

FCC PART 22H, 24E & 27
MEASUREMENT AND TEST REPORT

For

ADC Telecommunications, Inc.

P.O. Box 1101, Minneapolis, Minnesota 55440, USA

FCC ID: NOO-F0695-011

Report Type: Original Report	Product Type: InterReach Fusion System, RAU
Test Engineer: <u>Alvin Huang</u> <i>Alvin Huang</i>	
Report Number: <u>RSZ11011101</u>	
Report Date: <u>2011-03-16</u>	
Reviewed By: <u>EMC Engineer</u> <i>Merry Zhao</i>	
Prepared By: Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008	

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP*, NIST, or any agency of the Federal Government.

* This report contains data that are not covered by the NVLAP accreditation and are marked with an asterisk "★" (Rev.2)

TABLE OF CONTENTS

GENERAL INFORMATION.....	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
OBJECTIVE	4
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY	4
TEST FACILITY	5
SYSTEM TEST CONFIGURATION.....	6
JUSTIFICATION	6
EQUIPMENT MODIFICATIONS	6
LOCAL SUPPORT EQUIPMENT LIST AND DETAILS	6
EXTERNAL I/O CABLE.....	6
CONFIGURATION OF TEST SETUP	7
BLOCK DIAGRAM OF TEST SETUP	7
SUMMARY OF TEST RESULTS	8
FCC §1.1307 & §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)	9
APPLICABLE STANDARDS.....	9
TEST DATA	9
FCC §2.1047 - MODULATION CHARACTERISTIC	10
FCC §2.1046, §22.913(A), §24.232(C) & §27.50 - RF OUTPUT POWER.....	11
APPLICABLE STANDARD	11
TEST PROCEDURE	11
TEST EQUIPMENT LIST AND DETAILS.....	11
TEST DATA	12
FCC §2.1049, §22.917, §22.905, §24.238 & §27.53 - OCCUPIED BANDWIDTH	14
APPLICABLE STANDARDS.....	14
TEST PROCEDURE	14
TEST EQUIPMENT LIST AND DETAILS.....	14
TEST DATA	14
FCC §2.1051, §22.917(A), §24.238(A) & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS	71
APPLICABLE STANDARDS.....	71
TEST PROCEDURE	71
TEST EQUIPMENT LIST AND DETAILS.....	71
TEST DATA	71
FCC §2.1053, §22.917, §24.238 & §27.53 - SPURIOUS RADIATED EMISSIONS	136
APPLICABLE STANDARDS.....	136
TEST PROCEDURE	136
TEST EQUIPMENT LIST AND DETAILS.....	136
TEST DATA	137
FCC §22.917(A), §24.238(A) & §27.53 - BAND EDGES.....	141
APPLICABLE STANDARDS.....	141
TEST PROCEDURE	141

TEST EQUIPMENT LIST AND DETAILS.....	141
TEST DATA	141
FCC §2.1055, §22.355, §24.235 & § 27.54 – FREQUENCY STABILITY	158
APPLICABLE STANDARD	158
TEST PROCEDURE	158
TEST DATA	158
TEST EQUIPMENT LIST AND DETAILS.....	158
TEST RESULTS	159

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The ADC Telecommunications, Inc.'s product, FCC ID: NOO-F0695-011, model number: FSN-2-758519-1 is the remote access unit of InterReach Fusion system, the system consists three modular components, the Main Hub (model number: FSN-2-MH-1, Expansion Hub (model: FSN-EH-2) and RAU (model: FSN-2-758519-1).

Dimension of Remote Access Unit: 28.1 cm (L) x 28.6 cm (W) x 5.4 cm (H).

Frequency Range:

Cellular Band: 869-894 MHz (Downlink)
PCS Band: 1930-1995 MHz (Downlink)
LTE Band: 746-757 MHz (Downlink)

Transmitter Output Power:

Cellular Band: 16.5 dBm (Downlink)
PCS Band: 16.5 dBm (Downlink)
LTE Band: 15 dBm (Downlink)

All measurement and test data in this report was gathered from production sample serial number: 11010017 (Assigned by BACL, Shenzhen). The EUT was received on 2011-01-11.

Objective

This type approval report is prepared on behalf of *ADC Telecommunications, Inc.* in accordance with Part 2, Subpart J, Part 22 Subpart H, Part 24 Subpart E and Part 27 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for output power, modulation characteristic, occupied bandwidth, and spurious emission at antenna terminal, spurious radiated emission, frequency stability, band edge and radiated margin.

Related Submittal(s)/Grant(s)

N/A

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Subpart J as well as the following parts:

Part 22 Subpart H - Public Mobile Services
Part 24 Subpart E - Personal Communication Services
Part 27 - Miscellaneous Wireless Communication Services

Applicable Standards: TIA/EIA 603-C, ANSI C63.4-2003.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp.(Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



The current scope of accreditations can be found at <http://ts.nist.gov/Standards/scopes/2007070.htm>

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to TIA/EIA-603-C.

The final qualification test was performed with the EUT operating at normal mode.

Equipment Modifications

No modifications were made to the EUT.

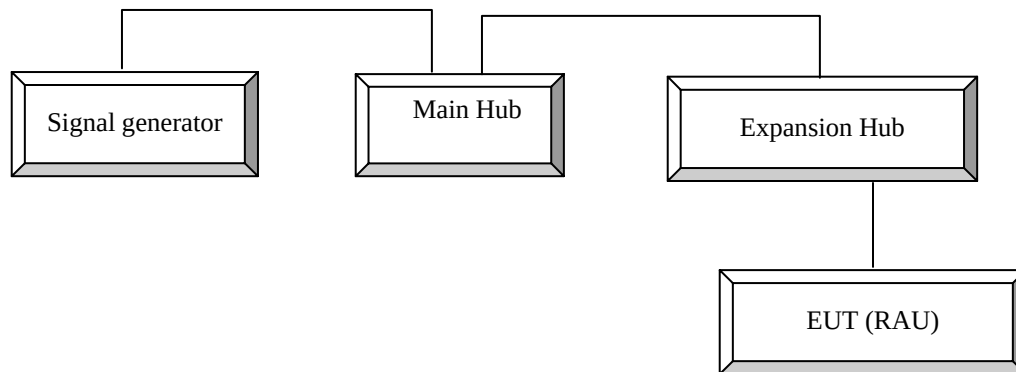
Local Support Equipment List and Details

Manufacturer	Device Name	Model	Serial Number	FCC ID
Agilent	ESG-D Series Signal Generator	E4432B	US38441663	-
HP	Signal Generator	HP8648C	-	-
ADC	Main Hub	-	-	-
ADC	Expansion Hub	-	-	-

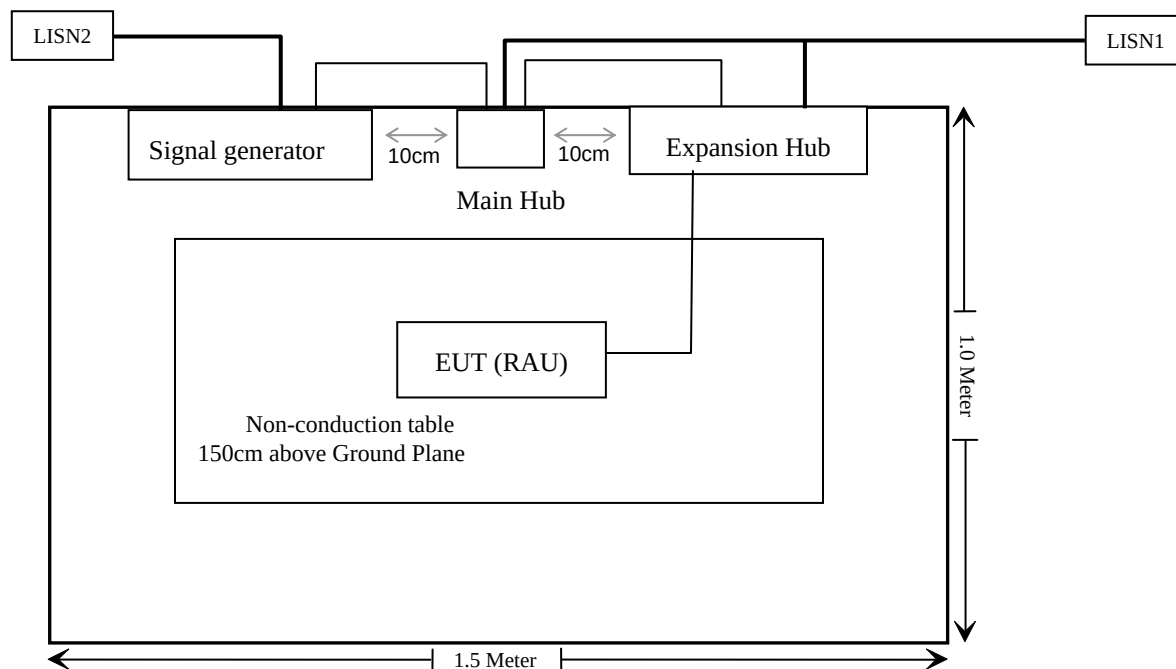
External I/O Cable

Cable Description	Length (m)	From/Port	To
Shielded Detachable K/B Cable	150	Expansion Hub	RAU (EUT)
Fiber Cable	2.0	Main Hub	Expansion Hub
RF Cable	0.5	Signal Generator	RAU(EUT)
RF Cable	0.5	RAU(EUT)	Spectrum Analyzer

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307 (b)(1), §2.1091	Maximum Permissible Exposure (MPE)	Compliance
§2.1046; §22.913 (a); §24.232 (c); §27.50 (i)	RF Output Power	Compliance
§2.1047	Modulation Characteristics	N/A
§2.1049; §22.905 §22.917; §24.238; §27.53 (c)	99% & -26 dB Occupied Bandwidth	Compliance
§2.1051, §22.917 (a); §24.238 (a); §27.53 (c)	Spurious Emissions at Antenna Terminal	Compliance
§2.1053, §22.917 (a); §24.238 (a); §27.53 (c)	Field Strength of Spurious Radiation	Compliance
§22.917 (a); §24.238 (a); §27.53 (c)	Out of band emission, Band Edge	Compliance
§2.1055; §22.355; §24.235; §27.54	Frequency stability vs. temperature Frequency stability vs. voltage	Compliance

FCC §1.1307 & §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standards

According to FCC §1.1307 (b)(1) and §2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mw/cm ²)	Averaging Time (Minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

Test Data

Predication of MPE limit at a given distance

$$S = PG/4\pi R^2$$

Where:

S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally **numeric** gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Cellular Band:

Band	Mode	Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
			(dBi)	(numeric)	(dBm)	(mW)			
Cellular	Downlink	881.6	3	2.0	16.87	48.64	20	0.019	0.588
PCS	Downlink	1960	3	2.0	16.83	48.19	20	0.019	1.00
700 LTE	Downlink	752	3	2.0	15.01	31.69	20	0.0126	0.501

Result: The device meets the MPE limit at 20 cm distance.

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H & 24E, 27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC §2.1046, §22.913(a), §24.232(c) & §27.50 - RF OUTPUT POWER**Applicable Standard**

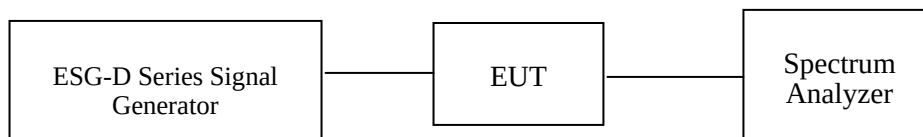
According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §24.232 (C), in no case may the peak output power of a base station transmitter exceed 2 watt EIRP.

According to §27.50, the maximum effective radiated power (ERP) of fixed and base station must not exceed 1000 Watts.

Test Procedure*Conducted method:*

The RF output of the transmitter was connected to the wireless test set and the spectrum analyzer through sufficient attenuation.

*Radiated method:*

TIA 603-C section 2.2.17

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2010-11-24	2011-11-23
Agilent	ESG-D Series Signal Generator	E4432B	US38441663	2010-06-11	2011-06-10
Agilent	Spectrum Analyzer	E4446A	US44300386	2010-08-18	2011-08-17

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data**Environmental Conditions**

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Alvin Huang on 2011-02-23 to 2011-02-26.

Conducted Power:**Cellular Band (Part 22H)**

Mode	Channel	Frequency (MHz)	Output Power (dBm)
GSM	Low	869.2	16.41
	Middle	881.6	16.87
	High	893.8	15.87

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Output Power (dBm)
GSM	Low	1930.2	13.99
	Middle	1960	16.43
	High	1989.8	14.20

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Output Power (dBm)
EDGE	Low	869.2	16.32
	Middle	881.6	16.15
	High	893.8	15.87

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Output Power (dBm)
EDGE	Low	1930.2	14.83
	Middle	1960	16.83
	High	1989.8	14.82

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Output Power (dBm)
CDMA	Low	869.70	16.15
	Middle	881.52	16.58
	High	893.31	15.84

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Output Power (dBm)
CDMA	Low	1931.25	13.99
	Middle	1960	16.30
	High	1988.75	14.42

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Output Power (dBm)
WCDMA	Low	871.4	16.28
	Middle	881.4	16.54
	High	891.6	15.83

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Output Power (dBm)
WCDMA	Low	1932.4	14.74
	Middle	1960	16.66
	High	1987.6	14.13

LTE Band (Part 27)

Mode	Modulation	Frequency (MHz)	Output Power (dBm)
LTE	QPSK	752	15.01
	16QAM	752	16.43
	64QAM	752	14.20

FCC §2.1049, §22.917, §22.905, §24.238 & §27.53 - OCCUPIED BANDWIDTH

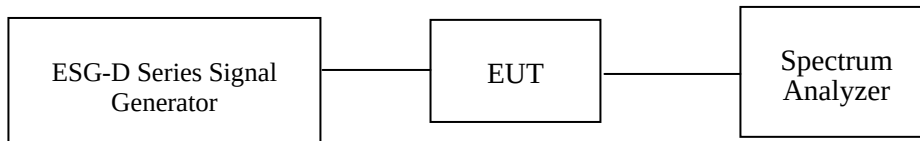
Applicable Standards

FCC §2.1049, §22.917, §22.905 §24.238, and §27.53.

Test Procedure

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 30 kHz (Cellular /PCS) and the 26 dB & 99% bandwidth was recorded.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2010-11-24	2011-11-23
Agilent	ESG-D Series Signal Generator	E4432B	US38441663	2010-06-11	2011-06-10
Agilent	Spectrum Analyzer	E4446A	US44300386	2010-08-18	2011-08-17

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56%
ATM Pressure:	100.0kPa

The testing was performed by Alvin Huang on 2011-02-23 to 2011-03-15.

GSM:

Cellular Band (Part 22H)

Channel	Frequency (MHz)	26 dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
Low	869.2	336	254
Mid	881.6	336	254
High	893.8	334	256

PCS Band (Part 24E)

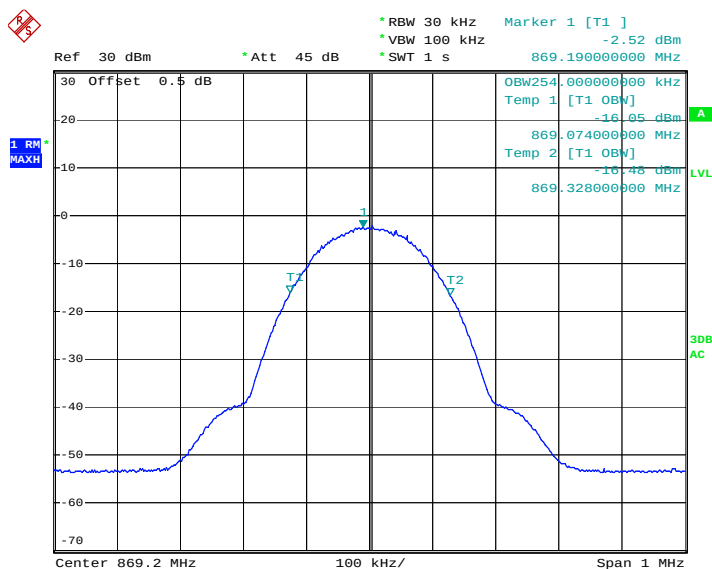
Channel	Frequency (MHz)	26 dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
Low	1930.2	336	256
Mid	1960	336	254
High	1989.8	336	254

Please refer to the following plots.

Cellular Band (Part 22H)

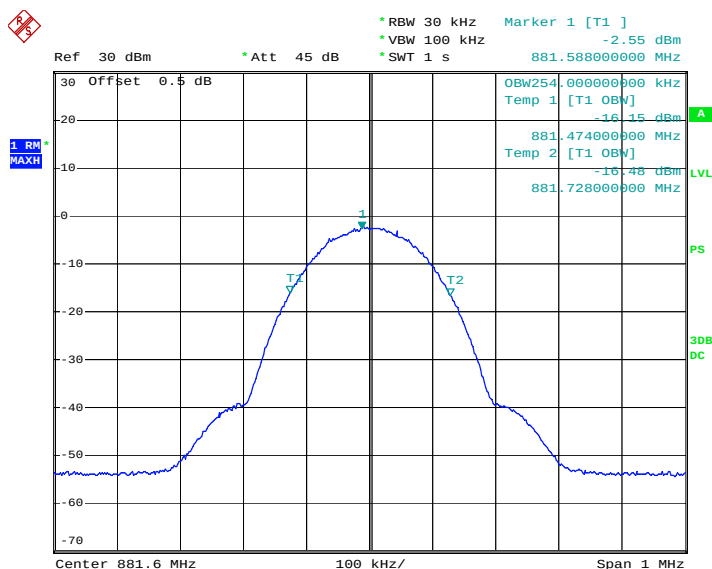
99% Occupied Bandwidth:

Input Signal –Low Channel



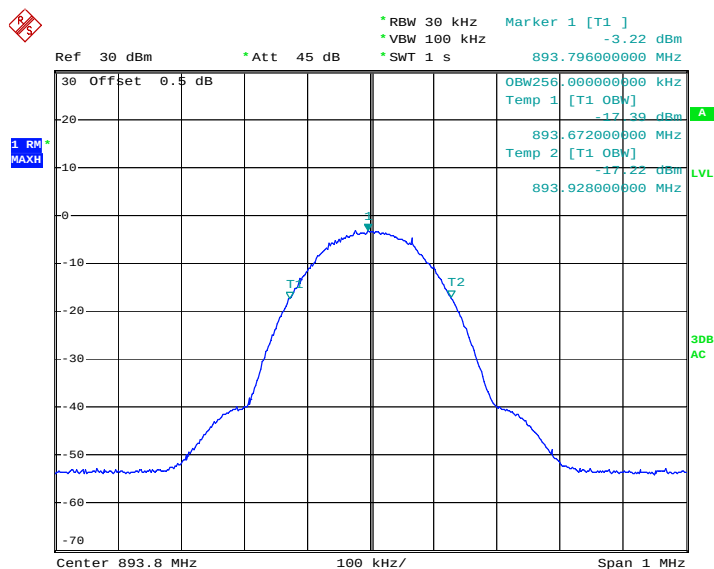
Date: 15.MAR.2011 19:05:10

Input Signal –Middle Channel



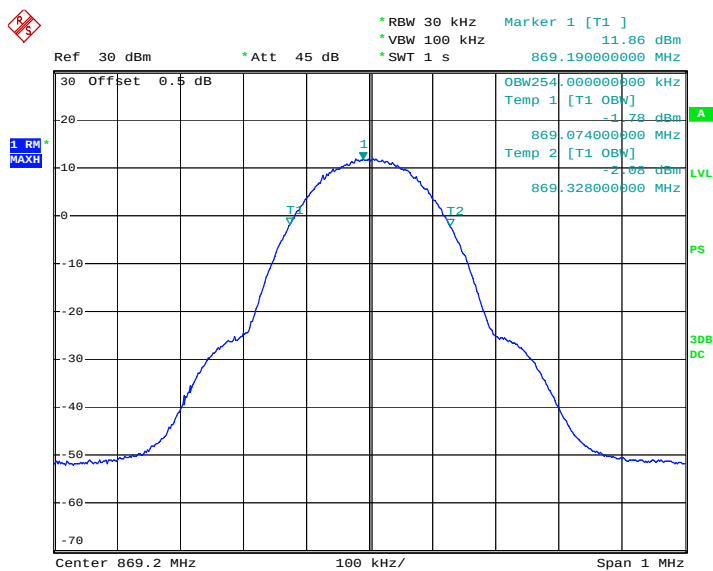
Date: 23.FEB.2011 20:07:26

Input Signal –High Channel



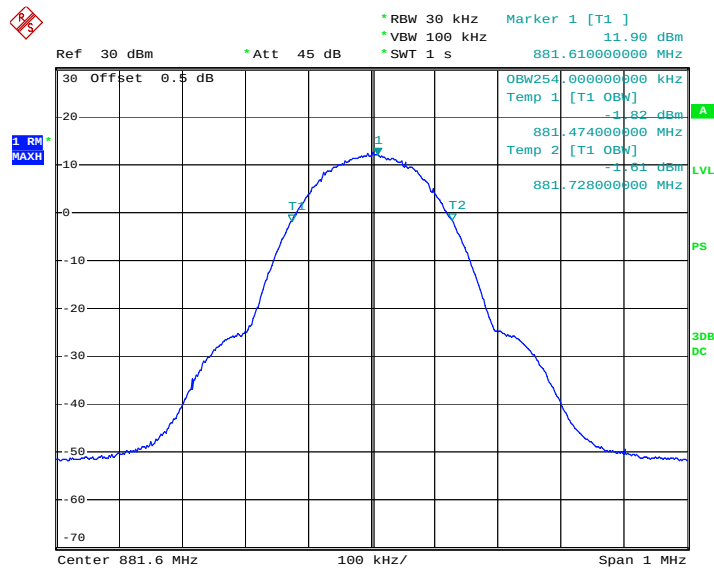
Date: 15.MAR.2011 19:05:43

Low Channel



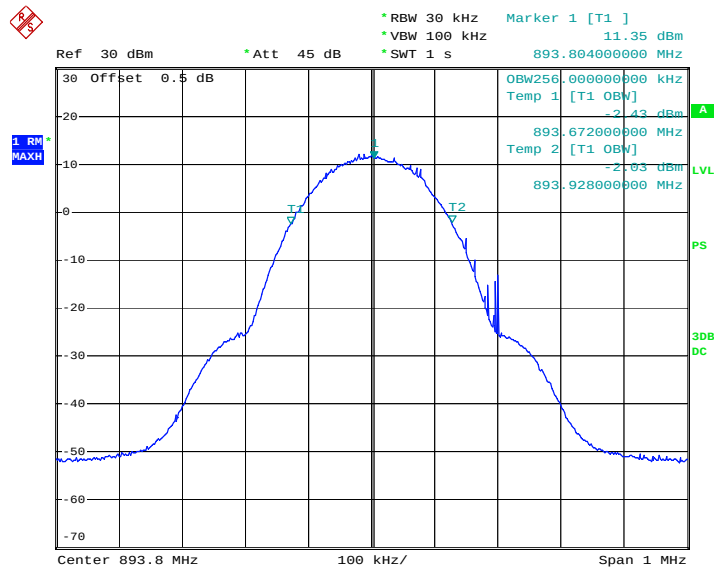
Date: 23.FEB.2011 18:50:40

Middle Channel

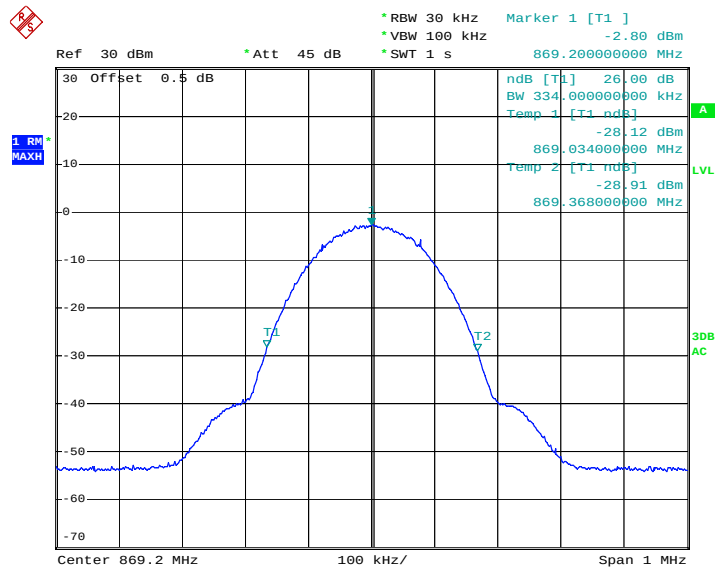


Date: 23.FEB.2011 18:52:05

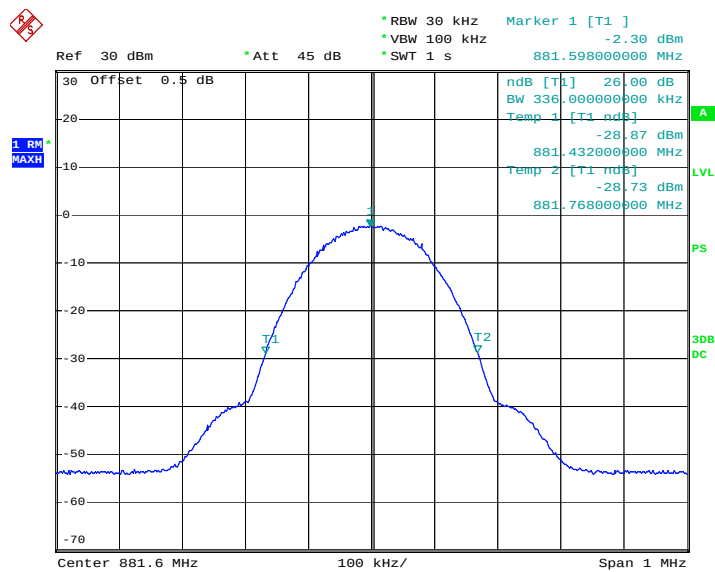
High Channel



Date: 23.FEB.2011 18:52:49

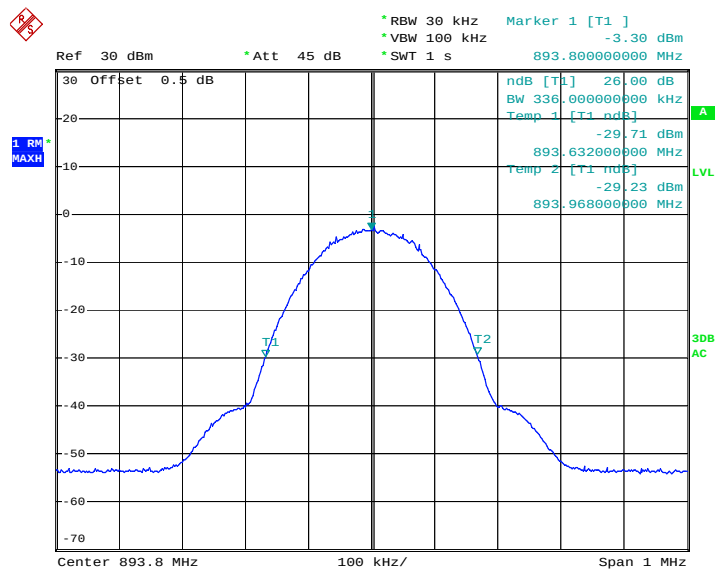
26 dB Bandwidth:**Input Signal-Low Channel**

Date: 15.MAR.2011 19:07:22

Input Signal-Middle Channel

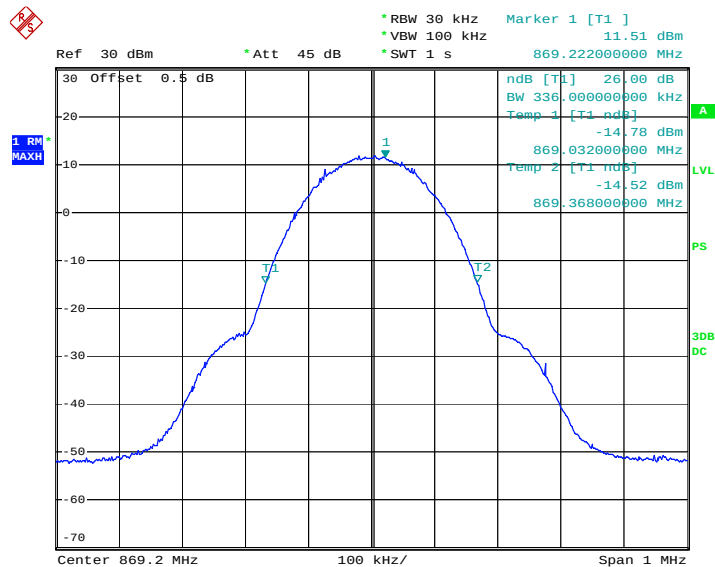
Date: 23.FEB.2011 20:07:06

Input Signal-High Channel



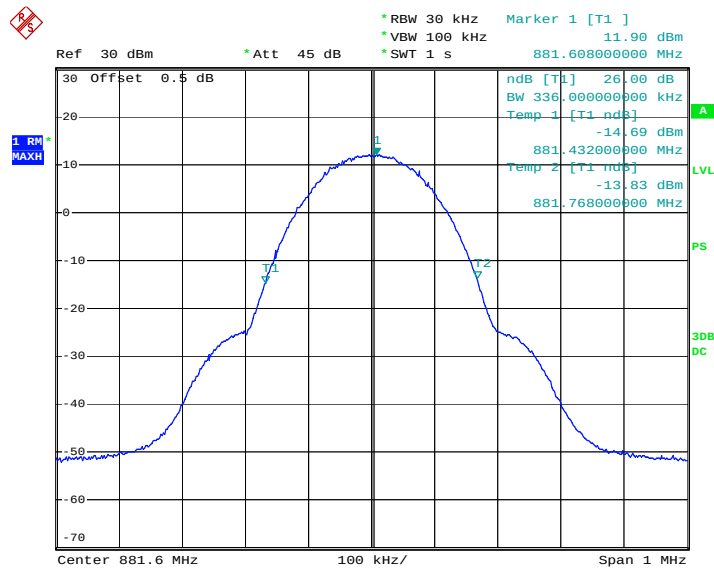
Date: 15.MAR.2011 19:06:53

Low Channel



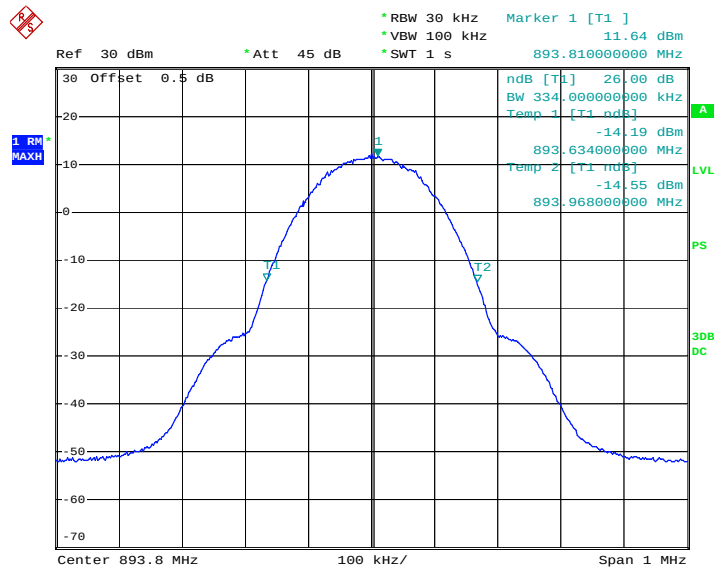
Date: 23.FEB.2011 18:54:44

Middle Channel



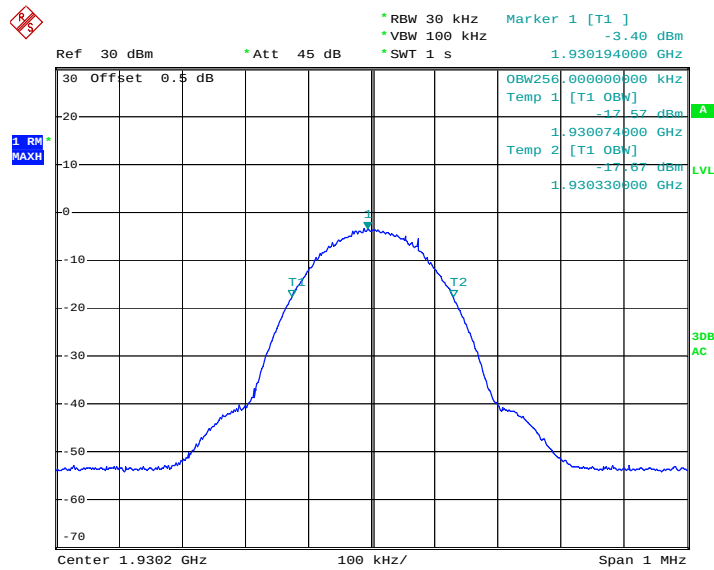
Date: 23.FEB.2011 18:54:13

High Channel

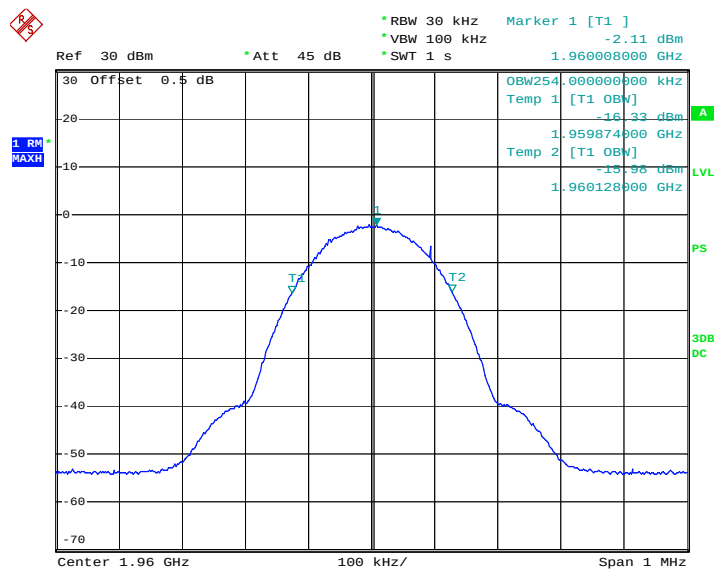


Date: 23.FEB.2011 18:53:39

PCS Band (Part 24E)

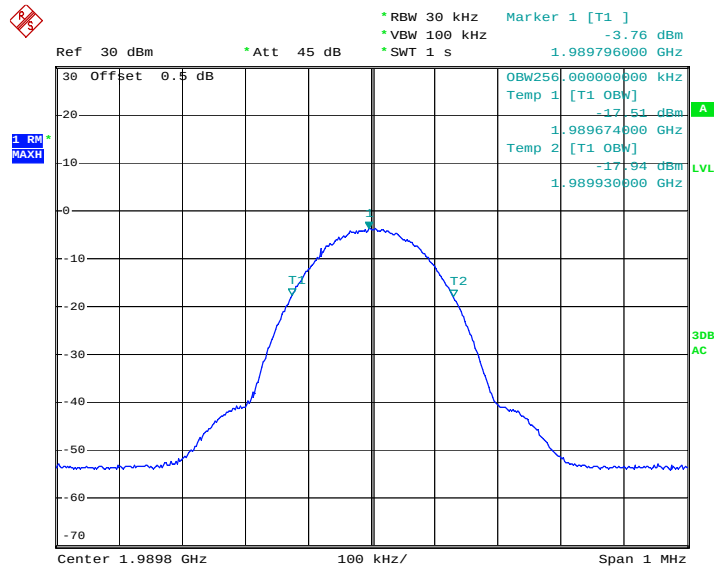
99% Occupied Bandwidth:**Input Signal-Low Channel**

Date: 15.MAR.2011 19:08:24

Input Signal-Middle Channel

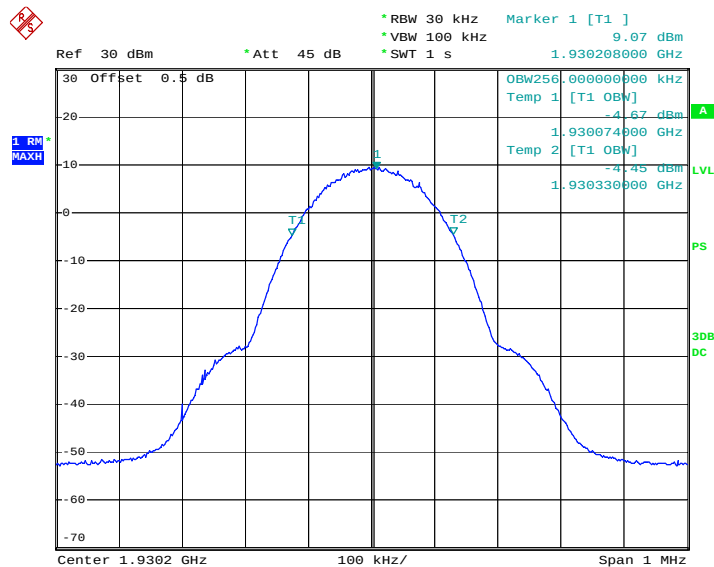
Date: 23.FEB.2011 20:05:59

Input Signal-High Channel



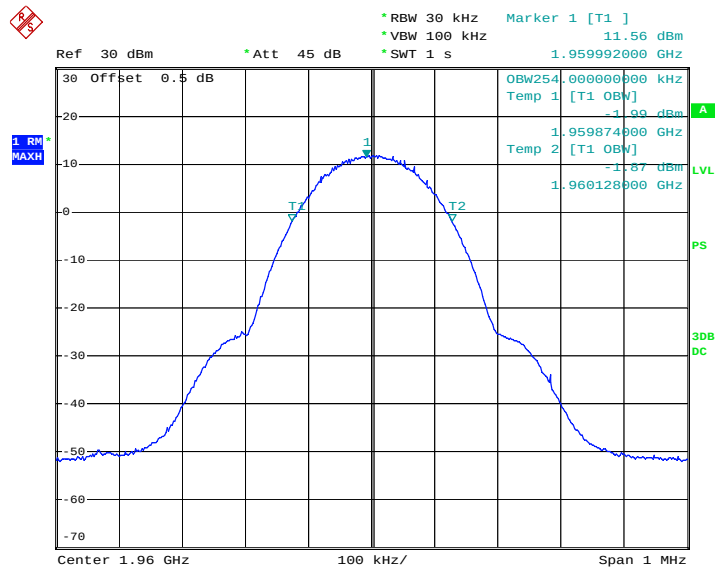
Date: 15.MAR.2011 19:09:00

Low Channel



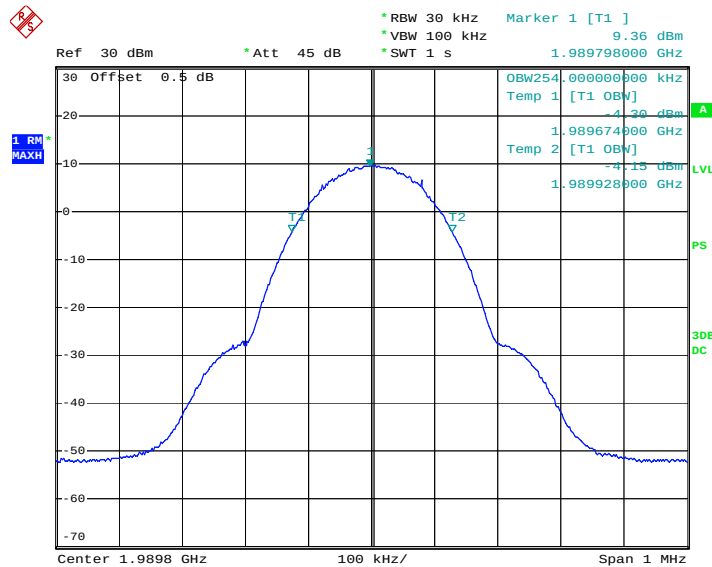
Date: 23.FEB.2011 20:00:39

Middle Channel

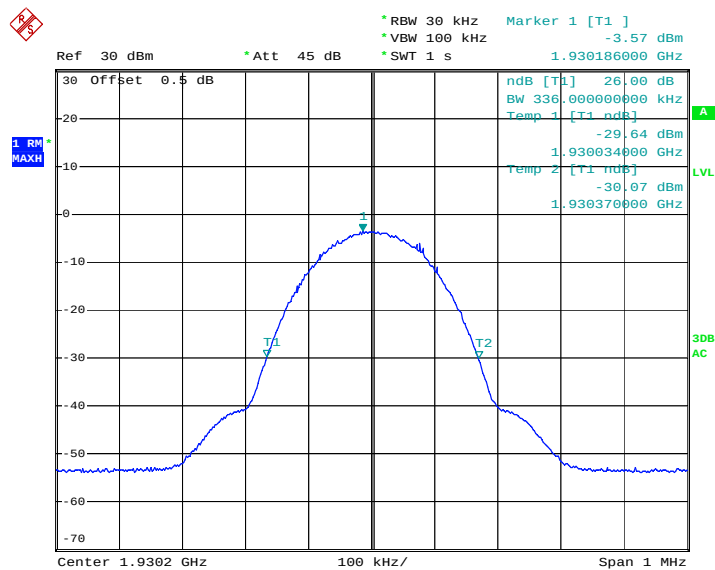


Date: 23.FEB.2011 20:00:07

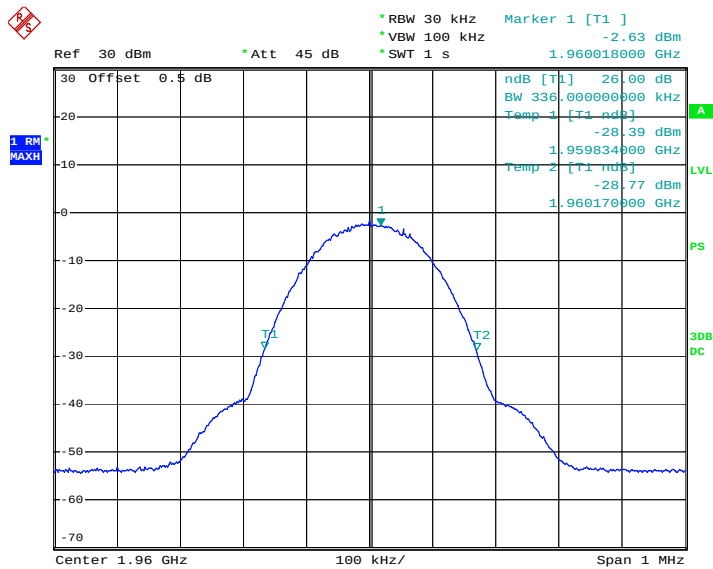
High Channel



Date: 23.FEB.2011 19:58:38

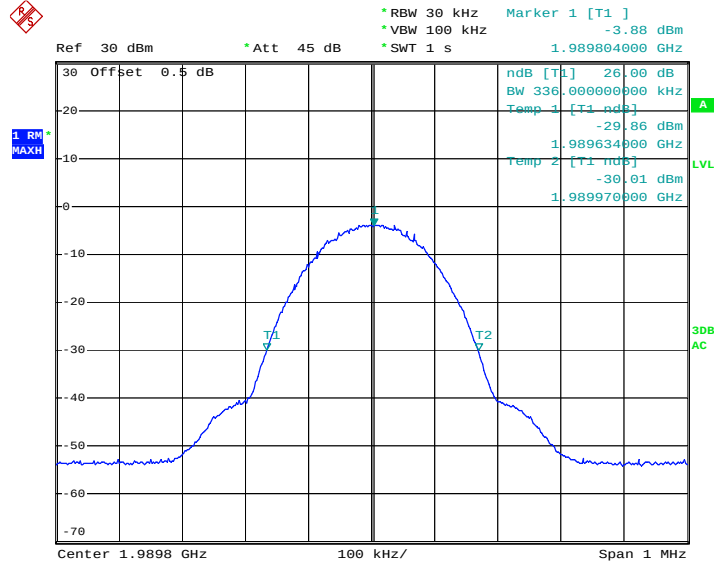
26 dB Bandwidth:**Input Signal-Low Channel**

Date: 15.MAR.2011 19:08:09

Input Signal-Middle Channel

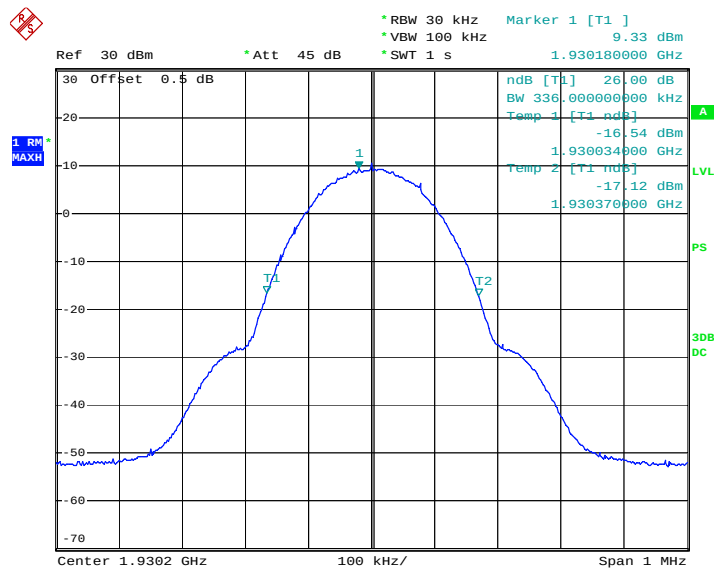
Date: 23.FEB.2011 20:06:22

Input Signal-High Channel



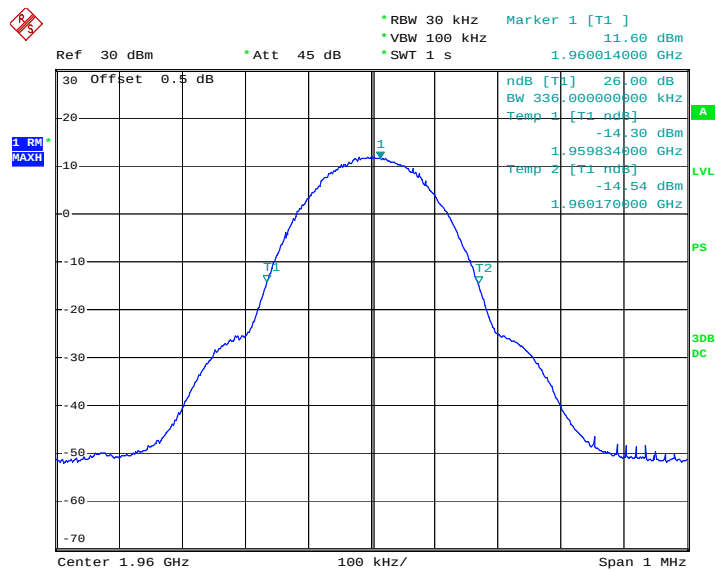
Date: 15.MAR.2011 19:09:16

Low Channel



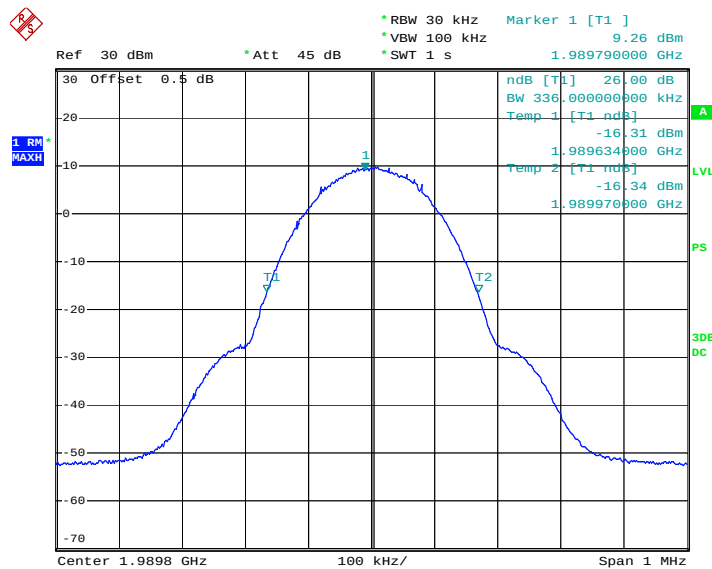
Date: 23.FEB.2011 20:01:03

Middle Channel



Date: 23.FEB.2011 19:59:48

High Channel



Date: 23.FEB.2011 19:59:02

EDGE:

Cellular Band (Part 22H)

Channel	Frequency (MHz)	26 dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
Low	869.2	326	258
Mid	881.6	332	258
High	893.8	326	258

PCS Band (Part 24E)

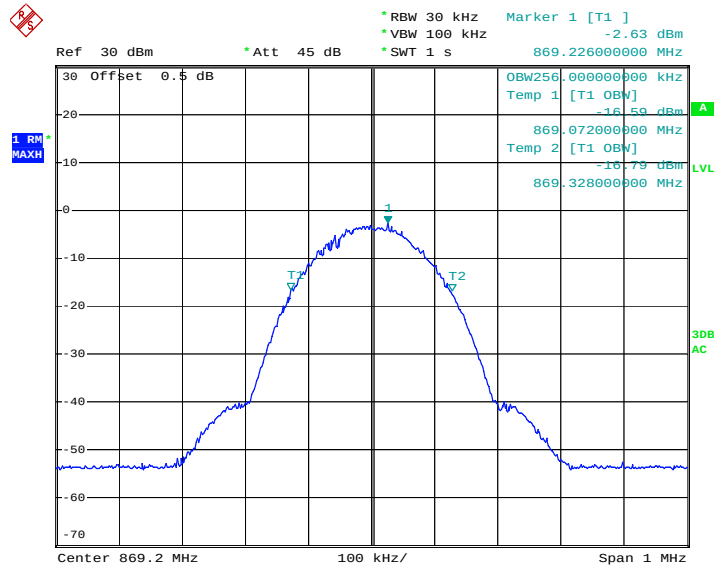
Channel	Frequency (MHz)	26 dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
Low	1930.2	336	256
Mid	1960	336	256
High	1989.8	332	256

Please refer to the following plots.

