

FCC RF Test Report

APPLICANT : NEC Corp. of America
EQUIPMENT : GSM / WCDMA Mobile Phone
BRAND NAME : NEC CASIO Mobile Communications, Ltd.
MODEL NAME : KMP7R4H1-1A
FCC ID : A98-FWP7935
STANDARD : FCC 47 CFR Part 2, 22(H), 24(E)
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)

The product was received on Sep. 27, 2012 and completely tested on Oct. 27, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI / TIA / EIA-603-C-2004 and shown compliance with the applicable technical standards.

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

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

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

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG282414-02	Rev. 01	Initial issue of report	Nov. 07, 2012

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	§2.1046	N/A	Conducted Output Power	N/A	PASS	-
3.2	§24.232(d)	N/A	Peak-to-Average Ratio	< 13 dB	PASS	-
3.3	§22.913(a)(2)	RSS-132(4.4) SRSP-503(5.1.3)	Effective Radiated Power	< 7 Watts	PASS	-
3.3	§24.232(c)	RSS-133 (6.4) SRSP-510(5.1.2)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
3.4	§2.1049 §22.917(a) §24.238(a)	N/A	Occupied Bandwidth	N/A	PASS	-
3.5	§2.1051 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Band Edge Measurement	< 43+10log ₁₀ (P[Watts])	PASS	-
3.6	§2.1051 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Conducted Spurious Emission	< 43+10log ₁₀ (P[Watts])	PASS	-
3.7	§2.1053 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Field Strength of Spurious Radiation	< 43+10log ₁₀ (P[Watts])	PASS	Under limit 14.62 dB at 2509.000 MHz
3.8	§2.1055 §22.355 §24.235	RSS-132(4.3) RSS-133(6.3)	Frequency Stability for Temperature & Voltage	< 2.5 ppm	PASS	-



1 General Description

1.1 Applicant

NEC Corp. of America

Mobile Communications Division, 6535 N. State Highway 161, Irving Texas 75039, United States

1.2 Manufacturer

Arima Communications Corp.

6F., No. 866, Jhongjheng Rd., Jhonghe Dist., New Taipei City 23586, Taiwan

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	GSM / WCDMA Mobile Phone
Brand Name	NEC CASIO Mobile Communications, Ltd.
Model Name	KMP7R4H1-1A
Sample 1	EUT with black color
Sample 2	EUT with white color
Sample 3	EUT with brown color
FCC ID	A98-FWP7935
EUT supports Radios application	GSM/GPRS/WCDMA/HSPA/ WLAN 11bgn / Bluetooth / NFC
HW Version	8007MB-004
SW Version	AN0020220r
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.

Product Specification subjective to this standard	
Tx Frequency	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz
Rx Frequency	GSM850: 869.2 MHz ~ 893.8 MHz GSM1900: 1930.2 MHz ~ 1989.8 MHz WCDMA Band V: 871.4 MHz ~ 891.6 MHz
Maximum Output Power to Antenna	GSM850 : 33.09 dBm GSM1900 : 29.63 dBm WCDMA Band V : 23.46 dBm
Antenna Type	Monopole Antenna
Type of Modulation	GSM: GMSK GPRS: GMSK WCDMA: QPSK (Uplink) HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink)

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

FCC Rule	System	Type of Modulation	Maximum ERP/EIRP (W)	Frequency Tolerance (% , Hz, ppm)	Emission Designator
Part 22	GSM850 GSM	GMSK	0.7447	0.03 ppm	250KGXW
Part 22	WCDMA Band V RMC 12.2Kbps	QPSK	0.0885	0.01 ppm	4M20F9W
Part 24	GSM1900 GSM	GMSK	1.0116	0.04 ppm	252KGXW

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	03CH05-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:

- Preliminary Guidance for Receiving Applications for Certification of 3G Device. May 9, 2006.
- FCC 47 CFR Part 2, 22(H), 24(E)
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v01
- IC RSS-132 Issue 2
- IC RSS-133 Issue 5

Remark:

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



1.7 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 and WCDMA Band V.
2. 30 MHz to 19000 MHz for GSM1900.

Test Modes		
Band	Radiated TCs	Conducted TCs
GSM 850	■ GSM Link for Sample 1 ■ GSM Link for Sample 2 ■ GSM Link for Sample 3	■ GSM Link
GSM 1900	■ GSM Link for Sample 1 ■ GSM Link for Sample 2 ■ GSM Link for Sample 3	■ GSM Link
WCDMA Band V	■ RMC 12.2Kbps Link for Sample 1	■ RMC 12.2Kbps Link

Note:

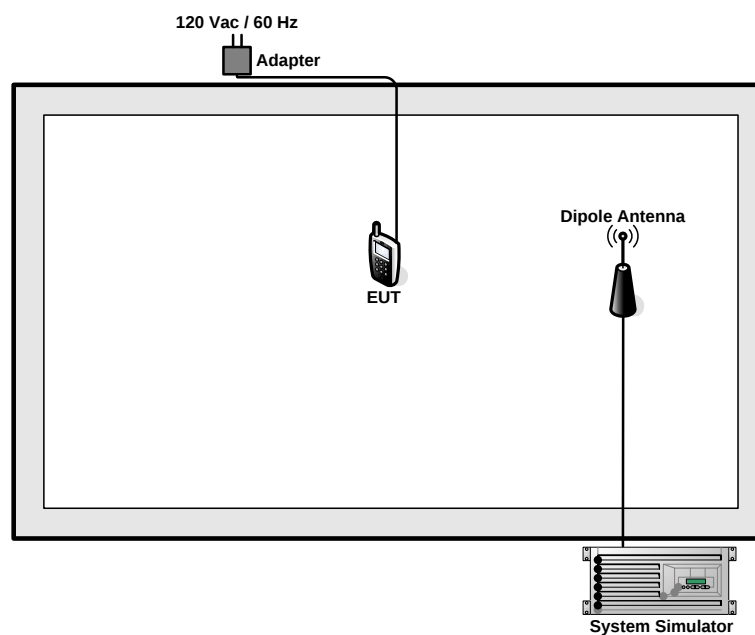
1. The maximum power levels are GSM mode for GMSK link, RMC 12.2Kbps mode for WCDMA band V, only these modes were used for all tests.
2. Because there are individual antennas for each WWAN, WLAN, and Bluetooth, the co-location test modes are not required.

The conducted power tables are as follows:

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	33.03	33.08	33.09	29.44	29.13	29.63

Conducted Power (*Unit: dBm)			
Band	WCDMA Band V		
Channel	4132	4182	4233
Frequency	826.4	836.4	846.6
RMC 12.2K	23.38	23.20	23.46
HSDPA Subtest-1	23.30	23.16	23.38
HSDPA Subtest-2	23.32	23.17	23.41
HSDPA Subtest-3	22.90	22.68	22.86
HSDPA Subtest-4	22.84	22.66	22.85
HSUPA Subtest-1	23.09	22.88	23.00
HSUPA Subtest-2	21.26	21.12	21.40
HSUPA Subtest-3	21.94	22.05	22.11
HSUPA Subtest-4	21.60	21.43	21.62
HSUPA Subtest-5	23.15	23.02	23.34

2.2 Connection Diagram of Test System



3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

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

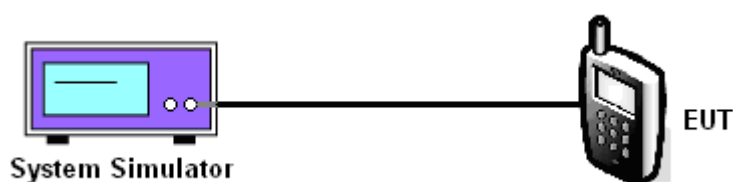
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The transmitter output port was connected to base station.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set EUT at maximum power through base station.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure the maximum burst average power for GSM and maximum average power for other modulation signal.

3.1.4 Test Setup



3.1.5 Test Result of Conducted Output Power

Cellular Band						
Modes	GSM850 (GSM)			WCDMA Band V (RMC 12.2Kbps)		
Channel	128 (Low)	189 (Mid)	251 (High)	4132 (Low)	4182 (Mid)	4233 (High)
Frequency (MHz)	824.2	836.4	848.8	826.4	836.4	846.6
Conducted Power (dBm)	33.03	33.08	33.09	23.38	23.20	23.46
Conducted Power (Watts)	2.01	2.03	2.04	0.22	0.21	0.22

PCS Band			
Modes	GSM1900 (GSM)		
Channel	512 (Low)	661 (Mid)	810 (High)
Frequency (MHz)	1850.2	1880	1909.8
Conducted Power (dBm)	29.44	29.13	29.63
Conducted Power (Watts)	0.88	0.82	0.92

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

3.2 Peak-to-Average Ratio

3.2.1 Description of the PAR Measurement

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

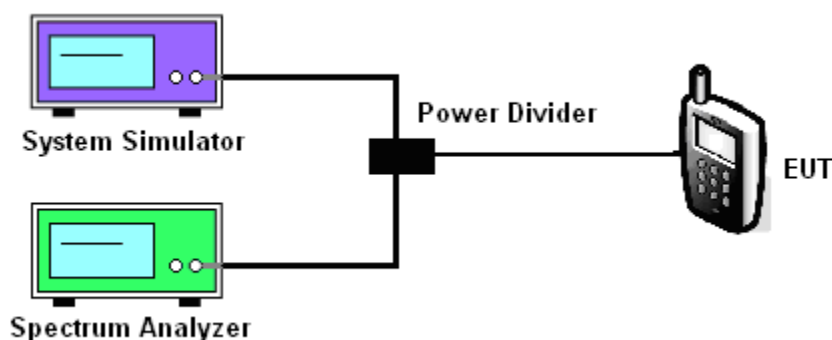
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

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

3.2.4 Test Setup



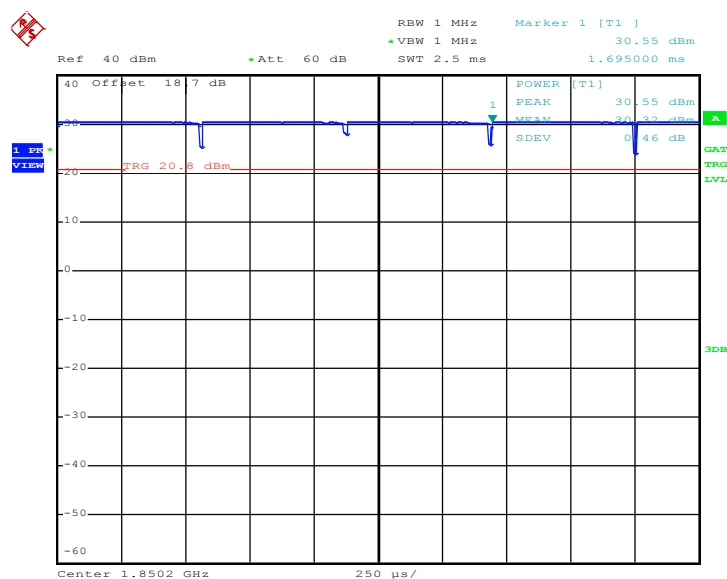
3.2.5 Test Result of Peak-to-Average Ratio

PCS Band			
Modes	GSM1900 (GSM)		
Channel	512 (Low)	661 (Mid)	810 (High)
Frequency (MHz)	1850.2	1880	1909.8
Peak-to-Average Ratio (dB)	0.23	0.16	0.21

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

Band :	GSM 1900	Test Mode :	GSM Link
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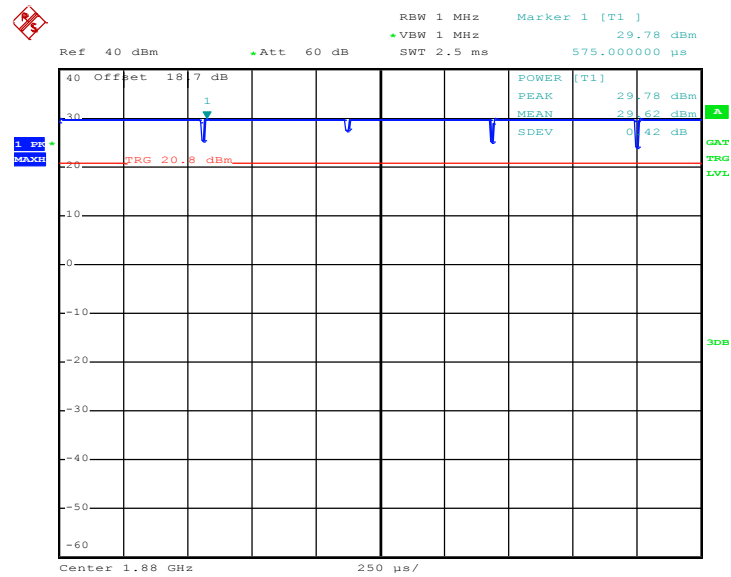
Peak-to-Average Ratio on Channel 512 (1850.2 MHz)



Date: 4.OCT.2012 09:54:19

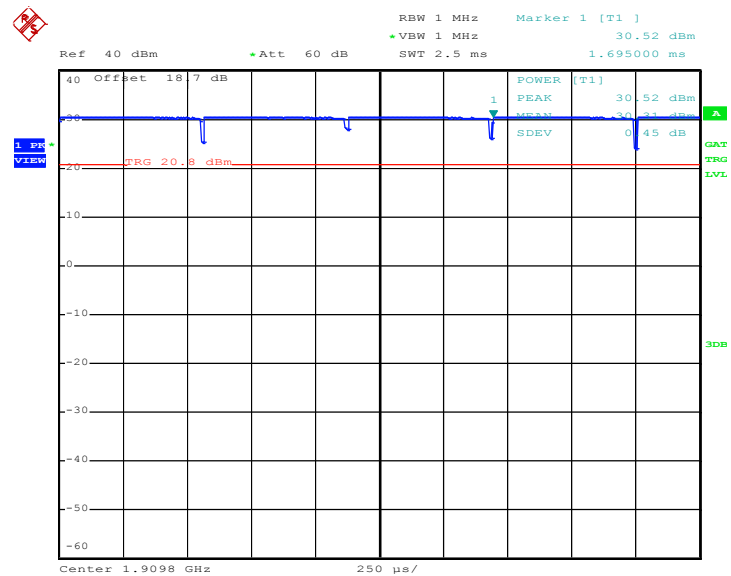


Peak-to-Average Ratio on Channel 661 (1880.0 MHz)



Date: 4.OCT.2012 09:52:40

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



Date: 4.OCT.2012 09:50:54

3.3 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

3.3.1 Description of the ERP/EIRP Measurement

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

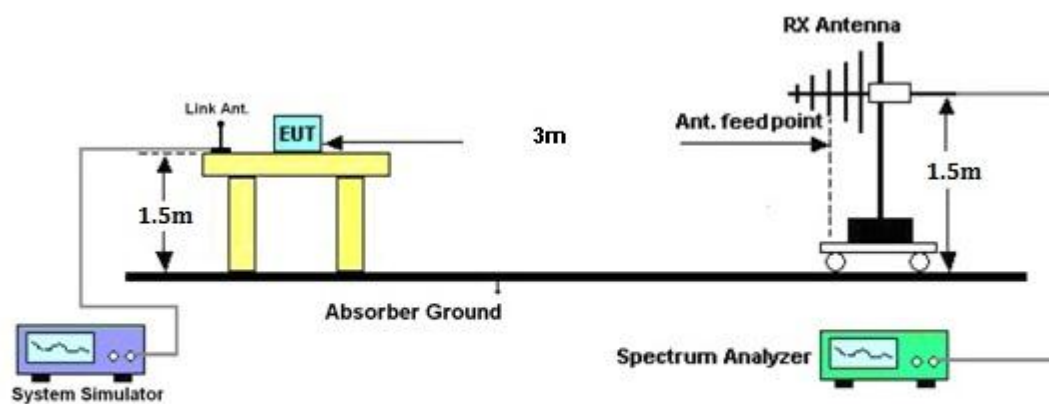
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The EUT was placed on a turntable with 1.5 meter height in a fully anechoic chamber.
2. The EUT was set at 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. GSM operating modes: Set RBW= 1MHz, VBW= 3MHz, RMS detector over burst;
UMTS operating modes: Set RBW= 100 KHz, VBW= 300 KHz, RMS detector over frame, and use channel power option with bandwidth=5MHz, per section 4.0 of KDB 971168 D01.
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
10. $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$
 P_s (dBm) : Input power to substitution antenna.
 G_s (dBi or dBd) : Substitution antenna Gain.
 $E_t = R_t + AF$
 $E_s = R_s + AF$
 AF (dB/m) : Receive antenna factor
 R_t : The highest received signal in spectrum analyzer for EUT.
 R_s : The highest received signal in spectrum analyzer for substitution antenna.

