FCC RF Test Report

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

The product was received on Nov. 18, 2014 and testing was completed on Dec. 03, 2014. We, SPORTON INTERNATIONAL (SHENZHEN) INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA / EIA-603-C-2004 and has been in 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: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

Testing Laboratory
2353

SPORTON INTERNATIONAL INC.

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APPENDIX A. SETUP PHOTOGRAPHS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG4N1803	Rev. 01	Initial issue of report	Dec. 15, 2014

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	-
	§24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
3.4	§2.1049 §22.917(b) §24.238(b)	Occupied 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 Radiation	< $43+10\log_{10}$(P[Watts])	PASS	Under limit 31.64 dB at 5722.800 MHz
3.8	§2.1055 §22.355	Frequency Stability for Temperature & Voltage	< 2.5 ppm for Part 22 Within Authorized Band	PASS	-
	§2.1055 §24.235				

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

Gionee Communication Equipment Co.,Ltd.
21/F, Times Technology Building, No. 7028, Shennan Avenue, Futian District, Shenzhen, China

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile phone
Brand Name	BLU
Model Name	Studio Energy
FCC ID	YHLBLUSTENERGY
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/HSPA+(Downlink Only) WLAN 2.4GHz 802.11b/g/n HT20/HT40/ Bluetooth v3.0+ EDR/ Bluetooth v4.0 LE
HW Version	Studio Energy_Mainboard_P2
SW Version	Studio Energy_V04_GENERIC
EUT Stage	Pre-Production

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

1.4 Product Specification subjective to this standard

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 : 32.94 dBm GSM1900 : 29.73 dBm WCDMA Band V : 22.80 dBm WCDMA Band II : 22.50 dBm
Antenna Type	IFA Antenna
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK WCDMA: QPSK (Uplink) HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink) HSPA+: 16QAM (Downlink Only)

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

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

FCC Rule	System	Type of Modulation	Maximum ERP/EIRP (W)	Frequency Tolerance (ppm)	Emission Designator
Part 22	GSM850 GSM	GMSK	0.8912	0.0705 ppm	252KGXW
Part 22	GSM850 EDGE class 8	8PSK	0.1900	0.0084 ppm	249KG7W
Part 22	WCDMA Band V RMC 12.2Kbps	QPSK	0.0851	0.0407 ppm	4M17F9W
Part 24	GSM1900 GSM	GMSK	1.7485	0.0489 ppm	247KGXW
Part 24	GSM1900 EDGE class 8	8PSK	0.8233	0.0500 ppm	245KG7W
Part 24	WCDMA Band II RMC 12.2Kbps	QPSK	0.3844	0.0048 ppm	4M18F9W

1.7 Testing Location

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.	
Test Site Location	1F & 2F,Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755-8637-9589 FAX: +86-755-8637-9595	
Test Site No.	**Sporton Site No.**	
	TH01-SZ	OTA02-SZ

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. China TEL: +86-755-3320-2398	
Test Site No.	**Sporton Site No.**	**FCC Registration No.**
	03CH01-SZ	831040

Note: The test site complies with ANSI C63.4-2009 requirement.

1.8 Applicable Standards

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

- FCC 47 CFR Part 2, 22(H), 24(E)
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v02r02

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

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r02 with maximum output power.

Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission.

Radiated emissions were investigated as following frequency range:

1. 30 MHz to its 10th harmonic GSM850 and WCDMA Band V.
2. 30 MHz to its 10th harmonic GSM1900 and WCDMA Band II.

All modes and data rates and positions were investigated.

Test modes are chosen to be reported as the worst case configuration below:

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

Conducted Power Measurement Results:

SIM 1 Card

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	32.91	**32.94**	32.76	29.34	29.54	**29.73**
GPRS class 8	32.90	32.92	32.75	29.33	29.52	29.72
GPRS class 10	32.04	32.05	31.88	28.61	28.82	29.05
GPRS class 11	30.18	30.19	30.02	26.90	27.13	27.36
GPRS class 12	29.19	29.20	29.02	25.89	26.11	26.38
EGPRS class 8	26.83	26.85	26.80	25.76	25.96	26.23
EGPRS class 10	25.64	25.70	25.62	24.62	24.89	25.12
EGPRS class 11	23.37	23.45	23.30	22.40	22.61	22.95
EGPRS class 12	22.25	22.32	22.19	21.03	21.52	21.79

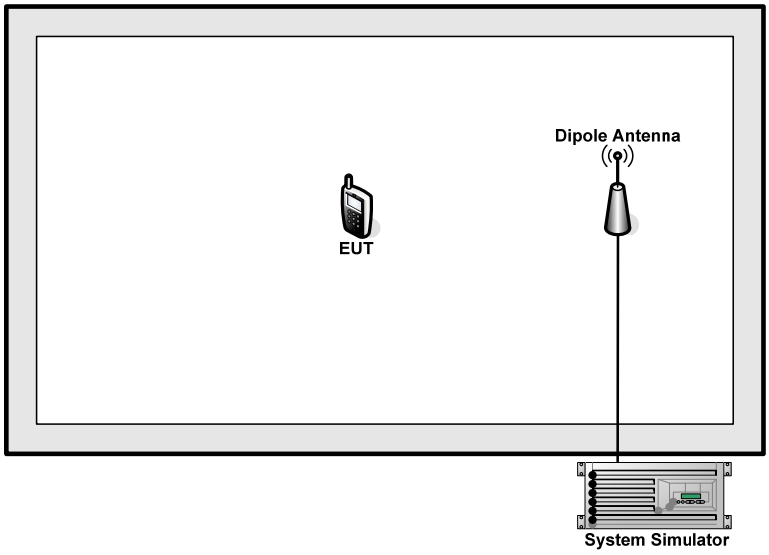
Conducted Power (*Unit: dBm)						
Band	**WCDMA Band V**			**WCDMA Band II**		
Channel	**4132**	**4182**	**4233**	**9262**	**9400**	**9538**
Frequency	**826.4**	**836.4**	**846.6**	**1852.4**	**1880.0**	**1907.6**
AMR 12.2K	22.69	22.48	22.78	22.19	22.43	22.49
RMC 12.2K	22.70	22.50	**22.80**	22.20	22.45	**22.50**
HSDPA Subtest-1	21.52	21.42	21.65	20.81	21.17	21.23
HSDPA Subtest-2	21.51	21.43	21.65	20.86	21.19	21.24
HSDPA Subtest-3	21.08	20.99	21.21	20.37	20.70	20.80
HSDPA Subtest-4	21.05	20.96	21.17	20.38	20.68	20.75
HSUPA Subtest-1	19.54	19.51	19.70	18.88	19.27	19.32
HSUPA Subtest-2	19.55	19.47	19.72	18.89	19.28	19.29
HSUPA Subtest-3	20.51	20.47	20.68	19.87	20.23	20.27
HSUPA Subtest-4	19.01	18.99	19.20	18.37	18.72	18.73
HSUPA Subtest-5	21.50	21.48	21.70	20.80	21.20	21.22

SIM 2 Card

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	32.90	**32.92**	32.75	29.32	29.53	**29.71**
GPRS class 8	32.89	32.91	32.74	29.30	29.51	29.70
GPRS class 10	32.02	32.03	31.87	28.60	28.80	29.03
GPRS class 11	30.16	30.18	30.01	26.89	27.12	27.35
GPRS class 12	29.18	29.19	29.00	25.87	26.10	26.37
EGPRS class 8	26.82	26.84	26.79	25.75	25.94	26.22
EGPRS class 10	25.61	25.69	25.61	24.60	24.88	25.08
EGPRS class 11	23.36	23.42	23.27	22.39	22.60	22.92
EGPRS class 12	22.24	22.30	22.18	21.02	21.51	21.77

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**
AMR 12.2K	22.65	22.47	22.77	22.18	22.41	22.47
RMC 12.2K	22.66	22.48	**22.78**	22.19	22.43	**22.48**
HSDPA Subtest-1	21.51	21.43	21.64	20.82	21.20	21.16
HSDPA Subtest-2	21.52	21.44	21.64	20.80	21.21	21.14
HSDPA Subtest-3	21.06	20.98	21.18	20.41	20.76	20.67
HSDPA Subtest-4	21.03	20.95	21.18	20.39	20.75	20.65
HSUPA Subtest-1	19.51	19.50	19.70	18.87	19.28	19.25
HSUPA Subtest-2	19.57	19.47	19.71	18.88	19.22	19.29
HSUPA Subtest-3	20.50	20.48	20.64	19.84	20.26	20.26
HSUPA Subtest-4	18.99	18.97	19.20	18.35	18.72	18.68
HSUPA Subtest-5	21.40	21.50	21.70	20.80	21.20	21.20

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration

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.	DC Power Supply	GW	3303D	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 RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level.

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

Offset = RF cable loss + attenuator factor.

The following shows an offset computation example with RF cable loss 5.0 dB and a 10dB attenuator.

Example :

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

= 5.0 + 10 = 15.0 (dB)

3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

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

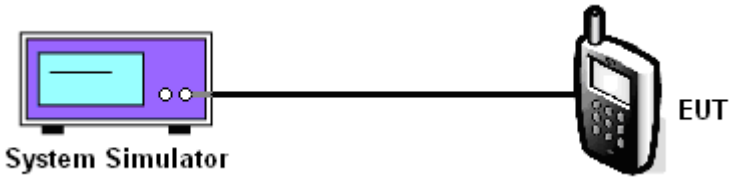
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through system simulator.
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 (GSM)			GSM850 (EDGE class 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)	32.91	32.94	32.76	26.83	26.85	26.80	22.70	22.50	22.80
Conducted Power (Watts)	1.95	1.97	1.89	0.48	0.48	0.48	0.19	0.18	0.19

PCS Band									
Modes	GSM1900 (GSM)			GSM1900 (EDGE class 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)	29.34	29.54	29.73	25.76	25.96	26.23	22.20	22.45	22.50
Conducted Power (Watts)	0.86	0.90	0.94	0.38	0.39	0.42	0.17	0.18	0.18

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.

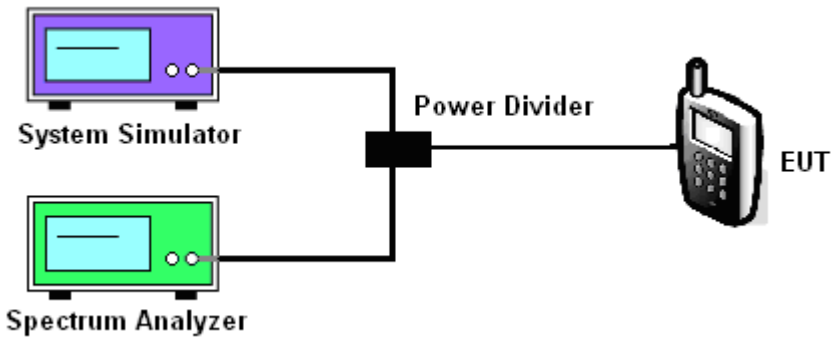
3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 5.7.1.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. For GSM/EGPRS operating modes:
   a. Set EUT in maximum power output.
   b. Set the RBW = 1MHz, VBW = 3MHz, Peak detector on spectrum analyzer for first trace.
   c. Set the RBW = 1MHz, VBW = 3MHz, RMS detector on 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 has synchronized with the spectrum analyzer.
4. For UMTS operating modes:
   a. Set the CCDF (Complementary Cumulative Distribution Function) option on the spectrum analyzer.
   b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
5. Record the deviation as Peak to Average Ratio.

3.2.4 Test Setup



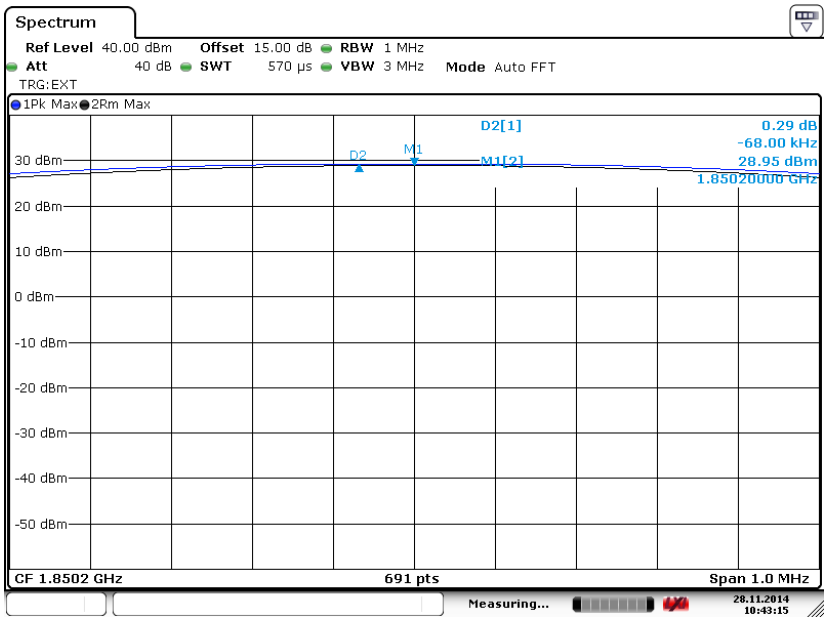
3.2.5 Test Result of Peak-to-Average Ratio

PCS Band									
Modes	GSM1900 (GSM)			GSM1900 (EDGE class 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	0.29	0.30	2.80	2.80	2.77	2.84	2.87	2.81

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

Band :	GSM 1900	Test Mode :	GSM Link (GMSK)

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



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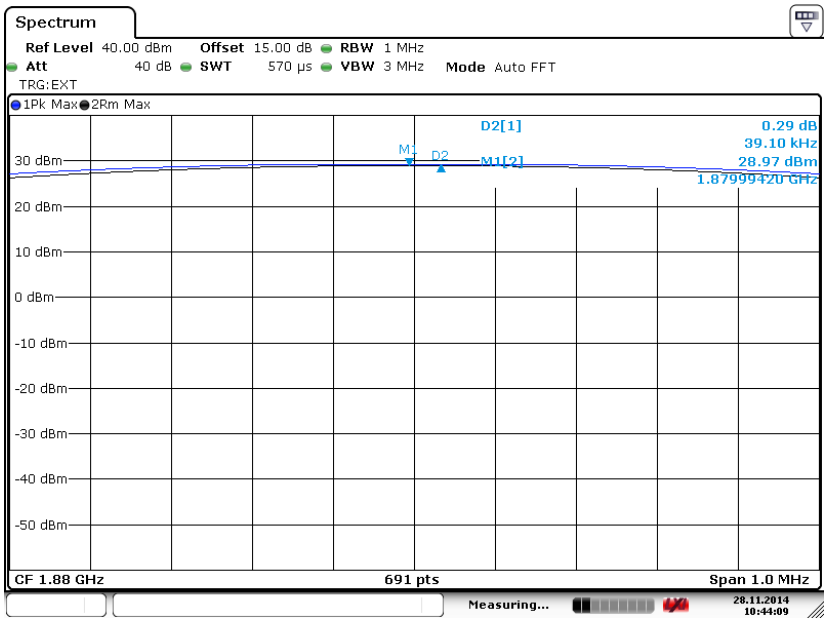
Peak-to-Average Ratio on Channel 661 (1880.0 MHz)



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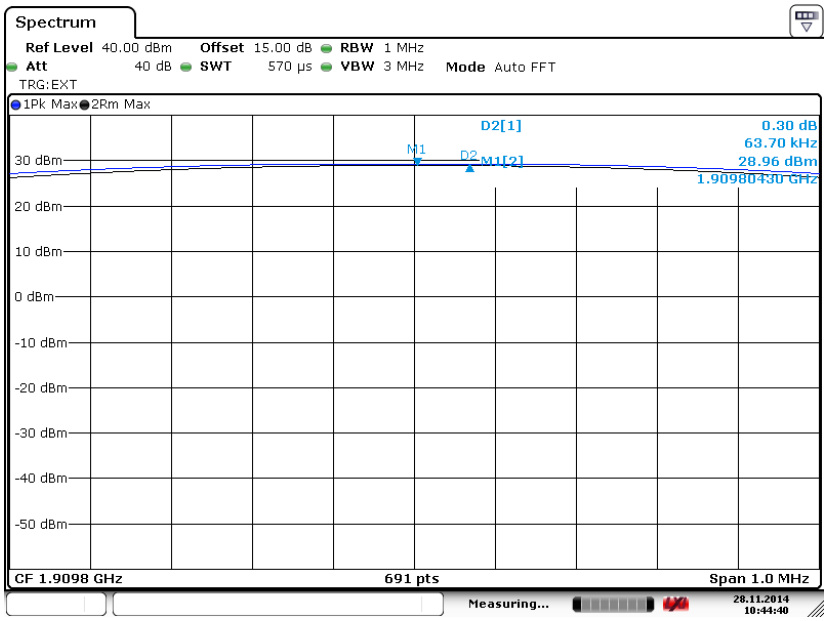
Peak-to-Average Ratio on Channel 810 (1909.8 MHz)



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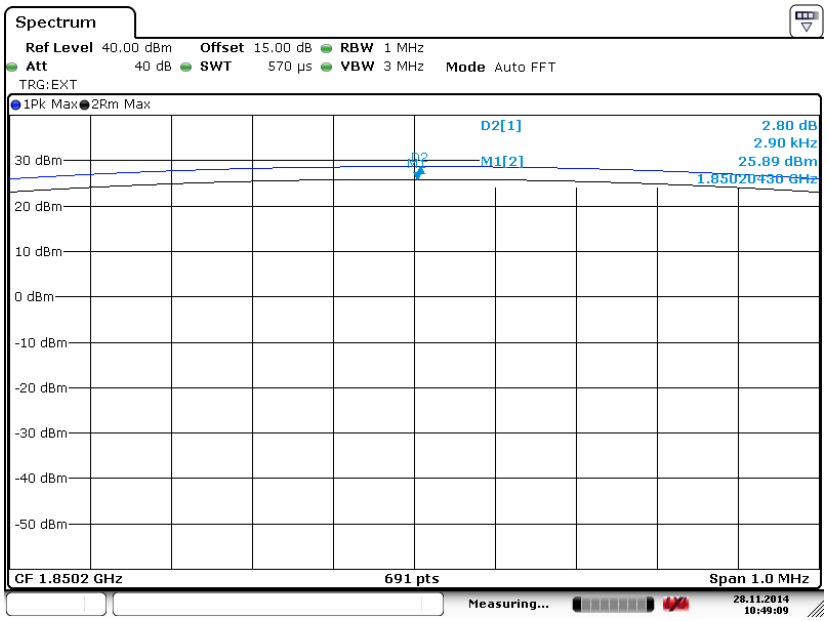
Band :	GSM 1900	Test Mode :	EDGE class 8 Link (8PSK)

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



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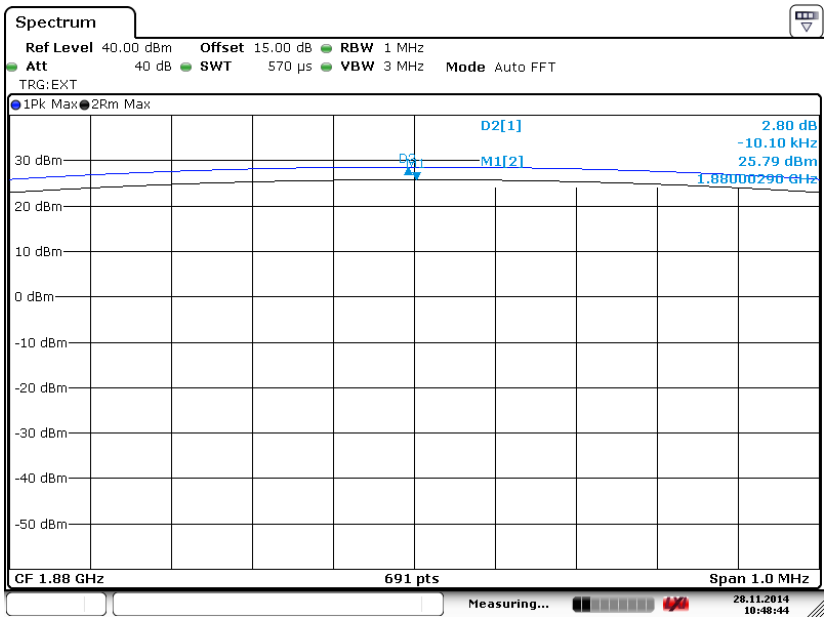
Peak-to-Average Ratio on Channel 661 (1880.0 MHz)



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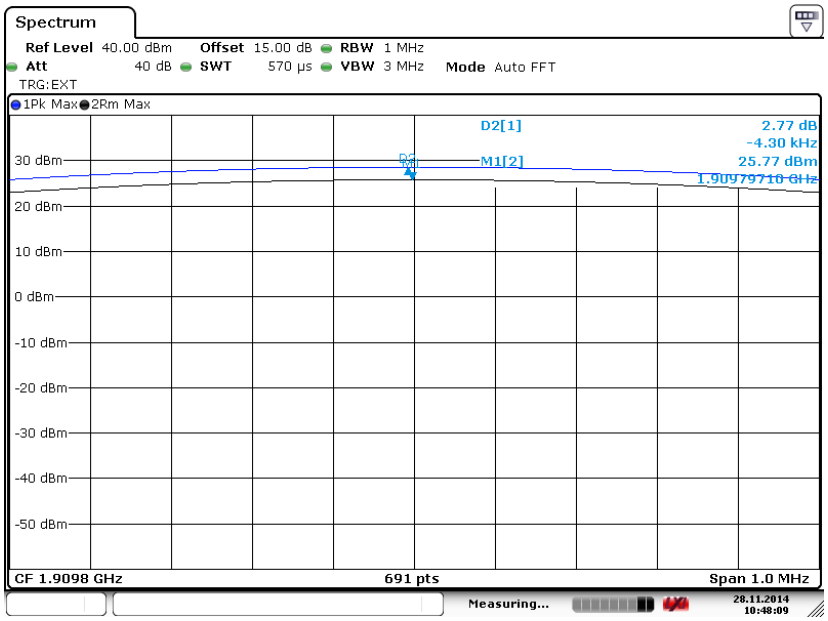
Peak-to-Average Ratio on Channel 810 (1909.8 MHz)



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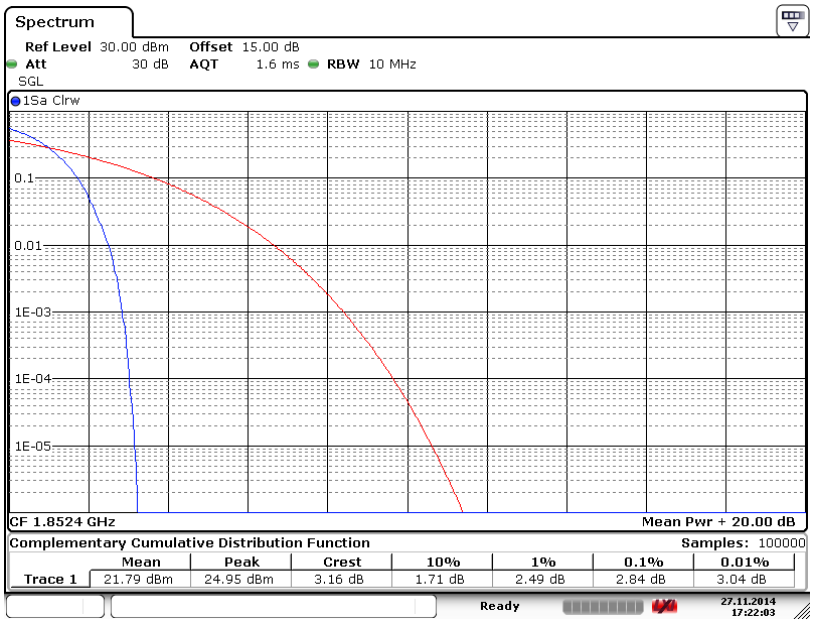
Band :	WCDMA Band II	Test Mode :	RMC 12.2Kbps Link (QPSK)

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



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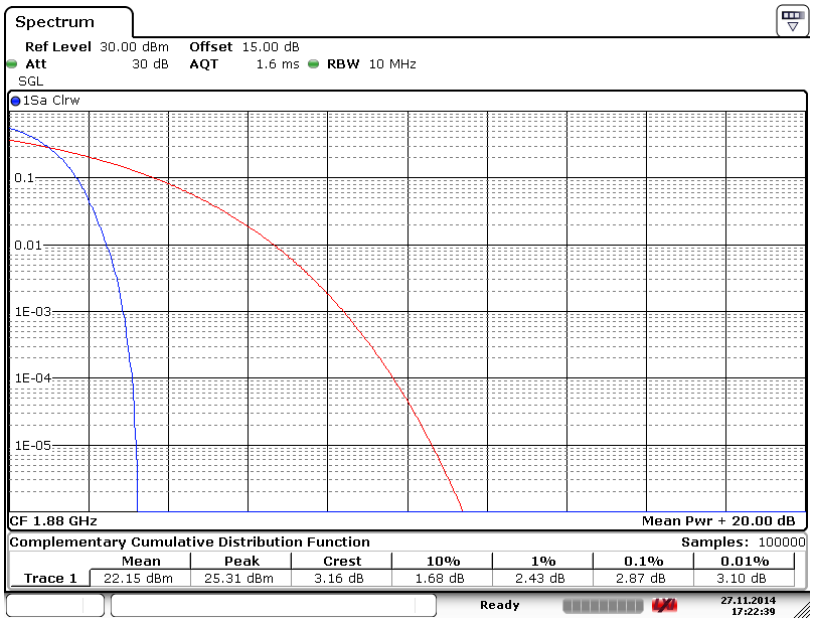
Peak-to-Average Ratio on Channel 9400 (1880.0 MHz)



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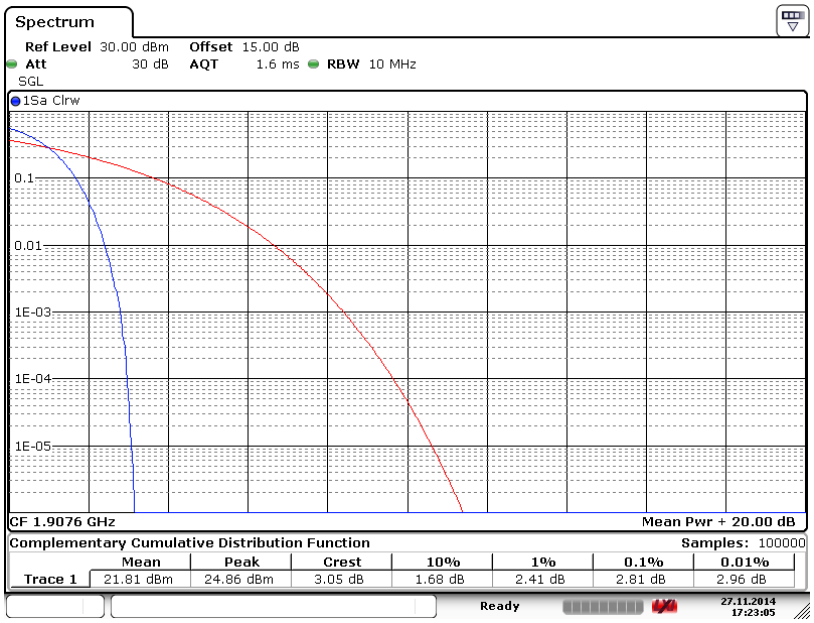
Peak-to-Average Ratio on Channel 9538 (1907.6 MHz)



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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 v02r02. The ERP of mobile transmitters must not exceed 7 Watts and the EIRP of mobile transmitters are limited to 2 Watts.

