on Channel 661 (1880.0 MHz)



Date: 26.APR.2013 04:01:11

26dB Bandwidth Plot on Channel 661 (1880.0 MHz)

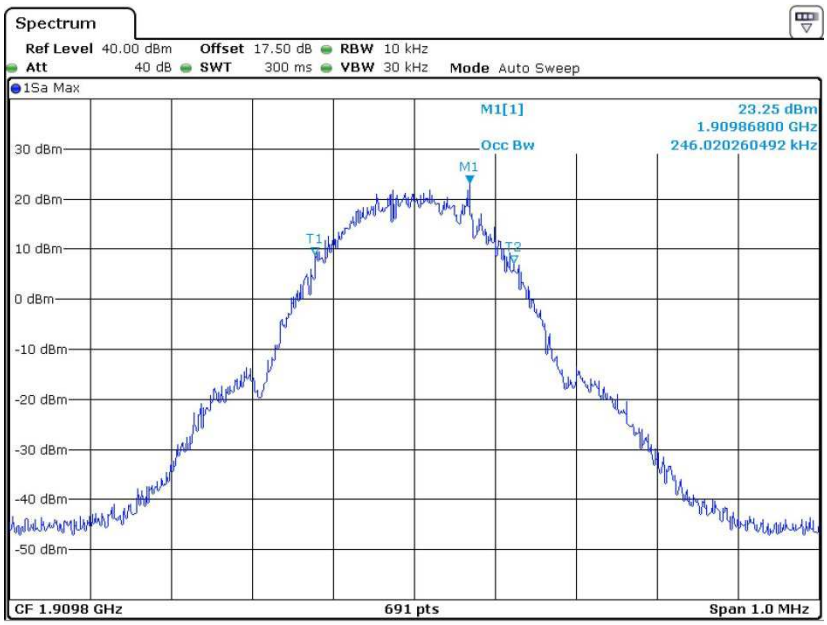


Marker

Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	1.8799841 GHz	20.30 dBm	ndB down	319.8 kHz
T1		1	1.8798408 GHz	-5.69 dBm	ndB	26.00 dB
T2		1	1.8801606 GHz	-5.51 dBm	Q factor	5878.1

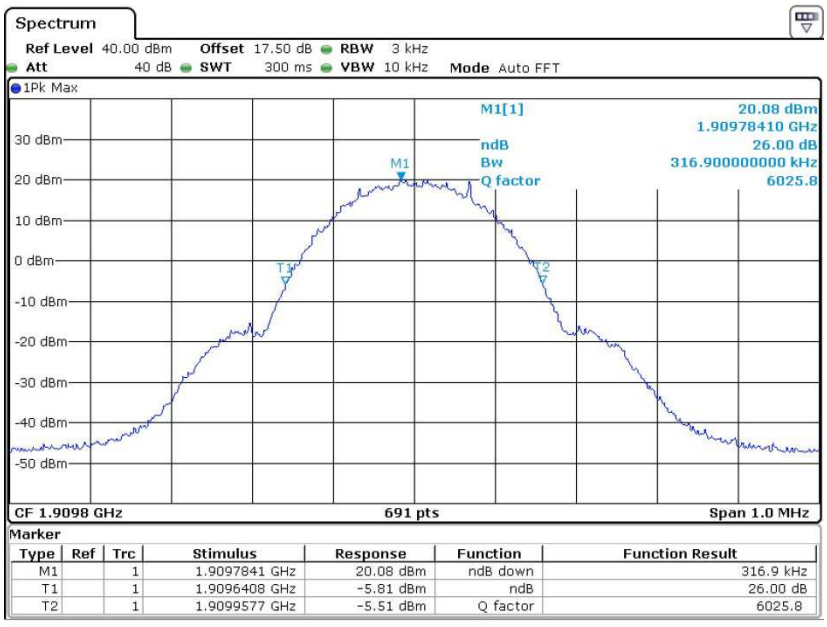
Date: 26.APR.2013 03:49:14

99% Occupied Bandwidth Plot on Channel 810 (1909.8 MHz)



Date: 26.APR.2013 03:59:19

26dB Bandwidth Plot on Channel 810 (1909.8 MHz)



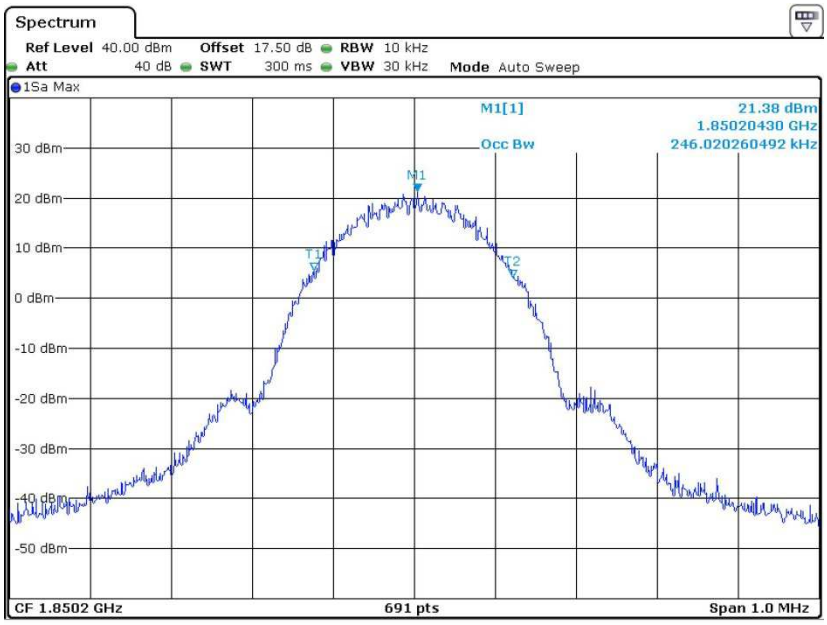
Marker

Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	1.9097841 GHz	20.08 dBm	ndB down	316.9 kHz
T1		1	1.9096408 GHz	-5.81 dBm	ndB	26.00 dB
T2		1	1.9099577 GHz	-5.51 dBm	Q factor	6025.8