3.3.4 Test Setup



3.3.5 Test Result of ERP

<Sample 1>

GSM850 (GSM) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-18.48	-48.12	0.00	-1.08	28.56	0.7178
836.40	-19.43	-48.28	0.00	-0.93	27.92	0.6194
848.80	-20.94	-48.35	0.00	-0.76	26.65	0.4624
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-33.53	-47.97	0.00	-1.08	13.36	0.0217
836.40	-34.13	-48.01	0.00	-0.93	12.95	0.0197
848.80	-35.10	-48.05	0.00	-0.76	12.19	0.0166

WCDMA Band V (RMC 12.2Kbps) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
826.40	-27.85	-48.12	0.00	-1.08	19.19	0.0830
836.40	-28.39	-48.28	0.00	-0.93	18.96	0.0787
846.60	-29.46	-48.35	0.00	-0.76	18.13	0.0650
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
826.40	-42.29	-47.97	0.00	-1.08	4.60	0.0029
836.40	-42.87	-48.01	0.00	-0.93	4.21	0.0026
846.60	-43.67	-48.05	0.00	-0.76	3.62	0.0023

<Sample 2>

GSM850 (GSM) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-18.35	-48.12	0.00	-1.08	28.69	0.7396
836.40	-18.95	-48.28	0.00	-0.93	28.40	0.6918
848.80	-20.33	-48.35	0.00	-0.76	27.26	0.5321
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-33.63	-47.97	0.00	-1.08	13.26	0.0212
836.40	-33.75	-48.01	0.00	-0.93	13.33	0.0215
848.80	-34.27	-48.05	0.00	-0.76	13.02	0.0200

WCDMA Band V (RMC 12.2Kbps) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
826.40	-27.57	-48.12	0.00	-1.08	19.47	0.0885
836.40	-28.24	-48.28	0.00	-0.93	19.11	0.0815
846.60	-29.01	-48.35	0.00	-0.76	18.58	0.0721
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
826.40	-42.06	-47.97	0.00	-1.08	4.83	0.0030
836.40	-42.77	-48.01	0.00	-0.93	4.31	0.0027
846.60	-43.20	-48.05	0.00	-0.76	4.09	0.0026

<Sample 3>

GSM850 (GSM) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-18.32	-48.12	0.00	-1.08	28.72	0.7447
836.40	-19.34	-48.28	0.00	-0.93	28.01	0.6324
848.80	-20.72	-48.35	0.00	-0.76	26.87	0.4864
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-33.31	-47.97	0.00	-1.08	13.58	0.0228
836.40	-34.18	-48.01	0.00	-0.93	12.90	0.0195
848.80	-35.37	-48.05	0.00	-0.76	11.92	0.0156

WCDMA Band V (RMC 12.2Kbps) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
826.40	-28.25	-48.12	0.00	-1.08	18.79	0.0757
836.40	-28.85	-48.28	0.00	-0.93	18.50	0.0708
846.60	-29.53	-48.35	0.00	-0.76	18.06	0.0640
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
826.40	-42.75	-47.97	0.00	-1.08	4.14	0.0026
836.40	-43.54	-48.01	0.00	-0.93	3.54	0.0023
846.60	-43.76	-48.05	0.00	-0.76	3.53	0.0023

3.3.6 Test Result of EIRP

<Sample 1>

GSM1900 (GSM) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-25.02	-51.88	0.00	1.96	28.82	0.7621
1880.00	-26.45	-52.99	0.00	2.00	28.54	0.7145
1909.80	-28.18	-54.28	0.00	1.98	28.08	0.6427
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-25.34	-52.13	0.00	1.96	28.75	0.7499
1880.00	-26.80	-53.17	0.00	2.00	28.37	0.6871
1909.80	-28.37	-54.13	0.00	1.98	27.74	0.5943

<Sample 2>

GSM1900 (GSM) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-23.92	-51.88	0.00	1.96	29.92	0.9817
1880.00	-25.68	-52.99	0.00	2.00	29.31	0.8531
1909.80	-27.46	-54.28	0.00	1.98	28.80	0.7586
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-24.04	-52.13	0.00	1.96	30.05	1.0116
1880.00	-26.31	-53.17	0.00	2.00	28.86	0.7691
1909.80	-27.93	-54.13	0.00	1.98	28.18	0.6577

<Sample 3>

GSM1900 (GSM) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-25.46	-51.88	0.00	1.96	28.38	0.6887
1880.00	-26.53	-52.99	0.00	2.00	28.46	0.7015
1909.80	-28.41	-54.28	0.00	1.98	27.85	0.6095
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-25.54	-52.13	0.00	1.96	28.55	0.7161
1880.00	-26.76	-53.17	0.00	2.00	28.41	0.6934
1909.80	-28.35	-54.13	0.00	1.98	27.76	0.5970

3.4 99% Occupied Bandwidth and 26dB Bandwidth Measurement

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

The 99% occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

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

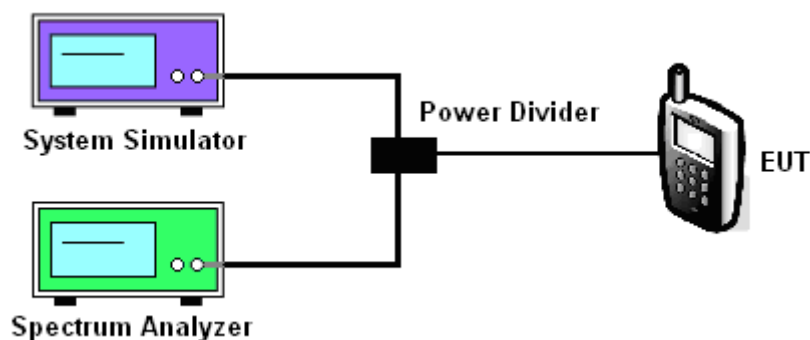
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The 99% occupied bandwidth and 26 dB bandwidth of the middle channel for the highest RF powers were measured.

3.4.4 Test Setup



3.4.5 Test Result of Occupied Bandwidth and 26dB Bandwidth

Cellular Band			
Modes	GSM850 (GSM)		
Channel	128 (Low)	189 (Mid)	251 (High)
Frequency (MHz)	824.2	836.4	848.8
99% OBW (KHz)	246.00	246.00	250.00
26dB BW (KHz)	310.00	304.00	310.00

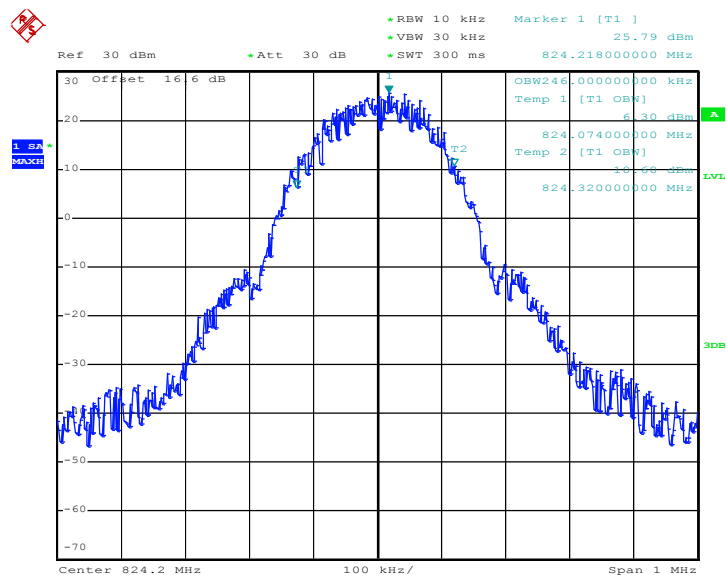
PCS Band			
Modes	GSM1900 (GSM)		
Channel	512 (Low)	661 (Mid)	810 (High)
Frequency (MHz)	1850.2	1880	1909.8
99% OBW (KHz)	252.00	246.00	244.00
26dB BW (KHz)	316.00	310.00	312.00

Cellular Band			
Modes	WCDMA Band V (RMC 12.2Kbps)		
Channel	4132 (Low)	4182 (Mid)	4233 (High)
Frequency (MHz)	826.4	836.4	846.6
99% OBW (MHz)	4.14	4.20	4.16
26dB BW (MHz)	4.68	4.68	4.68

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

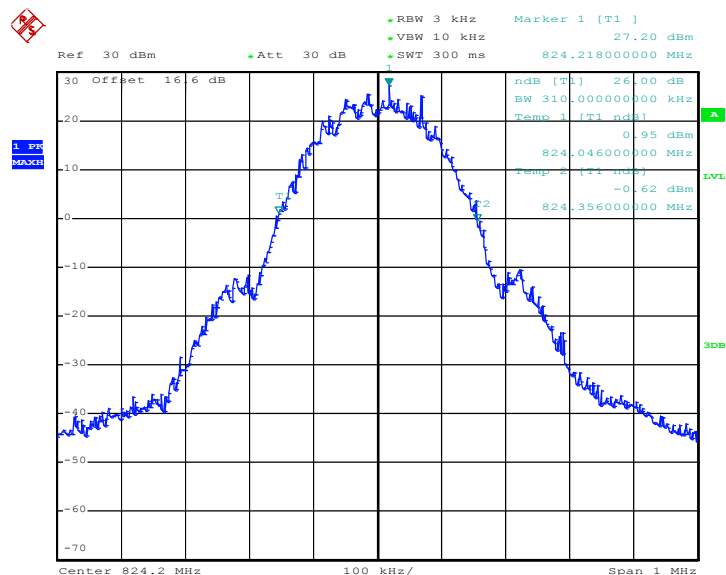
Band :	GSM 850	Test Mode :	GSM Link
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99% Occupied Bandwidth Plot on Channel 128 (824.2 MHz)



Date: 3.OCT.2012 20:35:15

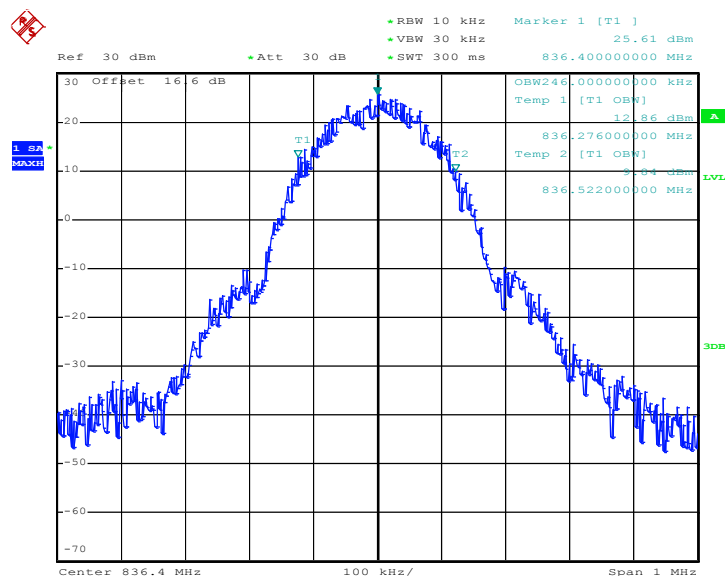
26dB Bandwidth Plot on Channel 128 (824.2 MHz)



Date: 3.OCT.2012 20:19:41

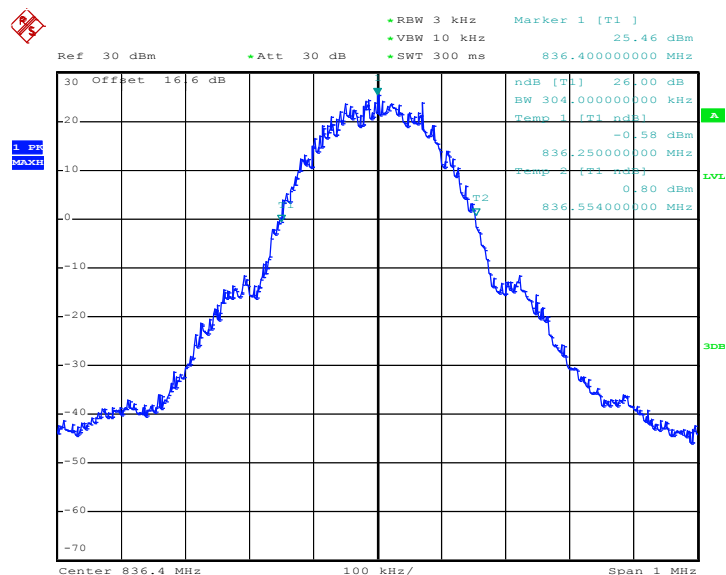


99% Occupied Bandwidth Plot on Channel 189 (836.4 MHz)



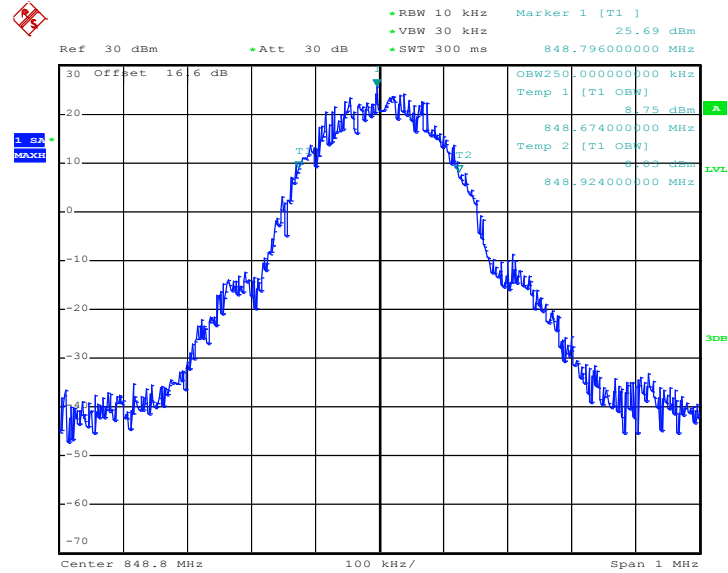
Date: 3.OCT.2012 20:35:41

26dB Bandwidth Plot on Channel 189 (836.4 MHz)



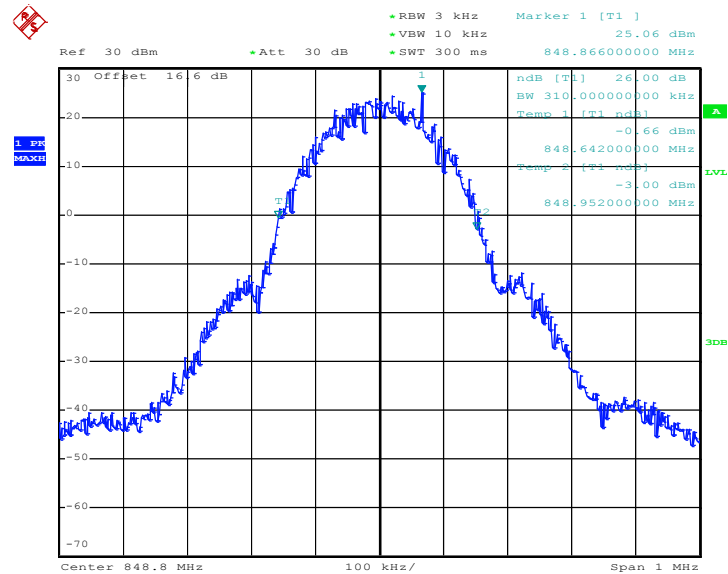
Date: 3.OCT.2012 20:20:07

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



Date: 3.OCT.2012 20:36:07

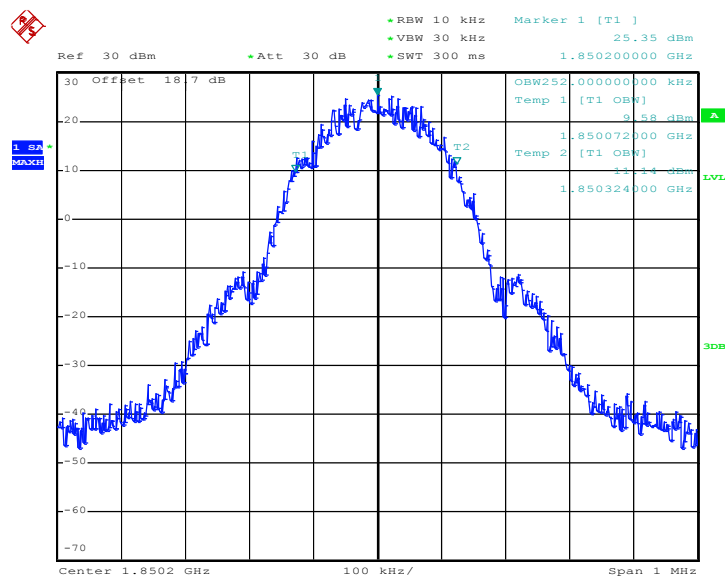
26dB Bandwidth Plot on Channel 251 (848.8 MHz)