Cellular Band (Part 22H)

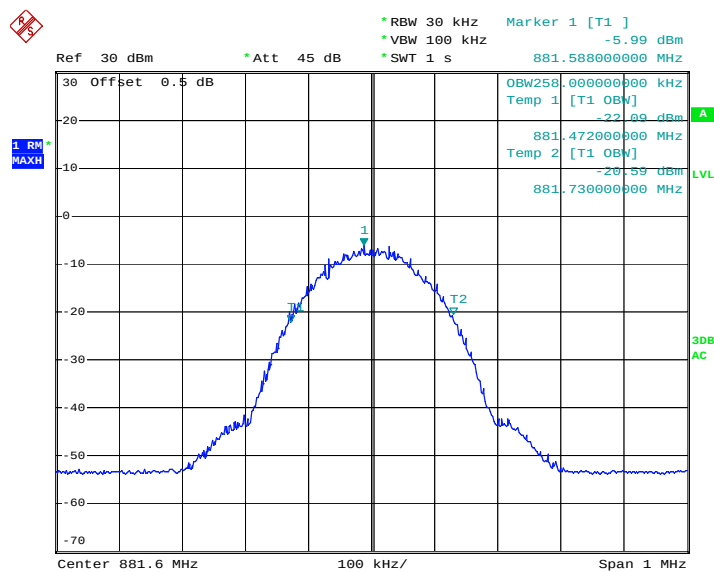
99% Occupied Bandwidth:

Input Signal-Low Channel



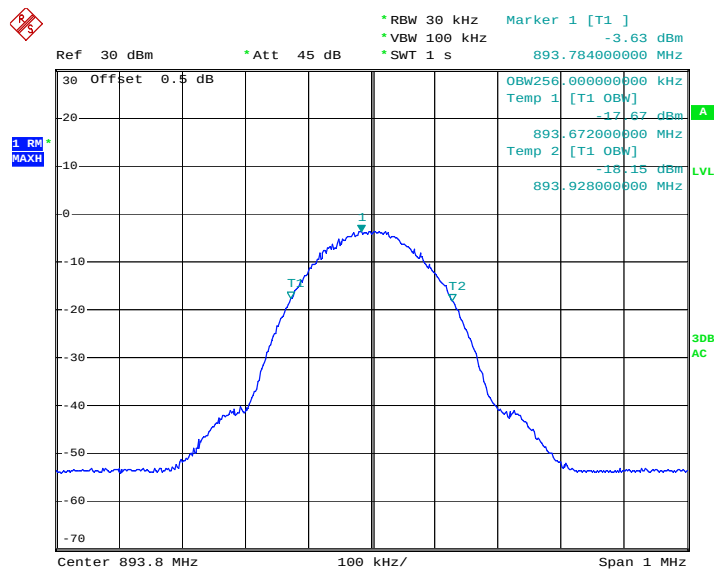
Date: 15.MAR.2011 19:16:34

Input Signal-Middle Channel



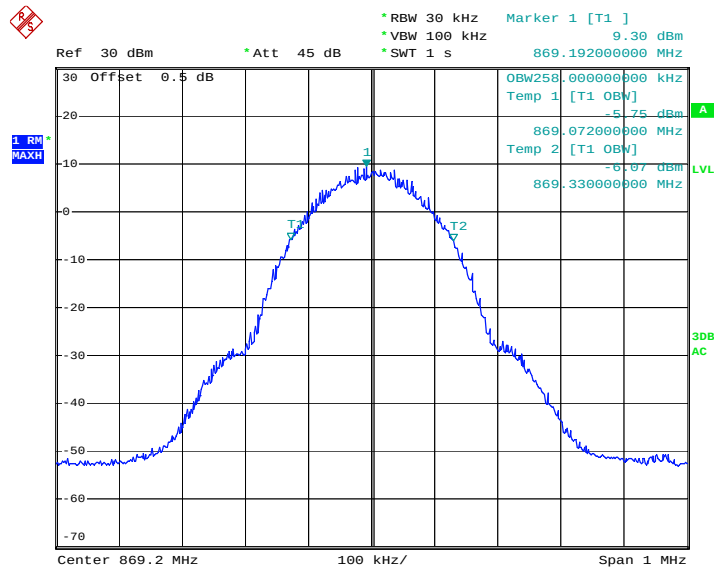
Date: 24.FEB.2011 19:22:24

Input Signal-High Channel



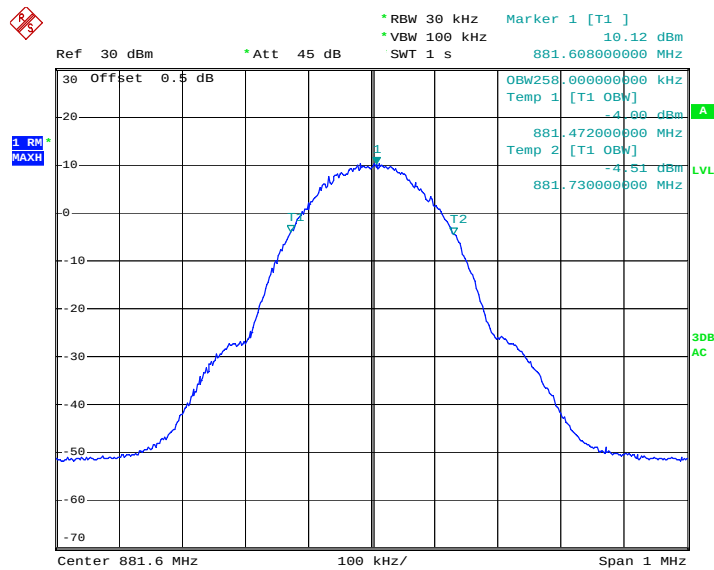
Date: 15.MAR.2011 19:20:23

Low Channel



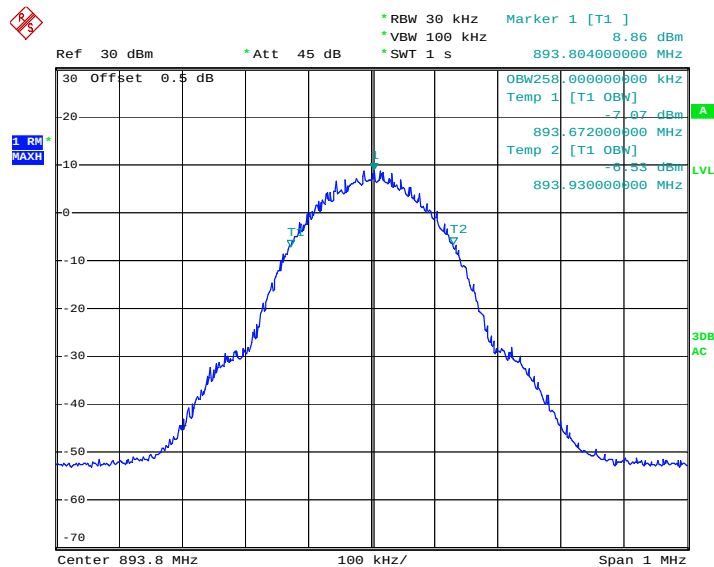
Date: 24.FEB.2011 19:18:46

Middle Channel

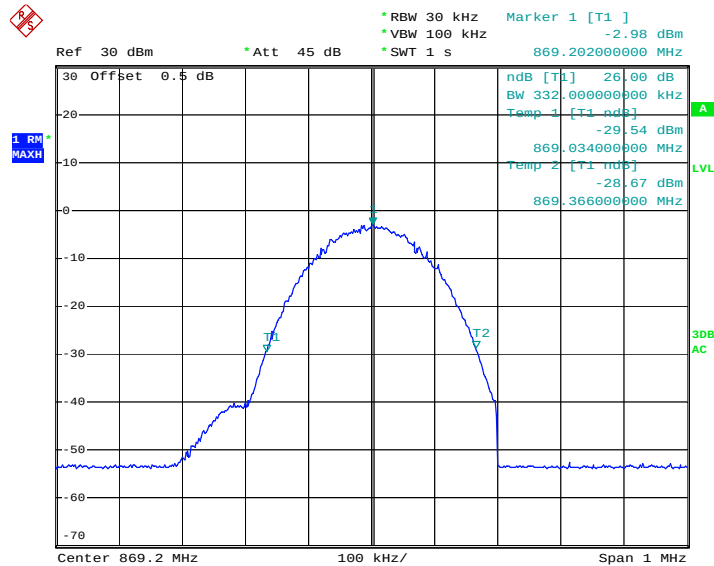


Date: 24.FEB.2011 19:15:22

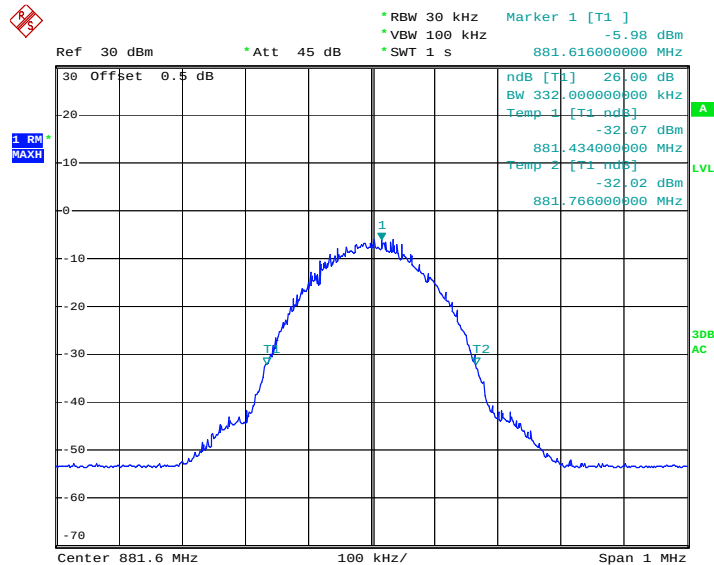
High Channel



Date: 24.FEB.2011 19:19:34

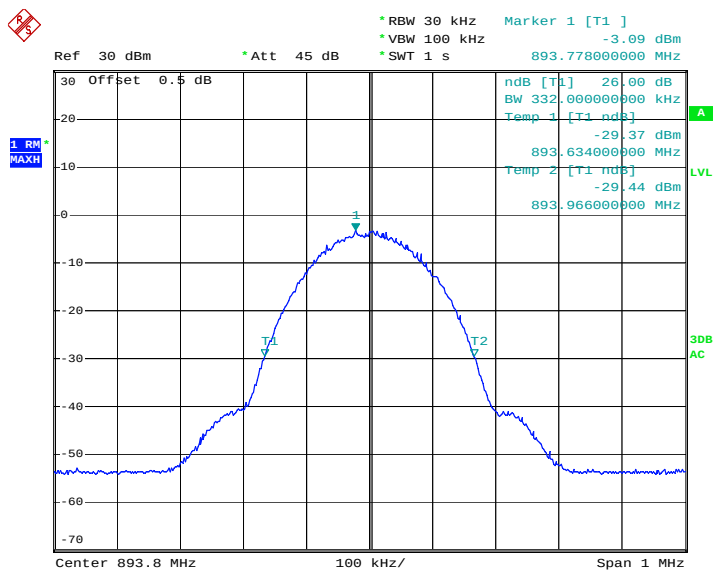
26 dB Bandwidth:**Input Signal-Low Channel**

Date: 15.MAR.2011 19:15:40

Input Signal-Middle Channel

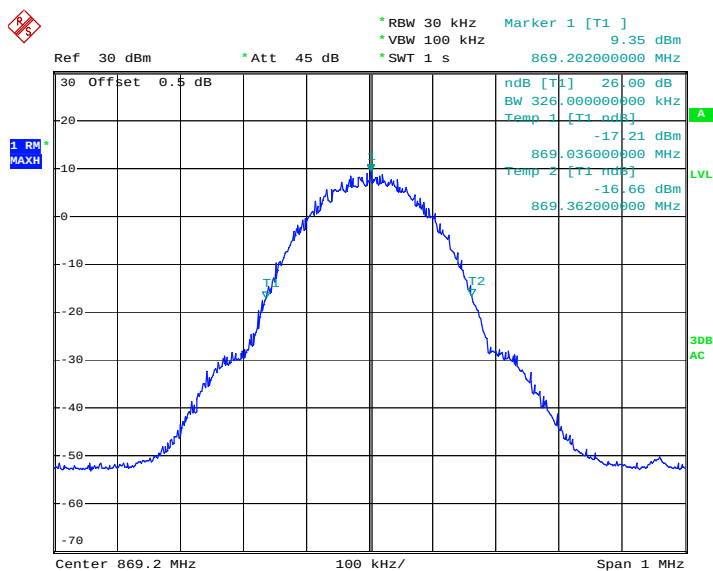
Date: 24.FEB.2011 19:21:46

Input Signal-High Channel



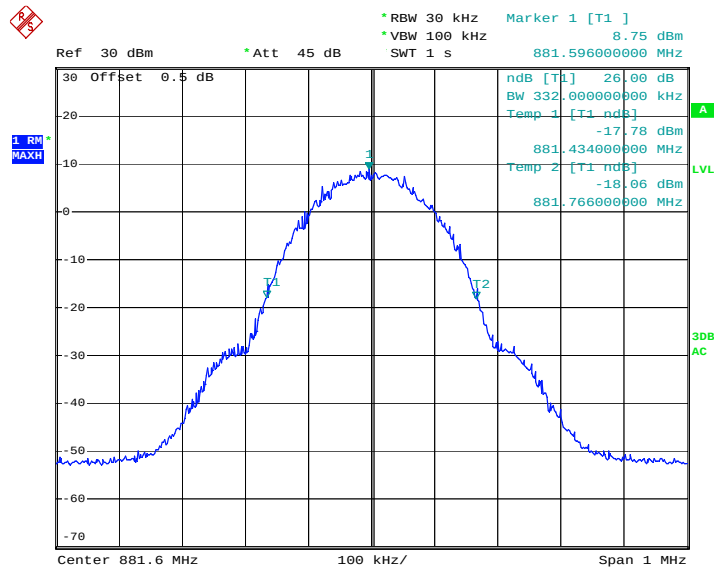
Date: 15.MAR.2011 19:21:24

Low Channel



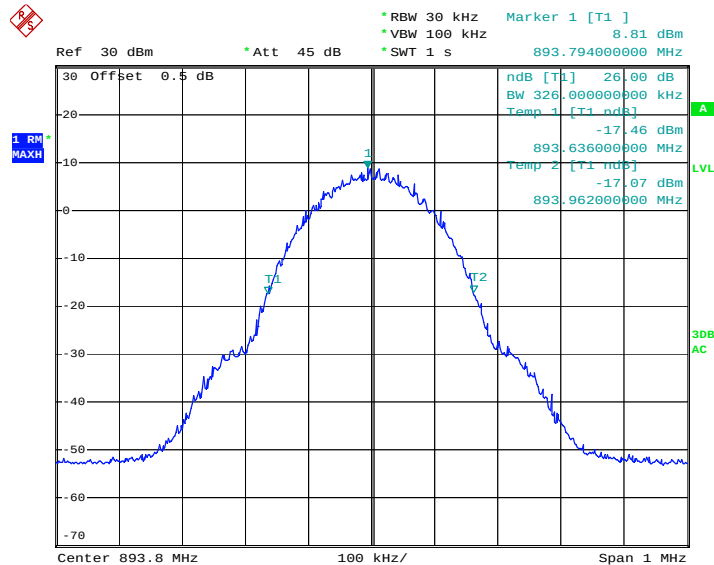
Date: 24.FEB.2011 19:18:17

Middle Channel



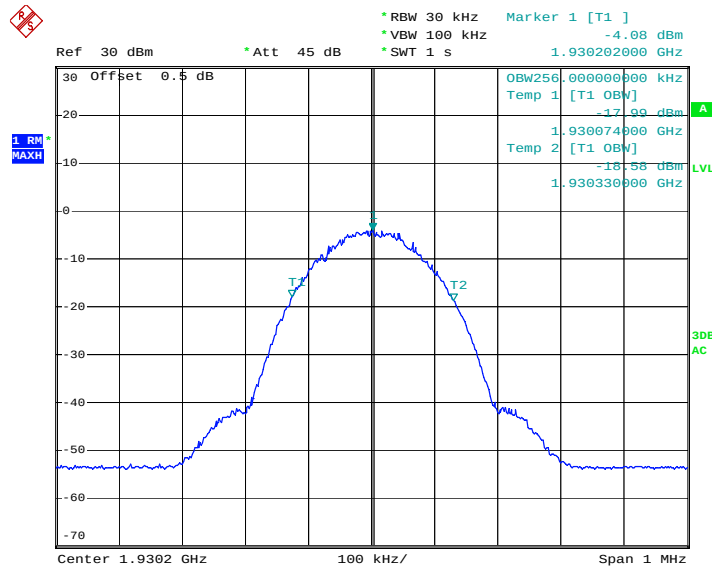
Date: 24.FEB.2011 19:16:40

High Channel

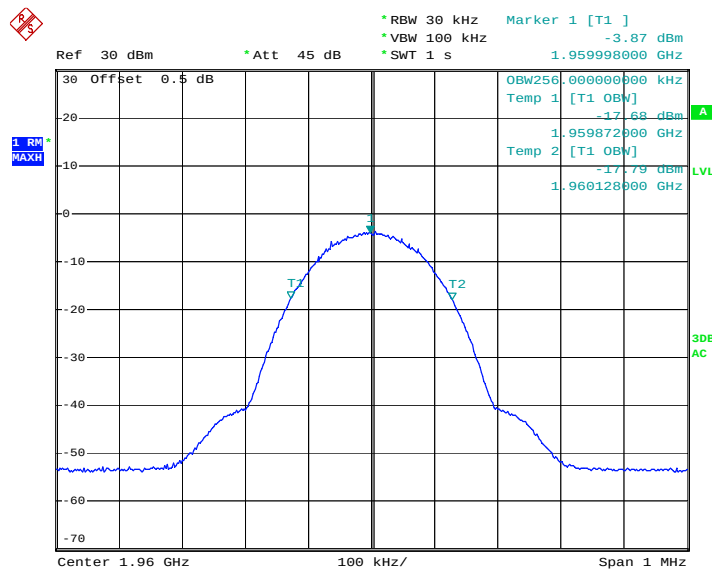


Date: 24.FEB.2011 19:19:55

PCS Band (Part 24E)

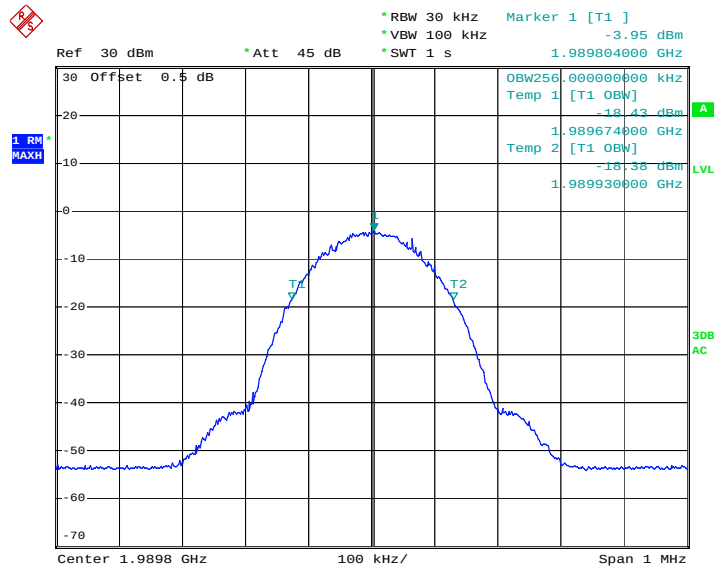
99% Occupied Bandwidth:**Input Signal-Low Channel**

Date: 15.MAR.2011 19:13:09

Input Signal-Middle Channel

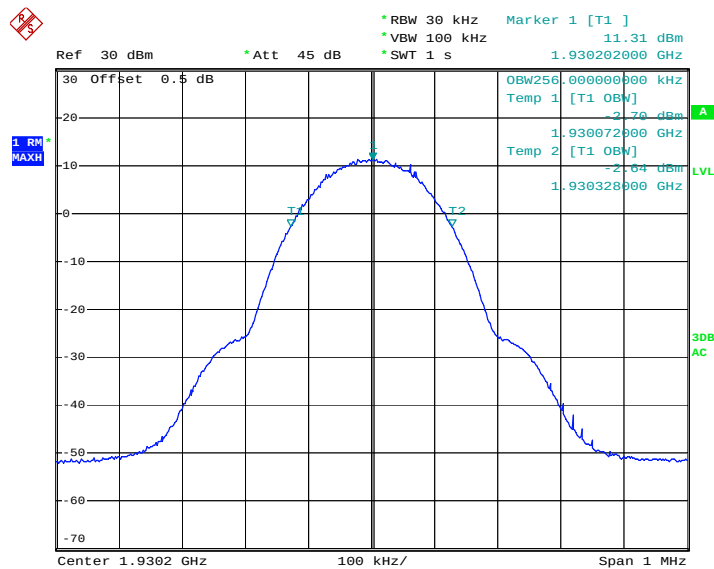
Date: 26.FEB.2011 11:05:35

Input Signal-High Channel



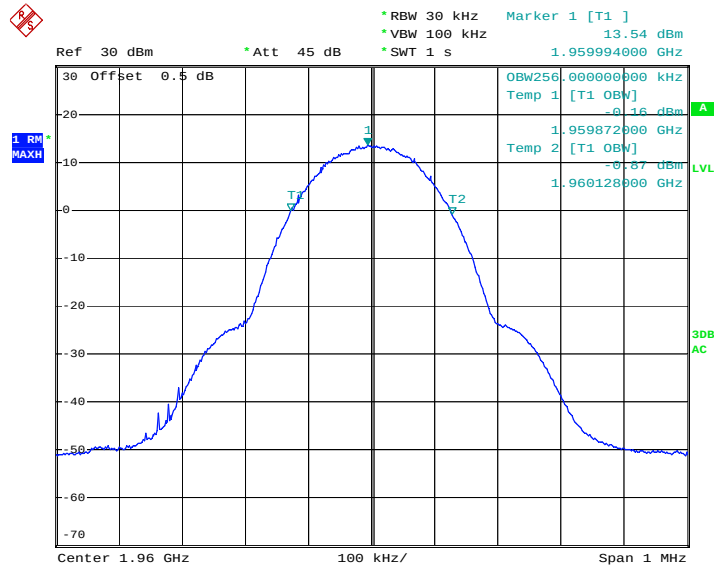
Date: 15.MAR.2011 19:11:41

Low Channel



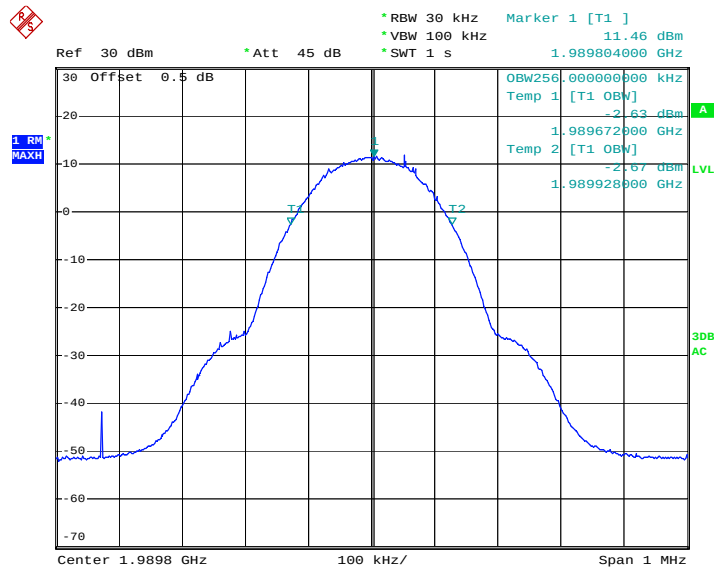
Date: 26.FEB.2011 11:01:40

Middle Channel

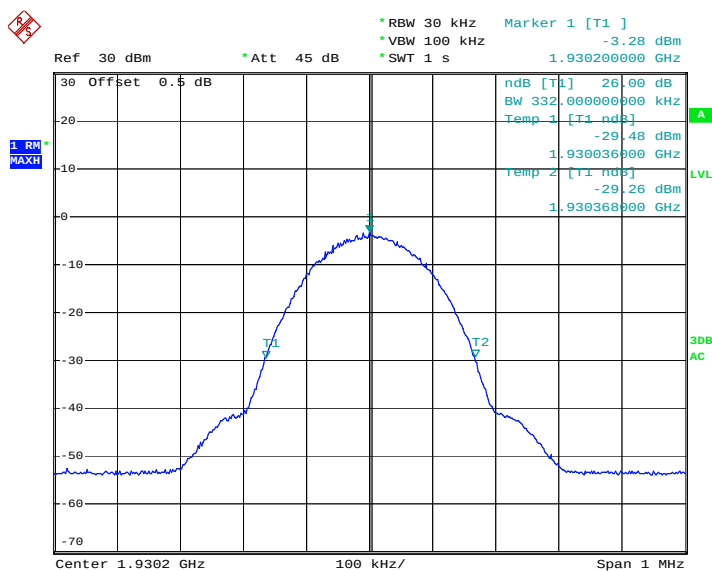


Date: 26.FEB.2011 10:40:36

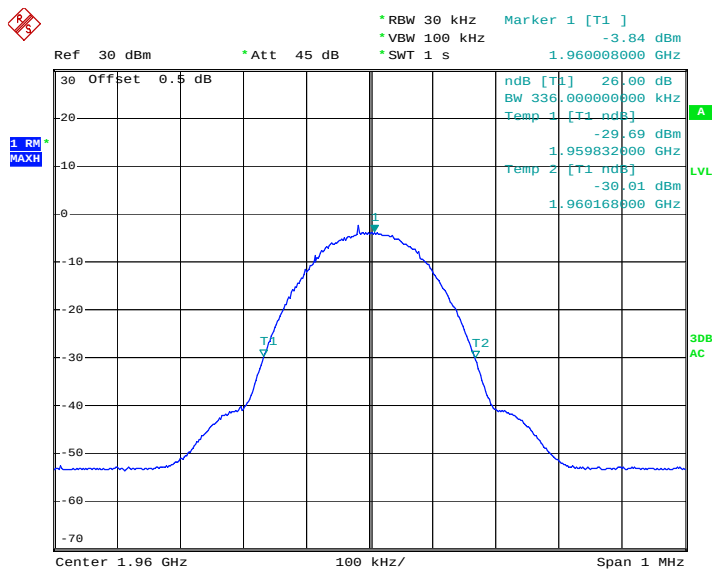
High Channel



Date: 26.FEB.2011 10:39:56

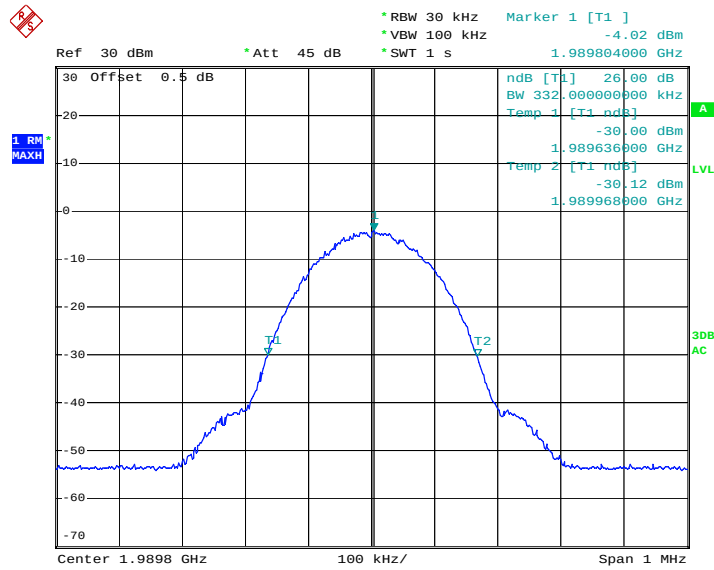
26 dB Bandwidth:**Input Signal-Low Channel**

Date: 15.MAR.2011 19:13:39

Input Signal-Middle Channel

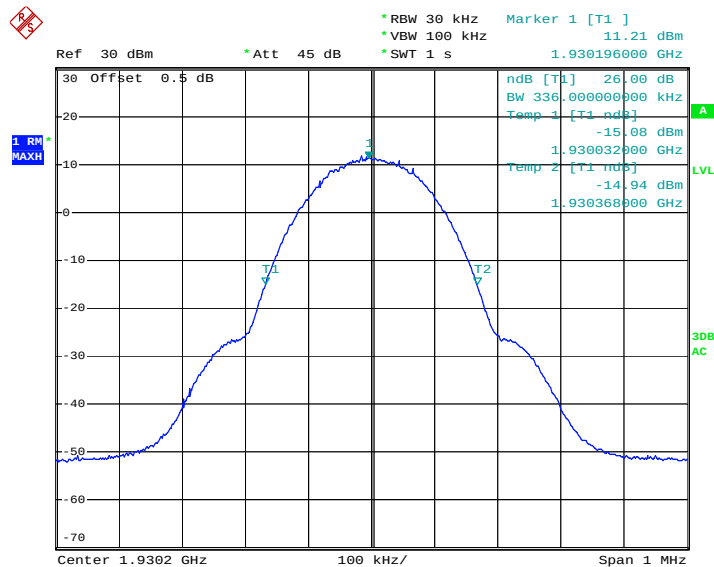
Date: 26.FEB.2011 11:05:16

Input Signal-High Channel



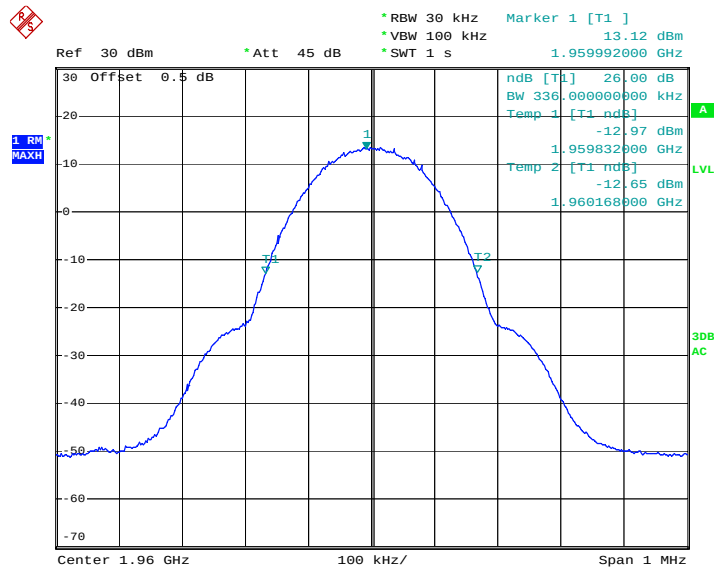
Date: 15.MAR.2011 19:11:03

Low Channel



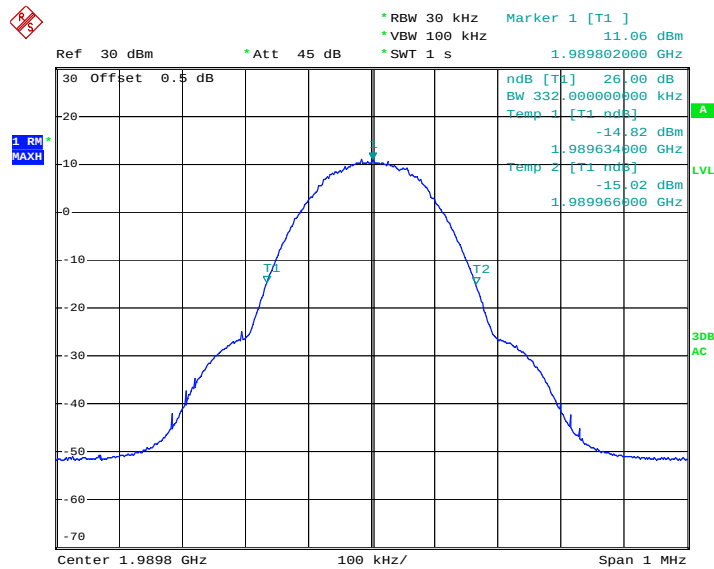
Date: 26.FEB.2011 11:01:21

Middle Channel



Date: 26.FEB.2011 10:40:57

High Channel



Date: 26.FEB.2011 10:39:26

CDMA:

Cellular Band (Part 22H)

Channel	Frequency (MHz)	26 dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
Low	869.70	1400	1260
Mid	881.52	1420	1260
High	893.31	1420	1260

PCS Band (Part 24E)

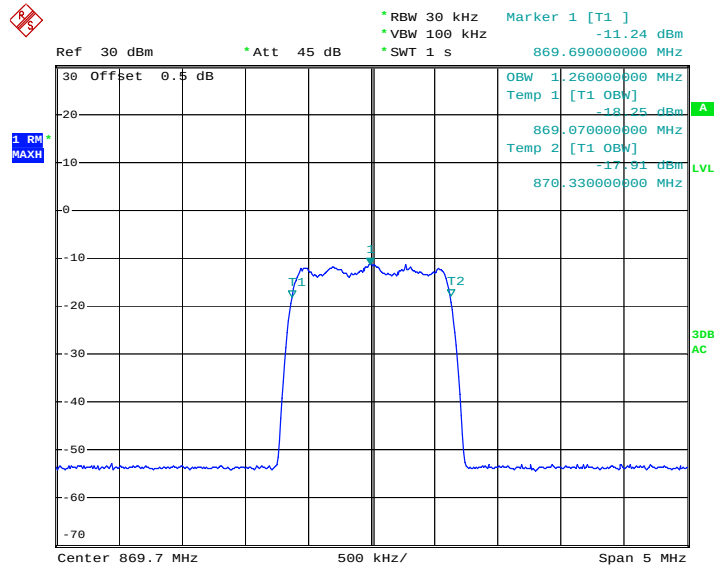
Channel	Frequency (MHz)	26 dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
Low	1931.25	1400	1260
Mid	1960	1400	1260
High	1988.75	1400	1260

Please refer to the following plots.

Cellular Band (Part 22H)

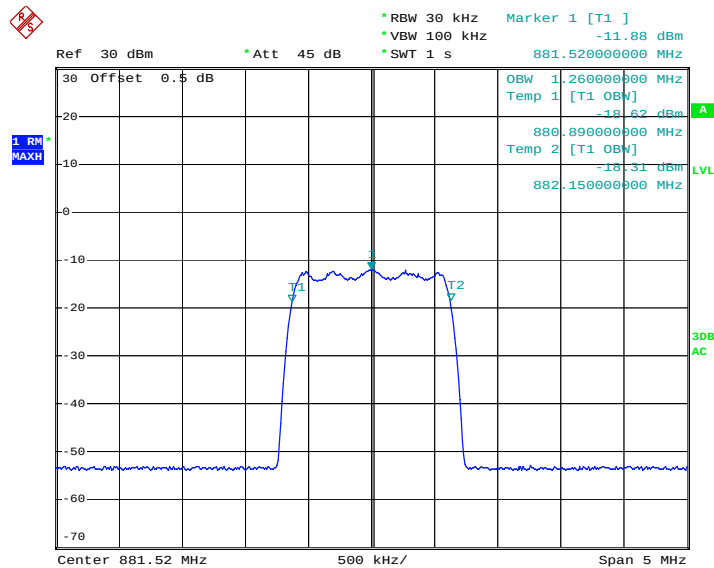
99% Occupied Bandwidth:

Input Signal-Low Channel



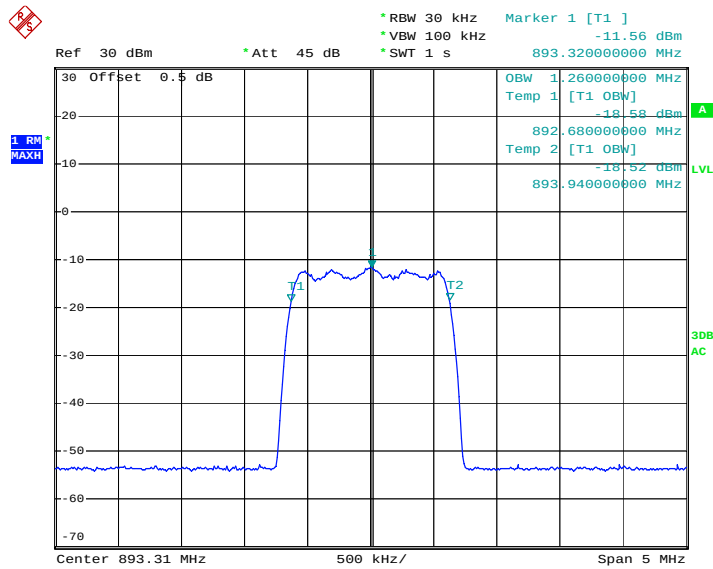
Date: 15.MAR.2011 19:24:18

Input Signal-Middle Channel



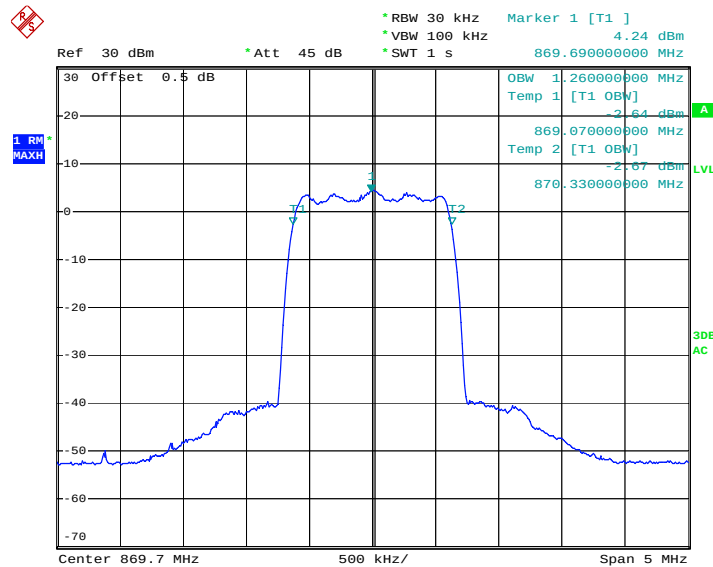
Date: 26.FEB.2011 09:39:10

Input Signal-High Channel



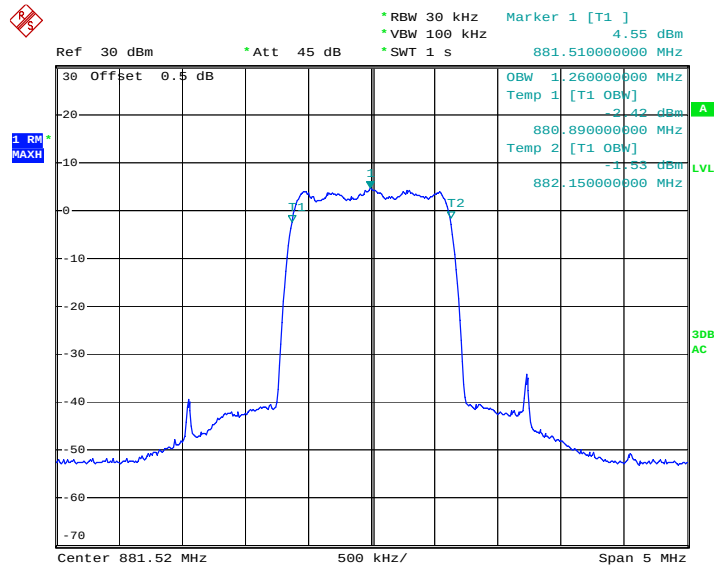
Date: 15.MAR.2011 19:24:46

Low Channel



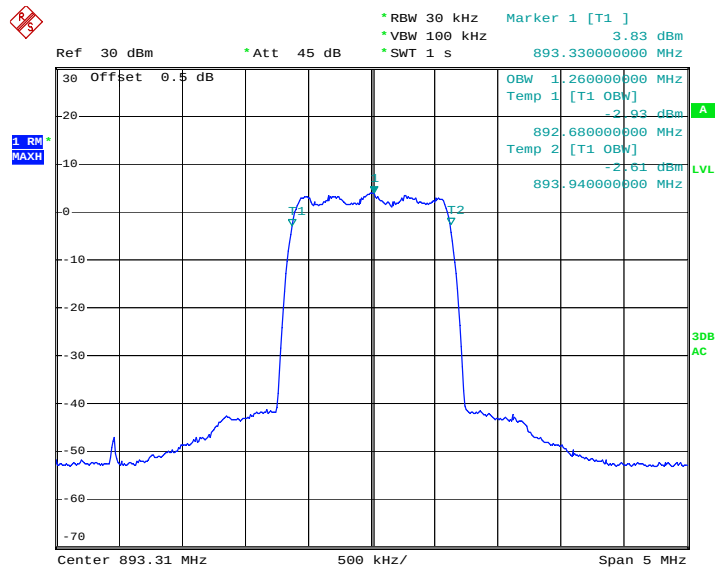
Date: 26.FEB.2011 09:18:21

Middle Channel

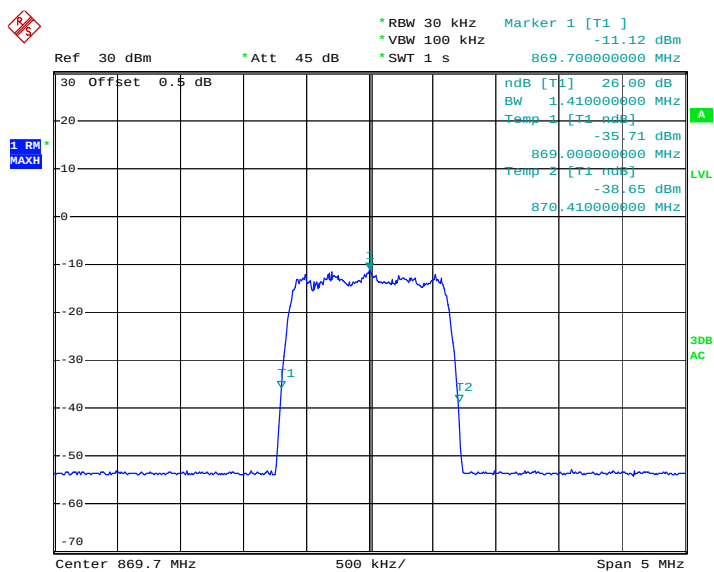


Date: 26.FEB.2011 09:20:37

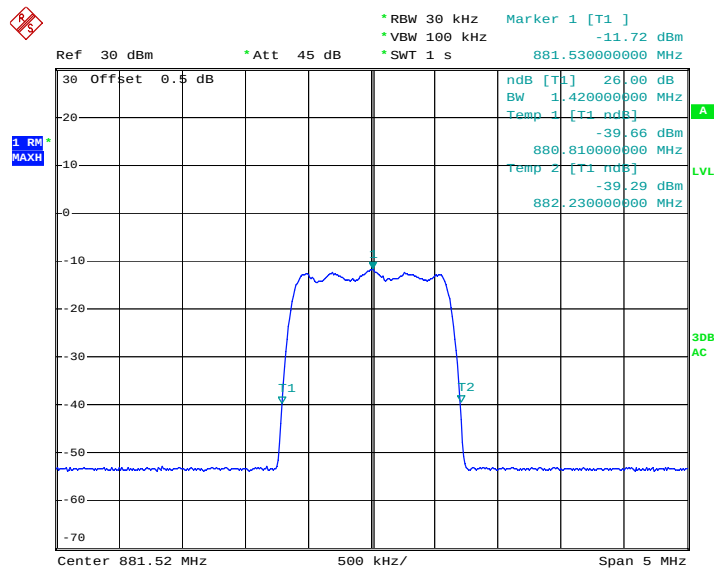
High Channel



Date: 26.FEB.2011 09:22:19

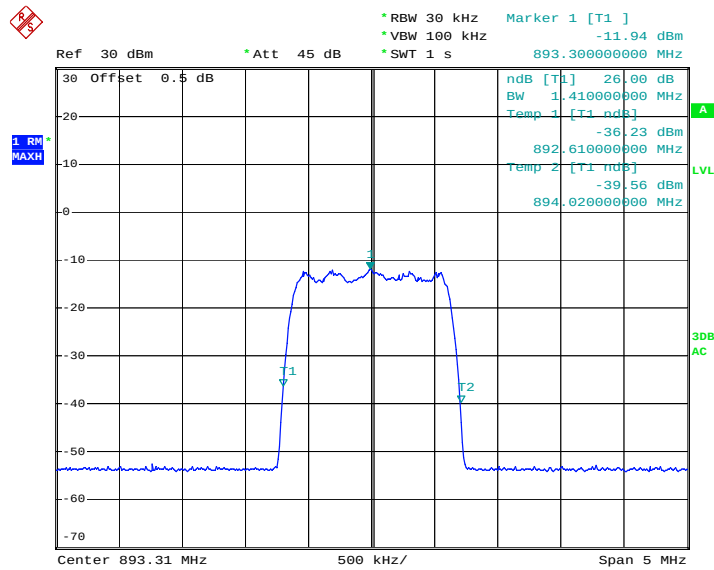
26 dB Bandwidth:**Input Signal-Low Channel**