Date: 26.APR.2013 03:55:16

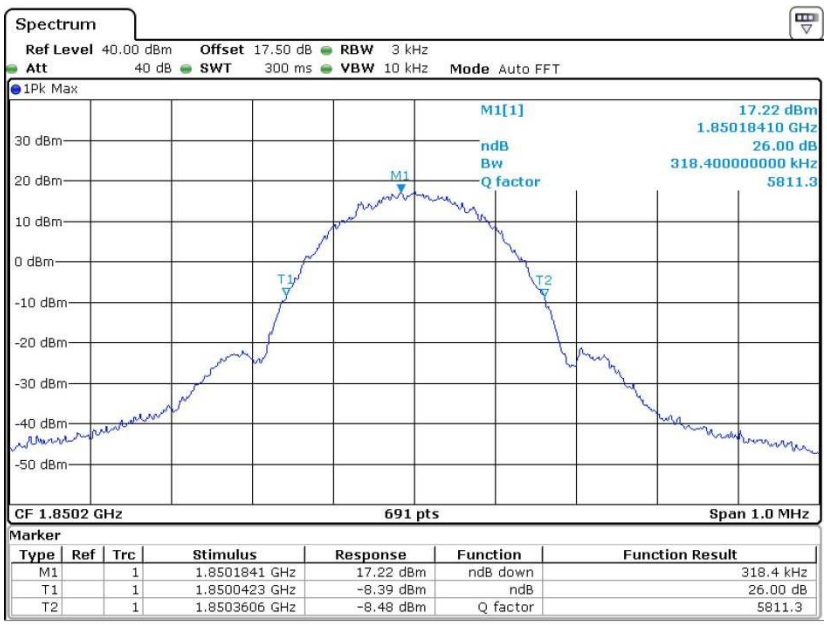
Band :	GSM 1900	Test Mode :	EDGE 8 Link

99% Occupied Bandwidth Plot on Channel 512 (1850.2 MHz)



Date: 28.APR.2013 10:41:35

26dB Bandwidth Plot on Channel 512 (1850.2 MHz)

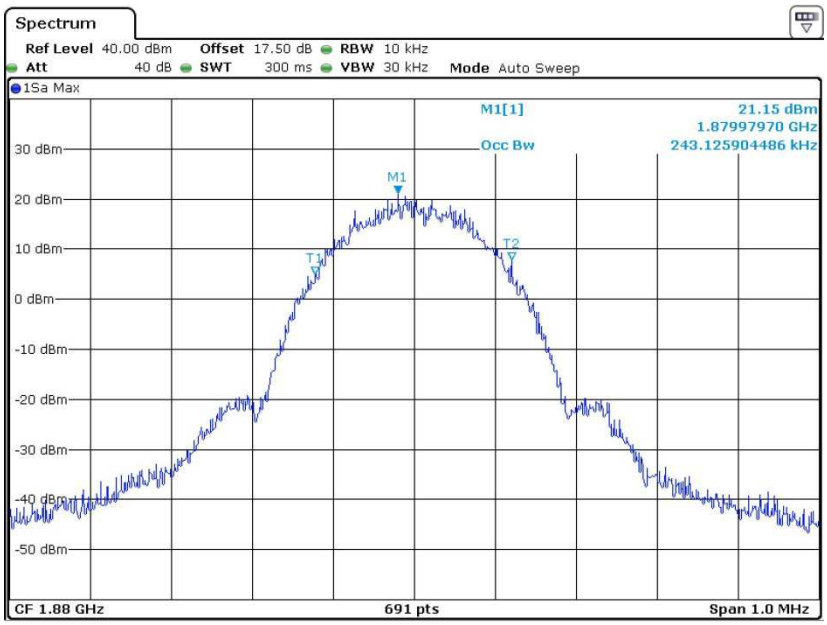


Marker

Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	1.8501841 GHz	17.22 dBm	ndB down	318.4 kHz
T1		1	1.8500423 GHz	-8.39 dBm	ndB	26.00 dB
T2		1	1.8503606 GHz	-8.48 dBm	Q factor	5811.3

