

Variant FCC RF Test Report

APPLICANT : Motorola Mobility, Inc.
EQUIPMENT : Mobile Phone
BRAND NAME : Motorola
MODEL NAME : XT685
MARKETING NAME : MOTOLUXE XT685
GPPD NUMBER : 3402
FCC ID : IHDP56MM5
STANDARD : FCC 47 CFR Part 2, 22(H), 24(E)
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)
Tx/Rx FREQUENCY RANGE : GSM850 : 824.2 ~ 848.8 MHz /
869.2 ~ 893.8 MHz
GSM1900 : 1850.2 ~ 1909.8 MHz /
1930.2 ~ 1989.8 MHz
MAX. ERP/EIRP POWER : GSM850 (GSM) : 0.1746 W
GSM850 (EDGE 8) : 0.0485 W
GSM1900 (GSM) : 0.0955 W
GSM1900 (EDGE 8) : 0.0488 W

This is a variant report which is only valid together with the original test report. The product was received on Apr. 20, 2012 and completely tested on May 23, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI / TIA / EIA-603-C-2004 and shown compliance with the applicable technical standards.

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

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

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

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FCC ID : IHDP56MM5

Page Number : 1 of 64

Report Issued Date : May 31, 2012

Report Version : Rev. 01

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG1O0527-02	Rev. 01	This is a variant report which can be referred to product equality declaration as appendix A. All the test cases were performed in original report which can be referred to Sporton Report No. FG1O0527 as appendix B.	May 31, 2012

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	§2.1046	N/A	Conducted Output Power	N/A	PASS	-
3.2	§22.913(a)(2)	RSS-132(4.4) SRSP-503(5.1.3)	Effective Radiated Power	< 7 Watts	PASS	-
3.2	§24.232(c)	RSS-133 (6.4) SRSP-510(5.1.2)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
3.3	§2.1049 §22.917(a) §24.238(a)	N/A	Occupied Bandwidth	N/A	PASS	-
3.2	§24.232(d)	N/A	Peak-to-Average Ratio	< 13 dB	PASS	-
3.4	§2.1051 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Band Edge Measurement	< 43+10log ₁₀ (P[Watts])	PASS	-
3.5	§2.1051 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Conducted Emission	< 43+10log ₁₀ (P[Watts])	PASS	-
3.6	§2.1053 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Field Strength of Spurious Radiation	< 43+10log ₁₀ (P[Watts])	PASS	Under limit 22.48 dB at 2509.000 MHz
3.7	§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 Description

1.1 Applicant

Motorola Mobility, Inc.

8F., No. 9, Songgao Rd., Taipei 110, Taiwan, R.O.C.

1.2 Manufacturer

Chi Mei Communication Systems, Inc.

No. 4, Mingsheng Street, Tucheng District, New Taipei City, 23678, Taiwan

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Mobile Phone
Brand Name	Motorola
Model Name	XT685
FCC ID	IHDP56MM5
Tx Frequency	GSM850 : 824 MHz ~ 849 MHz GSM1900 : 1850 MHz ~ 1910 MHz
Rx Frequency	GSM850 : 869 MHz ~ 894 MHz GSM1900 : 1930 MHz ~ 1990 MHz
Maximum Output Power to Antenna	GSM850 : 32.98 dBm GSM1900 : 30.15 dBm
Antenna Type	Fixed Internal Antenna
HW Version	PR1
SW Version	SW2_170
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK
EUT Stage	Identical Prototype

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

1.4 Emission Designator and Maximum ERP/EIRP Power

FCC Rule	System	Type of Modulation	Emission Designator	Maximum ERP/EIRP
Part 22	GSM850 GSM	GMSK	250KGXW	0.1746 W
Part 22	GSM850 EDGE 8	GMSK / 8PSK	248KG7W	0.0485 W
Part 24	GSM1900 GSM	GMSK	250KGXW	0.0955 W
Part 24	GSM1900 EDGE 8	GMSK / 8PSK	244KG7W	0.0488 W

1.5 Testing Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	TH02-HY	03CH07-HY	722060/4086B-1

1.6 Applied Standards

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

- ♦ FCC 47 CFR Part 2, 22(H), 24(E)
- ♦ ANSI / TIA / EIA-603-C-2004
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v01
- ♦ IC RSS-132 Issue 2
- ♦ IC RSS-133 Issue 5

Remark:

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



1.7 Ancillary Equipment List

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU200	N/A	N/A	Unshielded, 1.8 m

2 Test Configuration of Equipment Under Test

2.1 Test Mode

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

Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 9000 MHz for GSM850.
2. 30 MHz to 19000 MHz for GSM1900.

Test Modes		
Band	Radiated TCs	Conducted TCs
GSM 850	■ GSM Link ■ EDGE 8 Link	■ GSM Link ■ EDGE 8 Link
GSM 1900	■ GSM Link ■ EDGE 8 Link	■ GSM Link ■ EDGE 8 Link

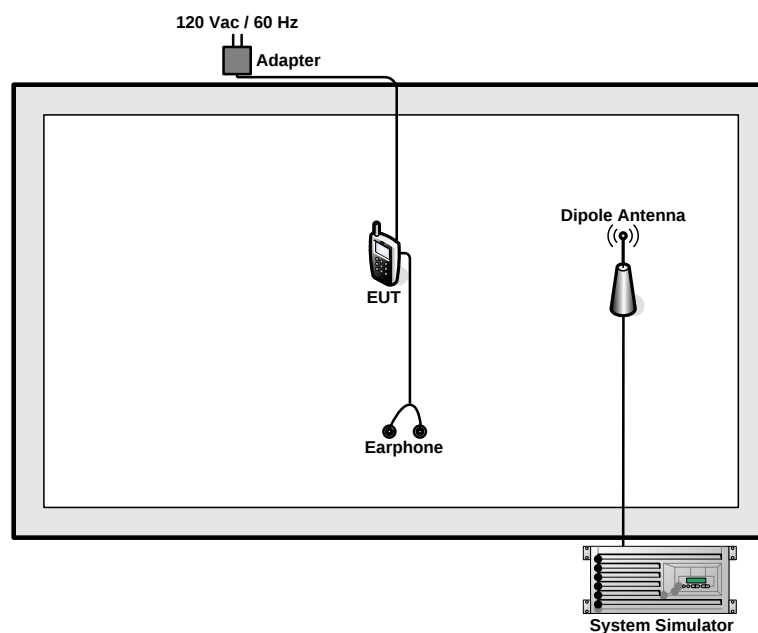
Note:

1. The maximum power levels are GSM mode for GMSK link, EDGE multi-slot class 8 mode for 8PSK link, only these modes were used for all tests.
2. Because there are individual antennas for each WWAN, WLAN, and Bluetooth, the co-location test modes are not required.

The conducted power tables are as follows:

Band	GSM850			GSM1900		
Channel	128	189	251	512	661	810
Frequency (MHz)	824.2	836.4	848.8	1850.2	1880.0	1909.8
GSM (1 Uplink)	32.92	32.98	32.96	30.10	30.15	30.12
GPRS 8 (1 Uplink)	32.90	32.93	32.91	30.09	30.13	30.11
GPRS 10 (2 Uplink)	28.67	28.75	28.73	26.97	27.05	27.01
GPRS 11 (3 Uplink)	26.18	26.25	26.23	25.46	25.53	25.52
GPRS 12 (4 Uplink)	26.17	26.23	26.21	24.37	24.43	24.40
EDGE 8 (MCS9) (1 Uplink)	27.03	27.08	27.06	26.08	26.16	26.14
EDGE 10 (MCS9) (2 Uplink)	24.49	24.55	24.53	23.87	24.00	23.97
EDGE 11 (MCS9) (3 Uplink)	22.69	22.81	22.77	22.27	22.37	22.32
EDGE 12 (MCS9) (4 Uplink)	21.06	21.12	21.10	20.86	20.96	20.94

2.2 Connection Diagram of Test System



3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

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

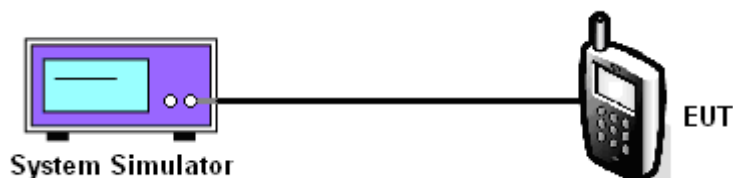
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup



3.1.5 Test Result of Conducted Output Power

Cellular Band						
Modes	GSM850 (GSM)			GSM850 (EDGE 8)		
Channel	128 (Low)	189 (Mid)	251 (High)	128 (Low)	189 (Mid)	251 (High)
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8
Conducted Power (dBm)	32.92	32.98	32.96	27.03	27.08	27.06
Conducted Power (Watts)	1.96	1.99	1.98	0.50	0.51	0.51

PCS Band						
Modes	GSM1900 (GSM)			GSM1900 (EDGE 8)		
Channel	512 (Low)	661 (Mid)	810 (High)	512 (Low)	661 (Mid)	810 (High)
Frequency (MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8
Conducted Power (dBm)	30.10	30.15	30.12	26.08	26.16	26.14
Conducted Power (Watts)	1.02	1.04	1.03	0.41	0.41	0.41

3.2 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

3.2.1 Description of the ERP/EIRP Measurement

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

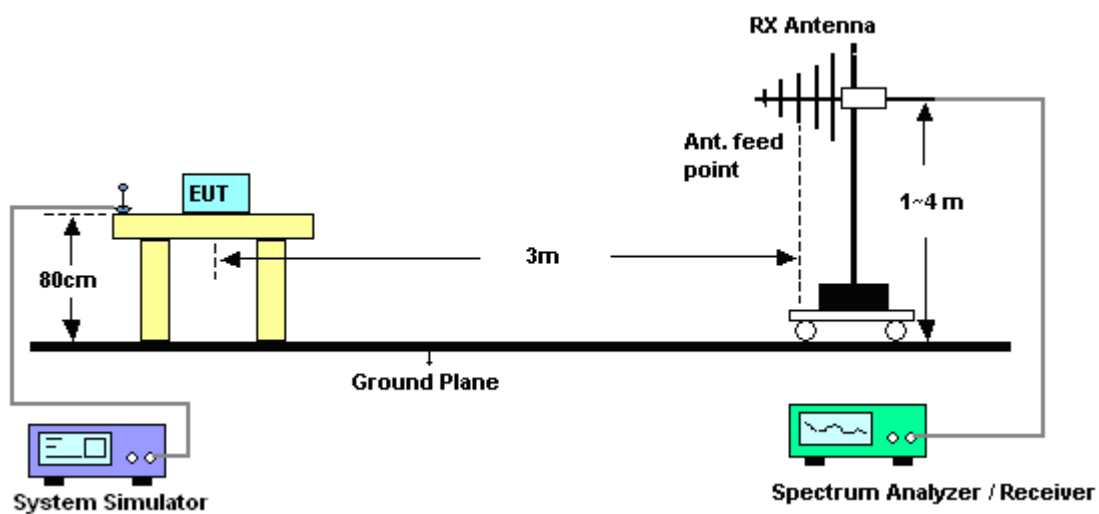
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The EUT was placed on 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= 1MHz, VBW= 3MHz for GSM, RBW= 300KHz, VBW= 1MHz for WCDMA, and RMS detector settings per section 4.0 of KDB 971168 D01.
1. 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.
2. 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 correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain - Analyzer reading. Then the EUT's EIRP was calculated with the correction factor, $EIRP = LVL + \text{Correction factor}$ and $ERP = EIRP - 2.15$.

3.2.4 Test Setup



3.2.5 Test Result of ERP

GSM850 (GSM) Radiated Power ERP				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
824.2	-6.32	30.89	22.42	0.1746
836.4	-6.87	31.13	22.11	0.1626
848.8	-7.34	31.62	22.13	0.1633
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
824.2	-14.97	35.93	18.81	0.0760
836.4	-14.70	34.95	18.10	0.0646
848.8	-15.41	34.71	17.15	0.0519

* ERP = LVL (dBm) + Correction Factor (dB) – 2.15

GSM850 (EDGE 8) Radiated Power ERP				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
824.2	-11.88	30.89	16.86	0.0485
836.4	-12.23	31.13	16.75	0.0473
848.8	-12.87	31.62	16.60	0.0457
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
824.2	-19.80	35.93	13.98	0.0250
836.4	-20.45	34.95	12.35	0.0172
848.8	-21.03	34.71	11.53	0.0142

* ERP = LVL (dBm) + Correction Factor (dB) – 2.15

3.2.6 Test Result of EIRP

GSM1900 (GSM) Radiated Power EIRP				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1850.2	-21.55	41.24	19.69	0.0931
1880.0	-21.66	41.46	19.80	0.0955
1909.8	-21.89	41.21	19.32	0.0855
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1850.2	-23.94	41.52	17.58	0.0573
1880.0	-23.79	43.10	19.31	0.0853
1909.8	-24.47	42.73	18.26	0.0670

* EIRP = LVL (dBm) + Correction Factor (dB)

GSM1900 (EDGE 8) Radiated Power EIRP				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1850.2	-24.36	41.24	16.88	0.0488
1880.0	-24.69	41.46	16.77	0.0475
1909.8	-25.35	41.21	15.86	0.0385
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1850.2	-26.62	41.52	14.90	0.0309
1880.0	-27.52	43.10	15.58	0.0361
1909.8	-28.08	42.73	14.65	0.0292

* EIRP = LVL (dBm) + Correction Factor (dB)

3.3 Occupied Bandwidth Measurement

3.3.1 Description of Occupied Bandwidth Measurement

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

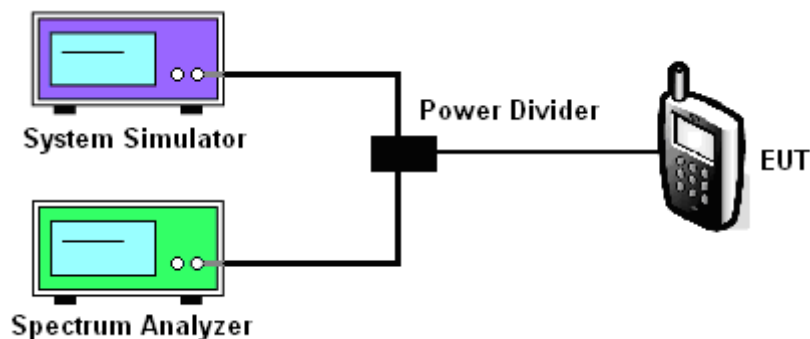
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

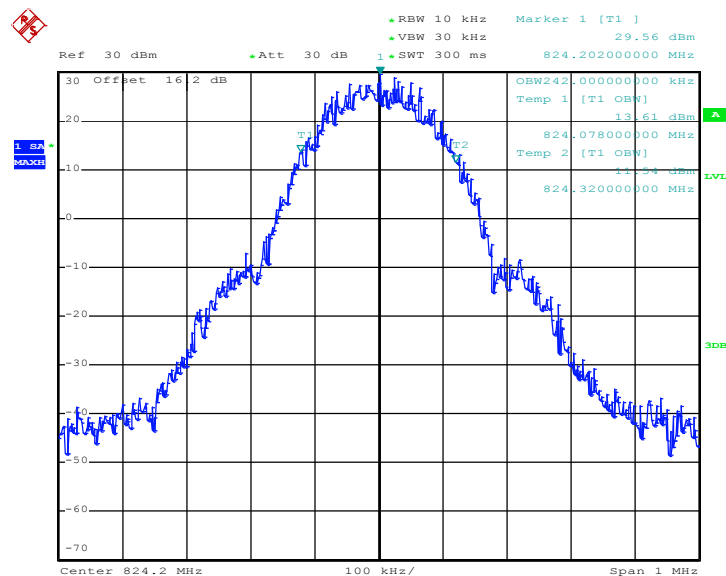
1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers were measured.