Date: 15.MAR.2011 19:23:59

Input Signal-Middle Channel

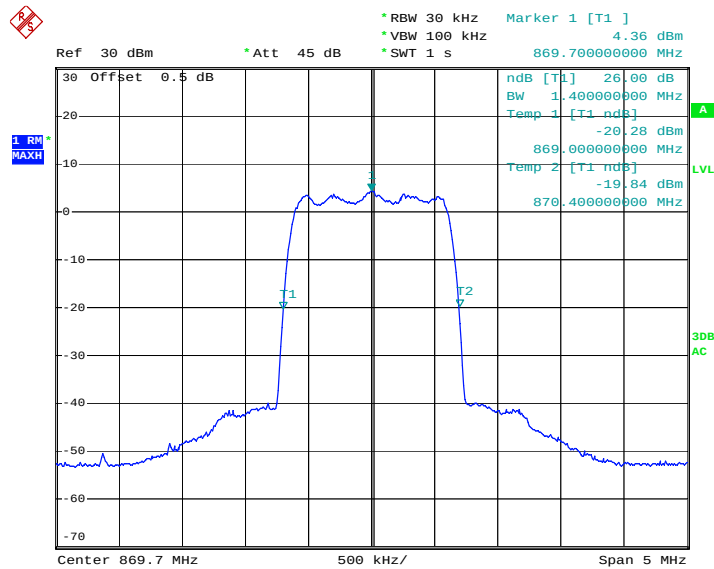
Date: 26.FEB.2011 09:38:41

Input Signal-High Channel



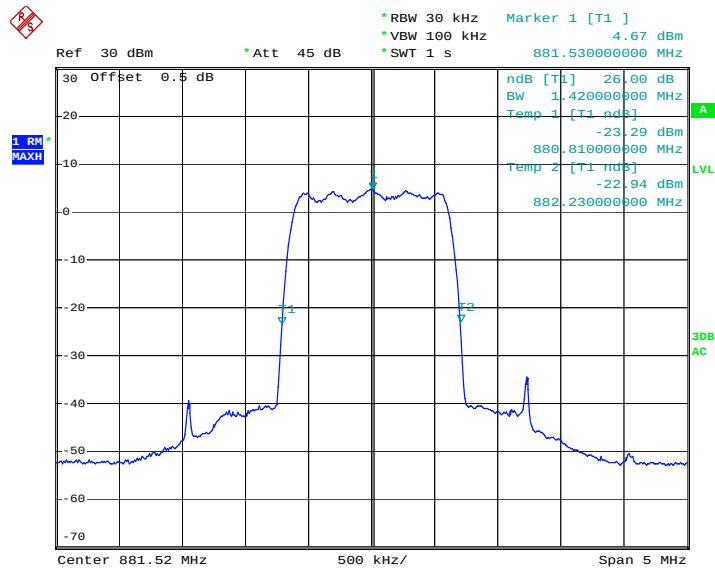
Date: 15.MAR.2011 19:25:37

Low Channel



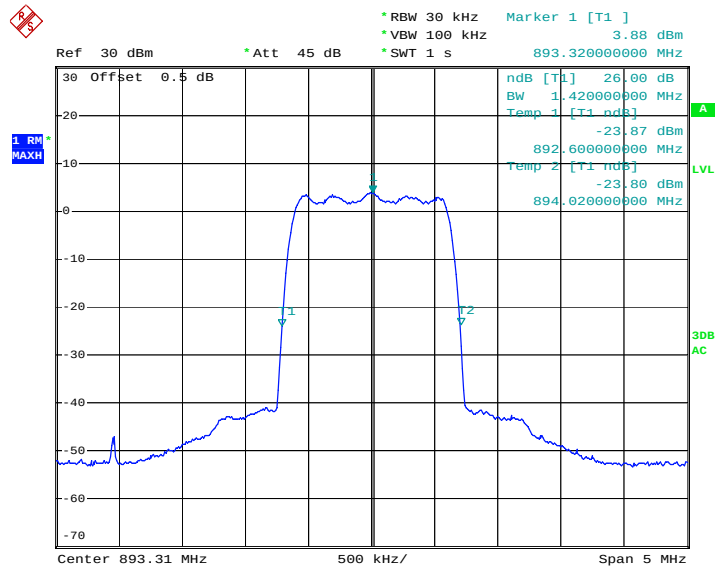
Date: 26.FEB.2011 09:21:15

Middle Channel



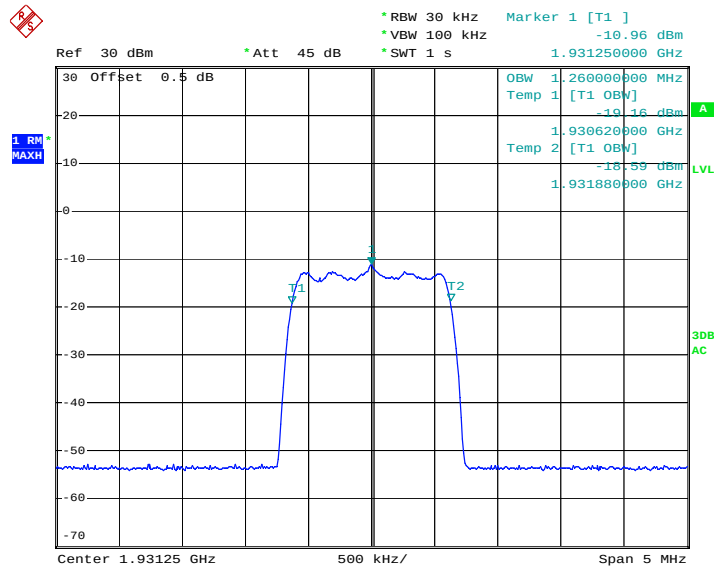
Date: 26.FEB.2011 09:20:21

High Channel

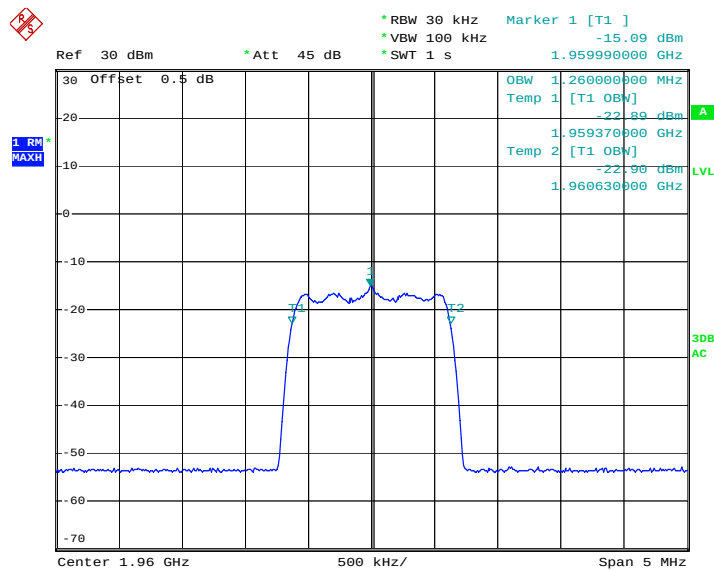


Date: 26.FEB.2011 09:22:00

PCS Band (Part 24E)

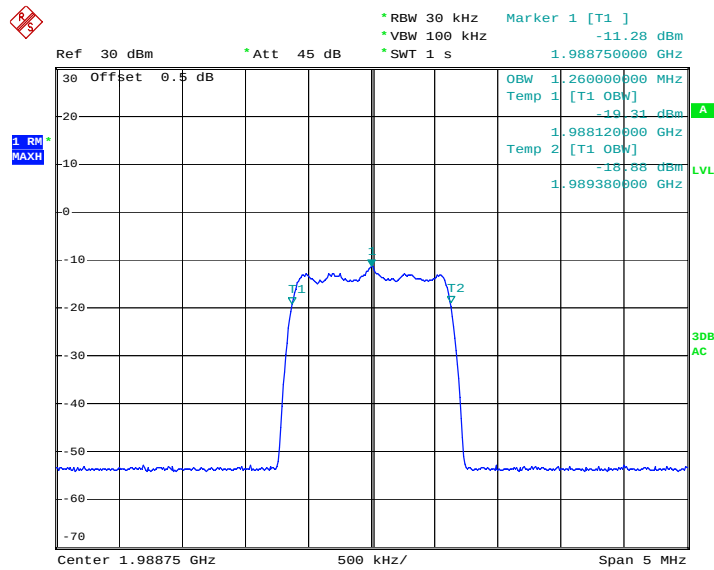
99% Occupied Bandwidth:**Input Signal-Low Channel**

Date: 15.MAR.2011 19:27:01

Input Signal-Middle Channel

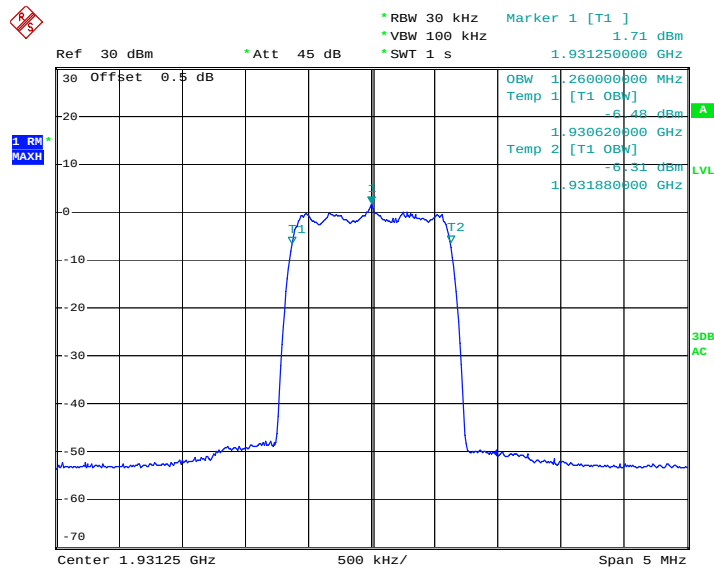
Date: 26.FEB.2011 09:53:35

Input Signal-High Channel



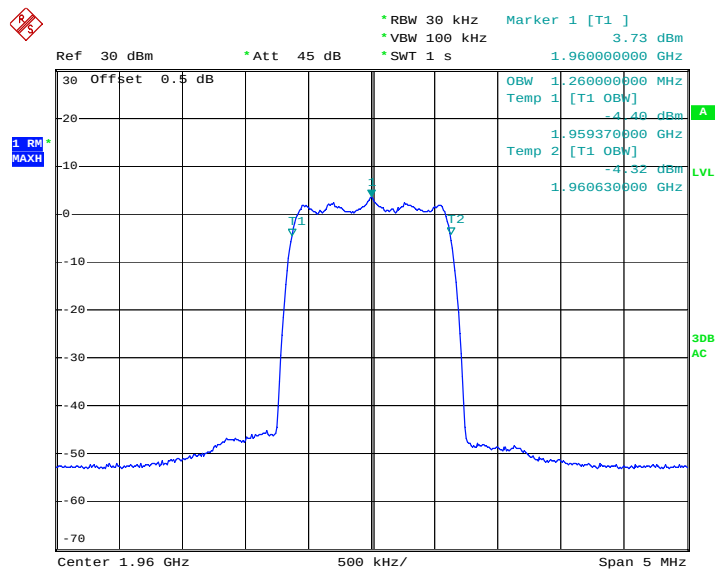
Date: 15.MAR.2011 19:27:33

Low Channel



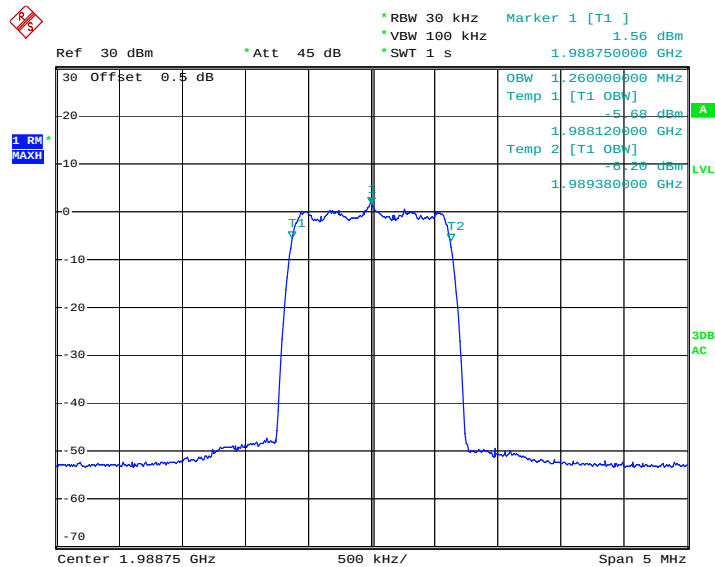
Date: 26.FEB.2011 09:49:44

Middle Channel

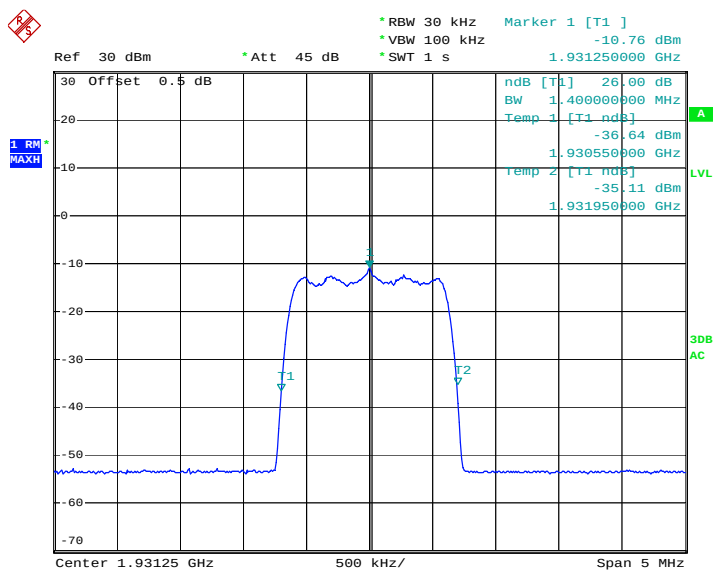


Date: 26.FEB.2011 09:48:47

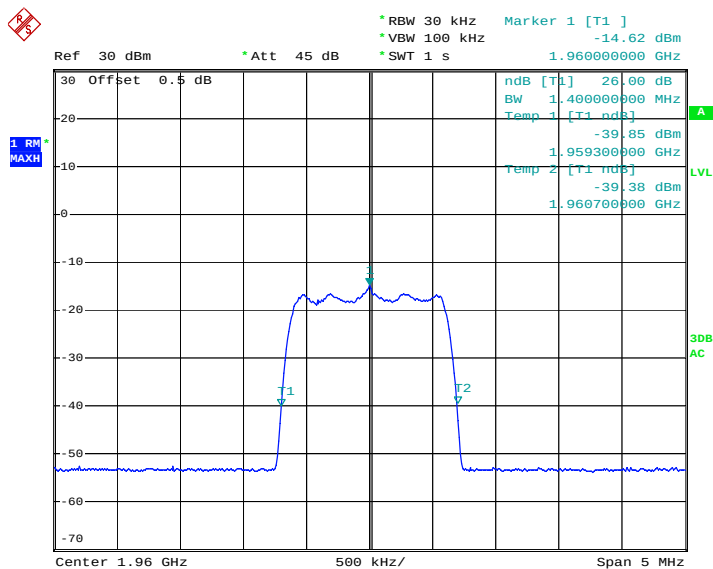
High Channel



Date: 26.FEB.2011 09:48:21

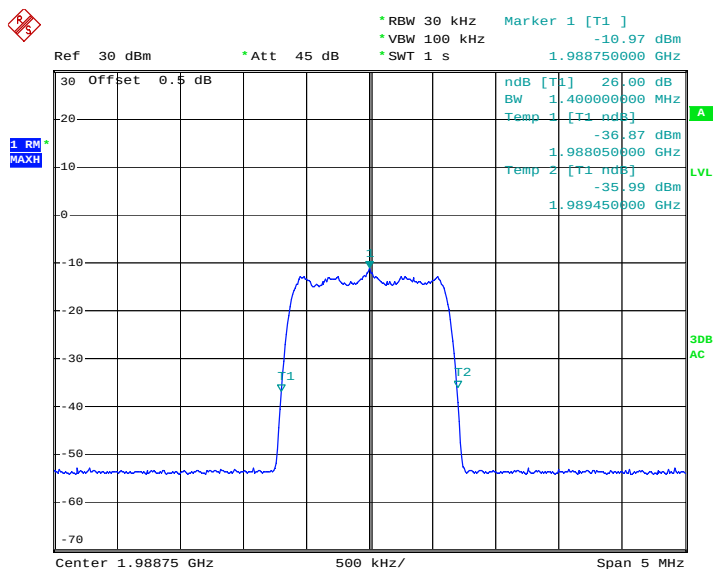
26 dB Bandwidth:**Input Signal-Low Channel**

Date: 15.MAR.2011 19:26:42

Input Signal-Middle Channel

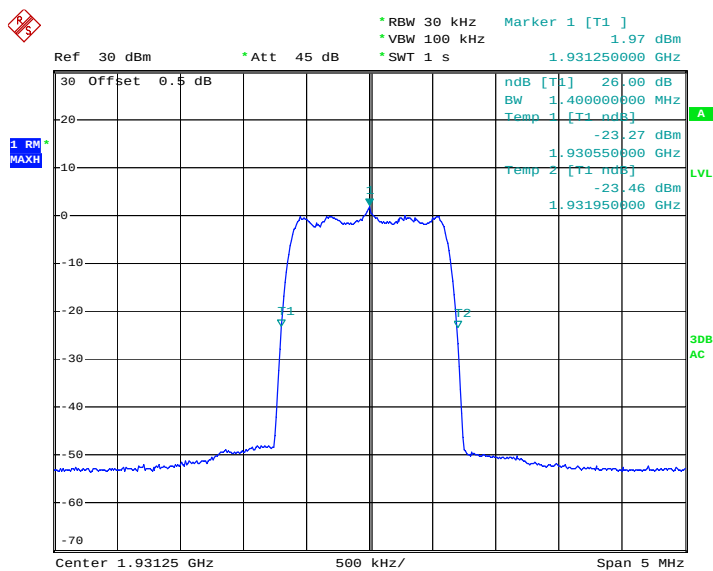
Date: 26.FEB.2011 09:53:19

Input Signal-High Channel



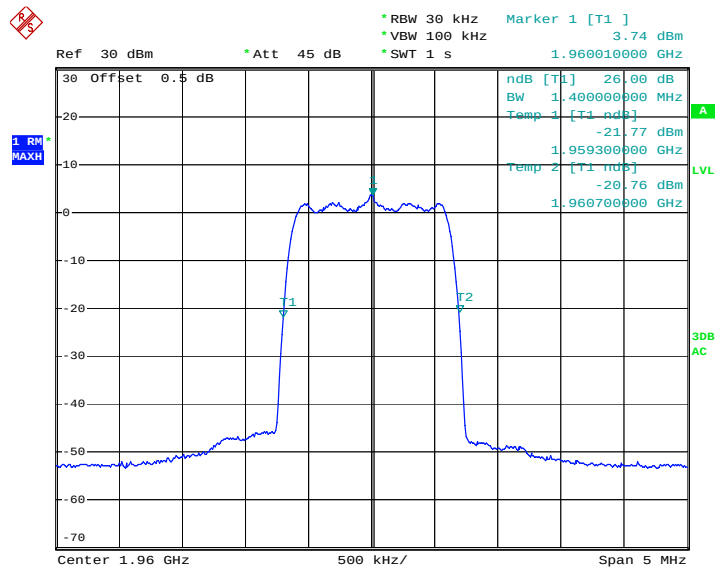
Date: 15.MAR.2011 19:27:48

Low Channel



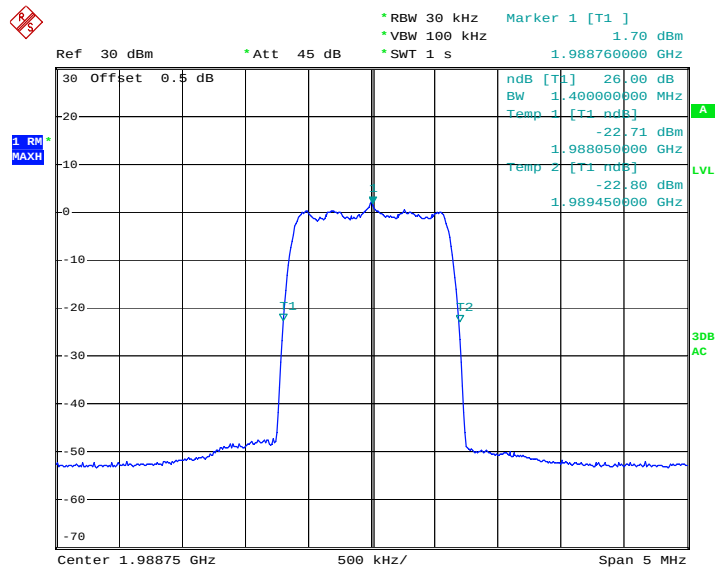
Date: 26.FEB.2011 09:49:31

Middle Channel



Date: 26.FEB.2011 09:49:00

High Channel



Date: 26.FEB.2011 09:48:05

WCDMA:

Cellular Band (Part 22H)

Channel	Frequency (MHz)	26 dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
Low	871.4	4680	4160
Mid	881.4	4700	4180
High	891.6	4680	4160

PCS Band (Part 24E)

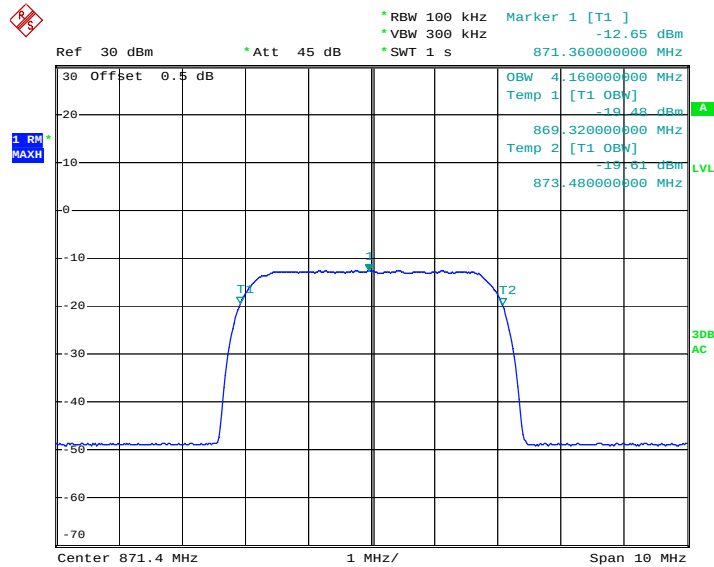
Channel	Frequency (MHz)	26 dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
Low	1932.4	4680	4160
Mid	1960	4800	4160
High	1987.6	4680	4160

Please refer to the following plots.

Cellular Band (Part 22H)

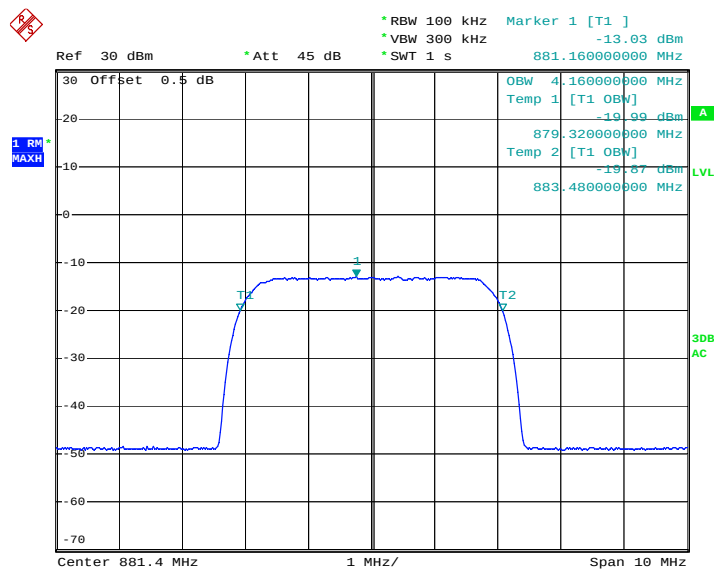
99% Occupied Bandwidth:

Input Signal-Low Channel



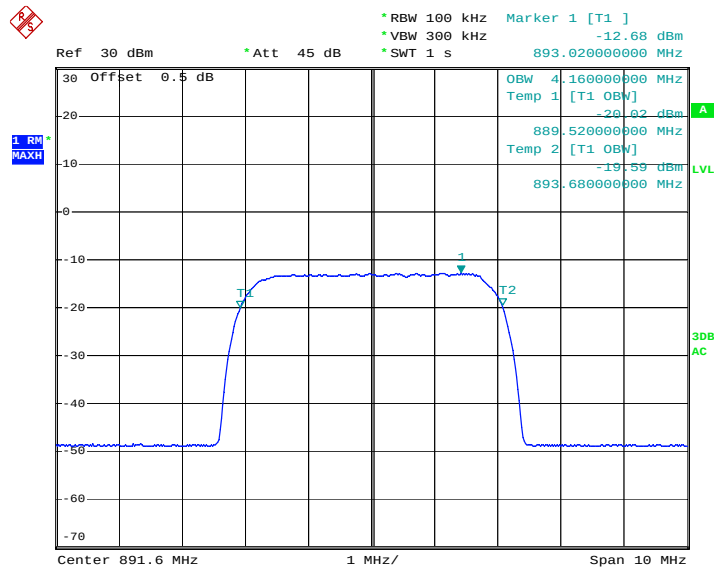
Date: 15.MAR.2011 19:30:30

Input Signal-Middle Channel



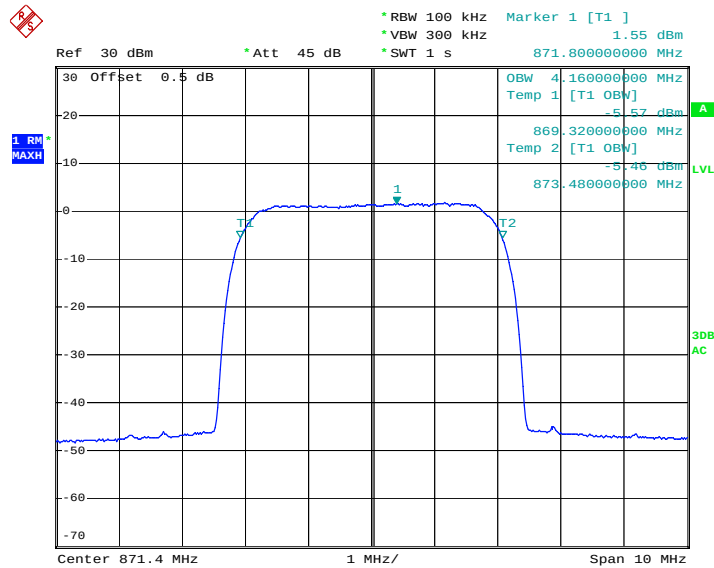
Date: 26.FEB.2011 10:12:41

Input Signal-High Channel



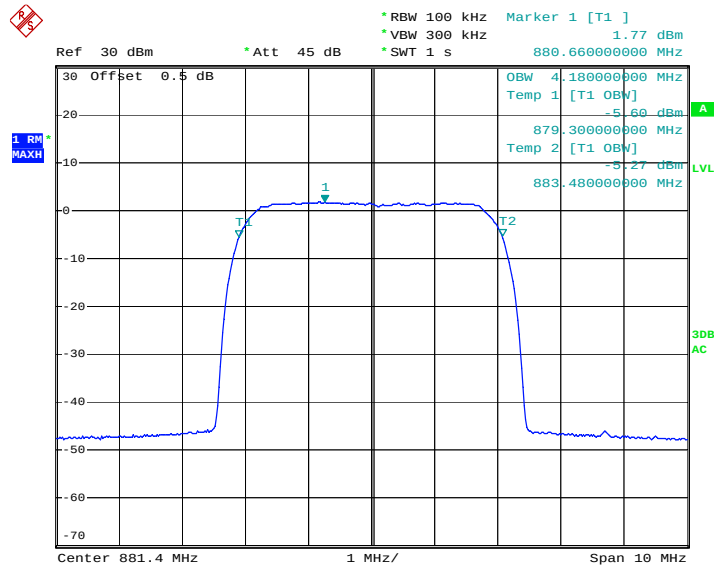
Date: 15.MAR.2011 19:32:34

Low Channel



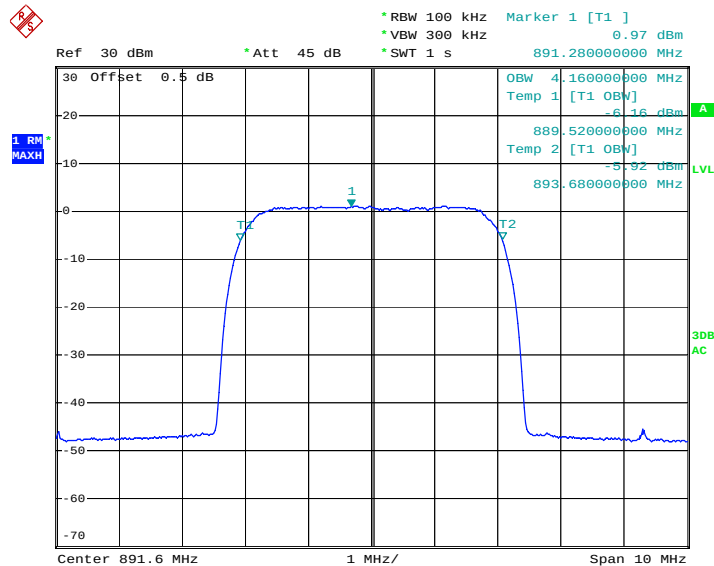
Date: 26.FEB.2011 10:08:44

Middle Channel

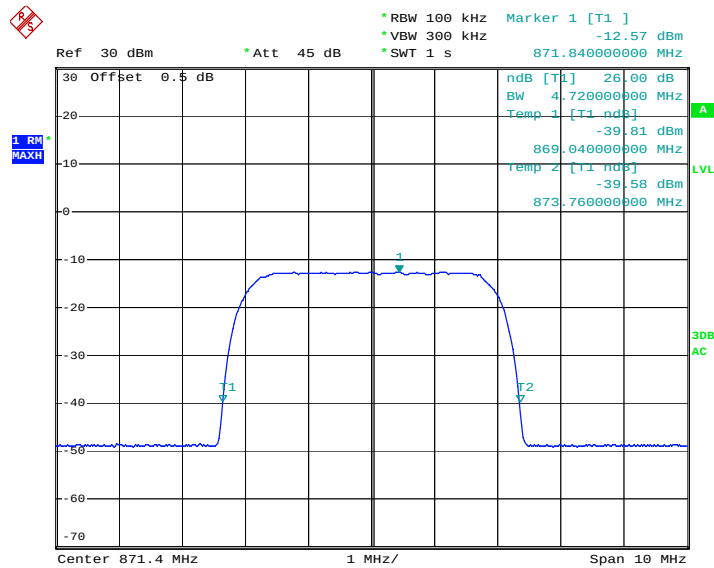


Date: 26.FEB.2011 10:01:31

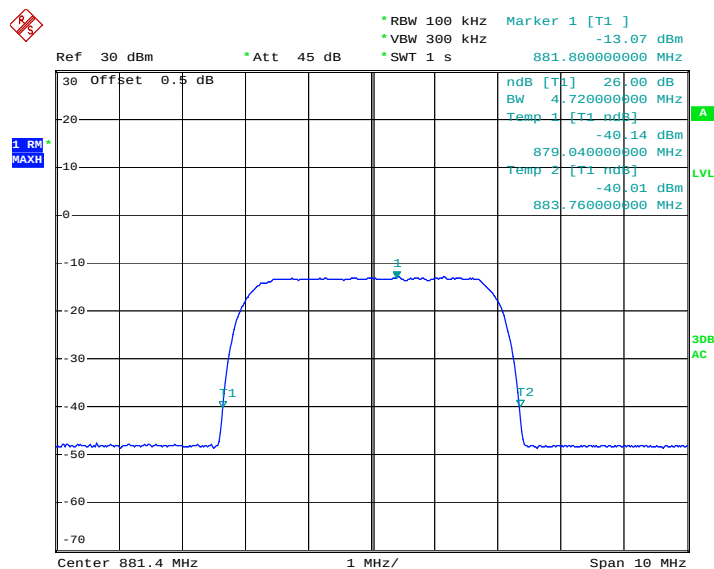
High Channel



Date: 26.FEB.2011 10:00:56

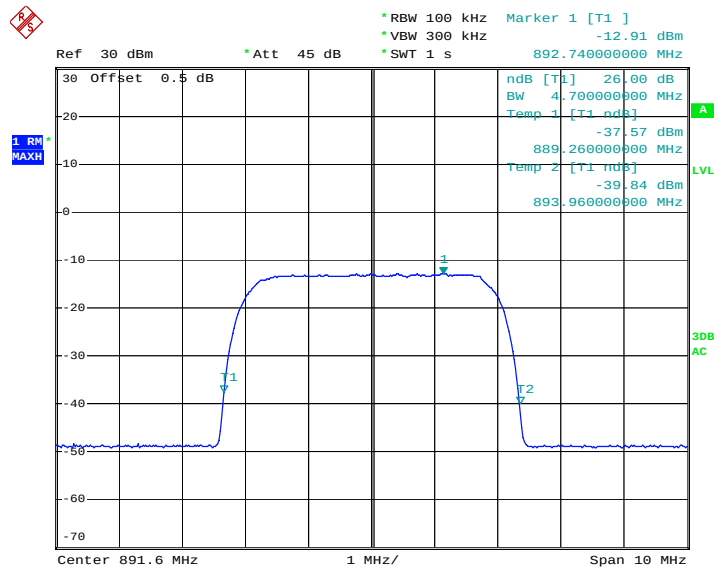
26 dB Bandwidth:**Input Signal-Low Channel**

Date: 15.MAR.2011 19:30:00

Input Signal-Middle Channel

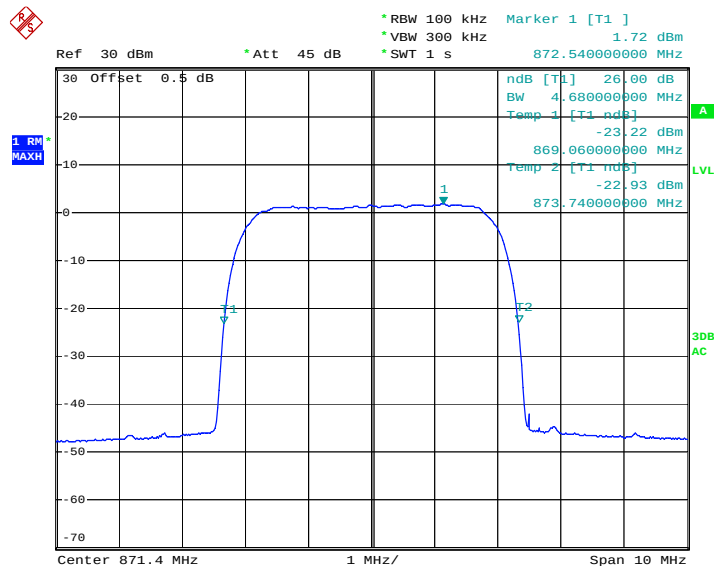
Date: 26.FEB.2011 10:12:26

Input Signal-High Channel



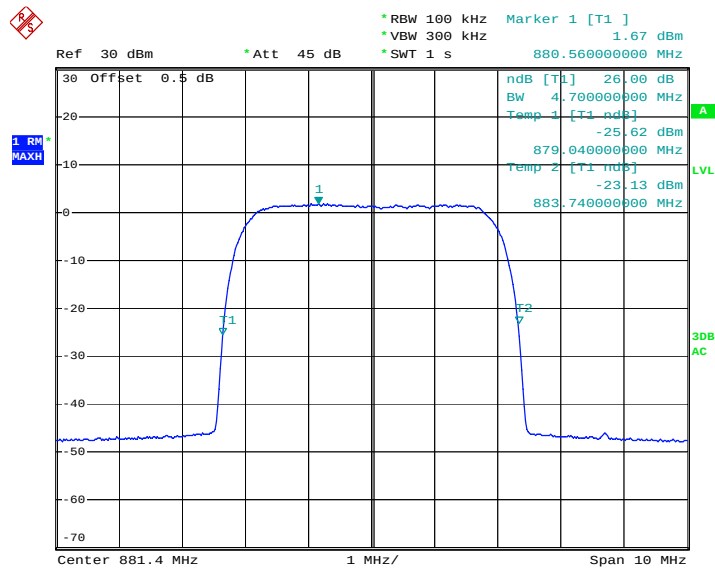
Date: 15.MAR.2011 19:32:58

Low Channel



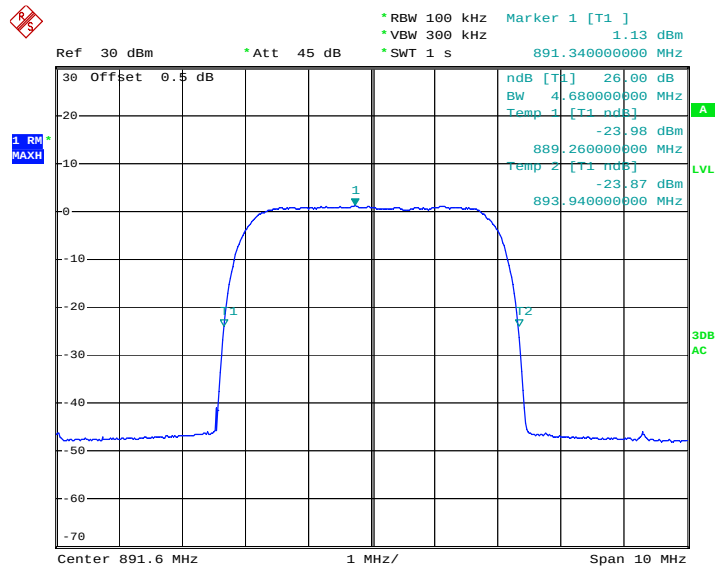
Date: 26.FEB.2011 10:08:29

Middle Channel



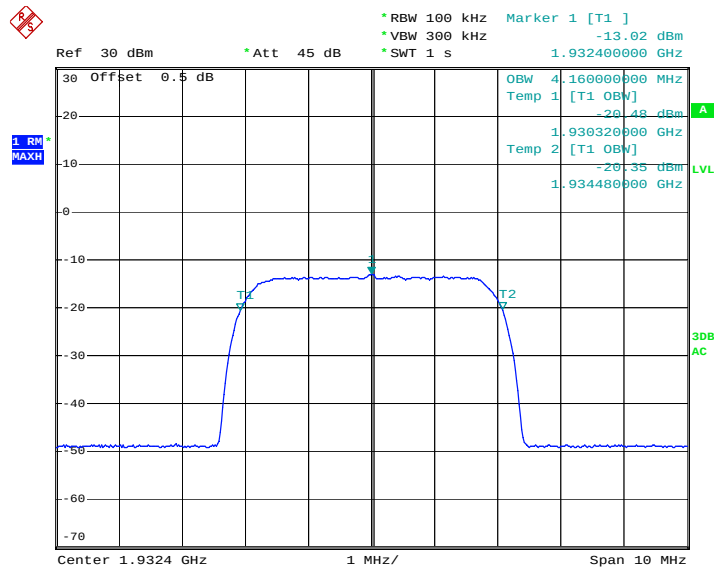
Date: 26.FEB.2011 10:01:50

High Channel

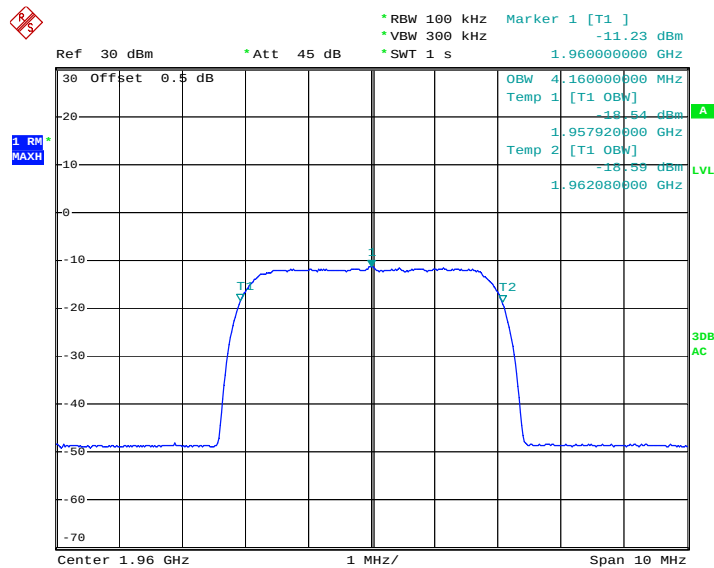


Date: 26.FEB.2011 10:00:31

PCS Band (Part 24E)

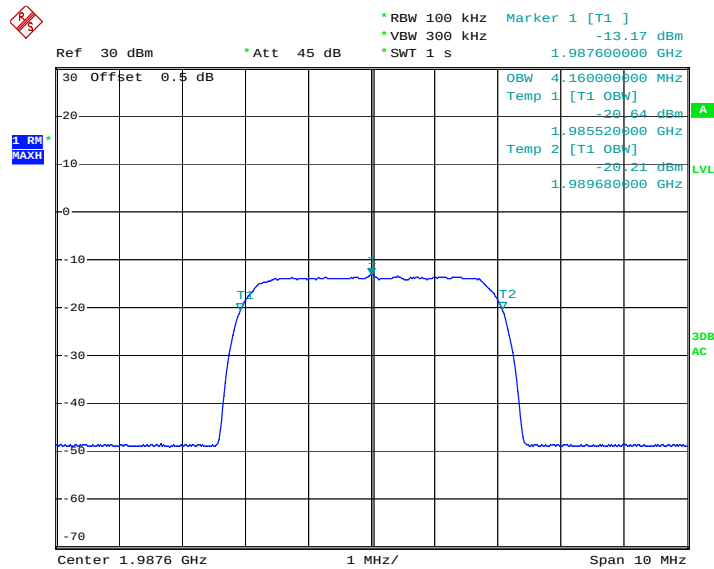
99% Occupied Bandwidth:**Input Signal-Low Channel**

Date: 15.MAR.2011 19:34:42

Input Signal-Middle Channel

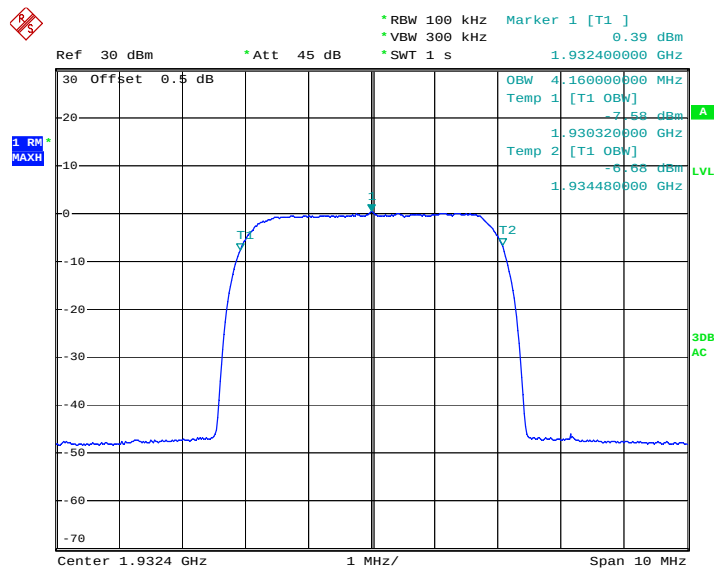
Date: 26.FEB.2011 10:21:31

Input Signal-High Channel



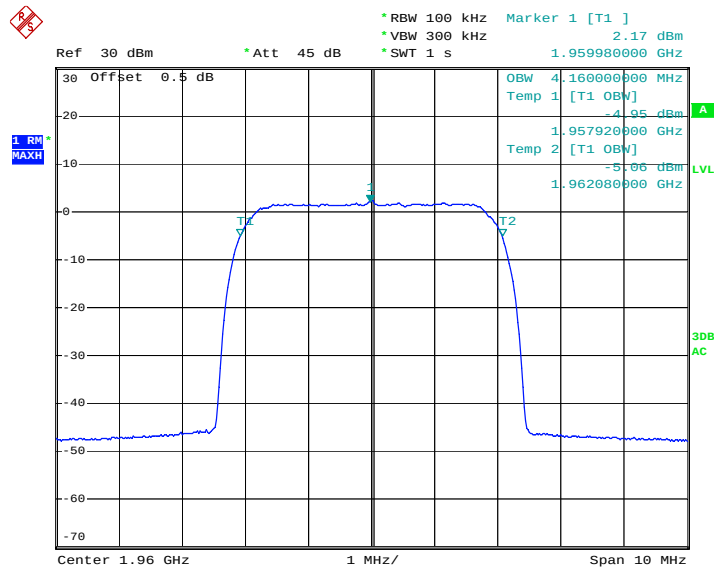
Date: 15.MAR.2011 19:35:17

Low Channel



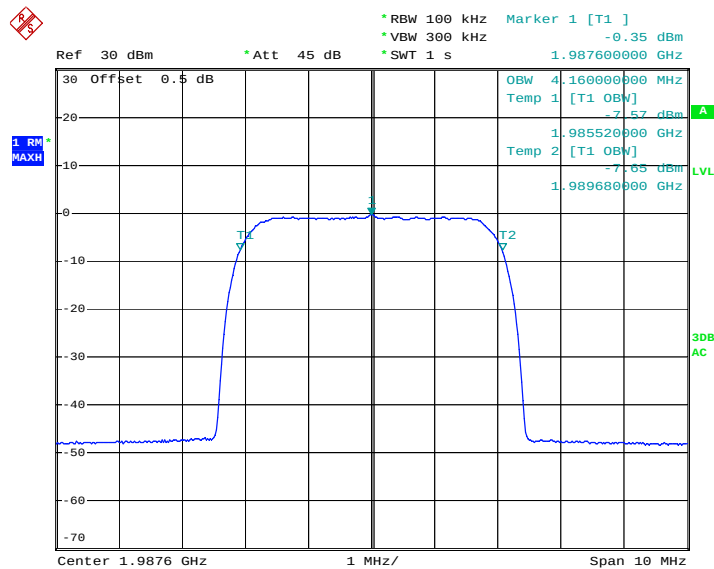
Date: 26.FEB.2011 10:19:09

Middle Channel

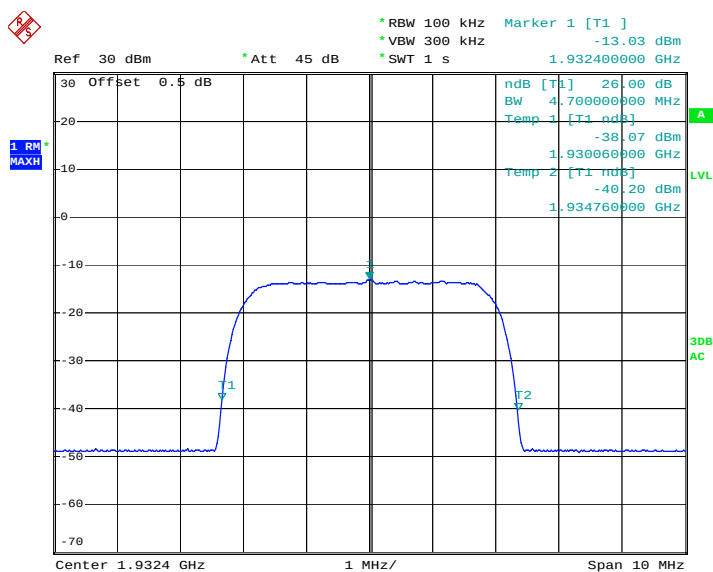


Date: 26.FEB.2011 10:19:43

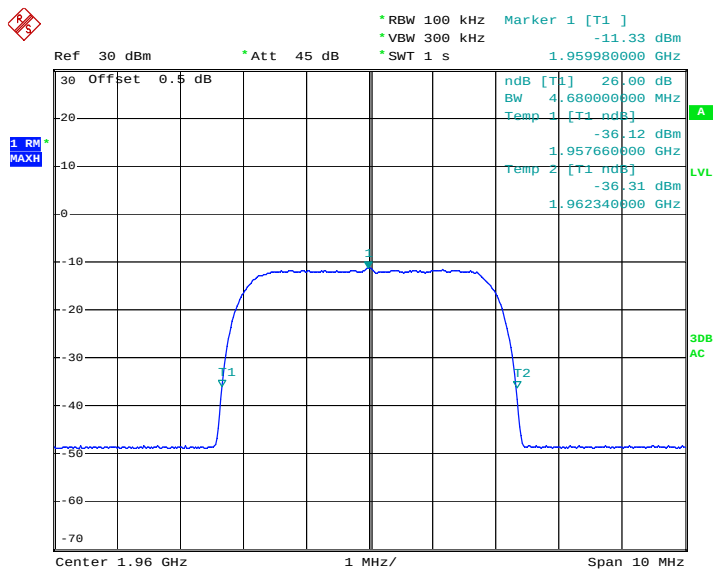
High Channel



Date: 26.FEB.2011 10:16:52

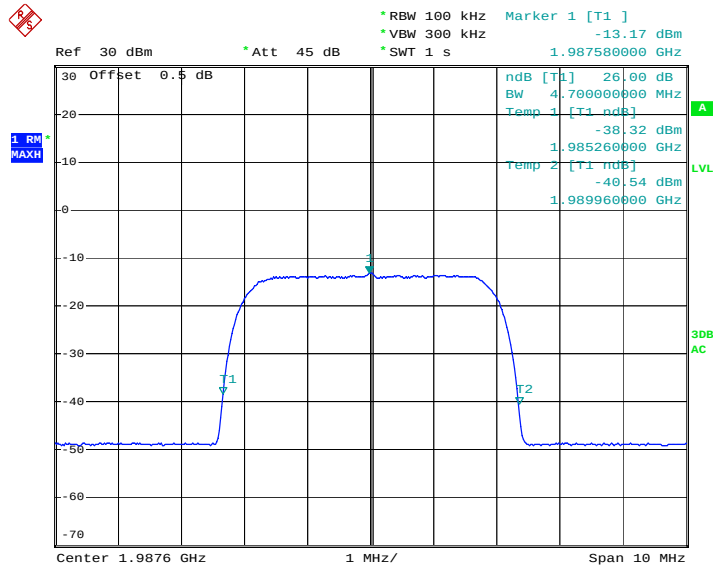
26 dB Bandwidth:**Input Signal-Low Channel**

