FCC RF Test Report

APPLICANT	:	**Motorola Solutions, Inc.**
EQUIPMENT	:	**Touch Computer**
BRAND NAME	:	**Motorola**
MODEL NAME	:	**TC55AH**
FCC ID	:	**UZ7TC55AH**
STANDARD	:	**FCC 47 CFR Part 2, 22(H), 24(E), 27(L)**
CLASSIFICATION	:	**PCS Licensed Transmitter Held to Ear (PCE)**

The product was received on Jun. 02, 2013 and completely tested on Jul. 02, 2013. 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.

Louis Wu

Reviewed by: Louis Wu / Manager

Jones Tsai

Approved by: Jones Tsai / Manager

Testing Laboratory 1190

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
FG322304-07A	Rev. 01	Initial issue of report	Aug. 14, 2013

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	§2.1046	RSS-132 (5.4) RSS-133 (6.4) RSS-139 (6.4)	Conducted Output Power	Reporting Only	PASS	-
3.2	§24.232(d) §27.50(d)(5)	RSS-132 (5.4) RSS-133(6.4) RSS-139 (6.4)	Peak-to-Average Ratio	< 13 dB	PASS	-
3.3	§22.913(a)(2)	RSS-132(5.4) 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	-
3.3	§27.50(d)(4)	RSS-139 (6.4) SRSP-513(5.1.2)	Equivalent Isotropic Radiated Power	< 1 Watts	PASS	-
3.4	§2.1049 §22.917(b) §24.238(b)	RSS-GEN(4.6.1) RSS-132 (3.1) RSS-133(3.1) RSS-139 (3.1)	Occupied Bandwidth	Reporting Only	PASS	-
3.5	§2.1049 §22.917(a) §24.238(a) §27.53(h)	RSS-132 (5.5) RSS-133 (6.5) RSS-139 (6.5)	Band Edge Measurement	< 43+10log10(P[Watts])	PASS	-
3.6	§2.1051 §22.917(a) §24.238(a) §27.53(h)	RSS-132 (5.5) RSS-133 (6.5) RSS-139 (6.5)	Conducted Emission	< 43+10log10(P[Watts])	PASS	-
3.7	§2.1053 §22.917(a) §24.238(a) §27.53(h)	RSS-132 (5.5) RSS-133 (6.5) RSS-139 (6.5)	Field Strength of Spurious Radiation	< 43+10log10(P[Watts])	PASS	Under limit 25.13 dB at 7520.000 MHz
3.8	§2.1055 §22.355 §24.235 §27.54	RSS-132 (5.3) RSS-133 (6.3) RSS-139 (6.3)	Frequency Stability for Temperature & Voltage	< 2.5 ppm	PASS	-

1 General Description

1.1 Applicant

Motorola Solutions, Inc.
One Motorola Plaza, Holtsville, NY 11742-1300 USA

1.2 Manufacturer

Motorola Solutions, Inc.
One Motorola Plaza, Holtsville, NY 11742-1300 USA

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Touch Computer
Brand Name	Motorola
Model Name	TC55AH
FCC ID	UZ7TC55AH
Sample 1	EUT with Scanner
Sample 2	EUT without Scanner
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/LTE
HW Version	DV1
SW Version	Android 4.1.2
FW Version	BSP 1.27
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 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx Frequency	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz
Rx Frequency	GSM850: 869.2 MHz ~ 893.8 MHz GSM1900: 1930.2 MHz ~ 1989.8 MHz WCDMA Band V: 871.4 MHz ~ 891.6 MHz WCDMA Band IV: 2112.4 MHz ~ 2152.6 MHz WCDMA Band II: 1932.4 MHz ~ 1987.6 MHz
Maximum Output Power to Antenna	GSM850: 33.44 dBm GSM1900: 30.40 dBm WCDMA Band V: 24.35 dBm WCDMA Band IV: 24.21 dBm WCDMA Band II: 24.40 dBm
Antenna Type	Monopole Antenna
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK WCDMA: QPSK (Uplink) HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink)

1.5 Modification of EUT

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

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

FCC Rule	System	Type of Modulation	Maximum ERP/EIRP (W)	Frequency Tolerance (%, Hz, ppm)	Emission Designator
Part 22	GSM850 GSM	GMSK	1.0965	0.04 ppm	250KGXW
Part 22	GSM850 EDGE class 8	8PSK	0.2286	0.05 ppm	244KG7W
Part 22	WCDMA Band V RMC 12.2Kbps	QPSK	0.1517	0.01 ppm	4M16F9W
Part 24	GSM1900 GSM	GMSK	1.4256	0.01 ppm	250KGXW
Part 24	GSM1900 EDGE class 8	8PSK	0.4395	0.03 ppm	252KG7W
Part 24	WCDMA Band II RMC 12.2Kbps	QPSK	0.3540	0.01 ppm	4M20F9W
Part 27	WCDMA Band IV RMC 12.2Kbps	QPSK	0.4246	0.01 ppm	4M20F9W

1.7 Testing Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1st 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

1.8 Applied Standards

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

- 47 CFR Part 2, 22(H), 24(E), 27(L)
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v02r01

Remark:

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

2 Test Configuration of Equipment Under Test

2.1 Test Mode

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

Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 9000 MHz for GSM850 and WCDMA Band V.
2. 30 MHz to 19000 MHz for WCDMA Band IV.
3. 30 MHz to 19000 MHz for GSM1900 and WCDMA Band II.

Test Modes		
Band	**Radiated TCs**	**Conducted TCs**
GSM 850	■ GSM Link for Sample 1 with Battery 2 ■ EDGE class 8 Link for Sample 1 with Battery 2	■ GSM Link ■ EDGE class 8 Link
GSM 1900	■ GSM Link for Sample 1 with Battery 2 ■ EDGE class 8 Link for Sample 1 with Battery 2 ■ GSM Link for Sample 1 with Battery 1 ■ GSM Link for Sample 2 with Battery 2	■ GSM Link ■ EDGE class 8 Link
WCDMA Band V	■ RMC 12.2Kbps Link for Sample 1 with Battery 2	■ RMC 12.2Kbps Link
WCDMA Band IV	■ RMC 12.2Kbps Link for Sample 1 with Battery 2 ■ RMC 12.2Kbps Link for Sample 1 with Battery 1 ■ RMC 12.2Kbps Link for Sample 2 with Battery 2	■ RMC 12.2Kbps Link
WCDMA Band II	■ RMC 12.2Kbps Link for Sample 1 with Battery 2	■ RMC 12.2Kbps Link

Note:

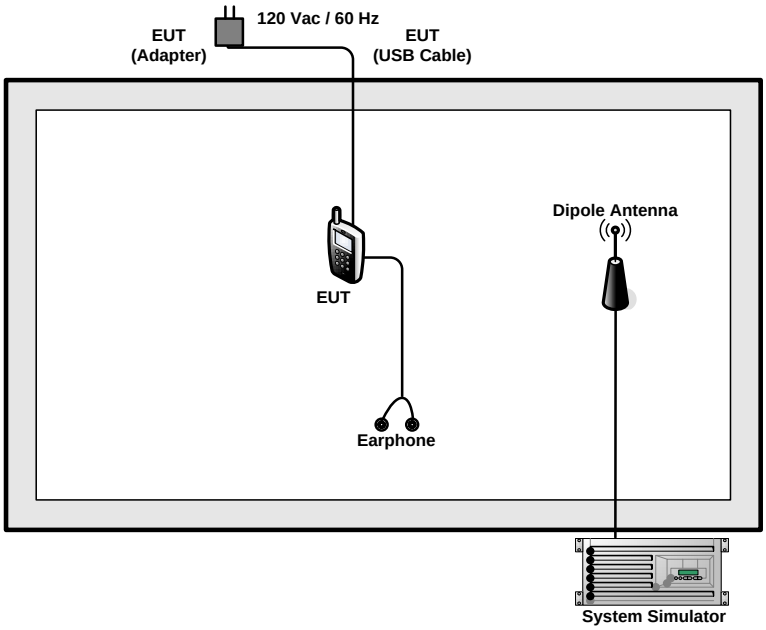
1. The maximum power levels are GSM mode for GMSK link, EDGE multi-slot class 8 mode for 8PSK link, RMC 12.2Kbps mode for WCDMA band V, RMC 12.2Kbps mode for WCDMA band IV, and RMC 12.2Kbps mode for WCDMA band II, only these modes were used for all tests.
2. Because there are individual antennas for 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**	**1909.8**
GSM	33.28	33.35	**33.44**	30.20	30.08	**30.40**
GPRS class 8	33.26	33.37	33.43	30.19	30.08	30.39
GPRS class 10	30.26	30.28	30.44	29.82	29.44	29.70
GPRS class 11	30.11	30.15	30.34	29.64	29.26	29.48
GPRS class 12	30.72	30.58	30.86	29.34	29.27	29.49
EGPRS class 8	26.80	26.76	**26.90**	**25.66**	25.47	25.50
EGPRS class 10	26.68	26.64	26.78	25.60	25.27	25.41
EGPRS class 11	26.48	26.46	26.65	25.42	25.07	25.17
EGPRS class 12	26.36	26.31	26.53	25.17	24.84	24.96

Conducted Power (*Unit: dBm)									
Band	**WCDMA Band V**			**WCDMA Band II**			**WCDMA Band IV**		
Tx Channel	**4132**	**4182**	**4233**	**9262**	**9400**	**9538**	**1312**	**1413**	**1513**
Frequency	**826.4**	**836.4**	**846.6**	**1852.4**	**1880**	**1907.6**	**1712.4**	**1732.6**	**1752.6**
RMC 12.2K	**24.35**	24.25	24.30	**24.21**	24.19	24.08	24.33	24.18	**24.40**
HSDPA Subtest-1	23.36	23.37	23.45	23.26	23.41	23.20	23.35	23.23	23.43
HSDPA Subtest-2	23.30	23.31	23.26	23.23	23.24	23.11	23.28	23.19	23.40
HSDPA Subtest-3	22.92	22.86	22.83	22.68	22.73	22.66	22.90	22.84	22.87
HSDPA Subtest-4	22.89	22.77	22.81	22.65	22.71	22.61	22.82	22.78	22.81
HSUPA Subtest-1	23.24	22.92	22.87	22.72	22.98	22.96	23.10	23.08	23.06
HSUPA Subtest-2	22.00	21.98	21.78	21.75	21.80	21.66	21.62	21.54	21.46
HSUPA Subtest-3	22.38	22.10	22.00	21.94	22.06	22.01	22.18	22.14	22.08
HSUPA Subtest-4	22.01	21.90	20.97	21.68	21.70	21.59	21.54	21.46	21.37
HSUPA Subtest-5	23.33	23.31	23.27	23.26	23.22	23.07	23.29	23.12	23.09

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU200	N/A	N/A	Unshielded, 1.8 m
2.	Earphone	Corton	MAX-300	N/A	Unshielded, 1.2 m	N/A

2.4 Measurement Results Explanation Example

For all conducted test items:

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

Example

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

Offset = RF cable loss + attenuator factor.

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

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

= 4.2 + 10 = 14.2 (dB)

3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power

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.

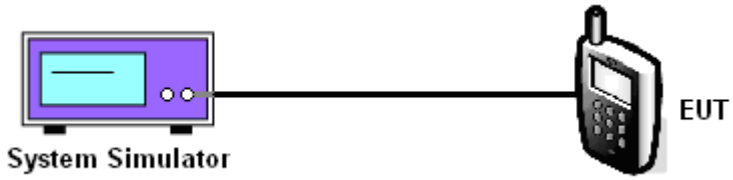
3.1.2 Measuring Instruments

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 RMS conducted power for GSM and WCDMA modes.

3.1.4 Test Setup



3.1.5 Test Result of Conducted Output Power

Cellular Band									
Modes	GSM850 (GSM)			GSM850 (EDGE class 8)			WCDMA Band V (RMC 12.2Kbps)		
Channel	128 (Low)	189 (Mid)	251 (High)	128 (Low)	189 (Mid)	251 (High)	4132 (Low)	4182 (Mid)	4233 (High)
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8	826.4	836.4	846.6
Conducted Power (dBm)	33.28	33.35	33.44	26.80	26.76	26.90	24.35	24.25	24.30
Conducted Power (Watts)	2.128	2.163	2.208	0.479	0.474	0.490	0.272	0.266	0.269

PCS Band									
Modes	GSM1900 (GSM)			GSM1900 (EDGE class 8)			WCDMA Band II (RMC 12.2Kbps)		
Channel	512 (Low)	661 (Mid)	810 (High)	512 (Low)	661 (Mid)	810 (High)	9262 (Low)	9400 (Mid)	9538 (High)
Frequency (MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8	1852.4	1880	1907.6
Conducted Power (dBm)	30.20	30.08	30.40	25.66	25.47	25.50	24.21	24.19	24.08
Conducted Power (Watts)	1.047	1.019	1.096	0.368	0.352	0.355	0.264	0.262	0.256

AWS Band			
Modes	WCDMA Band IV (RMC 12.2Kbps)		
Channel	1312(Low)	1413 (Mid)	1513 (High)
Frequency (MHz)	1712.4	1732.6	1752.6
Conducted Power (dBm)	24.33	24.18	24.40
Conducted Power (Watts)	0.271	0.262	0.275

3.2 Peak-to-Average Ratio

3.2.1 Description of the PAR Measurement

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

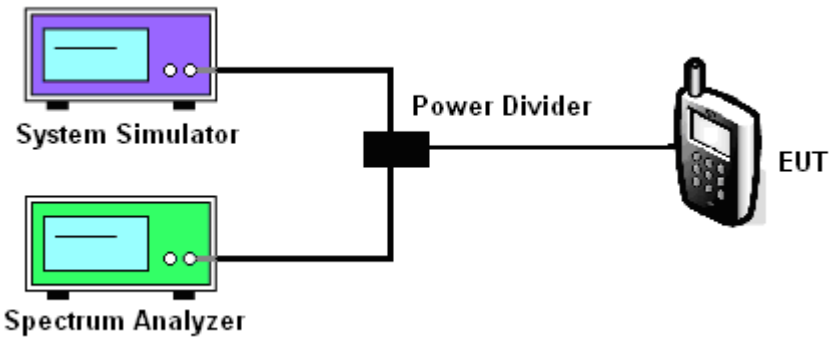
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and System Simulator via power divider.
2. For GSM/EGPRS operating modes:
   a. Set EUT in maximum power output.
   b. Set the RBW = 1MHz, VBW = 3MHz, Peak detector in spectrum analyzer for first trace.
   c. Set the RBW = 1MHz, VBW = 3MHz, RMS detector in spectrum analyzer for second trace.
   d. The wanted burst signal is triggered by spectrum analyzer, and measured respectively the peak level and Mean level without burst-off time, after system simulator synchronized with the spectrum analyzer.
3. For UMTS operating modes:
   a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
   b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
4. Record the deviation as Peak to Average Ratio.

3.2.4 Test Setup



3.2.5 Test Result of Peak-to-Average Ratio

Cellular Band									
Modes	GSM850 (GSM)			GSM850 (EDGE class 8)			WCDMA Band V (RMC 12.2Kbps)		
Channel	128 (Low)	189 (Mid)	251 (High)	128 (Low)	189 (Mid)	251 (High)	4132 (Low)	4182 (Mid)	4233 (High)
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8	826.4	836.4	846.6
Peak-to-Average Ratio (dB)	0.47	0.48	0.39	2.88	2.99	2.97	3.16	3.20	3.08

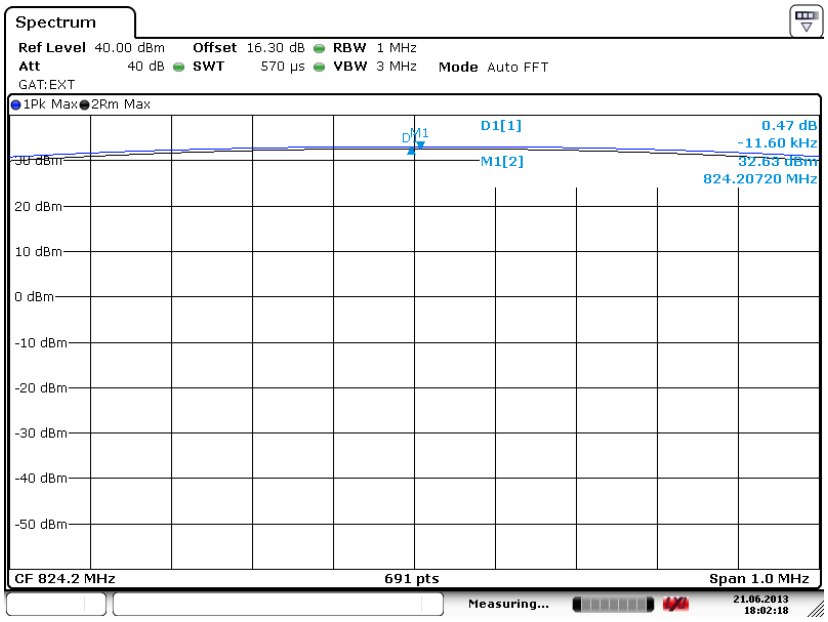
PCS Band									
Modes	GSM1900 (GSM)			GSM1900 (EDGE class 8)			WCDMA Band II (RMC 12.2Kbps)		
Channel	512 (Low)	661 (Mid)	810 (High)	512 (Low)	661 (Mid)	810 (High)	9262 (Low)	9400 (Mid)	9538 (High)
Frequency (MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8	1852.4	1880	1907.6
Peak-to-Average Ratio (dB)	0.33	0.28	0.34	2.77	2.80	2.91	3.00	3.08	3.28

AWS Band			
Modes	WCDMA Band IV (RMC 12.2Kbps)		
Channel	1312(Low)	1413 (Mid)	1513 (High)
Frequency (MHz)	1712.4	1732.6	1752.6
Peak-to-Average Ratio (dB)	3.16	3.12	3.04

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

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

Peak-to-Average Ratio on Channel 128 (824.2 MHz)



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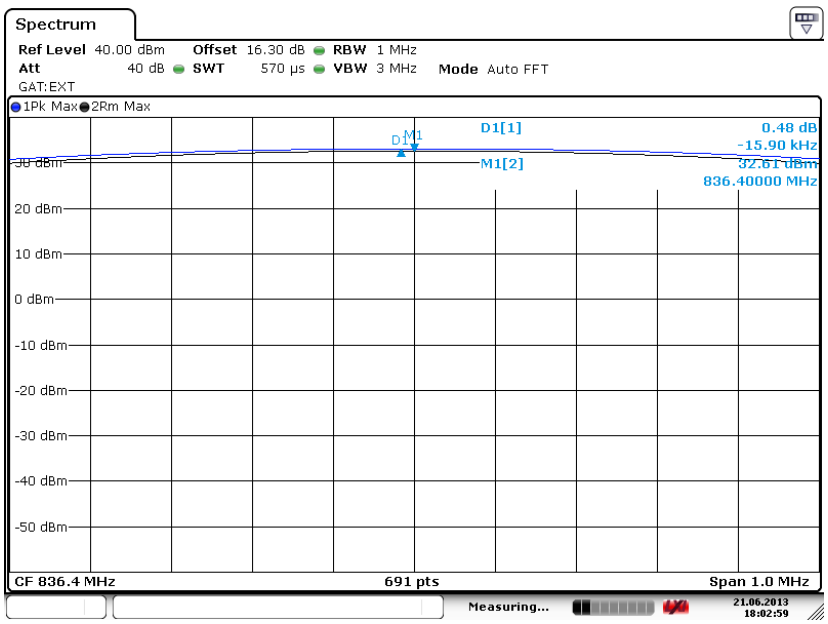
Peak-to-Average Ratio on Channel 189 (836.4 MHz)



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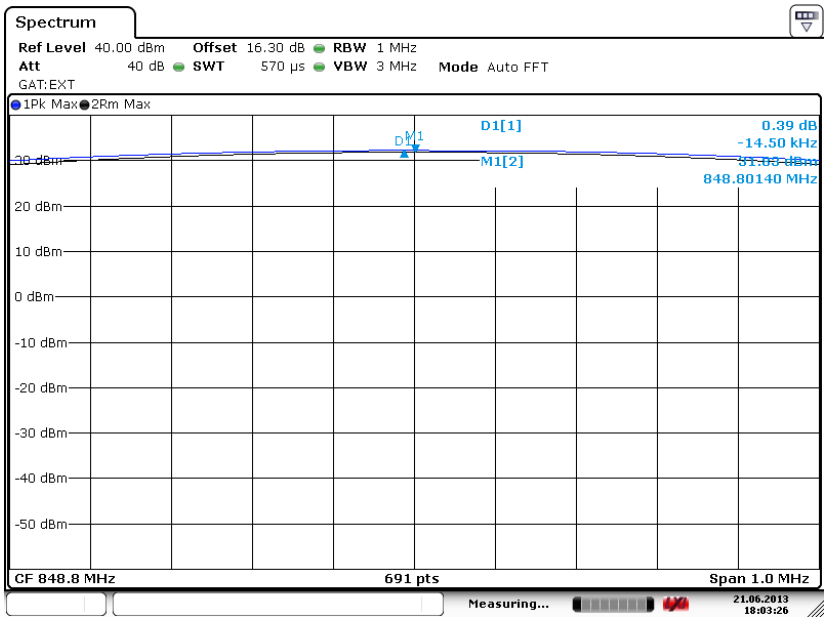
Peak-to-Average Ratio on Channel 251 (848.8 MHz)



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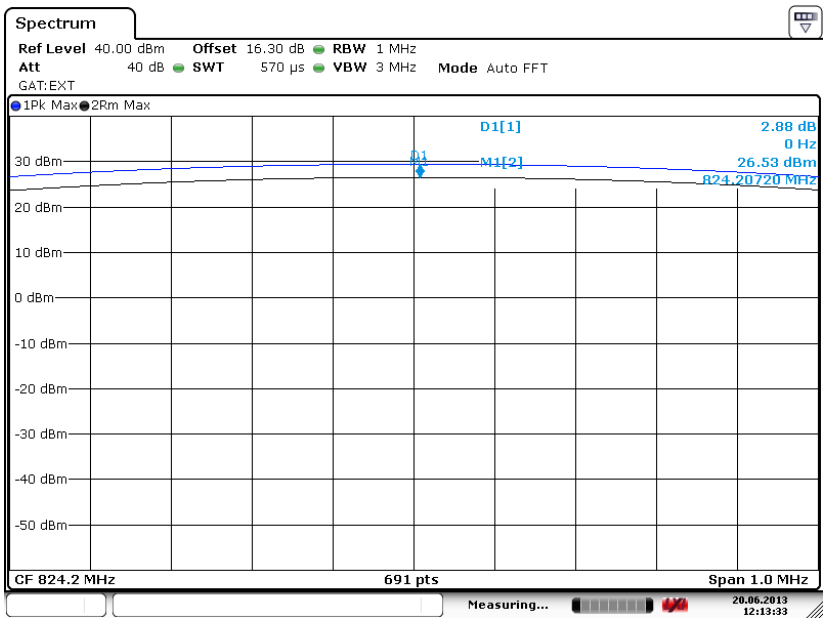
Band :	GSM 850	Test Mode :	EDGE class 8 Link (8PSK)

Peak-to-Average Ratio on Channel 128 (824.2 MHz)



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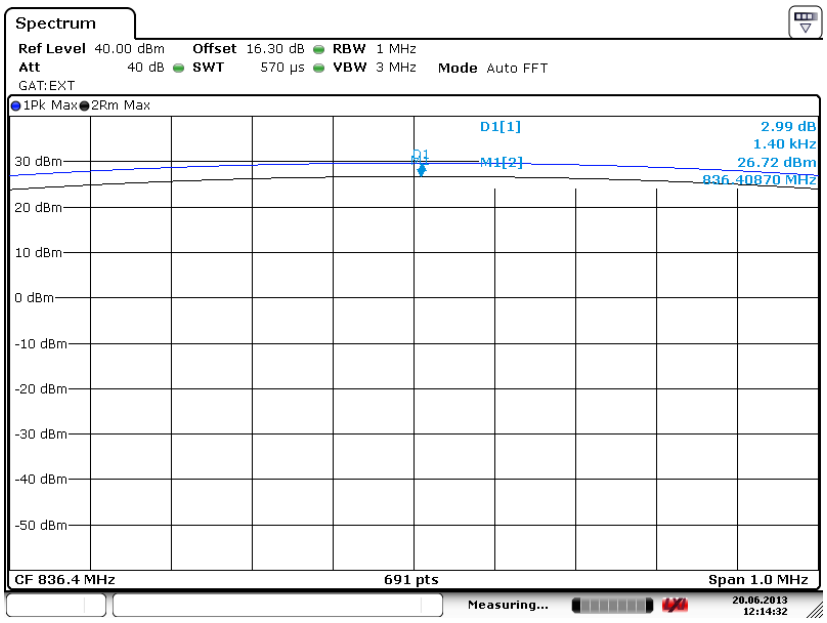
Peak-to-Average Ratio on Channel 189 (836.4 MHz)



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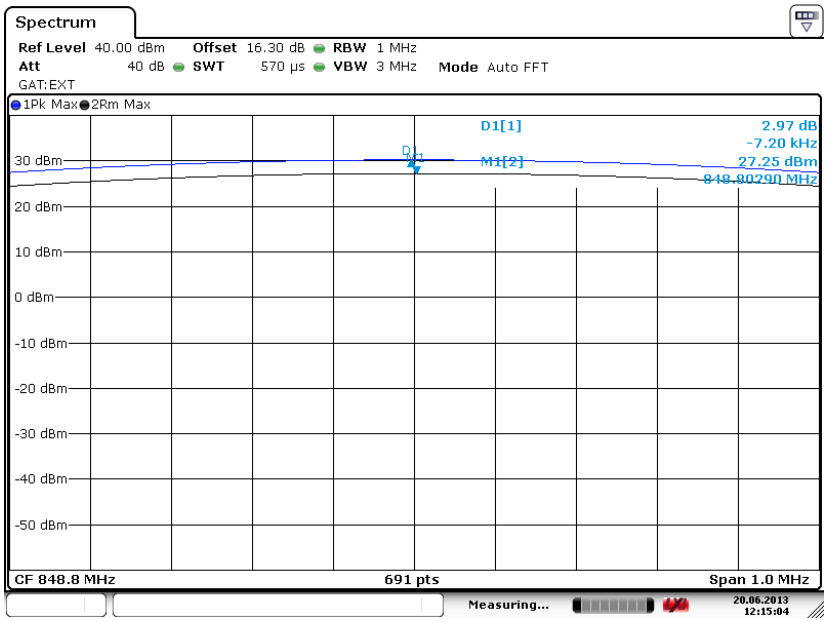
Peak-to-Average Ratio on Channel 251 (848.8 MHz)



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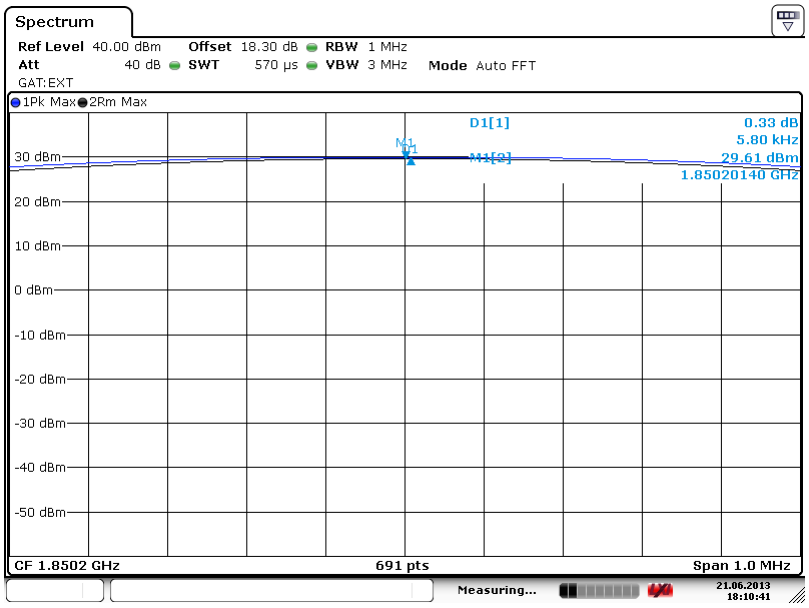
Band :	GSM 1900	Test Mode :	GSM Link (GMSK)

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



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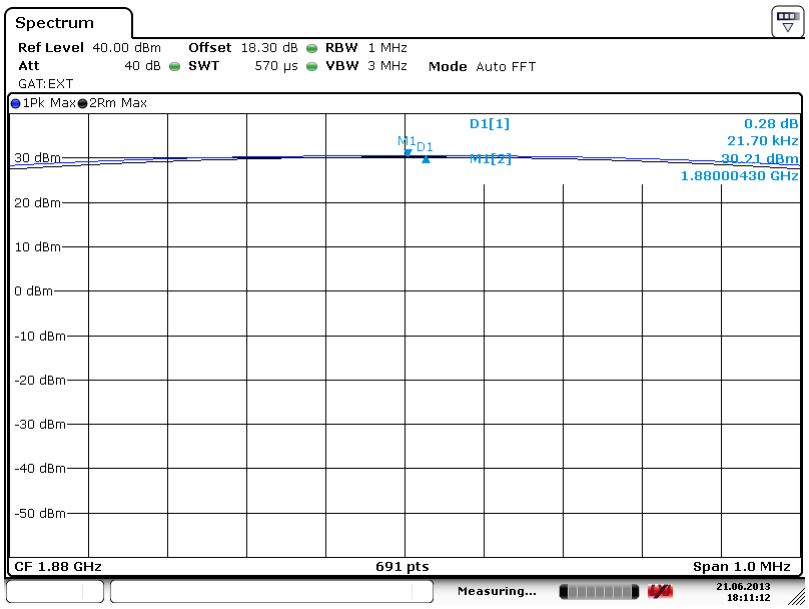
Peak-to-Average Ratio on Channel 661 (1880.0 MHz)