3.3.4 Test Setup

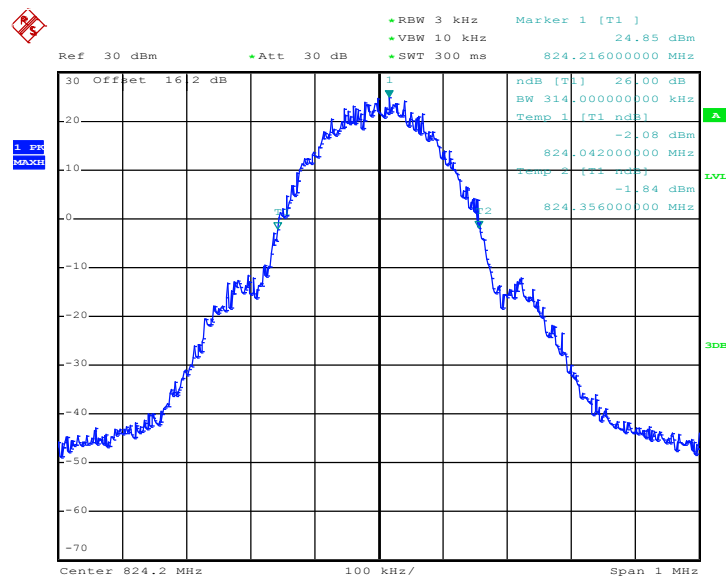


3.3.5 Test Result (Plots) of Occupied Bandwidth

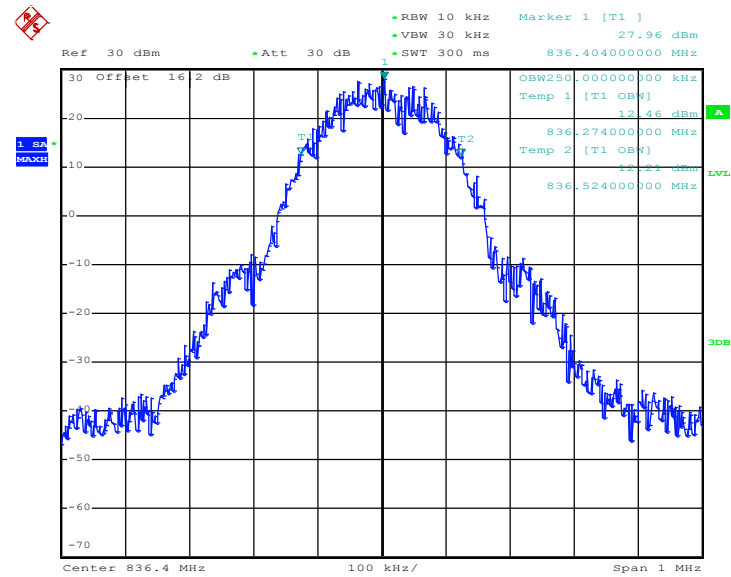
Band :	GSM 850	Power Stage :	High
Test Mode :	GSM Link		

99% Occupied Bandwidth Plot on Channel 128


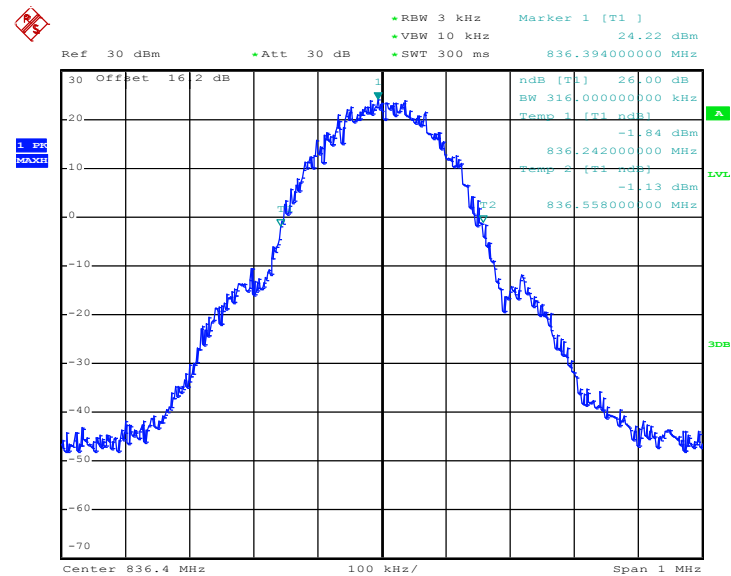
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26dB Bandwidth Plot on Channel 128


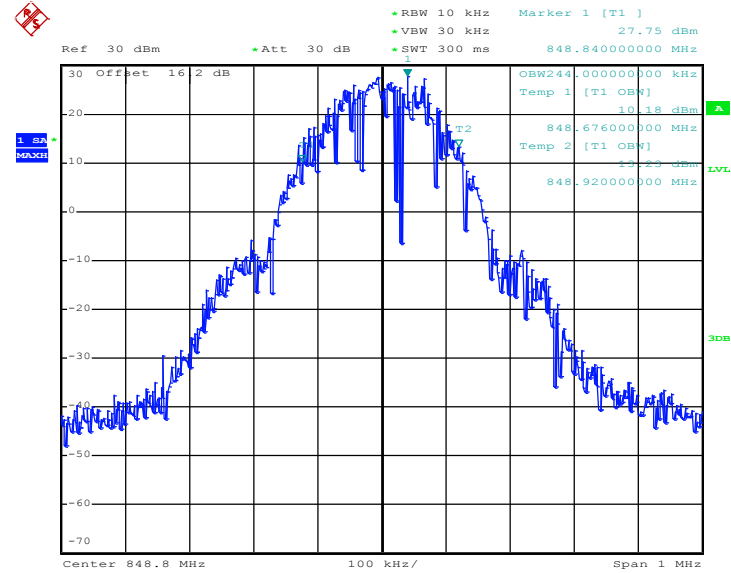
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99% Occupied Bandwidth Plot on Channel 189


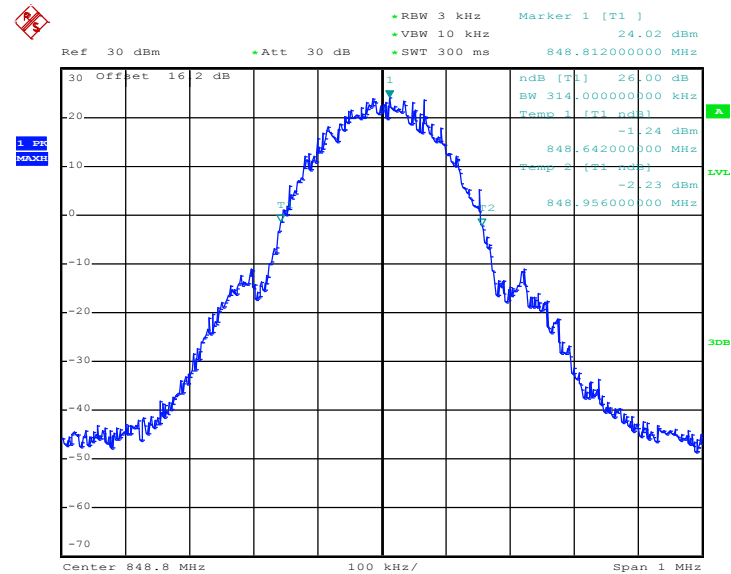
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26dB Bandwidth Plot on Channel 189


Date: 4.MAY.2012 14:26:51

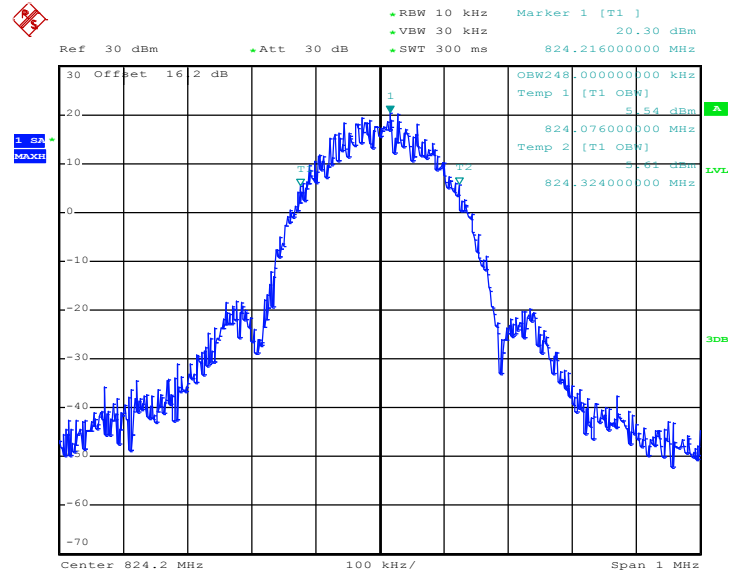
99% Occupied Bandwidth Plot on Channel 251


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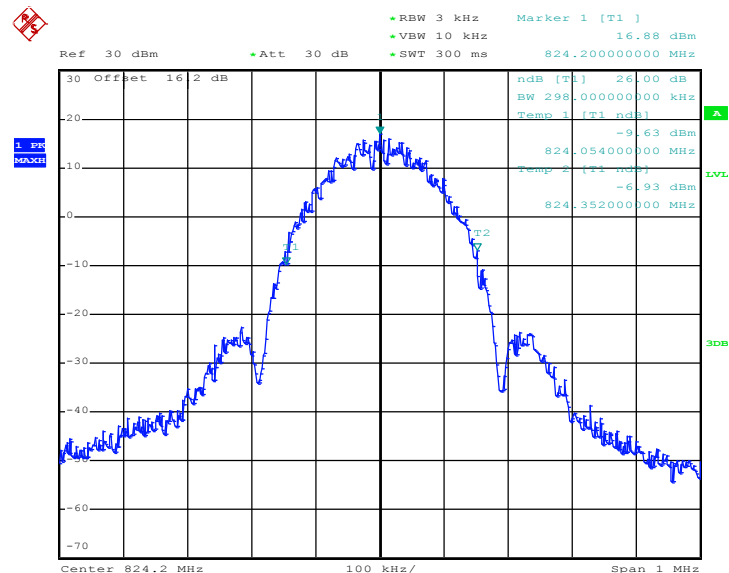
26dB Bandwidth Plot on Channel 251


Date: 4.MAY.2012 14:27:17

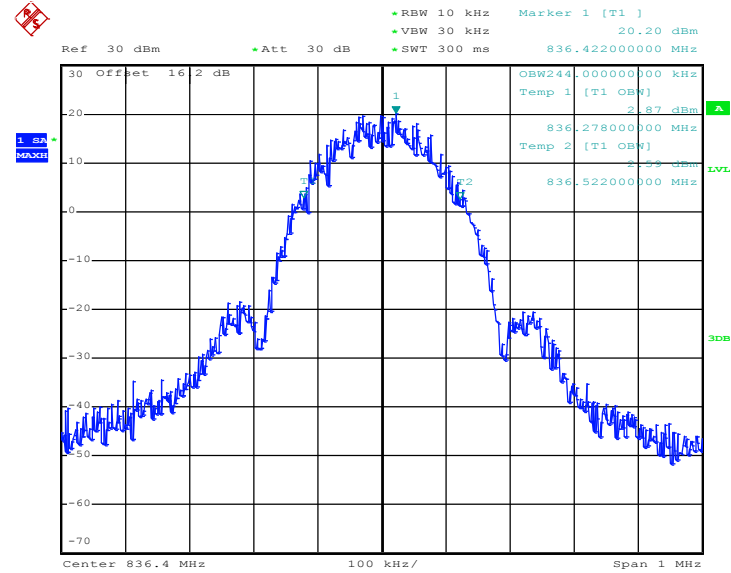
Band :	GSM 850	Power Stage :	High
Test Mode :	EDGE 8 Link		

99% Occupied Bandwidth Plot on Channel 128


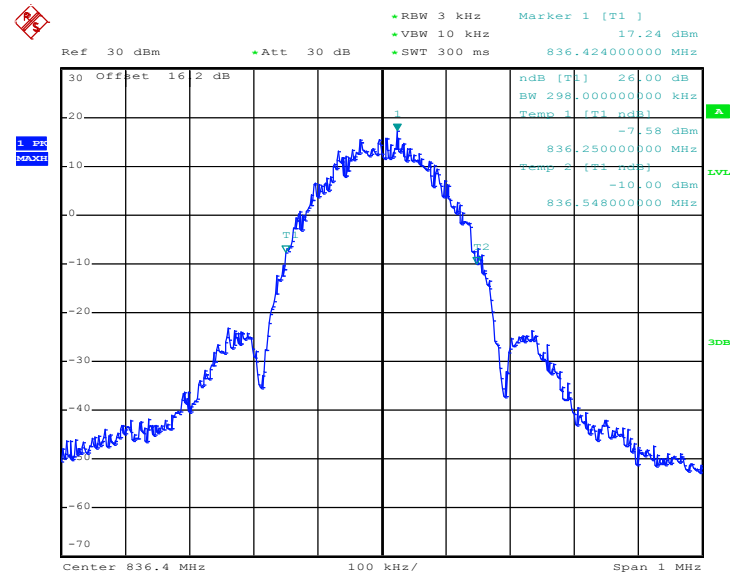
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26dB Bandwidth Plot on Channel 128


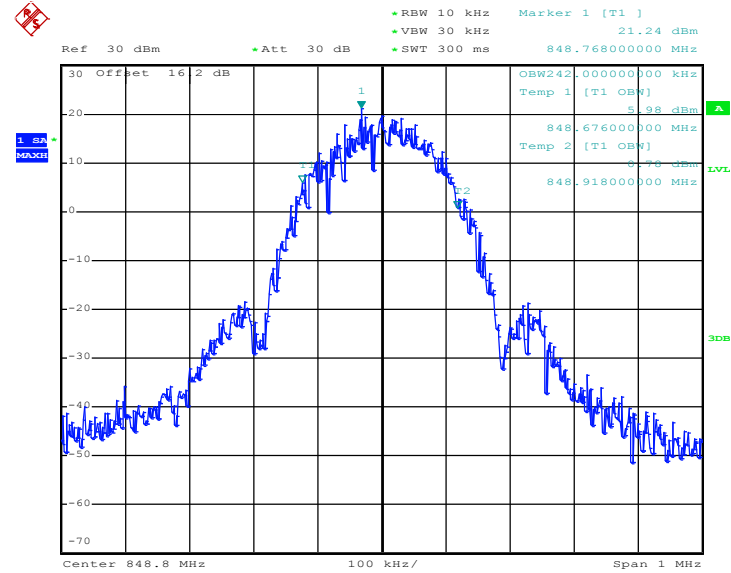
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99% Occupied Bandwidth Plot on Channel 189


