



FCC RF Test Report

**Product Name: LTE/CDMA 1X/EVDO Mobile Phone with
Bluetooth**

Model Number: HUAWEI M920

**Report No: SYBH(Z-RF)005112011-2002
FCC ID: QISM920**

Reliability Laboratory of Huawei Technologies Co., Ltd.

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Notice

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2. The laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 97456.
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Applicant: Huawei Technologies Co., Ltd.
Address: Huawei Base, Bantian, Longgang District, Shenzhen
518129, P.R. China
Date of Receipt Test Item: Nov.07, 2011
Start Date of Test: Nov.07, 2011
End Date of Test: Nov.25, 2011

Test Result: Pass

Approved By

Nov.26, 2011
Date

Dai Linjun
Name

Dai Linjun
Signature

Reviewed By

Nov.26, 2011
Date

Cousy Xu
Name

Cousy XU
Signature

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Nov.26, 2011
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Name

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1 General Information

1.1 Applied Standard

Applied Rules: 47 CFR FCC Part 2, Subpart J
47 CFR FCC Part 24, Subpart E
ANSI/TIA 603C:2004
KDB 971168 D01 Power Meas License Digital Systems v01

1.2 Test Location

Test Location 1: Reliability Laboratory of Huawei Technologies Co., Ltd.
Address: Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R.
China

1.3 Test Environment Condition

Ambient Temperature: 20 – 25 °C
Ambient Relative Humidity: 45 – 55 %
Atmospheric Pressure: 101 kPa

2 Summary

Table 1 Summary of results

PCS Band			
Test Case	FCC Part No.	Requirements	Result
Transmitter Output Power	2.1046 & 24.232	Peak EIRP not exceed 2 W Peak-to-average ratio not exceed 13 dB	Pass
Modulation Characteristics	2.1047	Digital modulation	Pass
Occupied Bandwidth	2.1049	(Not specified)	Pass
Band Edges Compliance	2.1051 & 24.238	Below -13 dBm/1%*EBW, in 1 MHz range	Pass
Spurious Emission at Antenna Terminals	2.1051 & 24.238	Below -13 dBm/1 kHz, 9 kHz to 150 kHz Below -13 dBm/10 kHz, 150 kHz to 30 MHz Below -13 dBm/1 MHz, 30 MHz to 10 th harmonics	Pass
Field Strength of Spurious Radiation	2.1053 & 24.238	Below -13 dBm/1 MHz	Pass
Frequency Stability	2.1055 & 24.235	Stay within the authorized frequency block	Pass

3 Product Description

3.1 Production Information

3.1.1 General Description

LTE/CDMA 1X/EVDO Mobile Phone with Bluetooth HUAWEI M920 is subscriber equipment in the LTE/CDMA system. The LTE frequency band is Band II and Band IV. The CDMA frequency band includes US Cellular, PCS, AWS, only Band II and PCS bands test data included in this report. The Mobile Phone implements such functions as RF signal receiving/transmitting, LTE/CDMA protocol processing, voice, video, MMS service, GPS, AGPS and WIFI etc. Externally it provides micro SD card interface, earphone port (to provide voice service). It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices.

3.1.2 Board

Table 1 Board Information

LTE/CDMA 1X/EVDO Mobile Phone with Bluetooth		
HUAWEI M920		
Main board		
Software Version	Hardware Version	Serial Number
M920V100R001C177B202SP0 8	Ver.A	B7PIEC11A2600091

3.1.3 Sub-Assembly

Sub-Assembly Name	Manufacturer	Description
AC/DC Adapter	Huawei Technologies Co., Ltd.	Model: HW-050100U1W Input voltage: ~100-240V (AC)50/60Hz 0.2A Output voltage: 5V  1A Rated Power: 5W

3.1.4 Battery Technical Data

Name	Manufacture	Description
Rechargeable Li-ion	Huawei Technologies Co., Ltd.	Battery Model: HB5F1H Rated capacity: 1880 mAh Nominal Voltage:  +3.7V Charging Voltage:  +4.2V

4 Test Description

4.1 Supported Frequency Range

Characteristics	Description
Downlink	1930 to 1990 MHz
Uplink	1850 to 1910MHz

4.2 Transmitter / Receiver Characteristics

Characteristics	Description
System Type	CDMA LTE
TX Output Power (per Antenna Port)	2 W (= 33 dBm)
Channel Spacing(s) / Bandwidth(s)	CDMA system: 1.23 MHz (Celluar band) 1.25 MHz (Other than Cellular band) LTE system: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz
Designation of Emissions	CDMA system: 1M23F9W (Celluar band) 1M25F9W (Other than Cellular band) LTE system: 1M10D9W (1.4 MHz channel bandwidth), 2M70D9W (3.0 MHz channel bandwidth), 4M50D9W (5.0 MHz channel bandwidth), 9M00D9W (10 MHz channel bandwidth),

4.3 Antenna Gain

Antenna Gain(dBi) of CDMA	-1.49
Antenna Gain(dBi) of LTE	-0.86

4.4 Power Supply

	Description
Power Supply Type	Directly Connected to DC /AC Power Supply
Input to EUT (DC power)	DC Voltage Nominal:  +5V DC Voltage Range:  +4.75 V to +5.25V
Input to EUT (AC power)	AC Voltage Nominal: ~ 220V (50/60 Hz) AC Voltage Range: ~ 100V-240V

5 General Test Conditions / Configurations

5.1 RF Channels under Test

Test Mode	TX / RX	RF Channel		
		Bottom (B)	Middle (M)	Top (T)
TM1/TM3/ Subtype 0/ Subtype 2	TX	Channel 25	Channel 600	Channel 1175
		1851.25MHz	1880.0MHz	1908.75MHz
	RX	Channel 25	Channel 600	Channel 1175
		1931.25MHz	1960.0MHz	1988.75MHz
LTE	TX (1.4M)	Channel 18607	Channel 18900	Channel 19193
		1850.7 MHz	1880.0MHz	1930.7 MHz
	TX (3M)	Channel 18615	Channel 18900	Channel 19185
		1851.5 MHz	1880.0MHz	1931.5 MHz
	TX (5M)	Channel 18625	Channel 18900	Channel 19175
		1852.5 MHz	1880.0MHz	1932.5 MHz
	TX (10M)	Channel 18650	Channel 18900	Channel 19150
		1855.0 MHz	1880.0MHz	1935.0 MHz
	RX (1.4M)	Channel 607	Channel 900	Channel 1193
		1909.3 MHz	1960.0MHz	1989.3 MHz
	RX (3M)	Channel 615	Channel 900	Channel 1185
		1908.5 MHz	1960.0MHz	1988.5MHz
	RX (5M)	Channel 625	Channel 900	Channel 1175
		1907.5 MHz	1960.0MHz	1987.5 MHz
	RX (10M)	Channel 650	Channel 900	Channel 1150
		1905.0 MHz	1960.0MHz	1985.0 MHz

5.2 Test Modes

Test Mode	Test Modes Description
TM1/TM3	CDMA2000 1x
Subtype 0/ Subtype 2	CDMA2000 1x EV-DO
TM4	LTE QPSK modulation
TM5	LTE 16QAM modulation

5.3 Test Environments

Environment Parameter	Selected Values During Tests	
Relative Humidity	Ambient	
Temperature	TN	Ambient
Voltage	VL	3.5V
	VN	3.7V
	VH	4.2V

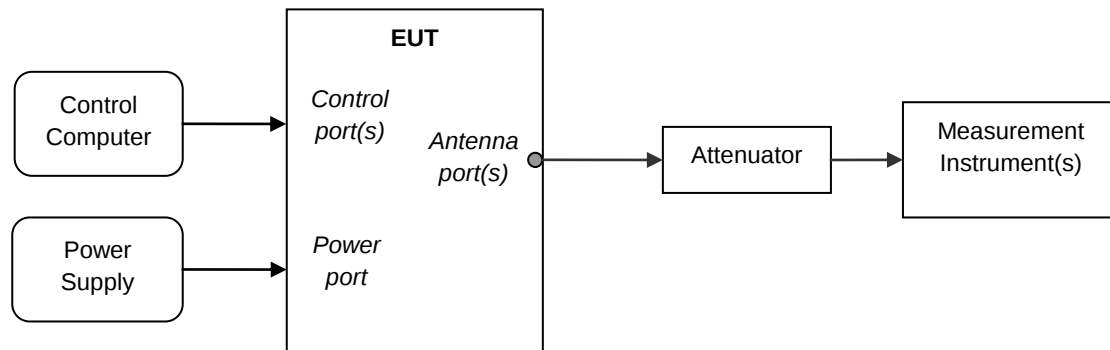
NOTE: VL= lower extreme test voltages
VN= nominal voltage
VH= upper extreme test voltage
TN= normal temperature

5.4 Test Setups

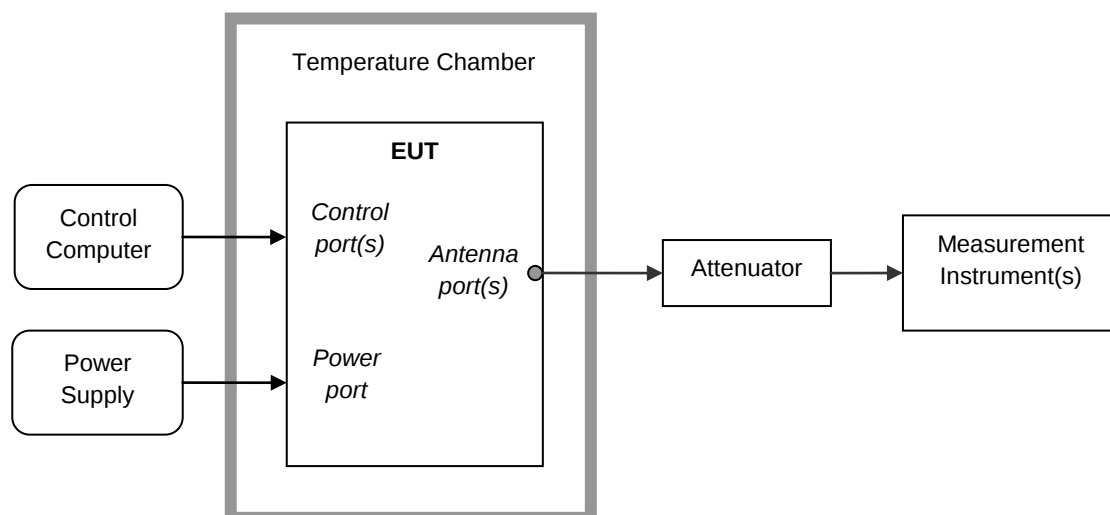
5.4.1 General Test Setup Configurations

Configuration	Description
Test Antenna Ports	Until otherwise declared, all TX tests are ONLY performed at the main Transmitter antenna port (e.g. TRXA, TXA and so on) of the EUT, and all RX tests are ONLY performed at the main Receiver antenna port (e.g. TRXA, RXA and so on) of the EUT.
Multiple RF Sources	Other than the tested RF source of the EUT, other RF source(s) are disabled or shutdown during measurements.

5.4.2 Test Setup 1



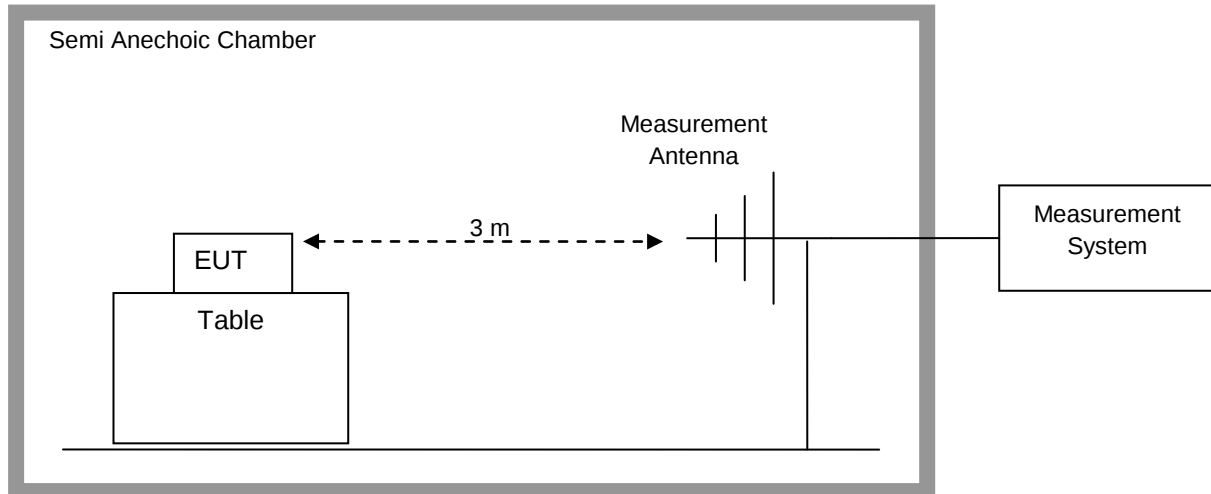
5.4.3 Test Setup 2



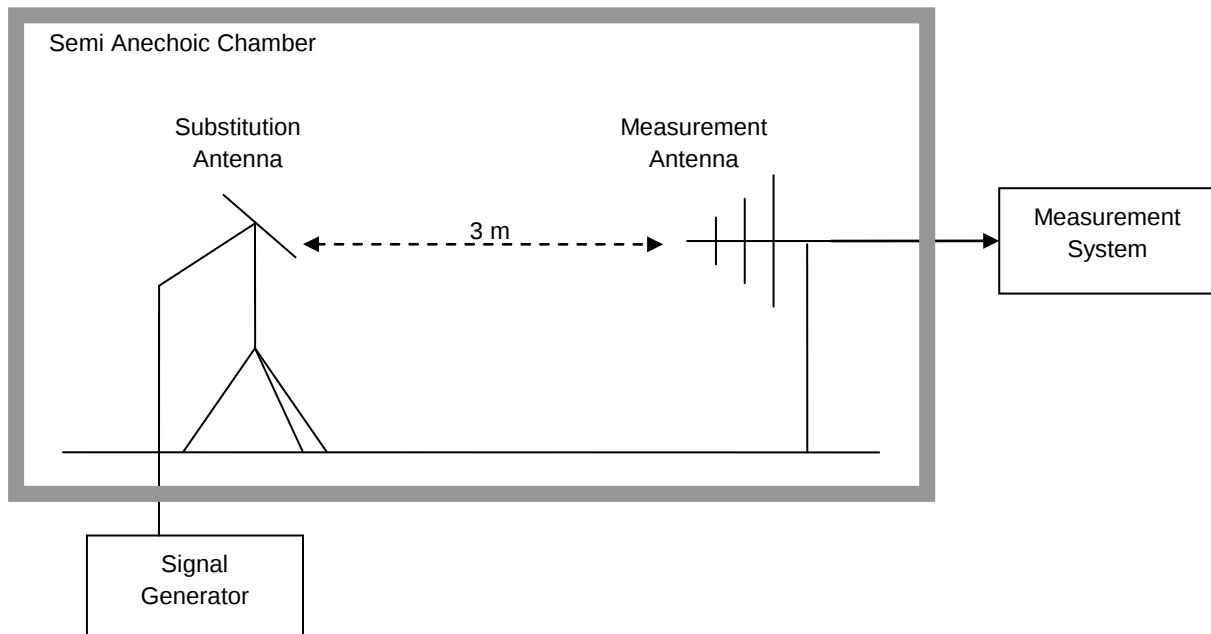
5.4.4 Test Setup 3

NOTE: Efficient Isotropic Radiated Power (EIRP) refers to the radiation power output of the EUT, assuming all emissions are radiated from half-wave dipole antennas.

Step 1: Pre-test



Step 2: Substitution method to verify the maximum EIRP



5.5 Test Conditions

Test Case	Test Conditions	
Transmitter Output Power	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Seup 1
	Detector	RMS
	RF Channels (TX)	B, M, T
	Test Mode	TM1/TM3/ Subtype 0/ Subtype 2/TM4//TM5
Modulation Characteristics	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Seup 1
	RF Channels (TX)	M
	Test Mode	TM1/TM3/ Subtype 0/ Subtype 2/TM4/TM5
Occupied Bandwidth	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Seup 1
	Detector	PK
	RF Channels (TX)	B, M, T
	Test Mode	TM1/TM3/ Subtype 0/ Subtype 2/TM4/TM5
Band Edges Compliance	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Seup 1
	Detector	RMS
	RF Channels (TX)	B, T
	Test Mode	TM1/TM3/ Subtype 0/ Subtype 2/TM4/TM5
Spurious Emission at Antenna Terminals	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Seup 1
	Detector	PK
	RF Channels (TX)	B, M,T
	Test Mode	TM1/TM3/ Subtype 0/ Subtype 2/TM4
Field Strength of Spurious Radiation	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Seup 3
	Detector	PK
	RF Channels (TX)	M
	Test Mode	TM1/TM3/ Subtype 0/ Subtype 2/TM4
Frequency Stability	Test Configuration	(1) -30 °C to +50 °C with step 10 °C at Rated Voltage; (2) 85%, 100% and 115% of Rated Voltage at Ambient Temperature.



Test Case	Test Conditions	
	Test Setup	Test Seup 2
	RF Channels (TX)	M
	Test Mode	TM1/TM3/ Subtype 0/ Subtype 2/TM4

6 Main Test Instruments

Table 2 Main Test Equipments

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until
Power supply	KEITHLEY	2303	1288003	Sep.27,2012
Universal Radio Communication Tester	R&S	CMU200	117341	Jan.13.2012
Universal Radio Communication Tester	Agilent	E5515C	MY50260239	Aug.31,2012
Spectrum Analyzer	Agilent	E4440A	MY49420179	Apr.20,2012
Signal Analyzer	R&S	FSQ31	200021	Sep.27,2012
Temperature Chamber	WEISS	WKL64	24600294	Jan.03,2012
Signal generator	Agilent	E8257D	MY49281095	Jul.9.2012
Test receiver	R&S	ESU26	100150	May.29.2012
Tunable Dipole	Schwarzbeck	D69250-UHAP/D69250-VHAP	919/1009	Jan.29.2012
Tunable Dipole	Schwarzbeck	D69250-UHAP/D69250-VHAP	979/917	Jan.29.2012
Horn Antenna	R & S	HF906	100683	May.15, 2012
Horn Antenna	R & S	HF906	100684	Jul.01, 2012
Broadband Antenna	Schwarzbeck	VULB 9163	9163-357	May.15, 2012
Broadband Antenna	Schwarzbeck	VULB 9163	9163-356	May.15, 2012
Universal Radio Communication Tester	R & S	CMW500	20347676	Sep.07,2012
Universal Radio Communication Tester	Anritsu	MT8820C	6200971028	May.04, 2012

7 Test Results

No.	Test Item	Test Result
1	Transmitter Output Power	Appendix A
2	Modulation Characteristics	Appendix B
3	Occupied Bandwidth	Appendix C
4	Band Edges Compliance	Appendix D
5	Spurious Emission at Antenna Terminals	Appendix E
6	Field Strength of Spurious Radiation	Appendix F
7	Frequency Stability	Appendix G
8	Photos of Radiated Spurious Emissions	Appendix H

NOTE: The Appendix H only photos of Radiated Spurious Emissions, no test data.

8 Measurement Uncertainty

For a 95% confidence level ($k=2$), the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

Test Item		Extended Uncertainty
Transmitter Output Power	Power (dBm)	U =0.39 dB
Occupied Bandwidth	Magnitude (%)	U=0.2%
Band Edge Compliance	Disturbance Power (dBm)	U=2.0 dB
Conducted Spurious Emissions	Disturbance Power (dBm)	U=2.0 dB
Field Strength of Spurious Radiation	ERP (dBm)	U=4.6 dB (30 MHz – 1GHz) U=3.0 dB (above 1 GHz)
Frequency Stability	Frequency Accuracy (ppm)	U=0.21 ppm



Appendix A

Transmitter Output Power

According to FCC Part 2.1046 & Part24.232



Conducted Power of Transmitter

Table 1 Measurement Results(CDMA)

TEST CONDITIONS (TN/VN)	RF Output Power(Conducted)					
	Channel 25(B) 1851.25MHz		Channel 600(M) 1880.0MHz		Channel 1175(T) 1908.75MHz	
	dBm		dBm		dBm	
	Measure d	Limit	Measure d	Limit	Measure d	Limit
TM1	23.91	33.0	23.96	33.0	23.82	33.0
TM3	23.89	33.0	23.92	33.0	23.81	33.0
Subtype 0	23.77	33.0	23.85	33.0	23.72	33.0
Subtype 2	23.87	33.0	24.03	33.0	23.94	33.0



Table 2 Measurement Results(LTE)

TM4&TM5 RF Output Power(Conducted)				
Test Mode	TN /VN			
	Modulation	RB	Measured (dBm)	Limit (dBm)
Channel (B) 1.4MHz(BW)	QPSK	1 RB/#0	22.39	33.0
		1 RB/#max	22.38	33.0
		3 RB/#2	22.37	33.0
		Full	21.41	33.0
	16QAM	1 RB/#0	22.06	33.0
		1 RB/#max	21.98	33.0
		3 RB/#2	21.56	33.0
		Full	21.11	33.0
Channel (B) 3MHz(BW)	QPSK	1 RB/#0	22.4	33.0
		1 RB/#max	22.79	33.0
		8 RB/#4	21.32	33.0
		Full	21.38	33.0
	16QAM	1 RB/#0	21.96	33.0
		1 RB/#max	22.13	33.0
		8 RB/#4	21.06	33.0
		Full	21.13	33.0
Channel (B) 5MHz(BW)	QPSK	1 RB/#0	22.42	33.0
		1 RB/#max	22.82	33.0
		12 RB/#6	21.38	33.0
		Full	21.45	33.0
	16QAM	1 RB/#0	21.53	33.0
		1 RB/#max	21.73	33.0



		12 RB/#6	21	33.0
		Full	21.23	33.0
Channel (B) 10MHz(BW)	QPSK	1 RB/#0	22.37	33.0
		1 RB/#max	22.87	33.0
		25 RB/#13	21.54	33.0
		Full	21.55	33.0
	16QAM	1 RB/#0	21.95	33.0
		1 RB/#max	22.43	33.0
		25 RB/#13	21.33	33.0
		Full	21.27	33.0
Channel (M) 1.4MHz(BW)	QPSK	1 RB/#0	22.54	33.0
		1 RB/#max	22.45	33.0
		3 RB/#2	22.31	33.0
		Full	21.47	33.0
	16QAM	1 RB/#0	22.19	33.0
		1 RB/#max	22.24	33.0
		3 RB/#2	21.79	33.0
		Full	21.13	33.0
Channel (M) 3MHz(BW)	QPSK	1 RB/#0	22.29	33.0
		1 RB/#max	22.63	33.0
		8 RB/#4	21.22	33.0
		Full	21.41	33.0
	16QAM	1 RB/#0	21.81	33.0
		1 RB/#max	22.2	33.0
		8 RB/#4	21.15	33.0



		Full	20.91	33.0
Channel (M) 5MHz(BW)	QPSK	1 RB/#0	22.24	33.0
		1 RB/#max	22.56	33.0
		12 RB/#6	21.19	33.0
		Full	21.41	33.0
	16QAM	1 RB/#0	21.33	33.0
		1 RB/#max	21.78	33.0
		12 RB/#6	20.87	33.0
		Full	21.04	33.0
Channel (M) 10MHz(BW)	QPSK	1 RB/#0	22.19	33.0
		1 RB/#max	22.63	33.0
		25 RB/#13	21.26	33.0
		Full	21.17	33.0
	16QAM	1 RB/#0	21.73	33.0
		1 RB/#max	22.21	33.0
		25 RB/#13	20.94	33.0
		Full	20.88	33.0
Channel (T) 1.4MHz(BW)	QPSK	1 RB/#0	22.87	33.0
		1 RB/#max	22.67	33.0
		3 RB/#2	22.65	33.0
		Full	21.75	33.0
	16QAM	1 RB/#0	22.47	33.0
		1 RB/#max	22.34	33.0
		3 RB/#2	22.12	33.0
		Full	21.46	33.0



Channel (T) 3MHz(BW)	QPSK	1 RB/#0	22.69	33.0
		1 RB/#max	22.83	33.0
		8 RB/#4	21.54	33.0
		Full	21.62	33.0
	16QAM	1 RB/#0	22.3	33.0
		1 RB/#max	22.28	33.0
		8 RB/#4	21.3	33.0
		Full	21.33	33.0
Channel (T) 5MHz(BW)	QPSK	1 RB/#0	22.81	33.0
		1 RB/#max	22.76	33.0
		12 RB/#6	21.68	33.0
		Full	21.68	33.0
	16QAM	1 RB/#0	21.87	33.0
		1 RB/#max	21.97	33.0
		12 RB/#6	21.32	33.0
		Full	21.32	33.0
Channel (T) 10MHz(BW)	QPSK	1 RB/#0	23.17	33.0
		1 RB/#max	22.77	33.0
		25 RB/#13	21.57	33.0
		Full	21.71	33.0
	16QAM	1 RB/#0	22.68	33.0
		1 RB/#max	22.37	33.0
		25 RB/#13	21.43	33.0
		Full	21.41	33.0



Peak-to-Average Ratio

Table 3 Measurement Results(CDMA)

TEST CONDITIONS (TN/VN)						
	Channel 25(B) 1851.25MHz		Channel 600(M) 1880.0MHz		Channel 1175(T) 1908.75MHz	
	dB		dB		dB	
	Measure d	Limit	Measure d	Limit	Measure d	Limit
TM1	6.52	13.0	6.63	13.0	6.51	13.0
TM3	6.48	13.0	6.49	13.0	6.49	13.0
Subtype 0	6.43	13.0	6.53	13.0	6.44	13.0
Subtype 2	6.37	13.0	6.49	13.0	6.46	13.0



Table 4 Measurement Results(LTE)

TM4&TM5				
Test Mode	TN /VN			
	Modulation	RB	Measured (dB)	Limit (dB)
Channel (B) 1.4MHz(BW)	QPSK	1 RB/#0	6.28	13.0
		1 RB/#max	6.37	13.0
		3 RB/#2	6.28	13.0
		Full	6.41	13.0
	16QAM	1 RB/#0	6.37	13.0
		1 RB/#max	6.40	13.0
		3 RB/#2	6.37	13.0
		Full	6.39	13.0
Channel (B) 3MHz(BW)	QPSK	1 RB/#0	6.39	13.0
		1 RB/#max	6.33	13.0
		8 RB/#4	6.36	13.0
		Full	6.43	13.0
	16QAM	1 RB/#0	6.37	13.0
		1 RB/#max	6.38	13.0
		8 RB/#4	6.42	13.0
		Full	6.38	13.0
Channel (B) 5MHz(BW)	QPSK	1 RB/#0	6.28	13.0
		1 RB/#max	6.36	13.0
		12 RB/#6	6.35	13.0
		Full	6.34	13.0
	16QAM	1 RB/#0	6.31	13.0
		1 RB/#max	6.29	13.0



		12 RB/#6	6.37	13.0
		Full	6.41	13.0
Channel (B) 10MHz(BW)	QPSK	1 RB/#0	6.39	13.0
		1 RB/#max	6.40	13.0
		25 RB/#13	6.38	13.0
		Full	6.39	13.0
	16QAM	1 RB/#0	6.36	13.0
		1 RB/#max	6.36	13.0
		25 RB/#13	6.37	13.0
		Full	6.27	13.0
Channel (M) 1.4MHz(BW)	QPSK	1 RB/#0	6.26	13.0
		1 RB/#max	6.29	13.0
		3 RB/#2	6.34	13.0
		Full	6.37	13.0
	16QAM	1 RB/#0	6.35	13.0
		1 RB/#max	6.36	13.0
		3 RB/#2	6.37	13.0
		Full	6.29	13.0
Channel (M) 3MHz(BW)	QPSK	1 RB/#0	6.37	13.0
		1 RB/#max	6.33	13.0
		8 RB/#4	6.29	13.0
		Full	6.37	13.0
	16QAM	1 RB/#0	6.29	13.0
		1 RB/#max	6.35	13.0
		8 RB/#4	6.12	13.0



		Full	6.35	13.0
Channel (M) 5MHz(BW)	QPSK	1 RB/#0	6.25	13.0
		1 RB/#max	6.07	13.0
		12 RB/#6	6.17	13.0
		Full	6.27	13.0
	16QAM	1 RB/#0	6.34	13.0
		1 RB/#max	6.37	13.0
		12 RB/#6	6.35	13.0
		Full	6.29	13.0
Channel (M) 10MHz(BW)	QPSK	1 RB/#0	6.27	13.0
		1 RB/#max	6.27	13.0
		25 RB/#13	6.37	13.0
		Full	6.35	13.0
	16QAM	1 RB/#0	6.29	13.0
		1 RB/#max	6.27	13.0
		25 RB/#13	6.34	13.0
		Full	6.32	13.0
Channel (T) 1.4MHz(BW)	QPSK	1 RB/#0	6.40	13.0
		1 RB/#max	6.39	13.0
		3 RB/#2	6.37	13.0
		Full	6.33	13.0
	16QAM	1 RB/#0	6.28	13.0
		1 RB/#max	6.27	13.0
		3 RB/#2	6.33	13.0
		Full	6.29	13.0



Channel (T) 3MHz(BW)	QPSK	1 RB/#0	6.29	13.0
		1 RB/#max	6.35	13.0
		8 RB/#4	6.37	13.0
		Full	6.27	13.0
	16QAM	1 RB/#0	6.33	13.0
		1 RB/#max	6.28	13.0
		8 RB/#4	6.38	13.0
		Full	6.36	13.0
Channel (T) 5MHz(BW)	QPSK	1 RB/#0	6.33	13.0
		1 RB/#max	6.04	13.0
		12 RB/#6	6.01	13.0
		Full	6.17	13.0
	16QAM	1 RB/#0	6.06	13.0
		1 RB/#max	6.14	13.0
		12 RB/#6	6.08	13.0
		Full	6.17	13.0
Channel (T) 10MHz(BW)	QPSK	1 RB/#0	6.11	13.0
		1 RB/#max	6.34	13.0
		25 RB/#13	6.28	13.0
		Full	6.35	13.0
	16QAM	1 RB/#0	6.38	13.0
		1 RB/#max	6.22	13.0
		25 RB/#13	6.19	13.0
		Full	6.29	13.0



Test Plot of Peak-to-Average Ratio

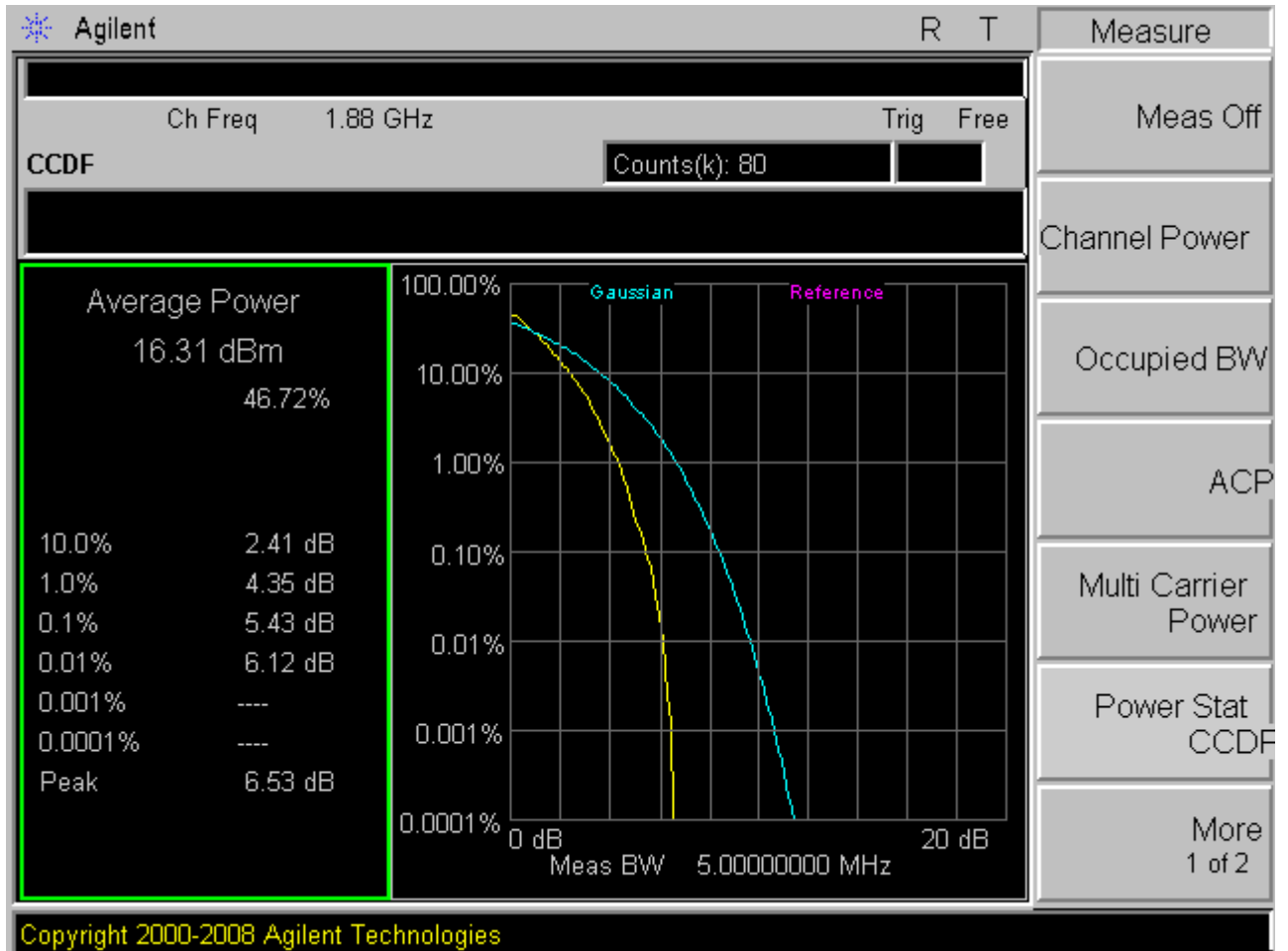
Note: All relevant operation modes have been tested, and the worst case Plot is included in this report.

