FCC RF Test Report

FCC 47 CFR Part 2, 22(H), 24(E)

Product Name	:	GSM/WCDMA MOBILE PHONE
Model No.	:	M4TEL SS330
FCC ID	:	CLNSS330

Prepared By:	:	Inventec Appliances(Pudong) Corporation
Address:	:	No.789 Pu Xing Road,Shanghai,PRC
Date of Receipt	:	2012.03.23
Date of Test	:	2012.03.26-2012.03.31
Report No.	:	20120323FCC-D

Test Report Certification

Date of Issue : Mar.26.2012

Report No. : 20120323FCC-D

Product Name	: GSM/WCDMA MOBILE PHONE
Model No.	: M4TEL SS330
Trade Name	: M4TEL
Applicant	: M FOURTEL MEXICO S.A. DE C.V.
Address	: Montecito 38, Piso 23, Oficina 15. Colonia Nápoles. C.P. 03810 Mexico
Standard	: FCC 47 CFR Part 2, 22(H), 24(E)
Classification	: PCS Licensed Transmitter Held to Ear (PCE)
Test Result	: Complied

TX/RX Frequency Range			
GSM/GPRS 850	: 824.2 ~ 848.8 MHz		869.2 ~ 893.8 MHz
GSM/GPRS 1900	: 1850.2 ~ 1909.8 MHz		1930.2 ~ 1989.8 MHz
WCDMA Band V	: 826.4 ~ 846.6 MHz		871.4 ~ 891.6 MHz
WCDMA Band II	: 1852.4 ~ 1907.6 MHz		1932.4 ~ 1987.6 MHz

The Test Results relate only to the samples tested.
The test report shall not be reproduced except in full without the written approval of Inventec Appliances(Pudong) Corporation

Documented By : Apr. 11.2012
Kelly Lin/Engineer

Tested By : Apr. 11.2012
Byran Hung/Senior Engineer

Approved By : , Apr. 11.2012
Jeff Huang/Director of Operations

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SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
2.1	§2.1046	N/A	Conducted Output Power	N/A	PASS	
2.2	§22.913(a)(2)	RSS-132(4.4) SRSP-503(5.1.3)	Effective Radiated Power	< 7 Watts	PASS	-
2.2	§24.232(c)	RSS-133 (6.4) SRSP-510(5.1.2)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
2.3	§2.1049 §22.917(a) §24.238(a)	N/A	Occupied Bandwidth	N/A	PASS	-
2.4	§2.1051 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Band Edge Measurement	< $43+10\log_{10}$(P[Watts])	PASS	-
2.5	§2.1051 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Conducted Emission	< $43+10\log_{10}$(P[Watts])	PASS	-
2.6	§2.1053 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Field Strength of Spurious Radiation	< $43+10\log_{10}$(P[Watts])	PASS	-
2.7	§2.1055 §22.355 §24.235	RSS-132(4.3) RSS-133(6.3)	Frequency Stability for Temperature & Voltage	< 2.5 ppm	PASS	-

1. GENERAL INFORMATION

1.1 Applicant

Company Name:MFOURTEL MEXICO S.A. DE C.V.

Address: Montecito 38, Piso 23, Oficina 15. Colonia Nápoles. C.P. 03810 Mexico

1.2 Manufacturer

Company Name:CK Telecom Limited

Address: Technology Road.High-Tech Development Zone. Heyuan, Guangdong,P.R.China.

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	GSM/WCDMA MOBILE PHONE
Brand Name	M4TEL
Model Name	M4TEL SS330
FCC ID	CLNSS330
Tx/Rx Frequency Range	GSM/GPRS 850 : 824.2 ~ 848.8 MHz / 869.2 ~ 893.8 MHz GSM/GPRS 1900: 1850.2 ~ 1909.8 MHz/ 1930.2 ~ 1989.8 MHz WCDMA Band V: 826.4 ~ 846.6 MHz / 871.4 ~ 891.6 MHz WCDMA Band II: 1852.4 ~ 1907.6 MHz/ 1932.4 ~ 1987.6 MHz
Number of Channels	GSM850 : 128 189 251 GSM1900 : 512 661 810 WCDMA Band V: 4132 4182 4233 WCDMA Band II: 9262 9400 9538
Carrier Frequency of Each Channel	GSM850 : 824.2 836.4 848.8 GSM1900 : 1850.2 1880.0 1909.8 WCDMA Band V: 826.4 836.4 846.6 WCDMA Band II: 1852.4 1880.0 1907.6
Maximum Output Power to Antenna	GSM850 : 31.73(dBm), 1.49(W) GSM1900 : 29.32(dBm), 0.86(W) WCDMA Band V: 22.32 (dBm), 0.17(W) WCDMA Band II: 21.34 (dBm), 0.14(W)
Antenna Type	Fixed Internal Antenna
HW Version	SATURN-V2.0
SW Version	SATURN-501A_TELCEL_L151N_100_120112
Type of Modulation	GSM/GPRS:GMSK EDGE: 8PSK WCDMA: QPSK
Type of Emission	GMSK:248KGXW 8PSK:248KG7W QPSK:4M18F9W

Remark:

1. For other wireless features of this EUT, test report will be issued separately.
2. This test report recorded only product characteristics and test results of PCS Licensed Transmitter Held to Ear (PCE).
3. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Applied Standards

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

- Preliminary Guidance for Receiving Applications for Certification of 3G Device. May 9, 2006.
- FCC 47 CFR Part 2, 22(H), 24(E)
- ANSI / TIA / EIA-603-C-2004

Remark:

All test items were verified and recorded according to the standards and without any deviation during the test.

2. Test Configuration of Equipment Under Test

2.1 Conducted Power

The conducted power tables are as follows:

Conducted Power (*Unit: dBm)						
Band	**GSM850**			**GSM1900**		
Channel	**128**	**189**	**251**	**512**	**661**	**810**
Frequency	**824.2**	**836.4**	**848.8**	**1850.2**	**1880.0**	**1909.8**
GSM	31.49	31.60	31.73	29.28	29.32	29.20
GPRS8(1up)	31.45	31.58	31.72	29.22	29.28	29.16
GPRS10(2up)	31.39	31.52	31.40	28.34	28.24	28.23
GPRS12(4up)	30.92	30.98	30.89	28.13	28.07	27.96

Conducted Power (*Unit: dBm)						
Band	**WCDMA band Ⅱ**			**WCDMA band Ⅴ**		
Channel	**9262**	**9400**	**9538**	**4132**	**4182**	**4233**
Frequency(MHz)	**1852.4**	**1880.0**	**1907.6**	**826.4**	**836.6**	**846.6**
WCDMA	21.50	21.34	21.15	22.30	22.05	22.32

2.2 Test Mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 9000 MHz for GSM850, WCDMA Band V.
2. 30 MHz to 19000 MHz for GSM1900, WCDMA Band II.

The following table shows the test modes as the worst cases and recorded in this report.

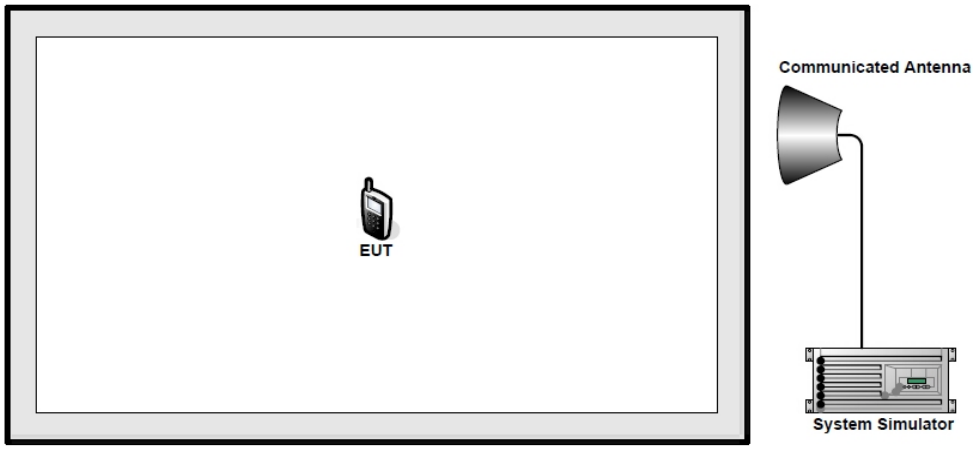
Test Mode		
Band	**Radiated TCs**	**Conducted TCs**
GSM850	■ GSM Link	■ GSM Link
GSM1900	■ GSM Link	■ GSM Link
WCDMA Band V	■ WCDMA Link	■ WCDMA Link
WCDMA Band II	■ WCDMA Link	■ WCDMA Link

Note:

1. The maximum power levels are performed on GSM, WCDMA mode.
2. The radiated emission testing was performed together with Adapter.

2.3 Connection Diagram of Test System

The EUT with adapter was placed on the turn table in a semi-anechoic chamber, and it was coupled to the supporting unit, system simulator, which was located outside the chamber.



3. Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

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

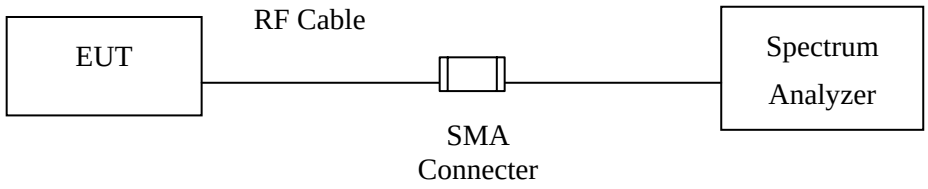
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedure

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

3.1.4 Test Setup



3.1.5 Test Result of Conducted Output Power

Cellular Band				
Modes	**Channel**	**Frequency (MHz)**	**Conducted Power (dBm)**	**Conducted Power (Watts)**
GSM850 (GSM)	128 (Low)	824.2	31.49	1.41
	189 (Mid)	836.4	31.60	1.45
	251 (High)	848.8	31.73	1.49

PCS Band				
Modes	**Channel**	**Frequency (MHz)**	**Conducted Power (dBm)**	**Conducted Power (Watts)**
GSM1900 (GSM)	512 (Low)	1850.2	29.28	0.85
	661 (Mid)	1880.0	29.32	0.86
	810 (High)	1909.8	29.20	0.83

WCDMA				
Modes	**Channel**	**Frequency (MHz)**	**Conducted Power (dBm)**	**Conducted Power (Watts)**
WCDMA Band V	4132 (Low)	826.4	22.30	0.17
	4182 (Mid)	836.6	22.05	0.16
	4233 (High)	846.6	22.32	0.17
WCDMA Band II	9262 (Low)	1852.4	21.50	0.14
	9400 (Mid)	1880.0	21.34	0.14
	9538 (High)	1907.6	21.15	0.13

3.2 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

3.2.1 Description of the ERP/EIRP Measurement

ERP/EIRP is measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The ERP of mobile transmitters must not exceed 7 Watts and the EIRP of mobile transmitters are limited to 2 Watts.

3.2.2 Measuring Instruments

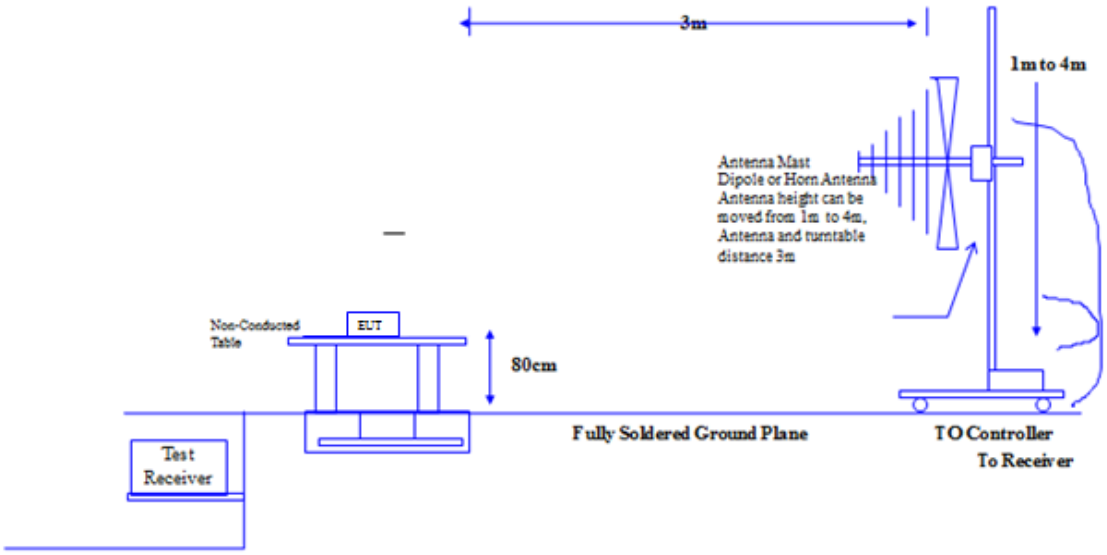
See list of measuring instruments of this test report.

3.2.3 Test Procedure

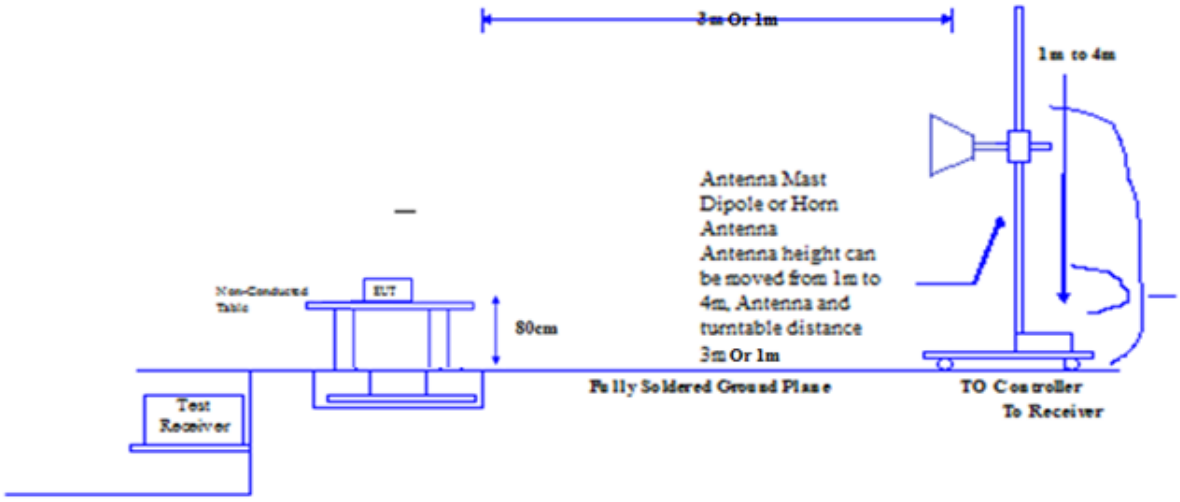
1. The EUT was placed on an non-conductive rotating platform with 0.8 meter height in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RBW= 3MHz,VBW= 3MHz, and peak detector settings.
2. During the measurement, the EUT was enforced in maximum power and linked with a base station. The highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
3. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (substitution antenna) at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The Path Loss(dB)= S.G. Power-TX Cable loss+ TX Antenna Gain-SPA. Reading. Then the EUT's EIRP was calculated with the Path Loss(dB), EIRP=SPA. Reading+ Path Loss. ERP= SPA. Reading+ Path Loss-2.15

3.2.4 Test Setup

30MHz~1GHz



Above 1GHz



3.2.5 Test Result of ERP

GSM850 (GSM) Radiated Power ERP							
Frequency (MHz)	**SPA. Reading (dBm)**	**S.G. Power (dBm)**	**TX Cable loss (dB)**	**TX Antenna Gain (dBi)**	**ERP(dBm)**	**ERP(W)**	**Polarization (H/V)**
824.2	-1.36	31.24	0.85	0.23	27.69	0.59	H
836.4	-1.52	31.22	0.85	0.51	27.41	0.55	H
848.8	-1.78	30.94	0.86	0.74	27.31	0.54	H
824.2	-11.76	26.5	0.85	0.23	20.80	0.12	V
836.4	-12.93	25.21	0.85	0.51	19.89	0.10	V
848.8	-10.76	25.85	0.86	0.74	21.79	0.15	V

ERP= SPA. Reading+ Path Loss-2.15

Path Loss						
Frequency (MHz)	**Path Loss(dB)**	**SPA. Reading (dBm)**	**S.G. Power (dBm)**	**TX Cable loss (dB)**	**TX Antenna Gain (dBi)**	**Polarization (H/V)**
824.2	31.2	-31.82	0	0.85	0.23	H
836.4	31.08	-31.42	0	0.85	0.51	H
848.8	31.24	-31.36	0	0.86	0.74	H
824.2	34.71	-35.33	0	0.85	0.23	V
836.4	34.97	-35.31	0	0.85	0.51	V
848.8	34.7	-34.82	0	0.86	0.74	V

Path Loss(dB)= S.G. Power-TX Cable loss+ TX Antenna Gain-SPA. Reading

WCDMA Band V(RMC 12.2Kbps) Radiated Power ERP							
Frequency (MHz)	**SPA. Reading (dBm)**	**S.G. Power (dBm)**	**TX Cable loss (dB)**	**TX Antenna Gain (dBi)**	**ERP(dBm)**	**ERP(W)**	**Polarization (H/V)**
826.4	-11.58	31.36	0.85	0.23	17.59	0.06	H
836.4	-11.20	31.22	0.85	0.51	17.73	0.06	H
846.6	-11.97	31.05	0.86	0.74	17.23	0.05	H
826.4	-18.83	26.56	0.85	0.23	13.79	0.02	V
836.4	-18.10	25.21	0.85	0.51	14.72	0.03	V
846.6	-17.97	25.88	0.86	0.74	14.61	0.03	V

ERP= SPA. Reading+ Path Loss-2.15

Path Loss						
Frequency (MHz)	**Path Loss(dB)**	**SPA. Reading (dBm)**	**S.G. Power (dBm)**	**TX Cable loss (dB)**	**TX Antenna Gain (dBi)**	**Polarization (H/V)**
826.4	31.32	-31.94	0	0.85	0.23	H
836.4	31.08	-31.42	0	0.85	0.51	H
846.6	31.35	-31.47	0	0.86	0.74	H
826.4	34.77	-35.39	0	0.85	0.23	V
836.4	34.97	-35.31	0	0.85	0.51	V
846.6	34.73	-34.85	0	0.86	0.74	V

Path Loss(dB)= S.G. Power-TX Cable loss+ TX Antenna Gain-SPA. Reading

3.2.6 Test Result of EIRP

GSM1900(GSM) Radiated Power EIRP							
Frequency (MHz)	**SPA. Reading (dBm)**	**S.G. Power (dBm)**	**TX Cable loss (dB)**	**TX Antenna Gain (dBi)**	**EIRP(dBm)**	**EIRP(W)**	**Polarization (H/V)**
1850.2	-4.48	29.22	1.64	1.25	26.83	0.48	H
1880	-4.45	29.03	1.64	1.56	26.95	0.50	H
1909.8	-5.37	28.32	1.64	1.79	26.47	0.44	H
1850.2	-10.43	27.28	1.64	1.25	24.89	0.31	V
1880	-11.52	25.95	1.64	1.56	23.87	0.24	V
1909.8	-11.11	25.55	1.64	1.79	23.70	0.23	V

ERP= SPA. Reading+ Path Loss

Path Loss						
Frequency (MHz)	**Path Loss(dB)**	**SPA. Reading (dBm)**	**S.G. Power (dBm)**	**TX Cable loss (dB)**	**TX Antenna Gain (dBi)**	**Polarization (H/V)**
1850.2	31.31	-32.72	0	1.64	1.25	H
1880	31.4	-32.53	0	1.64	1.56	H
1909.8	31.84	-32.74	0	1.64	1.79	H
1850.2	35.32	-36.73	0	1.64	1.25	V
1880	35.39	-36.52	0	1.64	1.56	V
1909.8	34.81	-35.71	0	1.64	1.79	V