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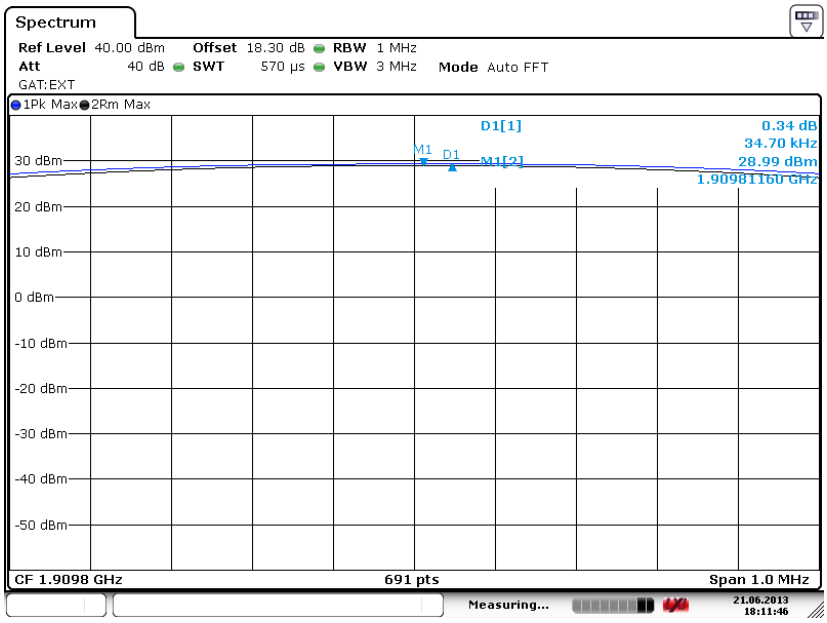
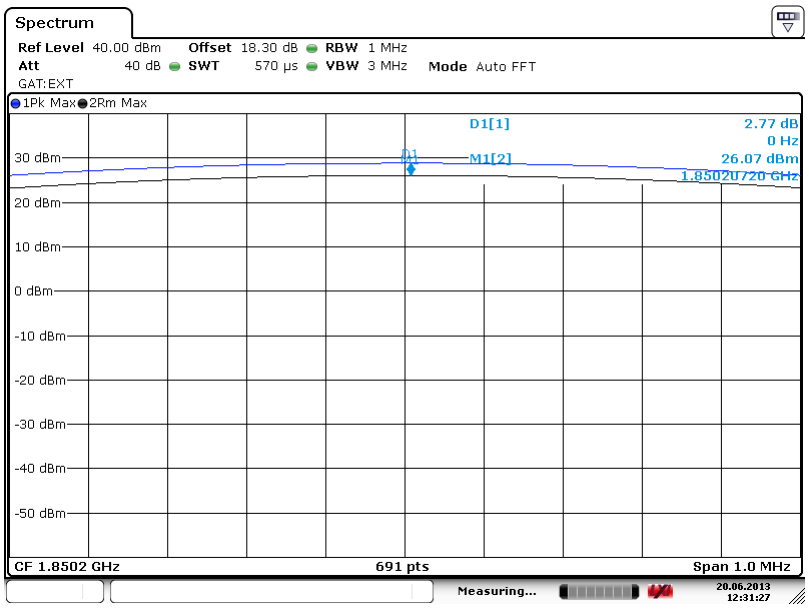
Peak-to-Average Ratio on Channel 810 (1909.8 MHz)



Date: 21.JUN.2013 18:11:47

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

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



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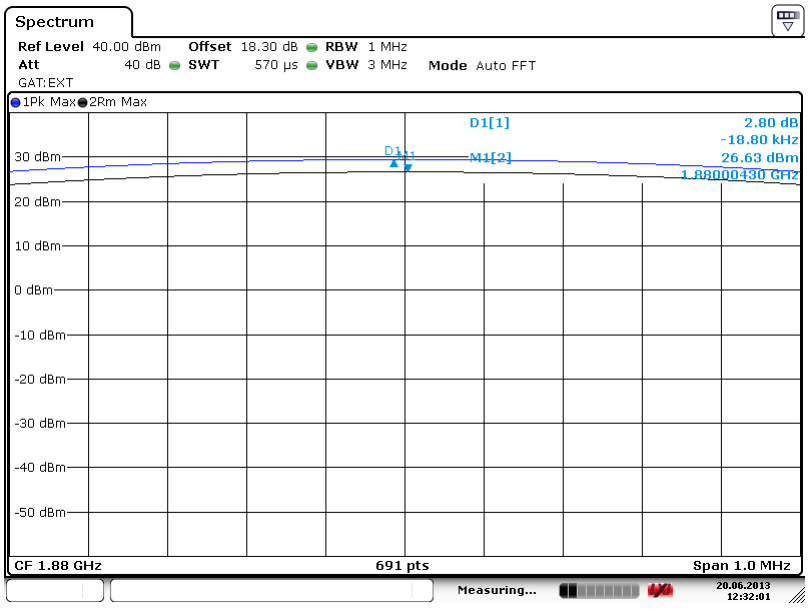
Peak-to-Average Ratio on Channel 661 (1880.0 MHz)



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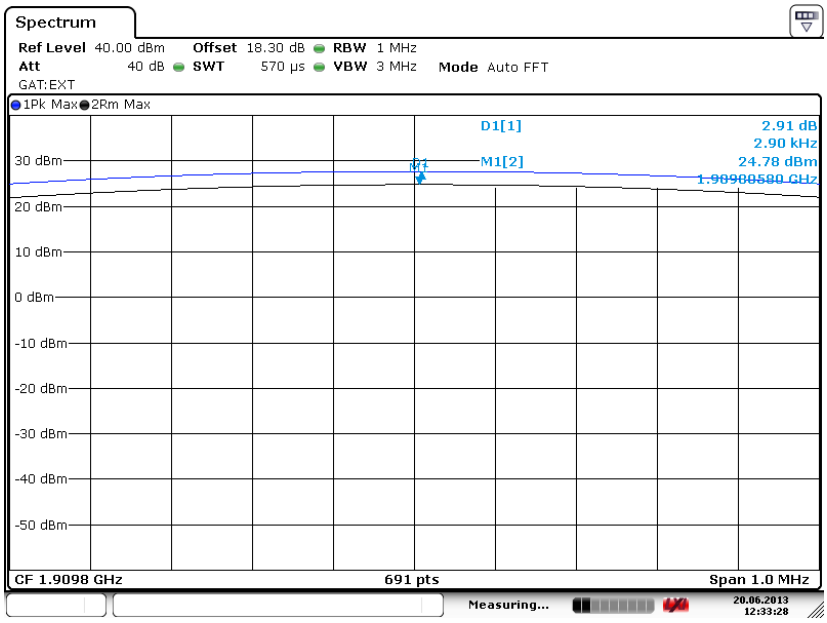
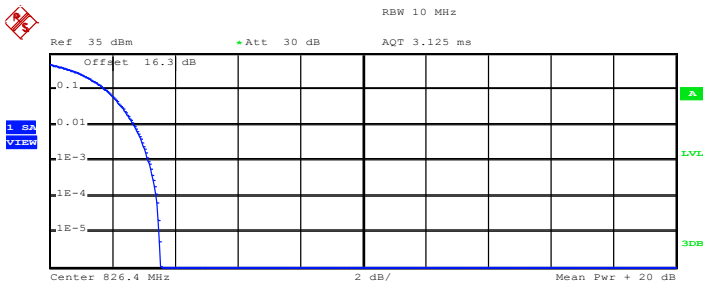
Peak-to-Average Ratio on Channel 810 (1909.8 MHz)



Date: 20.JUN.2013 12:33:28

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

Peak-to-Average Ratio on Channel 4132 (826.4 MHz)

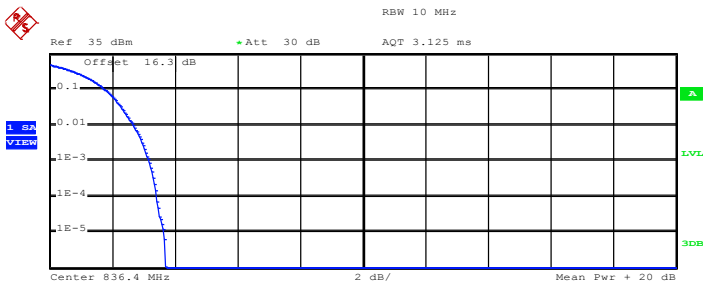


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	24.01 dBm
Peak	27.56 dBm
Crest	3.55 dB
10 %	1.80 dB
1 %	2.68 dB
.1 %	3.16 dB
.01 %	3.40 dB

Date: 19.JUN.2013 19:07:57

Peak-to-Average Ratio on Channel 4182 (836.4 MHz)

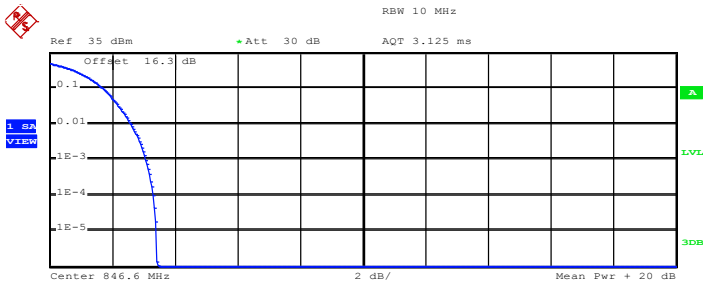


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	24.20 dBm
Peak	27.91 dBm
Crest	3.72 dB
10 %	1.80 dB
1 %	2.68 dB
.1 %	3.20 dB
.01 %	3.44 dB

Date: 19.JUN.2013 19:07:19

Peak-to-Average Ratio on Channel 4233 (846.6 MHz)



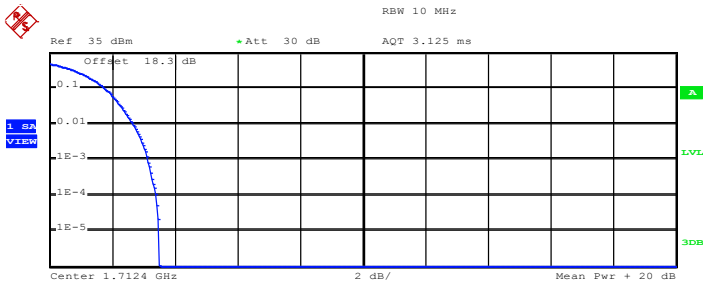
Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	23.91 dBm
Peak	27.35 dBm
Crest	3.44 dB
10 %	1.72 dB
1 %	2.60 dB
.1 %	3.08 dB
.01 %	3.32 dB

Date: 19.JUN.2013 19:06:50

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

Peak-to-Average Ratio on Channel 1312 (1712.4 MHz)

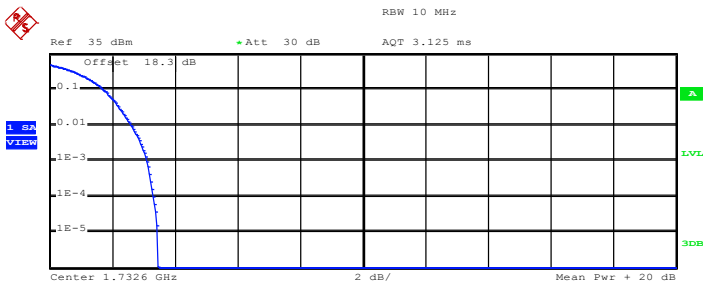


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	24.77 dBm
Peak	28.27 dBm
Crest	3.50 dB
10 %	1.76 dB
1 %	2.68 dB
.1 %	3.16 dB
.01 %	3.40 dB

Date: 19.JUN.2013 18:43:19

Peak-to-Average Ratio On Channel 1413 (1732.6 MHz)

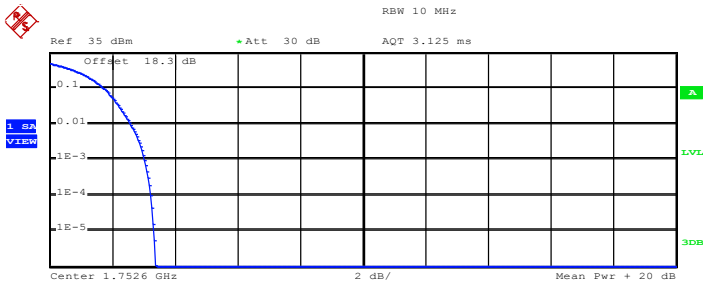


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	24.03 dBm
Peak	27.49 dBm
Crest	3.46 dB
10 %	1.76 dB
1 %	2.60 dB
.1 %	3.12 dB
.01 %	3.32 dB

Date: 19.JUN.2013 18:42:29

Peak-to-Average Ratio on Channel 1513 (1752.6 MHz)



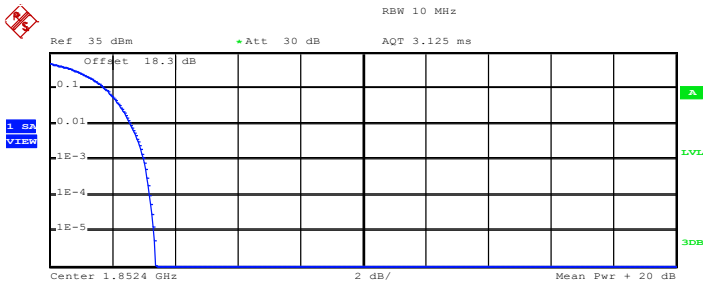
Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	24.17 dBm
Peak	27.56 dBm
Crest	3.39 dB
10 %	1.76 dB
1 %	2.60 dB
.1 %	3.04 dB
.01 %	3.24 dB

Date: 19.JUN.2013 18:42:55

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

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

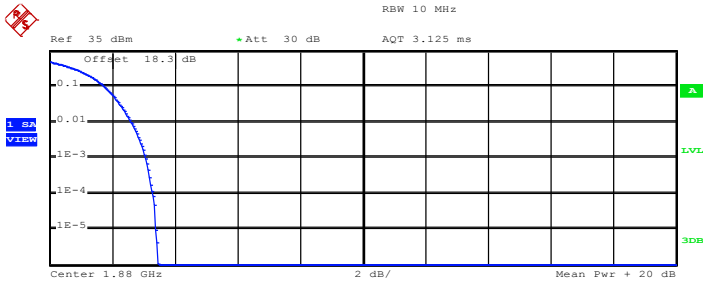


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	24.52 dBm
Peak	27.91 dBm
Crest	3.39 dB
10 %	1.76 dB
1 %	2.60 dB
.1 %	3.00 dB
.01 %	3.20 dB

Date: 19.JUN.2013 18:21:35

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

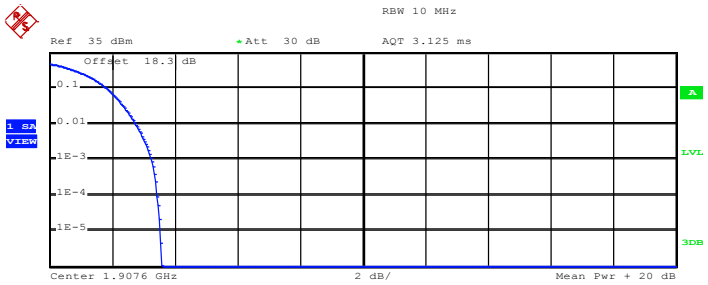


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	24.87 dBm
Peak	28.34 dBm
Crest	3.46 dB
10 %	1.76 dB
1 %	2.64 dB
.1 %	3.08 dB
.01 %	3.32 dB

Date: 19.JUN.2013 18:22:20

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



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	23.36 dBm
Peak	26.93 dBm
Crest	3.56 dB
10 %	1.84 dB
1 %	2.76 dB
.1 %	3.28 dB
.01 %	3.44 dB

Date: 19.JUN.2013 18:24:50

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 v02r01. The ERP of mobile transmitters must not exceed 7 Watts and the EIRP of mobile transmitters are limited to 2 Watts with GSM 1900 and WCDMA Band II and 1 Watts with WCDMA Band IV.

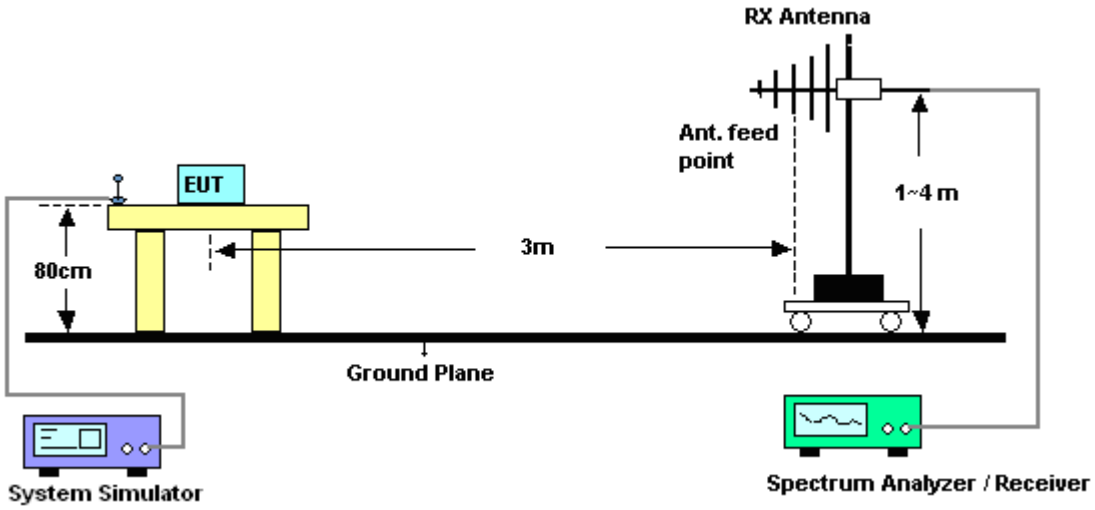
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The EUT was placed on 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= 100 kHz, VBW= 300 kHz, used channel power option with bandwidth=5MHz for WCDMA, and RMS detector settings per section 4.0 of KDB 971168 D01.
2. During the measurement, the EUT was enforced in maximum power and linked with a base station. The highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
3. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (substitution antenna) at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The 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 + Correction factor and ERP = EIRP – 2.15.

3.3.4 Test Setup



3.3.5 Test Result of ERP

GSM850 (GSM) Radiated Power ERP for sample 1 with Battery 1				
Horizontal Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (W)**
824.2	-0.09	31.54	29.30	0.8511
836.4	-0.87	32.04	29.02	0.7980
848.8	-0.04	32.59	30.40	1.0965
Vertical Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (W)**
824.2	-8.37	32.93	22.41	0.1742
836.4	-8.06	32.82	22.61	0.1824
848.8	-7.49	33.62	23.98	0.2500

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

GSM850 (EDGE class 8) Radiated Power ERP for sample 1 with Battery 1				
Horizontal Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (W)**
824.2	-5.80	31.54	23.59	0.2286
836.4	-7.14	32.04	22.75	0.1884
848.8	-7.66	32.59	22.78	0.1897
Vertical Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (W)**
824.2	-14.21	32.93	16.57	0.0454
836.4	-14.43	32.82	16.24	0.0421
848.8	-15.47	33.62	16.00	0.0398

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

GSM850 (GSM) Radiated Power ERP for sample 1 with Battery 2				
Horizontal Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (W)**
824.2	-0.84	31.54	28.55	0.7161
836.4	-1.72	32.04	28.17	0.6561
848.8	-1.31	32.59	29.13	0.8185
Vertical Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (W)**
824.2	-8.09	32.93	22.69	0.1858
836.4	-7.95	32.82	22.72	0.1871
848.8	-8.17	33.62	23.30	0.2138

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

GSM850 (GSM) Radiated Power ERP for sample 2 with Battery 1				
Horizontal Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (W)**
824.2	0.62	31.54	30.01	1.0023
836.4	-0.13	32.04	29.76	0.9462
848.8	-0.42	32.59	30.02	1.0046
Vertical Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (W)**
824.2	-7.75	32.93	23.03	0.2009
836.4	-7.54	32.82	23.13	0.2056
848.8	-8.13	33.62	23.34	0.2158

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

WCDMA Band V (RMC 12.2Kbps) Radiated Power ERP for sample 1 with Battery 1				
Horizontal Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (W)**
826.4	-7.82	31.44	21.47	0.1403
836.4	-8.08	32.04	21.81	0.1517
846.6	-9.55	32.63	20.93	0.1239
Vertical Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (W)**
826.4	-16.27	32.78	14.36	0.0273
836.4	-15.86	32.82	14.81	0.0303
846.6	-18.44	33.40	12.81	0.0191

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

3.3.6 Test Result of EIRP

GSM1900 (GSM) Radiated Power EIRP for sample 1 with Battery 1				
Horizontal Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1850.2	-12.71	43.69	30.98	1.2531
1880.0	-13.25	44.79	31.54	1.4256
1909.8	-12.86	43.59	30.73	1.1830
Vertical Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1850.2	-17.45	45.72	28.27	0.6714
1880.0	-18.09	46.78	28.69	0.7396
1909.8	-16.72	46.77	30.05	1.0116

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

GSM1900 (EDGE class 8) Radiated Power EIRP for sample 1 with Battery 1				
Horizontal Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1850.2	-17.57	43.69	26.12	0.4093
1880.0	-18.36	44.79	26.43	0.4395
1909.8	-17.86	43.59	25.73	0.3741
Vertical Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1850.2	-22.34	45.72	23.38	0.2178
1880.0	-22.73	46.78	24.05	0.2541
1909.8	-21.77	46.77	25.00	0.3162

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

GSM1900 (GSM) Radiated Power EIRP for sample 1 with Battery 2				
Horizontal Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1850.2	-12.72	43.69	30.97	1.2503
1880.0	-13.84	44.79	30.95	1.2445
1909.8	-13.54	43.59	30.05	1.0116
Vertical Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1850.2	-18.68	45.72	27.04	0.5058
1880.0	-18.85	46.78	27.93	0.6209
1909.8	-18.17	46.77	28.60	0.7244

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

GSM1900 (GSM) Radiated Power EIRP for sample 2 with Battery 1				
Horizontal Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1850.2	-13.24	43.69	30.45	1.1092
1880.0	-13.28	44.79	31.51	1.4158
1909.8	-12.56	43.59	31.03	1.2677
Vertical Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1850.2	-17.89	45.72	27.83	0.6714
1880.0	-19.05	46.78	27.73	0.7396
1909.8	-17.83	46.77	28.94	1.0116

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

WCDMA Band IV (RMC 12.2Kbps) Radiated Power EIRP for sample 1 with Battery 1				
Horizontal Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1712.4	-15.46	41.74	26.28	0.4246
1732.6	-16.94	42.41	25.47	0.3524
1752.6	-16.77	41.82	25.05	0.3199
Vertical Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1712.4	-25.63	43.38	17.75	0.0596
1732.6	-25.98	45.43	19.45	0.0881
1752.6	-27.19	44.43	17.24	0.0530

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

WCDMA Band IV (RMC 12.2Kbps) Radiated Power EIRP for sample 1 with Battery 2				
Horizontal Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1712.4	-16.96	41.74	24.78	0.3006
1732.6	-18.86	42.41	23.55	0.2265
1752.6	-18.04	41.82	23.78	0.2388
Vertical Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1712.4	-25.89	43.38	17.49	0.0561
1732.6	-27.45	45.43	17.98	0.0628
1752.6	-26.31	44.43	18.12	0.0649

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

WCDMA Band IV (RMC 12.2Kbps) Radiated Power EIRP for sample 2 with Battery 1				
Horizontal Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1712.4	-16.04	41.74	25.70	0.3715
1732.6	-17.95	42.41	24.46	0.2793
1752.6	-16.83	41.82	24.99	0.3155
Vertical Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1712.4	-26.03	43.38	17.35	0.0543
1732.6	-28.09	45.43	17.34	0.0542
1752.6	-26.99	44.43	17.44	0.0555

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

WCDMA Band II (RMC 12.2Kbps) Radiated Power EIRP for sample 1 with Battery 1				
Horizontal Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1852.4	-18.63	43.69	25.06	0.3206
1880.0	-19.30	44.79	25.49	0.3540
1907.6	-18.87	43.59	24.72	0.2965
Vertical Polarization				
Frequency (MHz)	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1852.4	-23.67	45.72	22.05	0.1603
1880.0	-23.46	46.78	23.32	0.2148
1907.6	-23.98	46.77	22.79	0.1901

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

3.4 Occupied Bandwidth and 26dB Bandwidth Measurement

3.4.1 Description of Occupied Bandwidth and 26dB Bandwidth Measurement

The 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.

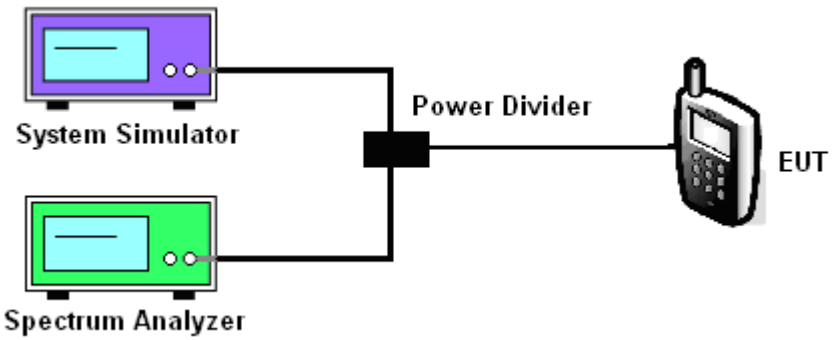
3.4.2 Measuring Instruments

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 were measured, set RBW= 1% of span, VBW= 3*RBW, sample detector, trace maximum hold.
4. The 26dB bandwidth were measured, set RBW= 1% of EBW, VBW= 3*RBW, peak detector, trace maximum hold.

3.4.4 Test Setup



3.4.5 Test Result of Occupied Bandwidth and 26dB Bandwidth

Cellular Band						
Modes	GSM850 (GSM)			GSM850 (EDGE class 8)		
Channel	128 (Low)	189 (Mid)	251 (High)	128 (Low)	189 (Mid)	251 (High)
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8
99% OBW (kHz)	246.00	250.00	244.00	242.00	244.00	242.00
26dB BW (kHz)	316.00	318.00	314.00	306.00	298.00	302.00

PCS Band						
Modes	GSM1900 (GSM)			GSM1900 (EDGE class 8)		
Channel	512 (Low)	661 (Mid)	810 (High)	512 (Low)	661 (Mid)	810 (High)
Frequency (MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8
99% OBW (kHz)	246.00	248.00	250.00	250.00	252.00	248.00
26dB BW (kHz)	288.00	310.00	314.00	296.00	300.00	306.00

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)	4.16	4.16	4.16
26dB BW (MHz)	4.68	4.68	4.68

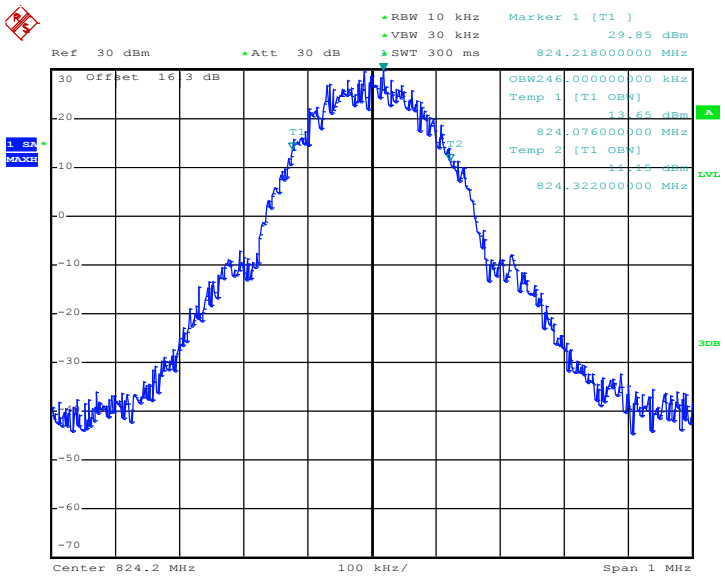
AWS Band			
Modes	WCDMA Band IV (RMC 12.2Kbps)		
Channel	1312(Low)	1413 (Mid)	1513 (High)
Frequency (MHz)	1712.4	1732.6	1752.6
99% OBW (MHz)	4.16	4.20	4.18
26dB BW (MHz)	4.68	4.68	4.68

PCS Band			
Modes	**WCDMA Band II (RMC 12.2Kbps)**		
Channel	**9262 (Low)**	**9400 (Mid)**	**9538 (High)**
Frequency (MHz)	**1852.4**	**1880**	**1907.6**
99% OBW (MHz)	4.16	4.18	4.20
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 (GMSK)

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



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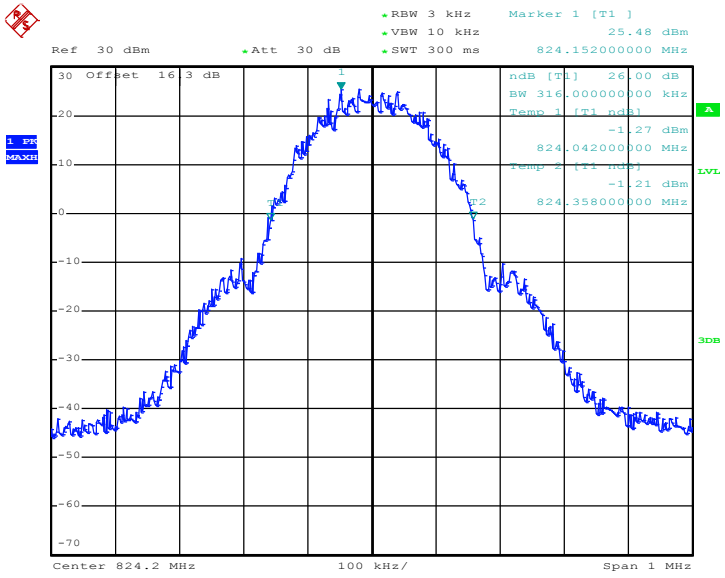
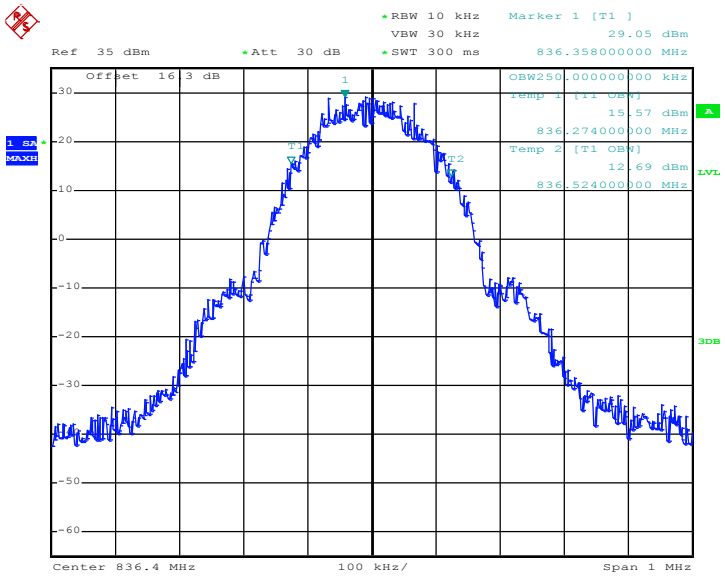
26dB Bandwidth Plot on Channel 128 (824.2 MHz)