CDMA





EVDO





LTE 1RB_10MHz(BW) 1 RB/#max





LTE 50%RB_3MHz(BW) 8 RB/#4





LTE 100%RB_3MHz(BW) Full





Effective Isotropic Radiated Power of Transmitter (EIRP)

Table 5 Substitution Results(CDMA)

Test Mode	Freq. [MHz]	Meas. Level [dBm]	Substitution Antenna Type	SGP [dBm]	Substitution Gain [dBi]	Cable Loss [dB]	Substitution Level (EIRP) [dBm]	FCC limit [dBm]	Result
TM1	1851.25	22.42	Horn Ant.	18.97	4.5	1	22.47	33	Pass
TM1	1880.0	22.47	Horn Ant.	18.93	4.5	1	22.43	33	Pass
TM1	1908.75	22.33	Horn Ant.	18.56	4.8	1	22.36	33	Pass
TM3	1851.25	22.40	Horn Ant.	18.92	4.5	1	22.42	33	Pass
TM3	1880.0	22.43	Horn Ant.	18.95	4.5	1	22.45	33	Pass
TM3	1908.75	22.32	Horn Ant.	18.59	4.8	1	22.39	33	Pass
Subtype 0	1851.25	22.28	Horn Ant.	18.73	4.5	1	22.23	33	Pass
Subtype 0	1880.0	22.36	Horn Ant.	18.84	4.5	1	22.34	33	Pass
Subtype 0	1908.75	22.23	Horn Ant.	18.47	4.8	1	22.27	33	Pass
Subtype 2	1851.25	22.38	Horn Ant.	18.83	4.5	1	22.33	33	Pass
Subtype 2	1880.0	22.54	Horn Ant.	19.07	4.5	1	22.57	33	Pass
Subtype 2	1908.75	22.45	Horn Ant.	18.69	4.8	1	22.49	33	Pass



Table 6 Substitution Results (LTE)

Test Mode			Meas. Level [dBm]	Substitution Antenna Type	SGP[dBm]	Substitution Gain [dBi]	Cable Loss [dB]	Substitution Level (EIRP) [dBm]	FCC limit [dBm]	Result
Channel	Modulation	RB								
Channel (B) 1.4MHz(BW)	QPSK	1 RB/#0	21.53	Horn Ant.	18.05	4.5	1	21.55	33	Pass
		1 RB/#max	21.52	Horn Ant.	18.04	4.5	1	21.54	33	Pass
		3 RB/#2	21.51	Horn Ant.	18.07	4.5	1	21.57	33	Pass
		Full	20.55	Horn Ant.	17.01	4.5	1	20.51	33	Pass
	16QAM	1 RB/#0	21.20	Horn Ant.	17.76	4.5	1	21.26	33	Pass
		1 RB/#max	21.12	Horn Ant.	17.69	4.5	1	21.19	33	Pass
		3 RB/#2	20.70	Horn Ant.	17.22	4.5	1	20.72	33	Pass
		Full	20.25	Horn Ant.	16.73	4.5	1	20.23	33	Pass
Channel (B) 3MHz(BW)	QPSK	1 RB/#0	21.54	Horn Ant.	18.02	4.5	1	21.52	33	Pass
		1 RB/#max	21.93	Horn Ant.	18.48	4.5	1	21.98	33	Pass
		8 RB/#4	20.46	Horn Ant.	16.93	4.5	1	20.43	33	Pass
		Full	20.52	Horn Ant.	17.07	4.5	1	20.57	33	Pass
	16QAM	1 RB/#0	21.10	Horn Ant.	17.63	4.5	1	21.13	33	Pass
		1 RB/#max	21.27	Horn Ant.	17.73	4.5	1	21.23	33	Pass
		8 RB/#4	20.20	Horn Ant.	16.75	4.5	1	20.25	33	Pass
		Full	20.27	Horn Ant.	16.74	4.5	1	20.24	33	Pass
Channel (B)	QPSK	1 RB/#0	21.56	Horn Ant.	18.01	4.5	1	21.51	33	Pass



5MHz(BW)		1 RB/#max	21.96	Horn Ant.	18.49	4.5	1	21.99	33	Pass
		12 RB/#6	20.52	Horn Ant.	17.04	4.5	1	20.54	33	Pass
		Full	20.59	Horn Ant.	17.05	4.5	1	20.55	33	Pass
	16QAM	1 RB/#0	20.67	Horn Ant.	17.16	4.5	1	20.66	33	Pass
		1 RB/#max	20.87	Horn Ant.	17.39	4.5	1	20.89	33	Pass
		12 RB/#6	20.14	Horn Ant.	16.61	4.5	1	20.11	33	Pass
		Full	20.37	Horn Ant.	16.84	4.5	1	20.34	33	Pass
Channel (B) 10MHz(BW)	QPSK	1 RB/#0	21.51	Horn Ant.	18.06	4.5	1	21.56	33	Pass
		1 RB/#max	22.01	Horn Ant.	18.58	4.5	1	22.08	33	Pass
		25 RB/#13	20.68	Horn Ant.	17.13	4.5	1	20.63	33	Pass
		Full	20.69	Horn Ant.	17.11	4.5	1	20.61	33	Pass
	16QAM	1 RB/#0	21.09	Horn Ant.	17.52	4.5	1	21.02	33	Pass
		1 RB/#max	21.57	Horn Ant.	18.03	4.5	1	21.53	33	Pass
		25 RB/#13	20.47	Horn Ant.	16.92	4.5	1	20.42	33	Pass
		Full	20.41	Horn Ant.	16.96	4.5	1	20.46	33	Pass
Channel (M) 1.4MHz(BW)	QPSK	1 RB/#0	21.68	Horn Ant.	18.13	4.5	1	21.63	33	Pass
		1 RB/#max	21.59	Horn Ant.	18.05	4.5	1	21.55	33	Pass
		3 RB/#2	21.45	Horn Ant.	17.97	4.5	1	21.47	33	Pass
		Full	20.61	Horn Ant.	17.18	4.5	1	20.68	33	Pass
	16QAM	1 RB/#0	21.33	Horn Ant.	17.89	4.5	1	21.39	33	Pass
		1 RB/#max	21.38	Horn Ant.	17.82	4.5	1	21.32	33	Pass



		3 RB/#2	20.93	Horn Ant.	17.45	4.5	1	20.95	33	Pass
		Full	20.27	Horn Ant.	16.72	4.5	1	20.22	33	Pass
Channel (M) 3MHz(BW)	QPSK	1 RB/#0	21.43	Horn Ant.	17.97	4.5	1	21.47	33	Pass
		1 RB/#max	21.77	Horn Ant.	18.25	4.5	1	21.75	33	Pass
		8 RB/#4	20.36	Horn Ant.	16.82	4.5	1	20.32	33	Pass
		Full	20.55	Horn Ant.	17.08	4.5	1	20.58	33	Pass
	16QAM	1 RB/#0	20.95	Horn Ant.	17.41	4.5	1	20.91	33	Pass
		1 RB/#max	21.34	Horn Ant.	17.89	4.5	1	21.39	33	Pass
		8 RB/#4	20.29	Horn Ant.	16.76	4.5	1	20.26	33	Pass
		Full	20.05	Horn Ant.	16.53	4.5	1	20.03	33	Pass
Channel (M) 5MHz(BW)	QPSK	1 RB/#0	21.38	Horn Ant.	17.84	4.5	1	21.34	33	Pass
		1 RB/#max	21.70	Horn Ant.	18.27	4.5	1	21.77	33	Pass
		12 RB/#6	20.33	Horn Ant.	16.85	4.5	1	20.35	33	Pass
		Full	20.55	Horn Ant.	17.06	4.5	1	20.56	33	Pass
	16QAM	1 RB/#0	20.47	Horn Ant.	16.97	4.5	1	20.47	33	Pass
		1 RB/#max	20.92	Horn Ant.	17.47	4.5	1	20.97	33	Pass
		12 RB/#6	20.01	Horn Ant.	16.58	4.5	1	20.08	33	Pass
		Full	20.18	Horn Ant.	16.68	4.5	1	20.18	33	Pass
Channel (M) 10MHz(BW)	QPSK	1 RB/#0	21.33	Horn Ant.	17.86	4.5	1	21.36	33	Pass
		1 RB/#max	21.77	Horn Ant.	18.24	4.5	1	21.74	33	Pass
		25 RB/#13	20.40	Horn Ant.	16.93	4.5	1	20.43	33	Pass



		Full	20.31	Horn Ant.	16.89	4.5	1	20.39	33	Pass
	16QAM	1 RB/#0	20.87	Horn Ant.	17.35	4.5	1	20.85	33	Pass
		1 RB/#max	21.35	Horn Ant.	17.83	4.5	1	21.33	33	Pass
		25 RB/#13	20.08	Horn Ant.	16.52	4.5	1	20.02	33	Pass
		Full	20.02	Horn Ant.	16.59	4.5	1	20.09	33	Pass
Channel (T) 1.4MHz(BW)	QPSK	1 RB/#0	22.01	Horn Ant.	18.24	4.8	1	22.04	33	Pass
		1 RB/#max	21.81	Horn Ant.	18.05	4.8	1	21.85	33	Pass
		3 RB/#2	21.79	Horn Ant.	17.96	4.8	1	21.76	33	Pass
		Full	20.89	Horn Ant.	17.06	4.8	1	20.86	33	Pass
	16QAM	1 RB/#0	21.61	Horn Ant.	17.84	4.8	1	21.64	33	Pass
		1 RB/#max	21.48	Horn Ant.	17.62	4.8	1	21.42	33	Pass
		3 RB/#2	21.26	Horn Ant.	17.42	4.8	1	21.22	33	Pass
		Full	20.60	Horn Ant.	16.83	4.8	1	20.63	33	Pass
Channel (T) 3MHz(BW)	QPSK	1 RB/#0	21.83	Horn Ant.	18.08	4.8	1	21.88	33	Pass
		1 RB/#max	21.97	Horn Ant.	18.19	4.8	1	21.99	33	Pass
		8 RB/#4	20.68	Horn Ant.	16.82	4.8	1	20.62	33	Pass
		Full	20.76	Horn Ant.	16.97	4.8	1	20.77	33	Pass
	16QAM	1 RB/#0	21.44	Horn Ant.	17.65	4.8	1	21.45	33	Pass
		1 RB/#max	21.42	Horn Ant.	17.68	4.8	1	21.48	33	Pass
		8 RB/#4	20.44	Horn Ant.	16.61	4.8	1	20.41	33	Pass
		Full	20.47	Horn Ant.	16.63	4.8	1	20.43	33	Pass



Channel (T) 5MHz(B W)	QPSK	1 RB/#0	21.95	Horn Ant.	18.12	4.8	1	21.92	33	Pass
		1 RB/#max	21.90	Horn Ant.	18.13	4.8	1	21.93	33	Pass
		12 RB/#6	20.82	Horn Ant.	17.08	4.8	1	20.88	33	Pass
		Full	20.82	Horn Ant.	17.06	4.8	1	20.86	33	Pass
	16QA M	1 RB/#0	21.01	Horn Ant.	17.25	4.8	1	21.05	33	Pass
		1 RB/#max	21.11	Horn Ant.	17.37	4.8	1	21.17	33	Pass
		12 RB/#6	20.46	Horn Ant.	16.60	4.8	1	20.40	33	Pass
		Full	20.46	Horn Ant.	16.62	4.8	1	20.42	33	Pass
Channel (T) 10MHz(B W)	QPSK	1 RB/#0	22.31	Horn Ant.	18.57	4.8	1	22.37	33	Pass
		1 RB/#max	21.91	Horn Ant.	18.08	4.8	1	21.88	33	Pass
		25 RB/#13	20.71	Horn Ant.	16.96	4.8	1	20.76	33	Pass
		Full	20.85	Horn Ant.	17.02	4.8	1	20.82	33	Pass
	16QA M	1 RB/#0	21.82	Horn Ant.	18.06	4.8	1	21.86	33	Pass
		1 RB/#max	21.51	Horn Ant.	17.74	4.8	1	21.54	33	Pass
		25 RB/#13	20.57	Horn Ant.	16.75	4.8	1	20.55	33	Pass
		Full	20.55	Horn Ant.	16.79	4.8	1	20.59	33	Pass

Note: a, For getting the EIRP (Efficient Isotropic Radiated Power) in substitution method, the following formula should take to calculate it,

$$\text{EIRP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBi]}$$

b, SGP=Signal Generator Level



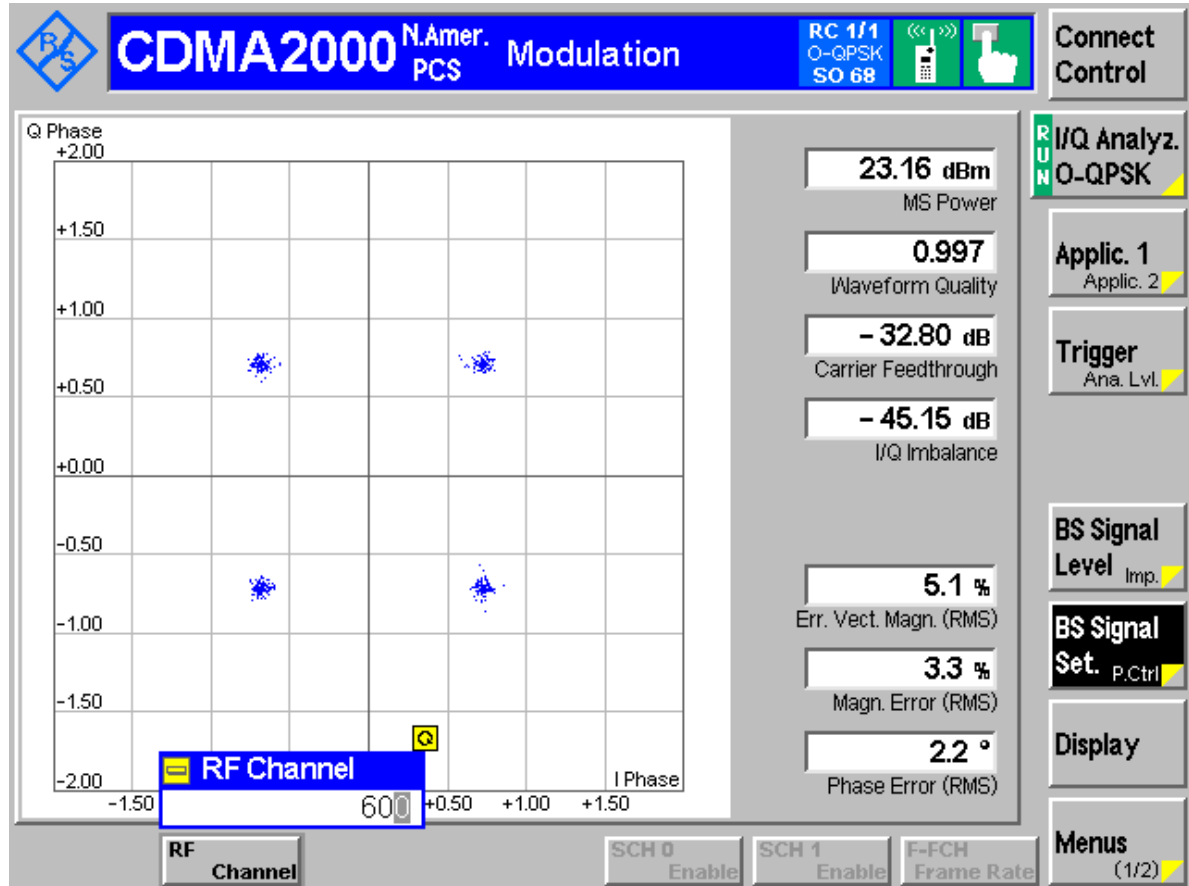
Appendix B

Modulation Characteristics

According to FCC Part 2.1047& Part 24 Subpart E

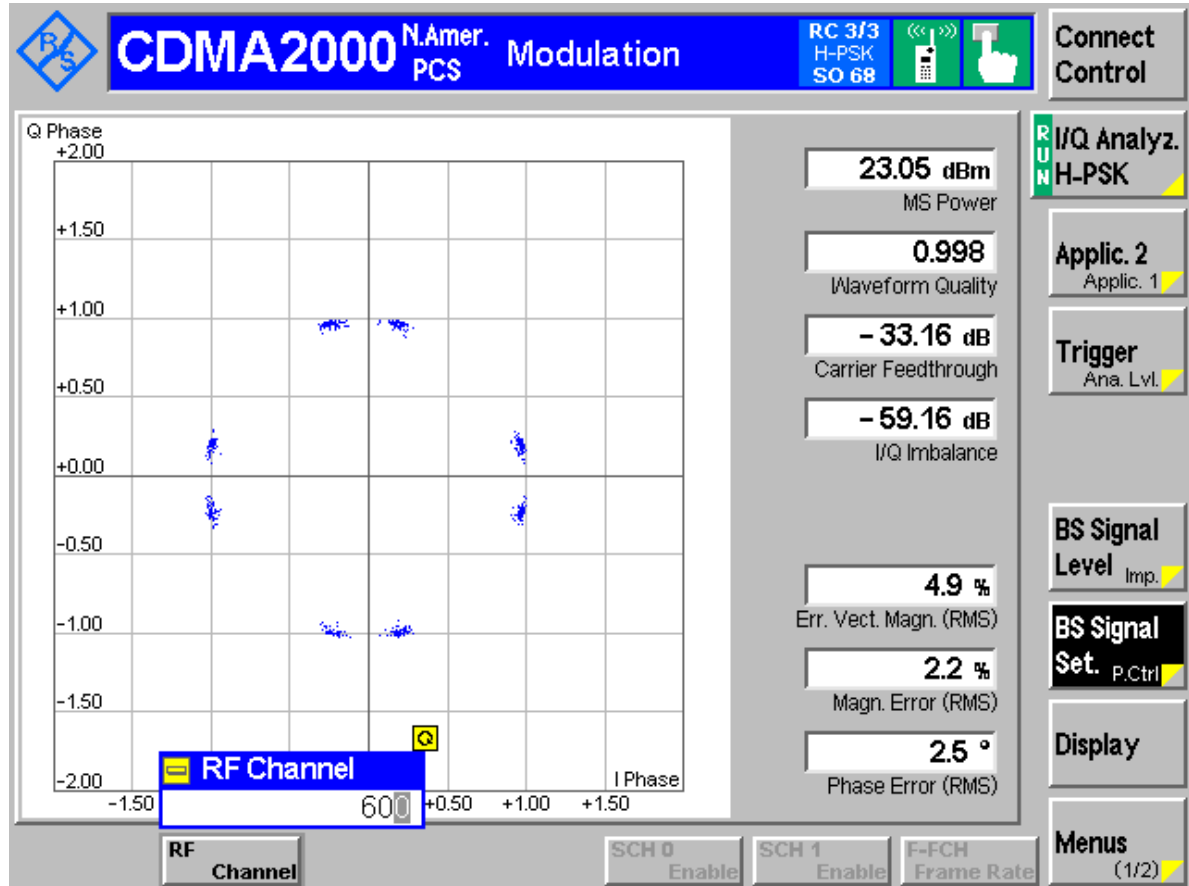


Channel 600 (TM1)



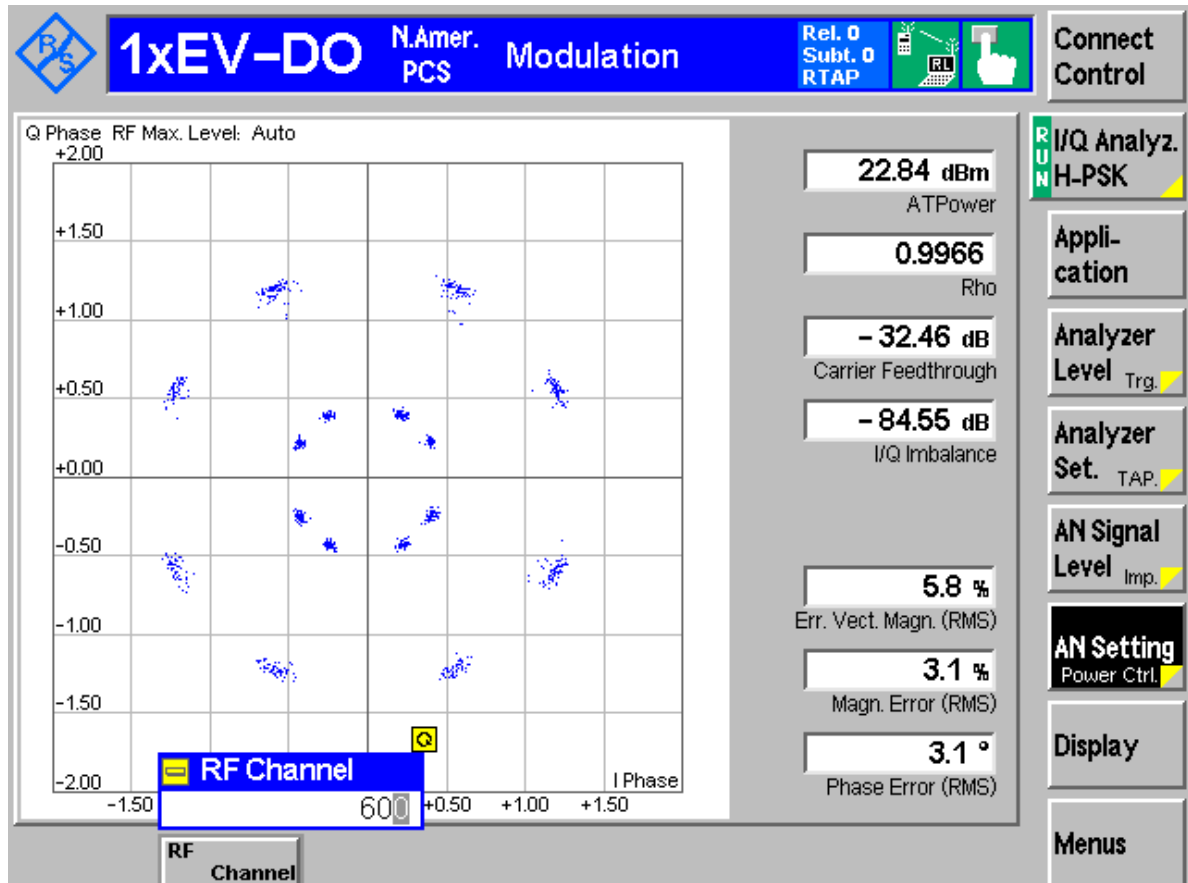


Channel 600 (TM3)





Channel600 (Subtype 0) (HPSK)

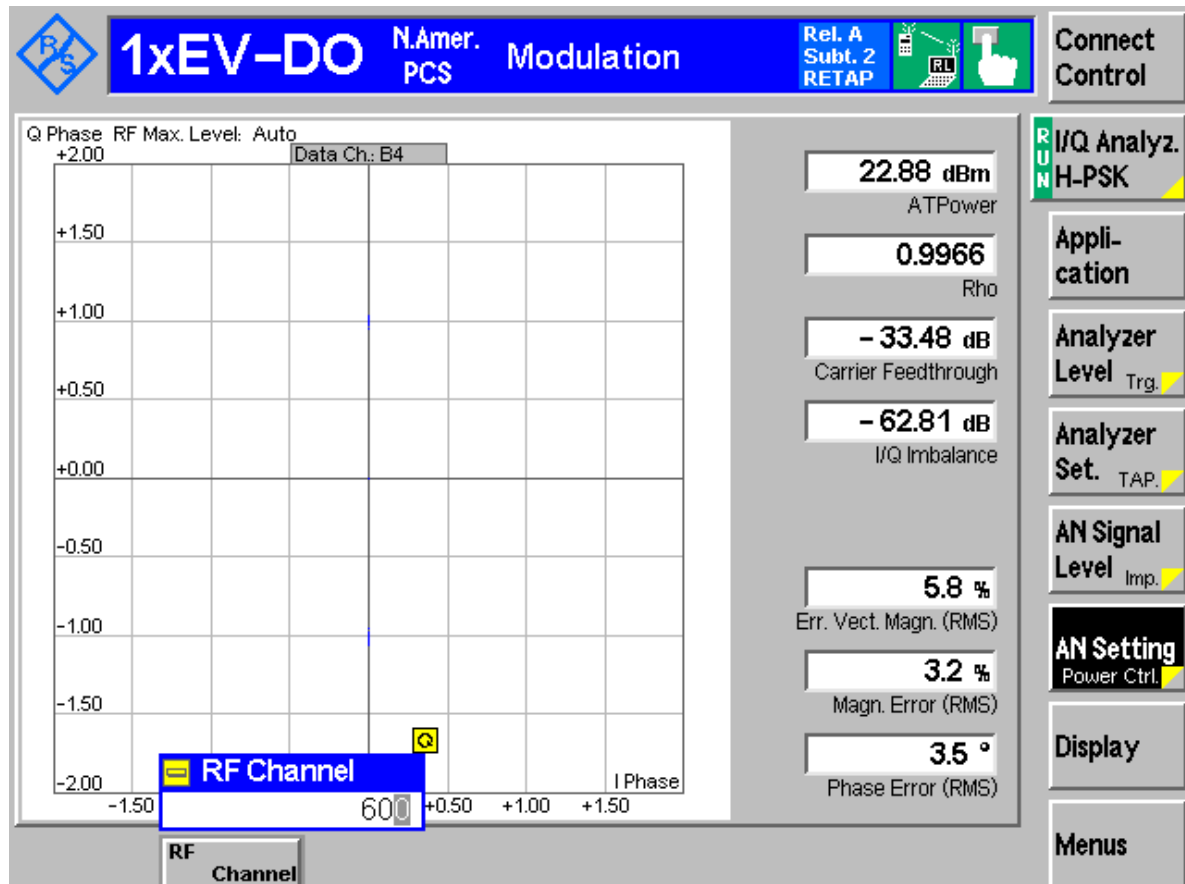




Channel600 (Subtype 2)

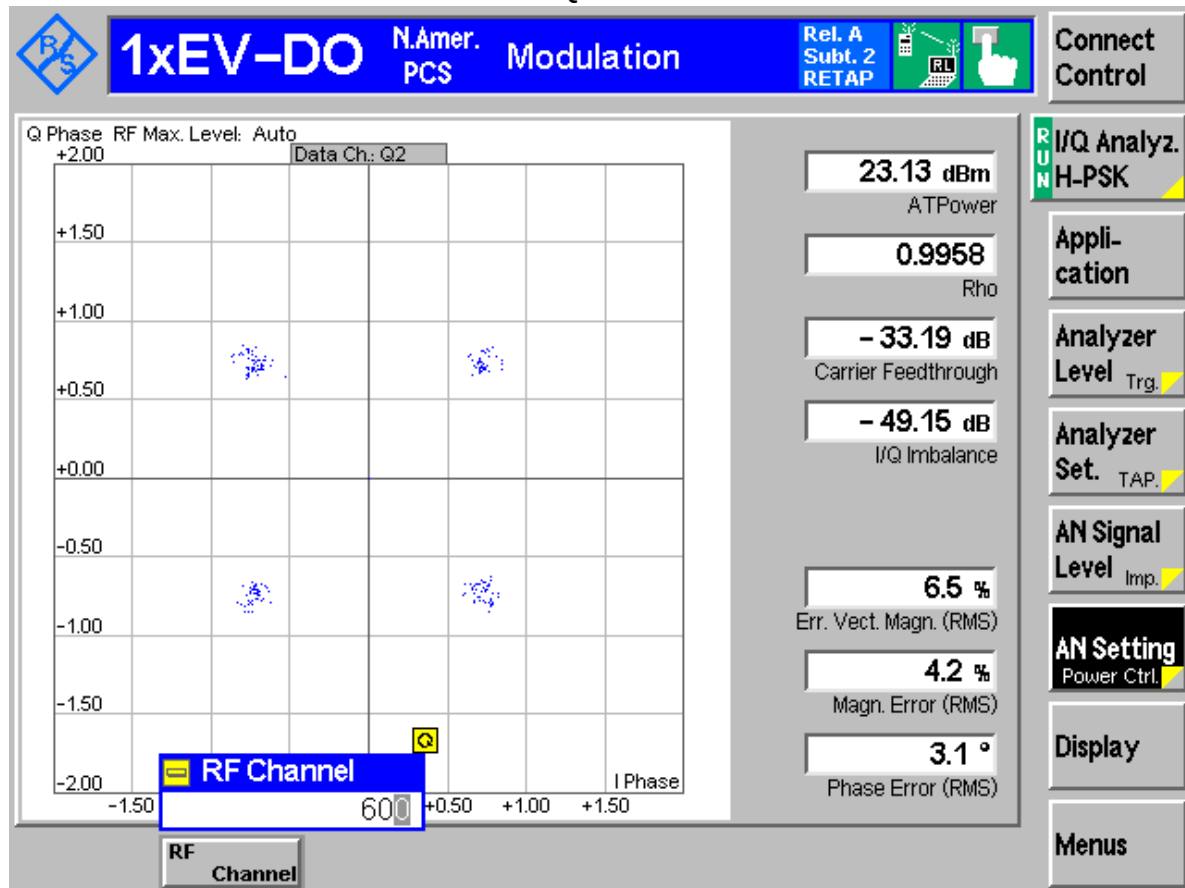
The R-Data packet size determines the modulation format:

R-Data Pkt Size (256 bits)
(BPSK)



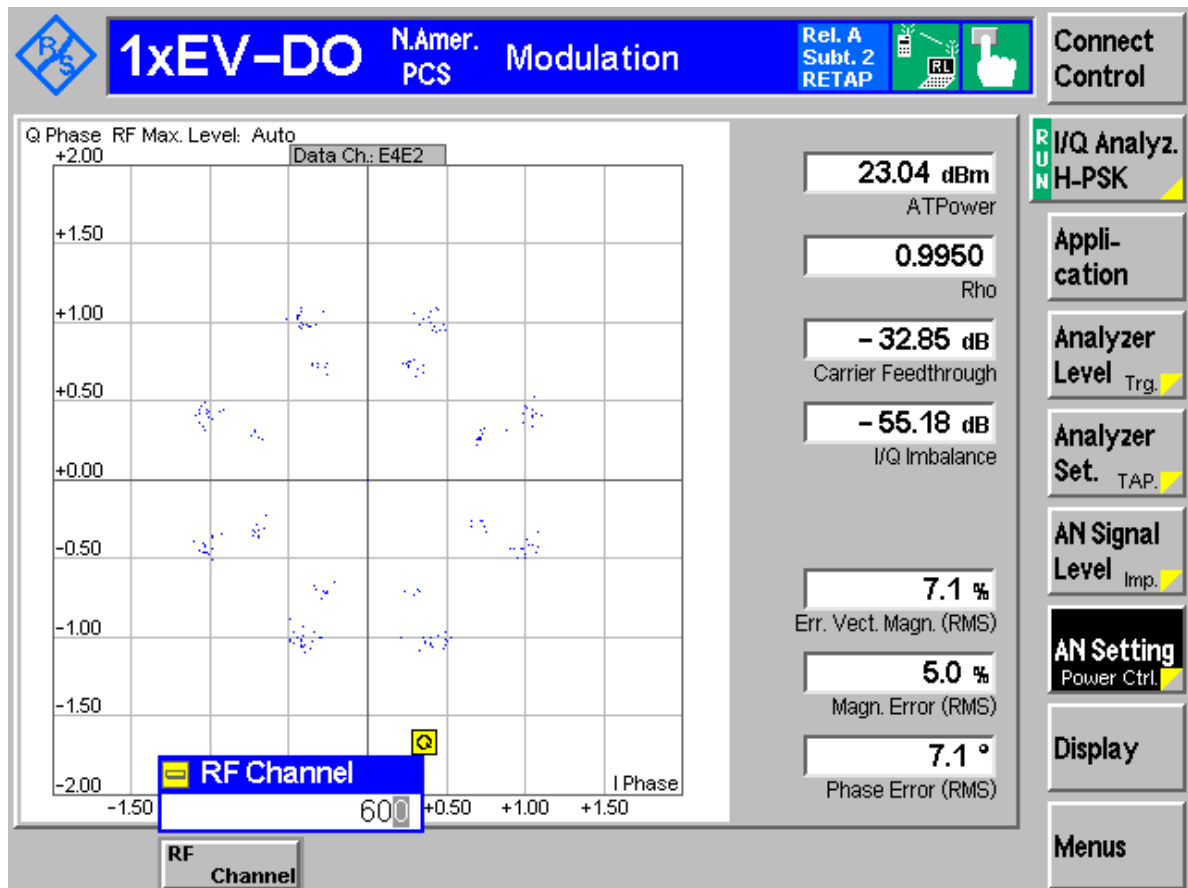


R-Data Pkt Size (4096 bits)
(QPSK)



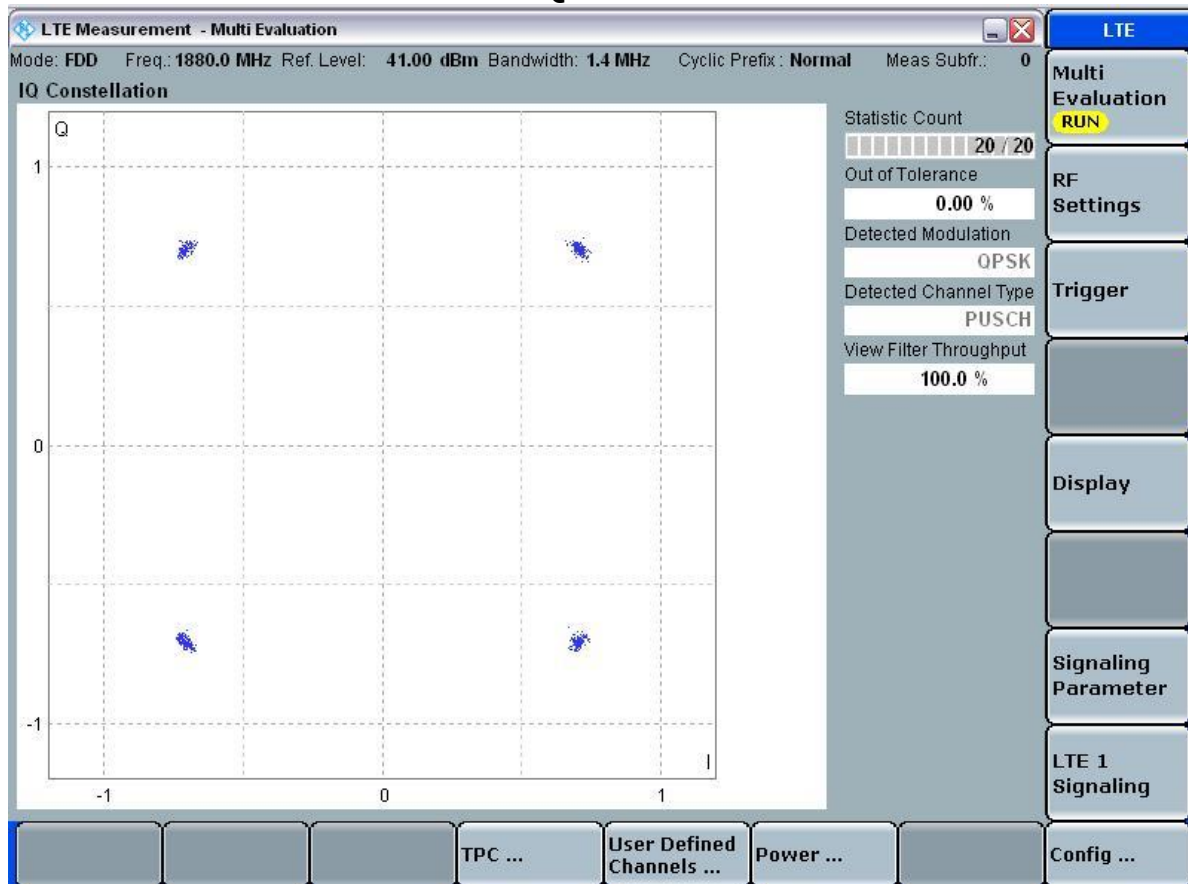


R-Data Pkt Size (12288 bits)
(8PSK)