Path Loss(dB)= S.G. Power-TX Cable loss+ TX Antenna Gain-SPA. Reading

WCDMA Band II (RMC 12.2Kbps) Radiated Power EIRP							
Frequency (MHz)	**SPA. Reading (dBm)**	**S.G. Power (dBm)**	**TX Cable loss (dB)**	**TX Antenna Gain (dBi)**	**EIRP(dBm)**	**EIRP(W)**	**Polarization (H/V)**
1850.2	-7.82	29.22	1.64	1.25	23.49	0.22	H
1880	-8.05	29.03	1.64	1.56	23.35	0.22	H
1909.8	-8.61	28.32	1.64	1.79	23.23	0.21	H
1850.2	-15.67	27.28	1.64	1.25	19.65	0.09	V
1880	-15.32	25.95	1.64	1.56	20.07	0.10	V
1909.8	-15.09	25.55	1.64	1.79	19.72	0.09	V

ERP= SPA. Reading+ Path Loss

Path Loss						
Frequency (MHz)	**Path Loss(dB)**	**SPA. Reading (dBm)**	**S.G. Power (dBm)**	**TX Cable loss (dB)**	**TX Antenna Gain (dBi)**	**Polarization (H/V)**
1850.2	31.31	-32.72	0	1.64	1.25	H
1880	31.4	-32.53	0	1.64	1.56	H
1909.8	31.84	-32.74	0	1.64	1.79	H
1850.2	35.32	-36.73	0	1.64	1.25	V
1880	35.39	-36.52	0	1.64	1.56	V
1909.8	34.81	-35.71	0	1.64	1.79	V

Path Loss(dB)= S.G. Power-TX Cable loss+ TX Antenna Gain-SPA. Reading

3.3 Occupied Bandwidth Measurement

3.3.1 Description of Occupied Bandwidth Measurement

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

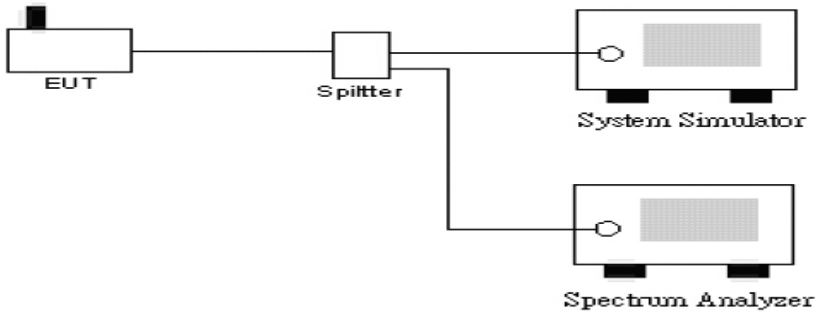
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedure

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

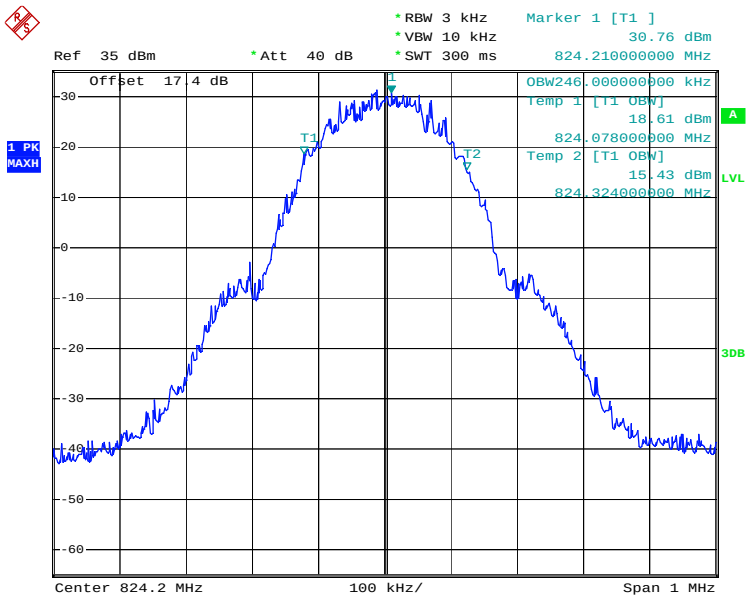
3.3.4 Test Setup



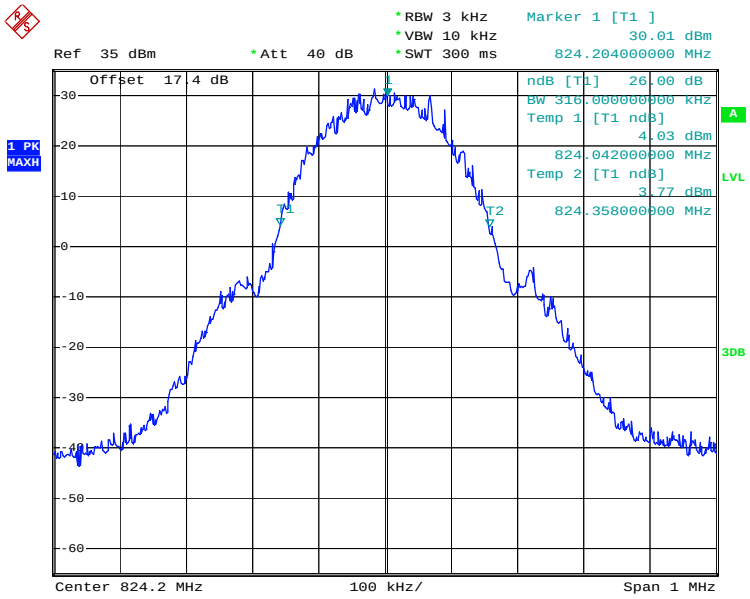
3.3.5 Test Result (Plots) of Occupied Bandwidth

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

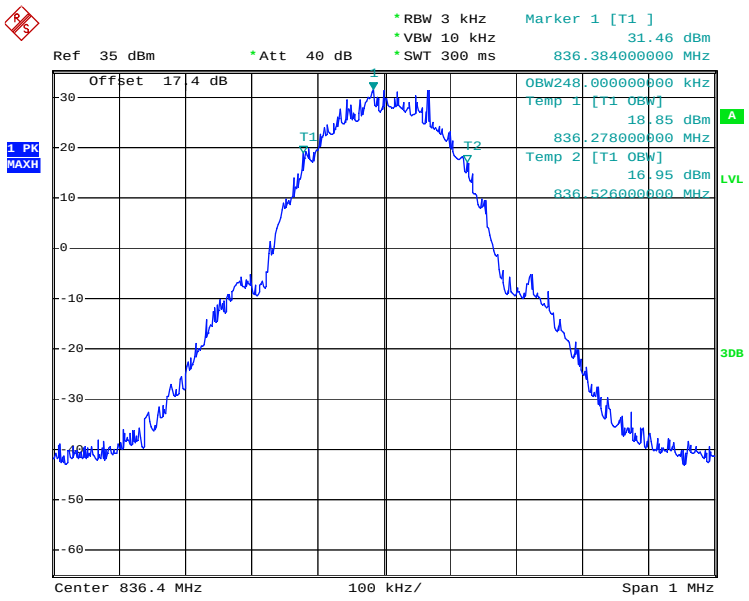
99% Occupied Bandwidth Plot on Channel 128



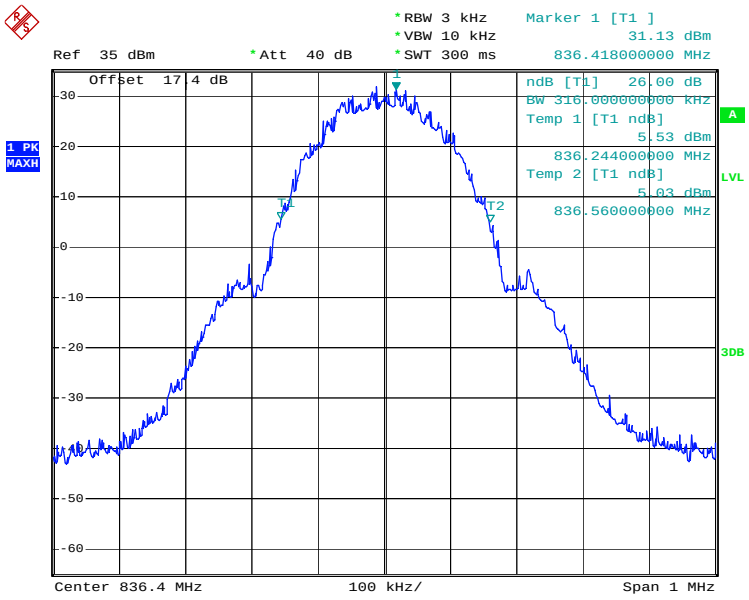
26dB Bandwidth Plot on Channel 128



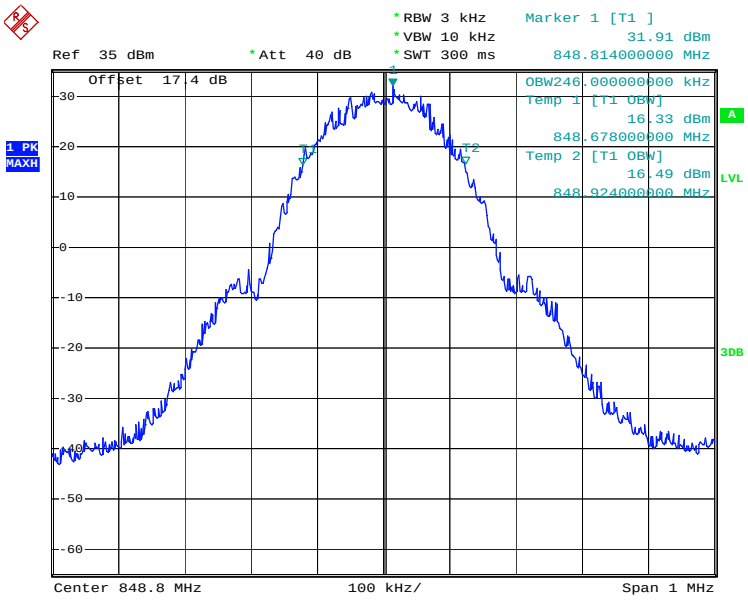
99% Occupied Bandwidth Plot on Channel 189



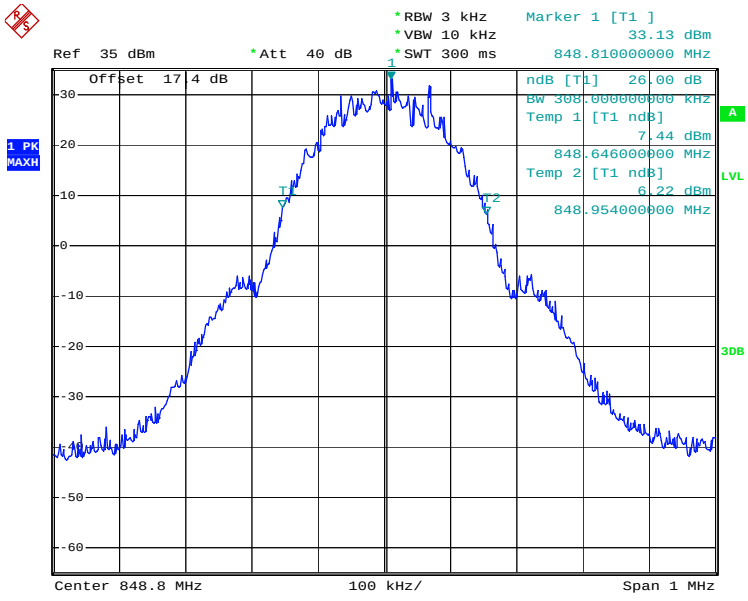
26dB Bandwidth Plot on Channel 189



99% Occupied Bandwidth Plot on Channel 251

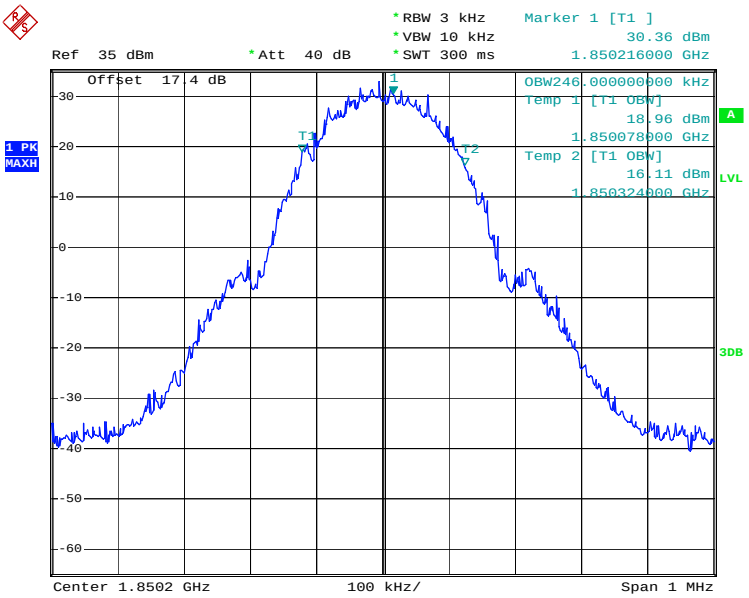


26dB Bandwidth Plot on Channel 251



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

99% Occupied Bandwidth Plot on Channel 512



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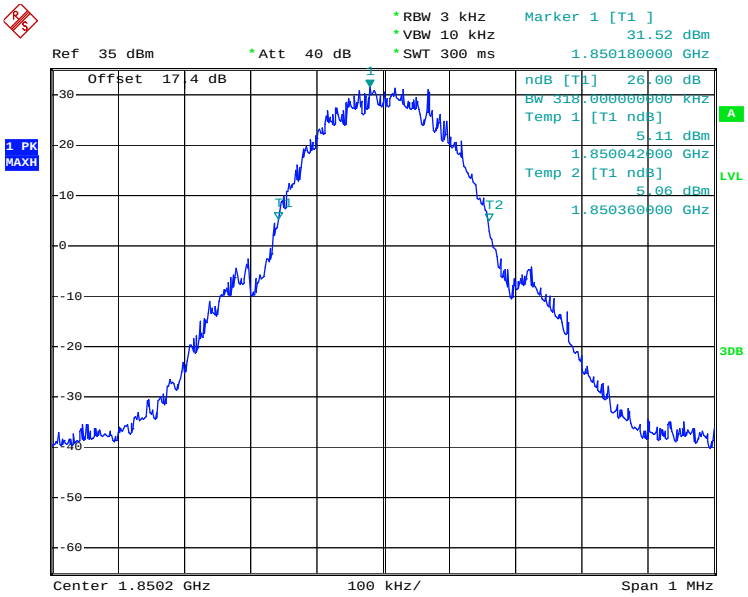
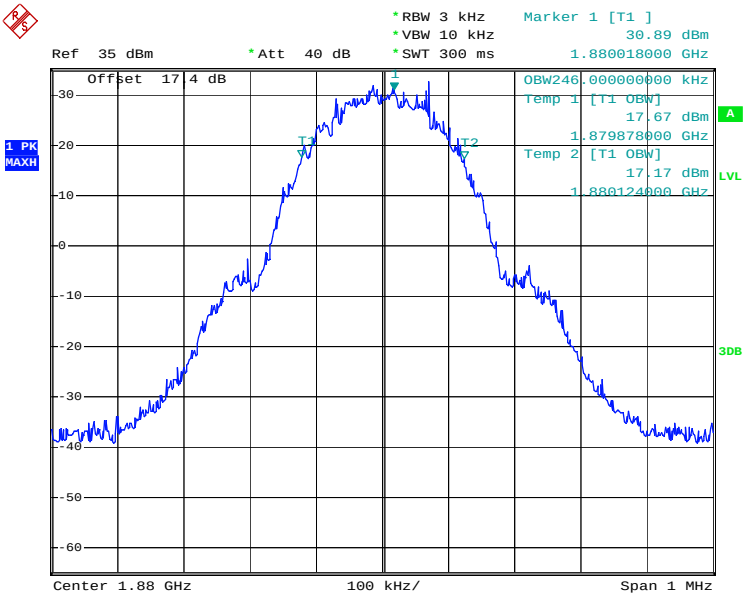
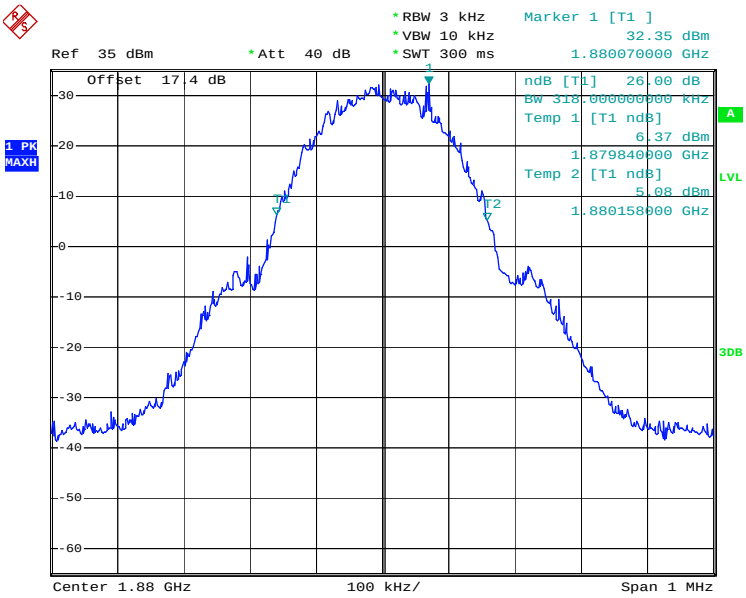
26dB Bandwidth Plot on Channel 512



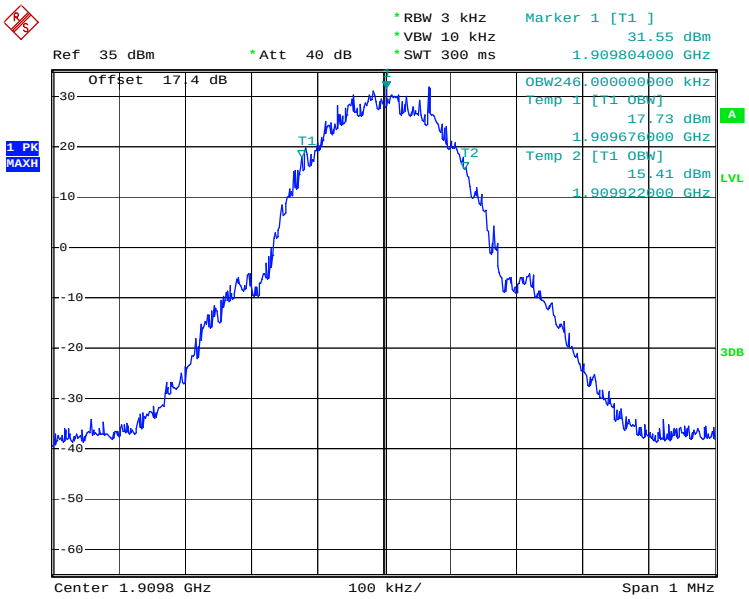
99% Occupied Bandwidth Plot on Channel 661