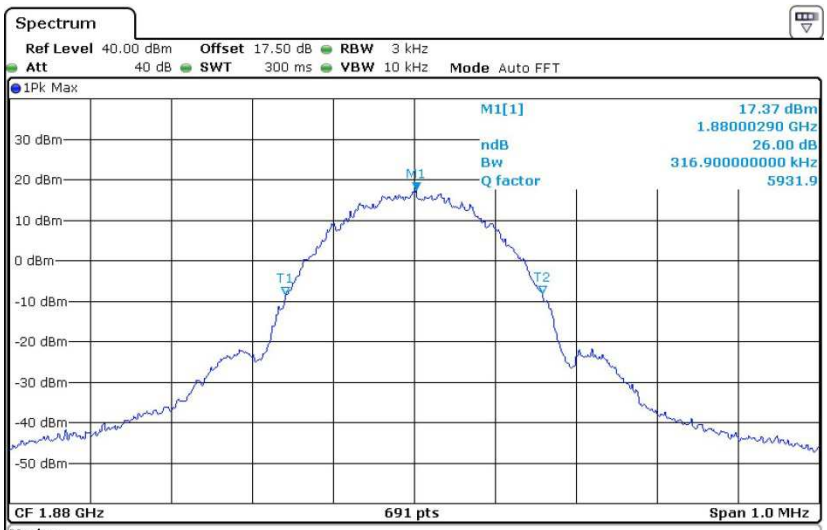
Date: 28.APR.2013 10:25:36

99% Occupied Bandwidth Plot on Channel 661 (1880.0 MHz)



Date: 28.APR.2013 10:36:54

26dB Bandwidth Plot on Channel 661 (1880.0 MHz)

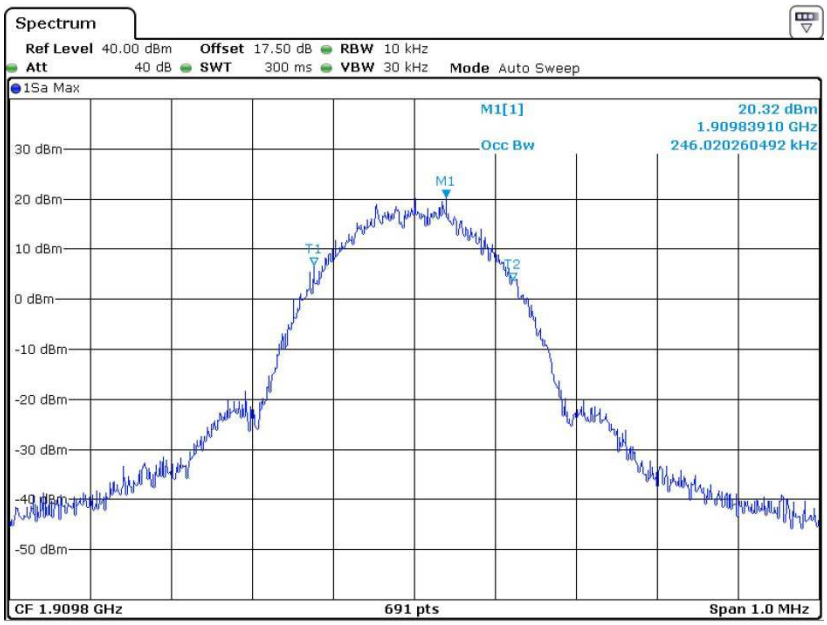


Marker

Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	1.8800029 GHz	17.37 dBm	ndB down	316.9 kHz
T1		1	1.8798408 GHz	-8.38 dBm	ndB	26.00 dB
T2		1	1.8801577 GHz	-8.08 dBm	Q factor	5931.9

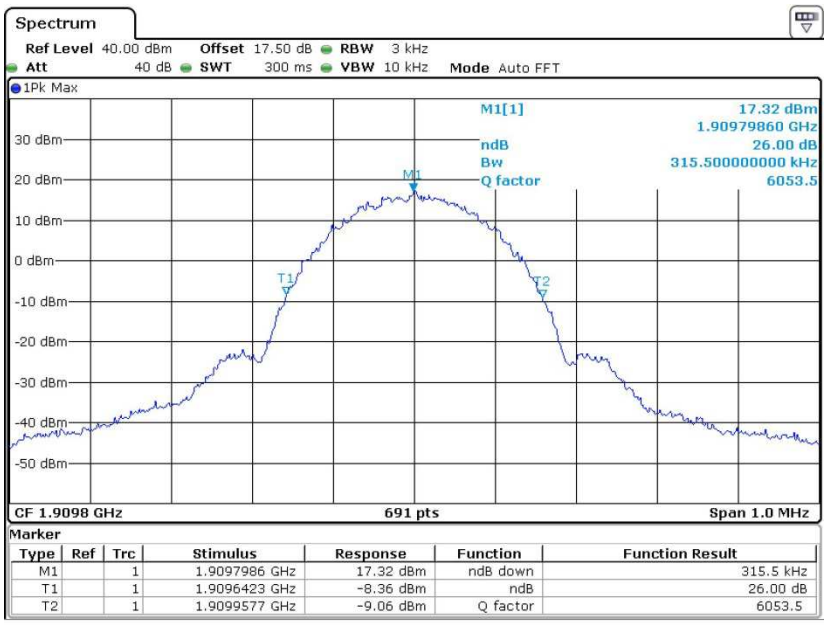
Date: 28.APR.2013 10:24:46

99% Occupied Bandwidth Plot on Channel 810 (1909.8 MHz)



Date: 28.APR.2013 10:34:25

26dB Bandwidth Plot on Channel 810 (1909.8 MHz)