Date: 3.OCT.2012 20:20:33

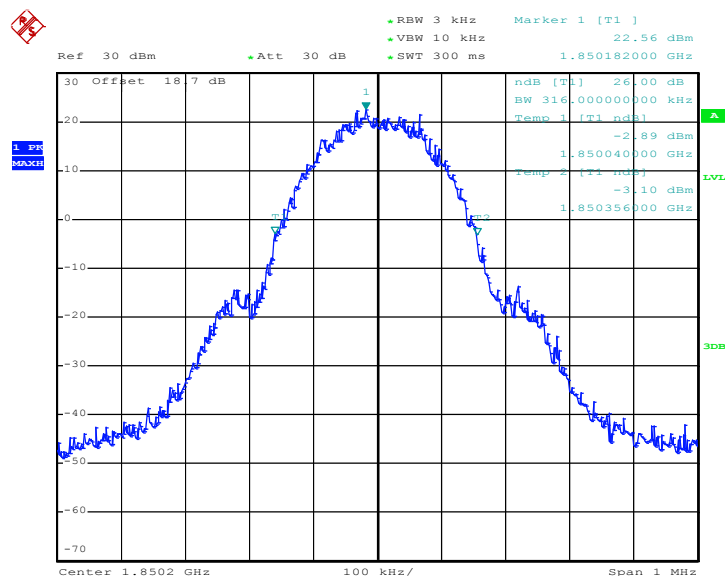
Band :	GSM 1900	Test Mode :	GSM Link
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99% Occupied Bandwidth Plot on Channel 512 (1850.2 MHz)



Date: 4.OCT.2012 09:33:12

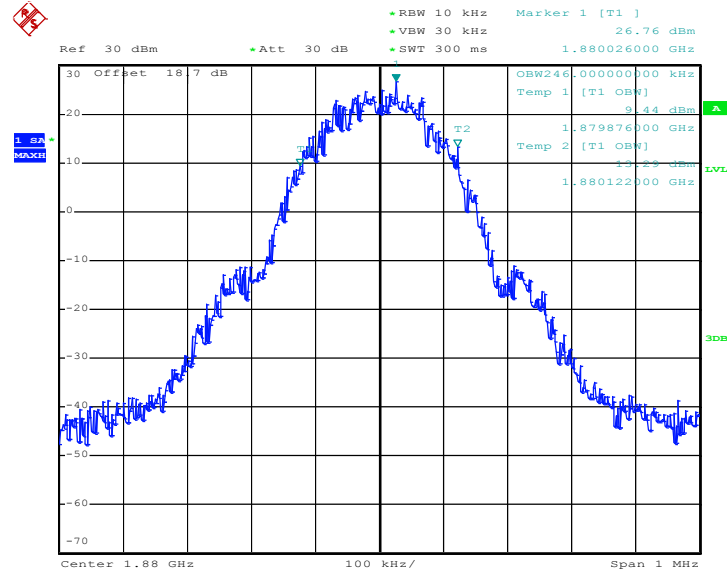
26dB Bandwidth Plot on Channel 512 (1850.2 MHz)



Date: 4.OCT.2012 09:31:53

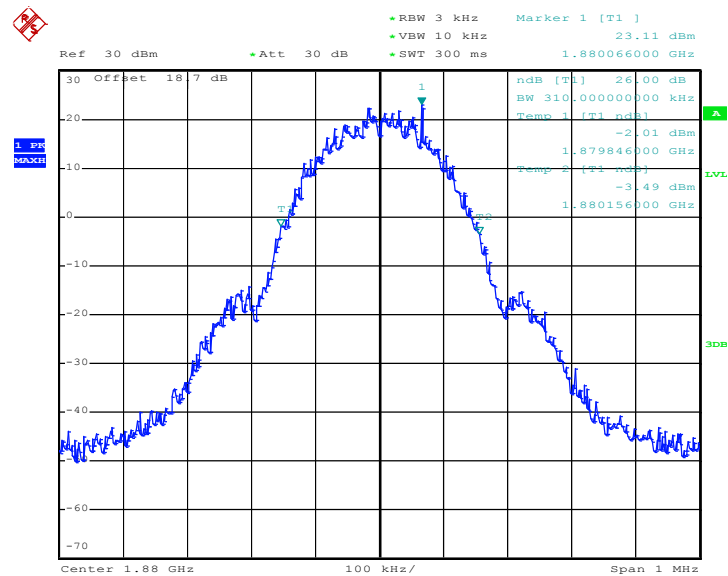


99% Occupied Bandwidth Plot on Channel 661 (1880.0 MHz)



Date: 4.OCT.2012 09:33:38

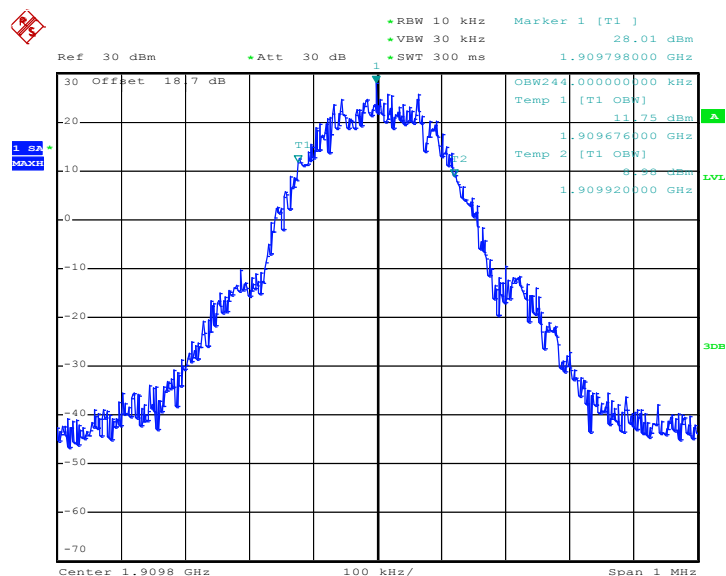
26dB Bandwidth Plot on Channel 661 (1880.0 MHz)



Date: 4.OCT.2012 09:32:20

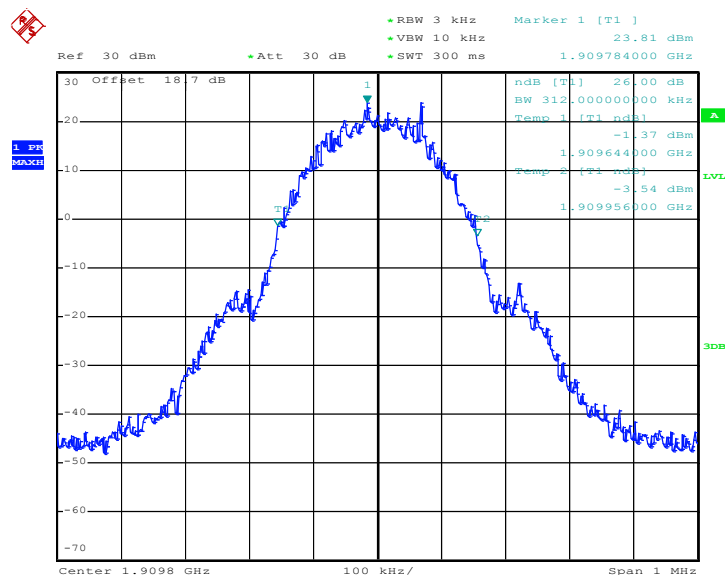


99% Occupied Bandwidth Plot on Channel 810 (1909.8 MHz)



Date: 4.OCT.2012 09:34:04

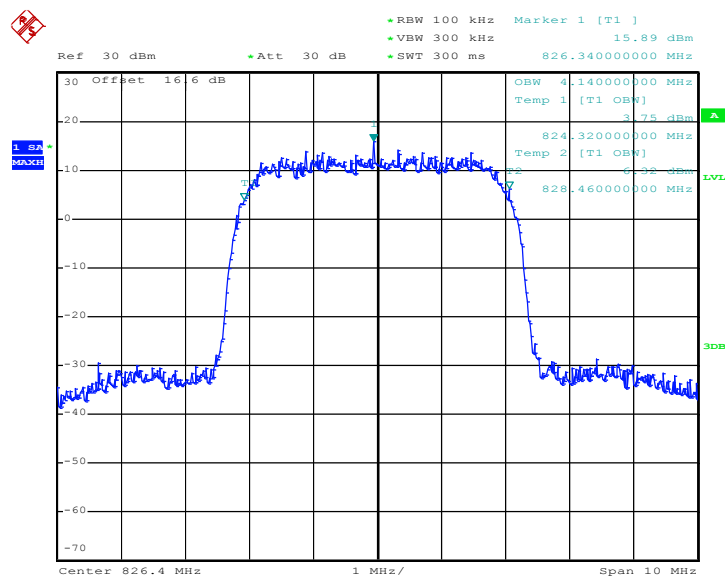
26dB Bandwidth Plot on Channel 810 (1909.8 MHz)



Date: 4.OCT.2012 09:32:46

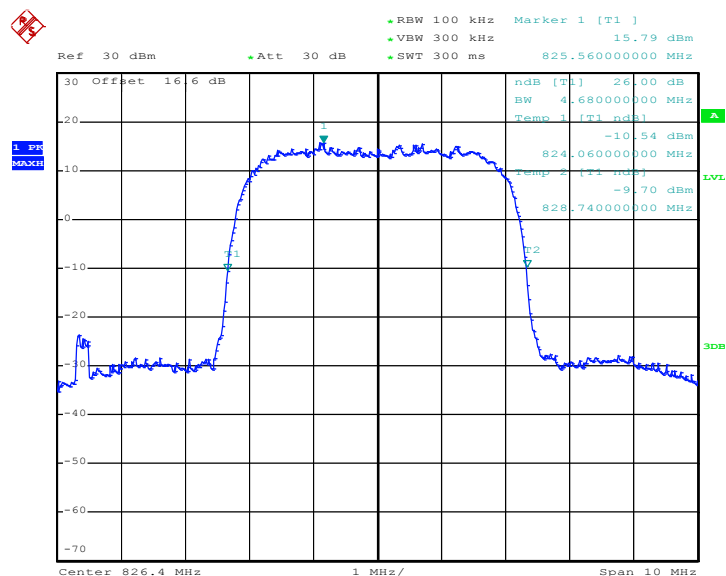
Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link
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99% Occupied Bandwidth Plot on Channel 4132 (826.4 MHz)



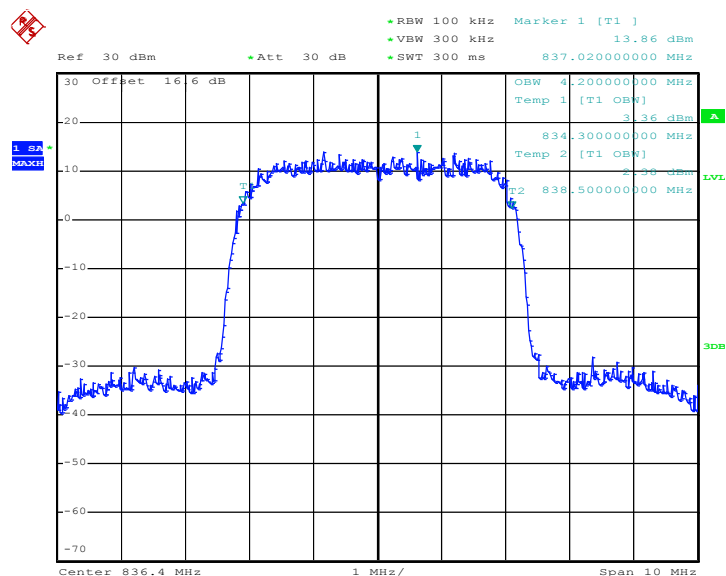
Date: 4.OCT.2012 10:23:16

26dB Bandwidth Plot on Channel 4132 (826.4 MHz)



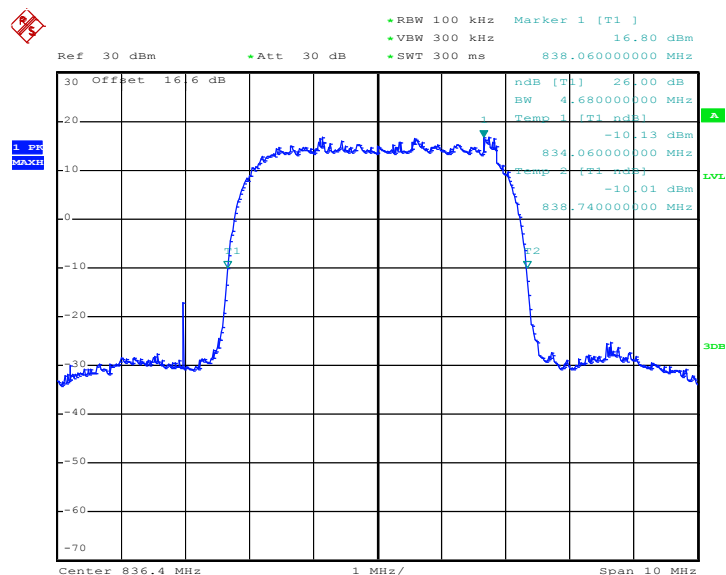
Date: 4.OCT.2012 10:42:22

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



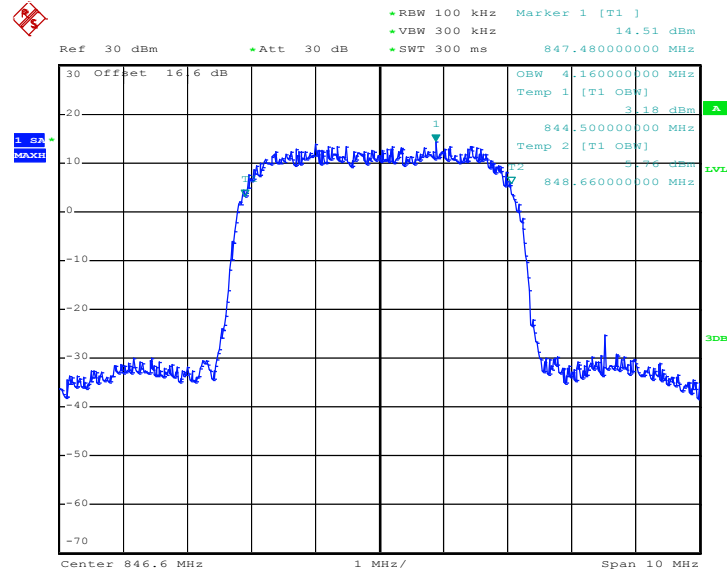
Date: 4.OCT.2012 10:23:42

26dB Bandwidth Plot on Channel 4182 (836.4 MHz)



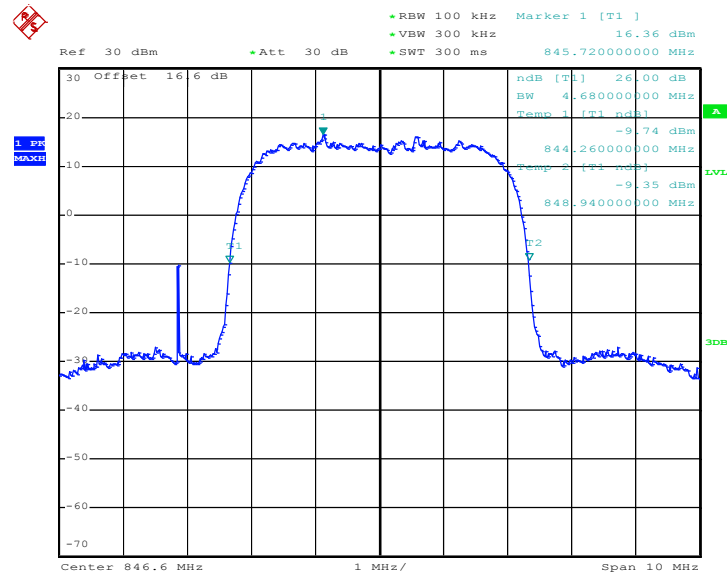
Date: 4.OCT.2012 10:42:49

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



Date: 4.OCT.2012 10:24:08

26dB Bandwidth Plot on Channel 4233 (846.6 MHz)



Date: 4.OCT.2012 10:43:15

3.5 Band Edge Measurement

3.5.1 Description of Band Edge Measurement

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

3.5.2 Measuring Instruments

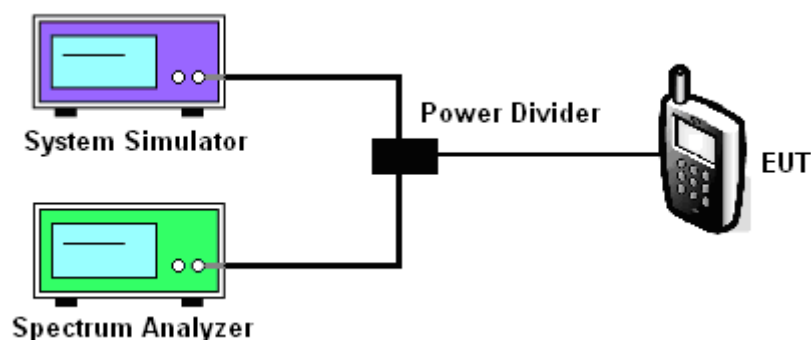
See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The band edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.