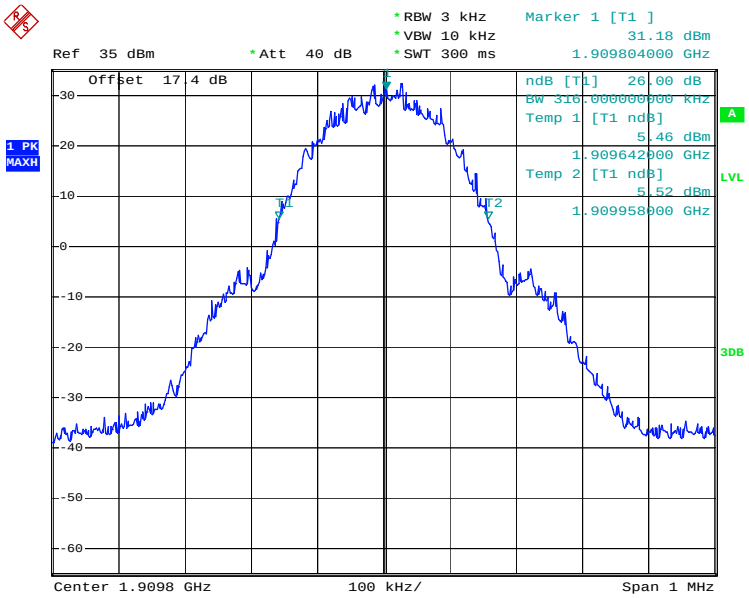
26dB Bandwidth Plot on Channel 661



99% Occupied Bandwidth Plot on Channel 810

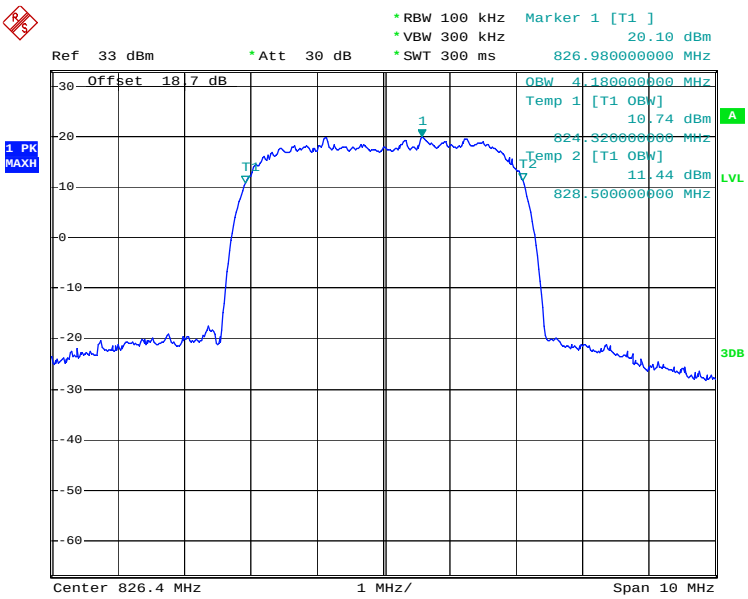


26dB Bandwidth Plot on Channel 810

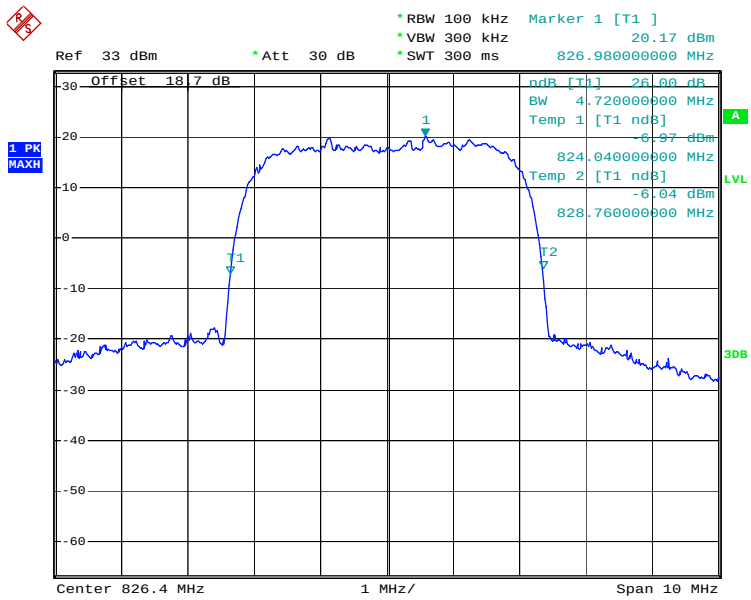


Band :	WCDMA BAND V	Power Stage : High
Test Mode :	RMC Link	

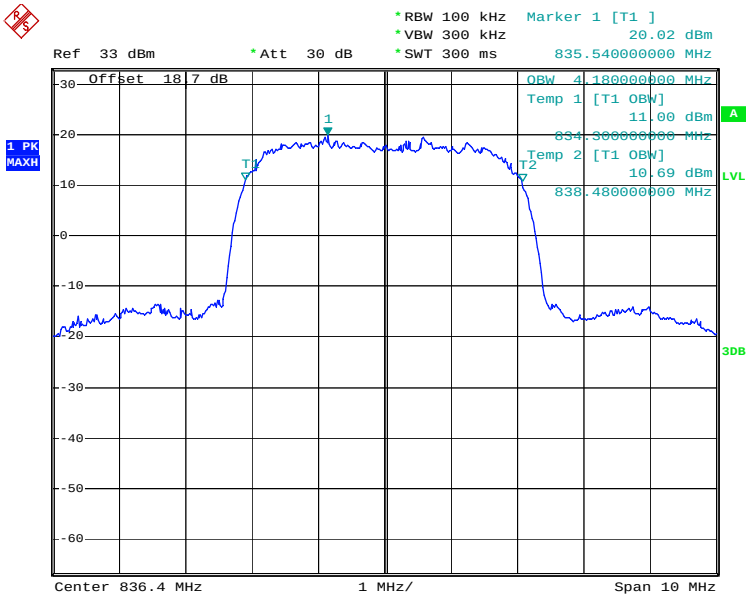
99% Occupied Bandwidth Plot on Channel 4132



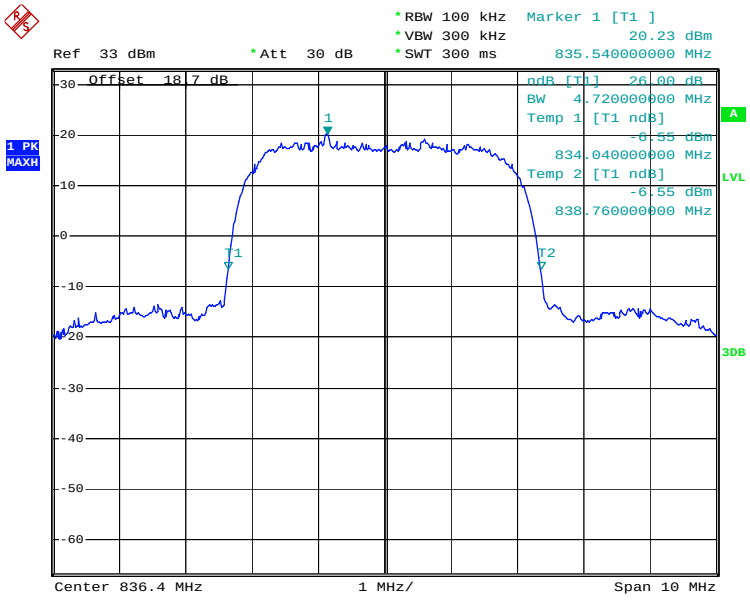
26dB Bandwidth Plot on Channel 4132



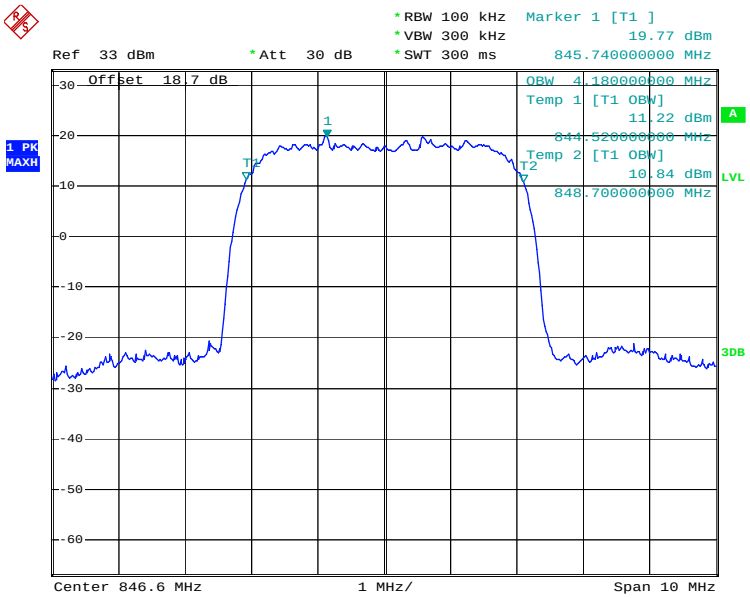
99% Occupied Bandwidth Plot on Channel 4182



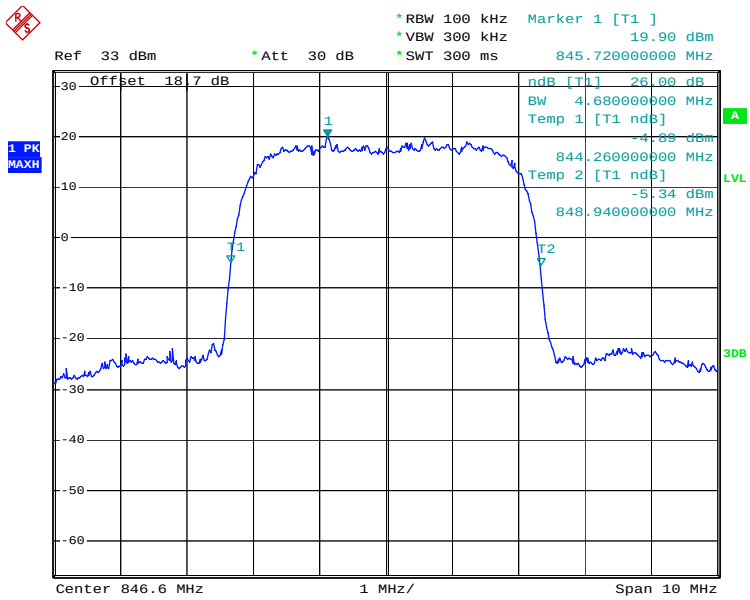
26dB Bandwidth Plot on Channel 4182



99% Occupied Bandwidth Plot on Channel 4233

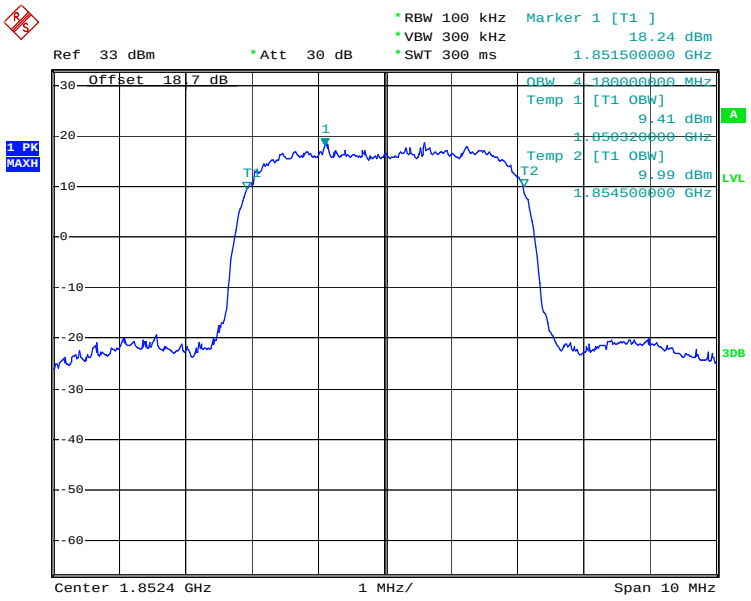


26dB Bandwidth Plot on Channel 4233

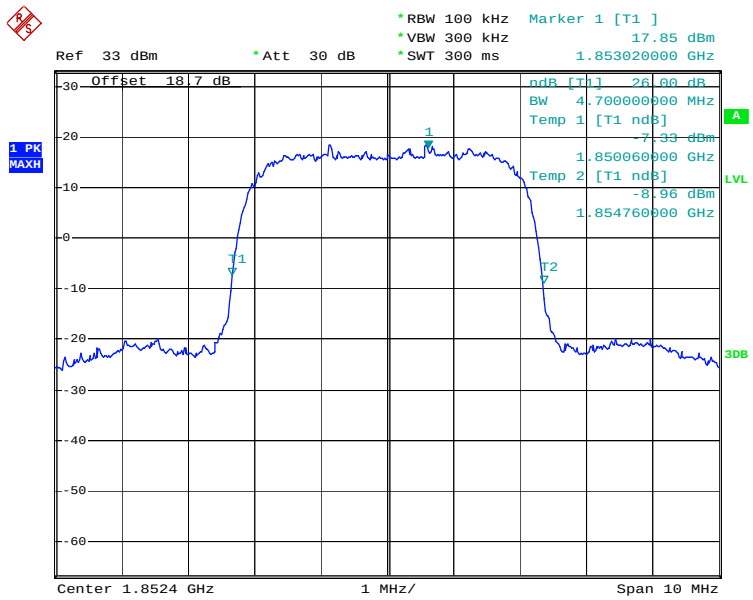


Band :	WCDMA BAND II	Power Stage : High
Test Mode :	RMC Link	

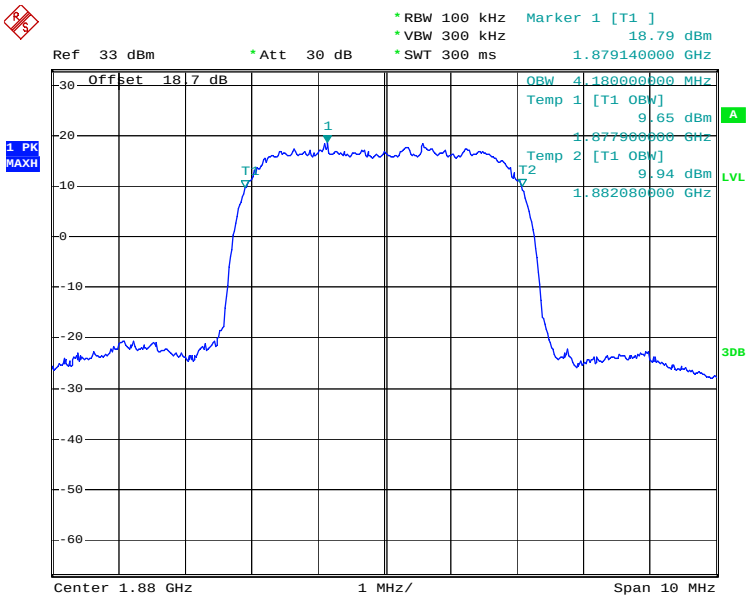
99% Occupied Bandwidth Plot on Channel 9262



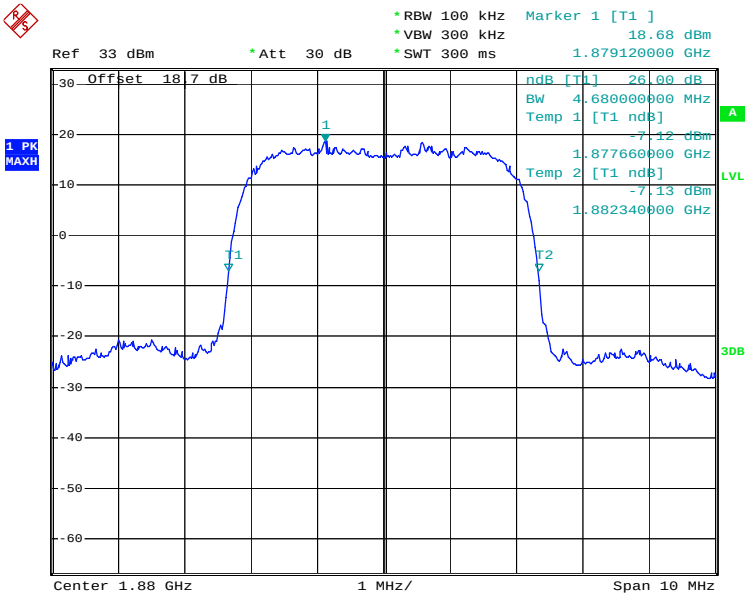
26dB Bandwidth Plot on Channel 9262



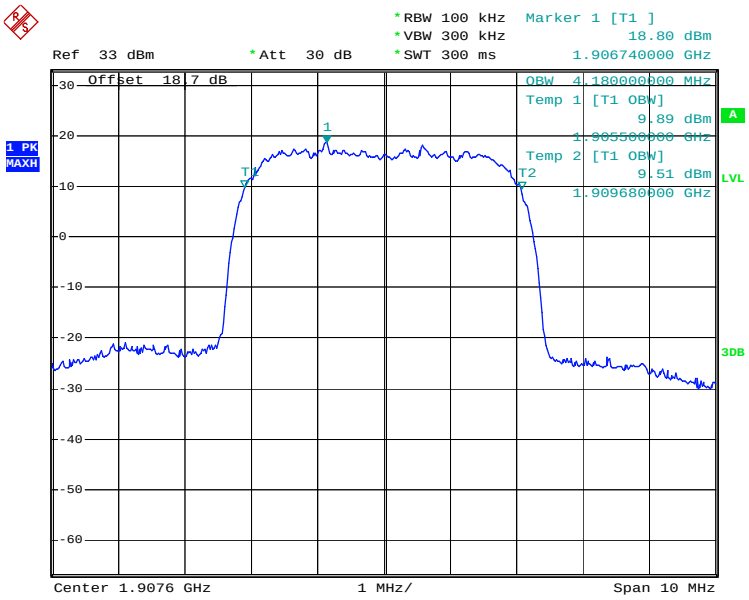
99% Occupied Bandwidth Plot on Channel 9400



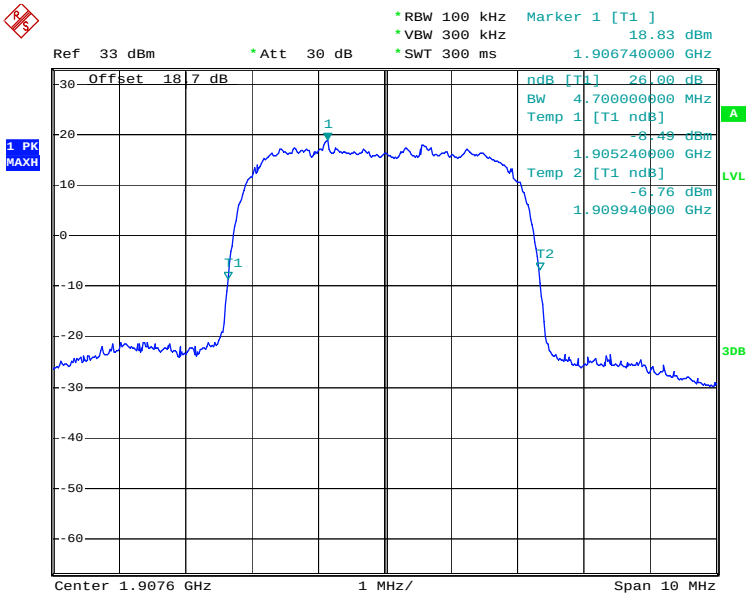
26dB Bandwidth Plot on Channel 9400



99% Occupied Bandwidth Plot on Channel 9538



26dB Bandwidth Plot on Channel 9538



3.4 Band Edge Measurement

3.4.1 Description of Band Edge Measurement

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

3.4.2 Measuring Instruments

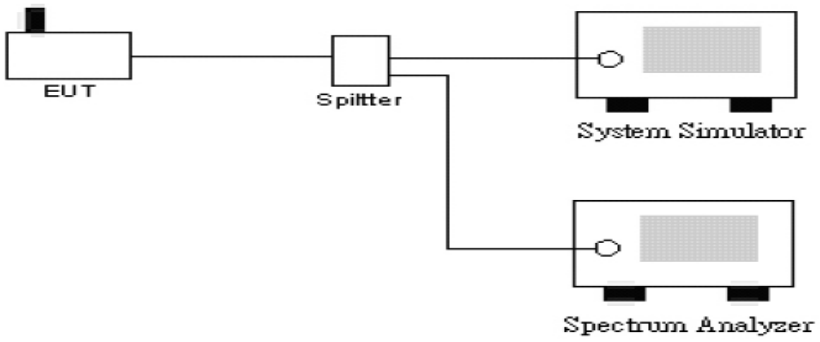
See list of measuring instruments of this test report.

3.4.3 Test Procedure

a. The EUT was connected to Spectrum Analyzer and Base Station via power divider.