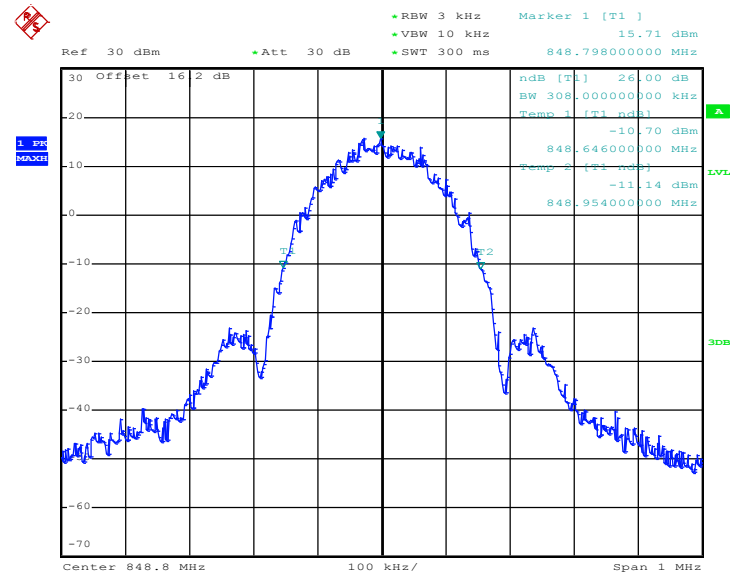
Date: 4.MAY.2012 14:47:33

26dB Bandwidth Plot on Channel 189


Date: 4.MAY.2012 14:46:13

99% Occupied Bandwidth Plot on Channel 251


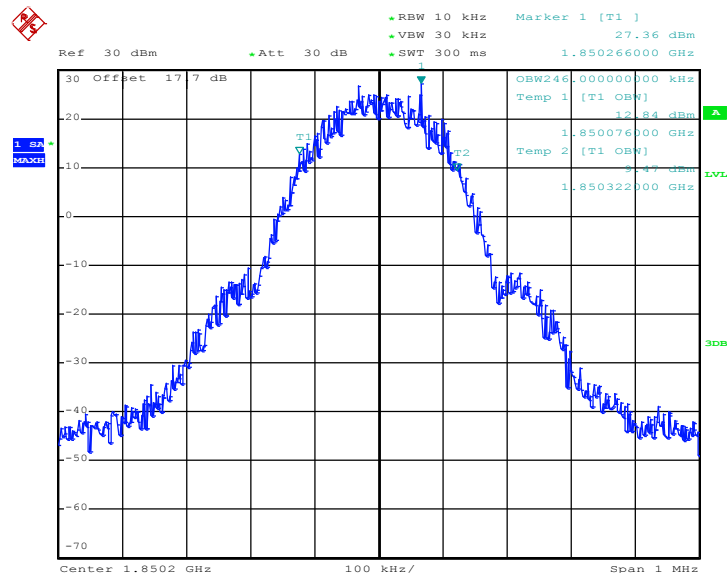
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26dB Bandwidth Plot on Channel 251


Date: 4.MAY.2012 14:46:40

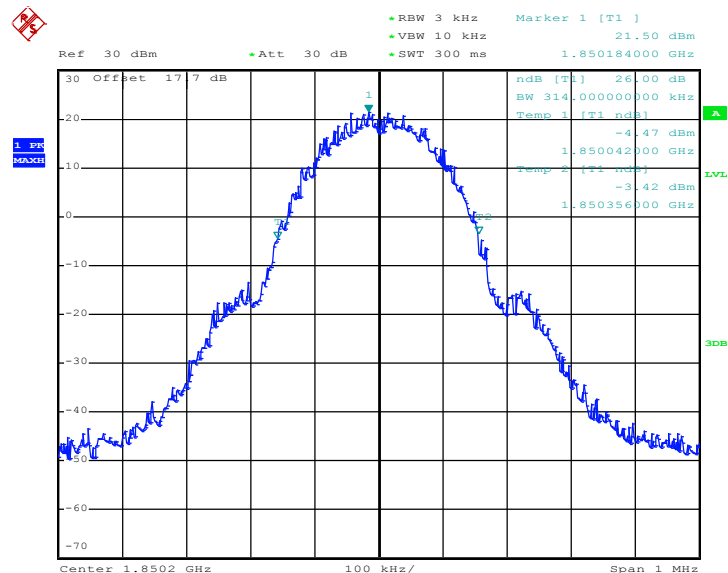
Band :	GSM 1900	Power Stage :	High
Test Mode :	GSM Link		

99% Occupied Bandwidth Plot on Channel 512

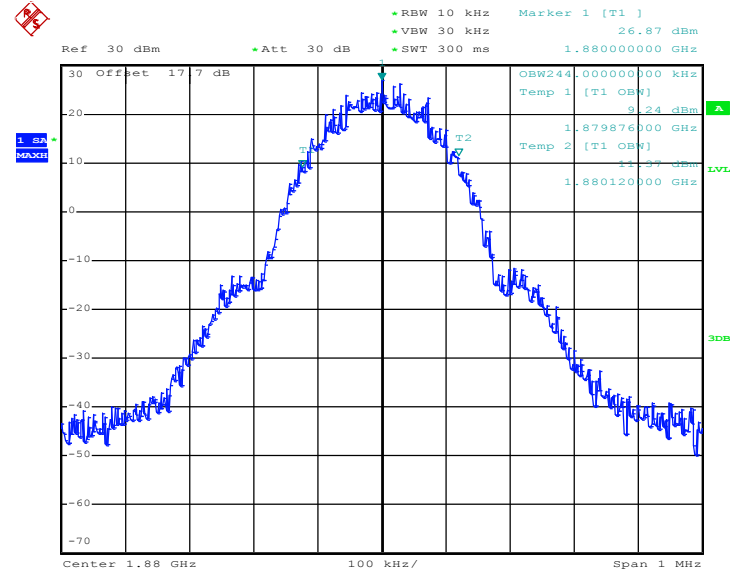


Date: 4.MAY.2012 15:26:37

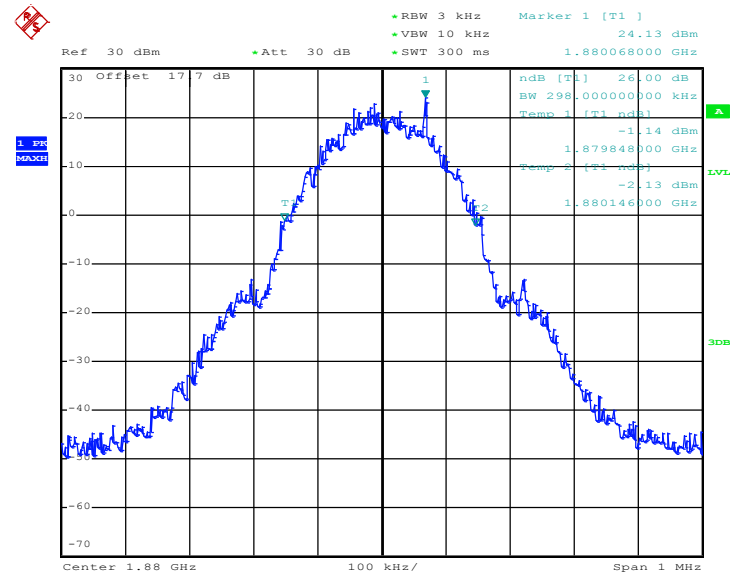
26dB Bandwidth Plot on Channel 512



Date: 4.MAY.2012 15:25:17

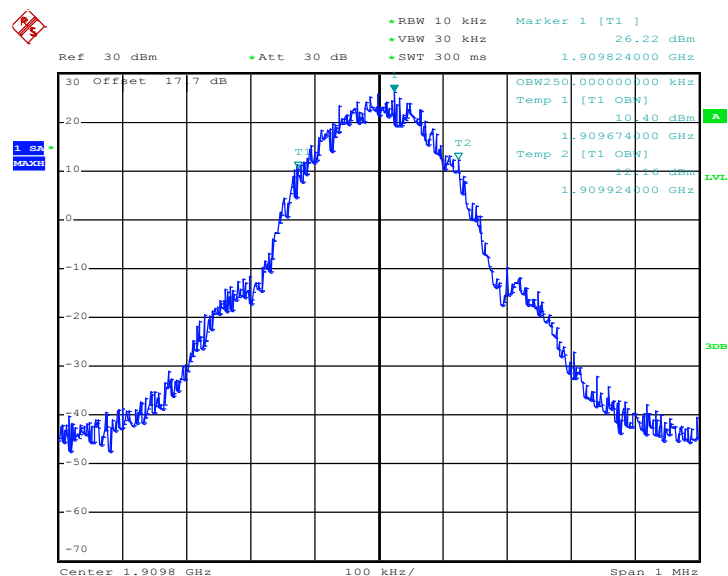
99% Occupied Bandwidth Plot on Channel 661


Date: 4.MAY.2012 15:27:03

26dB Bandwidth Plot on Channel 661


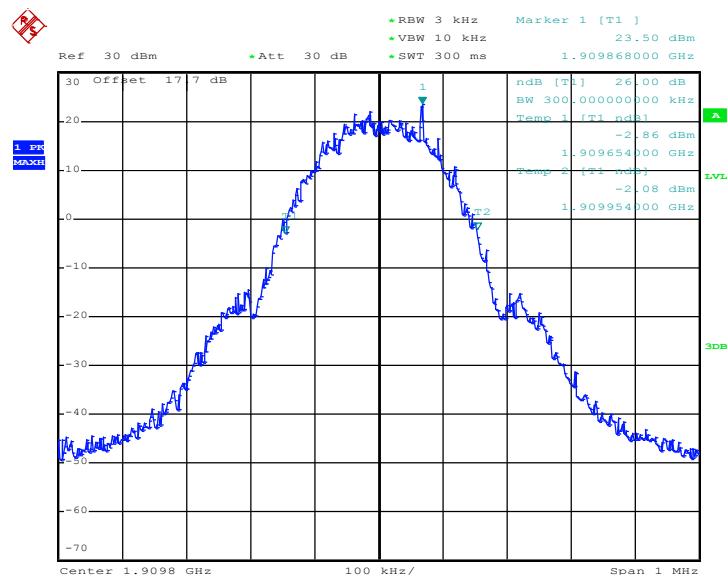
Date: 4.MAY.2012 15:25:44

99% Occupied Bandwidth Plot on Channel 810



Date: 4.MAY.2012 15:27:30

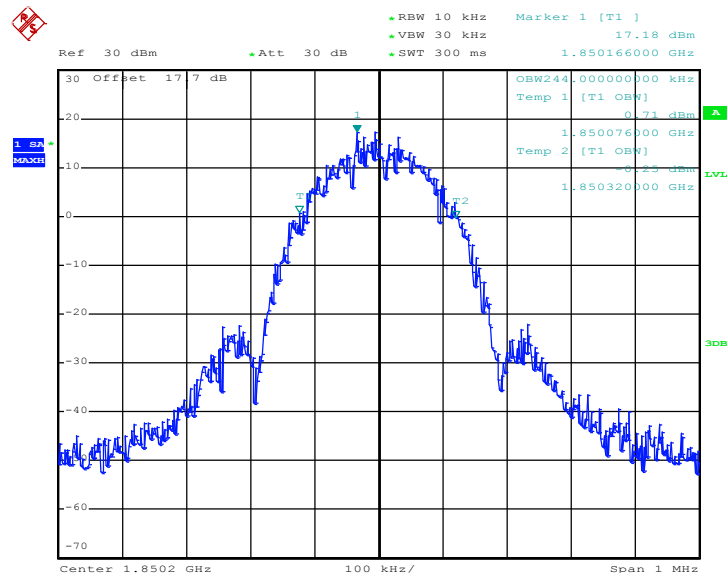
26dB Bandwidth Plot on Channel 810



Date: 4.MAY.2012 15:26:10

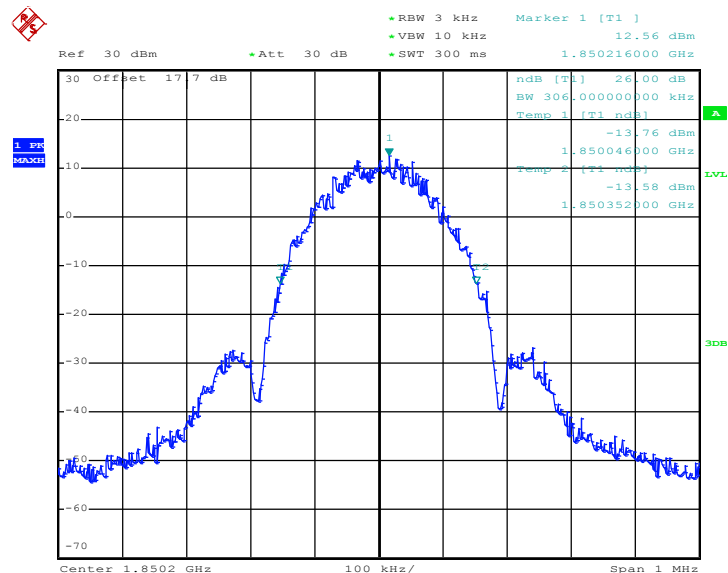
Band :	GSM 1900	Power Stage :	High
Test Mode :	EDGE 8 Link		