3.5.4 Test Setup

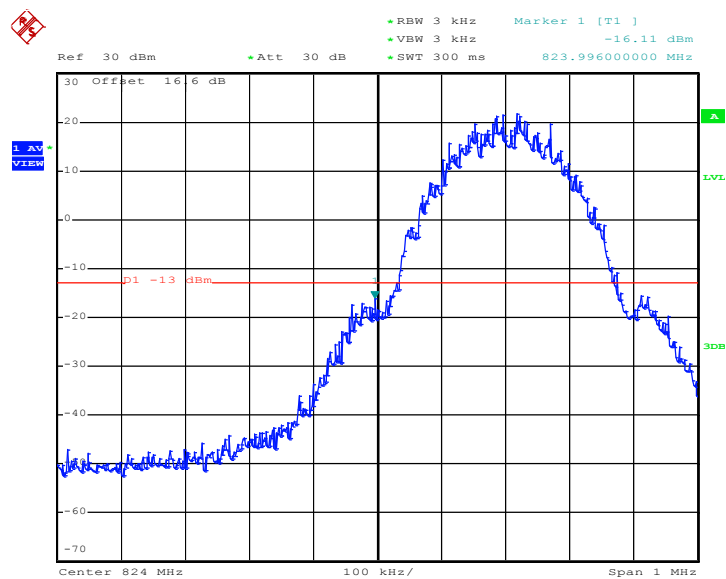
<Conducted Band Edge >



3.5.5 Test Result (Plots) of Conducted Band Edge

Band :	GSM850	Test Mode :	GSM Link
Correction Factor :	0.14dB	Maximum 26dB Bandwidth :	0.310MHz
Band Edge :	-15.97dBm	Measurement Value :	-16.11dBm

Lower Band Edge Plot on Channel 128 (824.2 MHz)

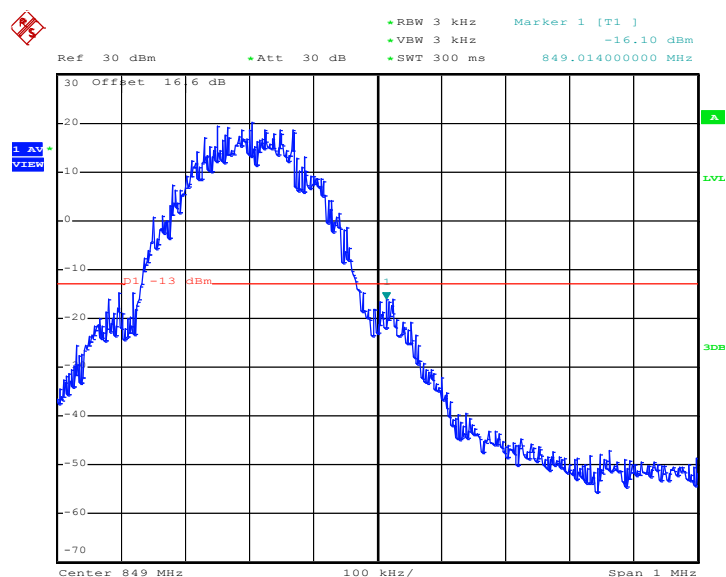


Date: 3.OCT.2012 20:23:17

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW/RBW})$
 2. Band Edge= Measurement Value + Correction Factor(dB)
- For example, $-16.11\text{dBm} + 0.14\text{dB} = -15.97\text{dBm}$

Band :	GSM850	Test Mode :	GSM Link
Correction Factor :	0.14dB	Maximum 26dB Bandwidth :	0.310MHz
Band Edge :	-15.96dBm	Measurement Value :	-16.10dBm

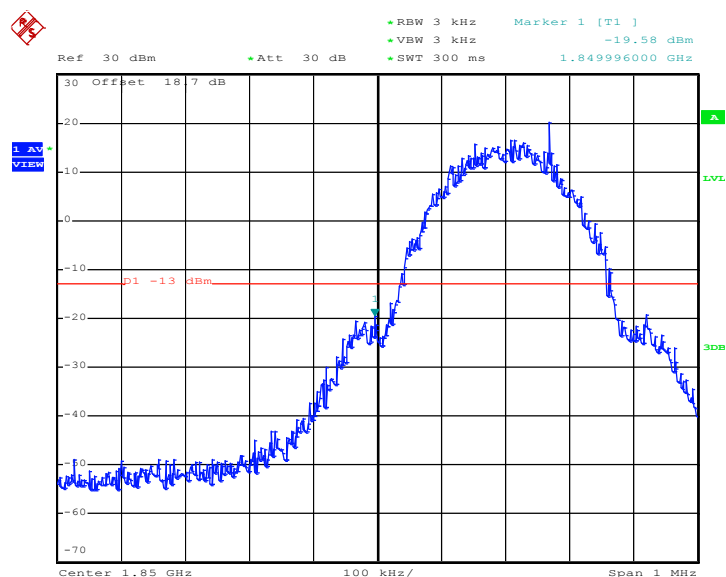
Higher Band Edge Plot on Channel 251 (848.8 MHz)



Date: 3.OCT.2012 20:23:44

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

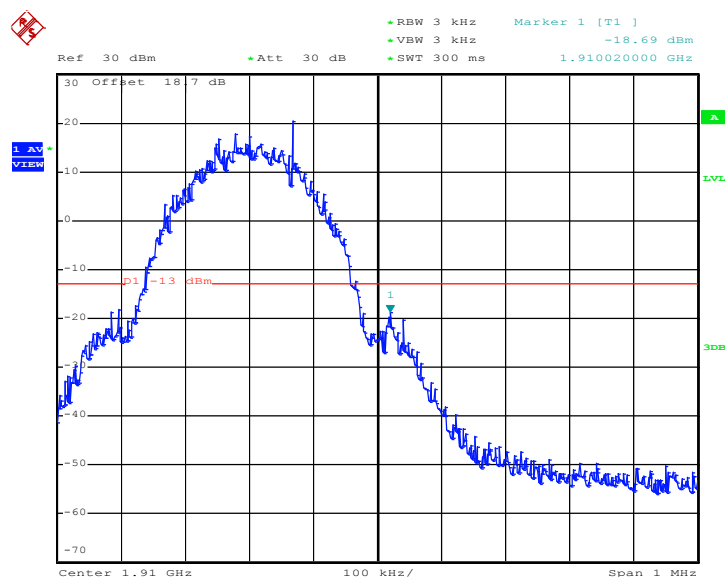
Band :	GSM1900	Test Mode :	GSM Link
Correction Factor :	0.23dB	Maximum 26dB Bandwidth :	0.316MHz
Band Edge :	-19.35dBm	Measurement Value :	-19.58dBm

Lower Band Edge Plot on Channel 512 (1850.2 MHz)


Date: 4.OCT.2012 09:35:29

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

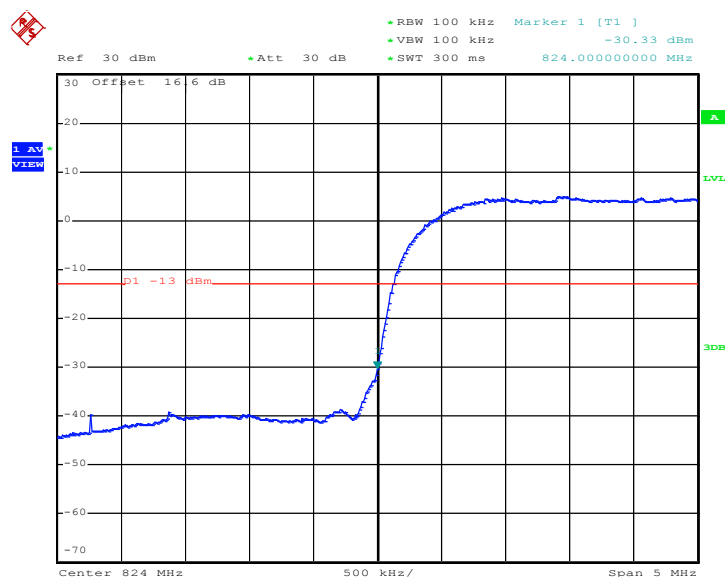
Band :	GSM1900	Test Mode :	GSM Link
Correction Factor :	0.23dB	Maximum 26dB Bandwidth :	0.316MHz
Band Edge :	-18.46dBm	Measurement Value :	-18.69dBm

Higher Band Edge Plot on Channel 810 (1909.8 MHz)


Date: 4.OCT.2012 09:35:56

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

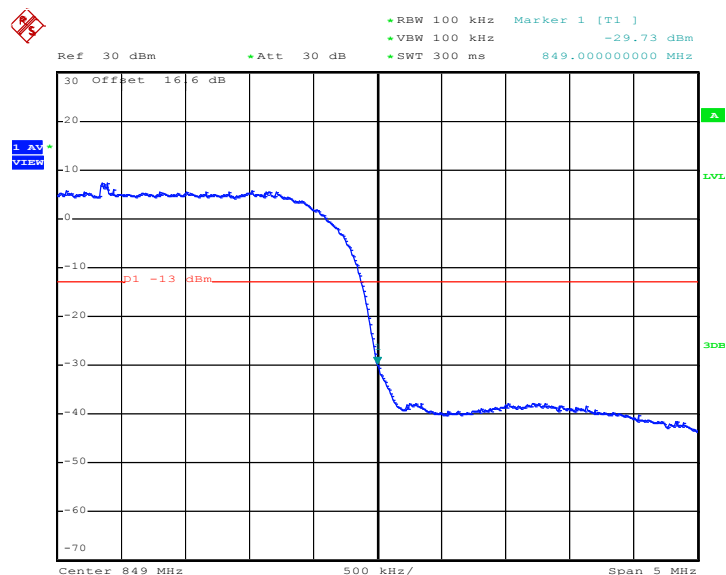
Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link
Correction Factor :	-3.30dB	Maximum 26dB Bandwidth :	4.68MHz
Band Edge :	-33.63dBm	Measurement Value :	-30.33dBm

Lower Band Edge Plot on Channel 4132 (826.4 MHz)


Date: 4.OCT.2012 10:44:18

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

Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link
Correction Factor :	-3.30dB	Maximum 26dB Bandwidth :	4.68MHz
Band Edge :	-33.03dBm	Measurement Value :	-29.73dBm

Higher Band Edge Plot on Channel 4233 (846.6 MHz)


Date: 4.OCT.2012 10:44:44

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

3.6 Conducted Spurious Emission Measurement

3.6.1 Description of Conducted Spurious Emission Measurement

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

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

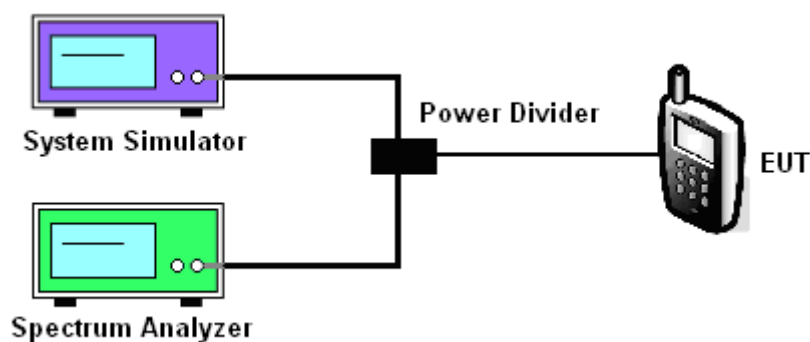
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

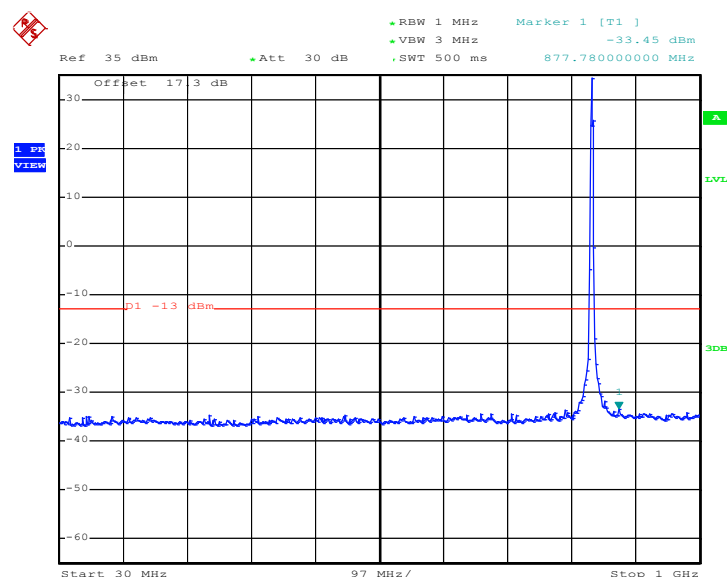
1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.

3.6.4 Test Setup

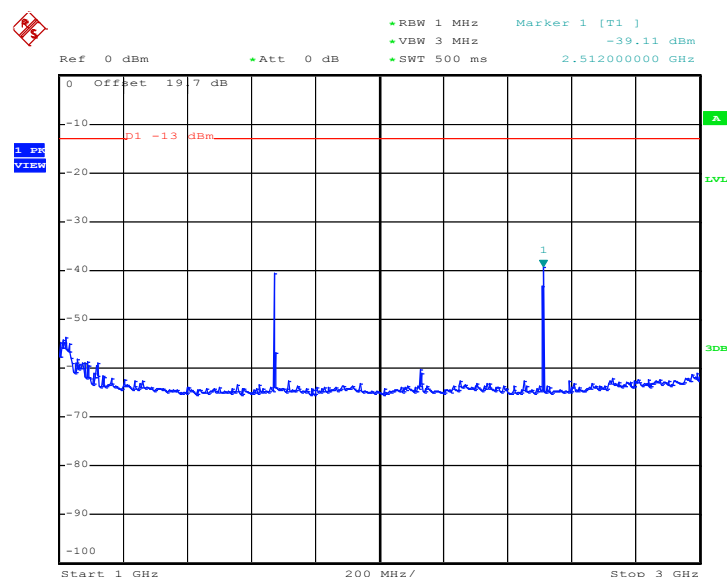


3.6.5 Test Result (Plots) of Conducted Spurious Emission

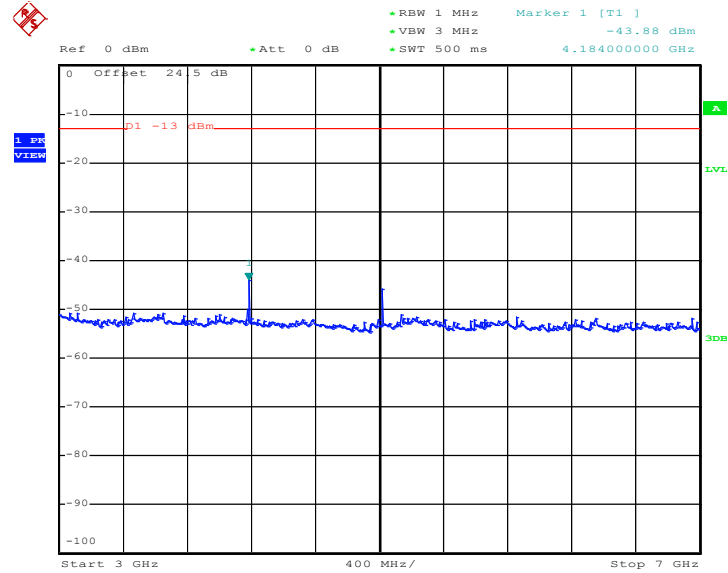
Band :	GSM850	Channel :	CH189
Test Mode :	GSM Link	Frequency :	836.4 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz


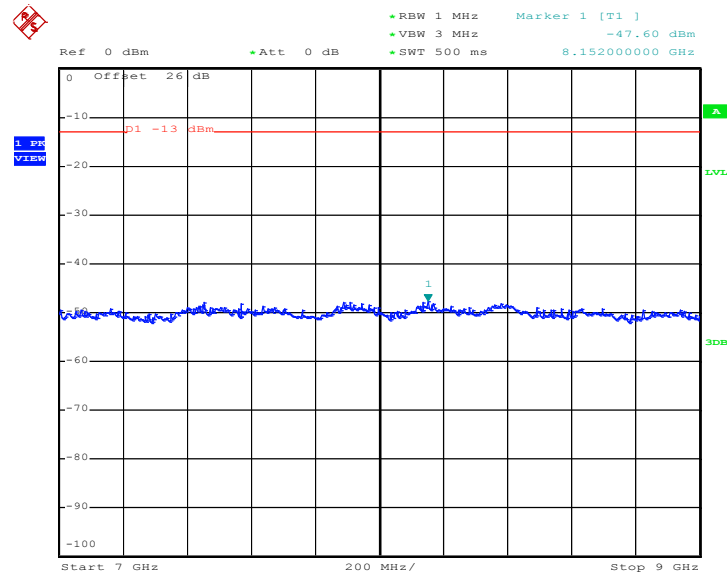
Date: 3.OCT.2012 20:18:22

Conducted Spurious Emission Plot between 1GHz ~ 3GHz


Date: 3.OCT.2012 20:14:13

Conducted Spurious Emission Plot between 3GHz ~ 7GHz


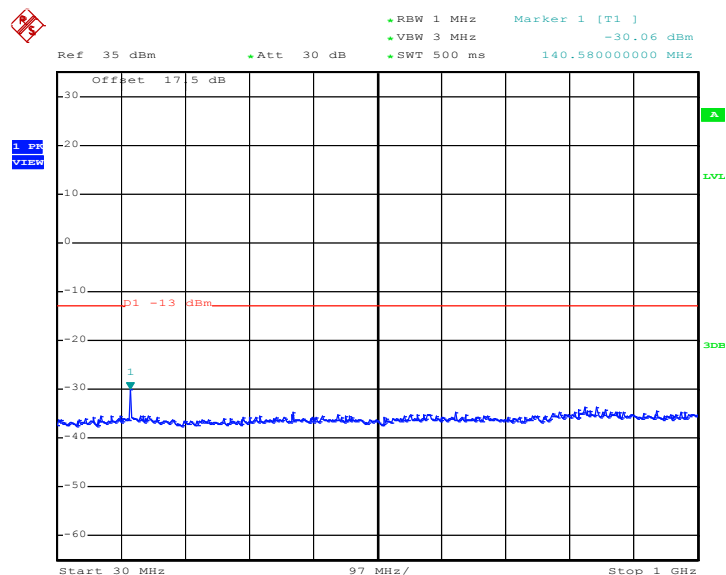
Date: 3.OCT.2012 20:14:25

Conducted Spurious Emission Plot between 7GHz ~ 9GHz


Date: 3.OCT.2012 20:14:37

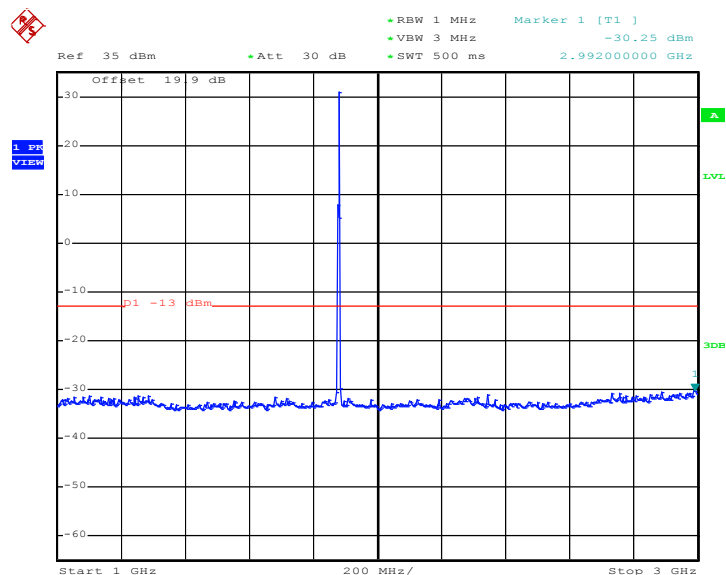
Band :	GSM1900	Channel :	CH661
Test Mode :	GSM Link	Frequency :	1880.0 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



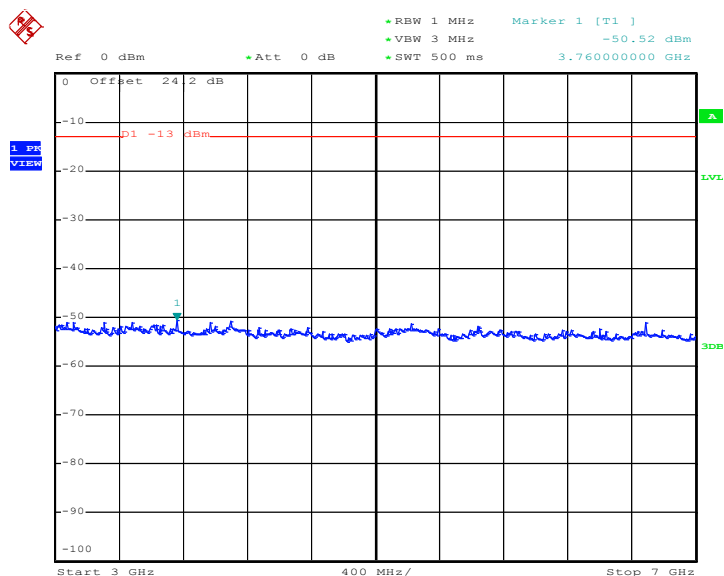
Date: 4.OCT.2012 09:25:09

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



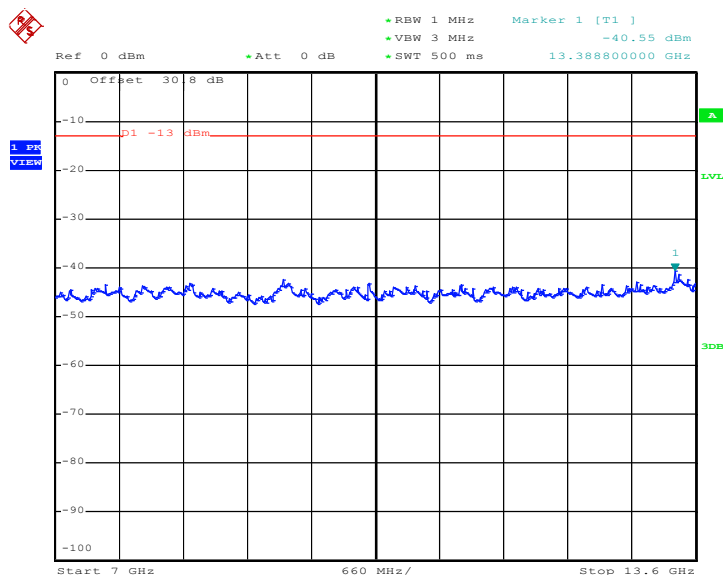
Date: 4.OCT.2012 09:25:22

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 4.OCT.2012 09:25:50

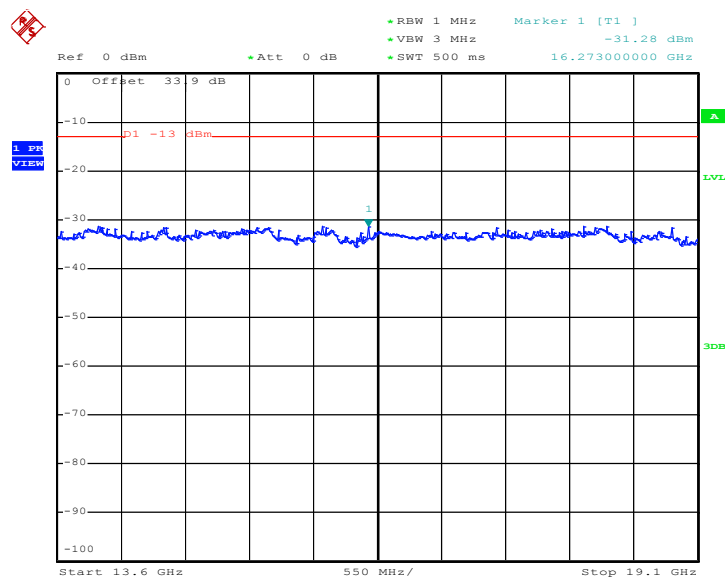
Conducted Emission Plot between 7GHz ~ 13.6GHz



Date: 4.OCT.2012 09:26:02

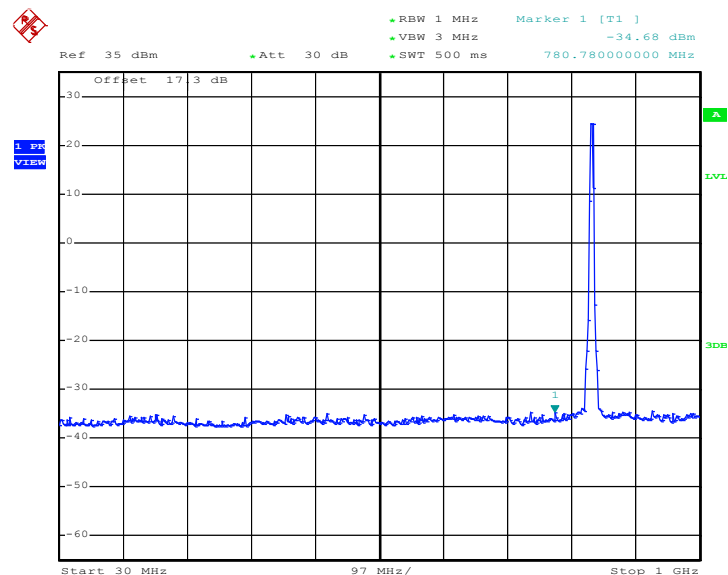


Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz

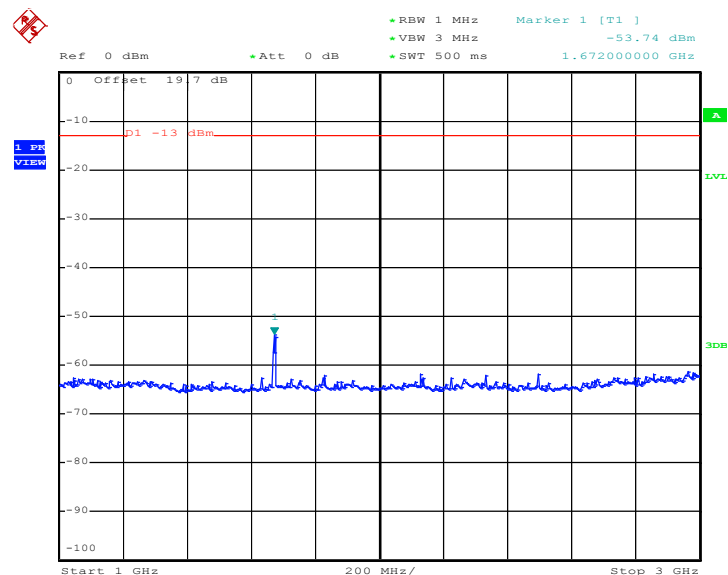


Date: 4.OCT.2012 09:26:15

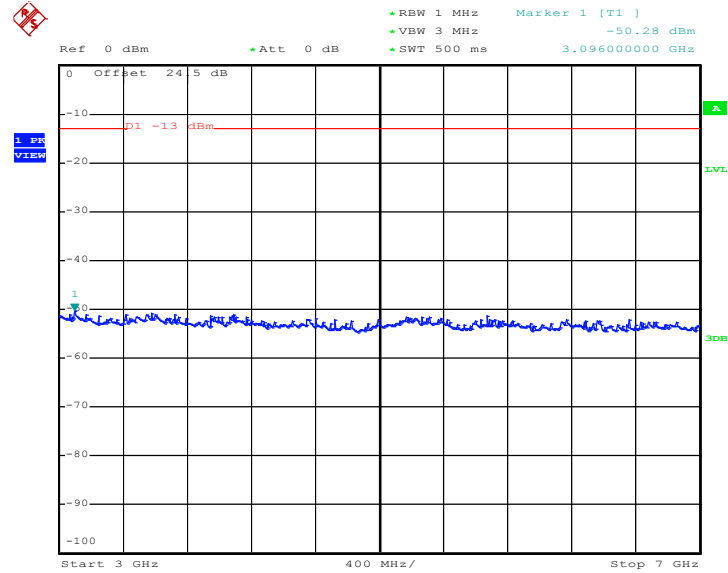
Band :	WCDMA Band V	Channel :	CH4182
Test Mode :	RMC 12.2Kbps Link	Frequency :	836.4 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz


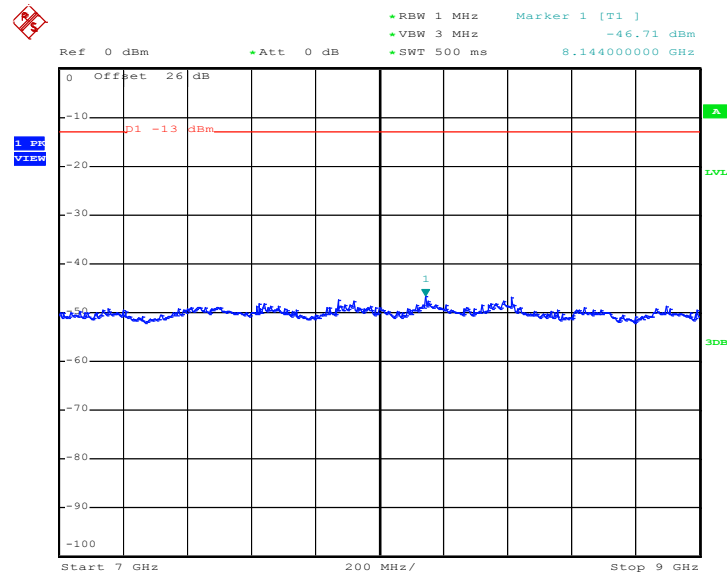
Date: 4.OCT.2012 11:24:29

Conducted Spurious Emission Plot between 1GHz ~ 3GHz


Date: 4.OCT.2012 11:14:59

Conducted Spurious Emission Plot between 3GHz ~ 7GHz


Date: 4.OCT.2012 11:15:11

Conducted Spurious Emission Plot between 7GHz ~ 9GHz


Date: 4.OCT.2012 11:15:23

3.7 Field Strength of Spurious Radiation Measurement

3.7.1 Description of Field Strength of Spurious Radiated Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

3.7.2 Measuring Instruments

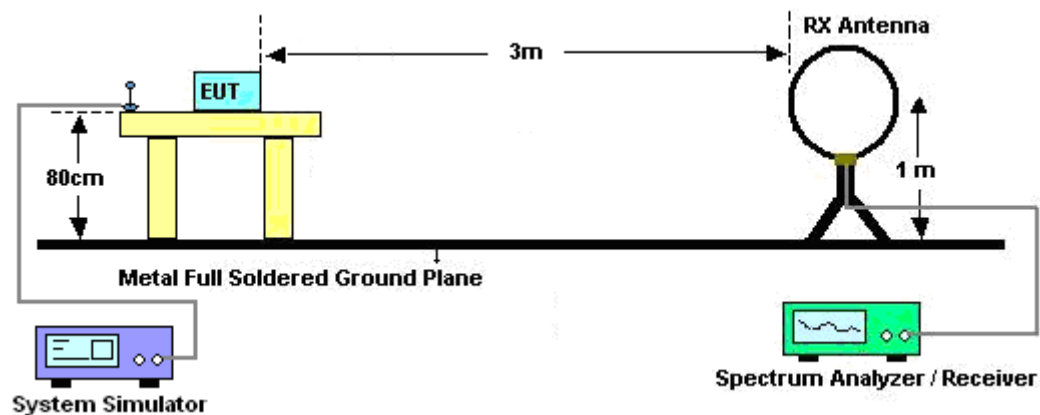
See list of measuring instruments of this test report.