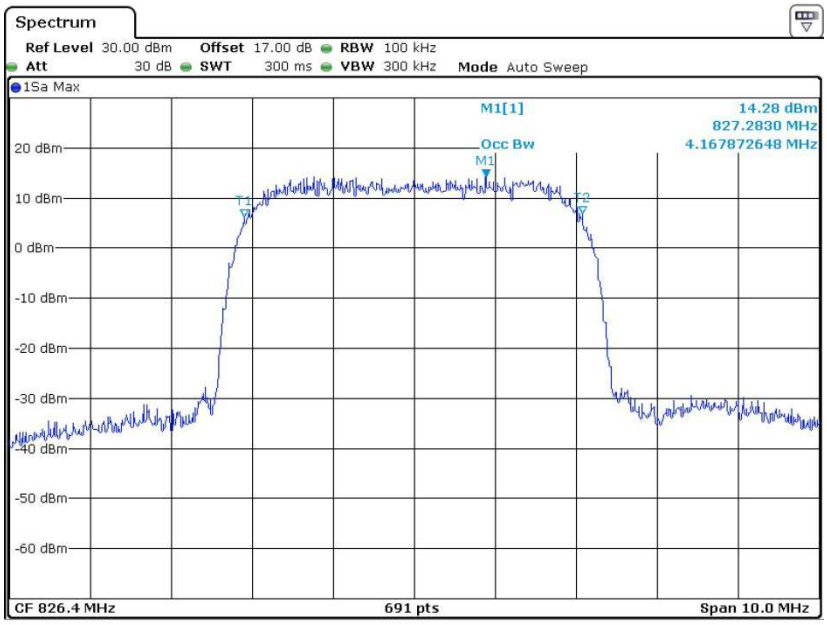
Marker

Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	1.9097986 GHz	17.32 dBm	ndB down	315.5 kHz
T1		1	1.9096423 GHz	-8.36 dBm	ndB	26.00 dB
T2		1	1.9099577 GHz	-9.06 dBm	Q factor	6053.5

Date: 28.APR.2013 10:26:39

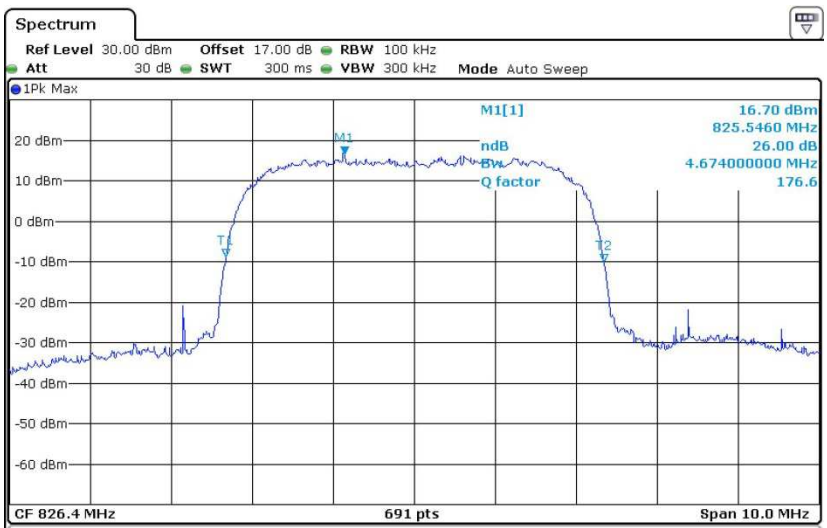
Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link

99% Occupied Bandwidth Plot on Channel 4132 (826.4 MHz)



Date: 25.APR.2013 10:06:15

26dB Bandwidth Plot on Channel 4132 (826.4 MHz)

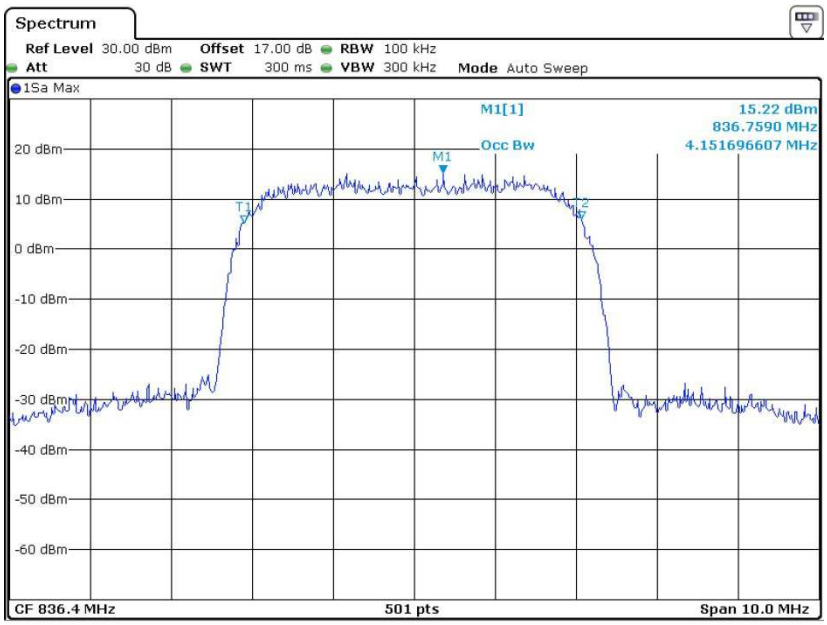


Marker

Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	825.546 MHz	16.70 dBm	ndB down	4.674 MHz
T1		1	824.07 MHz	-8.68 dBm	ndB	26.00 dB
T2		1	828.744 MHz	-9.92 dBm	Q factor	176.6