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

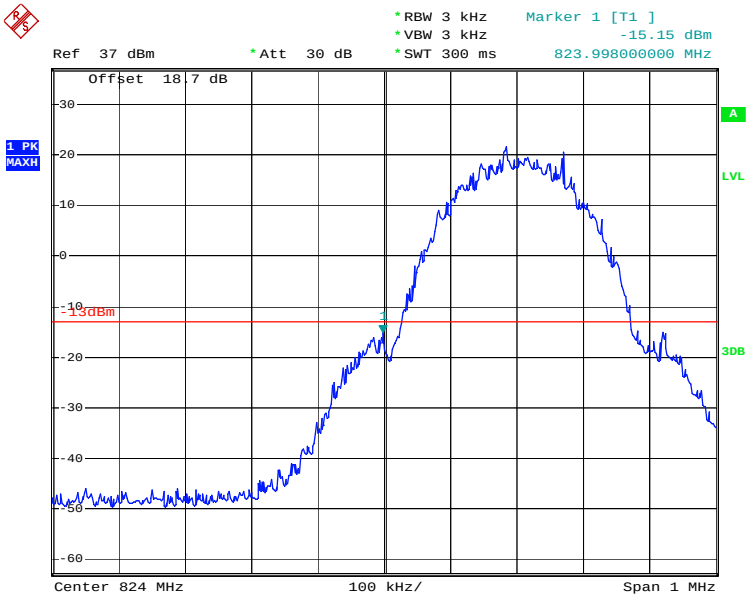
3.4.4 Test Setup



3.4.5 Test Result (Plots) of Conducted Band Edge

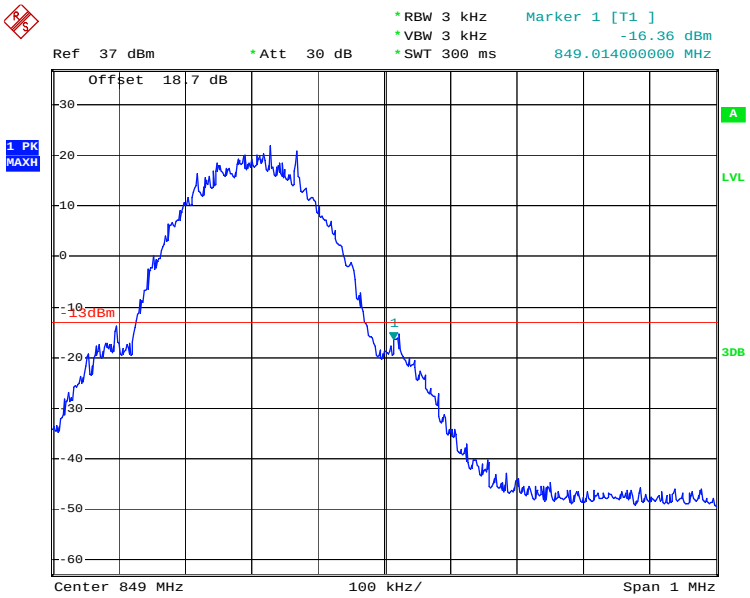
Band :	GSM850	Power Stage :	High
Test Mode :	GSM Link		

Lower Band Edge Plot on Channel 128



Date: 29.MAR.2012 08:08:54

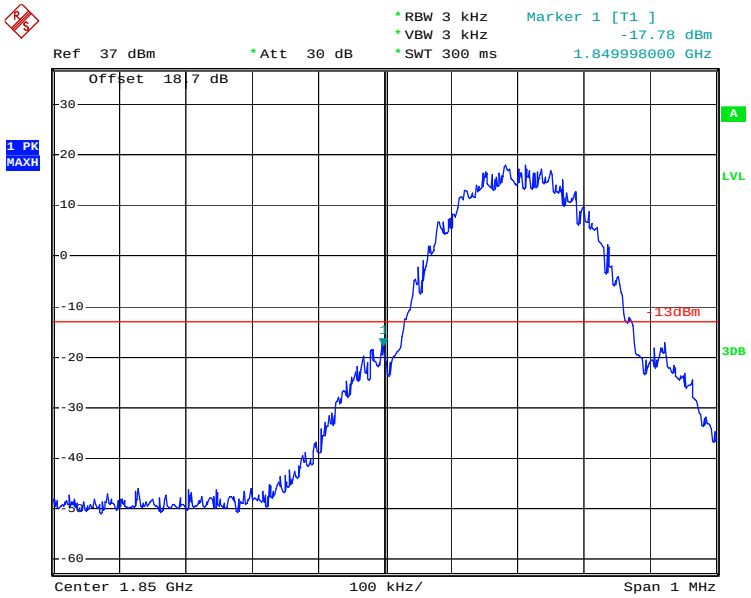
Higher Band Edge Plot on Channel 251



Date: 29.MAR.2012 08:16:52

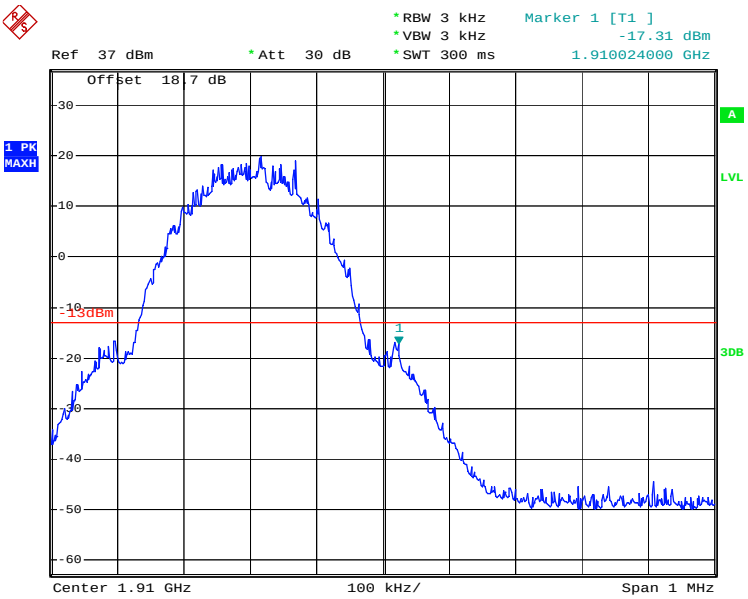
Band :	GSM1900	Power Stage :	High
Test Mode :	GSM Link		

Lower Band Edge Plot on Channel 512



Date: 29.MAR.2012 08:54:02

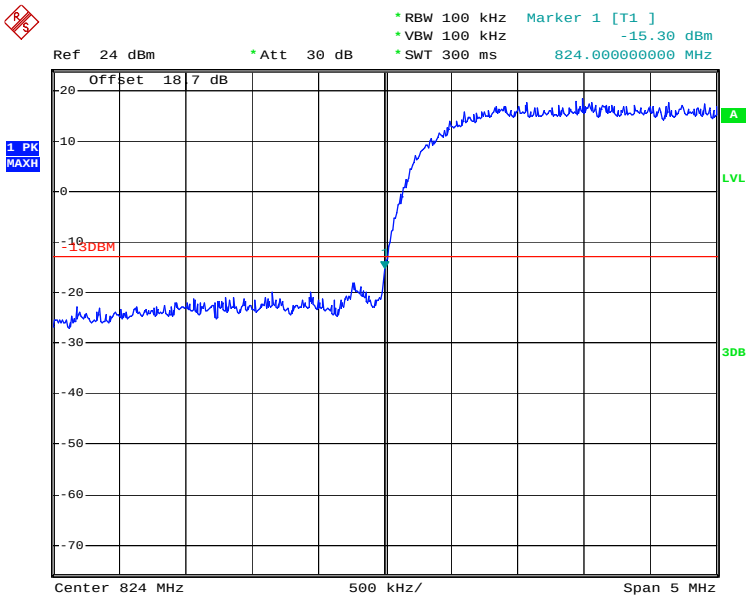
Higher Band Edge Plot on Channel 810



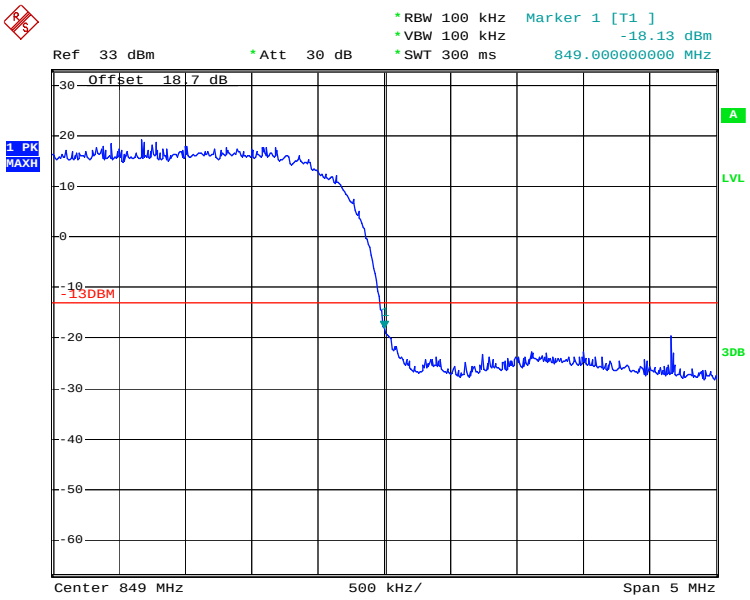
Date: 29.MAR.2012 08:55:19

Band :	WCDMA BAND V	Power Stage :	High
Test Mode :	RMC Link		

Lower Band Edge Plot on Channel 4132

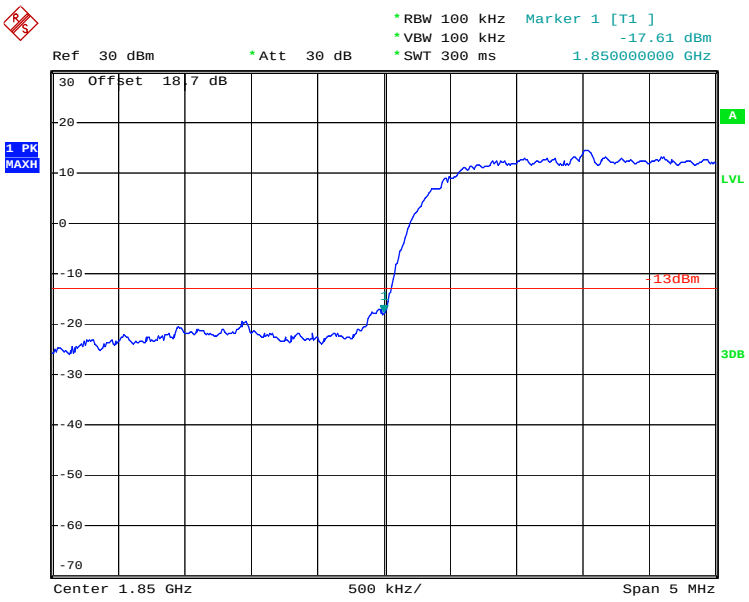


Higher Band Edge Plot on Channel 4233



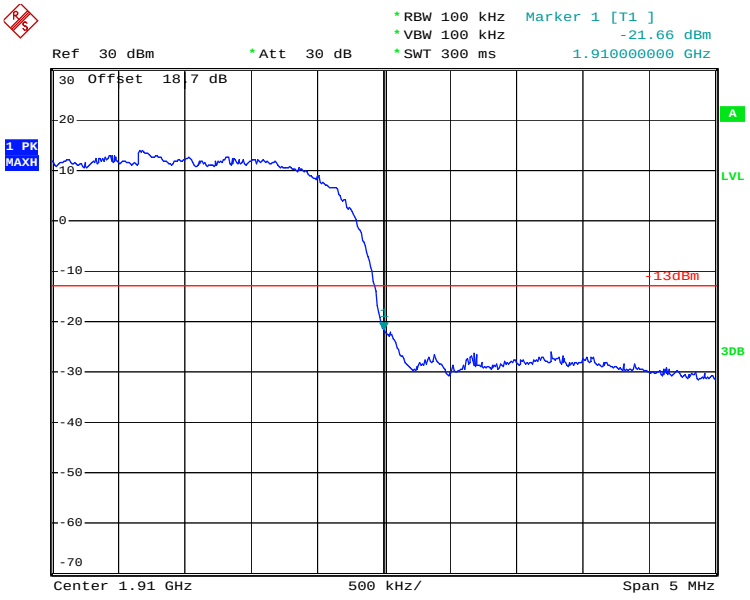
Band :	WCDMA BAND II	Power Stage :	High
Test Mode :	RMC Link		

Lower Band Edge Plot on Channel 9262



Date: 29.MAR.2012 07:56:31

Higher Band Edge Plot on Channel 9538



Date: 29.MAR.2012 07:58:10

3.5 Conducted Emission Measurement

3.5.1 Description of Conducted Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

3.5.2 Measuring Instruments

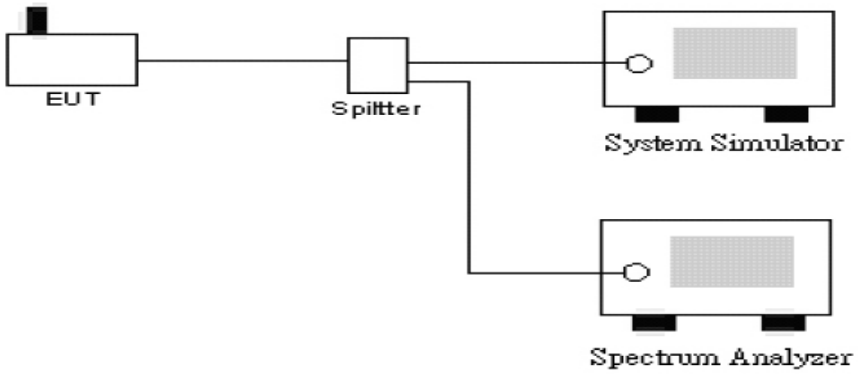
See list of measuring instruments of this test report.

3.5.3 Test Procedure

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

.

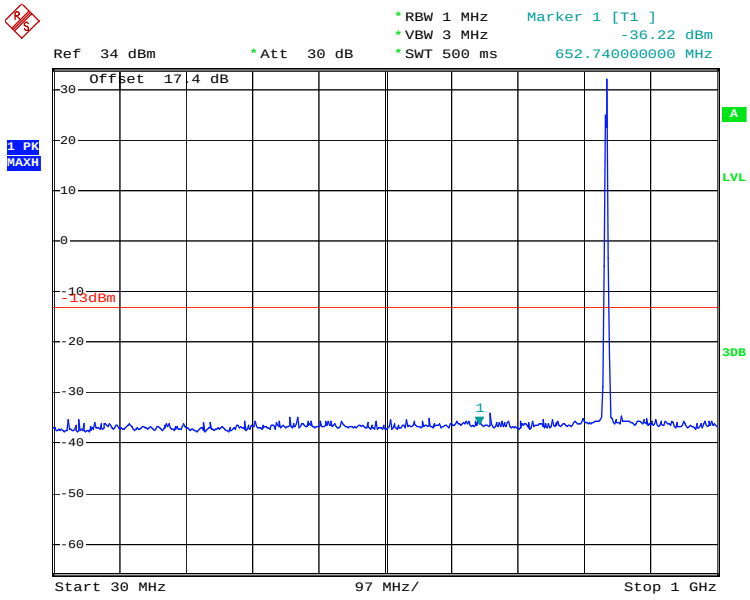
3.5.4 Test Setup



3.5.5 Test Result (Plots) of Conducted Emission

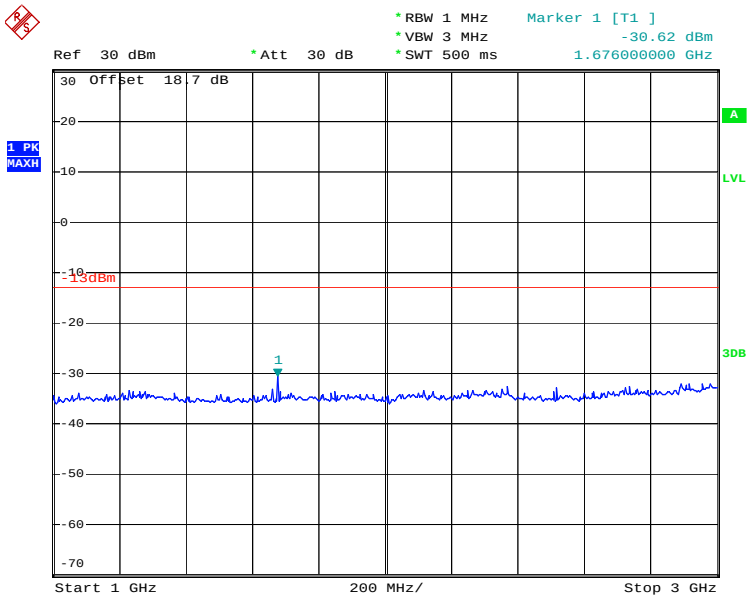
Band :	GSM850	Chnnel :	CH189
Test Mode :	GSM Link		

Conducted Emission Plot between 30MHz ~ 1GHz



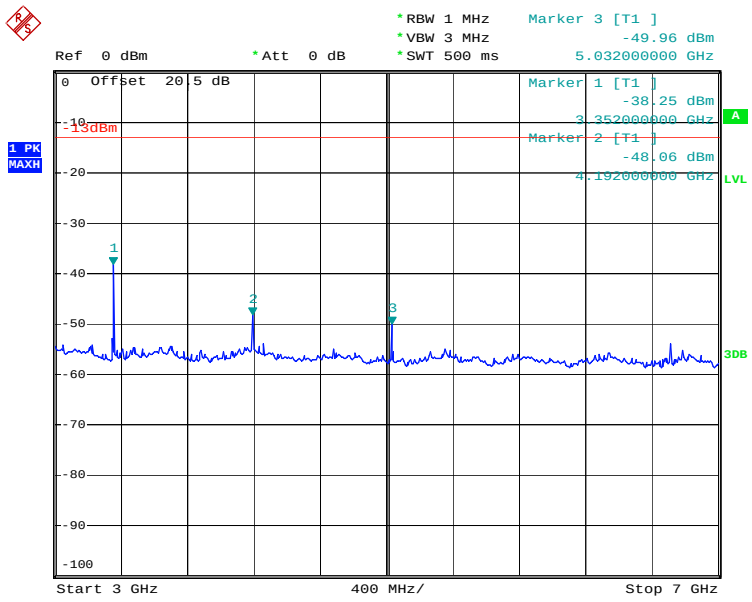
Date: 29.MAR.2012 10:51:19

Conducted Emission Plot between 1GHz ~ 3GHz



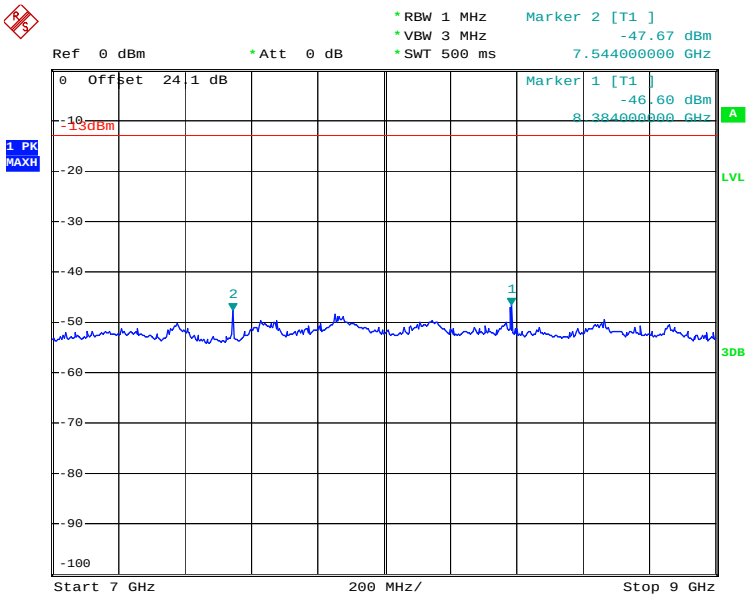
Date: 29.MAR.2012 10:52:48

Conducted Emission Plot between 3GHz ~ 7GHz



Date: 29.MAR.2012 10:55:58

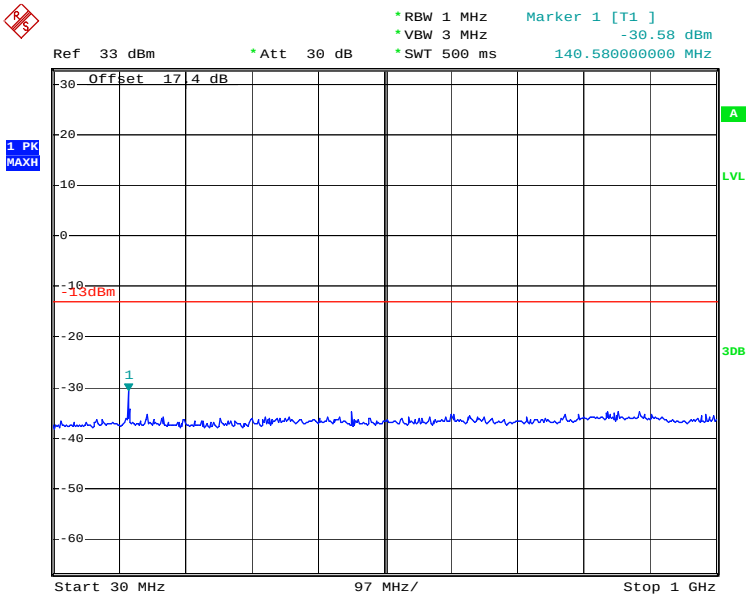
Conducted Emission Plot between 7GHz ~ 9GHz