3.7.3 Test Procedures

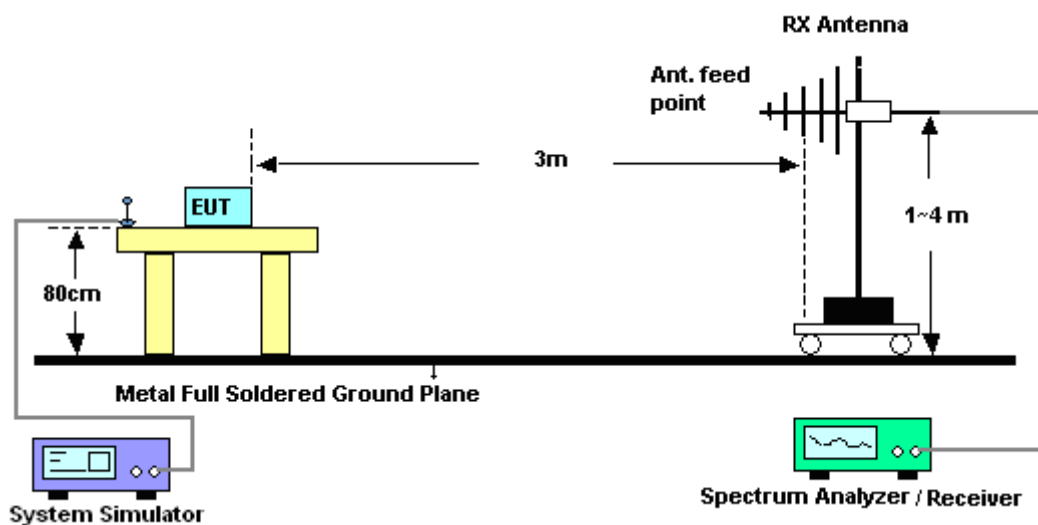
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving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

3.7.4 Test Setup

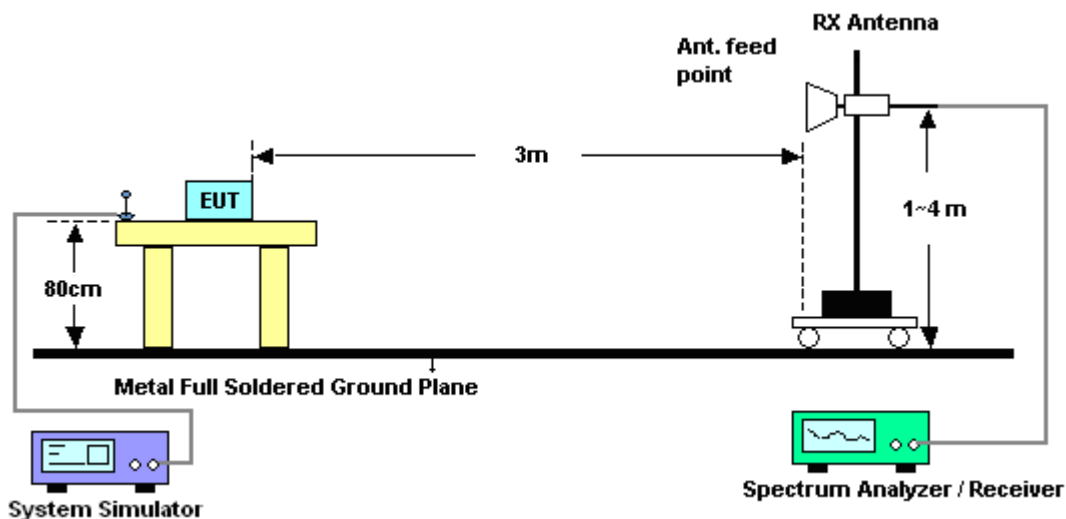
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



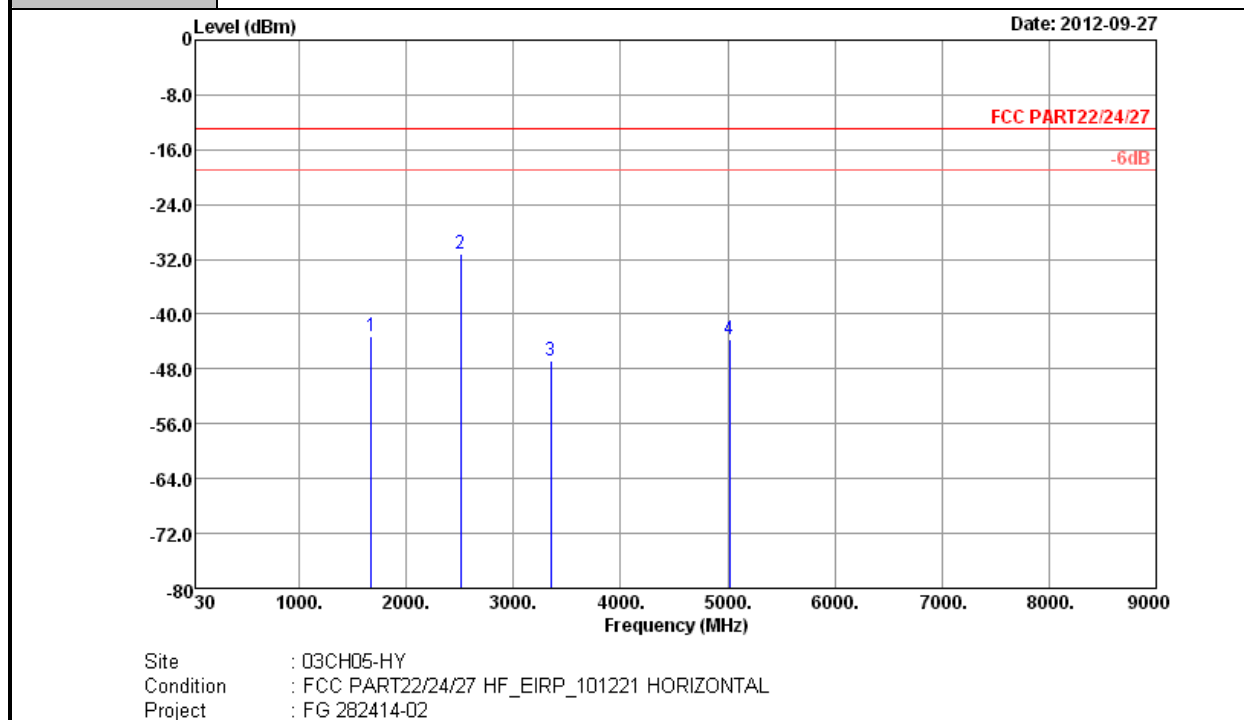
3.7.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

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

3.7.6 Test Result of Field Strength of Spurious Radiated

<Sample 1>

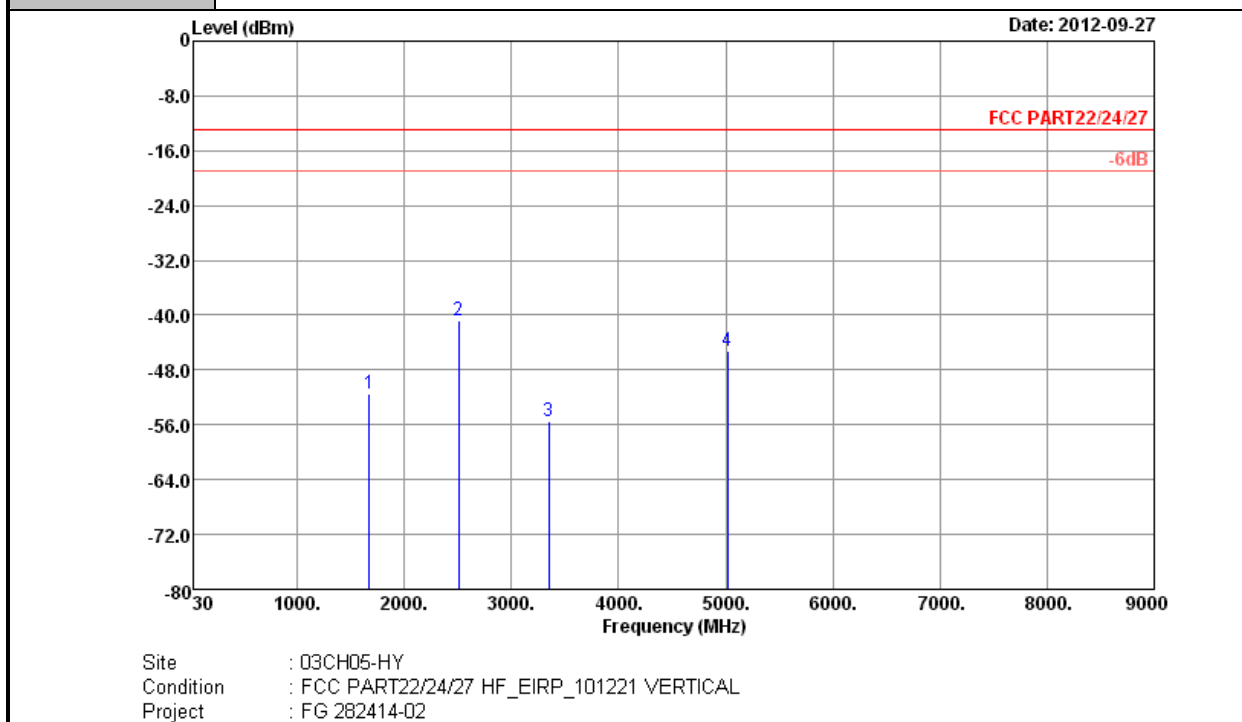
Band :	GSM850	Temperature :	20~22°C
Test Mode :	GSM Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-43.14	-13	-30.14	-49.15	-44.9	1.35	5.25	H	Pass
2509	-31.22	-13	-18.22	-40.49	-33.6	1.58	6.11	H	Pass
3346	-46.75	-13	-33.75	-58.31	-50.6	1.94	7.94	H	Pass
5015	-43.62	-13	-30.62	-60.81	-49.8	2.08	10.41	H	Pass



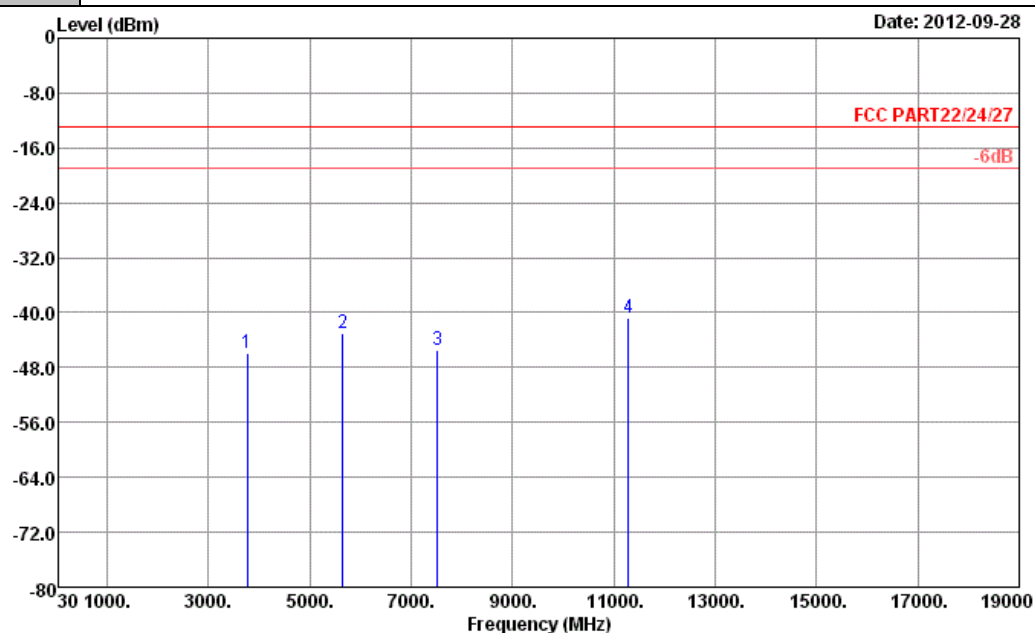
Band :	GSM850	Temperature :	20~22°C
Test Mode :	GSM Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-51.54	-13	-38.54	-57.55	-53.3	1.35	5.25	V	Pass
2509	-40.82	-13	-27.82	-50.22	-43.2	1.58	6.11	V	Pass
3346	-55.55	-13	-42.55	-67.08	-59.4	1.94	7.94	V	Pass
5015	-45.32	-13	-32.32	-62.45	-51.5	2.08	10.41	V	Pass



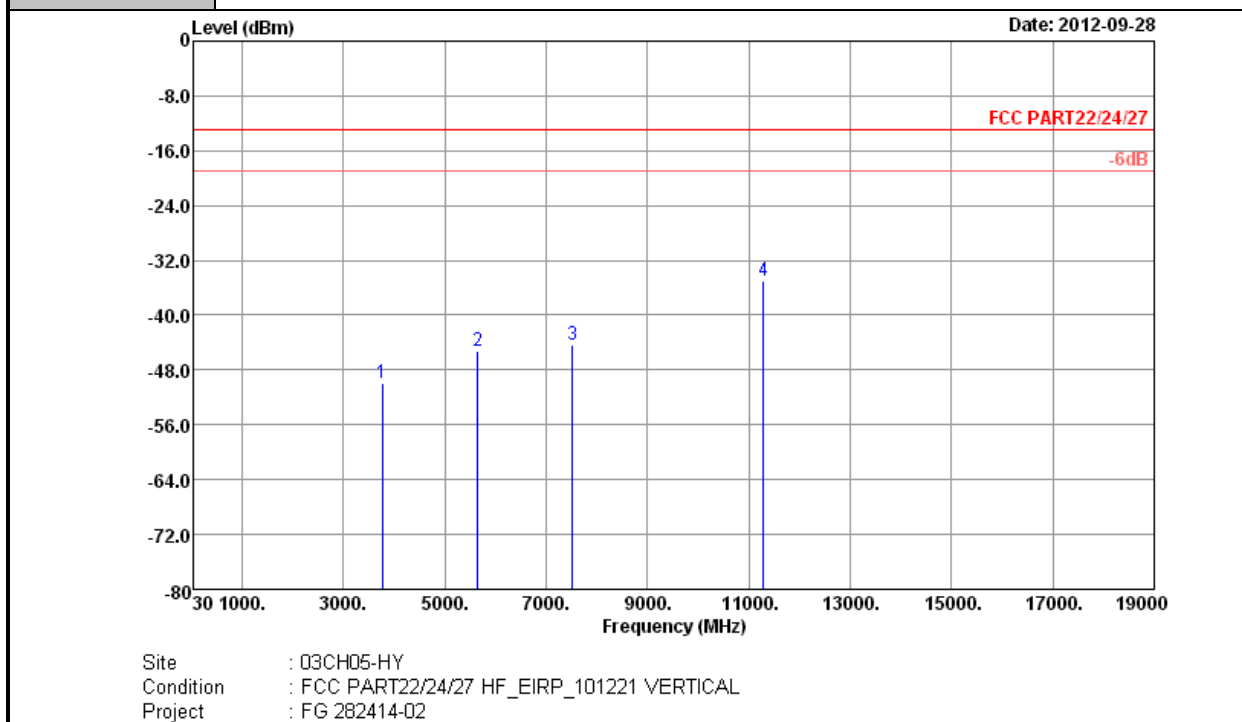
Band :	GSM1900	Temperature :	20~22°C
Test Mode :	GSM Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22/24/27 HF_EIRP_101221 HORIZONTAL
Project : FG 282414-02

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	-45.99	-13	-32.99	-59.41	-52.7	2.00	8.71	H	Pass
5640	-42.96	-13	-29.96	-61.89	-51.6	2.13	10.77	H	Pass
7520	-45.46	-13	-32.46	-67.38	-55	2.68	12.22	H	Pass
11280	-40.08	-13	-27.08	-67.1	-50.8	2.64	13.36	H	Pass

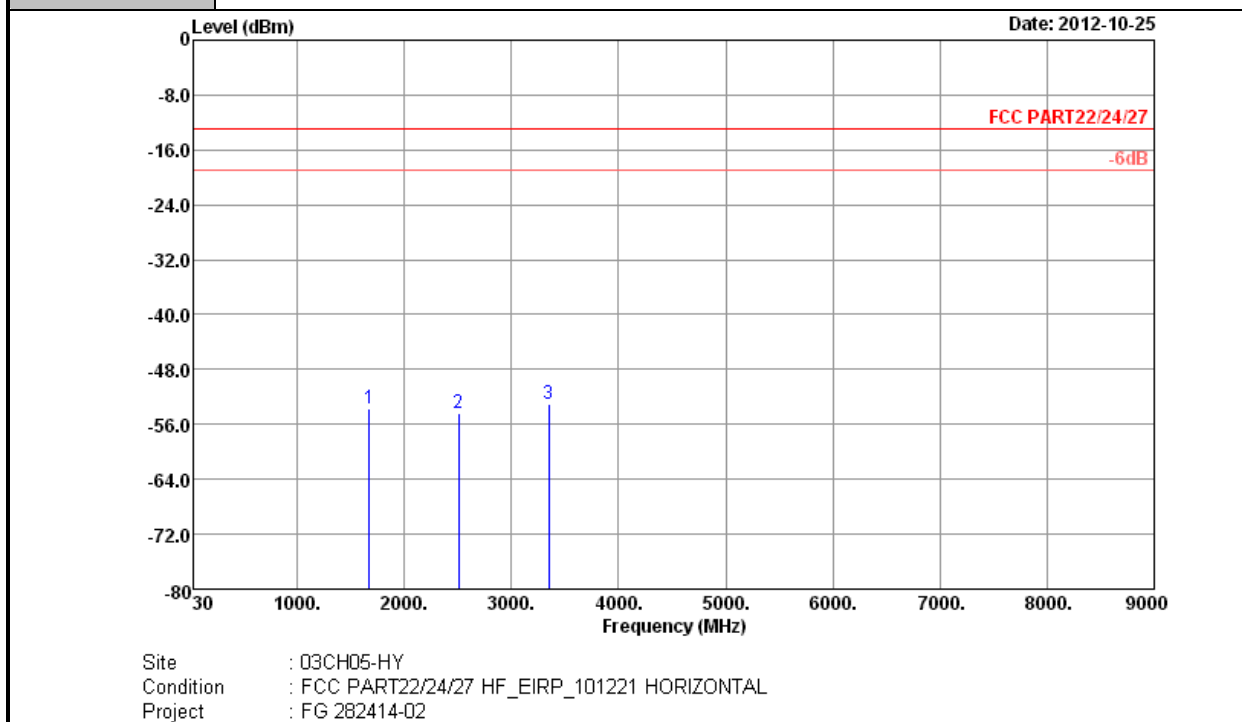
Band :	GSM1900	Temperature :	20~22°C
Test Mode :	GSM Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-49.99	-13	-36.99	-63.47	-56.7	2.00	8.71	V	Pass
5640	-45.16	-13	-32.16	-64.04	-53.8	2.13	10.77	V	Pass
7520	-44.26	-13	-31.26	-66.24	-53.8	2.68	12.22	V	Pass
11280	-34.98	-13	-21.98	-62.14	-45.7	2.64	13.36	V	Pass