Date: 15.MAR.2011 19:34:19

Input Signal-Middle Channel

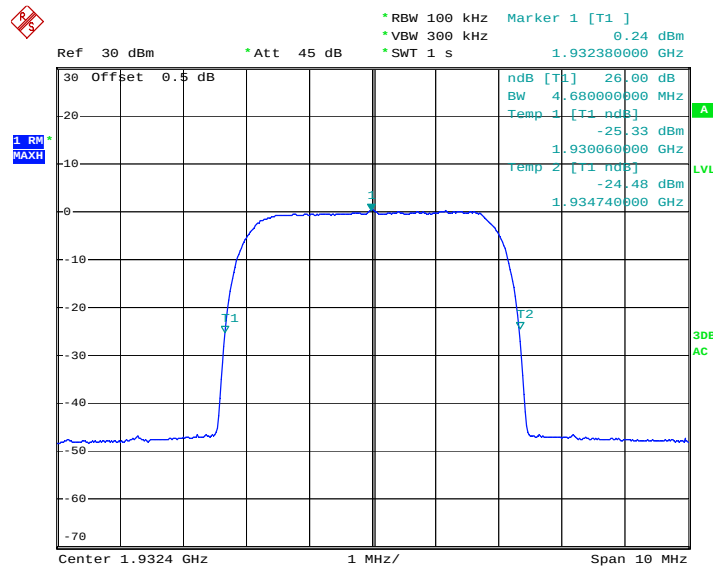
Date: 26.FEB.2011 10:21:10

Input Signal-High Channel



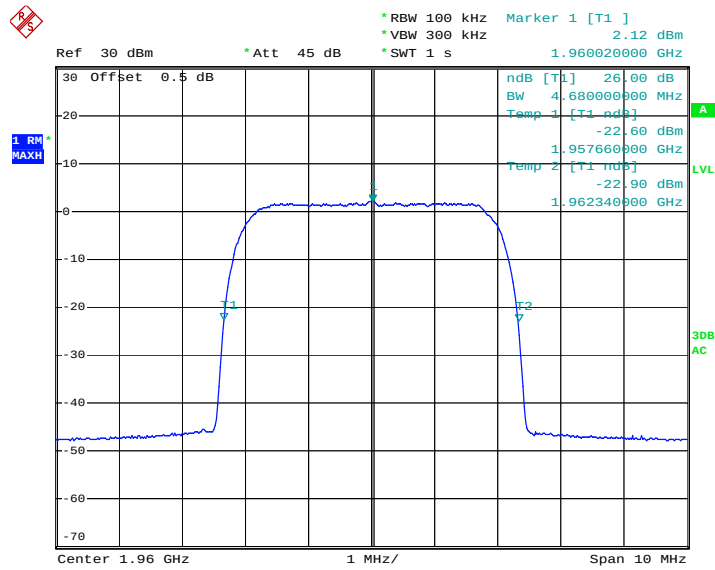
Date: 15.MAR.2011 19:35:33

Low Channel



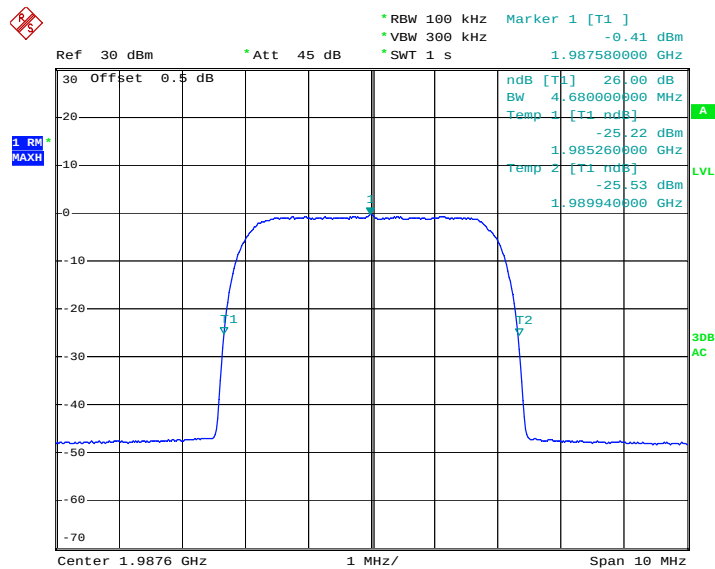
Date: 26.FEB.2011 10:18:56

Middle Channel



Date: 26.FEB.2011 10:19:56

High Channel



Date: 26.FEB.2011 10:16:35

LTE:

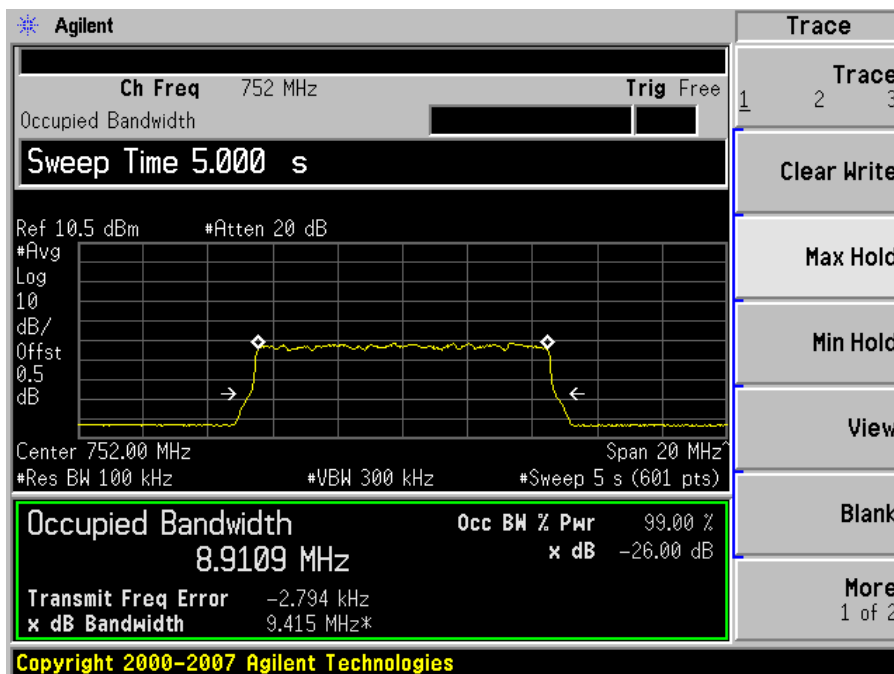
LTE Band (Part 27)

Modulation	Frequency (MHz)	99% Occupied Bandwidth (MHz)
QPSK	752	8.9499
16QAM	752	8.8969
64QAM	752	8.9529

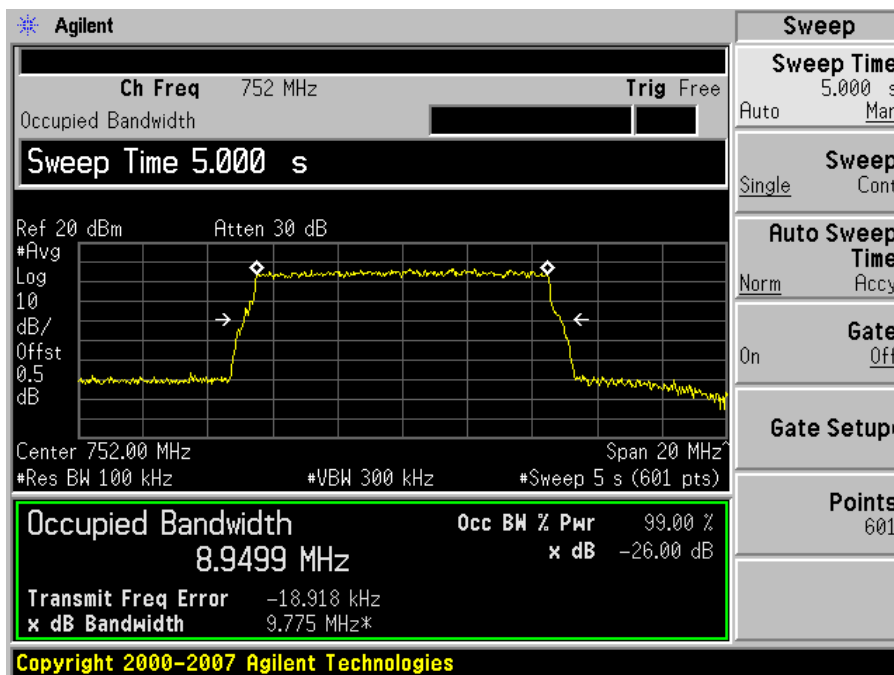
Please refer to the following plots.

Modulation: QPSK, Frequency: 752 MHz

Input

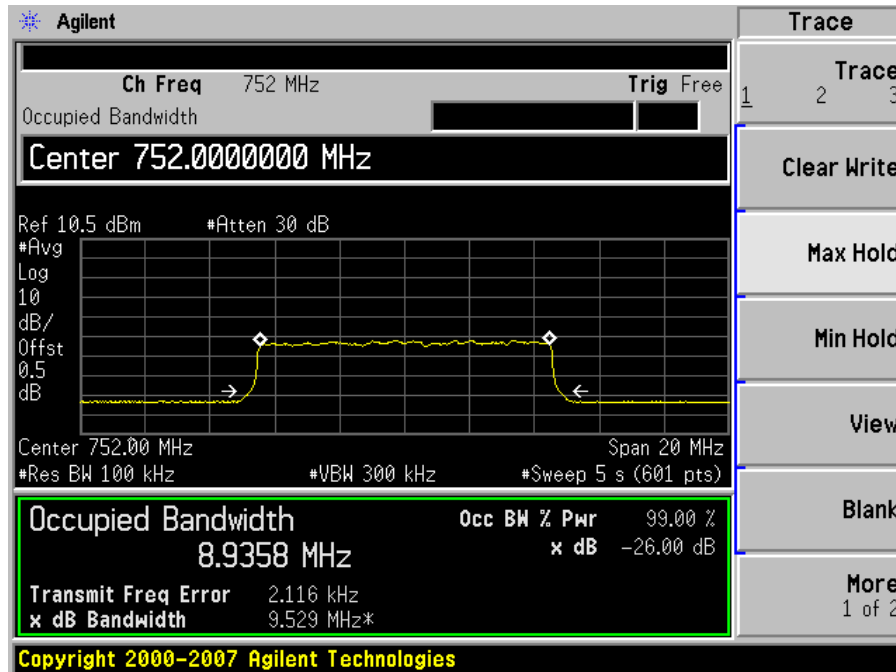


Output

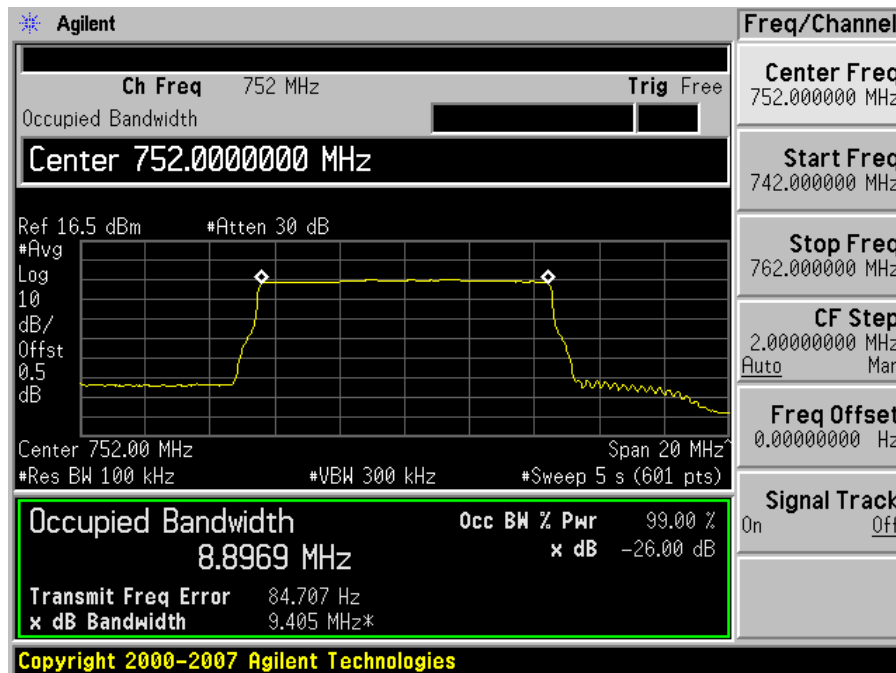


Modulation: 16 QAM, Frequency: 752 MHz

Input

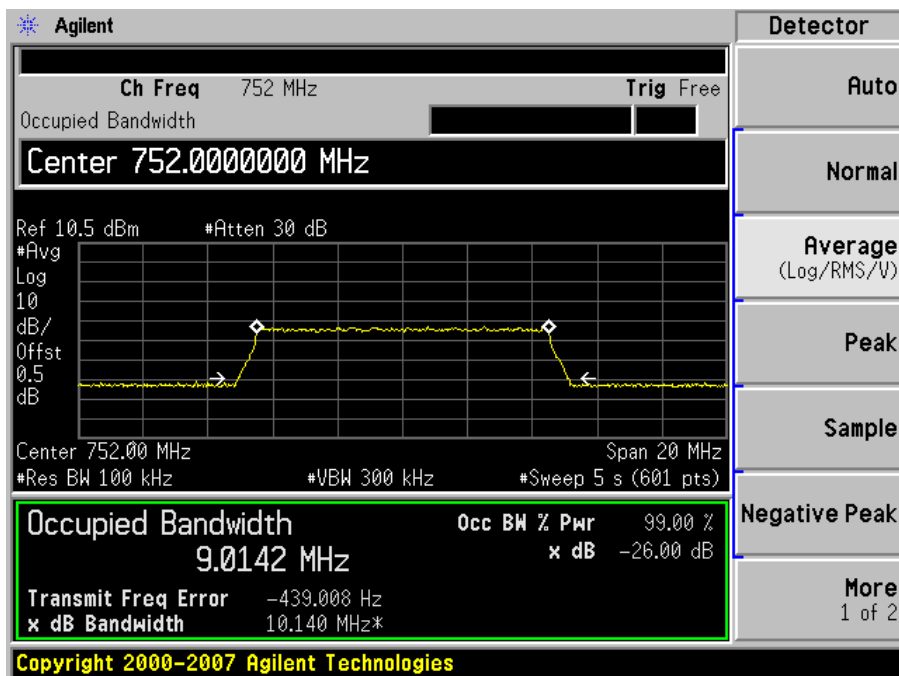


Output

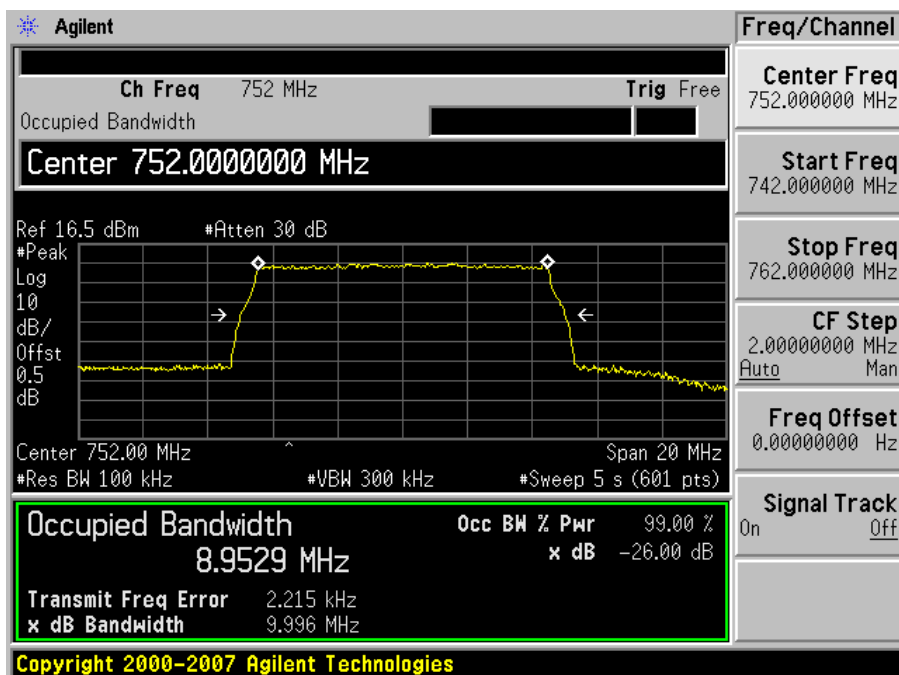


Modulation: 64 QAM, Frequency: 752 MHz

Input



Output



FCC §2.1051, §22.917(a), §24.238(a) & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

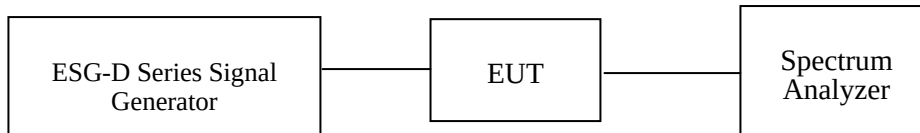
Applicable Standards

FCC §2.1051, §22.917(a) §24.238(a) and §27.53.

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1051.

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Spectrum Analyzer	8593A	2919A00242	2010-07-08	2011-07-07
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2010-11-24	2011-11-23
Agilent	ESG-D Series Signal Generator	E4432B	US38441663	2010-06-11	2011-06-10
Agilent	Spectrum Analyzer	E4446A	US44300386	2010-08-18	2011-08-17

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

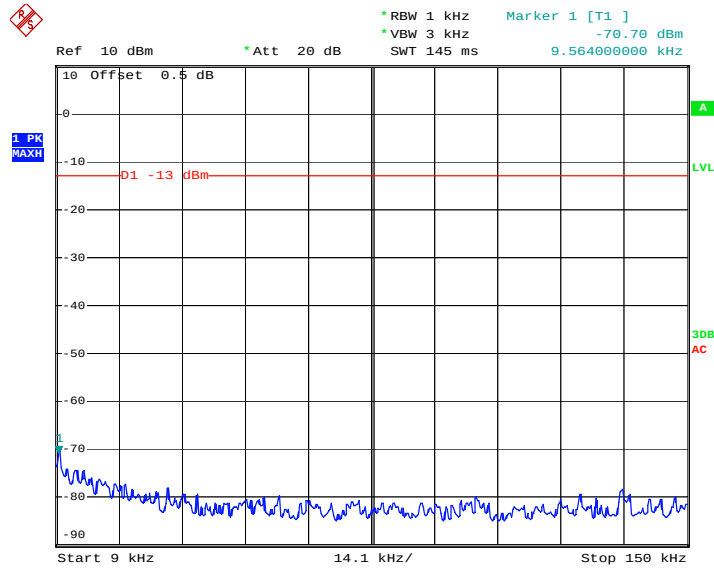
The testing was performed by Alvin Huang on 2011-02-24.

Please refer to the following plots.

GSM:

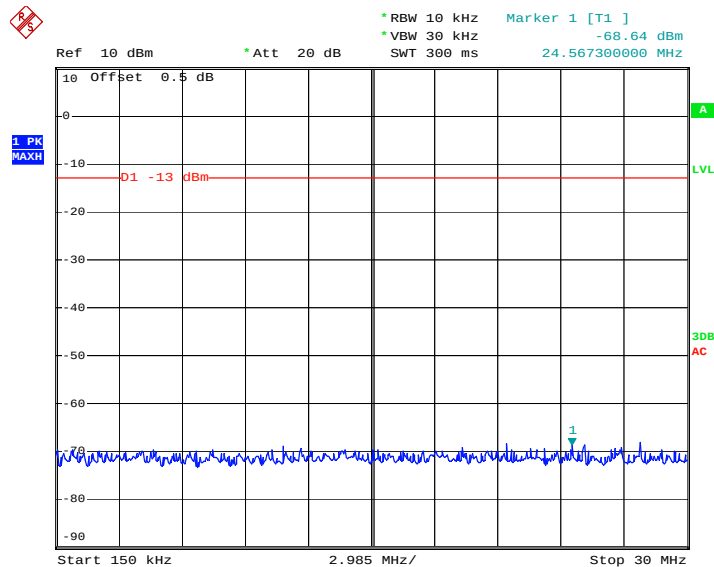
Cellular Band (Part 22H)

9-150 kHz – Low Channel



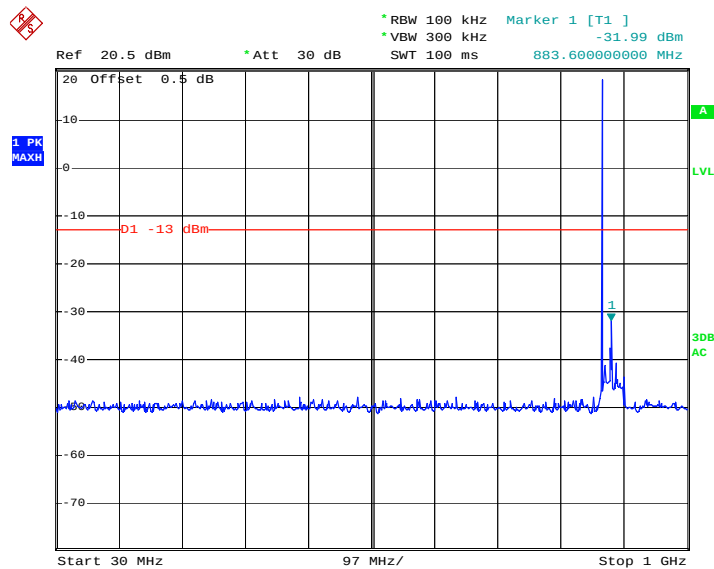
Date: 24.FEB.2011 15:59:08

150 kHz – 30 MHz - Low Channel



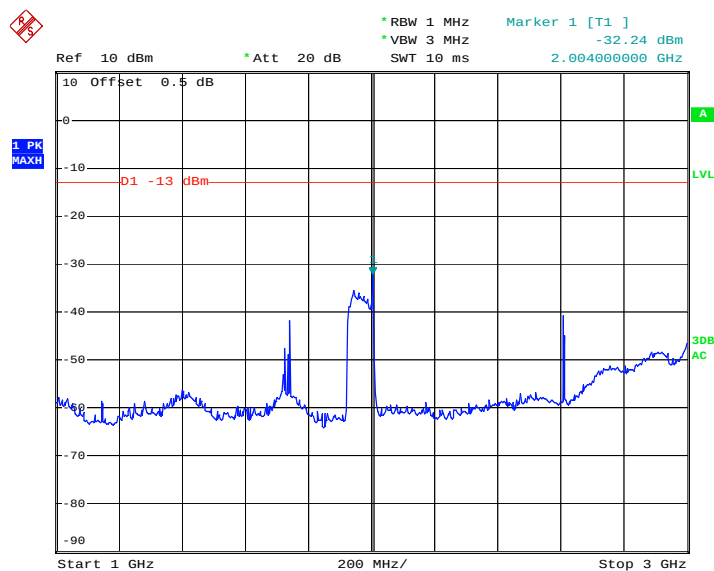
Date: 24.FEB.2011 15:58:52

30 – 1000 MHz - Low Channel



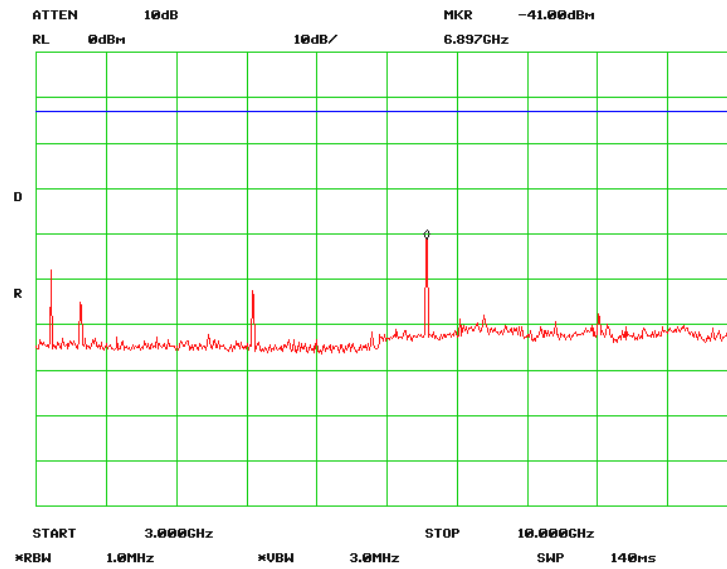
Date: 24.FEB.2011 15:53:44

1 – 3 GHz - Low Channel

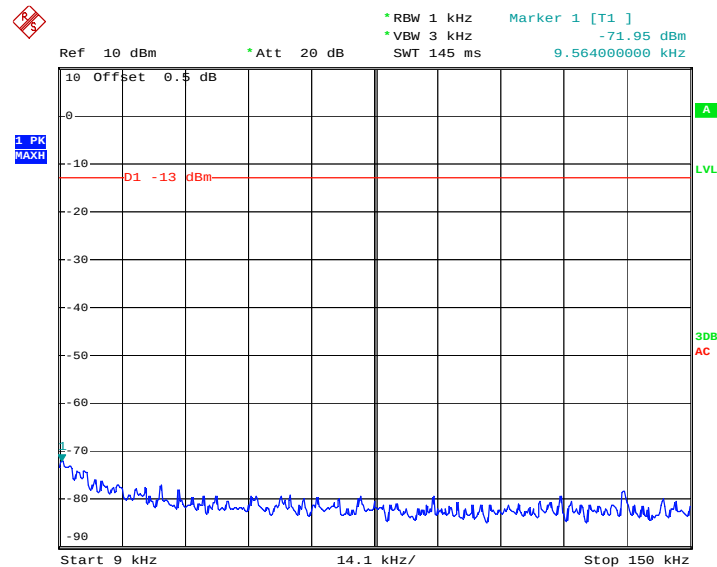


Date: 24.FEB.2011 16:11:45

3 – 10 GHz - Low Channel



9-150 kHz - Middle Channel



Date: 24.FEB.2011 15:58:08

1 PK MAX

Ref 10 dBm Att 20 dB RBW 10 kHz VBW 30 kHz SWT 300 ms Marker 1 [T1] -68.49 dBm 2.239500000 MHz

10 Offset 0.5 dB

D1 -13 dBm

1

Start 150 kHz 2.985 MHz/ Stop 30 MHz

Date: 24.FEB.2011 15:58:27

Ref 20.5 dBm Att 30 dB RBW 100 kHz VBW 300 kHz SWT 100 ms Marker 1 [T1] -39.75 dBm 870.02000000 MHz

20 OffSet 0.5 dB

1 PK MAXH

D1 -13 dBm

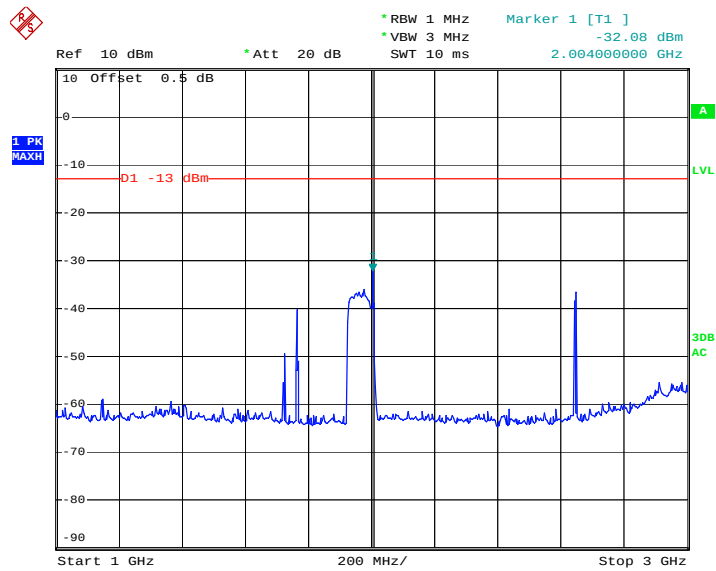
1

3dB AC

Start 30 MHz 97 MHz/ Stop 1 GHz

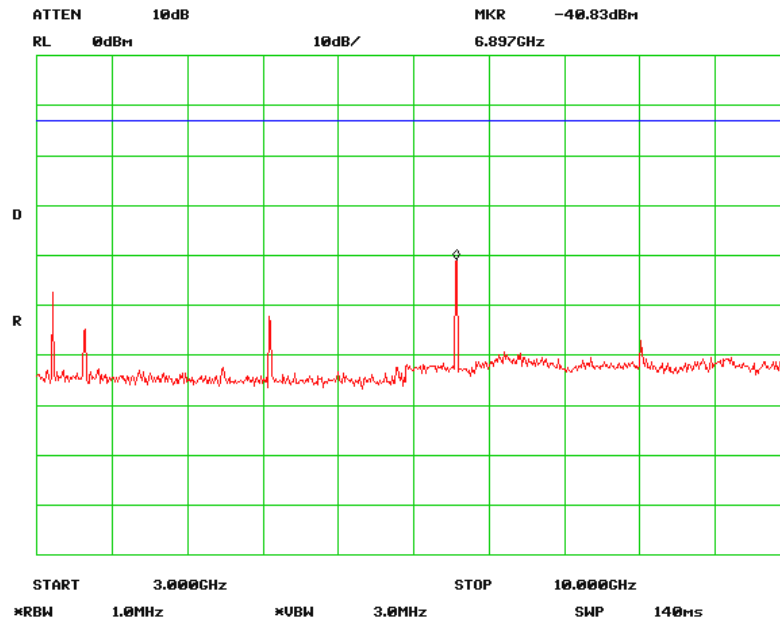
Date: 24.FEB.2011 15:54:37

1-3GHz - Middle Channel

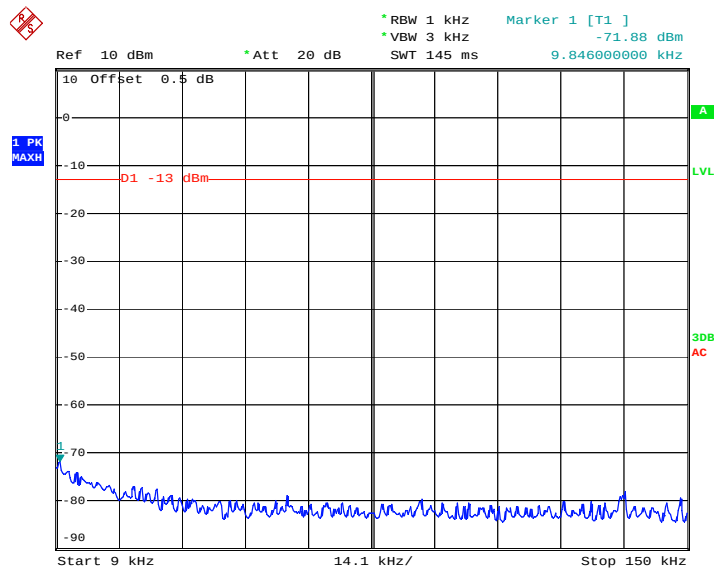


Date: 24.FEB.2011 15:57:46

3-10 GHz - Middle Channel

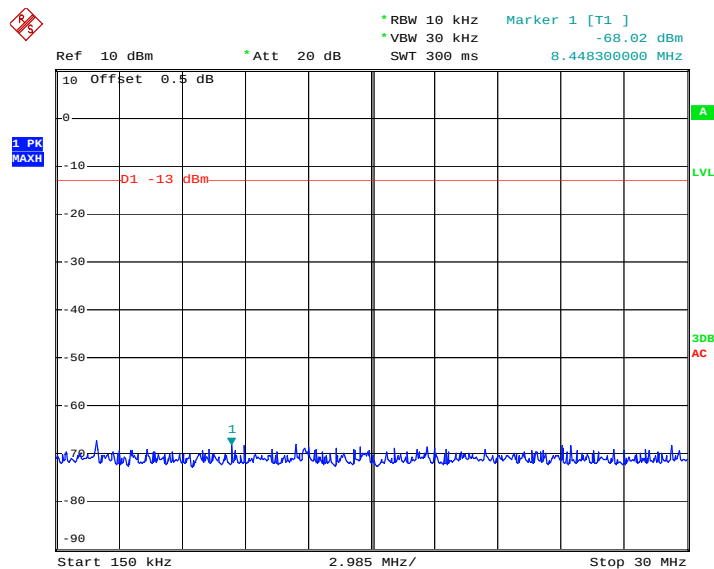


9-150 kHz – High Channel



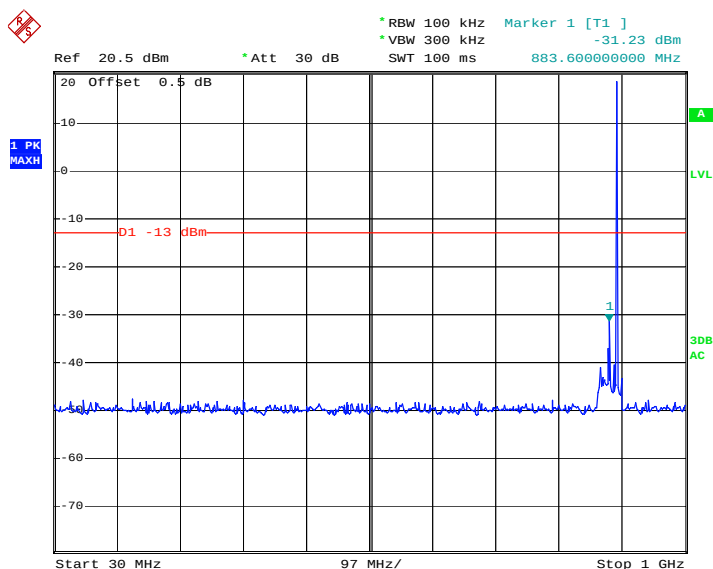
Date: 24.FEB.2011 15:55:53

150 kHz – 30 MHz - High Channel



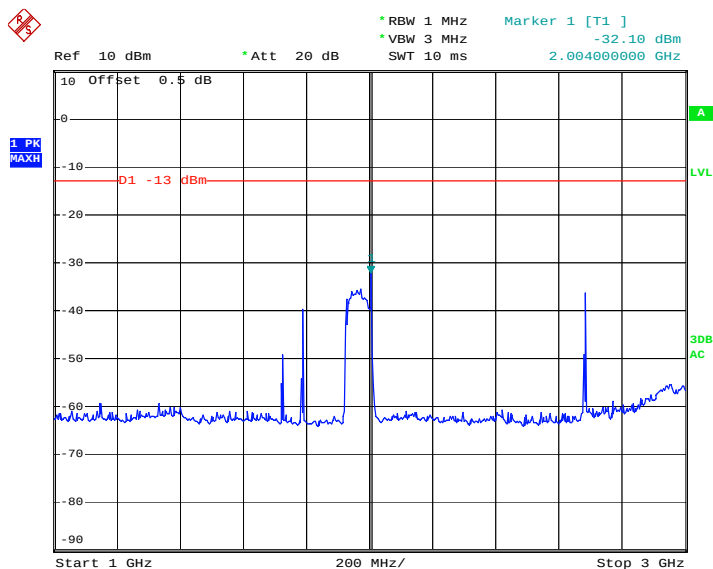
Date: 24.FEB.2011 15:56:17

30 – 1000 MHz - High Channel



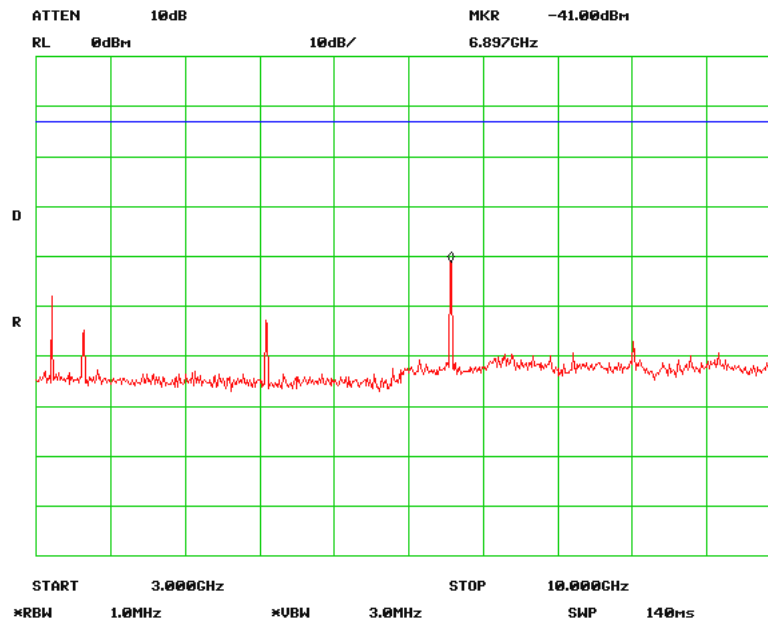
Date: 24.FEB.2011 15:55:20

1 – 3 GHz - High Channel

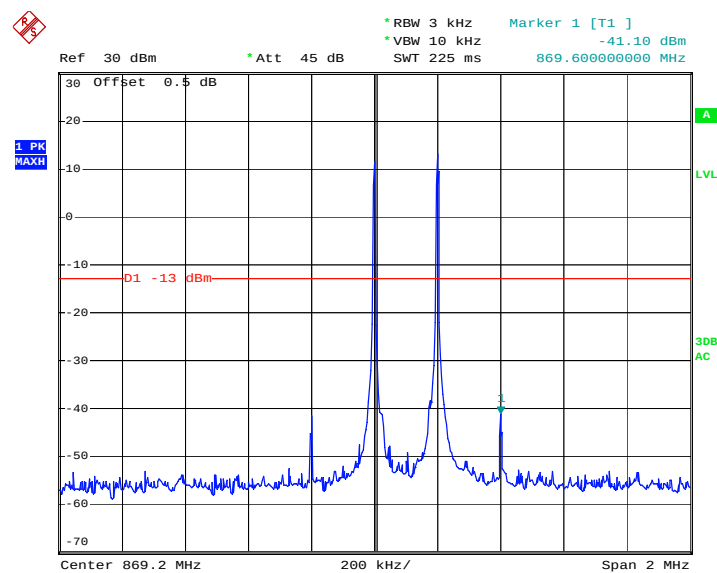


Date: 24.FEB.2011 15:57:20

3-10 GHz - High Channel

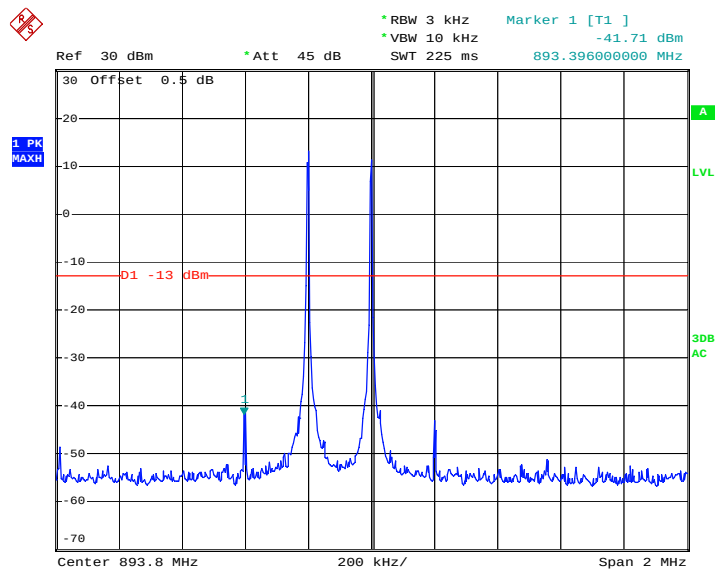


Two tone Inter modulation (Low Band edge)



Date: 24.FEB.2011 15:17:33

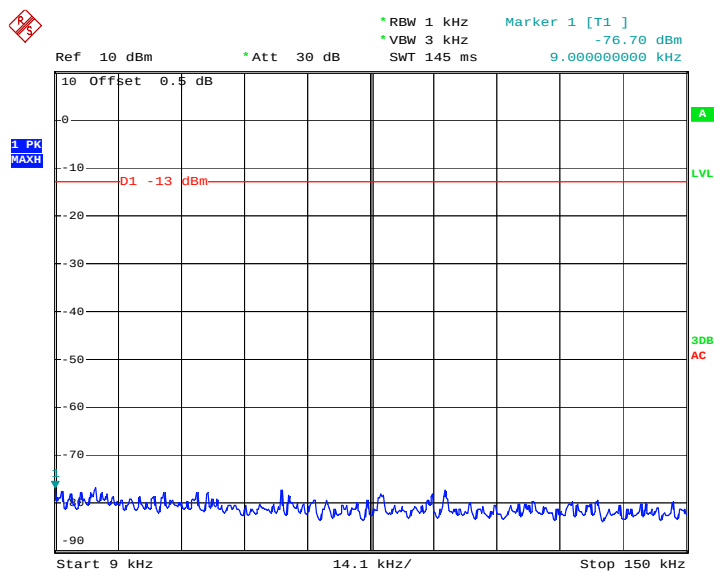
Two tone Inter modulation (High Band edge)



Date: 24.FEB.2011 15:19:00

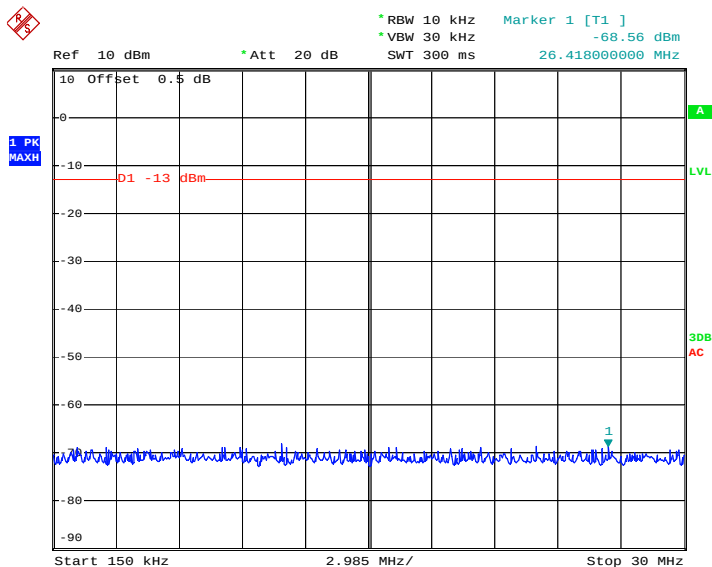
PCS Band (Part24E)