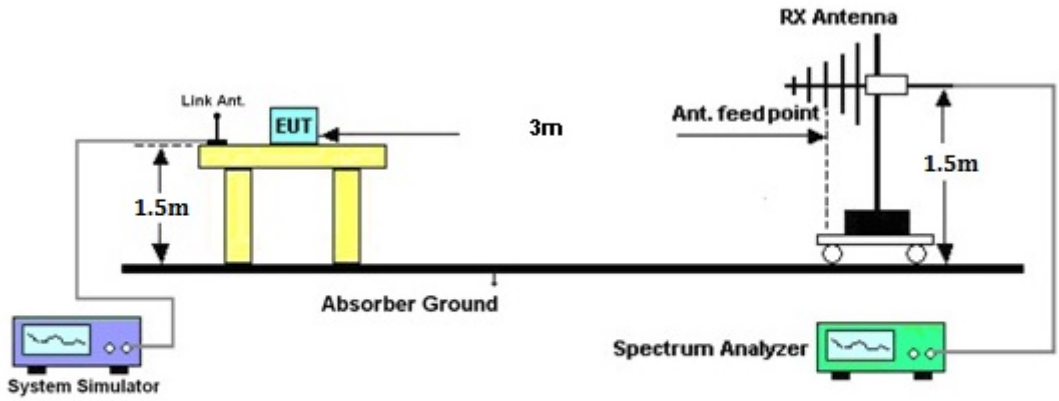
3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 5.2.1. (for CDMA/WCDMA), Section 5.2.2.2 (for GSM/GPRS/EDGE) and ANSI / TIA-603-C-2004 Section 2.2.17.
2. The EUT was placed on a turntable 1.5 meters high in a fully anechoic chamber.
3. The EUT was placed 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. 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 KDB 971168 D01.
5. The table was rotated 360 degrees to determine the position of the highest radiated power.
6. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
7. Taking the record of maximum ERP/EIRP.
8. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
9. The conducted power at the terminal of the dipole antenna is measured.
10. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
11. 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	-18.46	-48.12	0.00	-1.08	28.58	0.7208
836.40	-18.12	-48.28	0.00	-0.93	29.23	0.8370
848.80	-18.09	-48.35	0.00	-0.76	29.50	0.8912
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
824.20	-29.77	-47.97	0.00	-1.08	17.12	0.0516
836.40	-29.14	-48.01	0.00	-0.93	17.94	0.0622
848.80	-28.71	-48.05	0.00	-0.76	18.58	0.0721

GSM850 (EDGE class 8) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
824.20	-25.03	-48.12	0.00	-1.08	22.01	0.1588
836.40	-24.82	-48.28	0.00	-0.93	22.53	0.1789
848.80	-24.80	-48.35	0.00	-0.76	22.79	0.1900
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
824.20	-35.17	-47.97	0.00	-1.08	11.72	0.0149
836.40	-34.61	-48.01	0.00	-0.93	12.47	0.0177
848.80	-33.90	-48.05	0.00	-0.76	13.39	0.0218

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	-28.88	-48.12	0.00	-1.08	18.16	0.0655
836.40	-28.35	-48.28	0.00	-0.93	19.00	0.0794
846.60	-28.29	-48.35	0.00	-0.76	19.30	0.0851
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
826.40	-40.28	-47.97	0.00	-1.08	6.61	0.0046
836.40	-39.24	-48.01	0.00	-0.93	7.84	0.0061
846.60	-38.56	-48.05	0.00	-0.76	8.73	0.0075

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	-22.32	-51.88	0.00	1.96	31.52	1.4205
1880.00	-23.24	-52.99	0.00	2.00	31.75	1.4975
1909.80	-24.27	-54.28	0.00	1.98	31.99	1.5795
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBi)**	**EIRP (dBm)**	**EIRP (W)**
1850.20	-21.85	-52.13	0.00	1.96	32.24	1.6738
1880.00	-22.84	-53.17	0.00	2.00	32.33	1.7104
1909.80	-23.68	-54.13	0.00	1.98	32.43	1.7485

GSM1900 (EDGE class 8) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBi)**	**EIRP (dBm)**	**EIRP (W)**
1850.20	-25.71	-51.88	0.00	1.96	28.13	0.6507
1880.00	-26.49	-52.99	0.00	2.00	28.50	0.7077
1909.80	-27.64	-54.28	0.00	1.98	28.62	0.7285
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBi)**	**EIRP (dBm)**	**EIRP (W)**
1850.20	-25.14	-52.13	0.00	1.96	28.95	0.7857
1880.00	-26.06	-53.17	0.00	2.00	29.11	0.8154
1909.80	-26.95	-54.13	0.00	1.98	29.16	0.8233

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	-29.04	-51.88	0.00	1.96	24.80	0.3017
1880.00	-29.57	-52.99	0.00	2.00	25.42	0.3484
1907.60	-31.36	-54.28	0.00	1.98	24.90	0.3089
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBi)**	**EIRP (dBm)**	**EIRP (W)**
1852.40	-28.56	-52.13	0.00	1.96	25.53	0.3576
1880.00	-29.32	-53.17	0.00	2.00	25.85	0.3844
1907.60	-30.85	-54.13	0.00	1.98	25.26	0.3360

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.

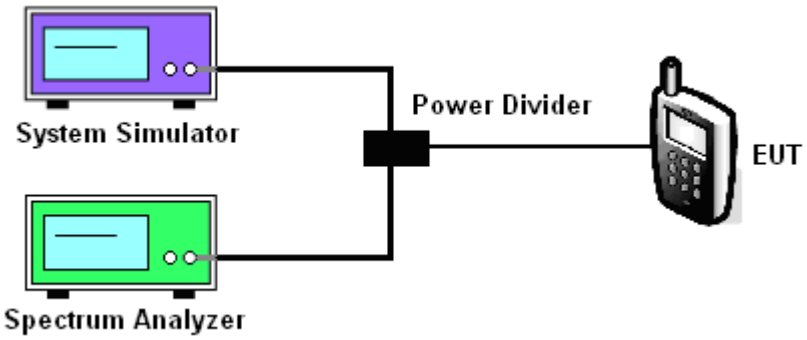
3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.4.3 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 4.2.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of the EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The 99% occupied bandwidth were measured, set RBW= 1% of span, VBW= 3*RBW, sample detector, trace maximum hold.
5. The 26dB bandwidth were measured, set RBW= 1% of EBW, VBW= 3*RBW, peak detector, trace maximum hold.

3.4.4 Test Setup



3.4.5 Test Result of Occupied Bandwidth and 26dB Bandwidth

Cellular Band						
Modes	GSM850 (GSM)			GSM850 (EDGE class 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)	244.57	251.81	244.57	246.02	248.91	246.02
26dB BW (kHz)	314.00	315.50	316.90	286.50	288.00	288.00

PCS Band						
Modes	GSM1900 (GSM)			GSM1900 (EDGE class 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	244.57	243.13	243.13	244.57	244.57
26dB BW (kHz)	312.60	315.50	315.50	308.20	301.00	306.80

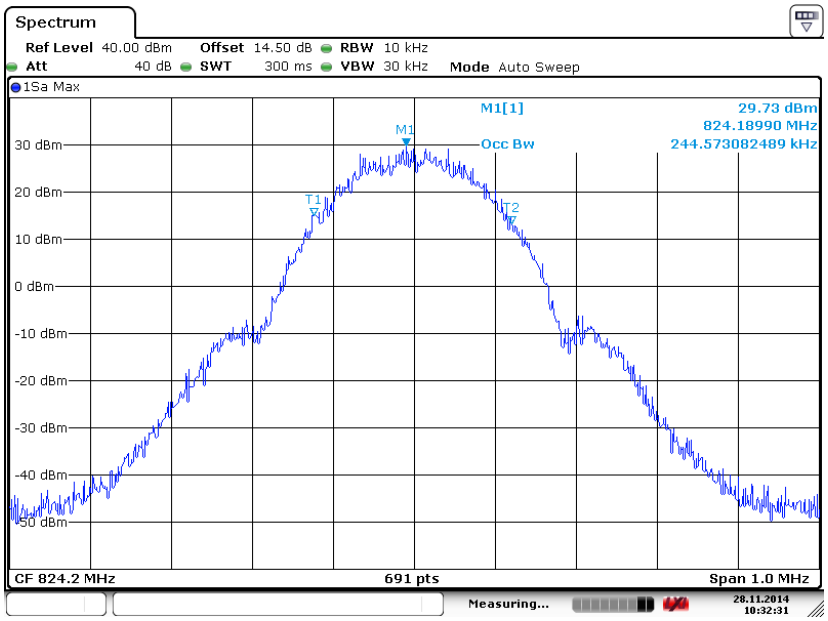
Cellular Band			
Modes	WCDMA Band V (RMC 12.2Kbps)		
Channel	4132 (Low)	4182 (Mid)	4233 (High)
Frequency (MHz)	826.4	836.4	846.6
99% OBW (MHz)	4.17	4.17	4.17
26dB BW (MHz)	4.69	4.70	4.69

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)	4.18	4.15	4.15
26dB BW (MHz)	4.69	4.69	4.69

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

Band :	GSM 850	Test Mode :	GSM Link (GMSK)

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



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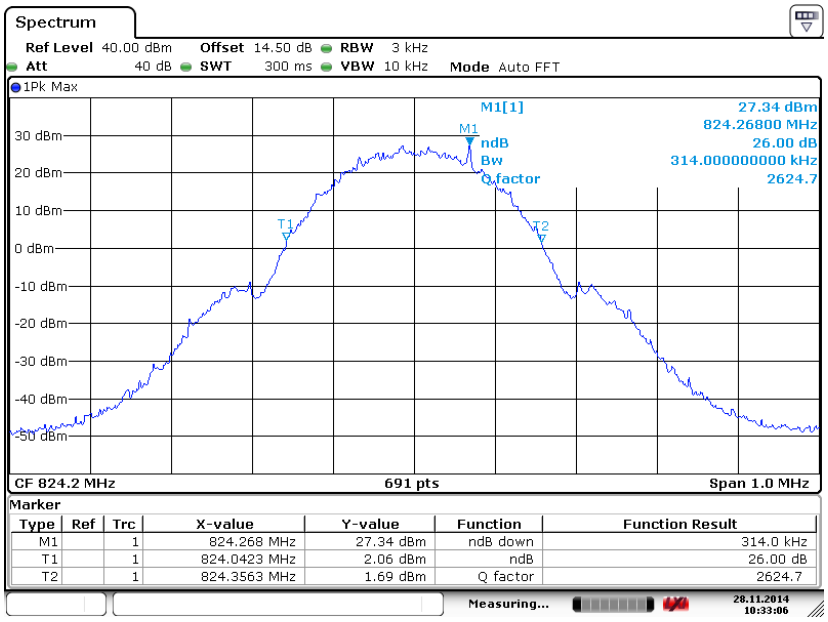
26dB Bandwidth Plot on Channel 128 (824.2 MHz)

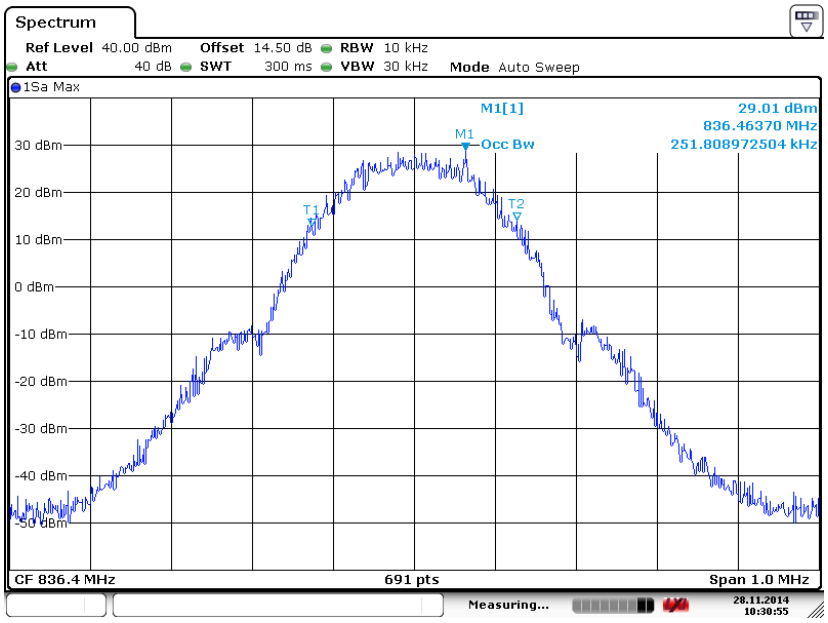


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	824.268 MHz	27.34 dBm	ndB down	314.0 kHz
T1		1	824.0423 MHz	2.06 dBm	ndB	26.00 dB
T2		1	824.3563 MHz	1.69 dBm	Q factor	2624.7

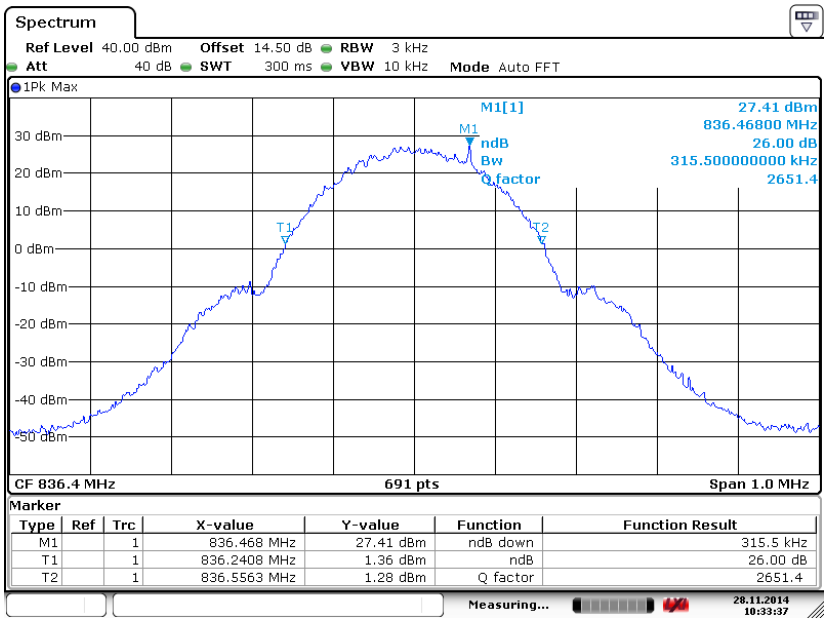
Date: 28.NOV.2014 10:33:06

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



Date: 28.NOV.2014 10:30:55

26dB Bandwidth Plot on Channel 189 (836.4 MHz)

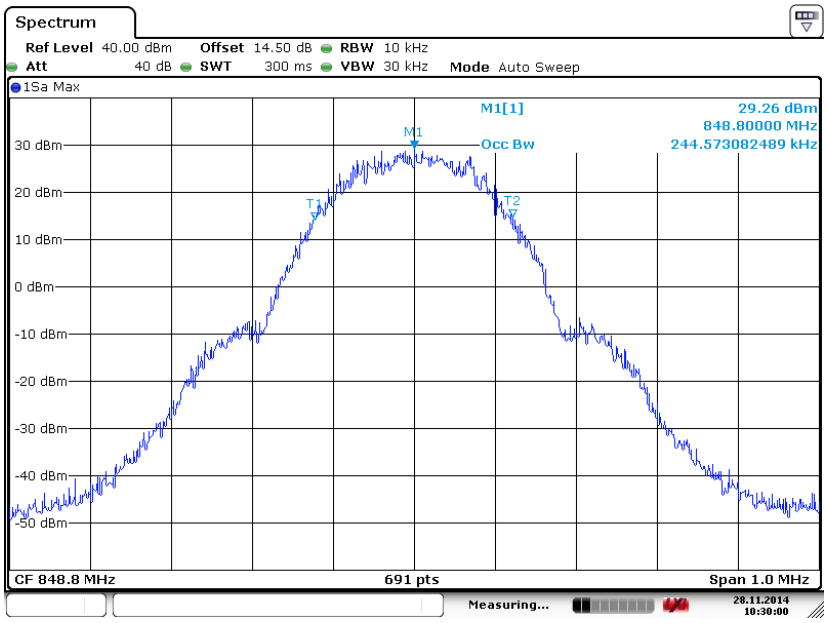


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	836.468 MHz	27.41 dBm	ndB down	315.5 kHz
T1		1	836.2408 MHz	1.36 dBm	ndB	26.00 dB
T2		1	836.5563 MHz	1.28 dBm	Q factor	2651.4

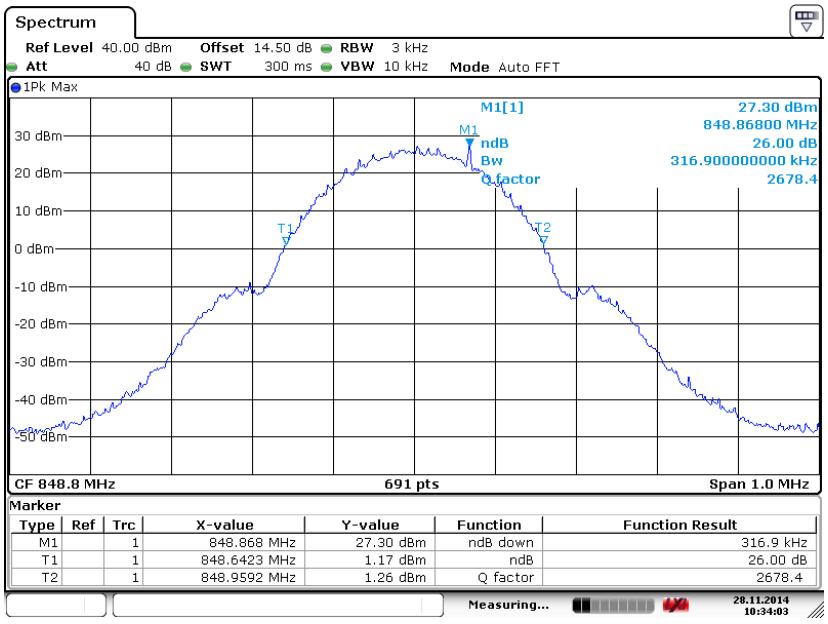
Date: 28.NOV.2014 10:33:37

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



Date: 28.NOV.2014 10:30:01

26dB Bandwidth Plot on Channel 251 (848.8 MHz)



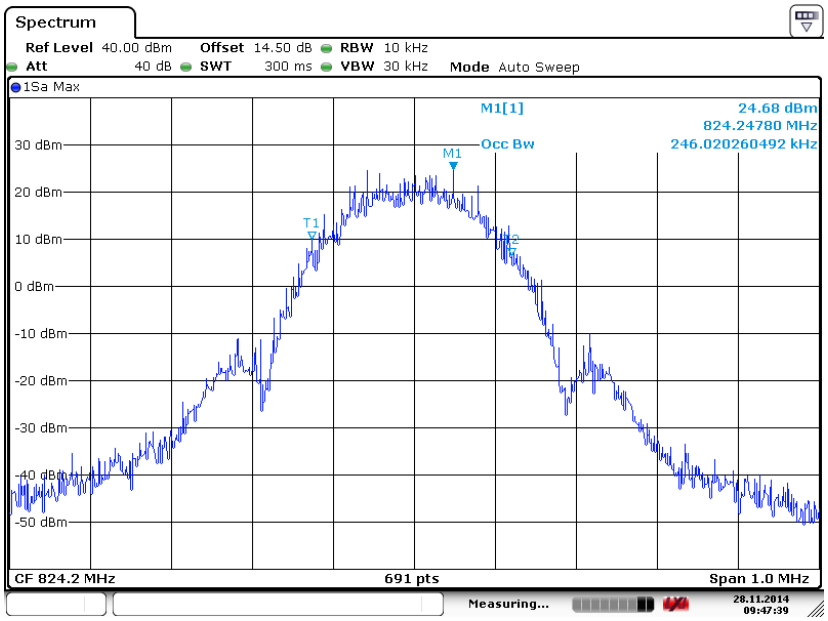
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	848.868 MHz	27.30 dBm	ndB down	316.9 kHz
T1		1	848.6423 MHz	1.17 dBm	ndB	26.00 dB
T2		1	848.9592 MHz	1.26 dBm	Q factor	2678.4

Date: 28.NOV.2014 10:34:04

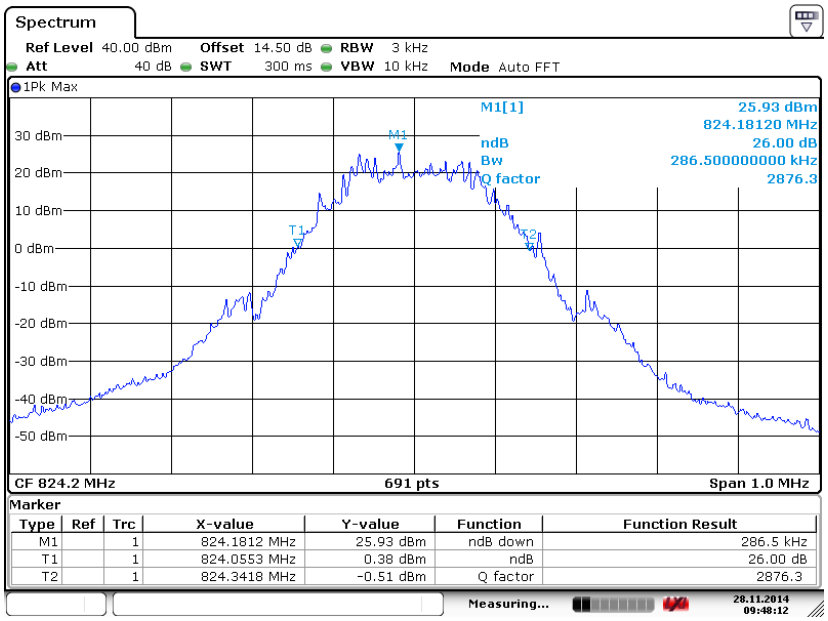
Band :	GSM 850	Test Mode :	EDGE class 8 Link (8PSK)

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



Date: 28.NOV.2014 09:47:40

26dB Bandwidth Plot on Channel 128 (824.2 MHz)

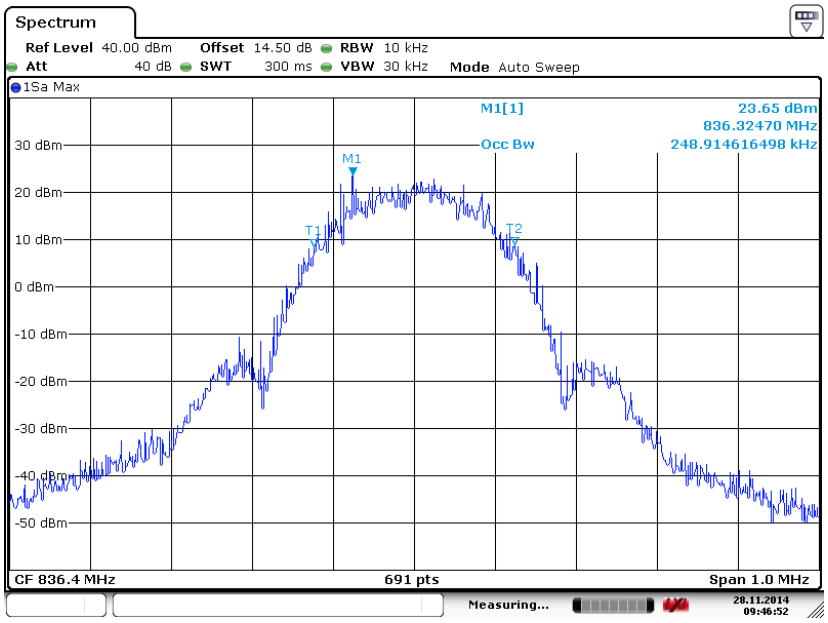


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	824.1812 MHz	25.93 dBm	ndB down	286.5 kHz
T1		1	824.0553 MHz	0.38 dBm	ndB	26.00 dB
T2		1	824.3418 MHz	-0.51 dBm	Q factor	2876.3