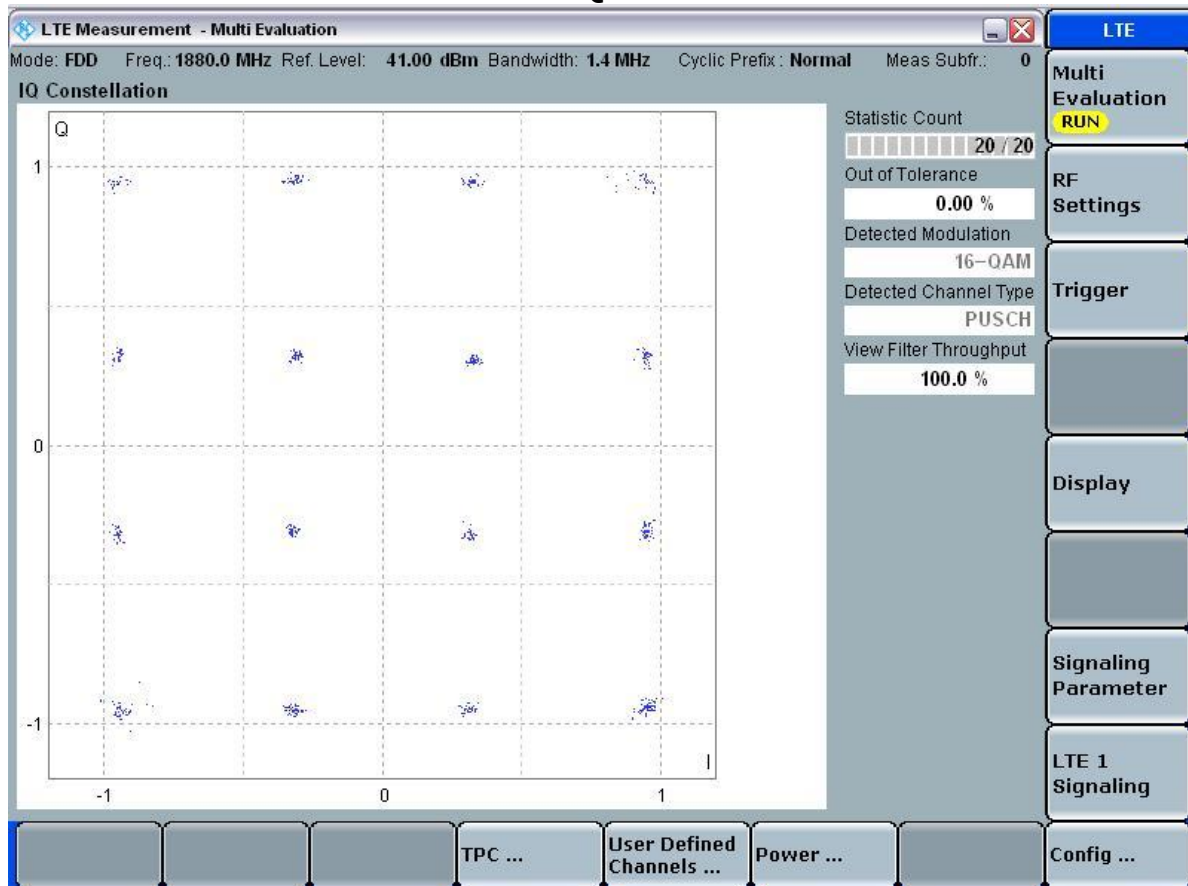


Channel 18900 (TM4) 1.4MHz(BW/) QPSK



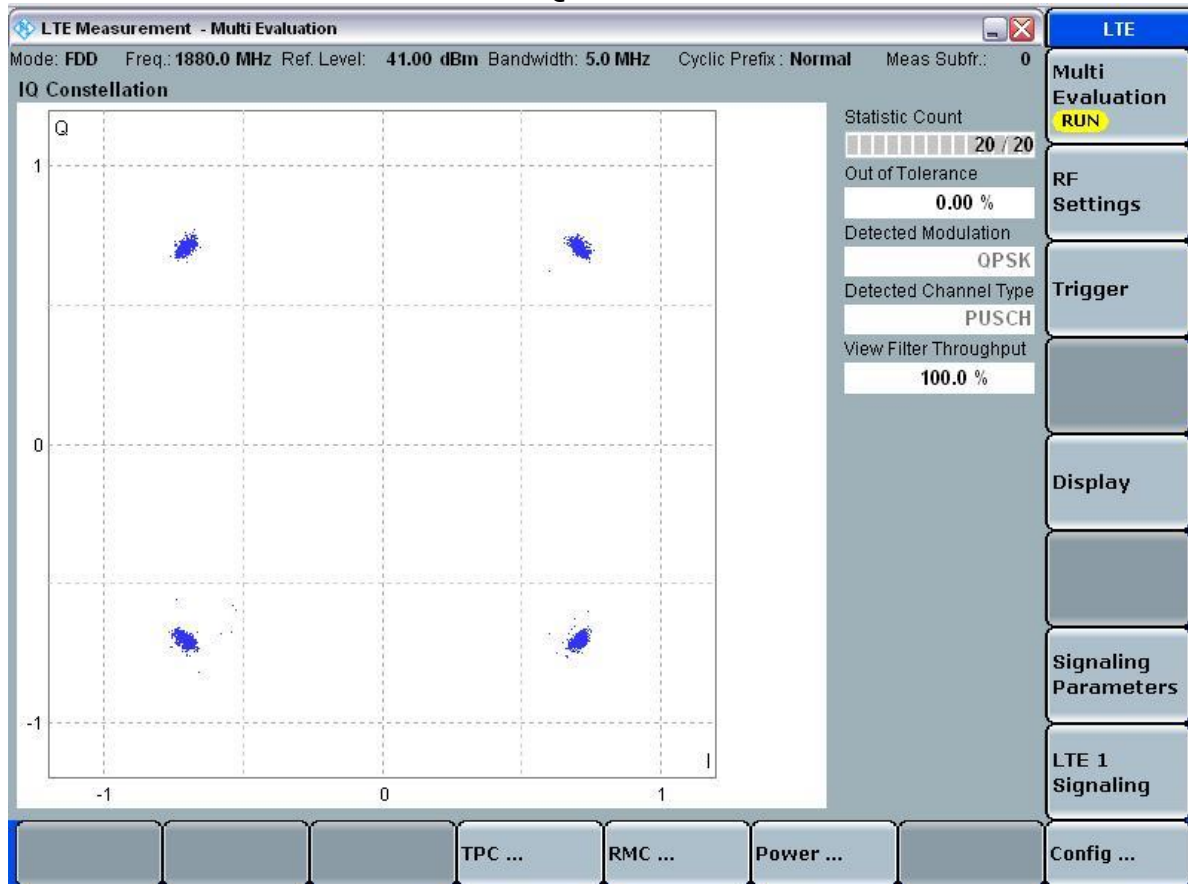


1.4MHz(BW/) (TM5) 16QAM



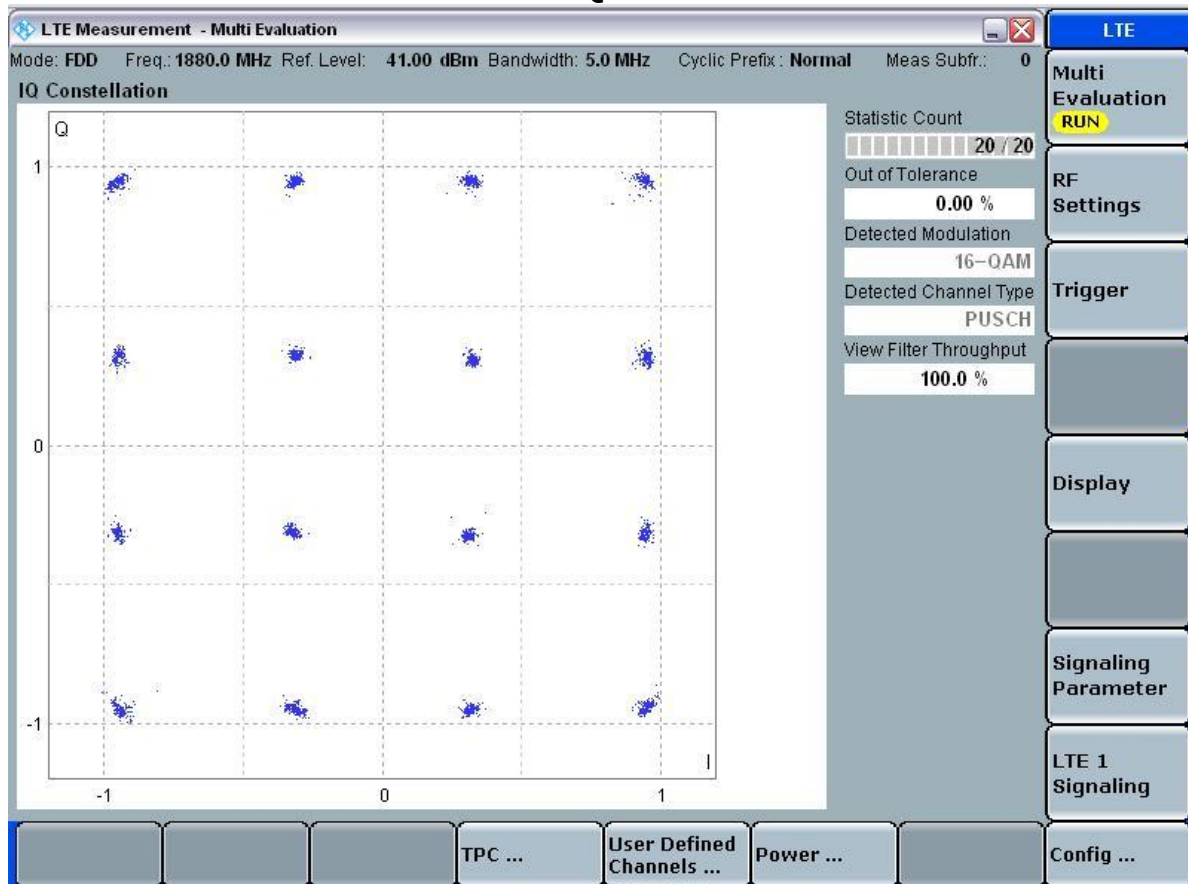


5MHz(BW/) (TM4) QPSK



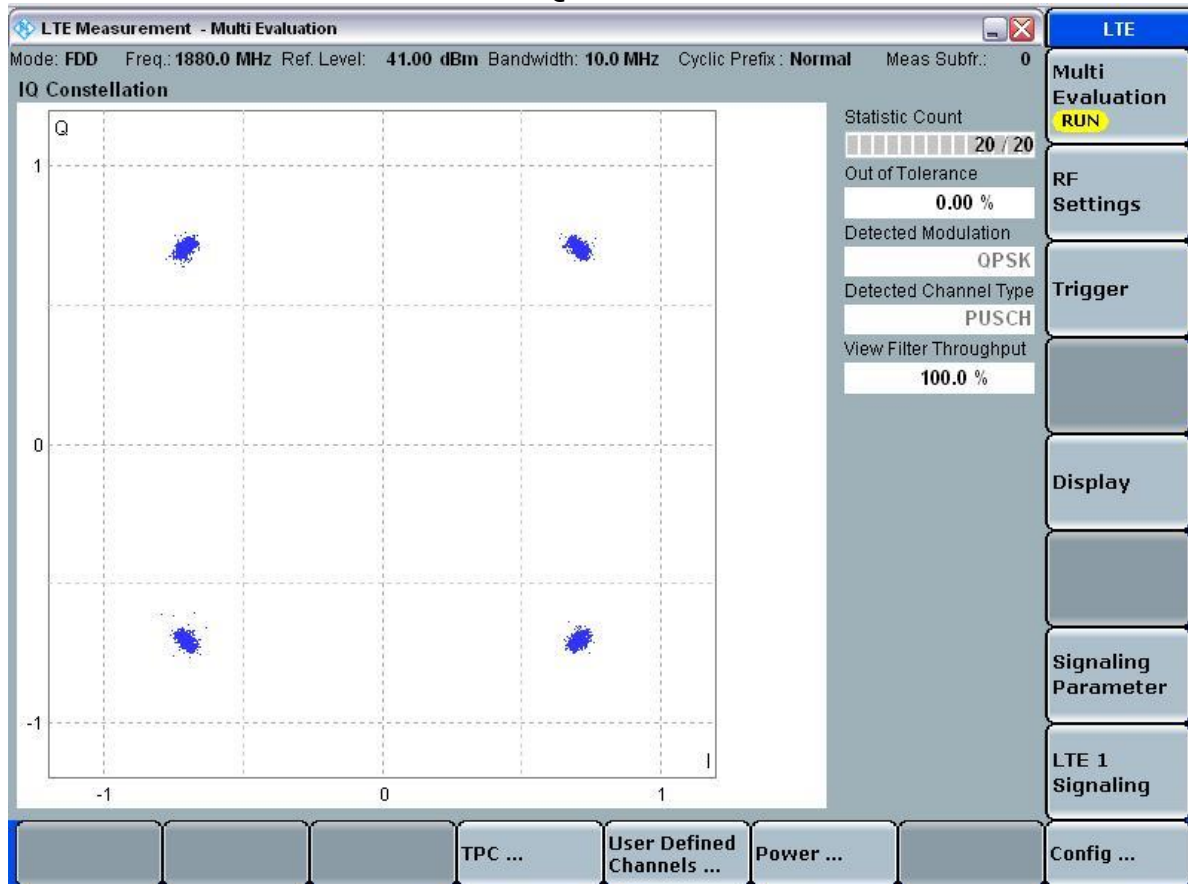


5MHz(BW/) (TM5) 16QAM



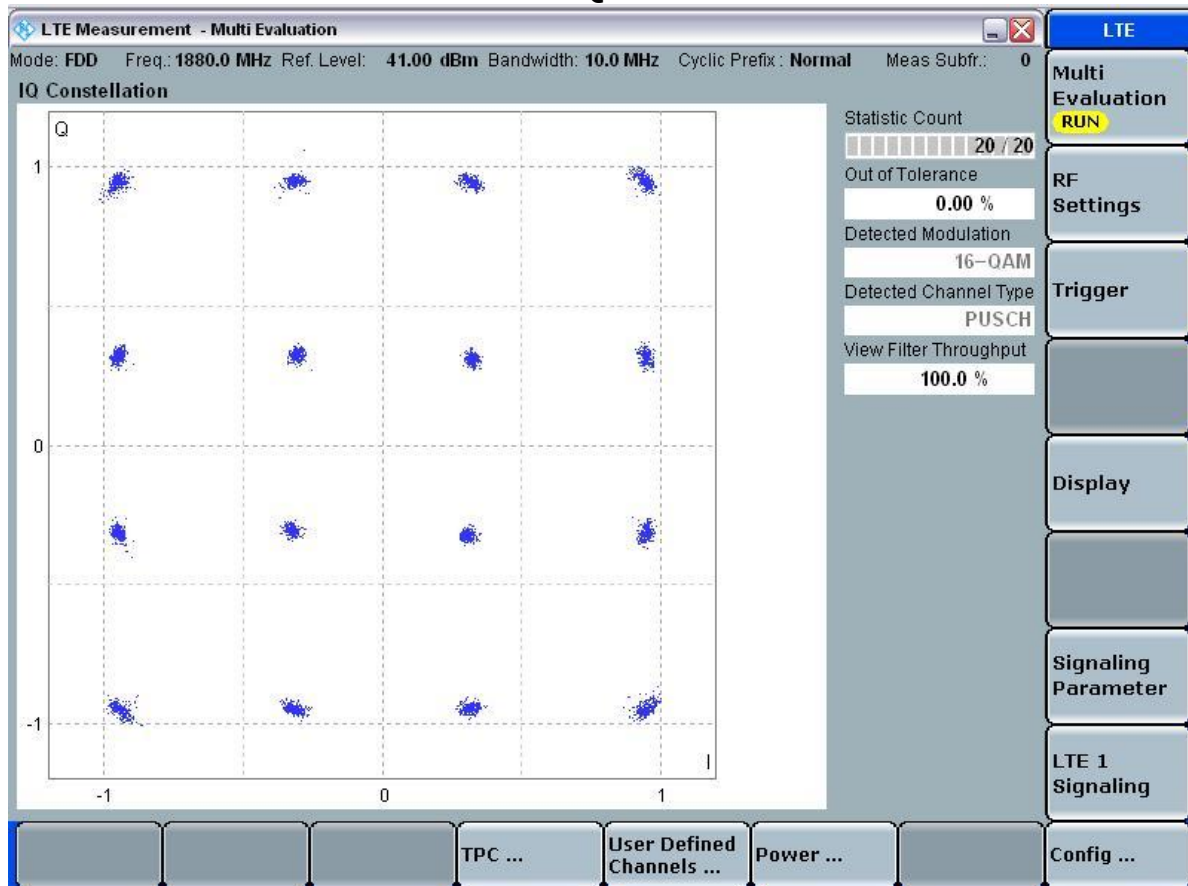


10MHz(BW/) (TM4) QPSK





10MHz(BW/) (TM5) 16QAM





Appendix C

Occupied Bandwidth According to FCC part 2.1049 & Part 24 Subpart E



Test Mode	RF Channel	99% BW [kHz] note1	-26dB BW [kHz] note2
TM1	25	1284	1450
	600	1291	1450
	1175	1291	1450
TM3	25	1284	1448
	600	1284	1450
	1175	1284	1448
Subtype 0	25	1292	1420
	600	1286	1421
	1175	1286	1420
Subtype 2	25	1286	1420
	600	1286	1421
	1175	1286	1421

Test Mode	Carrier Conf.	RF Ch.	RB/RB SIZE	99% BW [kHz] note1	-26dB BW [kHz] note2
TM4	1.4MHz	B	1/0	272	388
			1/5	263	387
			3/2	590	1035
			6/0	1077	1220
		M	1/0	260	380
			1/5	250	389
			3/2	554	1035
			6/0	1083	1227
		T	1/0	266	388
			1/5	266	389
			3/2	580	1020
			6/0	1077	1222
	3 MHz	B	1/0	537	510
			1/14	565	511
			8/4	1490	2170
			15/0	2684	2883
		M	1/0	505	520
			1/14	521	520
			8/4	1498	2172
			15/0	2684	2883
		T	1/0	489	510
			1/14	537	510
			8/4	1498	2172
			15/0	2692	2880
	5 MHz	B	1/0	885	710
			1/24	654	7712



Test Mode	Carrier Conf.	RF Ch.	RB/RB SIZE	99% BW [kHz] note1	-26dB BW [kHz] note2
			12/6	2218	3430
			25/0	4474	4780
		M	1/0	833	719
			1/24	679	7719
			12/6	2231	3430
			25/0	4474	4781
		T	1/0	718	708
			1/24	731	710
			12/6	2218	3428
			25/0	4487	4781
	10 MHz	B	1/0	1971	1220
			1/49	1538	11220
			25/13	4567	6034
			50/0	8942	9558
		M	1/0	1803	1229
			1/49	1803	1220
			25/13	4591	6040
			50/0	8942	9566
		T	1/0	1490	1220
			1/49	1923	1210
			25/13	4567	6034
			50/0	8942	9550
TM5	1.4MHz	B	1/0	337	388
			1/5	288	389
			3/2	564	1030
			6/0	1077	1219
		M	1/0	343	389
			1/5	298	3389
			3/2	561	1033
			6/0	1074	1222
		T	1/0	321	380
			1/5	304	387
			3/2	564	1032
			6/0	1077	1215
	3 MHz	B	1/0	545	511
			1/14	561	518
			8/4	1490	2162
			15/0	2684	2880
		M	1/0	513	518
			1/14	561	517
			8/4	1498	2170
			15/0	2684	2880
		T	1/0	505	520



Test Mode	Carrier Conf.	RF Ch.	RB/RB SIZE	99% BW [kHz] note1	-26dB BW [kHz] note2
			1/14	617	513
			8/4	1490	2170
			15/0	2676	2875
	5 MHz	B	1/0	962	718
			1/24	692	715
			12/6	2218	3428
			25/0	4474	4719
		M	1/0	897	700
			1/24	744	702
			12/6	2218	3425
			25/0	4474	4620
		T	1/0	782	710
			1/24	769	711
			12/6	2218	3258
			25/0	4462	4781
	10 MHz	B	1/0	2019	1220
			1/49	1370	1228
			25/13	4591	6004
			50/0	8894	9523
		M	1/0	1947	1218
			1/49	1611	1220
			25/13	4615	5987
			50/0	8918	9566
		T	1/0	1514	1220
			1/49	1587	1215
			25/13	4615	6038
			50/0	8918	9560

Note1: The 99% BW test data refer to “Test Plot of 99% Occupied Bandwidth”.

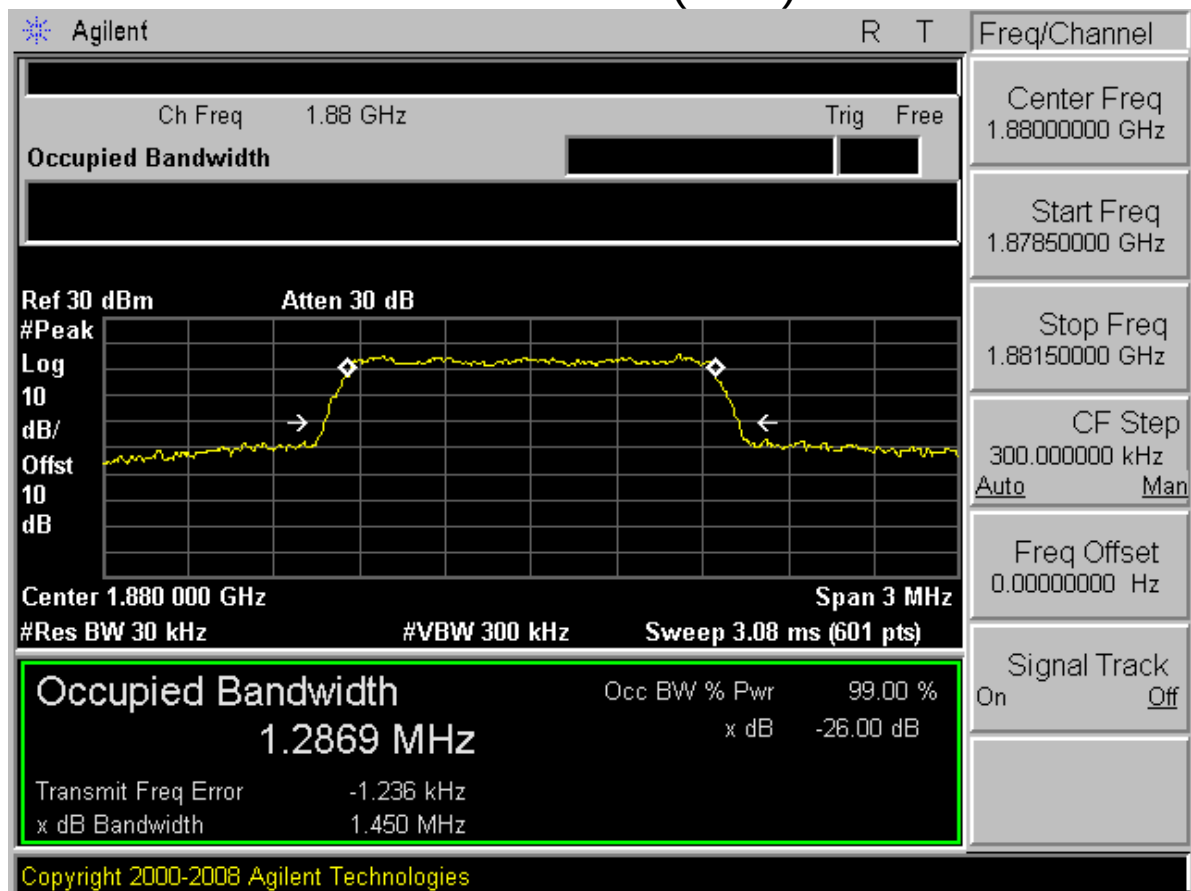
Note2: The -26dB BW test data refer to “Test Plot of -26dB Occupied Bandwidth”.



Test Plot of 26dB Occupied Bandwidth

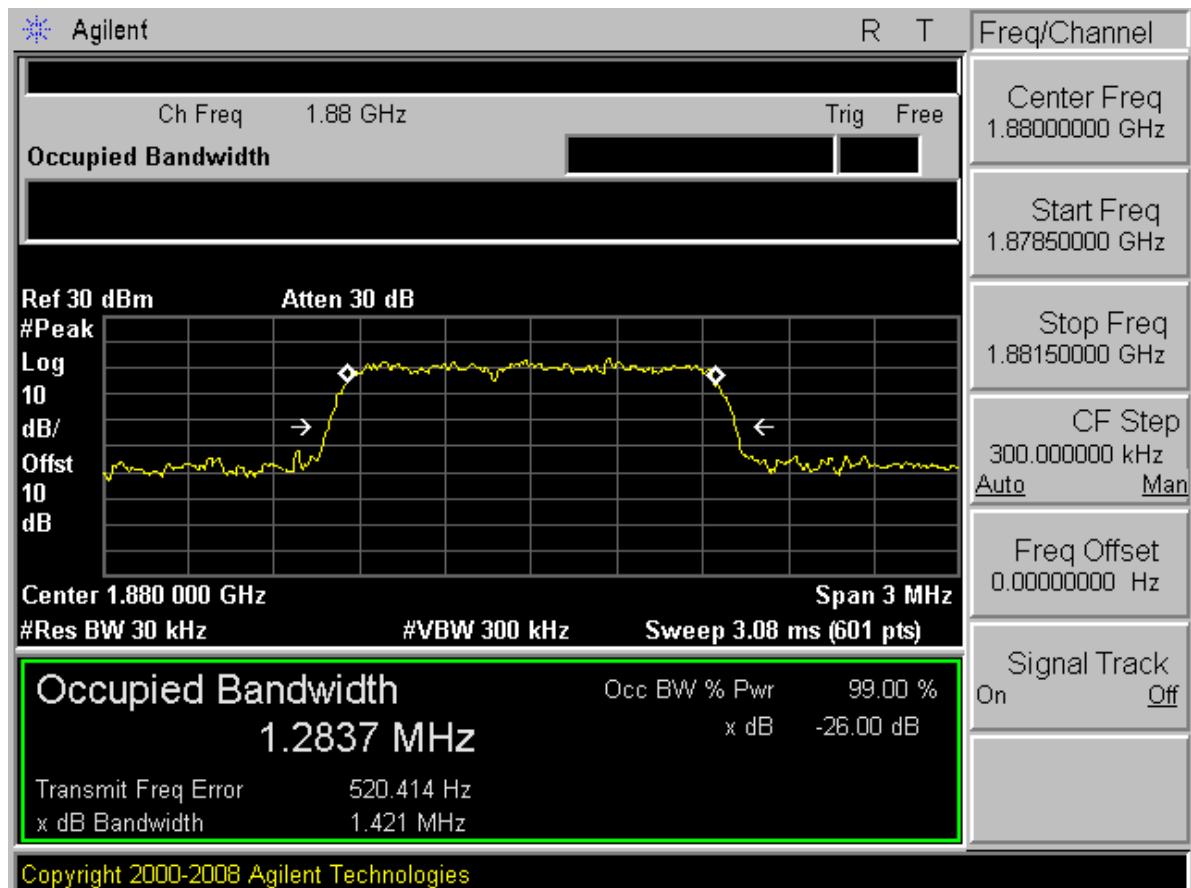
Note: All relevant operation modes have been tested, and the widest case Plot is included in this report.

Channel 600(TM1)





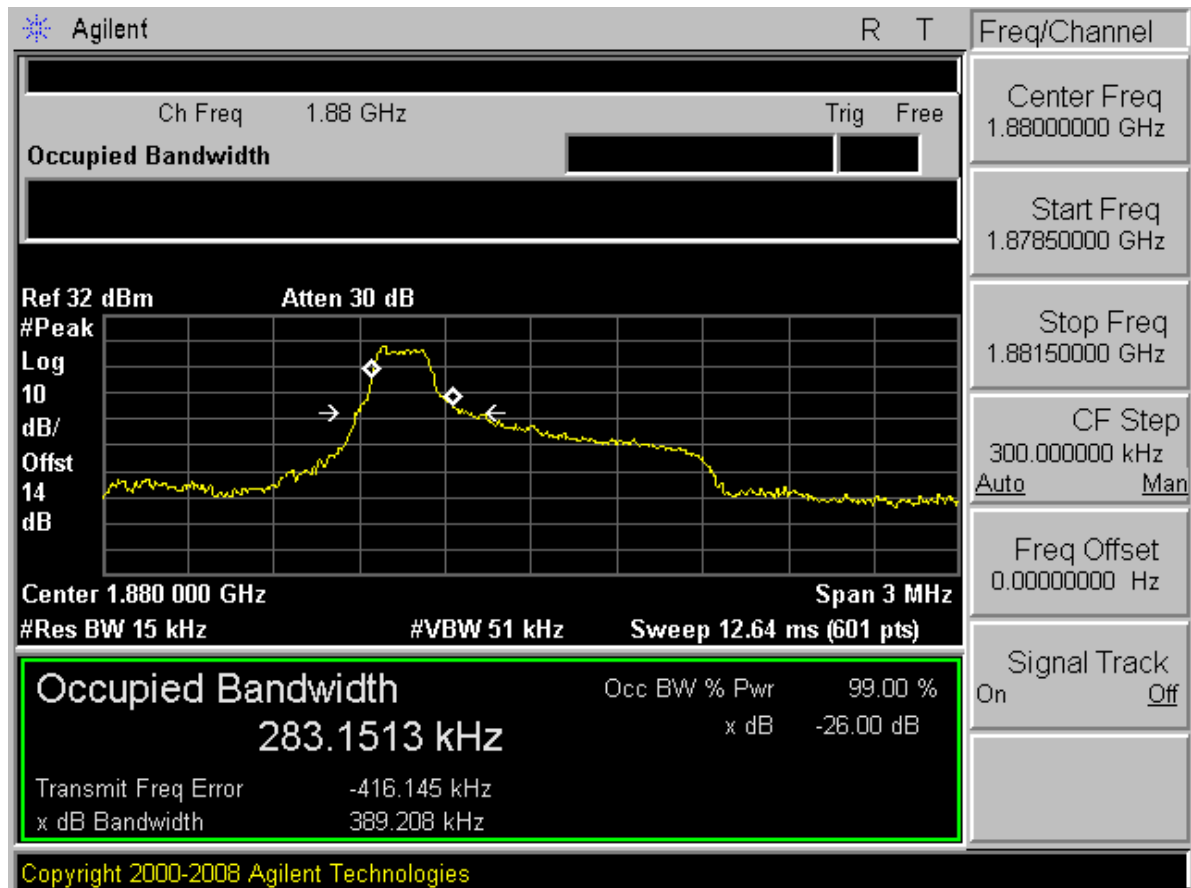
Channel 600 (EVDO subtype 2)





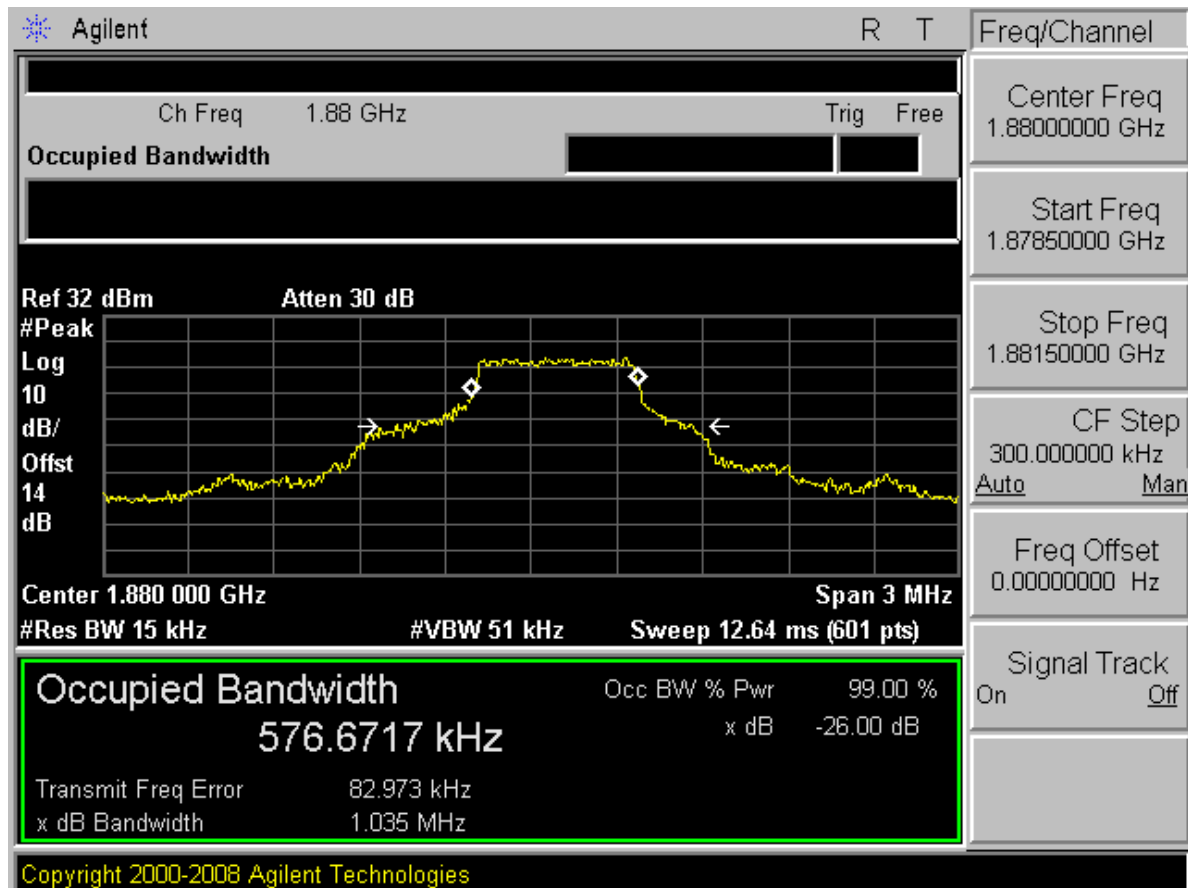
LTE MODE 1.4MHz(BW)