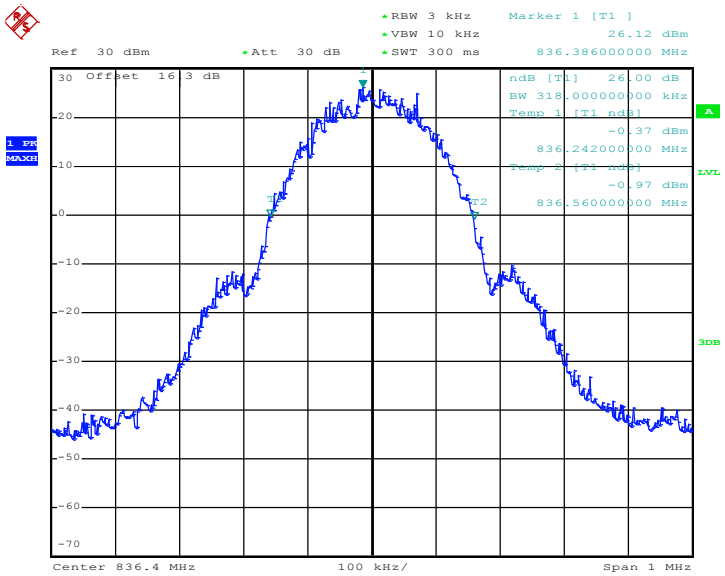
Date: 19.JUN.2013 15:40:50

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



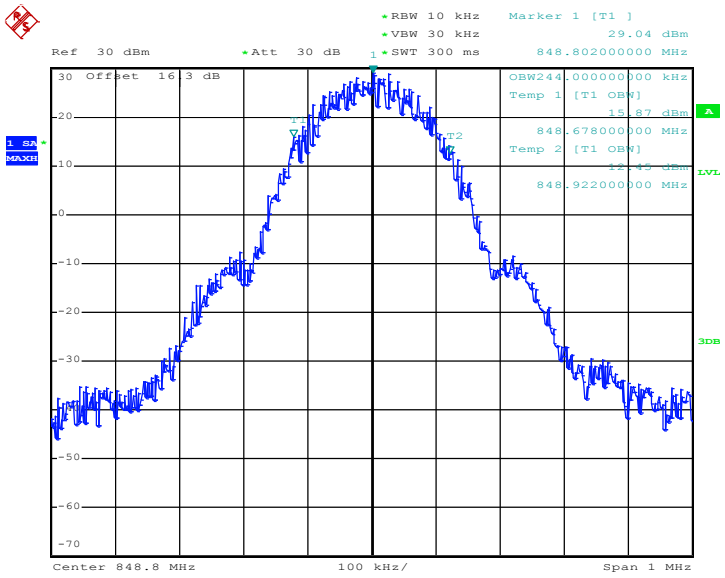
Date: 19.JUN.2013 15:57:36

26dB Bandwidth Plot on Channel 189 (836.4 MHz)



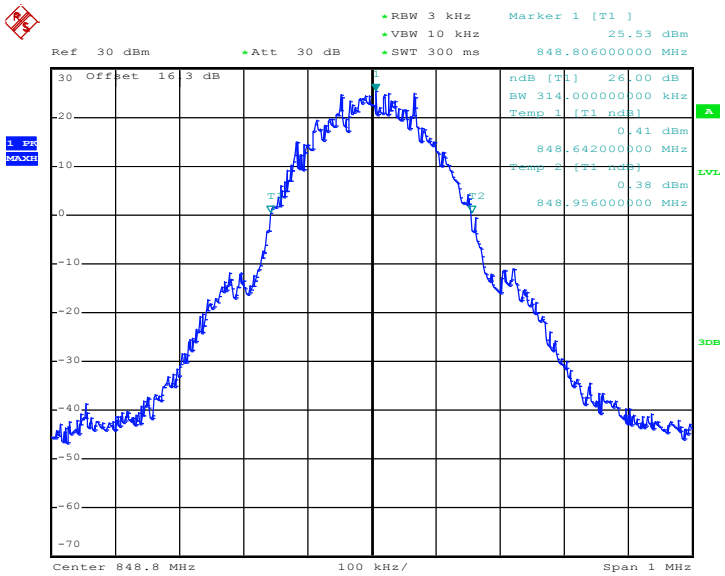
Date: 19.JUN.2013 15:41:16

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



Date: 19.JUN.2013 15:43:00

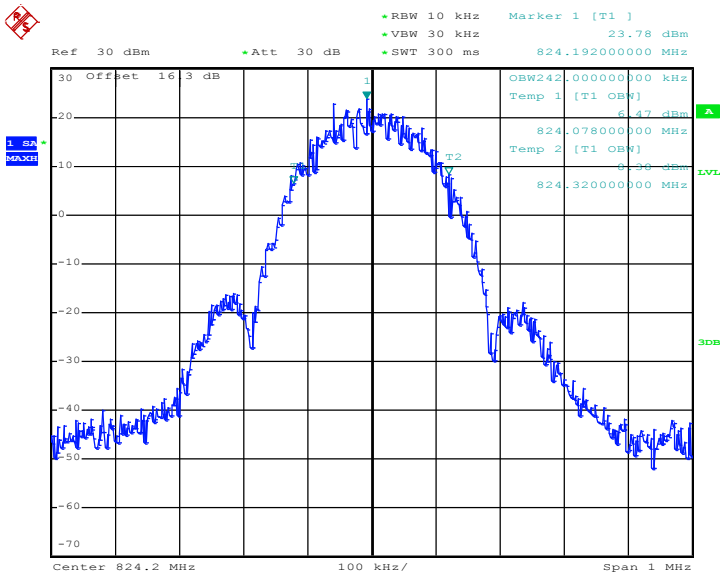
26dB Bandwidth Plot on Channel 251 (848.8 MHz)



Date: 19.JUN.2013 15:41:42

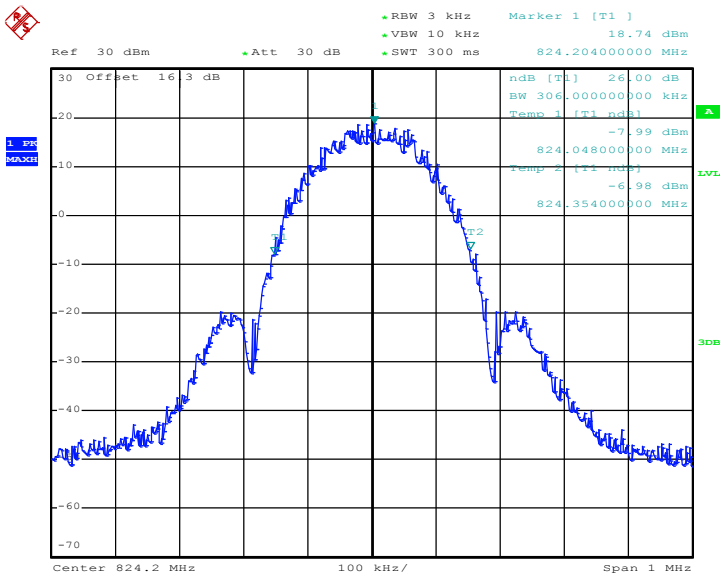
Band :	GSM 850	Test Mode :	EDGE class 8 Link (8PSK)

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



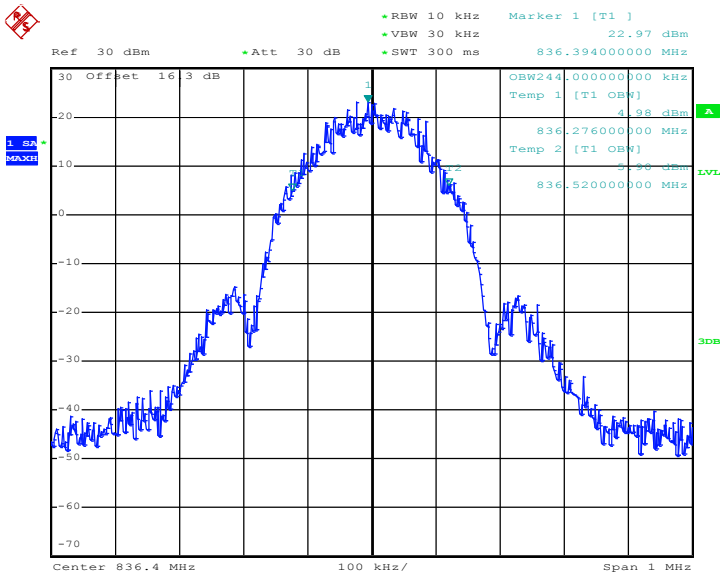
Date: 19.JUN.2013 16:27:51

26dB Bandwidth Plot on Channel 128 (824.2 MHz)



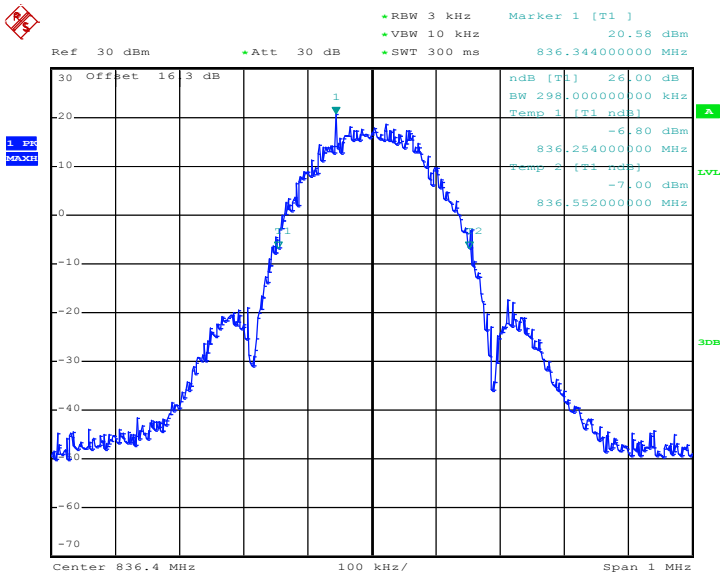
Date: 19.JUN.2013 16:26:33

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



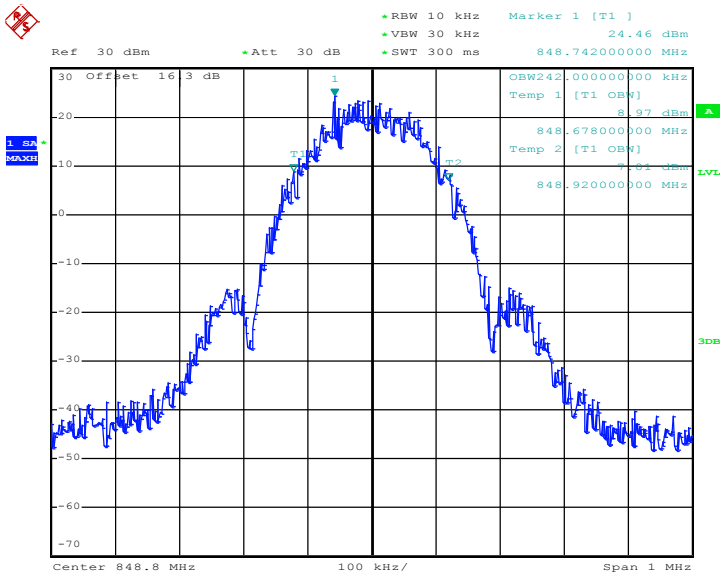
Date: 19.JUN.2013 16:28:17

26dB Bandwidth Plot on Channel 189 (836.4 MHz)



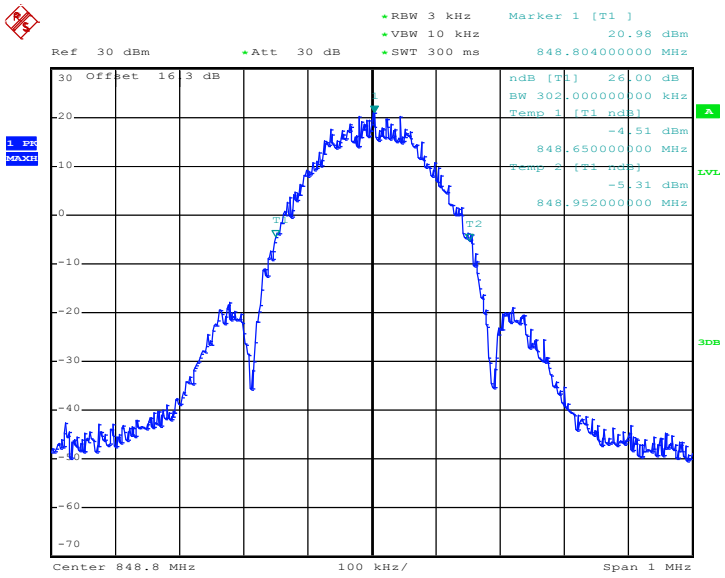
Date: 19.JUN.2013 16:26:59

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



Date: 19.JUN.2013 16:28:43

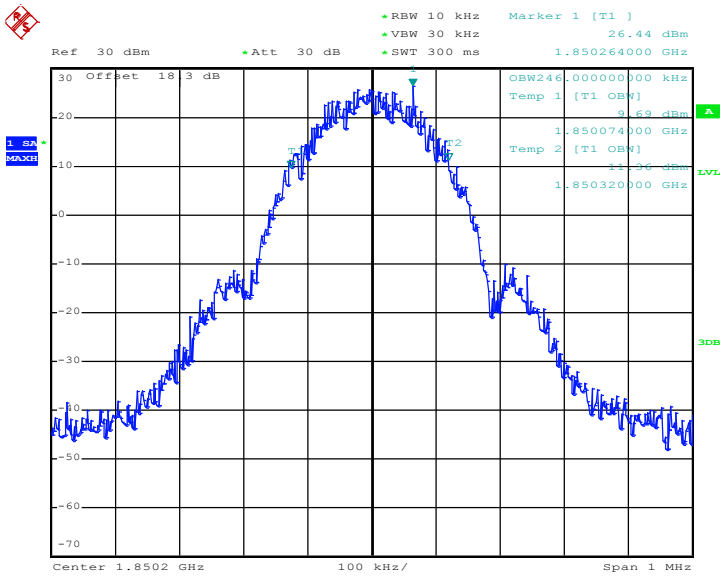
26dB Bandwidth Plot on Channel 251 (848.8 MHz)



Date: 19.JUN.2013 16:27:25

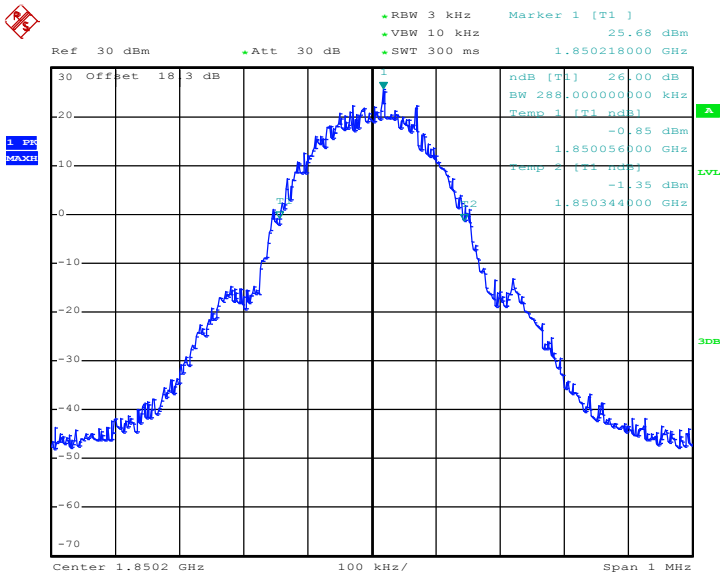
Band :	GSM 1900	Test Mode :	GSM Link (GMSK)

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



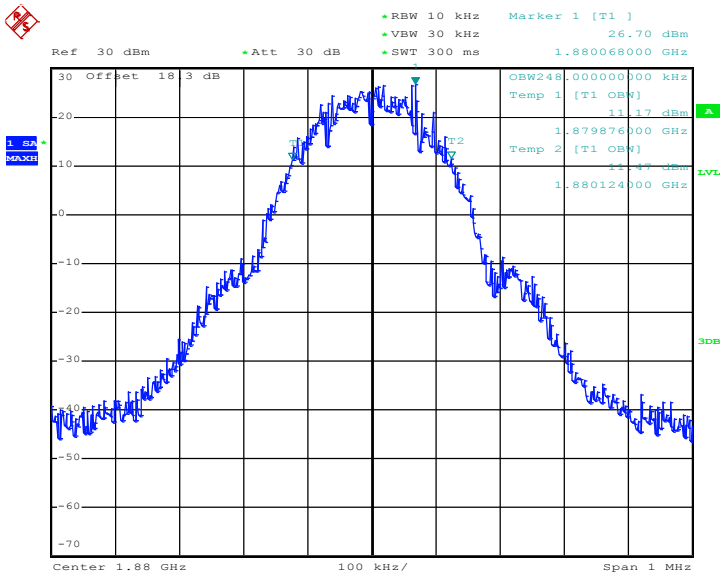
Date: 19.JUN.2013 17:08:12

26dB Bandwidth Plot on Channel 512 (1850.2 MHz)



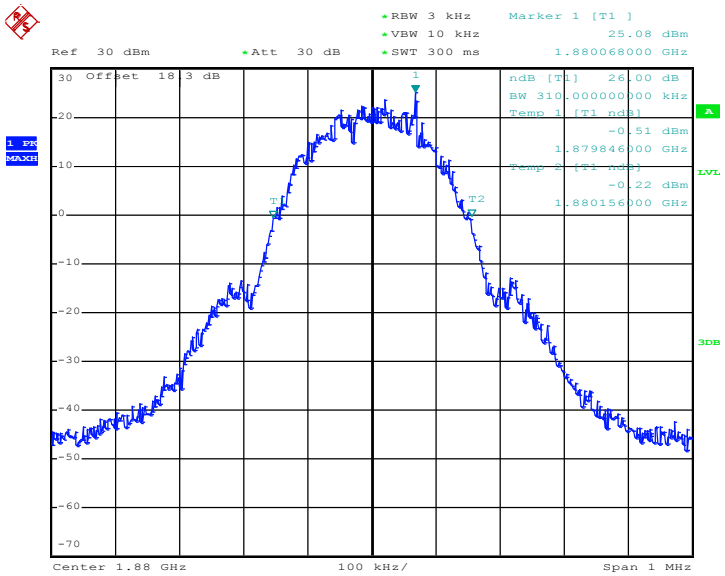
Date: 19.JUN.2013 17:06:54

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



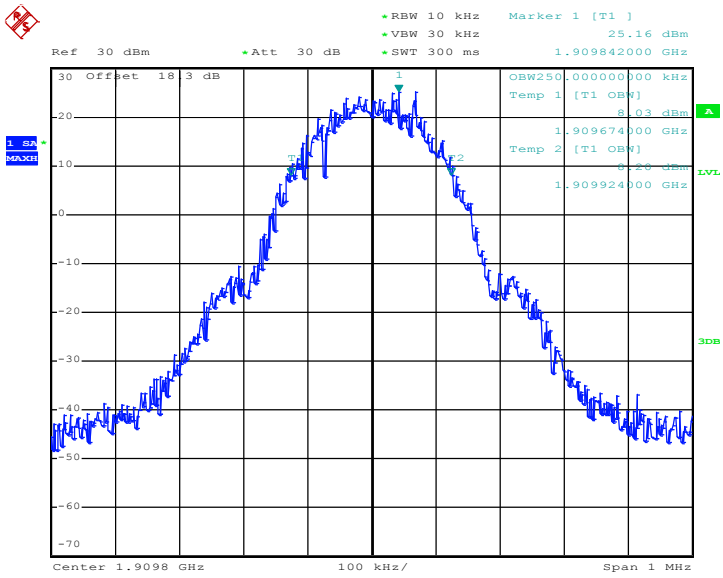
Date: 19.JUN.2013 17:08:38

26dB Bandwidth Plot on Channel 661 (1880.0 MHz)



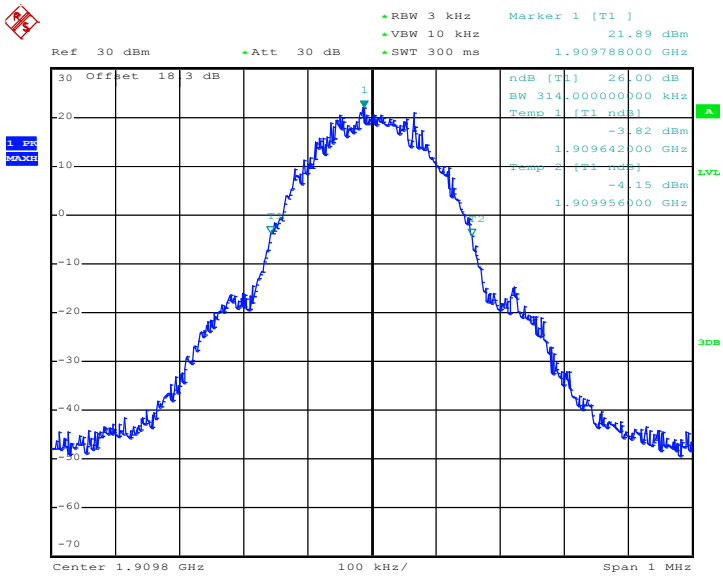
Date: 19.JUN.2013 17:07:20

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



Date: 19.JUN.2013 17:09:04

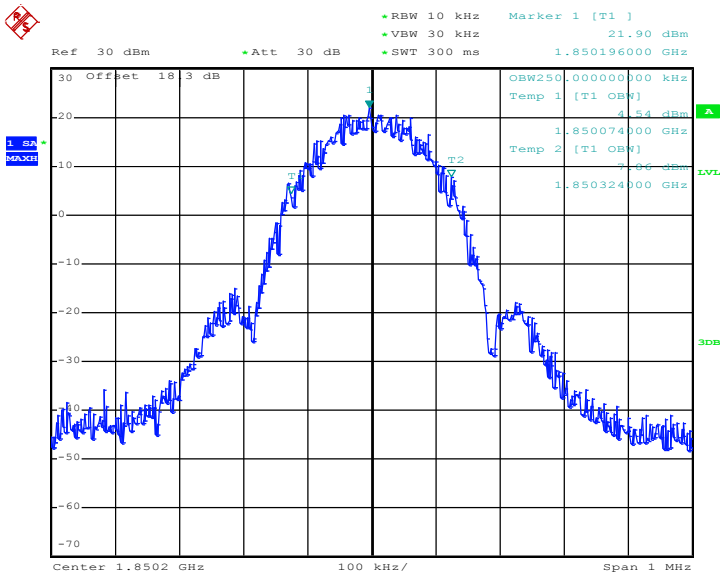
26dB Bandwidth Plot on Channel 810 (1909.8 MHz)



Date: 19.JUN.2013 17:07:46

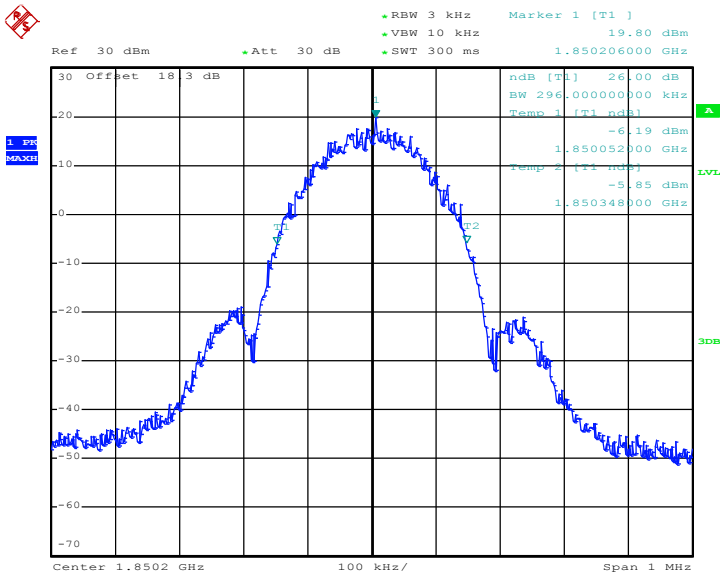
Band :	GSM 1900	Test Mode :	EDGE class 8 Link (8PSK)

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



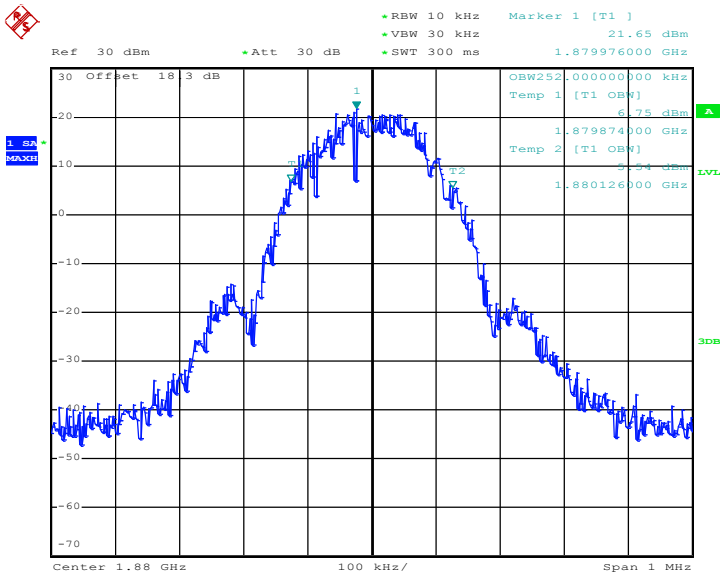
Date: 19.JUN.2013 17:29:00

26dB Bandwidth Plot on Channel 512 (1850.2 MHz)



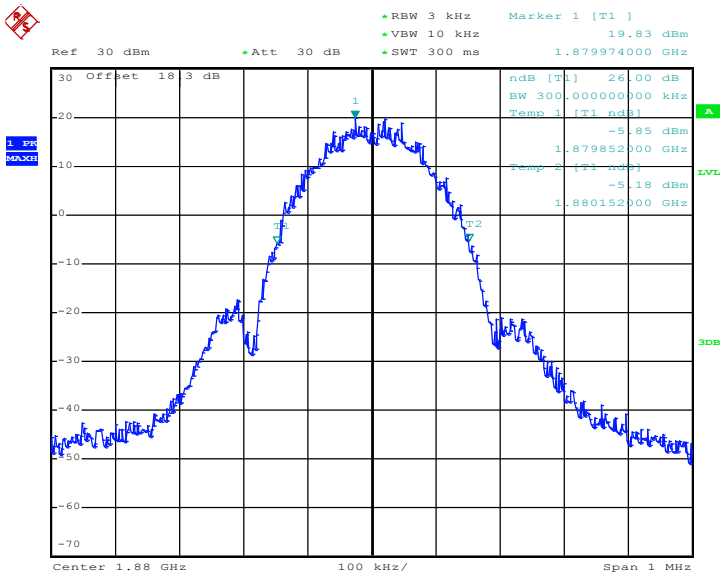
Date: 19.JUN.2013 17:27:41

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



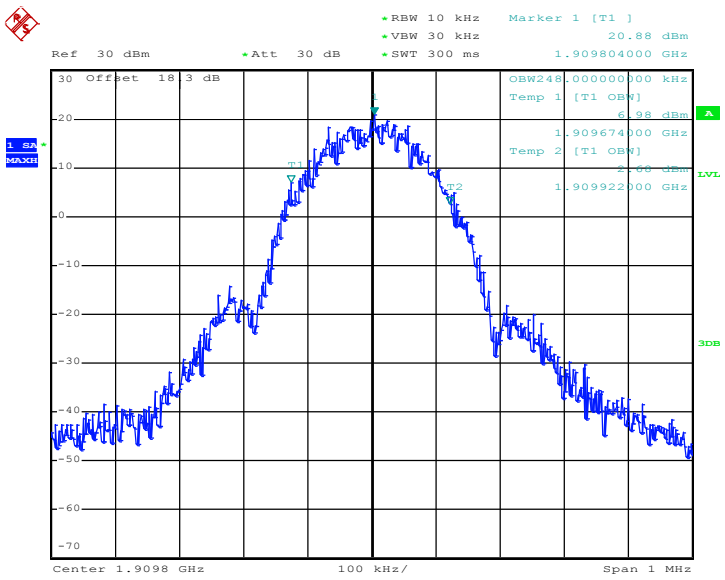
Date: 19.JUN.2013 17:29:26

26dB Bandwidth Plot on Channel 661 (1880.0 MHz)



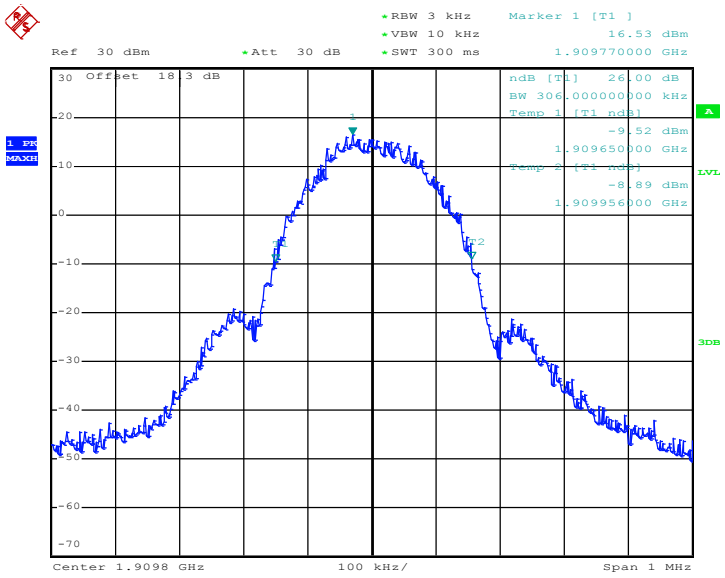
Date: 19.JUN.2013 17:28:08

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



Date: 19.JUN.2013 17:29:52

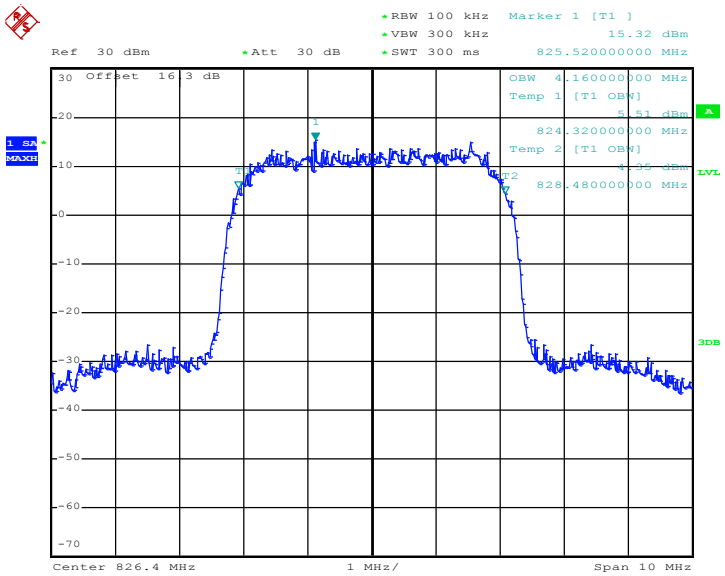
26dB Bandwidth Plot on Channel 810 (1909.8 MHz)



