

FCC RF Test Report

APPLICANT : Motorola Solutions, Inc.
EQUIPMENT : Enterprise Digital Assistant (EDA)
BRAND NAME : MOTOROLA
MODEL NAME : MC67ND
FCC ID : UZ7MC67ND
STANDARD : FCC 47 CFR Part 2, 22(H), 24(E)
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)

The product was received on Feb. 04, 2013 and completely tested on Feb. 19, 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.

Reviewed by:



Louis Wu / Manager

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

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

TABLE OF CONTENTS

REVISION HISTORY	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Applicant.....	5
1.2 Manufacturer	5
1.3 Feature of Equipment Under Test.....	5
1.4 Product Specification of Equipment Under Test	6
1.5 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator	7
1.6 Testing Site.....	7
1.7 Applied Standards	8
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	9
2.1 Test Mode.....	9
2.2 Connection Diagram of Test System	12
2.3 Support Unit used in test configuration and system.....	12
2.4 Measurement Results Explanation Example	12
3 TEST RESULT	13
3.1 RMS Conducted Output Power Measurement.....	13
3.2 Peak-to-Average Ratio	16
3.3 Effective Radiated Power and Effective Isotropic Radiated Power Measurement	34
3.4 99% Occupied Bandwidth and 26dB Bandwidth Measurement.....	40
3.5 Band Edge Measurement.....	67
3.6 Conducted Spurious Emission Measurement	84
3.7 Field Strength of Spurious Radiation Measurement	105
3.8 Frequency Stability Measurement.....	124
4 LIST OF MEASURING EQUIPMENT	129
5 UNCERTAINTY OF EVALUATION	130
APPENDIX A. PHOTOGRAPHS OF EUT	
APPENDIX B. SETUP PHOTOGRAPHS	

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG320416	Rev. 01	Initial issue of report	Mar. 22, 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)	Conducted Output Power	N/A	PASS	-
3.2	§24.232(d)	RSS-132 (5.4) RSS-133(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	-
3.4	§2.1049 §22.917(a) §24.238(a)	RSS-GEN(4.6.1) RSS-133(2.3)	Occupied Bandwidth	N/A	PASS	-
3.5	§2.1051 §22.917(a) §24.238(a)	RSS-132 (5.5) RSS-133 (6.5)	Band Edge Measurement	< 43+10log ₁₀ (P[Watts])	PASS	-
3.6	§2.1051 §22.917(a) §24.238(a)	RSS-132 (5.5) RSS-133 (6.5)	Conducted Spurious Emission	< 43+10log ₁₀ (P[Watts])	PASS	-
3.7	§2.1053 §22.917(a) §24.238(a)	RSS-132 (5.5) RSS-133 (6.5)	Field Strength of Spurious Radiation	< 43+10log ₁₀ (P[Watts])	PASS	Under limit 13.66 dB at 5640.000 MHz
3.8	§2.1055 §22.355 §24.235	RSS-132(5.3) RSS-133(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	Enterprise Digital Assistant (EDA)
Brand Name	MOTOROLA
Model Name	MC67ND
FCC ID	UZ7MC67ND
EUT supports Radios application	CDMA/EV-DO/GSM/EGPRS/WCDMA/HSPA/ WLAN 11abgn(HT20) / Bluetooth 2.1 EDR
HW Version	EV
SW Version	90.28.21 (RF Fusion Version : X_2.00.0.0.072R)
FW Version	2.47
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 II: 1852.4 MHz ~ 1907.6 MHz CDMA2000 BC0: 824.70 MHz ~ 848.31 MHz CDMA2000 BC1: 1851.25 MHz ~ 1908.75 MHz
Rx Frequency	GSM850: 869.2 MHz ~ 893.8 MHz GSM1900: 1930.2 MHz ~ 1989.8 MHz WCDMA Band V: 871.4 MHz ~ 891.6 MHz WCDMA Band II: 1932.4 MHz ~ 1987.6 MHz CDMA2000 BC0: 869.70 MHz ~ 893.31 MHz CDMA2000 BC1: 1931.25 MHz ~ 1988.75 MHz
Maximum Output Power to Antenna	GSM850 : 33.01 dBm GSM1900 : 30.09 dBm WCDMA Band V : 23.84 dBm WCDMA Band II : 23.56 dBm CDMA2000 BC0: 23.98 dBm CDMA2000 BC1: 23.75 dBm
Antenna Type	Fixed Internal Antenna type (PIFA Antenna)
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK WCDMA: QPSK (Uplink) HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink) CDMA2000 : QPSK CDMA2000 1xEV-DO : QPSK/8PSK

1.5 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	Cellular Band GSM	GMSK	1.2303	0.04 ppm	244KGXW
Part 22	Cellular Band EDGE class 8	8PSK	0.3184	0.06 ppm	254KG7W
Part 22	Cellular Band RMC 12.2Kbps	QPSK	0.1496	0.03 ppm	4M16F9W
Part 22	Cellular Band 1xEV-DO Rev. 0	QPSK	0.1892	0.03 ppm	1M28F9W
Part 24	PCS Band GPRS class 8	GMSK	0.8851	0.02 ppm	246KGXW
Part 24	PCS Band EDGE class 8	8PSK	0.3664	0.02 ppm	248KG7W
Part 24	PCS Band RMC 12.2Kbps	QPSK	0.1734	0.02 ppm	4M18F9W
Part 24	PCS Band 1xEV-DO Rev. 0	QPSK	0.2301	0.03 ppm	1M28F9W

1.6 Testing Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	TH02-HY	03CH05-HY	722060/4086B-1

1.7 Applied Standards

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

- ♦ FCC 47 CFR Part 2, 22(H), 24(E)
- ♦ ANSI / TIA / EIA-603-C-2004
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v01
- ♦ IC RSS-132 Issue 3
- ♦ IC RSS-133 Issue 6
- ♦ IC RSS-Gen Issue 3
- ♦ NOTICE 2012-DRS0126

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.
3. Per the section 2.2.3 of Notice of 2012-DRS0126, " Receivers Excluded from Industry Canada Requirements", only radio communication receivers operating in stand-alone mode within the band 30-960 MHz and scanner receivers are subject to Industry Canada requirements.

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, WCDMA Band V, and CDMA2000 BC0.
2. 30 MHz to 19000 MHz for GSM1900, WCDMA Band II, and CDMA2000 BC1.

The RMS conducted power tables are as follows:

Conducted Power (*Unit: dBm)						
Band	Cellular Band			PCS Band		
Channel	128	189	251	512	661	810
Frequency	824.2	836.4	848.8	1850.2	1880.0	1909.8
GSM	32.98	32.89	33.01	30.07	29.87	30.08
GPRS class 8	32.93	32.83	32.95	30.09	29.89	30.09
GPRS class 10	32.83	32.74	32.86	29.88	29.68	29.91
GPRS class 11	32.74	32.62	32.73	29.71	29.47	29.64
GPRS class 12	32.59	32.49	32.63	29.43	29.22	29.44
EGPRS class 8	26.56	26.51	26.52	25.53	25.53	25.70
EGPRS class 10	26.48	26.43	26.44	25.35	25.44	25.57
EGPRS class 11	26.39	26.34	26.34	25.24	25.31	25.42
EGPRS class 12	26.27	26.23	26.27	25.06	25.14	25.29

Conducted Power (*Unit: dBm)						
Band	Cellular Band			PCS Band		
Channel	4132	4182	4233	9262	9400	9538
Frequency	826.4	836.4	846.6	1852.4	1880.0	1907.6
RMC 12.2K	23.70	23.84	23.56	23.50	23.30	23.56
HSDPA Subtest-1	23.63	23.75	23.67	23.31	23.23	23.35
HSDPA Subtest-2	23.67	23.76	23.69	23.35	23.25	23.23
HSDPA Subtest-3	23.13	23.32	23.07	22.83	22.68	22.77
HSDPA Subtest-4	23.19	23.25	23.14	22.90	22.73	22.77
HSUPA Subtest-1	23.72	23.82	23.60	23.09	22.96	23.05
HSUPA Subtest-2	21.96	22.03	21.78	22.13	22.10	22.12
HSUPA Subtest-3	22.77	22.66	22.40	22.53	22.03	22.66
HSUPA Subtest-4	22.73	22.44	22.39	22.40	22.37	22.49
HSUPA Subtest-5	23.68	23.77	23.58	23.55	23.42	23.42

Conducted Power (*Unit: dBm)						
Band	Cellular Band			PCS Band		
Channel	1013	384	777	25	600	1175
Frequency	824.7	836.52	848.31	1851.25	1880	1908.75
1xRTT RC1+SO55	23.77	23.97	23.68	23.73	23.60	23.69
1xRTT RC3+SO55	23.75	23.96	23.60	23.67	23.50	23.61
1xRTT RC3 SO32(+ F-SCH)	23.73	23.93	23.57	23.67	23.49	23.60
1xRTT RC3 SO32(+SCH)	23.72	23.91	23.52	23.66	23.46	23.57
1xEV-DO RTAP 153.6K	23.80	23.98	23.76	23.74	23.63	23.75
1xEV-DO RETAP 4096K	23.76	23.96	23.74	23.73	23.62	23.70

Definition of each configuration about keypad and Camera for EUT

Keypads	Cameras
(1) Qwerty (2) Numeric (3) PIM	(1) With camera (2) Without camera

Preliminary test for Radiated Spurious Emissions:

Test Modes				
Preliminary test for Radiated TCs				
No.	Band	Mode	Keypad	Camera
1	Cellular Band	GSM Link	1	1
2	Cellular Band	GSM Link	2	1
3	Cellular Band	GSM Link	3	1
4	Cellular Band	GSM Link	1	2
1	PCS Band	GPRS class 8 Link	1	1
2	PCS Band	GPRS class 8 Link	2	1
3	PCS Band	GPRS class 8 Link	3	1
4	PCS Band	GPRS class 8 Link	1	2

The preliminary test purpose is to find out the worst configuration among all components, and choose the worst configuration to perform final test demonstrated in compliance with FCC standard. GPRS class 8 is mode with the highest power for cellular and PCS band, and it was selected for preliminary testing.

Radiated Spurious Emissions for final test configuration under Cellular and PCS band:

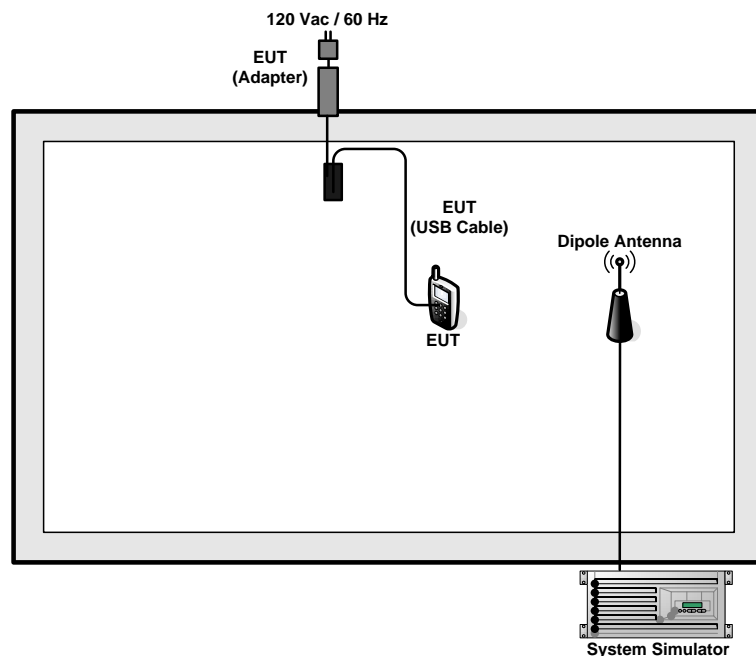
Test Modes				
Radiated TCs				
No.	Band	Mode	Keypad	Camera
1	Cellular Band	GSM Link	1	1
2	Cellular Band	EDGE class 8 Link	1	1
3	Cellular Band	RMC 12.2Kbps Link	1	1
4	Cellular Band	1xEV-DO Rev. 0 Link	1	1
1	PCS Band	GPRS class 8 Link	2	1
2	PCS Band	EDGE class 8 Link	2	1
3	PCS Band	RMC 12.2Kbps Link	2	1
4	PCS Band	1xEV-DO Rev. 0 Link	2	1

Test Modes		
Conducted TCs		
No.	Band	Mode
1	Cellular Band	GSM Link
2	Cellular Band	EDGE class 8 Link
3	Cellular Band	RMC 12.2Kbps Link
4	Cellular Band	1xEV-DO Rev. 0 Link
1	PCS Band	GPRS class 8 Link
2	PCS Band	EDGE class 8 Link
3	PCS Band	RMC 12.2Kbps Link
4	PCS Band	1xEV-DO Rev. 0 Link

Note:

1. The maximum power levels are GSM or GPRS multi-slot class 8 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 II, 1xEV-DO Rev. 0 RTAP 153.6K mode for CDMA2000 BC0, and 1xEV-DO Rev. 0 RTAP 153.6K mode for CDMA2000 BC1 on QPSK Link, only these modes were used for all tests.
2. For radiation test was performed together with USB charging cable with AC power.
3. Because there are individual antennas for each WWAN, WLAN, and Bluetooth, the co-location test modes are not required.
4. The DSD keypad PCB is the same as Numeric keypad PCB, only difference is color-printed.

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	CMU 200	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

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

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.

Example :

$$\begin{aligned}
 \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\
 &= 4.2 + 10 = 14.2 \text{ (dB)}
 \end{aligned}$$

3 Test Result

3.1 RMS Conducted Output Power Measurement

3.1.1 Description of the RMS Conducted Output Power Measurement

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

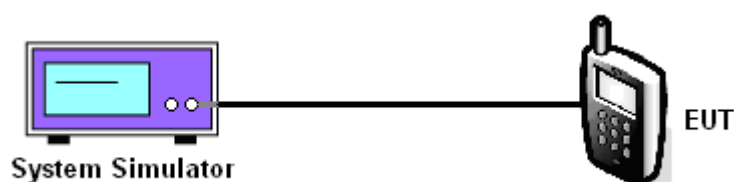
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup



3.1.5 Test Result of RMS Conducted Output Power

Cellular Band									
Modes	GSM			EDGE class 8			RMC 12.2Kbps		
Channel	128 (Low)	189 (Mid)	251 (High)	128 (Low)	189 (Mid)	251 (High)	4132 (Low)	4182 (Mid)	4233 (High)
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8	826.4	836.4	846.6
Conducted Power (dBm)	32.98	32.89	33.01	26.56	26.51	26.52	23.70	23.84	23.56
Conducted Power (Watts)	1.99	1.95	2.00	0.45	0.45	0.45	0.23	0.24	0.23

PCS Band									
Modes	GPRS class 8			EDGE class 8			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)	30.09	29.89	30.09	25.53	25.53	25.70	23.50	23.30	23.56
Conducted Power (Watts)	1.02	0.97	1.02	0.36	0.36	0.37	0.22	0.21	0.23



Cellular Band			
Test Mode	1xEV-DO Rev. 0		
Test Status	RTAP 153.6K		
Channel	1013 (Low)	384 (Mid)	777 (High)
Frequency (MHz)	824.70	836.52	848.31
Conducted Power (dBm)	23.80	23.98	23.76
Conducted Power (Watts)	0.24	0.25	0.24

PCS Band			
Test Mode	1xEV-DO Rev. 0		
Test Status	RTAP 153.6K		
Channel	25 (Low)	600 (Mid)	1175 (High)
Frequency (MHz)	1851.25	1880.00	1908.75
Conducted Power (dBm)	23.74	23.63	23.75
Conducted Power (Watts)	0.24	0.23	0.24

Note: maximum burst average power for GSM, and maximum average power for WCDMA and CDMA2000.

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.

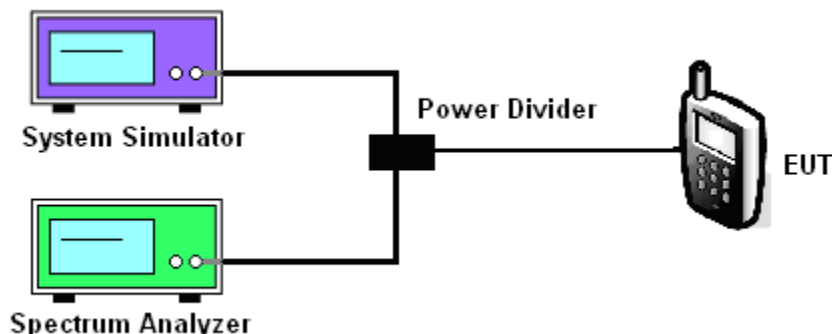
3.2.2 Measuring Instruments

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	GSM			EDGE class 8			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)	0.27	0.30	0.28	2.78	2.75	2.74	3.16	3.04	3.24

PCS Band									
Modes	GPRS class 8			EDGE class 8			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)	0.23	0.20	0.24	2.73	2.66	-2.70	3.04	3.16	3.12

Cellular Band			
Modes	1xEV-DO Rev. 0		
Test Status	RTAP 153.6K		
Channel	1013 (Low)	384 (Mid)	777 (High)
Frequency (MHz)	824.70	836.52	848.31
Peak-to-Average Ratio (dB)	4.16	4.08	4.20

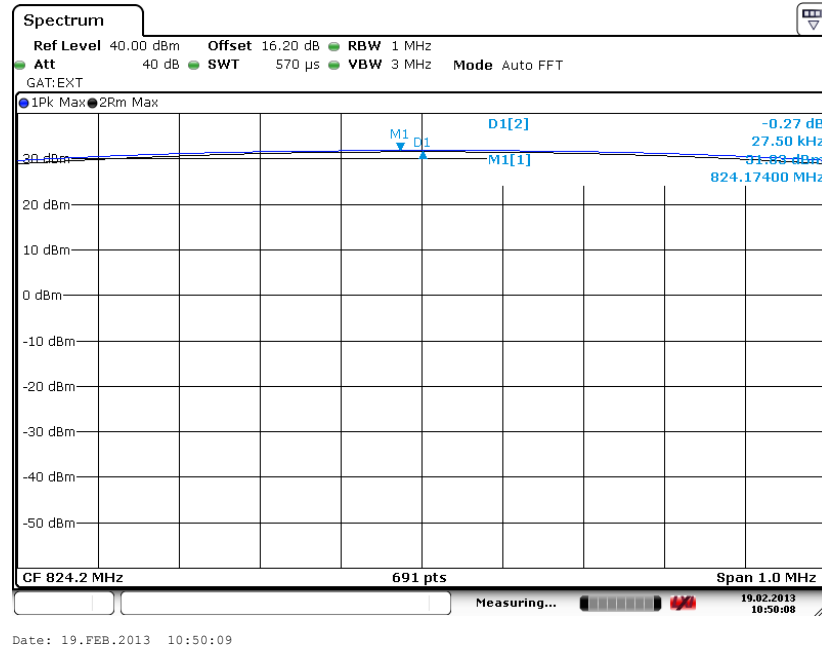
PCS Band			
Modes	1xEV-DO Rev. 0		
Test Status	RTAP 153.6K		
Channel	25 (Low)	600 (Mid)	1175 (High)
Frequency (MHz)	1851.25	1880.00	1908.75
Peak-to-Average Ratio (dB)	3.96	4.28	3.88



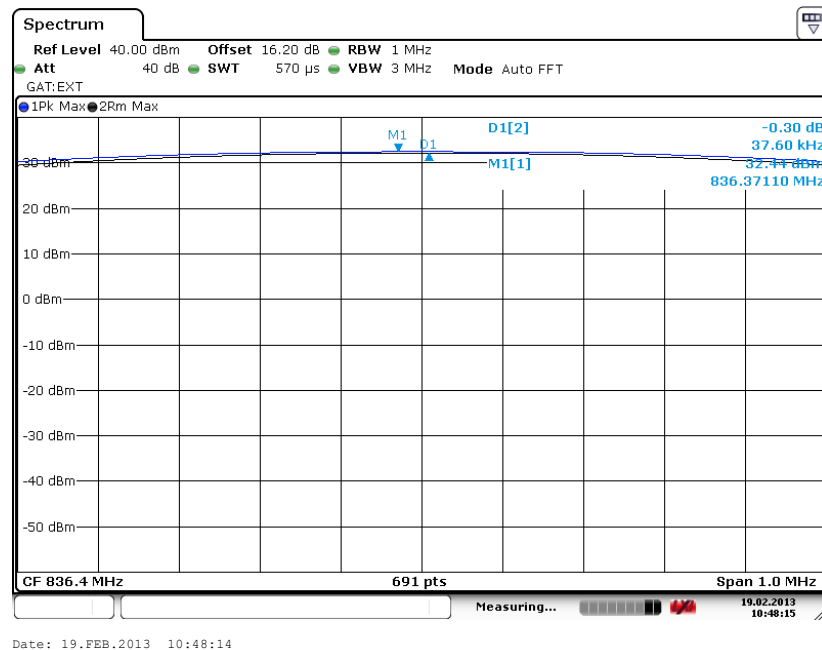
3.2.6 Test Result (Plots) of Peak-to-Average Ratio

Band :	Cellular Band	Test Mode :	GSM Link (GMSK)
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Peak-to-Average Ratio on Channel 128 (824.2 MHz)

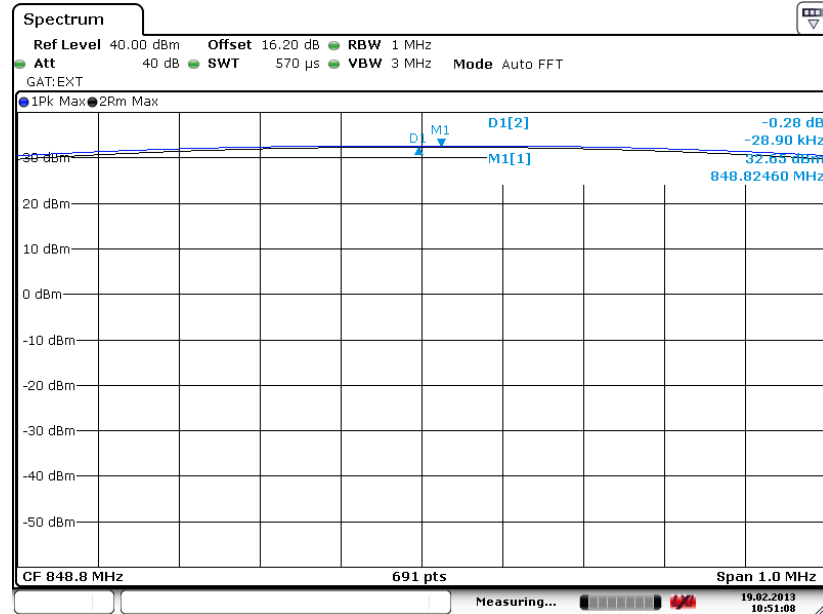


Peak-to-Average Ratio on Channel 189 (836.4 MHz)





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

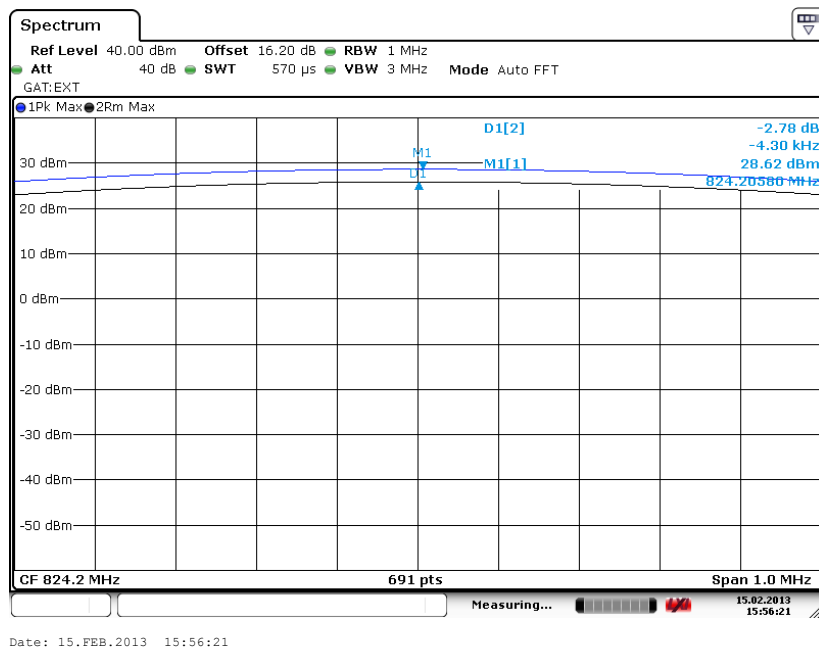


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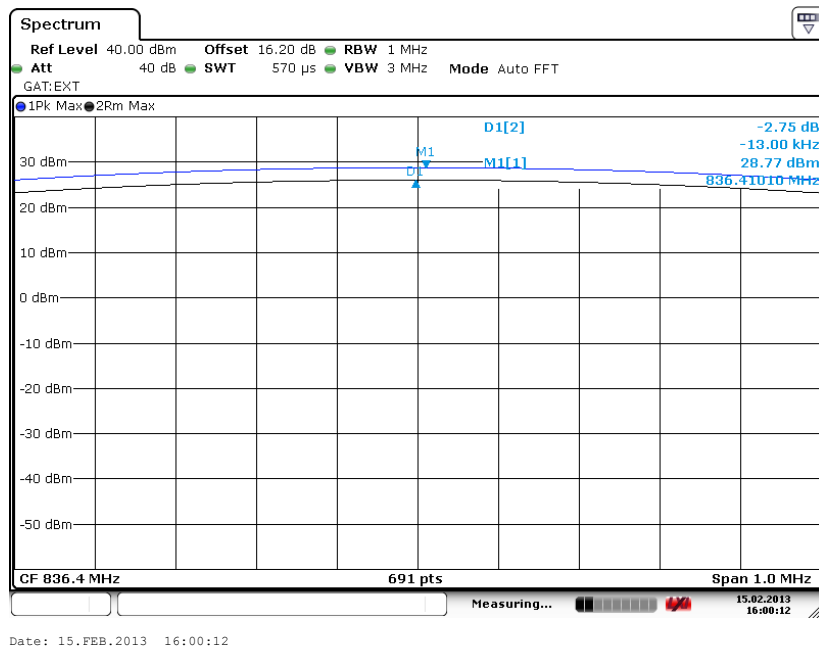


Band :	Cellular Band	Test Mode :	EDGE class 8 Link (8PSK)
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Peak-to-Average Ratio on Channel 128 (824.2 MHz)

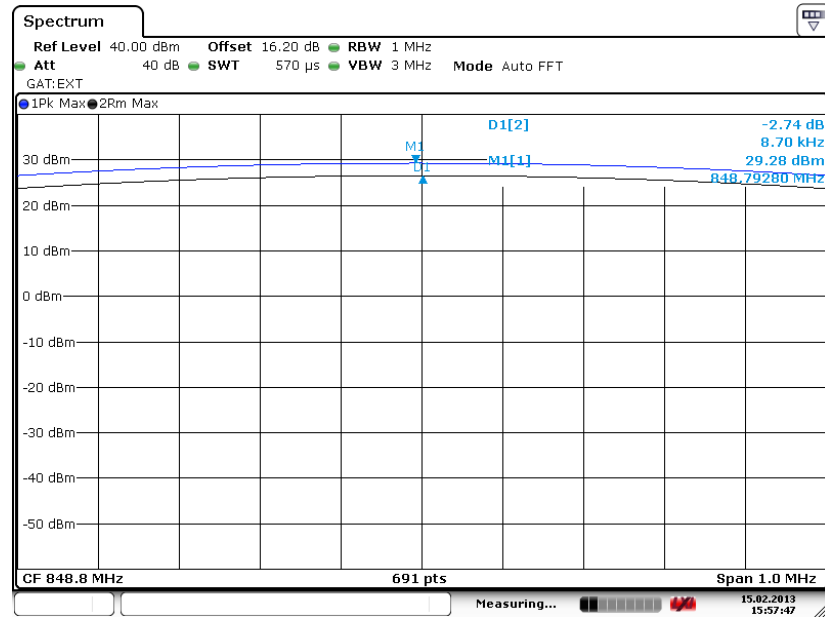


Peak-to-Average Ratio on Channel 189 (836.4 MHz)





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

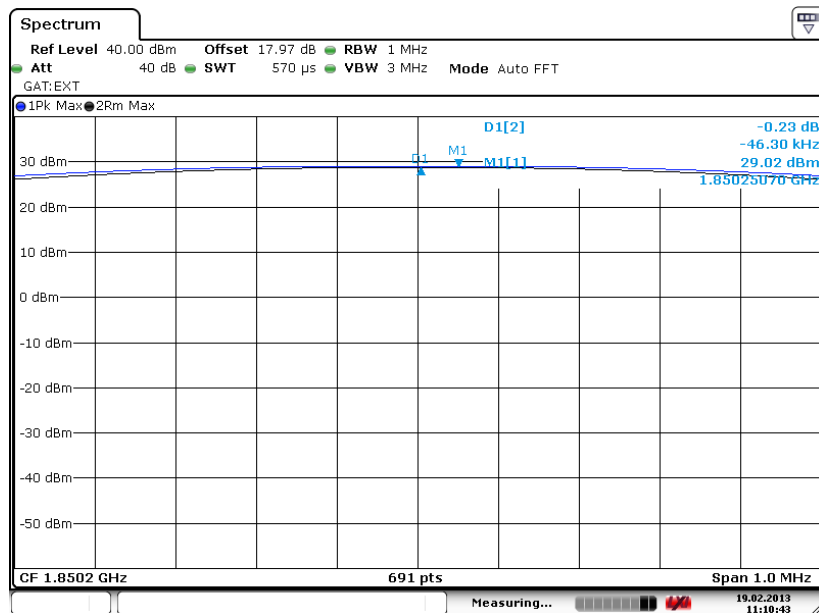


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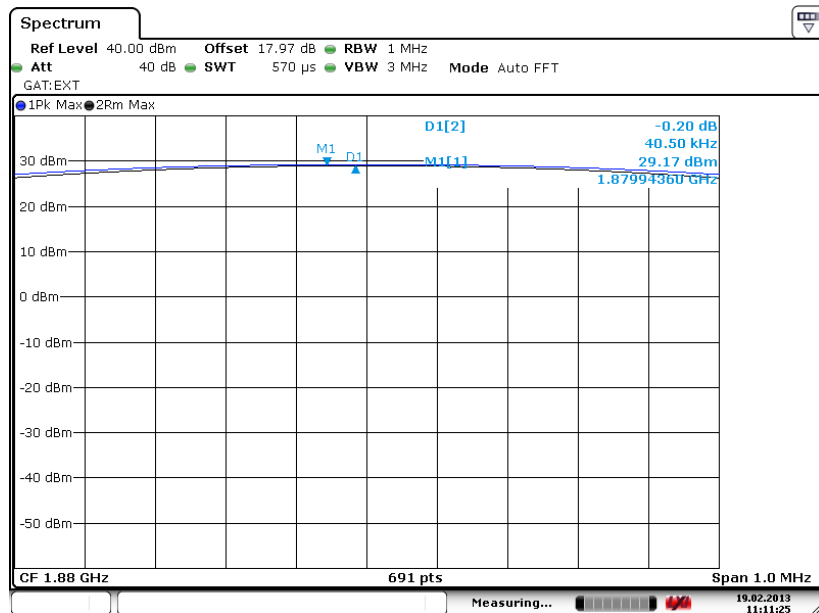
Band :	PCS Band	Test Mode :	GPRS class 8 Link (GMSK)
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Peak-to-Average Ratio on Channel 512 (1850.2 MHz)



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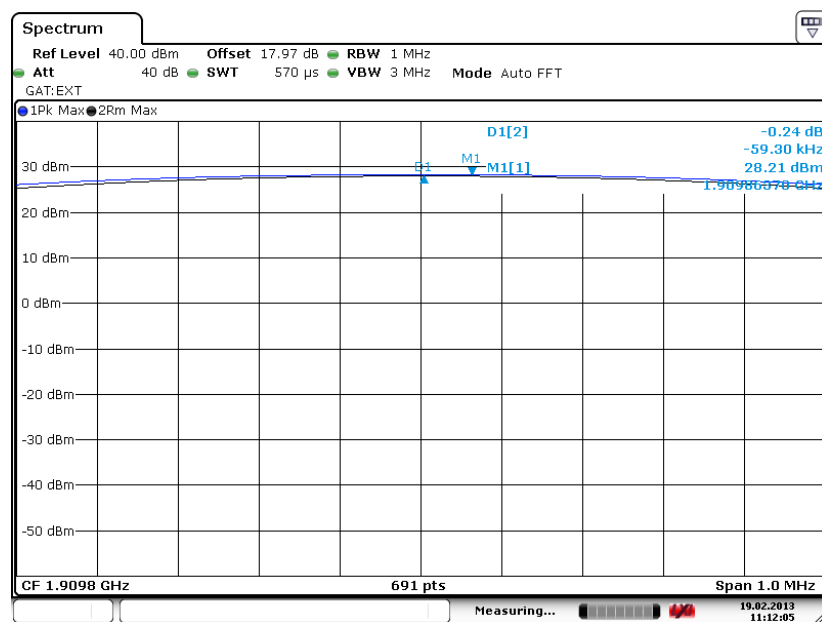
Peak-to-Average Ratio on Channel 661 (1880.0 MHz)