1RB/RB#0



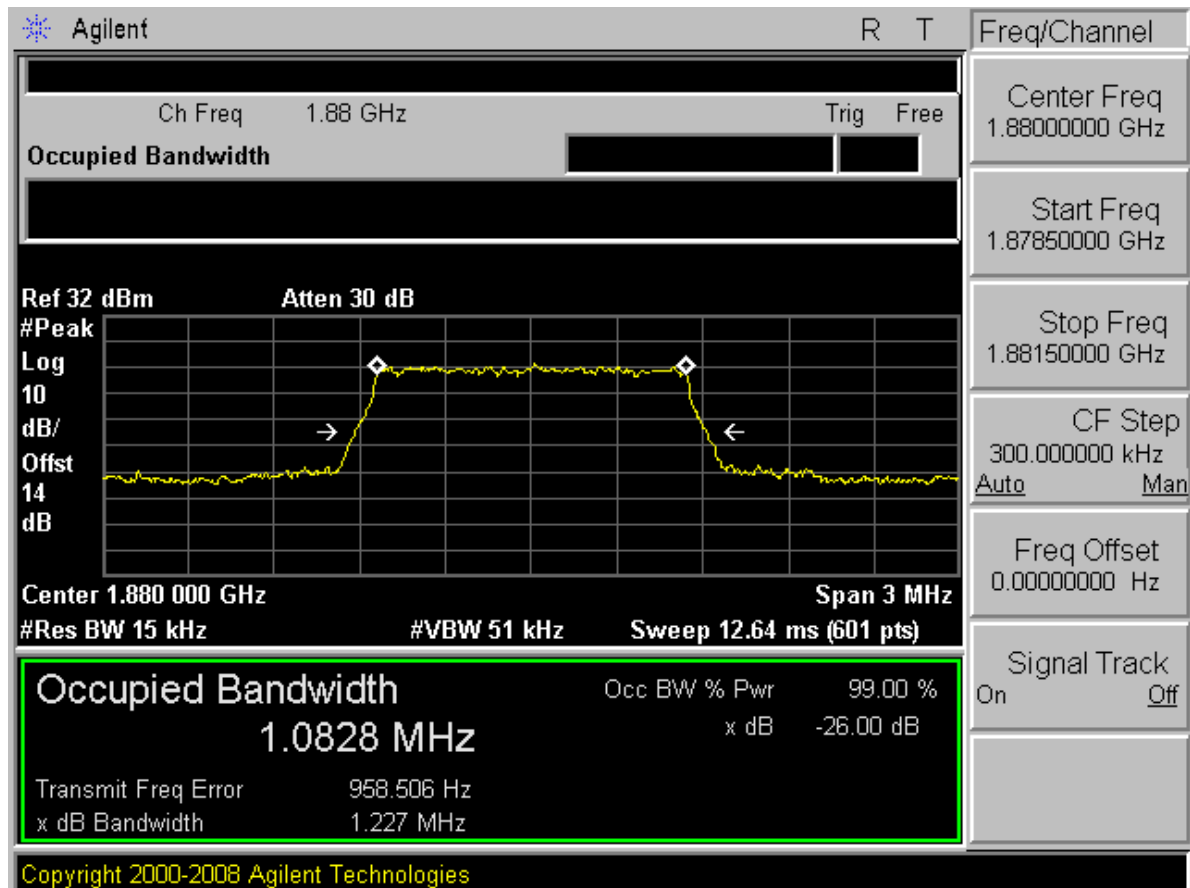


3 RB/RB #2





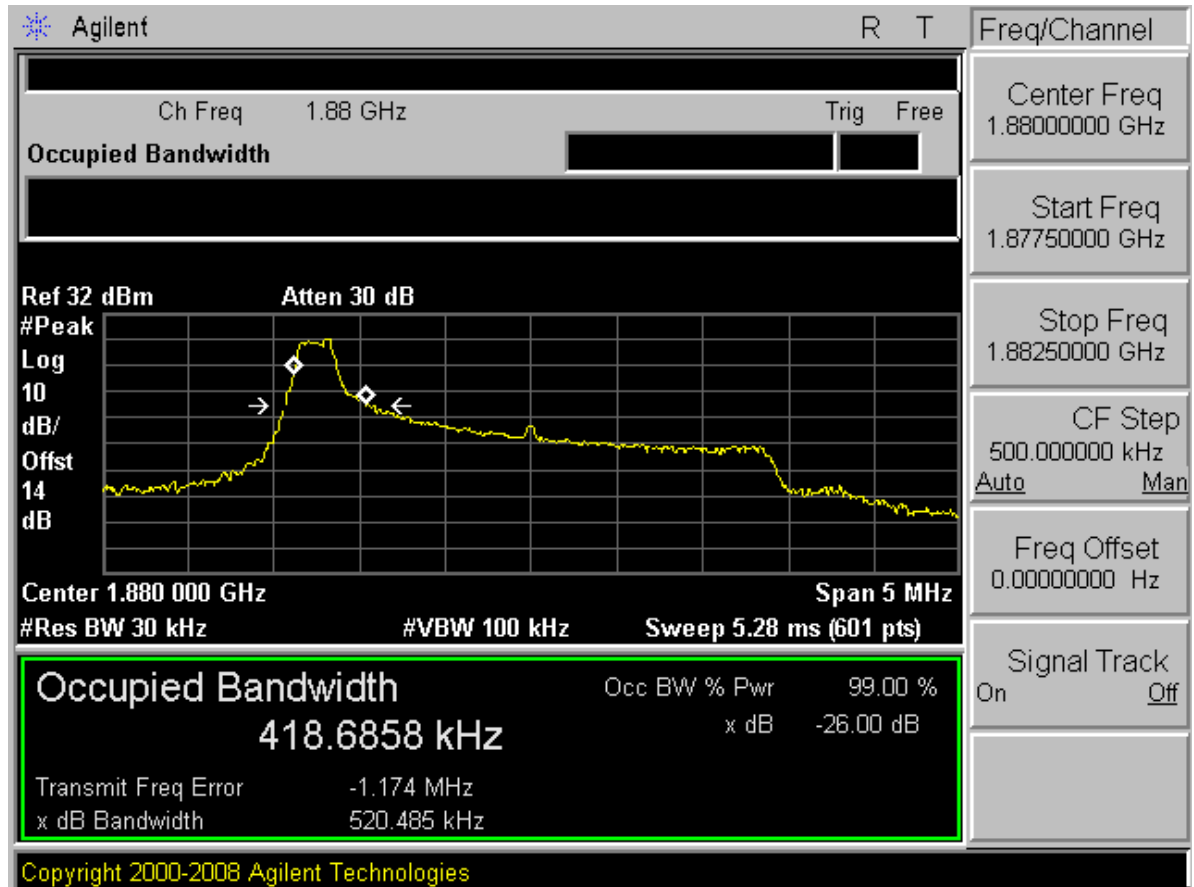
Full RBs





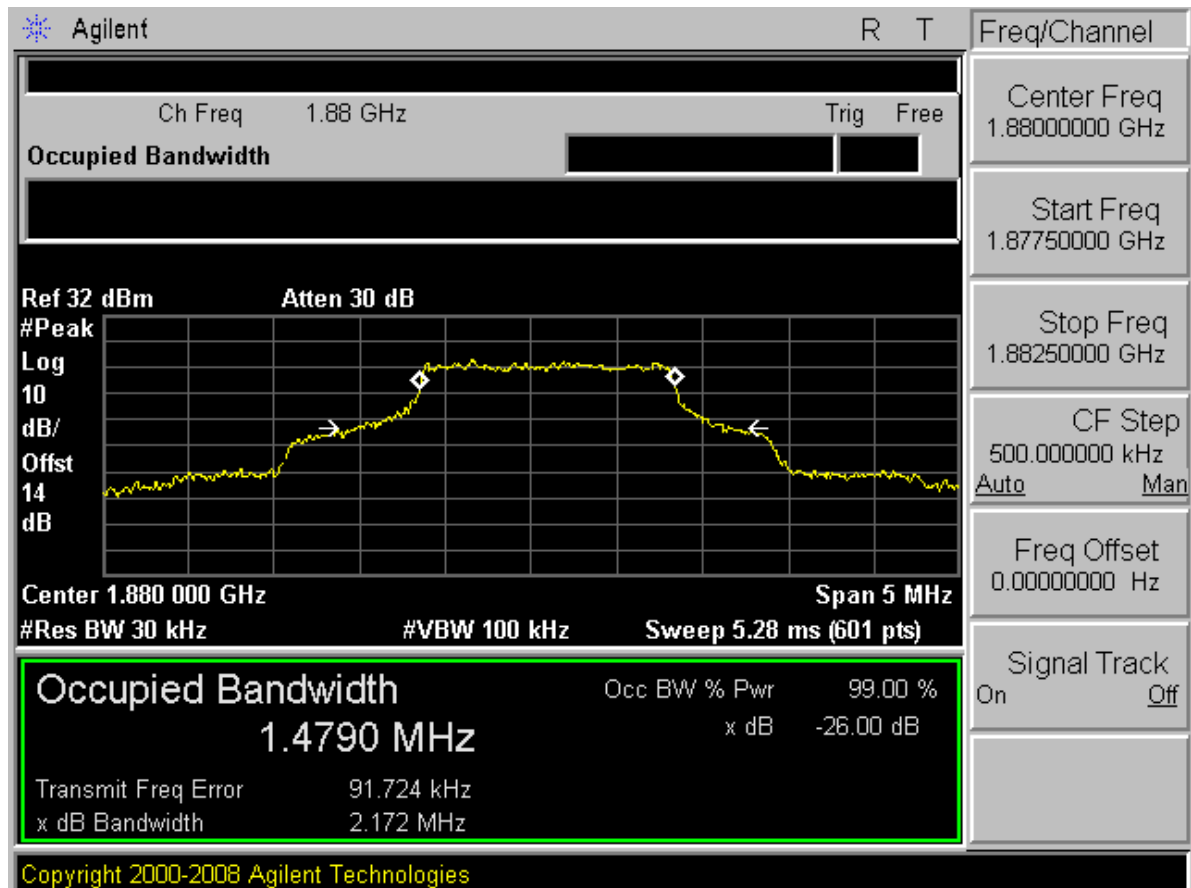
LTE MODE 3MHz(BW)

1RB/RB#0



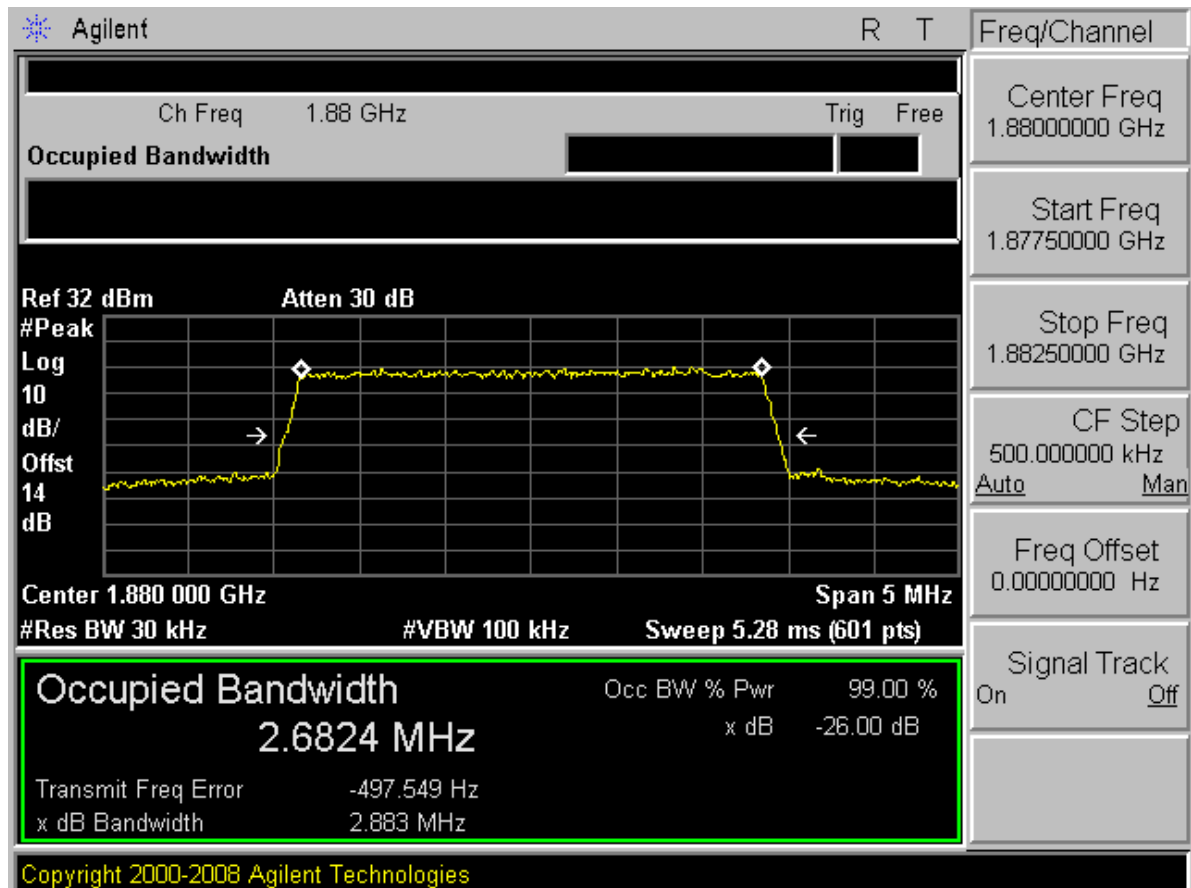


8RB/RB#4





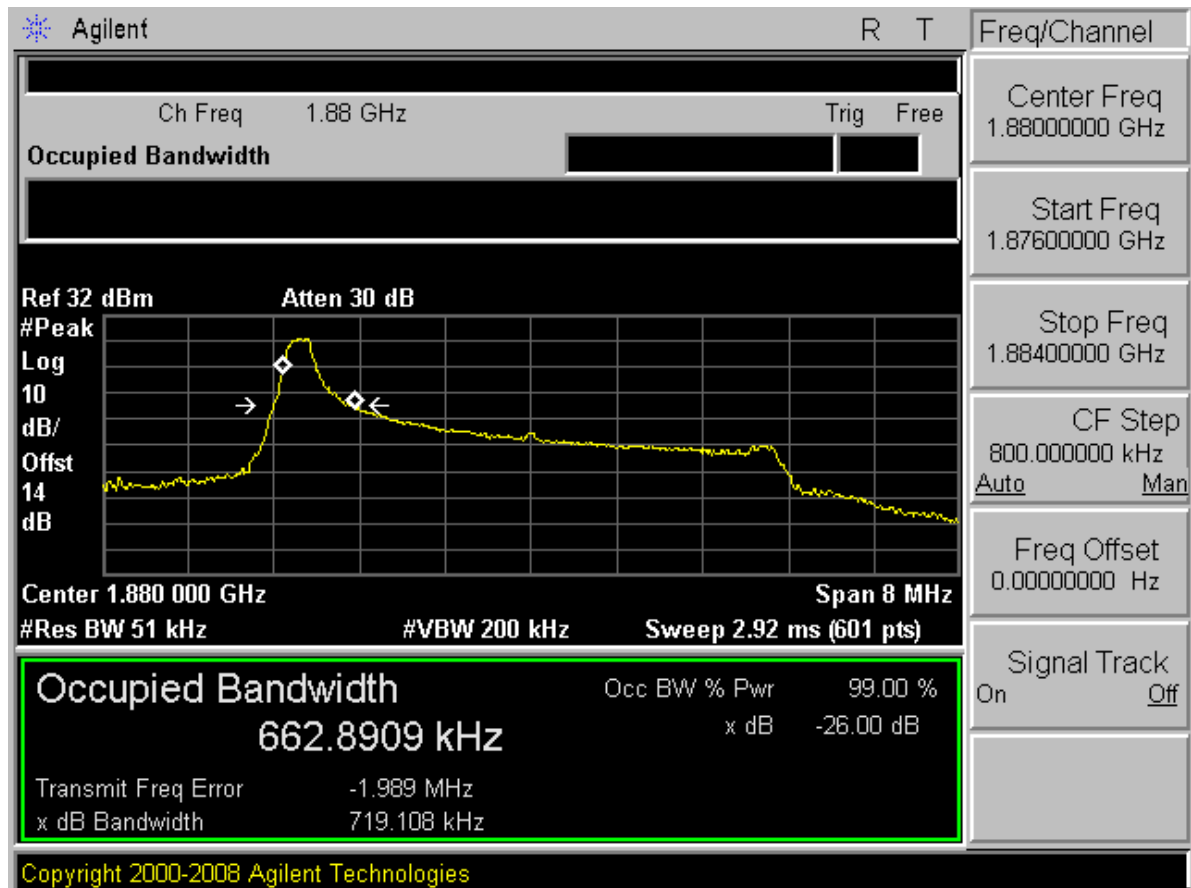
Full RBs





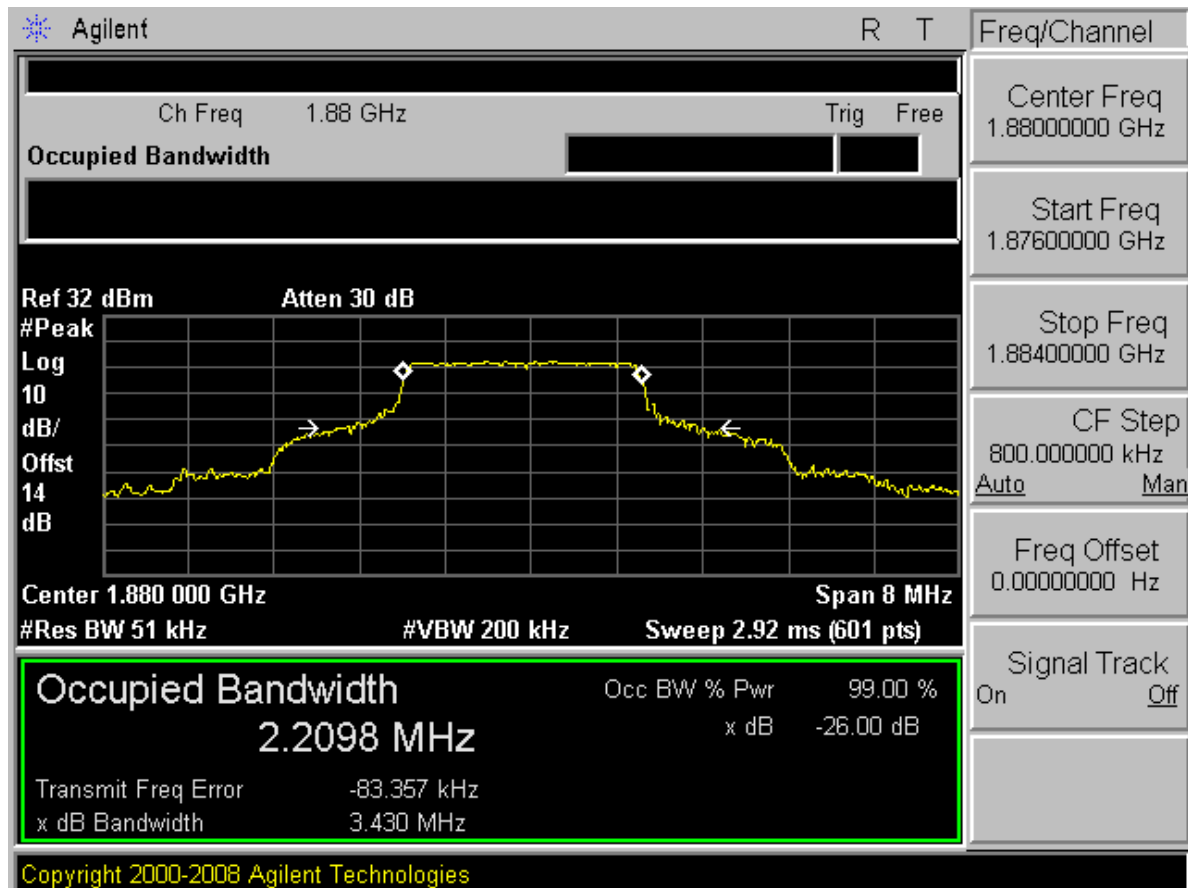
LTE MODE 5MHz(BW)

1RB/RB#0



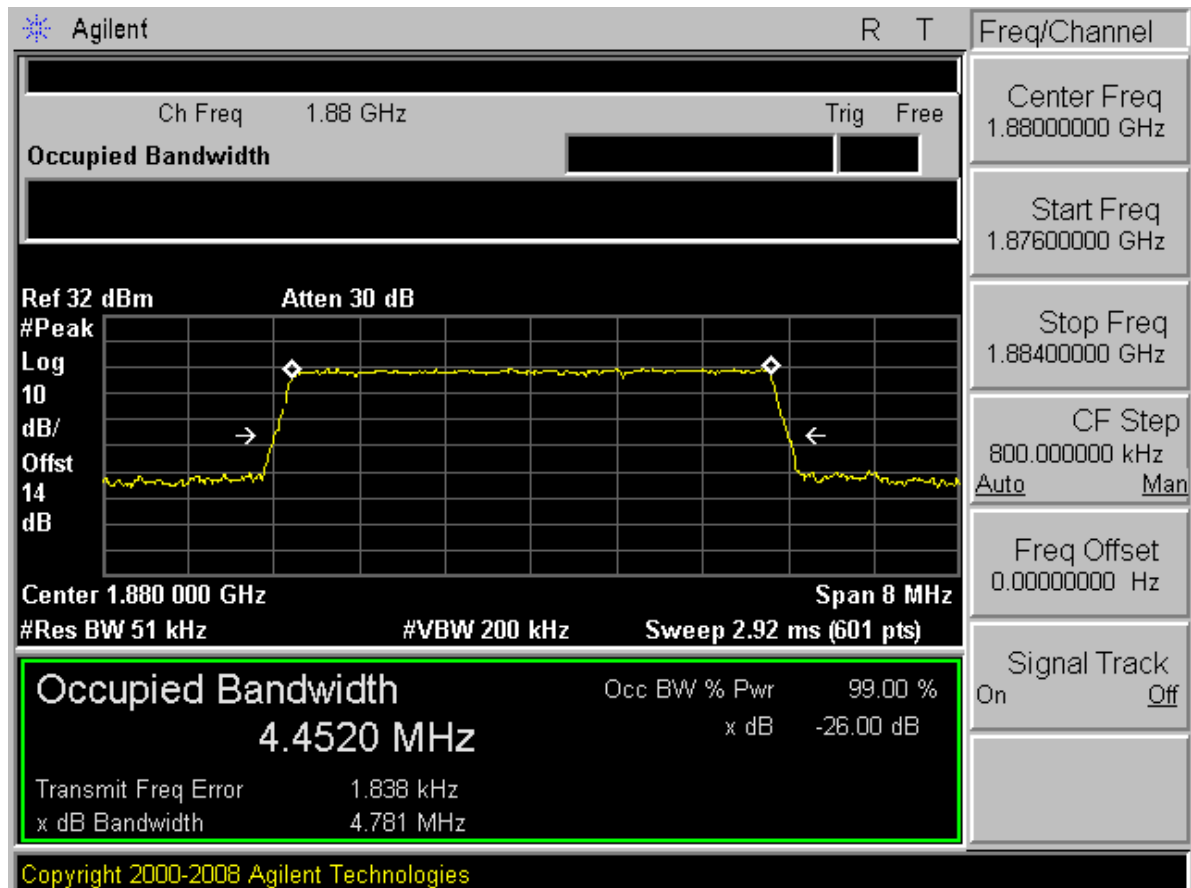


12RB/RB#6





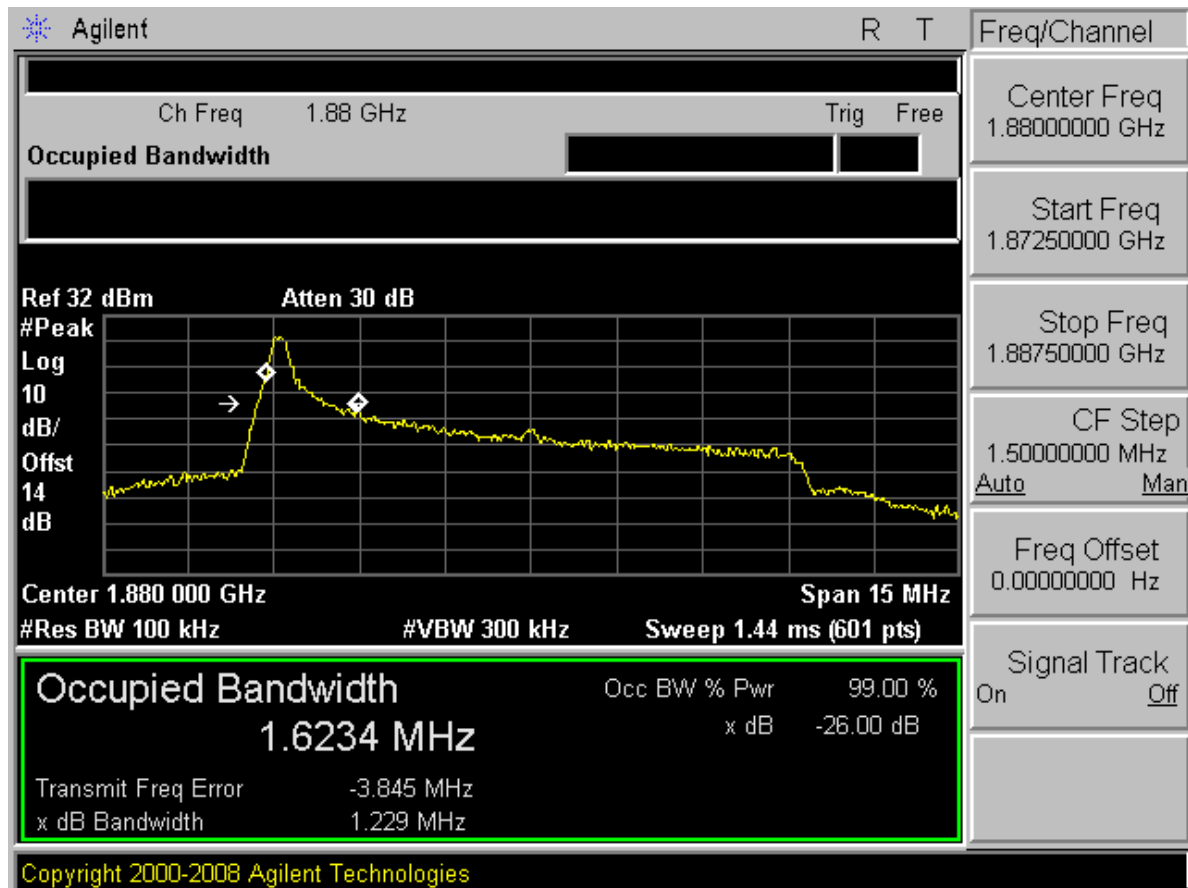
Full RBs





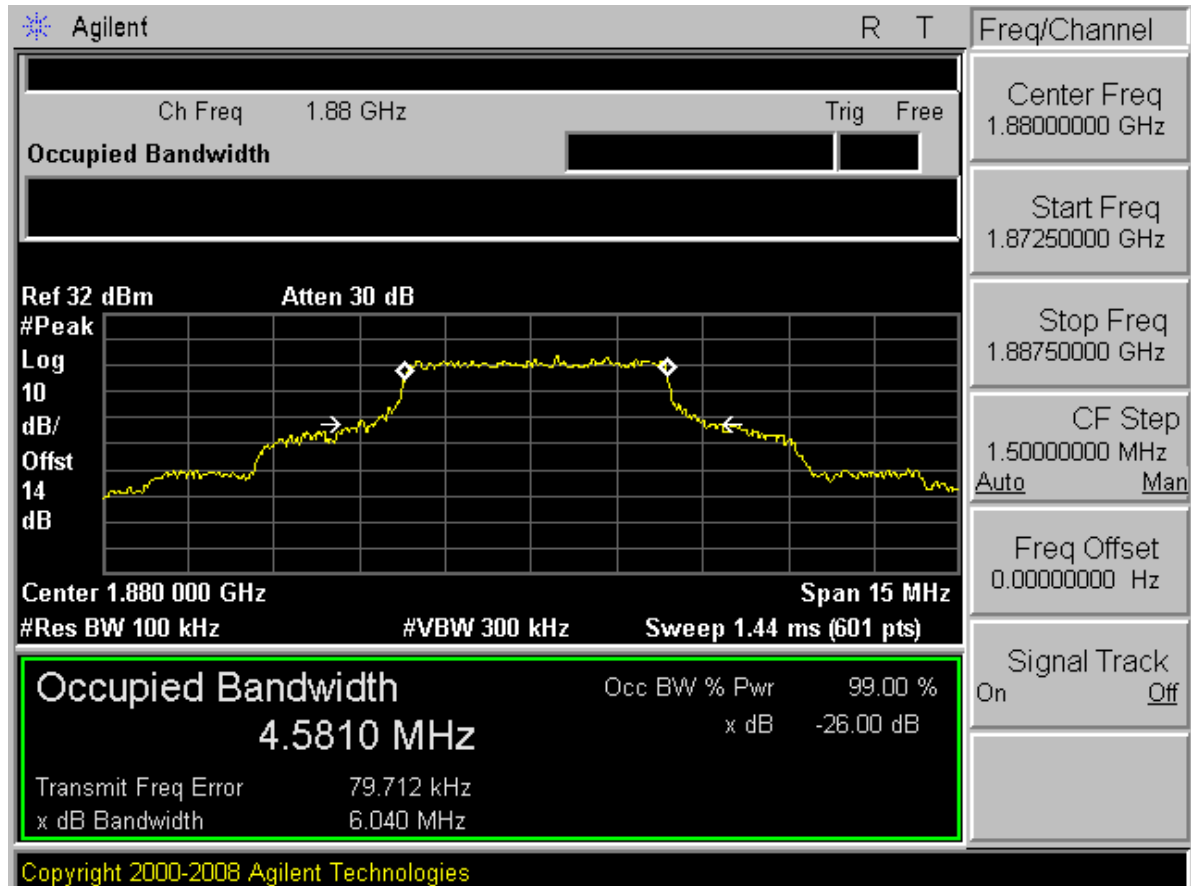
LTE MODE 10MHz(BW)

1RB/RB#0



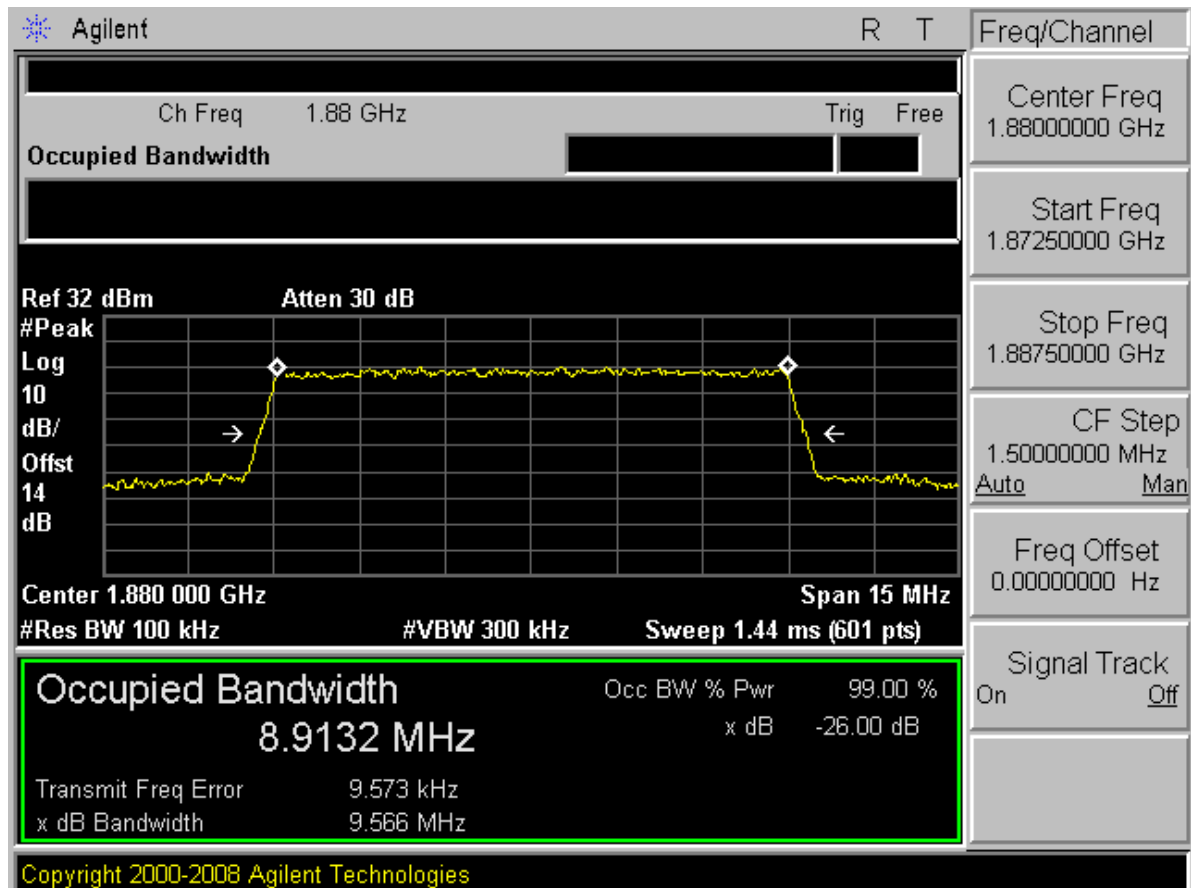


25 RB/RB#13





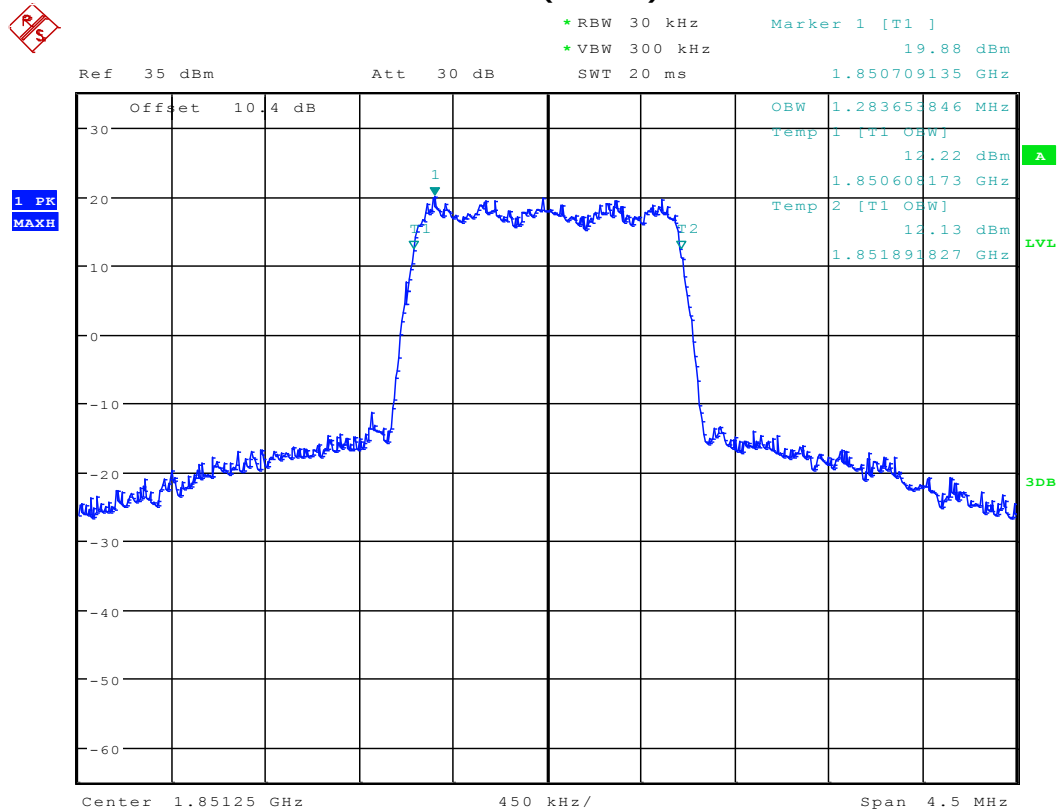
Full RBs





Test Plot of 99% Occupied Bandwidth

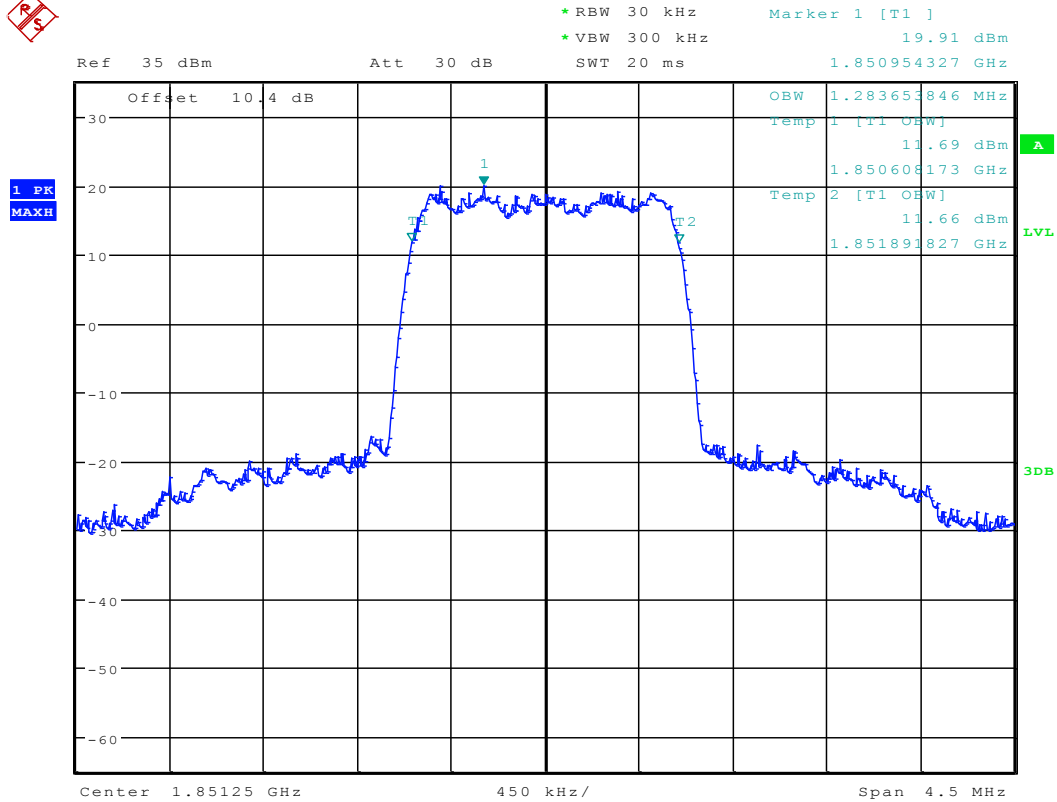
Channel 25 (TM1)