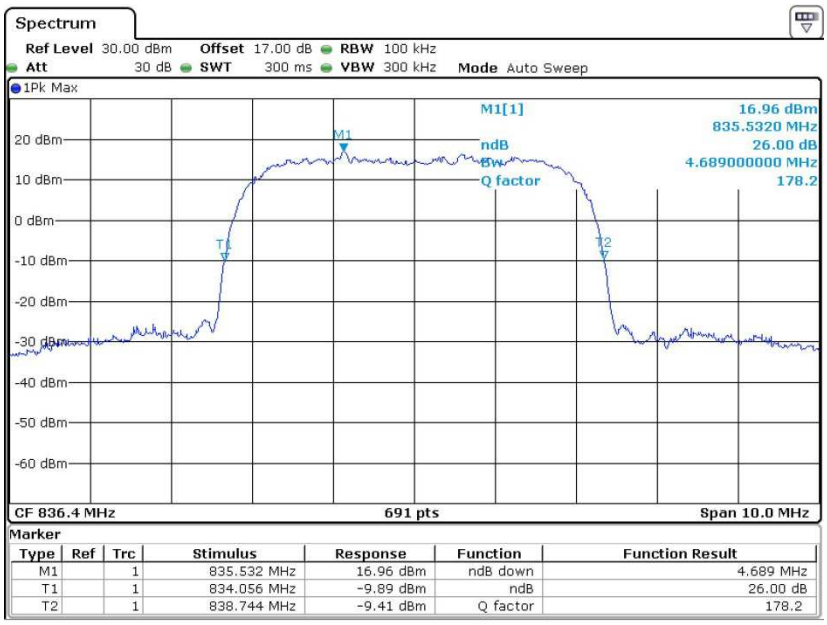
Date: 25.APR.2013 10:01:44

99% Occupied Bandwidth Plot on Channel 4182 (836.4 MHz)



Date: 25.APR.2013 10:08:05

26dB Bandwidth Plot on Channel 4182 (836.4 MHz)

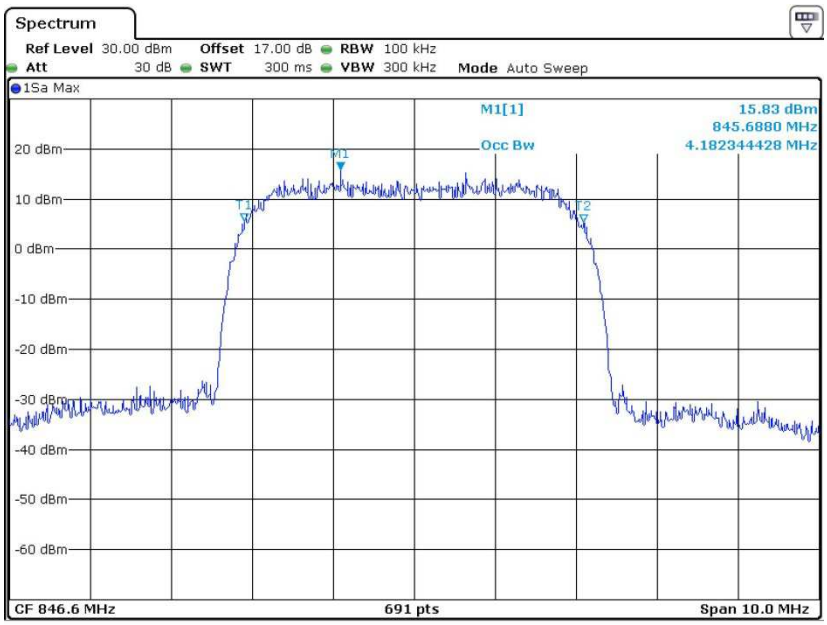


Marker

Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	835.532 MHz	16.96 dBm	ndB down	4.689 MHz
T1		1	834.056 MHz	-9.89 dBm	ndB	26.00 dB
T2		1	838.744 MHz	-9.41 dBm	Q factor	178.2

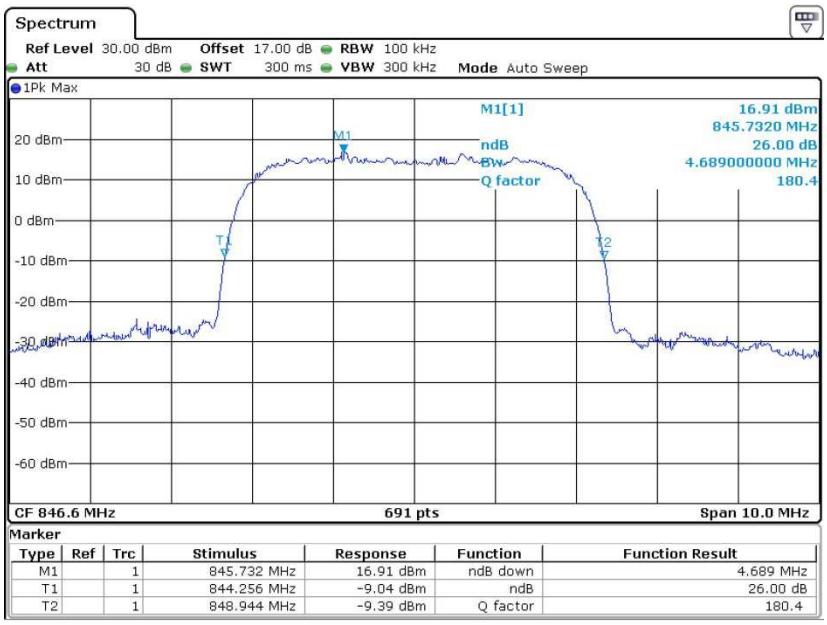
Date: 25.APR.2013 10:00:20

99% Occupied Bandwidth Plot on Channel 4233 (846.6 MHz)