99% Occupied Bandwidth Plot on Channel 512



Date: 4.MAY.2012 15:58:58

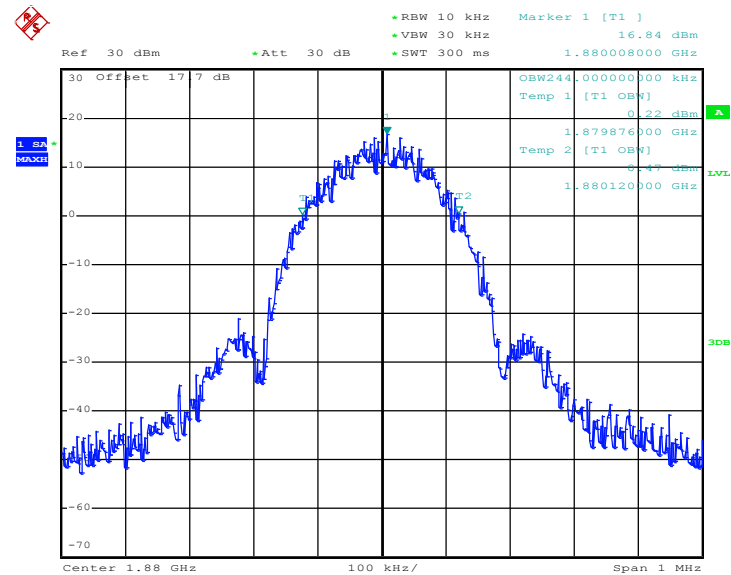
26dB Bandwidth Plot on Channel 512



Date: 4.MAY.2012 15:57:38

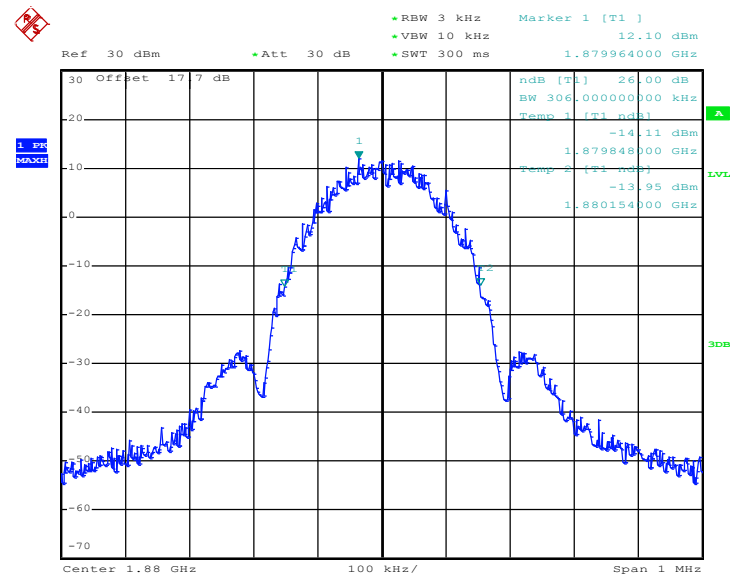


99% Occupied Bandwidth Plot on Channel 661



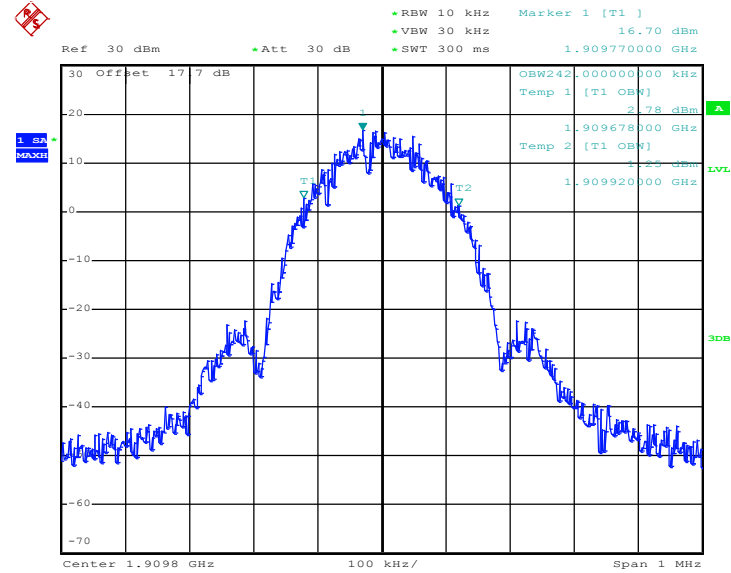
Date: 4.MAY.2012 15:59:25

26dB Bandwidth Plot on Channel 661



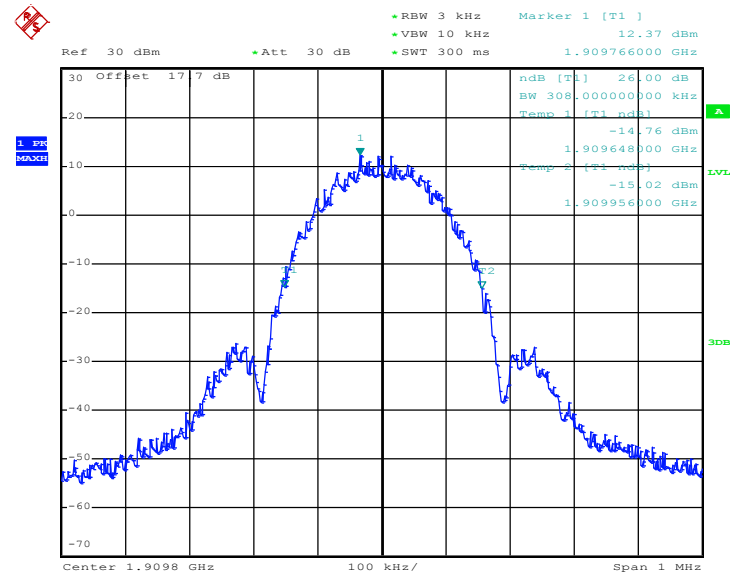
Date: 4.MAY.2012 15:58:05

99% Occupied Bandwidth Plot on Channel 810



Date: 4.MAY.2012 15:59:51

26dB Bandwidth Plot on Channel 810



Date: 4.MAY.2012 15:58:31

3.4 Band Edge Measurement

3.4.1 Description of Band Edge Measurement

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

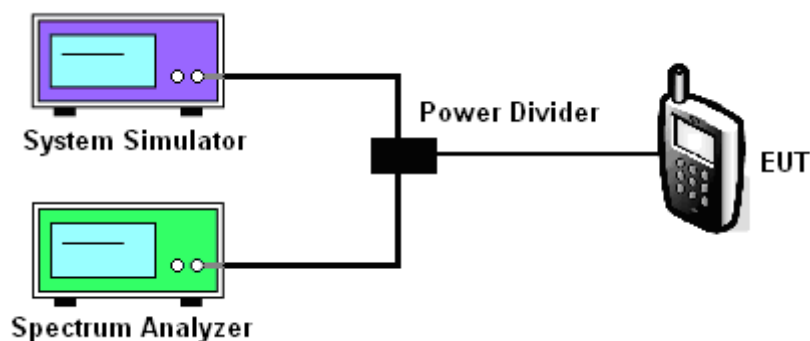
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

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

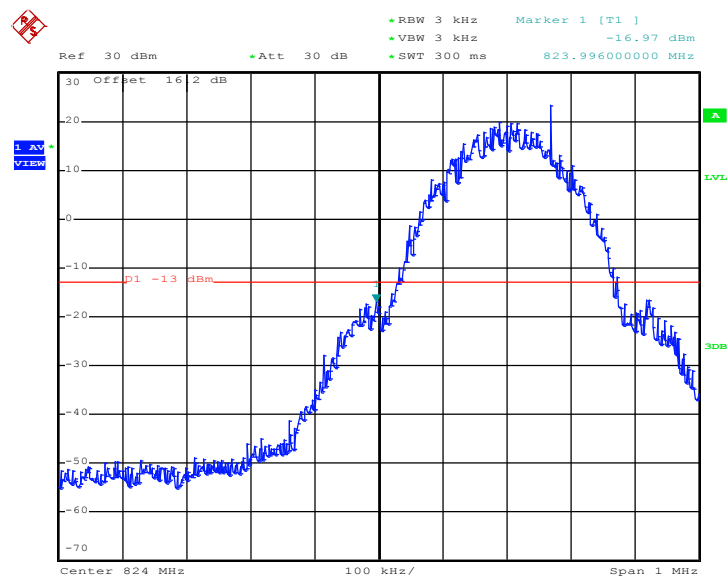
3.4.4 Test Setup



3.4.5 Test Result (Plots) of Conducted Band Edge

Band :	GSM850	Power Stage :	High
Test Mode :	GSM Link	Maximum 26dB Bandwidth :	0.316MHz
Correction Factor :	0.23dB	Measurement Value :	-16.97dBm
Band Edge :	-16.74dBm		

Lower Band Edge Plot on Channel 128

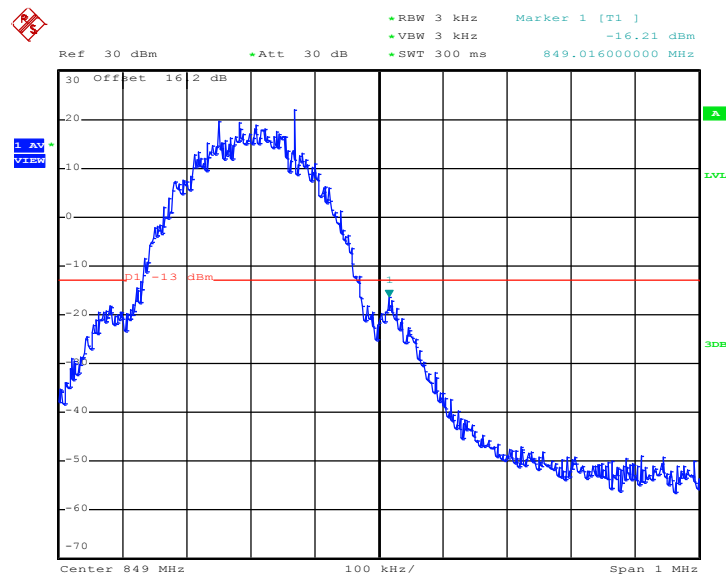


Date: 4.MAY.2012 14:30:04

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

Band :	GSM850	Power Stage :	High
Test Mode :	GSM Link	Maximum 26dB Bandwidth :	0.316MHz
Correction Factor :	0.23dB	Measurement Value :	-16.21dBm
Band Edge :	-15.98dBm		

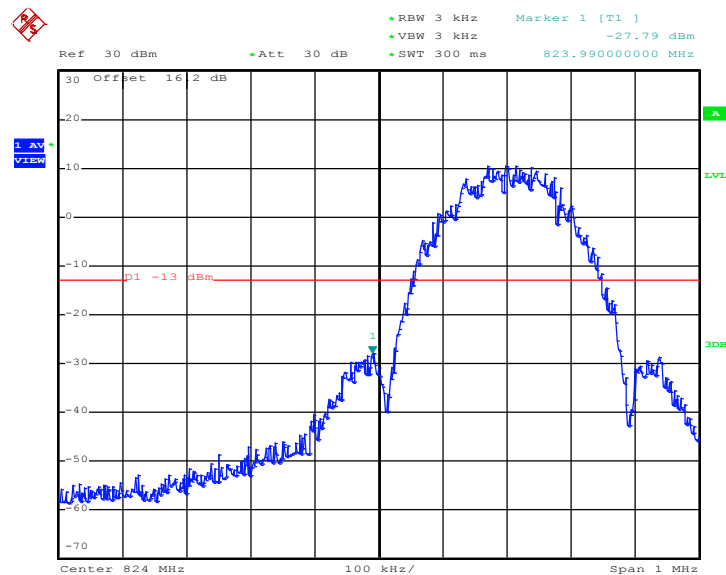
Higher Band Edge Plot on Channel 251



Date: 4.MAY.2012 14:30:30

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

Band :	GSM850	Power Stage :	High
Test Mode :	EDGE 8 Link	Maximum 26dB Bandwidth :	0.308MHz
Correction Factor :	0.11dB	Measurement Value :	-27.79dBm
Band Edge :	-27.68dBm		

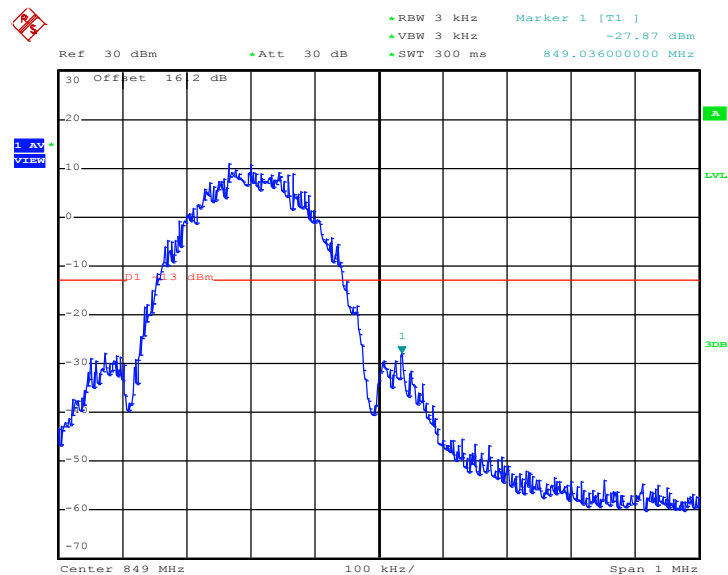
Lower Band Edge Plot on Channel 128


Date: 4.MAY.2012 14:49:26

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

Band :	GSM850	Power Stage :	High
Test Mode :	EDGE 8 Link	Maximum 26dB Bandwidth :	0.308MHz
Correction Factor :	0.11dB	Measurement Value :	-27.87dBm
Band Edge :	-27.76dBm		

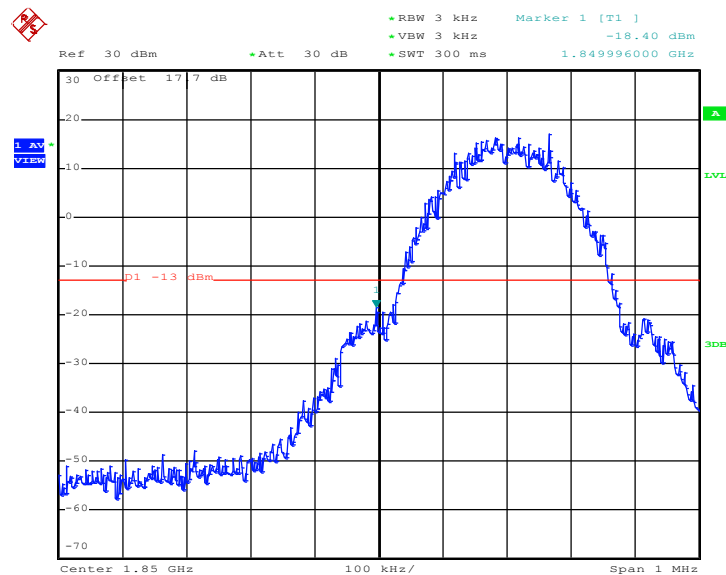
Higher Band Edge Plot on Channel 251



Date: 4.MAY.2012 14:49:53

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

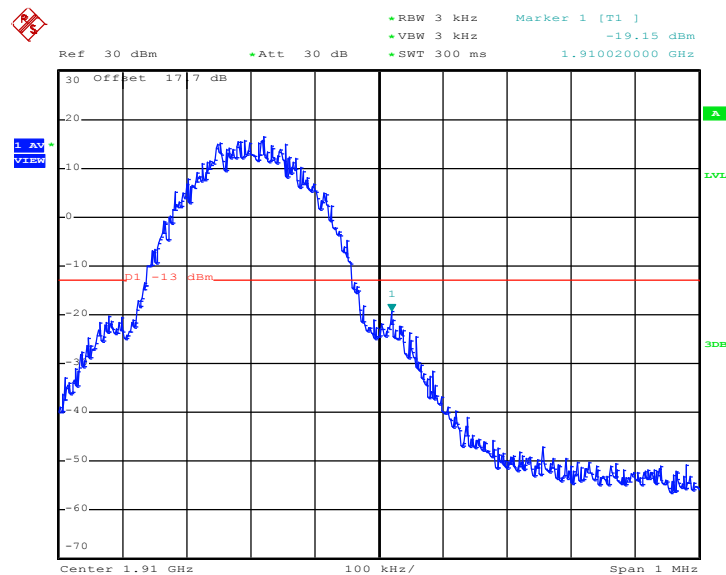
Band :	GSM1900	Power Stage :	High
Test Mode :	GSM Link	Maximum 26dB Bandwidth :	0.314MHz
Correction Factor :	0.20dB	Measurement Value :	-18.40dBm
Band Edge :	-18.20dBm		

Lower Band Edge Plot on Channel 512


Date: 4.MAY.2012 15:28:57

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

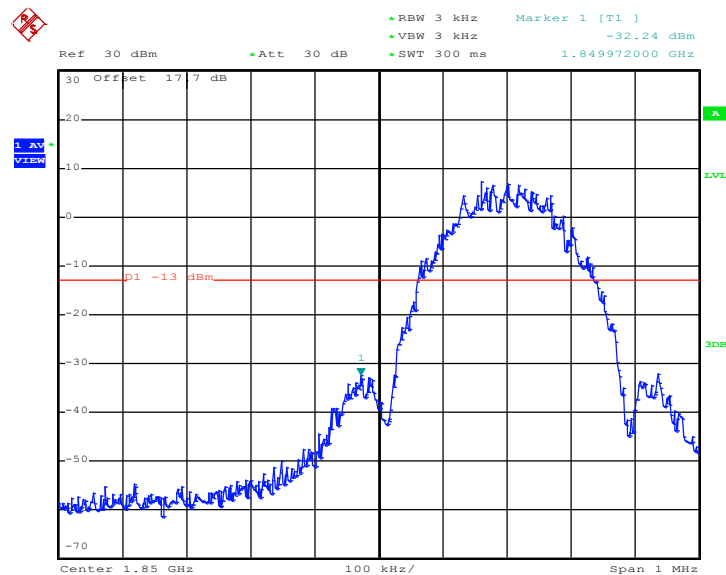
Band :	GSM1900	Power Stage :	High
Test Mode :	GSM Link	Maximum 26dB Bandwidth :	0.314MHz
Correction Factor :	0.20dB	Measurement Value :	-19.15dBm
Band Edge :	-18.95dBm		

Higher Band Edge Plot on Channel 810


Date: 4.MAY.2012 15:29:23

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

Band :	GSM1900	Power Stage :	High
Test Mode :	EDGE 8 Link	Maximum 26dB Bandwidth :	0.308MHz
Correction Factor :	0.11dB	Measurement Value :	-32.24dBm
Band Edge :	-32.13dBm		