Date: 8.NOV.2011 23:13:42

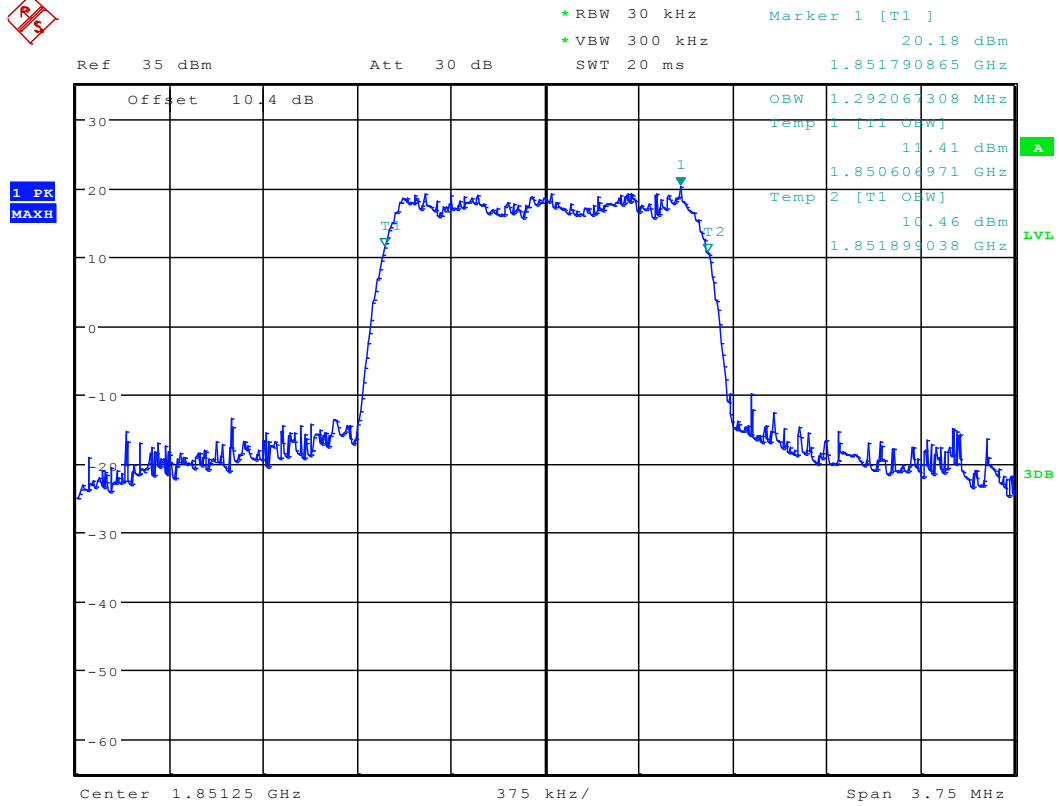


Channel 25 (TM3)



Date: 8.NOV.2011 23:14:25

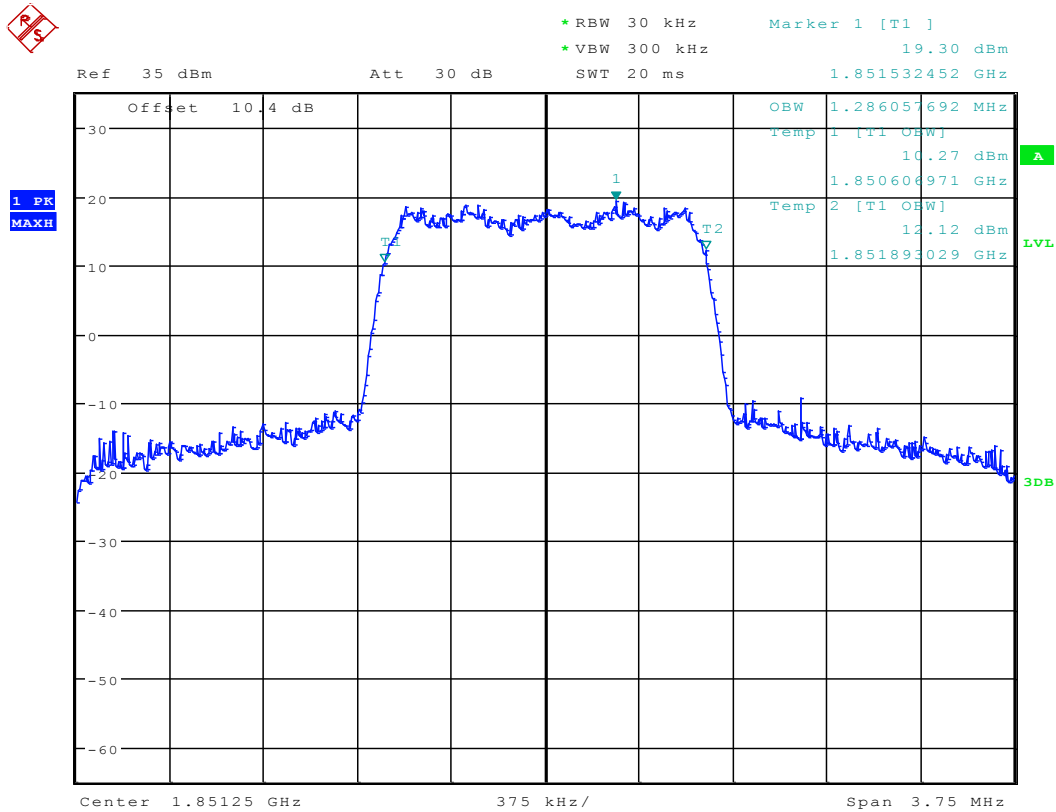
Channel 25(EVDO subtype 0)



Date: 8.NOV.2011 23:19:18



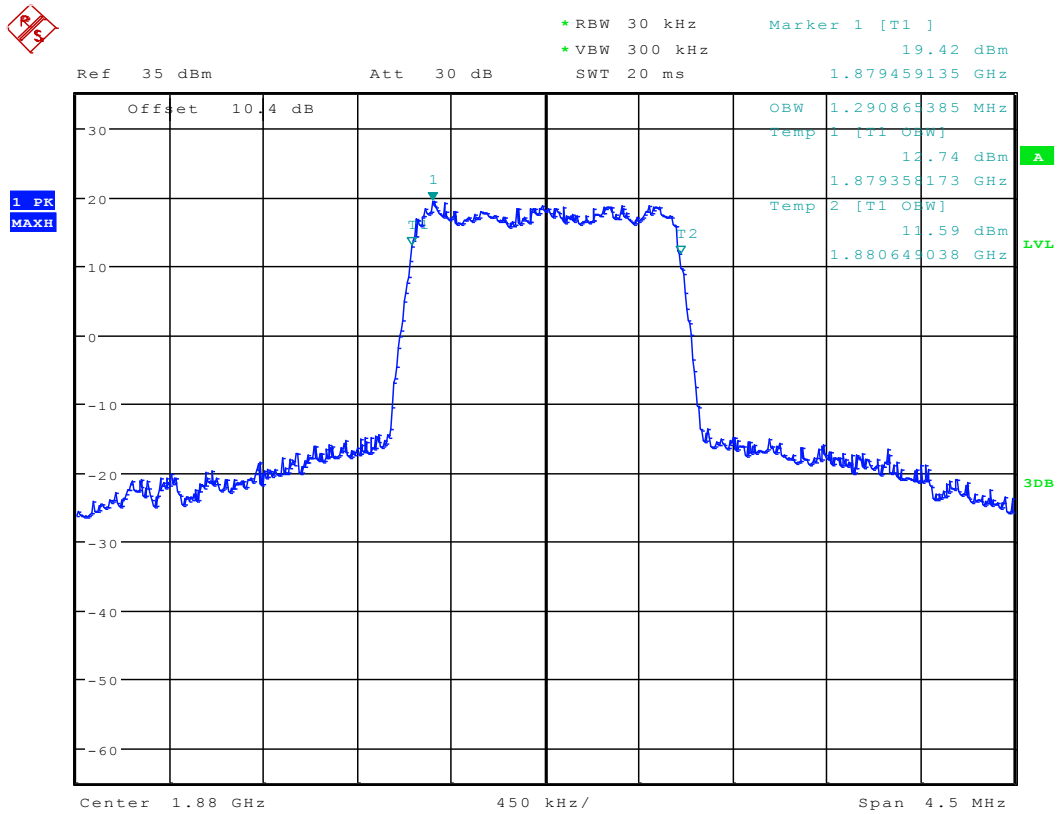
Channel 25 (EVDO Subtype 2)



Date: 8.NOV.2011 23:24:20



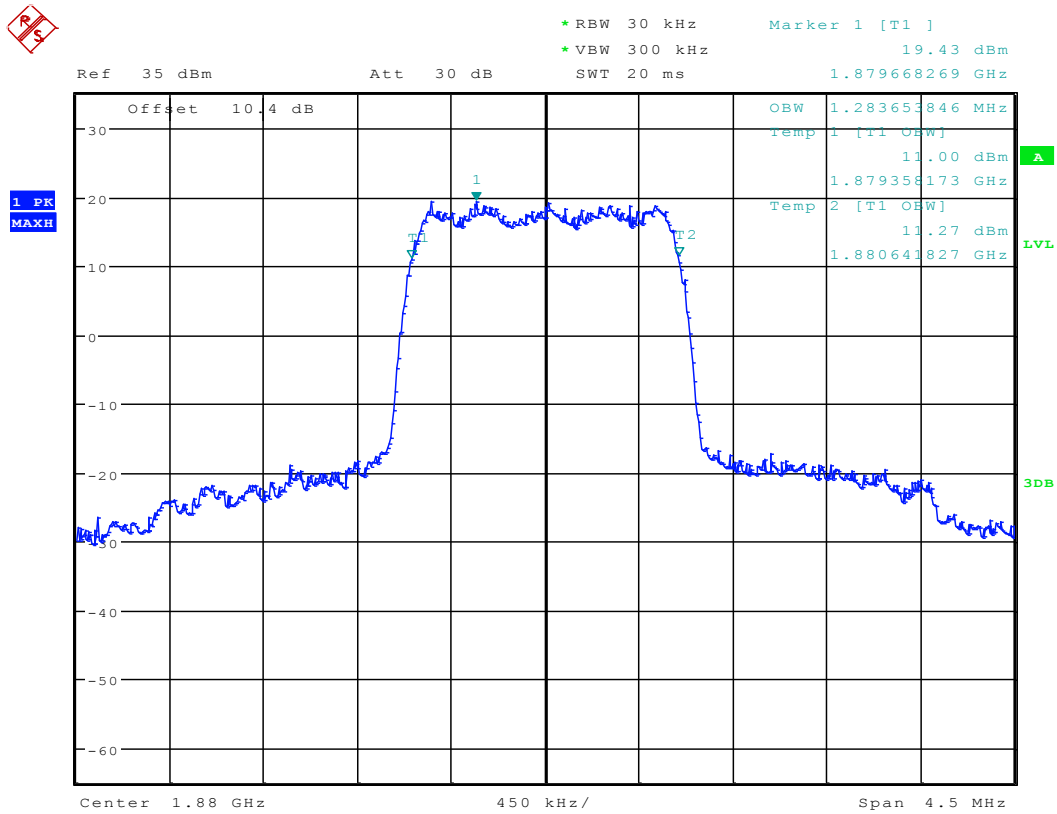
Channel 600(TM1)



Date: 8.NOV.2011 23:13:56



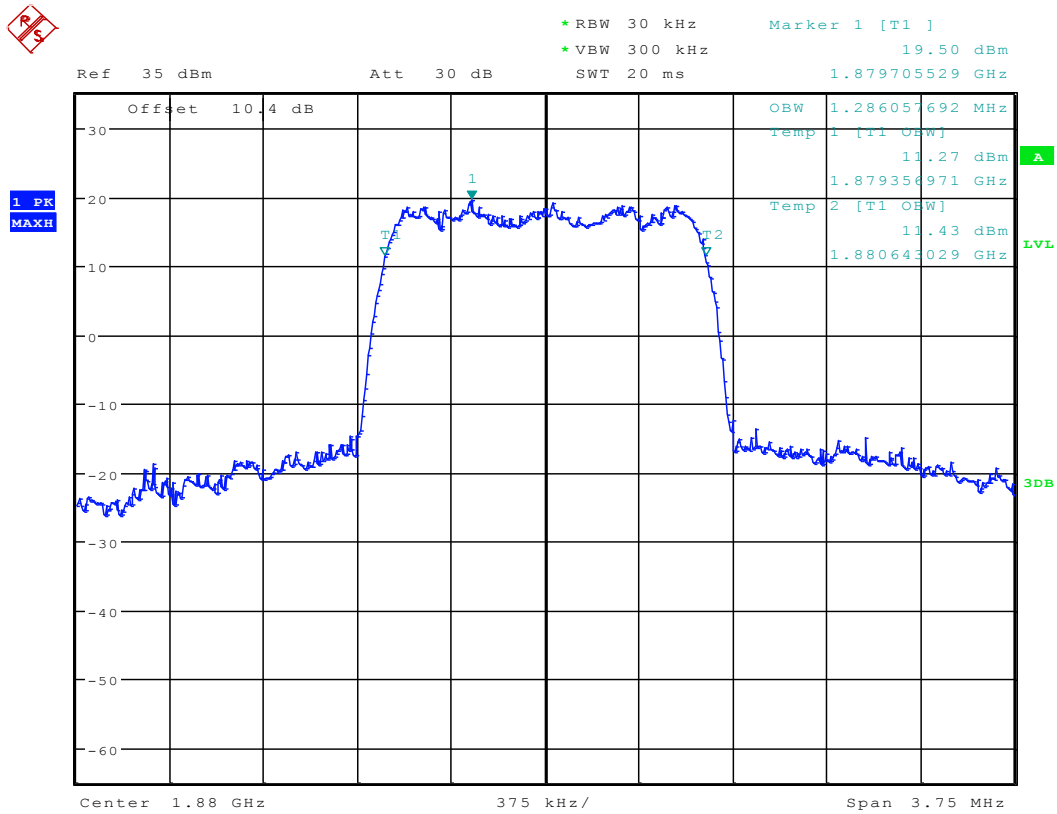
Channel 600(TM3)



Date: 8.NOV.2011 23:14:38



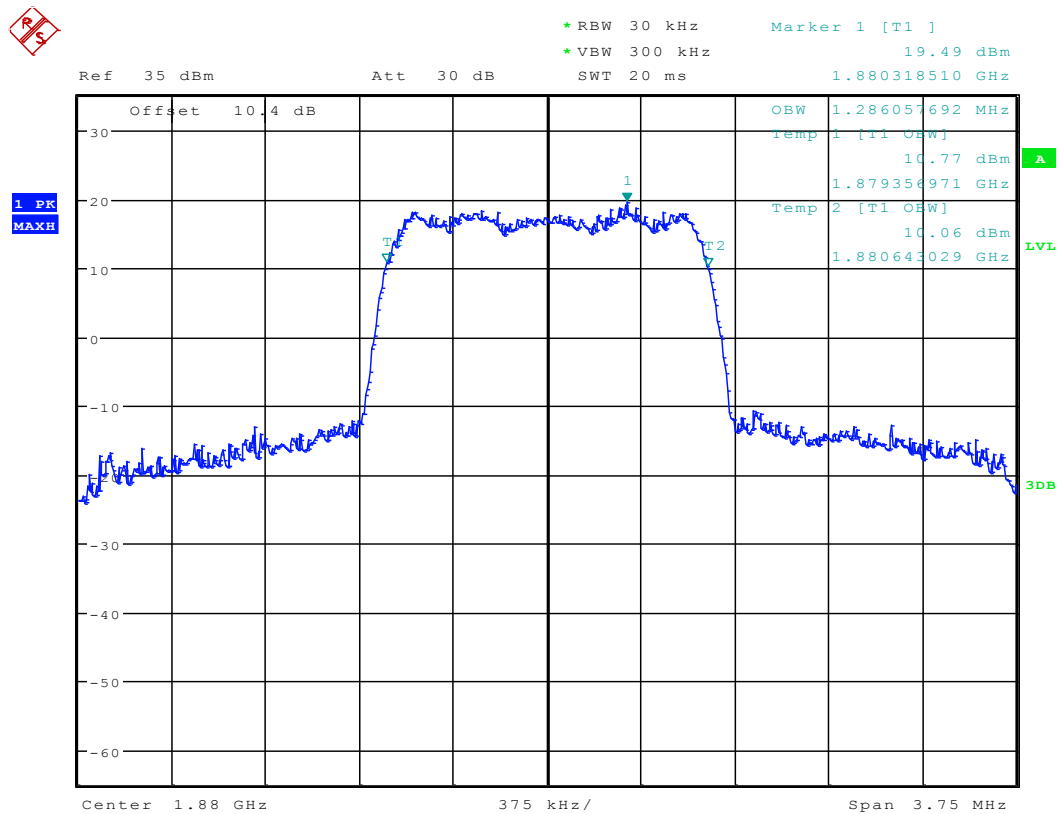
Channel 600 (EVDO subtype 0)



Date: 8.NOV.2011 23:19:32



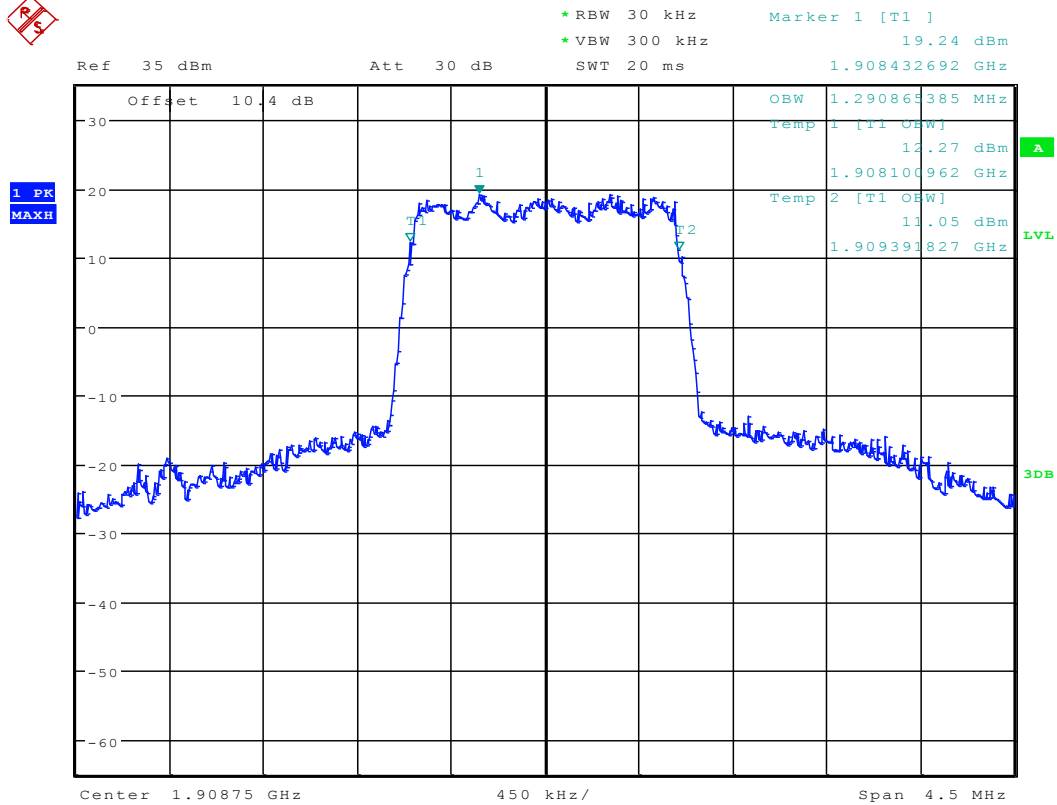
Channel 600 (EVDO subtype 2)



Date: 8.NOV.2011 23:24:32



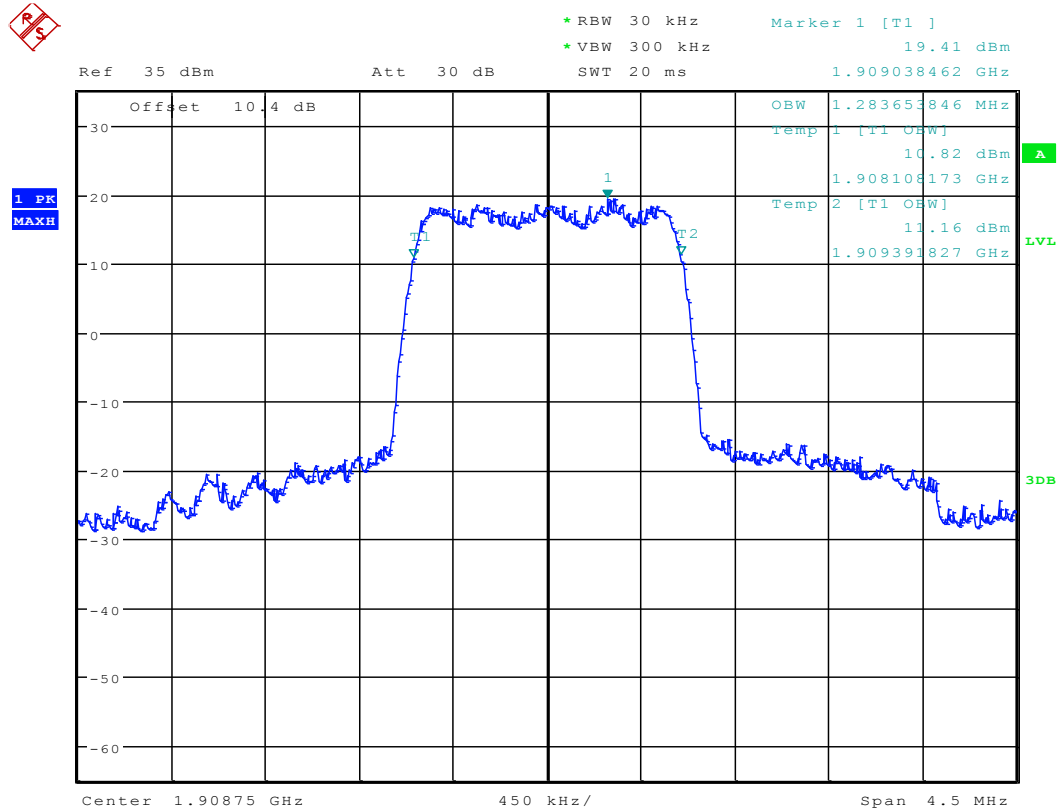
Channel 1175(TM1)



Date: 8.NOV.2011 23:14:09



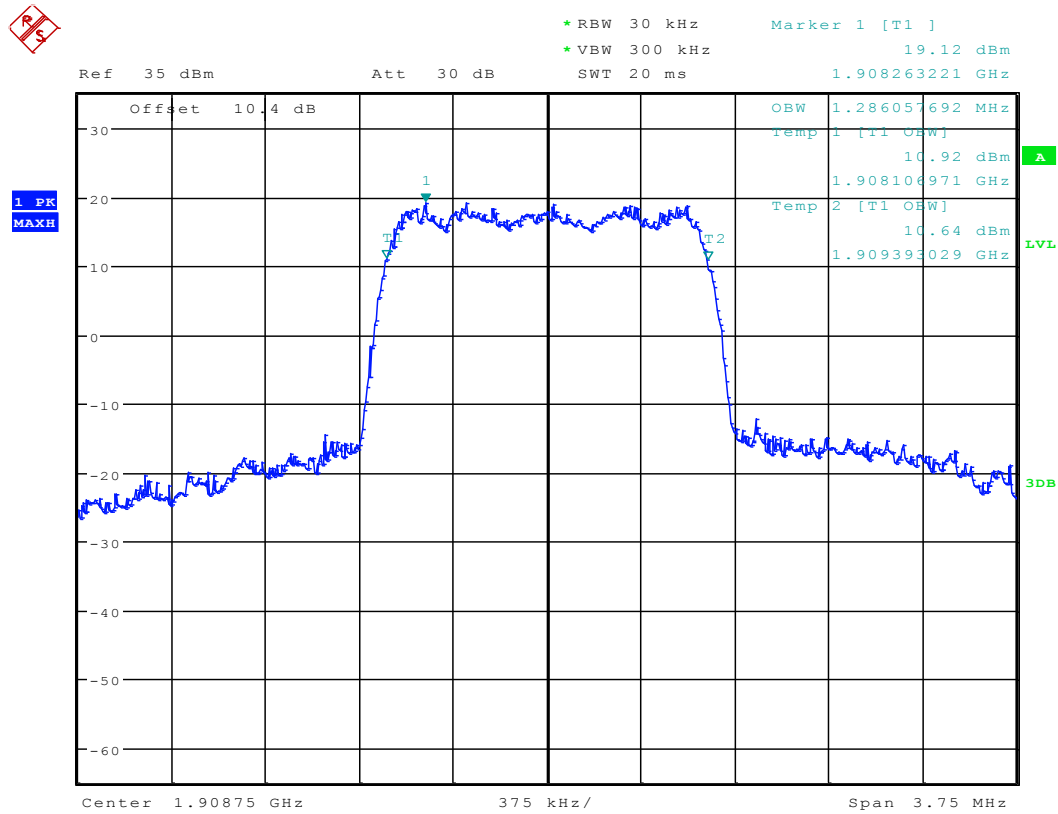
Channel 1175(TM3)



Date: 8.NOV.2011 23:14:52



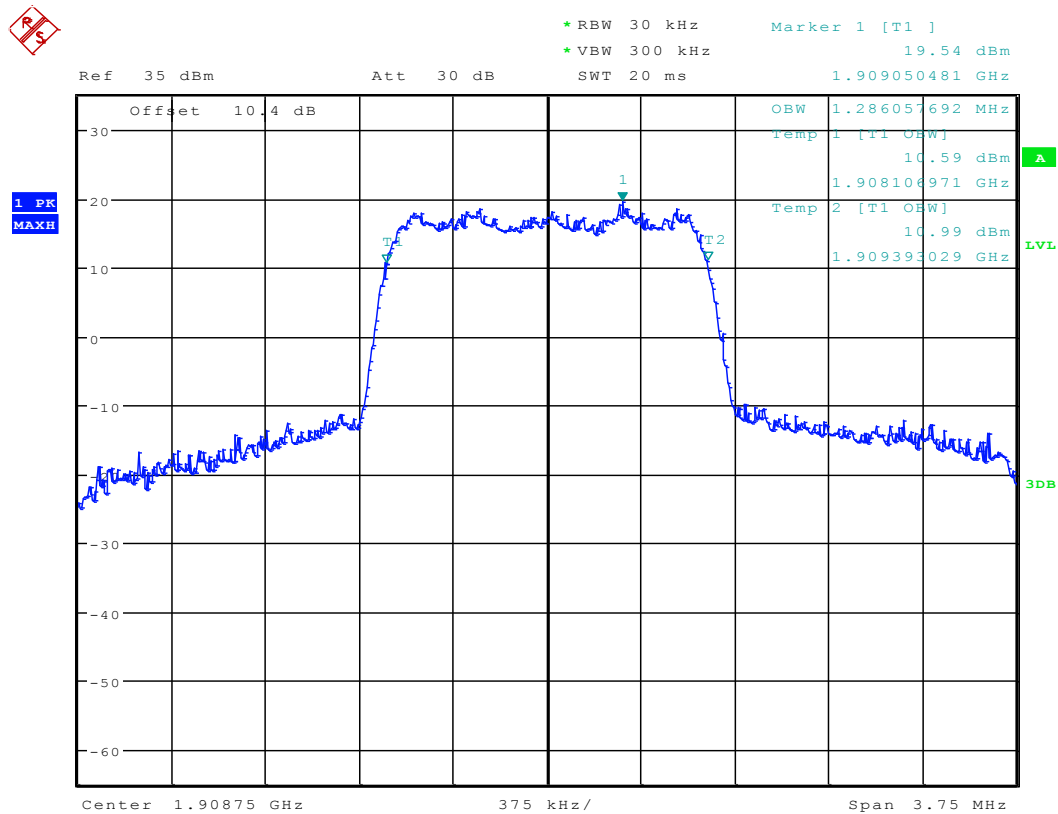
Channel 1175(EVDO subtype 0)



Date: 8.NOV.2011 23:19:46



Channel 1175 (EVDO subtype 2)