Date: 19.JUN.2013 17:28:34

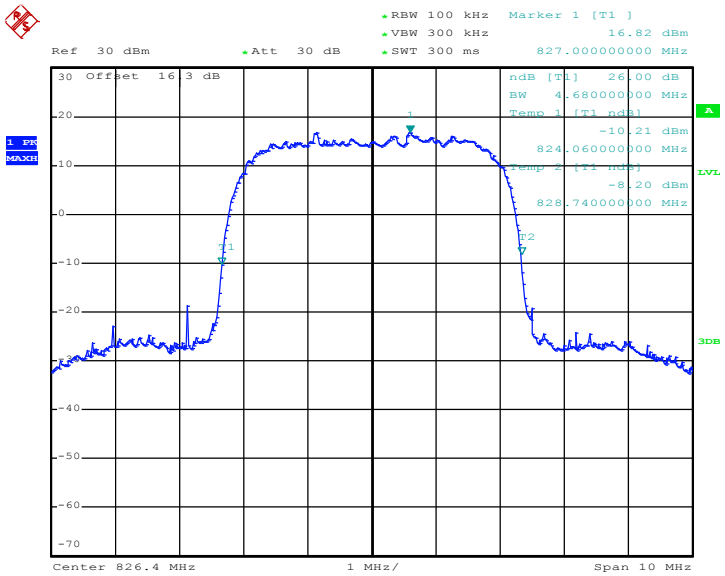
Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link (QPSK)

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



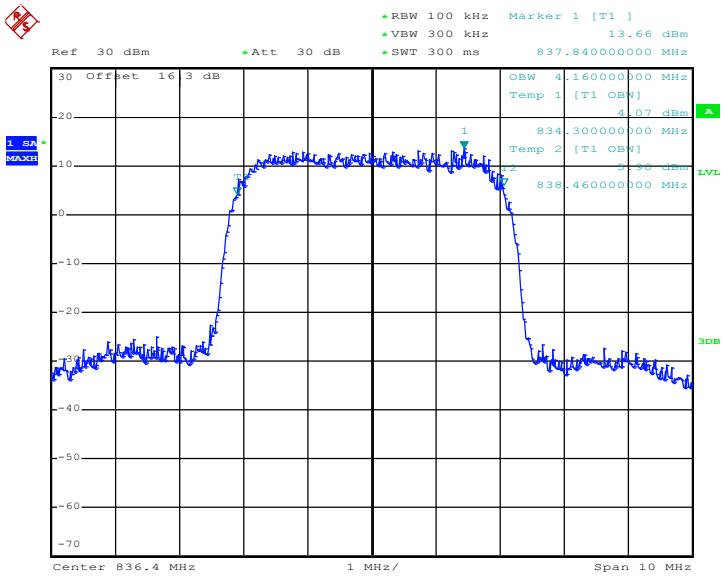
Date: 19.JUN.2013 18:49:59

26dB Bandwidth Plot on Channel 4132 (826.4 MHz)



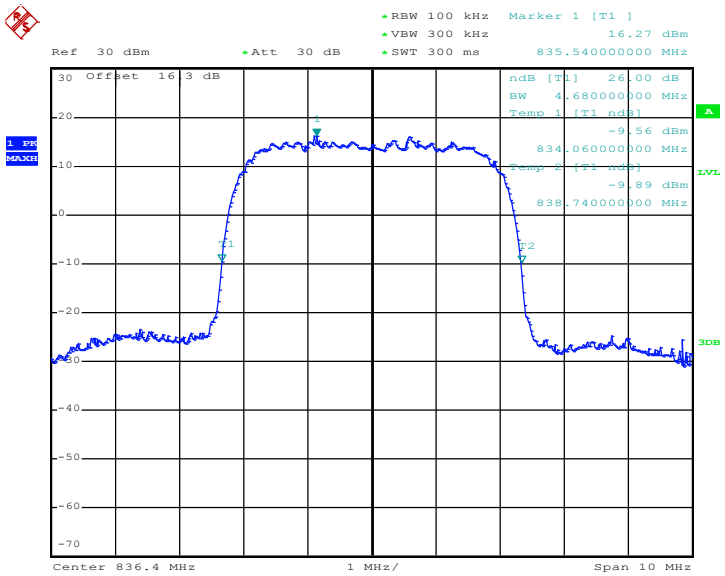
Date: 19.JUN.2013 18:48:40

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



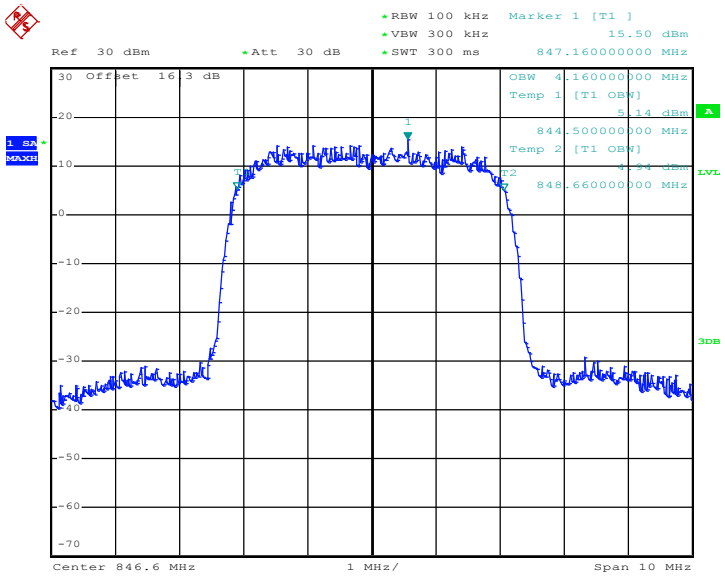
Date: 19.JUN.2013 18:50:25

26dB Bandwidth Plot on Channel 4182 (836.4 MHz)



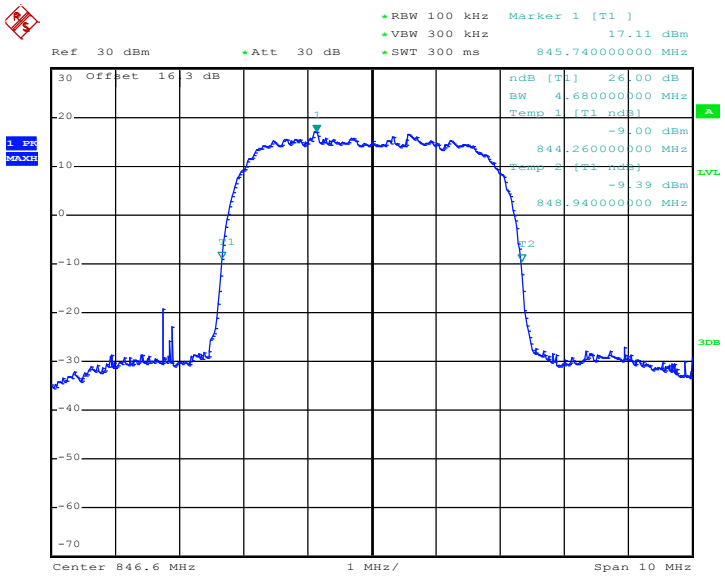
Date: 19.JUN.2013 18:49:06

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



Date: 19.JUN.2013 18:50:51

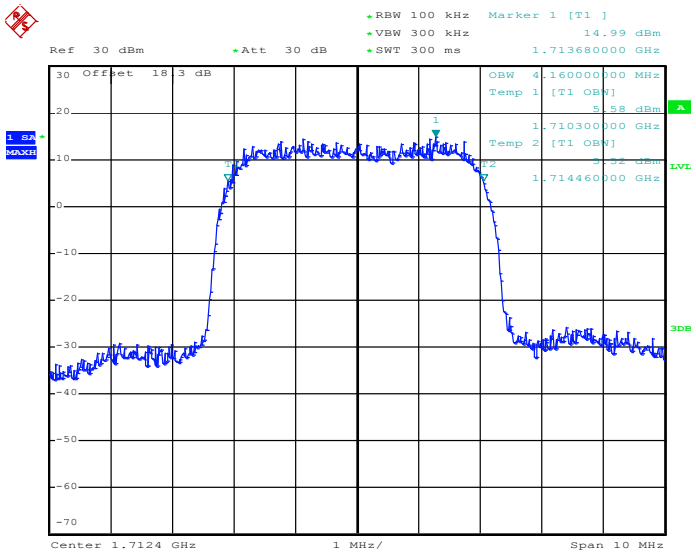
26dB Bandwidth Plot on Channel 4233 (846.6 MHz)



Date: 19.JUN.2013 18:49:32

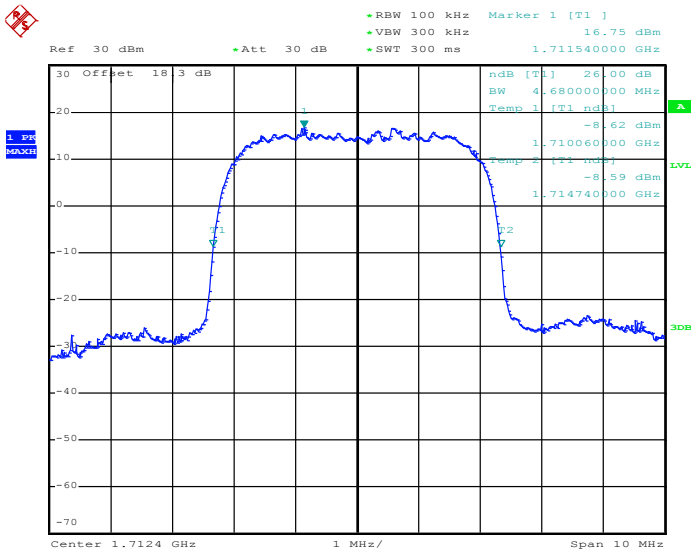
Band :	WCDMA Band IV	Test Mode :	RMC 12.2Kbps Link (QPSK)

99% Occupied Bandwidth Plot on Channel 1312 (1712.4 MHz)



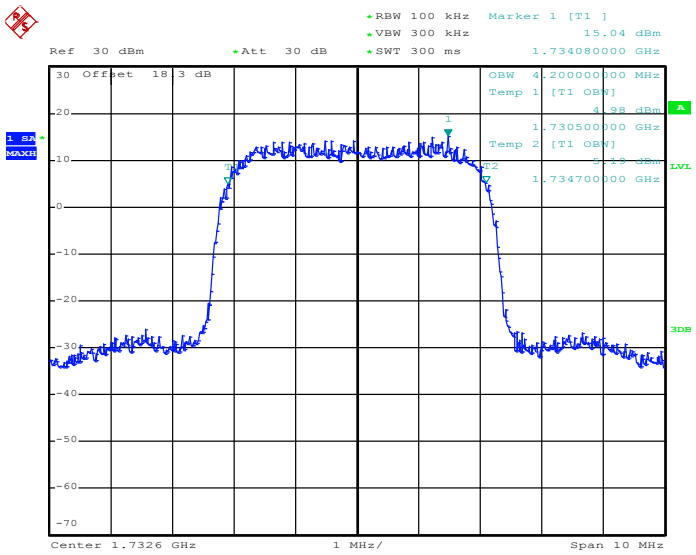
Date: 19.JUN.2013 18:30:50

26dB Bandwidth Plot on Channel 1312 (1712.4 MHz)



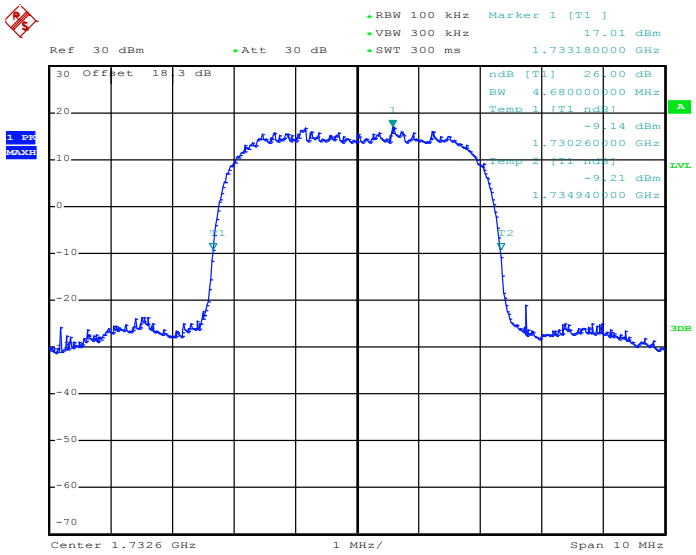
Date: 19.JUN.2013 18:29:32

99% Occupied Bandwidth Plot on Channel 1413 (1732.6 MHz)



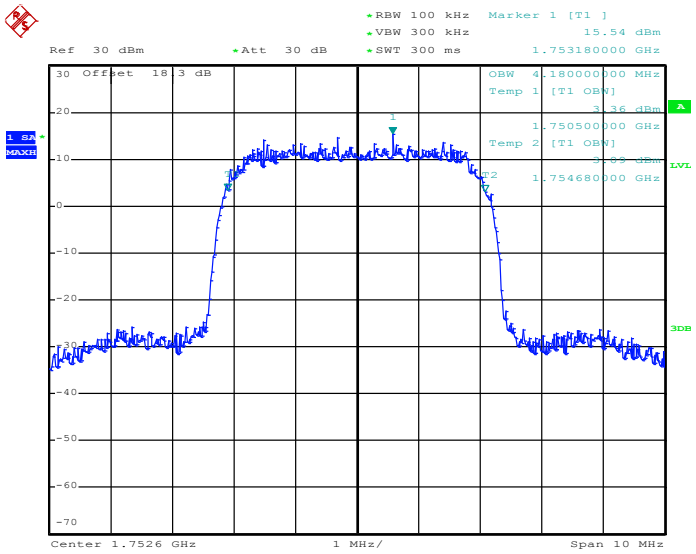
Date: 19.JUN.2013 18:31:16

26dB Bandwidth Plot on Channel 1413 (1732.6 MHz)



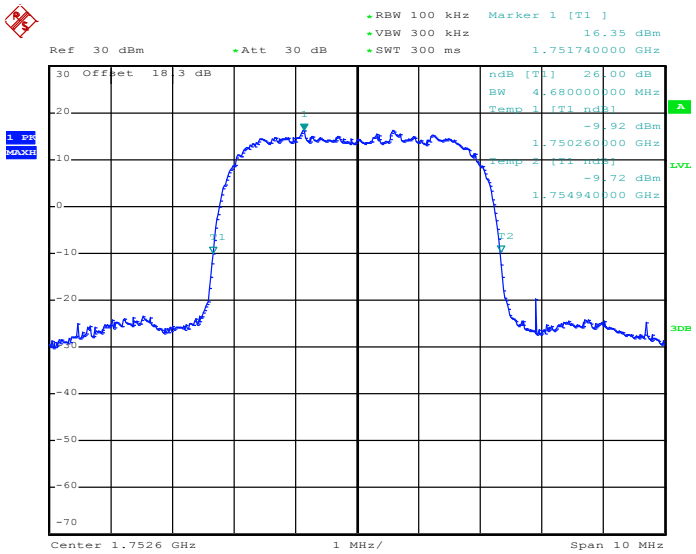
Date: 19.JUN.2013 18:29:58

99% Occupied Bandwidth Plot on Channel 1513 (1752.6 MHz)



Date: 19.JUN.2013 18:31:42

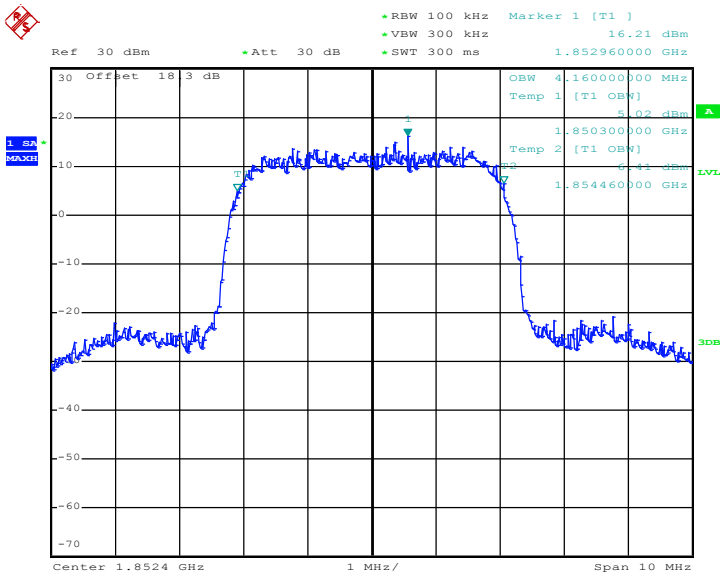
26dB Bandwidth Plot on Channel 1513 (1752.6 MHz)



Date: 19.JUN.2013 18:30:24

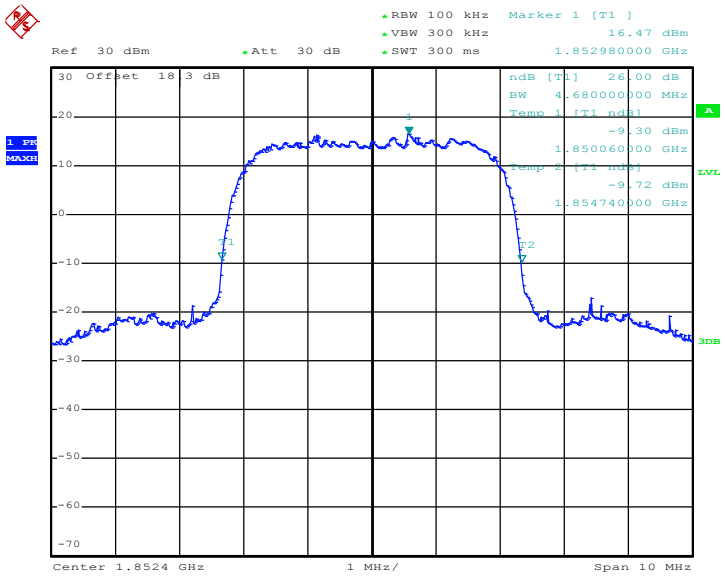
Band :	WCDMA Band II	Test Mode :	RMC 12.2Kbps Link (QPSK)

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



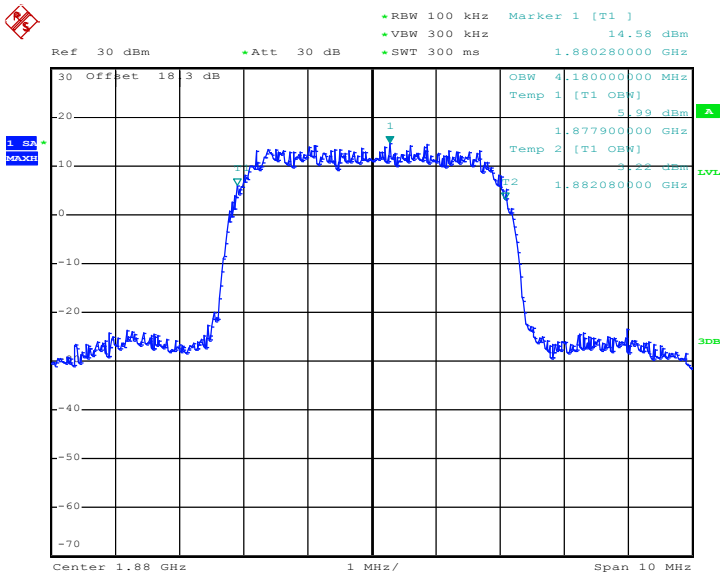
Date: 19.JUN.2013 18:14:52

26dB Bandwidth Plot on Channel 9262 (1852.4 MHz)

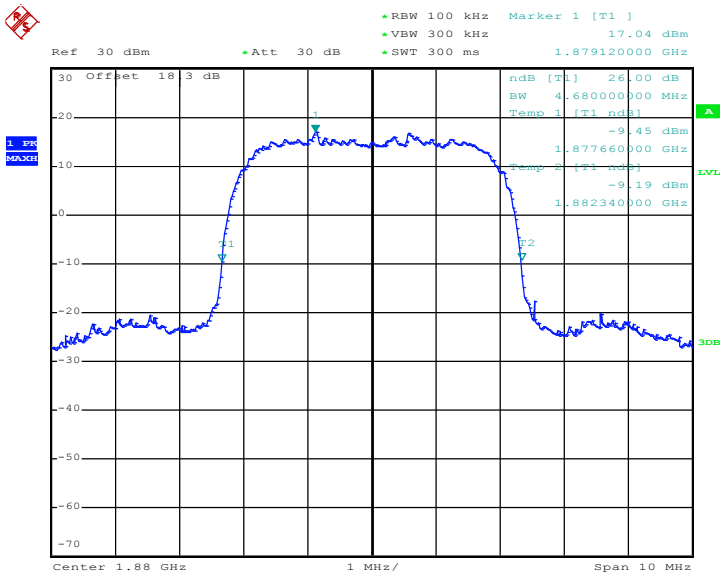


Date: 19.JUN.2013 18:13:33

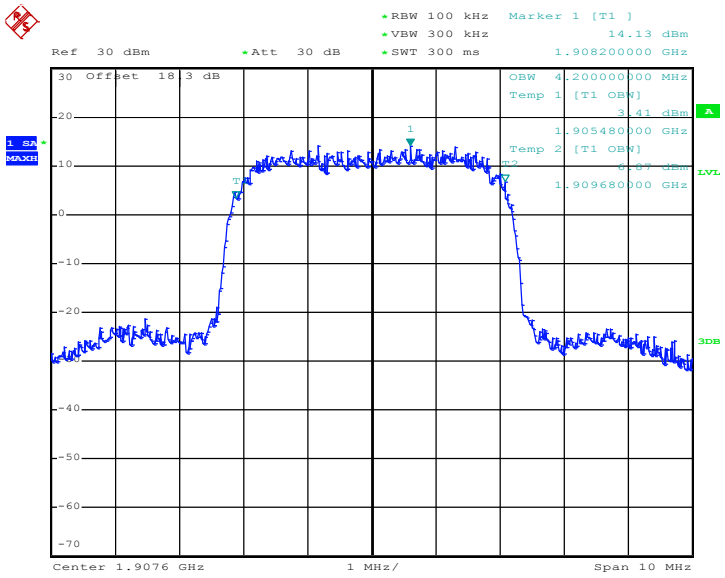
99% Occupied Bandwidth Plot on Channel 9400 (1880.0 MHz)



26dB Bandwidth Plot on Channel 9400 (1880.0 MHz)

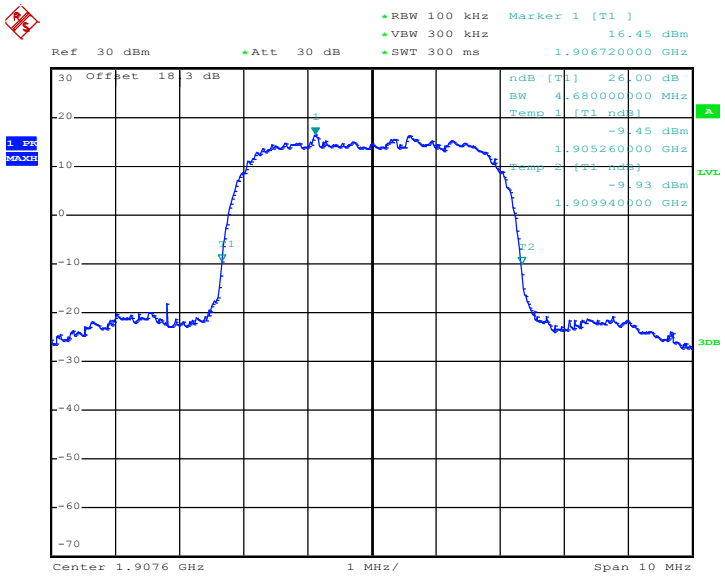


99% Occupied Bandwidth Plot on Channel 9538 (1907.6 MHz)



Date: 19.JUN.2013 18:15:44

26dB Bandwidth Plot on Channel 9538 (1907.6 MHz)



Date: 19.JUN.2013 18:14:26

3.5 Band Edge Measurement

3.5.1 Description of Band Edge Measurement

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

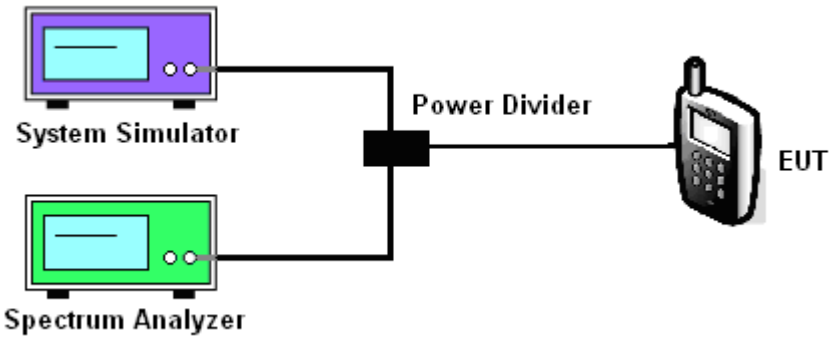
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

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

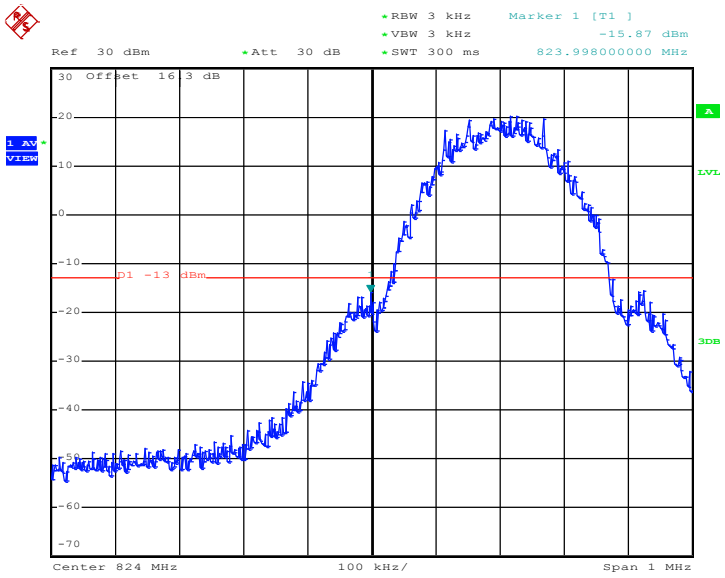
3.5.4 Test Setup



3.5.5 Test Result (Plots) of Conducted Band Edge

Band :	GSM850	Test Mode :	GSM Link (GMSK)
Correction Factor :	0.25 dB	Maximum 26dB Bandwidth :	0.318MHz
Band Edge :	-15.62 dBm	Measurement Value :	-15.87dBm

Lower Band Edge Plot on Channel 128 (824.2 MHz)



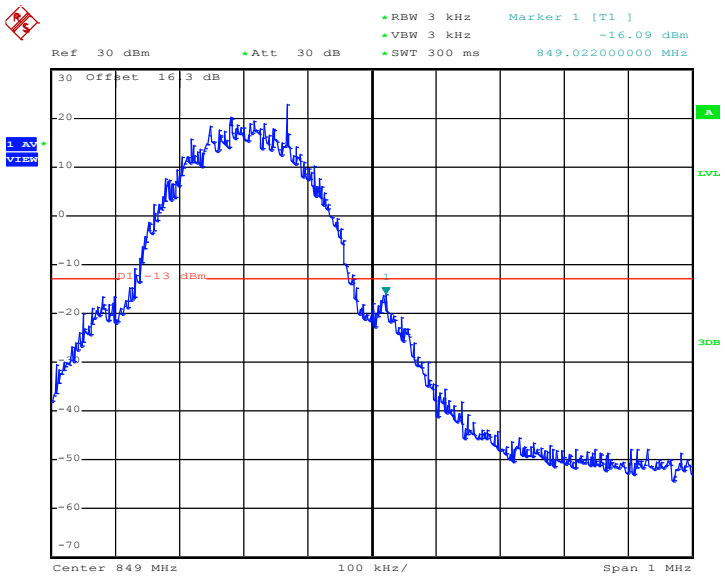
Date: 19.JUN.2013 15:43:27

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

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

Band :	GSM850	Test Mode :	GSM Link (GMSK)
Correction Factor :	0.25 dB	Maximum 26dB Bandwidth :	0.318MHz
Band Edge :	-15.84 dBm	Measurement Value :	-16.09dBm

Higher Band Edge Plot on Channel 251 (848.8 MHz)



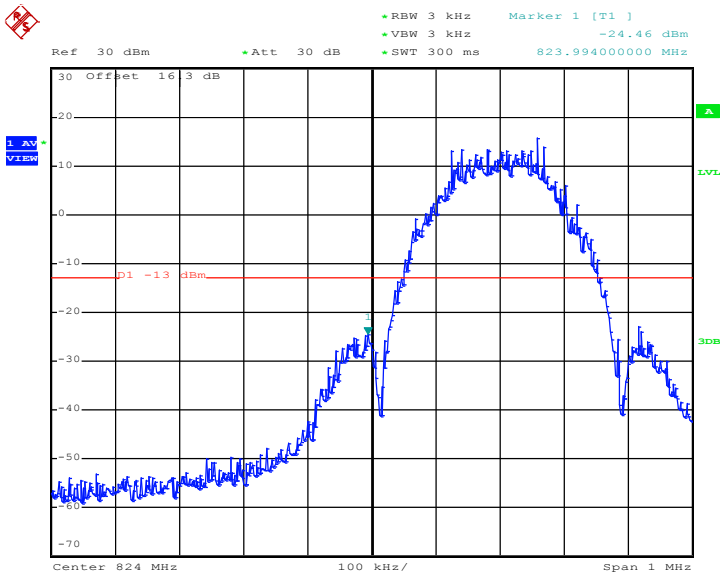
Date: 19.JUN.2013 15:43:53

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

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

Band :	GSM850	Test Mode :	EDGE class 8 Link (8PSK)
Correction Factor :	0.09 dB	Maximum 26dB Bandwidth :	0.306MHz
Band Edge :	-24.37 dBm	Measurement Value :	-24.46dBm

Lower Band Edge Plot on Channel 128 (824.2 MHz)

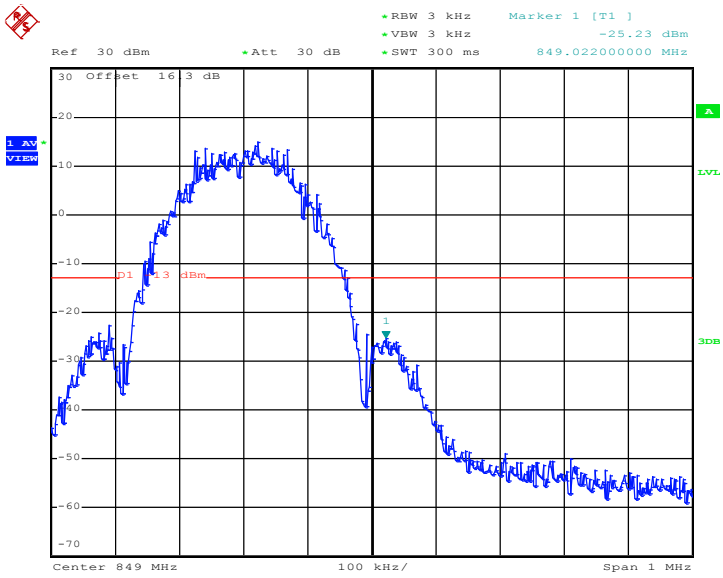


1. Correction Factor(dB)= 10log(1% Emission BW/RBW)

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

Band :	GSM850	Test Mode :	EDGE class 8 Link (8PSK)
Correction Factor :	0.09 dB	Maximum 26dB Bandwidth :	0.306MHz
Band Edge :	-25.14dBm	Measurement Value :	-25.23dBm