Date: 19.FEB.2013 11:11:26



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

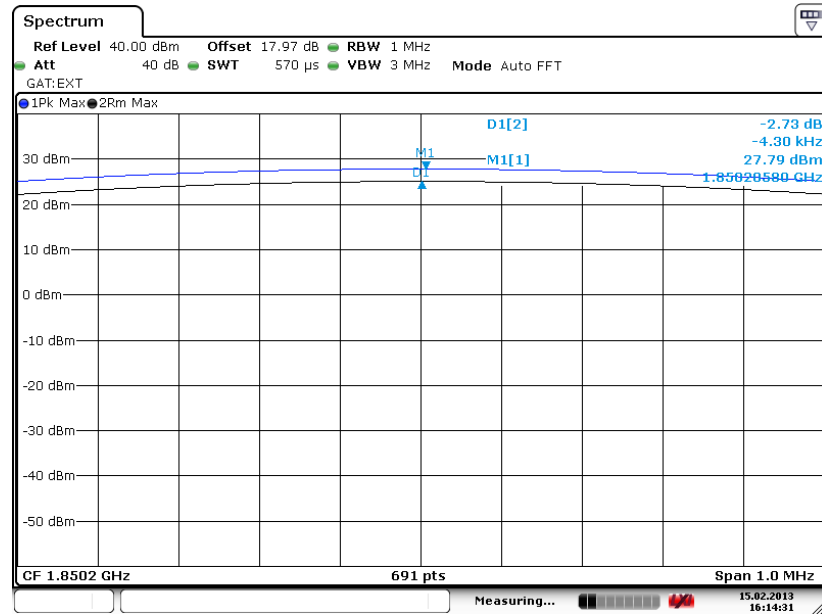


Date: 19.FEB.2013 11:12:06



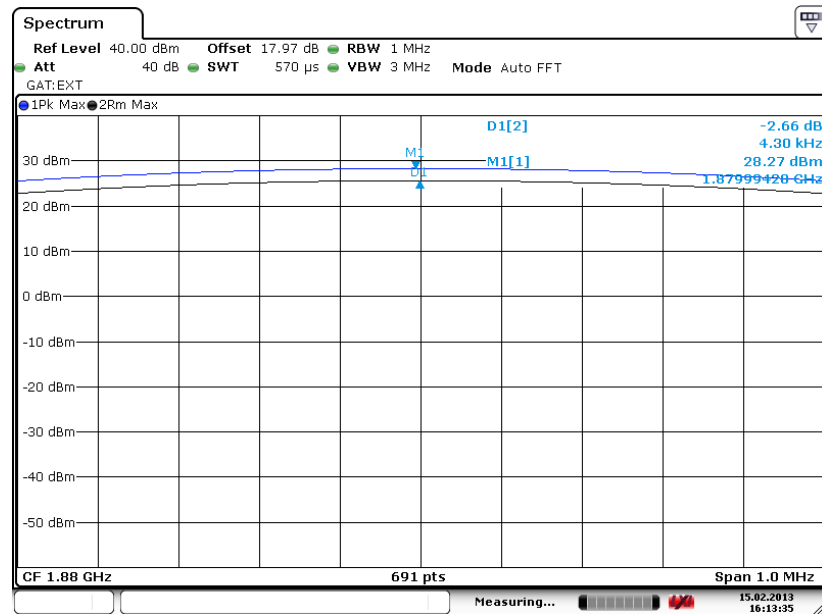
Band :	PCS Band	Test Mode :	EDGE class 8 Link (8PSK)
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Peak-to-Average Ratio on Channel 512 (1850.2 MHz)



Date: 15.FEB.2013 16:14:31

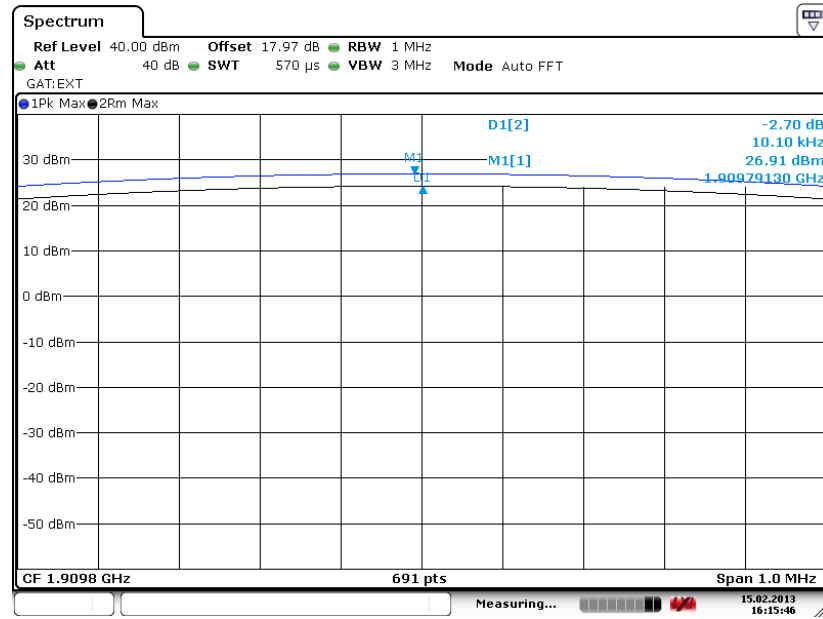
Peak-to-Average Ratio on Channel 661 (1880.0 MHz)



Date: 15.FEB.2013 16:13:35



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

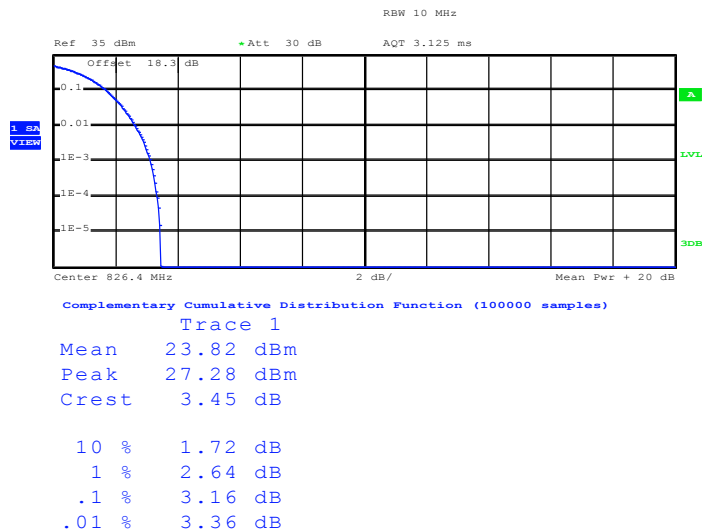


Date: 15.FEB.2013 16:15:45



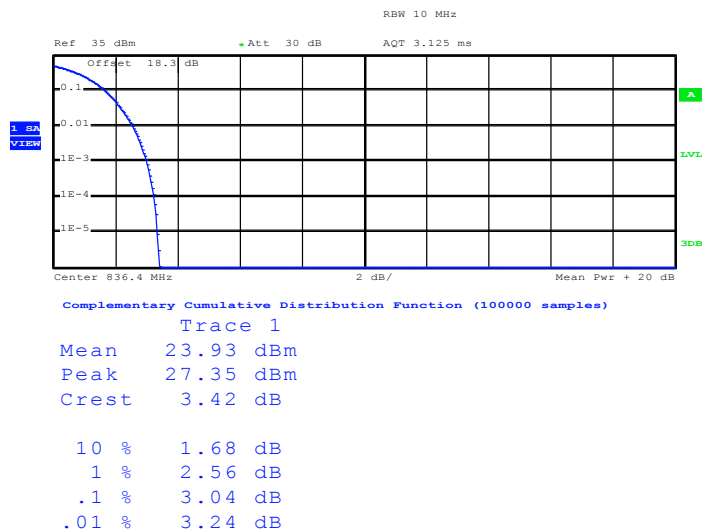
Band :	Cellular Band	Test Mode :	RMC 12.2Kbps Link (QPSK)
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Peak-to-Average Ratio on Channel 4132 (826.4 MHz)



Date: 9.FEB.2013 16:39:06

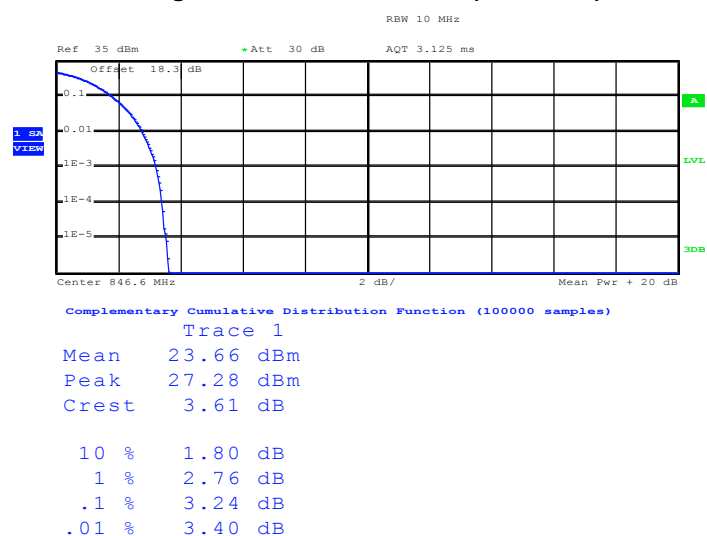
Peak-to-Average Ratio on Channel 4182 (836.4 MHz)



Date: 9.FEB.2013 16:39:55



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

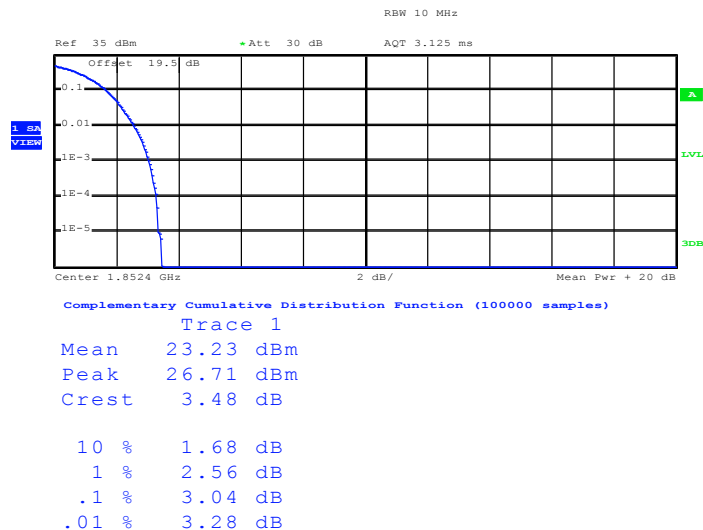


Date: 9.FEB.2013 16:40:35



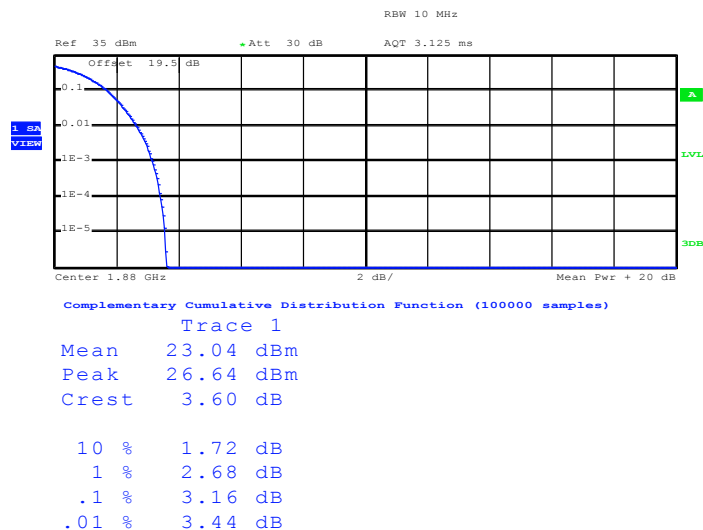
Band :	PCS Band	Test Mode :	RMC 12.2Kbps Link (QPSK)
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Peak-to-Average Ratio on Channel 9262 (1852.4 MHz)



Date: 9.FEB.2013 17:00:16

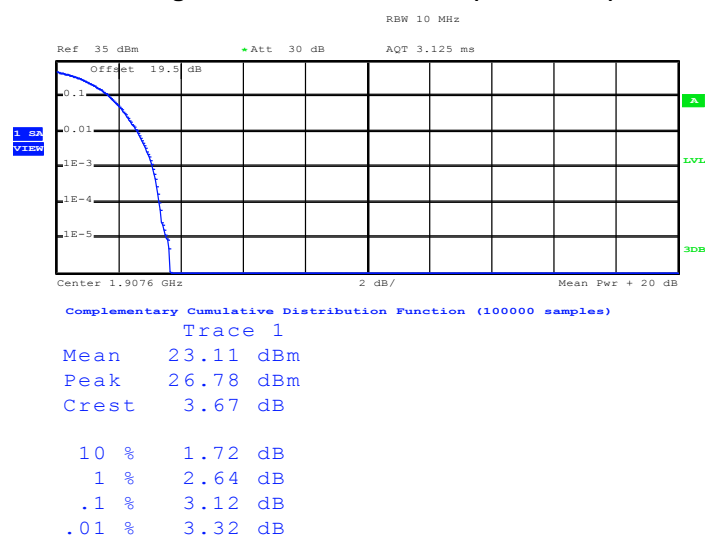
Peak-to-Average Ratio on Channel 9400 (1880.0 MHz)



Date: 9.FEB.2013 16:59:44



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

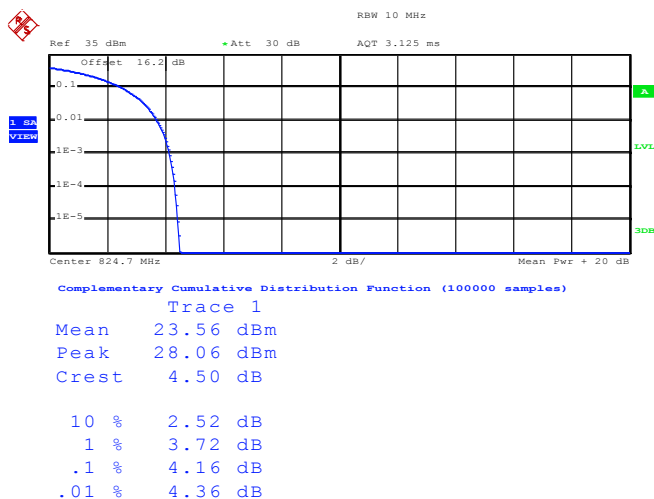


Date: 9.FEB.2013 16:59:20



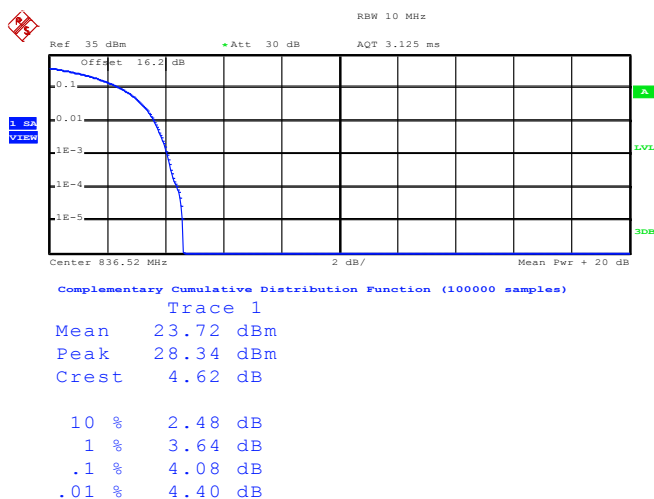
Band :	Cellular Band	Test Mode :	1XEVD0 Link (QPSK)
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Peak-to-Average Ratio on Channel 1013 (824.70 MHz)



Date: 13.FEB.2013 05:48:46

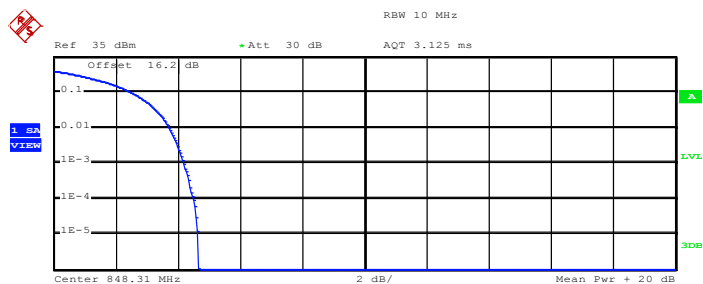
Peak-to-Average Ratio on Channel 384 (836.52 MHz)



Date: 13.FEB.2013 05:49:46



Peak-to-Average Ratio on Channel 777 (848.31 MHz)



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 23.18 dBm

Peak 27.85 dBm

Crest 4.66 dB

10 % 2.56 dB

1 % 3.72 dB

.1 % 4.20 dB

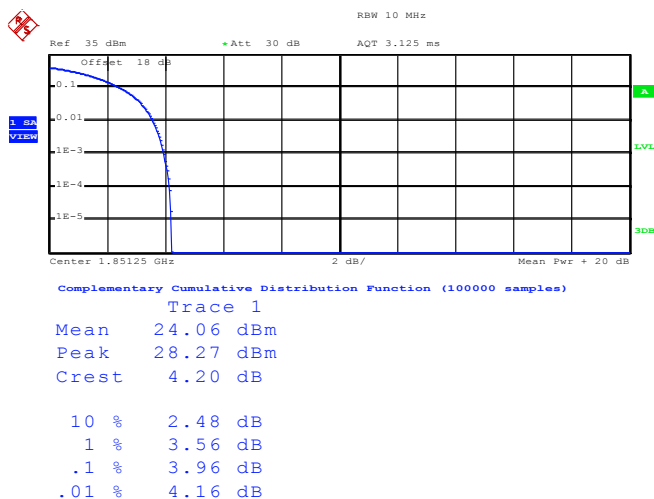
.01 % 4.52 dB

Date: 13.FEB.2013 05:50:37



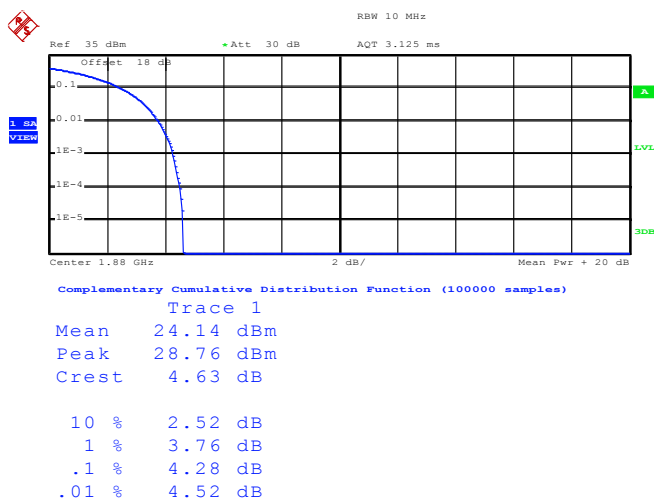
Band :	PCS Band	Test Mode :	1XEVD0 Link (QPSK)
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Peak-to-Average Ratio on Channel 25 (1851.25 MHz)



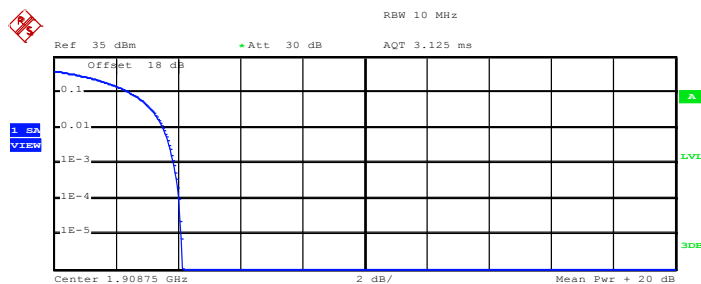
Date: 13.FEB.2013 06:31:07

Peak-to-Average Ratio on Channel 600 (1880 MHz)



Date: 13.FEB.2013 06:31:36

Peak-to-Average Ratio on Channel 1175 (1908.75 MHz)



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 23.50 dBm

Mean	25.88	dBm
Peak	27.63	dBm

Crest 4.13 dB

10 % 2.48 dB

1 % 3.52 dB

.1 % 3.88 dB

.1	%	3.98	dB
.01	%	4.04	dB

Date: 13.FEB.2013 06:32:43

3.3 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

3.3.1 Description of the ERP/EIRP Measurement

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

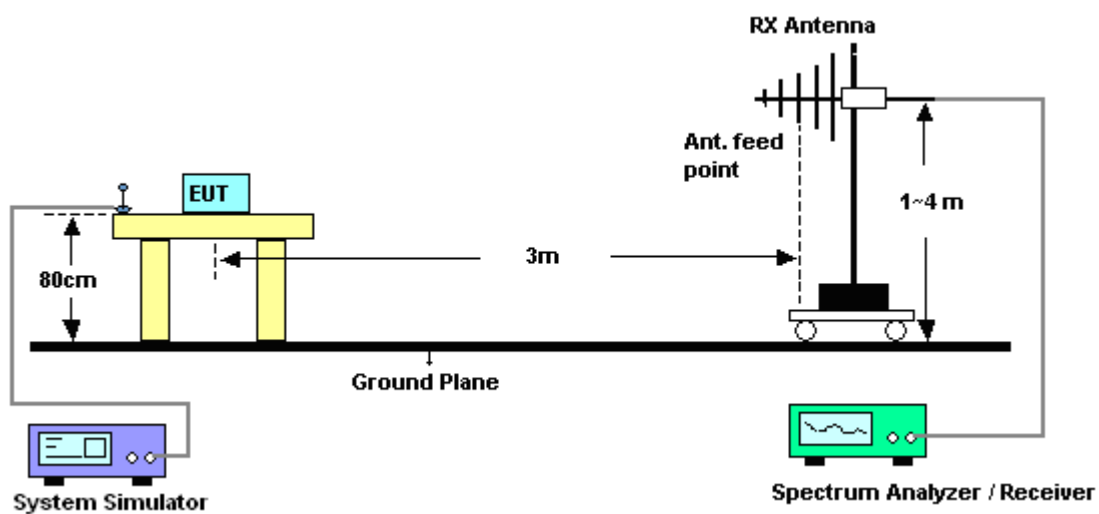
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The EUT was placed on 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= 300 KHz, VBW= 1 MHz, used channel power option with bandwidth=5MHz for WCDMA, RBW= 100 KHz, VBW= 300 KHz, used channel power option with bandwidth=1.5MHz for CDMA, 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, $EIRP = LVL + \text{Correction factor}$ and $ERP = EIRP - 2.15$.

3.3.4 Test Setup



3.3.5 Test Result of ERP

Cellular Band (GSM) Radiated Power ERP				
Qwerty Keypad with Camera				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
824.2	2.06	30.99	30.90	1.2303
836.4	1.76	30.89	30.50	1.1220
848.8	0.97	31.22	30.04	1.0093
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
824.2	-5.15	34.67	27.37	0.5458
836.4	-4.77	34.88	27.96	0.6252
848.8	-4.60	34.74	27.99	0.6295

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

Cellular Band (EDGE class 8) Radiated Power ERP				
Qwerty Keypad with Camera				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
824.2	-3.81	30.99	25.03	0.3184
836.4	-3.99	30.89	24.75	0.2985
848.8	-4.52	31.22	24.55	0.2851
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
824.2	-10.42	34.67	22.10	0.1622
836.4	-10.45	34.88	22.28	0.1690
848.8	-10.02	34.74	22.57	0.1807

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

Cellular Band (RMC 12.2Kbps) Radiated Power ERP				
Qwerty Keypad with Camera				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
826.40	-6.84	30.74	21.75	0.1496
836.40	-7.19	30.89	21.55	0.1429
846.60	-8.60	31.29	20.54	0.1132
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
826.40	-14.36	34.94	18.43	0.0697
836.40	-14.16	34.88	18.57	0.0719
846.60	-14.00	34.67	18.52	0.0711

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

Cellular Band (1xEV-DO Rev. 0_RTAP 153.6K) Radiated Power ERP				
Qwerty Keypad with Camera				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
824.70	-6.08	31	22.77	0.1892
836.52	-6.45	30.95	22.35	0.1718
848.31	-7.67	31.2	21.38	0.1374
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
824.70	-13.27	34.47	19.05	0.0804
836.52	-13.00	34.91	19.76	0.0946
848.31	-13.30	34.76	19.31	0.0853

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

3.3.6 Test Result of EIRP

PCS Band (GPRS class 8) Radiated Power EIRP				
Qwerty Keypad with Camera				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1850.2	-12.09	40.70	28.61	0.7261
1880.0	-12.44	41.91	29.47	0.8851
1909.8	-13.24	41.73	28.49	0.7063
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1850.2	-17.69	42.78	25.09	0.3228
1880.0	-18.15	43.75	25.60	0.3631
1909.8	-19.05	43.06	24.01	0.2518

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

PCS Band (EDGE class 8) Radiated Power EIRP				
Qwerty Keypad with Camera				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1850.2	-15.50	40.70	25.20	0.3311
1880.0	-16.27	41.91	25.64	0.3664
1909.8	-16.41	41.73	25.32	0.3404
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1850.2	-20.90	42.78	21.88	0.1542
1880.0	-21.61	43.75	22.14	0.1637
1909.8	-21.85	43.06	21.21	0.1321

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

PCS Band (RMC 12.2Kbps) Radiated Power EIRP				
Qwerty Keypad with Camera				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1852.40	-18.60	40.40	21.80	0.1514
1880.00	-19.52	41.91	22.39	0.1734
1907.60	-19.25	41.59	22.34	0.1714
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1852.40	-24.42	42.69	18.27	0.0671
1880.00	-25.49	43.75	18.26	0.0670
1907.60	-25.25	43.02	17.77	0.0598

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

PCS Band (1xEV-DO Rev. 0_RTAP 153.6K) Radiated Power EIRP				
Qwerty Keypad with Camera				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1851.25	-17.52	40.63	23.11	0.2046
1880.00	-18.63	41.91	23.28	0.2128
1908.75	-18.14	41.76	23.62	0.2301
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1851.25	-22.93	42.82	19.89	0.0975
1880.00	-23.87	43.75	19.88	0.0973
1908.75	-23.79	43.33	19.54	0.0899

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

3.4 99% Occupied Bandwidth and 26dB Bandwidth Measurement

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

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

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

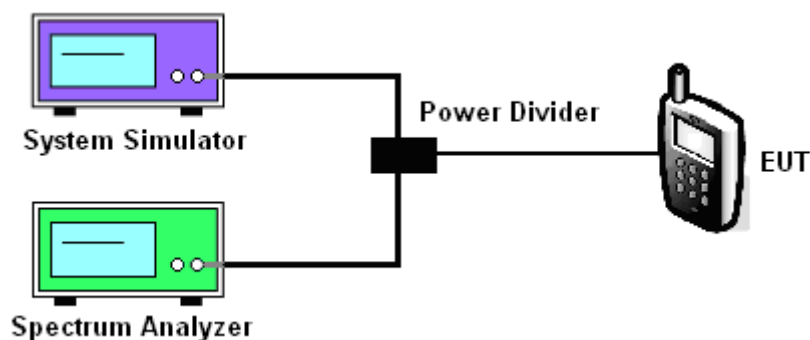
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

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

3.4.4 Test Setup



3.4.5 Test Result of Occupied Bandwidth and 26dB Bandwidth

Cellular Band						
Modes	GSM			EDGE class 8		
Channel	128 (Low)	189 (Mid)	251 (High)	128 (Low)	189 (Mid)	251 (High)
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8
99% OBW (KHz)	244.00	244.00	244.00	244.00	244.00	254.00
26dB BW (KHz)	314.00	316.00	318.00	310.00	314.00	310.00

PCS Band						
Modes	GPRS class 8			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)	244.00	244.00	246.00	244.00	248.00	248.00
26dB BW (KHz)	316.00	316.00	318.00	314.00	312.00	314.00

Cellular Band			
Modes	RMC 12.2Kbps		
Channel	4132 (Low)	4182 (Mid)	4233 (High)
Frequency (MHz)	826.4	836.4	846.6
99% OBW (MHz)	4.16	4.12	4.14
26dB BW (MHz)	4.68	4.68	4.66

PCS Band			
Modes	RMC 12.2Kbps		
Channel	9262 (Low)	9400 (Mid)	9538 (High)
Frequency (MHz)	1852.4	1880	1907.6
99% OBW (MHz)	4.18	4.18	4.16
26dB BW (MHz)	4.68	4.68	4.68

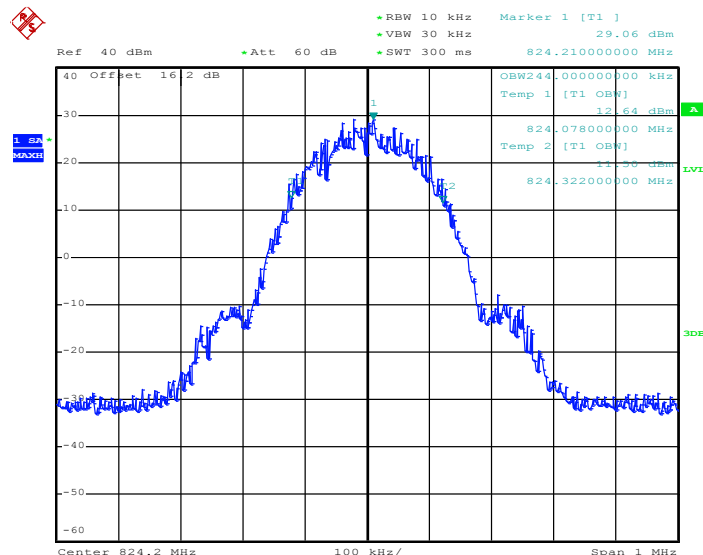
Cellular Band			
Test Mode	1xEV-DO Rev. 0		
Test Status	RTAP 153.6K		
Channel	1013 (Low)	384 (Mid)	777 (High)
Frequency (MHz)	824.70	836.52	848.31
99% OBW (MHz)	1.276	1.276	1.280
26dB BW (MHz)	1.432	1.428	1.428

PCS Band			
Test Mode	1xEV-DO Rev. 0		
Test Status	RTAP 153.6K		
Channel	25 (Low)	600 (Mid)	1175 (High)
Frequency (MHz)	1851.25	1880.00	1908.75
99% OBW (MHz)	1.280	1.280	1.280
26dB BW (MHz)	1.432	1.432	1.452

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

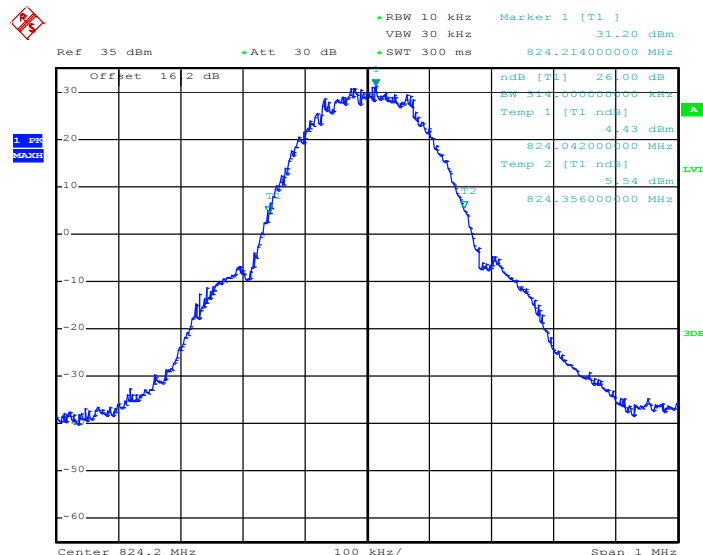
Band :	Cellular Band	Test Mode :	GSM Link (GMSK)
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99% Occupied Bandwidth Plot on Channel 128 (824.2 MHz)



Date: 7.FEB.2013 02:45:35

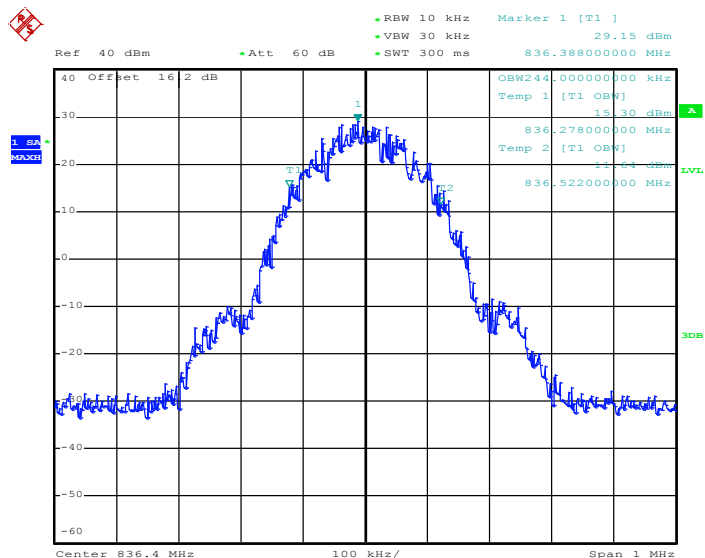
26dB Bandwidth Plot on Channel 128 (824.2 MHz)