Date: 25.APR.2013 10:05:01

26dB Bandwidth Plot on Channel 4233 (846.6 MHz)



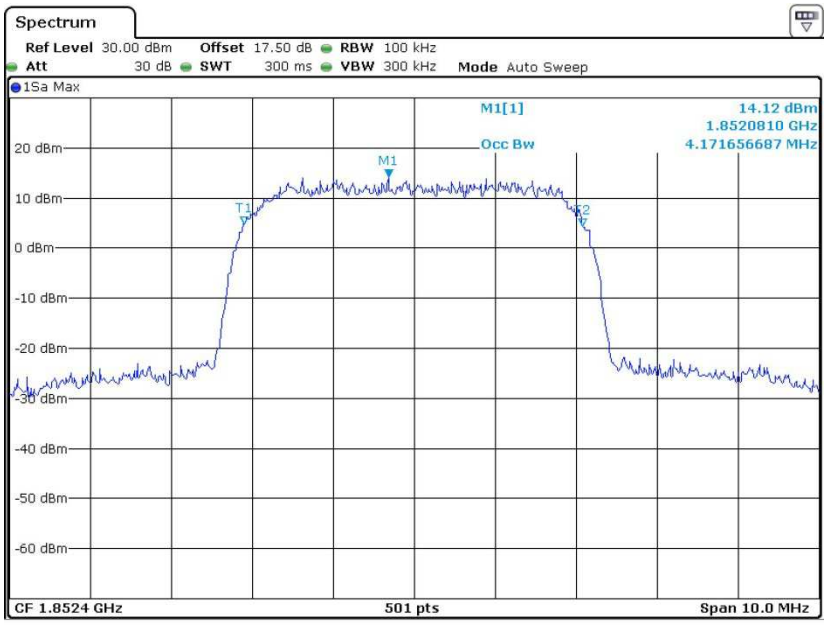
Marker

Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	845.732 MHz	16.91 dBm	ndB down	4.689 MHz
T1		1	844.256 MHz	-9.04 dBm	ndB	26.00 dB
T2		1	848.944 MHz	-9.39 dBm	Q factor	180.4

Date: 25.APR.2013 10:02:58

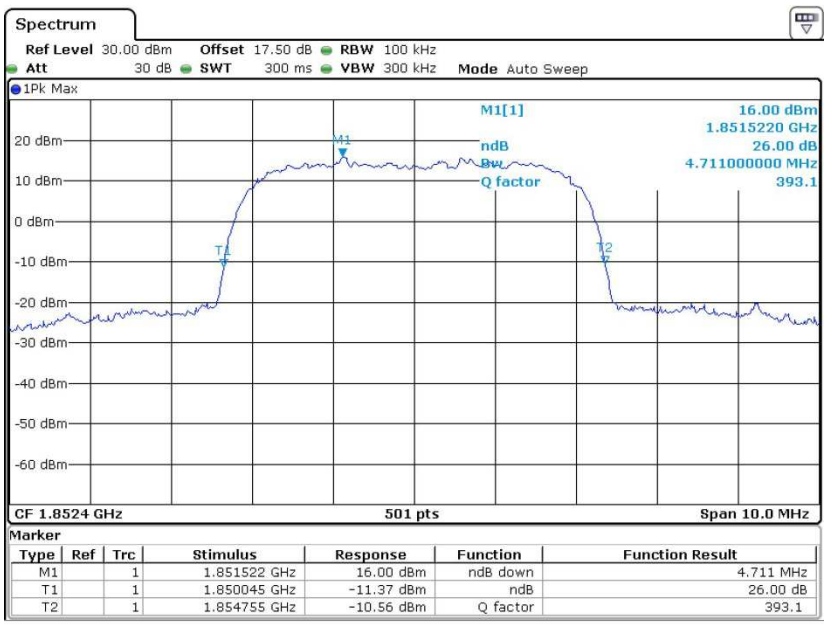
Band :	WCDMA Band II	Test Mode :	RMC 12.2Kbps Link

99% Occupied Bandwidth Plot on Channel 9262 (1852.4 MHz)



Date: 25.APR.2013 11:10:00

26dB Bandwidth Plot on Channel 9262 (1852.4 MHz)