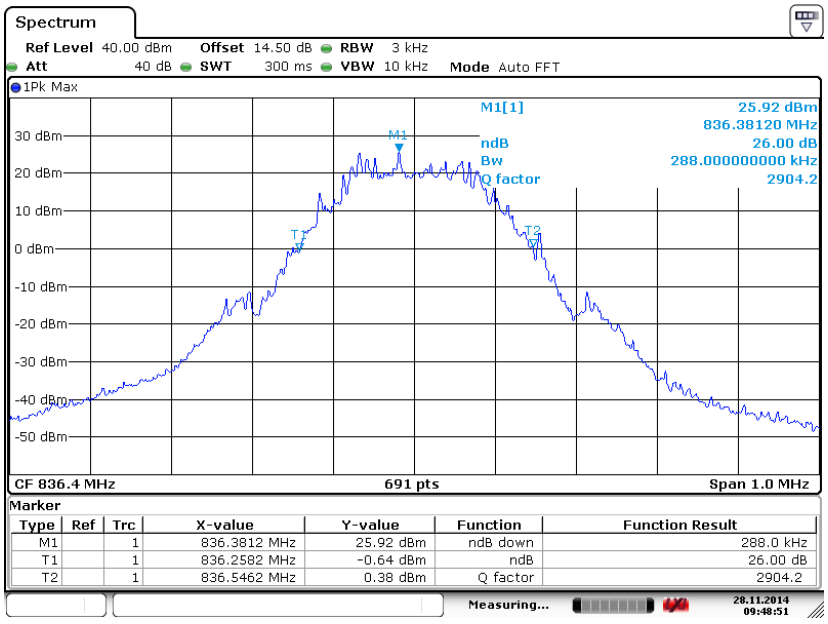
Date: 28.NOV.2014 09:48:13

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



Date: 28.NOV.2014 09:46:52

26dB Bandwidth Plot on Channel 189 (836.4 MHz)

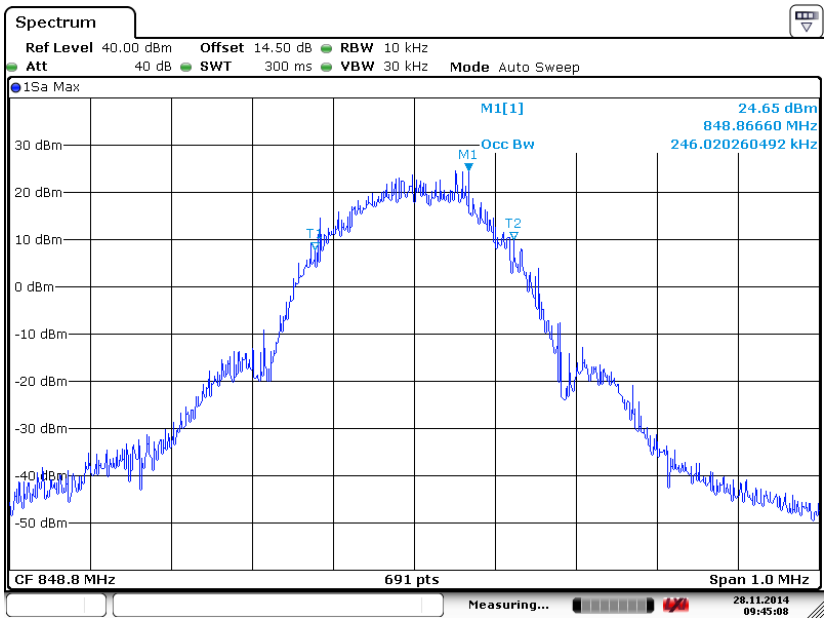


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	836.3812 MHz	25.92 dBm	ndB down	288.0 kHz
T1		1	836.2582 MHz	-0.64 dBm	ndB	26.00 dB
T2		1	836.5462 MHz	0.38 dBm	Q factor	2904.2

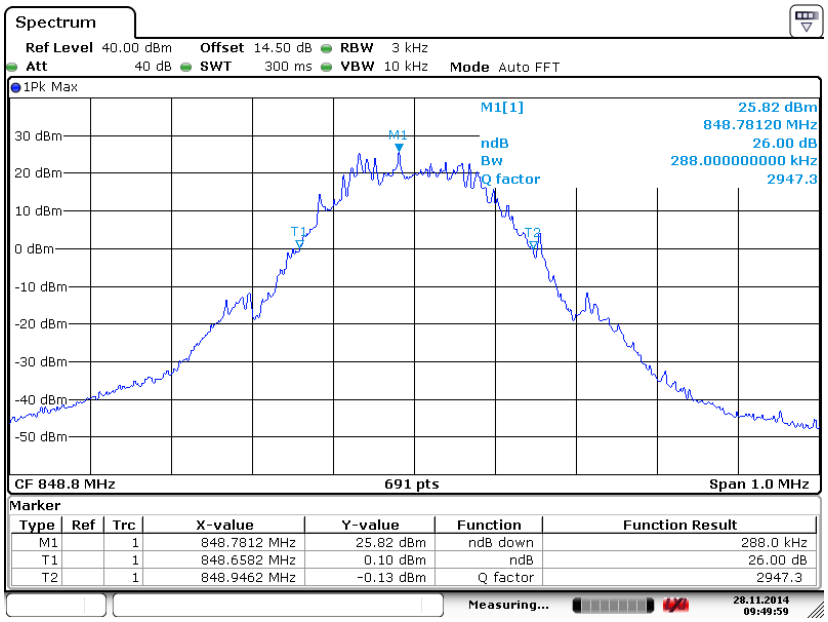
Date: 28.NOV.2014 09:48:52

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



Date: 28.NOV.2014 09:45:09

26dB Bandwidth Plot on Channel 251 (848.8 MHz)



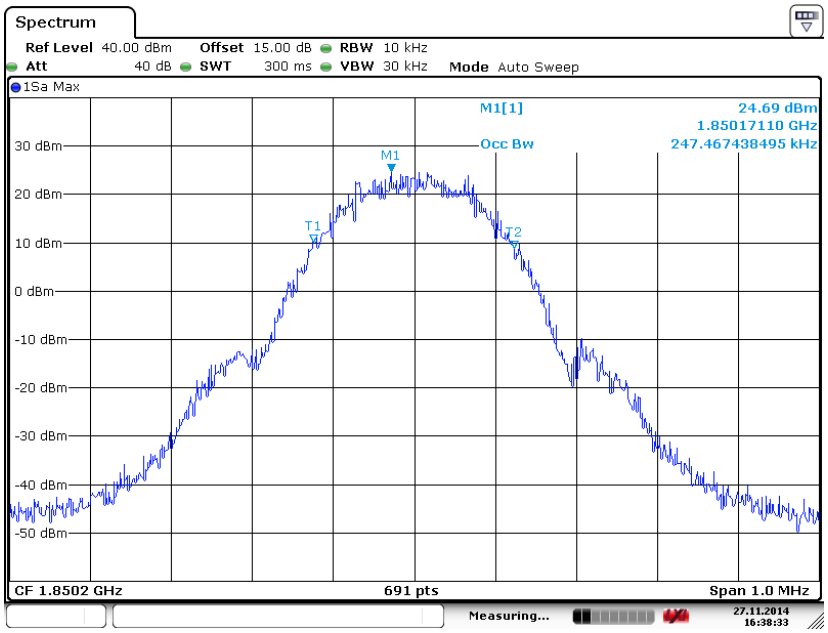
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	848.7812 MHz	25.82 dBm	ndB down	288.0 kHz
T1		1	848.6582 MHz	0.10 dBm	ndB	26.00 dB
T2		1	848.9462 MHz	-0.13 dBm	Q factor	2947.3

Date: 28.NOV.2014 09:49:59

Band :	GSM 1900	Test Mode :	GSM Link (GMSK)

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



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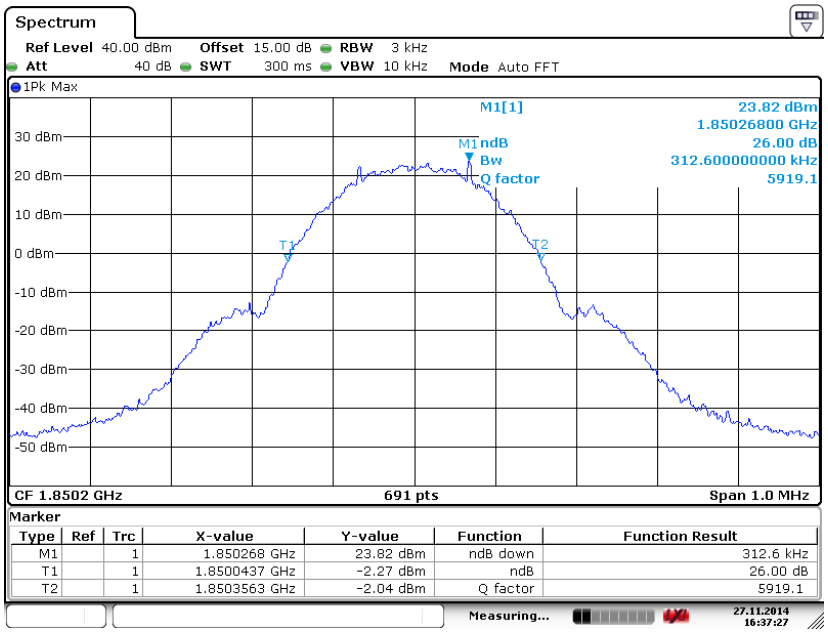
26dB Bandwidth Plot on Channel 512 (1850.2 MHz)

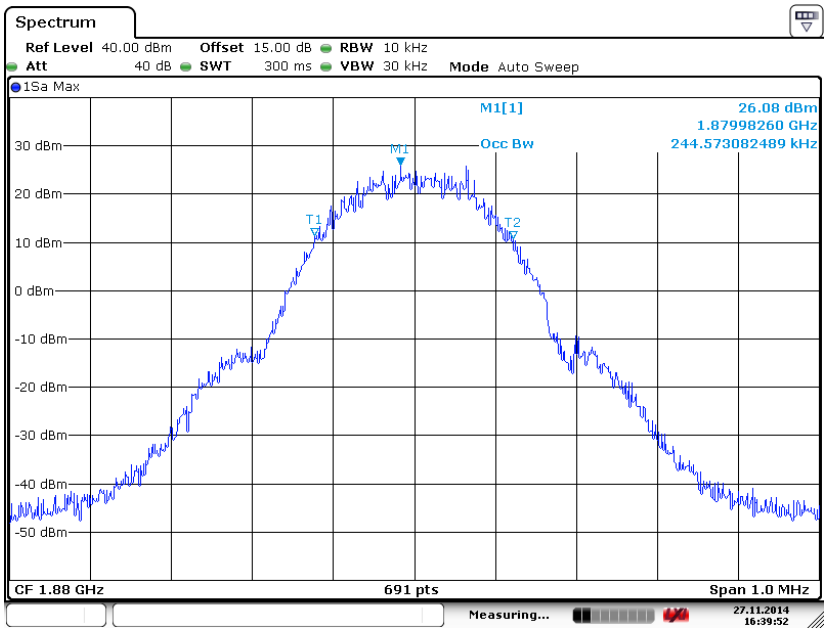


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.850268 GHz	23.82 dBm	ndB down	312.6 kHz
T1		1	1.8500437 GHz	-2.27 dBm	ndB	26.00 dB
T2		1	1.8503563 GHz	-2.04 dBm	Q factor	5919.1

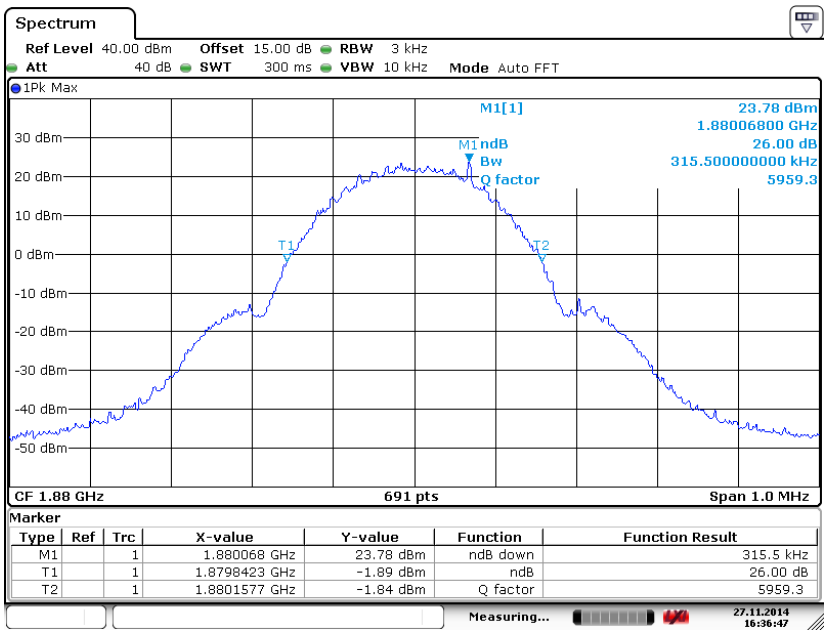
Date: 27.NOV.2014 16:37:27

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



Date: 27.NOV.2014 16:39:51

26dB Bandwidth Plot on Channel 661 (1880.0 MHz)

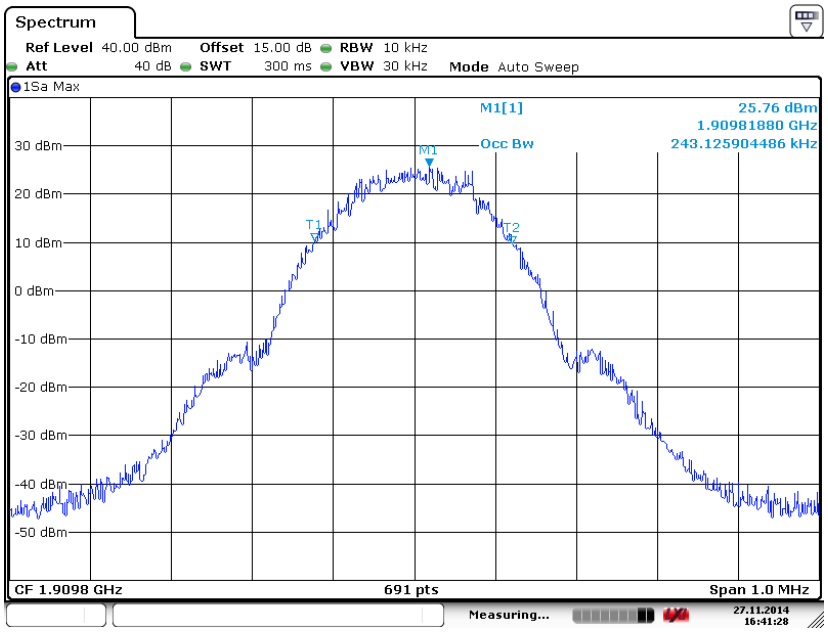


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.880068 GHz	23.78 dBm	ndB down	315.5 kHz
T1		1	1.8798423 GHz	-1.89 dBm	ndB	26.00 dB
T2		1	1.8801577 GHz	-1.84 dBm	Q factor	5959.3

Date: 27.NOV.2014 16:36:47

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



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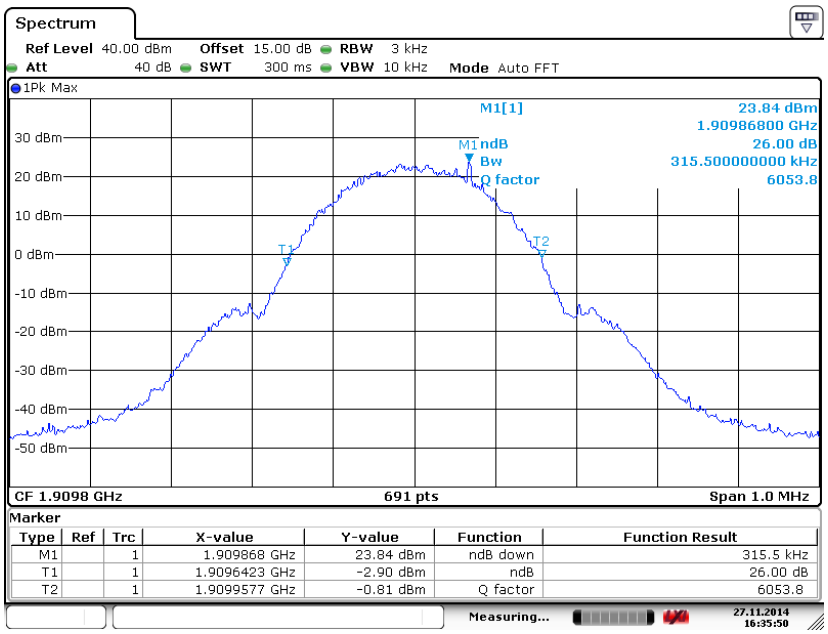
26dB Bandwidth Plot on Channel 810 (1909.8 MHz)



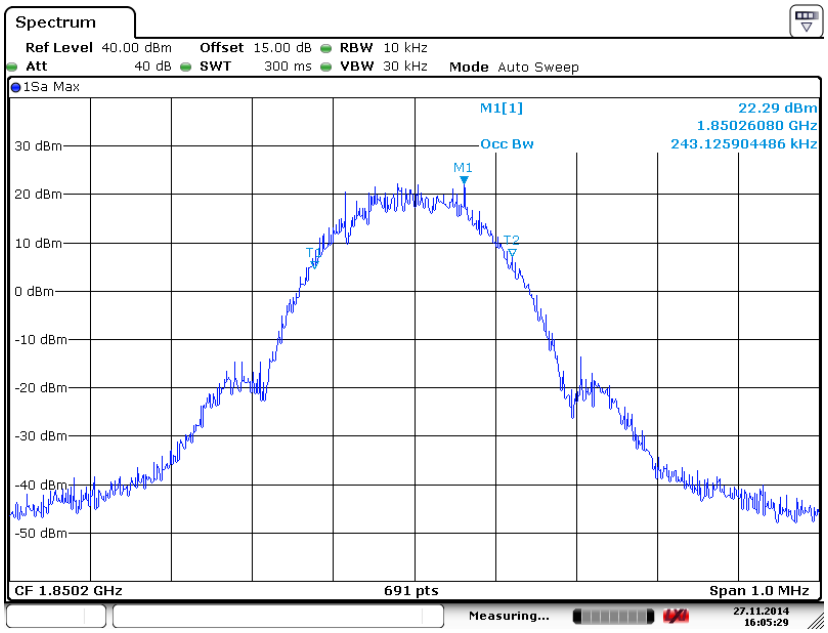
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.909868 GHz	23.84 dBm	ndB down	315.5 kHz
T1		1	1.9096423 GHz	-2.90 dBm	ndB	26.00 dB
T2		1	1.9099577 GHz	-0.81 dBm	Q factor	6053.8

Date: 27.NOV.2014 16:35:50

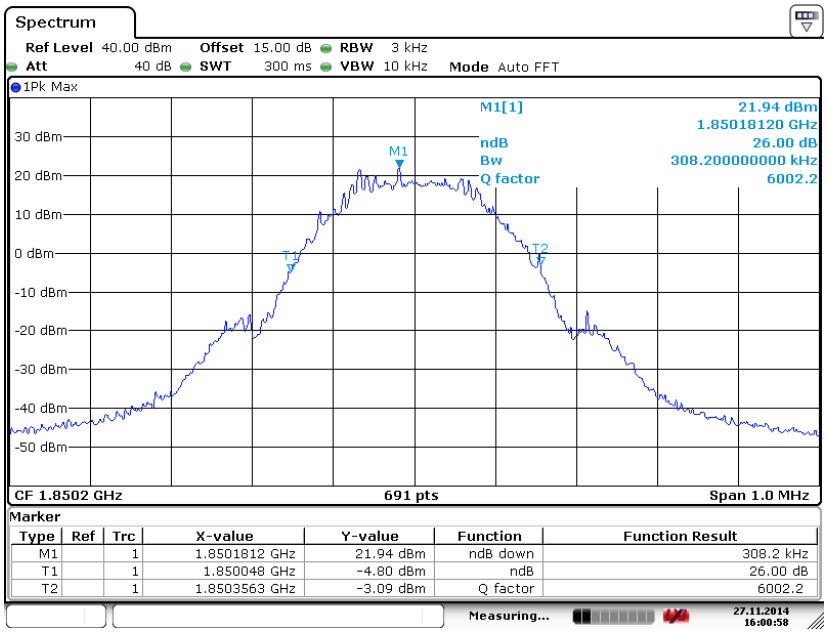
Band :	GSM 1900	Test Mode :	EDGE class 8 Link (8PSK)

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



Date: 27.NOV.2014 16:05:29

26dB Bandwidth Plot on Channel 512 (1850.2 MHz)

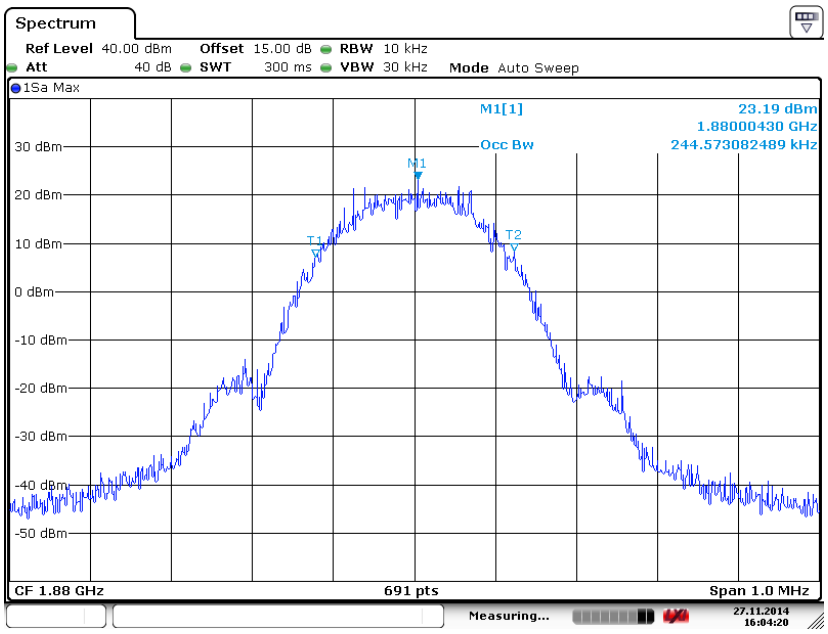


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.8501812 GHz	21.94 dBm	ndB down	308.2 kHz
T1		1	1.850048 GHz	-4.80 dBm	ndB	26.00 dB
T2		1	1.8503563 GHz	-3.09 dBm	Q factor	6002.2

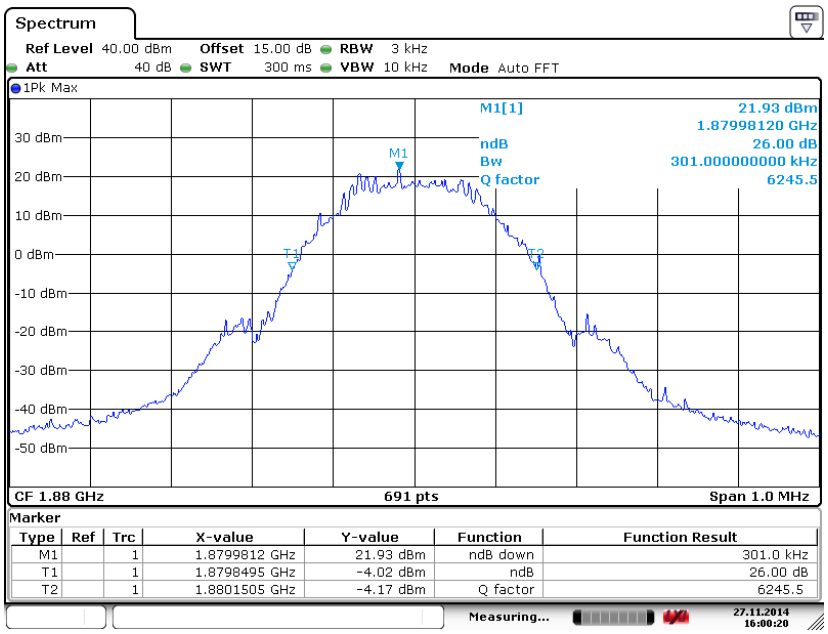
Date: 27.NOV.2014 16:00:58

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



Date: 27.NOV.2014 16:04:20

26dB Bandwidth Plot on Channel 661 (1880.0 MHz)

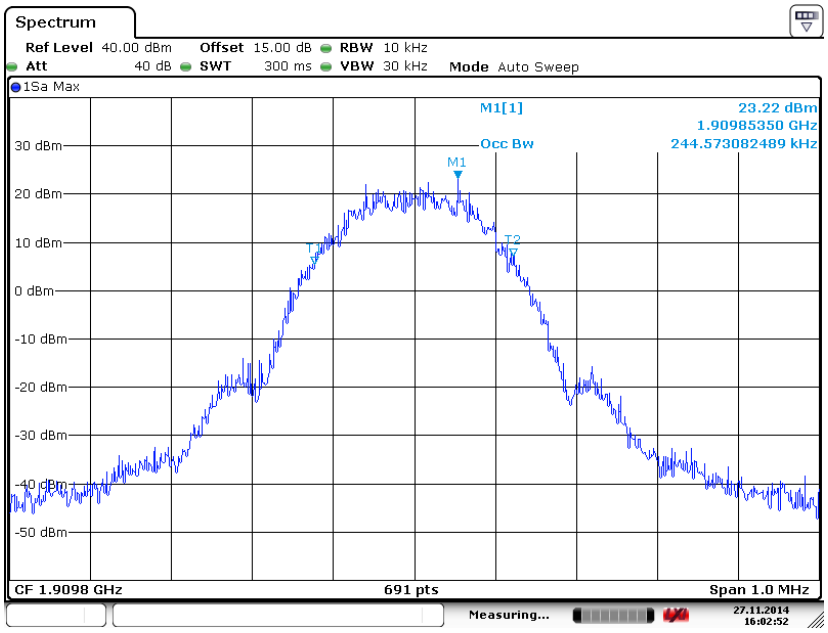


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.8799812 GHz	21.93 dBm	ndB down	301.0 kHz
T1		1	1.8798495 GHz	-4.02 dBm	ndB	26.00 dB
T2		1	1.8801505 GHz	-4.17 dBm	Q factor	6245.5