Date: 7.FEB.2013 03:06:38

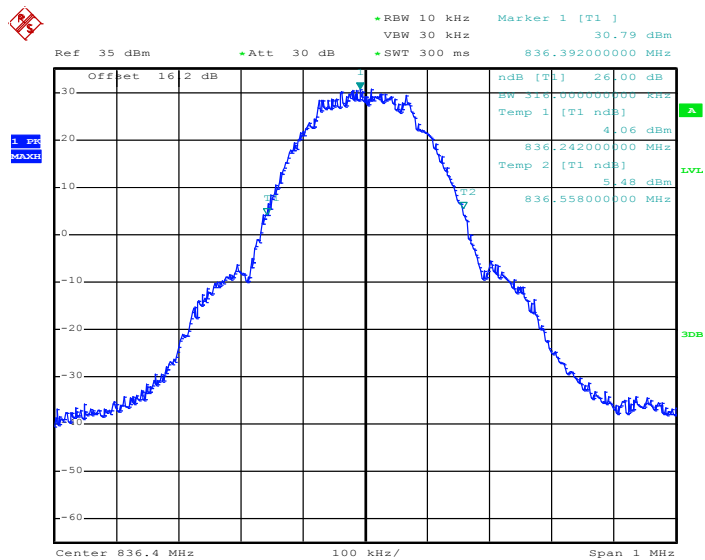


99% Occupied Bandwidth Plot on Channel 189 (836.4 MHz)



Date: 7.FEB.2013 02:46:01

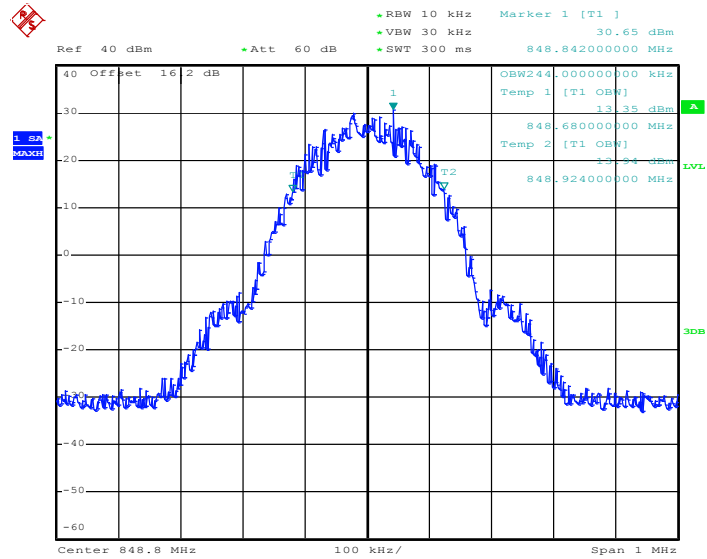
26dB Bandwidth Plot on Channel 189 (836.4 MHz)



Date: 7.FEB.2013 03:05:44

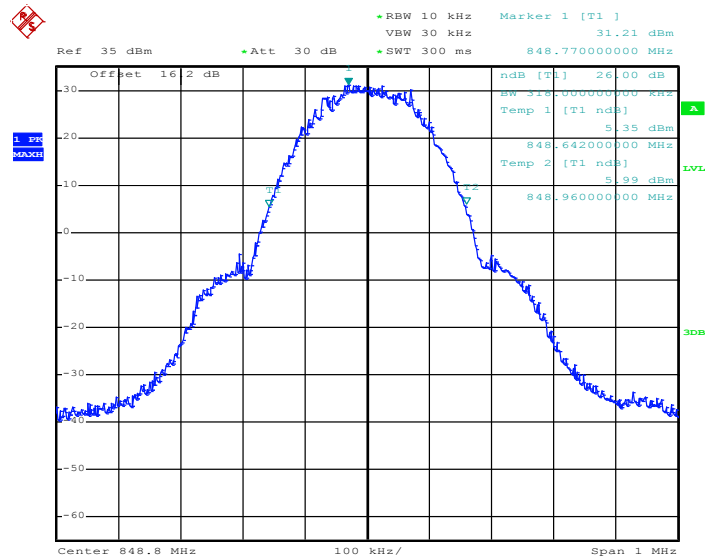


99% Occupied Bandwidth Plot on Channel 251 (848.8 MHz)



Date: 7.FEB.2013 02:46:27

26dB Bandwidth Plot on Channel 251 (848.8 MHz)

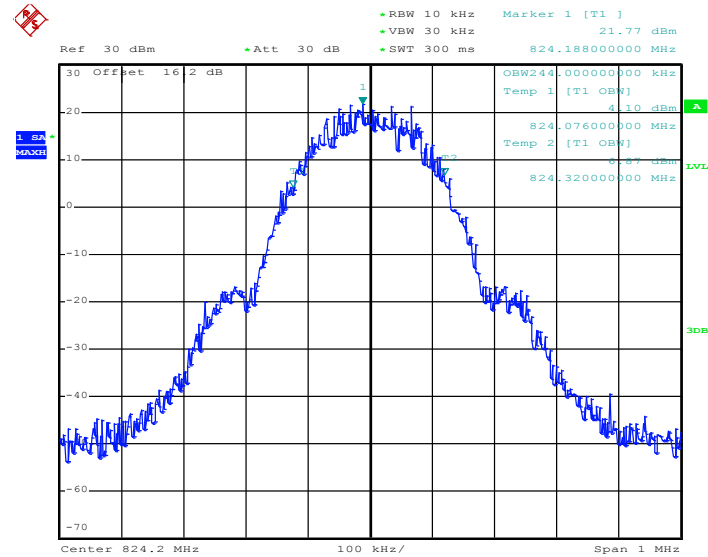


Date: 7.FEB.2013 03:04:59



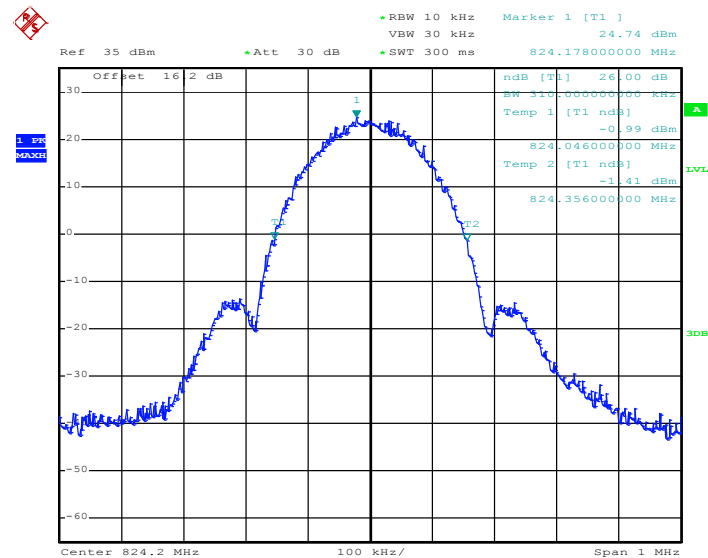
Band :	Cellular Band	Test Mode :	EDGE class 8 Link (8PSK)
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99% Occupied Bandwidth Plot on Channel 128 (824.2 MHz)



Date: 13.FEB.2013 02:50:09

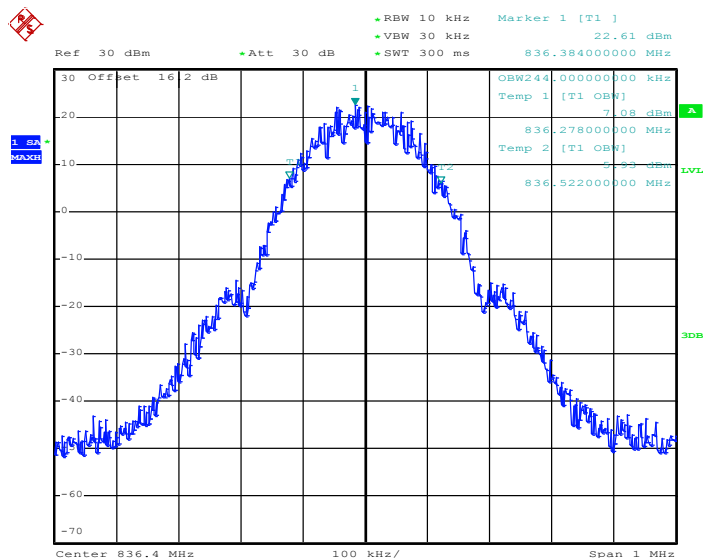
26dB Bandwidth Plot on Channel 128 (824.2 MHz)



Date: 7.FEB.2013 03:17:02

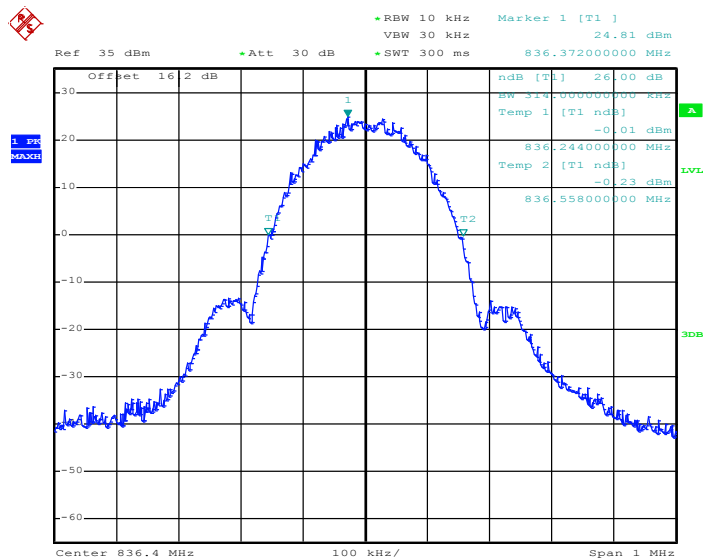


99% Occupied Bandwidth Plot on Channel 189 (836.4 MHz)



Date: 13.FEB.2013 02:50:35

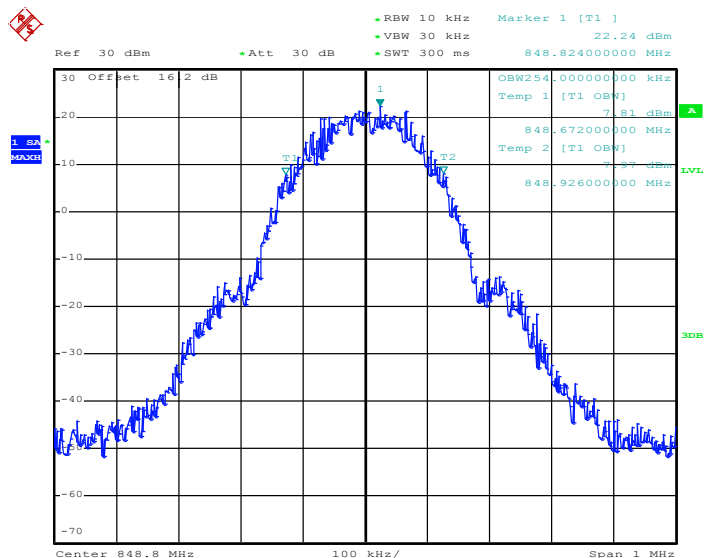
26dB Bandwidth Plot on Channel 189 (836.4 MHz)



Date: 7.FEB.2013 03:18:19

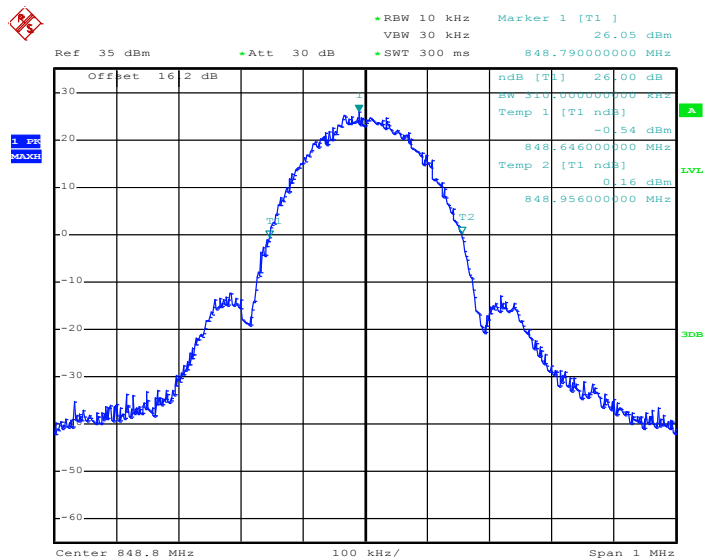


99% Occupied Bandwidth Plot on Channel 251 (848.8 MHz)



Date: 13.FEB.2013 02:51:01

26dB Bandwidth Plot on Channel 251 (848.8 MHz)

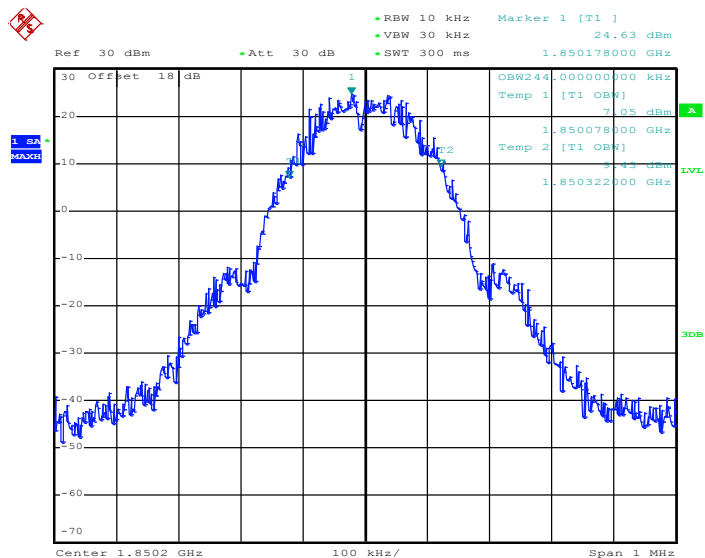


Date: 7.FEB.2013 03:19:27



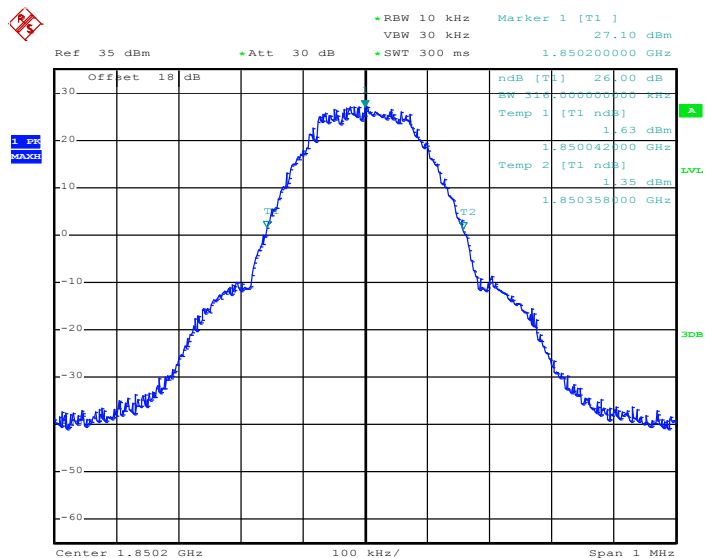
Band :	PCS Band	Test Mode :	GPRS class 8 Link (GMSK)
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99% Occupied Bandwidth Plot on Channel 512 (1850.2 MHz)



Date: 13.FEB.2013 03:25:53

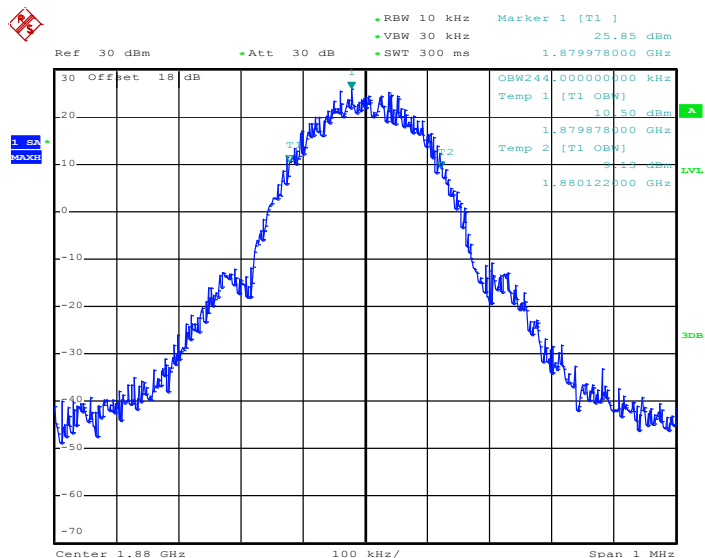
26dB Bandwidth Plot on Channel 512 (1850.2 MHz)



Date: 13.FEB.2013 03:46:14

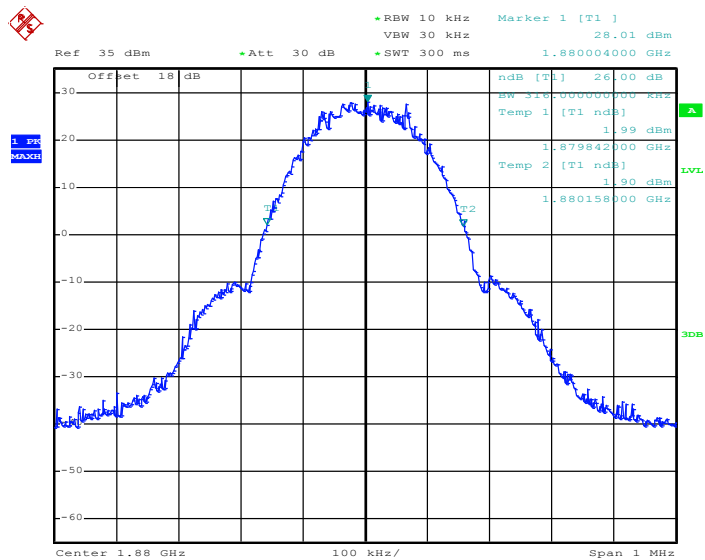


99% Occupied Bandwidth Plot on Channel 661 (1880.0 MHz)



Date: 13.FEB.2013 03:26:19

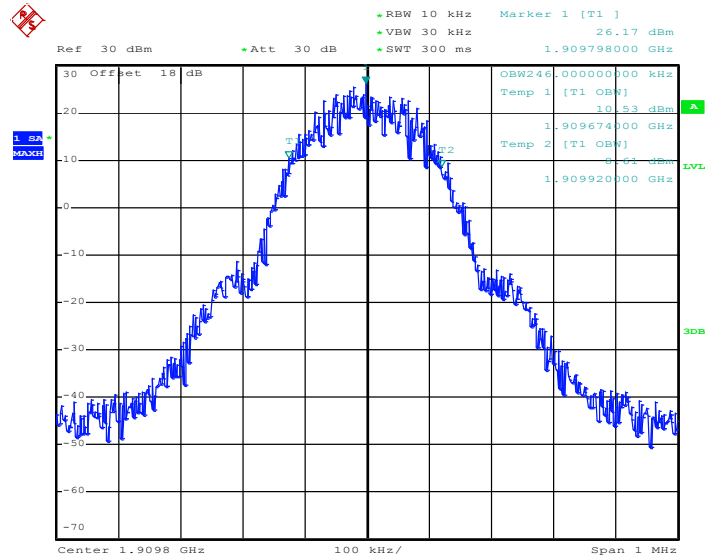
26dB Bandwidth Plot on Channel 661 (1880.0 MHz)



Date: 13.FEB.2013 03:45:20

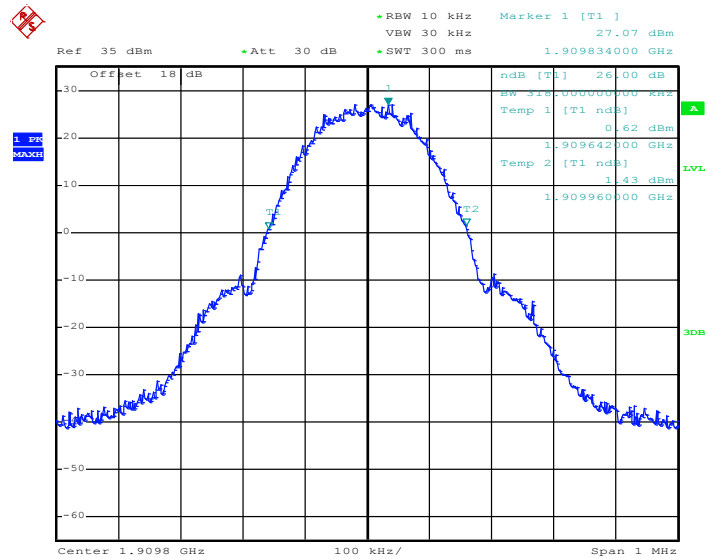


99% Occupied Bandwidth Plot on Channel 810 (1909.8 MHz)



Date: 13.FEB.2013 03:26:45

26dB Bandwidth Plot on Channel 810 (1909.8 MHz)

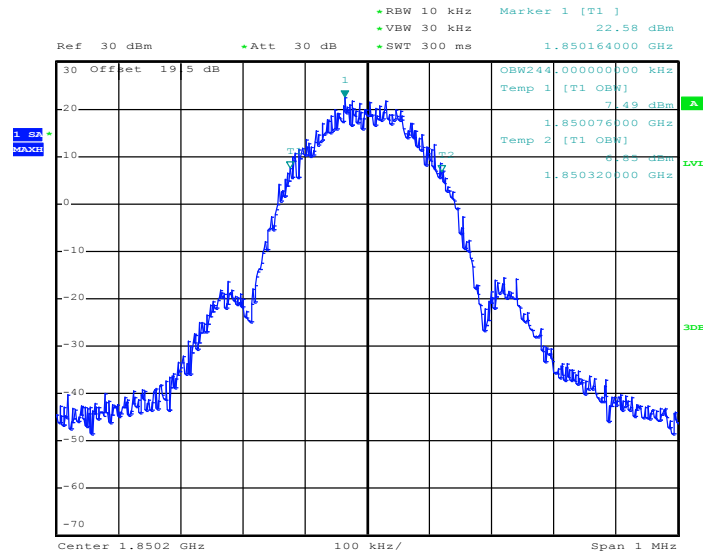


Date: 13.FEB.2013 03:44:41



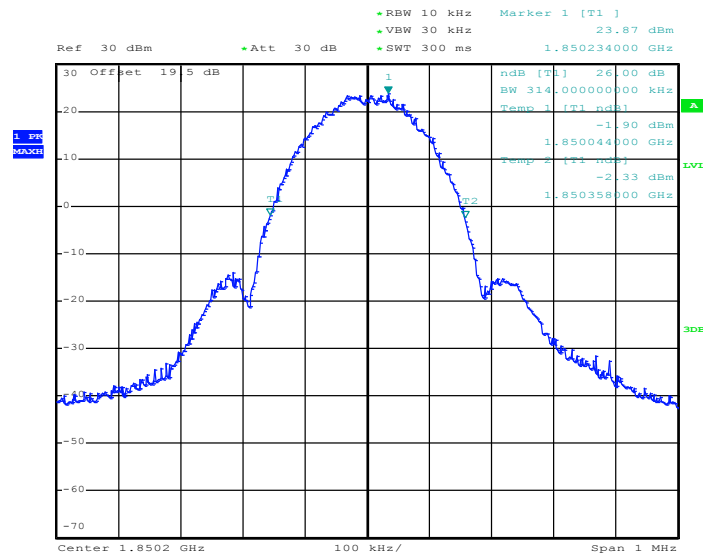
Band :	PCS Band	Test Mode :	EDGE class 8 Link (8PSK)
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99% Occupied Bandwidth Plot on Channel 512 (1850.2 MHz)



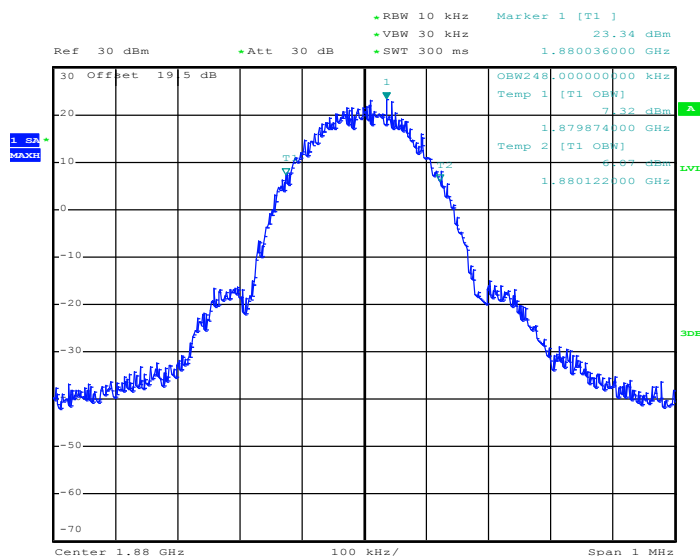
Date: 9.FEB.2013 13:41:13

26dB Bandwidth Plot on Channel 512 (1850.2 MHz)



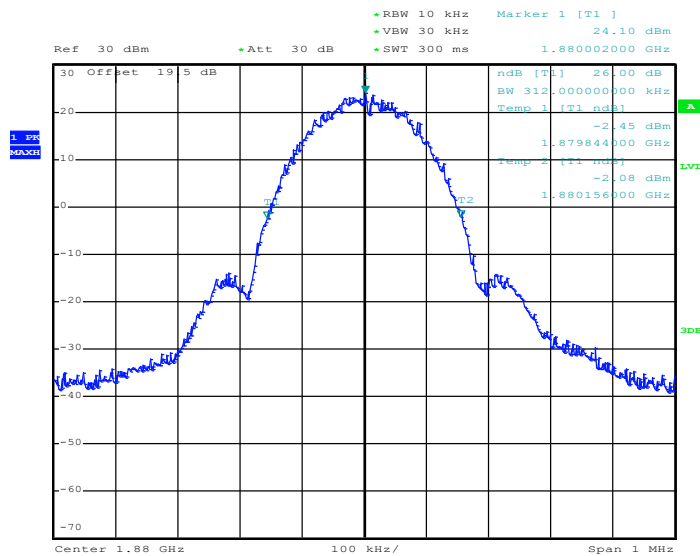
Date: 9.FEB.2013 13:56:31

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



Date: 9.FEB.2013 13:42:55

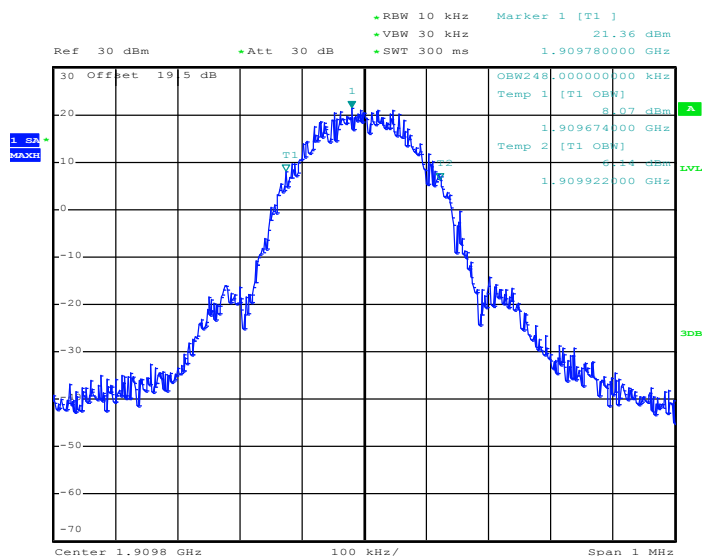
26dB Bandwidth Plot on Channel 661 (1880.0 MHz)



Date: 9.FEB.2013 13:57:42

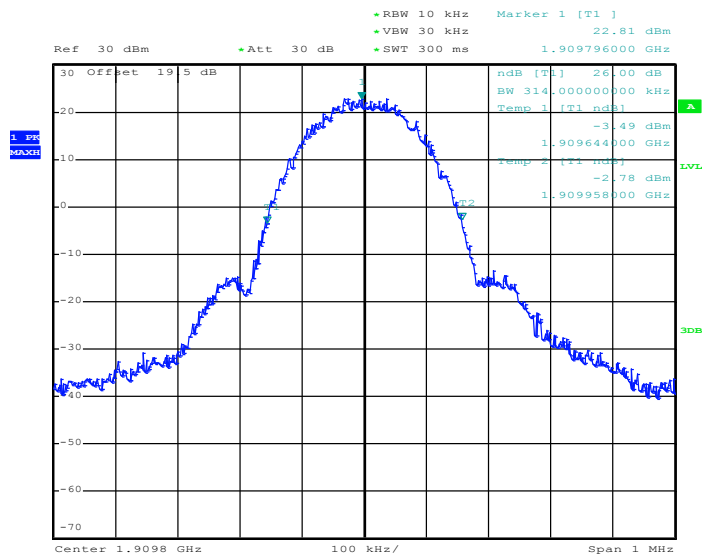


99% Occupied Bandwidth Plot on Channel 810 (1909.8 MHz)



Date: 9.FEB.2013 13:44:22

26dB Bandwidth Plot on Channel 810 (1909.8 MHz)

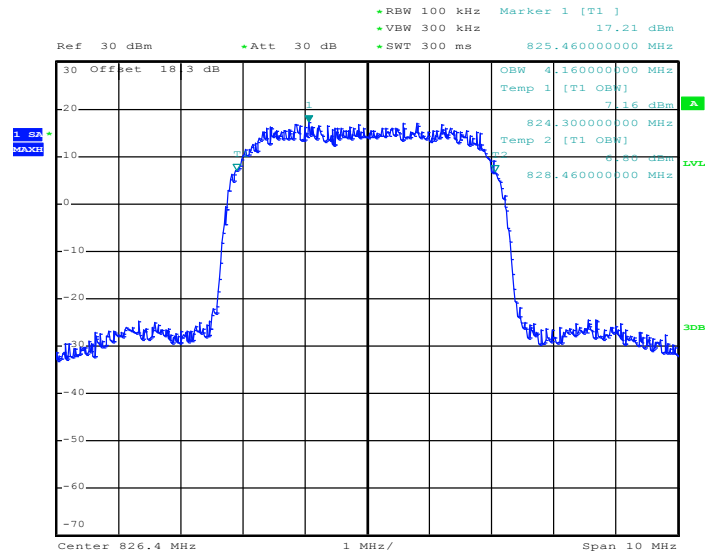


Date: 9.FEB.2013 14:02:23



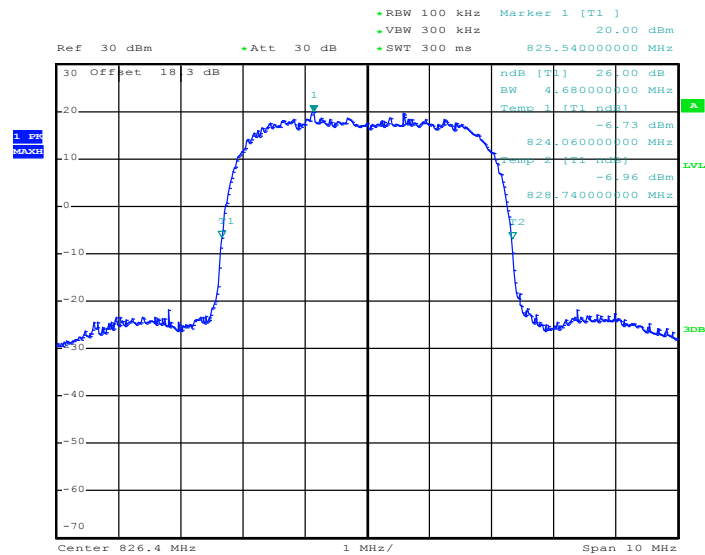
Band :	Cellular Band	Test Mode :	RMC 12.2Kbps Link (QPSK)
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99% Occupied Bandwidth Plot on Channel 4132 (826.4 MHz)