Higher Band Edge Plot on Channel 251 (848.8 MHz)



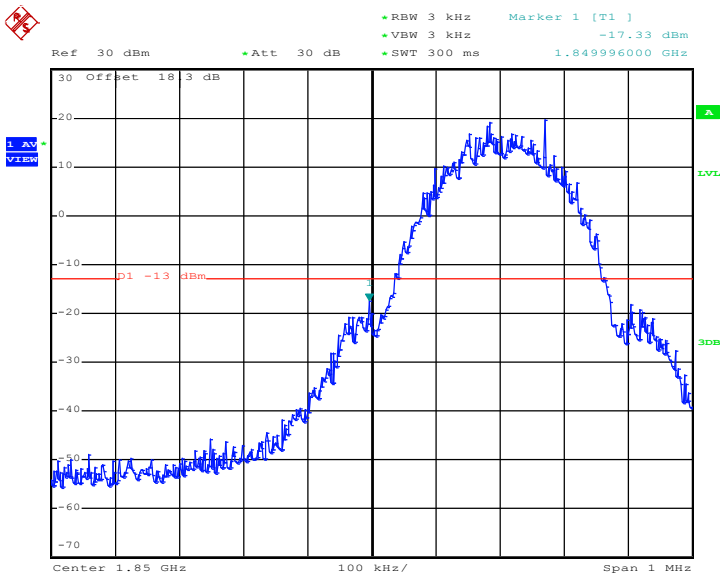
Date: 19.JUN.2013 16:29:36

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

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

Band :	GSM1900	Test Mode :	GSM Link (GMSK)
Correction Factor :	0.20dB	Maximum 26dB Bandwidth :	0.314MHz
Band Edge :	-17.13dBm	Measurement Value :	-17.33dBm

Lower Band Edge Plot on Channel 512 (1850.2 MHz)



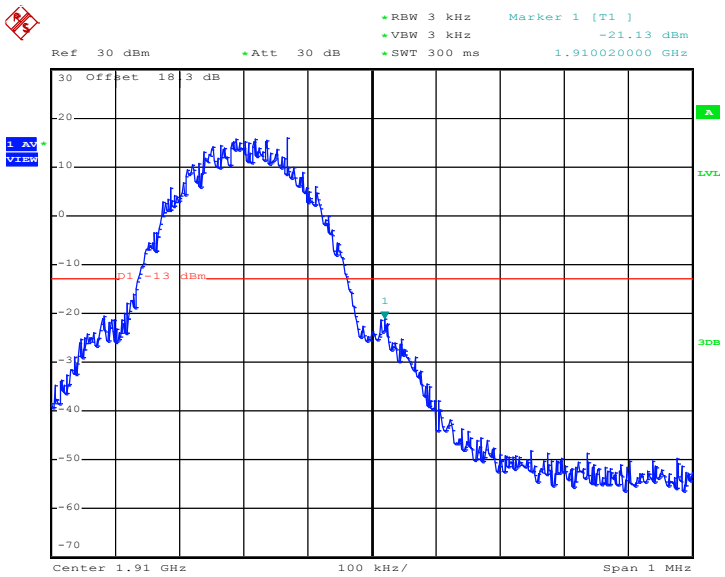
Date: 19.JUN.2013 17:11:33

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

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

Band :	GSM1900	Test Mode :	GSM Link (GMSK)
Correction Factor :	0.20dB	Maximum 26dB Bandwidth :	0.314MHz
Band Edge :	-20.93dBm	Measurement Value :	-21.13dBm

Higher Band Edge Plot on Channel 810 (1909.8 MHz)



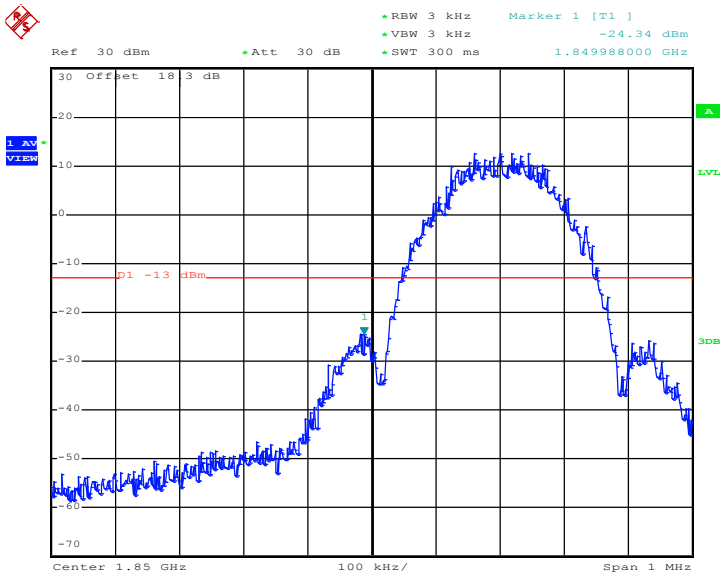
Date: 19.JUN.2013 17:11:59

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

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

Band :	GSM1900	Test Mode :	EDGE class 8 Link (8PSK)
Correction Factor :	0.09 dB	Maximum 26dB Bandwidth :	0.306MHz
Band Edge :	-24.25 dBm	Measurement Value :	-24.34dBm

Lower Band Edge Plot on Channel 512 (1850.2 MHz)



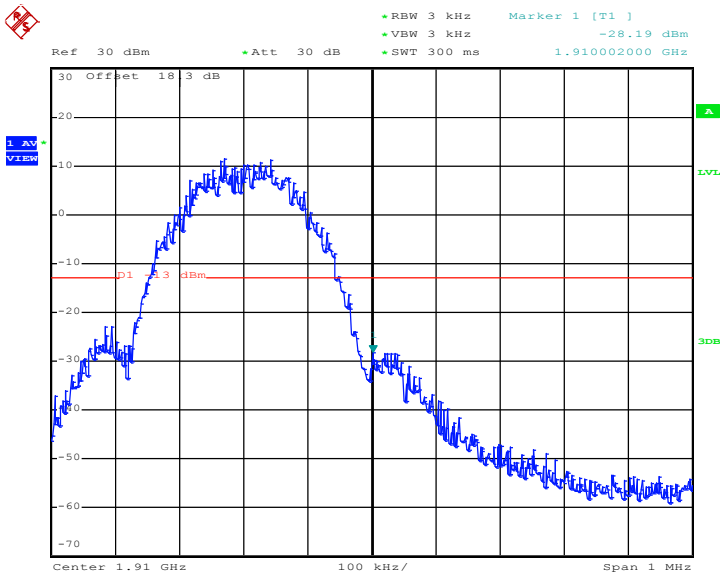
Date: 19.JUN.2013 17:32:02

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

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

Band :	GSM1900	Test Mode :	EDGE class 8 Link (8PSK)
Correction Factor :	0.09 dB	Maximum 26dB Bandwidth :	0.306MHz
Band Edge :	-28.10 dBm	Measurement Value :	-28.19dBm

Higher Band Edge Plot on Channel 810 (1909.8 MHz)



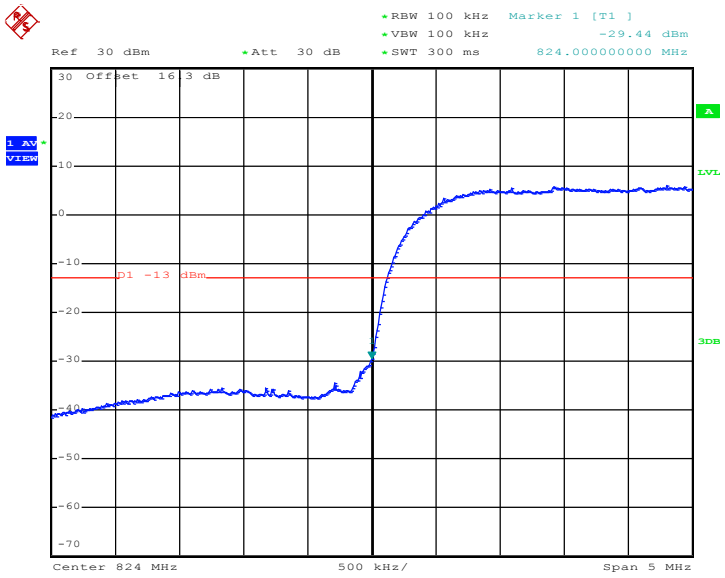
Date: 19.JUN.2013 17:30:45

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 (QPSK)
Correction Factor :	-3.30 dB	Maximum 26dB Bandwidth :	4.68MHz
Band Edge :	-32.74 dBm	Measurement Value :	-29.44 dBm

Lower Band Edge Plot on Channel 4132 (826.4 MHz)



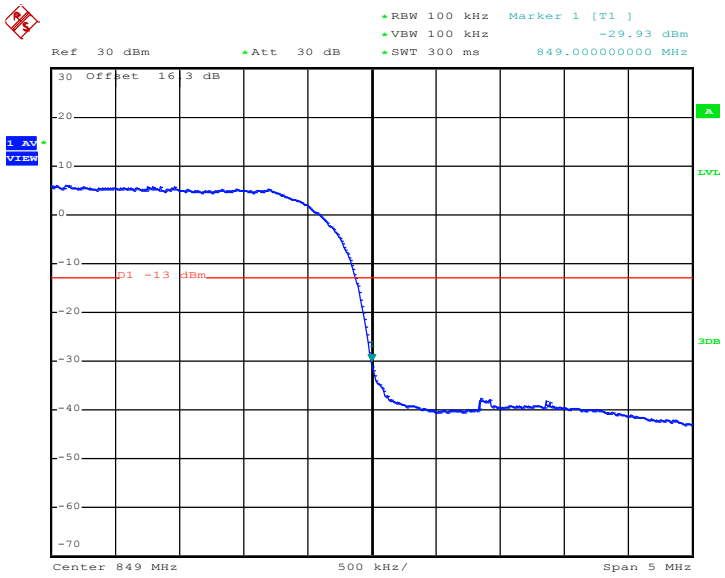
Date: 19.JUN.2013 18:51:17

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 (QPSK)
Correction Factor :	-3.30 dB	Maximum 26dB Bandwidth :	4.68MHz
Band Edge :	-33.23 dBm	Measurement Value :	-29.93 dBm

Higher Band Edge Plot on Channel 4233 (846.6 MHz)

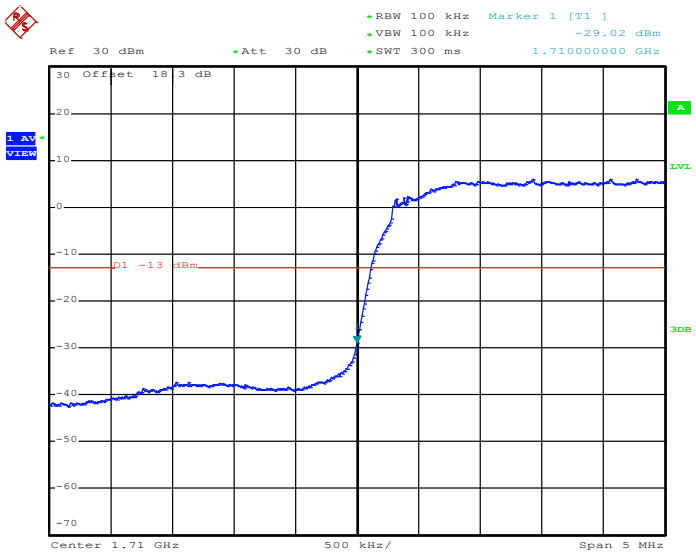


1. Correction Factor(dB)= 10log(1% Emission BW/RBW)

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

Band :	WCDMA Band IV	Test Mode :	RMC 12.2Kbps Link (QPSK)
Correction Factor :	-3.30 dB	Maximum 26dB Bandwidth :	4.68 MHz
Band Edge :	-32.32 dBm	Measurement Value :	-29.02 dBm

Lower Band Edge Plot on Channel 1312 (1712.4 MHz)



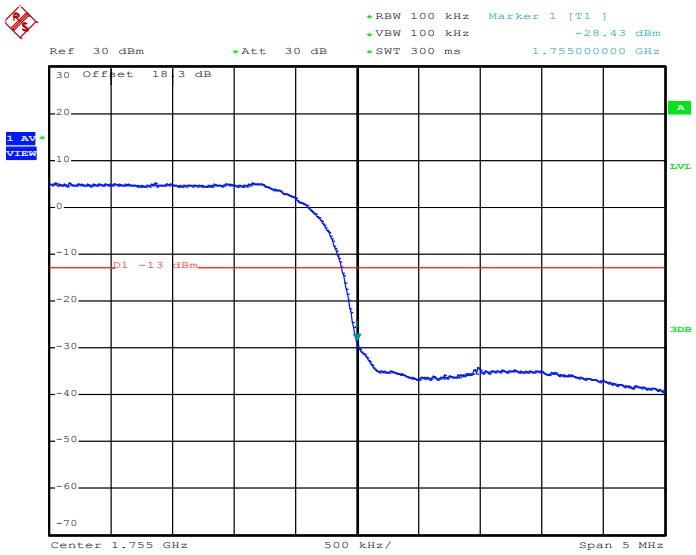
Date: 19.JUN.2013 18:32:09

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

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

Band :	WCDMA Band IV	Test Mode :	RMC 12.2Kbps Link (QPSK)
Correction Factor :	-3.30 dB	Maximum 26dB Bandwidth :	4.68 MHz
Band Edge :	-31.73 dBm	Measurement Value :	-28.43 dBm

Higher Band Edge Plot on Channel 1513 (1752.6 MHz)



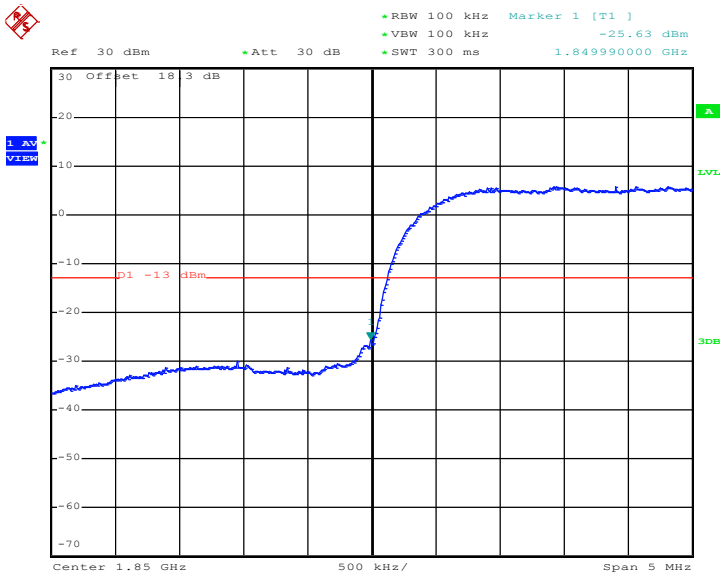
Date: 19.JUN.2013 18:32:35

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

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

Band :	WCDMA Band II	Test Mode :	RMC 12.2Kbps Link (QPSK)
Correction Factor :	-3.30 dB	Maximum 26dB Bandwidth :	4.68MHz
Band Edge :	-28.93 dBm	Measurement Value :	-25.63 dBm

Lower Band Edge Plot on Channel 9262 (1852.4 MHz)



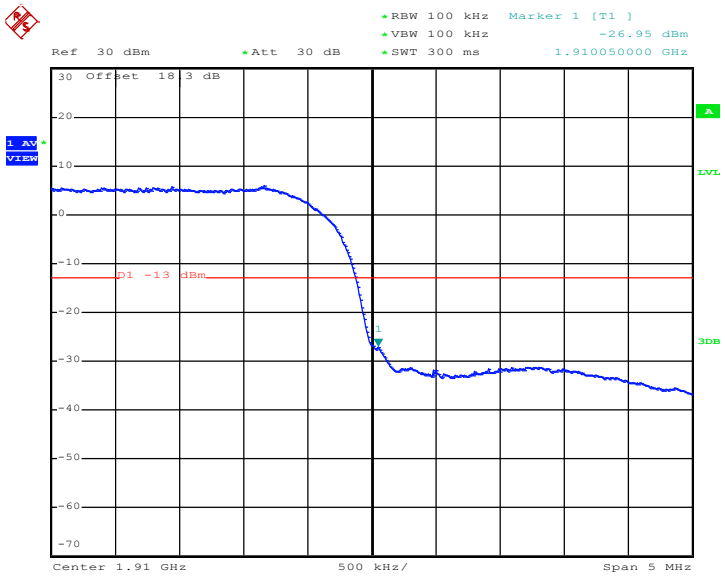
Date: 19.JUN.2013 18:07:40

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

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

Band :	WCDMA Band II	Test Mode :	RMC 12.2Kbps Link (QPSK)
Correction Factor :	-3.30 dB	Maximum 26dB Bandwidth :	4.68MHz
Band Edge :	-30.25 dBm	Measurement Value :	-26.95 dBm

Higher Band Edge Plot on Channel 9538 (1907.6 MHz)



Date: 19.JUN.2013 18:08:06

1. Correction Factor(dB)= 10log(1% 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 10^{th} harmonic.

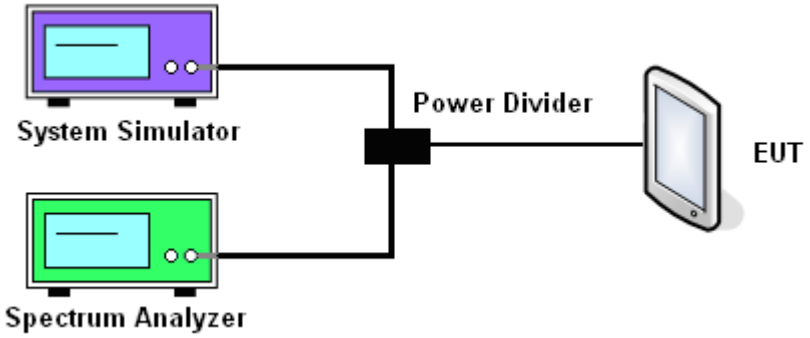
3.6.2 Measuring Instruments

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.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)
   = P(W) - [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.

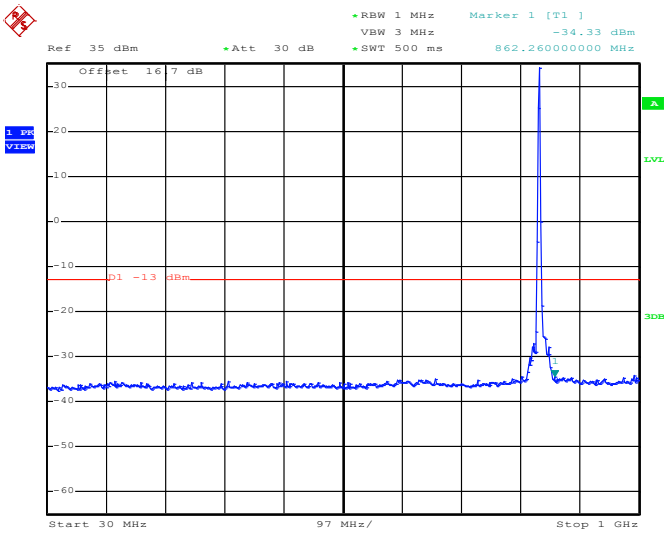
3.6.4 Test Setup



3.6.5 Test Result (Plots) of Conducted Emission

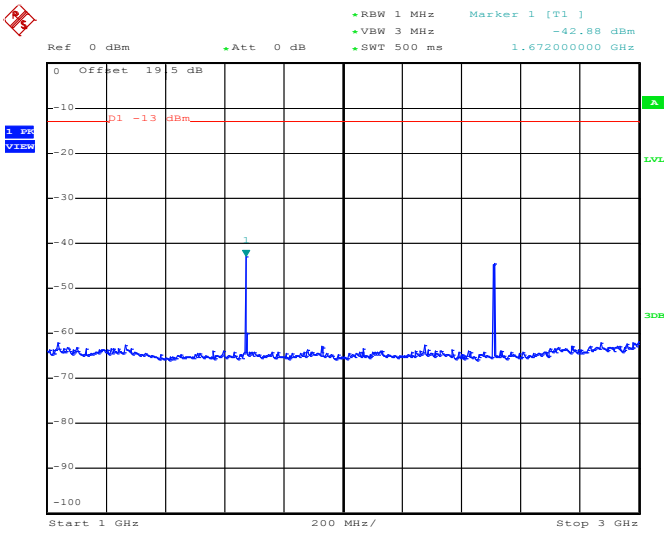
Band :	GSM850	Channel :	CH189
Test Mode :	GSM Link (GMSK)	Frequency :	836.4 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



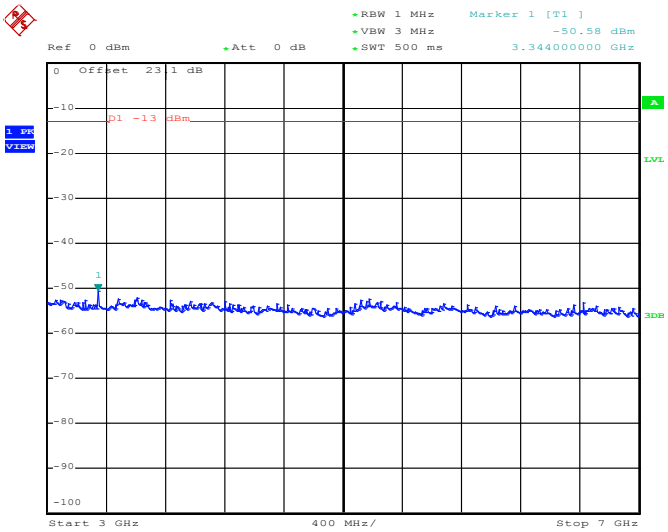
Date: 19.JUN.2013 15:34:22

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



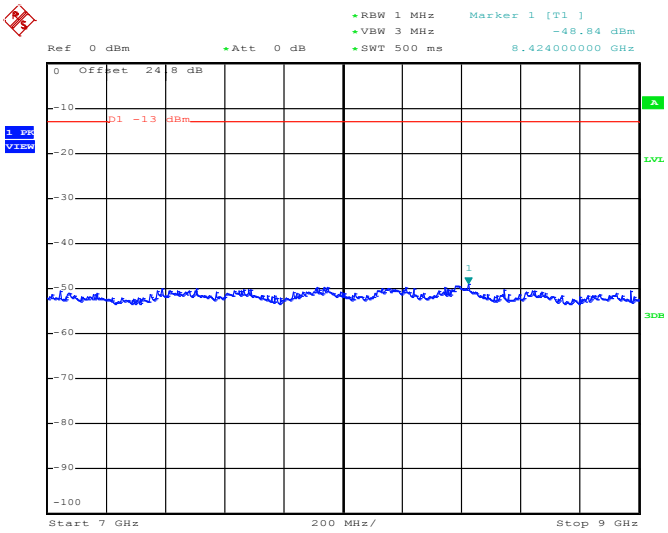
Date: 19.JUN.2013 15:24:48

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 19.JUN.2013 15:25:00

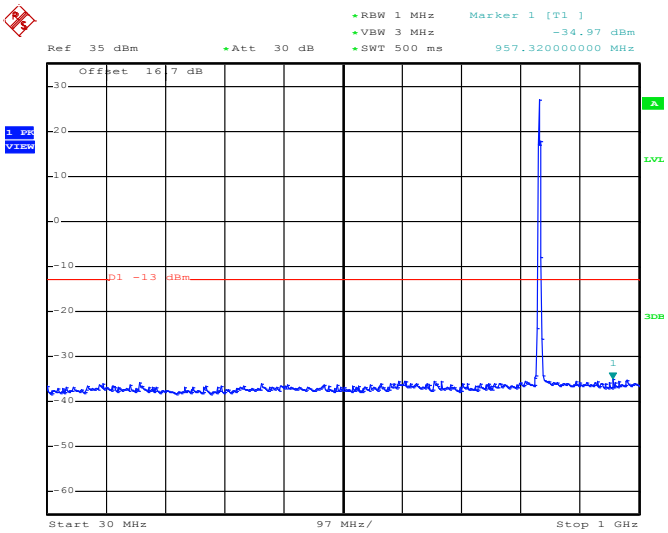
Conducted Spurious Emission Plot between 7GHz ~ 9GHz



Date: 19.JUN.2013 15:25:13

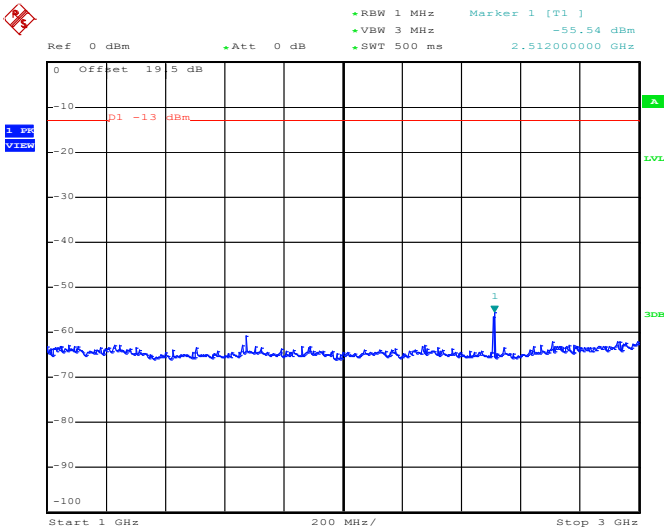
Band :	GSM850	Channel :	CH189
Test Mode :	EDGE class 8 Link (8PSK)	Frequency :	836.4 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



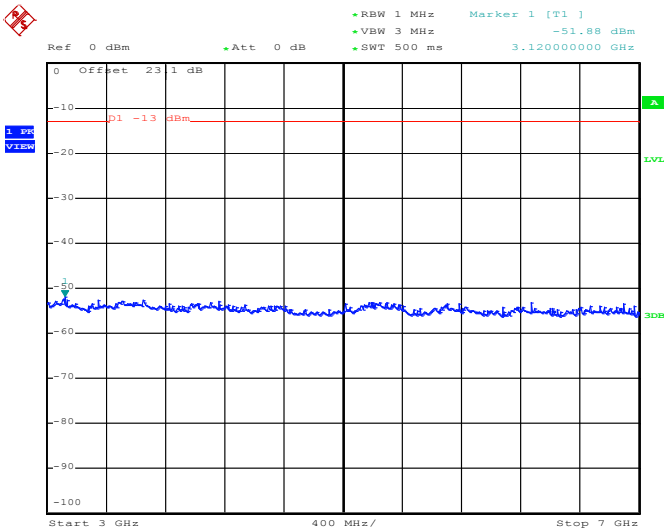
Date: 19.JUN.2013 16:17:16

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



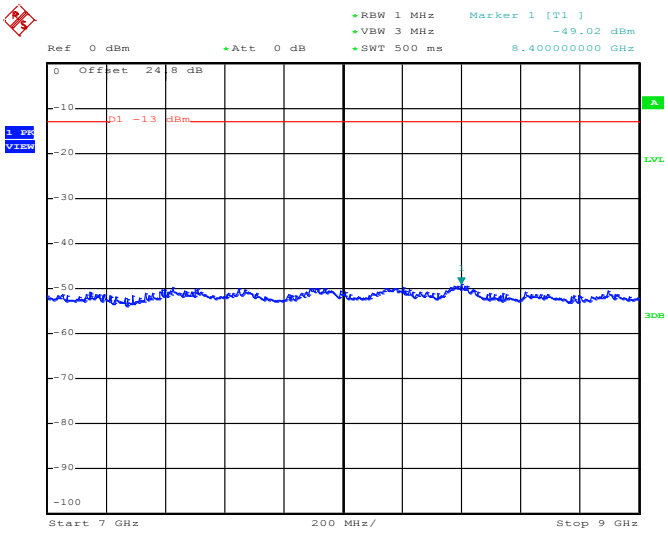
Date: 19.JUN.2013 16:17:33

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 19.JUN.2013 16:17:45

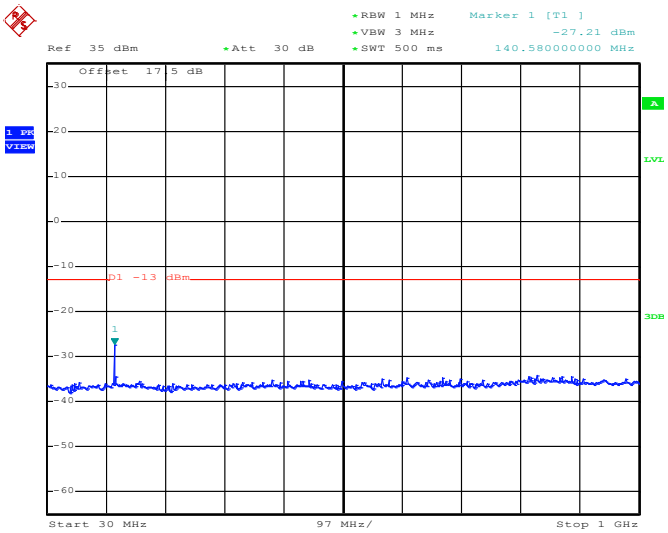
Conducted Spurious Emission Plot between 7GHz ~ 9GHz



Date: 19.JUN.2013 16:17:57

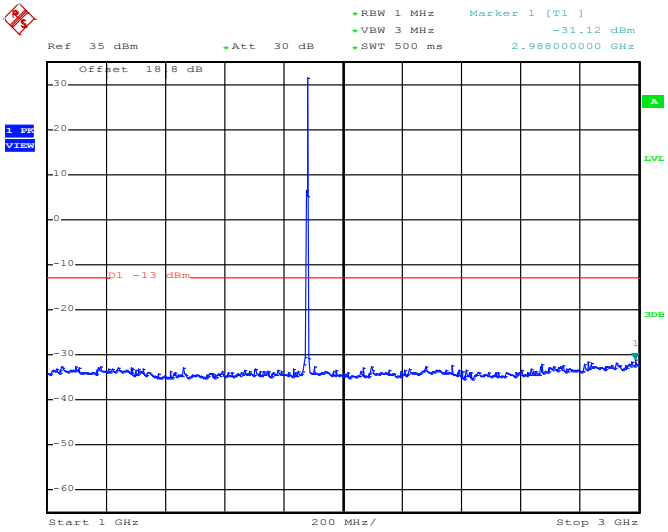
Band :	GSM1900	Channel :	CH661
Test Mode :	GSM Link (GMSK)	Frequency :	1880.0 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