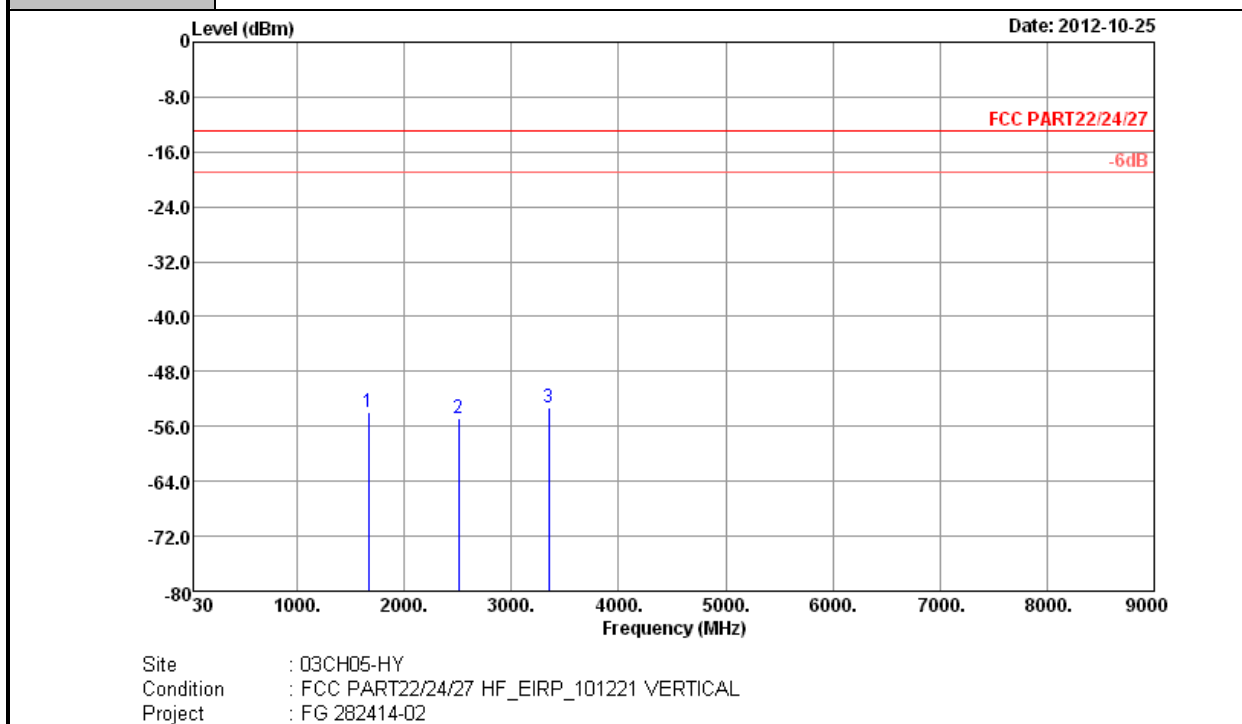
Band :	WCDMA Band V	Temperature :	20~22°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-53.74	-13	-40.74	-59.71	-55.5	1.35	5.25	H	Pass
2509	-54.32	-13	-41.32	-63.63	-56.7	1.58	6.11	H	Pass
3346	-53.05	-13	-40.05	-64.56	-56.9	1.94	7.94	H	Pass



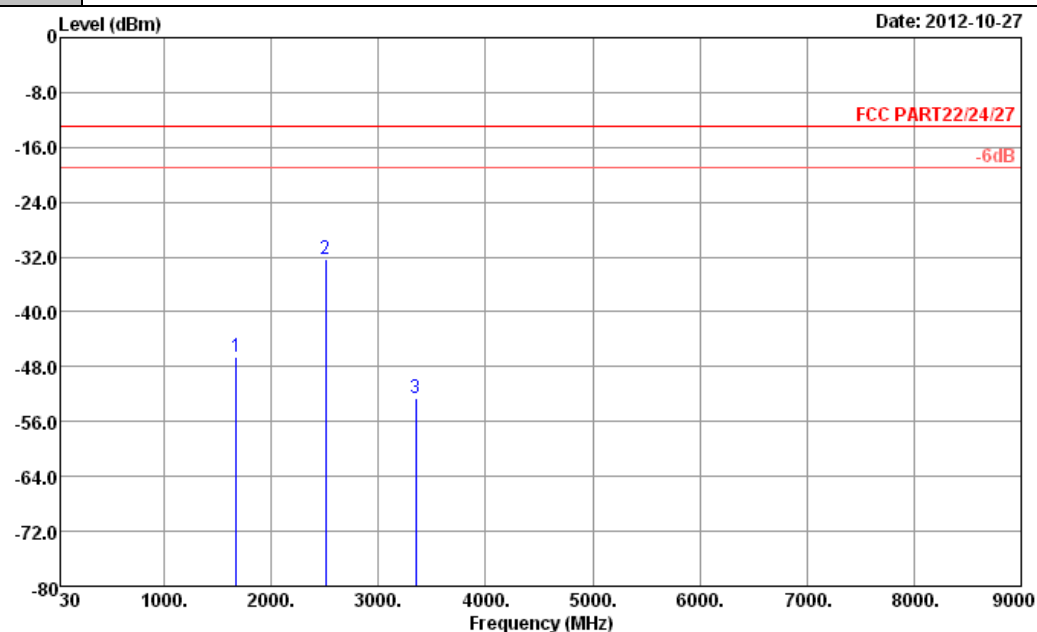
Band :	WCDMA Band V	Temperature :	20~22°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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
1669	-53.84	-13	-40.84	-59.72	-55.6	1.35	5.25	V	Pass
2509	-54.92	-13	-41.92	-64.21	-57.3	1.58	6.11	V	Pass
3346	-53.35	-13	-40.35	-64.92	-57.2	1.94	7.94	V	Pass

<Sample 2>

Band :	GSM850	Temperature :	20~22°C
Test Mode :	GSM Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

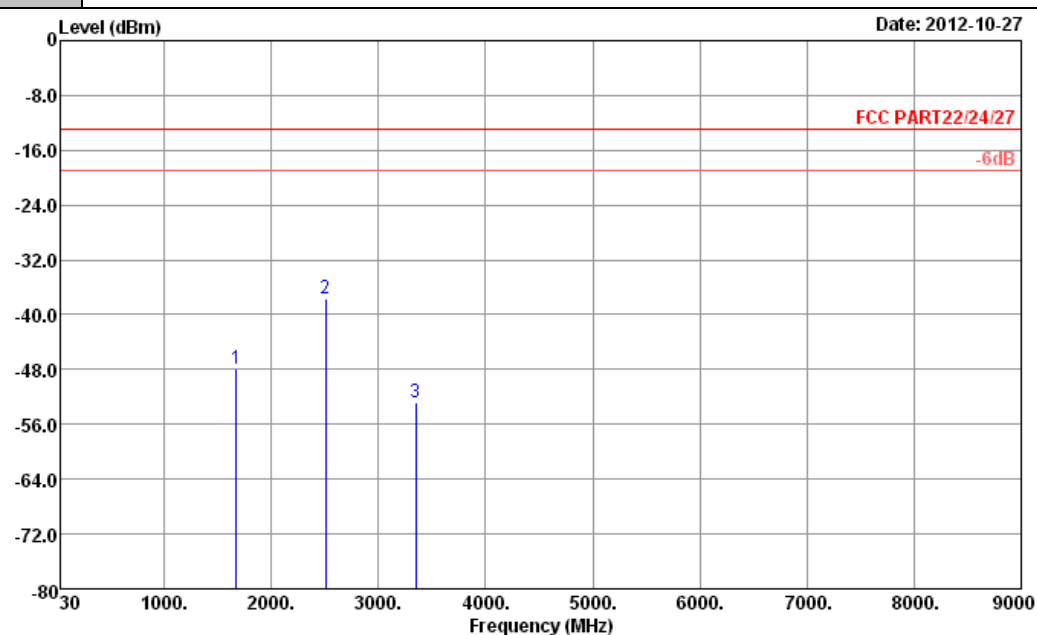


Site : 03CH05-HY
Condition : FCC PART22/24/27 HF_EIRP_101221 HORIZONTAL
Project : FG 282414-02

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-46.64	-13	-33.64	-52.68	-48.4	1.35	5.25	H	Pass
2509	-32.22	-13	-19.22	-41.53	-34.6	1.58	6.11	H	Pass
3346	-52.65	-13	-39.65	-64.47	-56.5	1.94	7.94	H	Pass



Band :	GSM850	Temperature :	20~22°C
Test Mode :	GSM Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

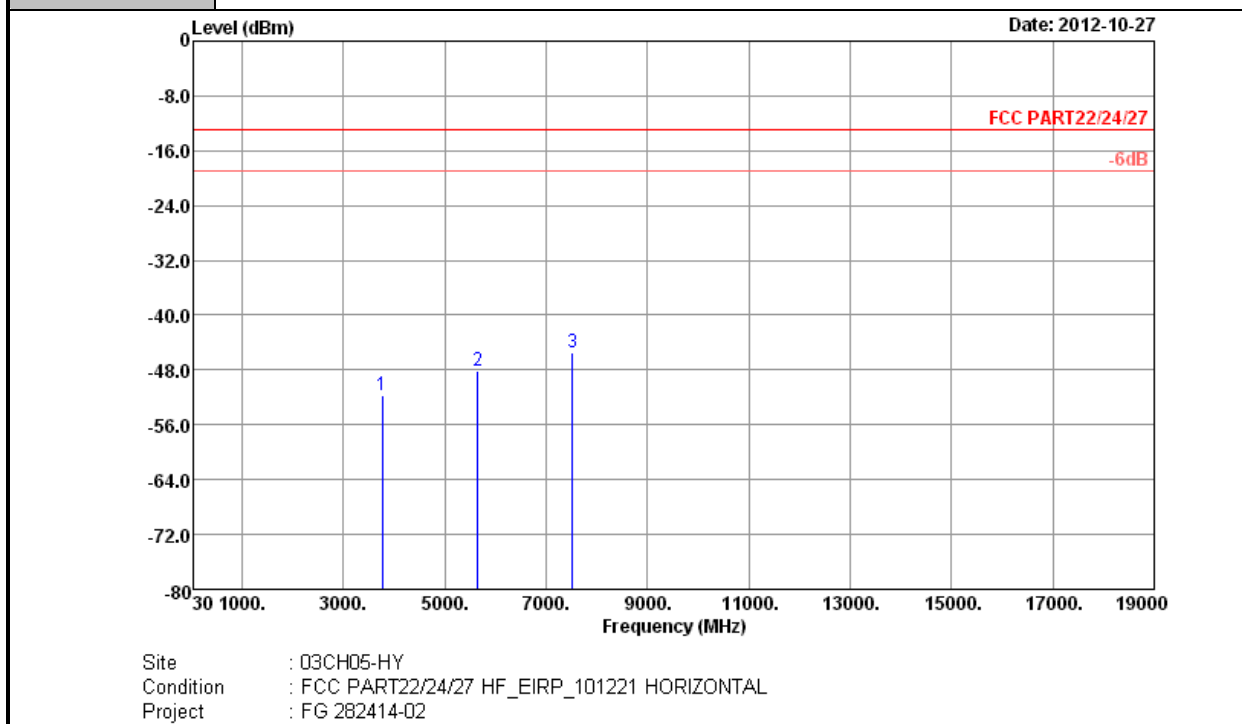


Site : 03CH05-HY
Condition : FCC PART22/24/27 HF_EIRP_101221 VERTICAL
Project : FG 282414-02

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	-47.94	-13	-34.94	-53.93	-49.7	1.35	5.25	V	Pass
2509	-37.72	-13	-24.72	-47.1	-40.1	1.58	6.11	V	Pass
3346	-52.85	-13	-39.85	-64.37	-56.7	1.94	7.94	V	Pass



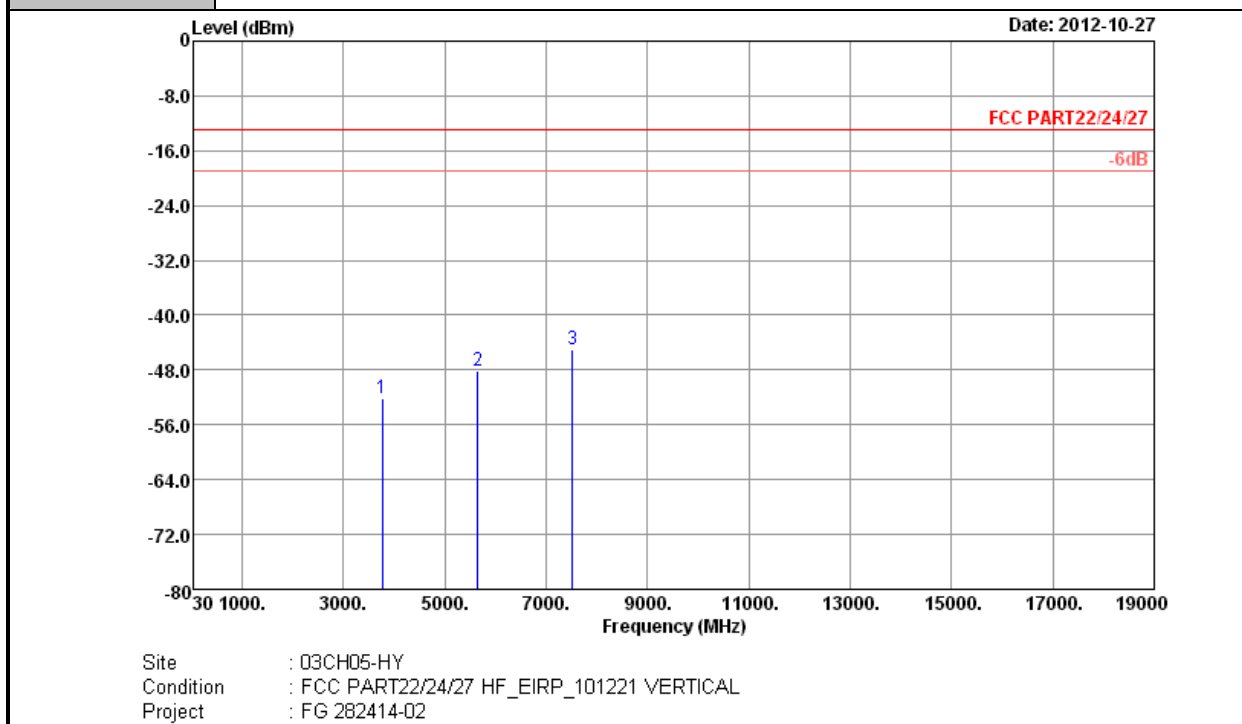
Band :	GSM1900	Temperature :	20~22°C
Test Mode :	GSM Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-51.79	-13	-38.79	-65.25	-58.5	2.00	8.71	H	Pass
5640	-48.16	-13	-35.16	-67.01	-56.8	2.13	10.77	H	Pass
7520	-45.46	-13	-32.46	-67.46	-55	2.68	12.22	H	Pass



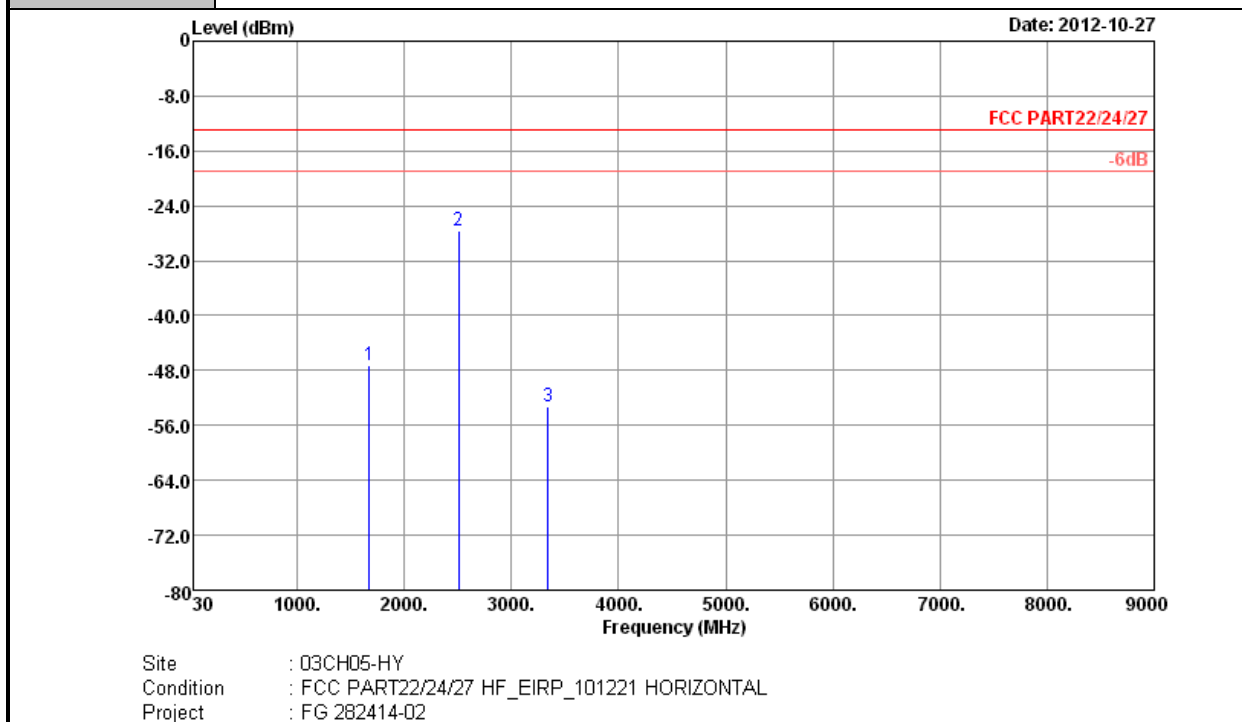
Band :	GSM1900	Temperature :	20~22°C
Test Mode :	GSM Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-52.04	-13	-39.04	-65.48	-58.75	2.00	8.71	V	Pass
5640	-48.06	-13	-35.06	-66.98	-56.7	2.13	10.77	V	Pass
7520	-45.06	-13	-32.06	-67.02	-54.6	2.68	12.22	V	Pass