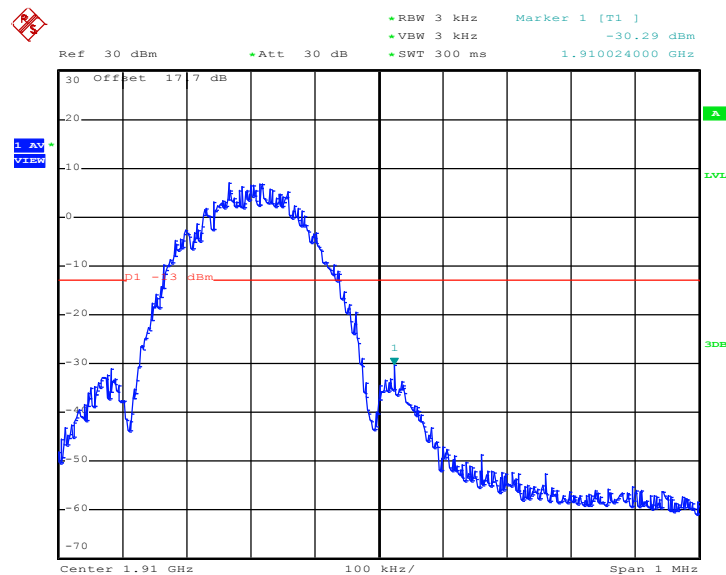
Lower Band Edge Plot on Channel 512


Date: 4.MAY.2012 16:01:18

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

Band :	GSM1900	Power Stage :	High
Test Mode :	EDGE 8 Link	Maximum 26dB Bandwidth :	0.308MHz
Correction Factor :	0.11dB	Measurement Value :	-30.29dBm
Band Edge :	-30.18dBm		

Higher Band Edge Plot on Channel 810



Date: 4.MAY.2012 16:01:45

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

3.5 Conducted Emission Measurement

3.5.1 Description of Conducted Emission Measurement

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

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

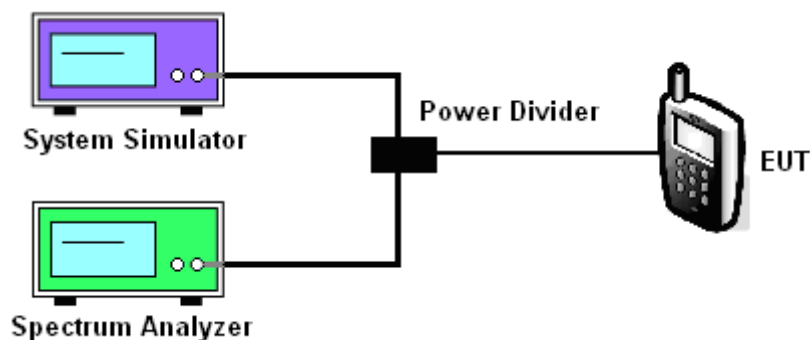
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

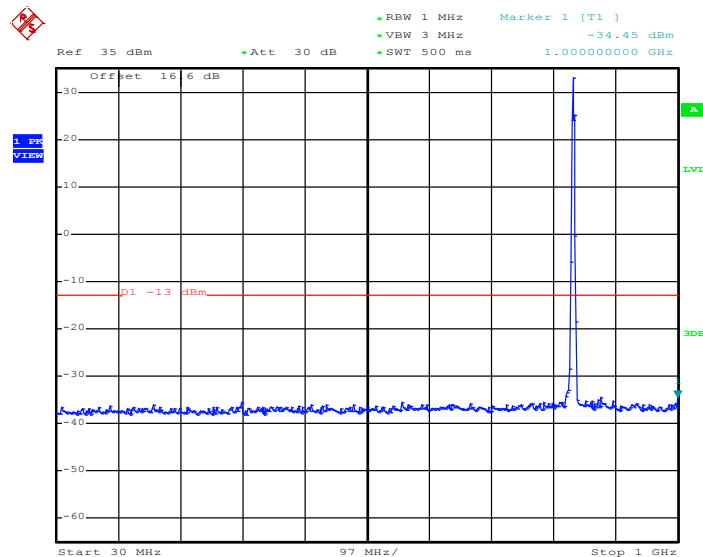
1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The middle channel for the highest RF power within the transmitting frequency was measured.
3. The conducted spurious emission for the whole frequency range was taken.

3.5.4 Test Setup

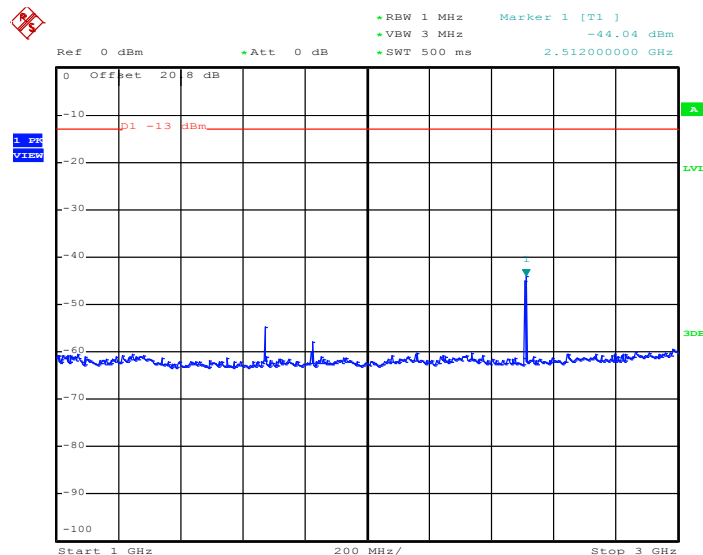


3.5.5 Test Result (Plots) of Conducted Emission

Band :	GSM850	Channel :	CH189
Test Mode :	GSM Link		

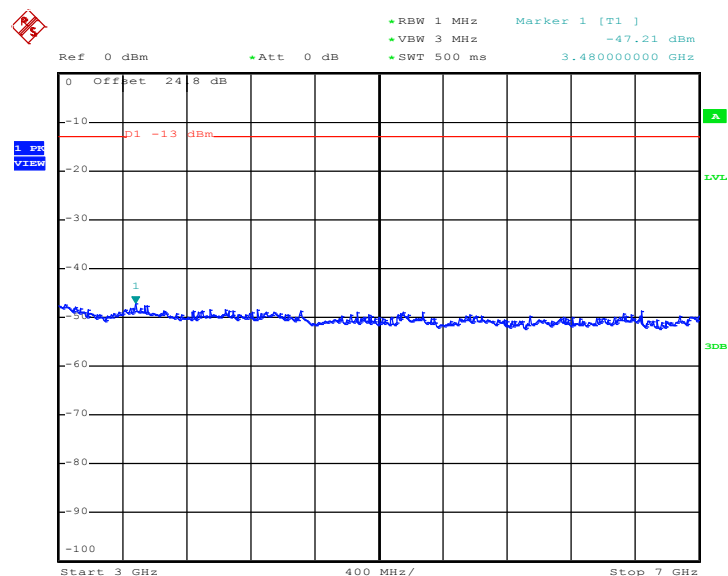
Conducted Emission Plot between 30MHz ~ 1GHz


Date: 4.MAY.2012 14:40:42

Conducted Emission Plot between 1GHz ~ 3GHz


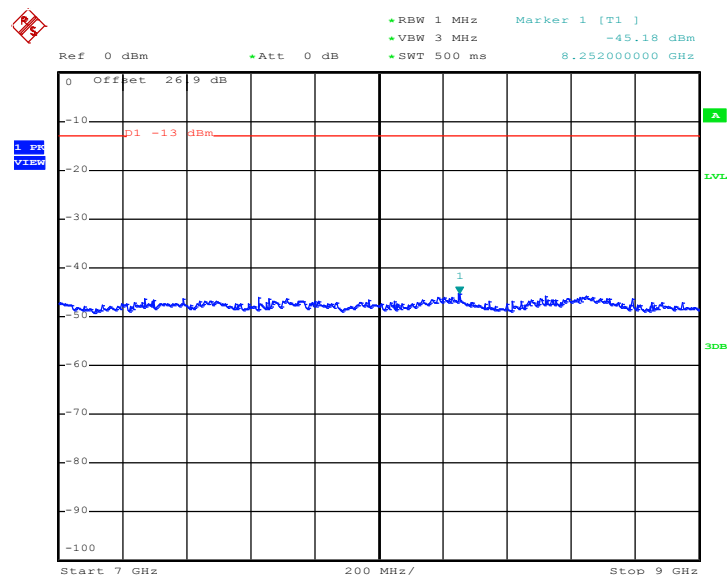
Date: 4.MAY.2012 14:41:00

Conducted Emission Plot between 3GHz ~ 7GHz



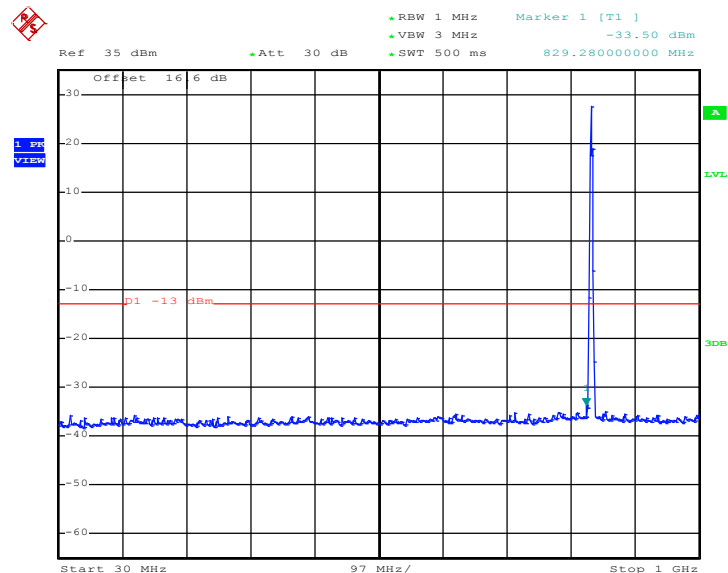
Date: 4.MAY.2012 14:41:13

Conducted Emission Plot between 7GHz ~ 9GHz

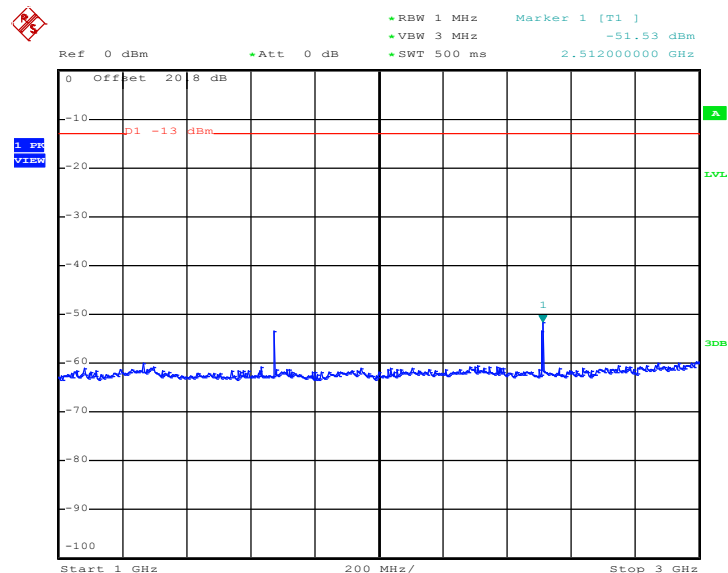


Date: 4.MAY.2012 14:41:25

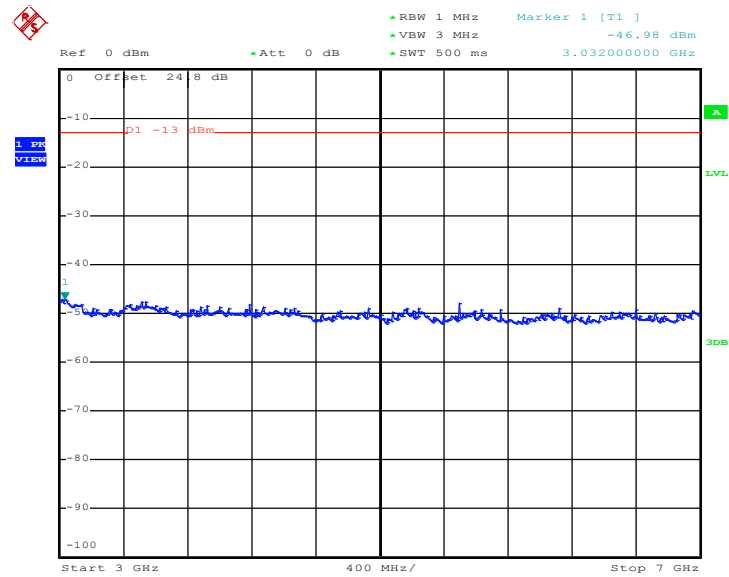
Band :	GSM850	Channel :	CH189
Test Mode :	EDGE 8 Link		

Conducted Emission Plot between 30MHz ~ 1GHz


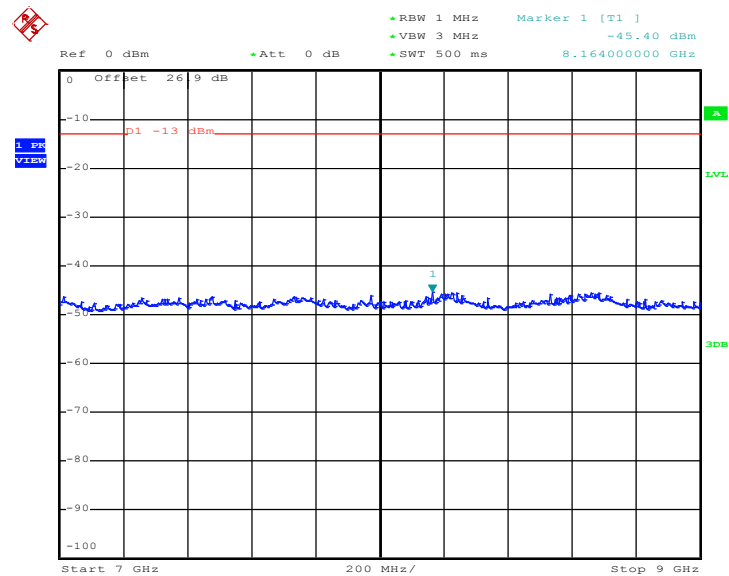
Date: 4.MAY.2012 14:42:59

Conducted Emission Plot between 1GHz ~ 3GHz


Date: 4.MAY.2012 14:43:15

Conducted Emission Plot between 3GHz ~ 7GHz


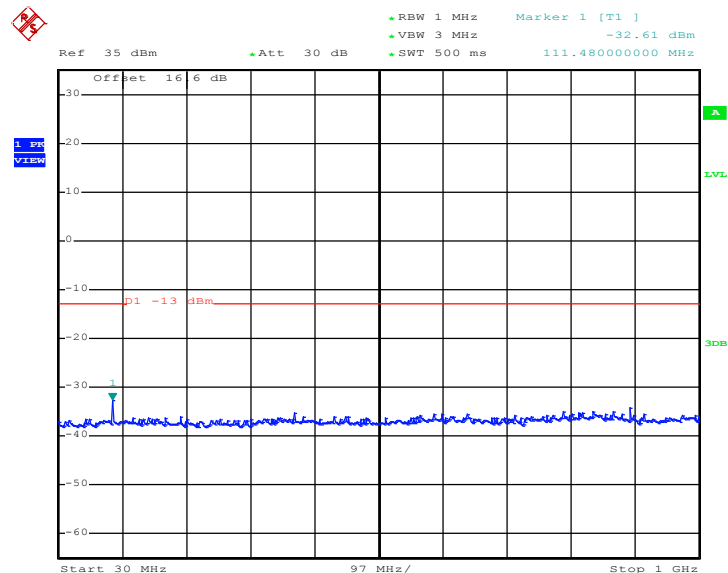
Date: 4.MAY.2012 14:43:28

Conducted Emission Plot between 7GHz ~ 9GHz


Date: 4.MAY.2012 14:43:40

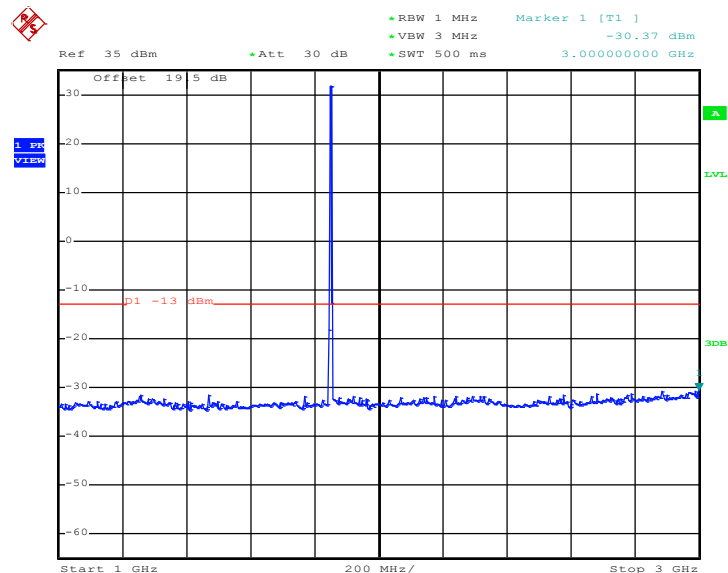
Band :	GSM1900	Channel :	CH661
Test Mode :	GSM Link		