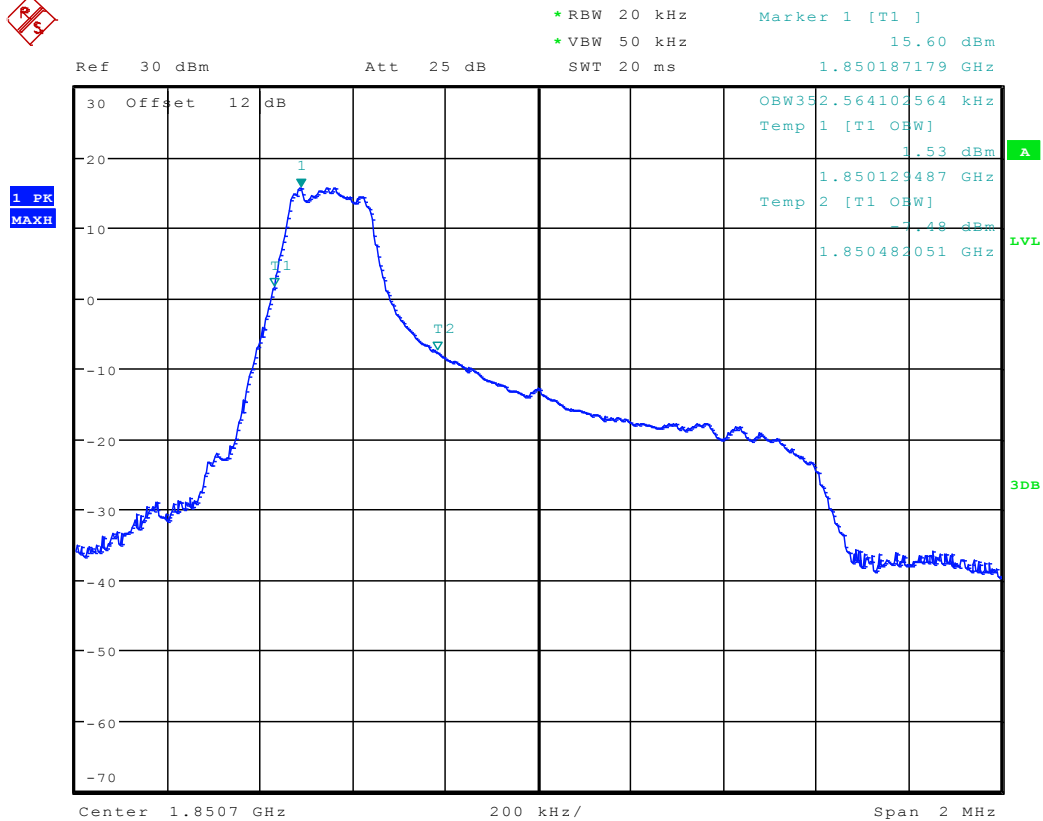
Date: 8.NOV.2011 23:24:43



1.4MHz(BW) Channel 18607

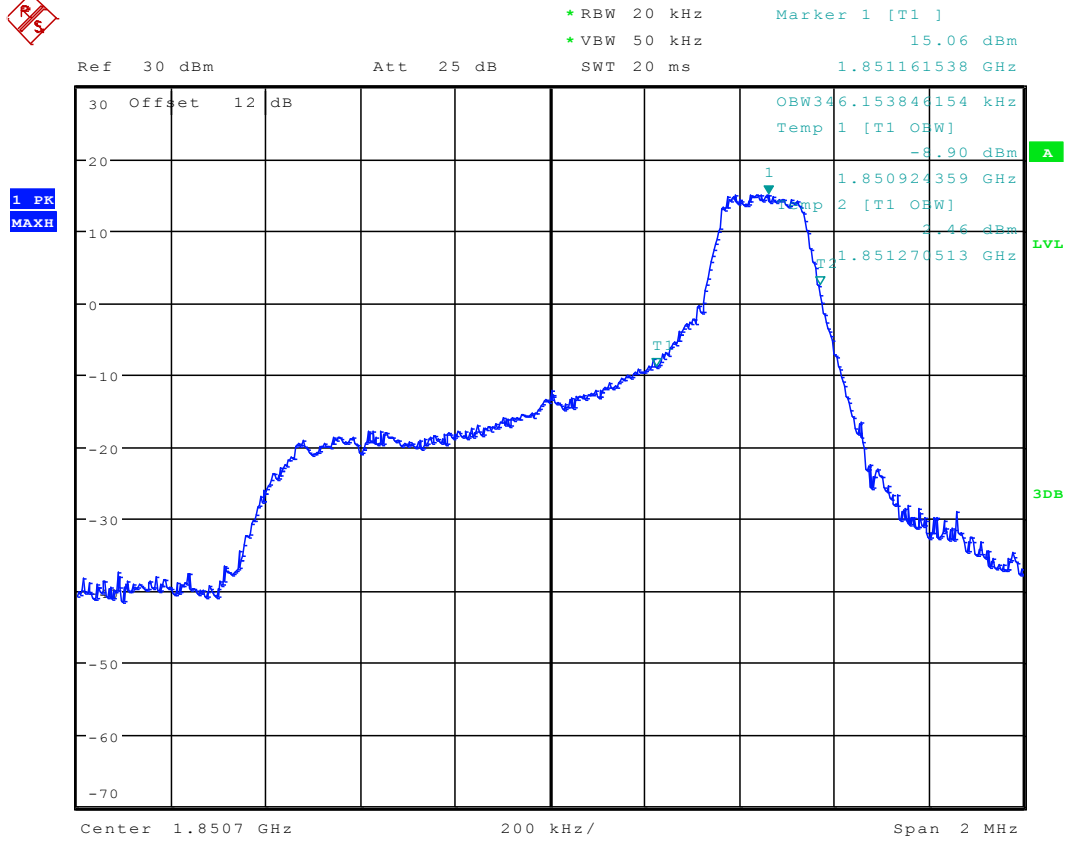
TM4

QPSK/1 RB/RB #0



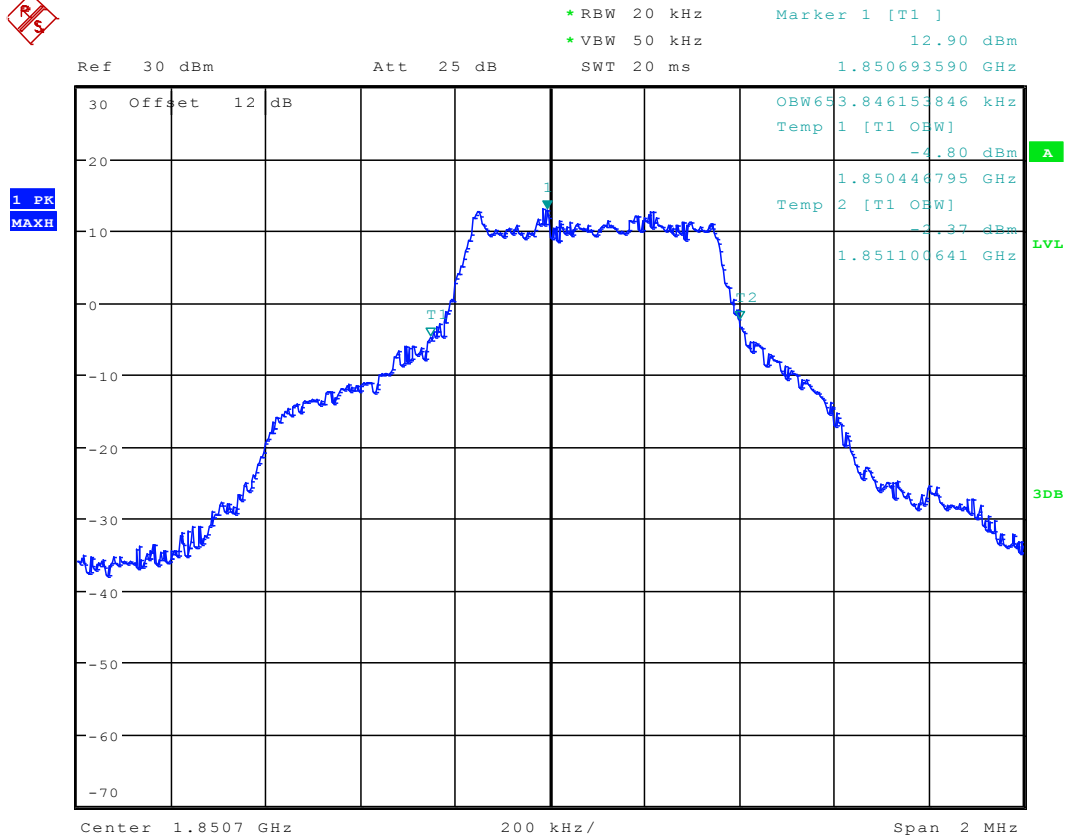


QPSK/1 RB/RB #max



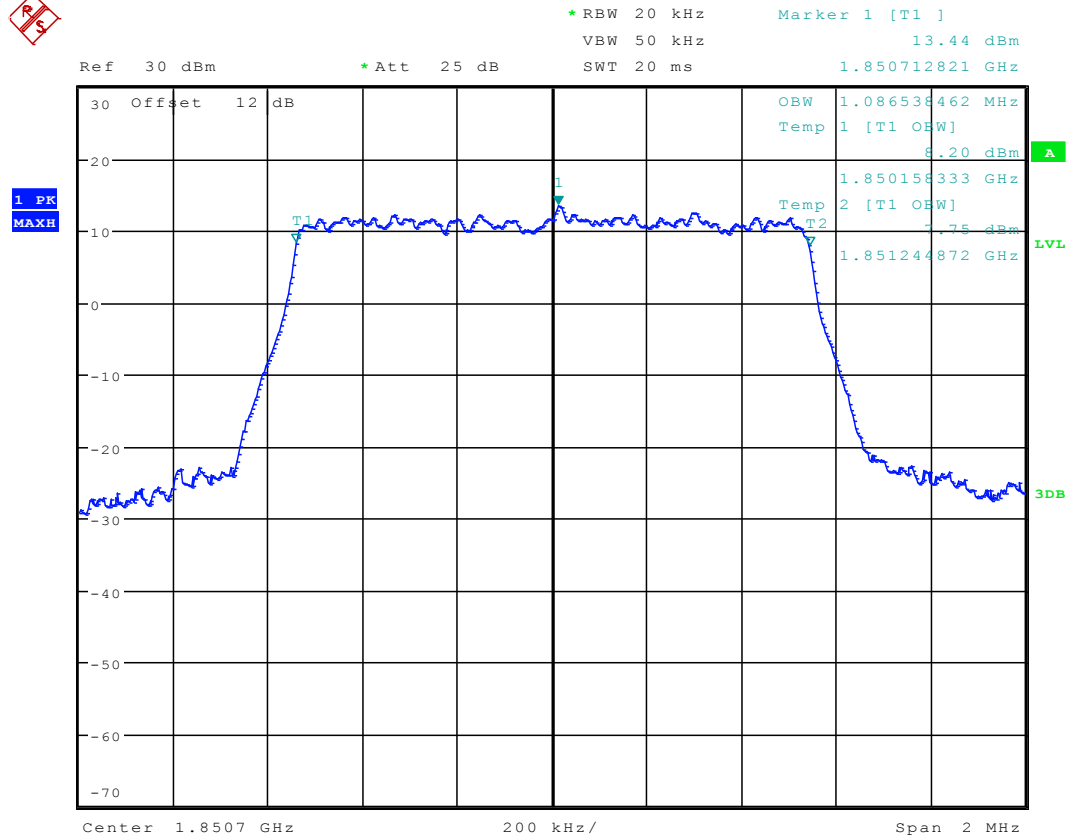


QPSK/3 RB/RB #2





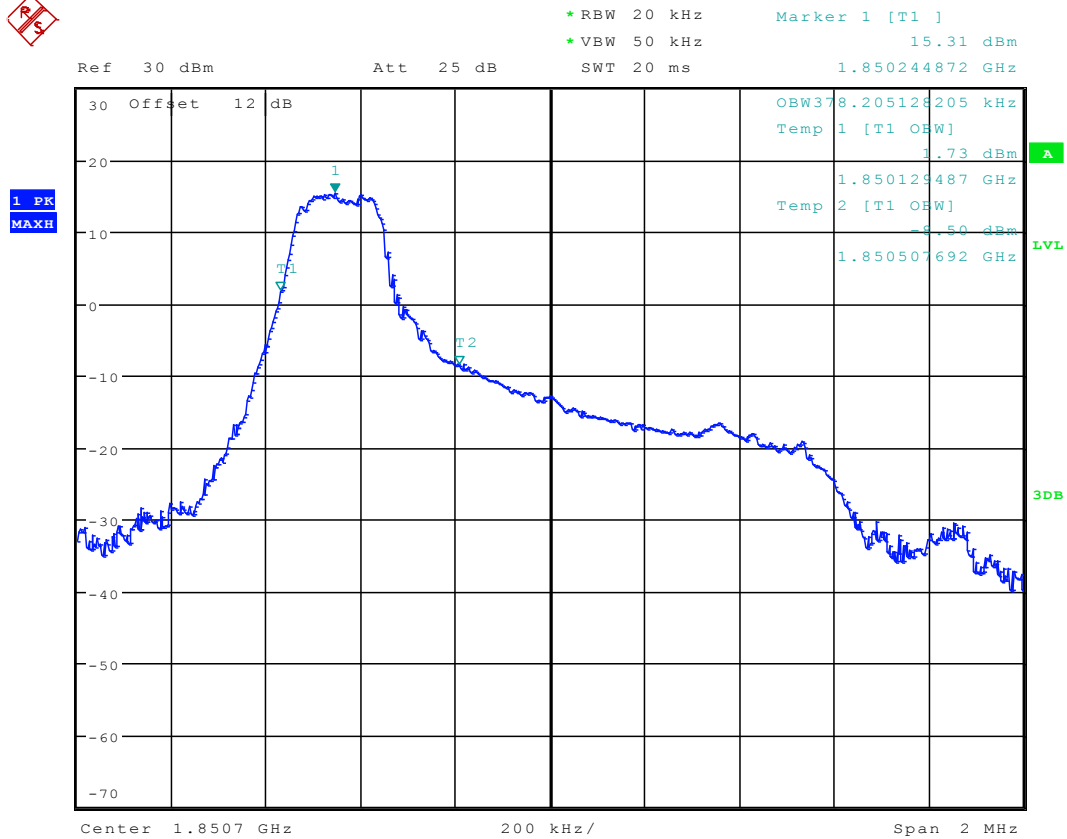
QPSK/ full RBs





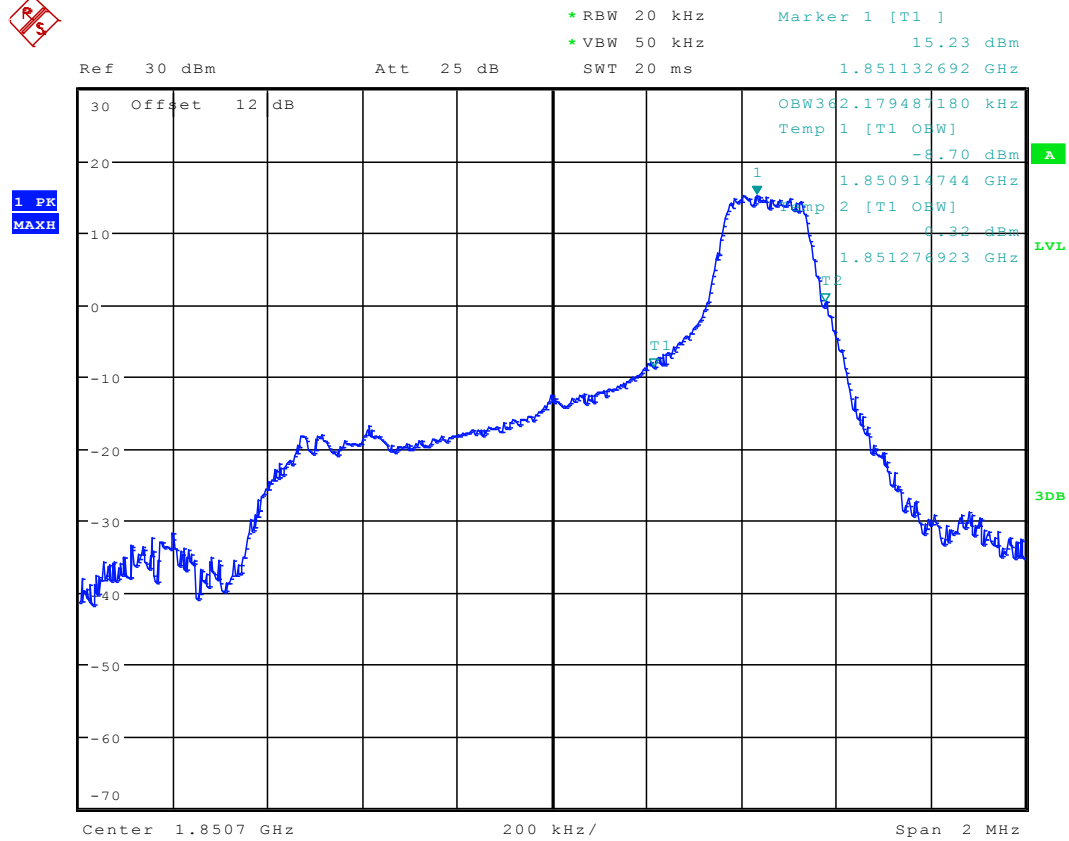
TM5

16QAM /1 RB/RB #0



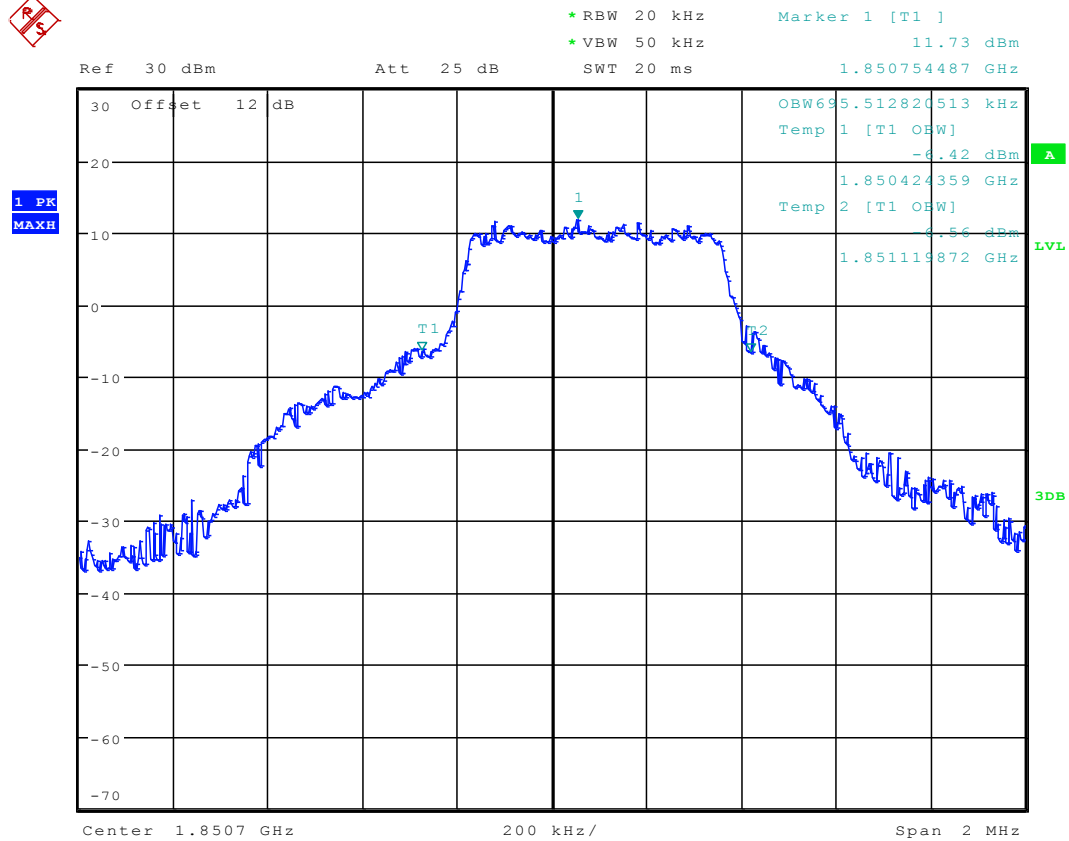


16QAM /1 RB/RB #max



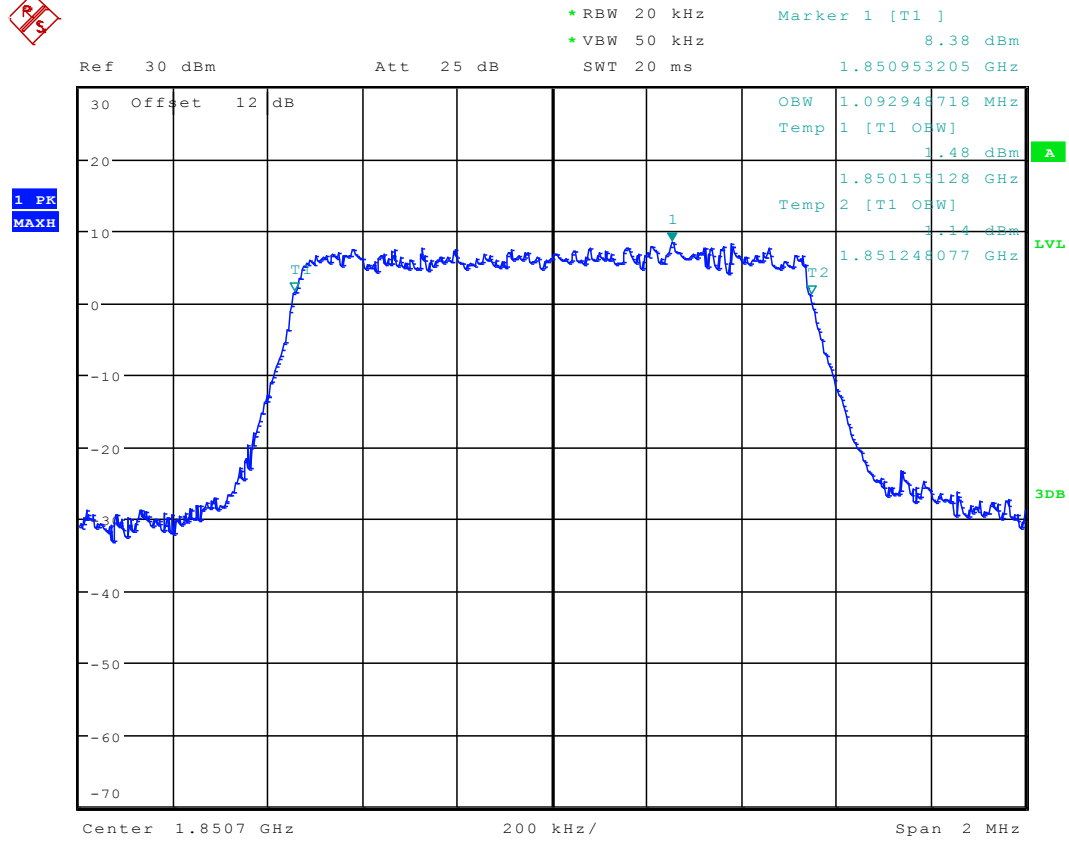


16QAM /3 RB/RB #2





16QAM/full RBs

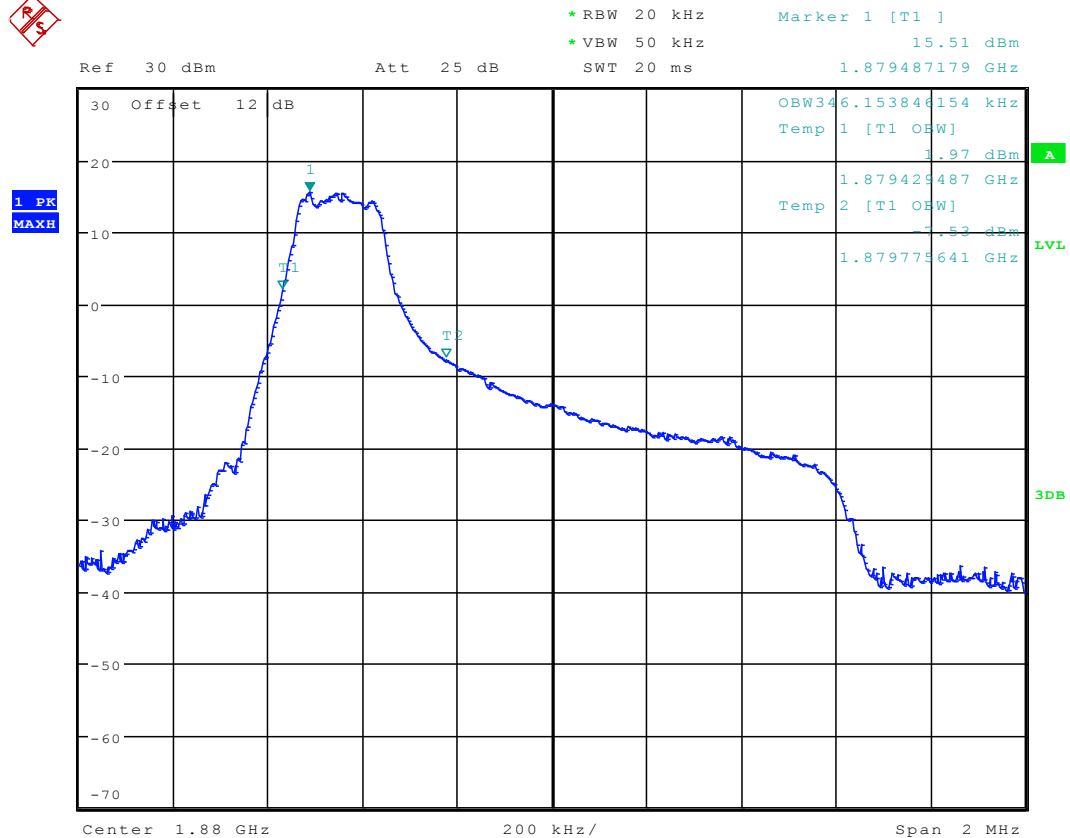




Channel 18900

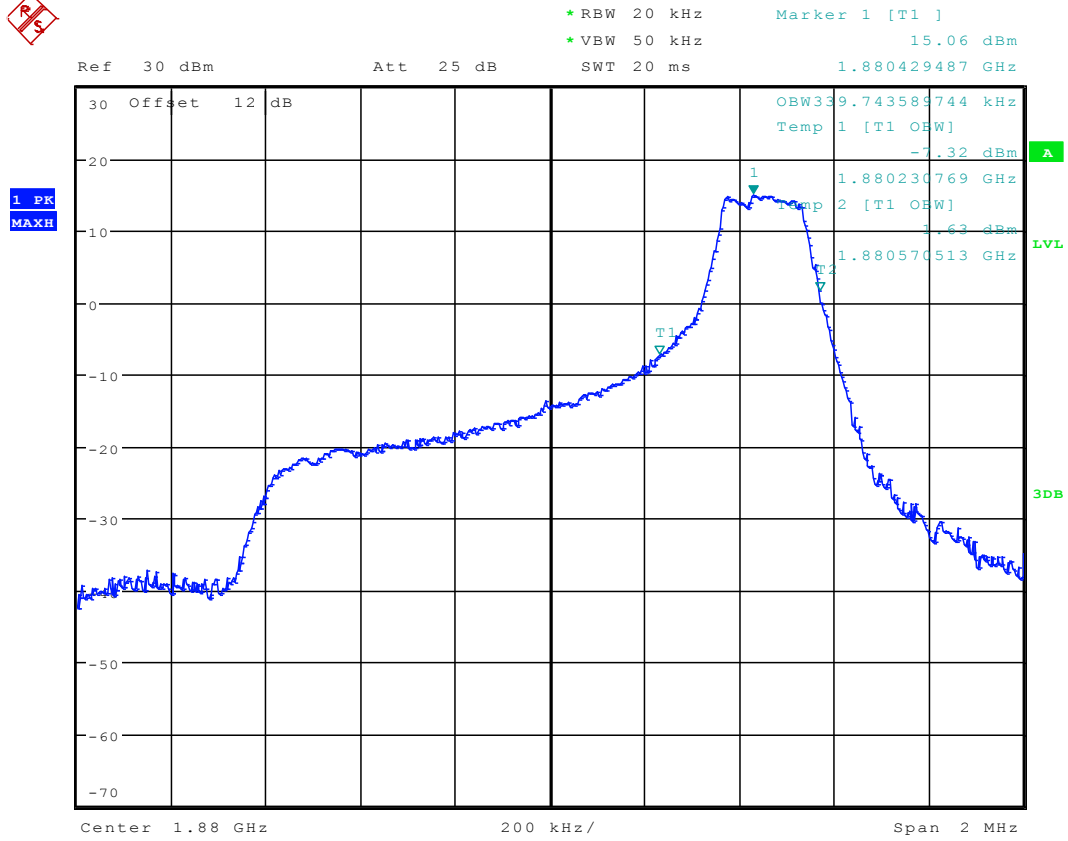
TM4

QPSK/1 RB/RB #0



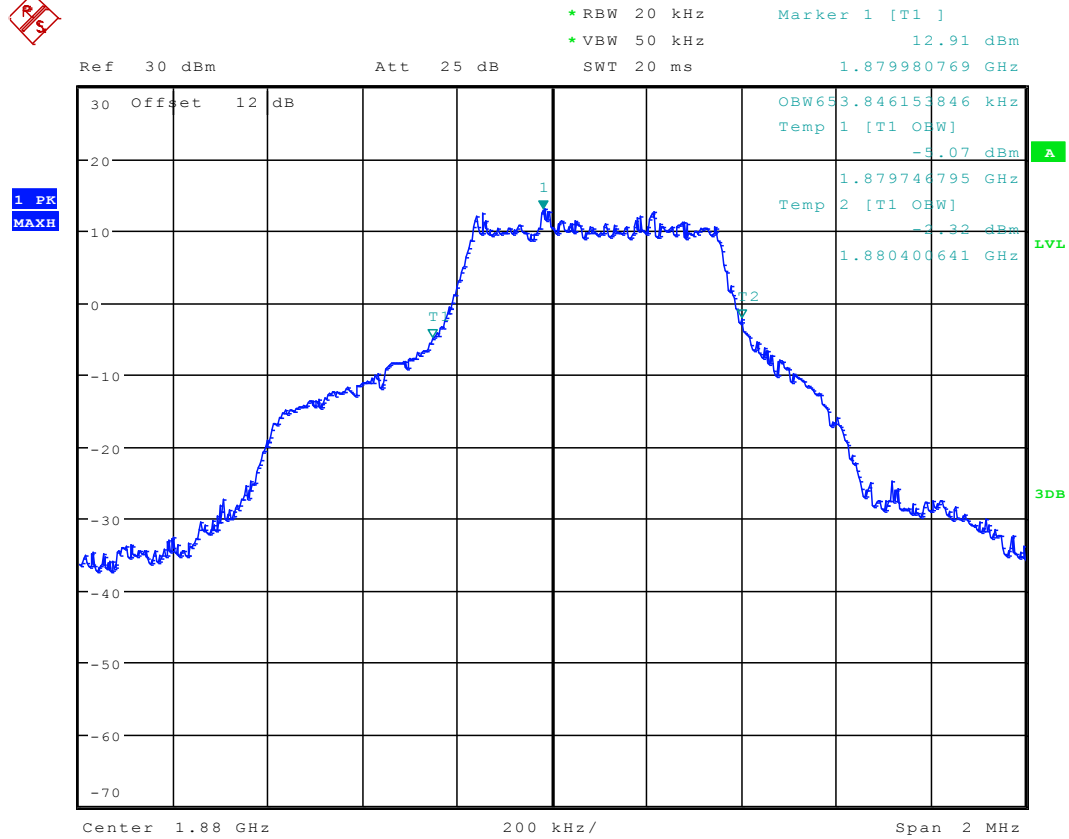


QPSK/1 RB/RB #max



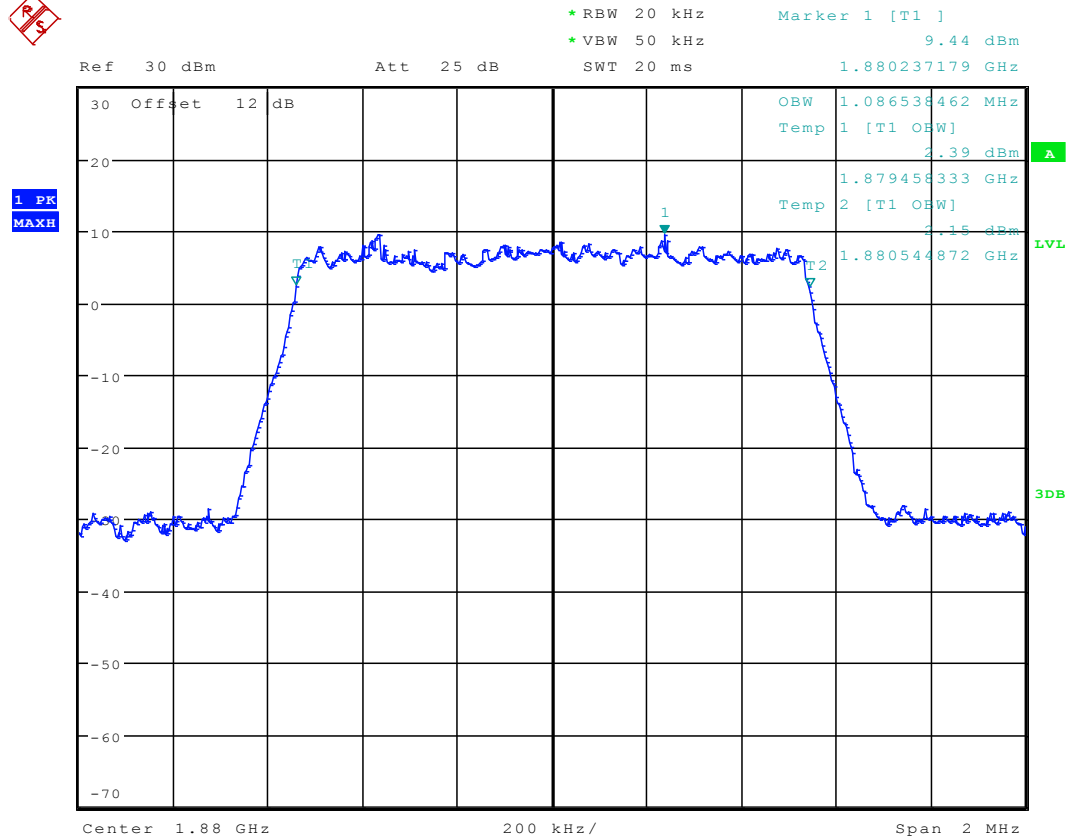


QPSK/3 RB/RB #2





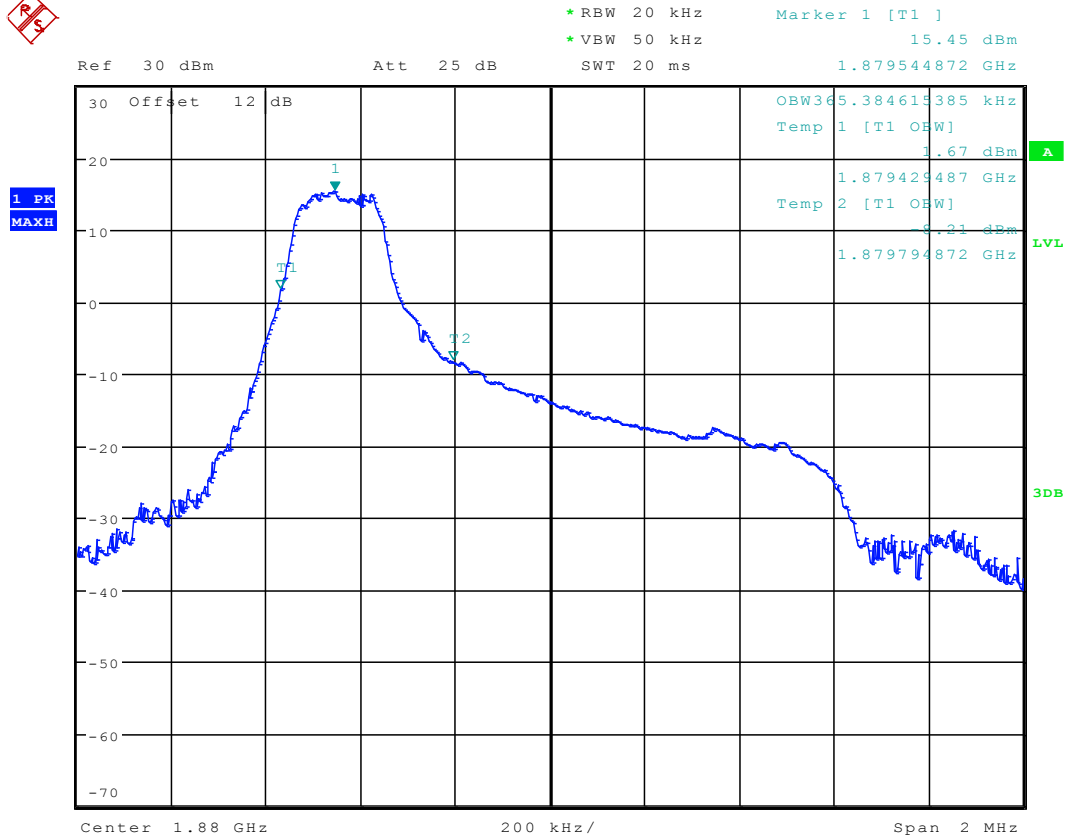
QPSK/ full RBs





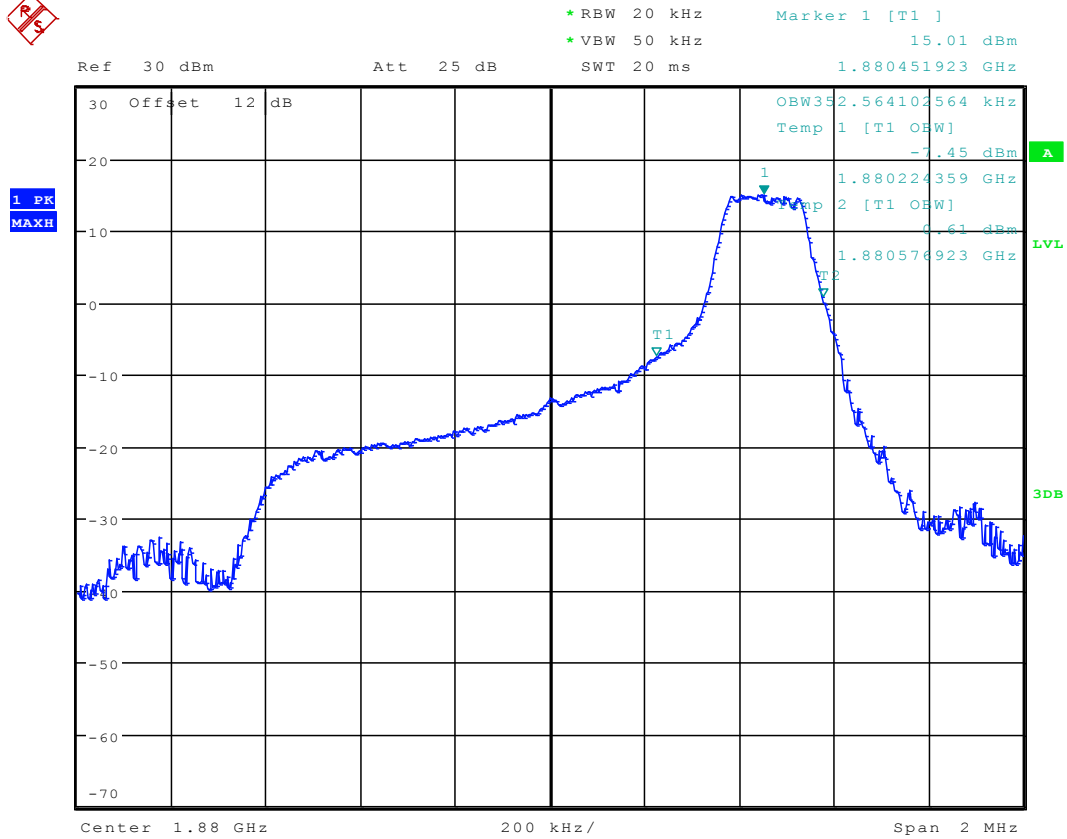
TM5