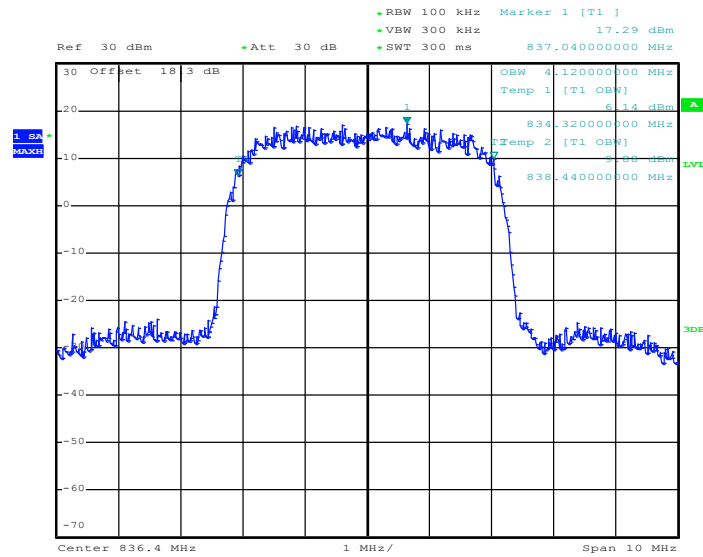


Date: 9.FEB.2013 16:44:41

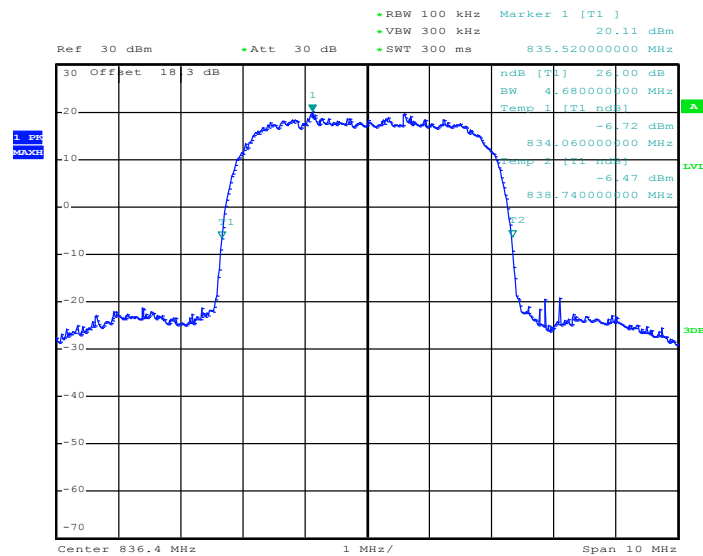
26dB Bandwidth Plot on Channel 4132 (826.4 MHz)



Date: 9.FEB.2013 16:47:25

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


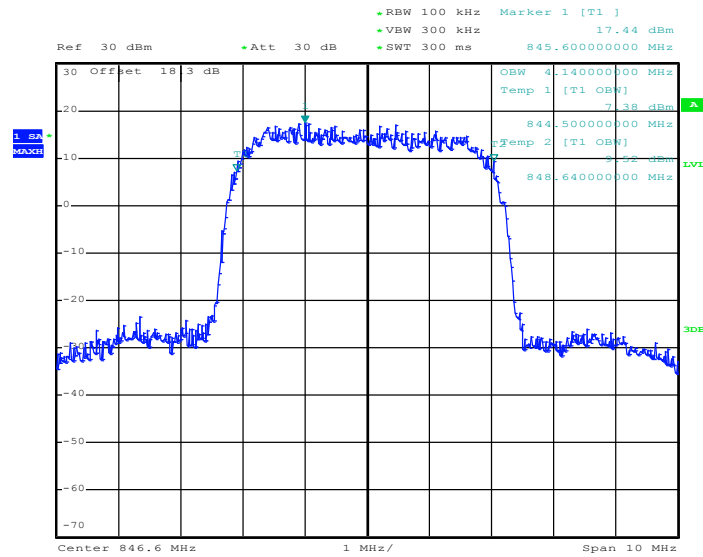
Date: 9.FEB.2013 16:45:11

26dB Bandwidth Plot on Channel 4182 (836.4 MHz)


Date: 9.FEB.2013 16:46:57

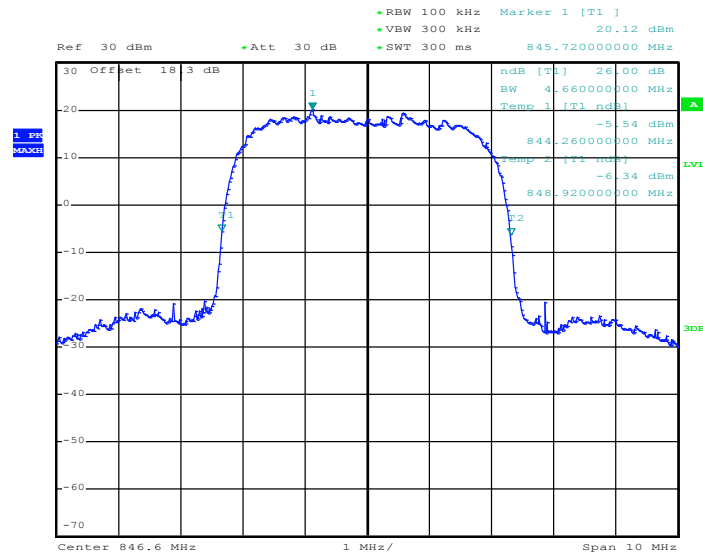


99% Occupied Bandwidth Plot on Channel 4233 (846.6 MHz)



Date: 9.FEB.2013 16:45:42

26dB Bandwidth Plot on Channel 4233 (846.6 MHz)

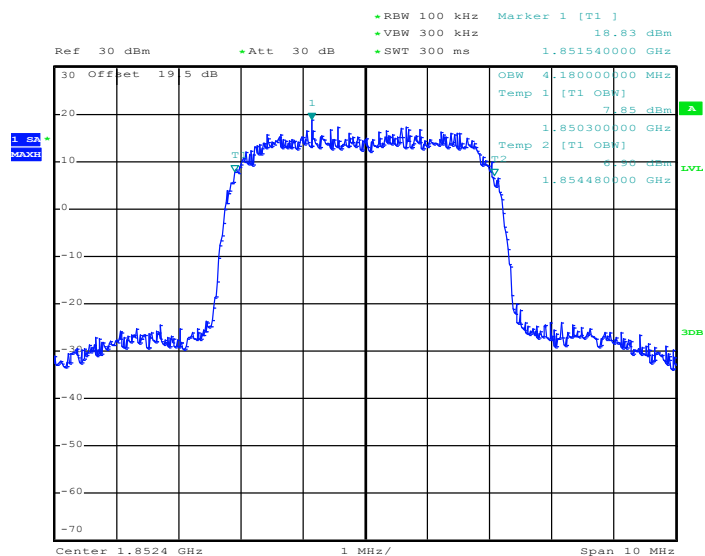


Date: 9.FEB.2013 16:46:26



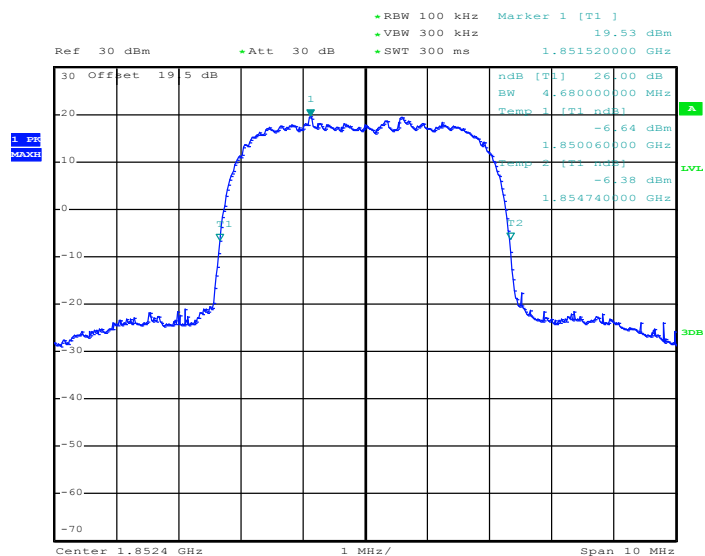
Band :	PCS Band	Test Mode :	RMC 12.2Kbps Link (QPSK)
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99% Occupied Bandwidth Plot on Channel 9262 (1852.4 MHz)



Date: 9.FEB.2013 16:56:06

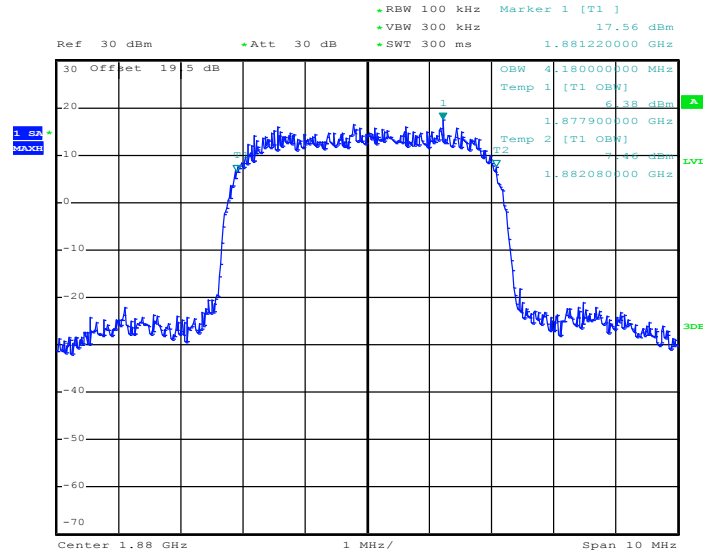
26dB Bandwidth Plot on Channel 9262 (1852.4 MHz)



Date: 9.FEB.2013 16:56:49

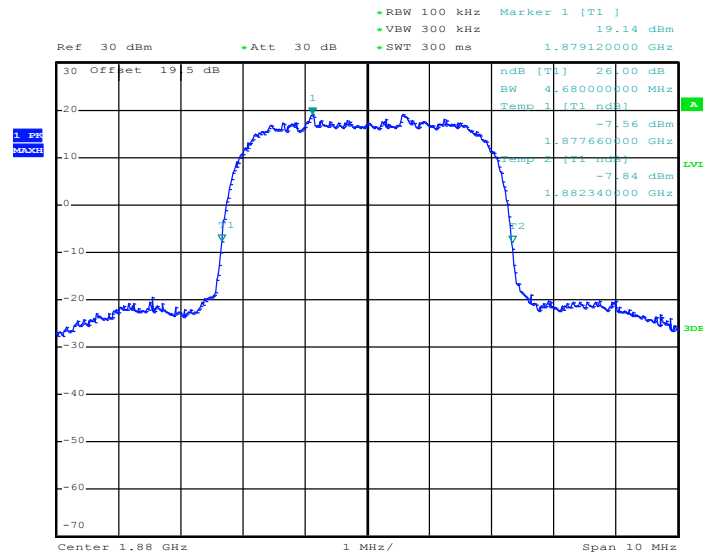


99% Occupied Bandwidth Plot on Channel 9400 (1880.0 MHz)

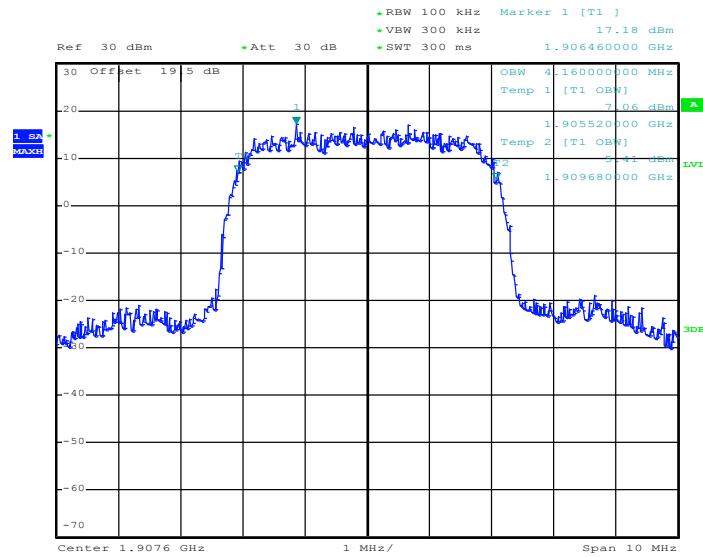


Date: 9.FEB.2013 16:54:58

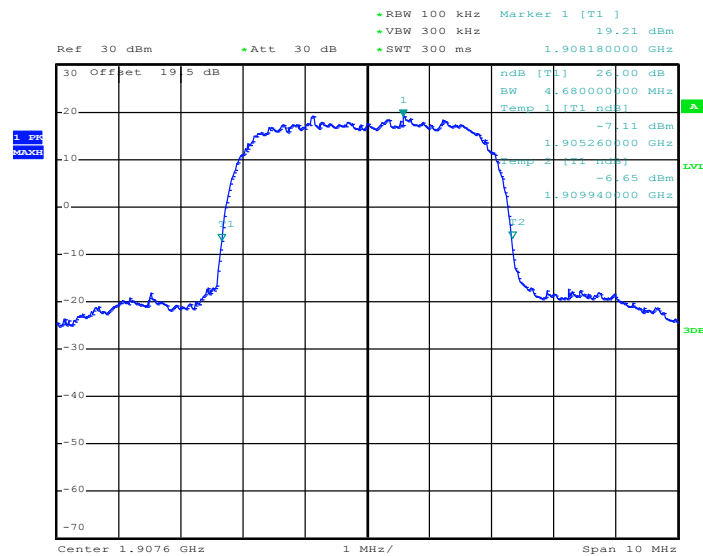
26dB Bandwidth Plot on Channel 9400 (1880.0 MHz)



Date: 9.FEB.2013 16:57:11

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


Date: 9.FEB.2013 16:55:31

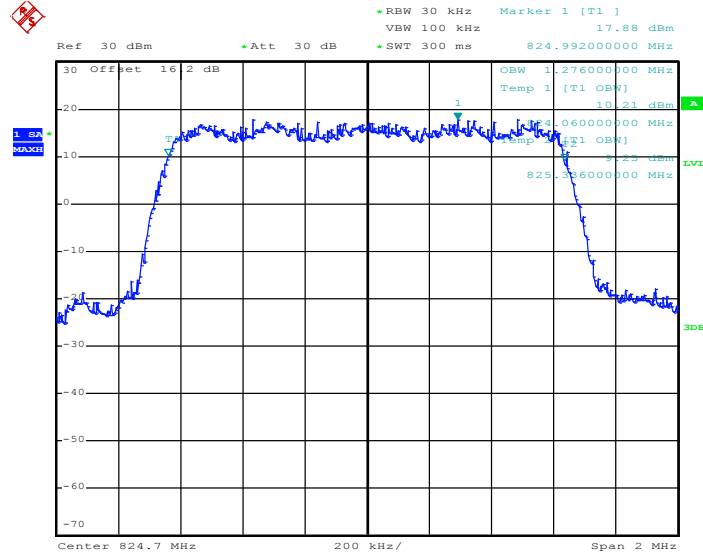
26dB Bandwidth Plot on Channel 9538 (1907.6 MHz)


Date: 9.FEB.2013 16:57:59



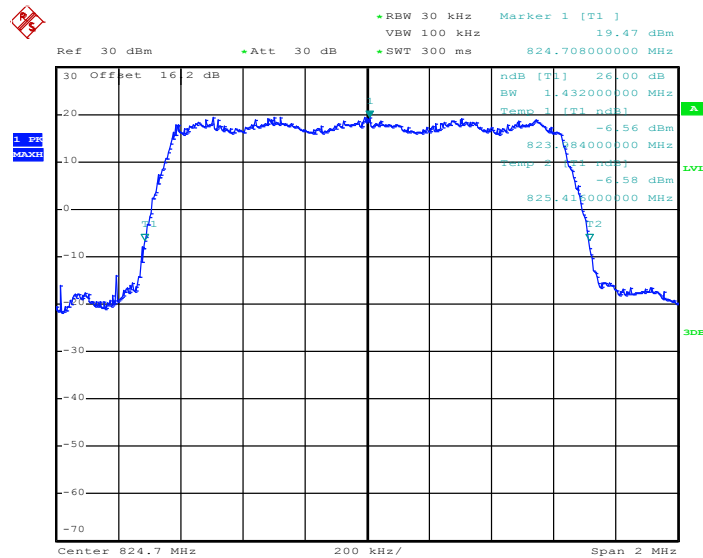
Band :	Cellular Band	Test Mode :	1xEV-DO Rev. 0_RTAP 153.6K (QPSK)
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99% Occupied Bandwidth Plot on Channel 1013 (824.7 MHz)

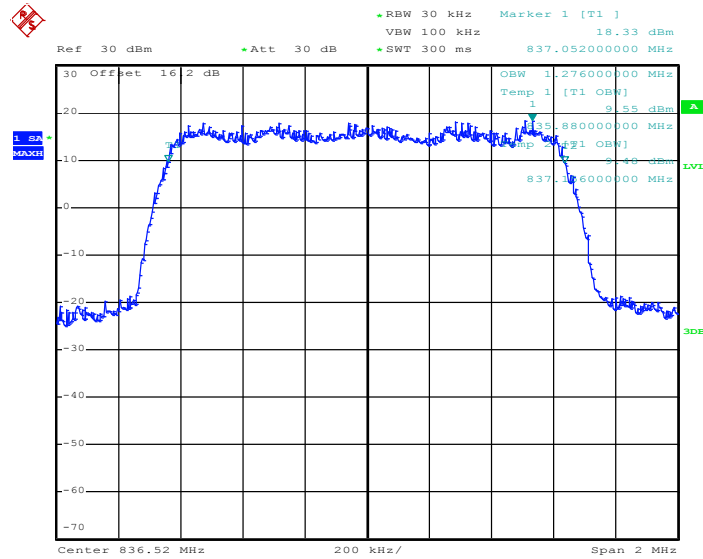


Date: 13.FEB.2013 05:47:08

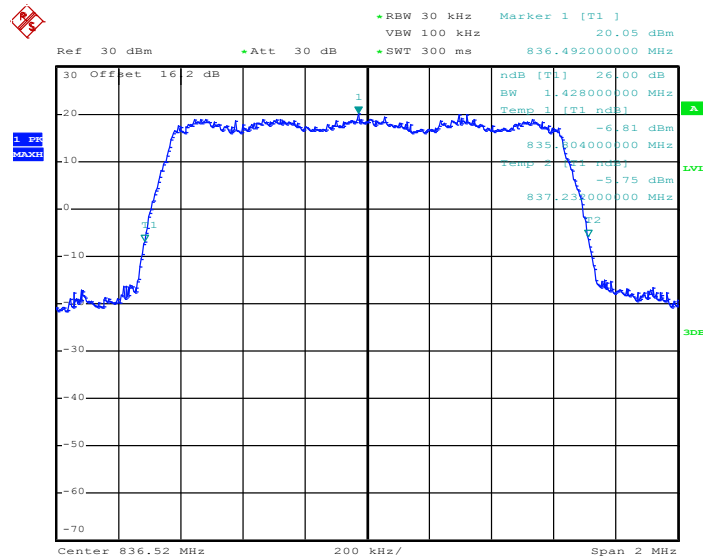
26dB Bandwidth Plot on Channel 1013 (824.7 MHz)



Date: 13.FEB.2013 05:37:21

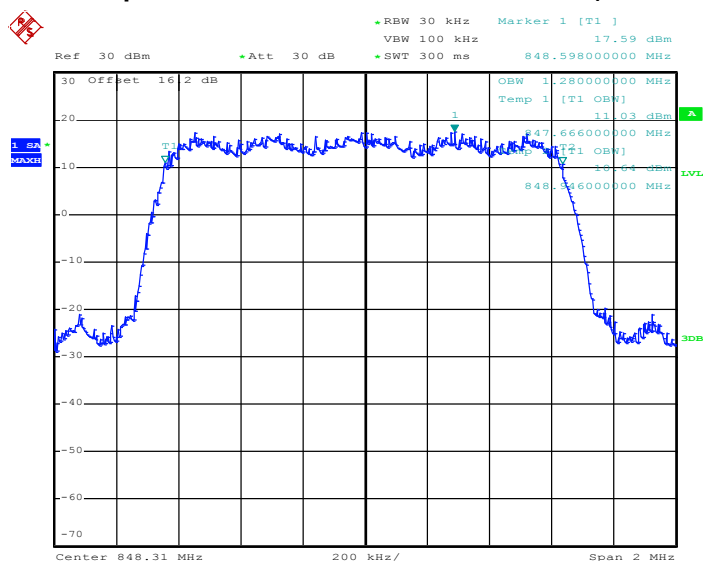
99% Occupied Bandwidth Plot on Channel 384 (836.52 MHz)


Date: 13.FEB.2013 05:43:59

26dB Bandwidth Plot on Channel 384 (836.52 MHz)


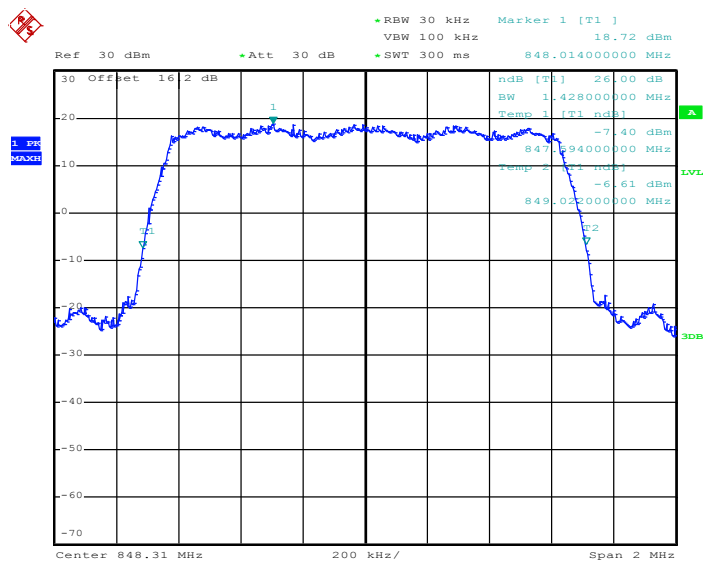
Date: 13.FEB.2013 05:35:36

99% Occupied Bandwidth Plot on Channel 777 (848.31 MHz)



Date: 13.FEB.2013 05:45:31

26dB Bandwidth Plot on Channel 777 (848.31 MHz)

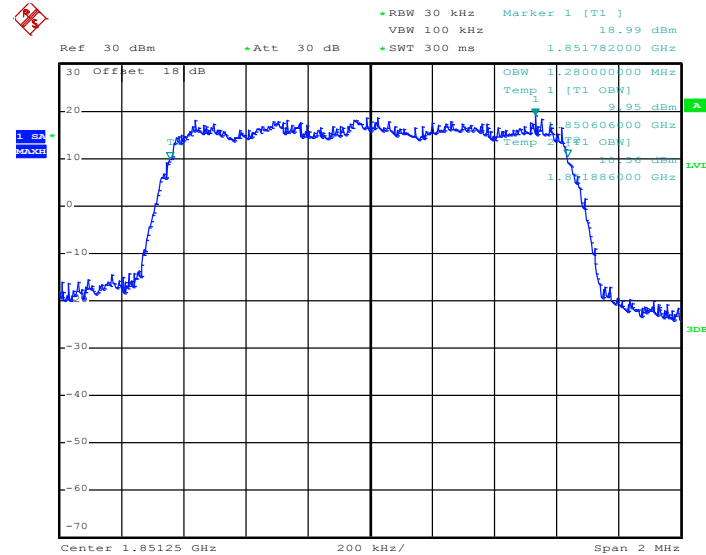


Date: 13.FEB.2013 05:39:48



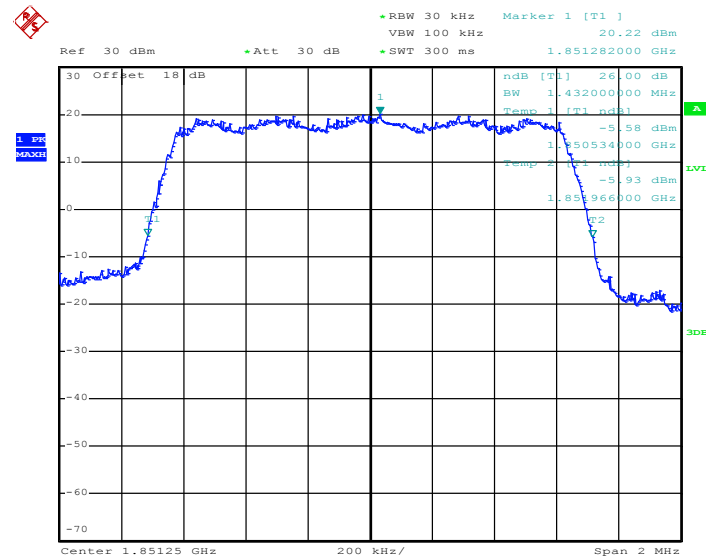
Band :	PCS Band	Test Mode :	1xEV-DO Rev. 0_RTAP 153.6K (QPSK)
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99% Occupied Bandwidth Plot on Channel 25 (1851.24 MHz)

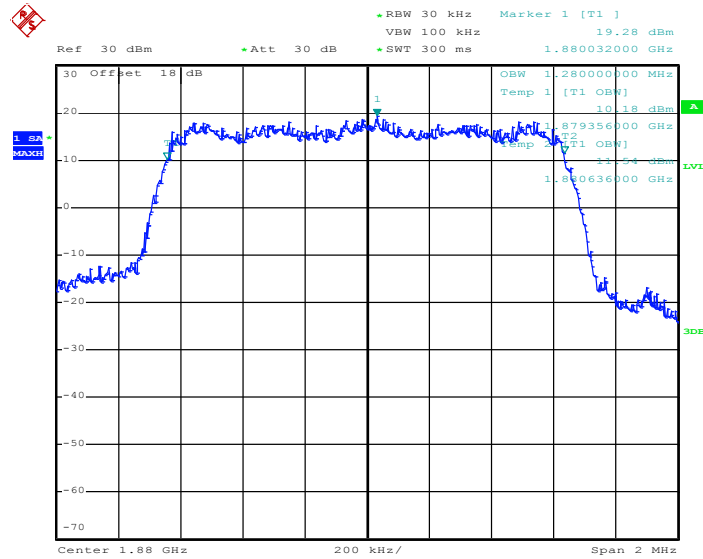


Date: 13.FEB.2013 06:29:10

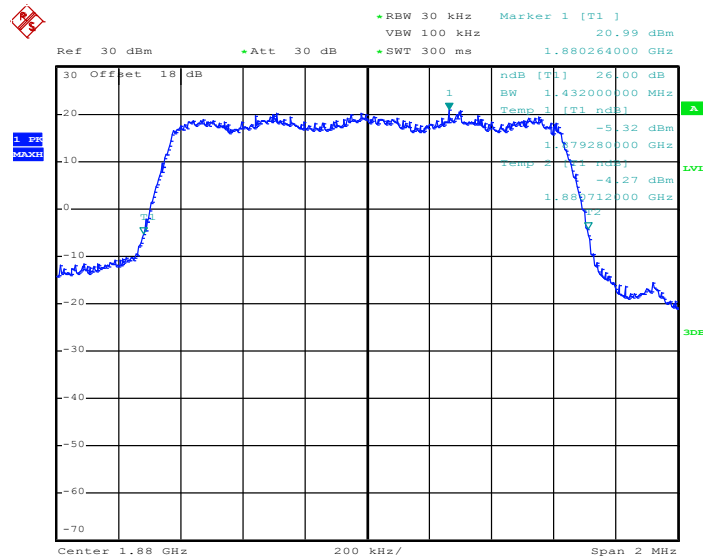
26dB Bandwidth Plot on Channel 25 (1851.24 MHz)



Date: 13.FEB.2013 06:22:45

99% Occupied Bandwidth Plot on Channel 600 (1880.0 MHz)


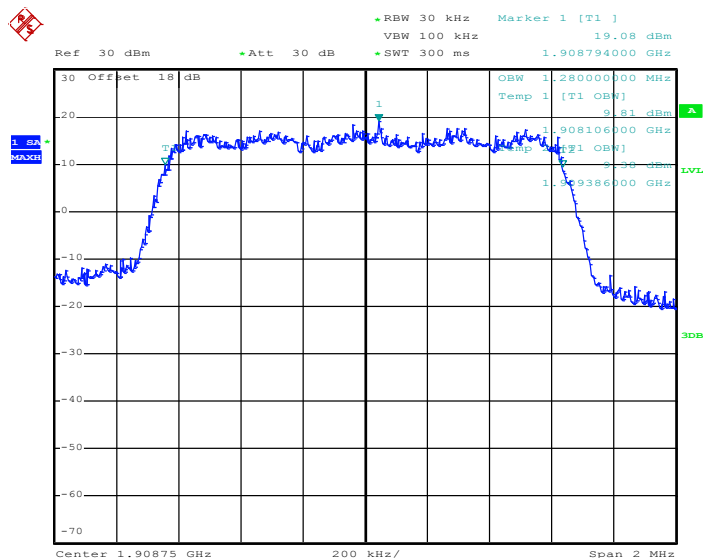
Date: 13.FEB.2013 06:27:15

26dB Bandwidth Plot on Channel 600 (1880.0 MHz)


Date: 13.FEB.2013 06:21:42

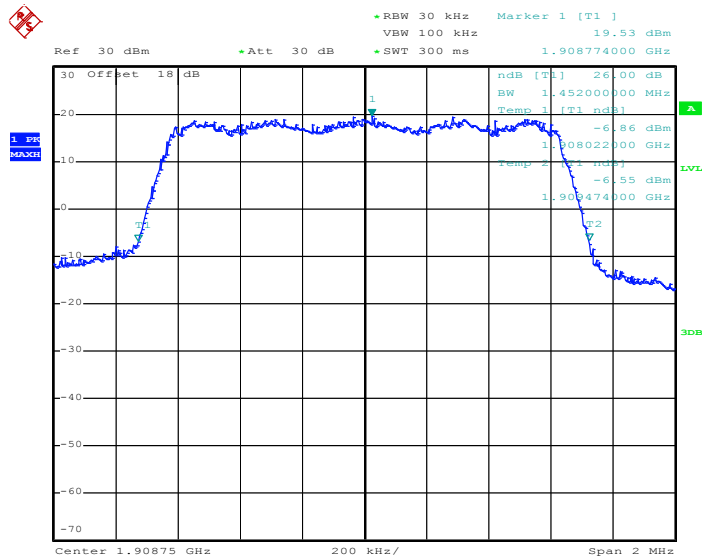


99% Occupied Bandwidth Plot on Channel 1175 (1908.75 MHz)



Date: 13.FEB.2013 06:25:34

26dB Bandwidth Plot on Channel 1175 (1908.75 MHz)



Date: 13.FEB.2013 06:24:04

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 RBW was replaced by 10 kHz, slightly smaller than the value in (2), due to the spectrum analyzer limitation to set the exact value. A worst case correction factor of $10 \cdot \log (1\% \text{ emission-BW/measurement RBW})$ was compensated.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. The limit line is derived from $43 + 10 \log (P)$ dB below the transmitter power P(Watts)

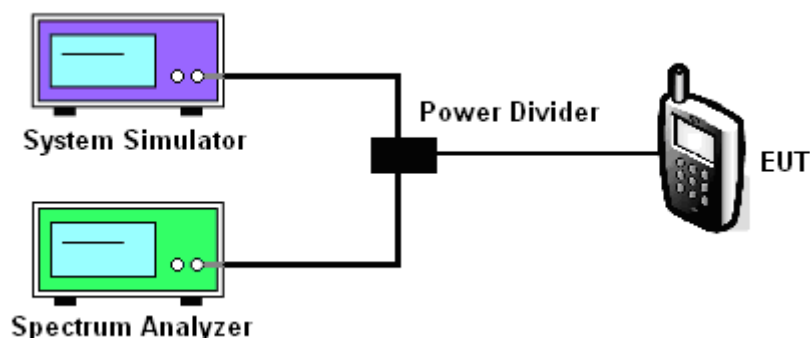
$$= P(W) - [43 + 10 \log (P)] \text{ (dB)}$$

$$= [30 + 10 \log (P)] \text{ (dBm)} - [43 + 10 \log (P)] \text{ (dB)}$$

$$= -13 \text{ dBm.}$$

3.5.4 Test Setup

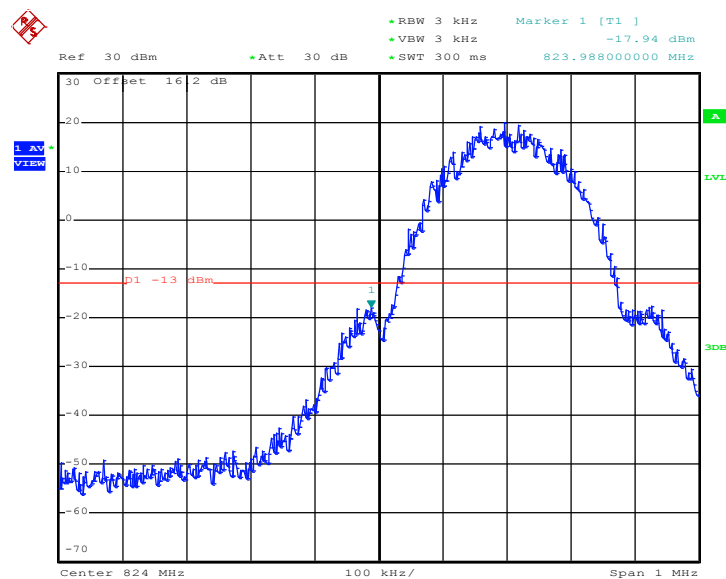
<Conducted Band Edge >



3.5.5 Test Result (Plots) of Conducted Band Edge

Band :	Cellular Band	Test Mode :	GSM Link (GMSK)
Correction Factor :	0.25dB	Maximum 26dB Bandwidth :	0.318MHz
Band Edge :	-17.69dBm	Measurement Value :	-17.94dBm