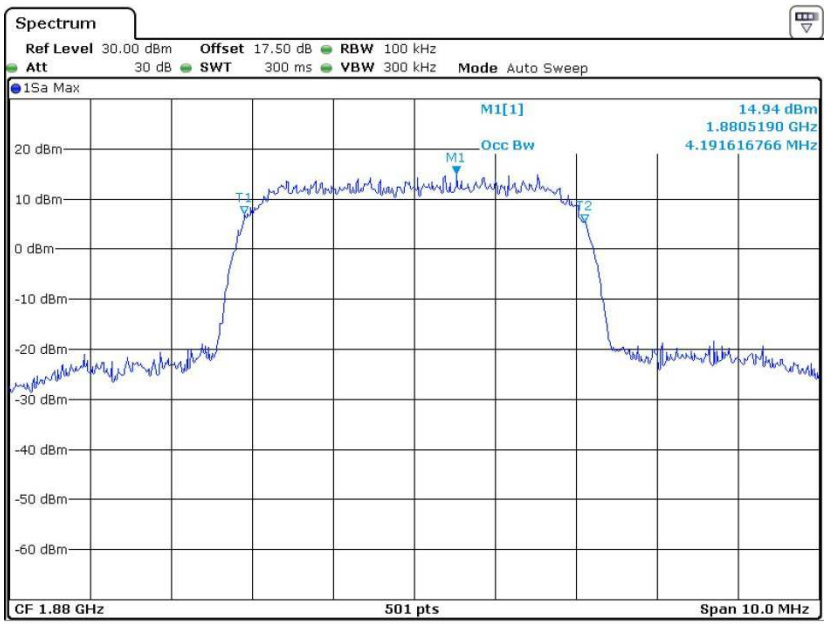


Marker

Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	1.851522 GHz	16.00 dBm	ndB down	4.711 MHz
T1		1	1.850045 GHz	-11.37 dBm	ndB	26.00 dB
T2		1	1.854755 GHz	-10.56 dBm	Q factor	393.1

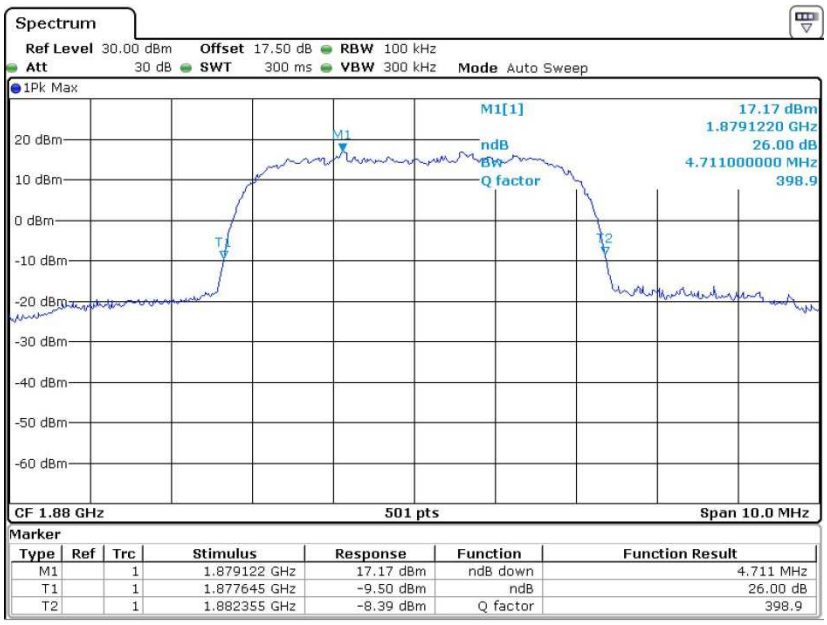
Date: 25.APR.2013 11:06:50

99% Occupied Bandwidth Plot on Channel 9400 (1880.0 MHz)



Date: 25.APR.2013 11:12:47

26dB Bandwidth Plot on Channel 9400 (1880.0 MHz)

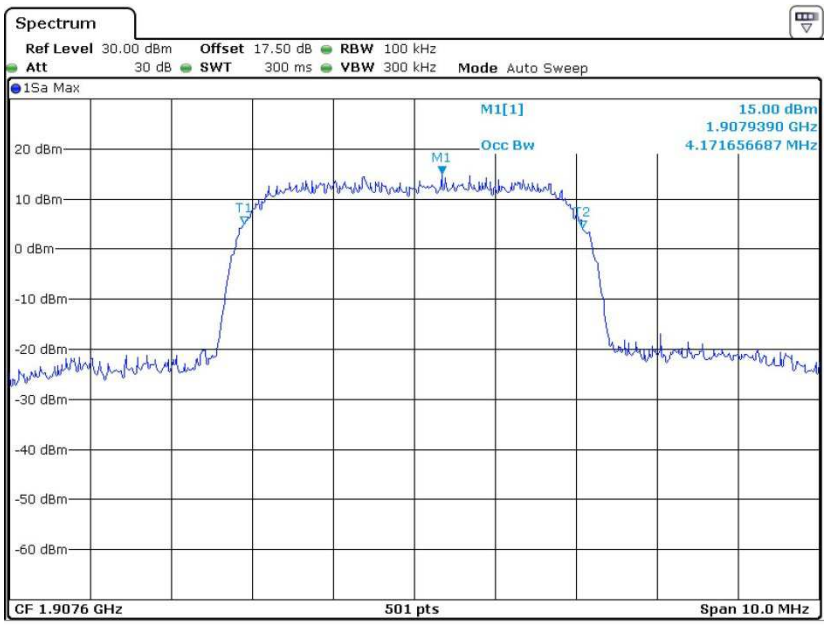


Marker

Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	1.879122 GHz	17.17 dBm	ndB down	4.711 MHz
T1		1	1.877645 GHz	-9.50 dBm	ndB	26.00 dB
T2		1	1.882355 GHz	-8.39 dBm	Q factor	398.9