9-150 kHz – Low Channel



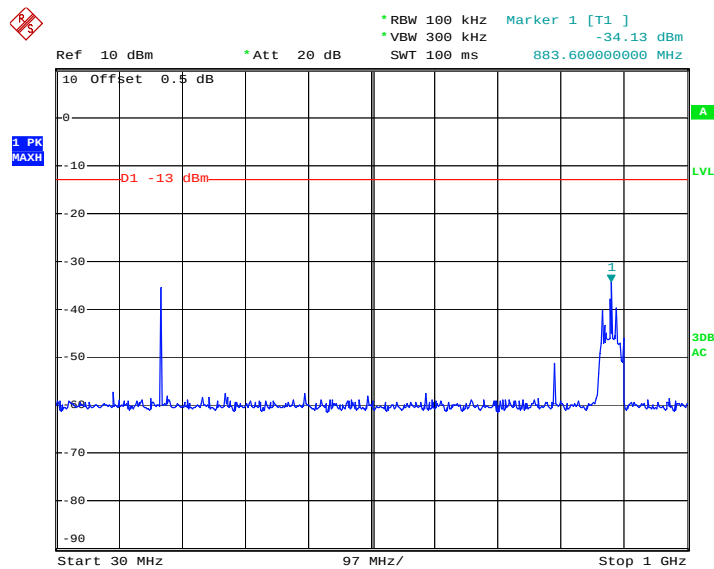
Date: 24.FEB.2011 12:00:39

150 kHz – 30 MHz - Low Channel



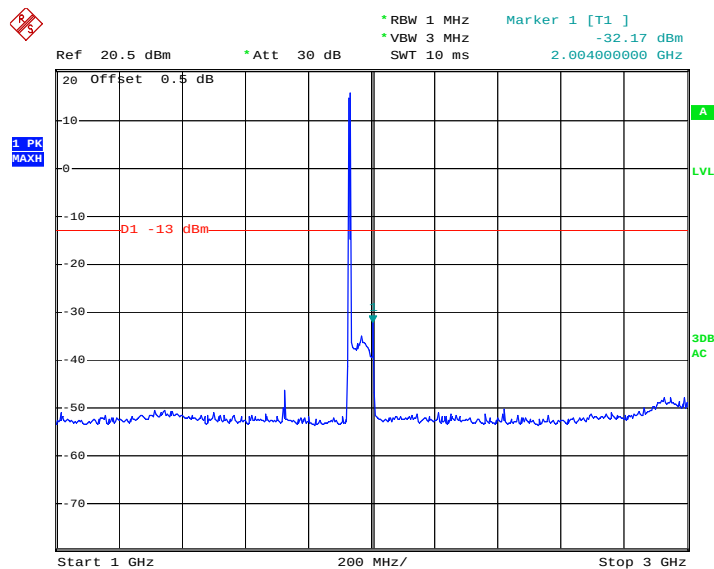
Date: 24.FEB.2011 11:55:57

30 – 1000 MHz - Low Channel



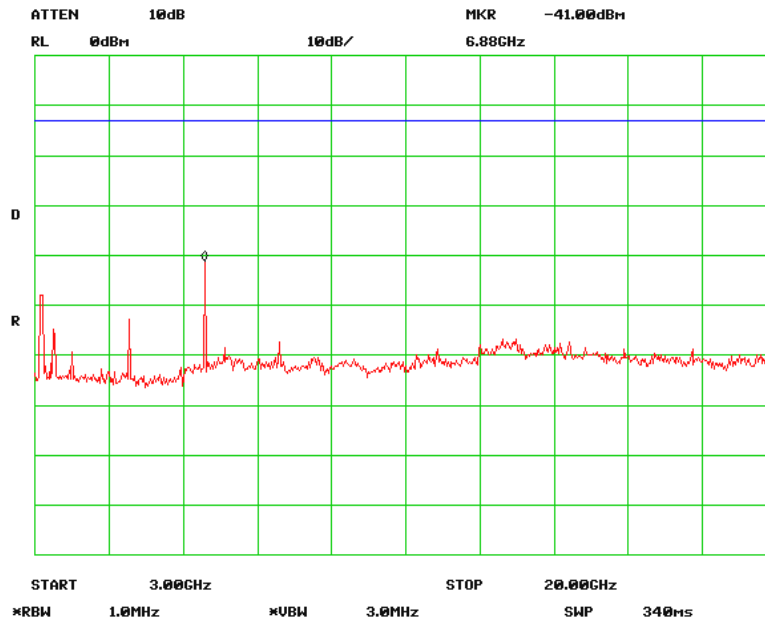
Date: 24.FEB.2011 11:56:19

1 – 3GHz - Low Channel

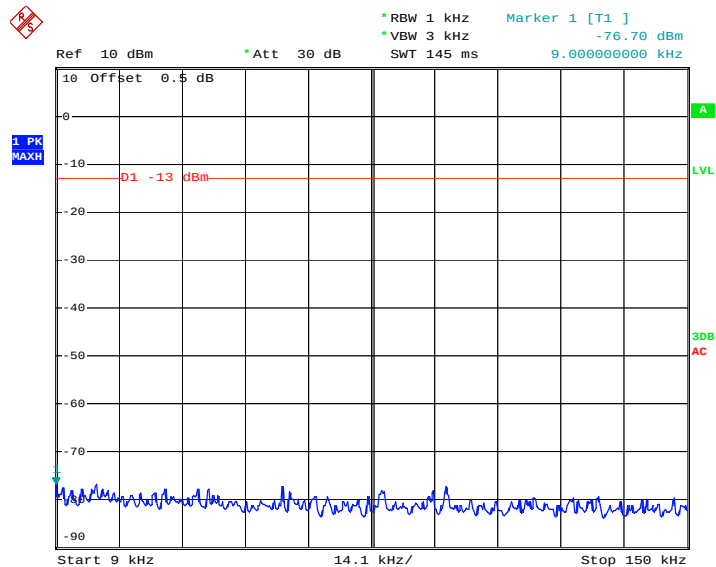


Date: 24.FEB.2011 11:57:42

3-20 GHz - Low Channel



9-150 kHz - Middle Channel



Date: 24.FEB.2011 12:00:39

1. PK MAXH

Ref 10 dBm * Att 30 dB

* RBW 10 kHz * VBW 30 kHz

SWT 300 ms

Marker 1 [T1] -67.59 dBm

2.538000000 MHz

10 Offset 0.5 dB

0 -10 -20 -30 -40 -50 -60 -80 -90

01 -13 dBm

1

Start 150 kHz 2.985 MHz/ Stop 30 MHz

Date: 24.FEB.2011 12:00:21

Ref 10 dBm * Att 30 dB * RBW 100 kHz * VBW 300 kHz * SWT 100 ms Marker 1 [T1] -33.98 dBm 883.600000000 MHz

10 Offset 0.5 dB

0 -10 -20 -30 -40 -50 -60 -70 -80 -90

1 PK MAX

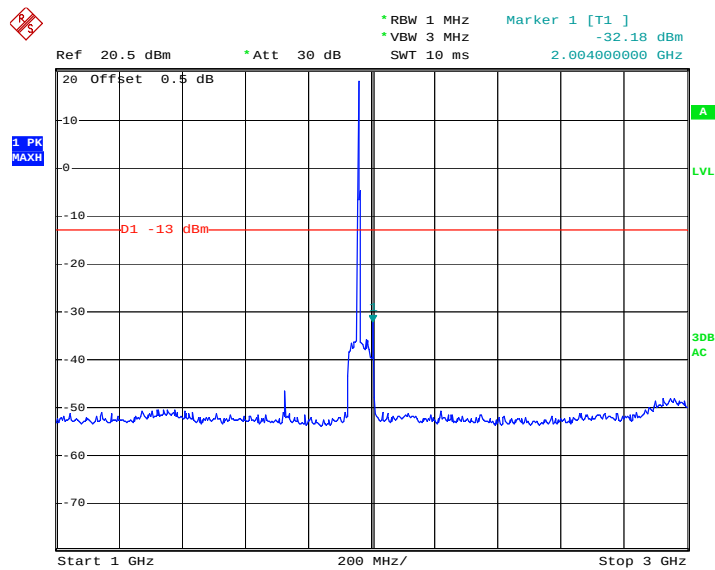
D1 -13 dBm

Start 30 MHz 97 MHz/ Stop 1 GHz

LVL 30B AC

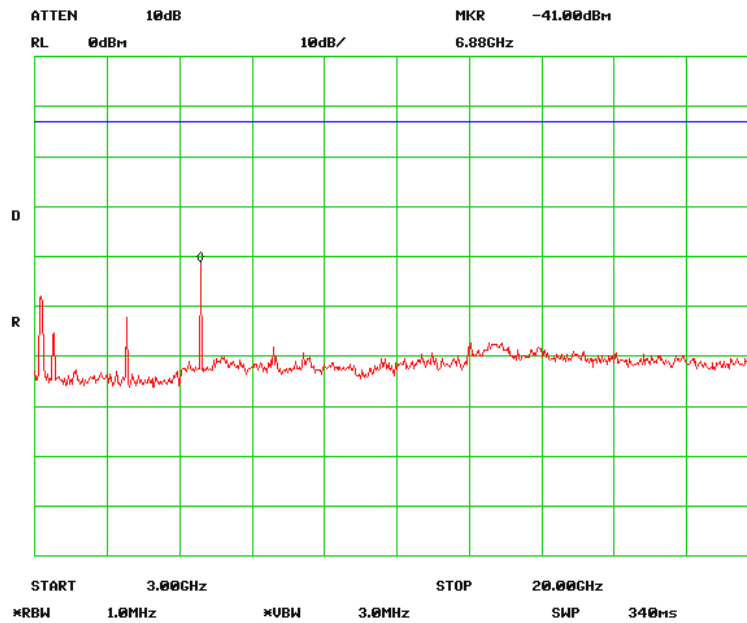
Date: 24.FEB.2011 11:59:45

1-3 GHz - Middle Channel

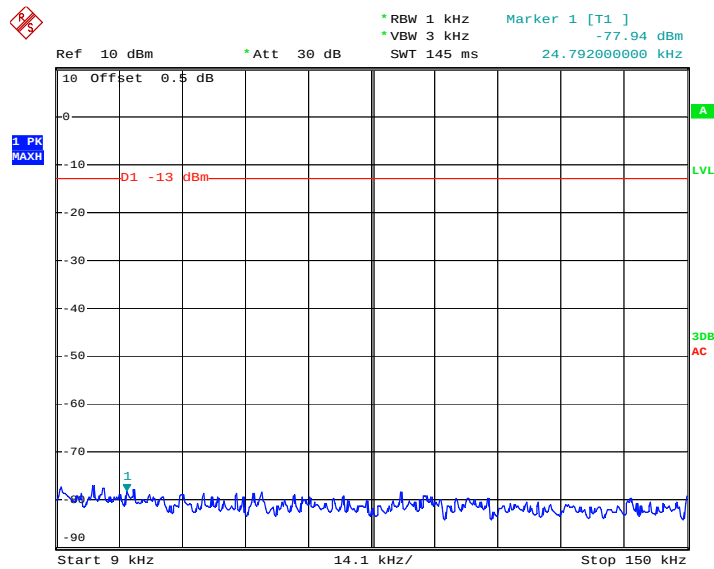


Date: 24.FEB.2011 11:59:18

3-20 GHz - Middle Channel

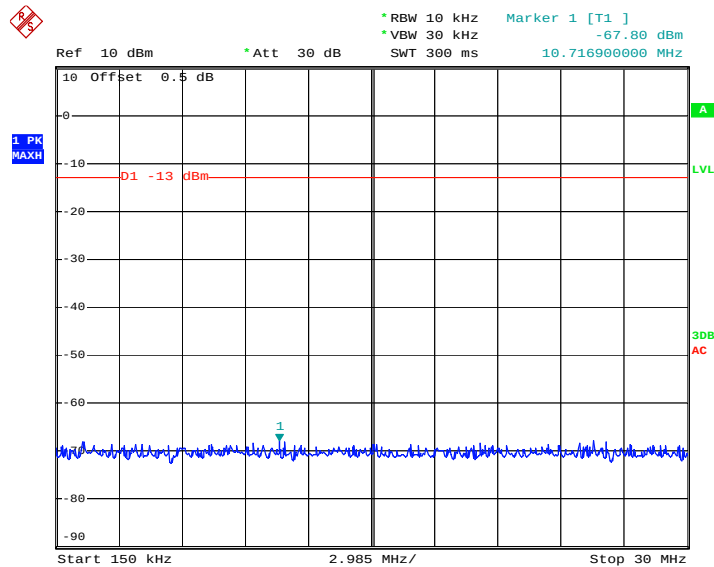


9-150 kHz – High Channel



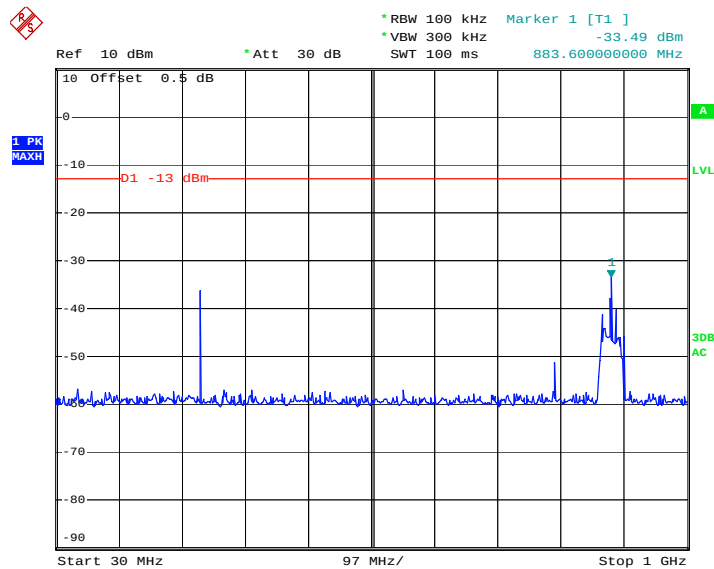
Date: 24.FEB.2011 12:01:04

150 kHz – 30 MHz - High Channel



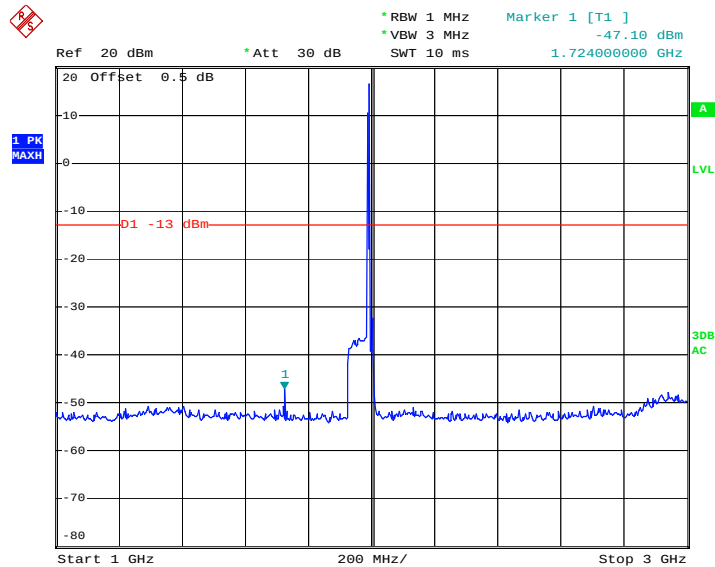
Date: 24.FEB.2011 12:01:25

30 – 1000 MHz - High Channel



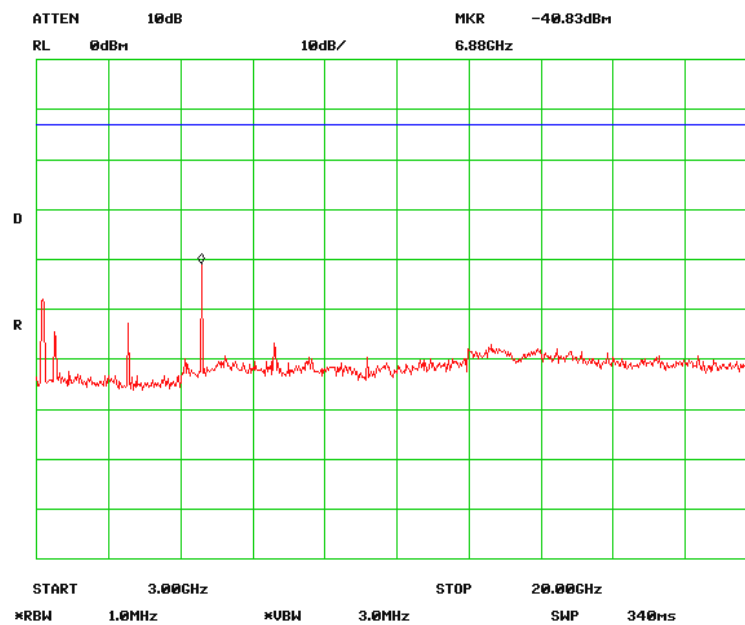
Date: 24.FEB.2011 12:01:49

1 –3 GHz - High Channel

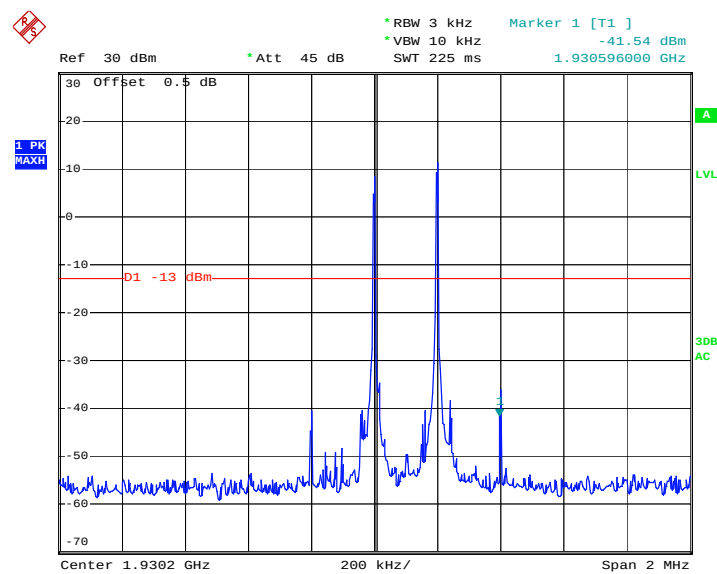


Date: 24.FEB.2011 12:03:09

3-20 GHz - High Channel

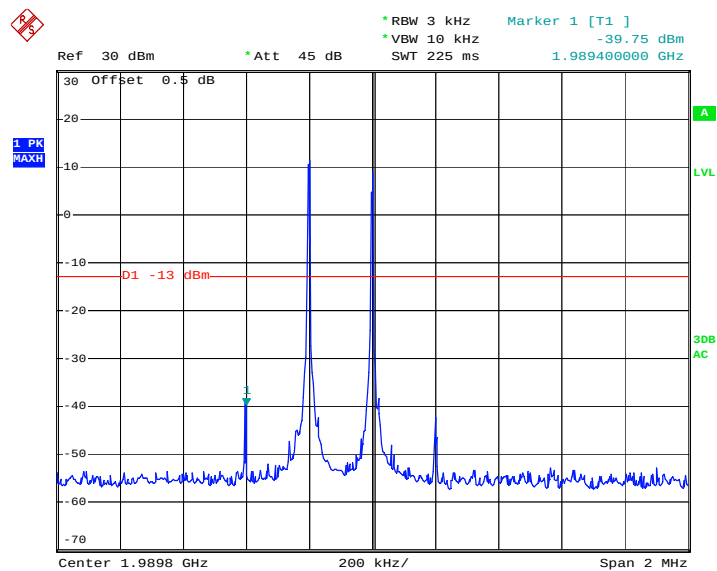


Two tone Inter modulation (Low Band edge)

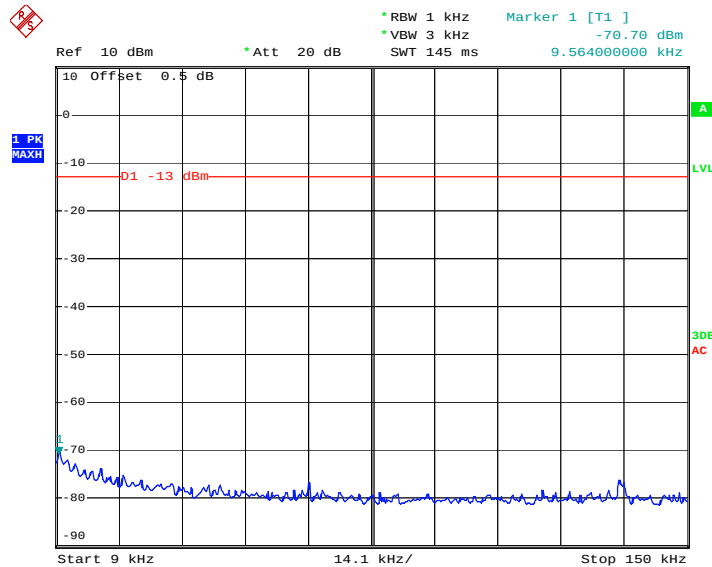


Date: 24.FEB.2011 15:24:26

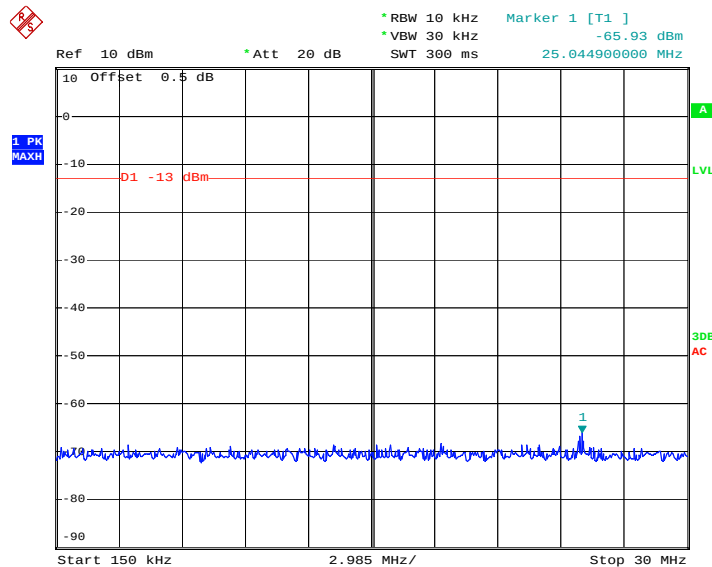
Two tone Inter modulation (High Band edge)



Date: 24.FEB.2011 15:27:10

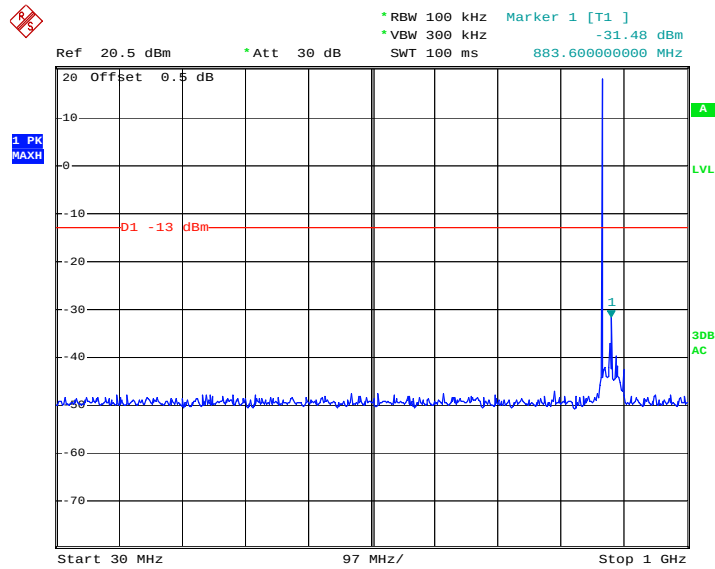
EDGE:**Cellular Band (Part 22H)****9-150 kHz – Low Channel**

Date: 24.FEB.2011 16:04:06

150 kHz – 30 MHz - Low Channel

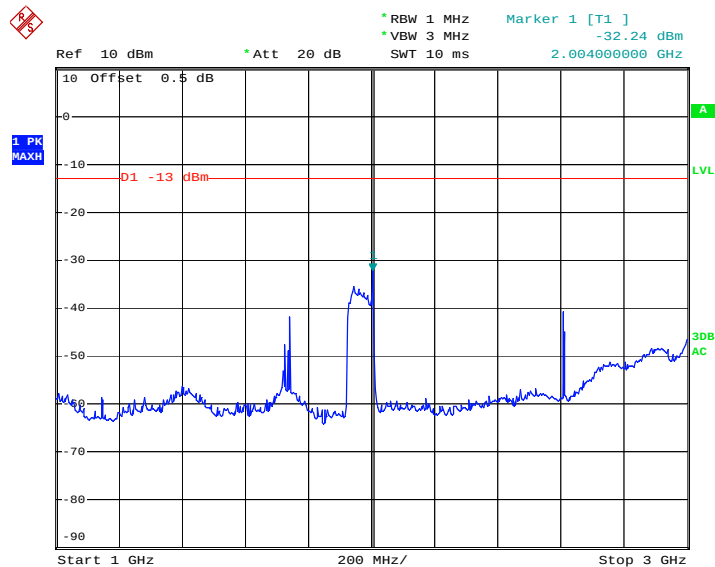
Date: 24.FEB.2011 16:05:48

30 – 1000 MHz - Low Channel



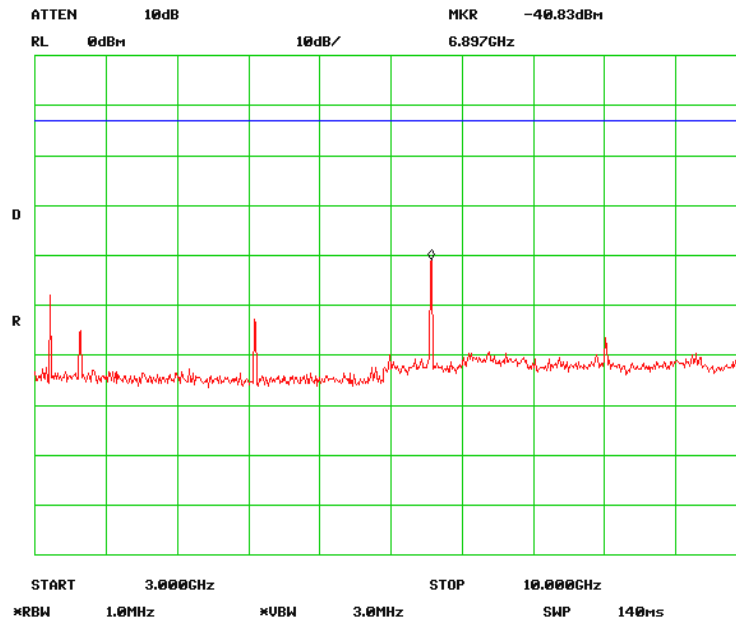
Date: 24.FEB.2011 16:08:01

1 – 3 GHz - Low Channel

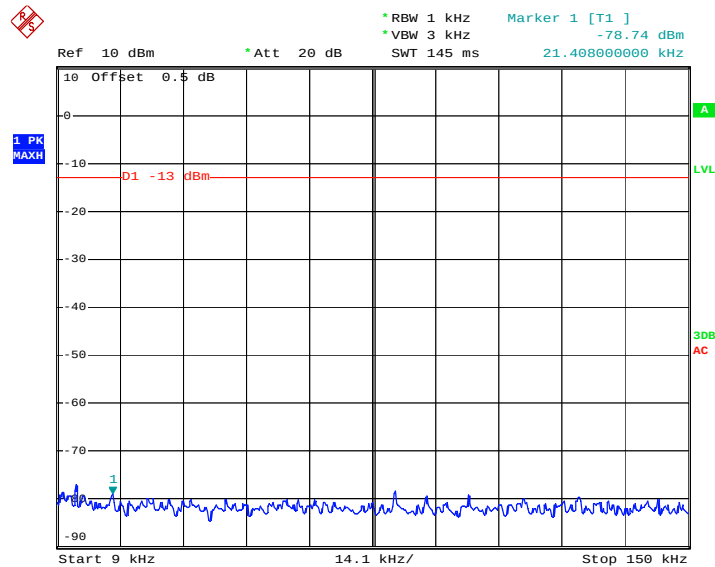


Date: 24.FEB.2011 16:11:45

3-10 GHz - Low Channel

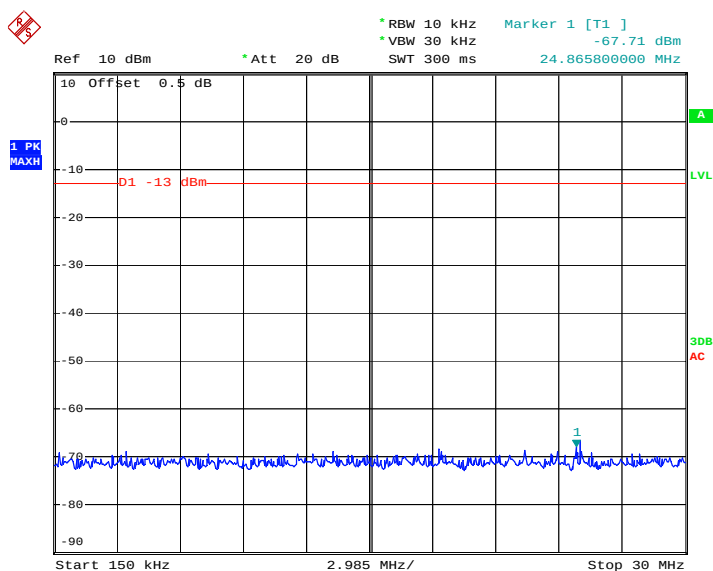


9-150 kHz - Middle Channel



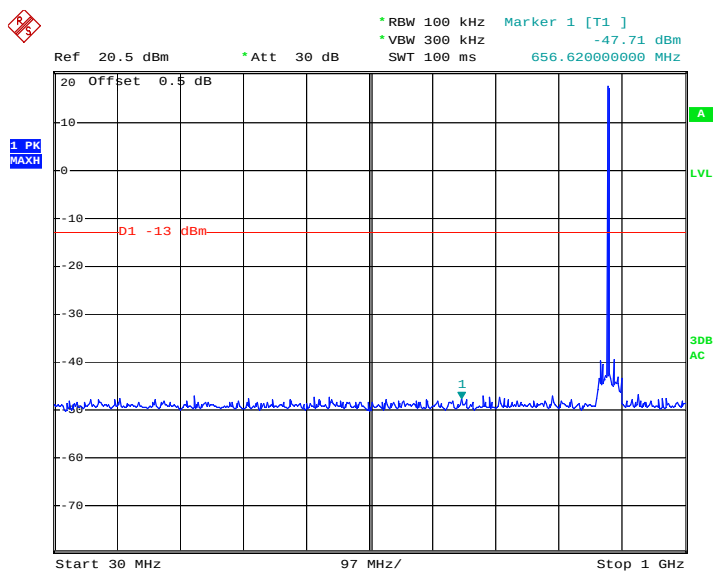
Date: 24.FEB.2011 16:17:34

150 kHz – 30 MHz - Middle Channel



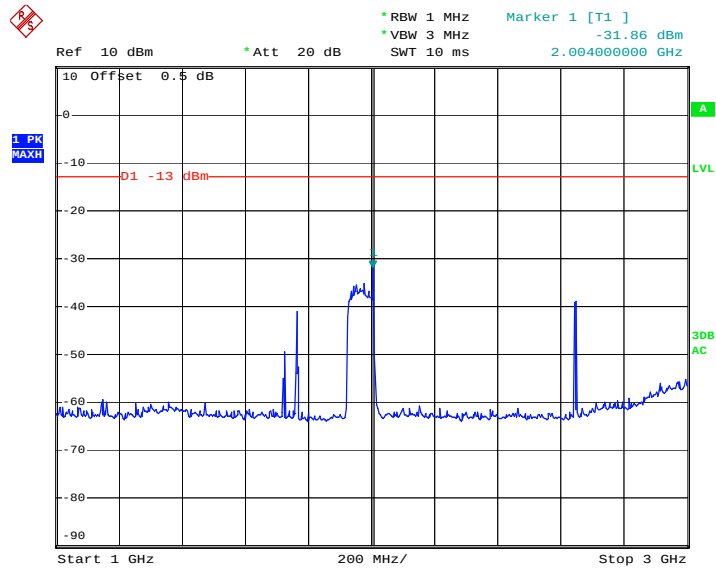
Date: 24.FEB.2011 16:05:36

30 – 1000 MHz - Middle Channel



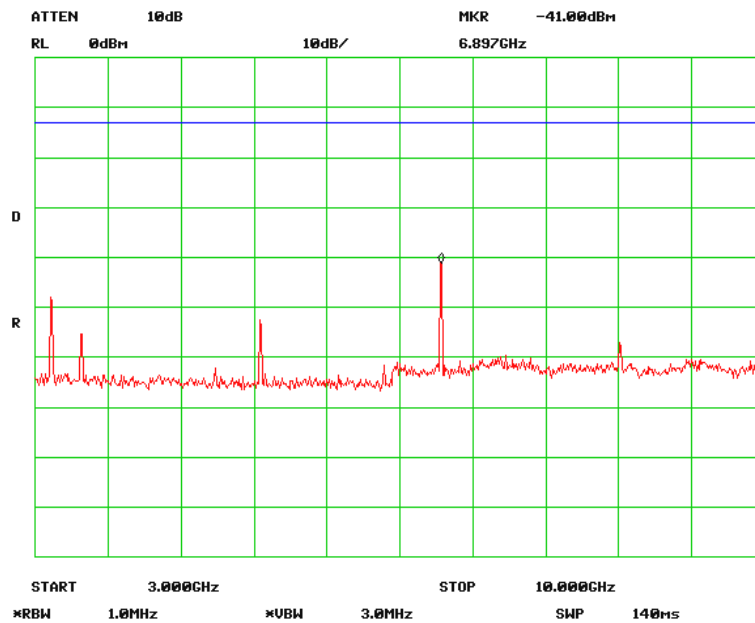
Date: 24.FEB.2011 16:07:22

1-3GHz - Middle Channel

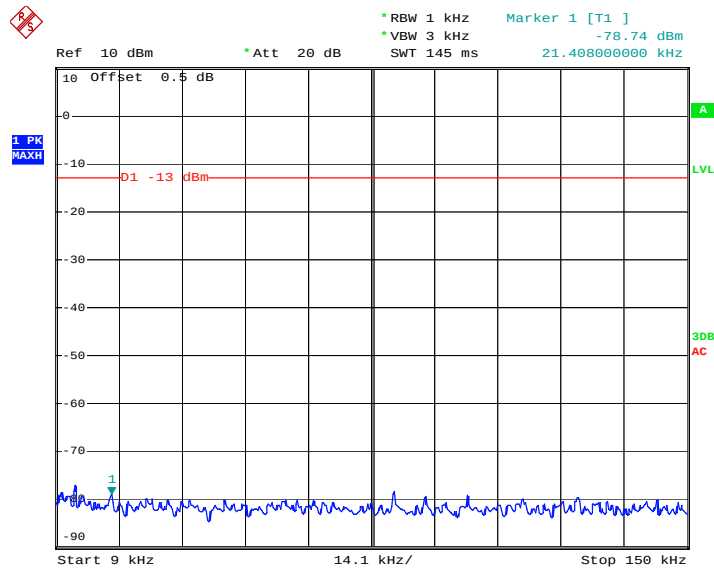


Date: 24.FEB.2011 16:11:22

3-10 GHz - Middle Channel

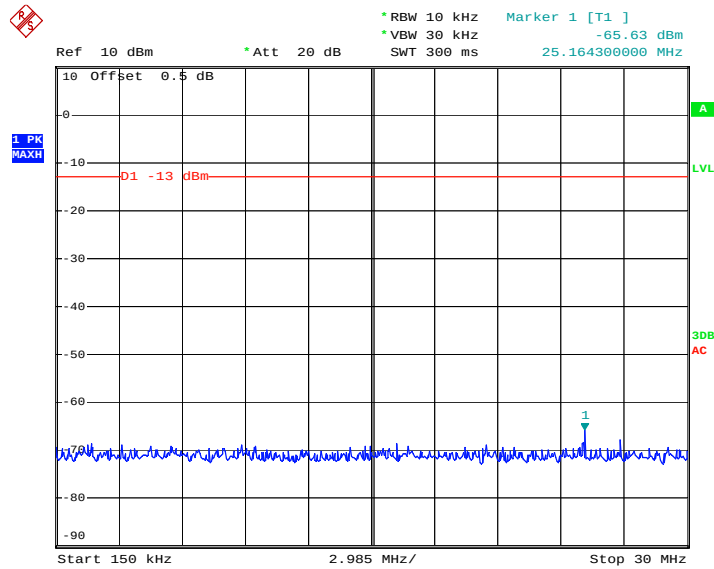


9-150 kHz – High Channel



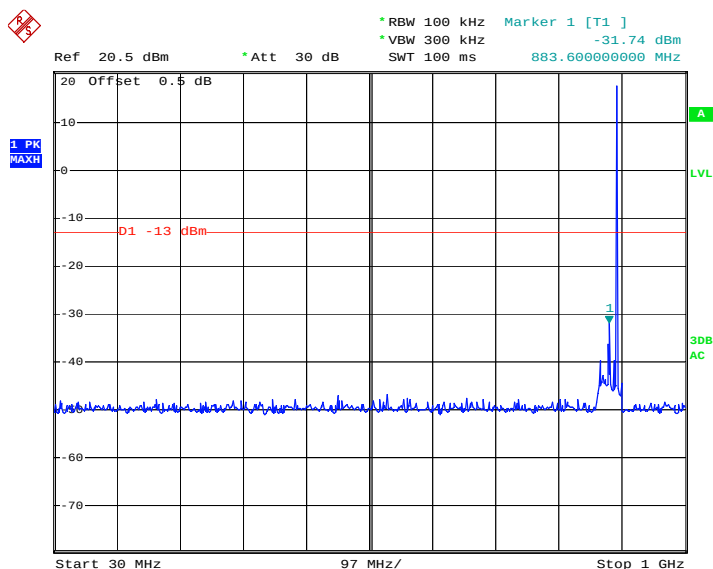
Date: 24.FEB.2011 16:17:34

150 kHz – 30 MHz - High Channel



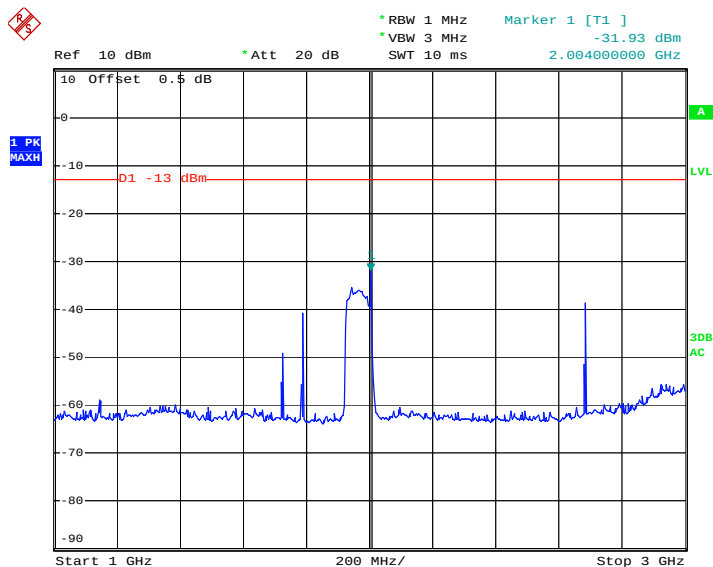
Date: 24.FEB.2011 16:05:11

30 – 1000 MHz - High Channel



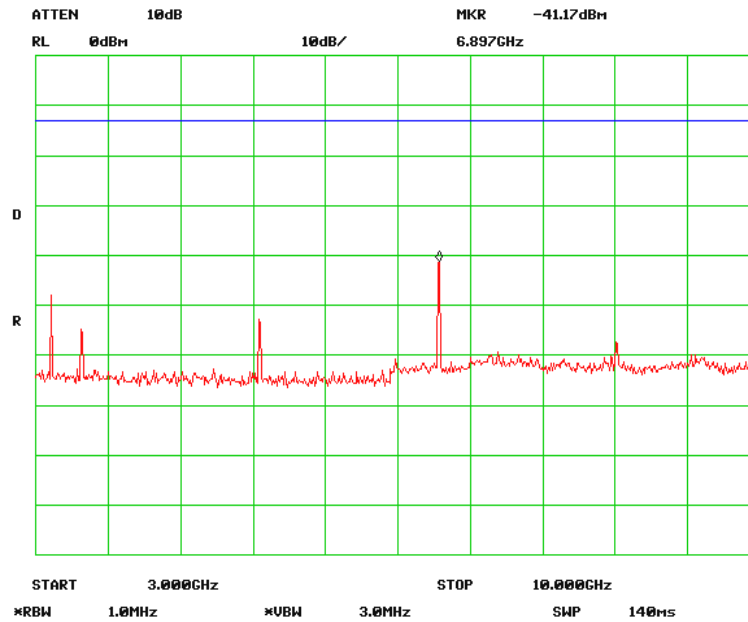
Date: 24.FEB.2011 16:08:22

1 – 3 GHz - High Channel

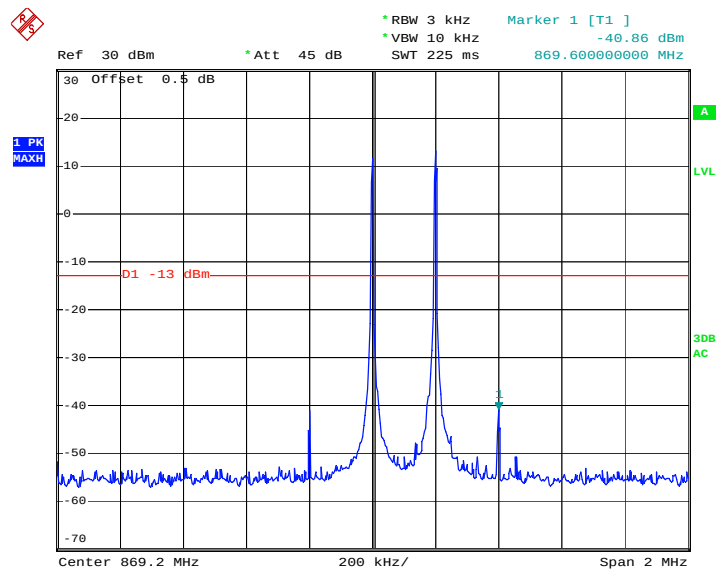


Date: 24.FEB.2011 16:10:49

3-10 GHz - High Channel

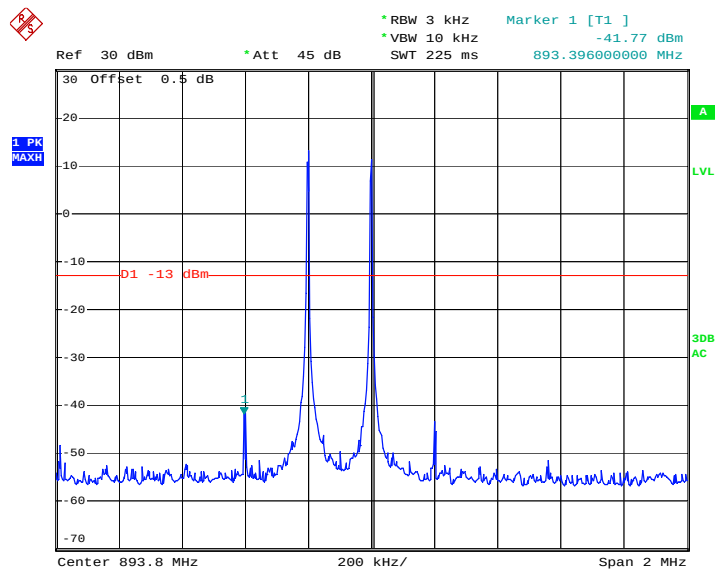


Two tone Inter modulation (Low Band edge)



Date: 24.FEB.2011 15:22:42

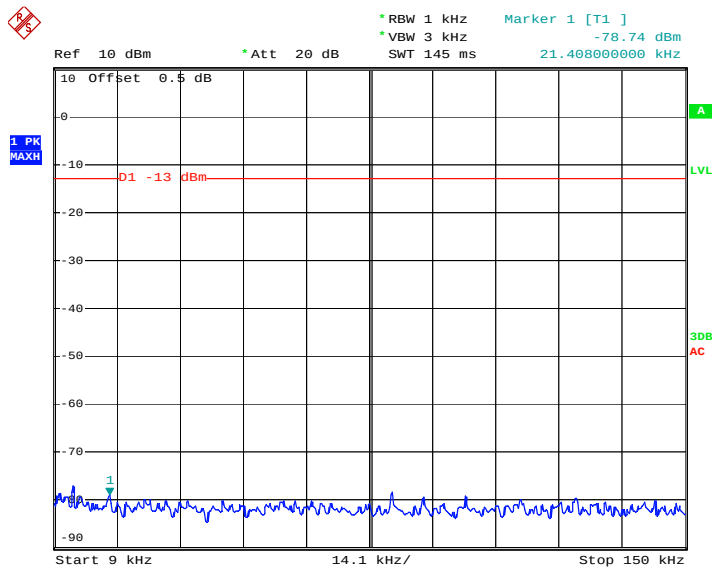
Two tone Inter modulation (High Band edge)



Date: 24.FEB.2011 15:21:53

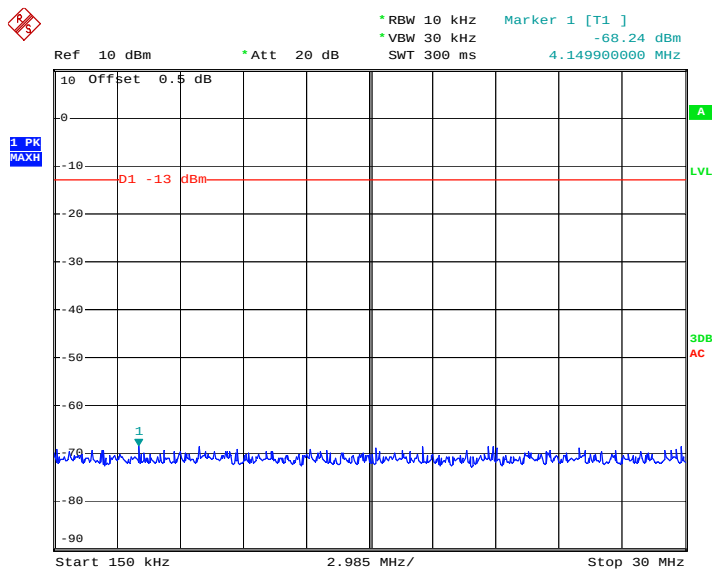
PCS Band (Part24E)