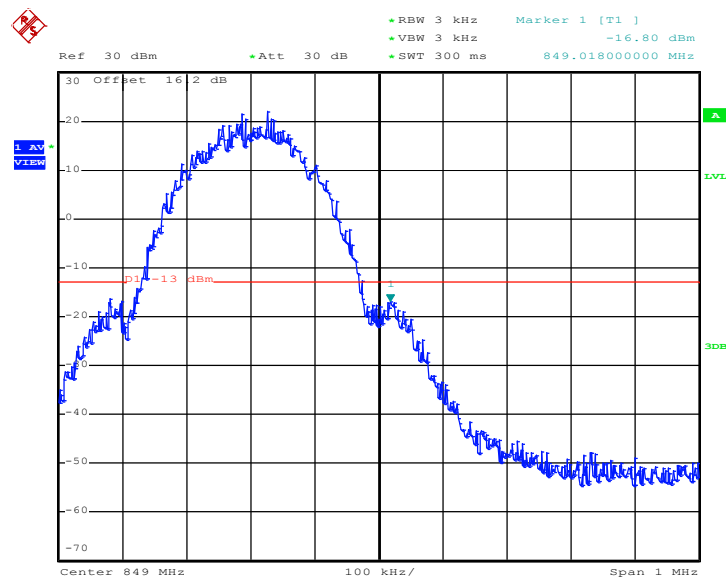
Lower Band Edge Plot on Channel 128 (824.2 MHz)



Date: 7.FEB.2013 02:41:49

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW/RBW})$
 2. Band Edge= Measurement Value + Correction Factor(dB)
- For example, $-17.94\text{dBm} + 0.25\text{dB} = -17.69\text{dBm}$

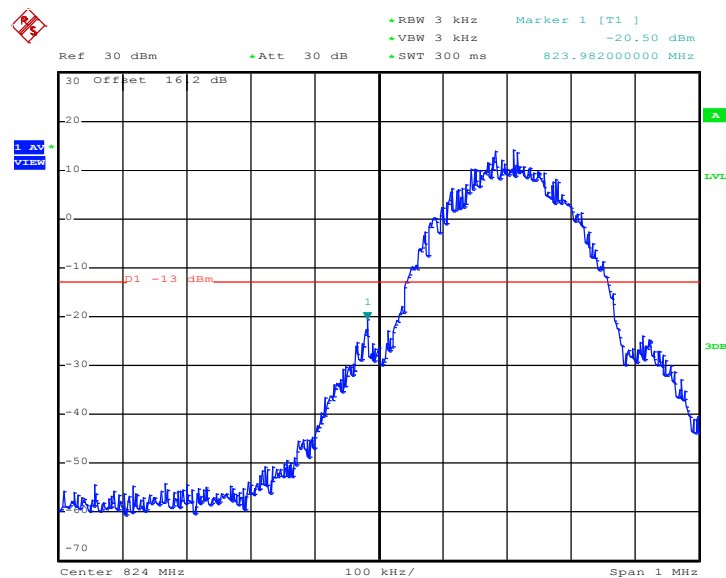
Band :	Cellular Band	Test Mode :	GSM Link (GMSK)
Correction Factor :	0.25dB	Maximum 26dB Bandwidth :	0.318MHz
Band Edge :	-16.55dBm	Measurement Value :	-16.80dBm

Higher Band Edge Plot on Channel 251 (848.8 MHz)


Date: 7.FEB.2013 02:42:15

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

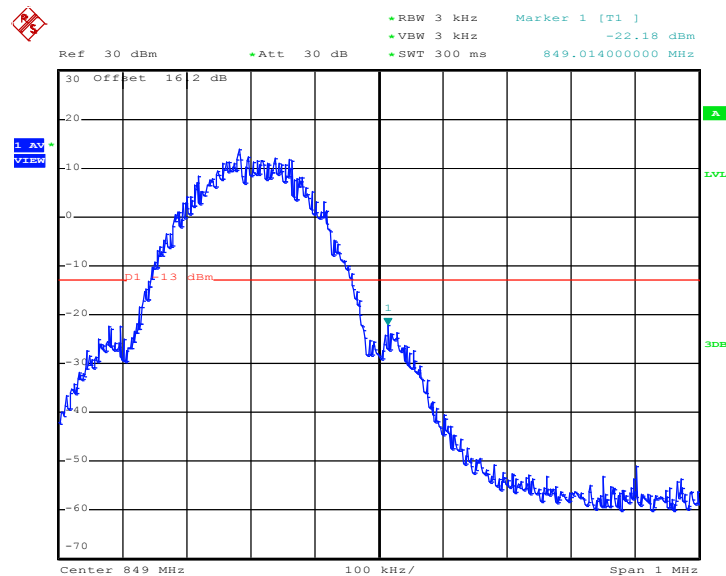
Band :	Cellular Band	Test Mode :	EDGE class 8 Link (8PSK)
Correction Factor :	0.20dB	Maximum 26dB Bandwidth :	0.314MHz
Band Edge :	-20.30dBm	Measurement Value :	-20.50dBm

Lower Band Edge Plot on Channel 128 (824.2 MHz)


Date: 13.FEB.2013 02:51:27

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

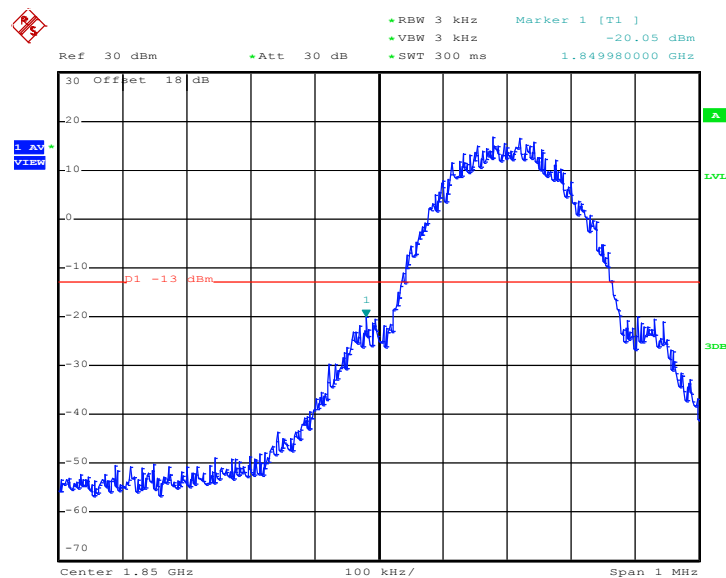
Band :	Cellular Band	Test Mode :	EDGE class 8 Link (8PSK)
Correction Factor :	0.20dB	Maximum 26dB Bandwidth :	0.314MHz
Band Edge :	-21.98dBm	Measurement Value :	-22.18dBm

Higher Band Edge Plot on Channel 251 (848.8 MHz)


Date: 13.FEB.2013 02:51:54

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

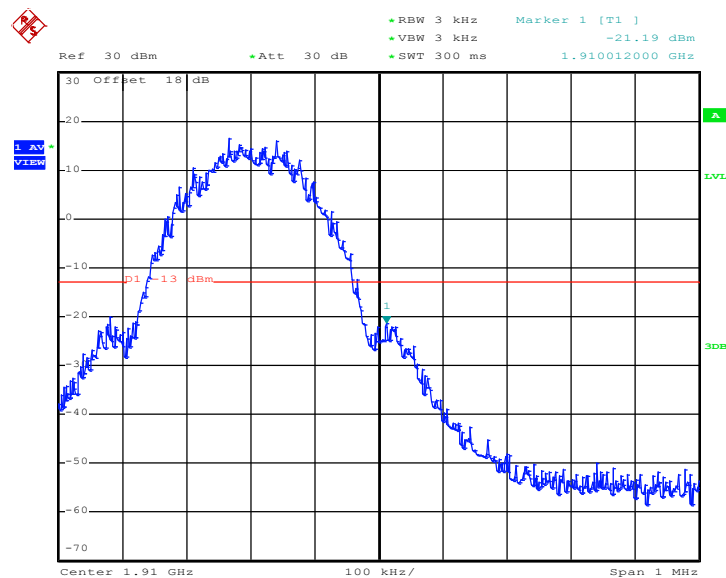
Band :	PCS Band	Test Mode :	GPRS class 8 Link (GMSK)
Correction Factor :	0.25dB	Maximum 26dB Bandwidth :	0.318MHz
Band Edge :	-19.80dBm	Measurement Value :	-20.05dBm

Lower Band Edge Plot on Channel 512 (1850.2 MHz)


Date: 13.FEB.2013 03:24:46

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

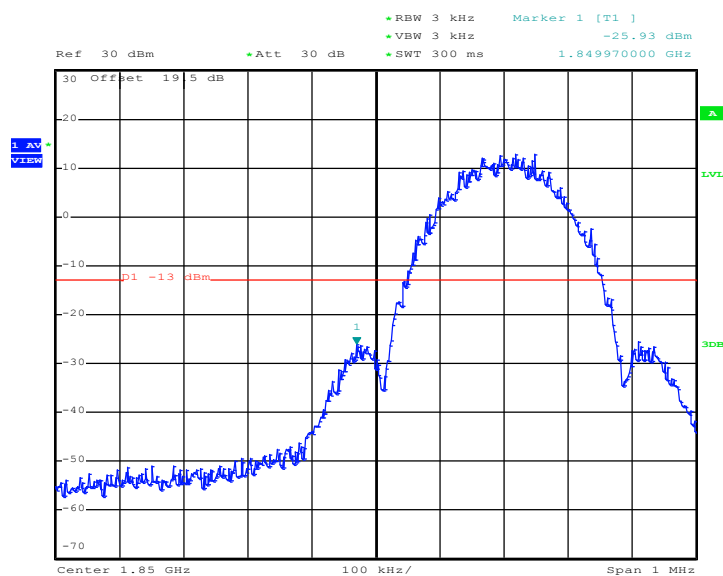
Band :	PCS Band	Test Mode :	GPRS class 8 Link (GMSK)
Correction Factor :	0.25dB	Maximum 26dB Bandwidth :	0.318MHz
Band Edge :	-20.94dBm	Measurement Value :	-21.19dBm

Higher Band Edge Plot on Channel 810 (1909.8 MHz)


Date: 13.FEB.2013 03:25:13

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

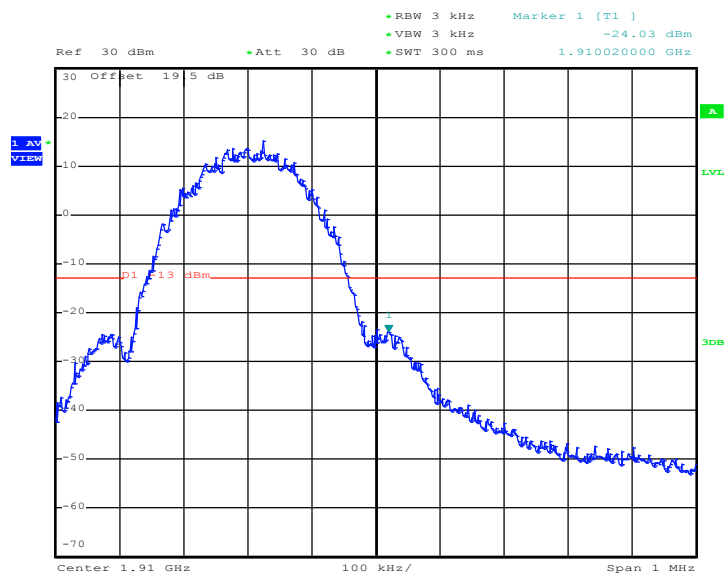
Band :	PCS Band	Test Mode :	EDGE class 8 Link (8PSK)
Correction Factor :	0.20dB	Maximum 26dB Bandwidth :	0.314MHz
Band Edge :	-25.73dBm	Measurement Value :	-25.93dBm

Lower Band Edge Plot on Channel 512 (1850.2 MHz)


Date: 9.FEB.2013 13:38:27

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

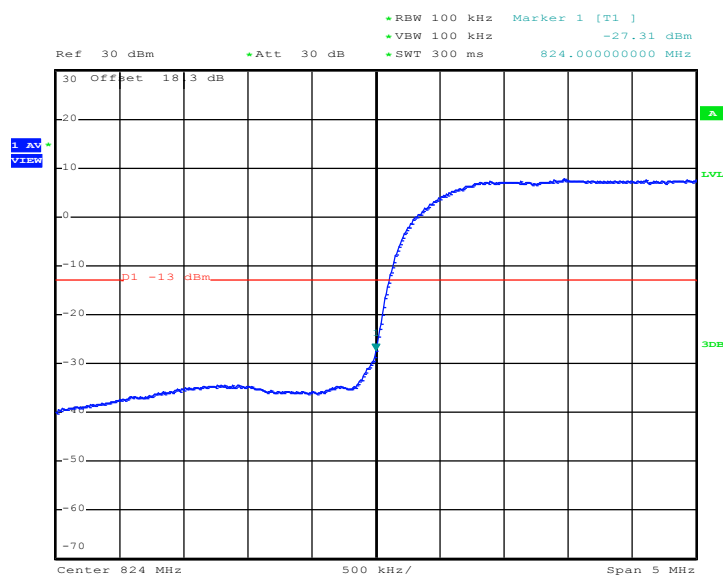
Band :	PCS Band	Test Mode :	EDGE class 8 Link (8PSK)
Correction Factor :	0.20dB	Maximum 26dB Bandwidth :	0.314MHz
Band Edge :	-23.83dBm	Measurement Value :	-24.03dBm

Higher Band Edge Plot on Channel 810 (1909.8 MHz)


Date: 9.FEB.2013 13:25:07

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

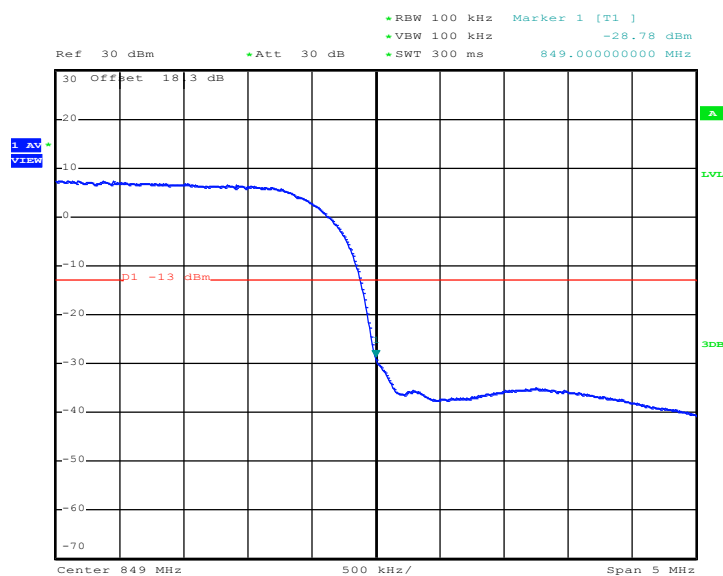
Band :	Cellular Band	Test Mode :	RMC 12.2Kbps Link (QPSK)
Correction Factor :	-3.30dB	Maximum 26dB Bandwidth :	4.680MHz
Band Edge :	-30.61dBm	Measurement Value :	-27.31dBm

Lower Band Edge Plot on Channel 4132 (826.4 MHz)


Date: 9.FEB.2013 16:48:45

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

Band :	Cellular Band	Test Mode :	RMC 12.2Kbps Link (QPSK)
Correction Factor :	-3.30dB	Maximum 26dB Bandwidth :	4.680MHz
Band Edge :	-32.08dBm	Measurement Value :	-28.78dBm

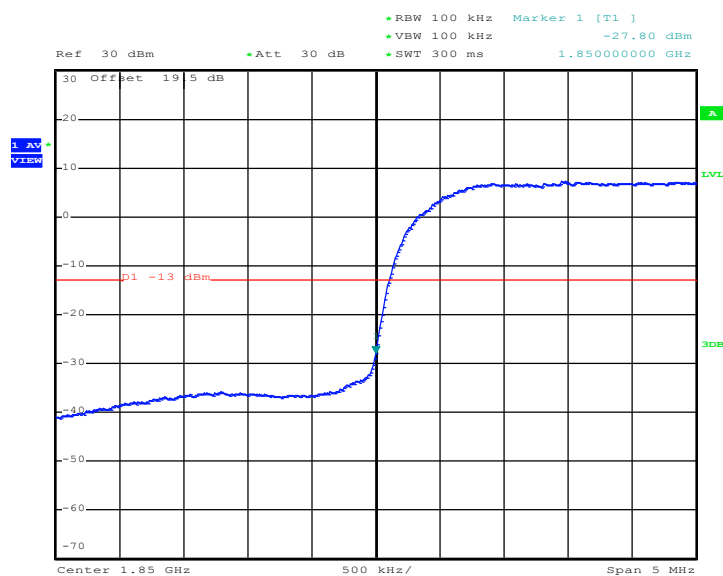
Higher Band Edge Plot on Channel 4233 (846.6 MHz)


Date: 9.FEB.2013 16:49:26

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



Band :	PCS Band	Test Mode :	RMC 12.2Kbps Link (QPSK)
Correction Factor :	-3.30dB	Maximum 26dB Bandwidth :	4.680MHz
Band Edge :	-31.10dBm	Measurement Value :	-27.80dBm

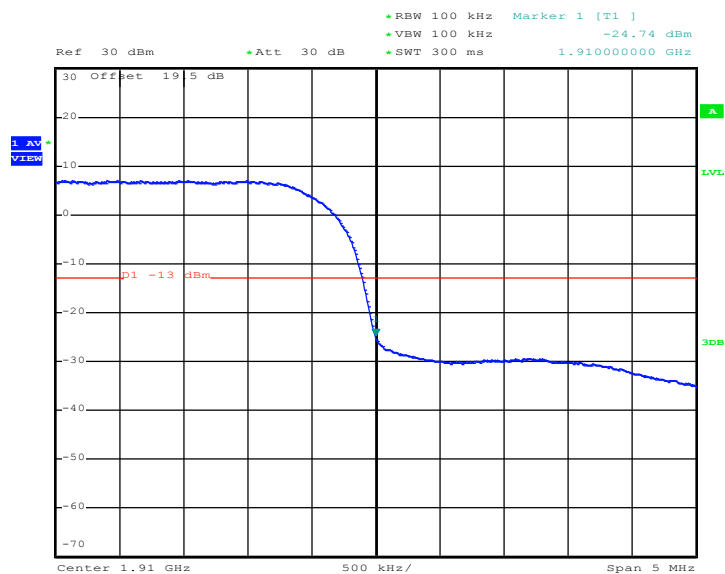
Lower Band Edge Plot on Channel 9262 (1852.4 MHz)

Date: 9.FEB.2013 16:50:54

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



Band :	PCS Band	Test Mode :	RMC 12.2Kbps Link (QPSK)
Correction Factor :	-3.30dB	Maximum 26dB Bandwidth :	4.680MHz
Band Edge :	-28.04dBm	Measurement Value :	-24.74dBm

Higher Band Edge Plot on Channel 9538 (1907.6 MHz)

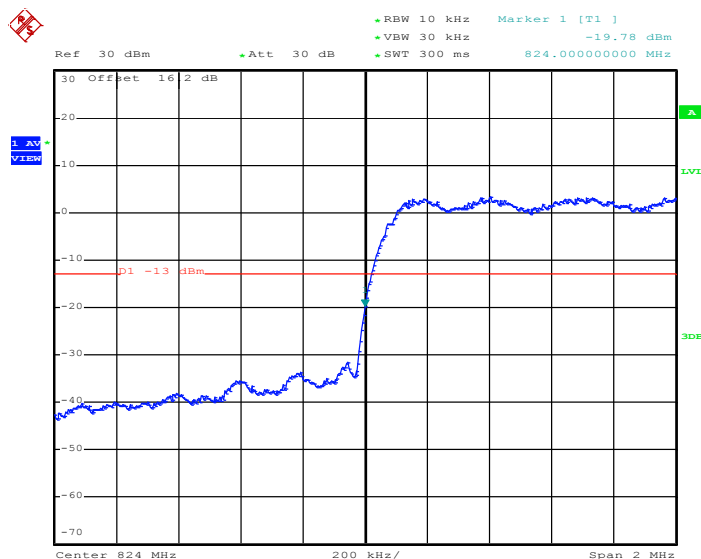
Date: 9.FEB.2013 16:52:33

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



Band :	Cellular Band	Test Mode :	1xEV-DO Rev. 0_RTAP 153.6K (QPSK)
Correction Factor :	1.56dB	Maximum 26dB Bandwidth :	1.432MHz
Band Edge :	-18.22dBm	Measurement Value :	-19.78dBm

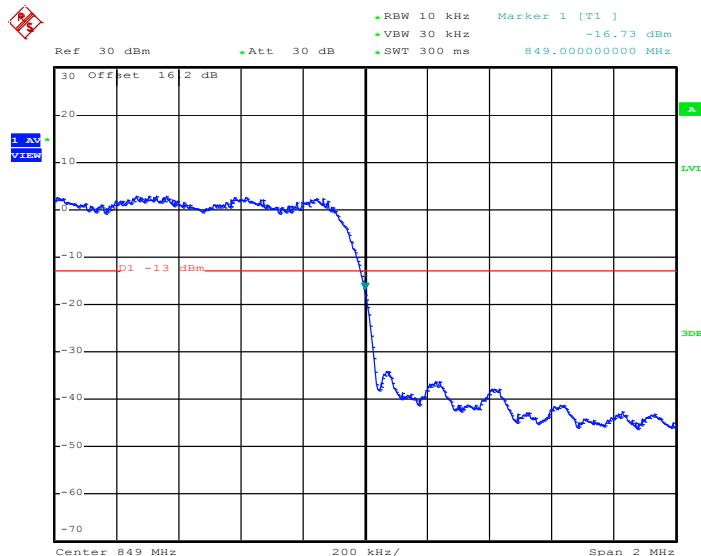
Lower Band Edge Plot on Channel 1013 (824.7 MHz)



Date: 13.FEB.2013 05:54:42

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

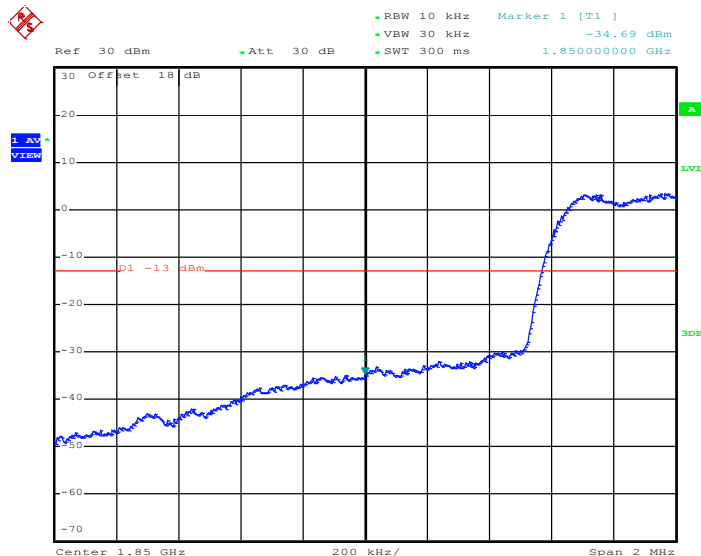
Band :	Cellular Band	Test Mode :	1xEV-DO Rev. 0_RTAP 153.6K (QPSK)
Correction Factor :	1.56dB	Maximum 26dB Bandwidth :	1.432MHz
Band Edge :	-15.17dBm	Measurement Value :	-16.73dBm

Higher Band Edge Plot on Channel 777 (848.31 MHz)


Date: 13.FEB.2013 05:53:30

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

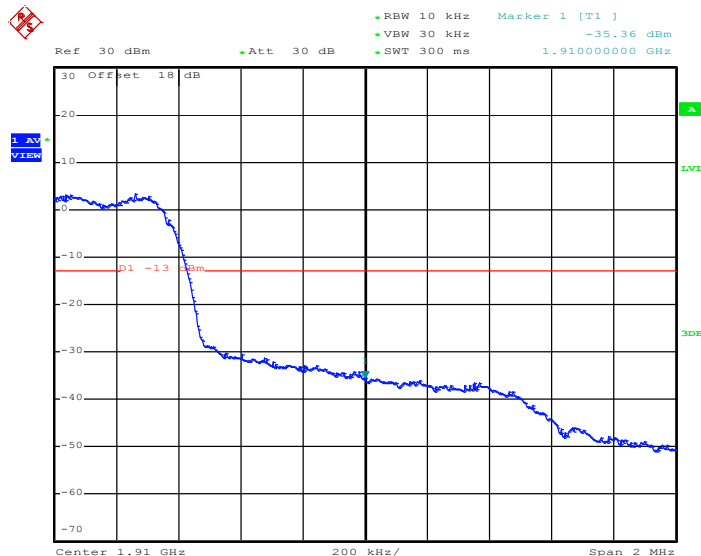
Band :	PCS Band	Test Mode :	1xEV-DO Rev. 0_RTAP 153.6K (QPSK)
Correction Factor :	1.62dB	Maximum 26dB Bandwidth :	1.452MHz
Band Edge :	-33.07dBm	Measurement Value :	-34.69dBm

Lower Band Edge Plot on Channel 25 (1851.25 MHz)


Date: 13.FEB.2013 06:37:36

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

Band :	PCS Band	Test Mode :	1xEV-DO Rev. 0_RTAP 153.6K (QPSK)
Correction Factor :	1.62dB	Maximum 26dB Bandwidth :	1.452MHz
Band Edge :	-33.74dBm	Measurement Value :	-35.36dBm

Higher Band Edge Plot on Channel 1175 (1908.75 MHz)


Date: 13.FEB.2013 06:36:20

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

3.6 Conducted Spurious Emission Measurement

3.6.1 Description of Conducted Spurious Emission Measurement

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

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

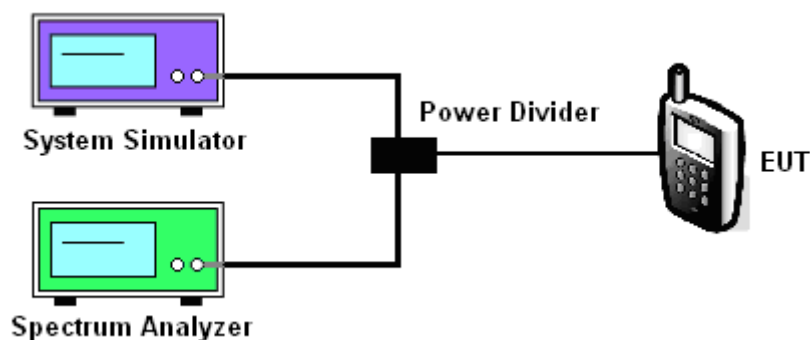
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

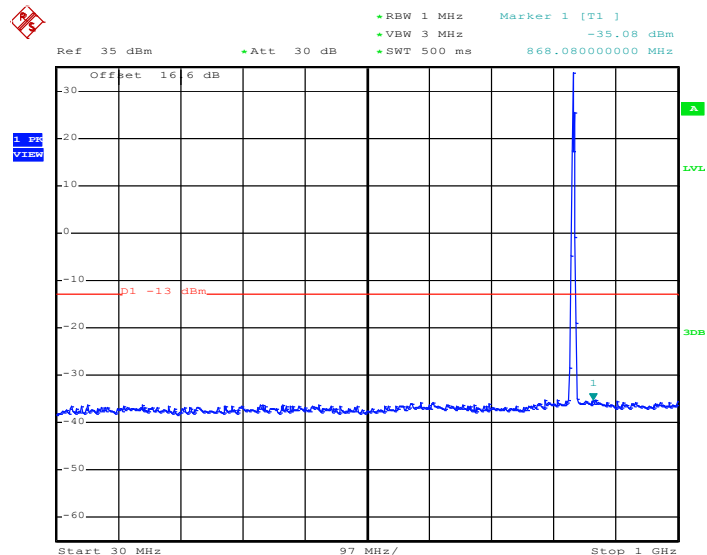
1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting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