16QAM /1 RB/RB #0



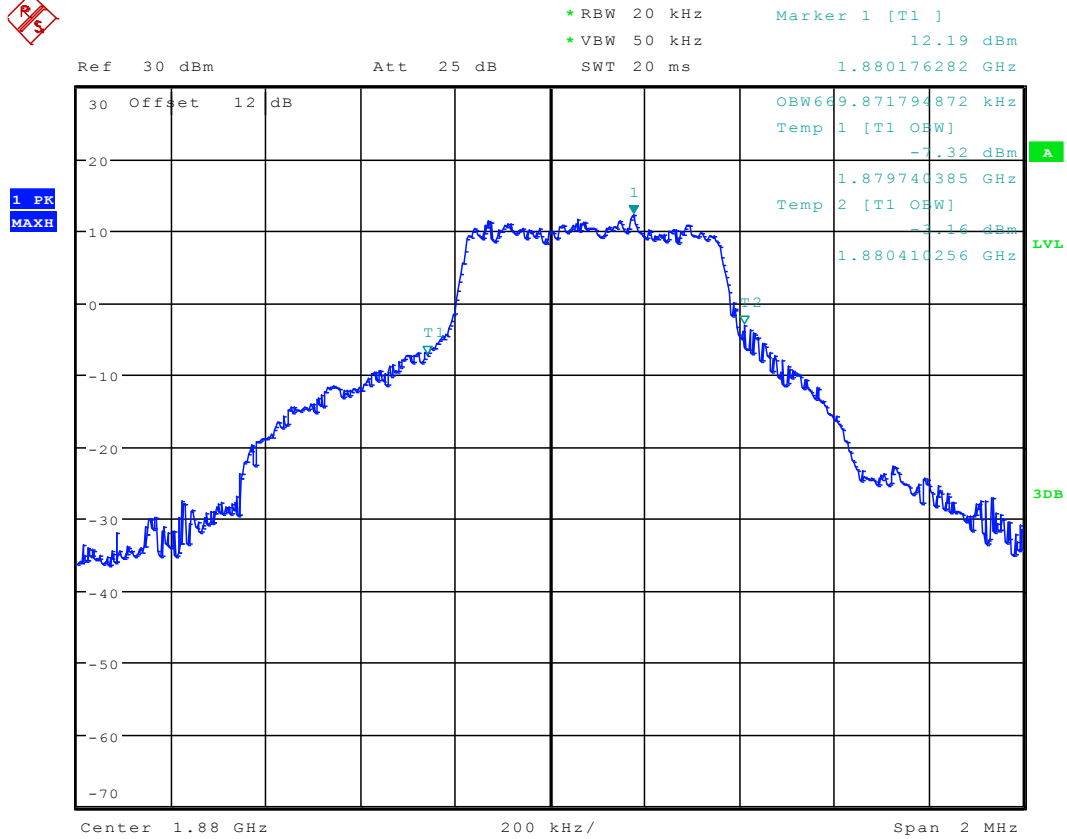


16QAM /1 RB/RB #max



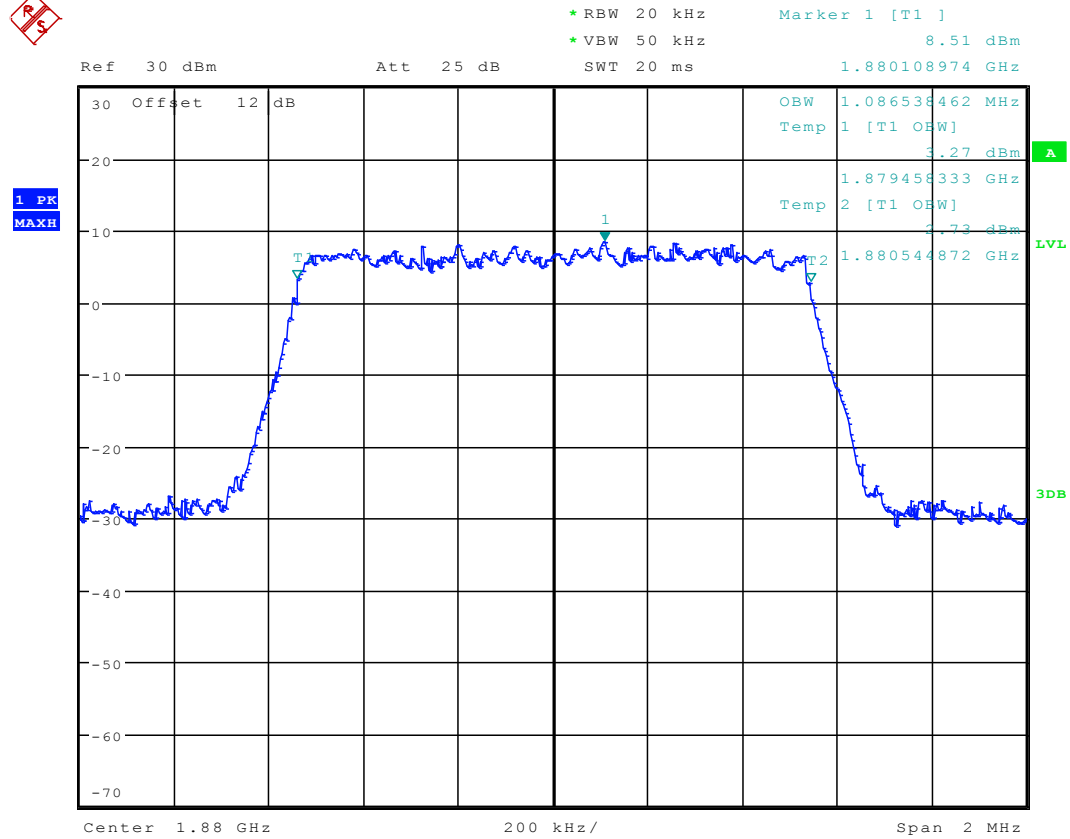


16QAM /3 RB/RB #2





16QAM/full RBs

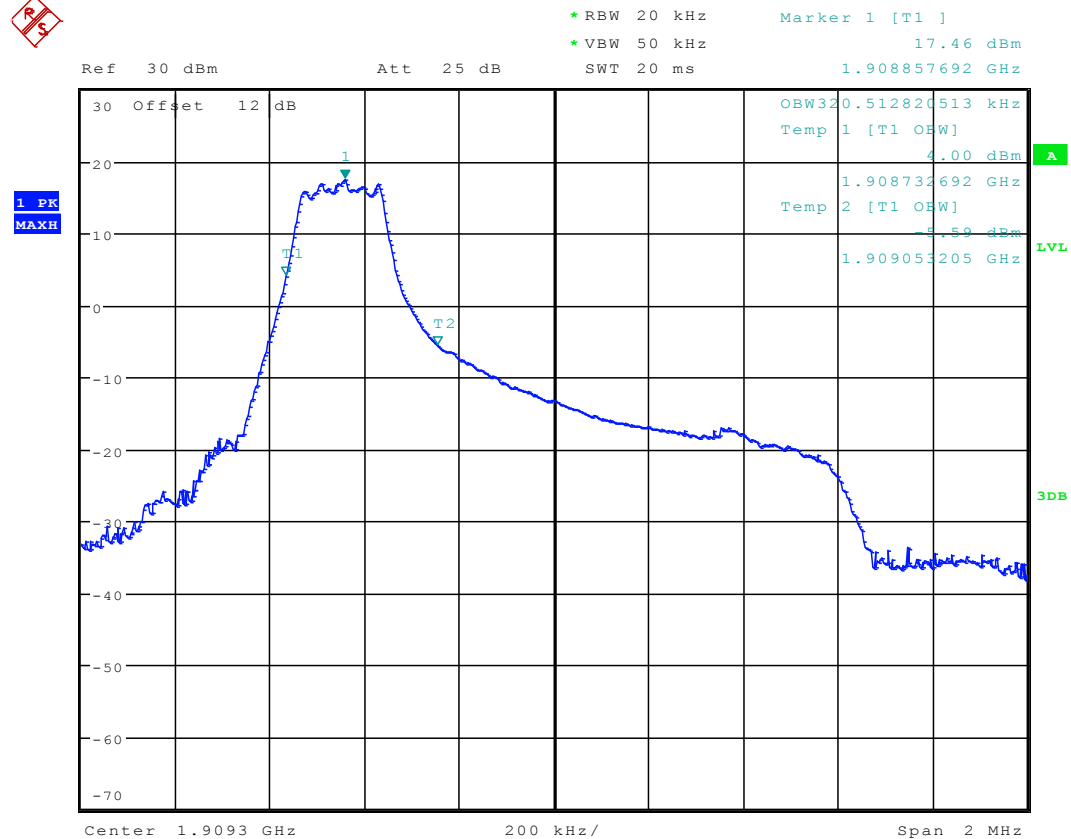




Channel 19193

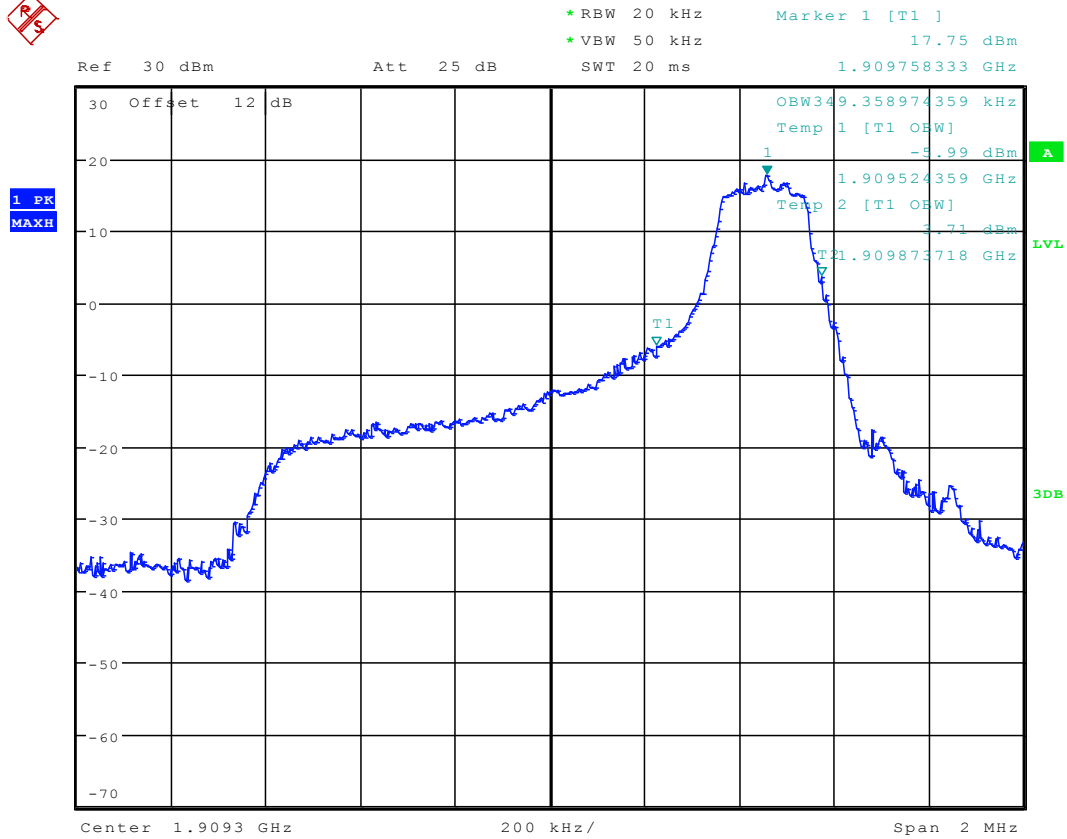
TM4

QPSK/1 RB/RB #0



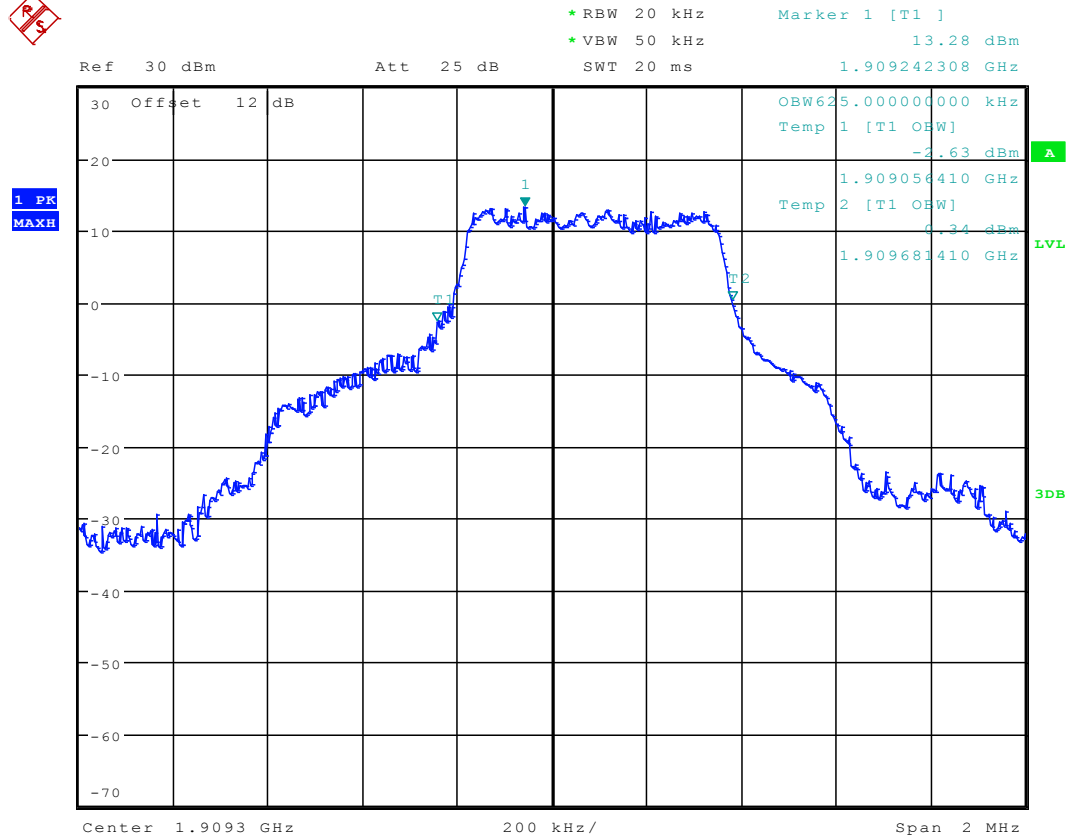


QPSK/1 RB/RB #max



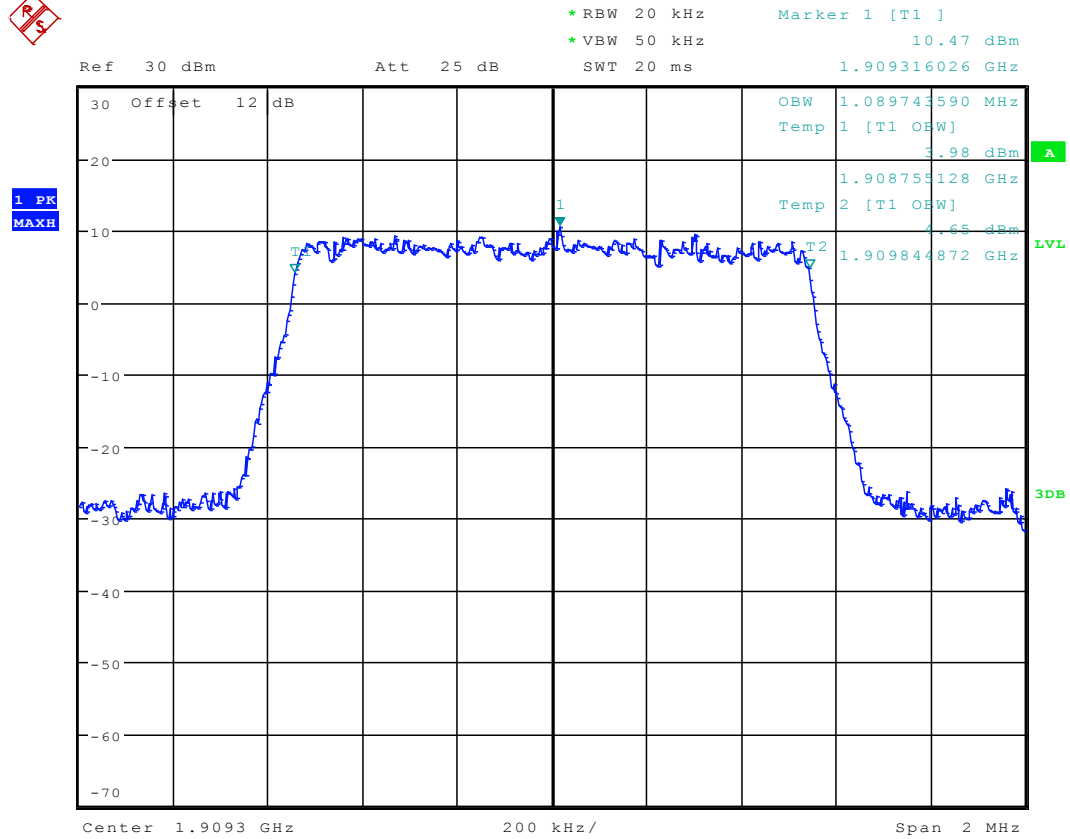


QPSK/3 RB/RB #2





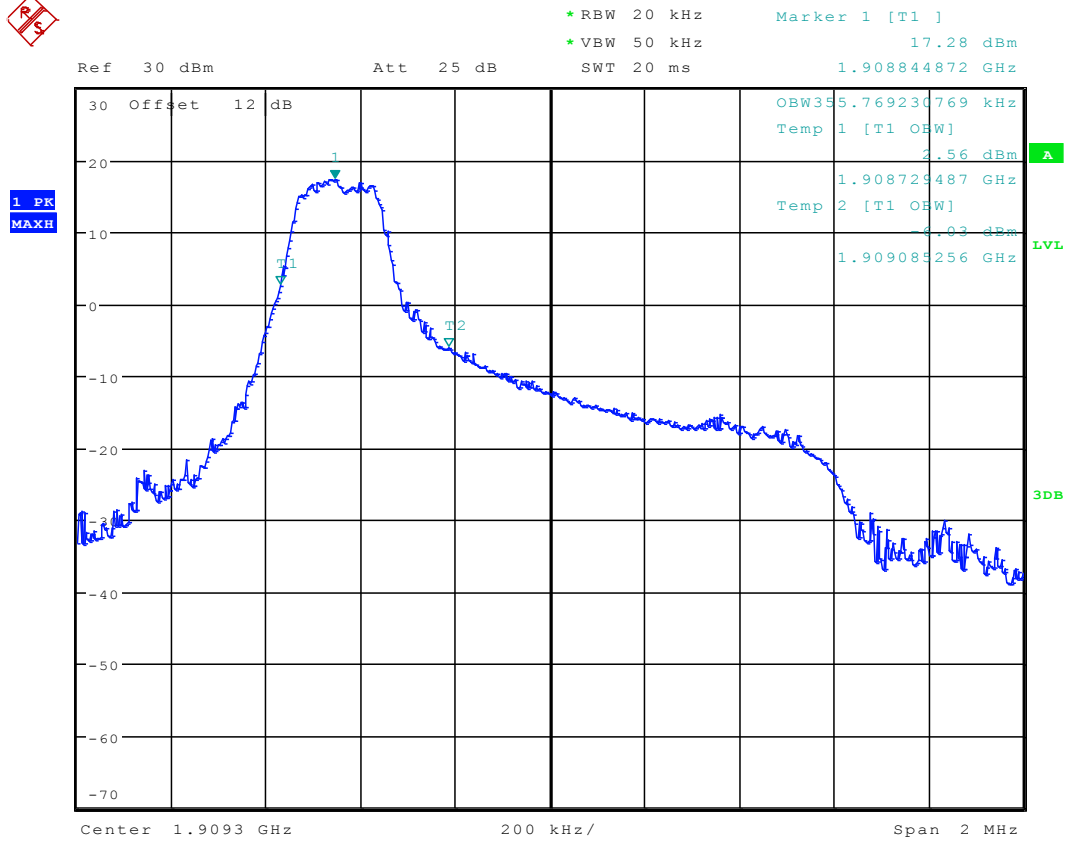
QPSK/ full RBs





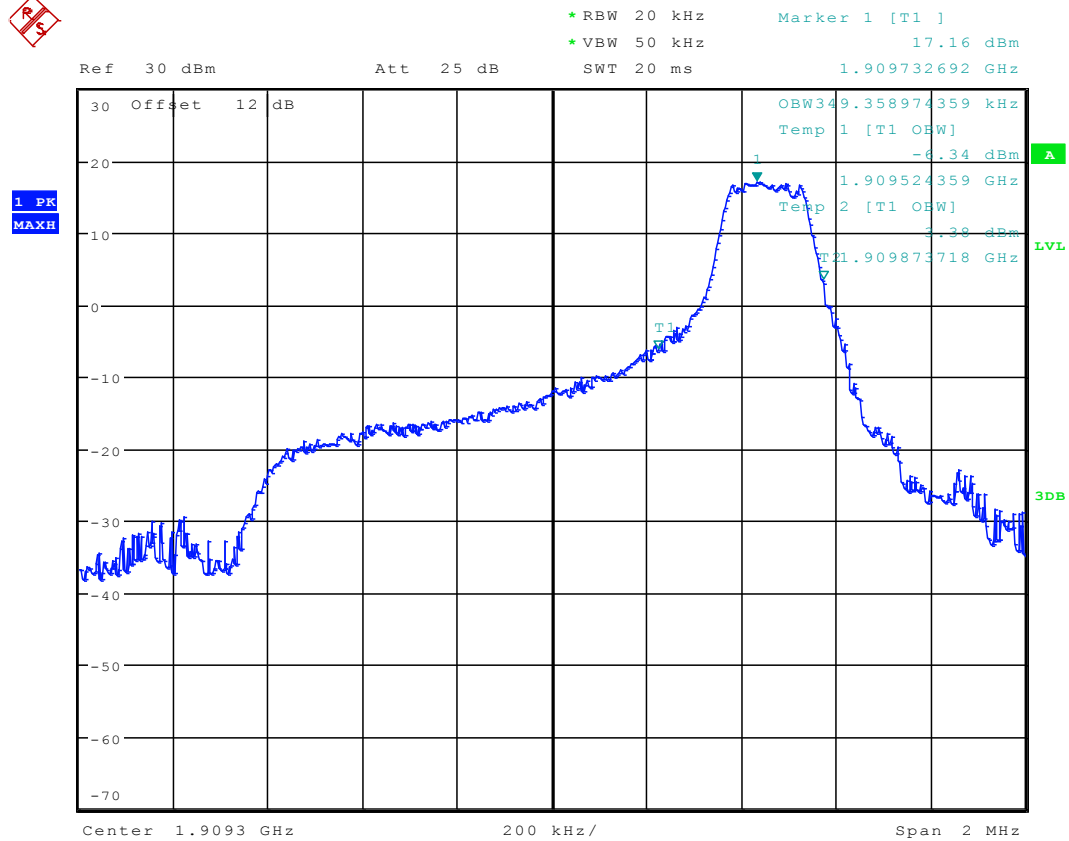
TM5

16QAM /1 RB/RB #0



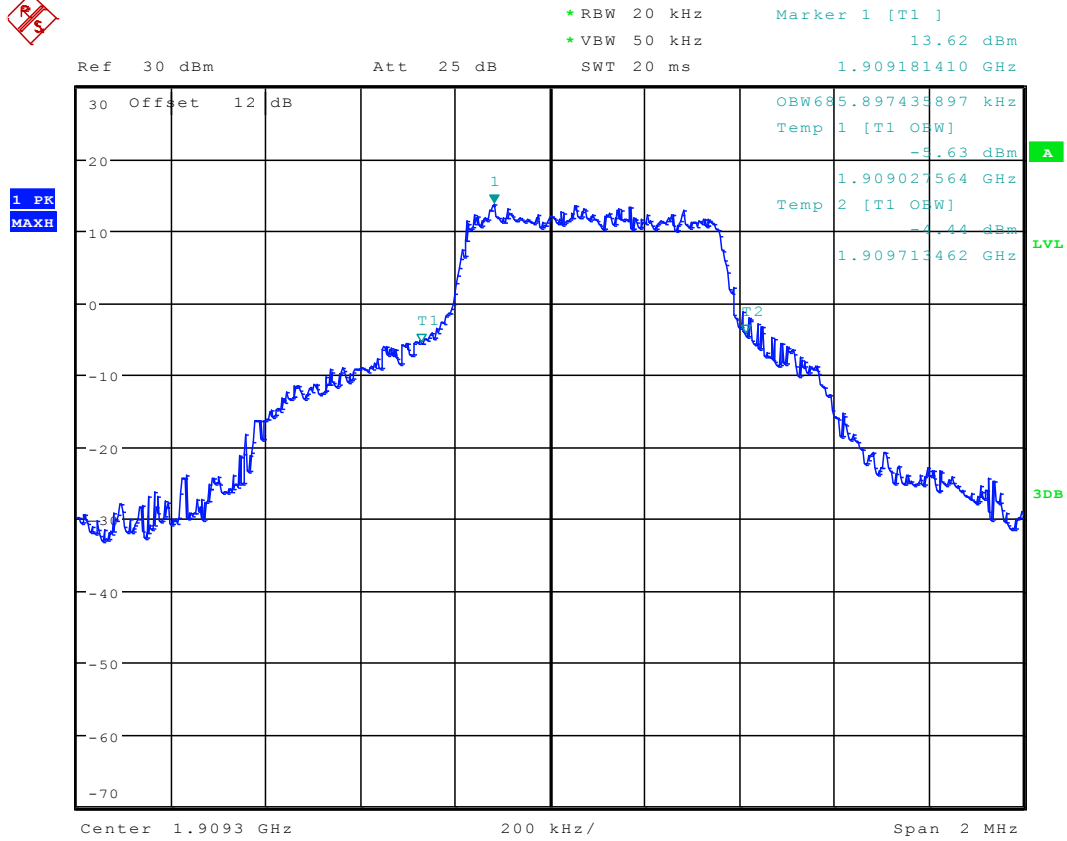


16QAM /1 RB/RB #max



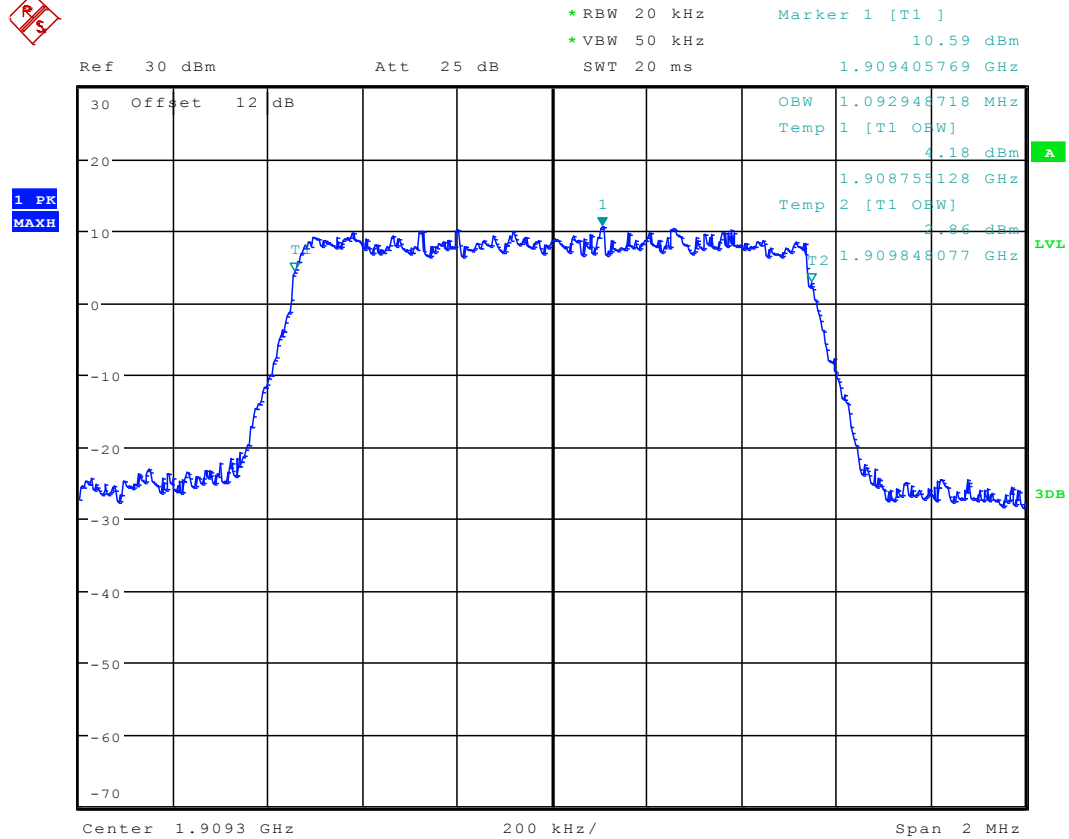


16QAM /3 RB/RB #2





16QAM/full RBs



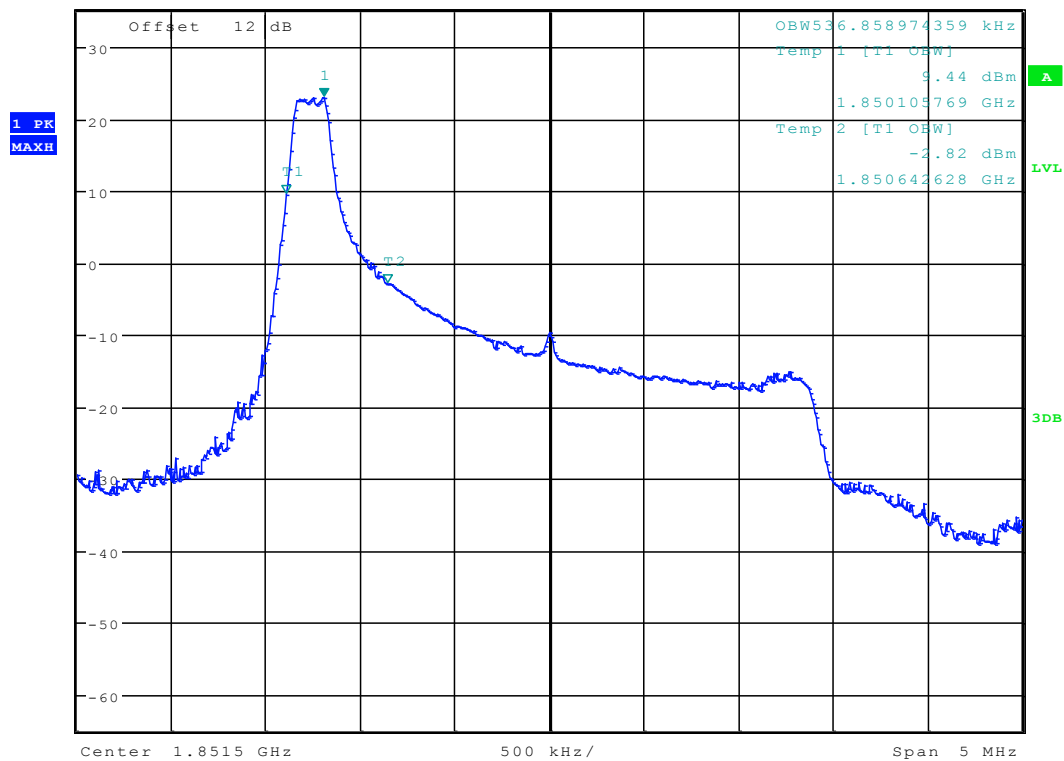
3MHz(BW)
Channel 18615

TM4

QPSK/1 RB/RB #0



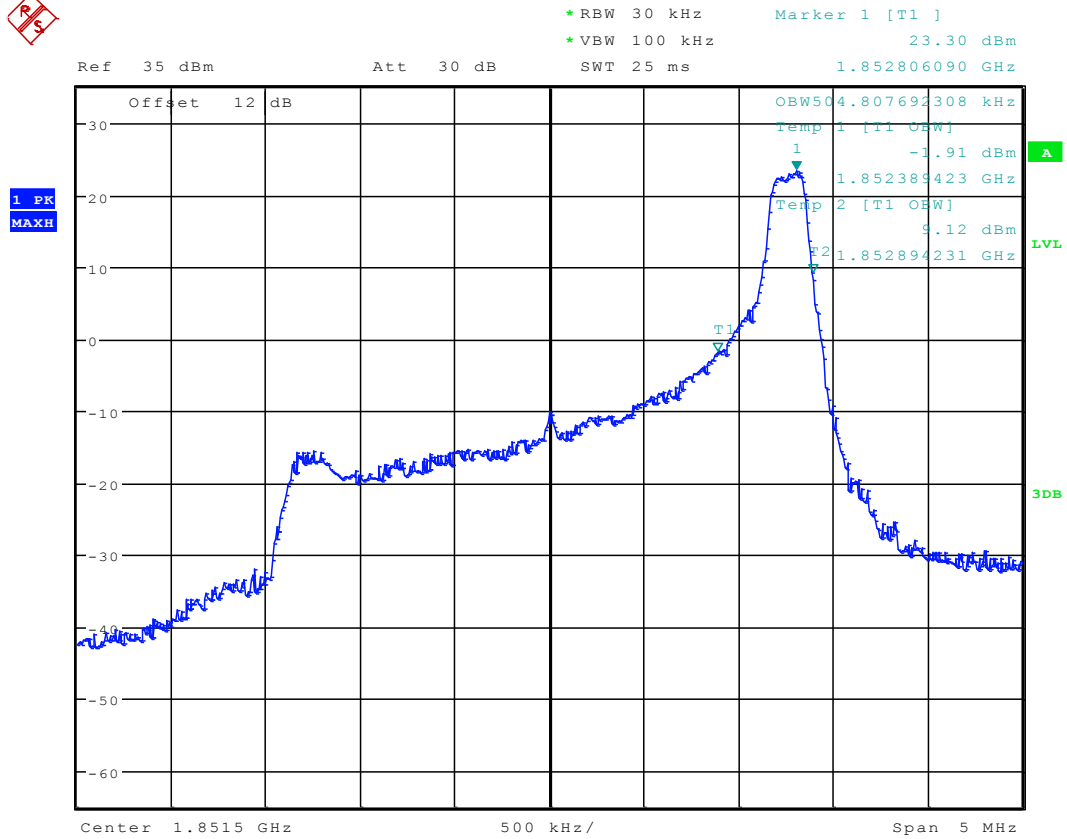
```
* RBW 30 kHz      Marker 1 [T1 ]
* VBW 100 kHz      22.96 dBm
  SWT 25 ms        1.850306090 GHz
```