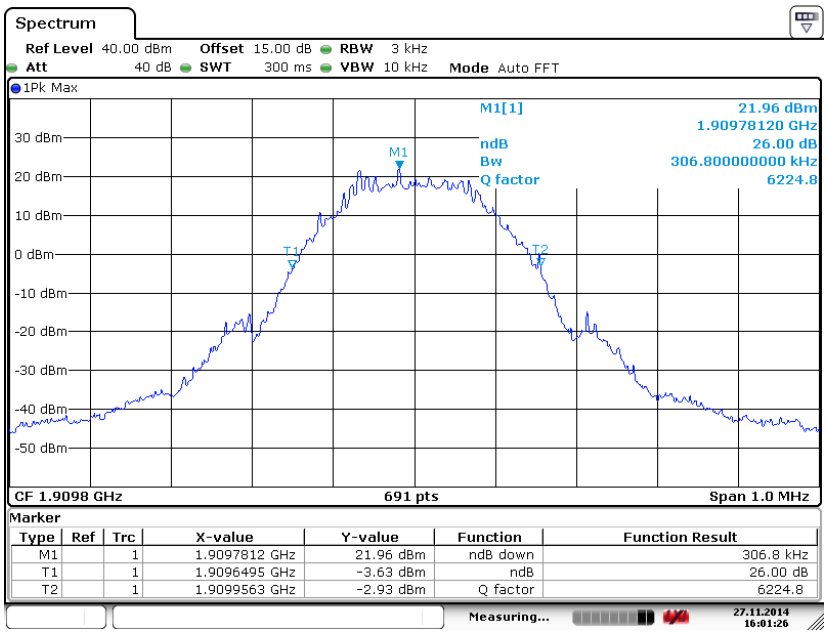
Date: 27.NOV.2014 16:00:20

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



Date: 27.NOV.2014 16:02:52

26dB Bandwidth Plot on Channel 810 (1909.8 MHz)



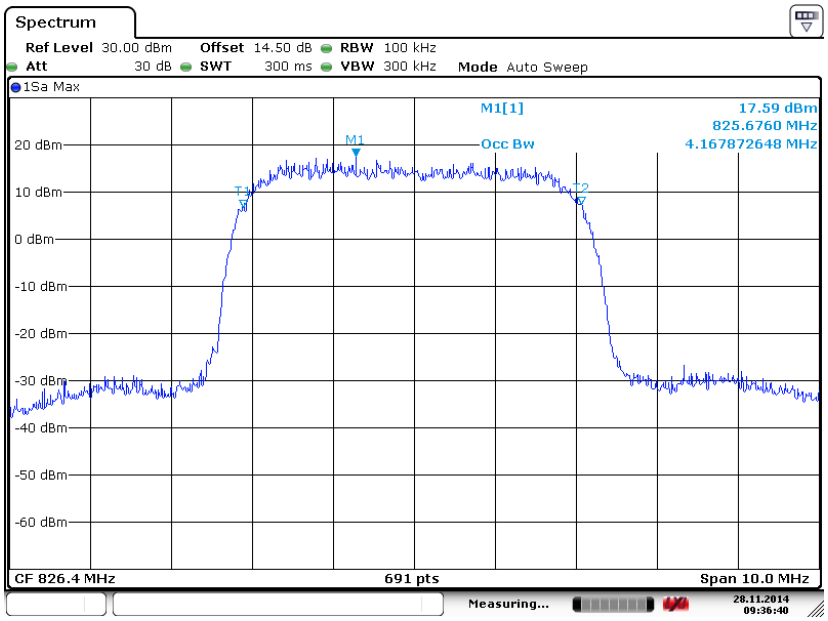
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.9097812 GHz	21.96 dBm	ndB down	306.8 kHz
T1		1	1.9096495 GHz	-3.63 dBm	ndB	26.00 dB
T2		1	1.9099563 GHz	-2.93 dBm	Q factor	6224.8

Date: 27.NOV.2014 16:01:26

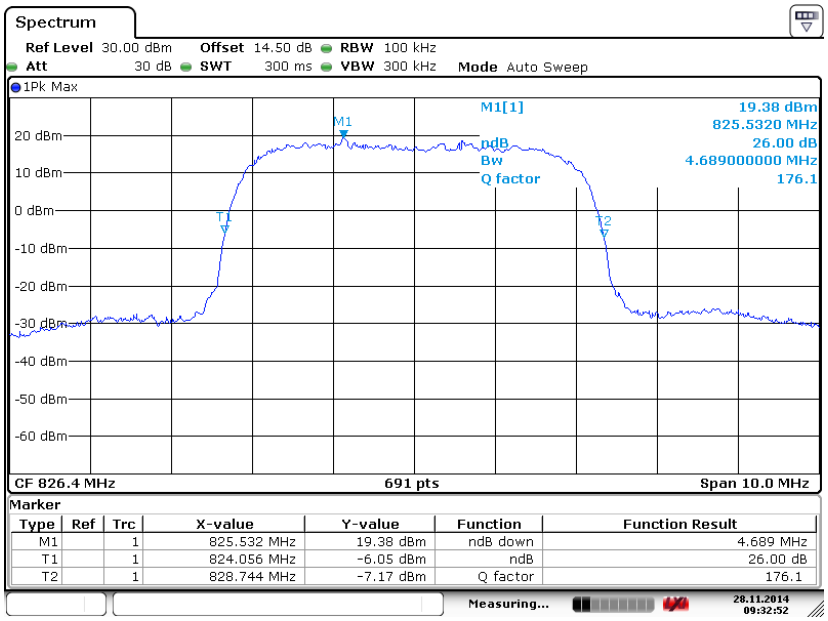
Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link (QPSK)

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



Date: 28.NOV.2014 09:36:40

26dB Bandwidth Plot on Channel 4132 (826.4 MHz)

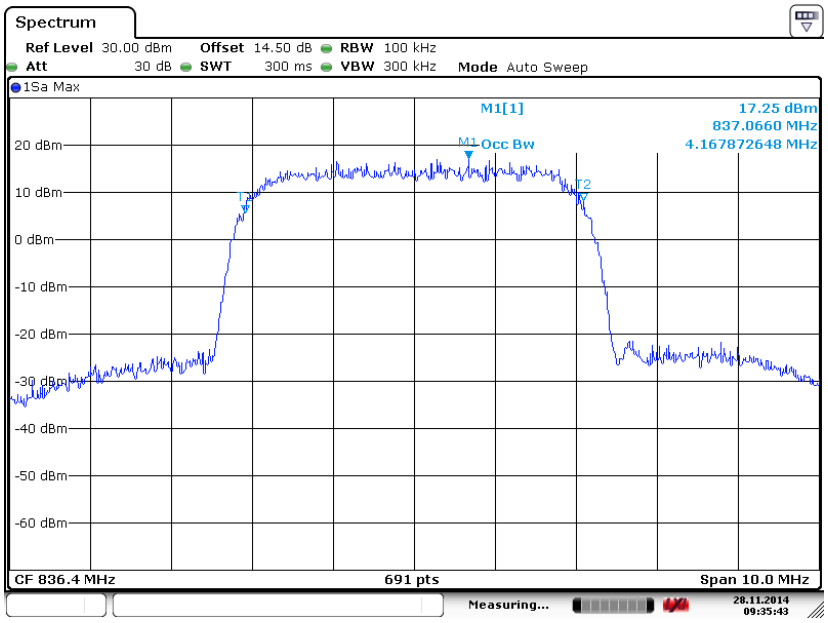


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	825.532 MHz	19.38 dBm	ndB down	4.689 MHz
T1		1	824.056 MHz	-6.05 dBm	ndB	26.00 dB
T2		1	828.744 MHz	-7.17 dBm	Q factor	176.1

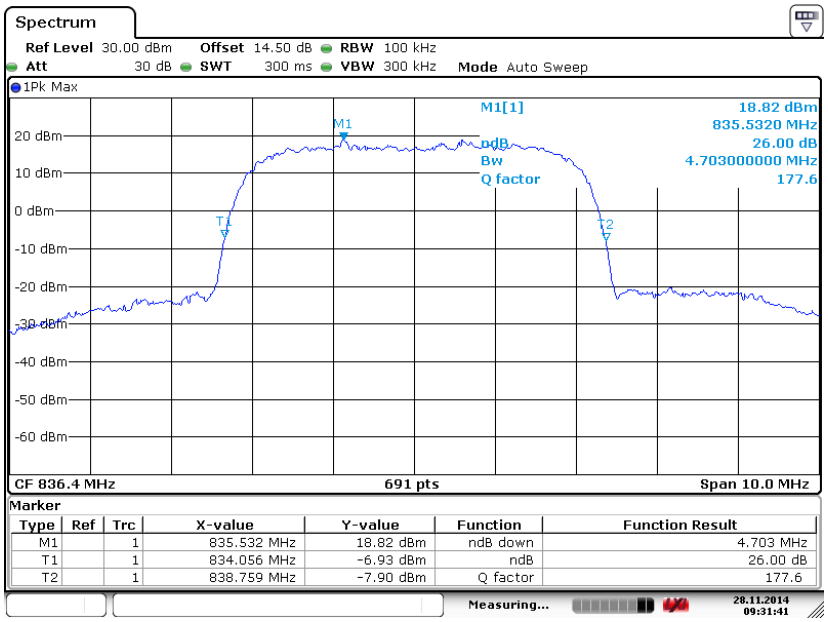
Date: 28.NOV.2014 09:32:52

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



Date: 28.NOV.2014 09:35:43

26dB Bandwidth Plot on Channel 4182 (836.4 MHz)

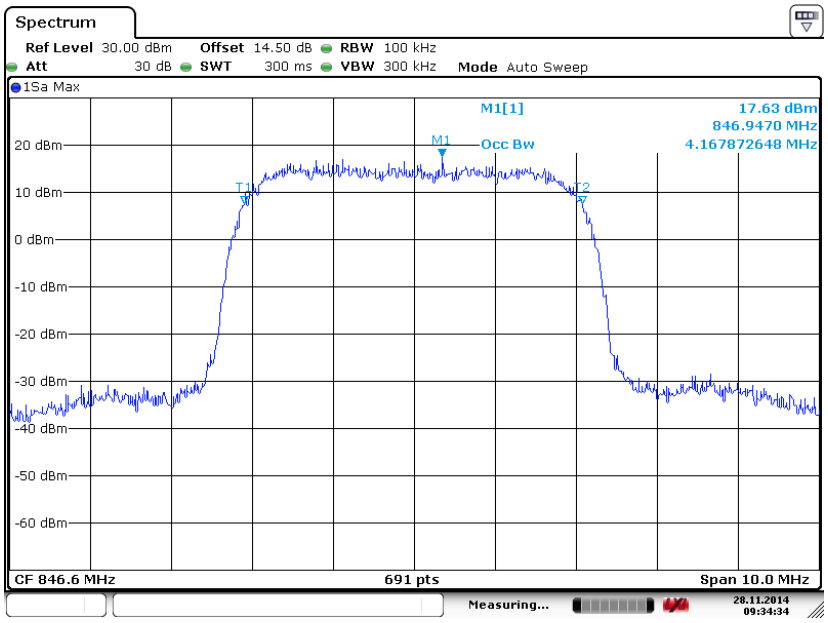


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	835.532 MHz	18.82 dBm	ndB down	4.703 MHz
T1		1	834.056 MHz	-6.93 dBm	ndB	26.00 dB
T2		1	838.759 MHz	-7.90 dBm	Q factor	177.6

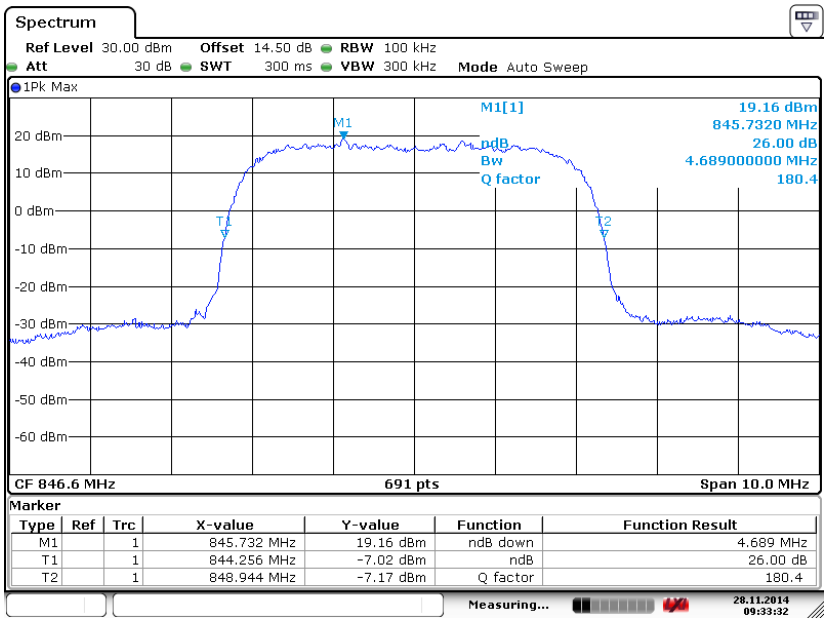
Date: 28.NOV.2014 09:31:41

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



Date: 28.NOV.2014 09:34:35

26dB Bandwidth Plot on Channel 4233 (846.6 MHz)



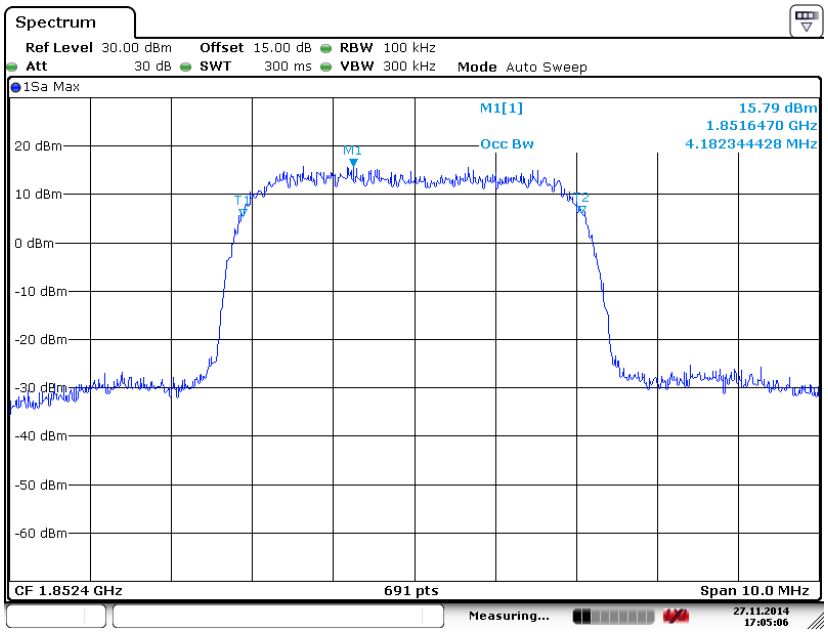
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	845.732 MHz	19.16 dBm	ndB down	4.689 MHz
T1		1	844.256 MHz	-7.02 dBm	ndB	26.00 dB
T2		1	848.944 MHz	-7.17 dBm	Q factor	180.4

Date: 28.NOV.2014 09:33:32

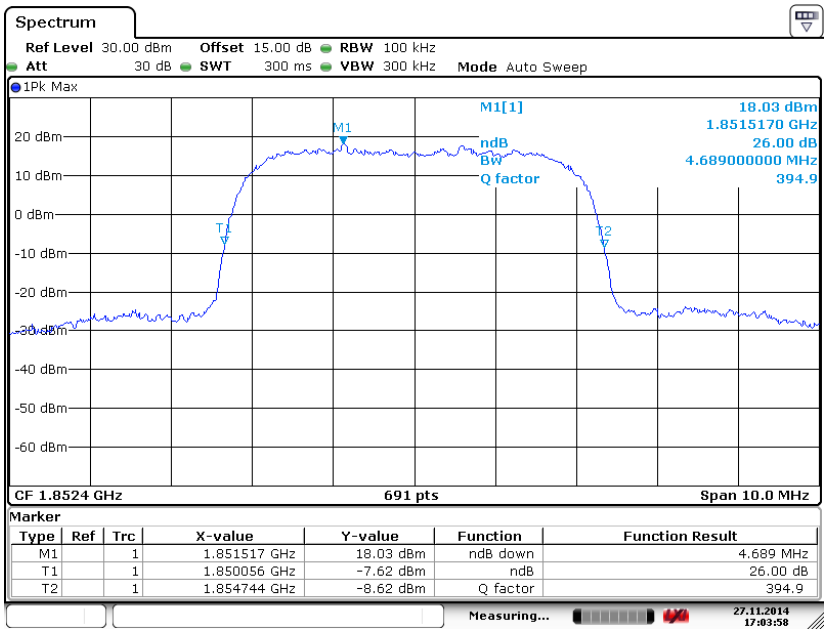
Band :	WCDMA Band II	Test Mode :	RMC 12.2Kbps Link (QPSK)

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



Date: 27.NOV.2014 17:05:06

26dB Bandwidth Plot on Channel 9262 (1852.4 MHz)

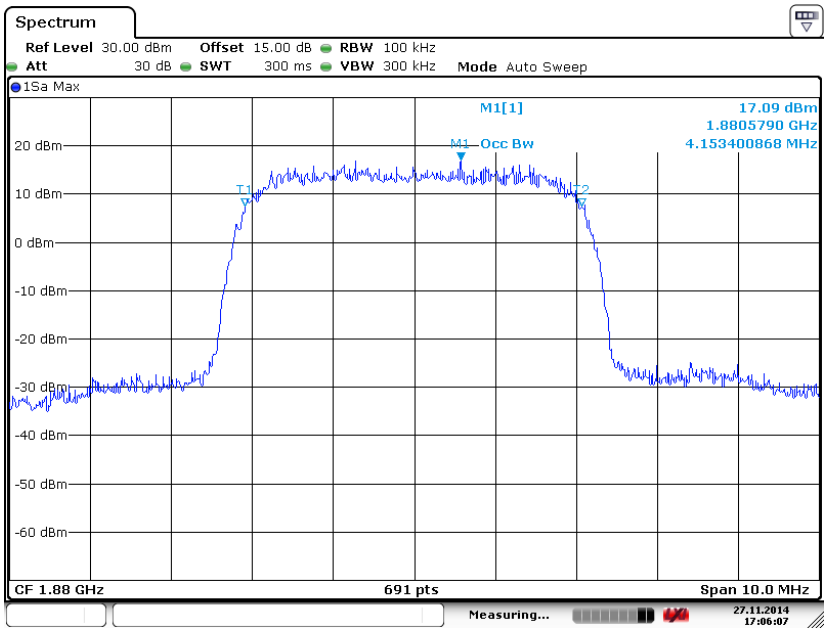


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.851517 GHz	18.03 dBm	ndB down	4.689 MHz
T1		1	1.850056 GHz	-7.62 dBm	ndB	26.00 dB
T2		1	1.854744 GHz	-8.62 dBm	Q factor	394.9

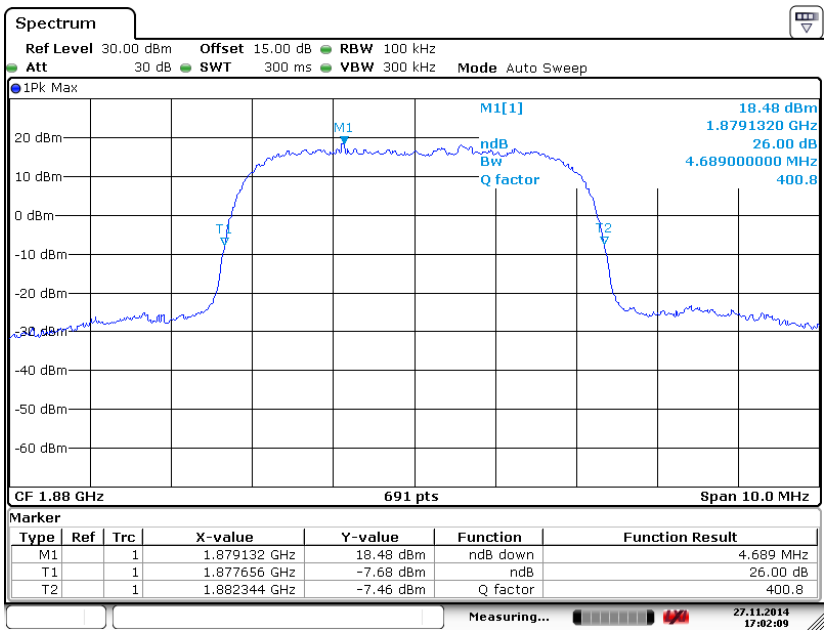
Date: 27.NOV.2014 17:03:58

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



Date: 27.NOV.2014 17:06:07

26dB Bandwidth Plot on Channel 9400 (1880.0 MHz)

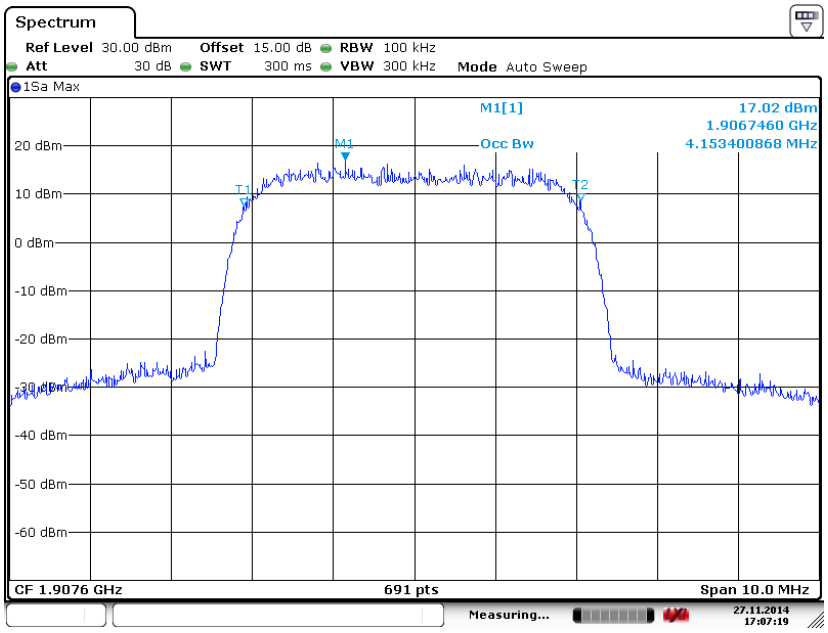


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.879132 GHz	18.48 dBm	ndB down	4.689 MHz
T1		1	1.877656 GHz	-7.68 dBm	ndB	26.00 dB
T2		1	1.882344 GHz	-7.46 dBm	Q factor	400.8

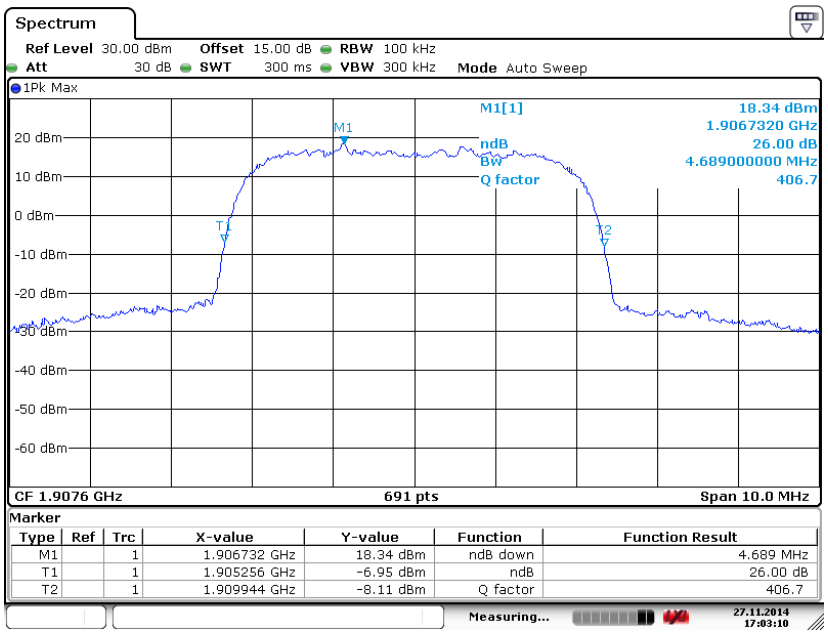
Date: 27.NOV.2014 17:02:09

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



Date: 27.NOV.2014 17:07:19

26dB Bandwidth Plot on Channel 9538 (1907.6 MHz)



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.906732 GHz	18.34 dBm	ndB down	4.689 MHz
T1		1	1.905256 GHz	-6.95 dBm	ndB	26.00 dB
T2		1	1.909944 GHz	-8.11 dBm	Q factor	406.7