Date: 29.MAR.2012 10:57:01

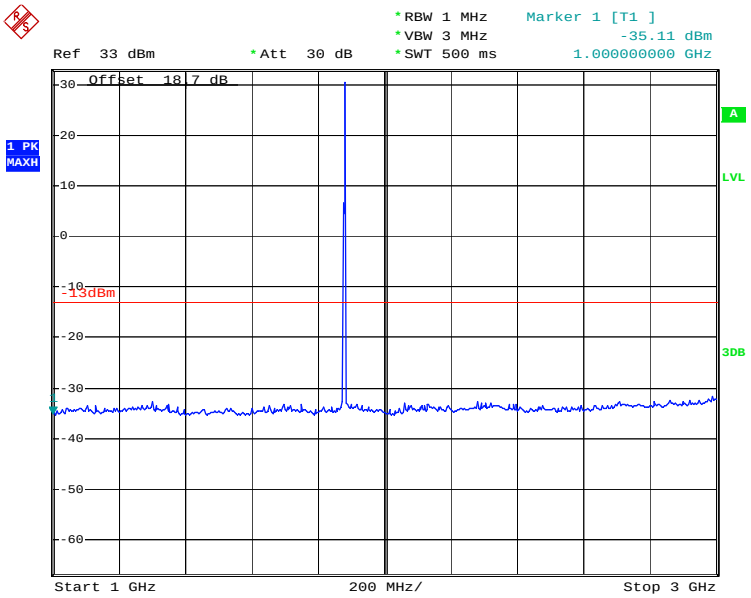
Band :	GSM1900	Channel :	CH661
Test Mode :	GSM Link		

Conducted Emission Plot between 30MHz ~ 1GHz



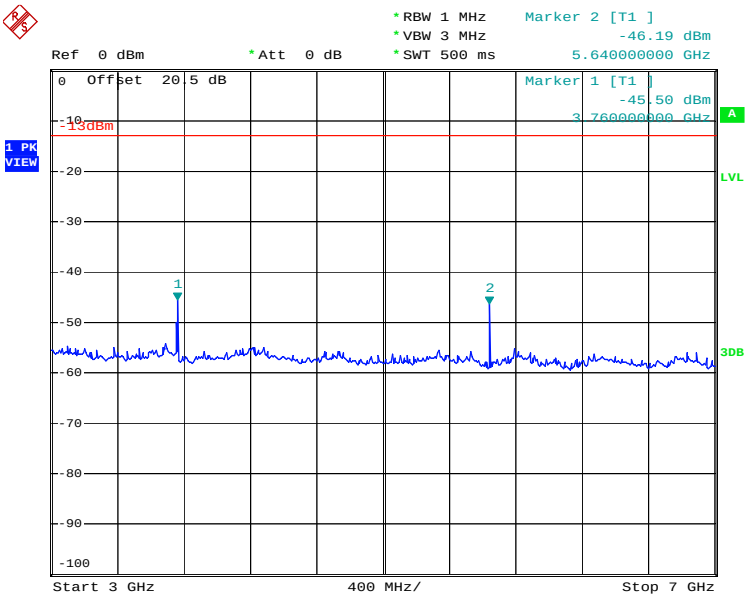
Date: 29.MAR.2012 10:00:10

Conducted Emission Plot between 1GHz ~ 3GHz



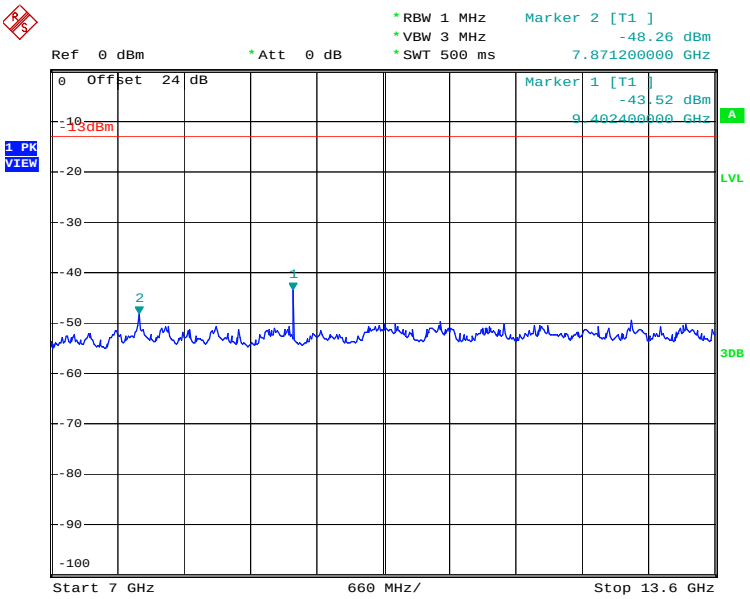
Date: 29.MAR.2012 10:01:10

Conducted Emission Plot between 3GHz ~ 7GHz



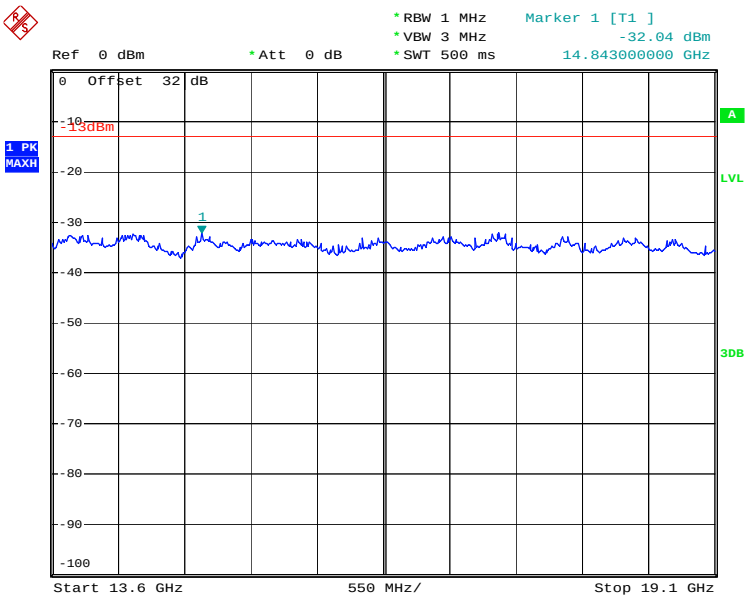
Date: 29.MAR.2012 10:03:38

Conducted Emission Plot between 7GHz ~ 13.6GHz



Date: 29.MAR.2012 10:05:23

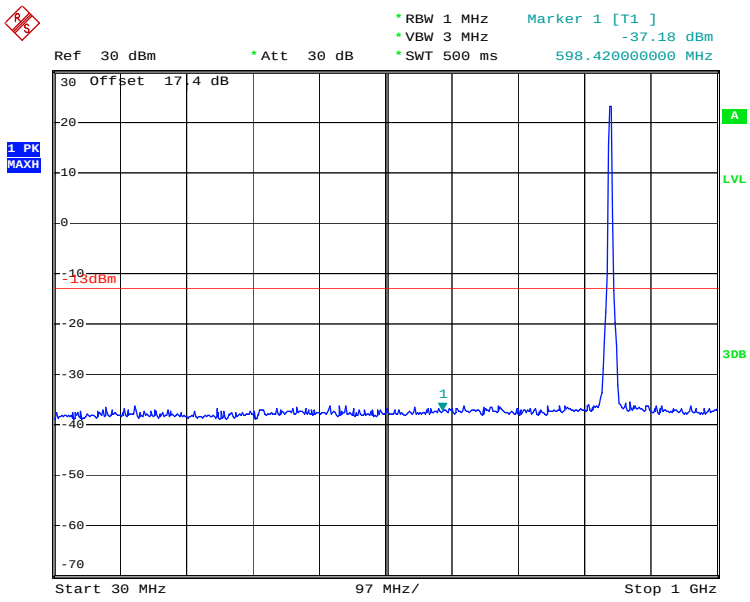
Conducted Emission Plot between 13.6GHz ~ 19.1GHz



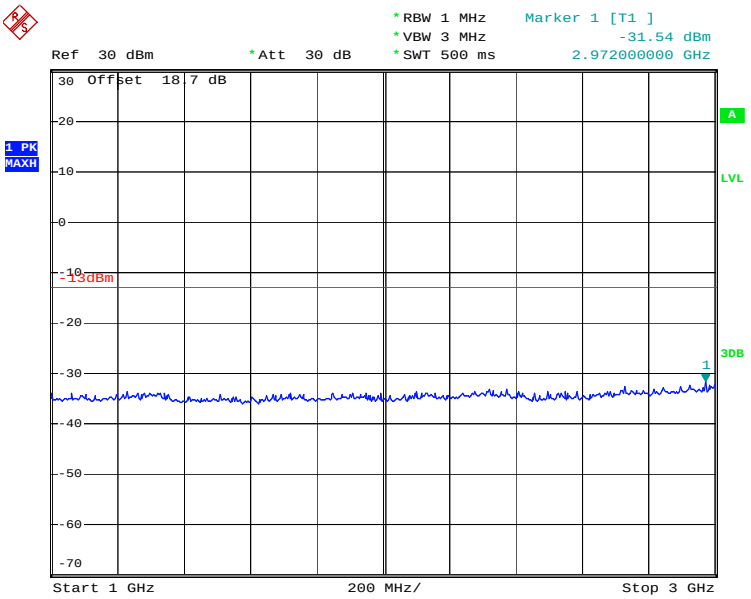
Date: 29.MAR.2012 10:06:57

Band :	WCDMA BAND V	Channel :	CH4128
Test Mode :	RMC Link		

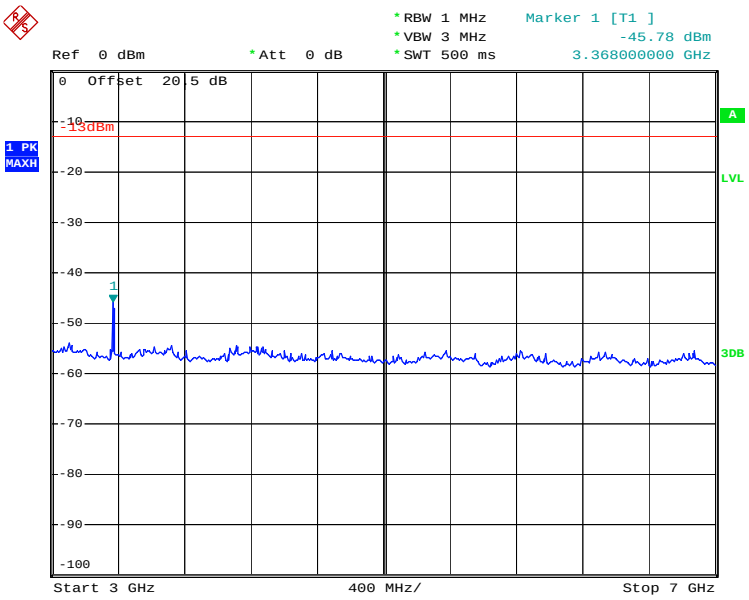
Conducted Emission Plot between 30MHz ~ 1GHz



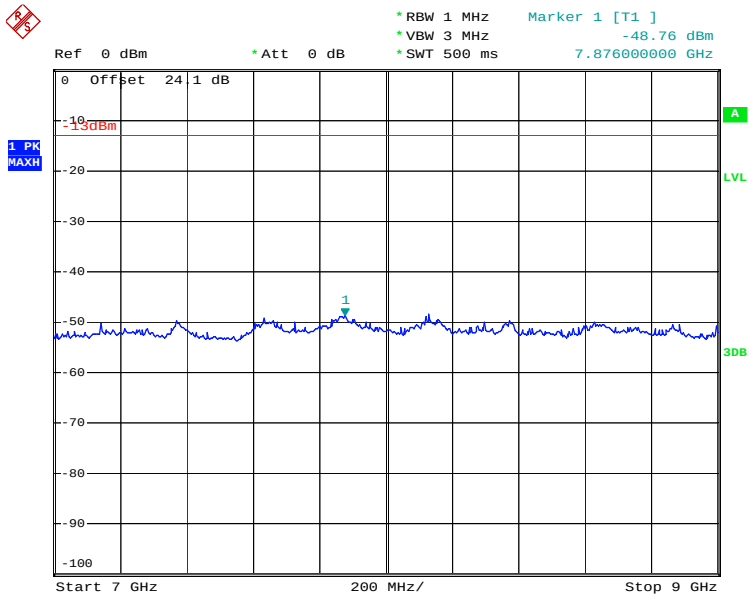
Conducted Emission Plot between 1GHz ~ 3GHz



Conducted Emission Plot between 3GHz ~ 7GHz

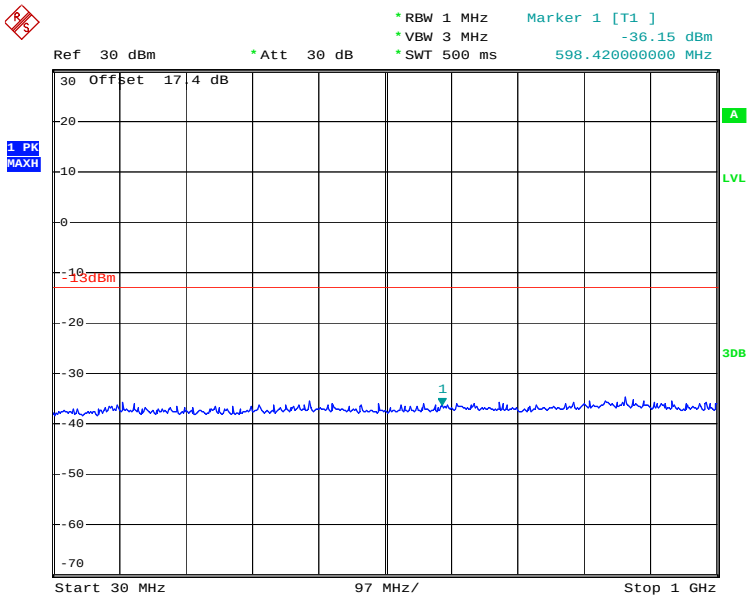


Conducted Emission Plot between 7GHz ~ 9GHz



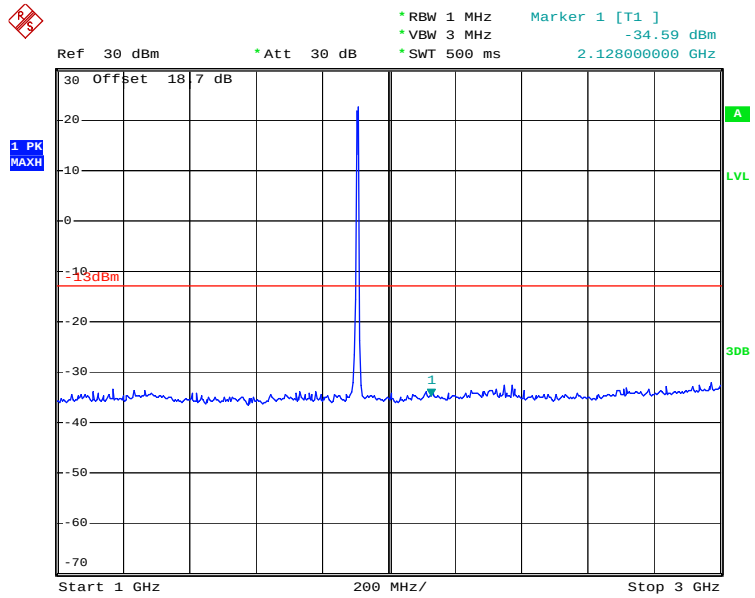
Band :	WCDMA BAND II	Channel :	CH9400
Test Mode :	RMC Link		