3.6.4 Test Setup

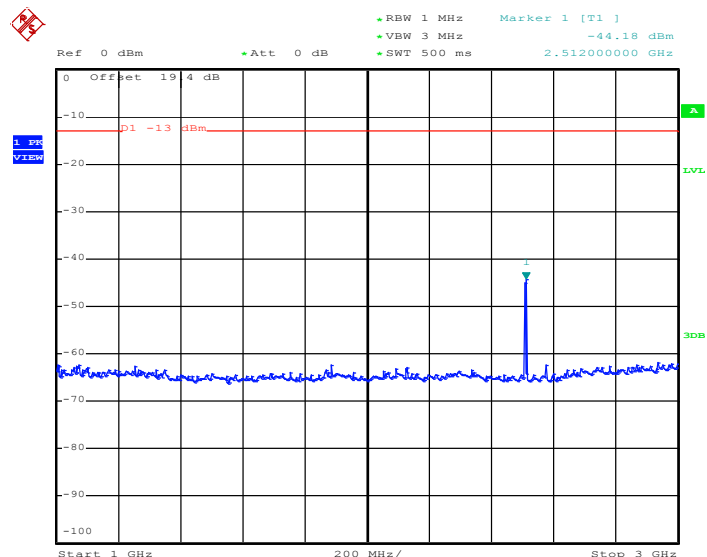


3.6.5 Test Result (Plots) of Conducted Spurious Emission

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

Conducted Spurious Emission Plot between 30MHz ~ 1GHz


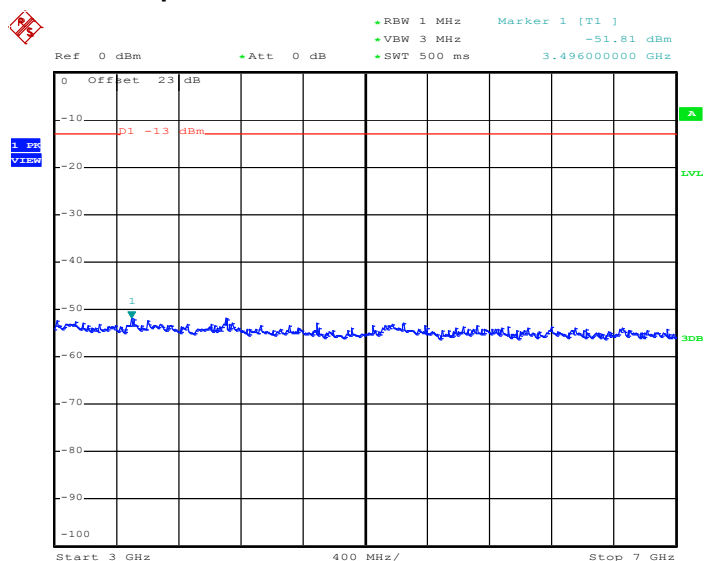
Date: 6.FEB.2013 04:54:56

Conducted Spurious Emission Plot between 1GHz ~ 3GHz


Date: 6.FEB.2013 04:55:15

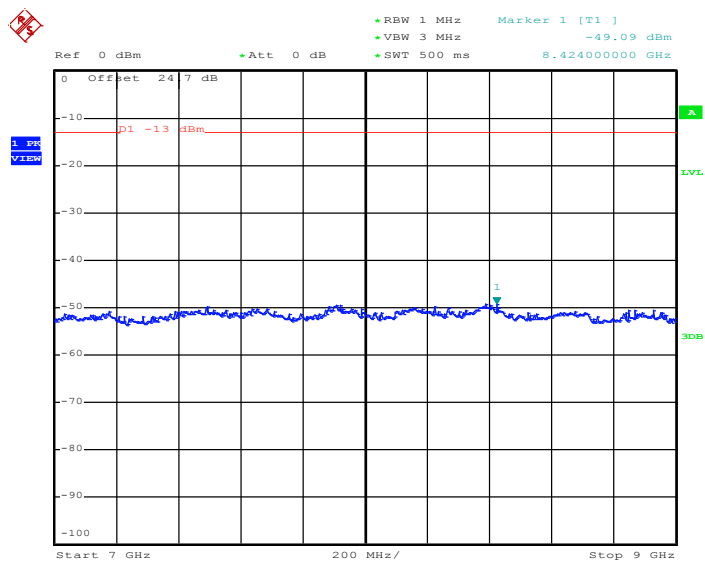


Conducted Spurious Emission Plot between 3GHz ~ 7GHz



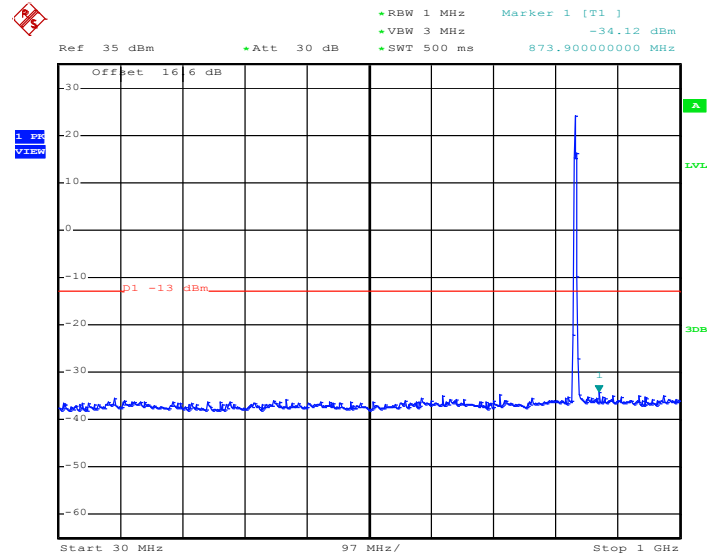
Date: 6.FEB.2013 04:55:27

Conducted Spurious Emission Plot between 7GHz ~ 9GHz

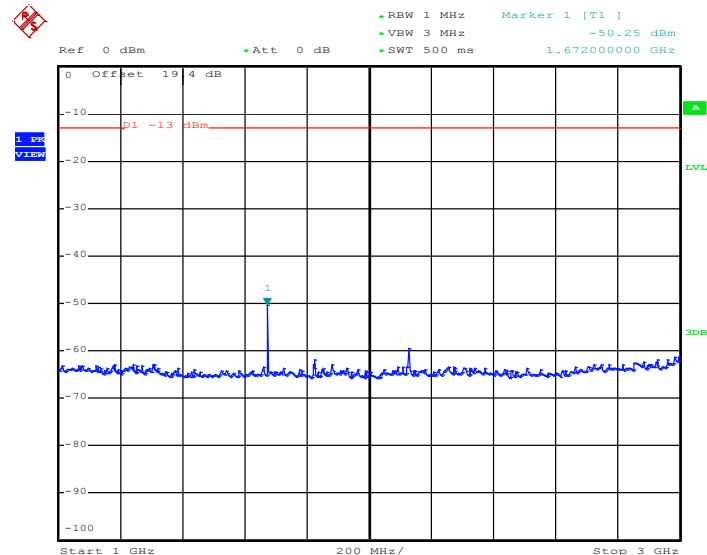


Date: 6.FEB.2013 04:55:40

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

Conducted Spurious Emission Plot between 30MHz ~ 1GHz


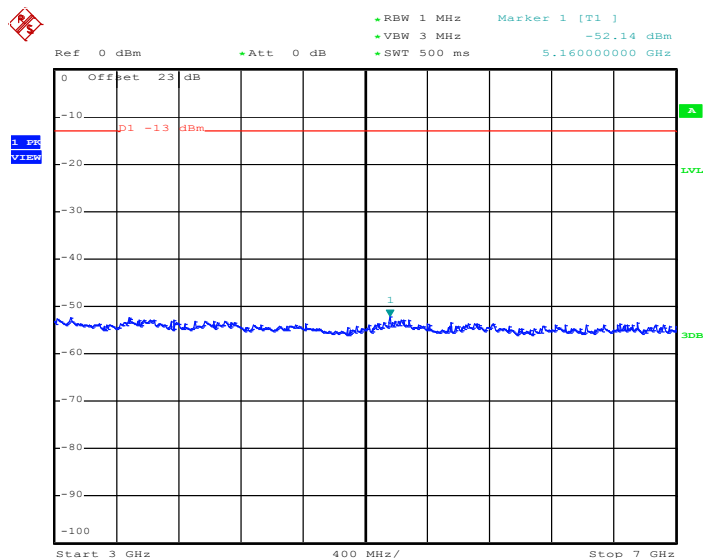
Date: 13.FEB.2013 02:37:45

Conducted Spurious Emission Plot between 1GHz ~ 3GHz


Date: 13.FEB.2013 02:38:02

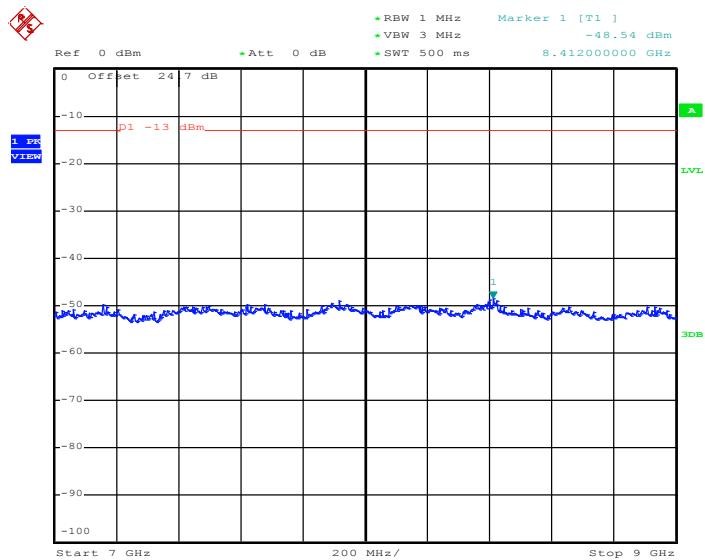


Conducted Spurious Emission Plot between 3GHz ~ 7GHz



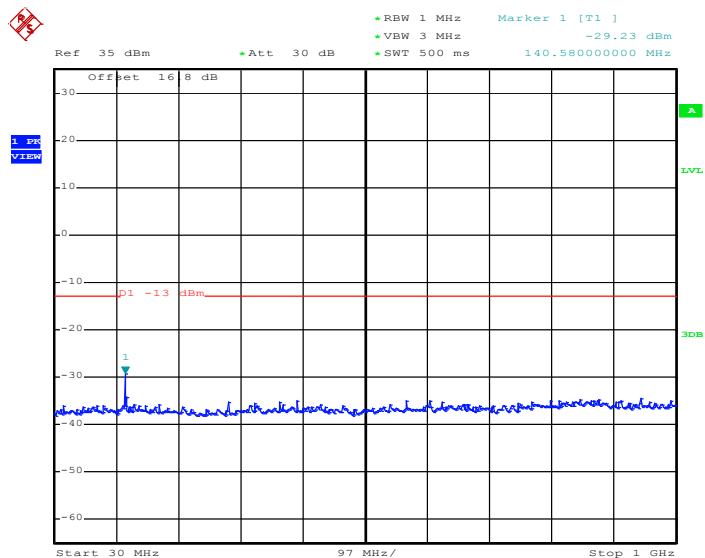
Date: 13.FEB.2013 02:38:15

Conducted Spurious Emission Plot between 7GHz ~ 9GHz

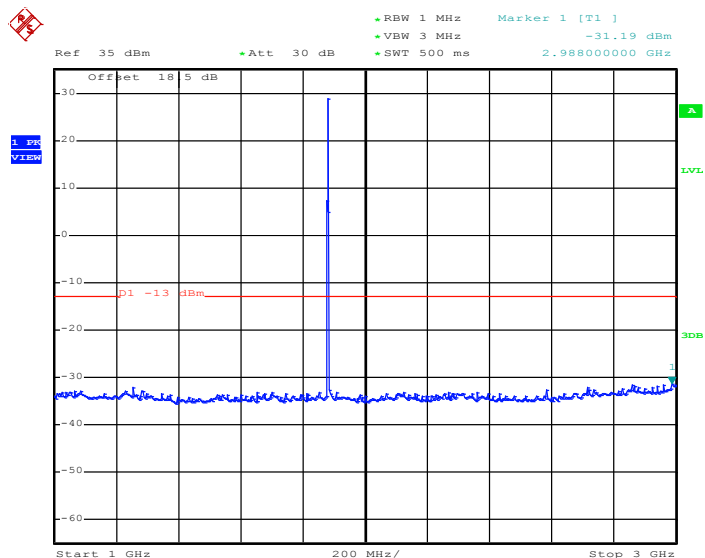


Date: 13.FEB.2013 02:38:27

Band :	PCS Band	Channel :	CH661
Test Mode :	GPRS class 8 Link (GMSK)	Frequency :	1880.0 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz


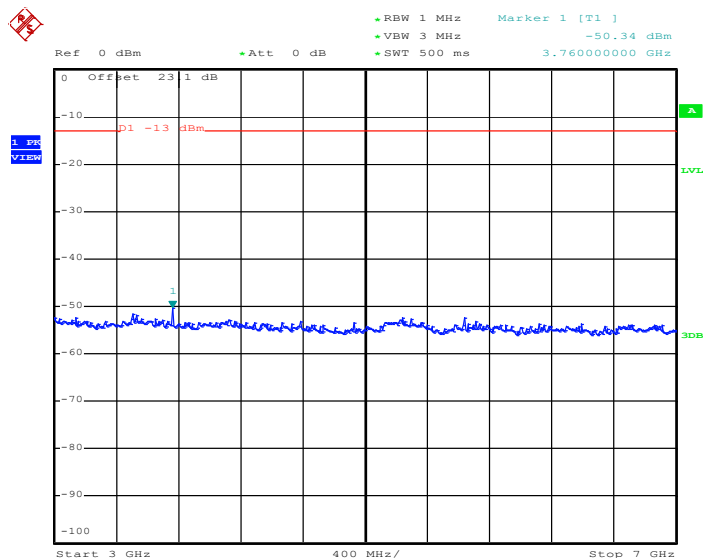
Date: 13.FEB.2013 03:10:19

Conducted Spurious Emission Plot between 1GHz ~ 3GHz


Date: 13.FEB.2013 03:10:31

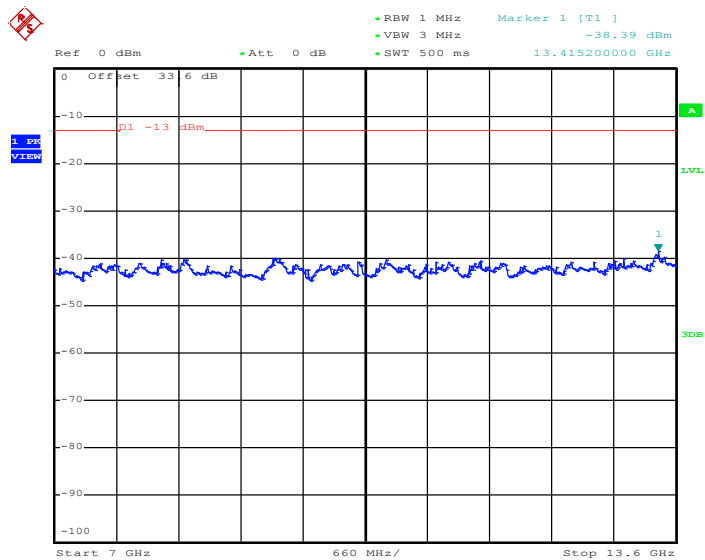


Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 13.FEB.2013 03:10:49

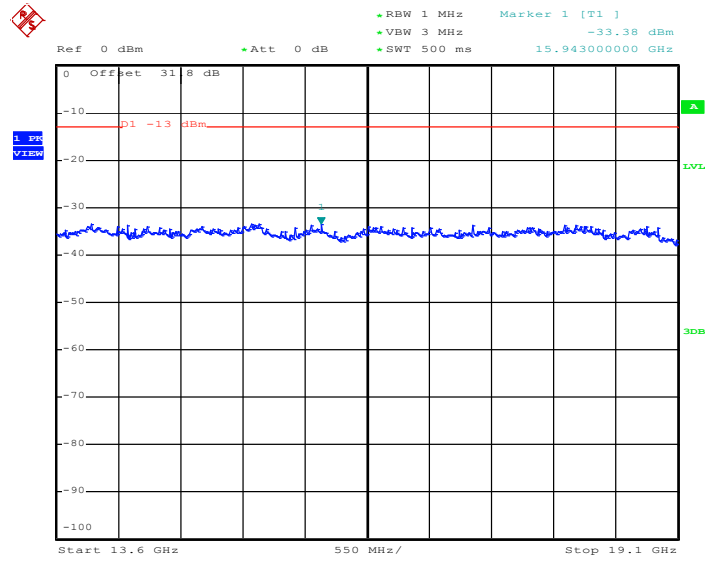
Conducted Emission Plot between 7GHz ~ 13.6GHz



Date: 13.FEB.2013 03:11:01



Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz

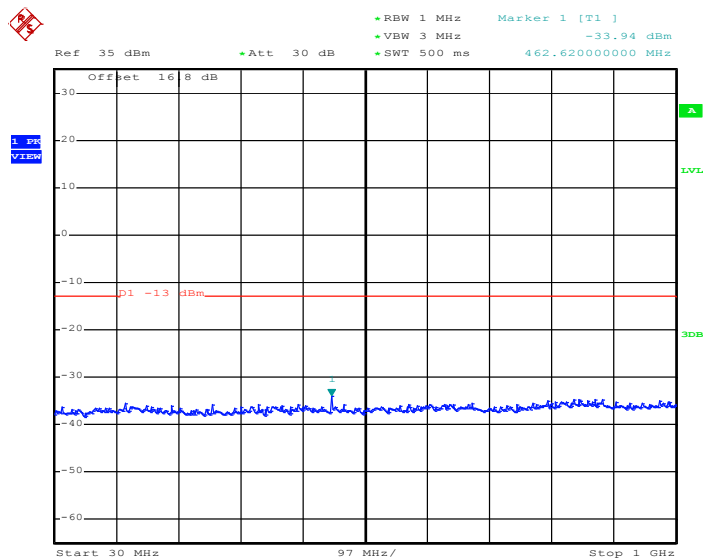


Date: 13.FEB.2013 03:11:14



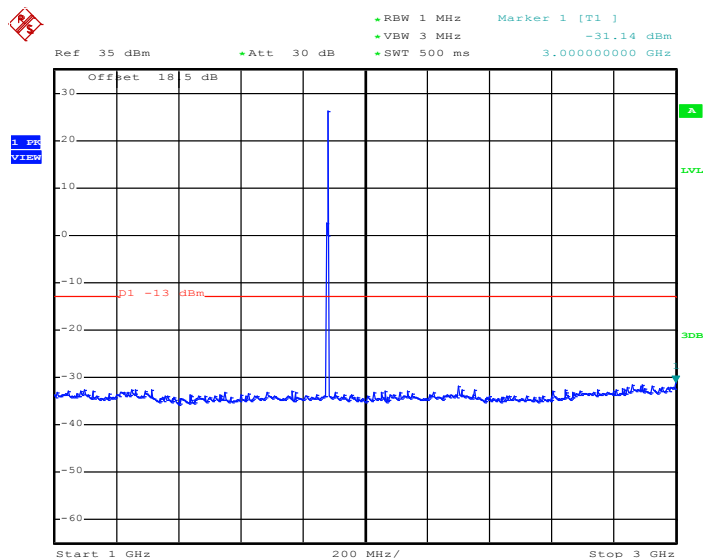
Band :	PCS Band	Channel :	CH661
Test Mode :	EDGE class 8 Link (8PSK)	Frequency :	1880.0 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



Date: 13.FEB.2013 04:20:34

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



Date: 13.FEB.2013 04:20:46

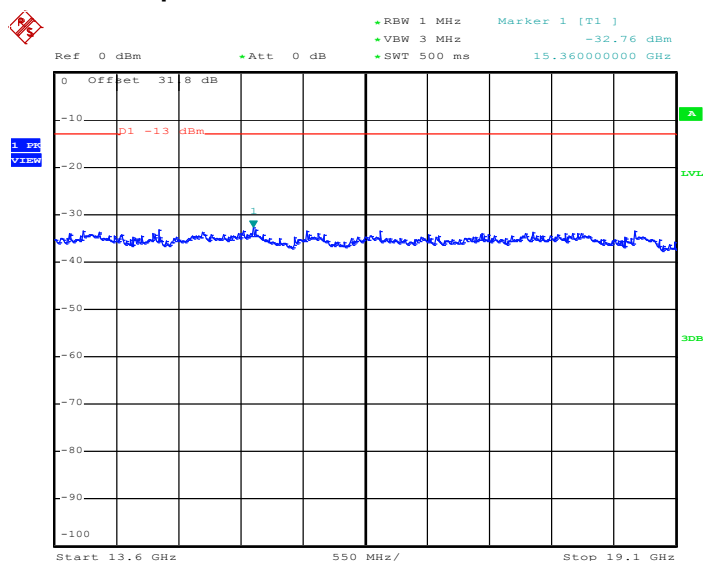


Conducted Spurious Emission Plot between 7GHz ~ 13.6GHz





Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz

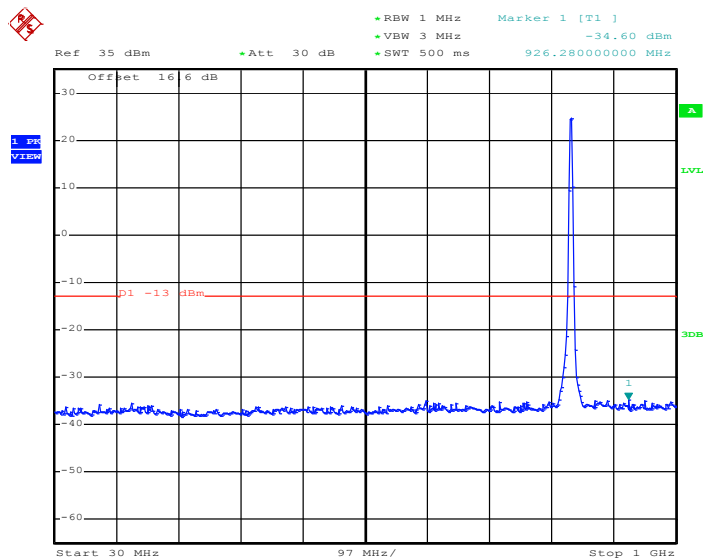


Date: 13.FEB.2013 04:21:30



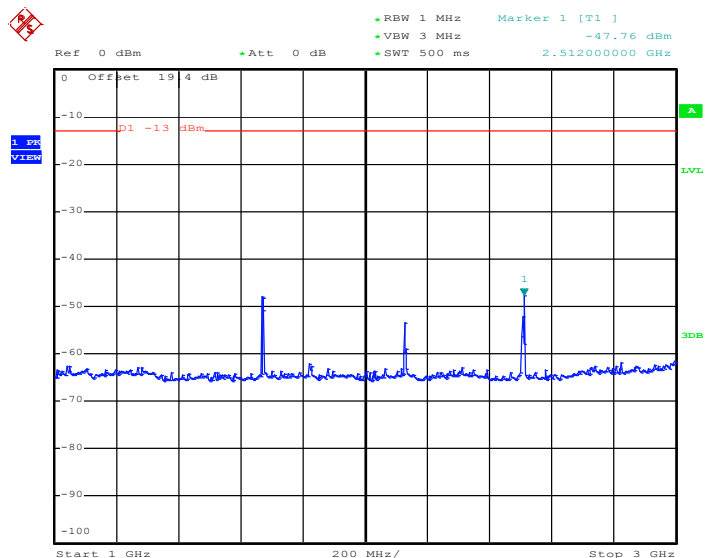
Band :	Cellular Band	Channel :	CH4182
Test Mode :	RMC 12.2Kbps Link (QPSK)	Frequency :	836.4 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



Date: 13.FEB.2013 04:40:03

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



Date: 13.FEB.2013 04:40:25

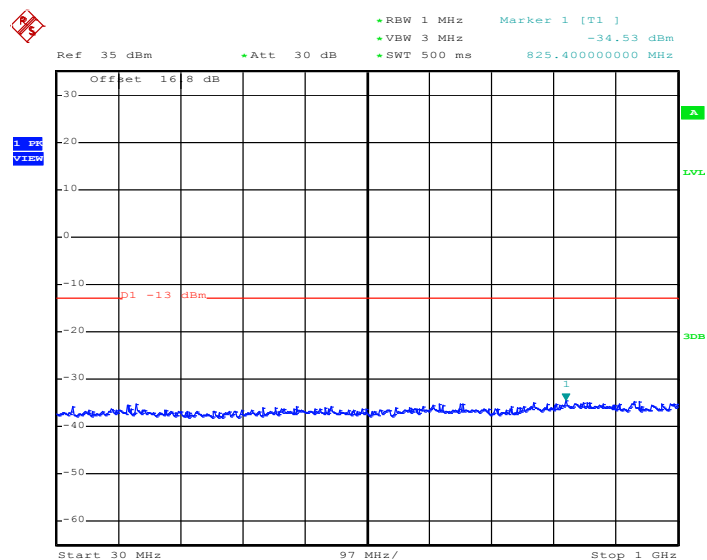


Conducted Spurious Emission Plot between 7GHz ~ 9GHz



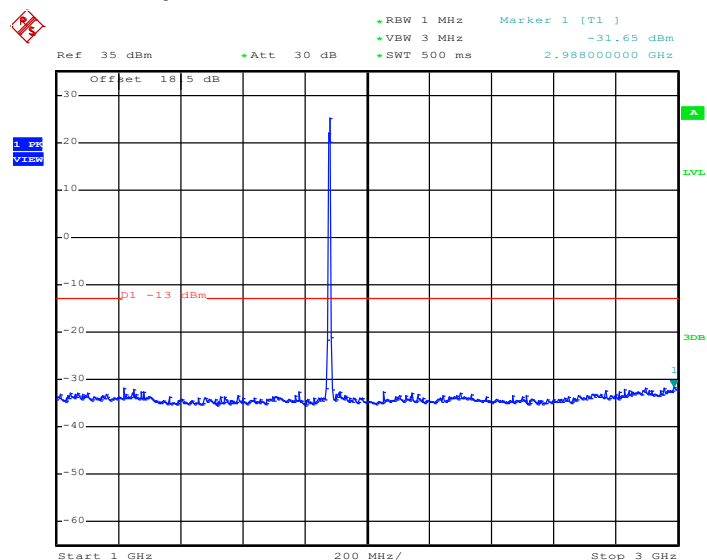
Band :	PCS Band	Channel :	CH9400
Test Mode :	RMC 12.2Kbps Link (QPSK)	Frequency :	1880.0 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



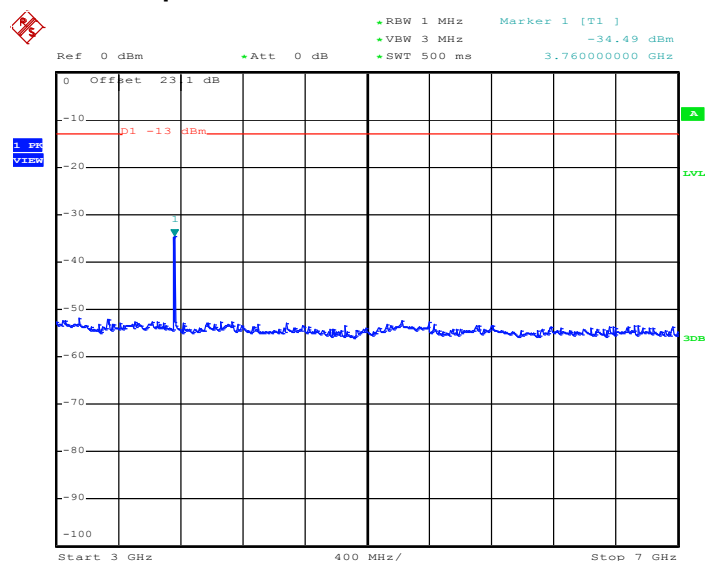
Date: 13.FEB.2013 04:36:01

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



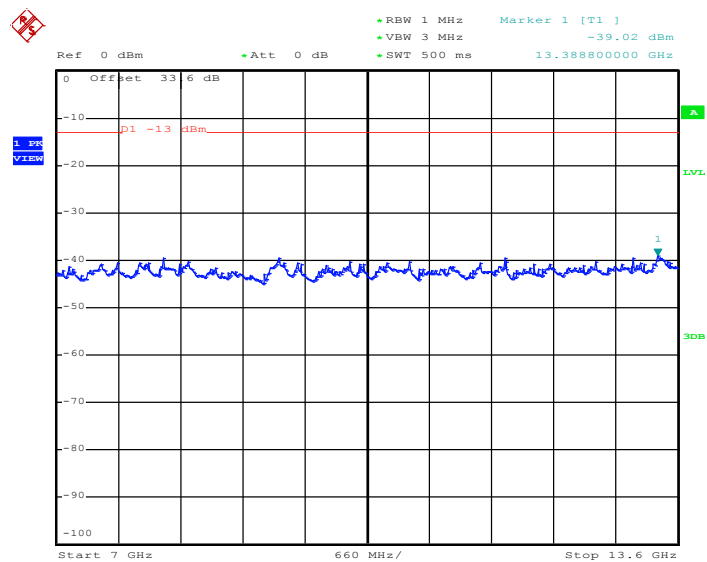
Date: 13.FEB.2013 04:36:14

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 13.FEB.2013 04:36:31

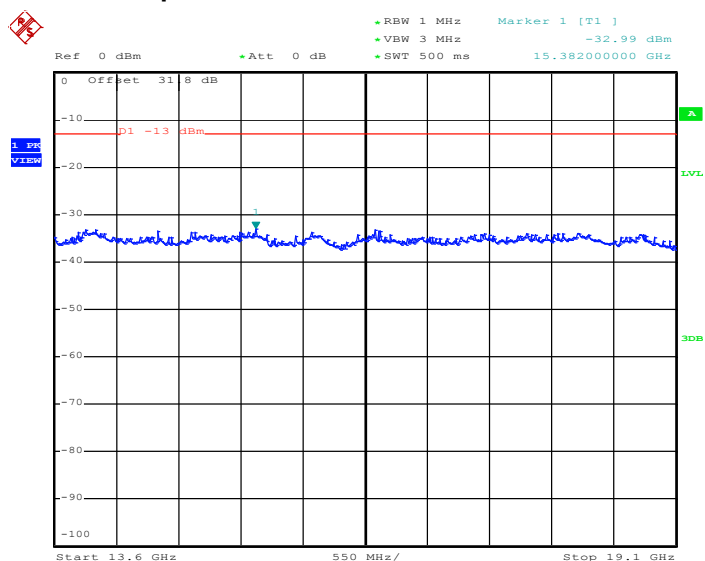
Conducted Spurious Emission Plot between 7GHz ~ 13.6GHz



Date: 13.FEB.2013 04:36:43



Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz

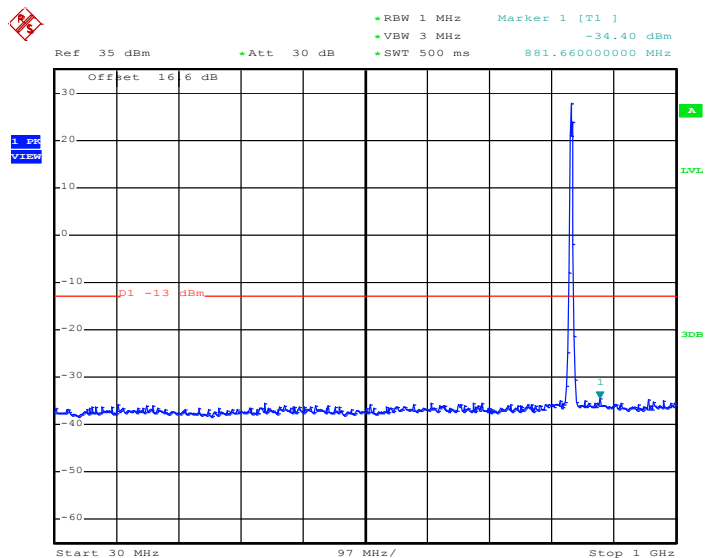


Date: 13.FEB.2013 04:36:56



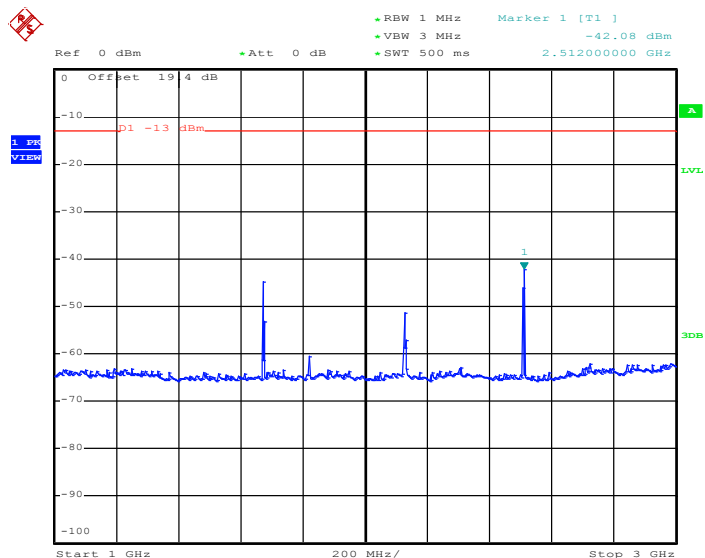
Band :	Cellular Band	Channel :	CH384
Test Mode :	1xEV-DO Rev. 0_RTAP 153.6K (QPSK)	Frequency :	836.52 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



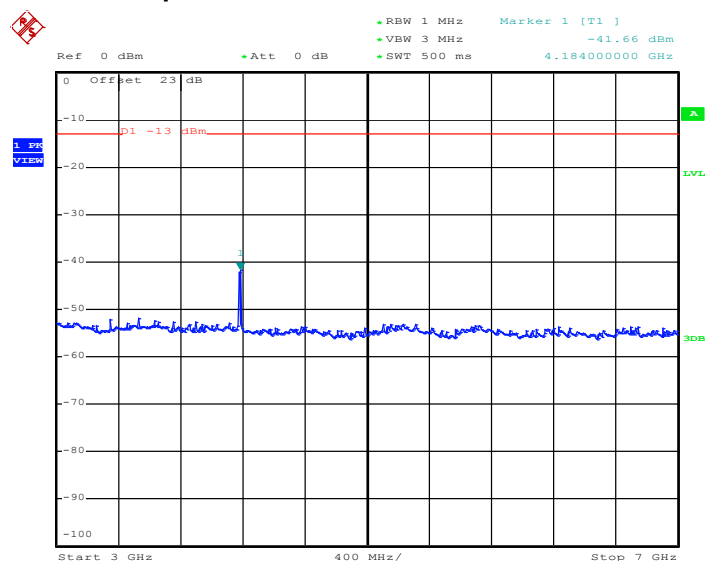
Date: 13.FEB.2013 05:30:18

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



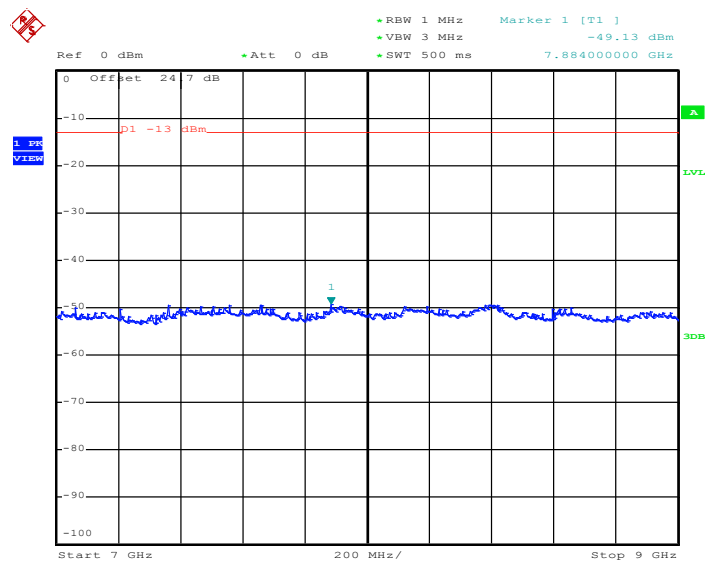
Date: 13.FEB.2013 05:30:36

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 13.FEB.2013 05:30:48

Conducted Spurious Emission Plot between 7GHz ~ 9GHz

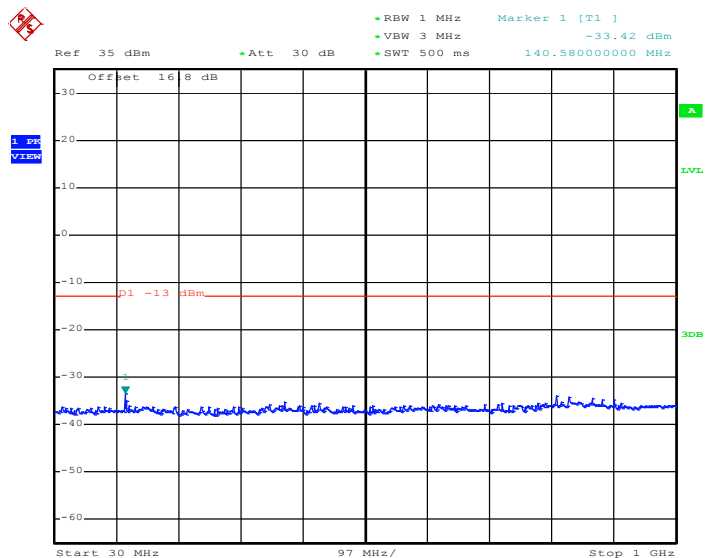


Date: 13.FEB.2013 05:31:00



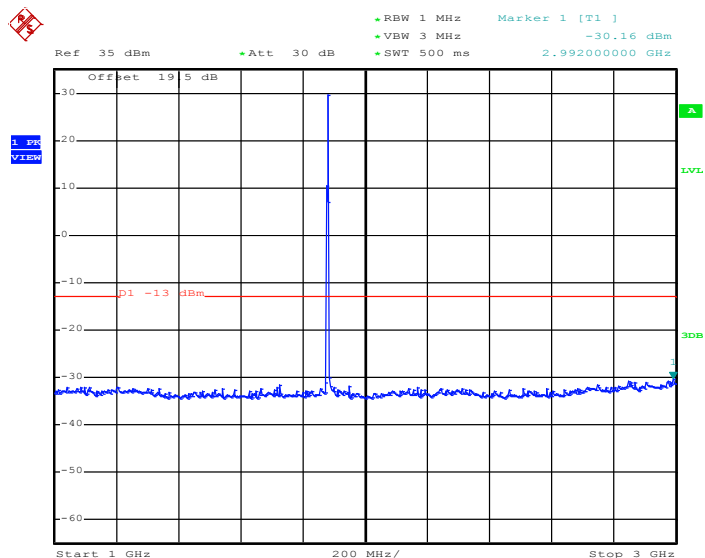
Band :	PCS Band	Channel :	CH600
Test Mode :	1xEV-DO Rev. 0_RTAP 153.6K (QPSK)	Frequency :	1880.0 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