Date: 27.NOV.2014 17:03:10

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

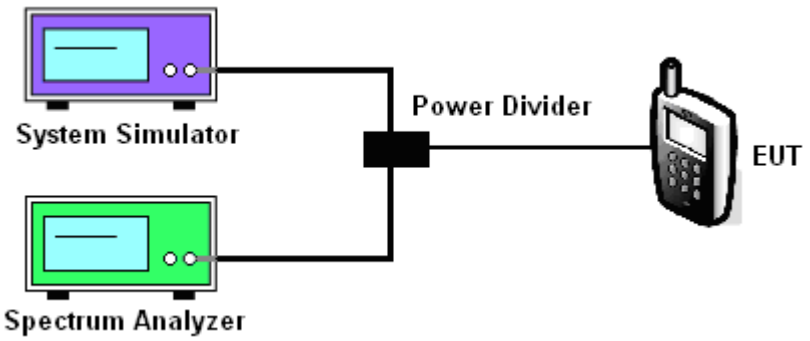
The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 6.0.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The band edges of low and high channels for the highest RF powers were measured.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. 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

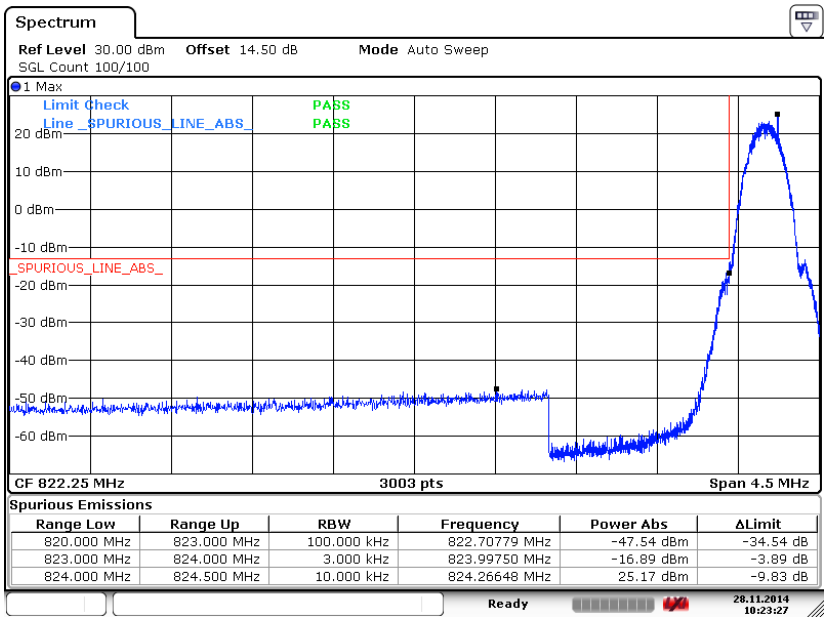
<Conducted Band Edge >



3.5.5 Test Result (Plots) of Conducted Band Edge

Band :	GSM850	Test Mode :	GSM Link (GMSK)

Lower Band Edge Plot on Channel 128 (824.2 MHz)



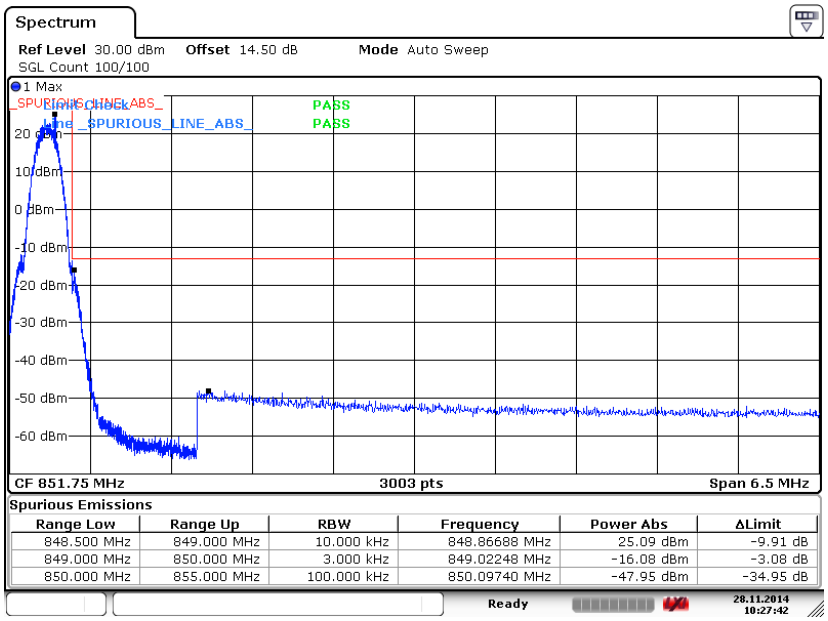
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
820.000 MHz	823.000 MHz	100.000 kHz	822.70779 MHz	-47.54 dBm	-34.54 dB
823.000 MHz	824.000 MHz	3.000 kHz	823.99750 MHz	-16.89 dBm	-3.89 dB
824.000 MHz	824.500 MHz	10.000 kHz	824.26648 MHz	25.17 dBm	-9.83 dB

Date: 28.NOV.2014 10:23:27

Band :	GSM850	Test Mode :	GSM Link (GMSK)

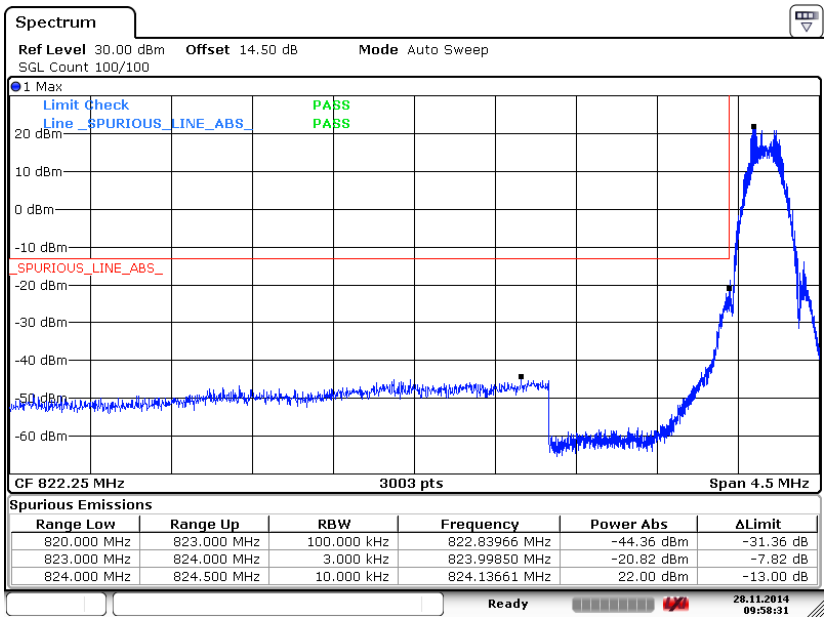
Higher Band Edge Plot on Channel 251 (848.8 MHz)



Date: 28.NOV.2014 10:27:42

Band :	GSM850	Test Mode :	EDGE class 8 Link (8PSK)

Lower Band Edge Plot on Channel 128 (824.2 MHz)



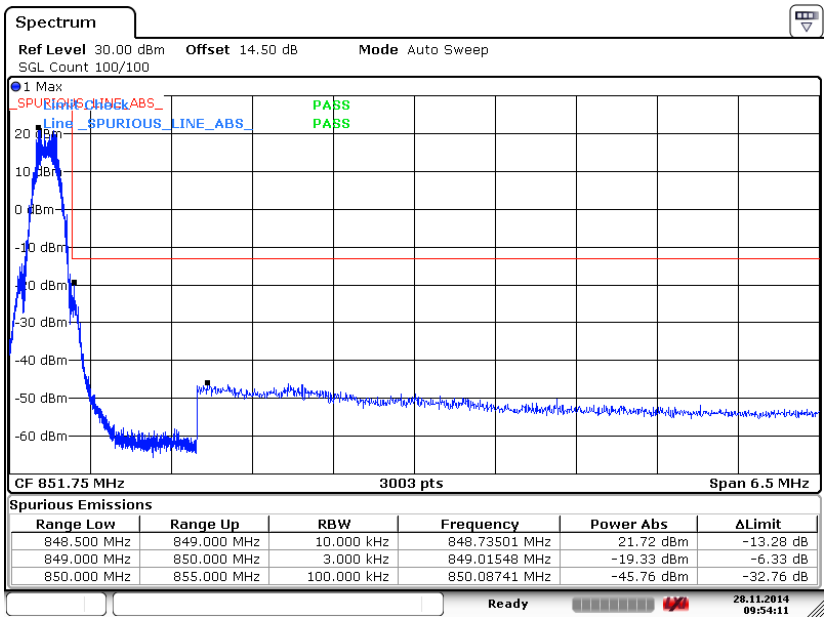
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
820.000 MHz	823.000 MHz	100.000 kHz	822.83966 MHz	-44.36 dBm	-31.36 dB
823.000 MHz	824.000 MHz	3.000 kHz	823.99850 MHz	-20.82 dBm	-7.82 dB
824.000 MHz	824.500 MHz	10.000 kHz	824.13661 MHz	22.00 dBm	-13.00 dB

Date: 28.NOV.2014 09:58:31

Band :	GSM850	Test Mode :	EDGE class 8 Link (8PSK)

Higher Band Edge Plot on Channel 251 (848.8 MHz)



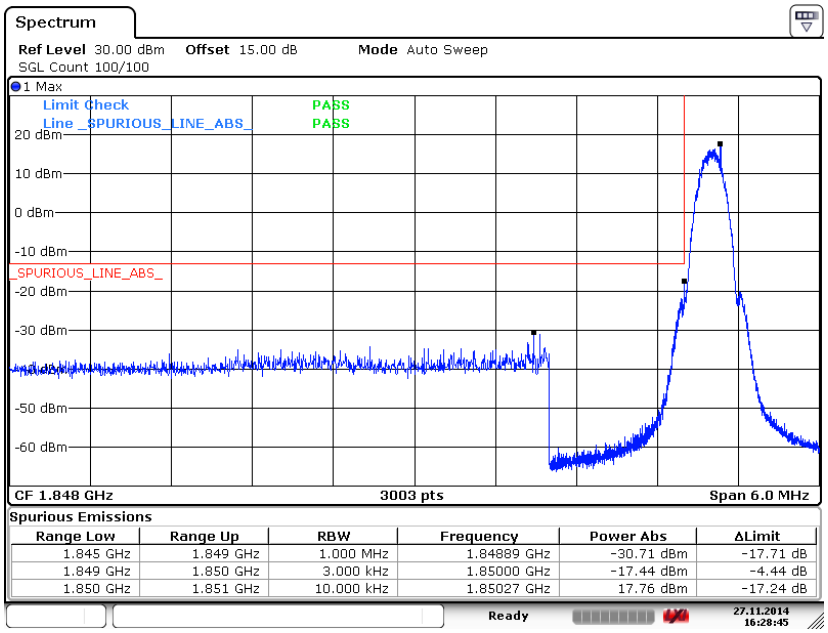
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
848.500 MHz	849.000 MHz	10.000 kHz	848.73501 MHz	21.72 dBm	-13.28 dB
849.000 MHz	850.000 MHz	3.000 kHz	849.01548 MHz	-19.33 dBm	-6.33 dB
850.000 MHz	855.000 MHz	100.000 kHz	850.08741 MHz	-45.76 dBm	-32.76 dB

Date: 28.NOV.2014 09:54:11

Band :	GSM1900	Test Mode :	GSM Link (GMSK)

Lower Band Edge Plot on Channel 512 (1850.2 MHz)



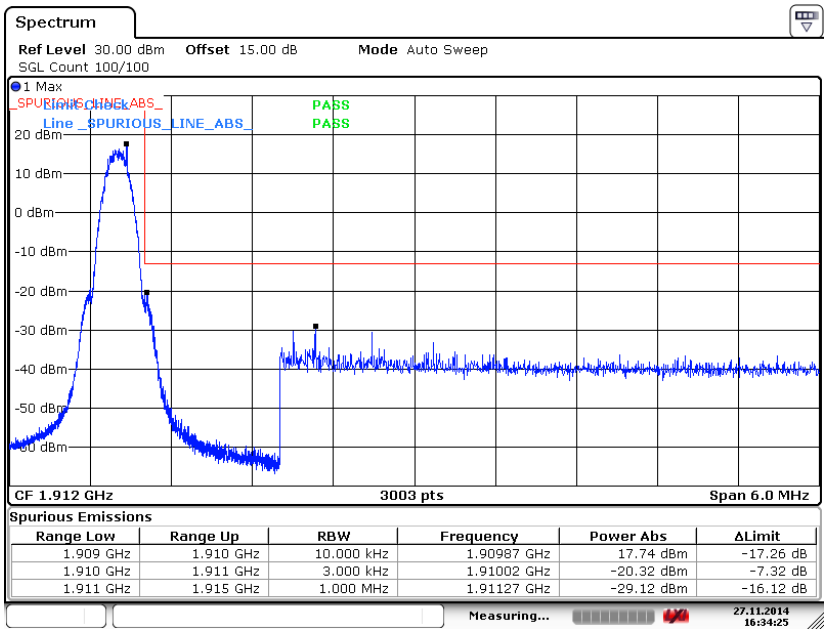
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.845 GHz	1.849 GHz	1.000 MHz	1.84889 GHz	-30.71 dBm	-17.71 dB
1.849 GHz	1.850 GHz	3.000 kHz	1.85000 GHz	-17.44 dBm	-4.44 dB
1.850 GHz	1.851 GHz	10.000 kHz	1.85027 GHz	17.76 dBm	-17.24 dB

Date: 27.NOV.2014 16:28:45

Band :	GSM1900	Test Mode :	GSM Link (GMSK)

Higher Band Edge Plot on Channel 810 (1909.8 MHz)



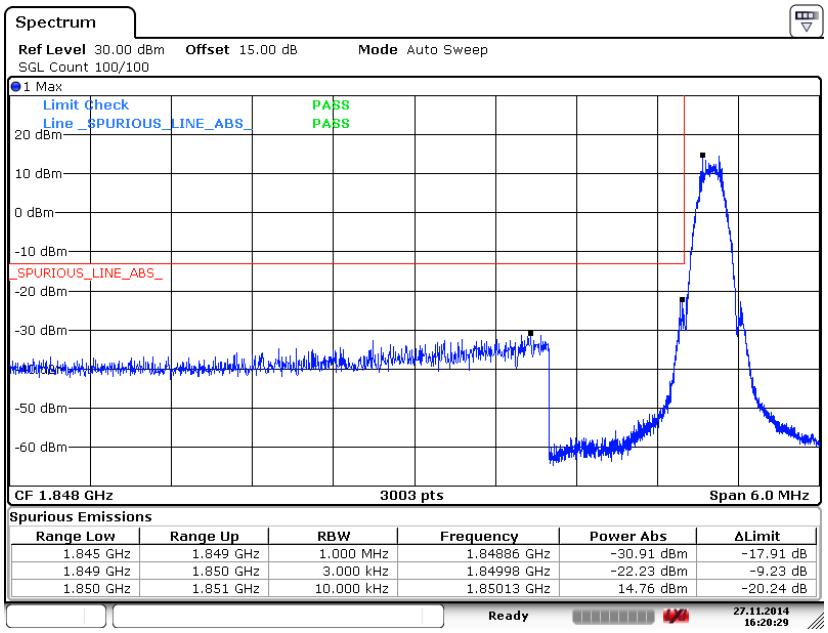
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.909 GHz	1.910 GHz	10.000 kHz	1.90987 GHz	17.74 dBm	-17.26 dB
1.910 GHz	1.911 GHz	3.000 kHz	1.91002 GHz	-20.32 dBm	-7.32 dB
1.911 GHz	1.915 GHz	1.000 MHz	1.91127 GHz	-29.12 dBm	-16.12 dB

Date: 27.NOV.2014 16:34:25

Band :	GSM1900	Test Mode :	EDGE class 8 Link (8PSK)

Lower Band Edge Plot on Channel 512 (1850.2 MHz)



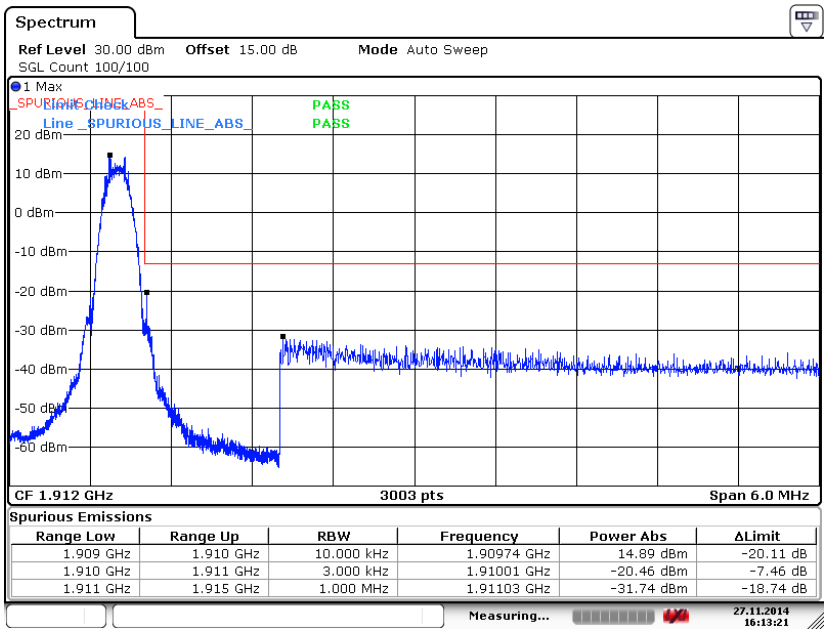
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.845 GHz	1.849 GHz	1.000 MHz	1.84886 GHz	-30.91 dBm	-17.91 dB
1.849 GHz	1.850 GHz	3.000 kHz	1.84998 GHz	-22.23 dBm	-9.23 dB
1.850 GHz	1.851 GHz	10.000 kHz	1.85013 GHz	14.76 dBm	-20.24 dB

Date: 27.NOV.2014 16:20:29

Band :	GSM1900	Test Mode :	EDGE class 8 Link (8PSK)

Higher Band Edge Plot on Channel 810 (1909.8 MHz)



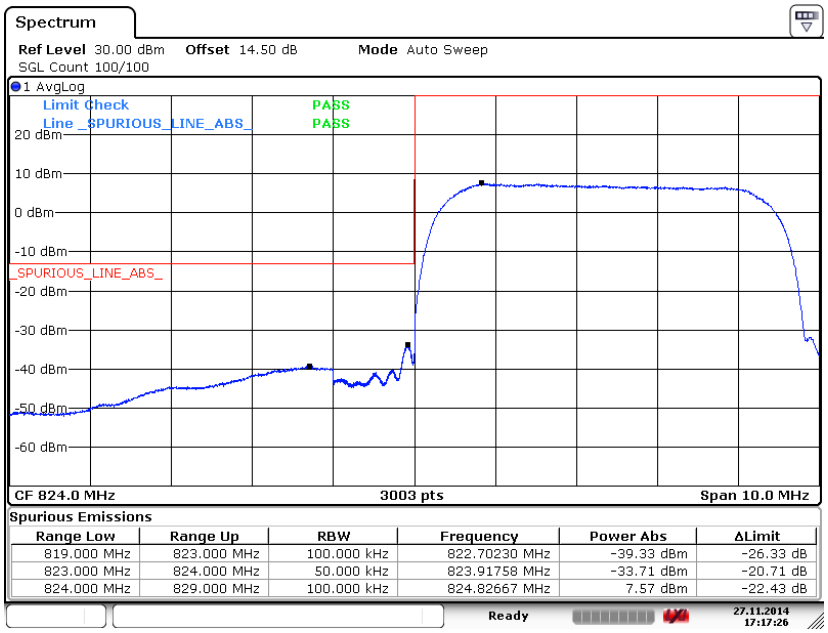
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.909 GHz	1.910 GHz	10.000 kHz	1.90974 GHz	14.89 dBm	-20.11 dB
1.910 GHz	1.911 GHz	3.000 kHz	1.91001 GHz	-20.46 dBm	-7.46 dB
1.911 GHz	1.915 GHz	1.000 MHz	1.91103 GHz	-31.74 dBm	-18.74 dB

Date: 27.NOV.2014 16:13:21

Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link (QPSK)

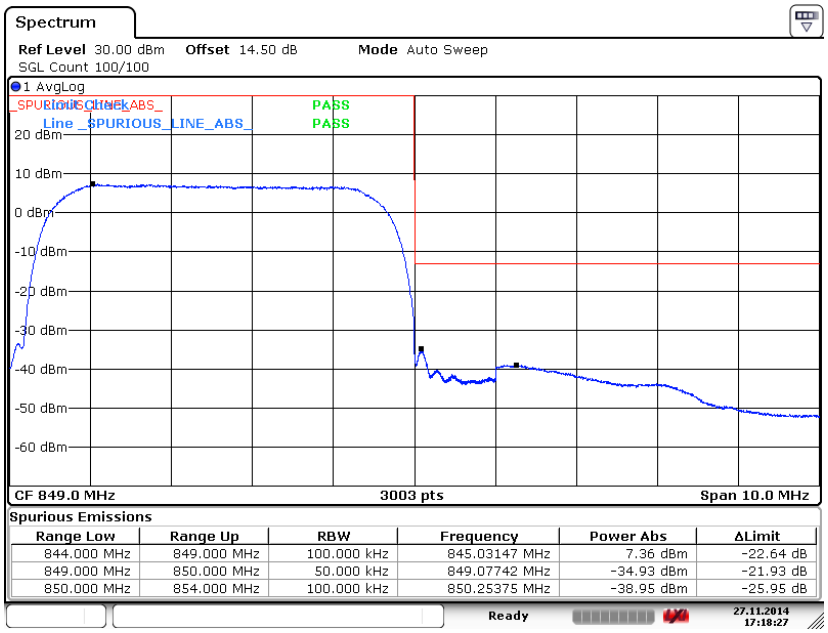
Lower Band Edge Plot on Channel 4132 (826.4 MHz)



Date: 27.NOV.2014 17:17:26

Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link (QPSK)

Higher Band Edge Plot on Channel 4233 (846.6 MHz)



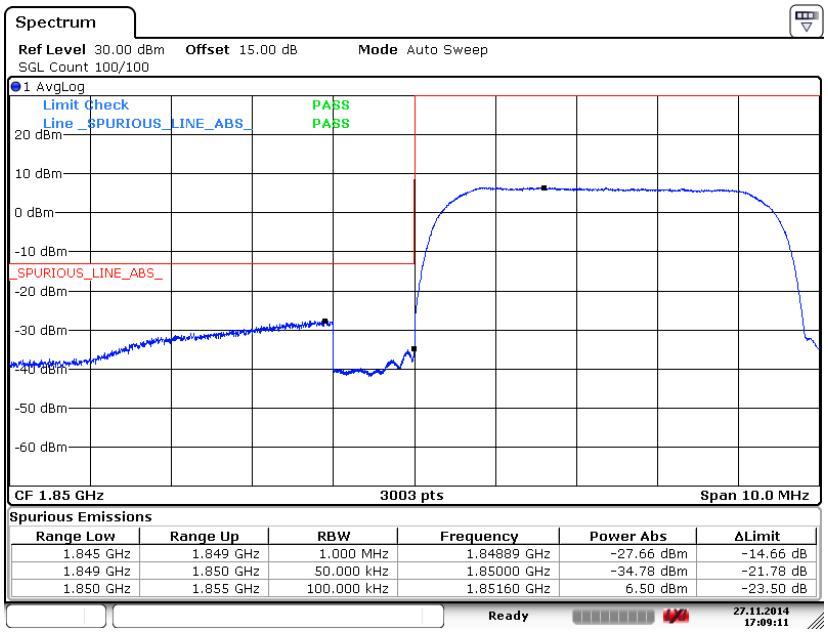
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
844.000 MHz	849.000 MHz	100.000 kHz	845.03147 MHz	7.36 dBm	-22.64 dB
849.000 MHz	850.000 MHz	50.000 kHz	849.07742 MHz	-34.93 dBm	-21.93 dB
850.000 MHz	854.000 MHz	100.000 kHz	850.25375 MHz	-38.95 dBm	-25.95 dB

Date: 27.NOV.2014 17:18:27

Band :	WCDMA Band II	Test Mode :	RMC 12.2Kbps Link (QPSK)

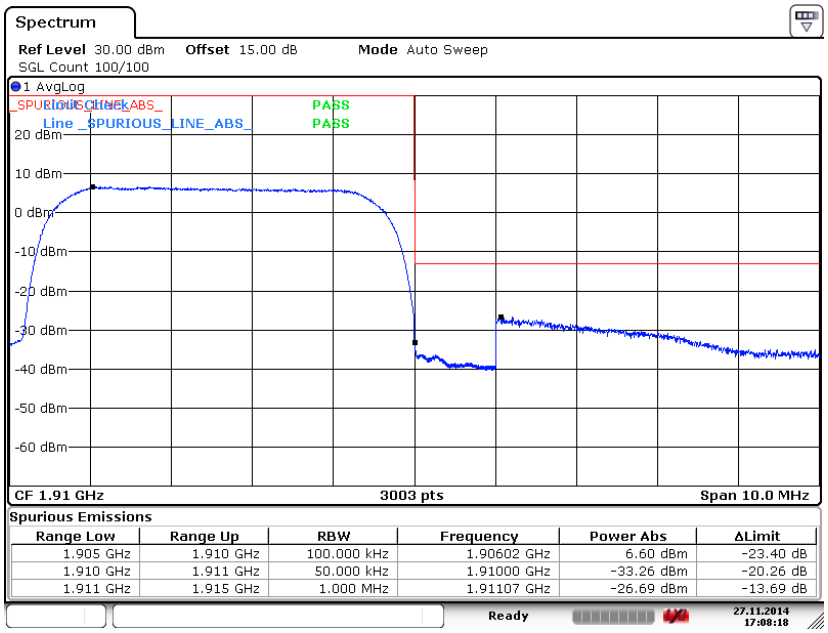
Lower Band Edge Plot on Channel 9262 (1852.4 MHz)



Date: 27.NOV.2014 17:09:10

Band :	WCDMA Band II	Test Mode :	RMC 12.2Kbps Link (QPSK)

Higher Band Edge Plot on Channel 9538 (1907.6 MHz)



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.905 GHz	1.910 GHz	100.000 kHz	1.90602 GHz	6.60 dBm	-23.40 dB
1.910 GHz	1.911 GHz	50.000 kHz	1.91000 GHz	-33.26 dBm	-20.26 dB
1.911 GHz	1.915 GHz	1.000 MHz	1.91107 GHz	-26.69 dBm	-13.69 dB

Date: 27.NOV.2014 17:08:18

3.6 Conducted Spurious Emission Measurement

3.6.1 Description of Conducted Spurious 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.

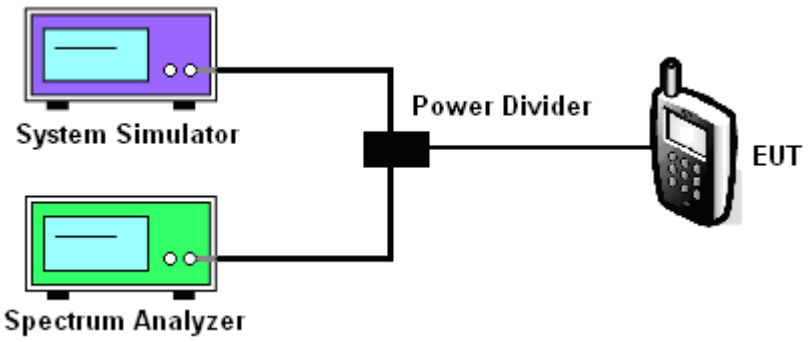
3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.6.3 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 6.0.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. 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.