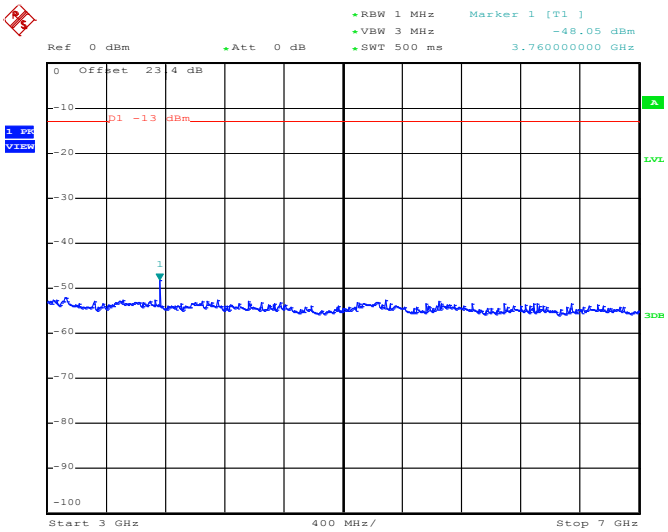
Date: 19.JUN.2013 17:04:22

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



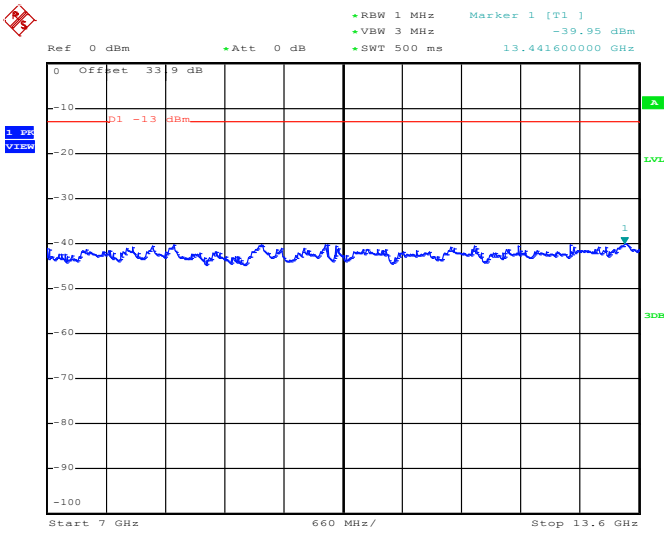
Date: 19.JUN.2013 17:04:35

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



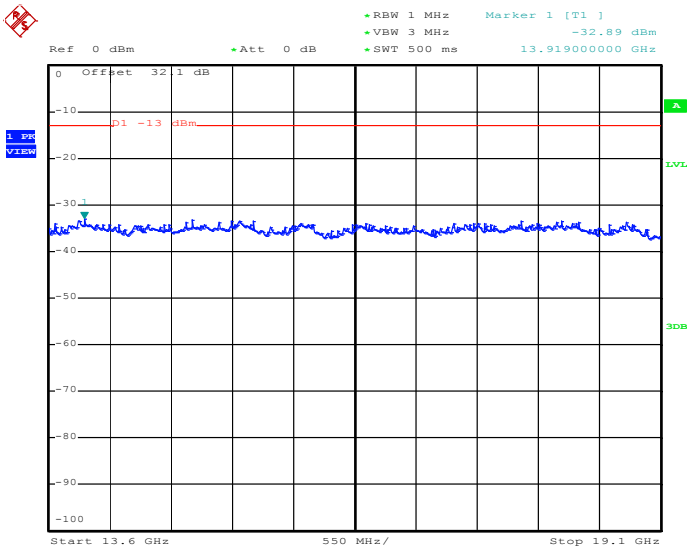
Date: 19.JUN.2013 17:04:52

Conducted Spurious Emission Plot between 7GHz ~ 13.6G



Date: 19.JUN.2013 17:05:04

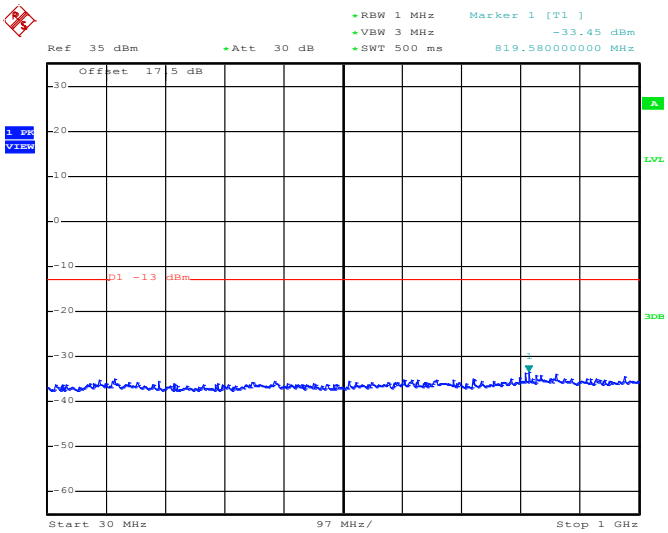
Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz



Date: 19.JUN.2013 17:05:17

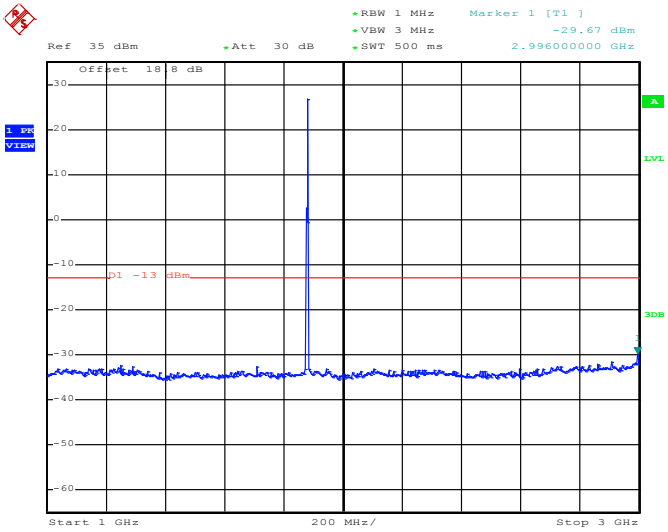
Band :	GSM1900	Channel :	CH661
Test Mode :	EDGE class 8 Link (8PSK)	Frequency :	1880.0 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



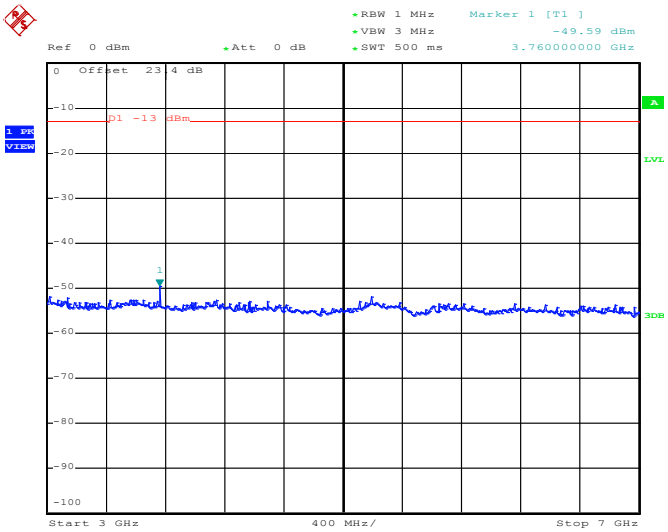
Date: 19.JUN.2013 17:18:40

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



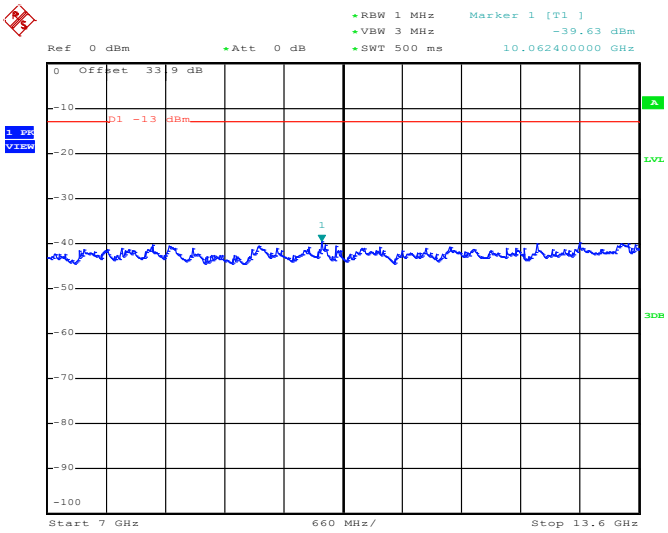
Date: 19.JUN.2013 17:18:52

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



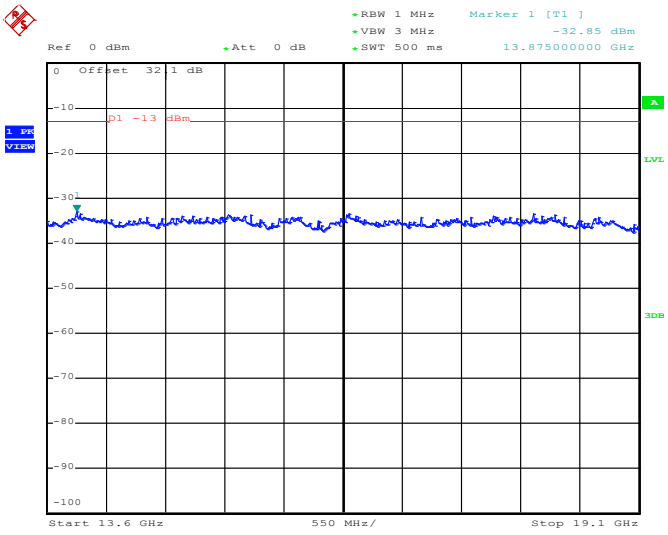
Date: 19.JUN.2013 17:19:09

Conducted Spurious Emission Plot between 7GHz ~ 13.6GHz



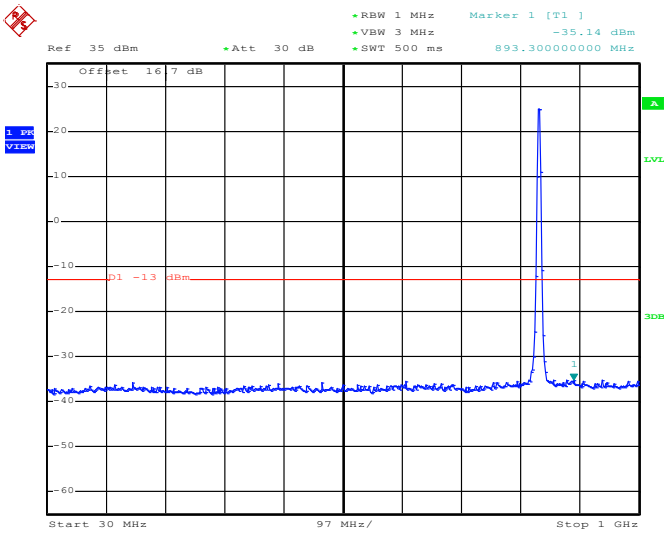
Date: 19.JUN.2013 17:19:21

Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz



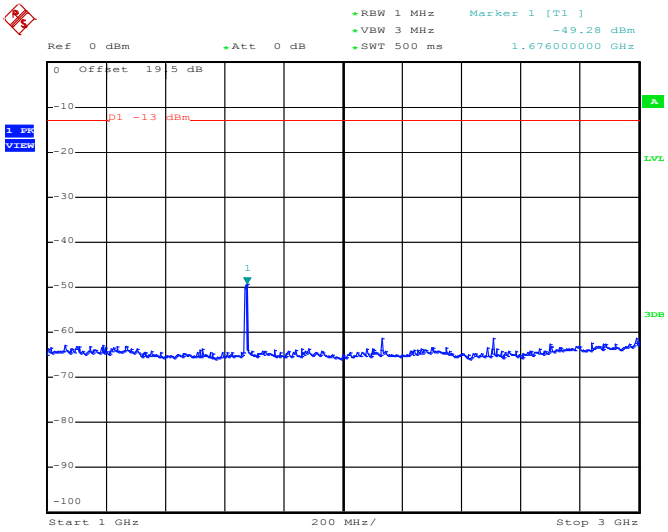
Band :	WCDMA Band V	Channel :	CH4182
Test Mode :	RMC 12.2Kbps Link (QPSK)	Frequency :	836.4 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



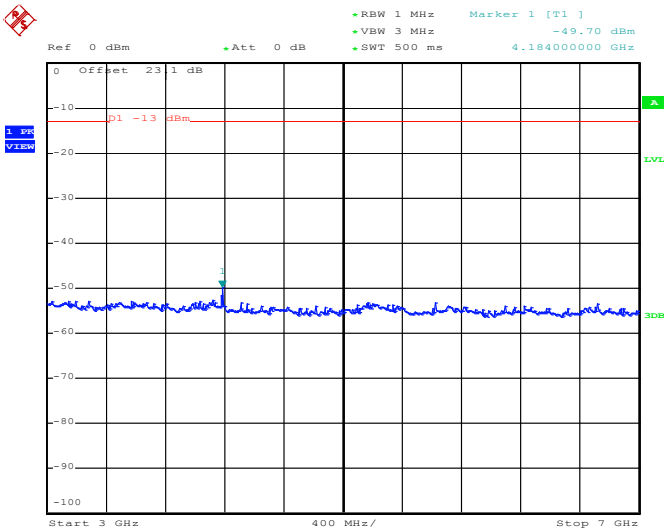
Date: 19.JUN.2013 18:46:31

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



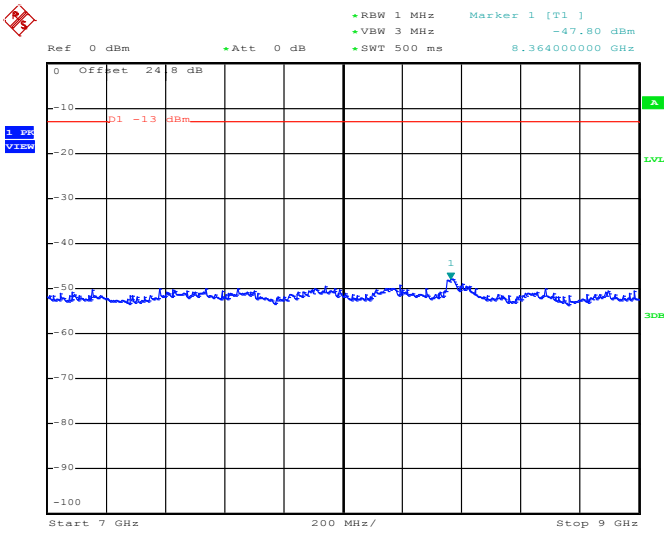
Date: 19.JUN.2013 18:46:48

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 19.JUN.2013 18:47:00

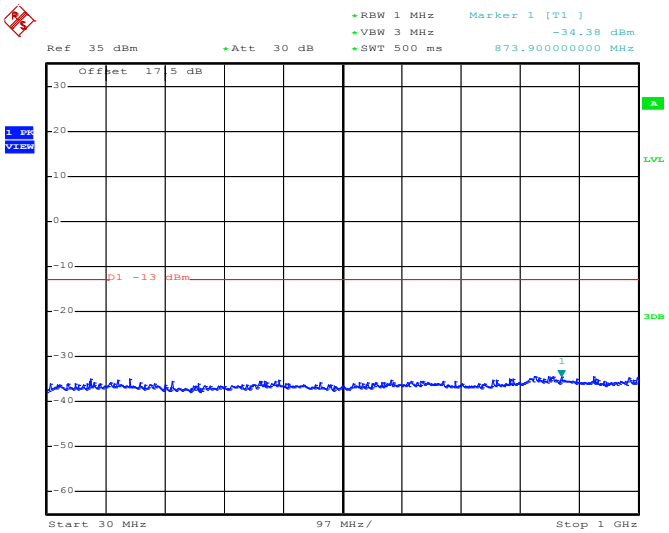
Conducted Spurious Emission Plot between 7GHz ~ 9GHz



Date: 19.JUN.2013 18:47:13

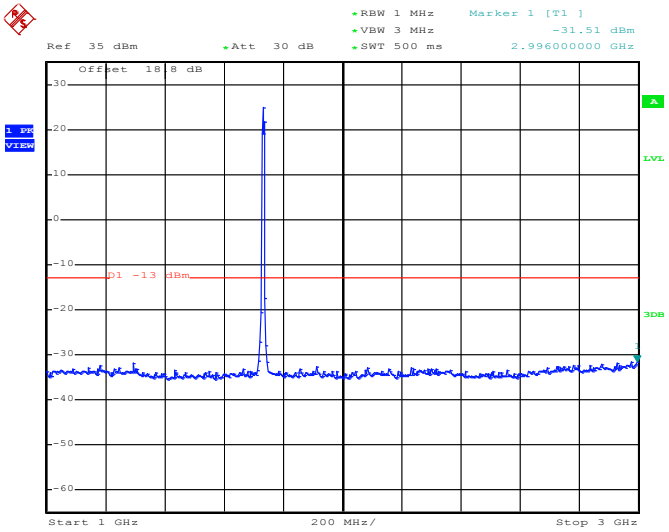
Band :	WCDMA Band IV	Channel :	CH1413
Test Mode :	RMC 12.2Kbps Link (QPSK)	Frequency :	1732.6 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



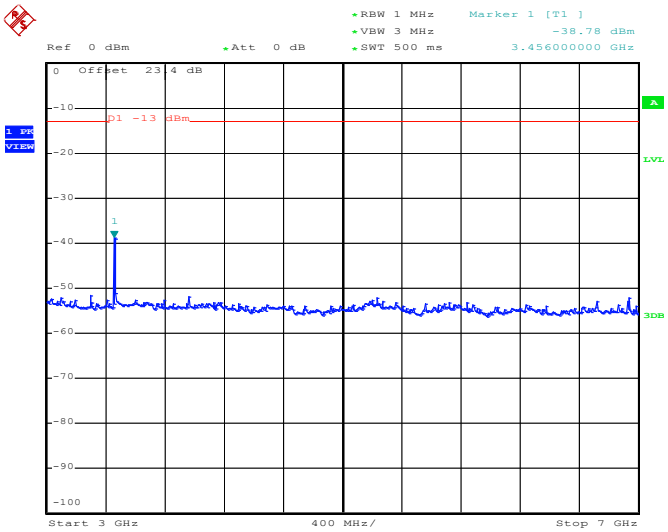
Date: 19.JUN.2013 18:26:56

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



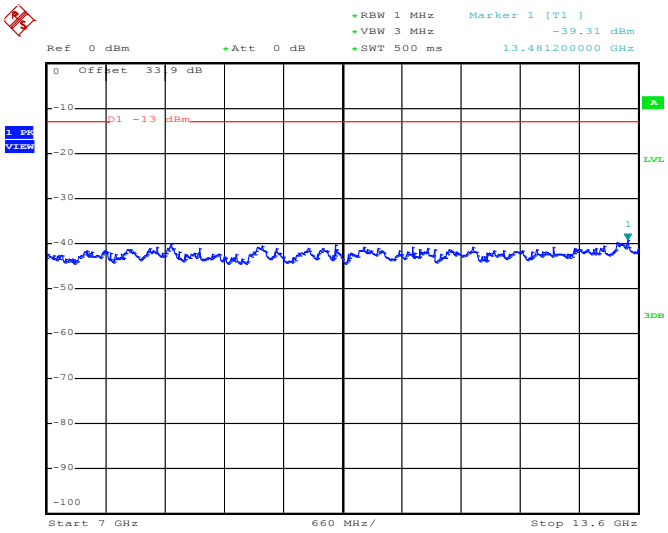
Date: 19.JUN.2013 18:27:08

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



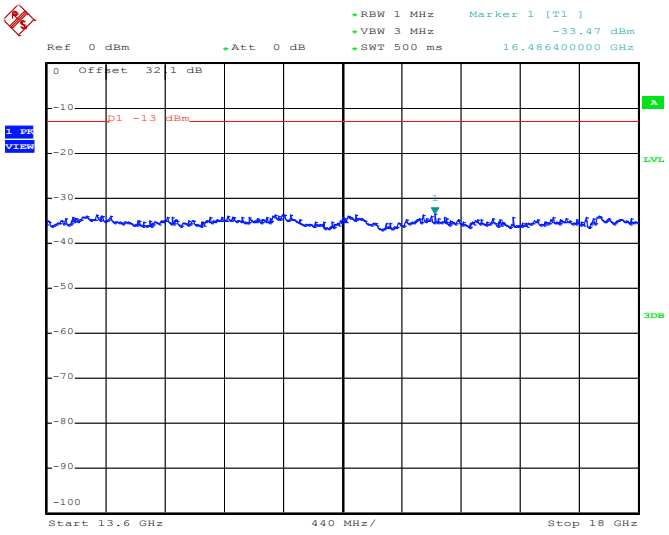
Date: 19.JUN.2013 18:27:25

Conducted Spurious Emission Plot between 7GHz ~ 13.6GHz



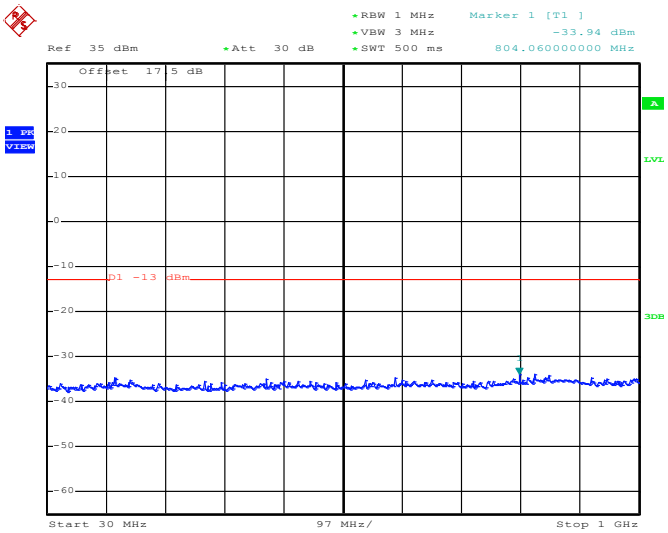
Date: 19.JUN.2013 18:27:37

Conducted Spurious Emission Plot between 13.6GHz ~ 18GHz



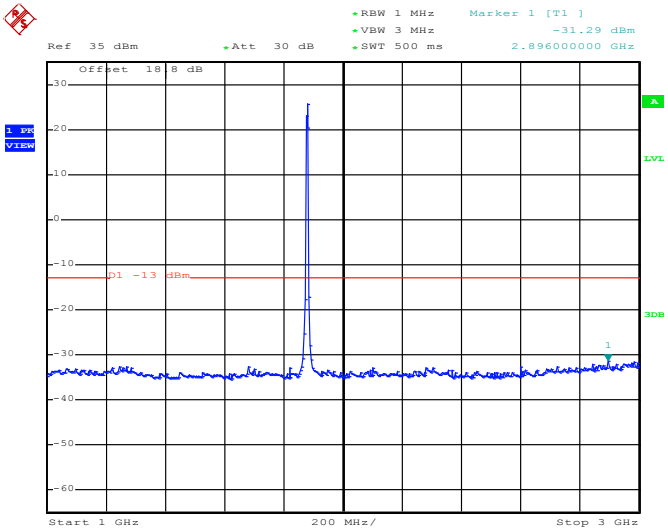
Band :	WCDMA Band II	Channel :	CH9400
Test Mode :	RMC 12.2Kbps Link (QPSK)	Frequency :	1880.0 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



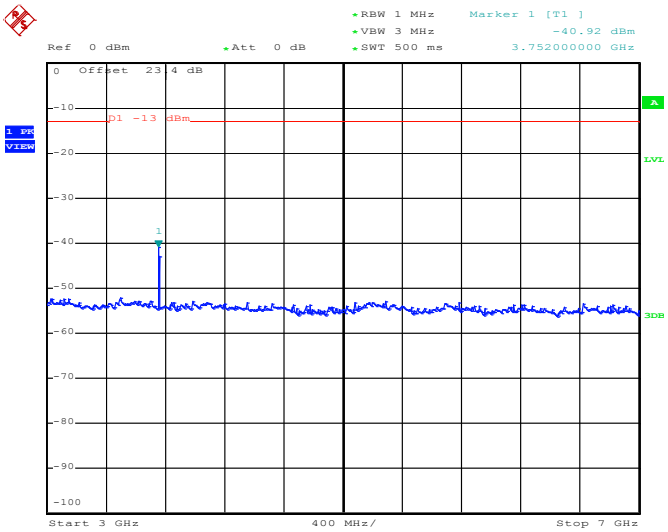
Date: 19.JUN.2013 18:02:30

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



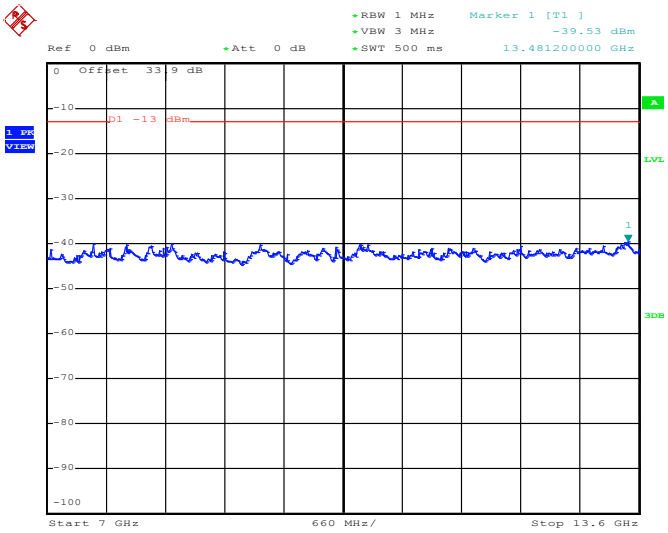
Date: 19.JUN.2013 18:02:42

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



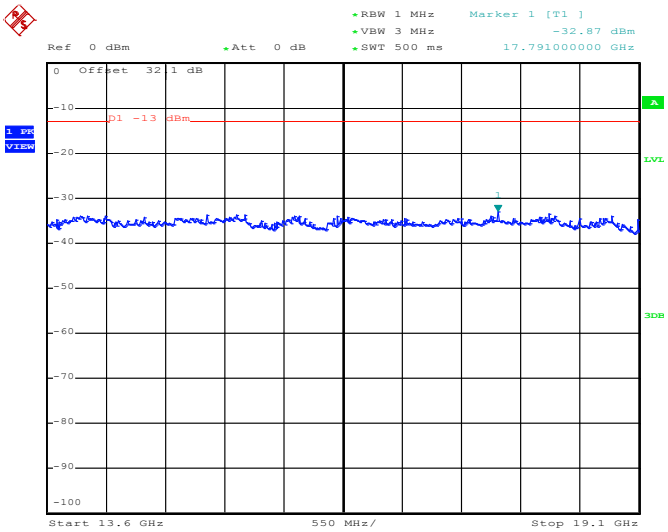
Date: 19.JUN.2013 18:02:59

Conducted Spurious Emission Plot between 7GHz ~ 13.6GHz



Date: 19.JUN.2013 18:03:12

Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz



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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

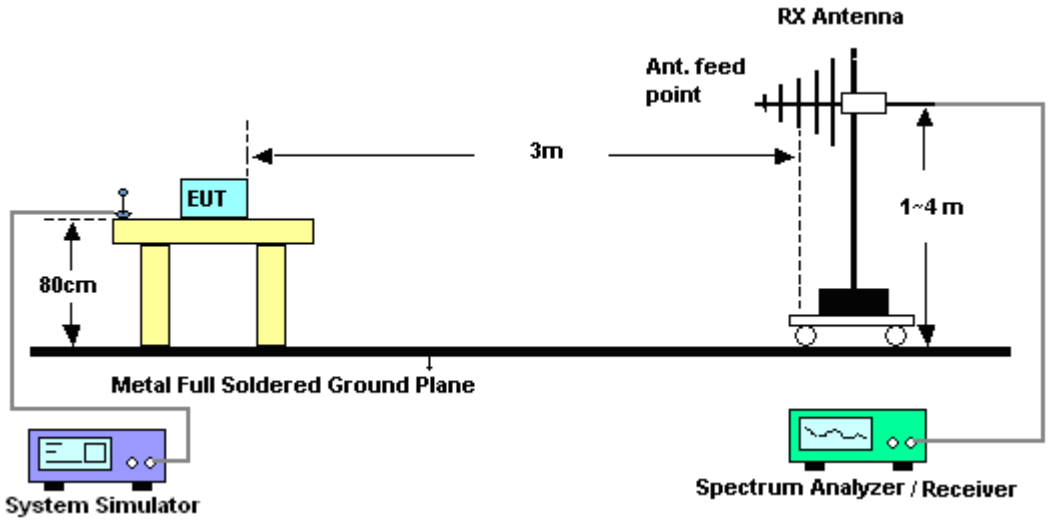
See list of measuring instruments of this test report.