Conducted Emission Plot between 30MHz ~ 1GHz



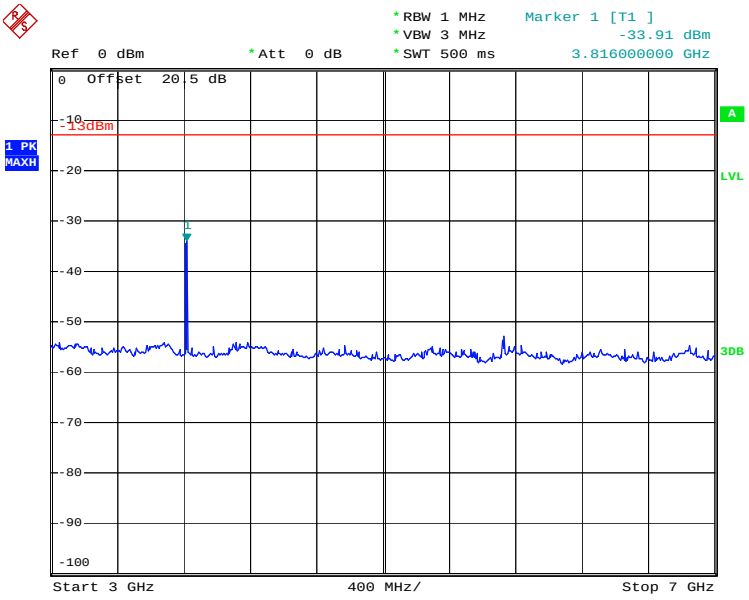
Date: 29.MAR.2012 11:07:57

Conducted Emission Plot between 1GHz ~ 3GHz



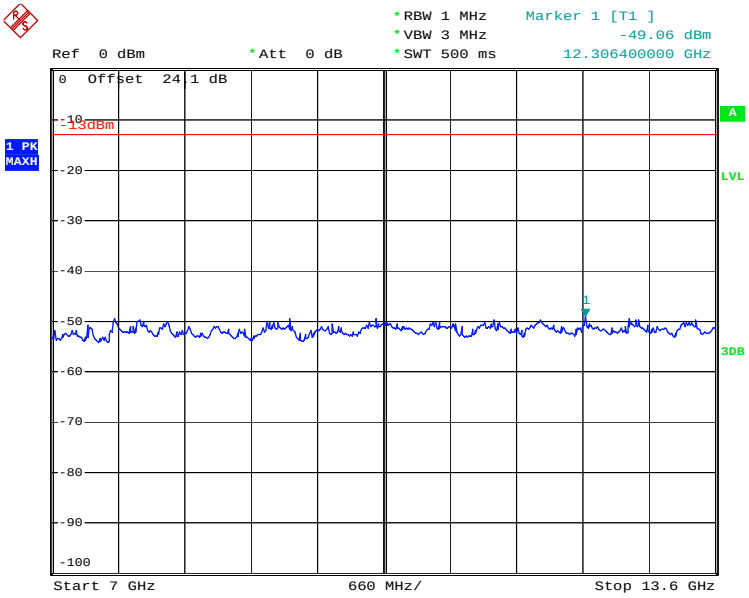
Date: 29.MAR.2012 11:08:57

Conducted Emission Plot between 3GHz ~ 7GHz



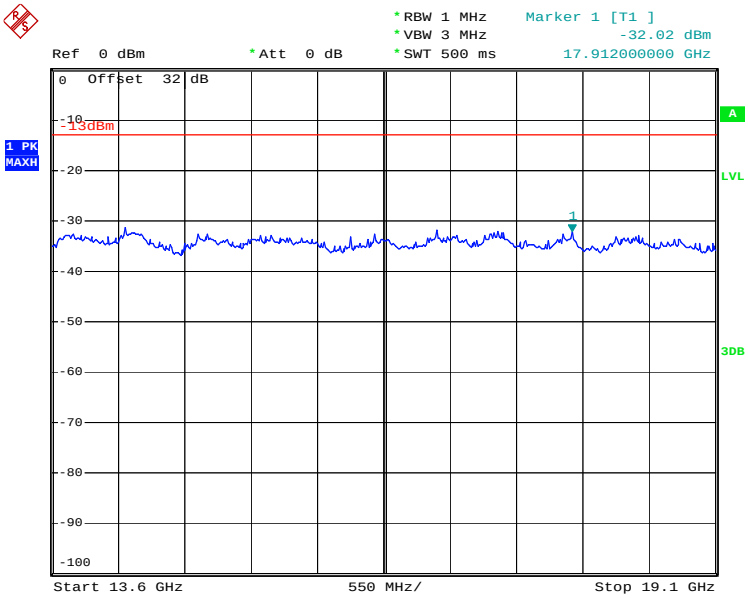
Date: 29.MAR.2012 11:10:58

Conducted Emission Plot between 7GHz ~ 13.6GHz



Date: 29.MAR.2012 11:12:07

Conducted Emission Plot between 13.6GHz ~ 19.1GHz



Date: 29.MAR.2012 11:13:17

3.6 Field Strength of Spurious Radiation Measurement

3.6.1 Description of Field Strength of Spurious Radiated Measurement

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

3.6.2 Measuring Instruments

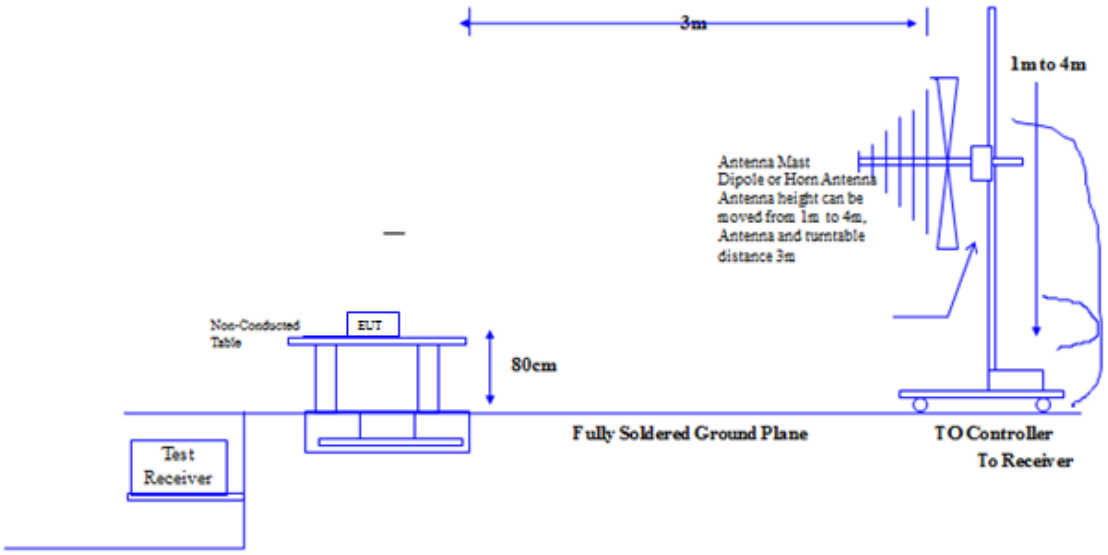
See list of measuring instruments of this test report.

3.6.3 Test Procedure

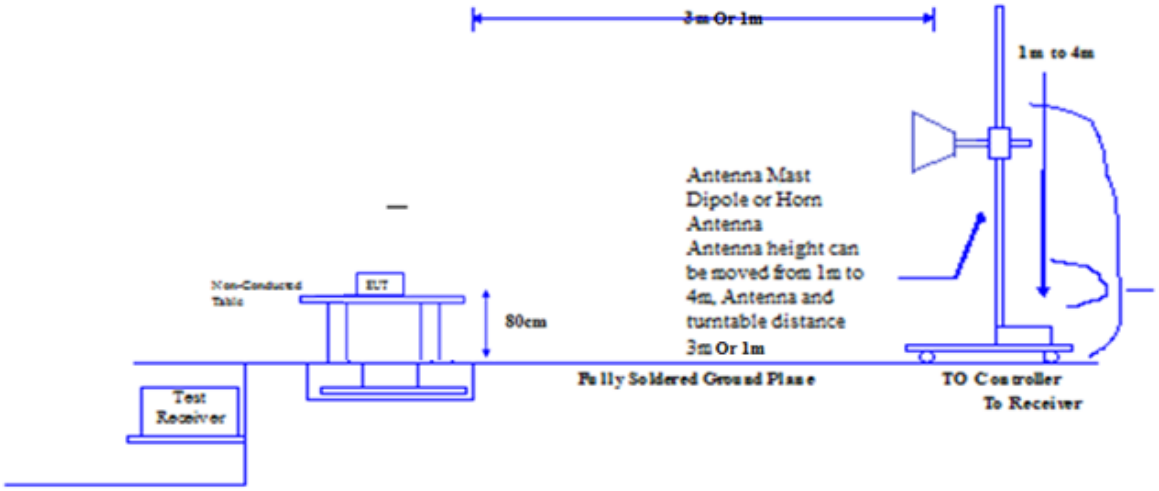
1. The EUT was placed on a rotatable wooden table with 0.8 meter about ground
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, Sweep =500ms, and set the test-receiver system to Peak Detect Function. Taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
11. ERP (dBm) = EIRP - 2.15

3.6.4 Test Setup

30MHz~1GHz



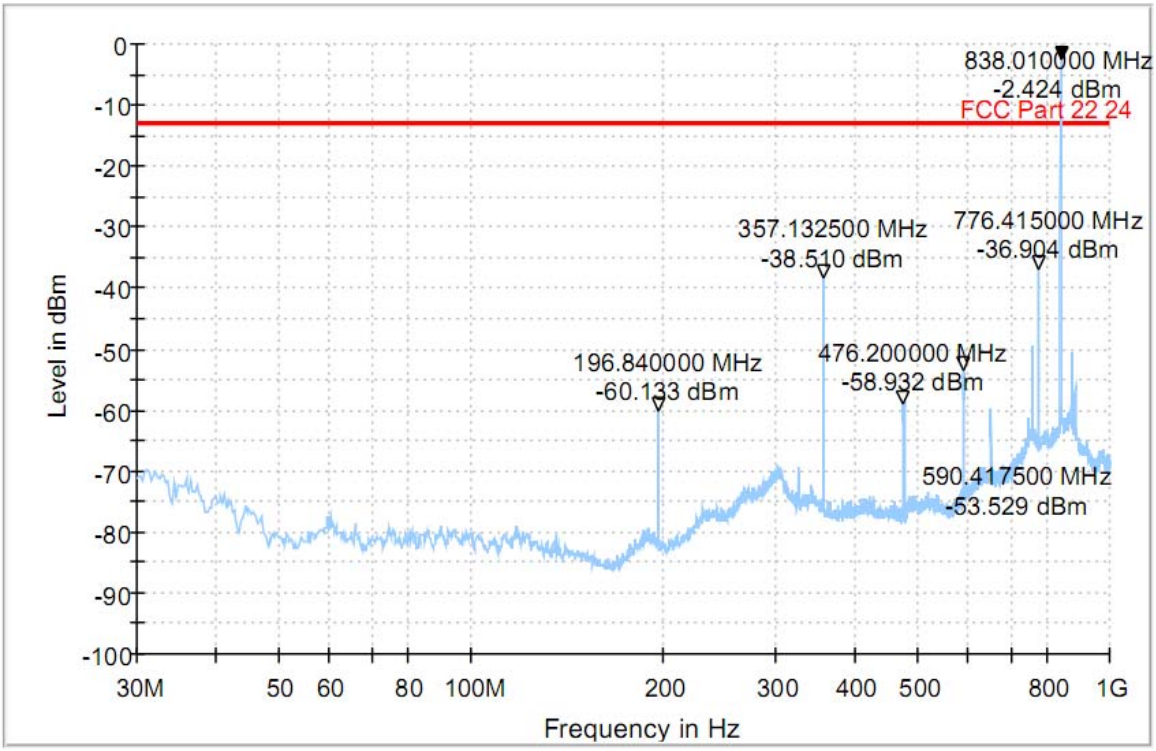
Above 1GHz



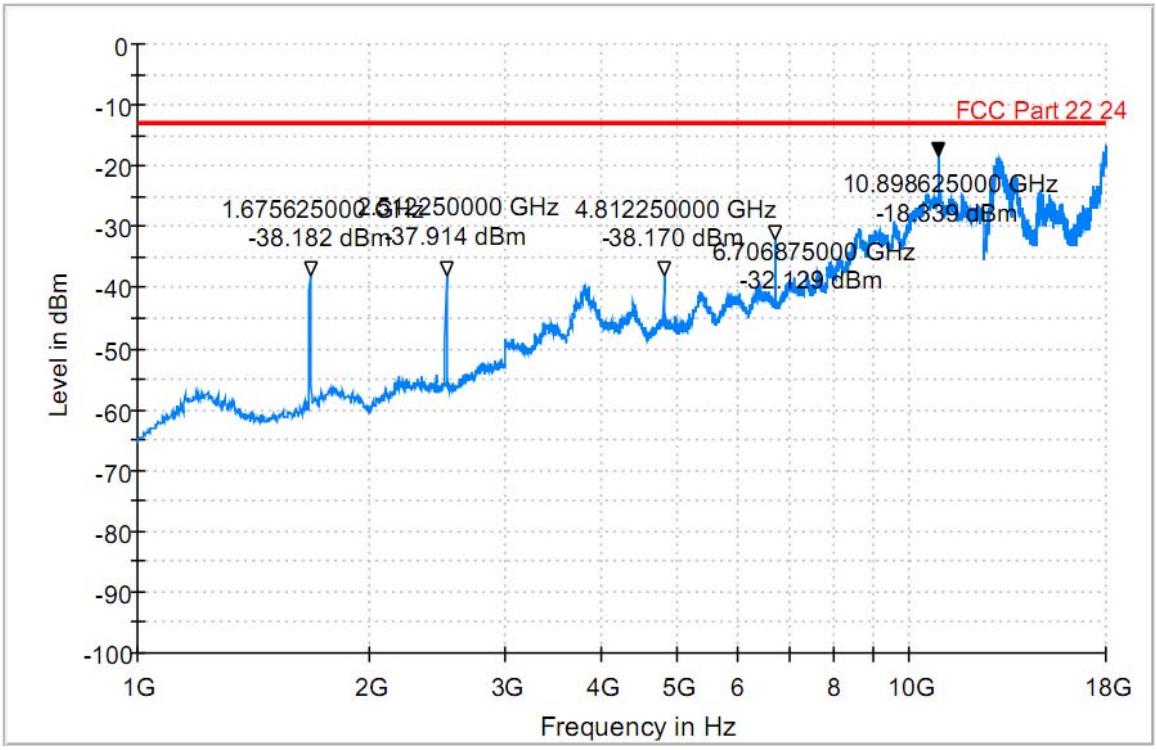
3.6.5 Test Result of Field Strength of Spurious Radiated

Band :	GSM850
Test Mode :	GSM850 Link + Adapter
Test Voltage	120V/60Hz

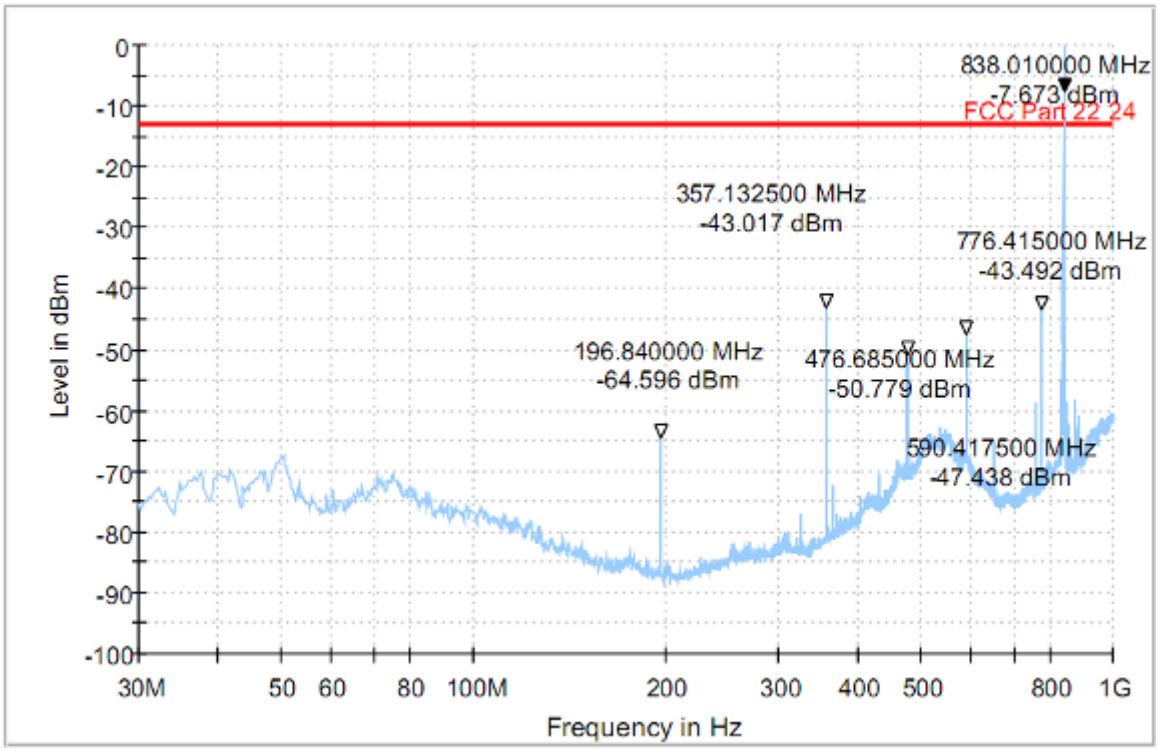
Field Strength of Spurious Radiated 30MHz-1GHz Vertical



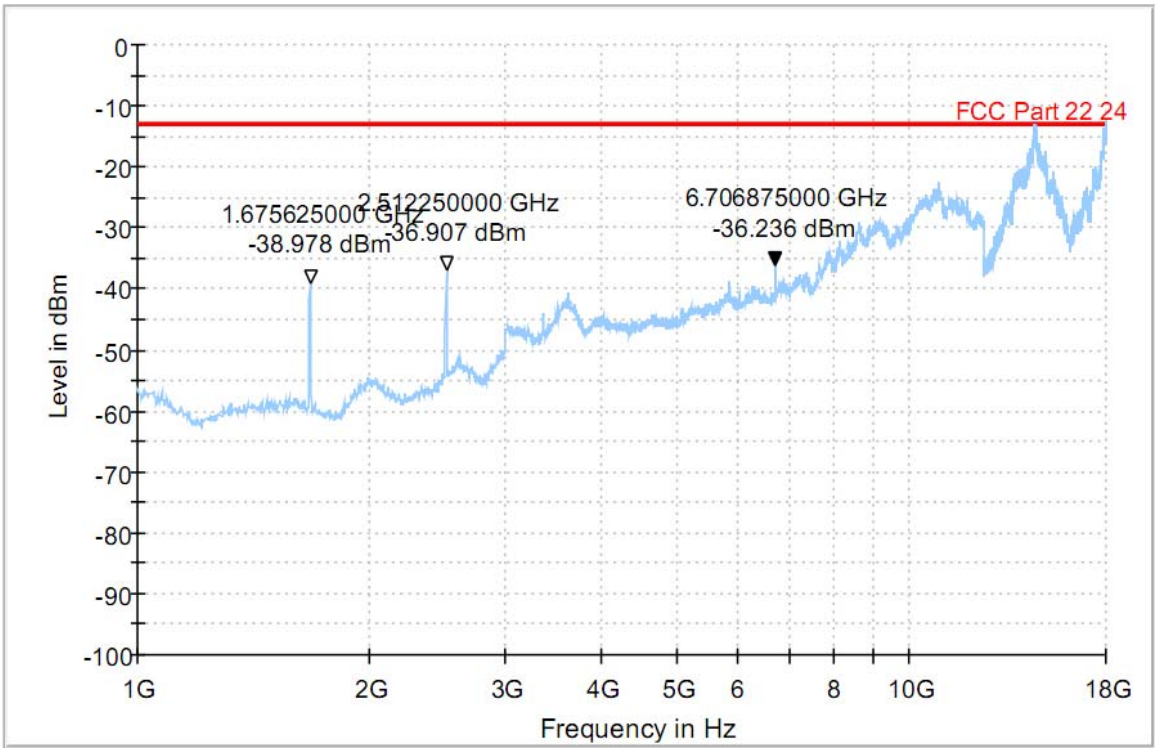
Field Strength of Spurious Radiated 1GHz-18GHz Vertical