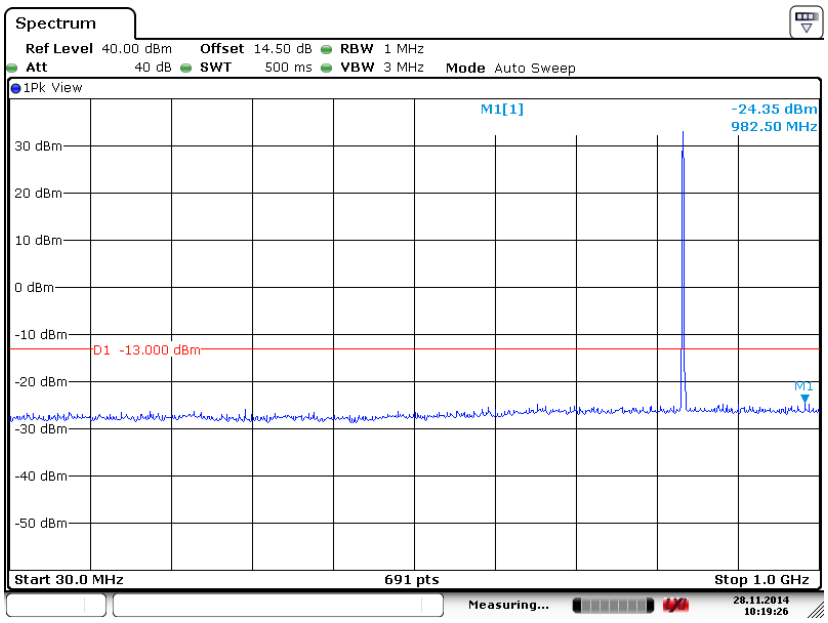
3.6.4 Test Setup



3.6.5 Test Result (Plots) of Conducted Spurious Emission

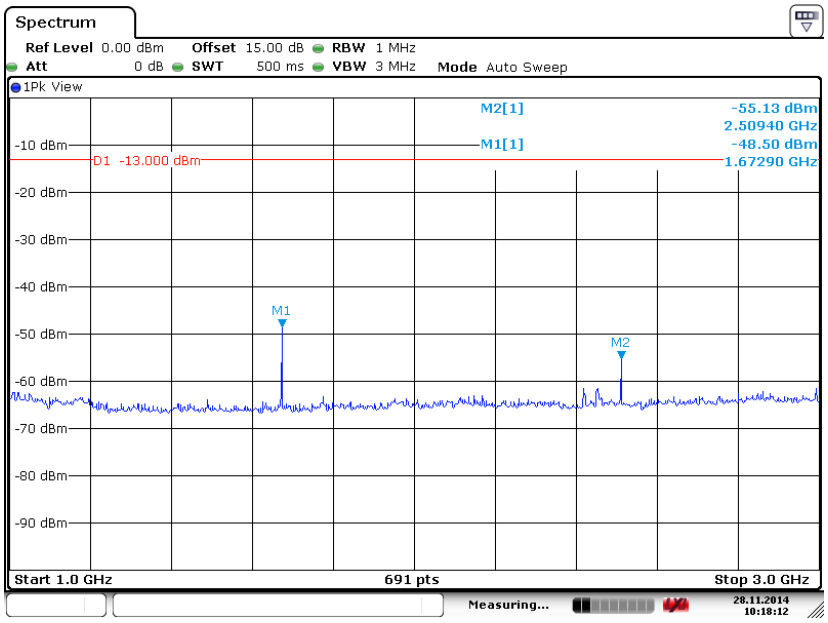
Band :	GSM850	Channel :	CH189
Test Mode :	GSM Link (GMSK)	Frequency :	836.4 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



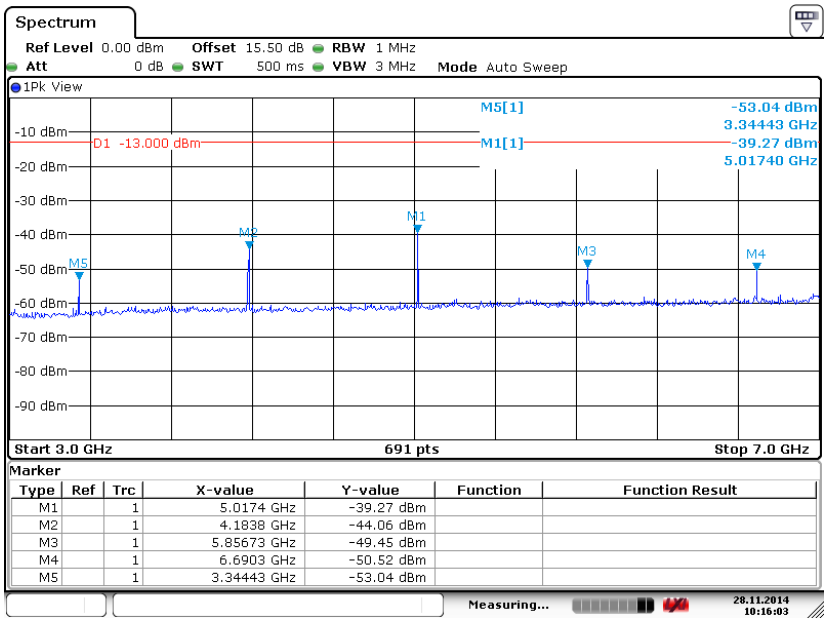
Date: 28.NOV.2014 10:19:26

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



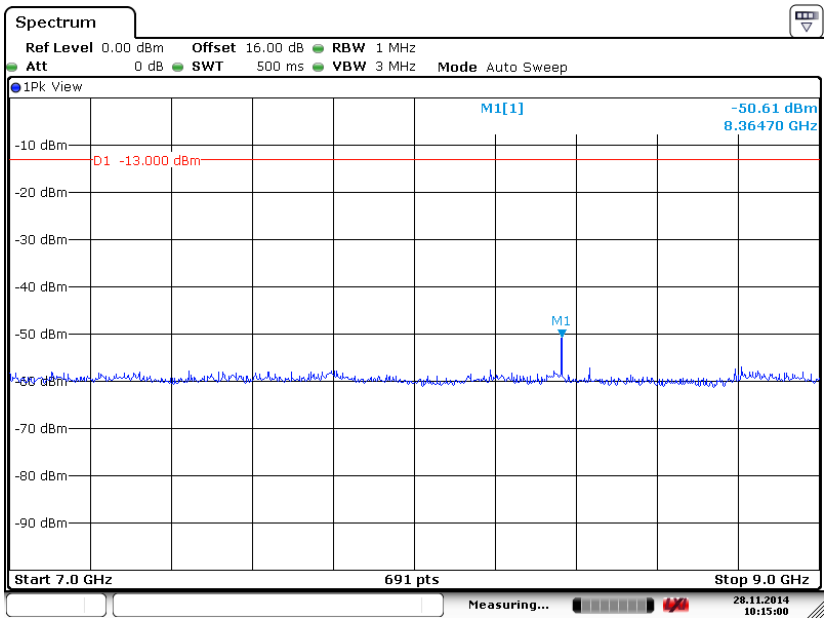
Date: 28.NOV.2014 10:18:12

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 28.NOV.2014 10:16:03

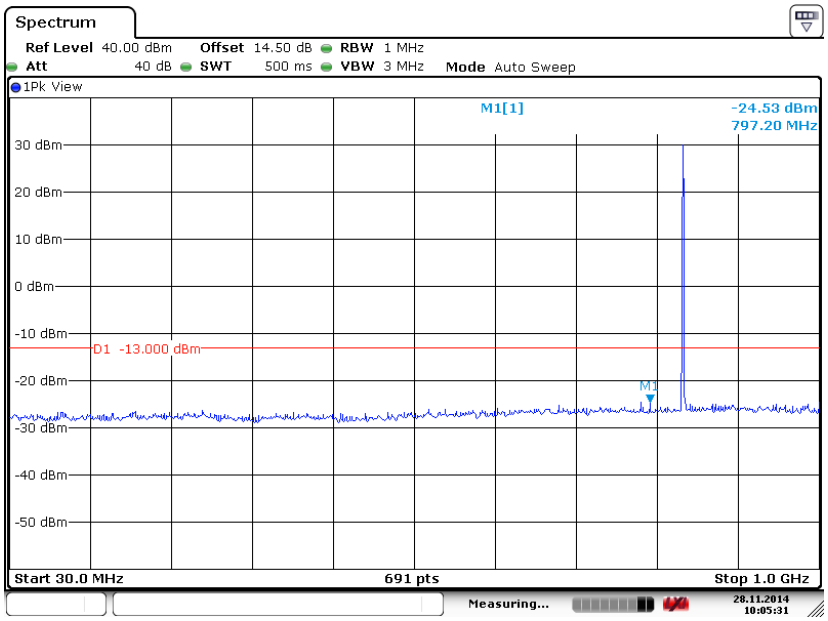
Conducted Spurious Emission Plot between 7GHz ~ 9GHz



Date: 28.NOV.2014 10:15:00

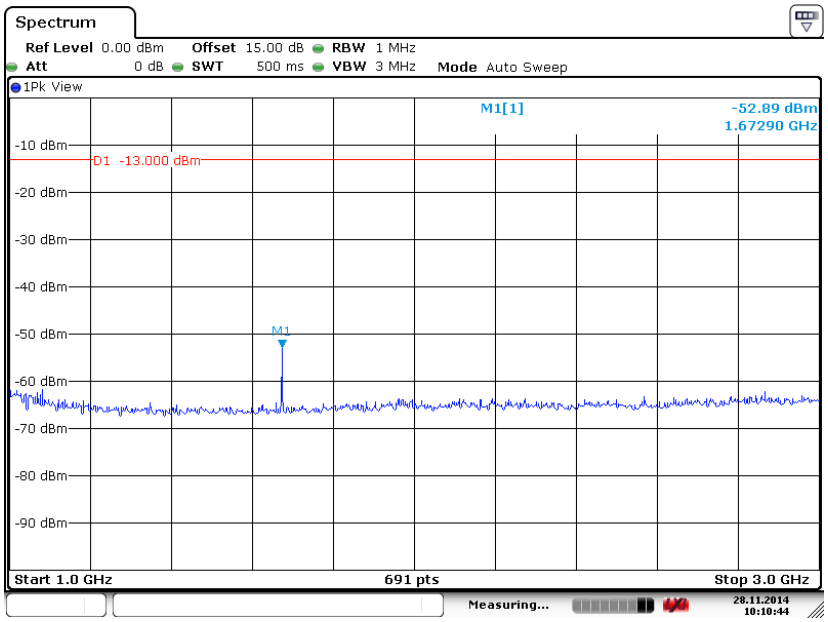
Band :	GSM850	Channel :	CH189
Test Mode :	EDGE class 8 Link (8PSK)	Frequency :	836.4 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



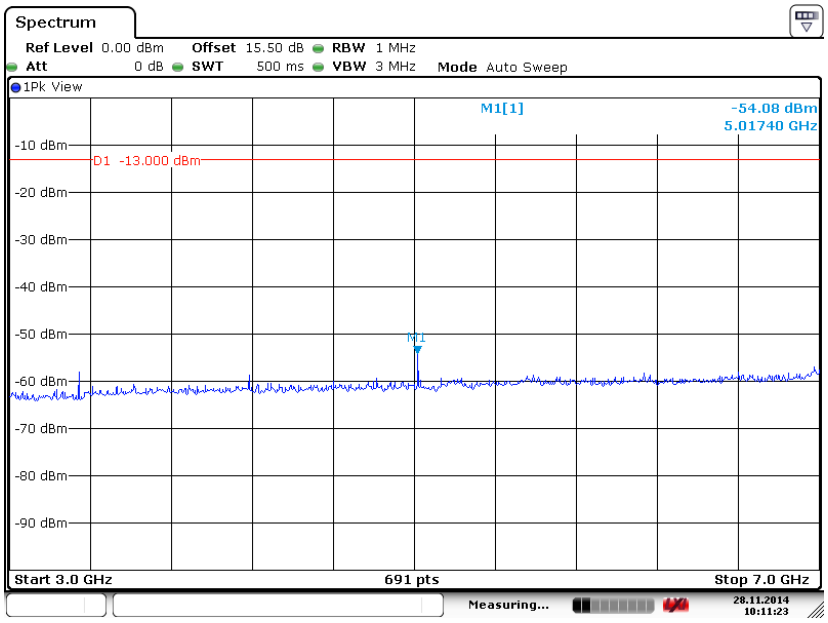
Date: 28.NOV.2014 10:05:32

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



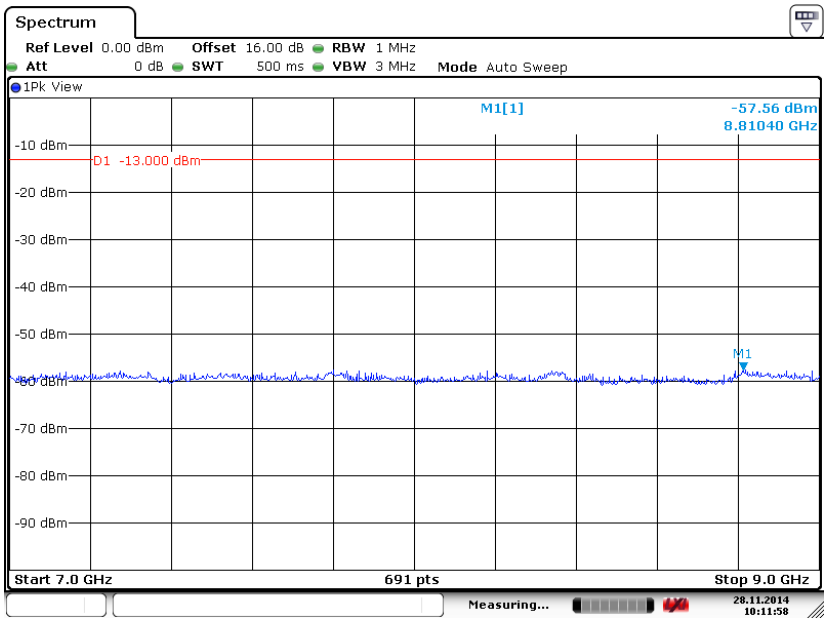
Date: 28.NOV.2014 10:10:45

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 28.NOV.2014 10:11:23

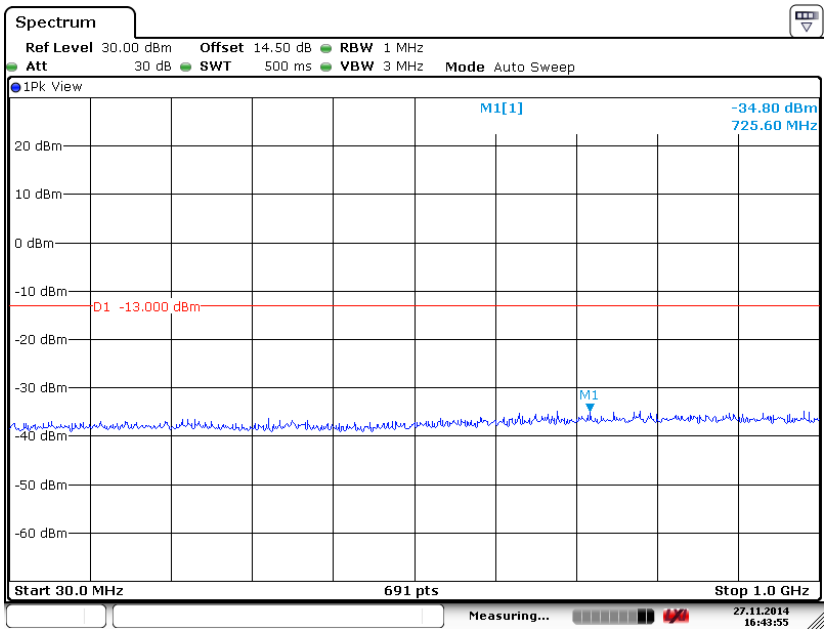
Conducted Spurious Emission Plot between 7GHz ~ 9GHz



Date: 28.NOV.2014 10:11:59

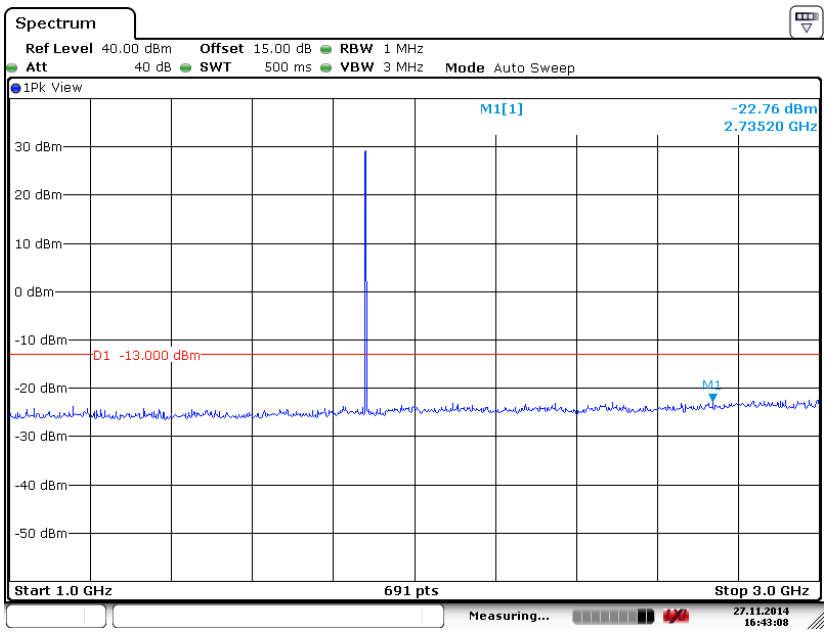
Band :	GSM1900	Channel :	CH661
Test Mode :	GSM Link (GMSK)	Frequency :	1880.0 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



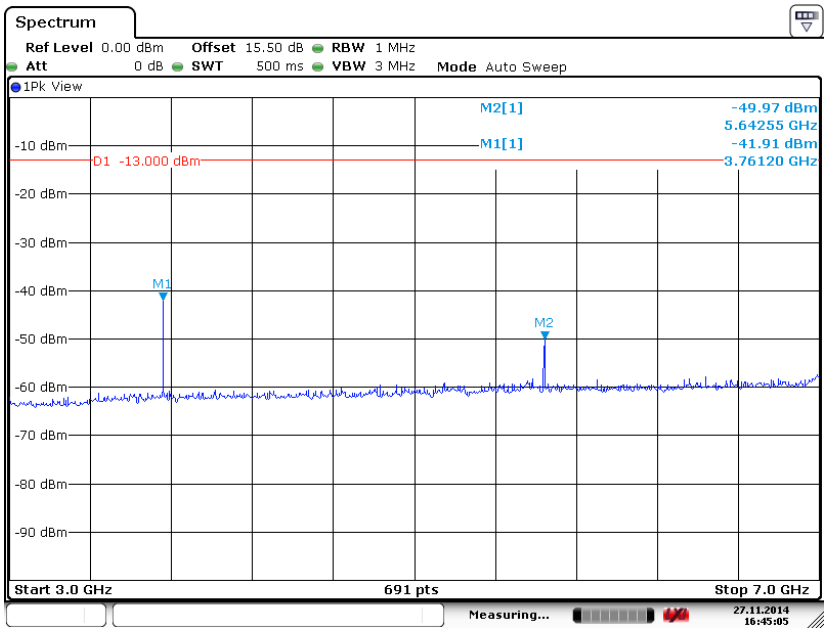
Date: 27.NOV.2014 16:43:54

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



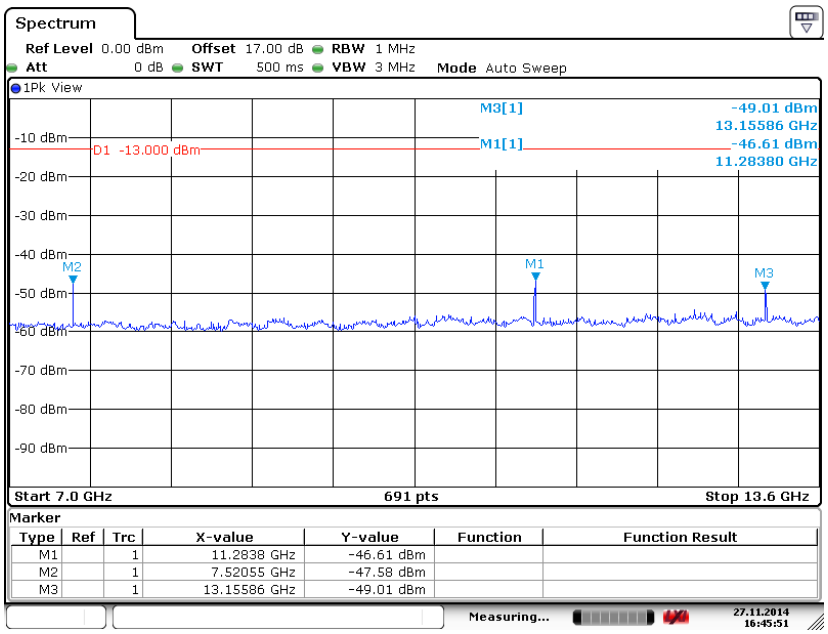
Date: 27.NOV.2014 16:43:08

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 27.NOV.2014 16:45:05

Conducted Spurious Emission Plot between 7GHz ~ 13.6GHz

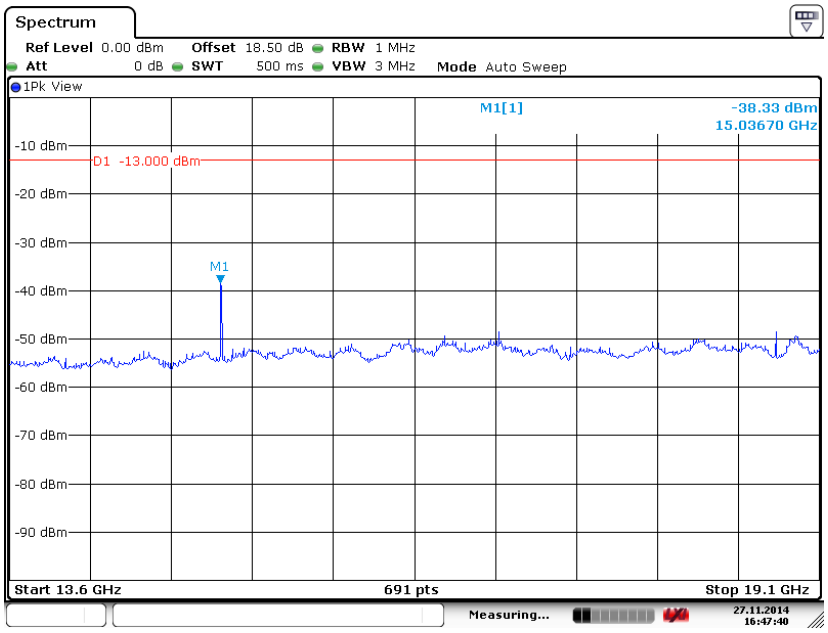


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	11.2838 GHz	-46.61 dBm		
M2		1	7.52055 GHz	-47.58 dBm		
M3		1	13.15586 GHz	-49.01 dBm		