9-150 kHz – Low Channel



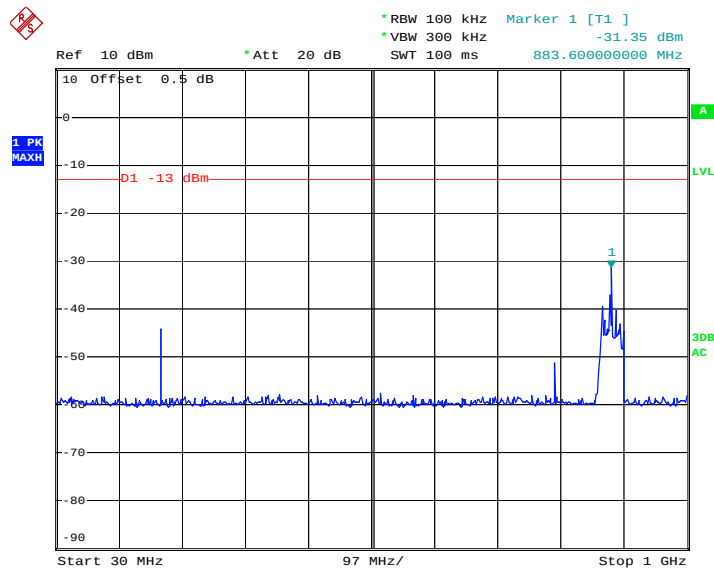
Date: 24.FEB.2011 16:17:34

150 kHz – 30 MHz - Low Channel



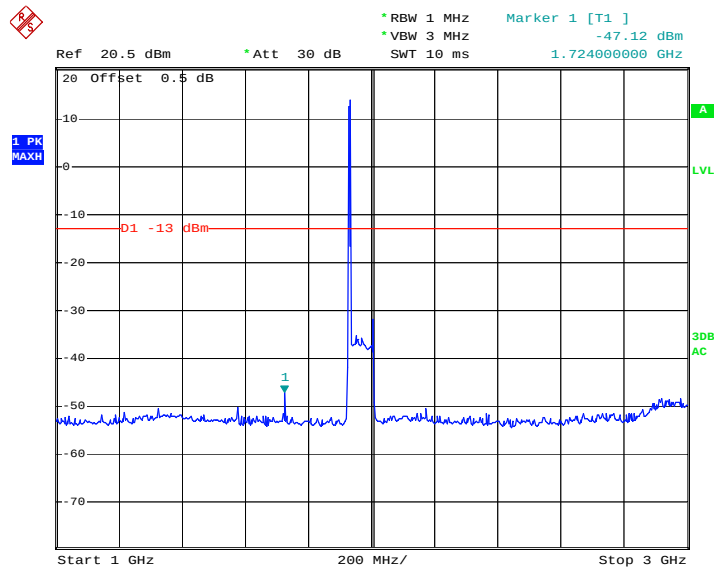
Date: 24.FEB.2011 16:19:20

30 – 1000 MHz - Low Channel



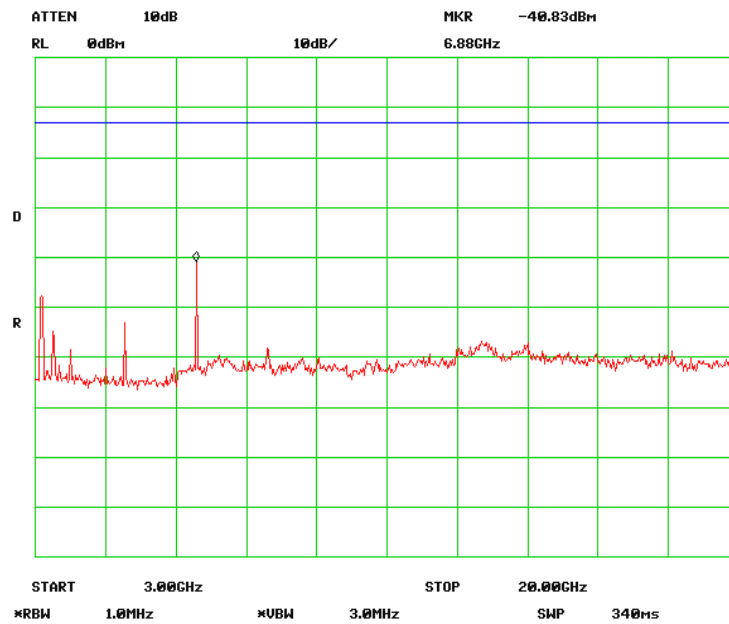
Date: 24.FEB.2011 16:20:14

1 – 3GHz - Low Channel

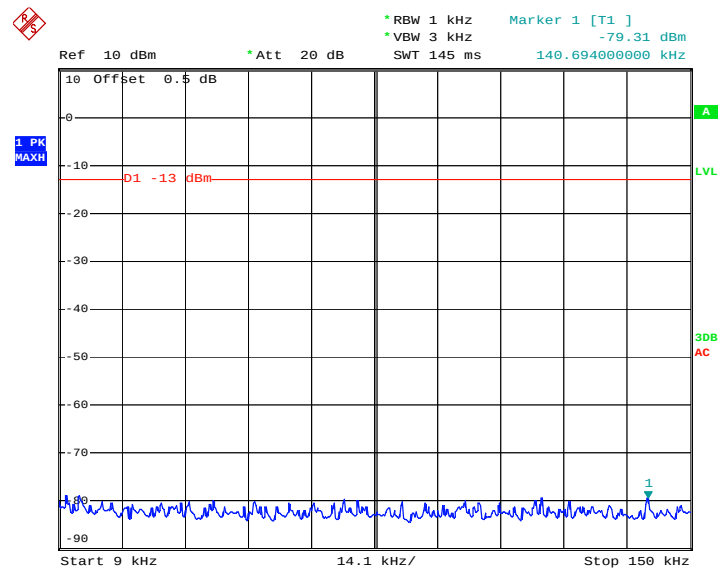


Date: 24.FEB.2011 16:24:16

3-20 GHz - Low Channel

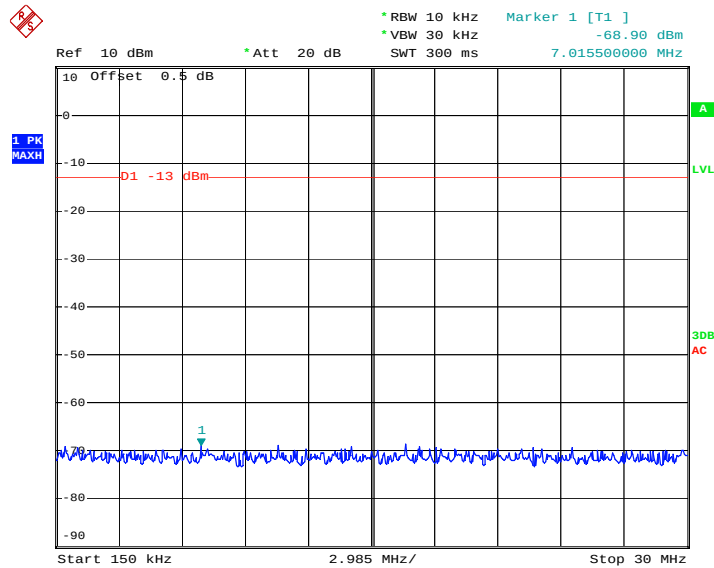


9-150 kHz - Middle Channel



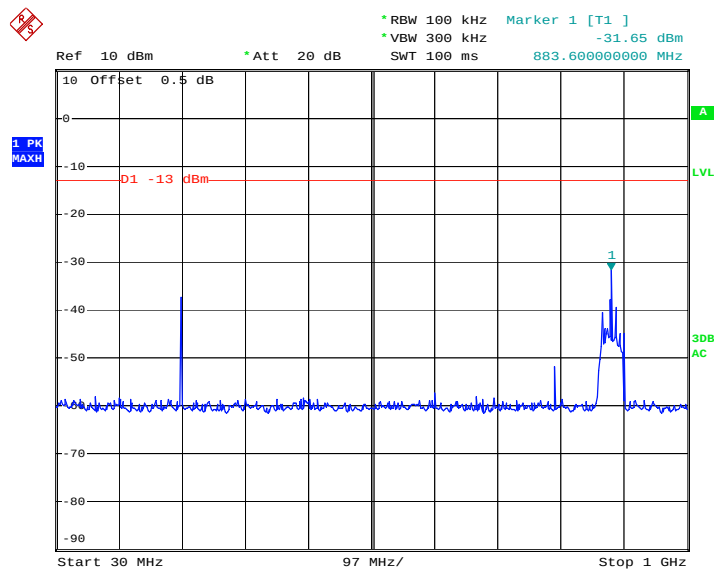
Date: 24.FEB.2011 16:17:53

150 kHz – 30 MHz - Middle Channel



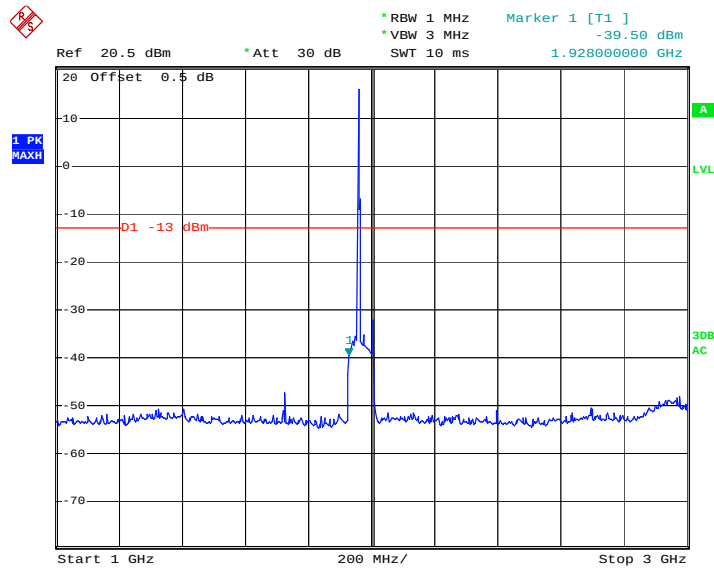
Date: 24.FEB.2011 16:19:04

30 – 1000 MHz - Middle Channel



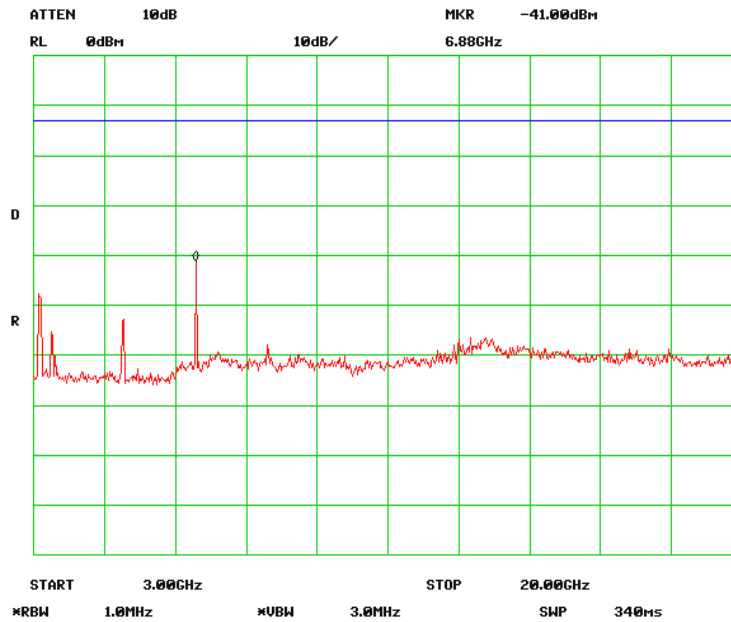
Date: 24.FEB.2011 16:20:34

1-3 GHz - Middle Channel

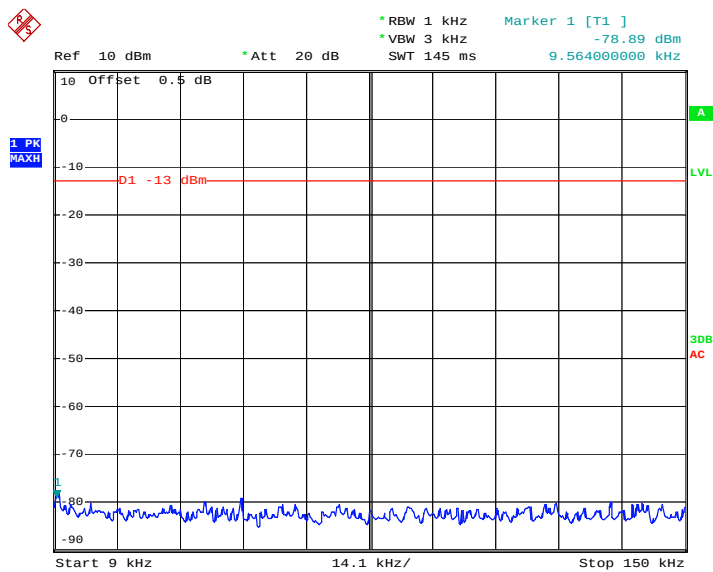


Date: 24.FEB.2011 16:23:41

3-20 GHz - Middle Channel

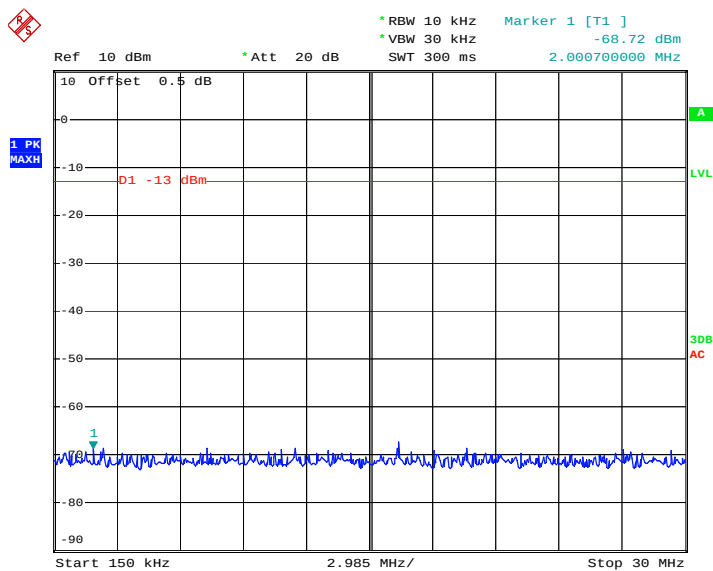


9-150 kHz – High Channel



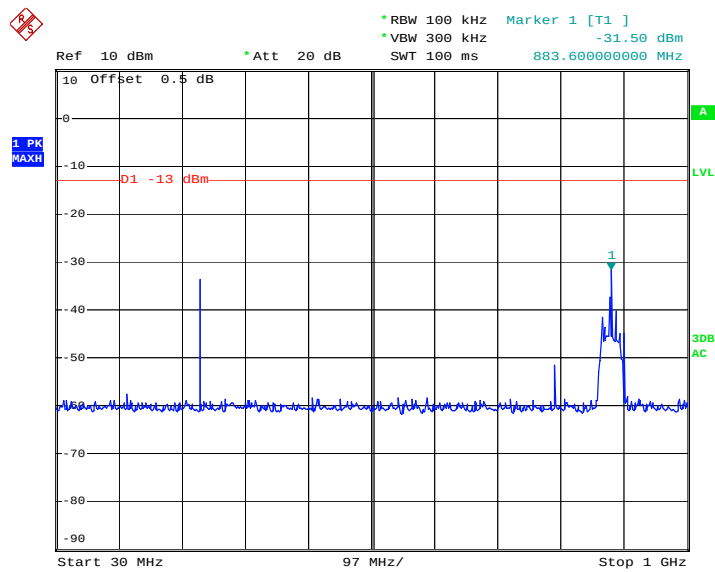
Date: 24.FEB.2011 16:18:10

150 kHz – 30 MHz - High Channel



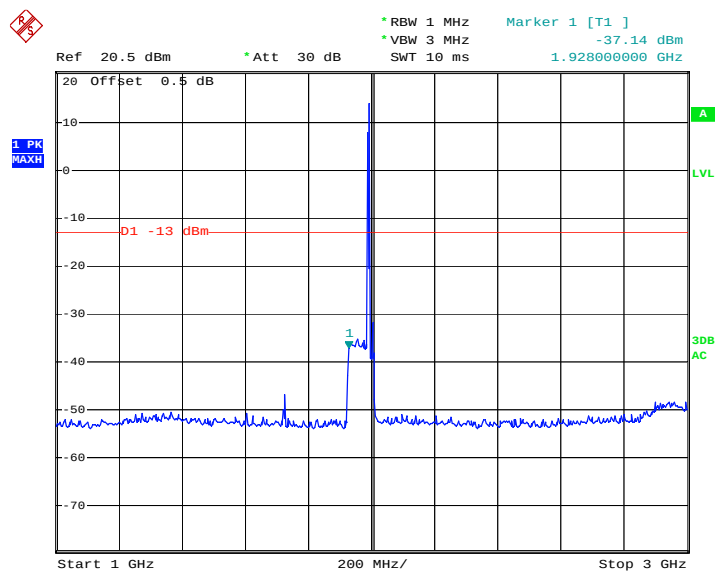
Date: 24.FEB.2011 16:18:53

30 – 1000 MHz - High Channel



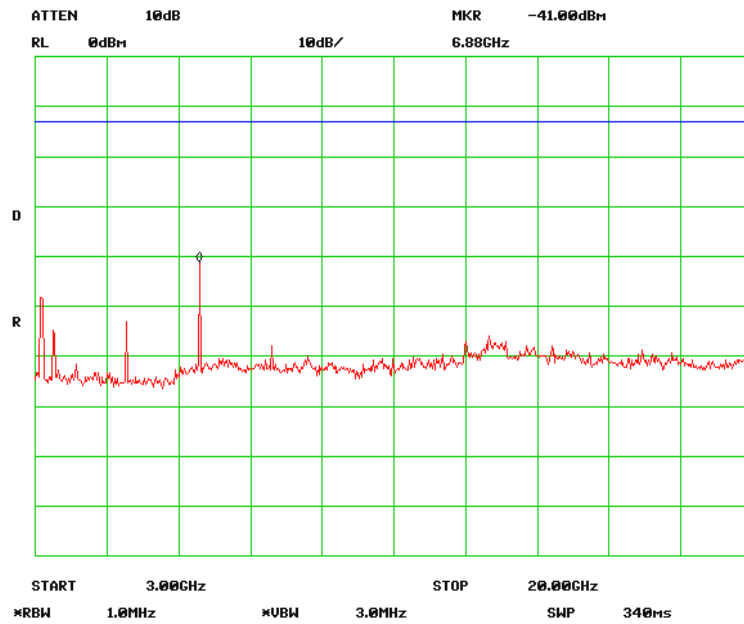
Date: 24.FEB.2011 16:20:54

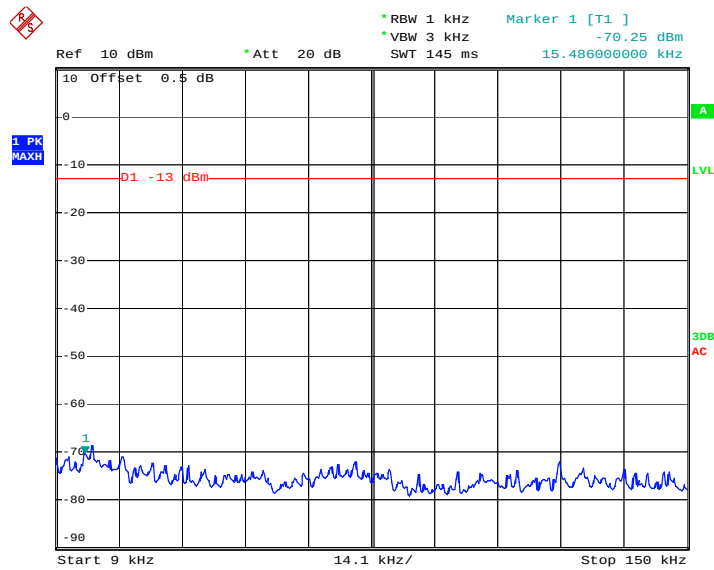
1 –3GHz - High Channel



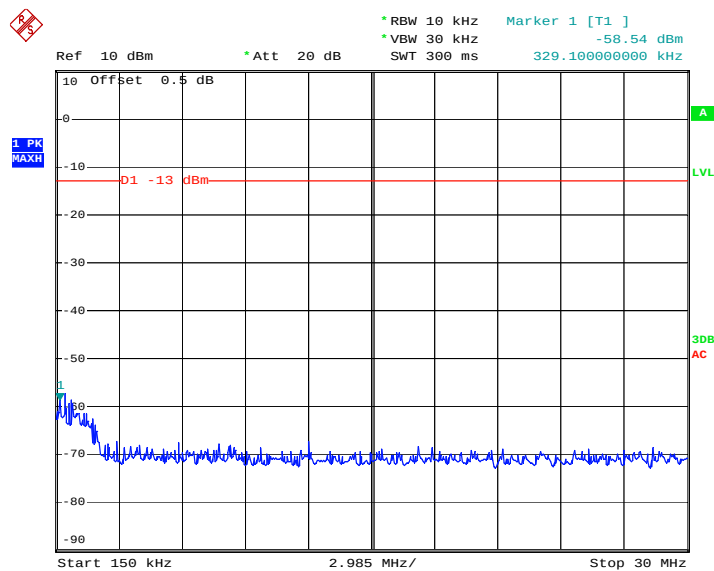
Date: 24.FEB.2011 16:23:15

3-20 GHz - High Channel



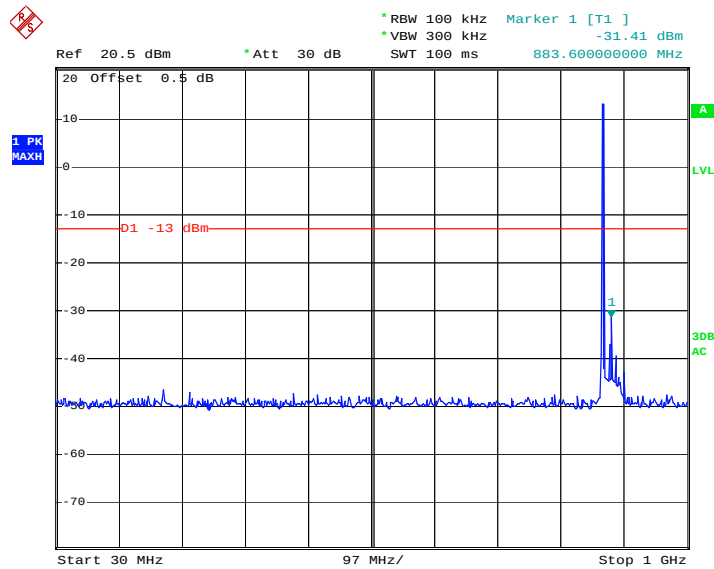
CDMA:**Cellular Band (Part 22H)****9-150 kHz – Low Channel**

Date: 24.FEB.2011 16:59:02

150 kHz – 30 MHz - Low Channel

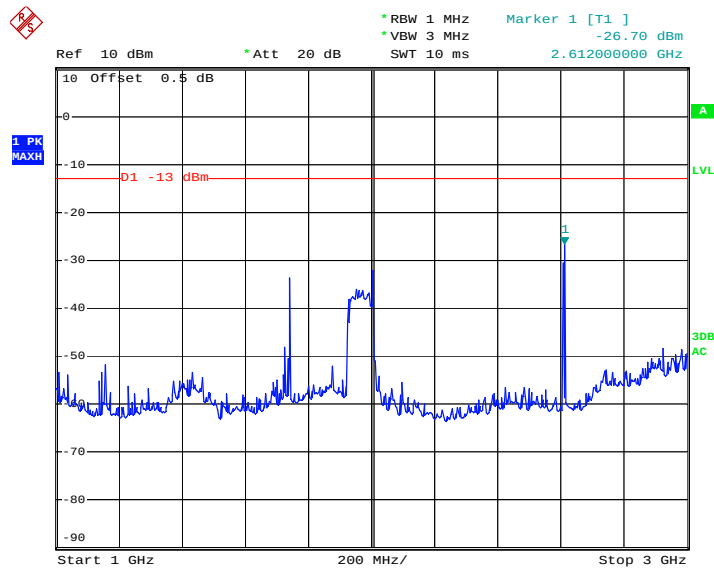
Date: 24.FEB.2011 16:59:48

30 – 1000 MHz - Low Channel



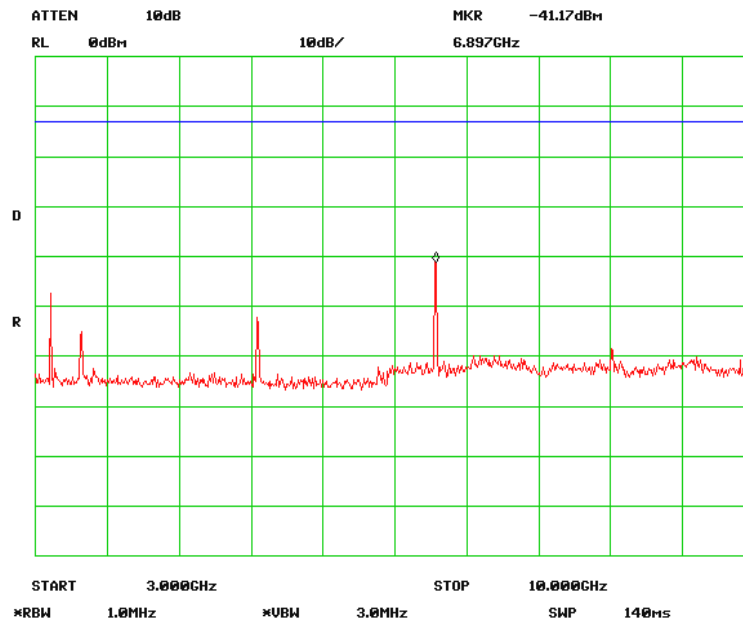
Date: 24.FEB.2011 16:55:50

1 – 3 GHz - Low Channel

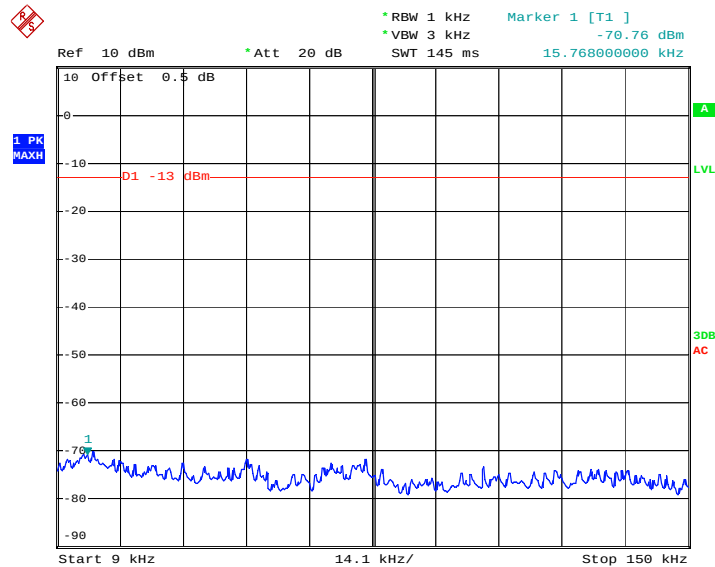


Date: 24.FEB.2011 16:58:06

3-10 GHz - Low Channel

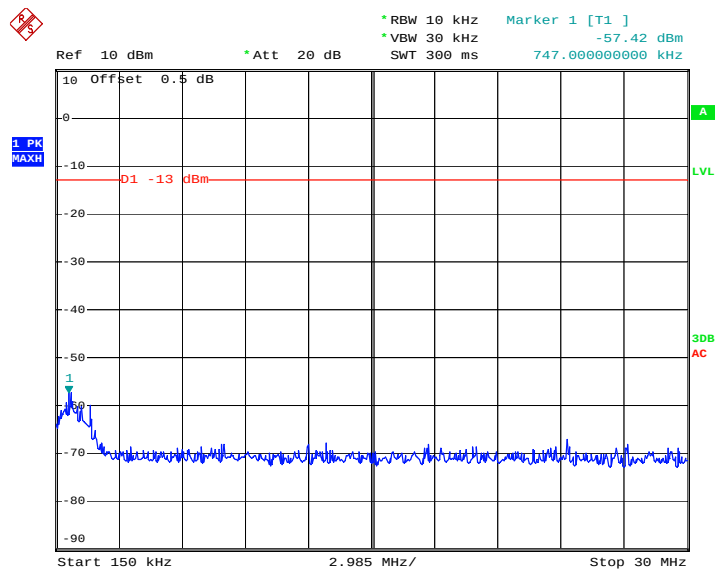


9-150 kHz - Middle Channel



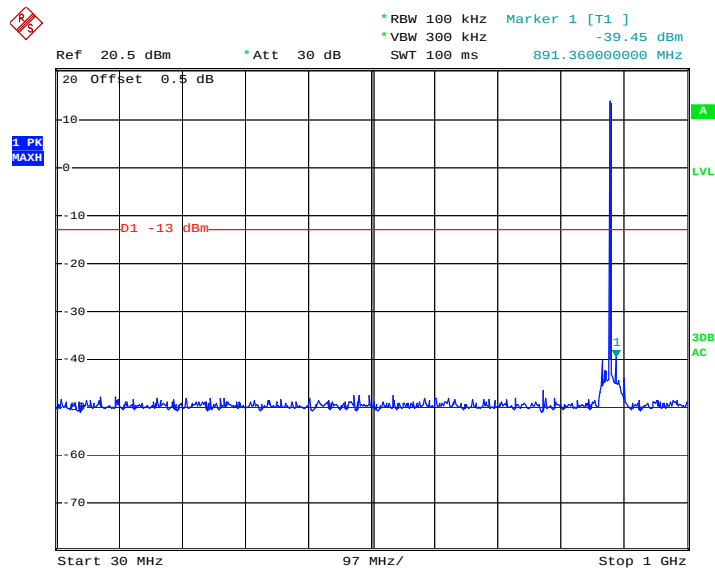
Date: 24.FEB.2011 16:58:50

150 kHz – 30 MHz - Middle Channel



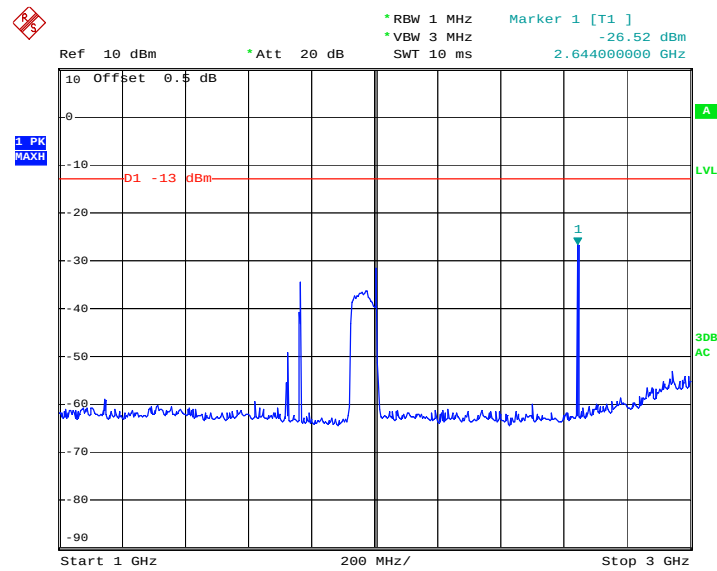
Date: 24.FEB.2011 16:59:35

30 – 1000 MHz - Middle Channel



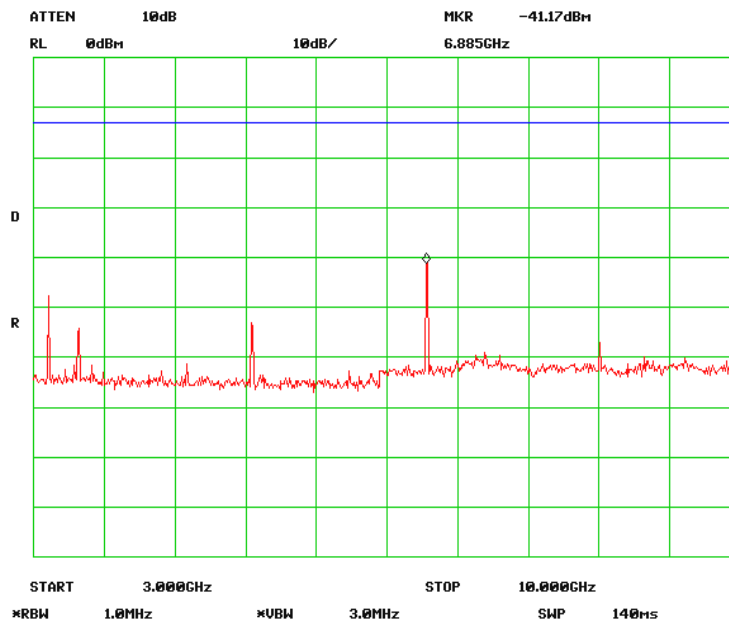
Date: 24.FEB.2011 16:56:17

1-3GHz - Middle Channel

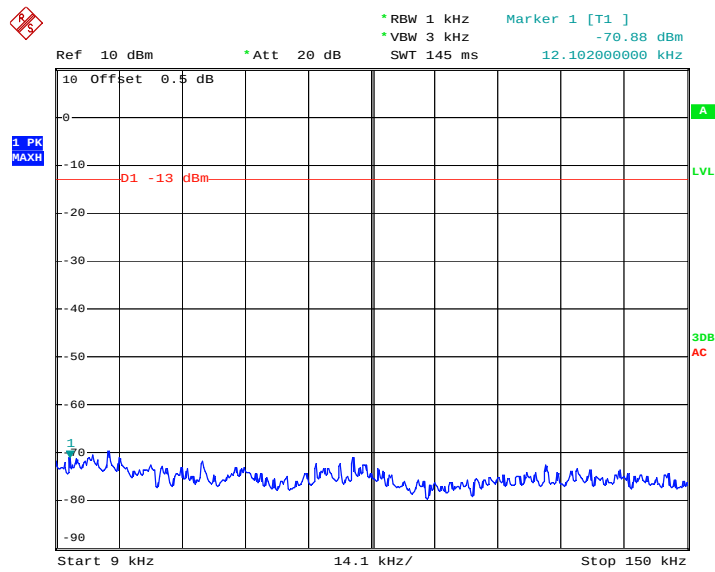


Date: 24.FEB.2011 16:57:48

3-10 GHz - Middle Channel

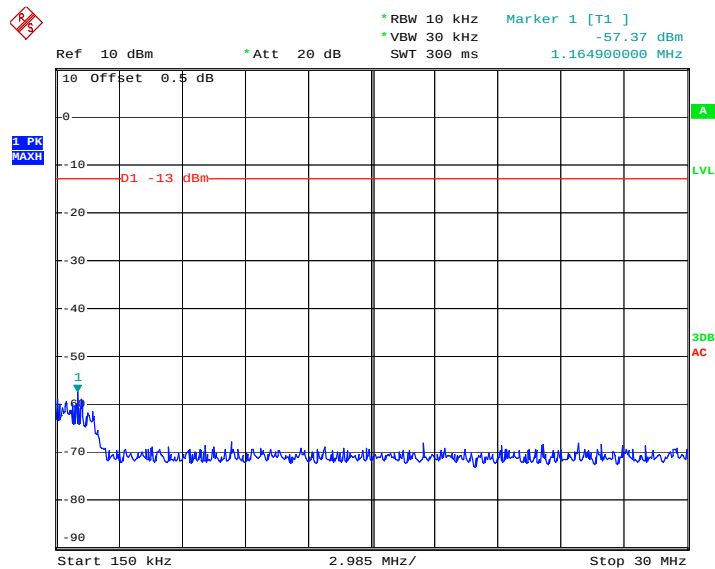


9-150 kHz – High Channel



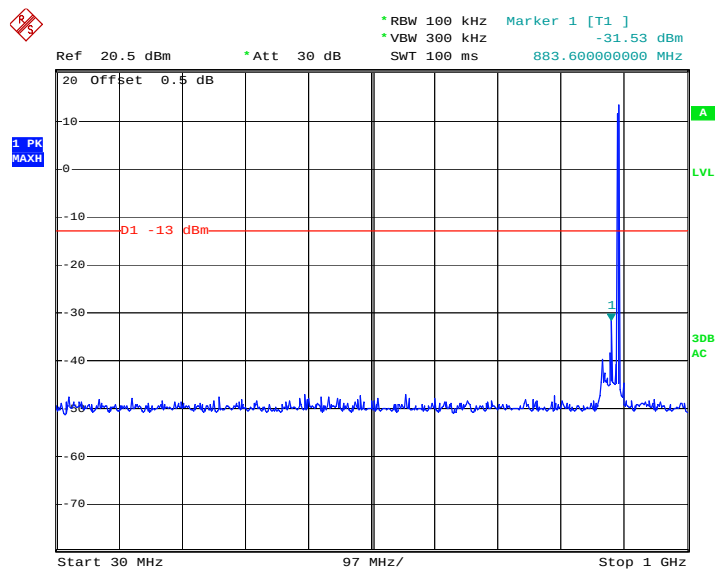
Date: 24.FEB.2011 16:58:36

150 kHz – 30 MHz - High Channel



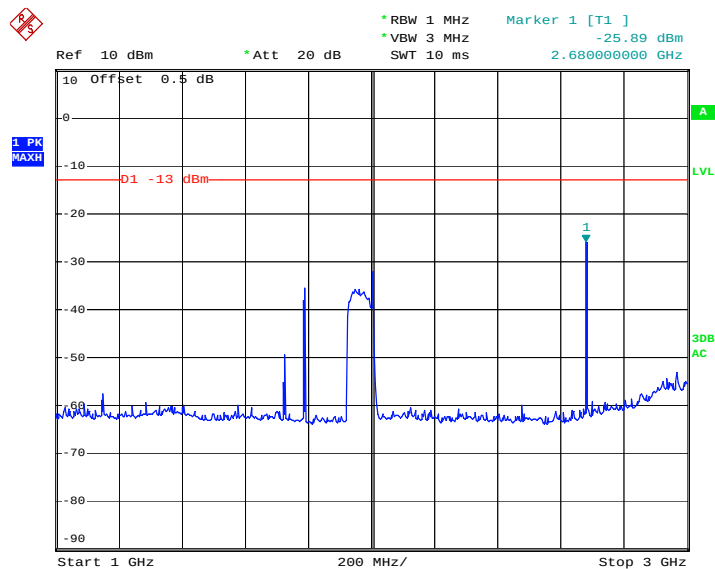
Date: 24.FEB.2011 16:59:20

30 – 1000 MHz - High Channel



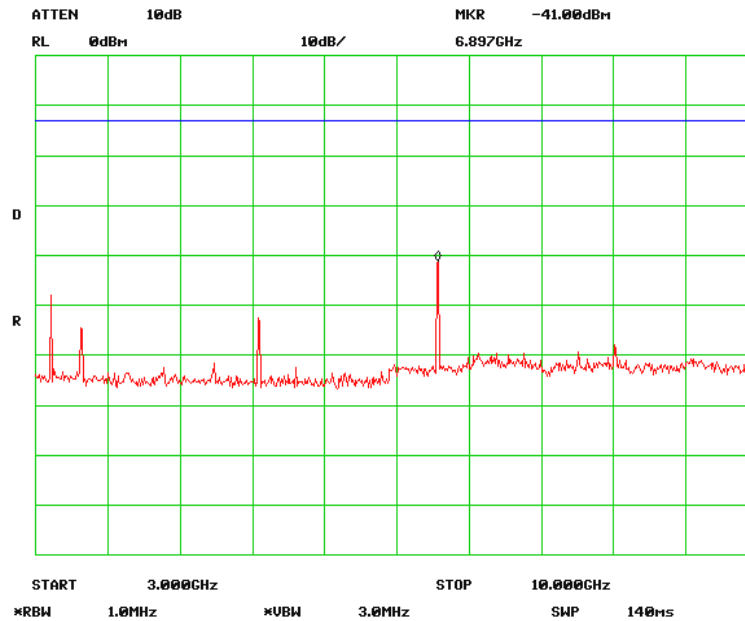
Date: 24.FEB.2011 16:56:47

1 – 3 GHz - High Channel

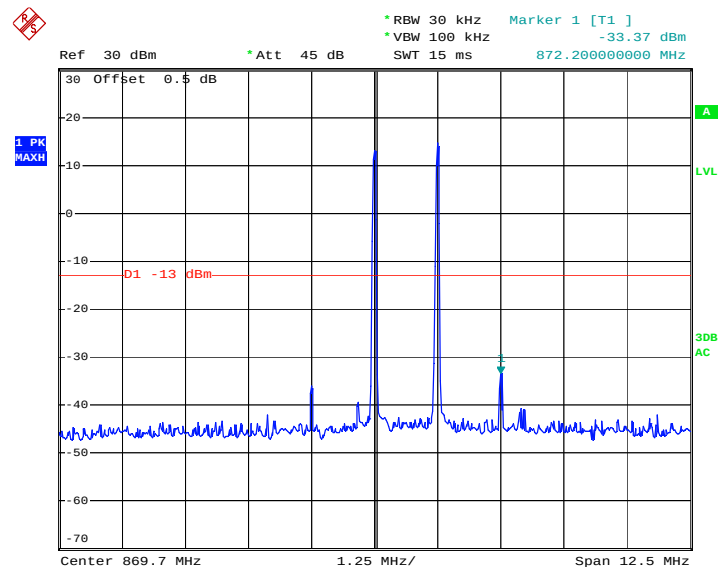


Date: 24.FEB.2011 16:57:29

3-10 GHz - High Channel

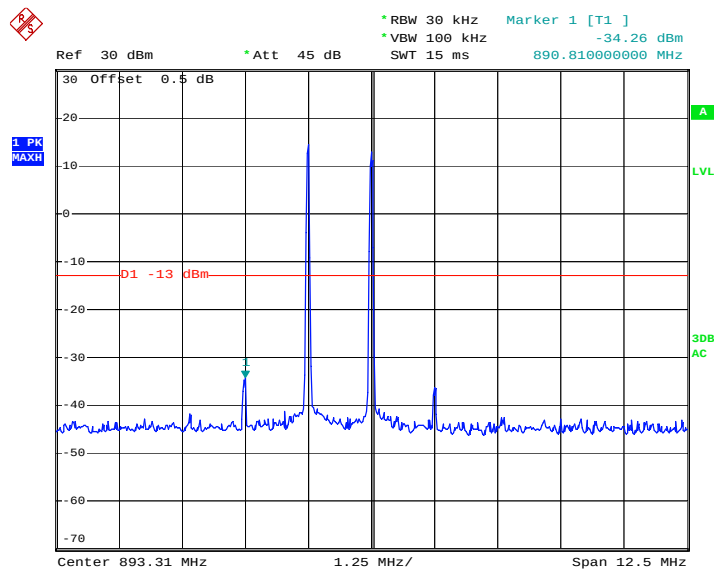


Two tone Inter modulation (Low Band edge)



Date: 24.FEB.2011 15:36:22

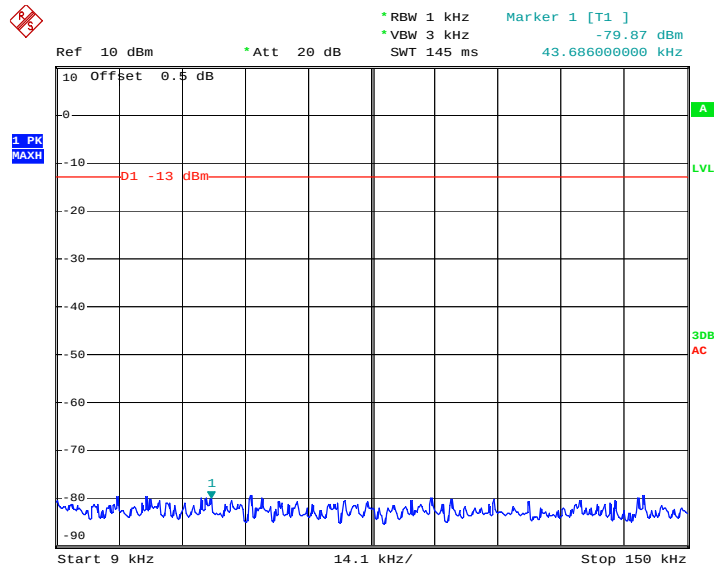
Two tone Inter modulation (High Band edge)



Date: 24.FEB.2011 15:37:38

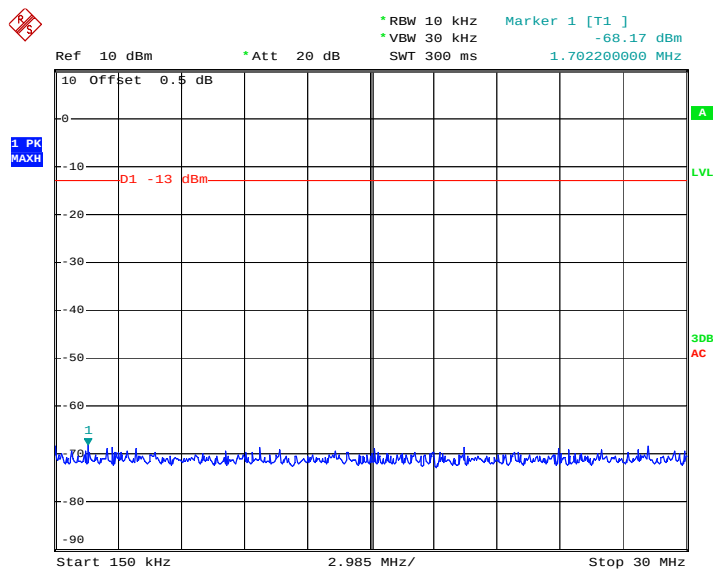
PCS Band (Part24E)