Conducted Emission Plot between 30MHz ~ 1GHz

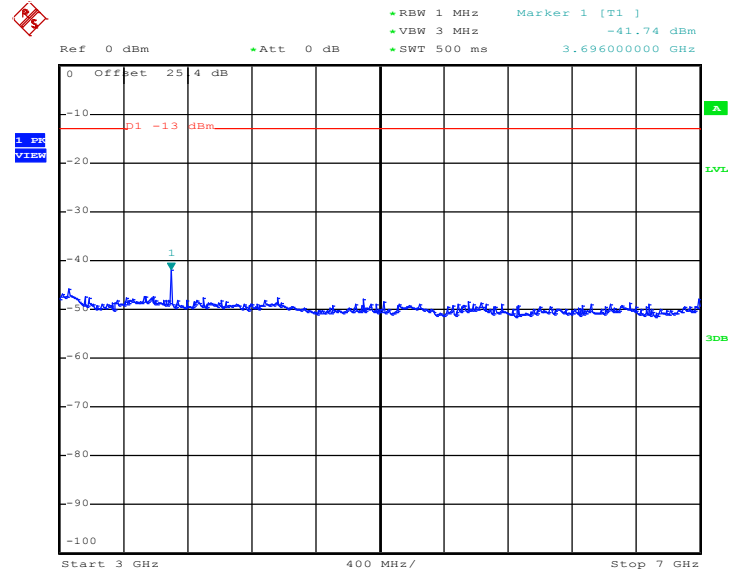


Date: 4.MAY.2012 15:36:00

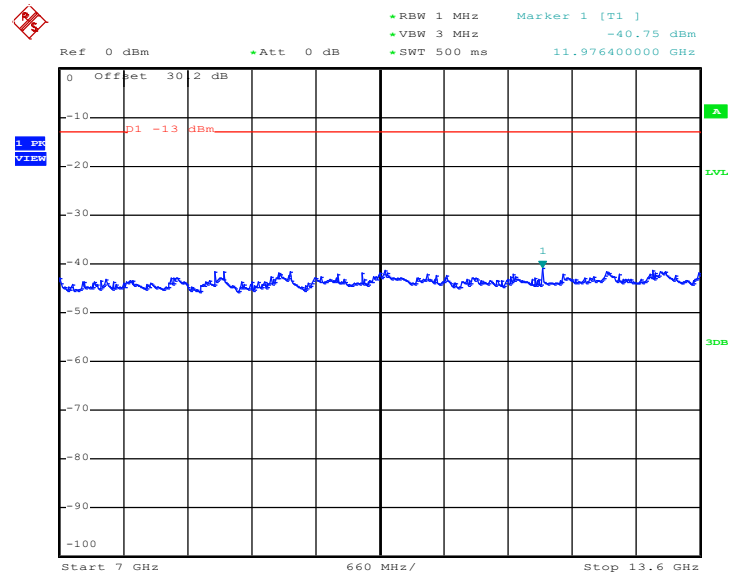
Conducted Emission Plot between 1GHz ~ 3GHz



Date: 4.MAY.2012 15:36:12

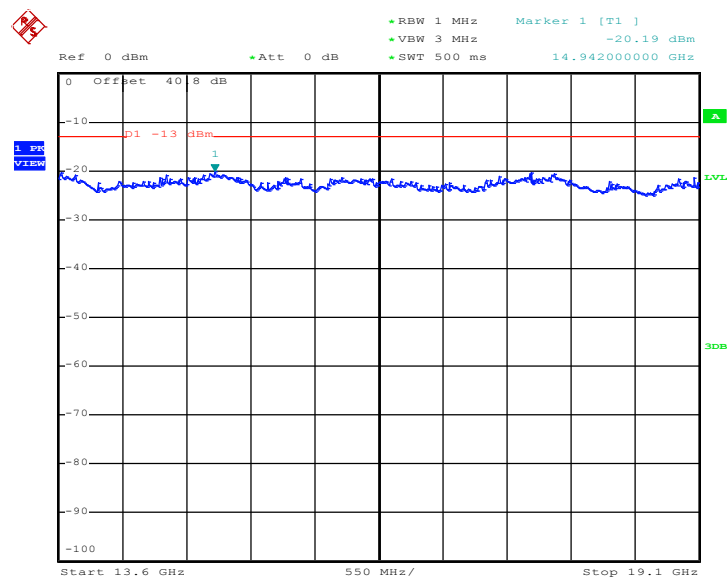
Conducted Emission Plot between 3GHz ~ 7GHz


Date: 4.MAY.2012 15:36:30

Conducted Emission Plot between 7GHz ~ 13.6GHz


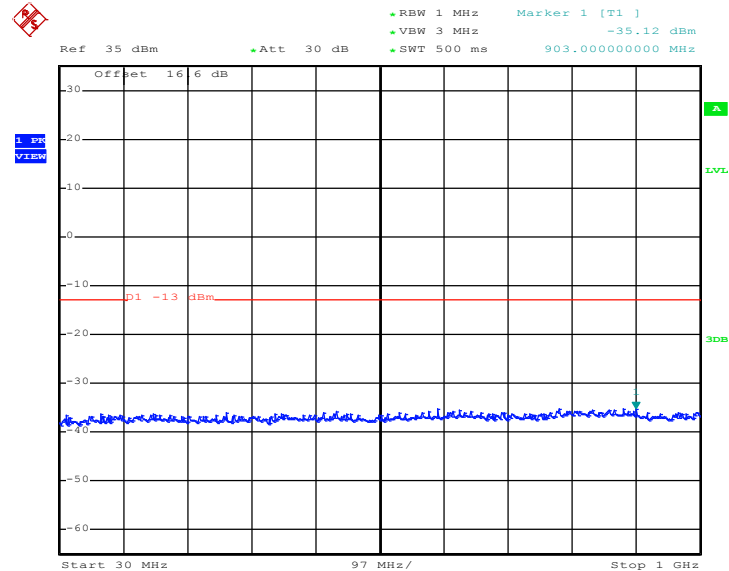
Date: 4.MAY.2012 15:36:42

Conducted Emission Plot between 13.6GHz ~ 19.1GHz

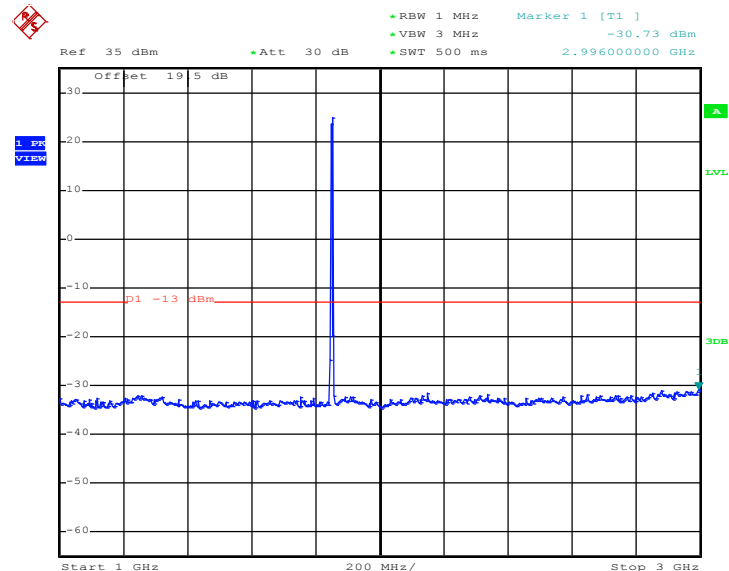


Date: 4.MAY.2012 15:36:55

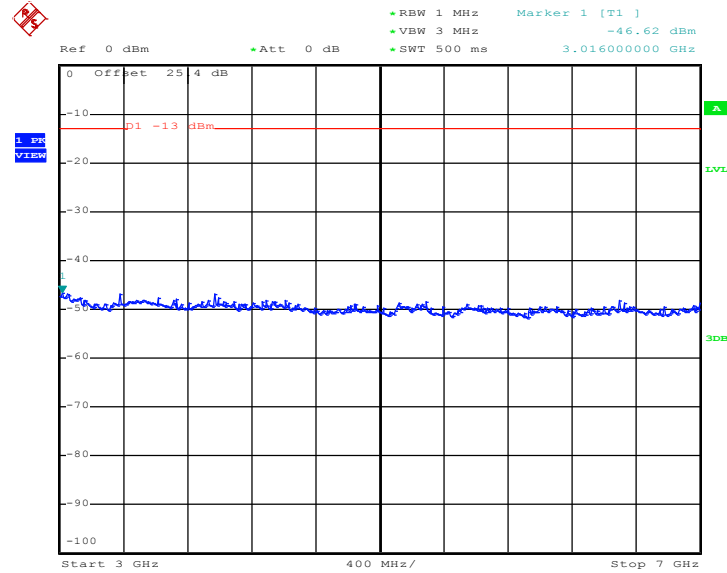
Band :	GSM1900	Channel :	CH661
Test Mode :	EDGE 8 Link		

Conducted Emission Plot between 30MHz ~ 1GHz


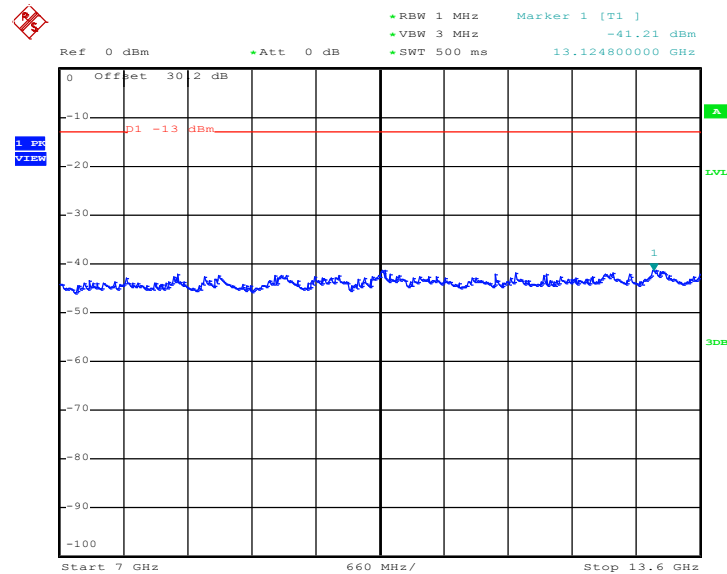
Date: 4.MAY.2012 16:07:58

Conducted Emission Plot between 1GHz ~ 3GHz


Date: 4.MAY.2012 16:08:11

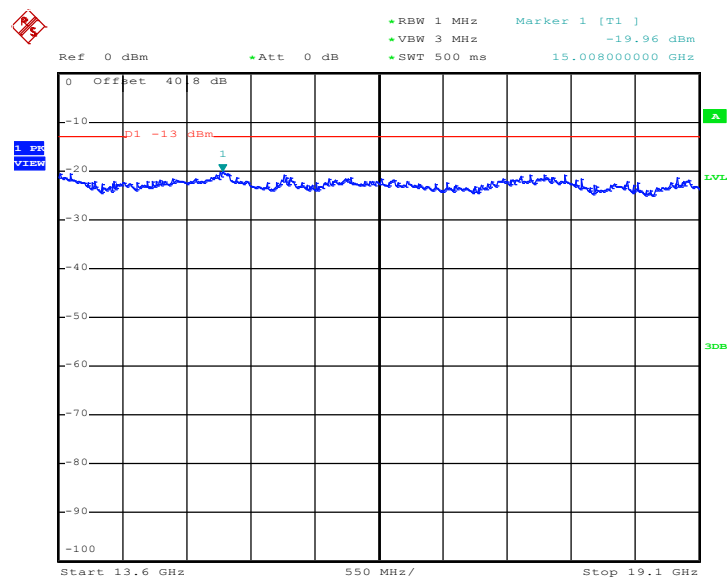
Conducted Emission Plot between 3GHz ~ 7GHz


Date: 4.MAY.2012 16:08:28

Conducted Emission Plot between 7GHz ~ 13.6GHz


Date: 4.MAY.2012 16:08:40

Conducted Emission Plot between 13.6GHz ~ 19.1GHz



Date: 4.MAY.2012 16:08:53

3.6 Field Strength of Spurious Radiation Measurement

3.6.1 Description of Field Strength of Spurious Radiated Measurement

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

3.6.2 Measuring Instruments

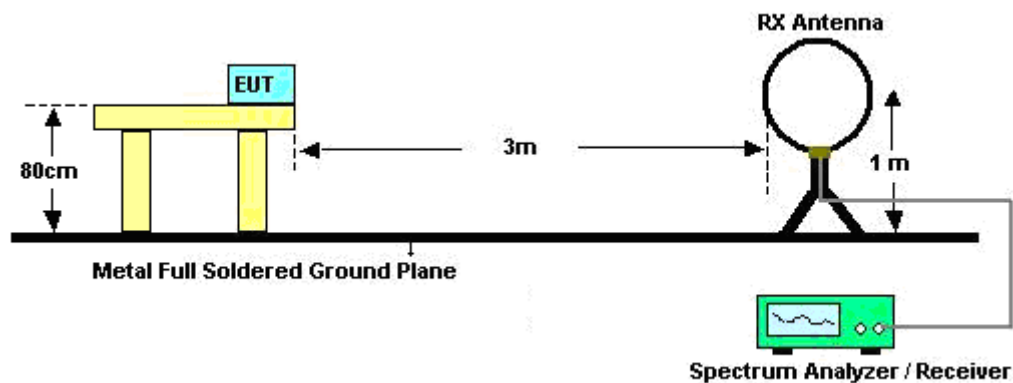
See list of measuring instruments of this test report.