Date: 13.FEB.2013 06:17:33

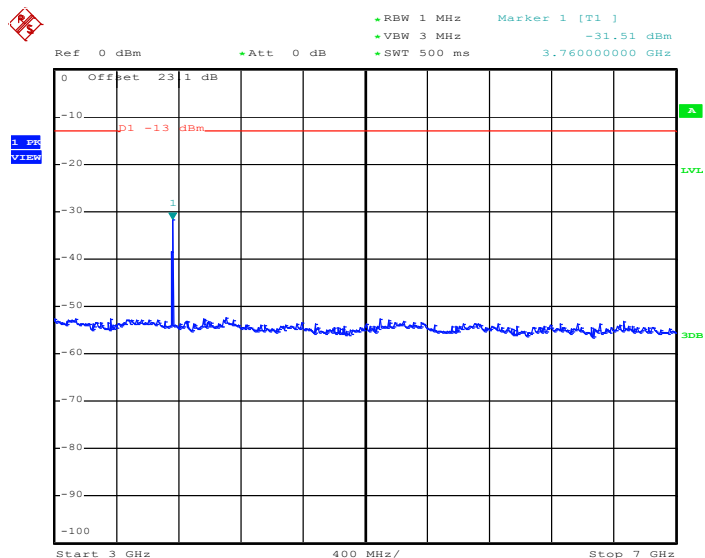
Conducted Spurious Emission Plot between 1GHz ~ 3GHz



Date: 13.FEB.2013 06:17:45

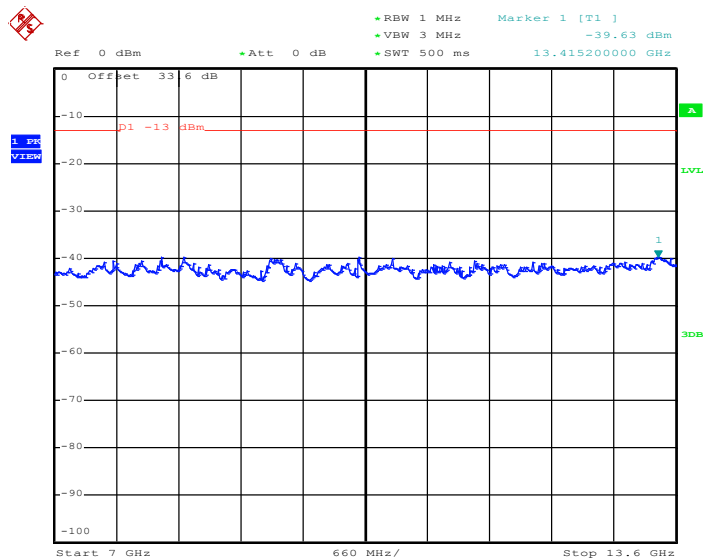


Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 13.FEB.2013 06:18:02

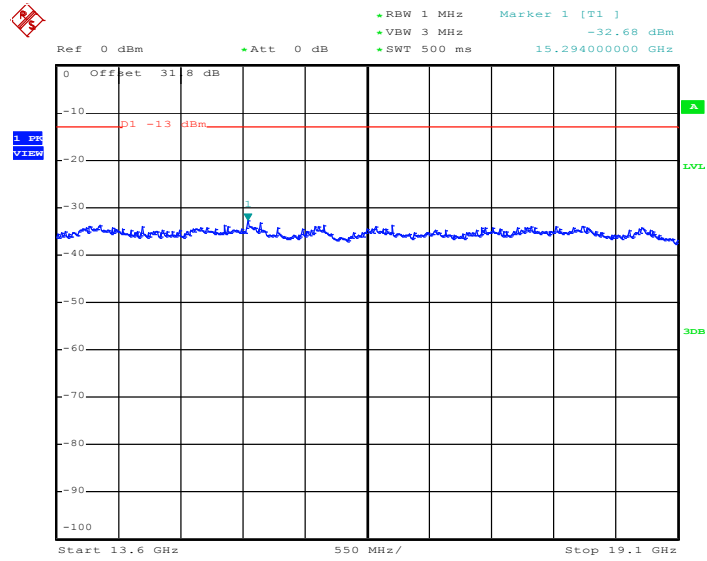
Conducted Spurious Emission Plot between 7GHz ~ 13.6GHz



Date: 13.FEB.2013 06:18:15



Conducted Spurious Emission Plot between 13.6GHz ~ 19.1GHz



Date: 13.FEB.2013 06:18:27

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

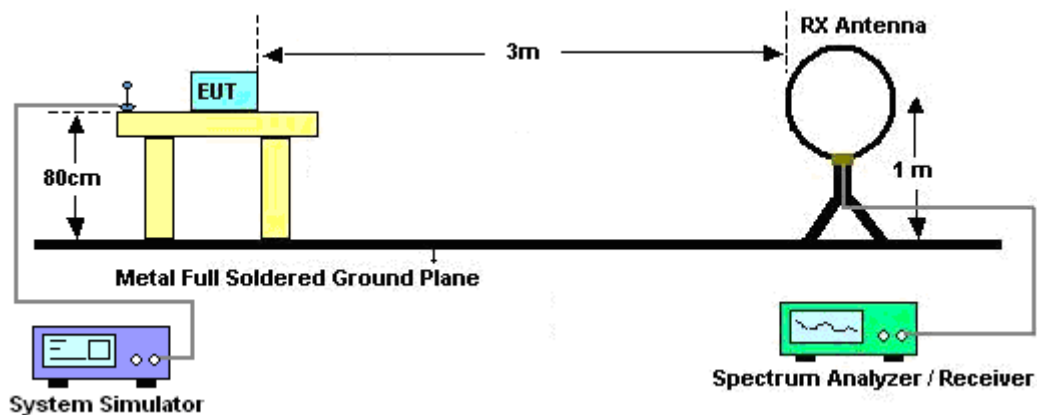
See list of measuring instruments of this test report.

3.7.3 Test Procedures

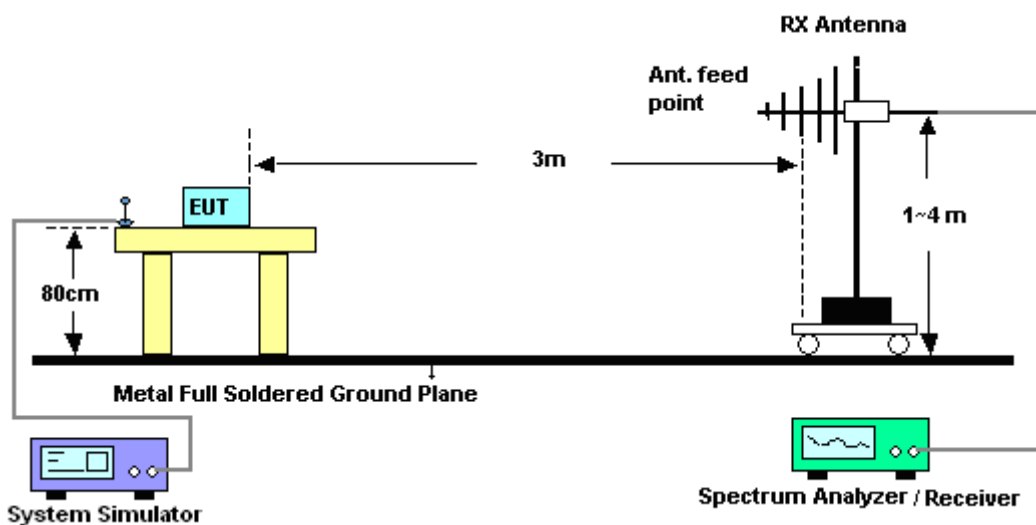
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving 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 $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}.$
12. $\text{EIRP (dBm)} = \text{S.G. Power} - \text{Tx Cable Loss} + \text{Tx Antenna Gain}$
13. $\text{ERP (dBm)} = \text{EIRP} - 2.15$

3.7.4 Test Setup

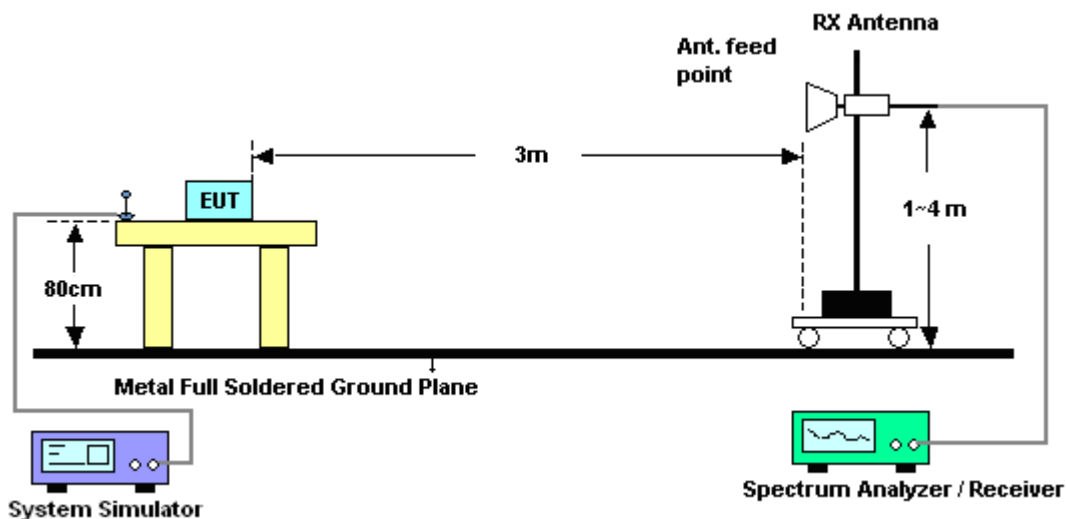
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

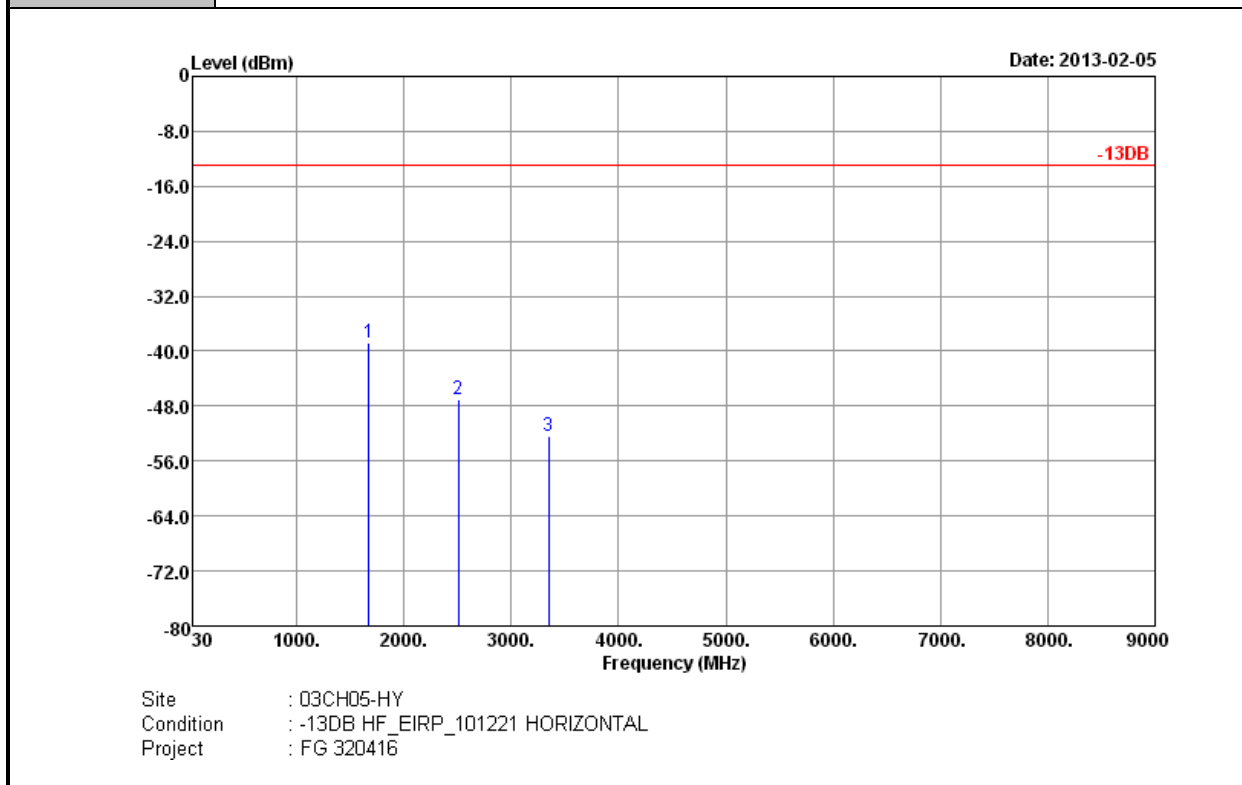


3.7.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

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

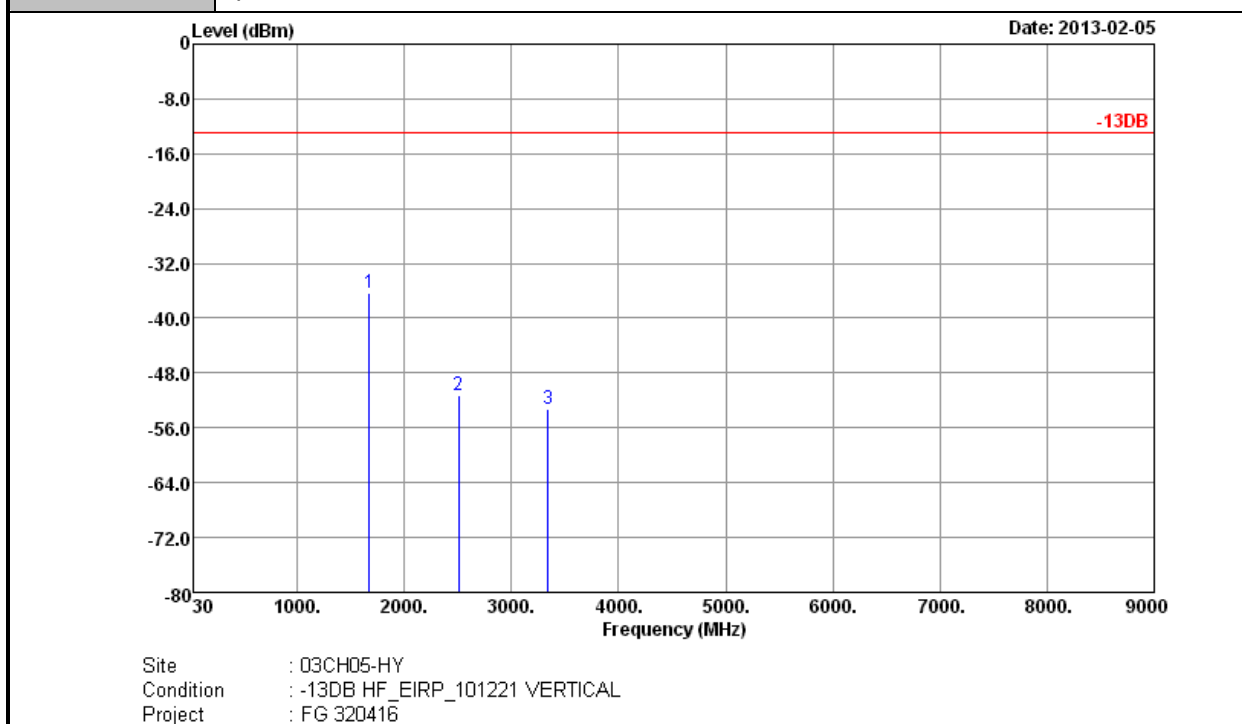
3.7.6 Test Result of Field Strength of Spurious Radiated

Band :	Cellular Band	Temperature :	23~25°C
Test Mode :	GSM Link (GMSK)	Relative Humidity :	53~55%
Test Engineer :	David Ke and Ivan Chiang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



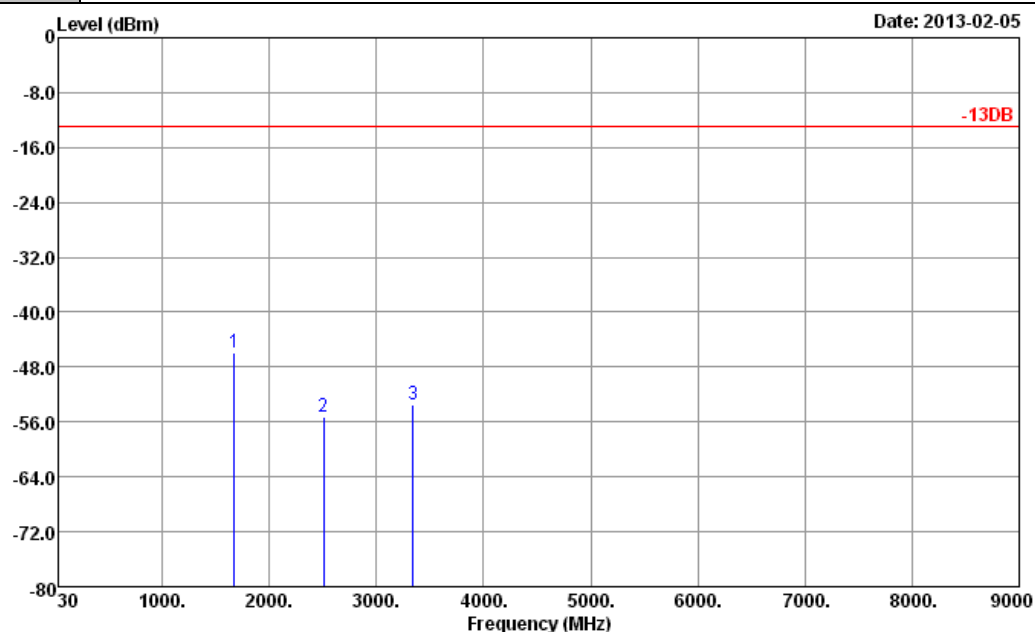
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-38.84	-13	-25.84	-44.83	-40.6	1.35	5.25	H	Pass
2509	-47.02	-13	-34.02	-56.26	-49.4	1.58	6.11	H	Pass
3346	-52.45	-13	-39.45	-63.96	-56.3	1.94	7.94	H	Pass

Band :	Cellular Band	Temperature :	23~25°C
Test Mode :	GSM Link (GMSK)	Relative Humidity :	53~55%
Test Engineer :	David Ke and Ivan Chiang	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	-36.24	-13	-23.24	-42.17	-38	1.35	5.25	V	Pass
2509	-51.22	-13	-38.22	-60.62	-53.6	1.58	6.11	V	Pass
3345	-53.35	-13	-40.35	-64.9	-57.2	1.94	7.94	V	Pass

Band :	Cellular Band	Temperature :	23~25°C
Test Mode :	EDGE class 8 Link (8PSK)	Relative Humidity :	53~55%
Test Engineer :	David Ke and Ivan Chiang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

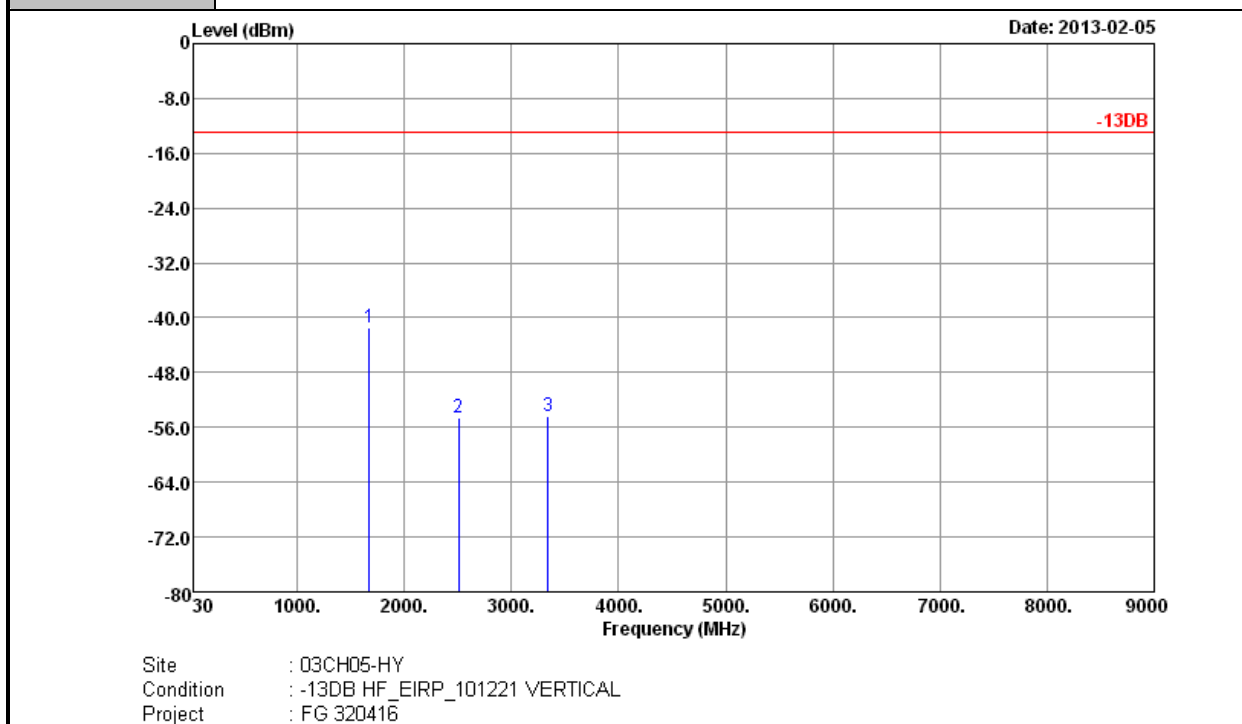


Site : 03CH05-HY
 Condition : -13DB HF_EIRP_101221 HORIZONTAL
 Project : FG 320416

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	-45.84	-13	-32.84	-51.84	-47.6	1.35	5.25	H	Pass
2509	-55.32	-13	-42.32	-64.62	-57.7	1.58	6.11	H	Pass
3345	-53.45	-13	-40.45	-64.97	-57.3	1.94	7.94	H	Pass

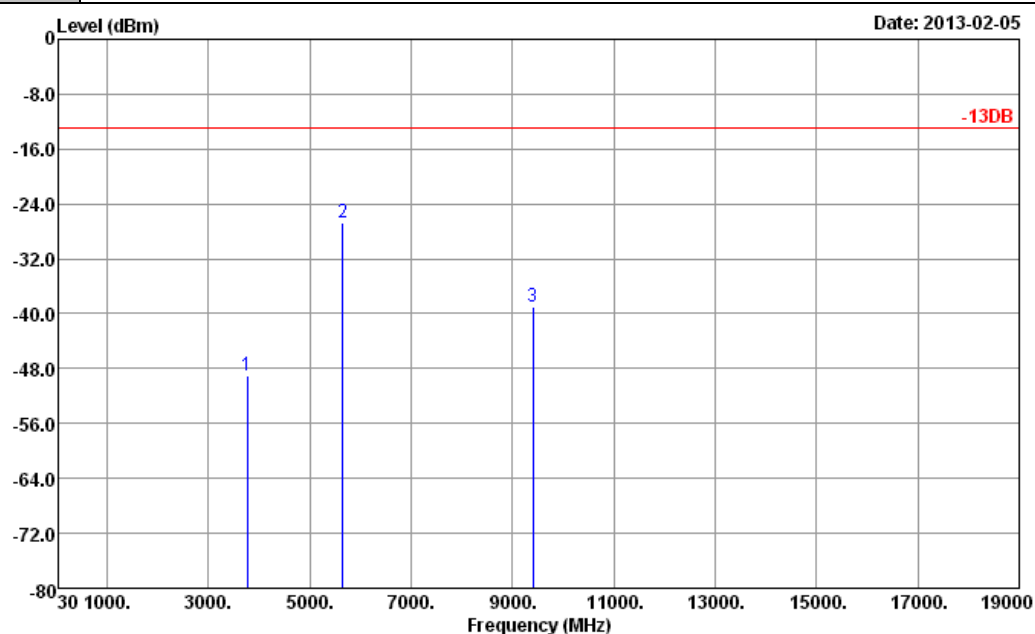


Band :	Cellular Band	Temperature :	23~25°C
Test Mode :	EDGE class 8 Link (8PSK)	Relative Humidity :	53~55%
Test Engineer :	David Ke and Ivan Chiang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-41.54	-13	-28.54	-47.56	-43.3	1.35	5.25	V	Pass
2509	-54.62	-13	-41.62	-63.86	-57	1.58	6.11	V	Pass
3345	-54.45	-13	-41.45	-65.02	-58.3	1.94	7.94	V	Pass

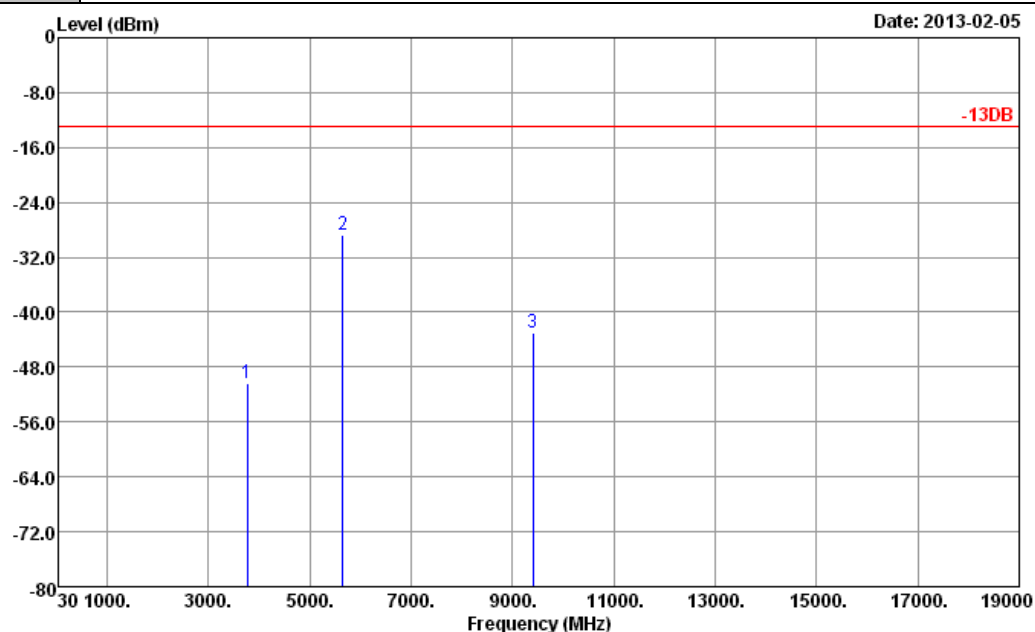
Band :	PCS Band	Temperature :	23~25°C
Test Mode :	GPRS class 8 Link (GMSK)	Relative Humidity :	53~55%
Test Engineer :	David Ke and Ivan Chiang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : -13DB HF_EIRP_101221 HORIZONTAL
Project : FG 320416

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	-49.03	-13	-36.03	-62.49	-55.74	2.00	8.71	H	Pass
5640	-26.66	-13	-13.66	-45.56	-35.3	2.13	10.77	H	Pass
9400	-38.99	-13	-25.99	-62.87	-49.5	2.87	13.38	H	Pass

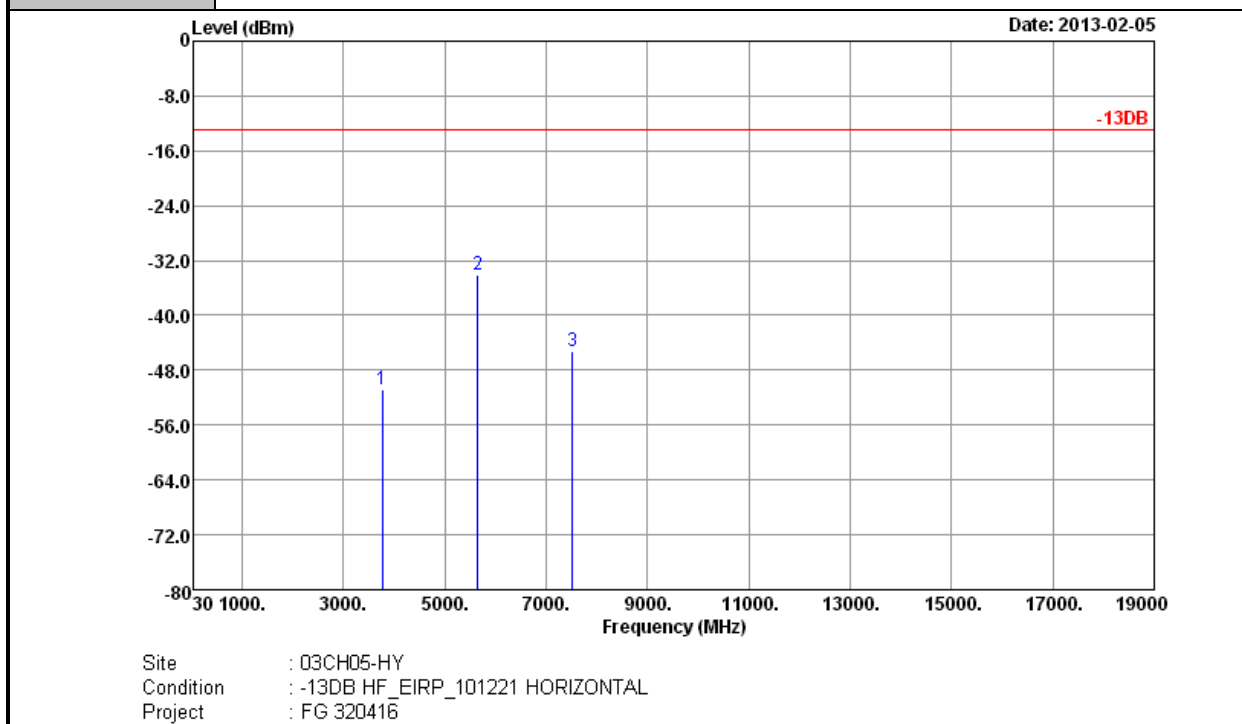
Band :	PCS Band	Temperature :	23~25°C
Test Mode :	GPRS class 8 Link (GMSK)	Relative Humidity :	53~55%
Test Engineer :	David Ke and Ivan Chiang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-50.29	-13	-37.29	-63.79	-57	2.00	8.71	V	Pass
5640	-28.83	-13	-15.83	-47.65	-37.47	2.13	10.77	V	Pass
9400	-43.03	-13	-30.03	-66.93	-53.54	2.87	13.38	V	Pass



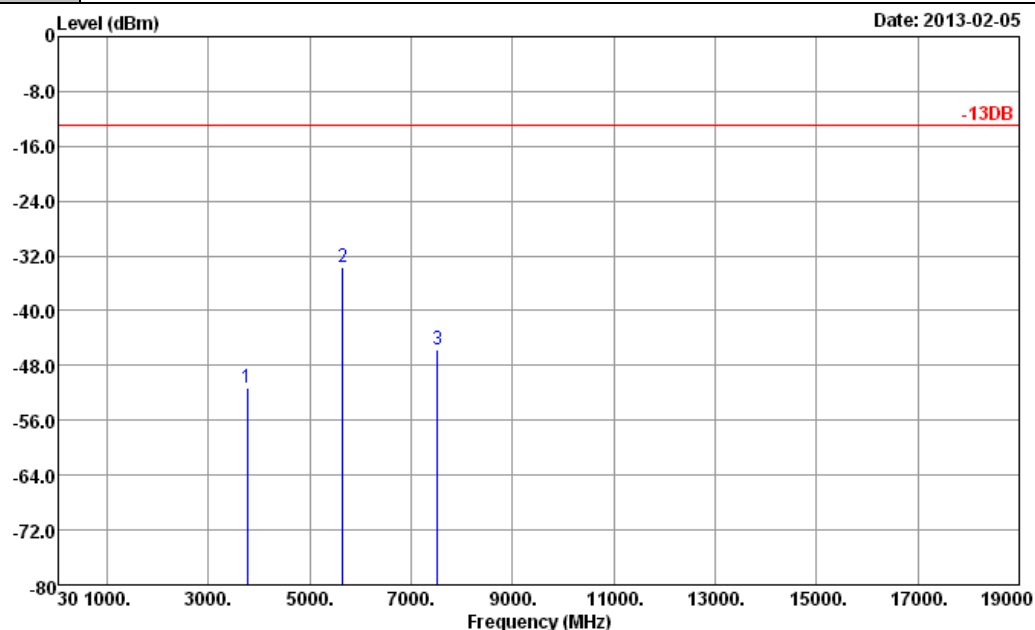
Band :	PCS Band	Temperature :	23~25°C
Test Mode :	EDGE class 8 Link (8PSK)	Relative Humidity :	53~55%
Test Engineer :	David Ke and Ivan Chiang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-50.89	-13	-37.89	-64.34	-57.6	2.00	8.71	H	Pass
5640	-34.12	-13	-21.12	-52.97	-42.76	2.13	10.77	H	Pass
7520	-45.27	-13	-32.27	-67.2	-54.81	2.68	12.22	H	Pass