9-150 kHz – Low Channel



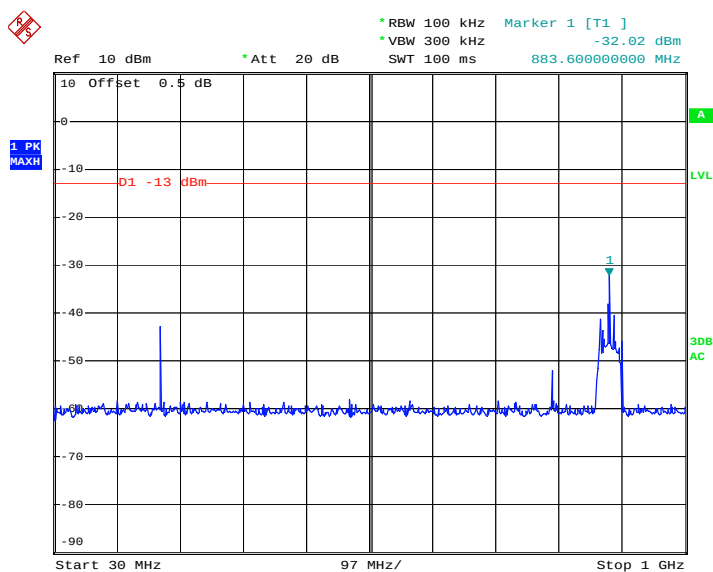
Date: 24.FEB.2011 16:51:32

150 kHz – 30 MHz - Low Channel



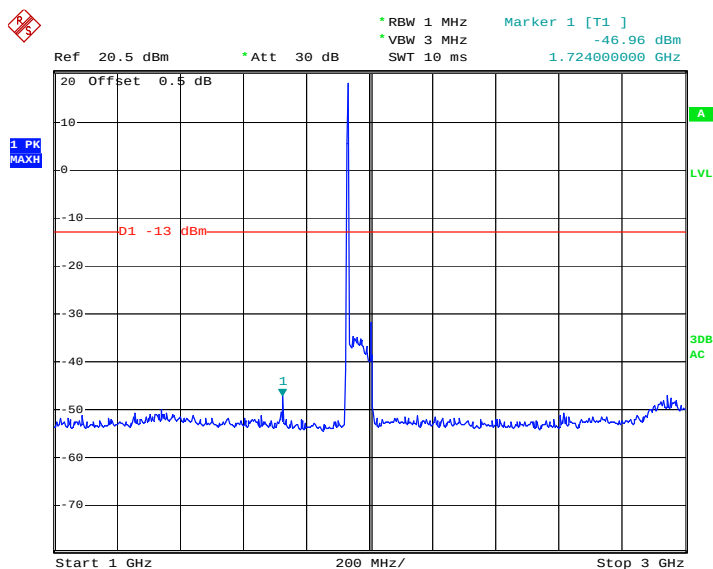
Date: 24.FEB.2011 16:52:19

30 – 1000 MHz - Low Channel



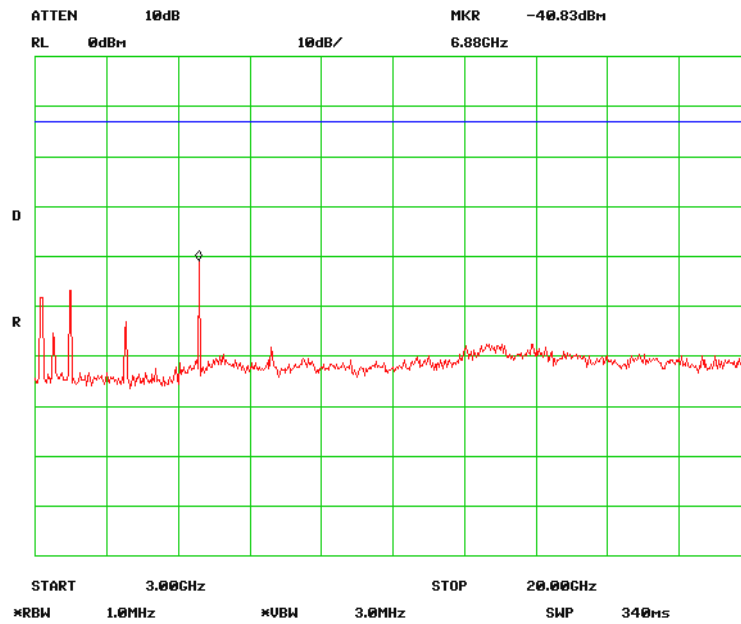
Date: 24.FEB.2011 16:54:04

1 – 3GHz - Low Channel

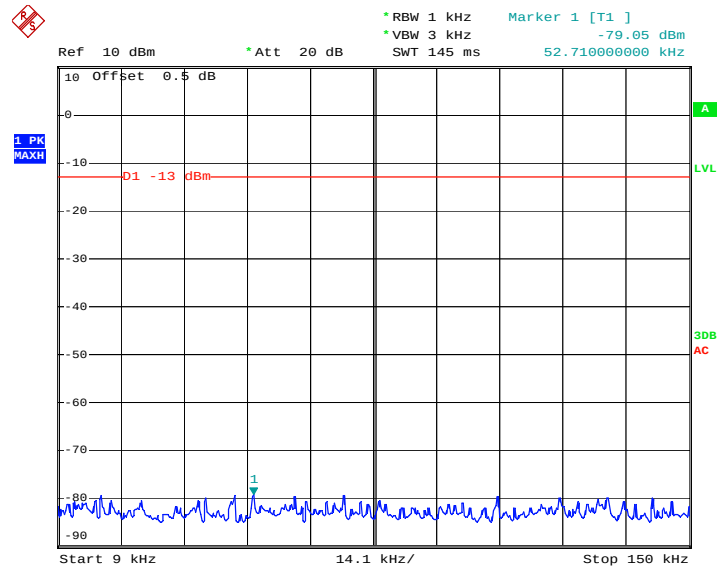


Date: 24.FEB.2011 16:34:05

3-20 GHz - Low Channel

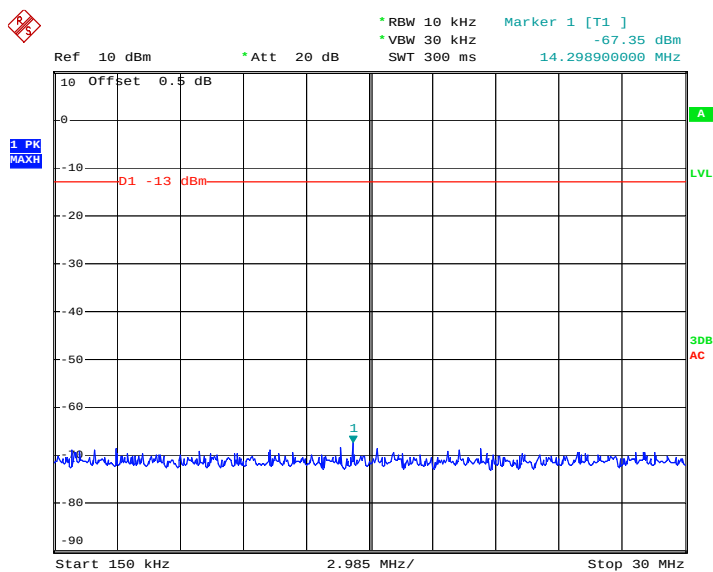


9-150 kHz - Middle Channel



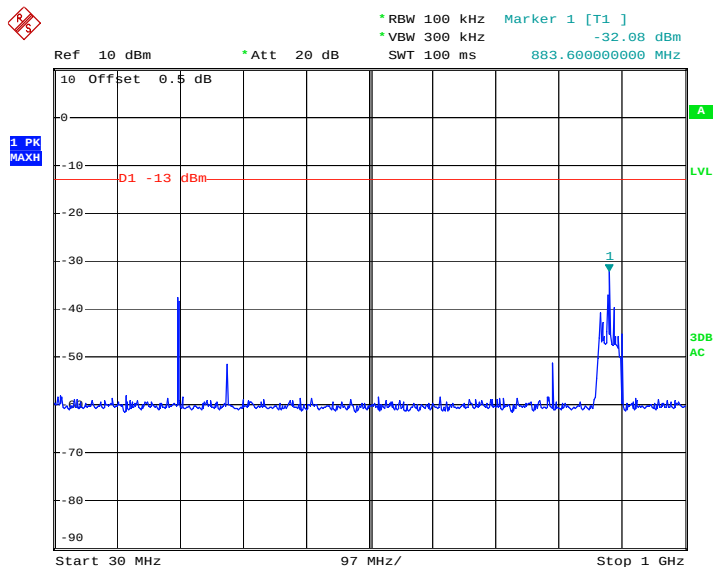
Date: 24.FEB.2011 16:51:46

150 kHz – 30 MHz - Middle Channel



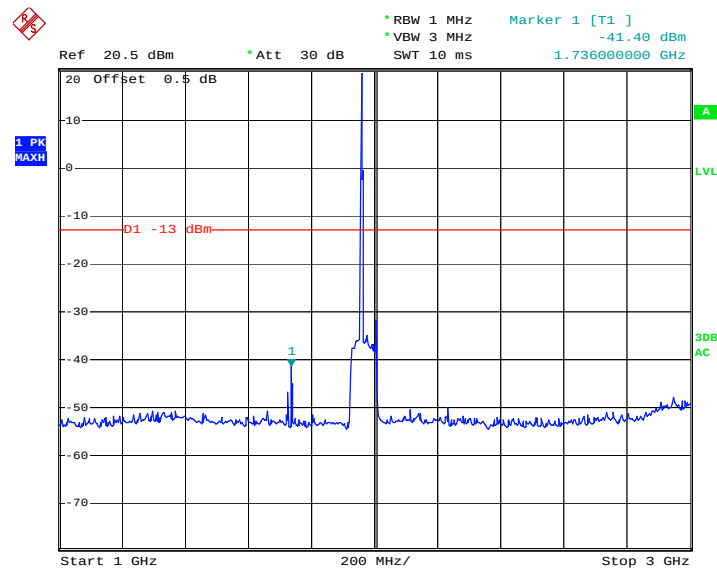
Date: 24.FEB.2011 16:52:34

30 – 1000 MHz - Middle Channel



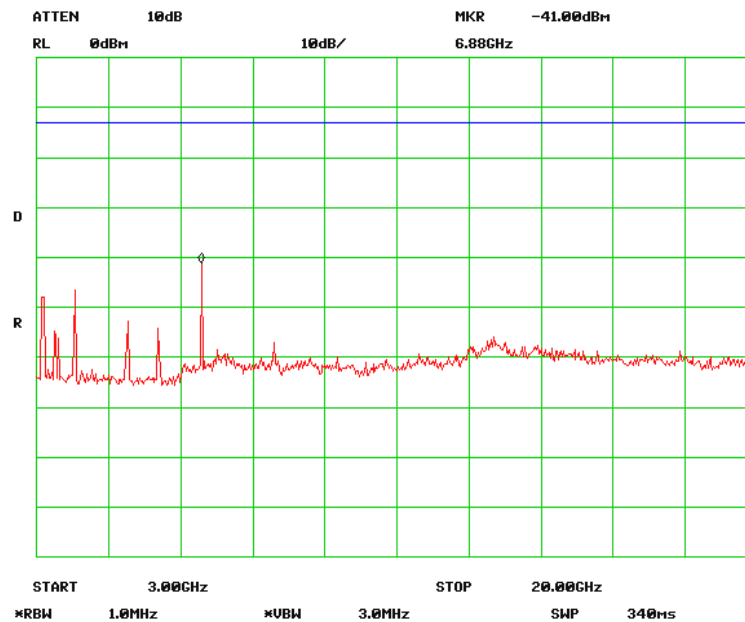
Date: 24.FEB.2011 16:53:49

1-3 GHz - Middle Channel

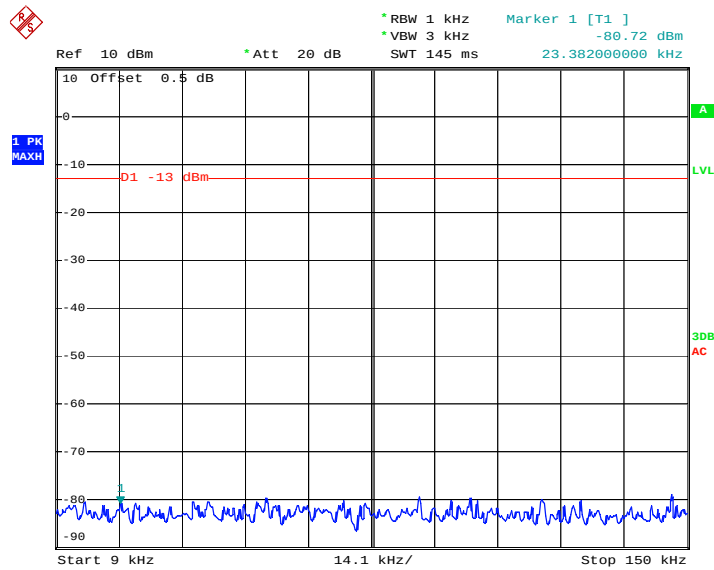


Date: 24.FEB.2011 16:34:34

3-20 GHz - Middle Channel

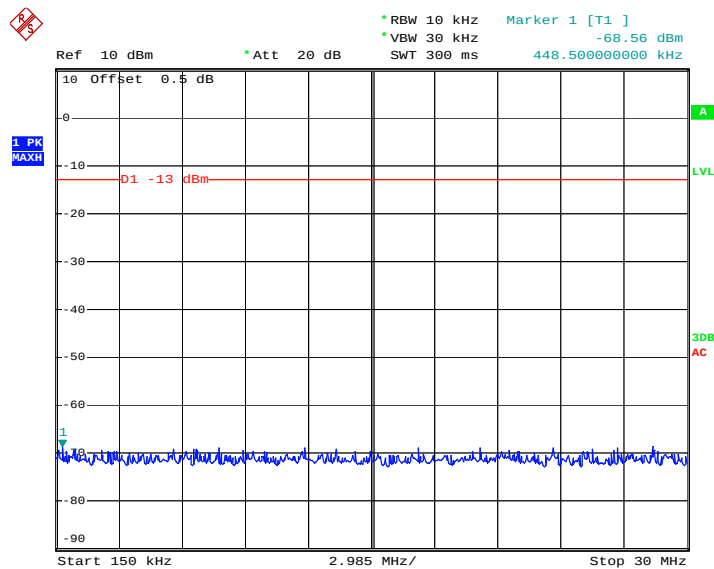


9-150 kHz – High Channel



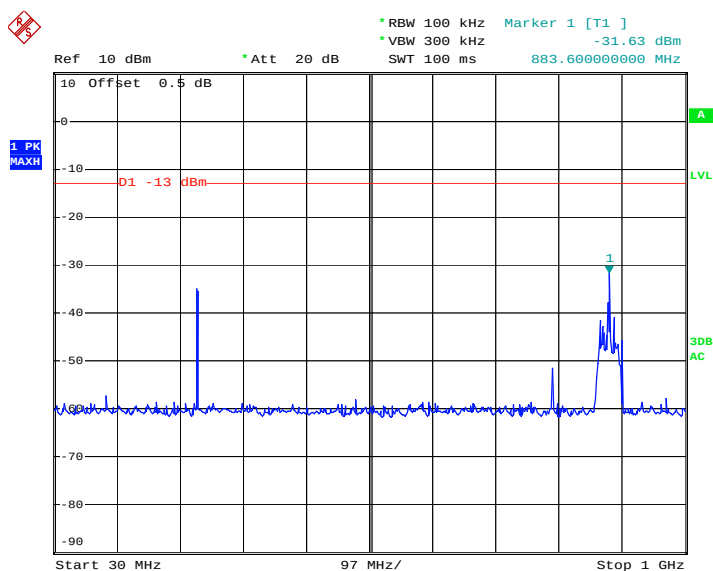
Date: 24.FEB.2011 16:51:59

150 kHz – 30 MHz - High Channel



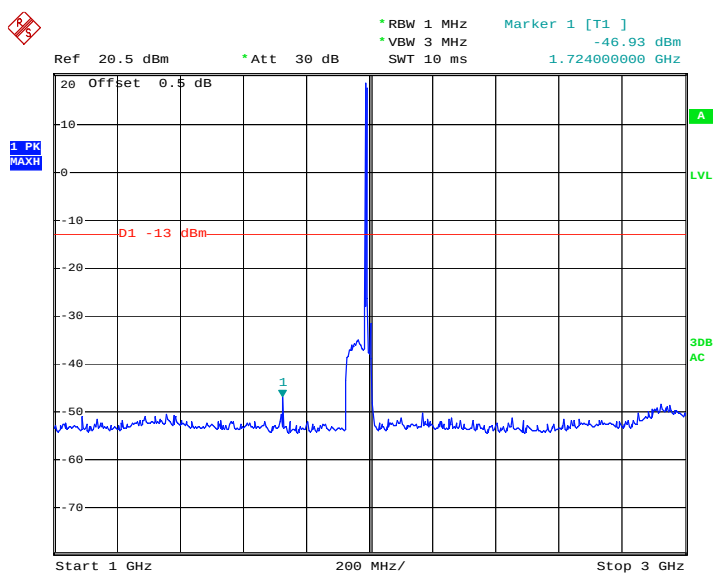
Date: 24.FEB.2011 16:52:47

30 – 1000 MHz - High Channel



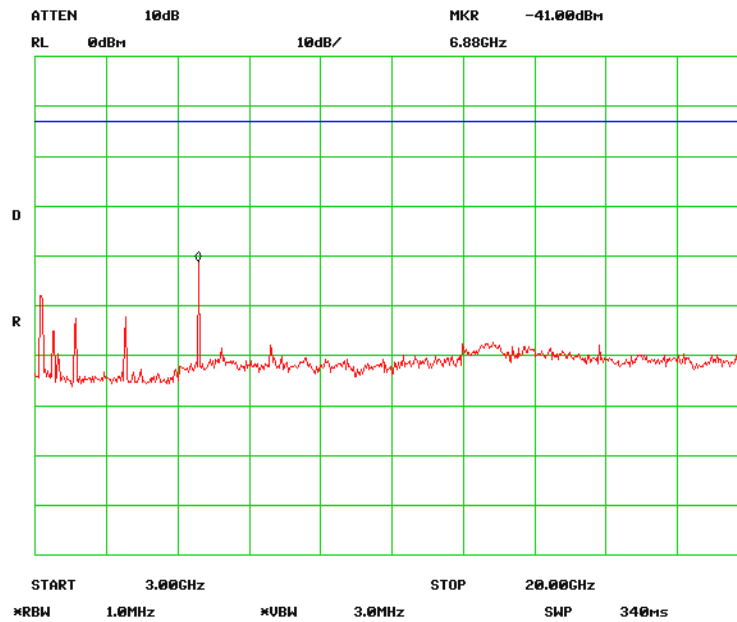
Date: 24.FEB.2011 16:54:23

1 – 3GHz - High Channel

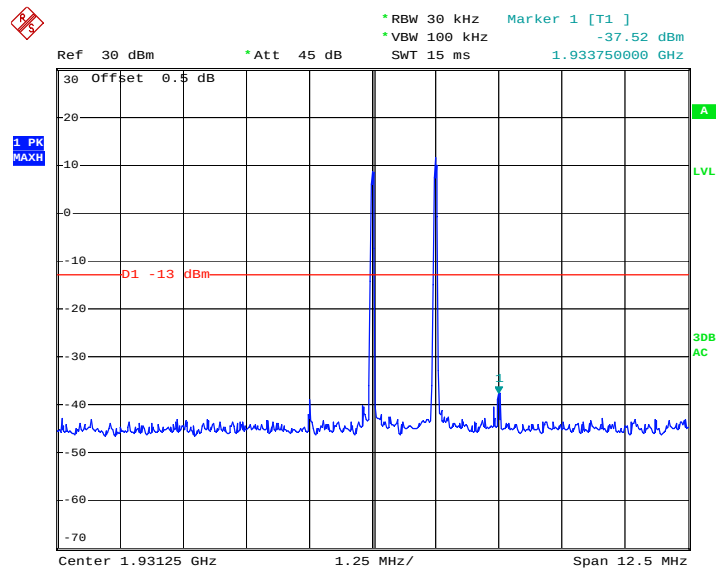


Date: 24.FEB.2011 16:34:58

3-20 GHz - High Channel

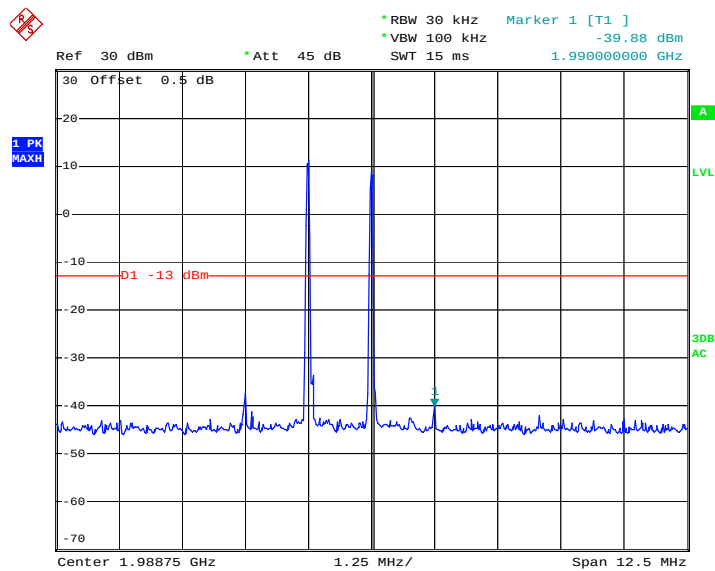


Two tone Inter modulation (Low Band edge)

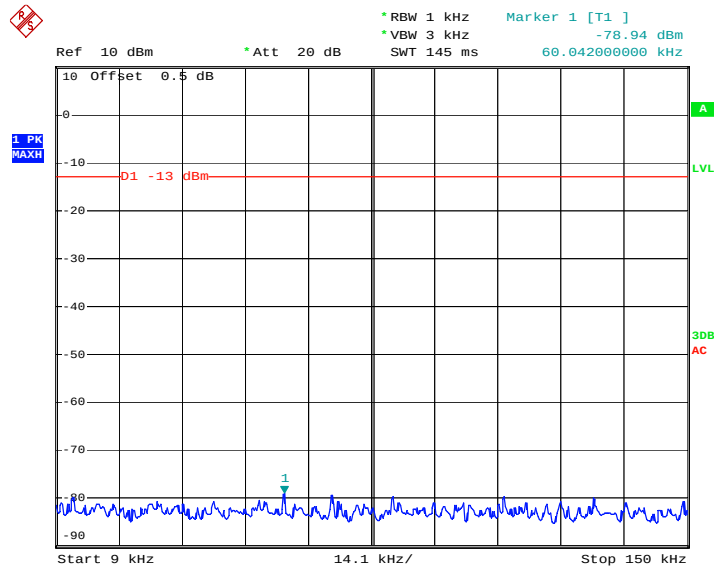


Date: 24.FEB.2011 15:34:15

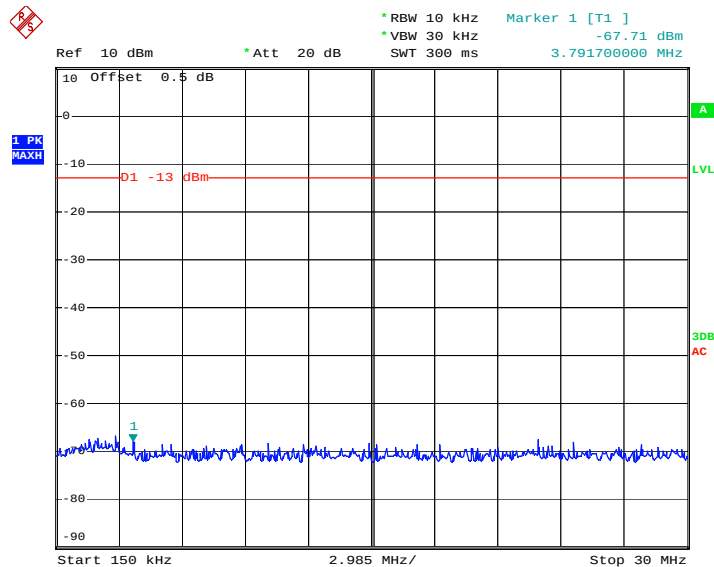
Two tone Inter modulation (High Band edge)



Date: 24.FEB.2011 15:32:39

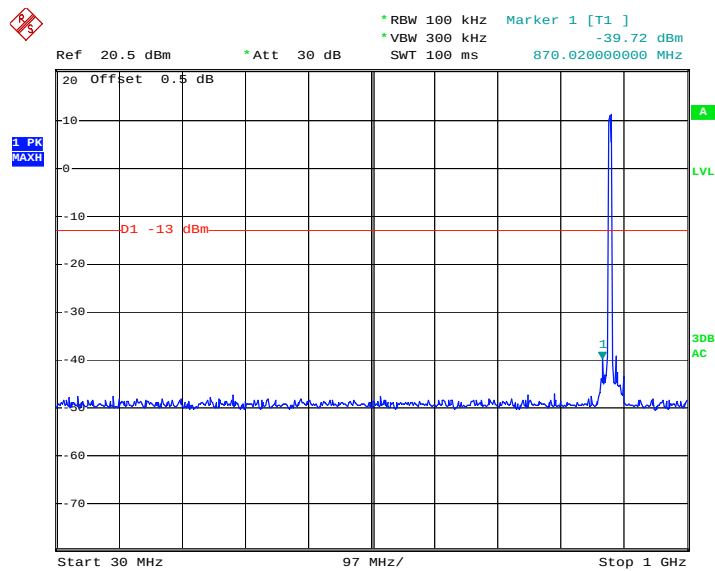
WCDMA:**Cellular Band (Part 22H)****9-150 kHz - Middle Channel**

Date: 24.FEB.2011 17:05:18

150 kHz – 30 MHz - Middle Channel

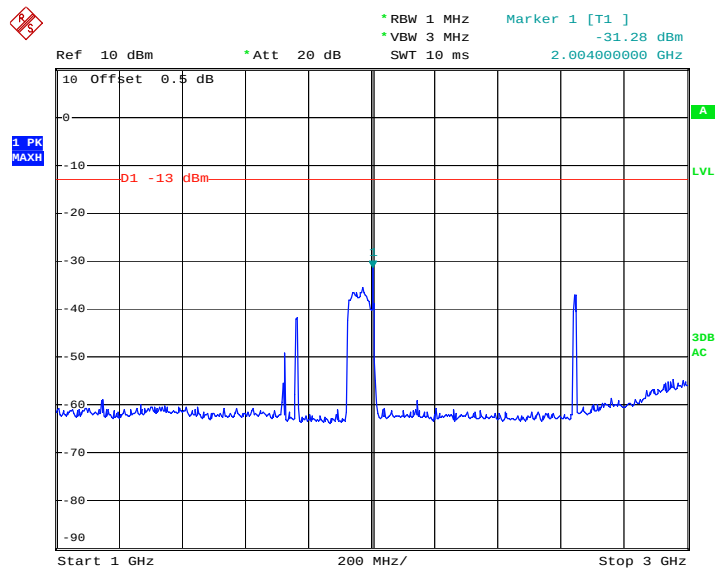
Date: 24.FEB.2011 17:04:10

30 – 1000 MHz - Middle Channel



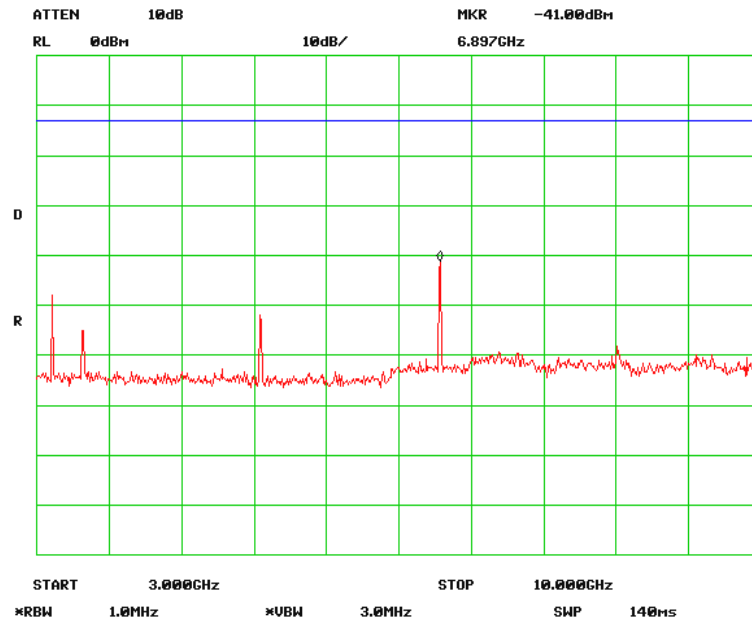
Date: 24.FEB.2011 17:06:08

1 – 3GHz - Middle Channel

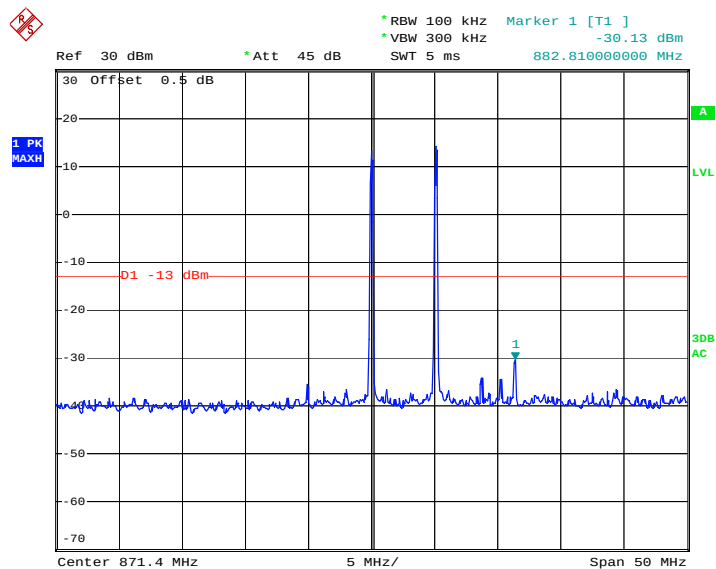


Date: 24.FEB.2011 17:06:33

3-10 GHz - Middle Channel

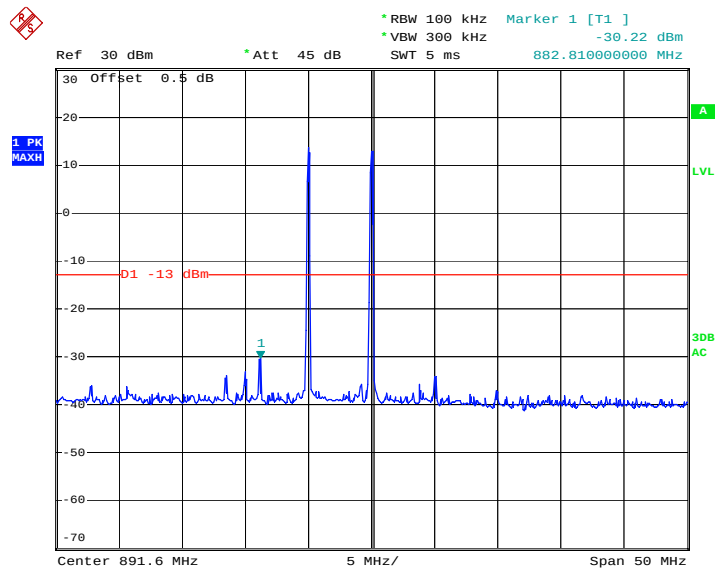


Two tone Inter modulation (Low Band edge)



Date: 24.FEB.2011 15:41:19

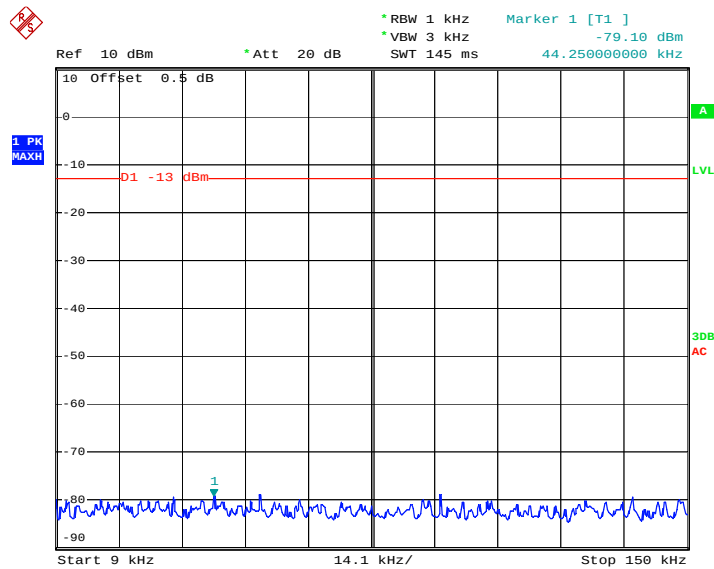
Two tone Inter modulation (High Band edge)



Date: 24.FEB.2011 15:42:36

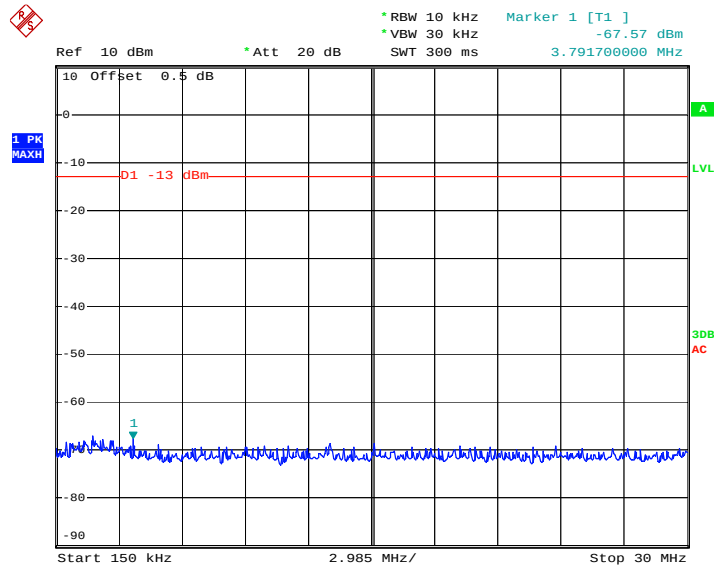
PCS Band (Part24E)

9-150 kHz - Middle Channel



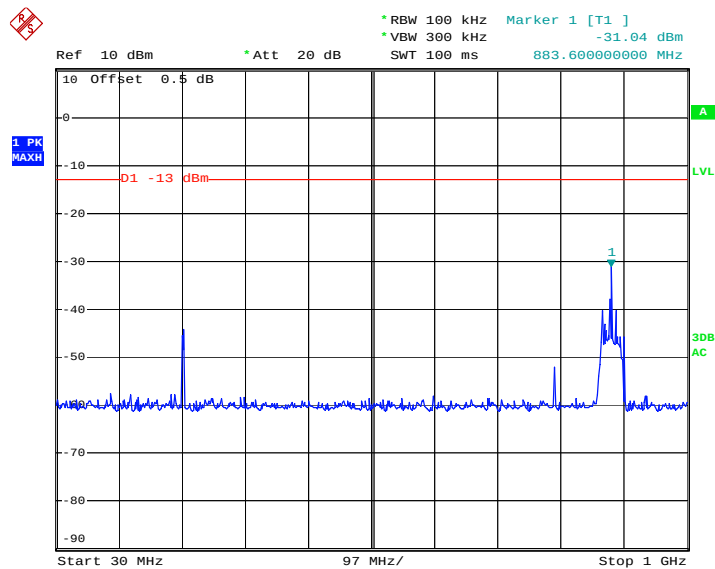
Date: 24.FEB.2011 17:08:28

150 kHz – 30 MHz - Middle Channel



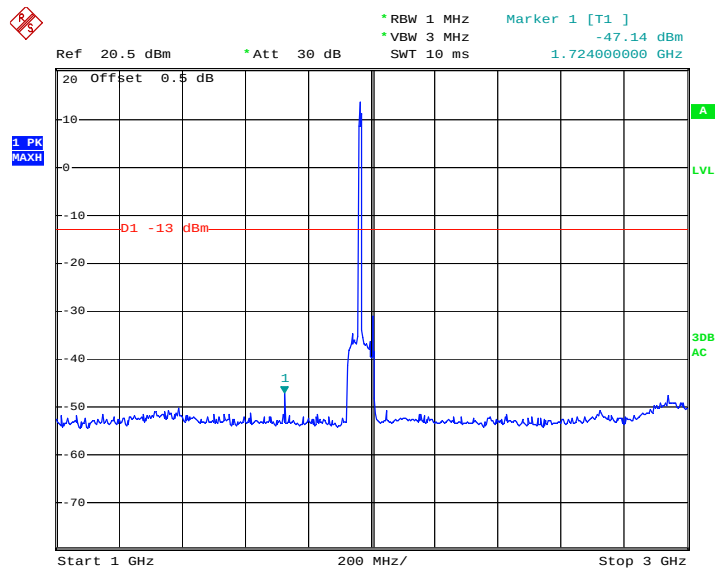
Date: 24.FEB.2011 17:08:08

30 – 1000 MHz - Middle Channel



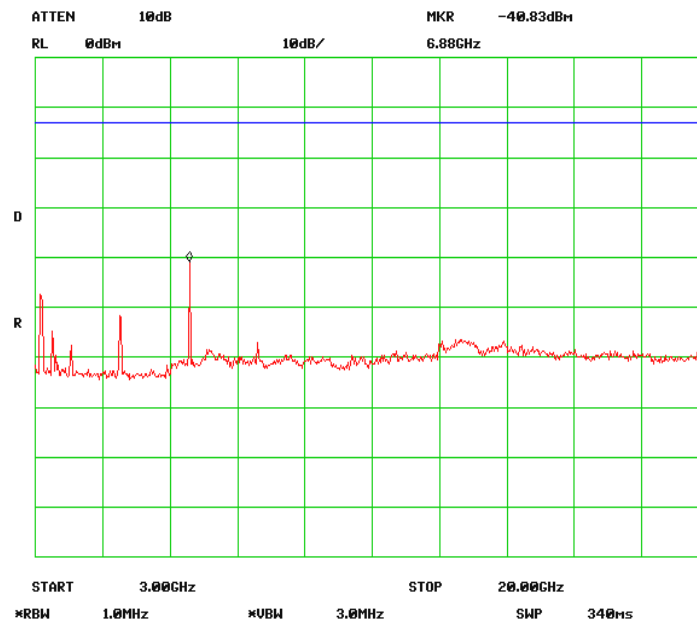
Date: 24.FEB.2011 17:07:49

1 –3 GHz - Middle Channel

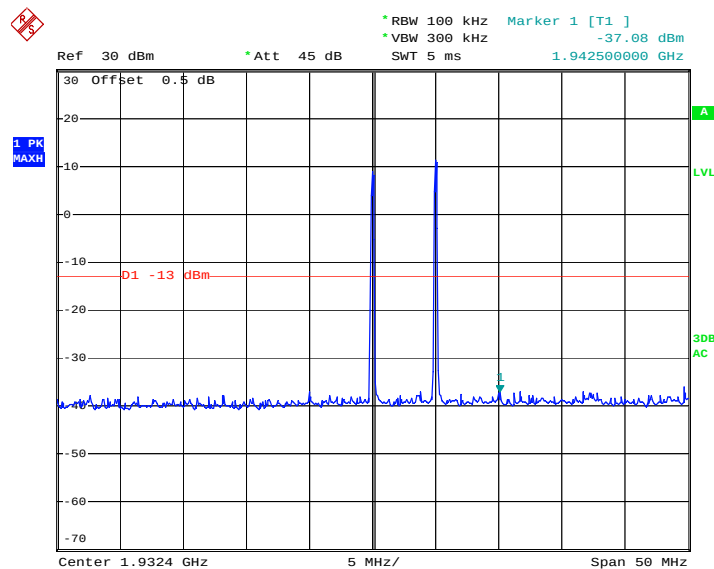


Date: 24.FEB.2011 17:07:23

3-20 GHz - Middle Channel

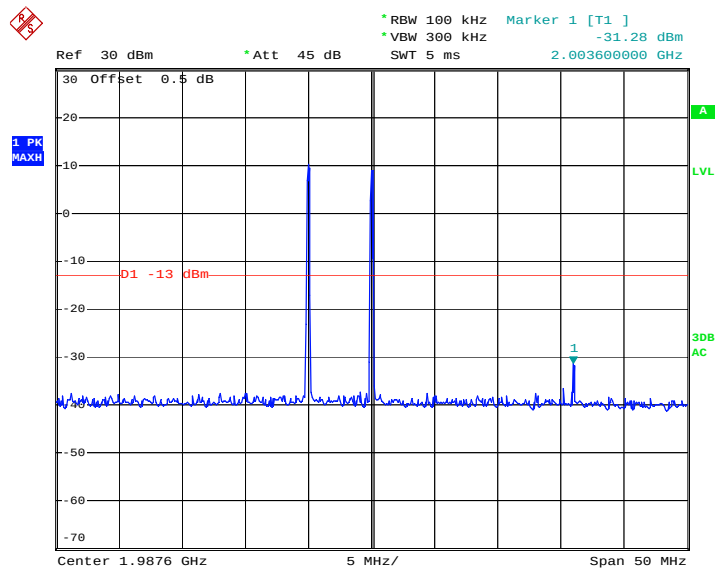


Two tone Inter modulation (Low Band edge)



Date: 24.FEB.2011 15:44:18

Two tone Inter modulation (High Band edge)

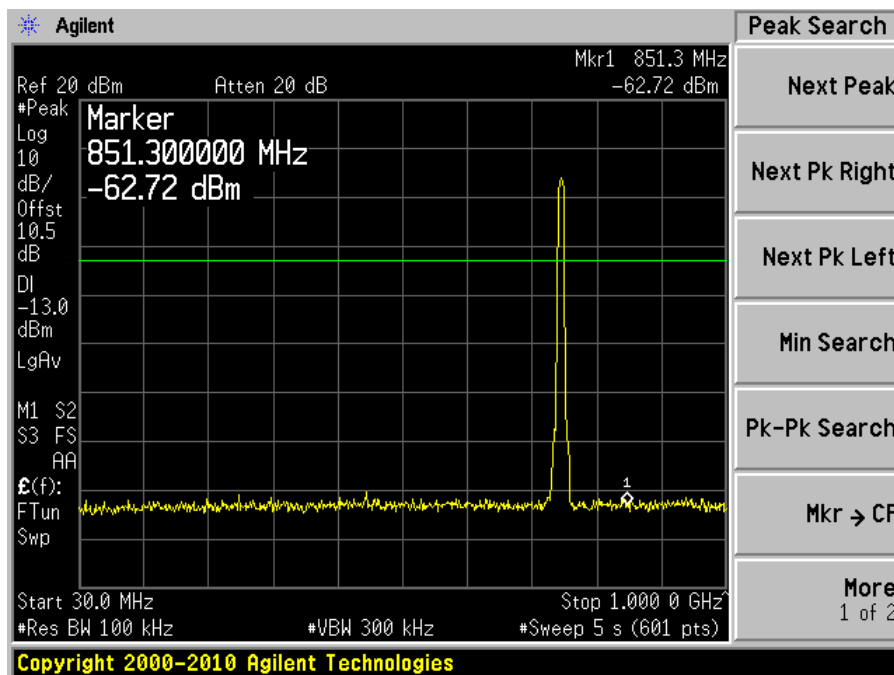


Date: 24.FEB.2011 15:45:11

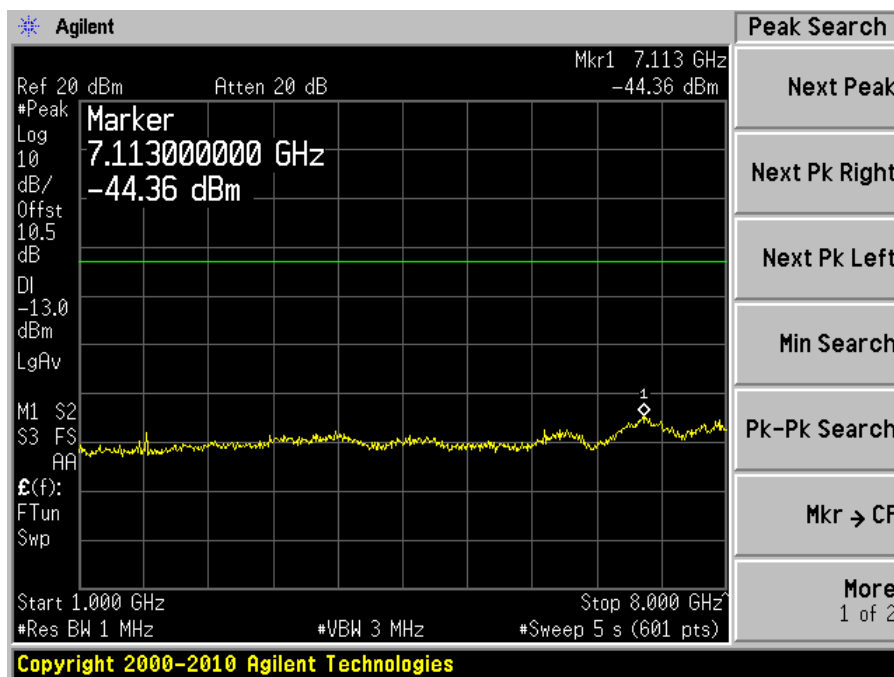
LTE Band (Part27)

Modulation: QPSK, 752 MHz

30MHz ~ 1GHz

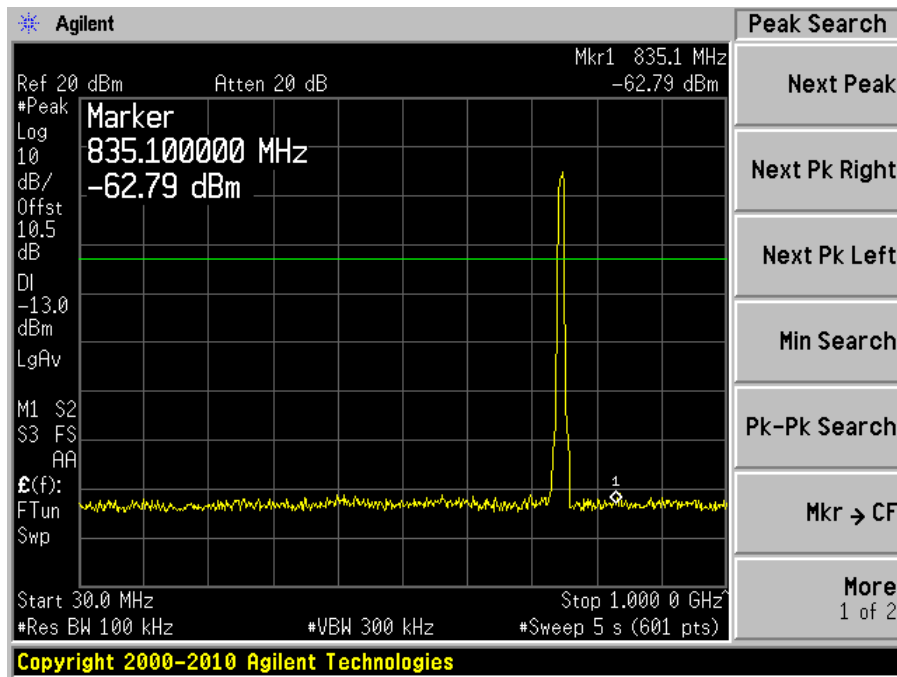


1GHz ~ 8GHz

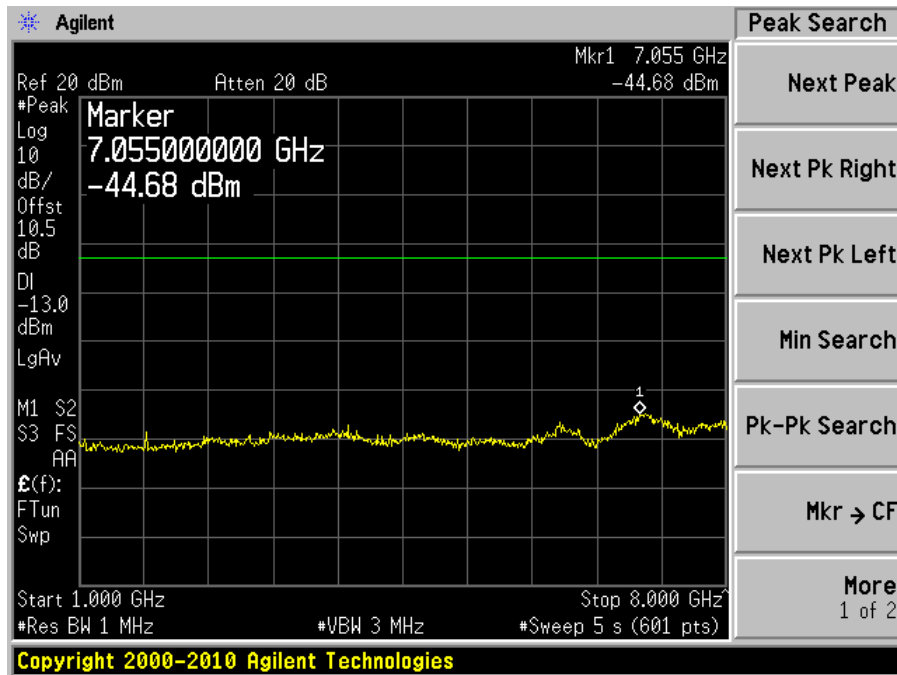


Modulation: 16QAM, 752MHz

30MHz ~ 1GHz

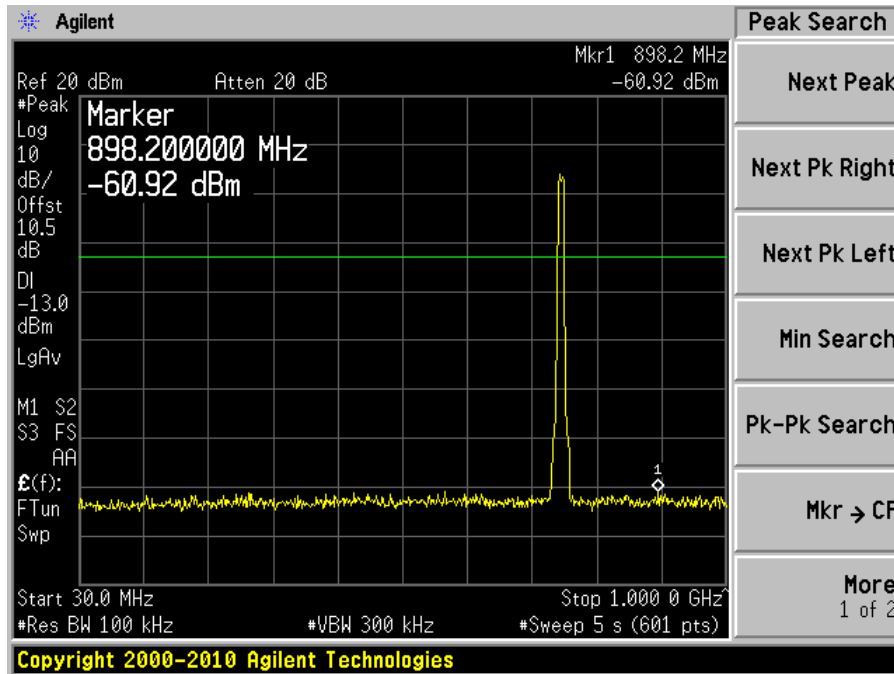


1GHz ~ 8GHz

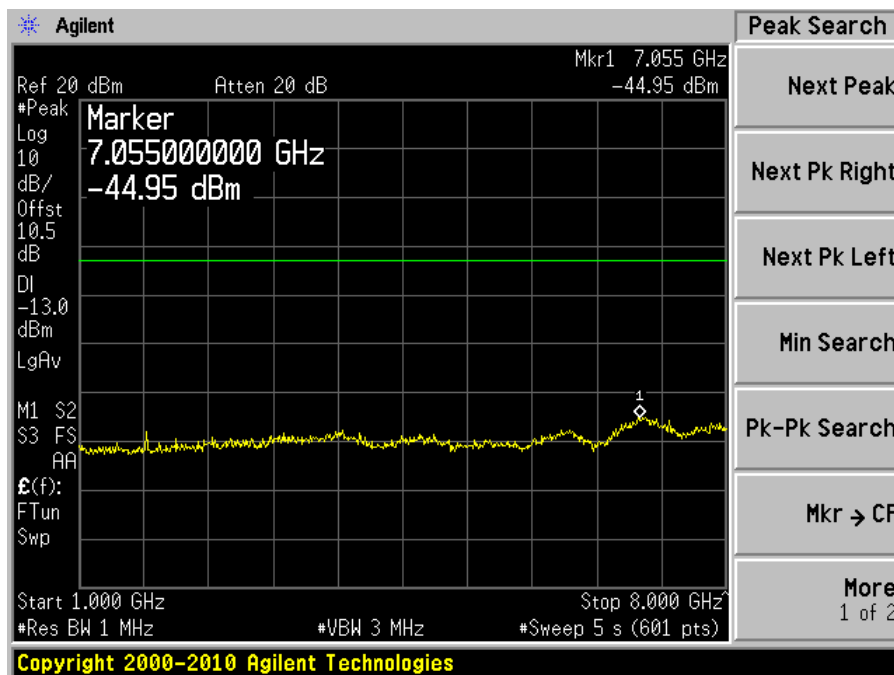


Modulation: 64QAM, 752MHz

30MHz ~ 1GHz



1GHz ~ 8GHz



FCC §2.1053, §22.917, §24.238 & §27.53 - SPURIOUS RADIATED EMISSIONS

Applicable Standards

FCC §2.1053, §22.917 § 24.238, and §27.53.