3.6.3 Test Procedures

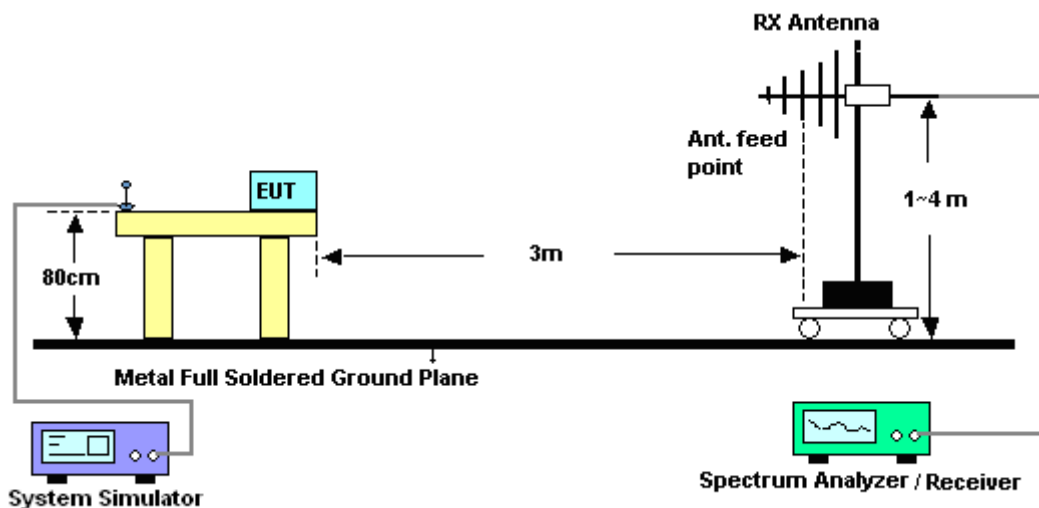
4. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
5. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
6. The table was rotated 360 degrees to determine the position of the highest spurious emission.
7. The height of the receiving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

3.6.4 Test Setup

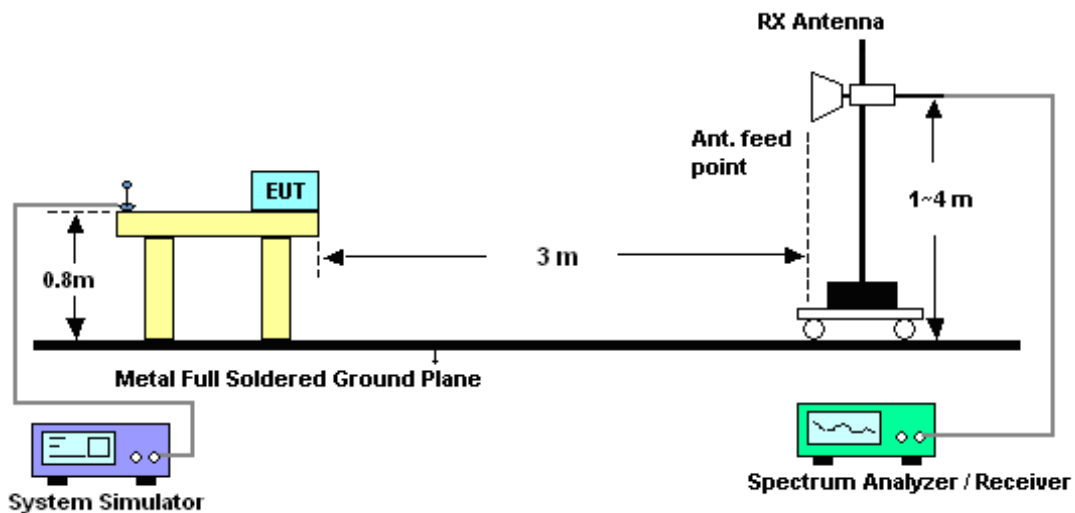
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

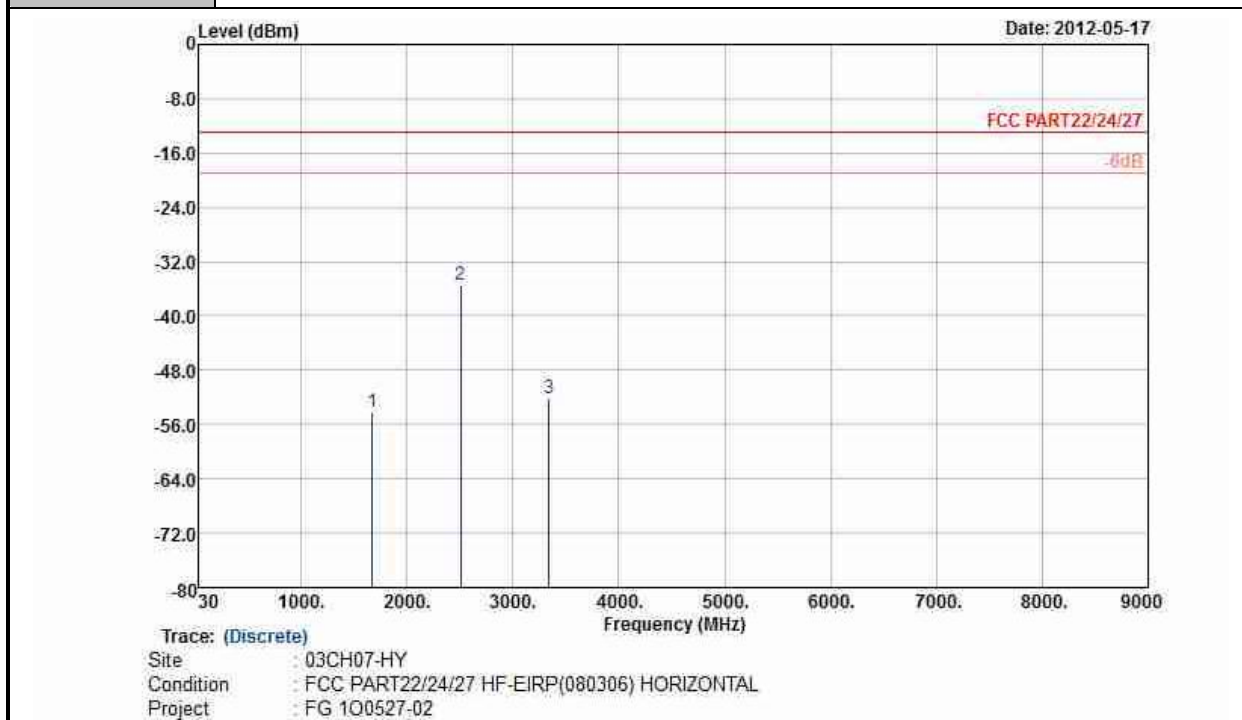


3.6.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

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

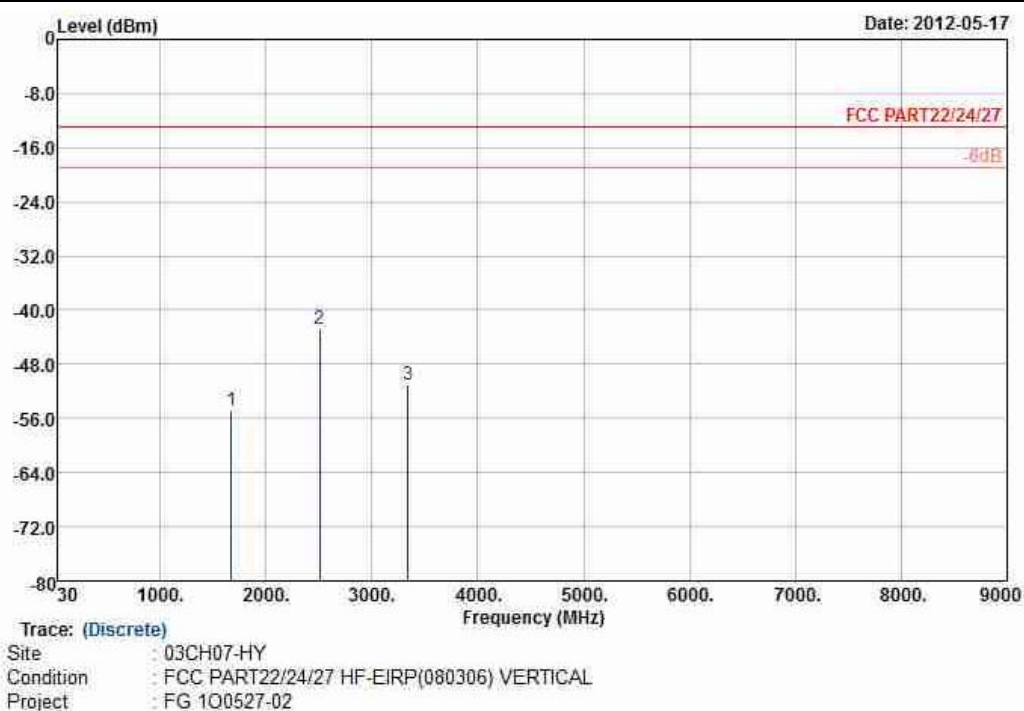
3.6.6 Test Result of Field Strength of Spurious Radiated

Band :	GSM850	Temperature :	23~25°C
Test Mode :	GSM Link	Relative Humidity :	50~52%
Test Engineer :	Kyle Zhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-54.16	-13	-41.16	-63.21	-55.88	1.62	5.49	H	Pass
2509	-35.48	-13	-22.48	-48.36	-37.45	2.1	6.22	H	Pass
3345	-52.04	-13	-39.04	-66.79	-54.93	3.03	8.07	H	Pass

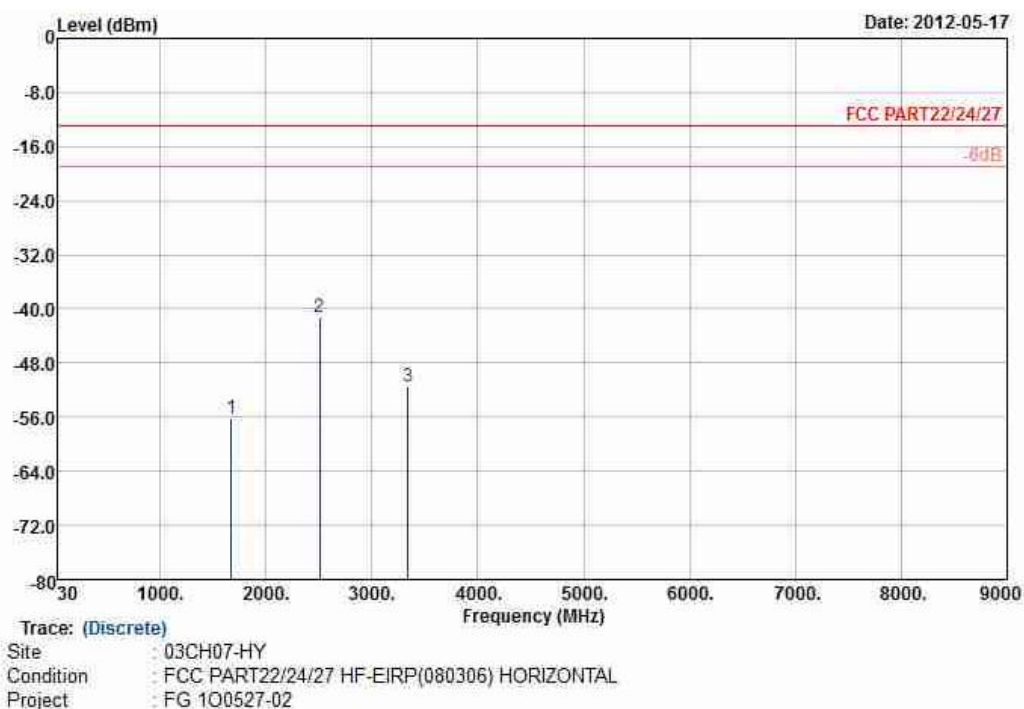
Band :	GSM850	Temperature :	23~25°C
Test Mode :	GSM Link	Relative Humidity :	50~52%
Test Engineer :	Kyle Zhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-54.73	-13	-41.73	-65.5	-56.45	1.62	5.49	V	Pass
2509	-42.74	-13	-29.74	-56.57	-44.71	2.1	6.22	V	Pass
3345	-50.93	-13	-37.93	-66.52	-53.82	3.03	8.07	V	Pass

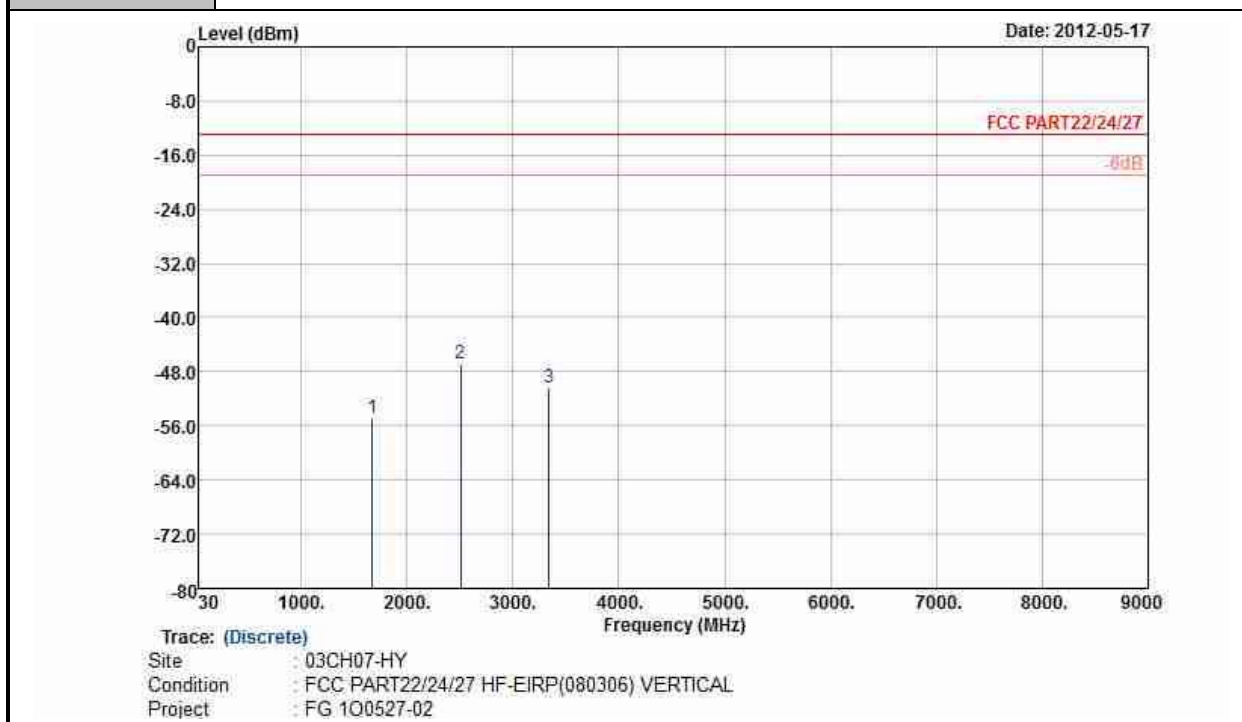


Band :	GSM850	Temperature :	23~25°C
Test Mode :	EDGE 8 Link	Relative Humidity :	50~52%
Test Engineer :	Kyle Zhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



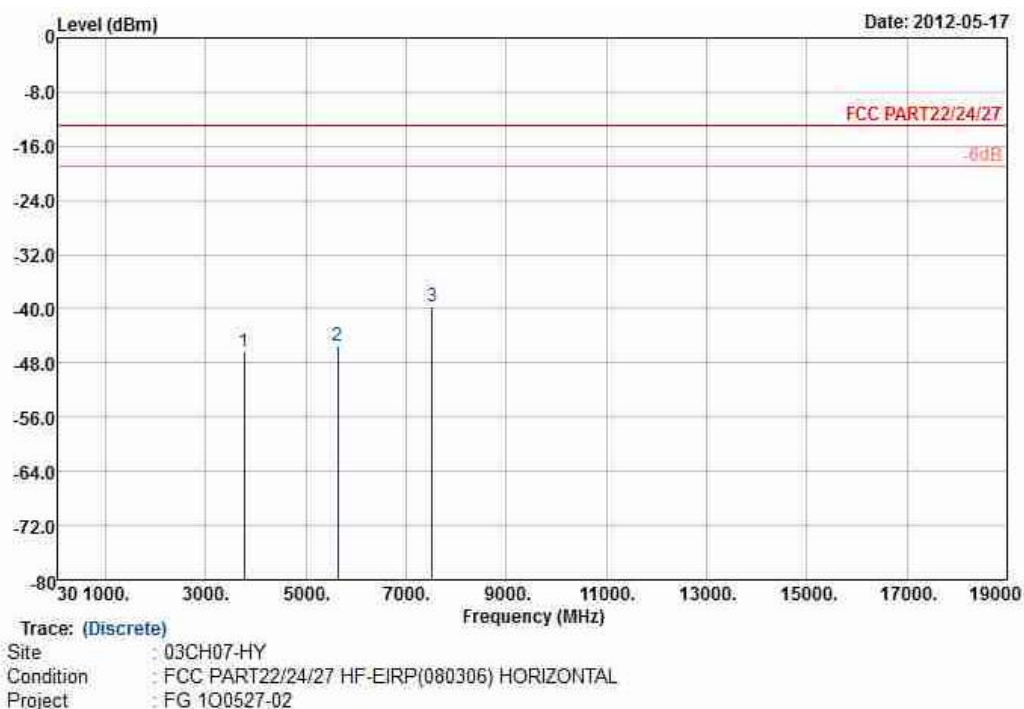
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-56.10	-13	-43.10	-65.26	-57.82	1.62	5.49	H	Pass
2509	-41.20	-13	-28.20	-55.2	-43.17	2.1	6.22	H	Pass
3345	-51.47	-13	-38.47	-65.57	-54.36	3.03	8.07	H	Pass