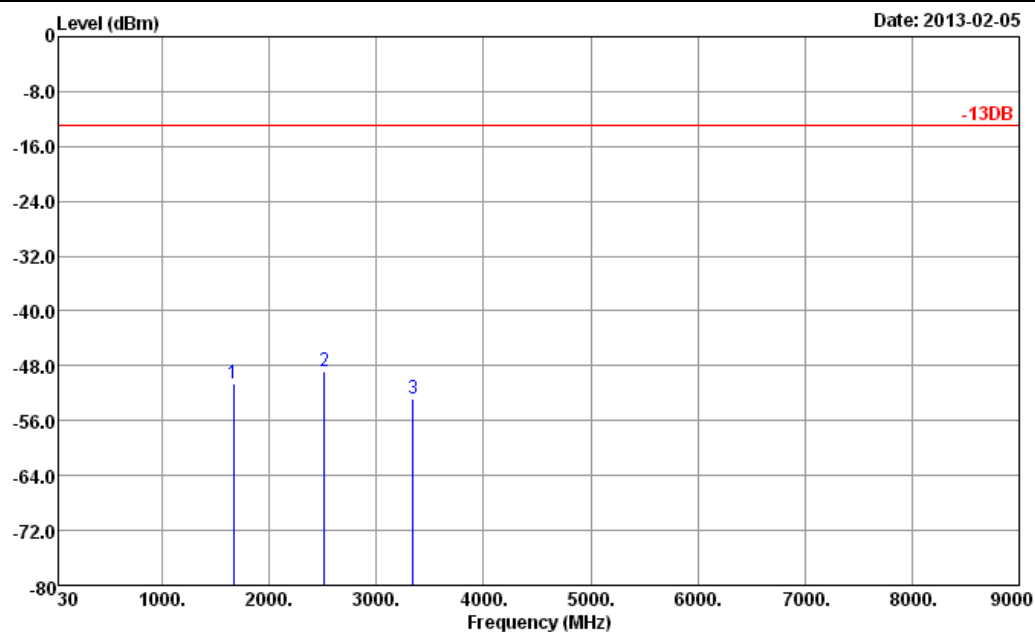
Band :	PCS Band	Temperature :	23~25°C
Test Mode :	EDGE class 8 Link (8PSK)	Relative Humidity :	53~55%
Test Engineer :	David Ke and Ivan Chiang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : -13DB HF_EIRP_101221 VERTICAL
Project : FG 320416

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-51.29	-13	-38.29	-64.71	-58	2.00	8.71	V	Pass
5640	-33.69	-13	-20.69	-52.53	-42.33	2.13	10.77	V	Pass
7520	-45.75	-13	-32.75	-67.65	-55.29	2.68	12.22	V	Pass

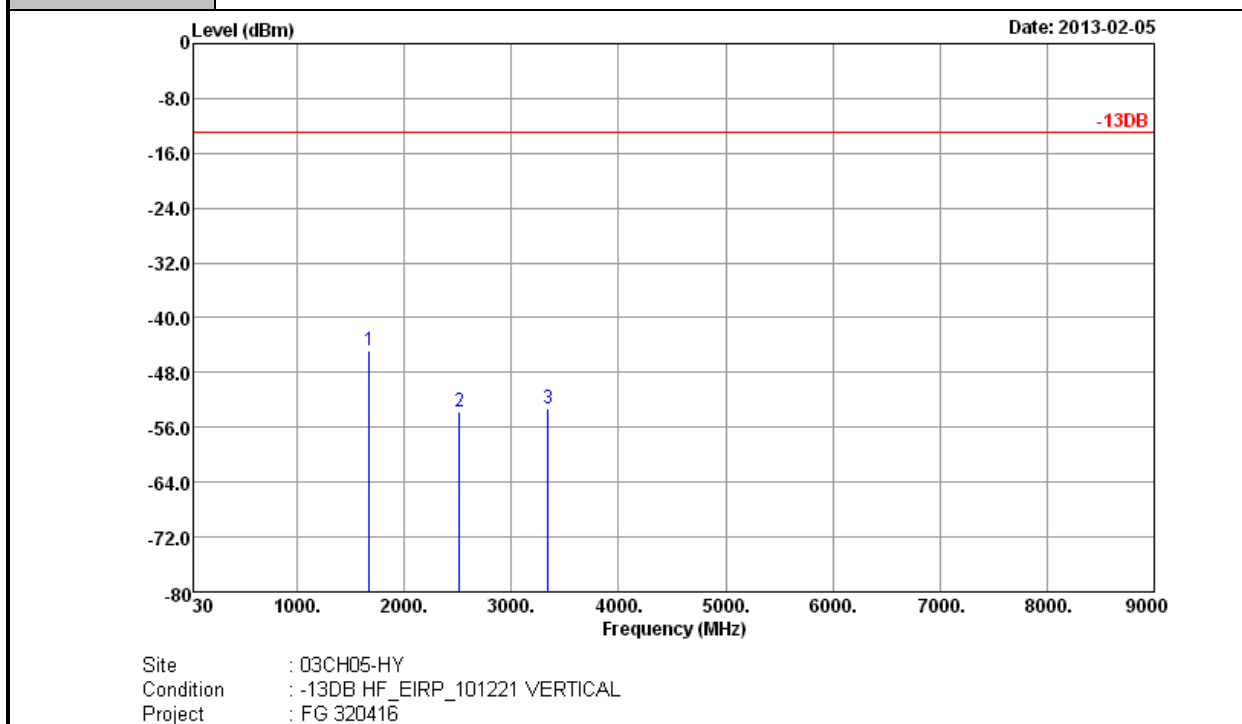
Band :	Cellular Band	Temperature :	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	Relative Humidity :	53~55%
Test Engineer :	David Ke and Ivan Chiang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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
1669	-50.54	-13	-37.54	-56.38	-52.3	1.35	5.25	H	Pass
2512	-48.82	-13	-35.82	-58.09	-51.2	1.58	6.11	H	Pass
3345	-52.75	-13	-39.75	-64.31	-56.6	1.94	7.94	H	Pass



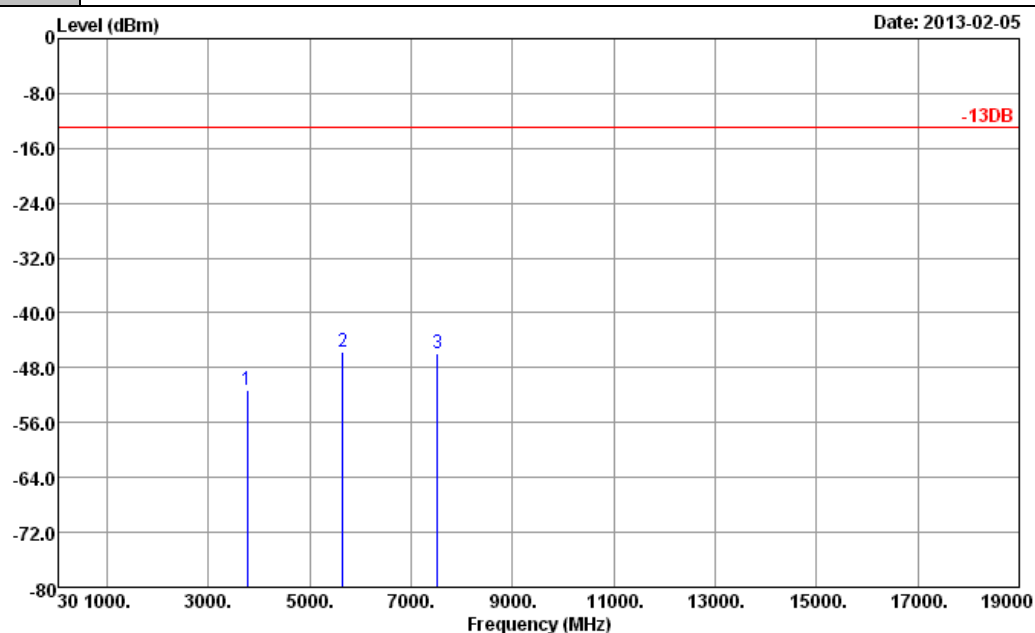
Band :	Cellular Band	Temperature :	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	Relative Humidity :	53~55%
Test Engineer :	David Ke and Ivan Chiang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-44.84	-13	-31.84	-50.83	-46.6	1.35	5.25	V	Pass
2512	-53.62	-13	-40.62	-62.89	-56	1.58	6.11	V	Pass
3345	-53.35	-13	-40.35	-64.92	-57.2	1.94	7.94	V	Pass



Band :	PCS Band	Temperature :	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	Relative Humidity :	53~55%
Test Engineer :	David Ke and Ivan Chiang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

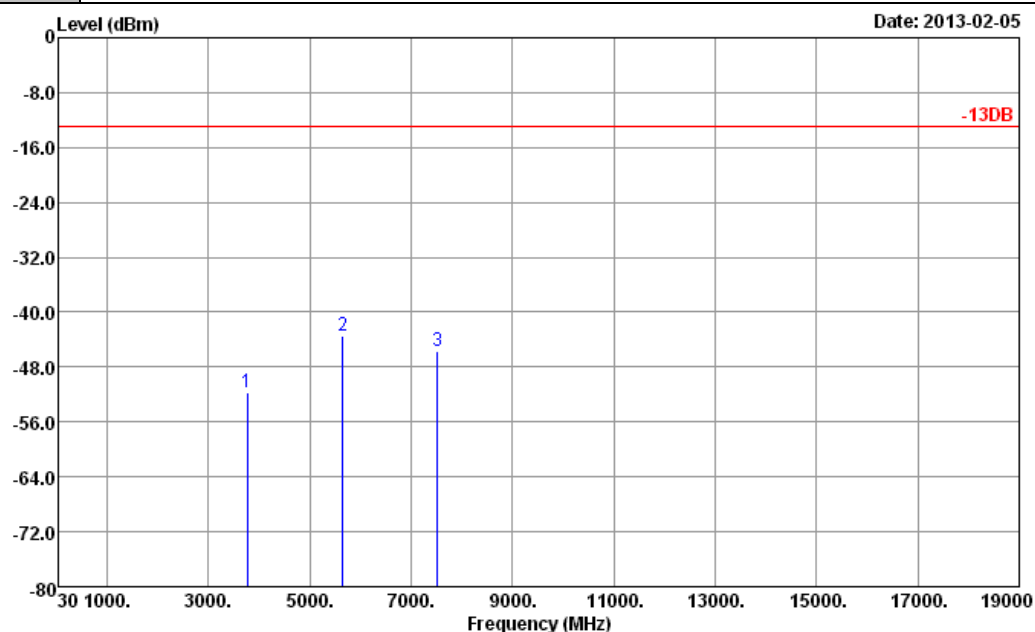


Site : 03CH05-HY
Condition : -13DB HF_EIRP_101221 HORIZONTAL
Project : FG 320416

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-51.29	-13	-38.29	-64.78	-58	2.00	8.71	H	Pass
5644	-45.72	-13	-32.72	-64.58	-54.36	2.13	10.77	H	Pass
7520	-45.98	-13	-32.98	-67.88	-55.52	2.68	12.22	H	Pass



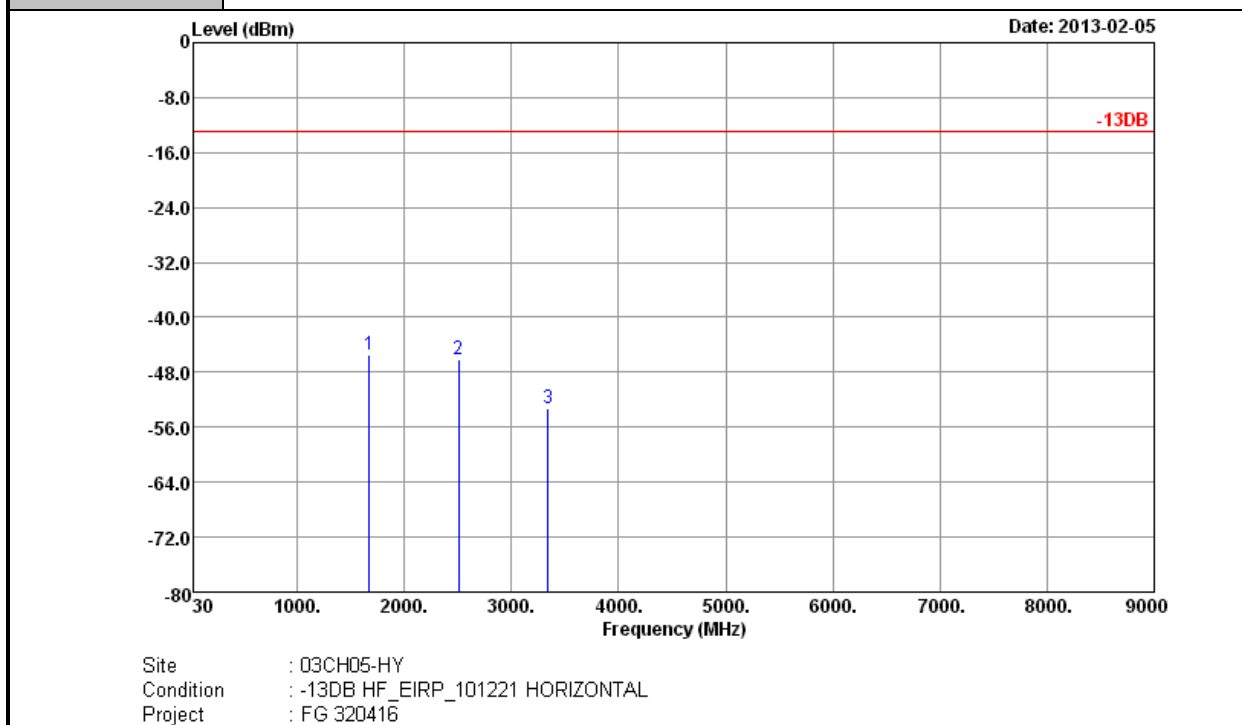
Band :	PCS Band	Temperature :	23~25°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	Relative Humidity :	53~55%
Test Engineer :	David Ke and Ivan Chiang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-51.63	-13	-38.63	-65.05	-58.34	2.00	8.71	V	Pass
5644	-43.42	-13	-30.42	-62.32	-52.06	2.13	10.77	V	Pass
7520	-45.59	-13	-32.59	-67.49	-55.13	2.68	12.22	V	Pass



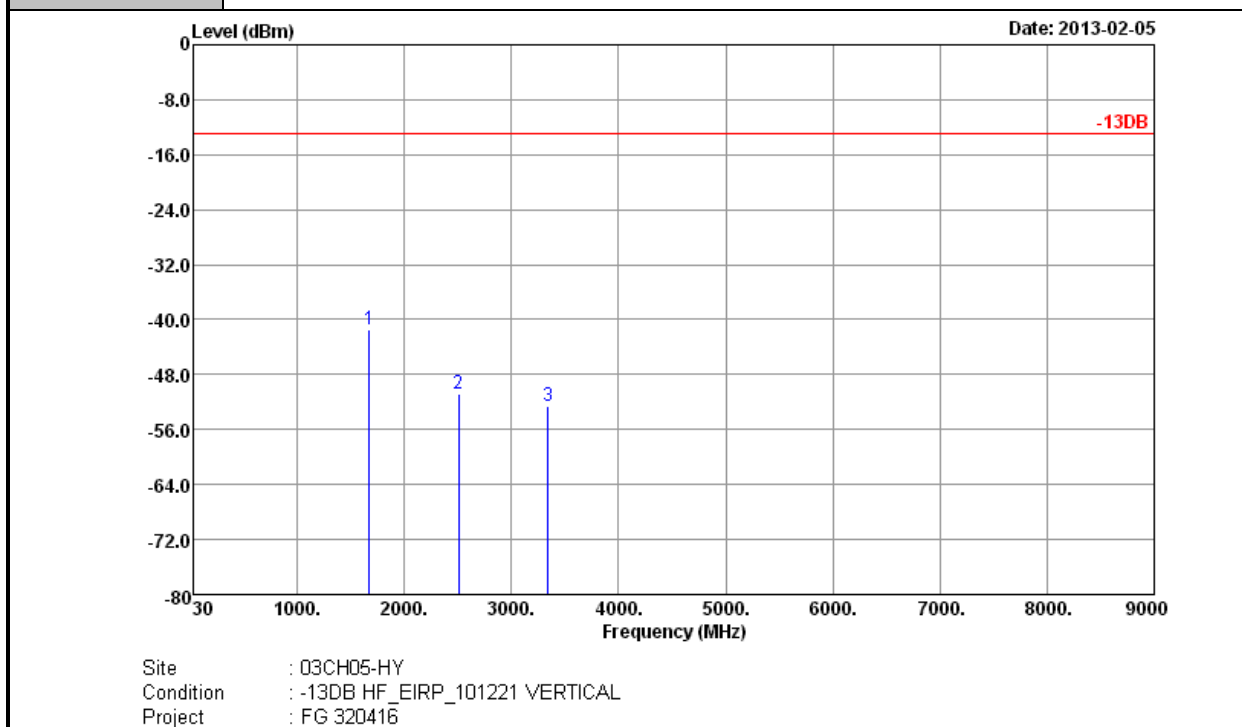
Band :	Cellular Band	Temperature :	23~25°C
Test Mode :	1xEV-DO Rev. 0_RTAP 153.6K (QPSK)	Relative Humidity :	53~55%
Test Engineer :	David Ke and Ivan Chiang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-45.54	-13	-32.54	-51.55	-47.3	1.35	5.25	H	Pass
2509	-46.02	-13	-33.02	-55.39	-48.4	1.58	6.12	H	Pass
3345	-53.35	-13	-40.35	-64.86	-57.2	1.94	7.94	H	Pass



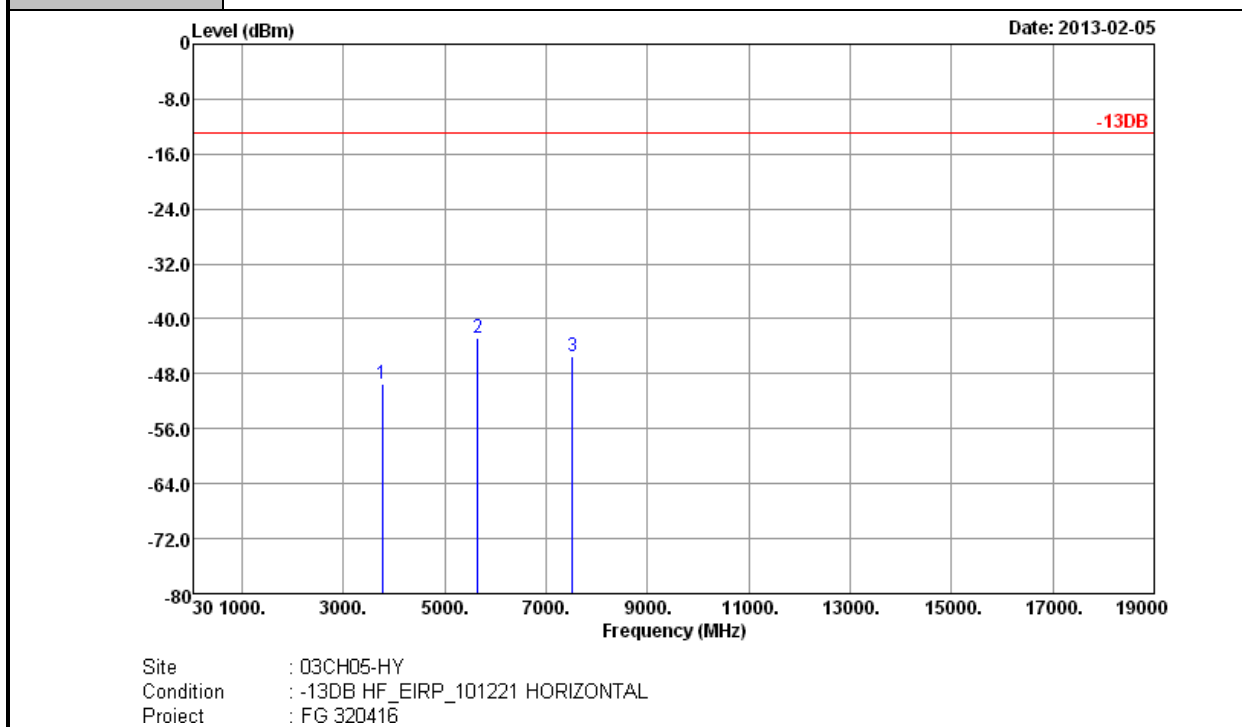
Band :	Cellular Band	Temperature :	23~25°C
Test Mode :	1xEV-DO Rev. 0_RTAP 153.6K (QPSK)	Relative Humidity :	53~55%
Test Engineer :	David Ke and Ivan Chiang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-41.54	-13	-28.54	-47.48	-43.3	1.35	5.25	V	Pass
2509	-50.72	-13	-37.72	-59.97	-53.1	1.58	6.12	V	Pass
3345	-52.55	-13	-39.55	-64.09	-56.4	1.94	7.94	V	Pass

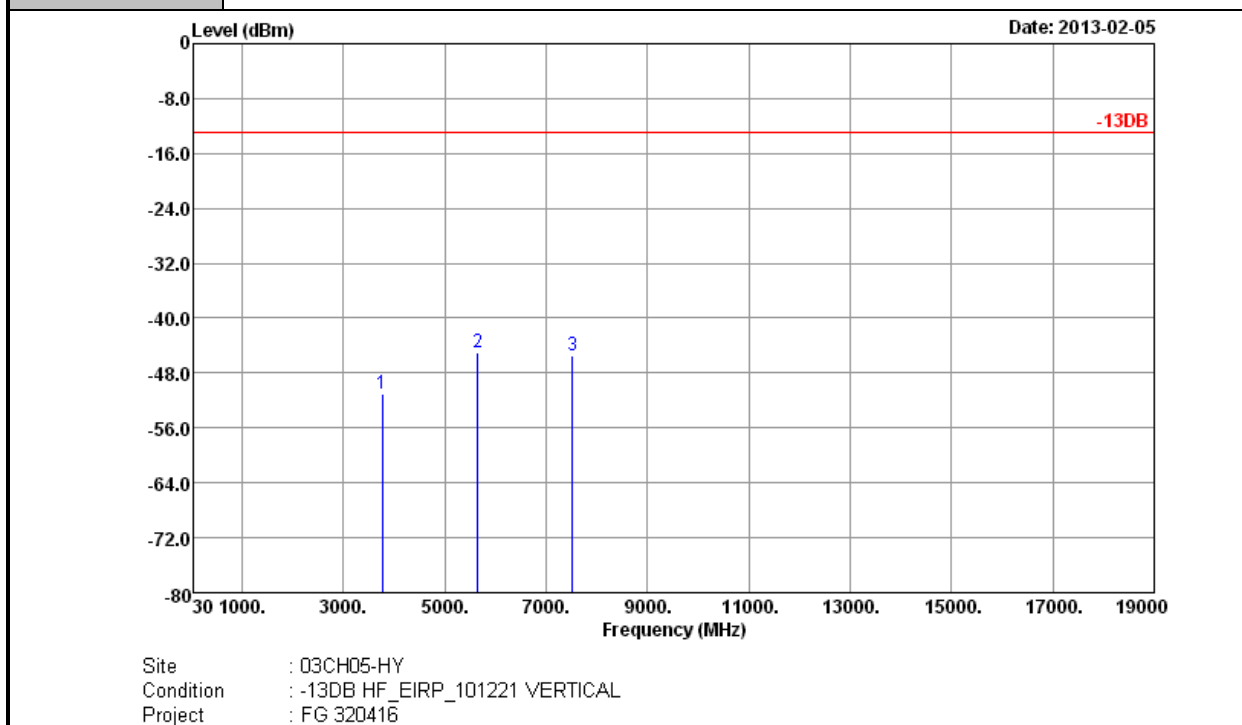


Band :	PCS Band	Temperature :	23~25°C
Test Mode :	1xEV-DO Rev. 0_RTAP 153.6K (QPSK)	Relative Humidity :	53~55%
Test Engineer :	David Ke and Ivan Chiang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-49.39	-13	-36.39	-62.85	-56.1	2.00	8.71	H	Pass
5640	-42.86	-13	-29.86	-61.73	-51.5	2.13	10.77	H	Pass
7520	-45.46	-13	-32.46	-67.43	-55	2.68	12.22	H	Pass

Band :	PCS Band	Temperature :	23~25°C
Test Mode :	1xEV-DO Rev. 0_RTAP 153.6K (QPSK)	Relative Humidity :	53~55%
Test Engineer :	David Ke and Ivan Chiang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-51.09	-13	-38.09	-64.58	-57.8	2.00	8.71	V	Pass
5640	-45.06	-13	-32.06	-63.94	-53.7	2.13	10.77	V	Pass
7520	-45.56	-13	-32.56	-67.49	-55.1	2.68	12.22	V	Pass

3.8 Frequency Stability Measurement

3.8.1 Description of Frequency Stability Measurement

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

3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

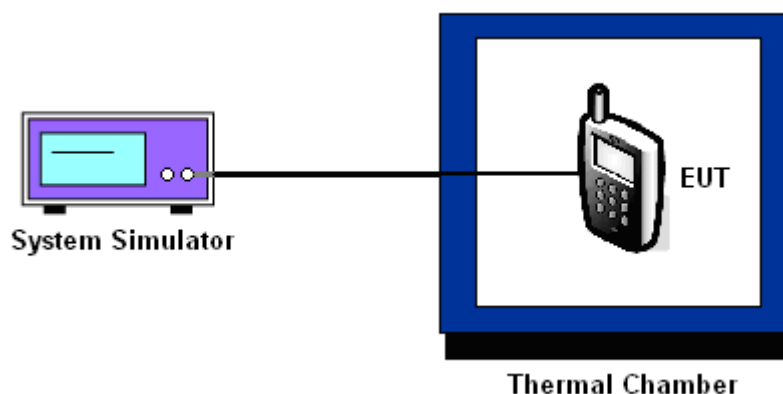
3.8.3 Test Procedures for Temperature Variation

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

3.8.4 Test Procedures for Voltage Variation

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

3.8.5 Test Setup



3.8.6 Test Result of Temperature Variation

Band :	Cellular Band	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	-19	-0.02	-54	-0.06	PASS
-20	-18	-0.02	-52	-0.06	
-10	-17	-0.02	-53	-0.06	
0	-21	-0.02	-50	-0.06	
10	-23	-0.03	-51	-0.06	
20	-21	-0.02	-51	-0.06	
30	-24	-0.03	-52	-0.06	
40	-27	-0.03	-53	-0.06	
50	-30	-0.04	-54	-0.06	

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

Temperature (°C)	GPRS class 8		EDGE class 8		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	22	0.01	-29	-0.02	PASS
-20	24	0.01	-30	-0.02	
-10	25	0.01	-32	-0.02	
0	26	0.01	-31	-0.02	
10	27	0.01	-34	-0.02	
20	29	0.02	-36	-0.02	
30	29	0.02	-40	-0.02	
40	30	0.02	-38	-0.02	
50	33	0.02	-41	-0.02	

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

Temperature (°C)	RMC 12.2Kbps		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-26	-0.03	PASS
-20	-18	-0.02	
-10	-16	-0.02	
0	-15	-0.02	
10	-14	-0.02	
20	16	0.02	
30	-18	-0.02	
40	-19	-0.02	
50	-22	-0.03	

Band :	PCS Band	Channel :	9400
Limit (ppm) :	2.5	Frequency :	1880.0 MHz

Temperature (°C)	RMC 12.2Kbps		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-29	-0.02	PASS
-20	32	0.02	
-10	-31	-0.02	
0	-34	-0.02	
10	-30	-0.02	
20	35	0.02	
30	35	0.02	
40	-39	-0.02	
50	-42	-0.02	



Band :	Cellular Band 1xEV-DO Rev. 0_RTAP 153.6K	Channel :	384
Limit (ppm) :	2.5	Frequency :	836.52 MHz

Temperature (°C)	Freq. Dev. (Hz)	Deviation (ppm)	Result
-30	14	0.02	PASS
-20	13	0.02	
-10	15	0.02	
0	13	0.02	
10	-14	-0.02	
20	15	0.02	
30	18	0.02	
40	21	0.02	
50	-24	-0.03	

Band :	PCS Band 1xEV-DO Rev. 0_RTAP 153.6K	Channel :	600
Limit (ppm) :	2.5	Frequency :	1880.0 MHz

Temperature (°C)	Freq. Dev. (Hz)	Deviation (ppm)	Result
-30	-32	-0.02	PASS
-20	-34	-0.02	
-10	-37	-0.02	
0	-43	-0.02	
10	-42	-0.02	
20	-40	-0.02	
30	-45	-0.02	
40	-48	-0.03	
50	-53	-0.03	

3.8.7 Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
Cellular Band CH189	GSM	3.7	-20	-0.02	2.5	PASS
		BEP	-18	-0.02		
		4.2	-26	-0.03		
	EDGE class 8	3.7	-45	-0.05		
		BEP	-47	-0.06		
		4.2	-49	-0.06		
PCS Band CH661	GPRS class 8	3.7	27	0.01		
		BEP	25	0.01		
		4.2	28	0.01		
	EDGE class 8	3.7	-42	-0.02		
		BEP	-37	-0.02		
		4.2	-39	-0.02		
Cellular Band CH4182	RMC 12.2Kbps	3.7	18	0.02		
		BEP	-21	-0.02		
		4.2	-16	-0.02		
PCS Band CH9400	RMC 12.2Kbps	3.7	-33	-0.02		
		BEP	30	0.02		
		4.2	37	0.02		
Cellular Band CH384	1xEV-DO Rev. 0 RTAP 153.6K	3.7	16	0.02		
		BEP	-13	-0.02		
		4.2	14	0.02		
PCS Band CH600	1xEV-DO Rev. 0 RTAP 153.6K	3.7	37	0.02		
		BEP	-34	-0.02		
		4.2	-45	-0.02		

Note:

1. Normal Voltage = 3.7V.
2. Battery End Point (BEP) = 3.3 V.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
System Simulator	R&S	CMU200	117995	N/A	Jul. 30, 2012	Feb. 06, 2013 ~ Feb. 19, 2013	Jul. 29, 2013	Conducted (TH02-HY)
System Simulator	Agilent	E5515C (8960)	GB46311322	N/A	Mar. 23, 2011	Feb. 06, 2013 ~ Feb. 19, 2013	Mar. 22, 2013	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 06, 2012	Feb. 06, 2013 ~ Feb. 19, 2013	Jun. 05, 2013	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSV30	100895	9kHz~30GHz	Dec. 21, 2012	Feb. 06, 2013 ~ Feb. 19, 2013	Dec. 20, 2013	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D3SP	TBN-930701	N/A	Jul. 23, 2012	Feb. 06, 2013 ~ Feb. 19, 2013	Jul. 22, 2013	Conducted (TH02-HY)
Spectrum Analyzer	R&S	ESU26	100390	20Hz~26.5GHz	Dec. 14, 2012	Feb. 05, 2013 ~ Feb. 06, 2013	Dec. 13, 2013	Radiation (03CH05-HY)
Bilog Antenna	Schaffner	CBL6111C	2725	30MHz~2GHz	Oct. 06, 2012	Feb. 05, 2013 ~ Feb. 06, 2013	Oct. 05, 2013	Radiation (03CH05-HY)
Turn Table	HD	Deis HD 2000	420/611	0 ~ 360 degree	N/A	Feb. 05, 2013 ~ Feb. 06, 2013	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	MA 240	240/666	1 m ~ 4 m	N/A	Feb. 05, 2013 ~ Feb. 06, 2013	N/A	Radiation (03CH05-HY)
Horn Antenna	ESCO	3117	66584	1GHz~18GHz	Aug. 10, 2012	Feb. 05, 2013 ~ Feb. 06, 2013	Aug. 09, 2013	Radiation (03CH05-HY)
Pre Amplifier	Agilent	8449B	3008A02665	1GHz~26.5GHz	Aug. 28, 2012	Feb. 05, 2013 ~ Feb. 06, 2013	Aug. 27, 2013	Radiation (03CH05-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz ~ 40GHz	Sep. 28, 2012	Feb. 05, 2013 ~ Feb. 06, 2013	Sep. 27, 2013	Radiation (03CH05-HY)
Pre Amplifier	COM-POWER	PA-103	161075	10-1000MHz.32dB .GAIN	Feb. 27, 2012	Feb. 05, 2013 ~ Feb. 06, 2013	Feb. 26, 2013	Radiation (03CH05-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9KHz ~ 30MHz	Jul. 03, 2012	Feb. 05, 2013 ~ Feb. 06, 2013	Jul. 02, 2013	Radiation (03CH05-HY)
System Simulator	R&S	CMU200	117995	N/A	Jul. 28, 2011	Feb. 05, 2013 ~ Feb. 06, 2013	Jul. 27, 2013	Radiation (03CH05-HY)

5 Uncertainty of Evaluation

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

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

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

Please refer to Sporton report number EP320416 as below.