Date: 27.NOV.2014 16:45:51

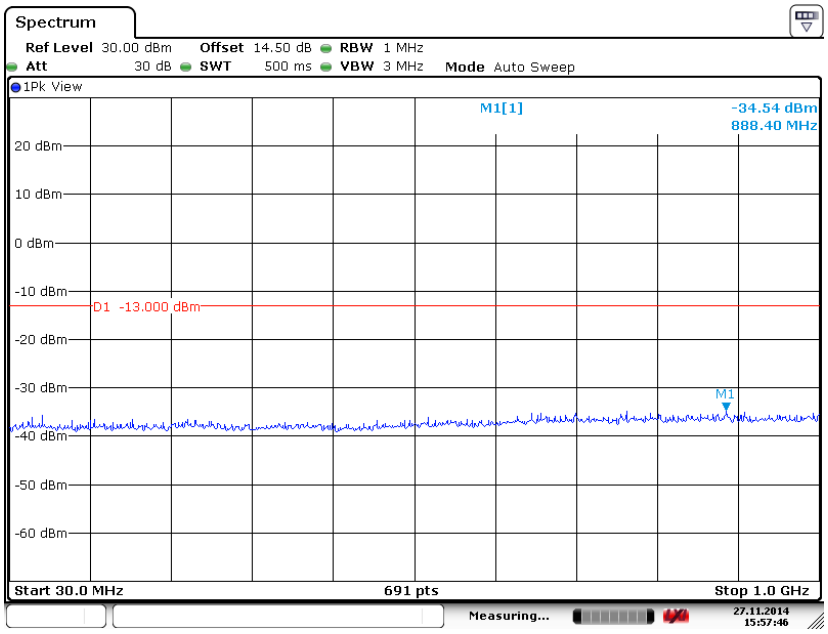
Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz



Date: 27.NOV.2014 16:47:40

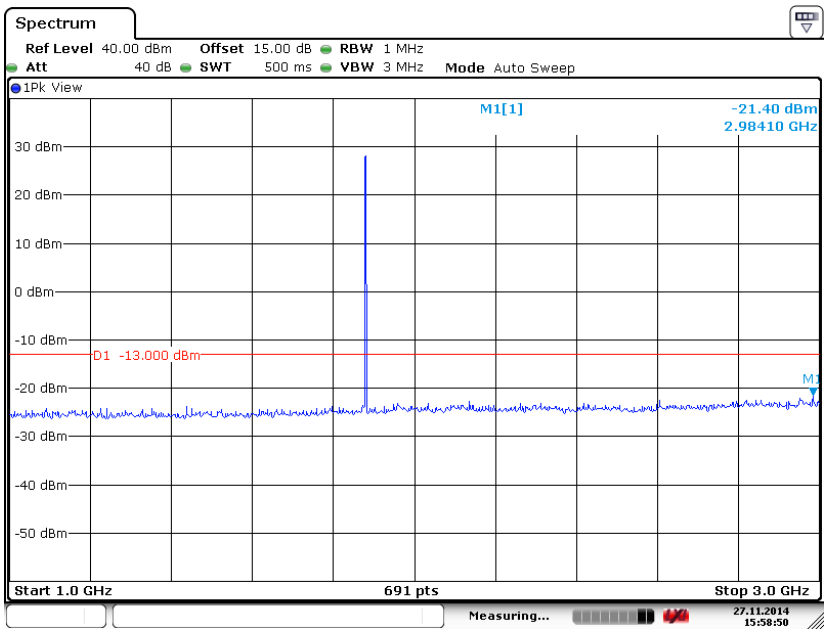
Band :	GSM1900	Channel :	CH661
Test Mode :	EDGE class 8 Link (8PSK)	Frequency :	1880.0 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



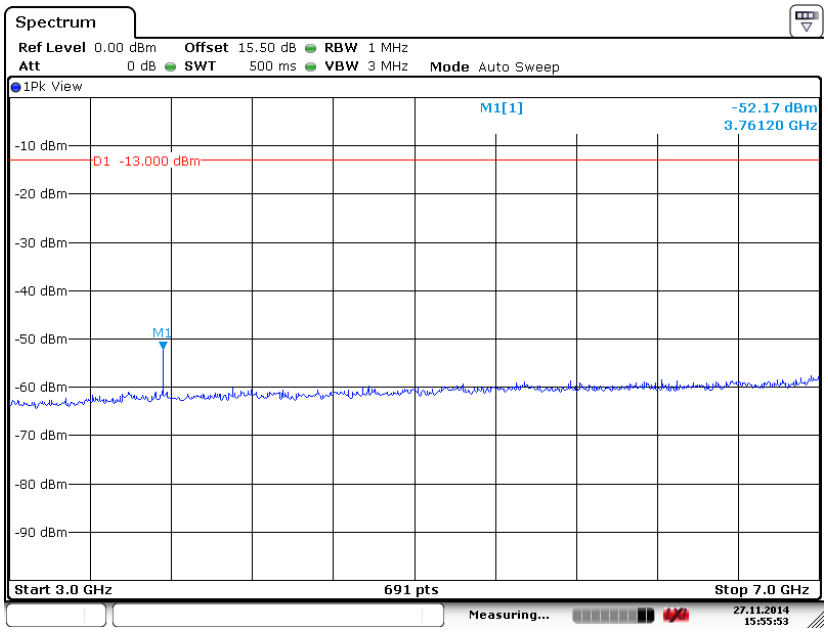
Date: 27.NOV.2014 15:57:46

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



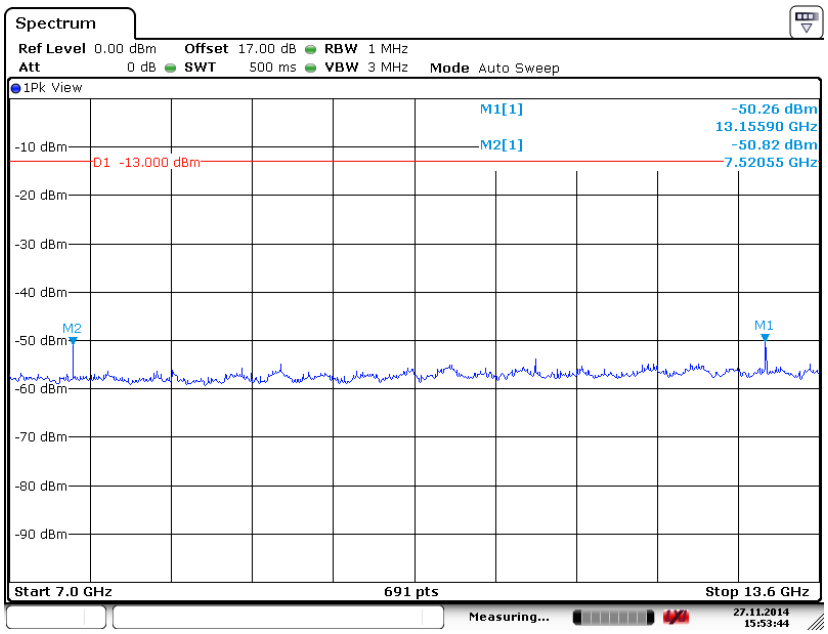
Date: 27.NOV.2014 15:58:50

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



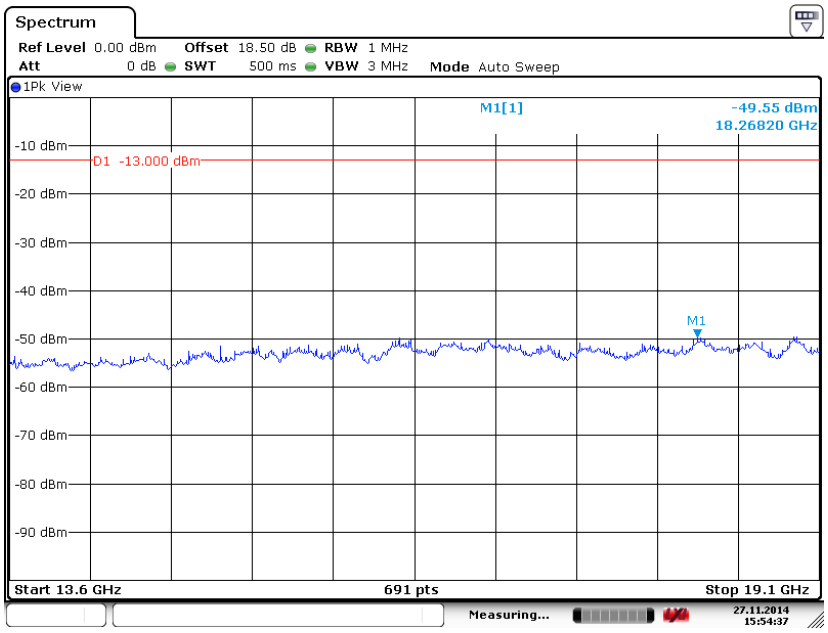
Date: 27.NOV.2014 15:55:53

Conducted Spurious Emission Plot between 7GHz ~ 13.6GHz



Date: 27.NOV.2014 15:53:44

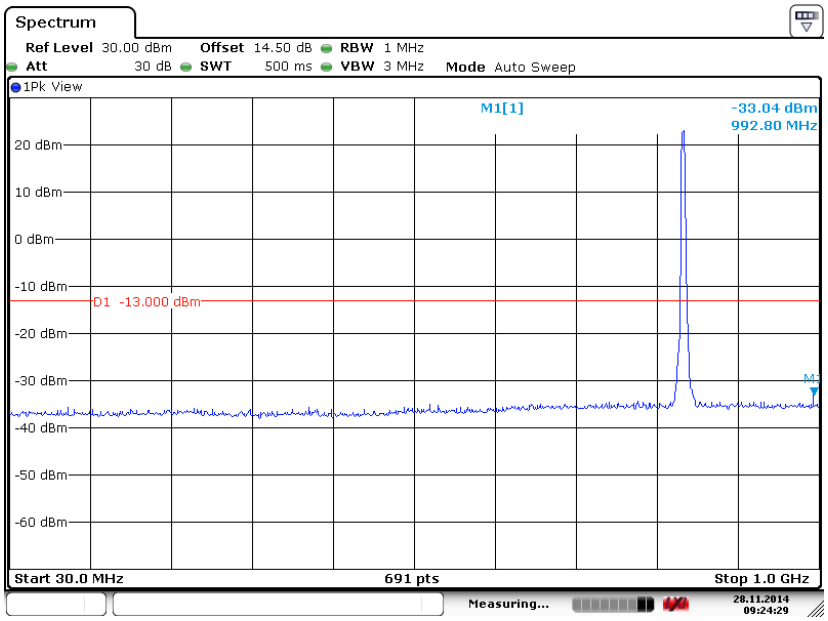
Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz



Date: 27.NOV.2014 15:54:36

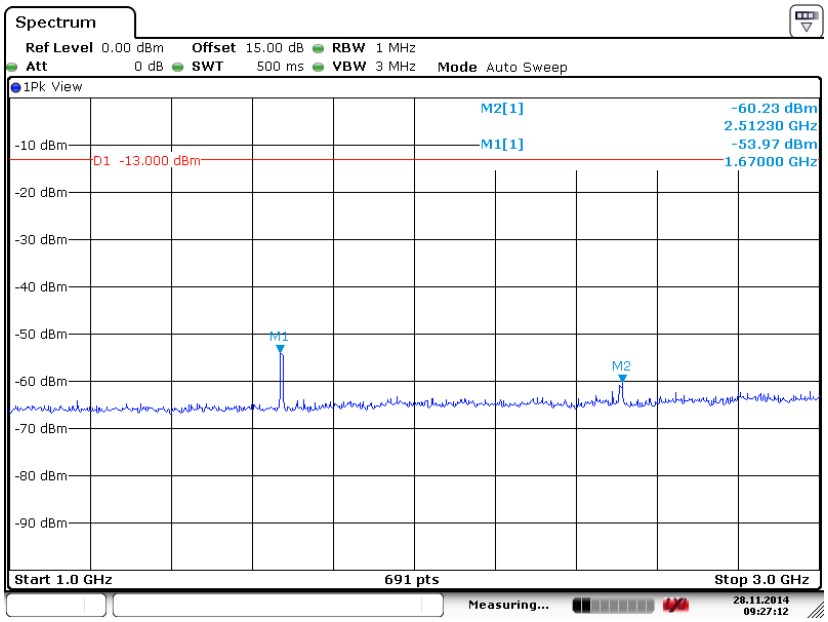
Band :	WCDMA Band V	Channel :	CH4182
Test Mode :	RMC 12.2Kbps Link (QPSK)	Frequency :	836.4 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



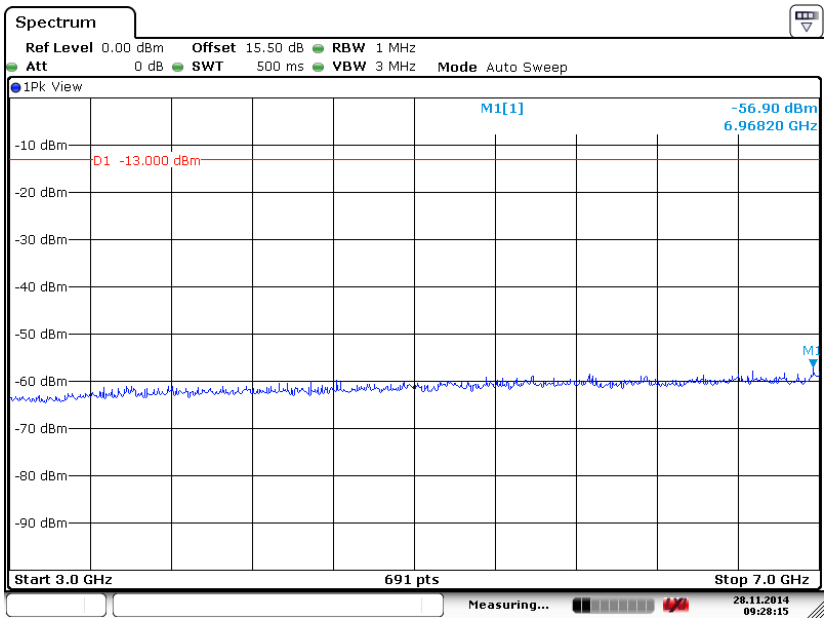
Date: 28.NOV.2014 09:24:29

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



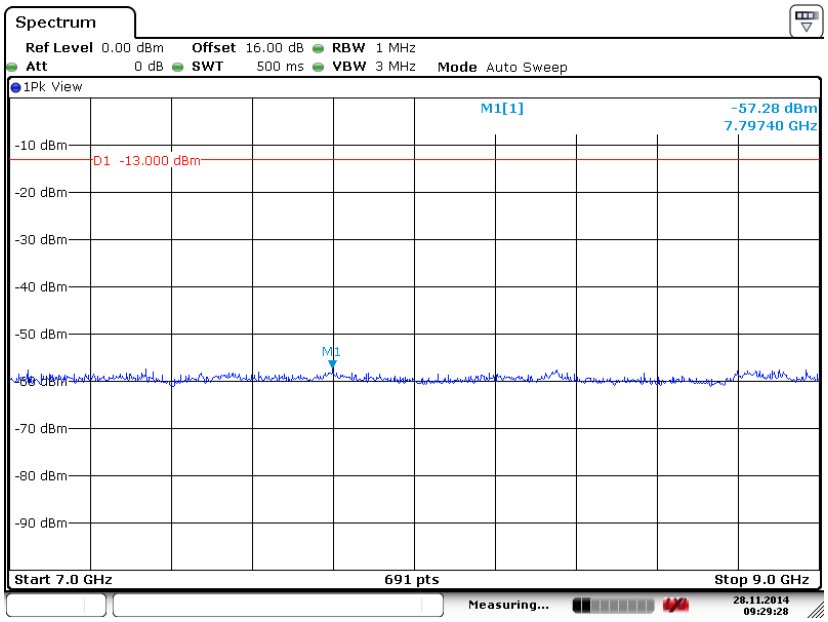
Date: 28.NOV.2014 09:27:12

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 28.NOV.2014 09:28:16

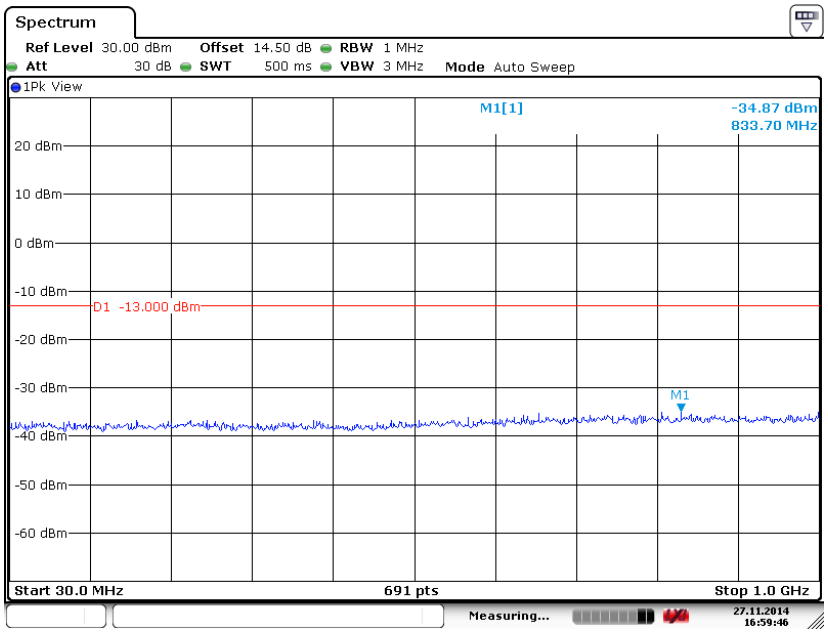
Conducted Spurious Emission Plot between 7GHz ~ 9GHz



Date: 28.NOV.2014 09:29:28

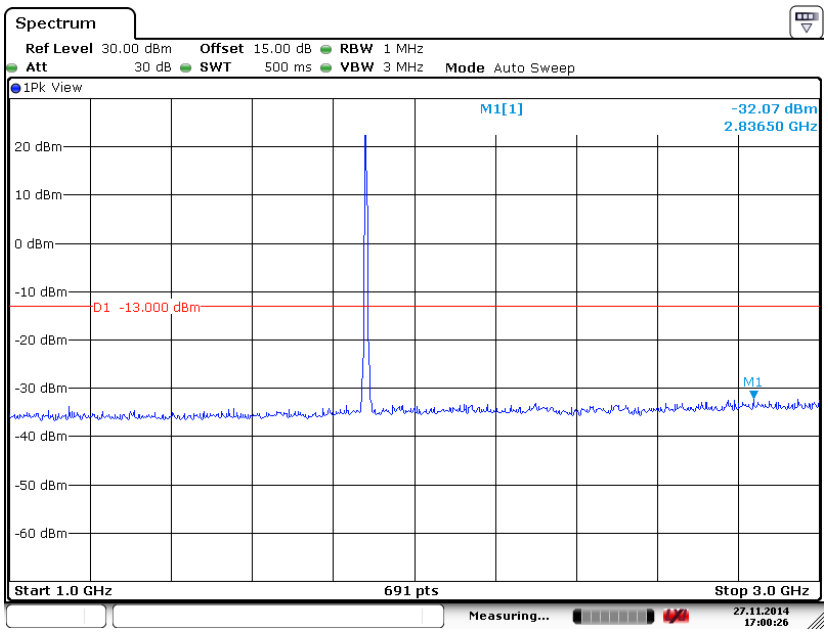
Band :	WCDMA Band II	Channel :	CH9400
Test Mode :	RMC 12.2Kbps Link (QPSK)	Frequency :	1880.0 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



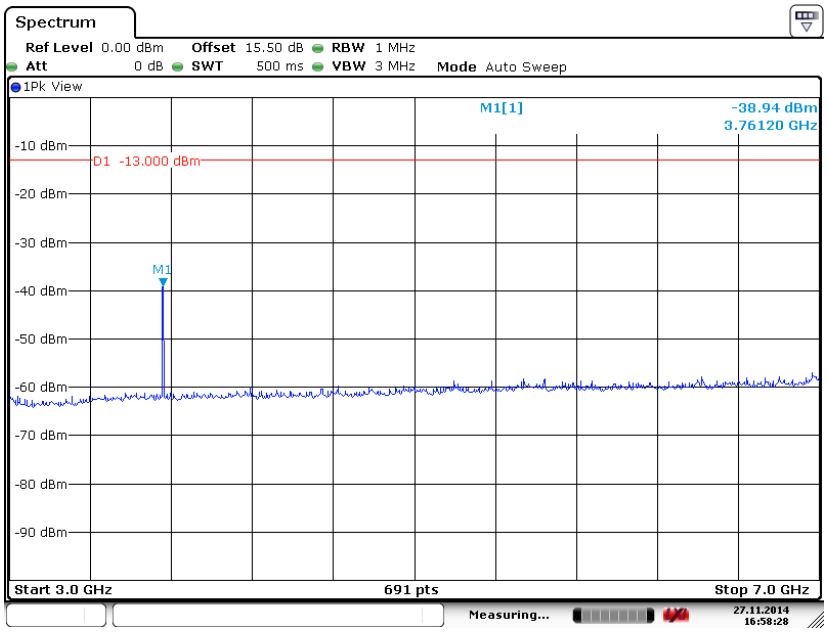
Date: 27.NOV.2014 16:59:46

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



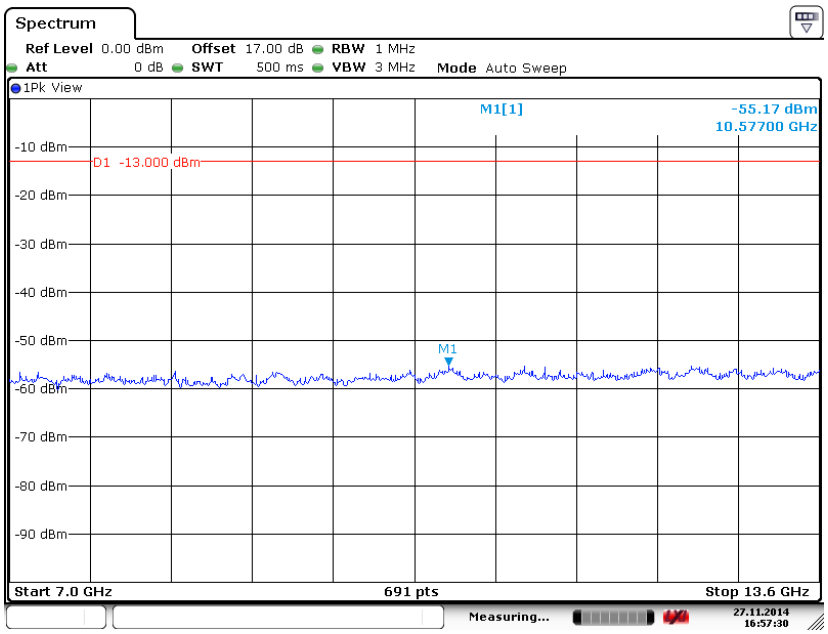
Date: 27.NOV.2014 17:00:26

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



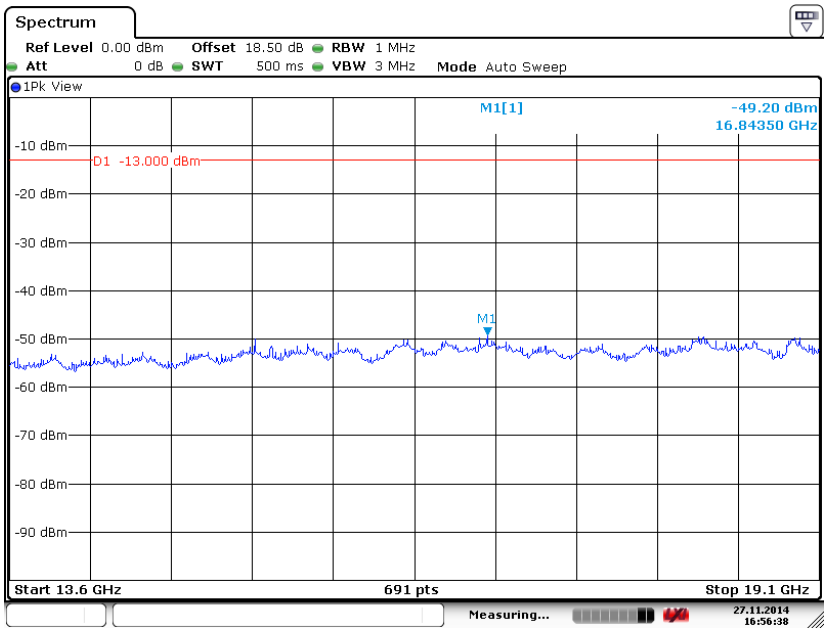
Date: 27.NOV.2014 16:58:28

Conducted Spurious Emission Plot between 7GHz ~ 13.6GHz



Date: 27.NOV.2014 16:57:30

Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz



Date: 27.NOV.2014 16:56:38

3.7 Field Strength of Spurious Radiation Measurement

3.7.1 Description of Field Strength of Spurious Radiated Measurement

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

The measuring equipment is listed in the section 4 of this test report.