Band :	GSM850	Temperature :	23~25°C
Test Mode :	EDGE 8 Link	Relative Humidity :	50~52%
Test Engineer :	Kyle Zhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-54.71	-13	-41.71	-66.14	-56.43	1.62	5.49	V	Pass
2509	-46.80	-13	-33.80	-60.57	-48.77	2.1	6.22	V	Pass
3345	-50.34	-13	-37.34	-66.21	-53.23	3.03	8.07	V	Pass

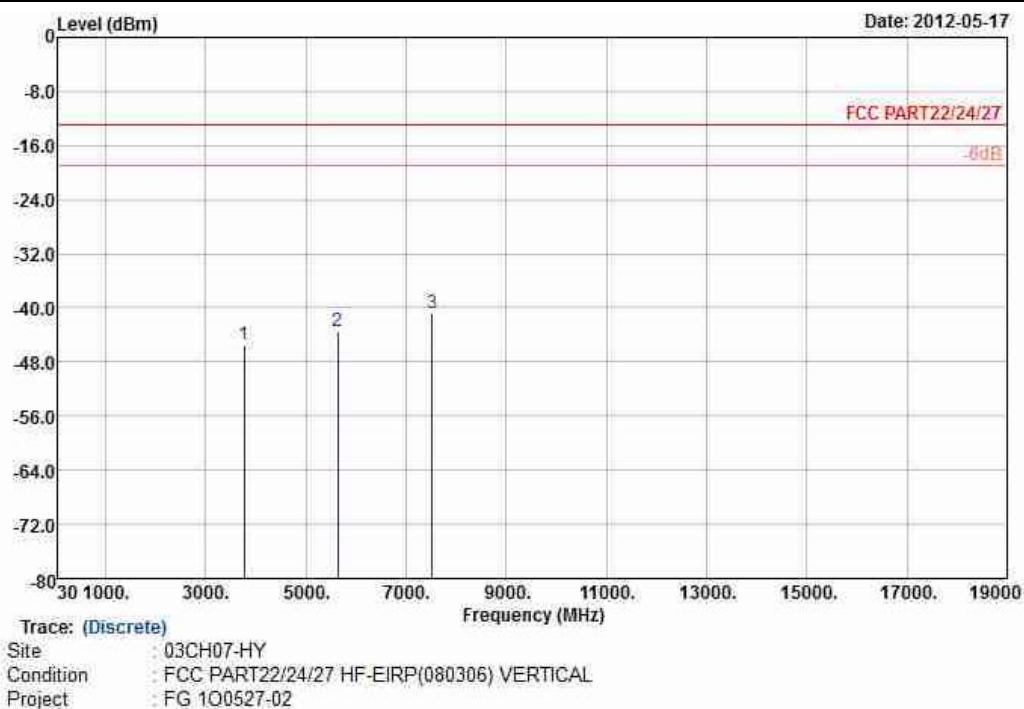
Band :	GSM1900	Temperature :	23~25°C
Test Mode :	GSM Link	Relative Humidity :	50~52%
Test Engineer :	Kyle Zhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-46.37	-13	-33.37	-61.51	-52.67	2.51	8.81	H	Pass
5636	-45.57	-13	-32.57	-66.65	-53.28	2.99	10.70	H	Pass
7520	-39.68	-13	-26.68	-66.92	-48.21	3.59	12.12	H	Pass



Band :	GSM1900	Temperature :	23~25°C
Test Mode :	GSM Link	Relative Humidity :	50~52%
Test Engineer :	Kyle Zhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



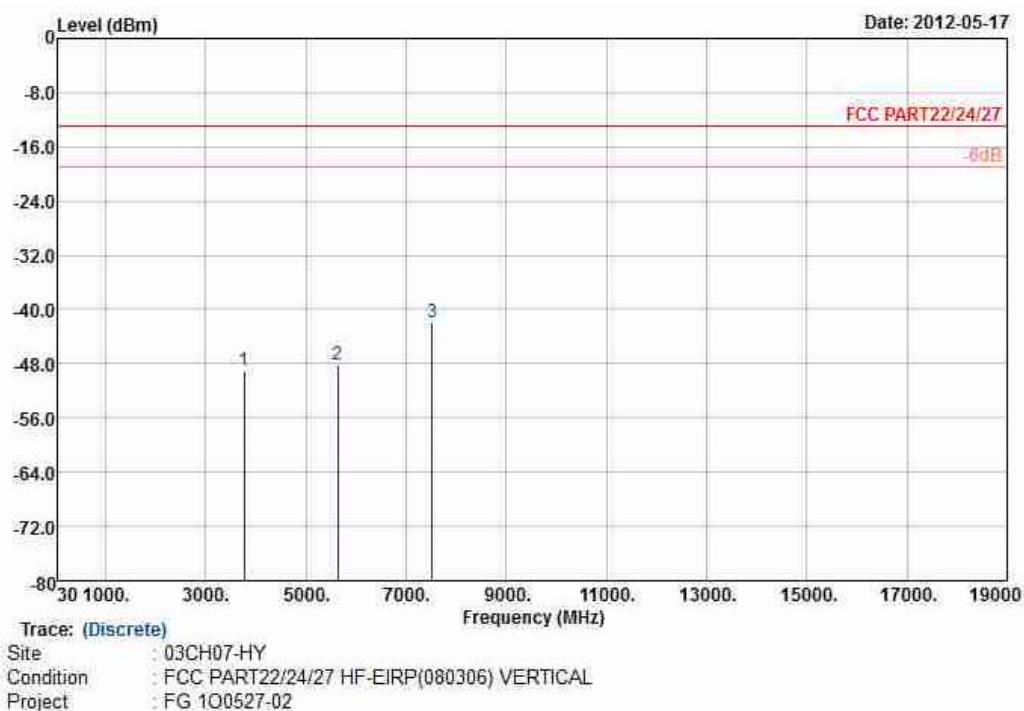
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-45.46	-13	-32.46	-62.04	-51.76	2.51	8.81	V	Pass
5636	-43.37	-13	-30.37	-63.75	-51.08	2.99	10.70	V	Pass
7520	-40.72	-13	-27.72	-67.79	-49.25	3.59	12.12	V	Pass

Band :	GSM1900	Temperature :	23~25°C
Test Mode :	EDGE 8 Link	Relative Humidity :	50~52%
Test Engineer :	Kyle Zhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-48.22	-13	-35.22	-63.11	-54.52	2.51	8.81	H	Pass
5636	-47.50	-13	-34.50	-68.4	-55.21	2.99	10.70	H	Pass
7520	-41.39	-13	-28.39	-67.89	-49.92	3.59	12.12	H	Pass

Band :	GSM1900	Temperature :	23~25°C
Test Mode :	EDGE 8 Link	Relative Humidity :	50~52%
Test Engineer :	Kyle Zhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-49.08	-13	-36.08	-64.79	-55.38	2.51	8.81	V	Pass
5636	-48.22	-13	-35.22	-69.18	-55.93	2.99	10.70	V	Pass
7520	-41.80	-13	-28.80	-68.33	-50.33	3.59	12.12	V	Pass

3.7 Frequency Stability Measurement

3.7.1 Description of Frequency Stability Measurement

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

3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

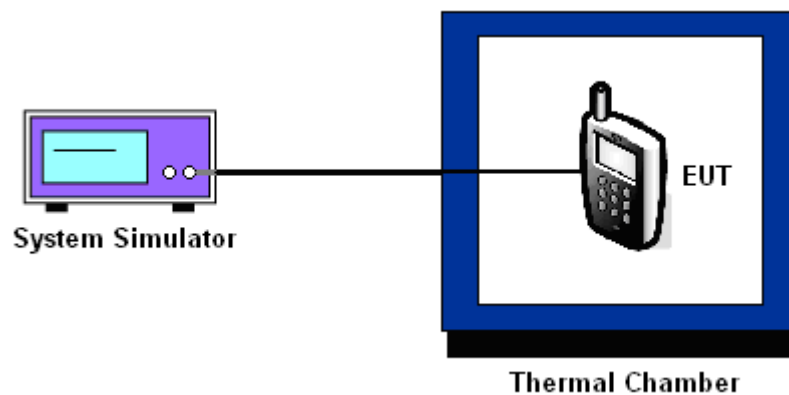
3.7.3 Test Procedures for Temperature Variation

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

3.7.4 Test Procedures for Voltage Variation

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

3.7.5 Test Setup



3.7.6 Test Result of Temperature Variation

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

Temperature (°C)	GSM		EDGE 8		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-43	-0.05	45	0.05	PASS
-20	-37	-0.04	36	0.04	
-10	-28	-0.03	26	0.03	
0	-26	-0.03	36	0.04	
10	24	0.03	39	0.05	
20	-34	-0.04	22	0.03	
30	-40	-0.05	-42	-0.05	
40	-39	-0.05	-21	-0.02	
50	-36	-0.04	-49	-0.06	

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

Temperature (°C)	GSM		EDGE 8		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-51	-0.03	-70	-0.04	PASS
-20	-48	-0.03	40	0.02	
-10	-43	-0.02	36	0.02	
0	-45	-0.02	40	0.02	
10	-38	-0.02	-33	-0.02	
20	-46	-0.02	-35	-0.02	
30	-51	-0.03	30	0.02	
40	-57	-0.03	-35	-0.02	
50	-61	-0.03	40	0.02	

3.7.7 Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
GSM 850 CH189	GSM	3.8	-41	-0.05	2.5	PASS
		BEP	45	0.05		
		4.2	-49	-0.06		
	EDGE 8	3.8	35	0.04		
		BEP	-30	-0.04		
		4.2	-41	-0.05		
GSM 1900 CH661	GSM	3.8	-44	-0.02		
		BEP	-39	-0.02		
		4.2	49	0.03		
	EDGE 8	3.8	-38	-0.02		
		BEP	34	0.02		
		4.2	43	0.02		

Note:

1. Normal Voltage = 3.8V.
2. Battery End Point (BEP) = 3.5 V.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
System Simulator	R&S	CMU200	117995	N/A	Jul. 28, 2011	May 04, 2012~ May 23, 2012	Jul. 27, 2012	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 13, 2011	May 04, 2012~ May 23, 2012	Jun. 12, 2012	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D35P	TBN-9307 01	N/A	Jul. 27, 2011	May 04, 2012~ May 23, 2012	Jul. 26, 2012	Conducted (TH02-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 22, 2011	May 17, 2012	Oct. 21, 2012	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP30	101067	9KHz ~ 30GHz	Dec. 06, 2011	May 17, 2012	Dec. 05, 2012	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 10, 2011	May 17, 2012	Aug. 09, 2012	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A023 62	1GHz ~ 26.5GHz	Dec. 05, 2011	May 17, 2012	Dec. 04, 2012	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32 dB.GAIN	Feb. 27, 2012	May 17, 2012	Feb. 26, 2013	Radiation (03CH07-HY)
EMI TEST RECEIVER	R&S	ESCI 7	100724	9kHz ~ 7GHz	Aug. 22, 2011	May 17, 2012	Aug. 21, 2012	Radiation (03CH07-HY)
Pre Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	159088	1GHz ~ 18GHz	Mar. 10, 2012	May 17, 2012	Mar. 09, 2013	Radiation (03CH07-HY)
System Simulator	R&S	CMU200	117997	N/A	Aug. 22, 2011	May 17, 2012	Aug. 21, 2013	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/00 1	9 kHz~30 MHz	Jul. 29, 2010	May 17, 2012	Jul. 28, 2012	Radiation (03CH05-HY)

5 Uncertainty of Evaluation

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

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

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

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

Appendix A. Product Equality Declaration

Chi Mei Communication System Inc.

Tel: 886-2-2268-5511; Fax: 886-2-2269-2922

Date: May 29, 2012

Product Equality Declaration

We, Chi Mei Communication System Inc., declare on our sole responsibility for the product of XT615 (model name) as below:

The difference between XT615 #3149 (900/2100) and XT685#3402 (900/2100) are:

- ◆ CPU difference : XT615 use 800MHz CPU, XT685 use 1GHz CPU.
- ◆ SIM difference : XT615 is single SIM, and XT685 is dual SIM.
- ◆ Battery difference : XT615 is SNN5843A, and XT685 is SNN5891A
- ◆ LCD Panel difference: XT615 is TOSHIBA_ LT040MDT9000, and XT685 is Truly_ TFT3P3446-M-E
- ◆ Color difference: XT615 is Black, and XT685 is white
- ◆ PCB is the same with XT615 (900/2100), only BOM difference listed below:

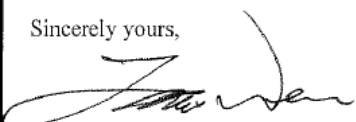
Reference	3149 (EU variant)		3402 (1G-Dual SIM)		Note
	Part Number	Description	Part Number	Description	
R902	SR004730231	RES_47K_0201 $\pm 1\%$ 1/20W_RM02FT N4702	SR000000252	RES_0 Ω _0201 $\pm 5\%$ 1/20W_RM02JTN0	HWID
R908	SR039030251	RES_390K_0201 $\pm 5\%$ 1/20W_RM02JT N394	SR000000252	RES_0 Ω _0201 $\pm 5\%$ 1/20W_RM02JTN0	HWID
U301	SA0227A00A0	IC_MSM7227A-0_3.3V_11*11*1.05_576P NSP	SA02271A0A0	IC_CPU_1GHz_4.28V_11*11*1.05mm_576P NSP	3149:MSM 7227A 3402:MSM 7227A-AA
CON104	N/A	Did not install	MEIRM47002A	CONN_SIM_6P_8.5*15.9*0.5mm	2 nd SIM reader
X701	SX0032K012H	CRYSTAL_32.768K Hz_CL:12.5pF ± 20 ppm_3.2*1	SX0032M012X	XTAL_32.768K_CL:7pF ± 20 ppm_3.2*1.5*0.9_Swatch	3402: uses 2 nd source to avoid shortage

ESD1901	SG012033110	ESD_Chip SMD Transient Voltage Suppressor	SG18131D0A0	ESD_TVS_CL-12V/1 A_OP-5V_1.25pF_2P SOD882	3402: uses 2 nd source to avoid shortage
ESD1902	SG012033110	ESD_Chip SMD Transient Voltage Suppressor	SG18131D0A0	ESD_TVS_CL-12V/1 A_OP-5V_1.25pF_2P SOD882	3402: uses 2 nd source to avoid shortage

Except Listings above, the others are the same as previous version.

Should you have any questions or comments regarding this matter, please have my best attention.

Sincerely yours,



James Wen

Chi Mei Communication System Inc.

Tel: 886-2-2268-5511

Fax: 886-2-2269-2922

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Appendix B. Original Report

Please refer to Sporton report number FG1O0527 as below.