Field Strength of Spurious Radiated 30MHz-1GHz Horizontal

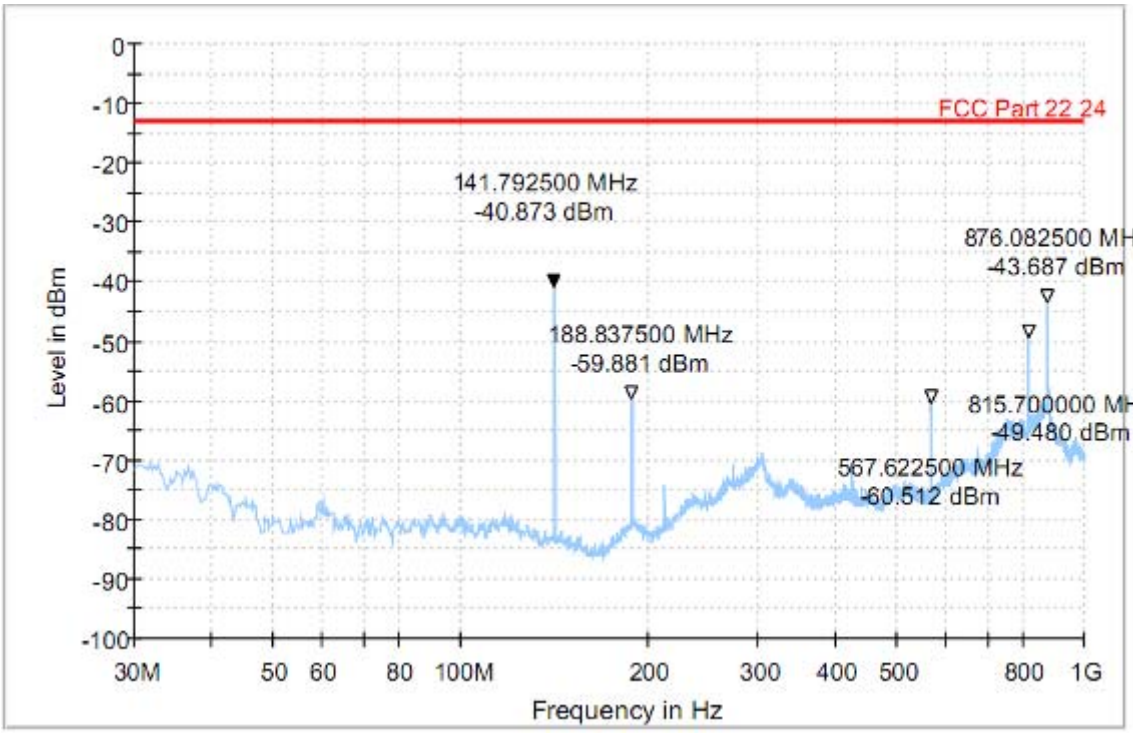


Field Strength of Spurious Radiated 1GHz-18GHz Horizontal

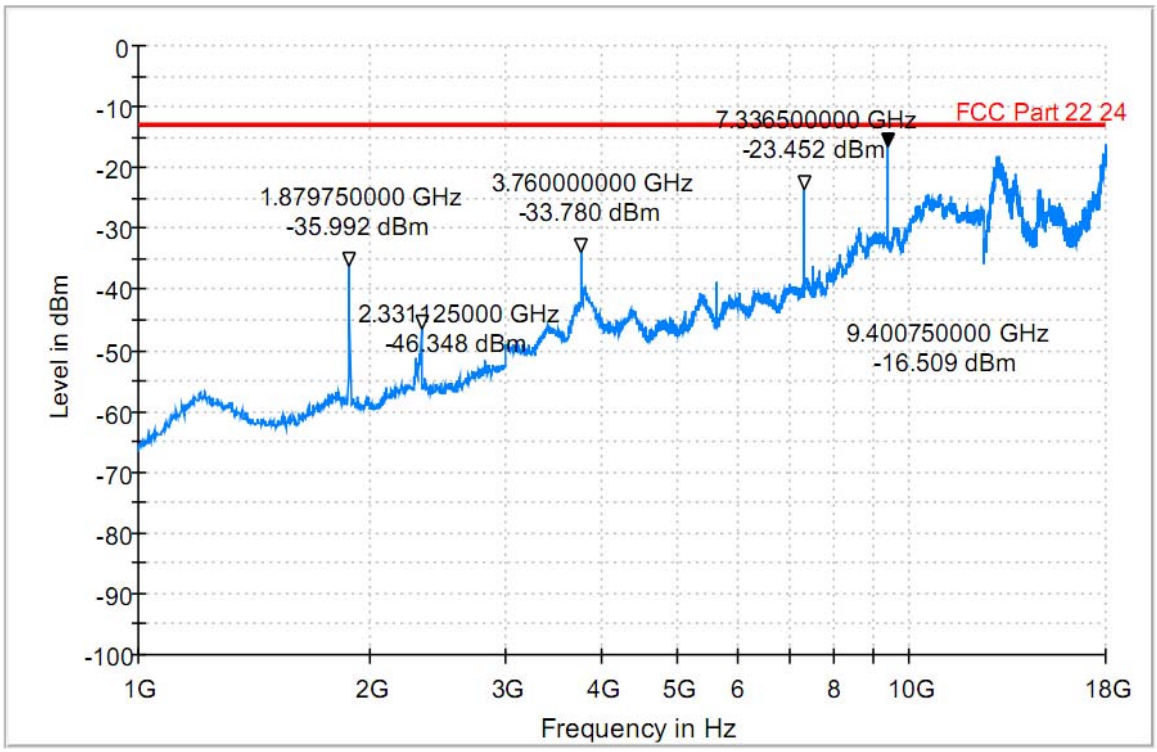


Band :	GSM1900
Test Mode :	GSM1900 Link + Adapter
Test Voltage	120V/60Hz

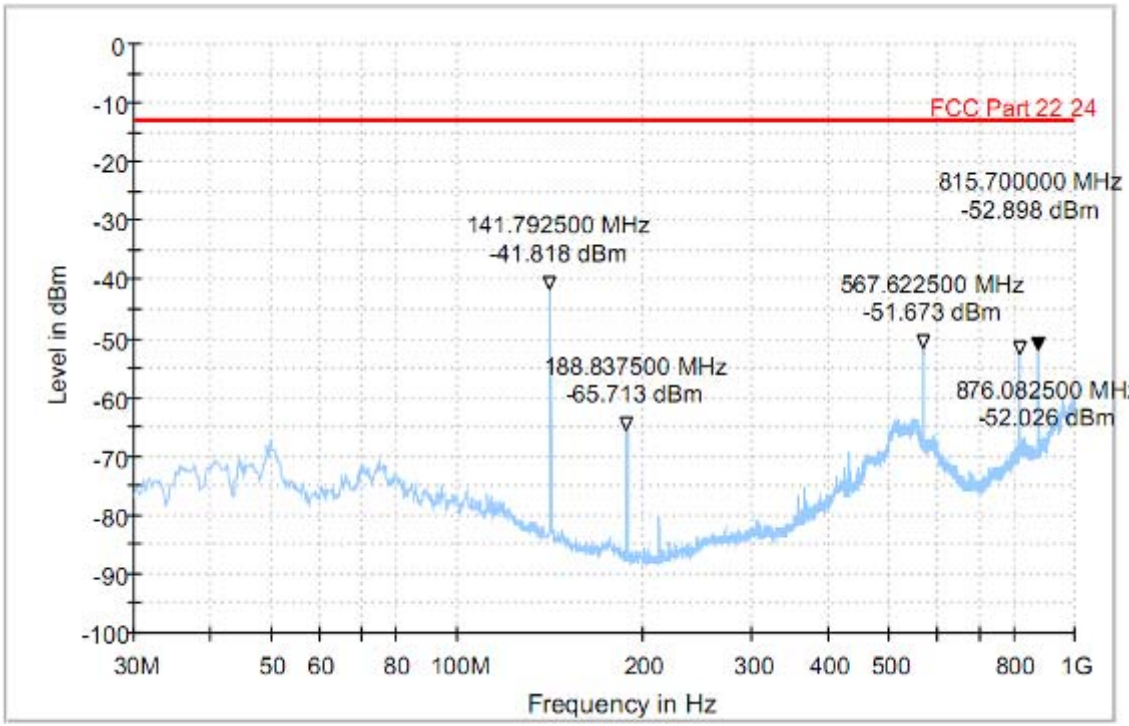
Field Strength of Spurious Radiated 30MHz-1GHz Vertical



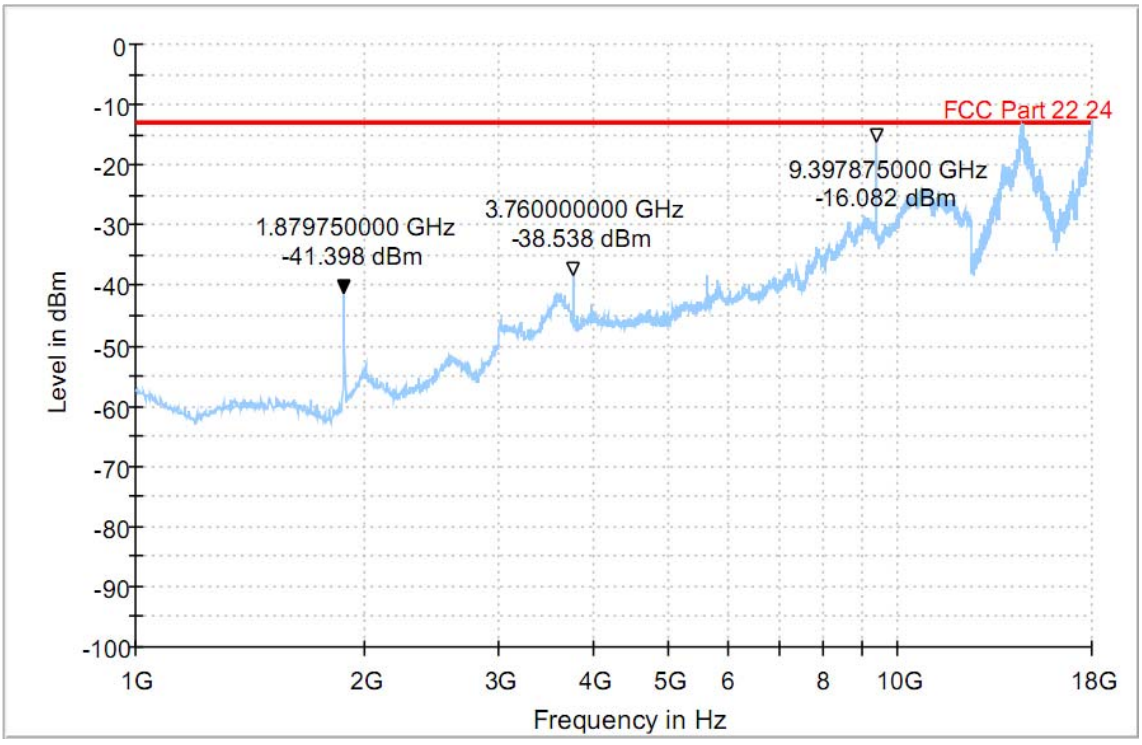
Field Strength of Spurious Radiated 1GHz-18GHz Vertical



Field Strength of Spurious Radiated 30MHz-1GHz Horizontal

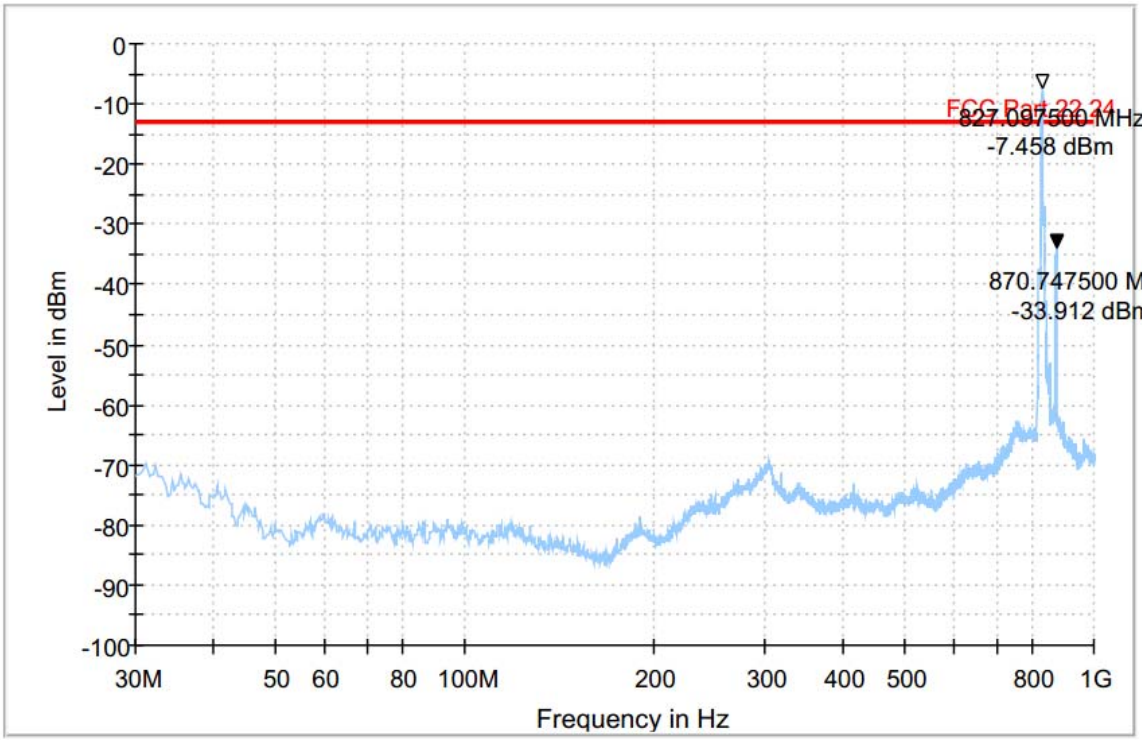


Field Strength of Spurious Radiated 1GHz-18GHz Horizontal

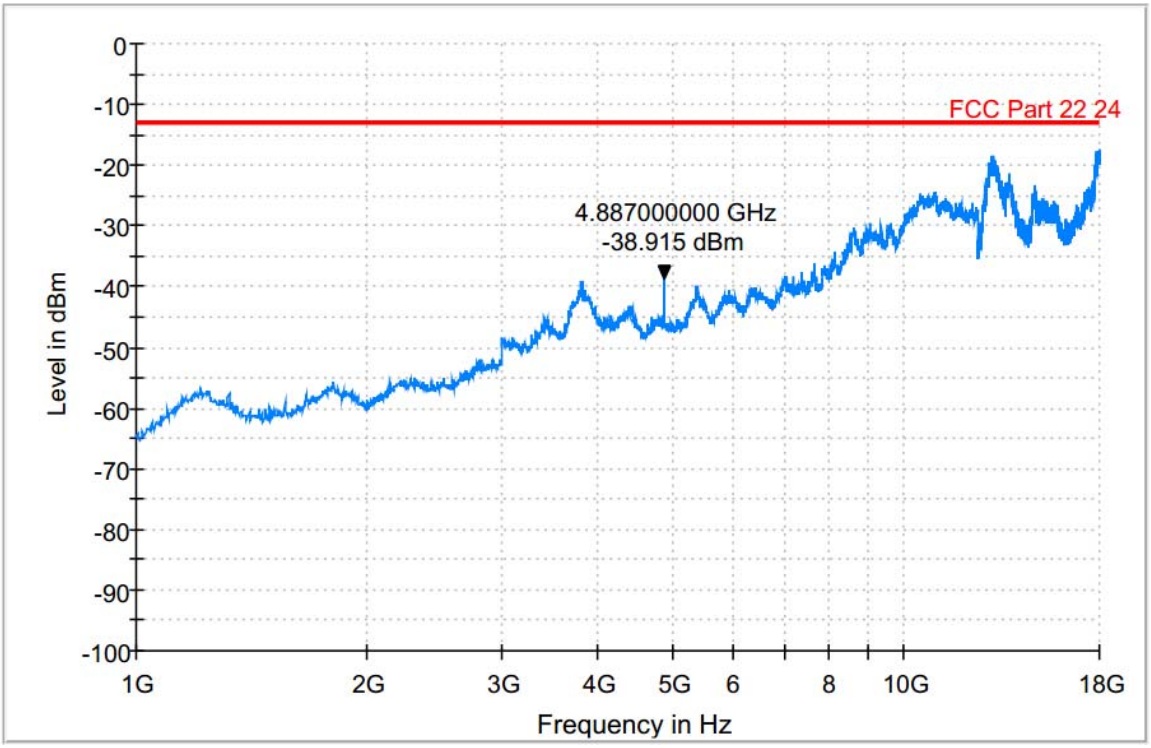


Band :	WCDMA BAND V
Test Mode :	RMC Link + Adapter
Test Voltage	120V/60Hz

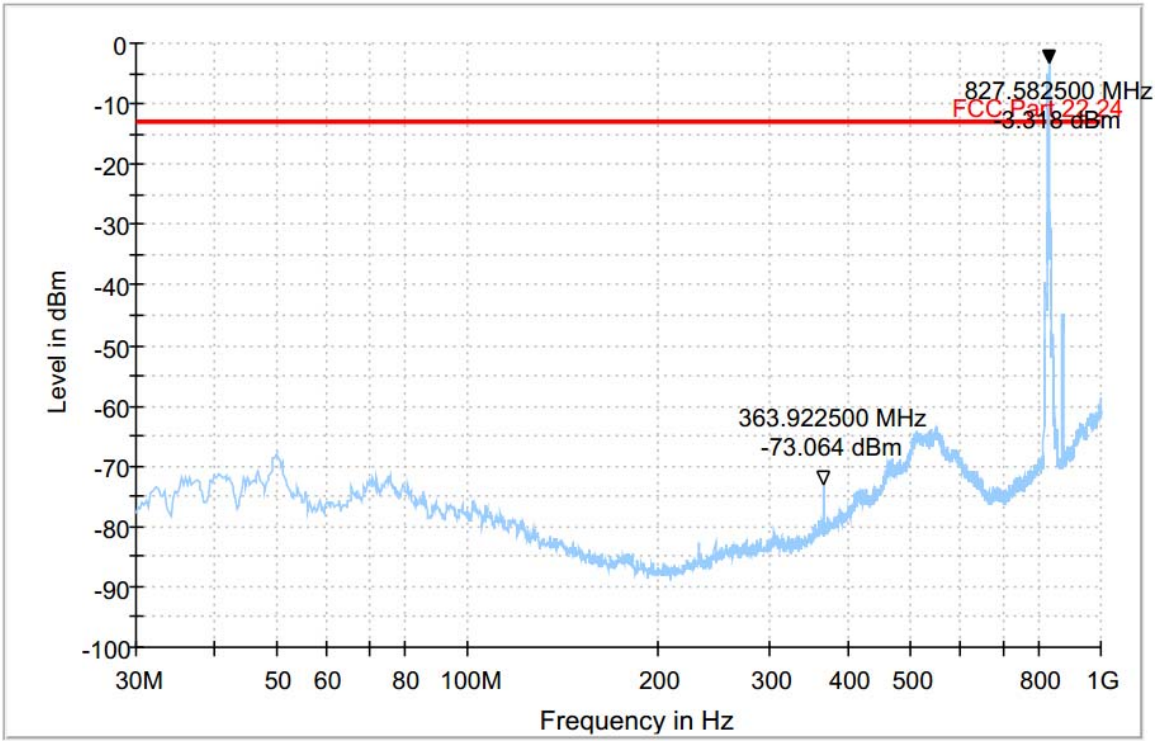
Field Strength of Spurious Radiated 30MHz-1GHz Vertical



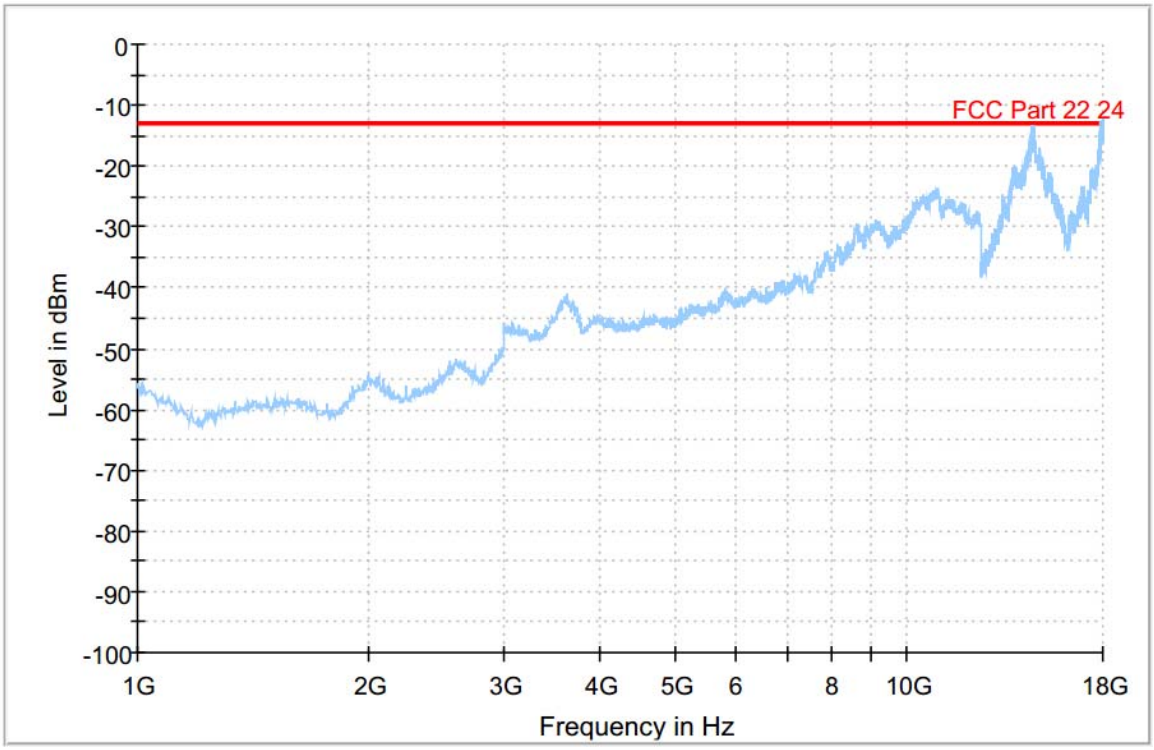
Field Strength of Spurious Radiated 1GHz-18GHz Vertical