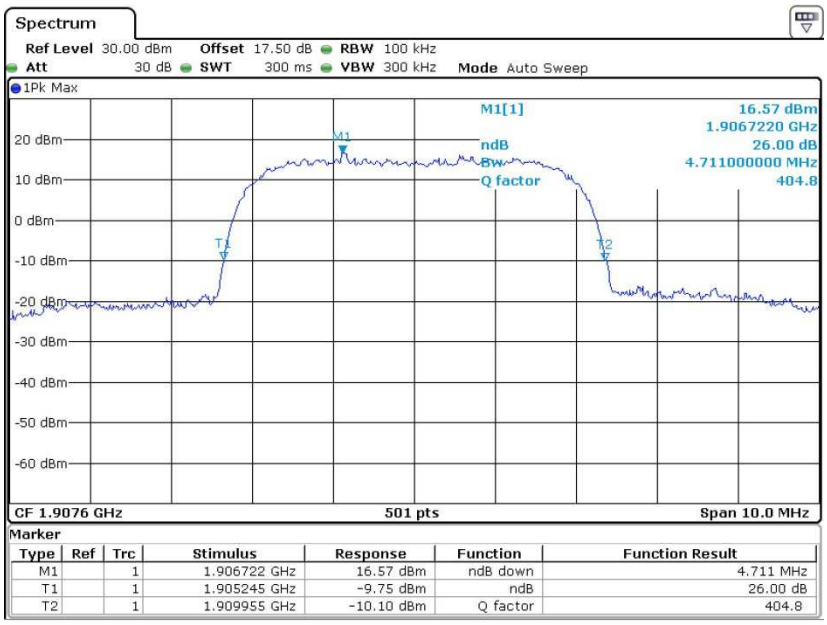
Date: 25.APR.2013 11:05:09

99% Occupied Bandwidth Plot on Channel 9538 (1907.6 MHz)



Date: 25.APR.2013 11:11:51

26dB Bandwidth Plot on Channel 9538 (1907.6 MHz)



Marker

Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	1.906722 GHz	16.57 dBm	ndB down	4.711 MHz
T1		1	1.905245 GHz	-9.75 dBm	ndB	26.00 dB
T2		1	1.909955 GHz	-10.10 dBm	Q factor	404.8

Date: 25.APR.2013 11:05:55

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.

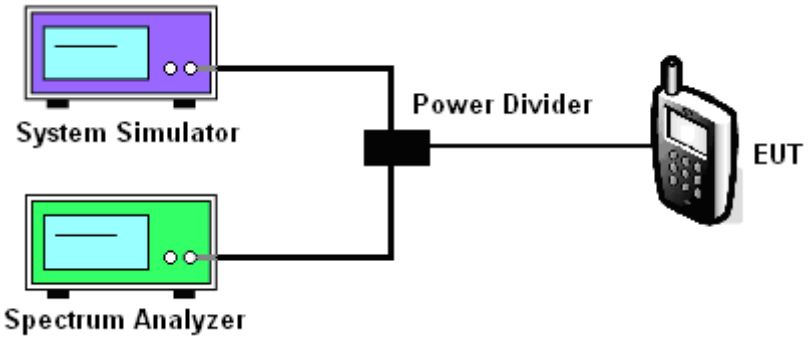
3.5.2 Measuring Instruments

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 RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The band edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.
4. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
5. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)
   = P(W) - [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.

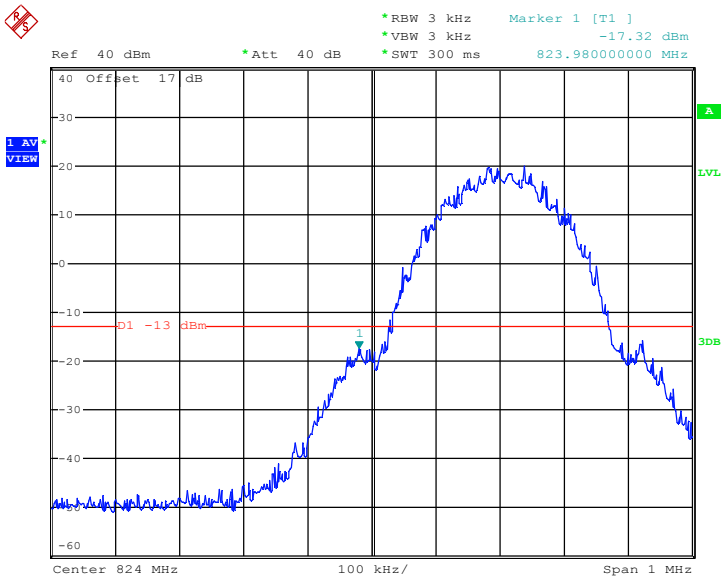
3.5.4 Test Setup



3.5.5 Test Result (Plots) of Conducted Band Edge

Band :	GSM850	Test Mode :	GSM Link
Correction Factor :	0.20dB	Maximum 26dB Bandwidth :	0.314MHz
Band Edge :	-17.12dBm	Measurement Value :	-17.32dBm

Lower Band Edge Plot on Channel 128 (824.2 MHz)



1. Correction Factor(dB)= 10log(1% Emission BW/RBW)

2. Band Edge= Measurement Value + Correction Factor(dB)

For example, -17.32dBm + 0.20dB = -17.12dBm