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = $10 \lg (\text{TXpwr in Watts}/0.001)$ – the absolute level

Spurious attenuation limit in dB = $43 + 10 \text{ Log}_{10} (\text{power out in Watts})$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052604	2010-05-05	2011-05-04
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2010-03-11	2011-03-11
HP	Spectrum Analyzer	8593A	2919A00242	2010-07-08	2011-07-07
HP	Amplifier	2VA-213+	T-E27H	2010-03-08	2011-03-07
HP	Signal Generator	HP8657A	2849U00982	2009-10-28	2010-10-27
HP	Amplifier	HP8447D	2944A09795	2010-08-02	2011-08-02
HP	Synthesized Sweeper	8341B	2624A00116	2009-11-07	2010-11-06
Com Power	Dipole Antenna	AD-100	041000	2009-09-25	2010-09-25
A.H. System	Horn Antenna	SAS-200/571	135	2010-05-17	2011-05-17
Agilent	ESG-D Series Signal Generator	E4432B	US38441663	2010-06-11	2011-06-10
Agilent	Spectrum Analyzer	E4446A	US44300386	2010-08-18	2011-08-17

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data**Environmental Conditions**

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Alvin Huang on 2011-03-01.

Test mode: Transmitting

GSM:

Cellular Band (Part 22H)

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
30 MHz-10 GHz, Middle Channel											
1717.03	59.67	15	1.3	V	1717.03	-40.5	6.2	1.0	-35.3	-13	22.3
1717.03	57.17	360	1.6	H	1717.03	-41.1	6.2	1.0	-35.9	-13	22.9
794.80	50.81	102	1.2	H	794.80	-44.3	0	0.6	-44.9	-13	31.9
794.80	50.56	125	1.8	V	794.80	-45.0	0	0.6	-45.6	-13	32.6

PCS Band (Part 24E)

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
30 MHz-20 GHz, Middle Channel											
1567.20	59.83	217	1.5	V	1567.20	-41.3	6.3	0.9	-35.9	-13	22.9
1575.75	55.50	254	1.2	H	1575.75	-44.4	6.3	0.9	-39.0	-13	26.0
794.80	50.85	142	1.3	H	794.80	-44.2	0	0.6	-44.8	-13	31.8
794.80	49.30	10	1.5	V	794.80	-46.3	0	0.6	-46.9	-13	33.9

EDGE:

Cellular Band (Part 22H)

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
30 MHz-10 GHz, Middle Channel											
1050.16	59.50	186	1.4	H	1050.16	-42.3	5.8	0.7	-37.2	-13	24.2
1050.12	60.83	0	1.6	V	1050.12	-43.0	5.8	0.7	-37.9	-13	24.9
794.80	51.01	125	1.6	H	794.80	-44.0	0	0.6	-44.6	-13	31.6
794.80	50.72	174	1.5	V	794.80	-44.7	0	0.6	-45.3	-13	32.3

PCS Band (Part 24E)

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
30 MHz-20 GHz, Middle Channel											
1567.20	60.15	253	1.9	V	1567.20	-41.0	6.3	0.9	-35.6	-13	22.6
1567.20	56.75	360	2.1	H	1567.20	-43.1	6.3	0.9	-37.7	-13	24.7
794.80	50.37	0	1.6	H	794.80	-44.8	0	0.6	-45.4	-13	32.4
794.80	50.15	0	1.7	V	794.80	-45.4	0	0.6	-46.0	-13	33.0

CDMA:

Cellular Band (Part 22H)

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
30 MHz-10 GHz, Middle Channel											
1567.20	59.24	10	1.7	V	1567.20	-42.0	6.3	0.9	-36.6	-13	23.6
1567.20	55.34	75	2.2	H	1567.20	-44.3	6.3	0.9	-38.9	-13	25.9
794.80	50.85	247	1.9	H	794.80	-44.3	0	0.6	-44.9	-13	31.9
794.80	51.24	120	1.5	V	794.80	-44.4	0	0.6	-45.0	-13	32.0

PCS Band (Part 24E)

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
30 MHz-20 GHz, Middle Channel											
1717.03	60.35	71	1.5	V	1717.03	-39.8	6.2	1.0	-34.6	-13	21.6
1717.03	58.10	43	1.4	H	1717.03	-40.2	6.2	1.0	-35.0	-13	22.0
794.80	51.34	275	1.6	V	794.80	-44.3	0	0.6	-44.9	-13	31.9
794.80	49.67	104	1.7	H	794.80	-45.4	0	0.6	-46.0	-13	33.0

WCDMA:

Cellular Band (Part 22H)

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
30 MHz-10 GHz, Middle Channel											
1567.20	60.02	176	1.5	V	1567.20	-41.1	6.3	0.9	-35.7	-13	22.7
1567.20	56.12	284	1.9	H	1567.20	-43.5	6.3	0.9	-38.1	-13	25.1
794.80	51.25	136	1.6	H	794.80	-44.0	0	0.6	-44.6	-13	31.6
794.80	50.00	0	1.3	V	794.80	-45.6	0	0.6	-46.2	-13	33.2

PCS Band (Part 24E)

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
30 MHz-20 GHz, Middle Channel											
1717.03	61.01	0	1.3	V	1717.03	-39.1	6.2	1.0	-33.9	-13	20.9
1717.03	58.57	0	1.7	H	1717.03	-39.5	6.2	1.0	-34.3	-13	21.3
794.80	50.10	0	1.5	H	794.80	-45.0	0	0.6	-45.6	-13	32.6
794.80	50.12	124	1.5	V	794.80	-45.3	0	0.6	-45.9	-13	32.9

LTE:

Modulation: QPSK

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
30 MHz-20 GHz											
1575.55	64.73	185	1	H	1575.55	-35.73	7.8	1.34	-29.27	-13	-16.27
1575.55	65.12	229	1.42	V	1575.55	-35.34	7.8	1.34	-28.88	-13	-15.88

Modulation: 16QAM

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
30 MHz-20 GHz											
1575.55	64.7	184	1	H	1575.55	-35.76	7.8	1.34	-29.3	-13	-16.3
1575.55	65.15	229	1.42	V	1575.55	-35.31	7.8	1.34	-28.85	-13	-15.85

Modulation: 64QAM

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
30 MHz-20 GHz											
1575.55	64.74	185	1	H	1575.55	-35.72	7.8	1.34	-29.26	-13	-16.26
1575.55	65.11	229	1.42	V	1575.55	-35.35	7.8	1.34	-28.89	-13	-15.89

FCC §22.917(a), §24.238(a) & §27.53 - BAND EDGES

Applicable Standards

According to FCC § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

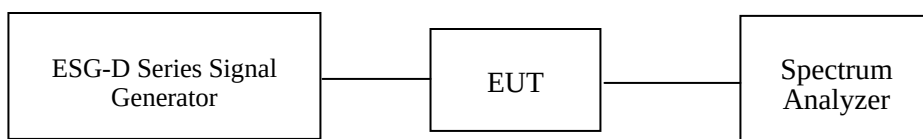
According to FCC §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to FCC § 27.53, the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency, RBW set to 10 kHz.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Spectrum Analyzer	8593A	2919A00242	2010-07-08	2011-07-07
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2010-11-24	2011-11-23
Agilent	ESG-D Series Signal Generator	E4432B	US38441663	2010-06-11	2011-06-10
Agilent	Spectrum Analyzer	E4446A	US44300386	2010-08-18	2011-08-17

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Alvin Huang on 2011-02-23 to 2011-03-26.

Please refer to the following tables and plots.

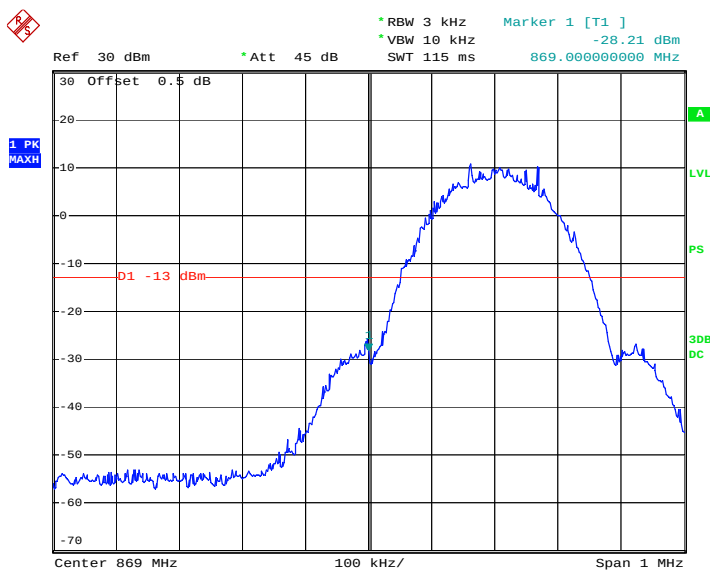
GSM:

Cellular Band (Part 22H)

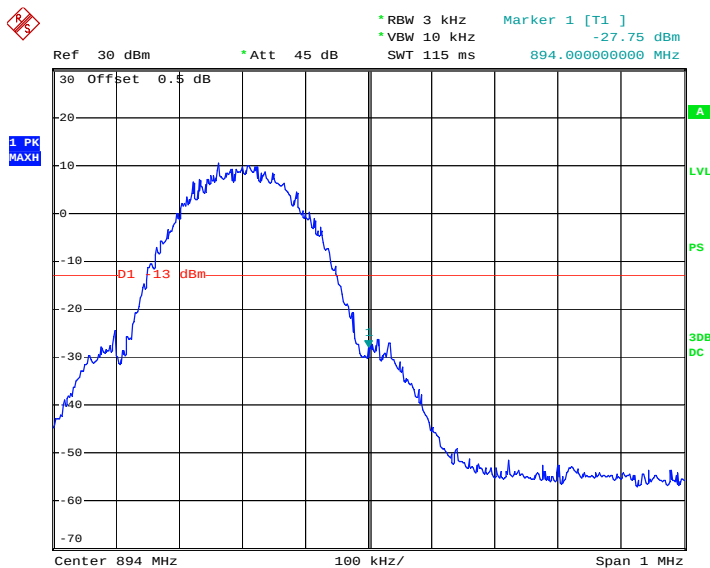
Frequency (MHz)	Emission (dBm)	Limit (dBm)
869	-28.21	-13
894	-27.75	-13

PCS Band (Part 24E)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1930	-29.49	-13
1990	-31.40	-13

Downlink (Part 22H):**Cellular Band, Lowest Channel**

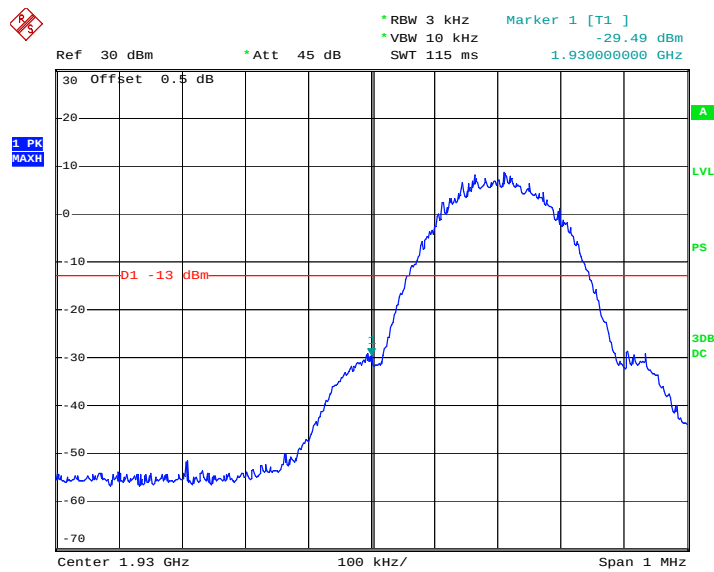
Date: 23.FEB.2011 18:59:25

Cellular Band, Highest Channel

Date: 23.FEB.2011 19:00:24

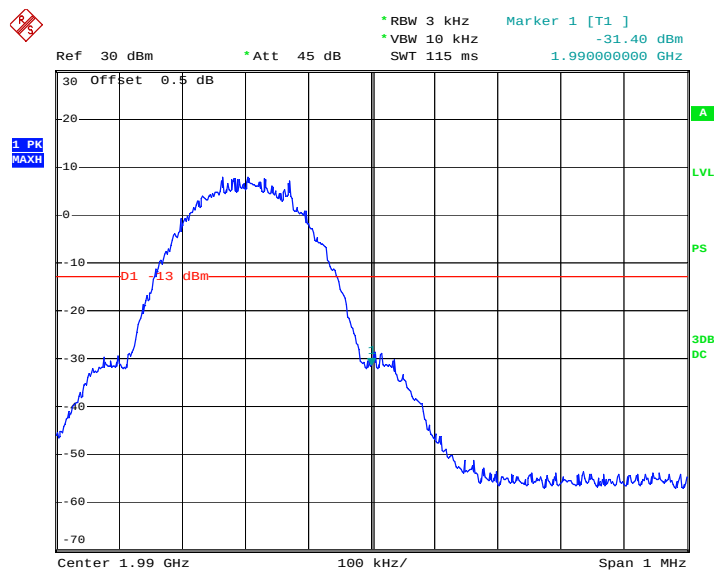
Downlink (Part 24H)

PCS Band, Lowest Channel



Date: 23.FEB.2011 20:02:53

PCS Band, Highest Channel



Date: 23.FEB.2011 20:03:26

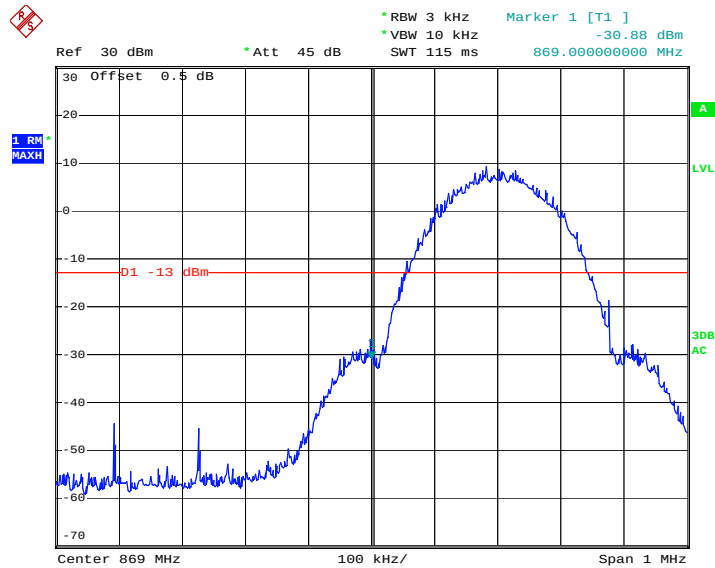
EDGE:

Cellular Band (Part 22H)

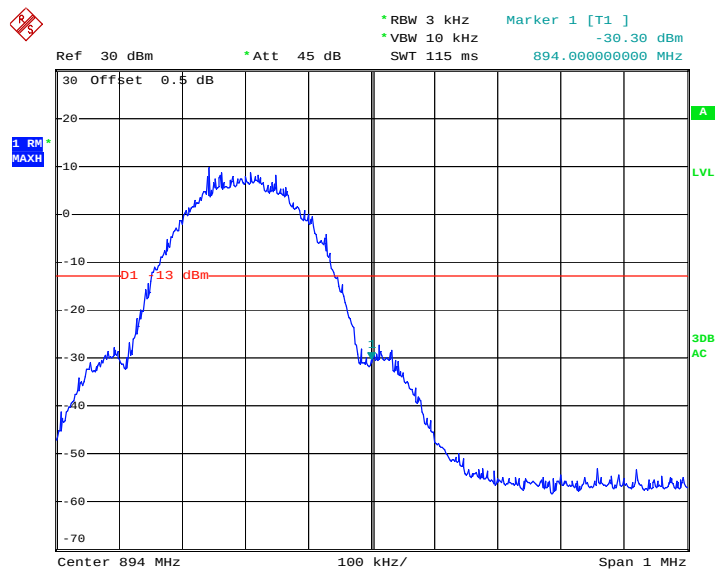
Frequency (MHz)	Emission (dBm)	Limit (dBm)
869	-30.88	-13
894	-30.30	-13

PCS Band (Part 24E)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1930	-34.80	-13
1990	-32.97	-13

Downlink (Part 22H):**Cellular Band, Lowest Channel**

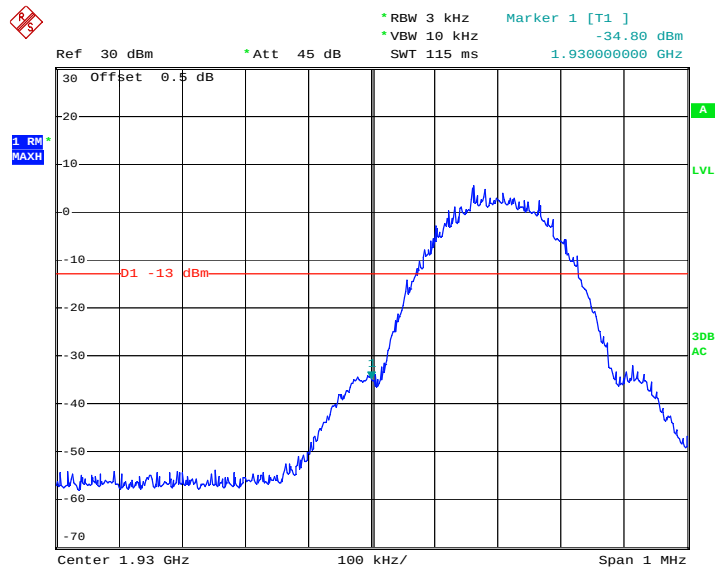
Date: 26.FEB.2011 11:14:34

Cellular Band, Highest Channel

Date: 26.FEB.2011 11:14:02

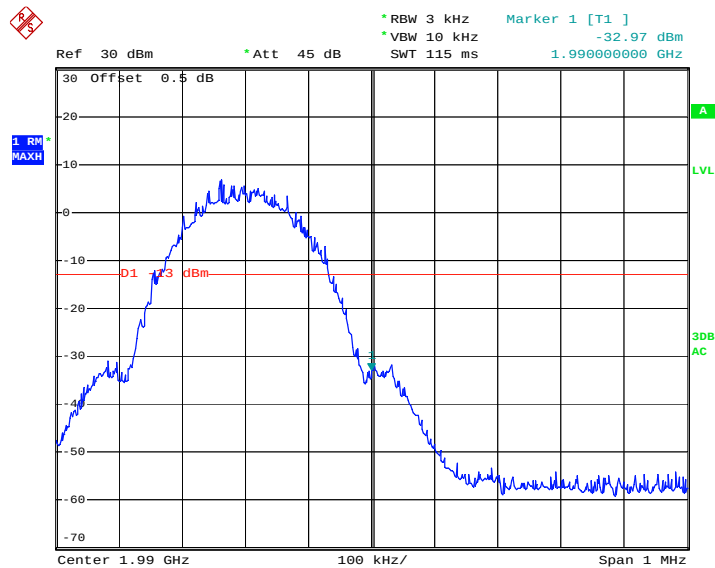
Downlink (Part 24H)

PCS Band, Lowest Channel



Date: 26.FEB.2011 11:15:55

PCS Band, Highest Channel



Date: 26.FEB.2011 11:16:23

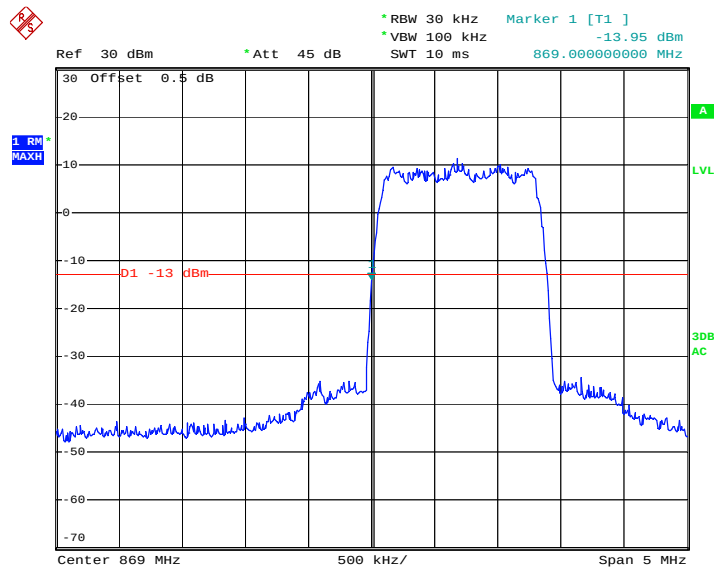
CDMA:

Cellular Band (Part 22H)

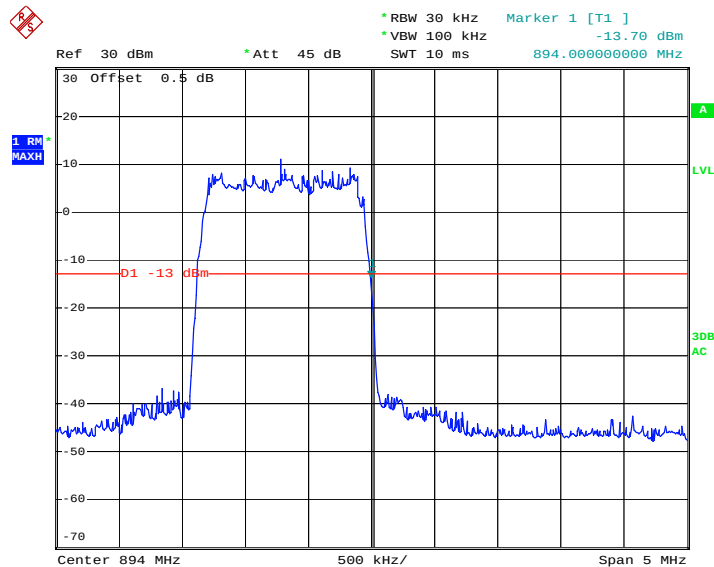
Frequency (MHz)	Emission (dBm)	Limit (dBm)
869	-13.95	-13
894	-13.70	-13

PCS Band (Part 24E)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1930	-44.15	-13
1990	-45.69	-13

Downlink (Part 22H):**Cellular Band, Lowest Channel**

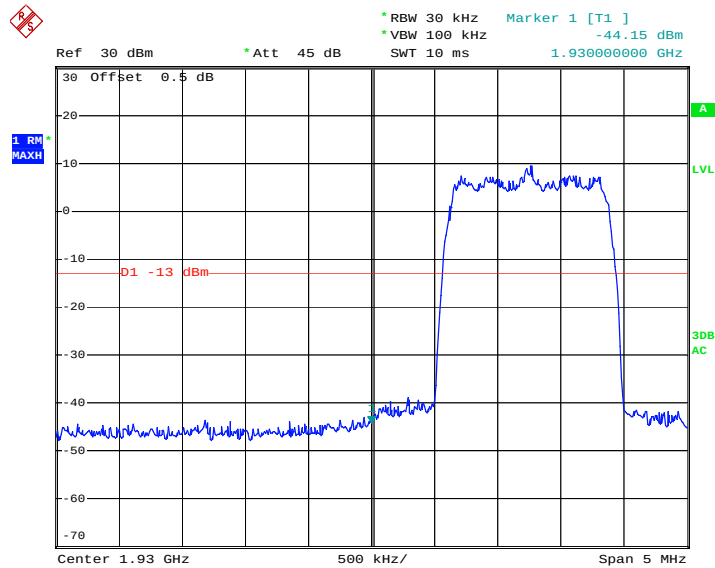
Date: 26.FEB.2011 09:29:26

Cellular Band, Highest Channel

Date: 26.FEB.2011 09:36:18

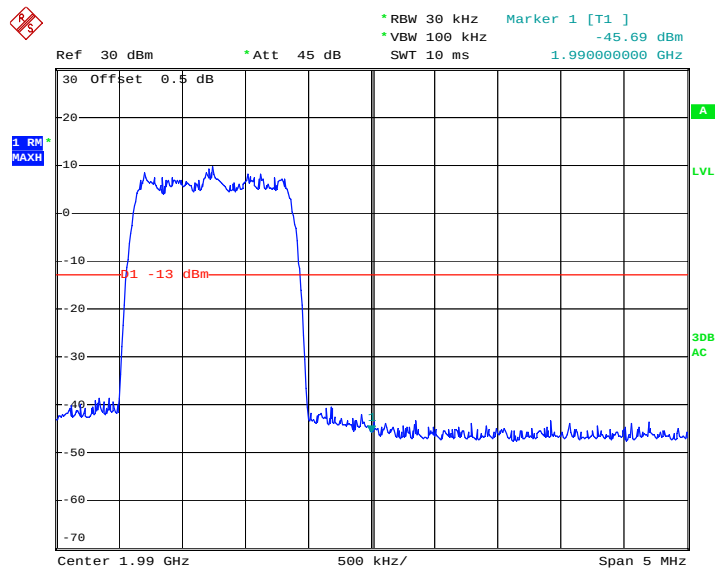
Downlink (Part 24H)

PCS Band, Lowest Channel



Date: 26.FEB.2011 09:51:06

PCS Band, Highest Channel



Date: 26.FEB.2011 09:51:34

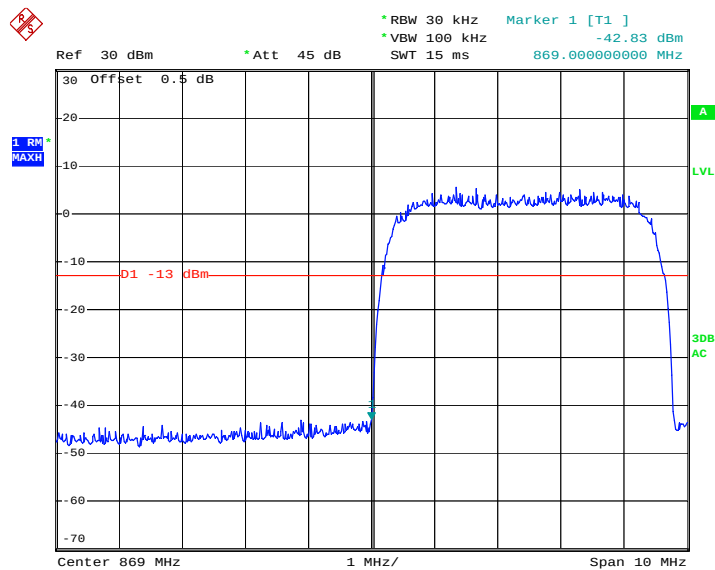
WCDMA:

Cellular Band (Part 22H)

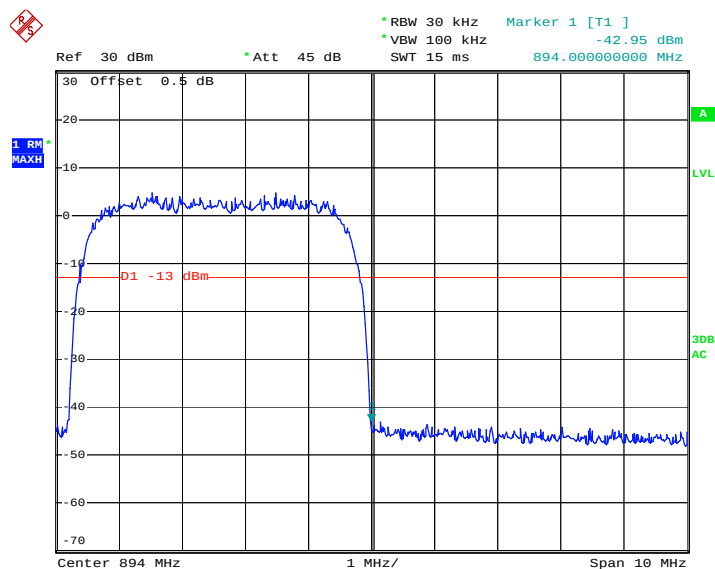
Frequency (MHz)	Emission (dBm)	Limit (dBm)
869	-42.83	-13
894	-42.95	-13

PCS Band (Part 24E)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1930	-28.37	-13
1990	-27.63	-13

Downlink (Part 22H):**Cellular Band, Lowest Channel**

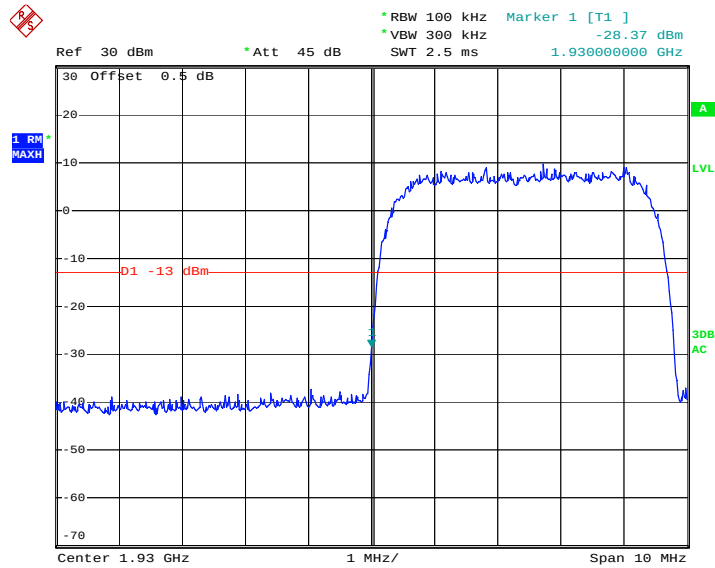
Date: 26.FEB.2011 10:09:58

Cellular Band, Highest Channel

Date: 26.FEB.2011 10:10:42

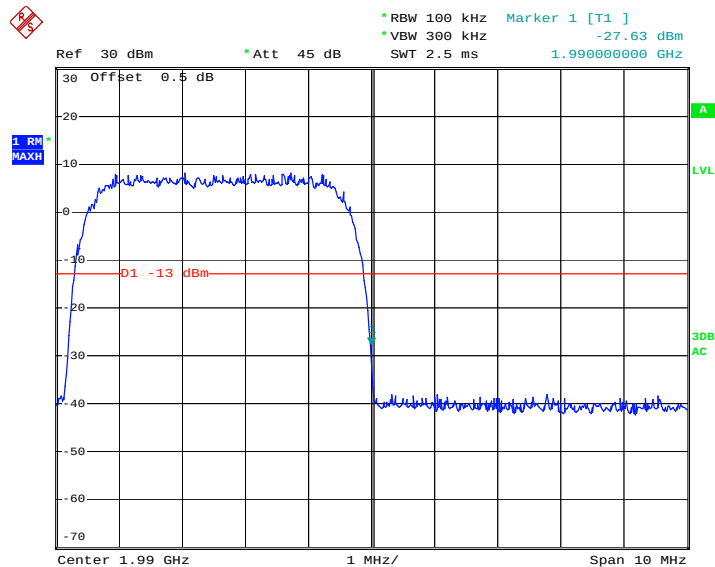
Downlink (Part 24H)

PCS Band, Lowest Channel



Date: 26.FEB.2011 10:18:10

PCS Band, Highest Channel



Date: 26.FEB.2011 10:17:34

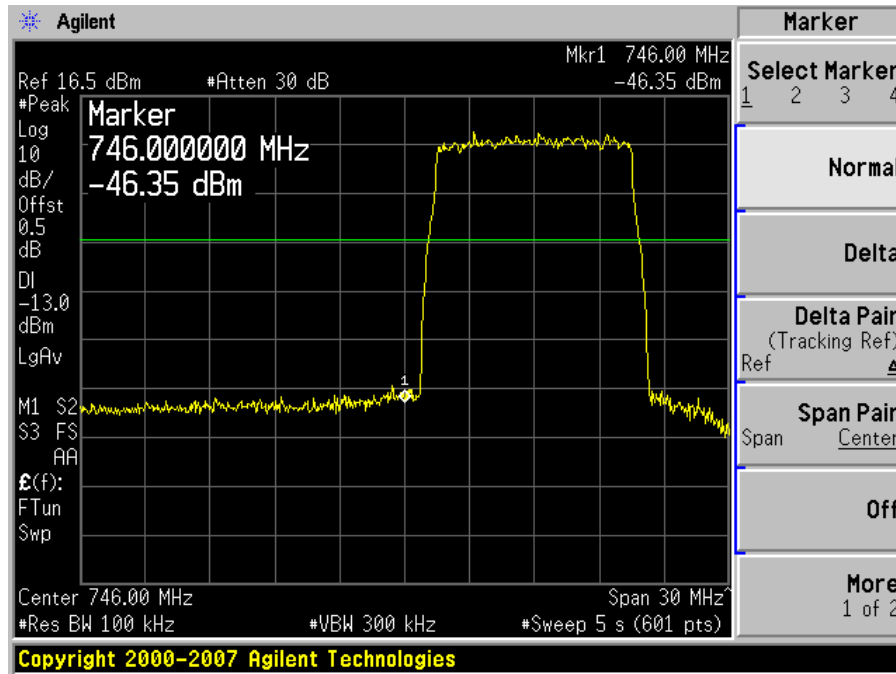
LTE:

LTE (Part 27)

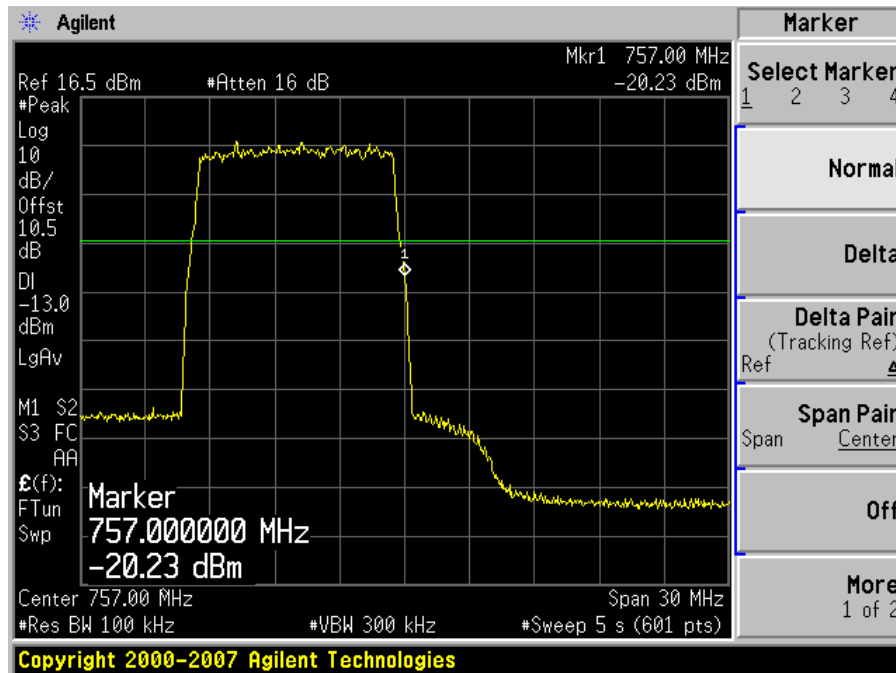
Modulation	Frequency (MHz)	Emission (dBm)	Limit (dBm)
QPSK	752	-20.23	-13
16QAM	752	-20.83	-13
64QAM	752	-18.83	-13

Modulation: QPSK

Lowest Edge

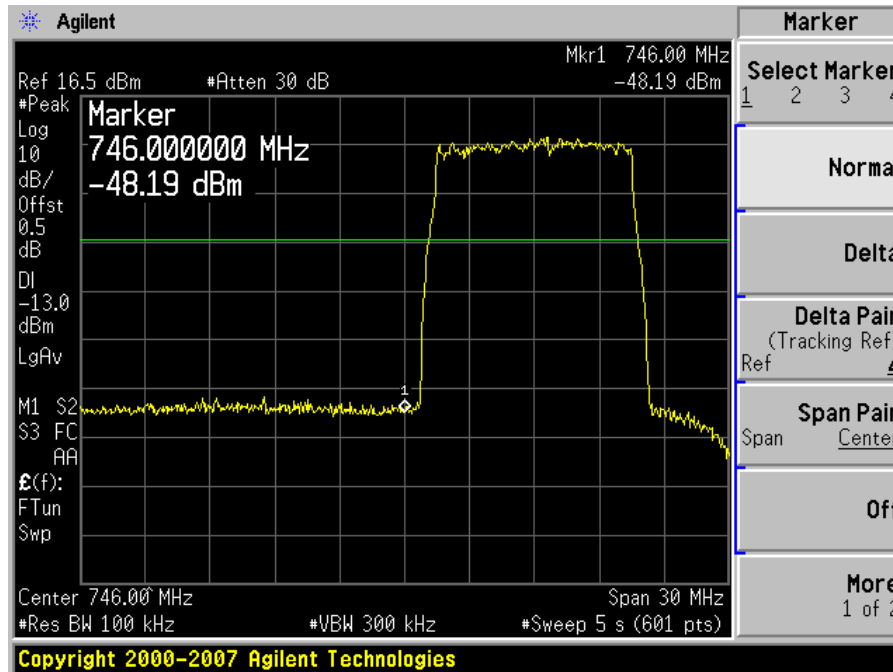


Highest Edge

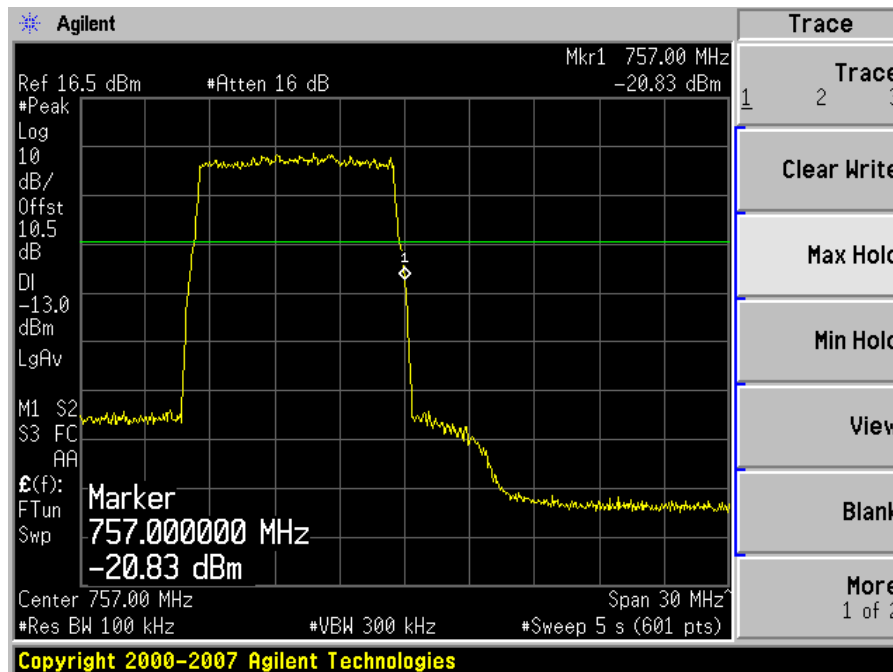


Modulation: 16QAM

Lowest Edge

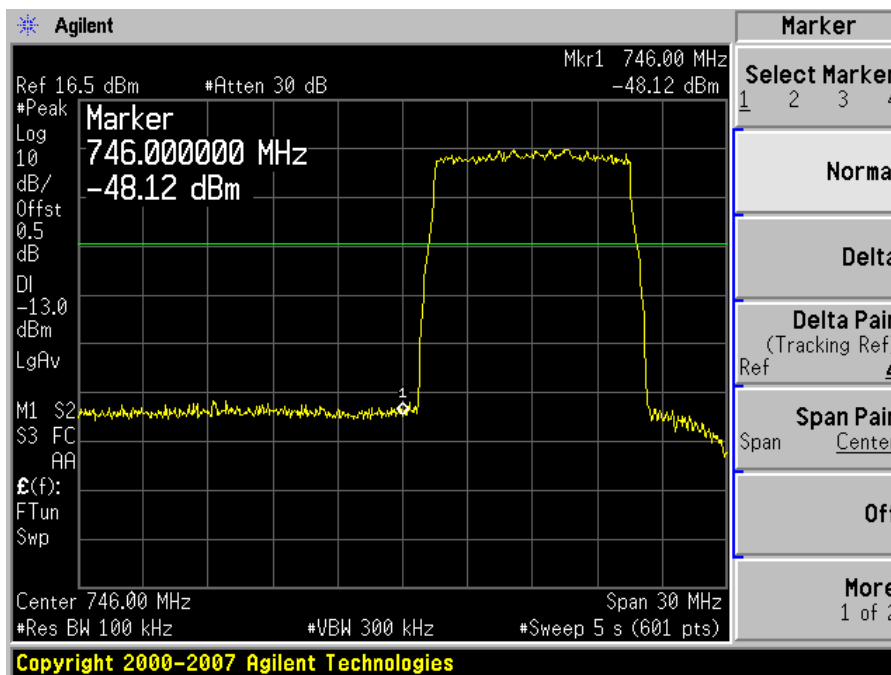


Highest Edge

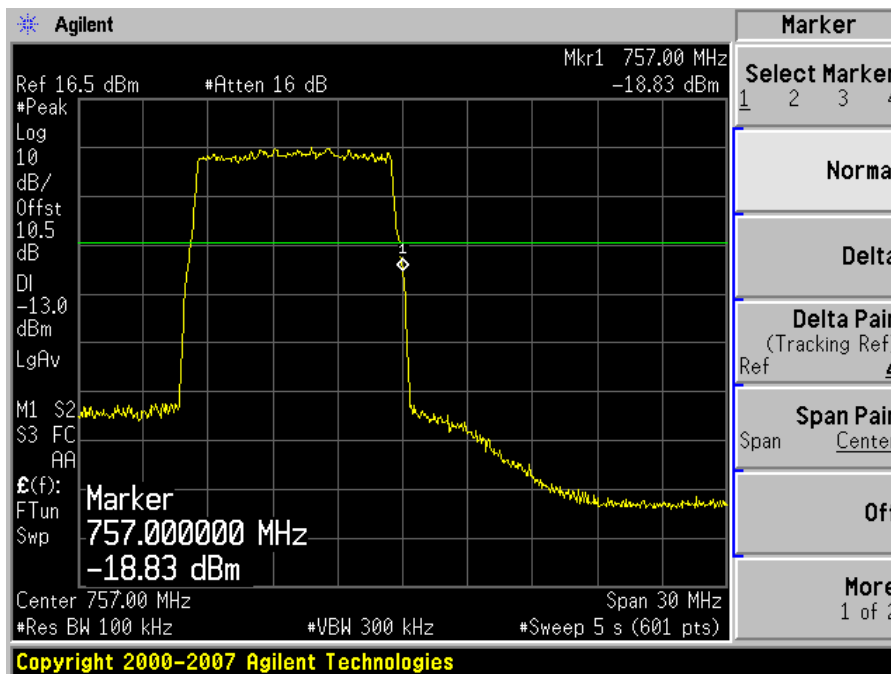


Modulation: 64QAM

Lowest Edge



Highest Edge



FCC §2.1055, §22.355, §24.235 & § 27.54 – FREQUENCY STABILITY

Applicable Standard

According to FCC §2.1055 the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Test Procedure

The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from - 30 °C to + 50 °C using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from battery end point to 115 % of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

Specification — the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency.

CW was tested as worst case.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Alvin Huang on 2011-03-01.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Tenney	Temperature Oven	Versa Tenn	12.431-8	2010-06-25	2011-06-24
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2010-11-24	2011-11-23
Agilent	ESG-D Series Signal Generator	E4432B	US38441663	2010-06-11	2011-06-10
Agilent	Spectrum Analyzer	E4446A	US44300386	2010-08-18	2011-08-17

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Results**Cellular 850 Band:**

The EUT is tested at 881.6 MHz with CW

Test Environment		Frequency Error (Hz)	Frequency Error (ppm)
Voltage (AC)	Temperature (°C)		
Frequency Drift with Supply Temperature Variation			
120	-30	79	0.08961
120	-20	75	0.08507
120	-10	71	0.08054
120	0	69	0.07827
120	10	68	0.07713
120	20	72	0.08167
120	30	75	0.08507
120	40	76	0.08621
120	50	70	0.07940
Frequency Drift with Supply Voltage Variation			
102	20	68	0.07713
138	20	62	0.07034

PCS 1900 Band

The EUT is tested at 1860.0 MHz with CW

Test Environment		Frequency Error (Hz)	Frequency Error (ppm)
Voltage (AC)	Temperature (°C)		
Frequency Drift with Supply Temperature Variation			
120	-30	89	0.047849
120	-20	85	0.045699
120	-10	81	0.043548
120	0	76	0.04086
120	10	82	0.044086
120	20	84	0.045161
120	30	90	0.048387
120	40	88	0.047312
120	50	91	0.048925
Frequency Drift with Supply Voltage Variation			
102	20	85	0.045699
138	20	89	0.047849

LTE 700 Band

The EUT is tested at 752 MHz with CW

Test Environment		Frequency Error (Hz)	Frequency Error (ppm)
Voltage (AC)	Temperature (°C)		
Frequency Drift with Supply Temperature Variation			
120	-30	51	0.067819
120	-20	52	0.069149
120	-10	50	0.066489
120	0	55	0.073138
120	10	56	0.074468
120	20	52	0.069149
120	30	53	0.070479
120	40	59	0.078457
120	50	55	0.073138
Frequency Drift with Supply Voltage Variation			
102	20	50	0.066489
138	20	53	0.070479

******* END OF REPORT *******