<Sample 3>

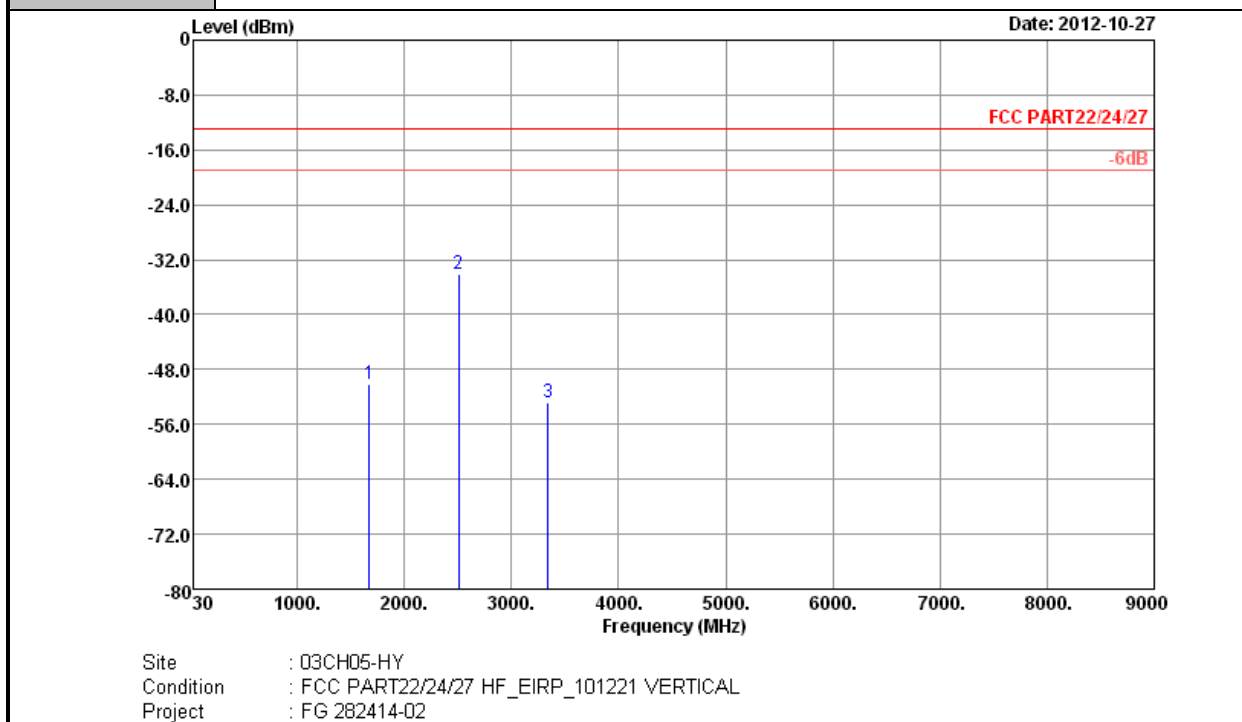
Band :	GSM850	Temperature :	20~22°C
Test Mode :	GSM Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-47.24	-13	-34.24	-53.27	-49	1.35	5.25	H	Pass
2509	-27.62	-13	-14.62	-36.97	-30	1.58	6.11	H	Pass
3345	-53.35	-13	-40.35	-64.96	-57.2	1.94	7.94	H	Pass



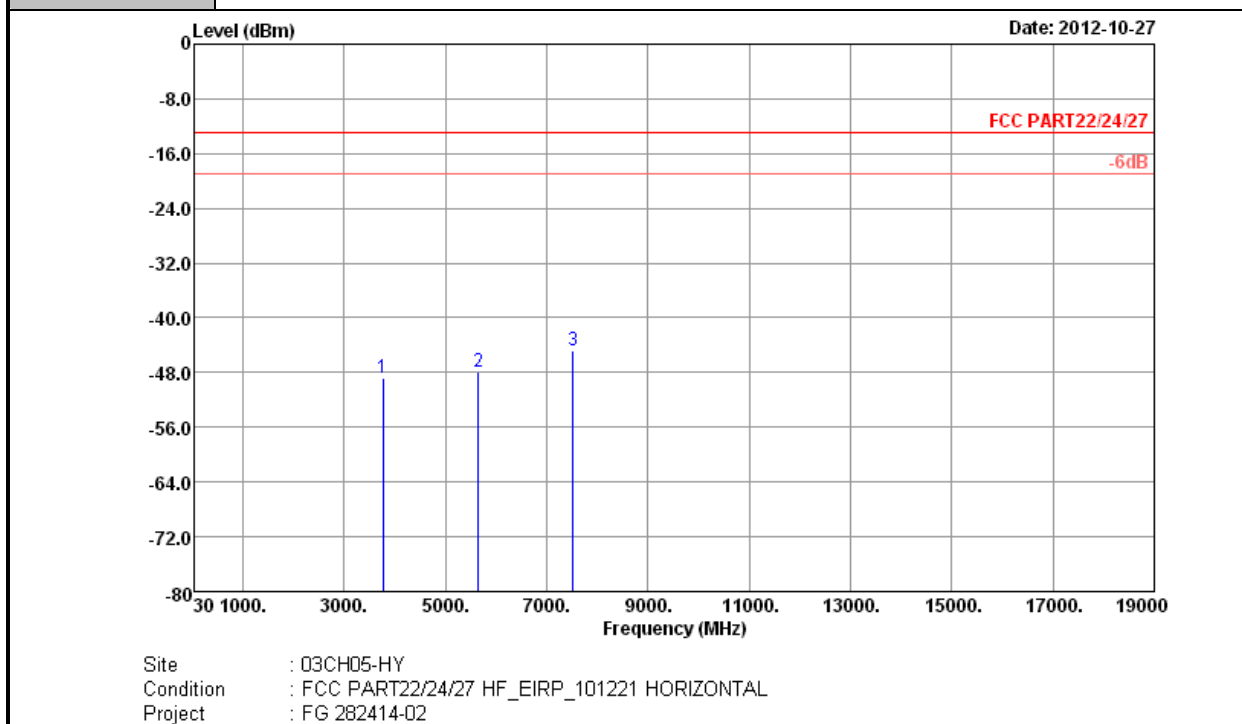
Band :	GSM850	Temperature :	20~22°C
Test Mode :	GSM Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-50.04	-13	-37.04	-56.01	-51.8	1.35	5.25	V	Pass
2509	-34.12	-13	-21.12	-43.38	-36.5	1.58	6.11	V	Pass
3345	-52.75	-13	-39.75	-64.33	-56.6	1.94	7.94	V	Pass

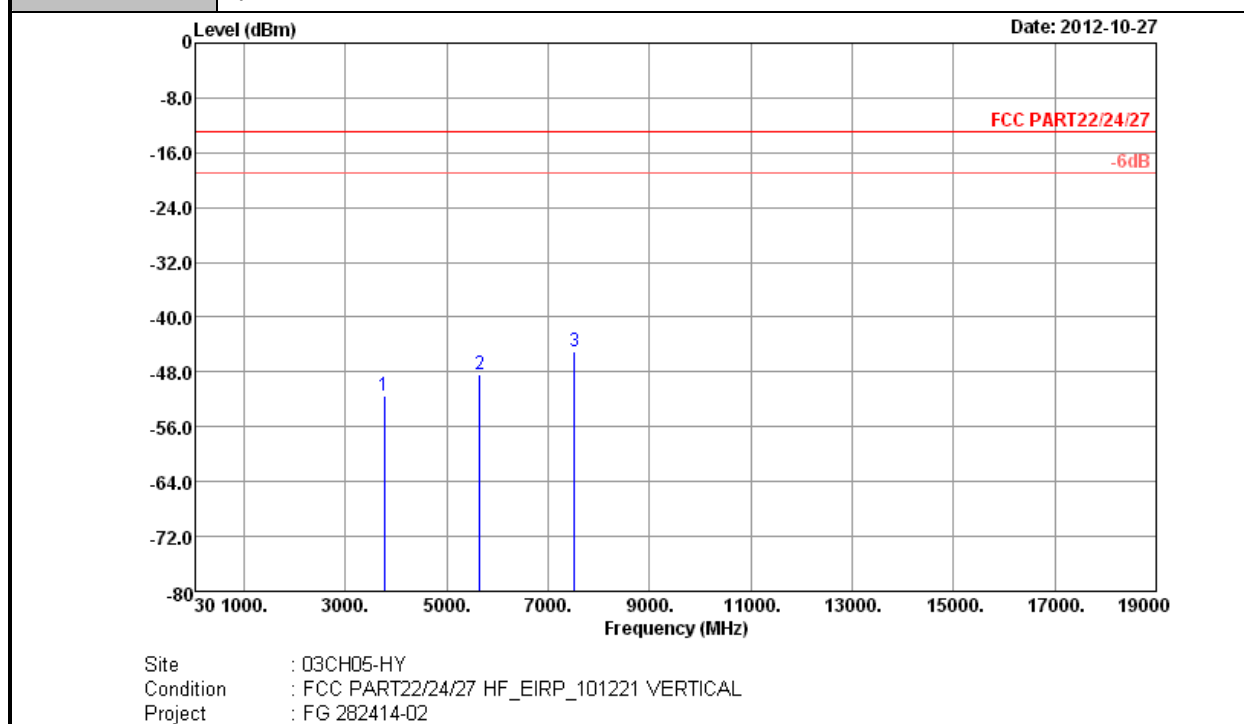


Band :	GSM1900	Temperature :	20~22°C
Test Mode :	GSM Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-48.79	-13	-35.79	-62.24	-55.5	2.00	8.71	H	Pass
5640	-48.01	-13	-35.01	-66.86	-56.65	2.13	10.77	H	Pass
7520	-44.76	-13	-31.76	-66.71	-54.3	2.68	12.22	H	Pass

Band :	GSM1900	Temperature :	20~22°C
Test Mode :	GSM Link	Relative Humidity :	40~42%
Test Engineer :	David Ke	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	-51.49	-13	-38.49	-65.08	-58.2	2.00	8.71	V	Pass
5640	-48.46	-13	-35.46	-67.34	-57.1	2.13	10.77	V	Pass
7520	-45.06	-13	-32.06	-66.98	-54.6	2.68	12.22	V	Pass

3.8 Frequency Stability Measurement

3.8.1 Description of Frequency Stability Measurement

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

3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

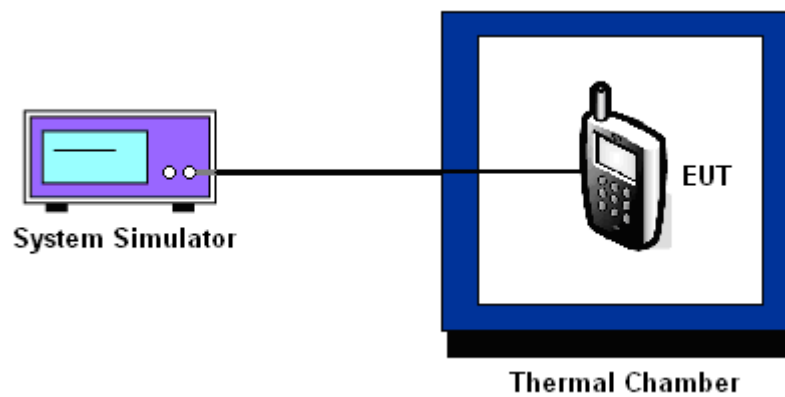
3.8.3 Test Procedures for Temperature Variation

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

3.8.4 Test Procedures for Voltage Variation

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

3.8.5 Test Setup



3.8.6 Test Result of Temperature Variation

Band :	GSM 850	Channel :	189
Limit (ppm) :	2.5	Frequency :	836.4 MHz

Temperature (°C)	GSM		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	22	0.03	PASS
-20	18	0.02	
-10	20	0.02	
0	16	0.02	
10	-19	-0.02	
20	16	0.02	
30	15	0.02	
40	11	0.01	
50	18	0.02	

Band :	GSM 1900	Channel :	661
Limit (ppm) :	2.5	Frequency :	1880.0 MHz

Temperature (°C)	GSM		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-69	-0.04	PASS
-20	-66	-0.03	
-10	-68	-0.04	
0	-66	-0.03	
10	-75	-0.04	
20	-68	-0.04	
30	-63	-0.03	
40	-67	-0.04	
50	-60	-0.03	

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

Temperature (°C)	RMC 12.2Kbps		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	9	0.01	PASS
-20	12	0.01	
-10	11	0.01	
0	-9	-0.01	
10	8	0.01	
20	-10	-0.01	
30	-7	-0.01	
40	-9	-0.01	
50	11	0.01	

3.8.7 Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
GSM 850 CH189	GSM	3.8	12	0.01	2.5	PASS
		BEP	16	0.02		
		4.2	-11	-0.01		
GSM 1900 CH661	GSM	3.8	-72	-0.04		
		BEP	67	0.04		
		4.2	-69	-0.04		
WCDMA Band V CH4182	RMC 12.2Kbps	3.8	7	0.01		
		BEP	8	0.01		
		4.2	-9	-0.01		

Note:

1. Normal Voltage = 3.8V.
2. Battery End Point (BEP) = 3.4 V.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
System Simulator	R&S	CMU200	117995	N/A	Jul. 30, 2012	Oct. 03, 2012 ~ Oct. 04, 2012	Jul. 29, 2013	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 06, 2012	Oct. 03, 2012 ~ Oct. 04, 2012	Jun. 05, 2013	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D3SP	TBN-930701	N/A	Jul. 23, 2012	Oct. 03, 2012 ~ Oct. 04, 2012	Jul. 22, 2013	Conducted (TH02-HY)
Spectrum Analyzer	R&S	ESU26	100390	20Hz ~ 26.5GHz	Dec. 22, 2011	Sep. 27, 2012~ Oct. 27, 2012	Dec. 21, 2012	Radiation (03CH05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2725	30MHz ~ 2GHz	Oct. 22, 2011	Sep. 27, 2012 ~ Oct. 20, 2012	Oct. 21, 2012	Radiation (03CH05-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz ~ 2GHz	Oct. 06, 2012	Oct. 21, 2012~ Oct. 27, 2012	Oct. 05, 2013	Radiation (03CH05-HY)
Turn Table	HD	Deis HD 2000	420/611	0 ~ 360 degree	N/A	Sep. 27, 2012~ Oct. 27, 2012	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	MA 240	240/666	1 m ~ 4 m	N/A	Sep. 27, 2012~ Oct. 27, 2012	N/A	Radiation (03CH05-HY)
Horn Antenna	ESCO	3117	66584	1GHz~18GHz	Aug. 10, 2012	Sep. 27, 2012~ Oct. 27, 2012	Aug. 09, 2013	Radiation (03CH05-HY)
Pre Amplifier	Agilent	8449B	3008A02665	1GHz~26.5GHz	Aug. 28, 2012	Sep. 27, 2012~ Oct. 27, 2012	Aug. 27, 2013	Radiation (03CH05-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA917025 1	15GHz ~ 40GHz	Oct. 21, 2011	Sep. 27, 2012~ Sep. 28, 2012	Oct. 20, 2012	Radiation (03CH05-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA917025 1	15GHz ~ 40GHz	Sep. 28, 2012	Sep. 29, 2012~ Oct. 27, 2012	Sep. 27, 2013	Radiation (03CH05-HY)
Pre Amplifier	COM-POWER	PA-103	161075	10-1000MHz.32dB. GAIN	Feb. 27, 2012	Sep. 27, 2012~ Oct. 27, 2012	Feb. 26, 2013	Radiation (03CH05-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9KHz ~ 30MHz	Jul. 03, 2012	Sep. 27, 2012~ Oct. 27, 2012	Jul. 02, 2014	Radiation (03CH05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Sep. 03, 2012	Sep. 27, 2012~ Oct. 27, 2012	Sep. 02, 2013	Radiation (03CH05-HY)
System Simulator	R&S	CMU200	117995	N/A	Jul. 28, 2011	Sep. 27, 2012~ Oct. 27, 2012	Jul. 27, 2013	Radiation (03CH05-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.54
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.72
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Appendix A. Photographs of EUT

Please refer to Sporton report number EP282414-02 as below.