3.7.3 Test Procedures

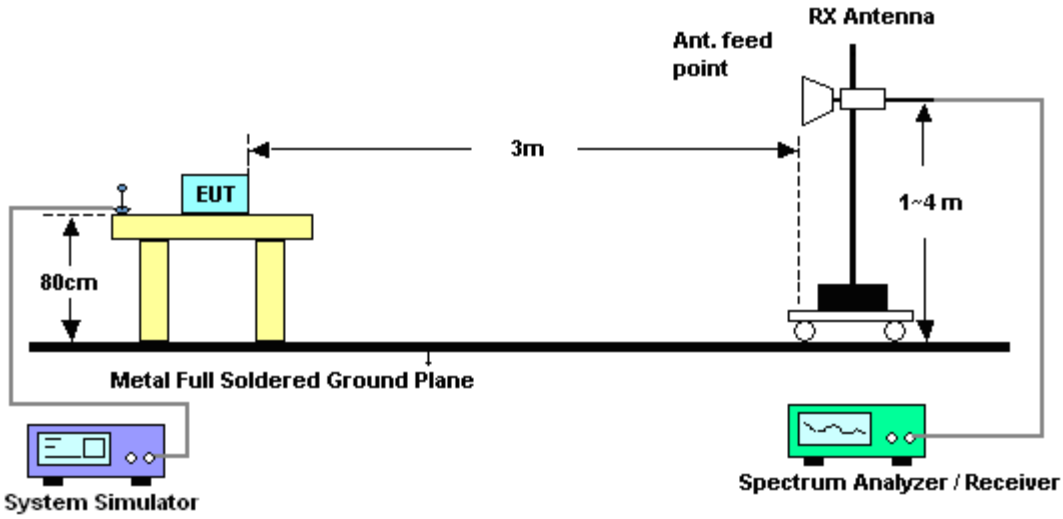
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving 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. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
11. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)
    = P(W) - [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.
12. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
13. ERP (dBm) = EIRP - 2.15

3.7.4 Test Setup

For radiated emissions from 30MHz to 1GHz

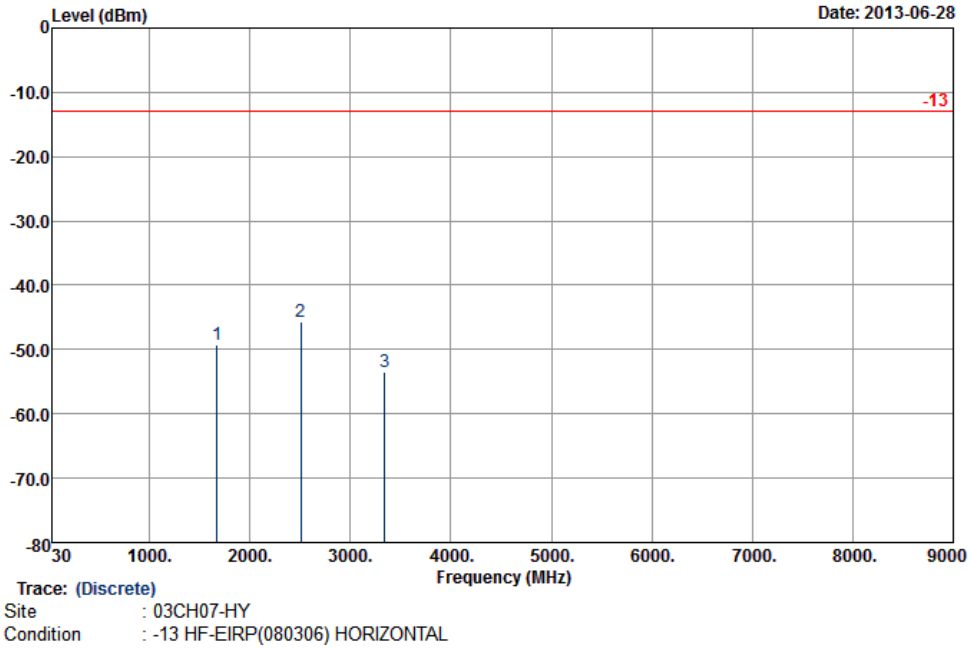


For radiated emissions above 1GHz



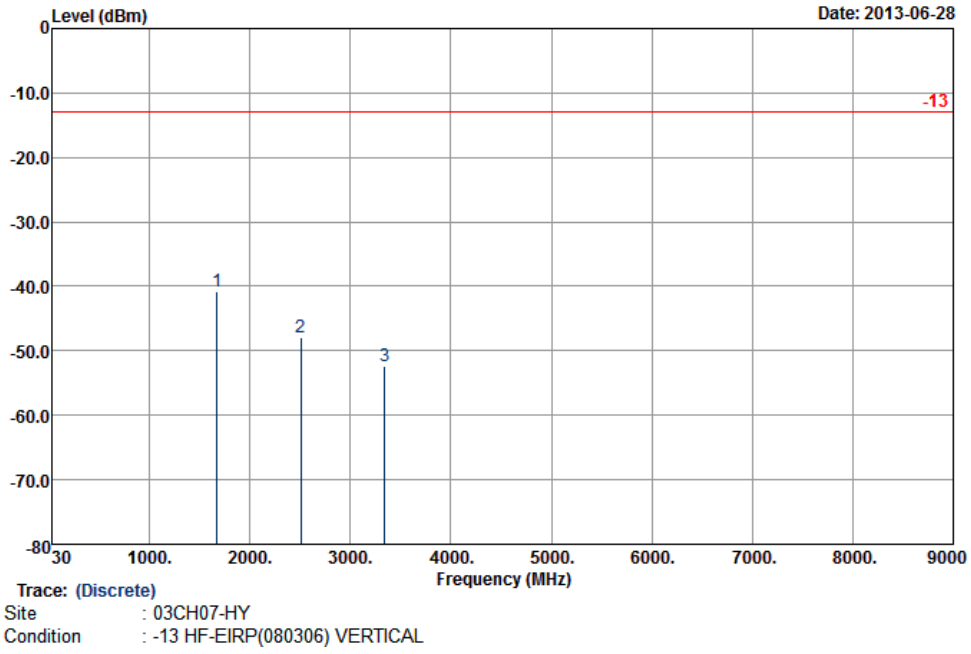
3.7.5 Test Result of Field Strength of Spurious Radiated

Band :	GSM850	**Temperature :**	23~25°C
Test Mode :	GSM Link (GMSK) for Sample 1 with Battery 2	**Relative Humidity :**	49~51%
Test Engineer :	Eric Shih	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



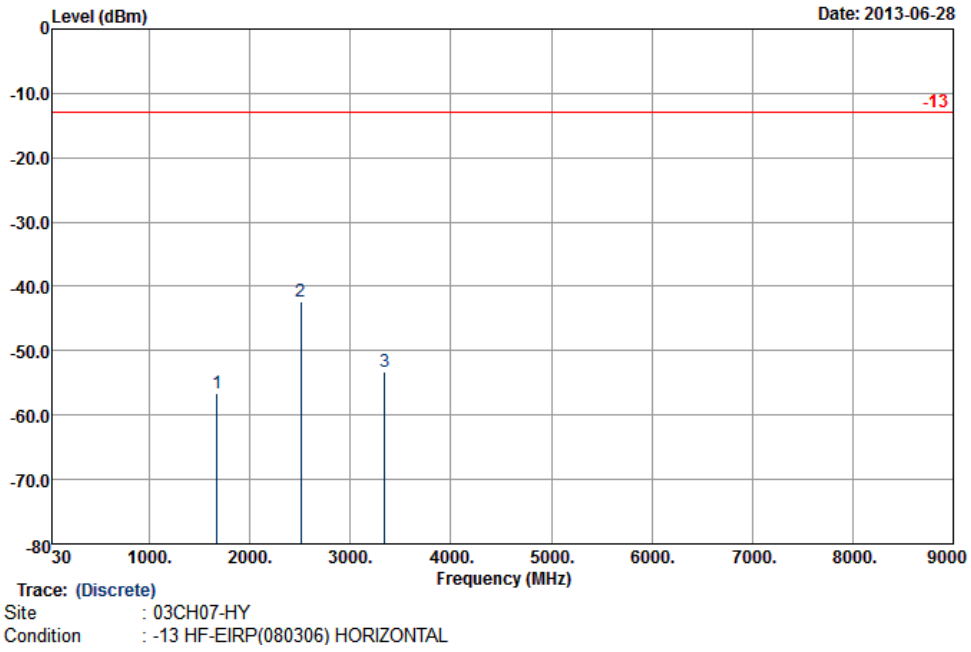
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-49.25	-13	-36.25	-58.17	-50.97	1.62	5.49	H	Pass
2509	-45.73	-13	-32.73	-59.02	-47.7	2.1	6.22	H	Pass
3345	-53.49	-13	-40.49	-67.59	-56.38	3.03	8.07	H	Pass

Band :	GSM850	**Temperature :**	23~25°C
Test Mode :	GSM Link (GMSK) for Sample 1 with Battery 2	**Relative Humidity :**	49~51%
Test Engineer :	Eric Shih	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



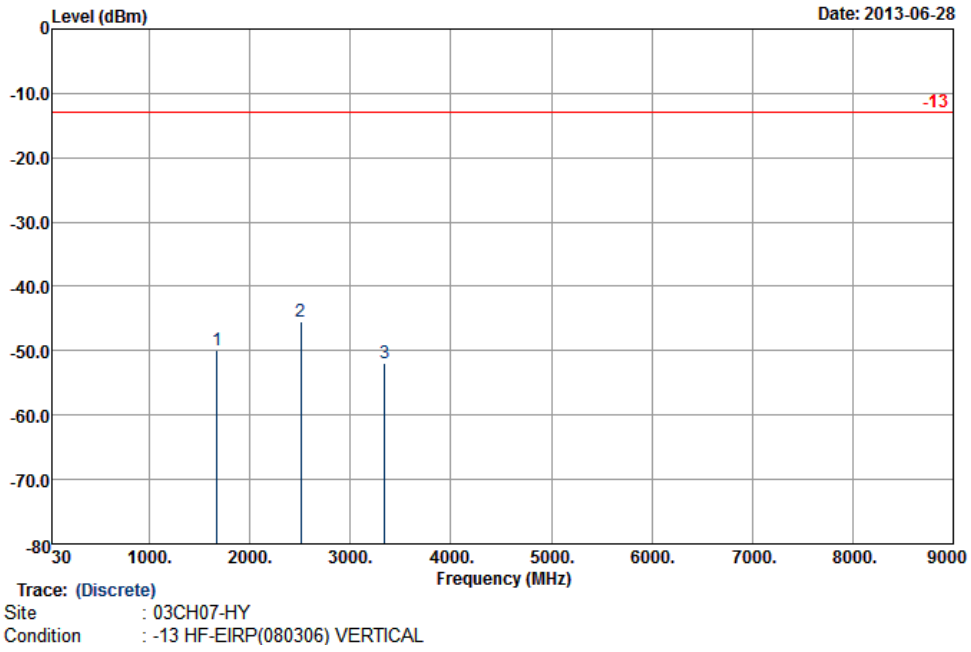
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-40.81	-13	-27.81	-51.97	-42.53	1.62	5.49	V	Pass
2509	-48.02	-13	-35.02	-61.76	-49.99	2.1	6.22	V	Pass
3345	-52.43	-13	-39.43	-68.02	-55.32	3.03	8.07	V	Pass

Band :	GSM850	Temperature :	23~25°C
Test Mode :	EDGE class 8 Link (8PSK) for Sample 1 with Battery 2	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



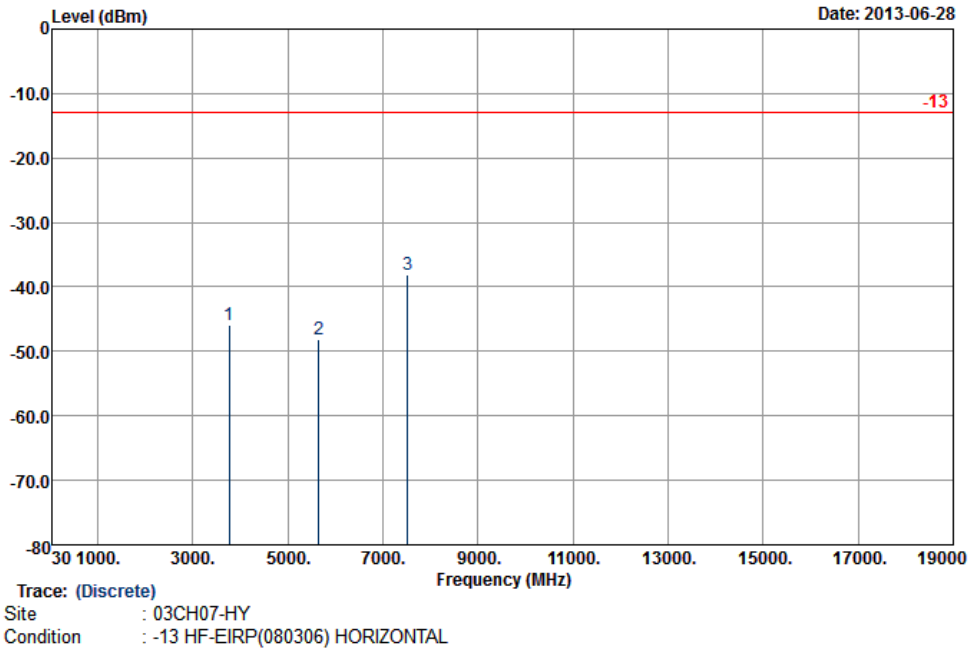
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-56.54	-13	-43.54	-65.46	-58.26	1.62	5.49	H	Pass
2509	-42.38	-13	-29.38	-55.67	-44.35	2.1	6.22	H	Pass
3345	-53.20	-13	-40.20	-67.3	-56.09	3.03	8.07	H	Pass

Band :	GSM850	**Temperature :**	23~25°C
Test Mode :	EDGE class 8 Link (8PSK) for Sample 1 with Battery 2	**Relative Humidity :**	49~51%
Test Engineer :	Eric Shih	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



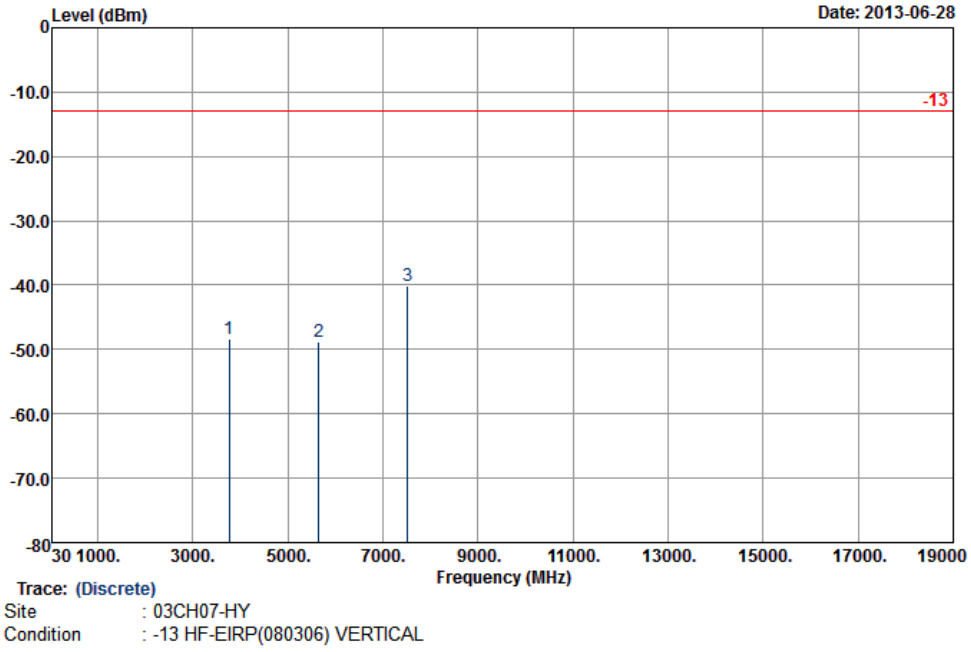
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-49.83	-13	-36.83	-60.99	-51.55	1.62	5.49	V	Pass
2509	-45.54	-13	-32.54	-59.28	-47.51	2.1	6.22	V	Pass
3345	-51.95	-13	-38.95	-67.54	-54.84	3.03	8.07	V	Pass

Band :	GSM1900	Temperature :	23~25°C
Test Mode :	GSM Link (GMSK) for Sample 1 with Battery 2	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



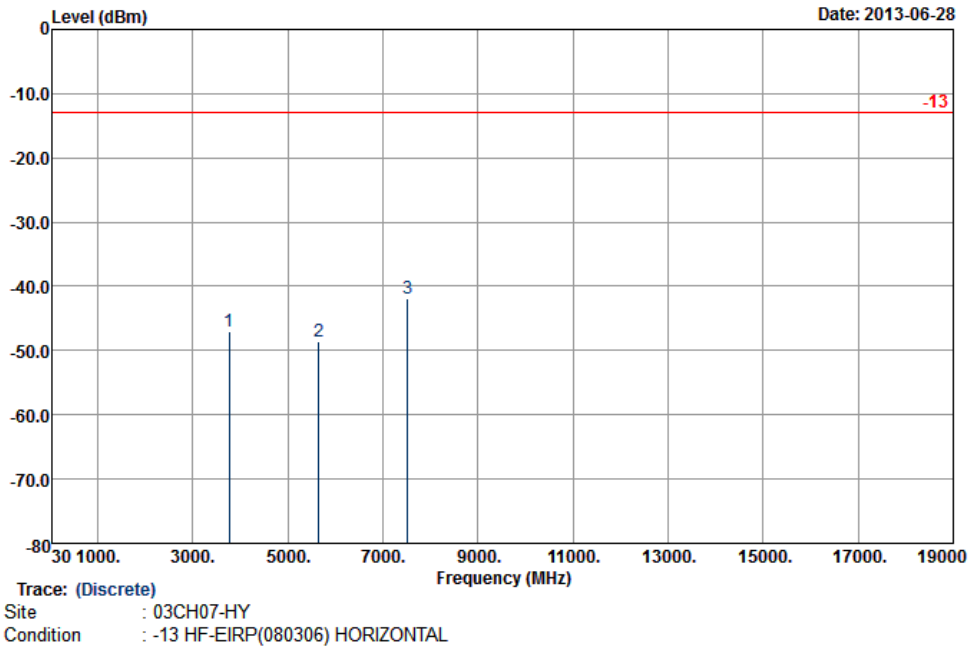
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-45.90	-13	-32.90	-61.25	-52.2	2.51	8.81	H	Pass
5640	-48.14	-13	-35.14	-68.9	-55.85	2.99	10.70	H	Pass
7520	-38.13	-13	-25.13	-65.4	-46.66	3.59	12.12	H	Pass

Band :	GSM1900	Temperature :	23~25°C
Test Mode :	GSM Link (GMSK) for Sample 1 with Battery 2	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



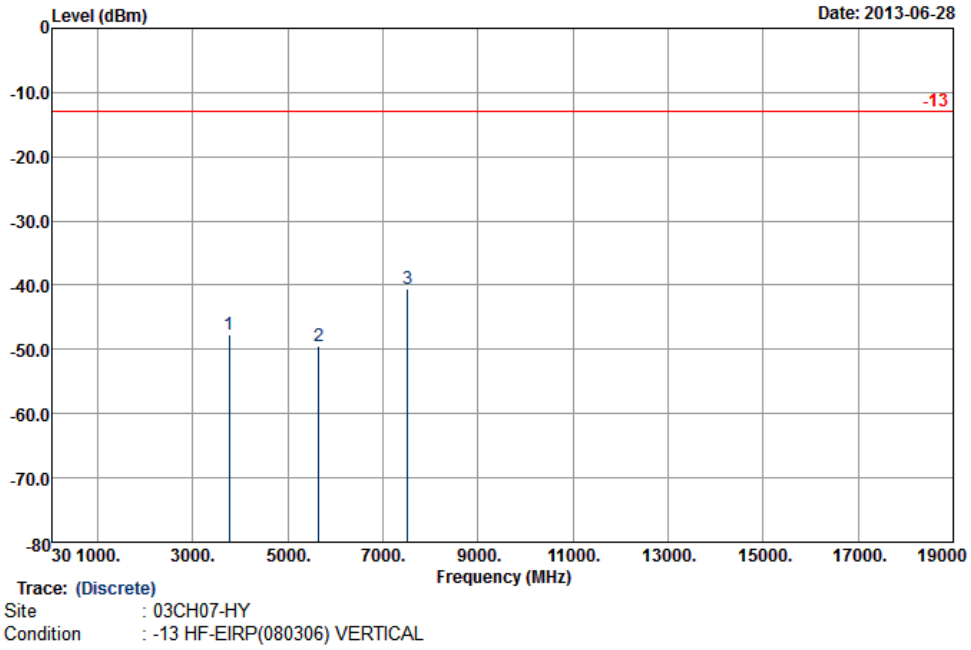
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-48.26	-13	-35.26	-64.56	-54.56	2.51	8.81	V	Pass
5640	-48.79	-13	-35.79	-69.36	-56.5	2.99	10.70	V	Pass
7520	-40.15	-13	-27.15	-67.2	-48.68	3.59	12.12	V	Pass

Band :	GSM1900	**Temperature :**	23~25°C
Test Mode :	EDGE class 8 Link (8PSK) for Sample 1 with Battery 2	**Relative Humidity :**	49~51%
Test Engineer :	Eric Shih	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



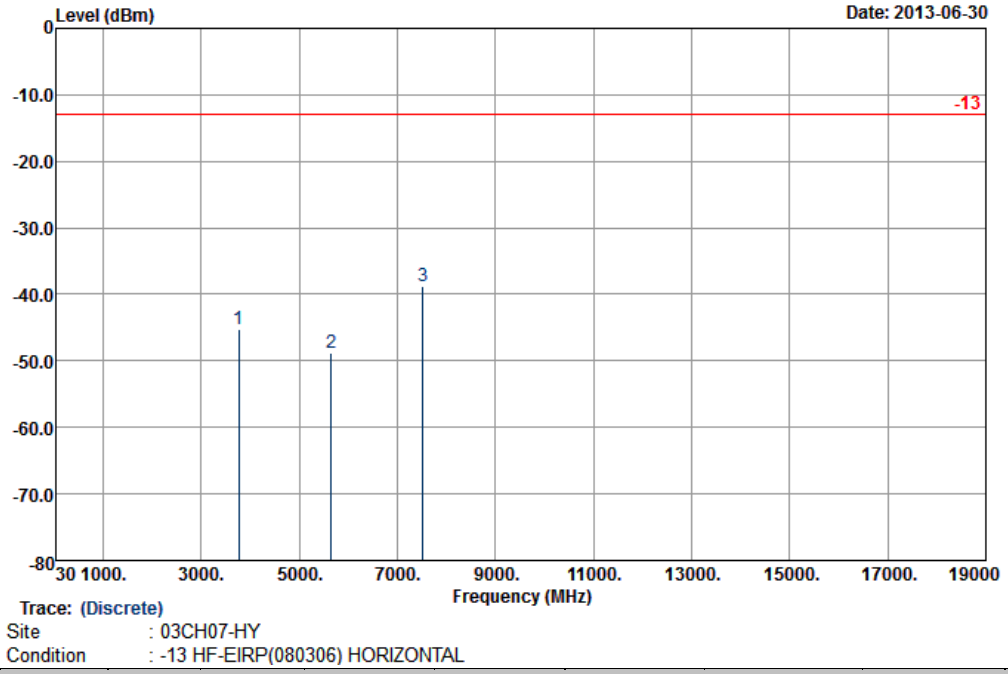
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-47.10	-13	-34.10	-62.45	-53.4	2.51	8.81	H	Pass
5640	-48.52	-13	-35.52	-69.28	-56.23	2.99	10.70	H	Pass
7520	-41.91	-13	-28.91	-69.18	-50.44	3.59	12.12	H	Pass

Band :	GSM1900	Temperature :	23~25°C
Test Mode :	EDGE class 8 Link (8PSK) for Sample 1 with Battery 2	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



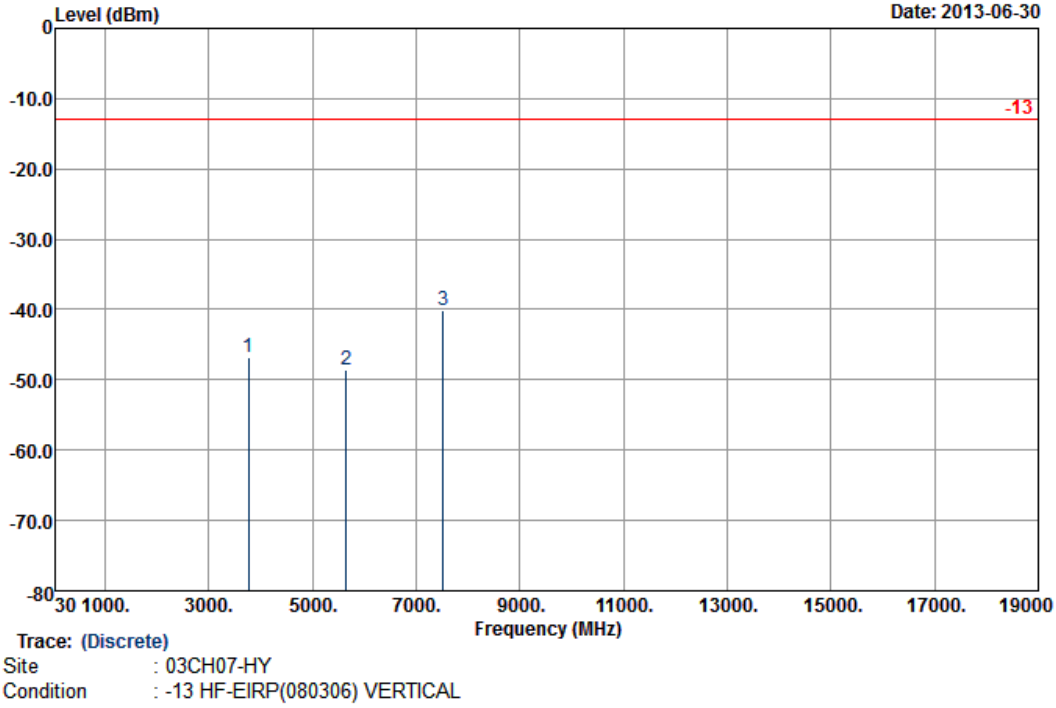
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-47.67	-13	-34.67	-63.97	-53.97	2.51	8.81	V	Pass
5640	-49.44	-13	-36.44	-70.01	-57.15	2.99	10.70	V	Pass
7520	-40.47	-13	-27.47	-67.52	-49	3.59	12.12	V	Pass

Band :	GSM1900	Temperature :	23~25°C
Test Mode :	GSM Link (GMSK) for Sample 1 with Battery 1	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



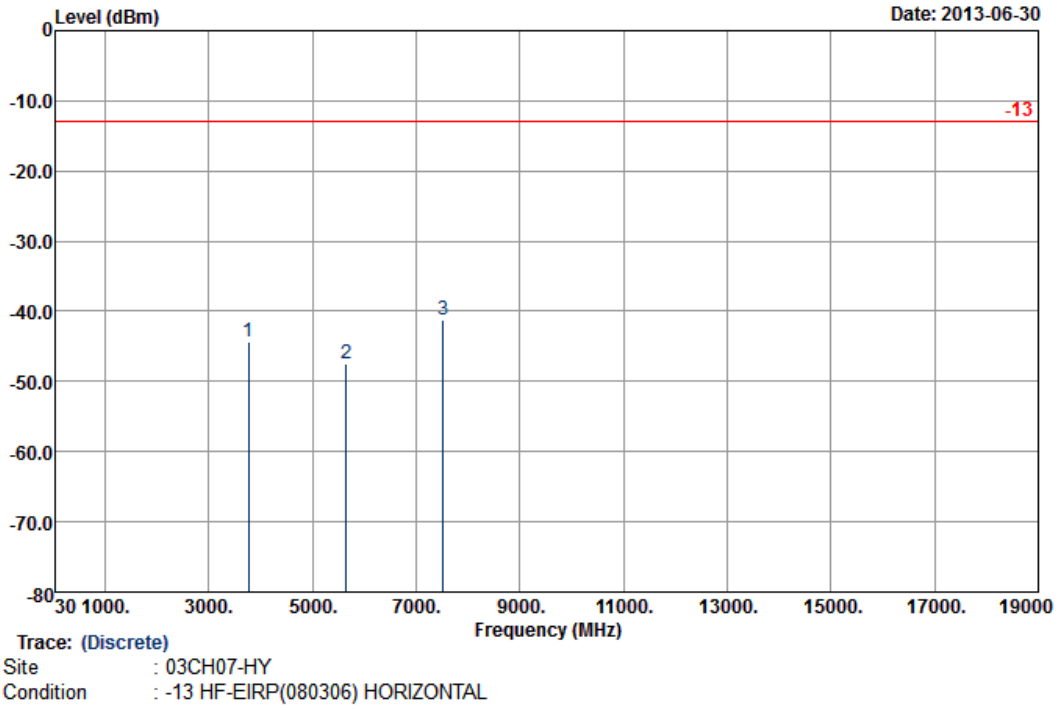
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-45.27	-13	-32.27	-60.62	-51.57	2.51	8.81	H	Pass
5640	-48.77	-13	-35.77	-69.53	-56.48	2.99	10.70	H	Pass
7520	-38.88	-13	-25.88	-66.15	-47.41	3.59	12.12	H	Pass

Band :	GSM1900	Temperature :	23~25°C
Test Mode :	GSM Link (GMSK) for Sample 1 with Battery 1	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



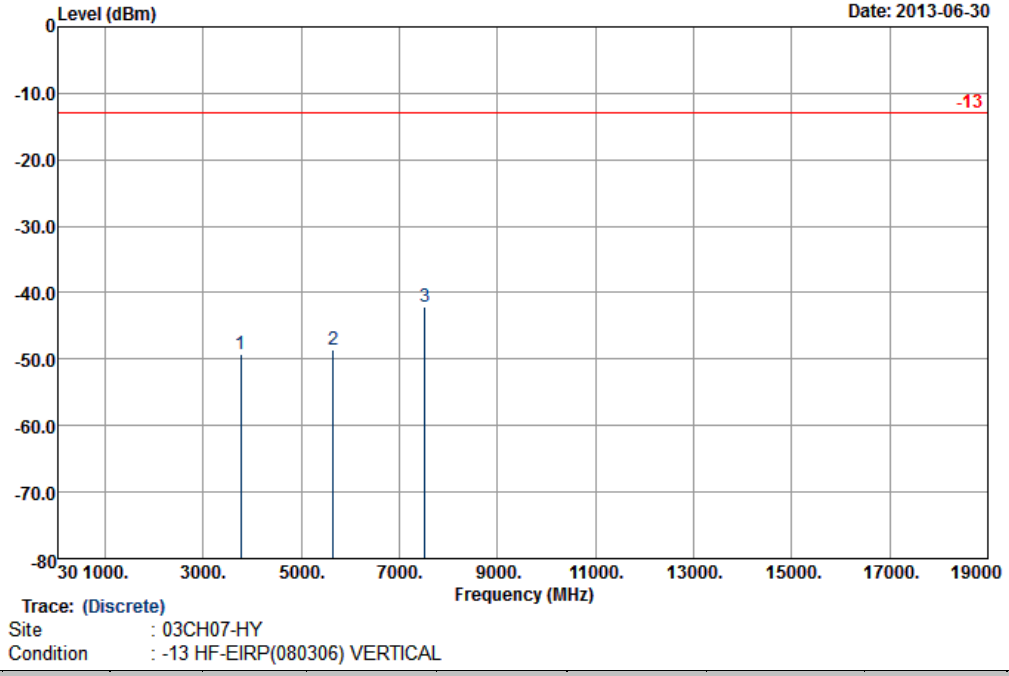
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-46.85	-13	-33.85	-63.15	-53.15	2.51	8.81	V	Pass
5640	-48.60	-13	-35.60	-69.17	-56.31	2.99	10.70	V	Pass
7520	-40.18	-13	-27.18	-67.23	-48.71	3.59	12.12	V	Pass

Band :	GSM1900	Temperature :	23~25°C
Test Mode :	GSM Link (GMSK) for Sample 2 with Battery 2	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



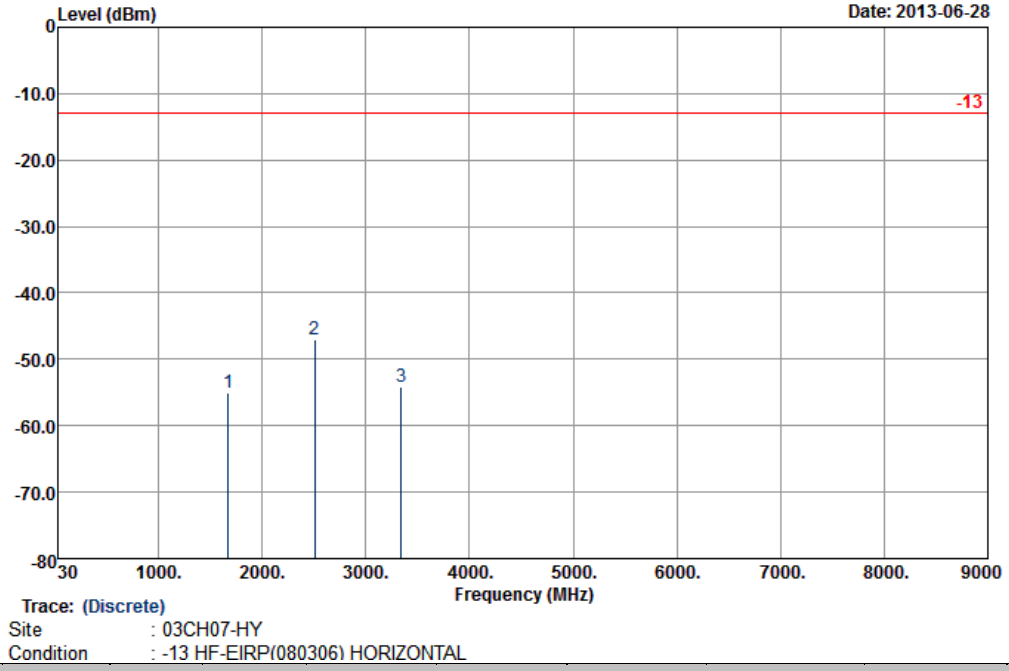
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-44.25	-13	-31.25	-59.6	-50.55	2.51	8.81	H	Pass
5640	-47.48	-13	-34.48	-68.24	-55.19	2.99	10.70	H	Pass
7520	-41.20	-13	-28.20	-68.47	-49.73	3.59	12.12	H	Pass