Field Strength of Spurious Radiated 30MHz-1GHz Horizontal

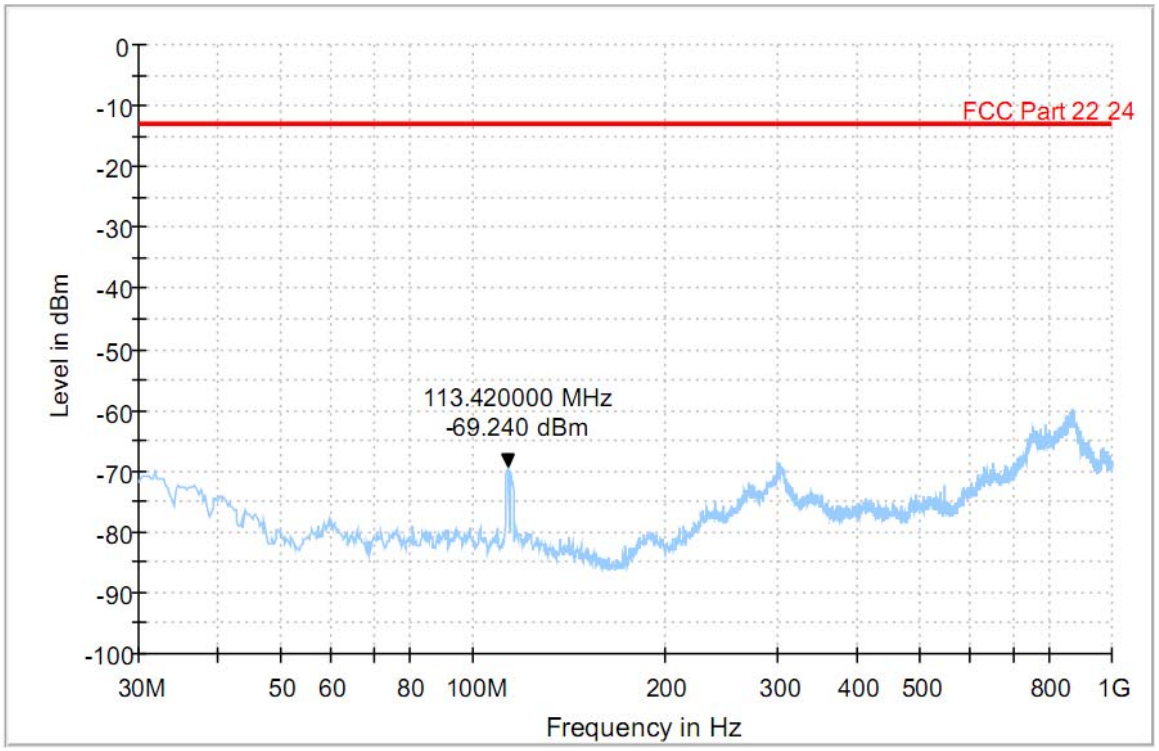


Field Strength of Spurious Radiated 1GHz-18GHz Horizontal

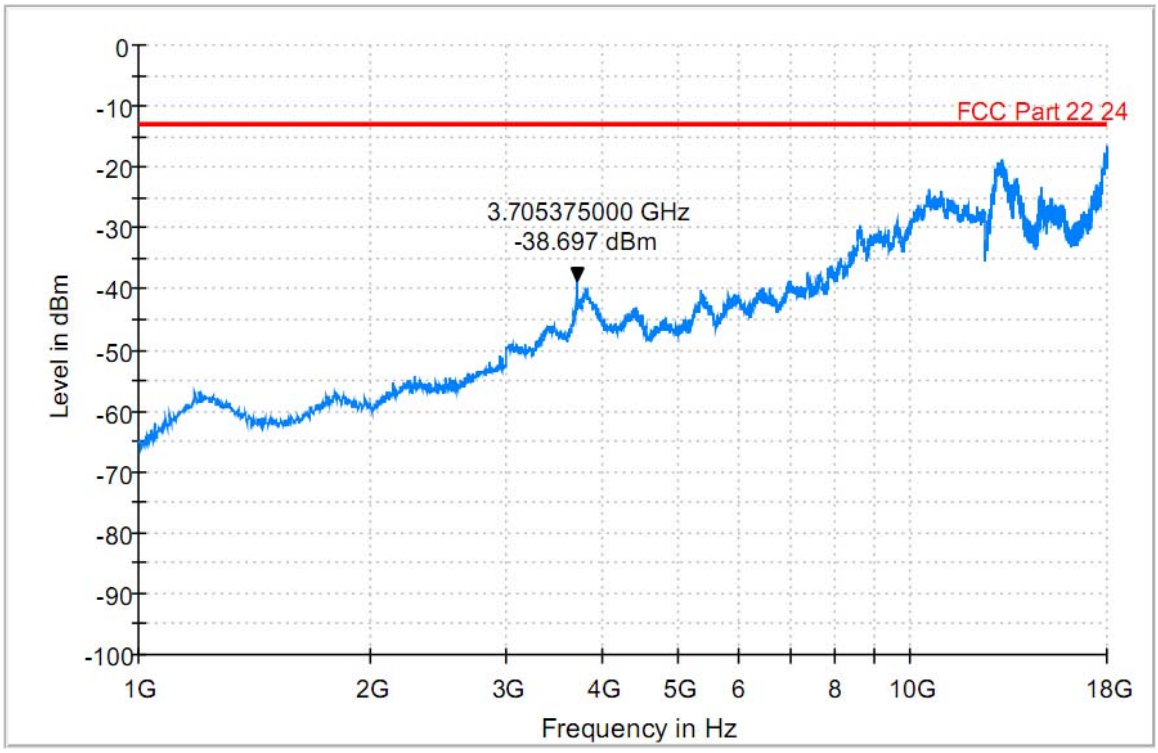


Band :	WCDMA BAND II
Test Mode :	RMC Link + Adapter
Test Voltage	120V/60Hz

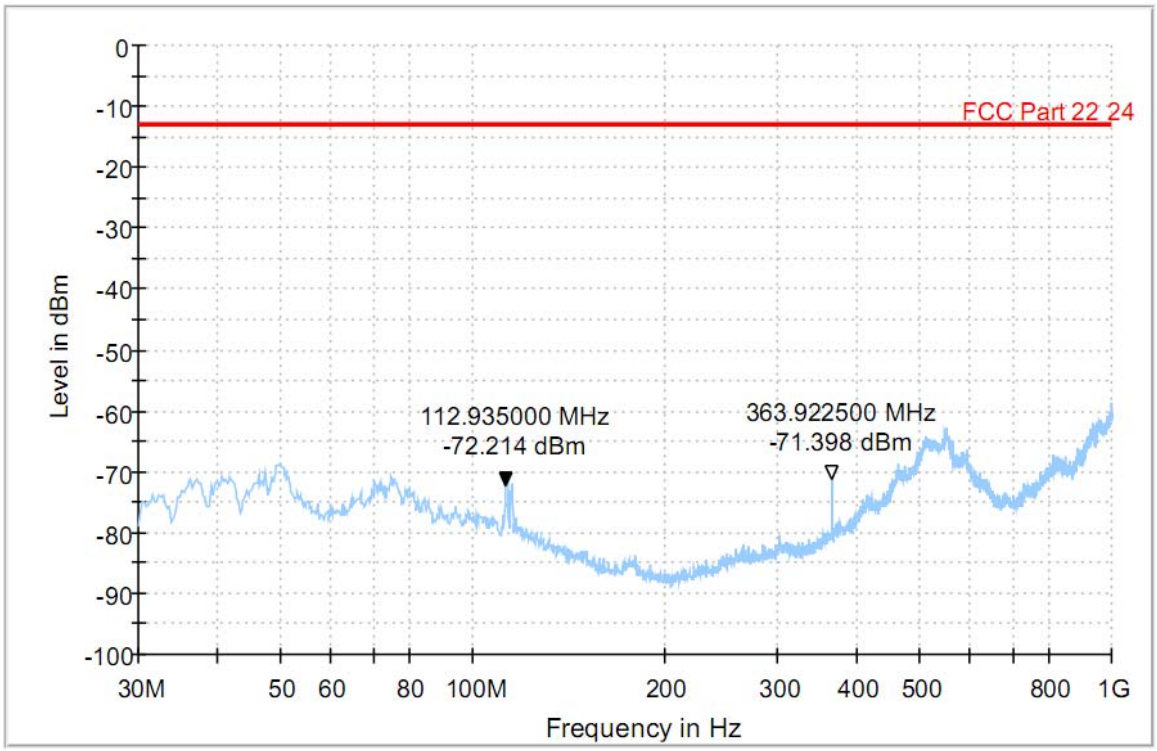
Field Strength of Spurious Radiated 30MHz-1GHz Vertical



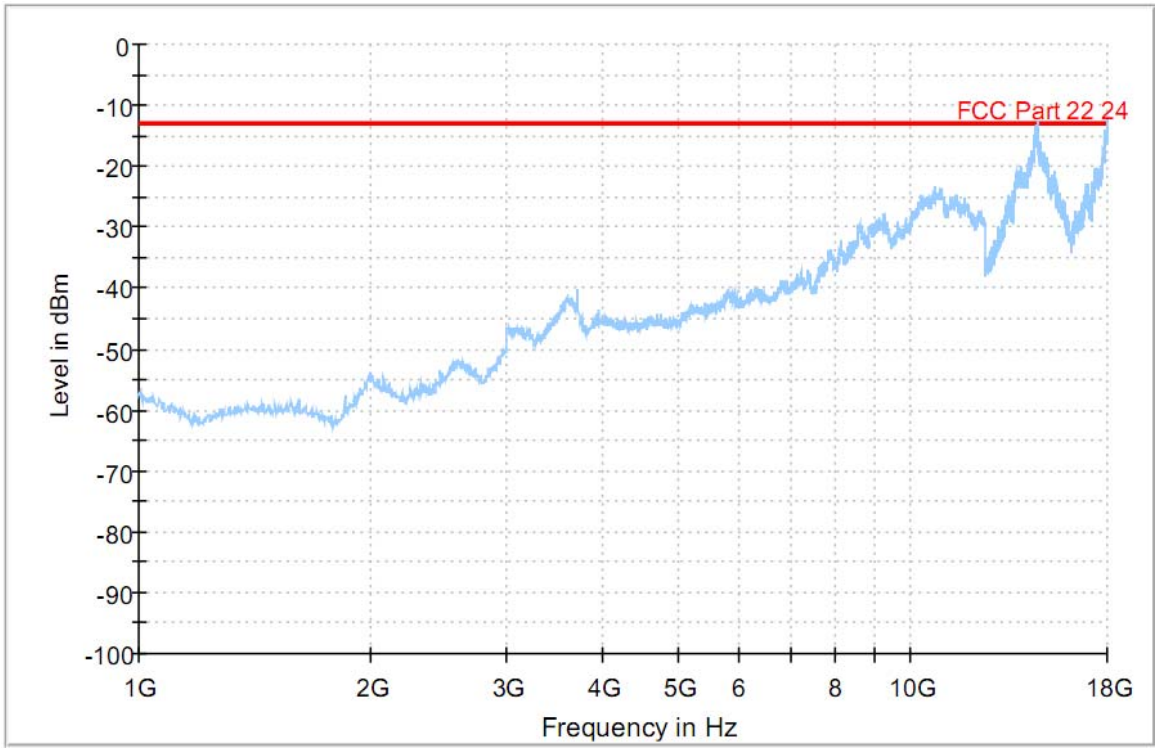
Field Strength of Spurious Radiated 1GHz-18GHz Vertical



Field Strength of Spurious Radiated 30MHz-1GHz Horizontal



Field Strength of Spurious Radiated 1GHz-18GHz Horizontal



3.6.6 Radiated Emission Measurement Results (18GHz-19.1GHz)

Test Engineer :	Hogan. He	**Temperature :**	23℃~26℃
		Relative Humidity :	40%~60%

Frequency (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Notes:

The amplitude of radiated emissions that are attenuated by more than 20dB below the permissible value has no need to be reported. The measurement performed at 1meter distance from turn table to antenna.

3.7 Frequency Stability Measurement

3.7.1 Description of Frequency Stability Measurement

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

3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

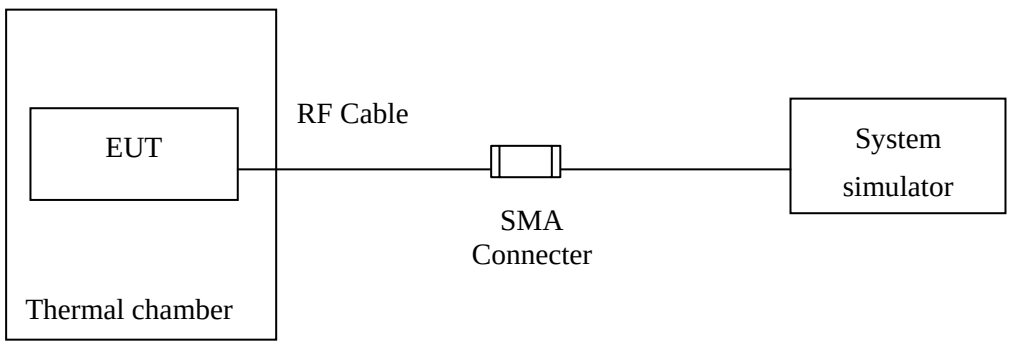
3.7.3 Test Procedures for Temperature Variation

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

3.7.4 Test Procedures for Voltage Variation

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

3.7.5 Test Setup



3.7.6 Test Result of Temperature Variation

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

Temperature	GSM850		Result
	Feq. Dev.(Hz)	Deviation(ppm)	
-30	-59.6	-0.071	PASS
-20	-65.4	-0.078	
-10	-58.4	-0.070	
0	-66.8	-0.080	
10	-67.6	-0.081	
20	58.3	0.070	
30	-62.7	-0.075	
40	-45.3	-0.054	
50	52.3	0.063	

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

Temperature	GSM1900		Result
	Feq. Dev.(Hz)	Deviation(ppm)	
-30	58.3	0.031	PASS
-20	-46.4	-0.025	
-10	-63.6	-0.034	
0	-63.4	-0.034	
10	-47.6	-0.025	
20	-59.7	-0.032	
30	-63.7	-0.034	
40	47.3	0.025	
50	-56.4	-0.030	

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

Temperature	WCDMA Band V		Result
	Feq. Dev.(Hz)	Deviation(ppm)	
-30	-63.2	-0.076	PASS
-20	-56.4	-0.066	
-10	-56.6	-0.066	
0	-53.4	-0.065	
10	46.6	0.055	
20	-63.7	-0.076	
30	-66.7	-0.078	
40	-45.2	-0.055	
50	-66.1	-0.078	

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

Temperature	WCDMA Band II		Result
	Feq. Dev.(Hz)	Deviation(ppm)	
-30	58.3	0.031	PASS
-20	-46.4	-0.025	
-10	-63.6	-0.034	
0	-63.4	-0.034	
10	-47.6	-0.025	
20	-59.7	-0.032	
30	-63.7	-0.034	
40	47.3	0.025	
50	-56.4	-0.030	

3.7.7 Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Feq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
GSM 850 CH189	GSM	3.8	39.4	0.047	2.5	PASS
		3.55	37.3	0.045		
		4.2	58.3	0.070		
GSM 1900 CH661	GSM	3.8	-62.3	-0.033		
		3.55	-38.6	-0.021		
		4.2	-47.1	-0.025		
WCDMA Band V CH4182	WCDMA	3.8	38.6	0.046		
		3.55	-56.3	-0.068		
		4.2	-56.8	-0.068		
WCDMA Band II CH9400	WCDMA	3.8	48.3	0.026		
		3.55	-61.2	-0.033		
		4.2	-53.2	-0.028		

4 List of Measuring Equipment

No	Instrument/Ancillary	Provider	Type/Model	Cal. Date
01	Base Station	Agilent	E5515C	2011.12.14
02	Spectrum Analyzer	R&S	FSP30(9kHz~30GHz)	2011.07.19
03	Antenna	Schwarzbeck	VULB9165(30M-1G)	2011.11.09
04	Antenna	R&S	HF906(1G-18G)	2011.08.10
05	Antenna	Schwarzbeck	BBHA 9170 (15G-26.5G)	2011.11.09
06	High Pass Filter	R&S	System Integrated	2011.11.14
07	Thermal chamber	Hitachi	EC- 85MHP	2011.12.25
08	Pre-Amplifier	R&S	Pre-Amp	2012.1.18
09	Helical Antenna	ETS	3102 (1G-10G)	NCR
10	Power Meter	R&S	NRP(10MHz~8GHz)	2011.12.05
11	Relay Switch	R&S	TS-REMI	NCR

5 Uncertainty Evaluation

5.1 Ucertainty of Radiated Spurious Emission evaluation (30MHz~1GHz)

Contribution		Probability Distribution	Partition Coefficient	Ucertainty (ui)	
				Horizontal 30MHz-1GHz	Vertical 30MHz-1GHz
Cable Loss Calibration	U01	Standard deviation	2.00	0.04	0.04
Sine wave voltage accuracy of Spectrum analyzer	U02	Triangle	2.45	0.82	0.82
Impulse response of spectrum analyzer	U03	Triangle	2.45	0.61	0.61
Pulse repetition rate of spectrum analyzer	U04	Triangle	2.45	0.61	0.61
Spectrum analyzer noise level	U05	Standard deviation	2.00	0.25	0.25
Measurement of the signal path mismatch	U06	U-Shape	1.41	0.69	0.69
Free-space antenna factor	U07	Standard deviation	2.00	0.50	0.50
Antenna Factor Interpolation for Frequency	U08	Rectangular	1.73	0.17	0.17
Antenna factor with height in the correlation	U09	Rectangular	1.73	0.17	0.17
Measurementantennaand theabsorbingmaterialintheimageof themutualcoupling effect	U10	Rectangular	1.73	0.58	0.58
Antenna phase center variation	U11	Rectangular	1.73	0.42	0.42
Antenna cross polarization response	U12	Rectangular	1.73	0.52	0.52
Antenna imbalance	U13	Rectangular	1.73	0.52	0.52
Test distance error	U14	Triangle	2.45	0.46	0.56
Test distance error	U15	Rectangular	1.73	0.17	0.17
Desktop terrain clearance variation	U16	Standard deviation	2.00	0.05	0.05
Random uncertainty	U17	Standard deviation	1.00	0.18	0.03
Combined Standard Uncertainty Uc(y)	Uc	Standard deviation	1.00	1.89	1.91
Measuring Uncertainty for a level of Confidence of 95%(U= 2Uc(y))	U=kUc	Standard deviation	k	3.79	3.82

5.2 Uncertainty of Radiated Spurious Emission evaluation (1GHz~26.5GHz)

Contribution		Probability Distribution	Partition Coefficient	Ucertainty (ui)	
				Horizontal 30MHz-1GHz	Vertical 30MHz-1GHz
Cable Loss Calibration	U01	Standard deviation	2	0.04	0.04
Sine wave voltage accuracy of Spectrum analyzer	U02	Triangle	2.45	0.82	0.82
Impulse response of spectrum analyzer	U03	Triangle	2.45	0.61	0.61
Pulse repetition rate of spectrum analyzer	U04	Triangle	2.45	0.61	0.61
Spectrum analyzer noise level	U05	Standard deviation	2.00	0.25	0.25
Measurement of the signal path mismatch	U06	U-Shape	1.41	0.69	0.69
Free-space antenna factor	U07	Standard deviation	2.00	0.50	0.50
Antenna Factor Interpolation for Frequency	U08	Rectangular	1.73	0.173	0.173
Antenna factor with height in the correlation	U09	Rectangular	1.73	NA	NA
Measurementantennaand theabsorbingmaterialintheimageof themutualcoupling effect	U10	Rectangular	1.73	0.58	0.58
Antenna phase center variation	U11	Rectangular	1.73	0.13	0.13
Antenna cross polarization response	U12	Rectangular	1.73	0.52	0.52
Antenna imbalance	U13	Rectangular	1.73	0.52	0.52
Test distance error	U14	Triangle	2.45	1.48	1.55
Test distance error	U15	Rectangular	1.73	0.17	0.17
Desktop terrain clearance variation	U16	Standard deviation	2.00	0.05	0.05
Random uncertainty	U17	Standard deviation	1.00	0.01	0.08
Combined Standard Uncertainty Uc(y)	Uc	Standard deviation	1.00	2.31	2.36
Measuring Uncertainty for a level of Confidence of 95%(U= 2Uc(y))	U=k Uc	Standard deviation	K	4.63	4.71