3.7.3 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 5.8 and ANSI / TIA-603-C-2004 Section 2.2.12.
2. The EUT was placed on a rotatable wooden table 0.8 meters above the ground.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between one meter and four meters to search for the maximum spurious emission for both horizontal and vertical polarizations.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. Taking the record of output power at antenna port.
10. Repeat step 7 to step 8 for another polarization.
11. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
12. ERP (dBm) = EIRP - 2.15
13. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
14. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

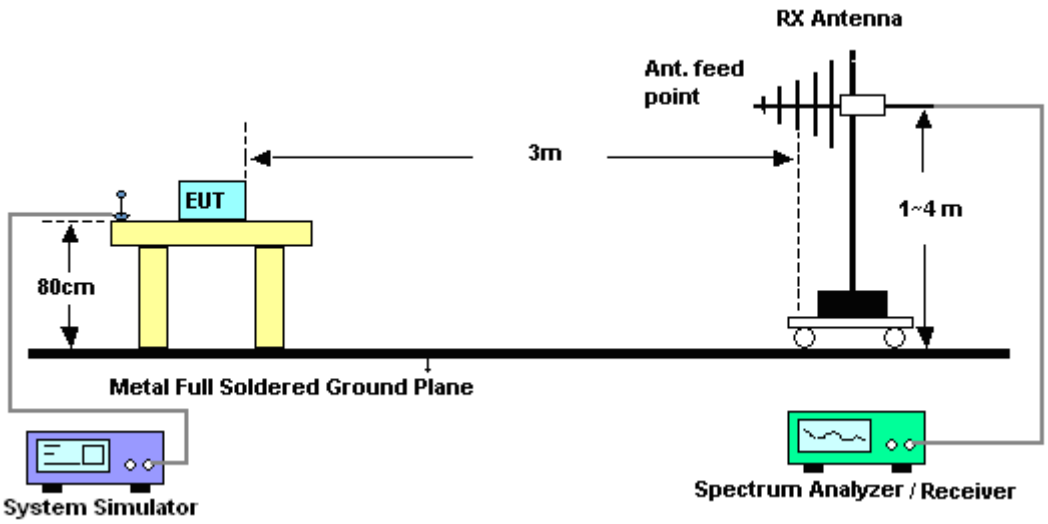
    = P(W) - [43 + 10log(P)] (dB)

    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)

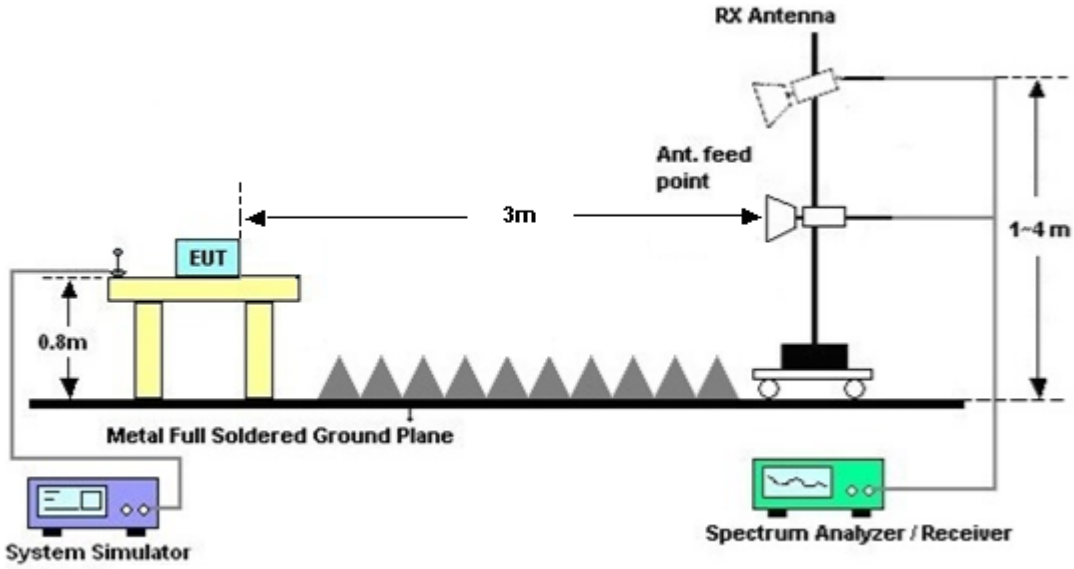
    = -13dBm.

3.7.4 Test Setup

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.7.5 Test Result of Field Strength of Spurious Radiated

Band :	GSM850 for CH128	**Temperature :**	23~25°C
Test Mode :	GSM Link (GMSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1648.4	-53.08	-13	-40.08	-58.15	-56.54	0.89	6.50	H	Pass
2472.6	-45.59	-13	-32.59	-62.78	-48.05	1.09	5.70	H	Pass
3296.8	-48.52	-13	-35.52	-64.64	-53.20	1.17	8.00	H	Pass

Band :	GSM850 for CH128	**Temperature :**	23~25°C
Test Mode :	GSM Link (GMSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Vertical
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1648.4	-46.95	-13	-33.95	-57.81	-50.41	0.89	6.50	V	Pass
2472.6	-54.53	-13	-41.53	-62.03	-56.99	1.09	5.70	V	Pass
3296.8	-52.02	-13	-39.02	-64.22	-56.70	1.17	8.00	V	Pass

Band :	GSM850 for CH189	**Temperature :**	23~25°C
Test Mode :	GSM Link (GMSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-50.96	-13	-37.96	-56.27	-54.42	0.89	6.50	H	Pass
2510	-50.36	-13	-37.36	-65.95	-52.82	1.09	5.70	H	Pass
3346	-48.89	-13	-35.89	-65.06	-53.57	1.17	8.00	H	Pass

Band :	GSM850 for CH189	**Temperature :**	23~25°C
Test Mode :	GSM Link (GMSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Vertical
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-46.16	-13	-33.16	-57.31	-49.62	0.89	6.50	V	Pass
2510	-58.19	-13	-45.19	-65.73	-60.65	1.09	5.70	V	Pass
3346	-53.07	-13	-40.07	-65.34	-57.75	1.17	8.00	V	Pass

Band :	GSM850 for CH251	**Temperature :**	23~25°C
Test Mode :	GSM Link (GMSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1697.6	-51.08	-13	-38.08	-56.35	-54.54	0.89	6.50	H	Pass
2546.4	-45.03	-13	-32.03	-62.30	-47.49	1.09	5.70	H	Pass
3395.2	-49.67	-13	-36.67	-65.86	-54.35	1.17	8.00	H	Pass

Band :	GSM850 for CH251	**Temperature :**	23~25°C
Test Mode :	GSM Link (GMSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Vertical
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1697.6	-46.11	-13	-33.11	-57.28	-49.57	0.89	6.50	V	Pass
2546.4	-59.15	-13	-46.15	-66.60	-61.61	1.09	5.70	V	Pass
3395.2	-53.77	-13	-40.77	-66.02	-58.45	1.17	8.00	V	Pass

Band :	GSM850 for CH128	**Temperature :**	23~25°C
Test Mode :	EDGE class 8 Link (8PSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1648.4	-52.42	-13	-39.42	-57.64	-55.88	0.89	6.50	H	Pass
2472.6	-50.65	-13	-37.65	-66.05	-53.11	1.09	5.70	H	Pass
3296.8	-49.37	-13	-36.37	-65.49	-54.05	1.17	8.00	H	Pass

Band :	GSM850 for CH128	**Temperature :**	23~25°C
Test Mode :	EDGE class 8 Link (8PSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Vertical
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1648.4	-49.97	-13	-36.97	-59.54	-53.43	0.89	6.50	V	Pass
2472.6	-57.65	-13	-44.65	-65.15	-60.11	1.09	5.70	V	Pass
3296.8	-52.78	-13	-39.78	-64.98	-57.46	1.17	8.00	V	Pass

Band :	GSM850 for CH189	**Temperature :**	23~25°C
Test Mode :	EDGE class 8 Link (8PSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-52.88	-13	-39.88	-58.03	-56.34	0.89	6.50	H	Pass
2510	-50.98	-13	-37.98	-66.27	-53.44	1.09	5.70	H	Pass
3346	-49.88	-13	-36.88	-66.05	-54.56	1.17	8.00	H	Pass

Band :	GSM850 for CH189	**Temperature :**	23~25°C
Test Mode :	EDGE class 8 Link (8PSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Vertical
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-52.71	-13	-39.71	-63.92	-56.17	0.89	6.50	V	Pass
2510	-59.02	-13	-46.02	-66.56	-61.48	1.09	5.70	V	Pass
3346	-53.22	-13	-40.22	-65.49	-57.90	1.17	8.00	V	Pass

Band :	GSM850 for CH251	**Temperature :**	23~25°C
Test Mode :	EDGE class 8 Link (8PSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1697.6	-57.77	-13	-44.77	-62.75	-61.23	0.89	6.50	H	Pass
2546.4	-50.72	-13	-37.72	-66.04	-53.18	1.09	5.70	H	Pass
3395.2	-50.08	-13	-37.08	-66.27	-54.76	1.17	8.00	H	Pass

Band :	GSM850 for CH251	**Temperature :**	23~25°C
Test Mode :	EDGE class 8 Link (8PSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Vertical
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1697.6	-53.91	-13	-40.91	-61.78	-57.37	0.89	6.50	V	Pass
2546.4	-59.01	-13	-46.01	-66.46	-61.47	1.09	5.70	V	Pass
3395.2	-53.56	-13	-40.56	-65.81	-58.24	1.17	8.00	V	Pass

Band :	GSM1900 for CH512	**Temperature :**	23~25°C
Test Mode :	GSM Link (GMSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3700.4	-51.88	-13	-38.88	-65.07	-63.23	1.25	12.60	H	Pass
5550.6	-53.65	-13	-40.65	-69.25	-65.32	1.43	13.10	H	Pass
7400.8	-47.93	-13	-34.93	-66.89	-56.97	2.26	11.30	H	Pass

Band :	GSM1900 for CH512	**Temperature :**	23~25°C
Test Mode :	GSM Link (GMSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Vertical
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3700.4	-53.49	-13	-40.49	-65.66	-64.84	1.25	12.6	V	Pass
5550.6	-54.34	-13	-41.34	-68.82	-66.01	1.43	13.1	V	Pass
7400.8	-45.47	-13	-32.47	-66.6	-54.51	2.26	11.3	V	Pass

Band :	GSM1900 for CH661	**Temperature :**	23~25°C
Test Mode :	GSM Link (GMSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-53.50	-13	-40.50	-66.61	-64.85	1.25	12.60	H	Pass
5640	-52.76	-13	-39.76	-68.30	-64.43	1.43	13.10	H	Pass
7520	-49.34	-13	-36.34	-68.26	-58.38	2.26	11.30	H	Pass

Band :	GSM1900 for CH661	**Temperature :**	23~25°C
Test Mode :	GSM Link (GMSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Vertical
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-54.19	-13	-41.19	-66.32	-65.54	1.25	12.6	V	Pass
5640	-54.29	-13	-41.29	-68.7	-65.96	1.43	13.1	V	Pass
7520	-46.69	-13	-33.69	-67.74	-55.73	2.26	11.3	V	Pass

Band :	GSM1900 for CH810	**Temperature :**	23~25°C
Test Mode :	GSM Link (GMSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3819.6	-53.33	-13	-40.33	-66.38	-64.68	1.25	12.60	H	Pass
5729.4	-52.74	-13	-39.74	-68.24	-64.41	1.43	13.10	H	Pass
7639.2	-49.28	-13	-36.28	-68.31	-58.32	2.26	11.30	H	Pass

Band :	GSM1900 for CH810	**Temperature :**	23~25°C
Test Mode :	GSM Link (GMSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Vertical
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3819.6	-54.25	-13	-41.25	-66.49	-65.60	1.25	12.6	V	Pass
5729.4	-53.36	-13	-40.36	-67.73	-65.03	1.43	13.1	V	Pass
7639.2	-46.97	-13	-33.97	-68.09	-56.01	2.26	11.3	V	Pass

Band :	GSM1900 for CH512	**Temperature :**	23~25°C
Test Mode :	EDGE class 8 Link (8PSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3700.4	-51.84	-13	-38.84	-65.03	-63.19	1.25	12.60	H	Pass
5550.6	-52.62	-13	-39.62	-68.22	-64.29	1.43	13.10	H	Pass
7400.8	-48.56	-13	-35.56	-67.52	-57.60	2.26	11.30	H	Pass

Band :	GSM1900 for CH512	**Temperature :**	23~25°C
Test Mode :	EDGE class 8 Link (8PSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Vertical
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3700.4	-54.04	-13	-41.04	-66.21	-65.39	1.25	12.6	V	Pass
5550.6	-53.15	-13	-40.15	-67.63	-64.82	1.43	13.1	V	Pass
7400.8	-46.51	-13	-33.51	-67.64	-55.55	2.26	11.3	V	Pass

Band :	GSM1900 for CH661	**Temperature :**	23~25°C
Test Mode :	EDGE class 8 Link (8PSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-53.52	-13	-40.52	-66.63	-64.87	1.25	12.60	H	Pass
5640	-52.23	-13	-39.23	-67.77	-63.90	1.43	13.10	H	Pass
7520	-49.33	-13	-36.33	-68.25	-58.37	2.26	11.30	H	Pass

Band :	GSM1900 for CH661	**Temperature :**	23~25°C
Test Mode :	EDGE class 8 Link (8PSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Vertical
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-54.78	-13	-41.78	-66.91	-66.13	1.25	12.6	V	Pass
5640	-53.04	-13	-40.04	-67.45	-64.71	1.43	13.1	V	Pass
7520	-46.50	-13	-33.50	-67.55	-55.54	2.26	11.3	V	Pass

Band :	GSM1900 for CH810	**Temperature :**	23~25°C
Test Mode :	EDGE class 8 Link (8PSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3819.6	-53.55	-13	-40.55	-66.60	-64.90	1.25	12.60	H	Pass
5729.4	-51.11	-13	-38.11	-66.61	-62.78	1.43	13.10	H	Pass
7639.2	-48.75	-13	-35.75	-67.78	-57.79	2.26	11.30	H	Pass

Band :	GSM1900 for CH810	**Temperature :**	23~25°C
Test Mode :	EDGE class 8 Link (8PSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Vertical
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3819.6	-54.19	-13	-41.19	-66.43	-65.54	1.25	12.6	V	Pass
5729.4	-53.93	-13	-40.93	-68.3	-65.60	1.43	13.1	V	Pass
7639.2	-46.28	-13	-33.28	-67.4	-55.32	2.26	11.3	V	Pass

Band :	WCDMA Band V for CH4132	**Temperature :**	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1652.8	-60.58	-13	-47.58	-65.54	-64.04	0.89	6.50	H	Pass
2479.2	-49.92	-13	-36.92	-65.65	-52.38	1.09	5.70	H	Pass
3305.6	-49.11	-13	-36.11	-65.23	-53.79	1.17	8.00	H	Pass

Band :	WCDMA Band V for CH4132	**Temperature :**	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Vertical
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1652.8	-54.00	-13	-41.00	-61.80	-57.46	0.89	6.50	V	Pass
2479.2	-57.68	-13	-44.68	-65.18	-60.14	1.09	5.70	V	Pass
3305.6	-52.99	-13	-39.99	-65.19	-57.67	1.17	8.00	V	Pass

Band :	WCDMA Band V for CH4182	**Temperature :**	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-60.38	-13	-47.38	-65.39	-63.84	0.89	6.50	H	Pass
2510	-52.04	-13	-39.04	-66.94	-54.50	1.09	5.70	H	Pass
3346	-49.89	-13	-36.89	-66.06	-54.57	1.17	8.00	H	Pass

Band :	WCDMA Band V for CH4182	**Temperature :**	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Vertical
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-51.40	-13	-38.40	-62.61	-54.86	0.89	6.50	V	Pass
2510	-58.74	-13	-45.74	-66.28	-61.20	1.09	5.70	V	Pass
3346	-53.15	-13	-40.15	-65.42	-57.83	1.17	8.00	V	Pass

Band :	WCDMA Band V for CH4233	**Temperature :**	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1693.2	-59.75	-13	-46.75	-64.73	-63.21	0.89	6.50	H	Pass
2539.8	-50.01	-13	-37.01	-65.66	-52.47	1.09	5.70	H	Pass
3386.4	-48.97	-13	-35.97	-65.16	-53.65	1.17	8.00	H	Pass

Band :	WCDMA Band V for CH4233	**Temperature :**	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Vertical
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1693.2	-54.50	-13	-41.50	-62.32	-57.96	0.89	6.50	V	Pass
2539.8	-59.46	-13	-46.46	-66.91	-61.92	1.09	5.70	V	Pass
3386.4	-52.79	-13	-39.79	-65.04	-57.47	1.17	8.00	V	Pass

Band :	WCDMA Band II for CH9262	**Temperature :**	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3704.8	-46.62	-13	-33.62	-59.93	-57.97	1.25	12.60	H	Pass
5557.2	-50.01	-13	-37.01	-65.55	-61.68	1.43	13.10	H	Pass
7409.6	-48.66	-13	-35.66	-67.74	-57.70	2.26	11.30	H	Pass

Band :	WCDMA Band II for CH9262	**Temperature :**	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Vertical
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3704.8	-50.73	-13	-37.73	-62.96	-62.08	1.25	12.6	V	Pass
5557.2	-47.54	-13	-34.54	-62.09	-59.21	1.43	13.1	V	Pass
7409.6	-46.60	-13	-33.60	-67.78	-55.64	2.26	11.3	V	Pass

Band :	WCDMA Band II for CH9400	**Temperature :**	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-45.79	-13	-32.79	-59.23	-57.14	1.25	12.60	H	Pass
5640	-49.44	-13	-36.44	-65.04	-61.11	1.43	13.10	H	Pass
7520	-49.20	-13	-36.20	-68.16	-58.24	2.26	11.30	H	Pass

Band :	WCDMA Band II for CH9400	**Temperature :**	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Vertical
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-51.31	-13	-38.31	-63.53	-62.66	1.25	12.6	V	Pass
5640	-49.24	-13	-36.24	-63.72	-60.91	1.43	13.1	V	Pass
7520	-46.76	-13	-33.76	-67.88	-55.80	2.26	11.3	V	Pass

Band :	WCDMA Band II for CH9538	**Temperature :**	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Horizontal
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3815.2	-45.50	-13	-32.50	-59.02	-56.85	1.25	12.60	H	Pass
5722.8	-49.11	-13	-36.11	-64.61	-60.78	1.43	13.10	H	Pass
7630.4	-48.99	-13	-35.99	-68.02	-58.03	2.26	11.30	H	Pass

Band :	WCDMA Band II for CH9538	**Temperature :**	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	**Relative Humidity :**	48~52%
Test Engineer :	Leo Liao	**Polarization :**	Vertical
Remark :	Spurious emissions below 1000MHz were found more than 20dB below limit line.		

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3815.2	-48.73	-13	-35.73	-60.97	-60.08	1.25	12.6	V	Pass
5722.8	-44.64	-13	-31.64	-59.66	-56.31	1.43	13.1	V	Pass
7630.4	-46.85	-13	-33.85	-67.97	-55.89	2.26	11.3	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 ±0.00025% (±2.5ppm) of the center frequency.

3.8.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

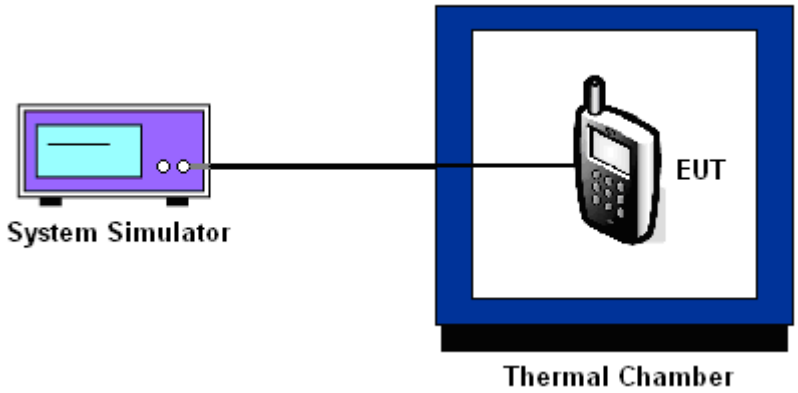
3.8.3 Test Procedures for Temperature Variation

1. The testing follows FCC KDB 971168 v02r02 Section 9.0.
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. 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.
4. With power OFF, the temperature was raised in 10°C steps 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.

3.8.4 Test Procedures for Voltage Variation

1. The testing follows FCC KDB 971168 v02r02 Section 9.0.
2. The EUT was placed in a temperature chamber at 25±5° C and connected with the system simulator.
3. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
4. 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	Frequency :	836.4 MHz

Temperature (°C)	GSM		EDGE class 8		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
50 ℃	30	0.0048	31	0.0084	PASS
40 ℃	28	0.0024	29	0.0060	
30 ℃	27	0.0012	27	0.0036	
20 ℃(Ref.)	26	0.0000	24	0.0000	
10 ℃	27	0.0012	25	0.0012	
0 ℃	25	0.0012	28	0.0048	
-10 ℃	-28	0.0646	29	0.0060	
-20 ℃	-29	0.0658	31	0.0084	
-30 ℃	-33	0.0705	31	0.0084	

Band :	GSM 1900	Channel :	661
Limit (ppm) :	within authorized band	Frequency :	1880.0 MHz

Temperature (°C)	GSM		EDGE class 8		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
50 ℃	-49	0.0473	-54	0.0500	PASS
40 ℃	45	0.0027	-50	0.0479	
30 ℃	43	0.0016	46	0.0032	
20 ℃(Ref.)	40	0.0000	40	0.0000	
10 ℃	41	0.0005	43	0.0016	
0 ℃	-43	0.0441	-42	0.0436	
-10 ℃	-47	0.0463	-45	0.0452	
-20 ℃	-50	0.0479	-52	0.0489	
-30 ℃	-52	0.0489	-54	0.0500	

Note: The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

Band :	WCDMA Band V	Channel :	4182
Limit (ppm) :	2.5	Frequency :	836.4 MHz

Temperature (°C)	RMC 12.2Kbps		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
50 ℃	41	0.0335	PASS
40 ℃	31	0.0215	
30 ℃	24	0.0132	
20 ℃(Ref.)	13	0.0000	
10 ℃	25	0.0143	
0 ℃	31	0.0215	
-10 ℃	36	0.0275	
-20 ℃	41	0.0335	
-30 ℃	47	0.0407	

Band :	WCDMA Band II	Channel :	9400
Limit (ppm) :	within authorized band	Frequency :	1880.0 MHz

Temperature (°C)	RMC 12.2Kbps		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
50 ℃	32	0.0048	PASS
40 ℃	29	0.0032	
30 ℃	25	0.0011	
20 ℃(Ref.)	23	0.0000	
10 ℃	21	0.0011	
0 ℃	24	0.0005	
-10 ℃	25	0.0011	
-20 ℃	28	0.0027	
-30 ℃	29	0.0032	

Note: The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

3.8.7 Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
GSM 850 CH189	GSM	4.35	27	0.0012	2.5	PASS
		3.82	26	0.0000		
		BEP	28	0.0024		
	EDGE class 8	4.35	28	0.0048		
		3.82	24	0.0000		
		BEP	28	0.0048		
GSM 1900 CH661	GSM	4.35	43	0.0016	(Note 3.)	
		3.82	40	0.0000		
		BEP	42	0.0011		
	EDGE class 8	4.35	42	0.0011		
		3.82	40	0.0000		
		BEP	46	0.0032		
WCDMA Band V CH4182	RMC 12.2Kbps	4.35	19	0.0072	2.5	
		3.82	13	0.0000		
		BEP	20	0.0084		
WCDMA Band II CH9400	RMC 12.2Kbps	4.35	25	0.0011	(Note 3.)	
		3.82	23	0.0000		
		BEP	26	0.0016		

Note:

1. Normal Voltage = 3.82V.
2. The manufacturer declared that the EUT could work properly between voltage 3.60V ~ 4.35V.
3. The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	May 08, 2014	Nov. 27, 2014~ Nov. 28, 2014	May 07, 2015	Conducted (TH01-SZ)
Thermal Chamber	Hongzhangroup	LP-150U	HD20120425	-40℃~150℃	Feb. 21, 2014	Nov. 27, 2014~ Nov. 28, 2014	Feb. 20, 2015	Conducted (TH01-SZ)
Spectrum Analyzer	R&S	FSP 7	100818	9kHz~7GHz	Jul. 17, 2014	Nov. 19, 2014	Jul. 16, 2015	ERP/EIRP (OTA02-SZ)
Quad-Ridged Horn	ETS-Lindgren	3164-08	00102954	700MHz~10000MHz	N/A	Nov. 19, 2014	N/A	ERP/EIRP (OTA02-SZ)
Multi-Devices Controller	ETS-Lindgren	2090-OPT1	00108147	N/A	N/A	Nov. 19, 2014	N/A	ERP/EIRP (OTA02-SZ)
Switch Control Mainframe	Agilent	3499A	MY42005451	N/A	N/A	Nov. 19, 2014	N/A	ERP/EIRP (OTA02-SZ)
ESCIO TEST Receiver	R&S	ESCI	100724	9kHz~3GHz	Feb. 21, 2014	Dec. 03, 2014	Feb. 20, 2015	Radiation (03CH01-SZ)
Spectrum Analyzer	Agilent	N9038A	MY52260185	20Hz~26.5GHz	May 26, 2014	Dec. 03, 2014	May 25, 2015	Radiation (03CH01-SZ)
Bilog Antenna	TESEQ	CBL 6112D	37877	30MHz~2GHz	Oct. 15, 2014	Dec. 03, 2014	Oct. 14, 2015	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS Lindgren	3117	00119436	1GHz~18GHz	Oct. 15, 2014	Dec. 03, 2014	Oct. 14, 2015	Radiation (03CH01-SZ)
Double Ridged Horn Antenna	COM-POWER	AH-840	101073	18GHz~40GHz	Jun. 09, 2014	Dec. 03, 2014	Jun. 08, 2015	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9kHz~3000MHz	Feb. 21, 2014	Dec. 03, 2014	Feb. 20, 2015	Radiation (03CH01-SZ)
Amplifier	Yiai	AV3860B	04030	2GHz~26.5GHz	May 08, 2014	Dec. 03, 2014	May 07, 2015	Radiation (03CH01-SZ)
AC Source(AVR)	Chroma	61601	616010001985	100Vac~250Vac	Mar. 25, 2014	Dec. 03, 2014	Mar. 24, 2015	Radiation (03CH01-SZ)
Turn Table	EM Electronics	EM 1000	N/A	0~360 degree	NCR	Dec. 03, 2014	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM Electronics	EM 1000	N/A	1 m~4 m	NCR	Dec. 03, 2014	NCR	Radiation (03CH01-SZ)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.9dB**