Band :	GSM1900	Temperature :	23~25°C
Test Mode :	GSM Link (GMSK) for Sample 2 with Battery 2	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



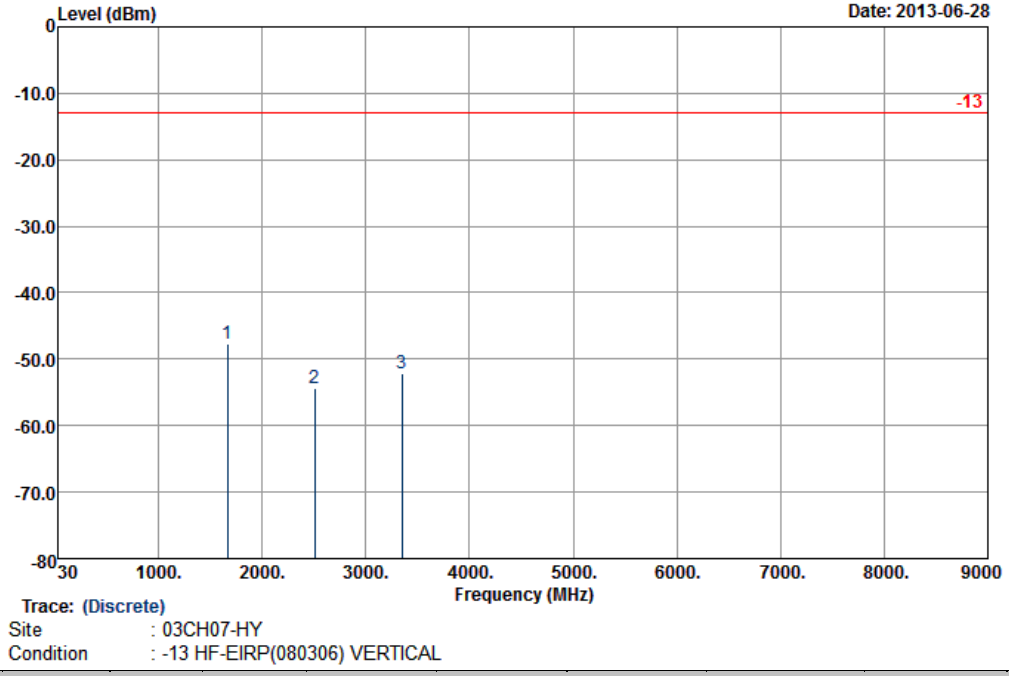
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-49.29	-13	-36.29	-65.59	-55.59	2.51	8.81	V	Pass
5640	-48.67	-13	-35.67	-69.24	-56.38	2.99	10.70	V	Pass
7520	-42.13	-13	-29.13	-69.18	-50.66	3.59	12.12	V	Pass

Band :	WCDMA Band V	Temperature :	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK) for Sample 1 with Battery 2	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



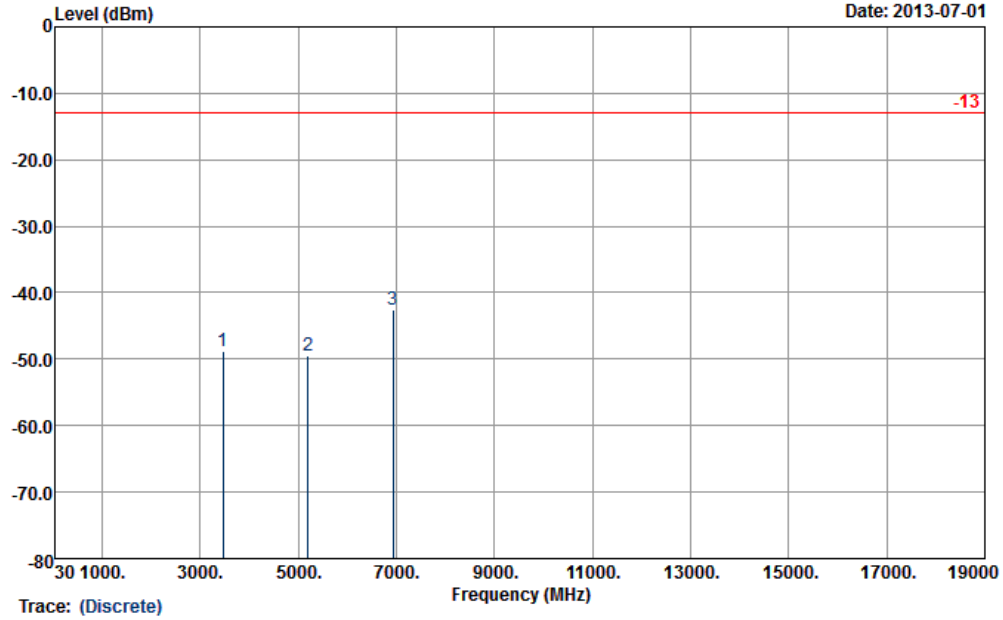
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-55.00	-13	-42.00	-63.92	-56.72	1.62	5.49	H	Pass
2506	-46.99	-13	-33.99	-60.28	-48.96	2.1	6.22	H	Pass
3345	-54.06	-13	-41.06	-68.16	-56.95	3.03	8.07	H	Pass

Band :	WCDMA Band V	**Temperature :**	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK) for Sample 1 with Battery 2	**Relative Humidity :**	49~51%
Test Engineer :	Eric Shih	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



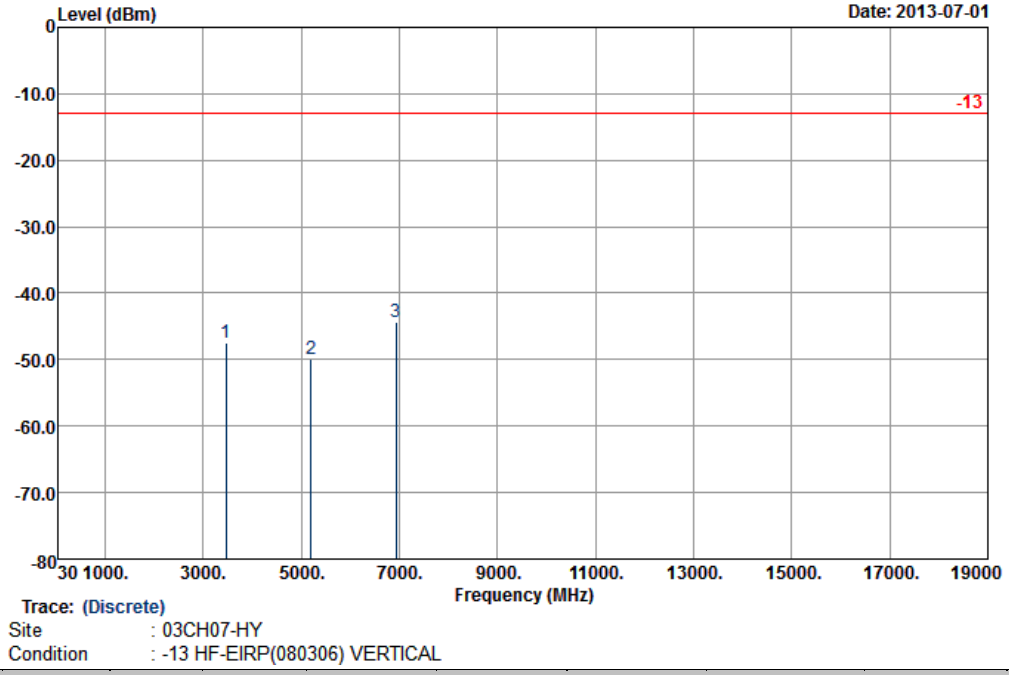
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1669	-47.68	-13	-34.68	-58.75	-49.4	1.62	5.49	V	Pass
2509	-54.27	-13	-41.27	-68.01	-56.24	2.1	6.22	V	Pass
3346	-52.12	-13	-39.12	-67.71	-55.01	3.03	8.07	V	Pass

Band :	WCDMA Band IV	Temperature :	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK) for Sample 1 with Battery 2	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



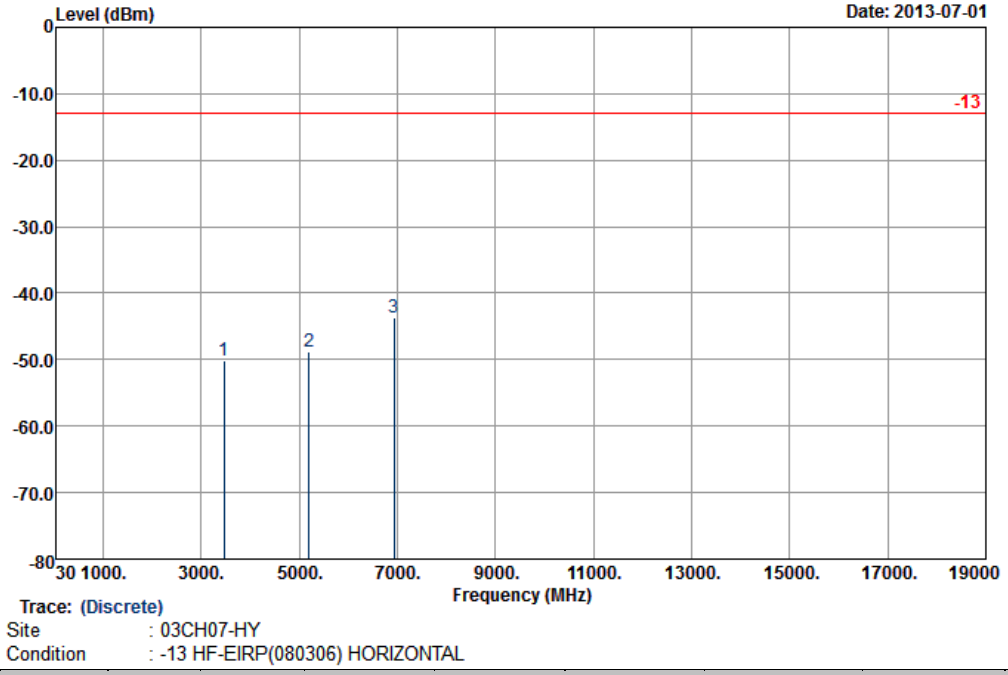
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3464	-48.74	-13	-35.74	-63.04	-52.57	4.48	8.31	H	Pass
5198	-49.41	-13	-36.41	-68.2	-54.05	5.332	9.98	H	Pass
6928	-42.66	-13	-29.66	-68.82	-47.9	6.1	11.34	H	Pass

Band :	WCDMA Band IV	Temperature :	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK) for Sample 1 with Battery 2	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



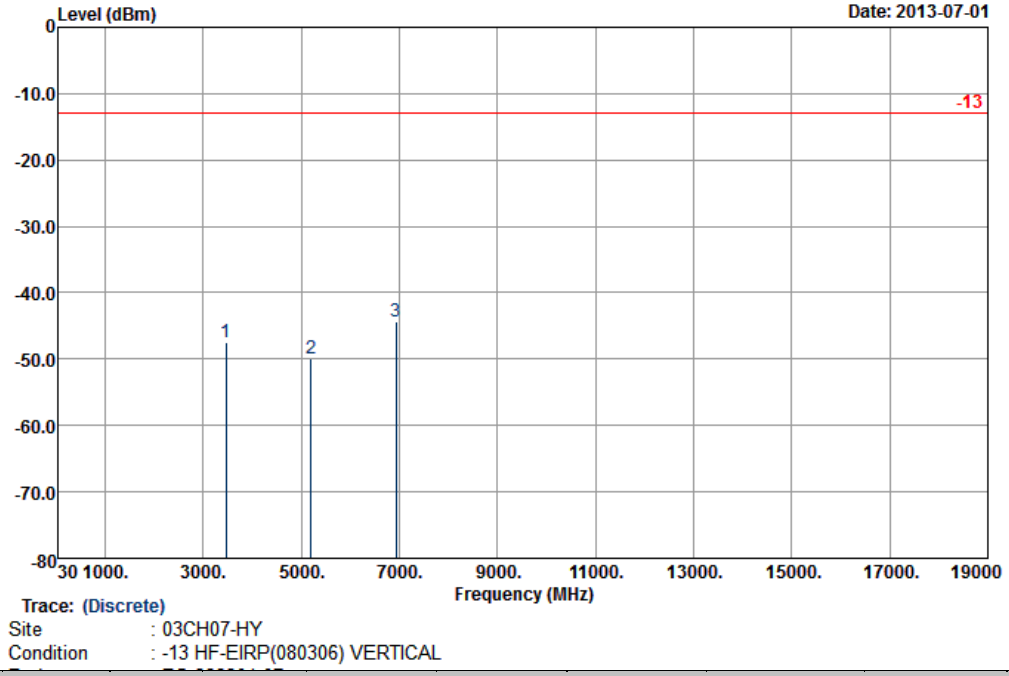
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3468	-46.60	-13	-33.60	-62.14	-50.43	4.48	8.31	V	Pass
5198	-49.65	-13	-36.65	-68.48	-54.29	5.332	9.98	V	Pass
6928	-44.43	-13	-31.43	-69.77	-49.67	6.1	11.34	V	Pass

Band :	WCDMA Band IV	Temperature :	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK) for Sample 1 with Battery 1	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



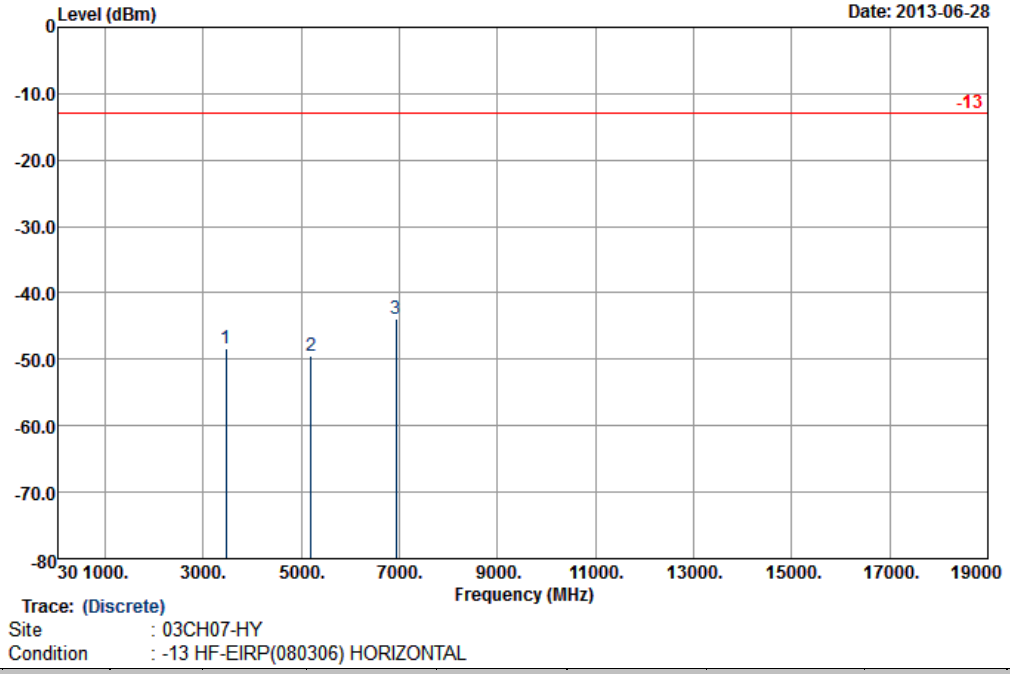
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3464	-50.22	-13	-37.22	-64.52	-54.05	4.48	8.31	H	Pass
5198	-48.71	-13	-35.71	-67.5	-53.35	5.332	9.98	H	Pass
6928	-43.75	-13	-30.75	-69.91	-48.99	6.1	11.34	H	Pass

Band :	WCDMA Band IV	Temperature :	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK) for Sample 1 with Battery 1	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line..		



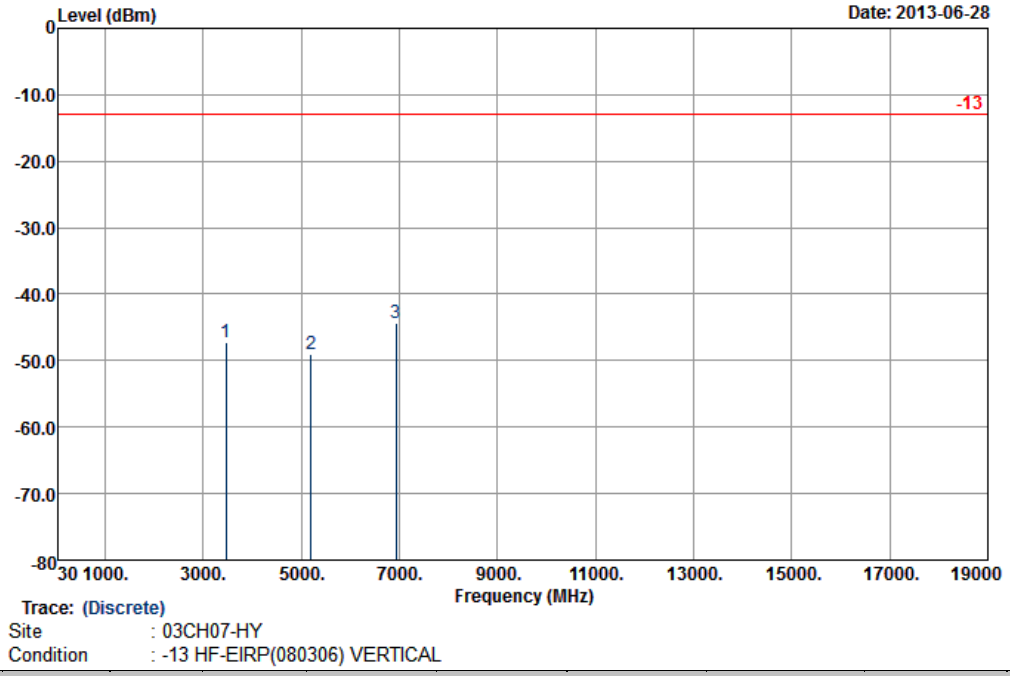
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3468	-47.53	-13	-34.53	-63.07	-51.36	4.48	8.31	V	Pass
5198	-49.95	-13	-36.95	-68.78	-54.59	5.332	9.98	V	Pass
6928	-44.28	-13	-31.28	-69.62	-49.52	6.1	11.34	V	Pass

Band :	WCDMA Band IV	Temperature :	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK) for Sample 2 with Battery 2	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



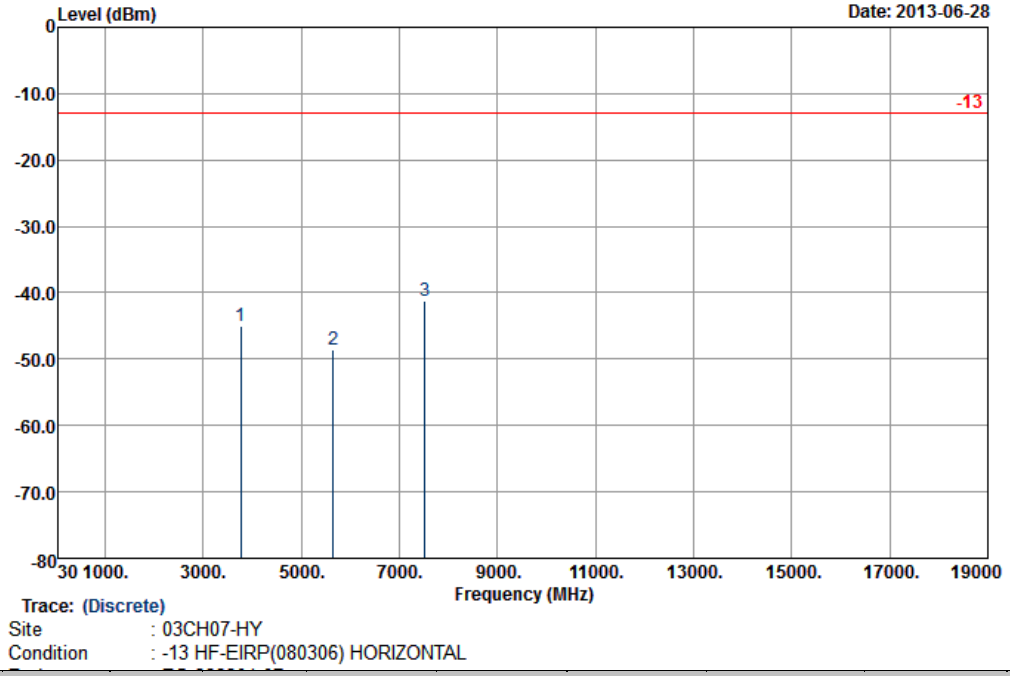
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3464	-48.32	-13	-35.32	-62.62	-52.15	4.48	8.31	H	Pass
5198	-49.43	-13	-36.43	-68.22	-54.07	5.332	9.98	H	Pass
6928	-43.85	-13	-30.85	-70.01	-49.09	6.1	11.34	H	Pass

Band :	WCDMA Band IV	Temperature :	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK) for Sample 2 with Battery 2	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line..		



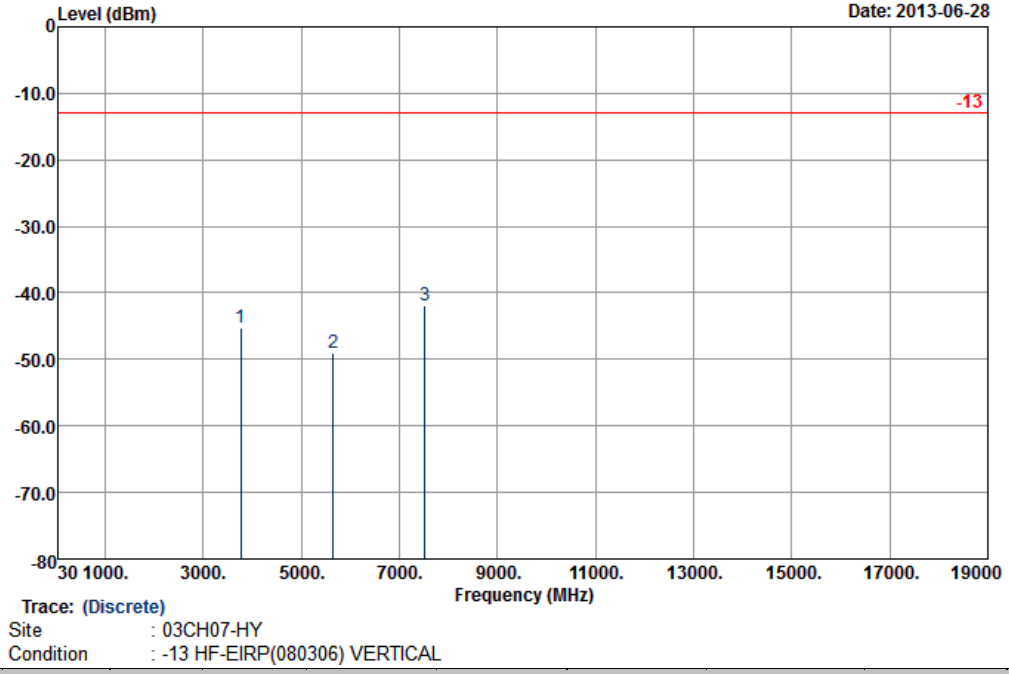
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3464	-47.25	-13	-34.25	-62.79	-51.08	4.48	8.31	V	Pass
5200	-48.96	-13	-35.96	-67.79	-53.6	5.332	9.98	V	Pass
6928	-44.31	-13	-31.31	69.65	-49.55	6.1	11.34	V	Pass

Band :	WCDMA Band II	Temperature :	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK) for Sample 1 with Battery 2	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	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	-44.91	-13	-31.91	-60.26	-51.21	2.51	8.81	H	Pass
5640	-48.69	-13	-35.69	-69.45	-56.4	2.99	10.70	H	Pass
7520	-41.22	-13	-28.22	-68.49	-49.75	3.59	12.12	H	Pass

Band :	WCDMA Band II	Temperature :	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK) for Sample 1 with Battery 2	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	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	-45.25	-13	-32.25	-61.55	-51.55	2.51	8.81	V	Pass
5640	-48.94	-13	-35.94	-69.51	-56.65	2.99	10.70	V	Pass
7520	-41.91	-13	-28.91	-68.96	-50.44	3.59	12.12	V	Pass

3.8 Frequency Stability Measurement

3.8.1 Description of Frequency Stability Measurement

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

3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

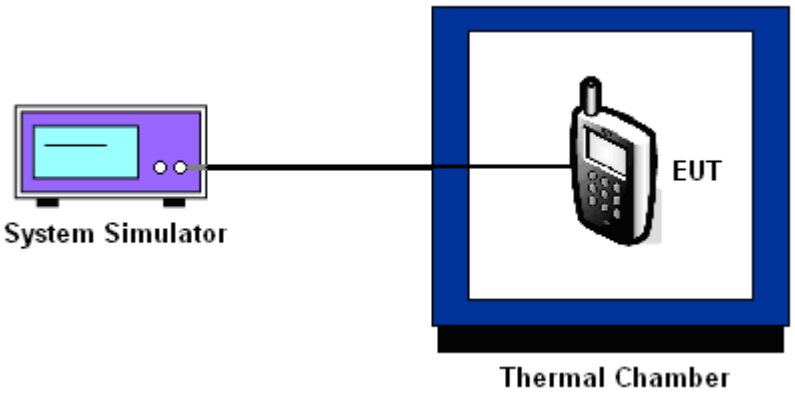
3.8.3 Test Procedures for Temperature Variation

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.

3.8.4 Test Procedures for Voltage Variation

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

3.8.5 Test Setup



3.8.6 Test Result of Temperature Variation

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

Temperature (°C)	GSM		EDGE class 8		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	35	0.04	45	0.05	PASS
-20	38	0.04	44	0.05	
-10	34	0.04	42	0.05	
0	32	0.04	38	0.04	
10	23	0.03	34	0.04	
20	24	0.03	37	0.04	
30	31	0.04	36	0.04	
40	30	0.04	42	0.05	
50	36	0.04	44	0.05	

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

Temperature (°C)	GSM		EDGE class 8		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	26	0.01	63	0.03	PASS
-20	20	0.01	58	0.03	
-10	18	0.01	54	0.03	
0	16	0.01	52	0.03	
10	-17	-0.01	49	0.03	
20	-15	-0.01	48	0.03	
30	-14	-0.01	51	0.03	
40	-20	-0.01	52	0.03	
50	-24	-0.01	61	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	10	0.01	PASS
-20	12	0.01	
-10	8	0.01	
0	7	0.01	
10	5	0.01	
20	6	0.01	
30	-6	-0.01	
40	7	0.01	
50	10	0.01	

Band :	WCDMA Band IV	Channel :	1413
Limit (ppm) :	2.5	Frequency :	1732.6 MHz

Temperature (°C)	RMC 12.2Kbps		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-16	-0.01	PASS
-20	-14	-0.01	
-10	-15	-0.01	
0	12	0.01	
10	10	0.01	
20	11	0.01	
30	13	0.01	
40	12	0.01	
50	14	0.01	

Band :	WCDMA Band II	Channel :	9400
Limit (ppm) :	2.5	Frequency :	1880 MHz

Temperature (°C)	RMC 12.2Kbps		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-16	-0.01	PASS
-20	-18	-0.01	
-10	-15	-0.01	
0	-12	-0.01	
10	-14	-0.01	
20	-13	-0.01	
30	-14	-0.01	
40	-16	-0.01	
50	-15	-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	3.7	28	0.03	2.5	PASS
		BEP	34	0.04		
		4.2	20	0.02		
	EDGE class 8	3.7	41	0.05		
		BEP	37	0.04		
		4.2	33	0.04		
GSM 1900 CH661	GSM	3.7	19	0.01		
		BEP	14	0.01		
		4.2	28	0.01		
	EDGE class 8	3.7	58	0.03		
		BEP	54	0.03		
		4.2	54	0.03		
WCDMA Band V CH4182	RMC 12.2Kbps	3.7	7	0.01		
		BEP	5	0.01		
		4.2	-6	-0.01		
WCDMA Band IV CH1413	RMC 12.2Kbps	3.7	9	0.01		
		BEP	12	0.01		
		4.2	11	0.01		
WCDMA Band II CH9400	RMC 12.2Kbps	3.7	-12	-0.01		
		BEP	-14	-0.01		
		4.2	-11	-0.01		

Note:

1. Normal Voltage = 3.7V.
2. Battery End Point (BEP) = 3.55 V.

4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 07, 2013	Jun. 19, 2013 ~ Jun. 21, 2013	Jun. 06, 2014	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D3SP	TBN-930701	N/A	Jul. 23, 2012	Jun. 19, 2013 ~ Jun. 21, 2013	Jul. 22, 2013	Conducted (TH02-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101067	9kHz~30GHz	Nov. 30, 2012	Jun. 27, 2013 ~ Jul. 02, 2013	Nov. 29, 2013	Radiation (03CH07-HY)
Bilog Antenna	Schaffner	CBL6111C	2726	30MHz~1GHz	Oct. 06, 2012	Jun. 27, 2013 ~ Jul. 02, 2013	Oct. 05, 2013	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	75962	1GHz~18GHz	Aug. 22, 2012	Jun. 27, 2013 ~ Jul. 02, 2013	Aug. 21, 2013	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz~40GHz	Sep. 28, 2012	Jun. 27, 2013 ~ Jul. 02, 2013	Sep. 27, 2013	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	30MHz~1GHz	Feb. 26, 2013	Jun. 27, 2013 ~ Jul. 02, 2013	Feb. 25, 2014	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~26.5GHz	Dec. 01, 2012	Jun. 27, 2013 ~ Jul. 02, 2013	Nov. 30, 2013	Radiation (03CH07-HY)
Turn Table	ChainTek	ChainTek 3000	N/A	0 ~ 360 degree	N/A	Jun. 27, 2013 ~ Jul. 02, 2013	N/A	Radiation (03CH07-HY)
Antenna Mast	ChainTek	ChainTek 3000	N/A	N/A	N/A	Jun. 27, 2013 ~ Jul. 02, 2013	N/A	Radiation (03CH07-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**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.72**