Date: 25.NOV.2011 15:19:43



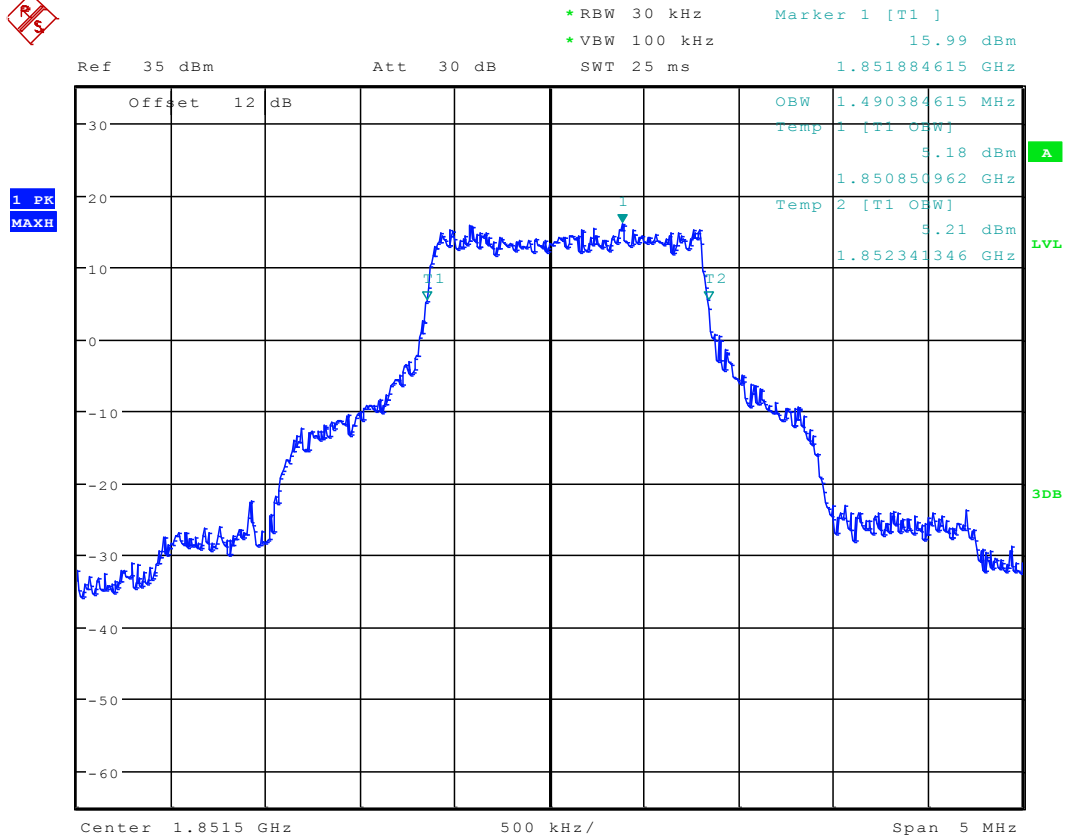
QPSK/1 RB/RB #max



Date: 25.NOV.2011 15:20:03



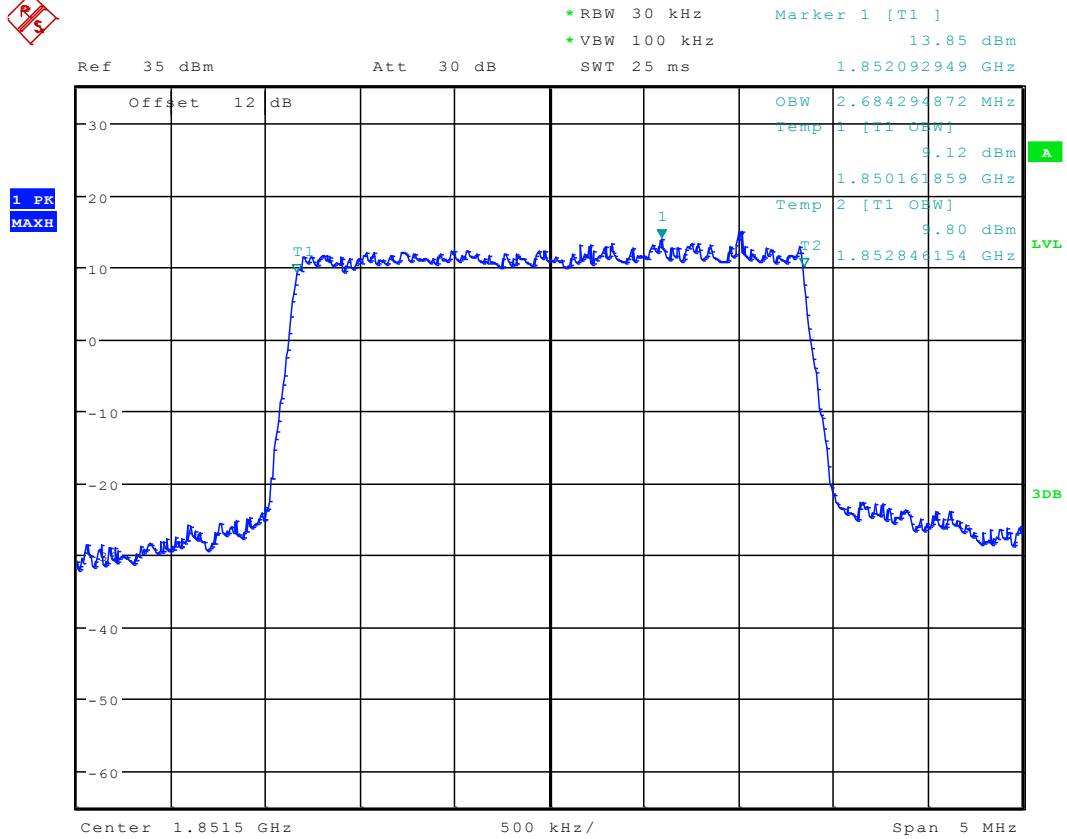
QPSK/8 RB/RB #4



Date: 25.NOV.2011 15:20:50



QPSK/ full RBs

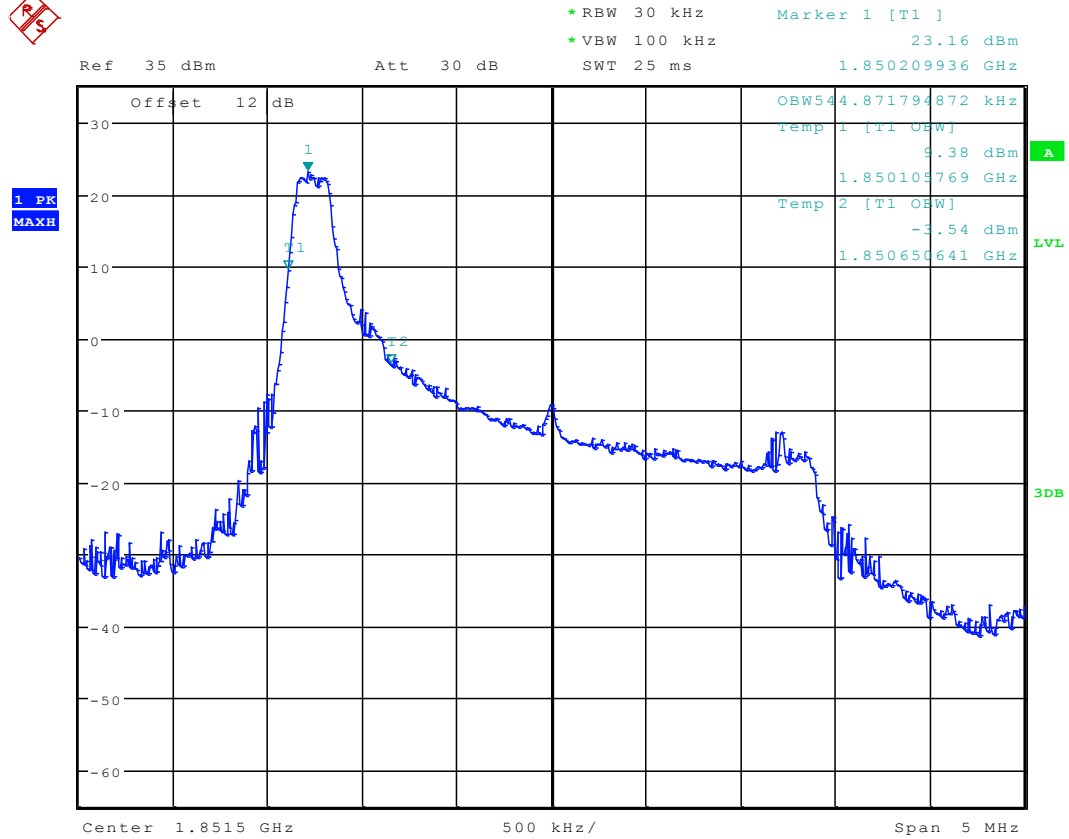


Date: 25.NOV.2011 15:18:15



TM5

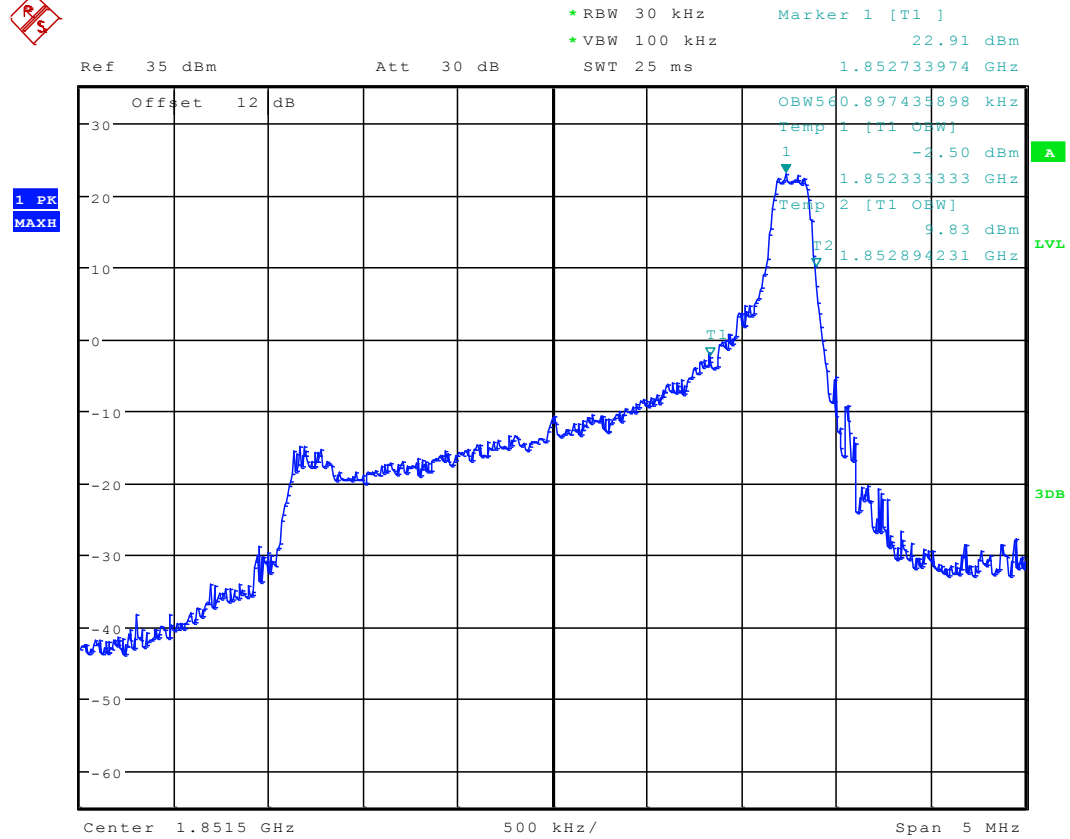
16QAM /1 RB/RB #0



Date: 25.NOV.2011 15:18:54



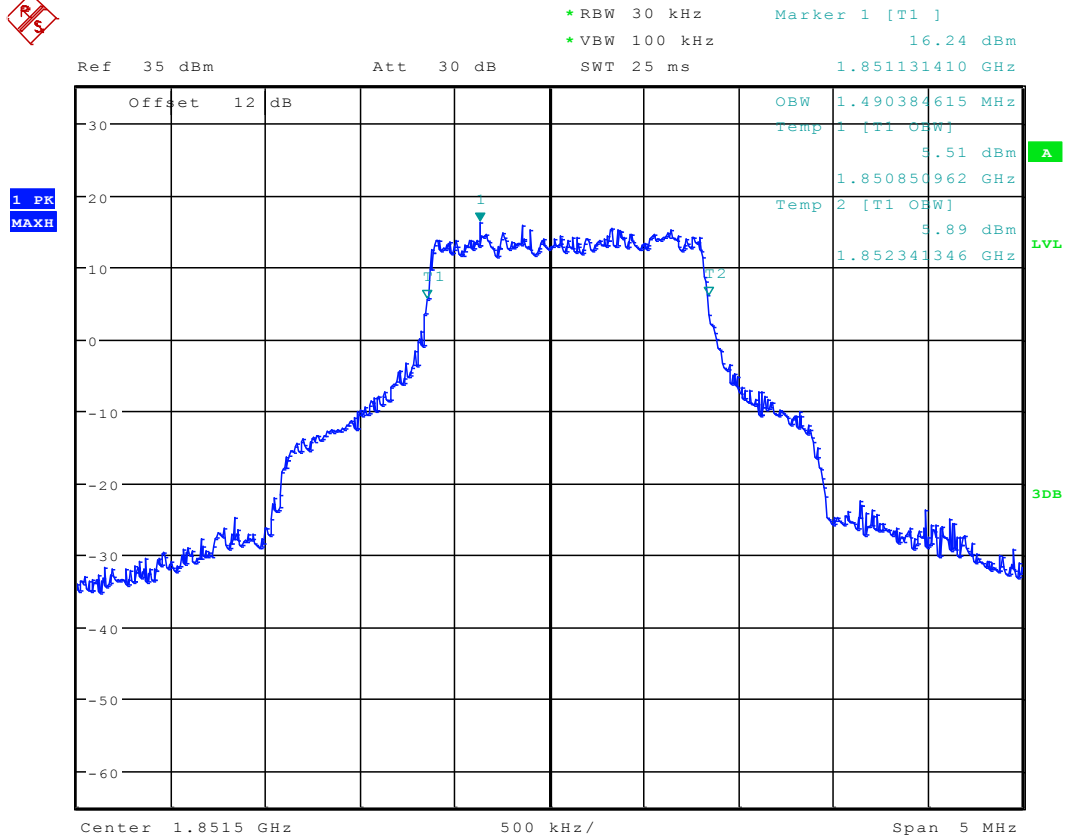
16QAM /1 RB/RB #max



Date: 25.NOV.2011 15:20:16



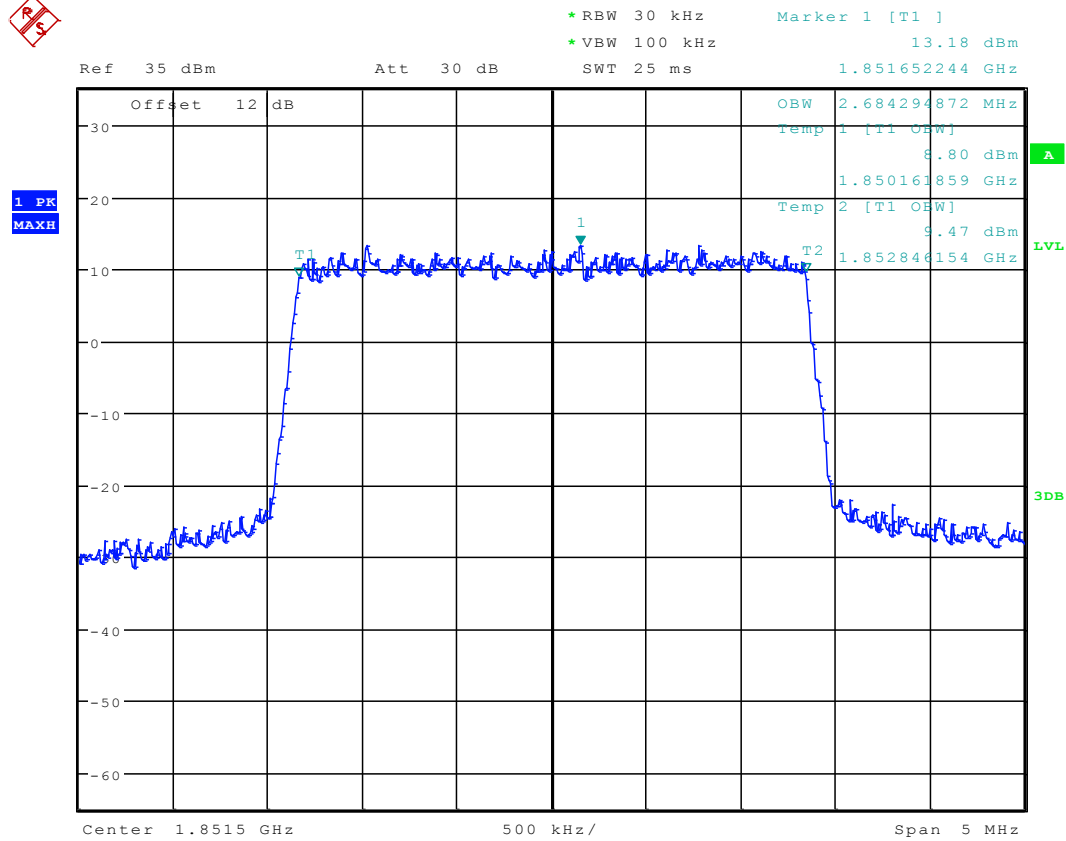
16QAM /8 RB/RB #4



Date: 25.NOV.2011 15:20:35



16QAM/full RBs



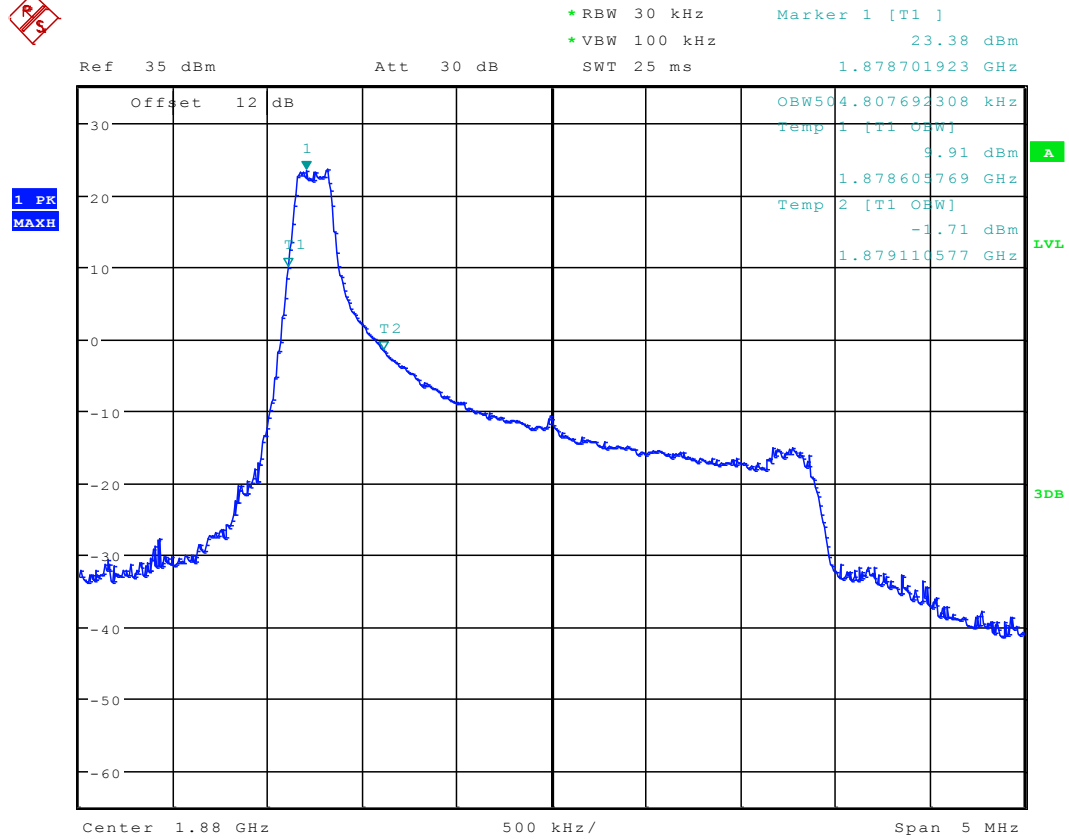
Date: 25.NOV.2011 15:18:35



Channel 18900

TM4

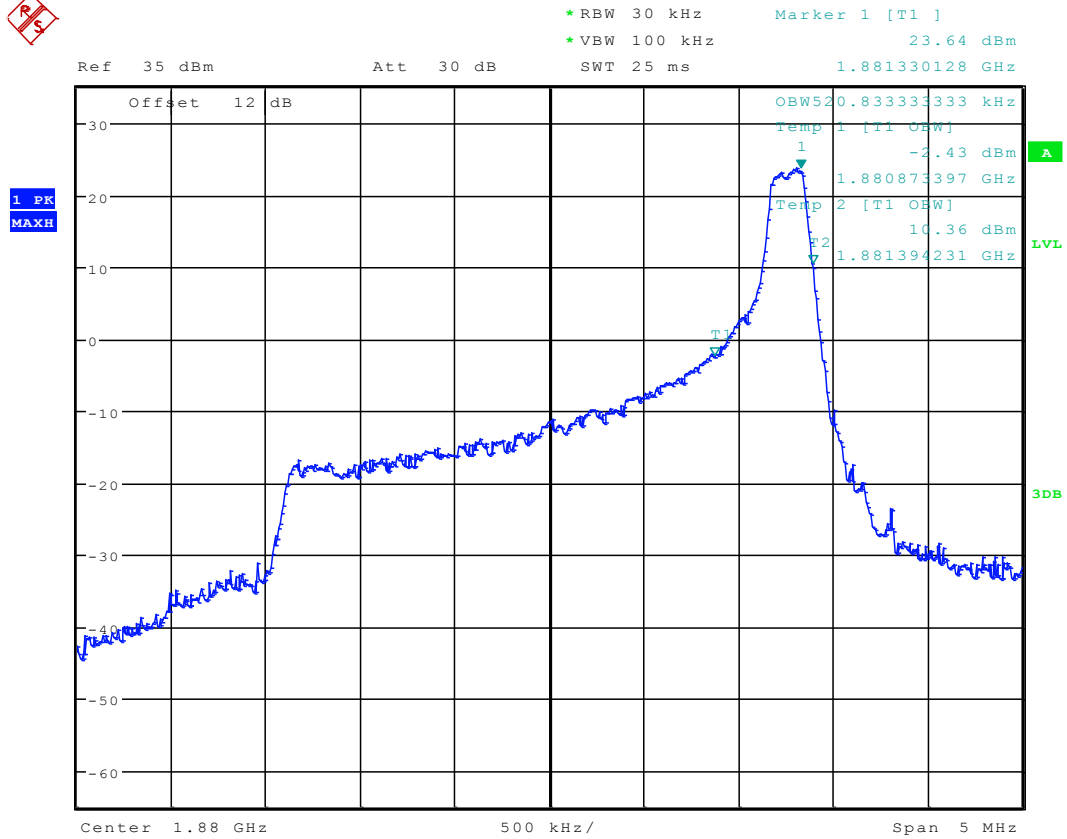
QPSK/1 RB/RB #0



Date: 25.NOV.2011 15:04:19



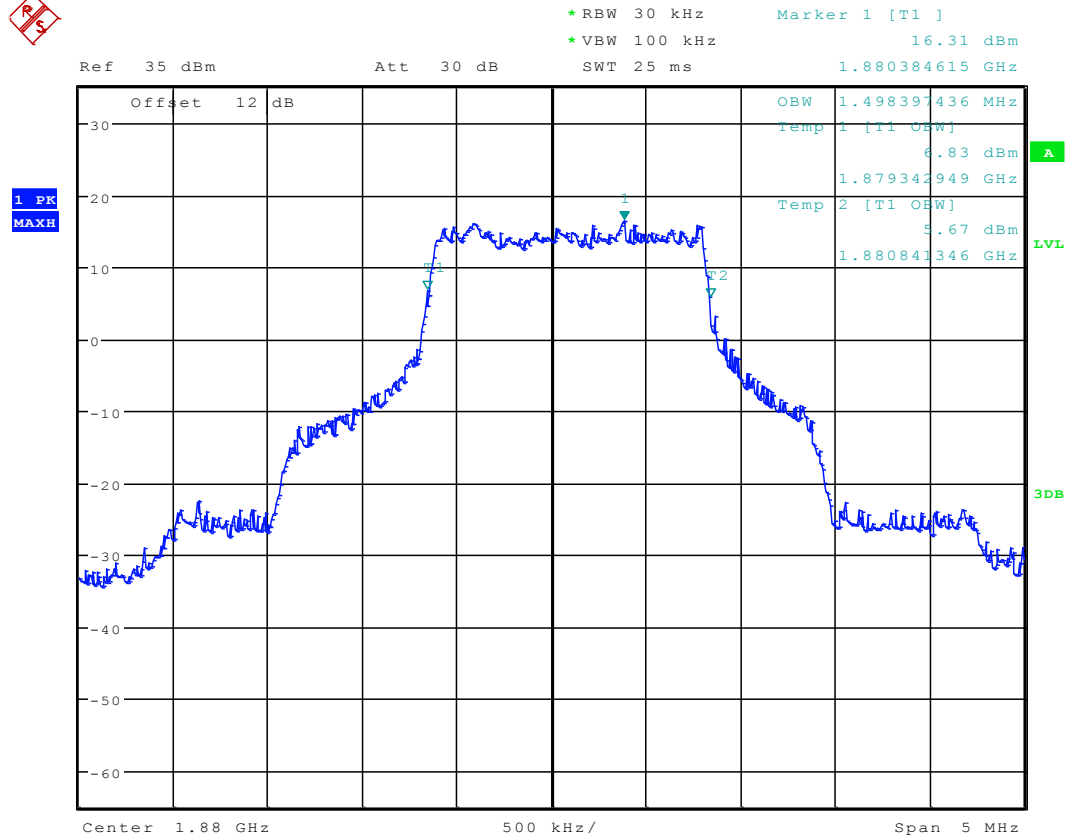
QPSK/1 RB/RB #max



Date: 25.NOV.2011 15:04:43



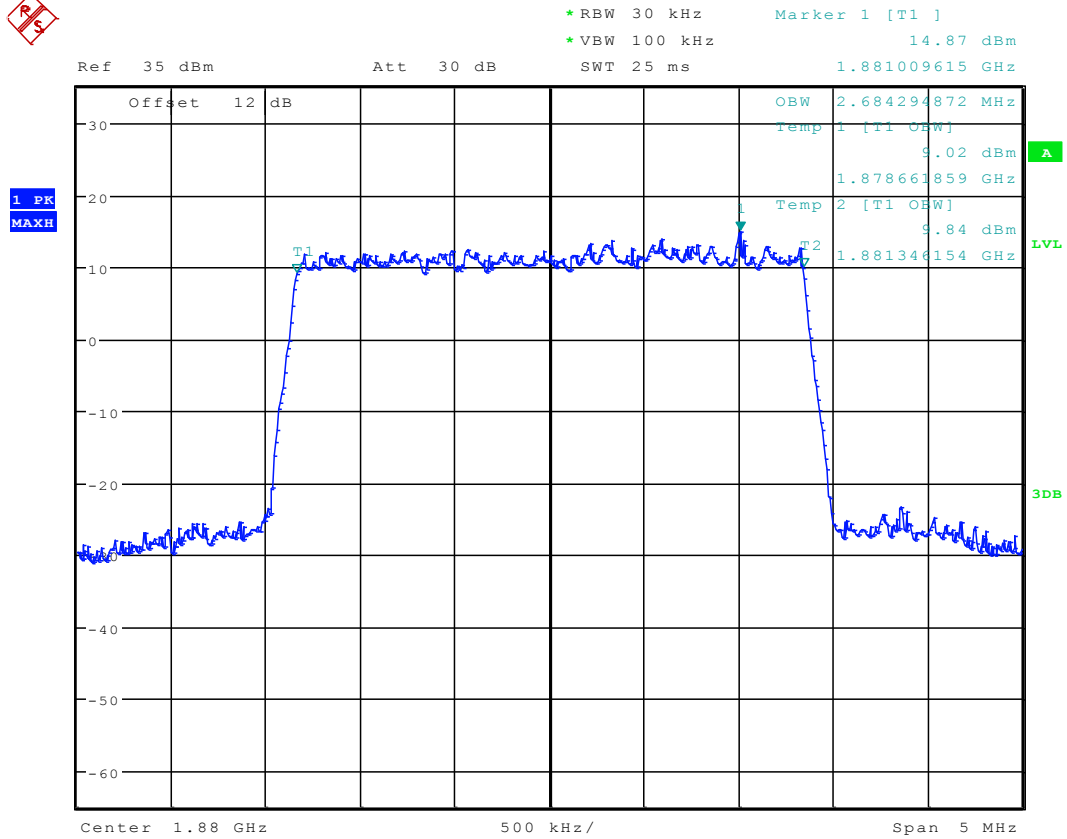
QPSK/8 RB/RB #4



Date: 25.NOV.2011 15:05:40



QPSK/ full RBs

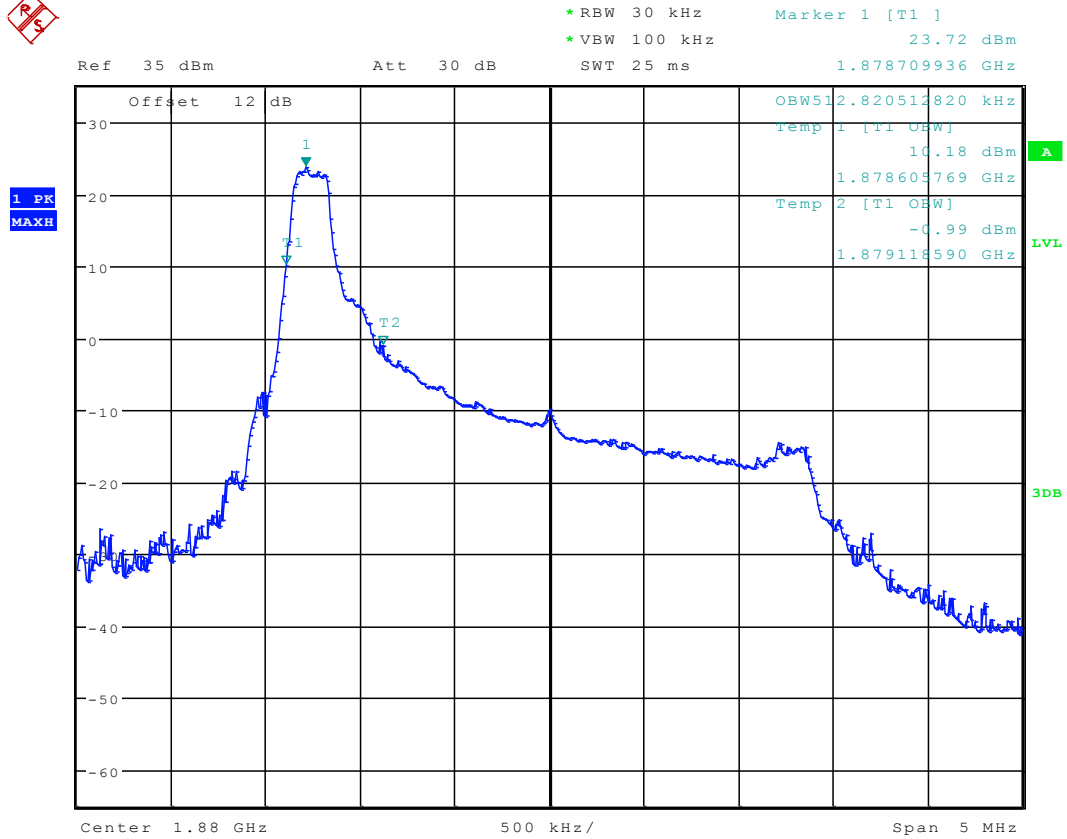


Date: 24.NOV.2011 16:35:45



TM5

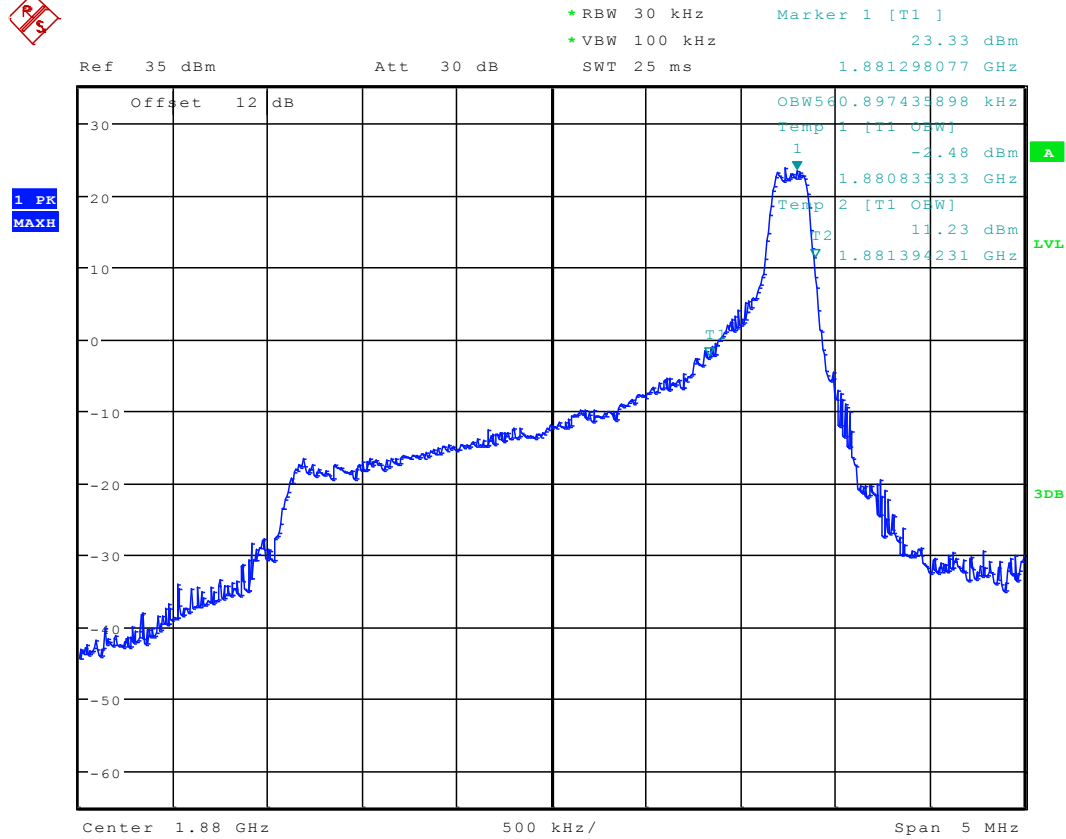
16QAM /1 RB/RB #0



Date: 25.NOV.2011 15:03:58



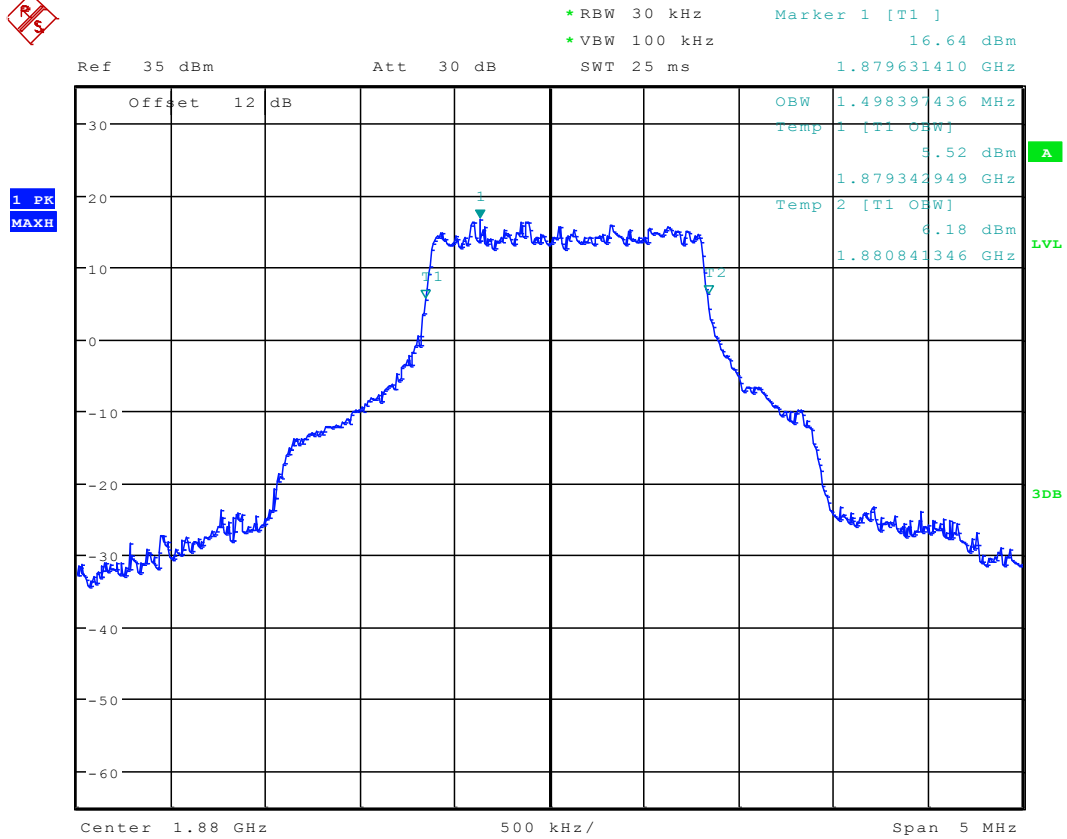
16QAM /1 RB/RB #max



Date: 25.NOV.2011 15:04:57



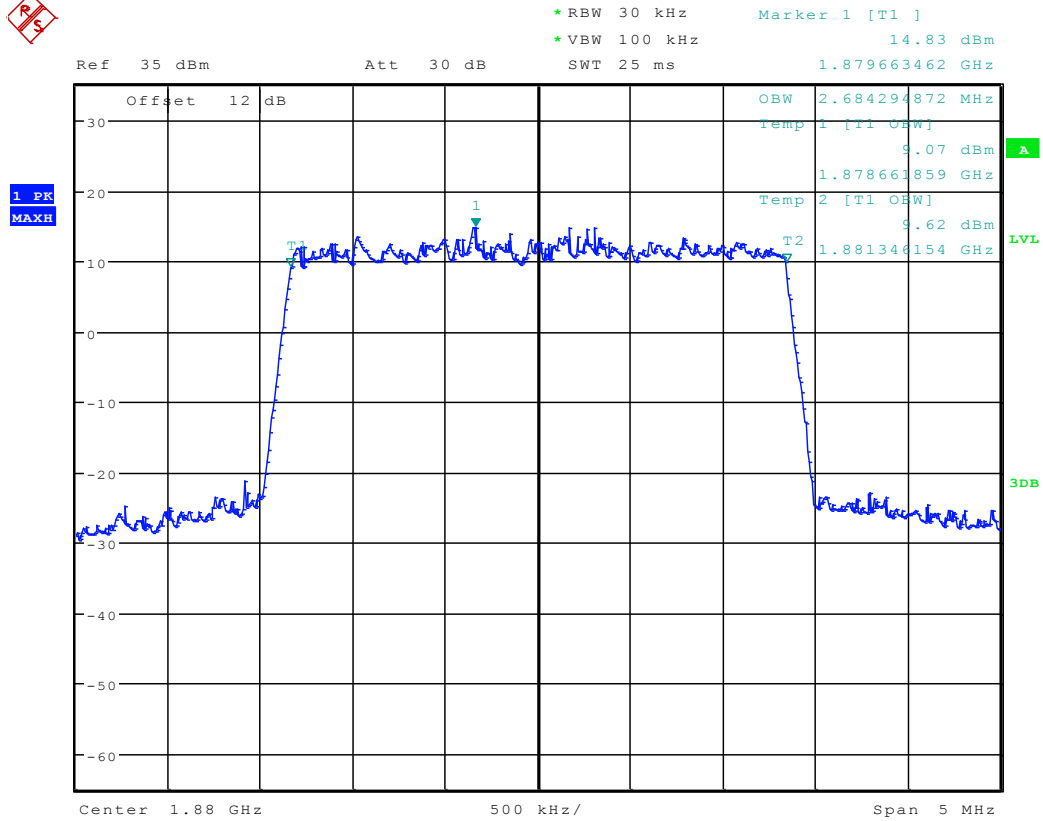
16QAM /8 RB/RB #4



Date: 25.NOV.2011 15:05:20



16QAM/full RBs



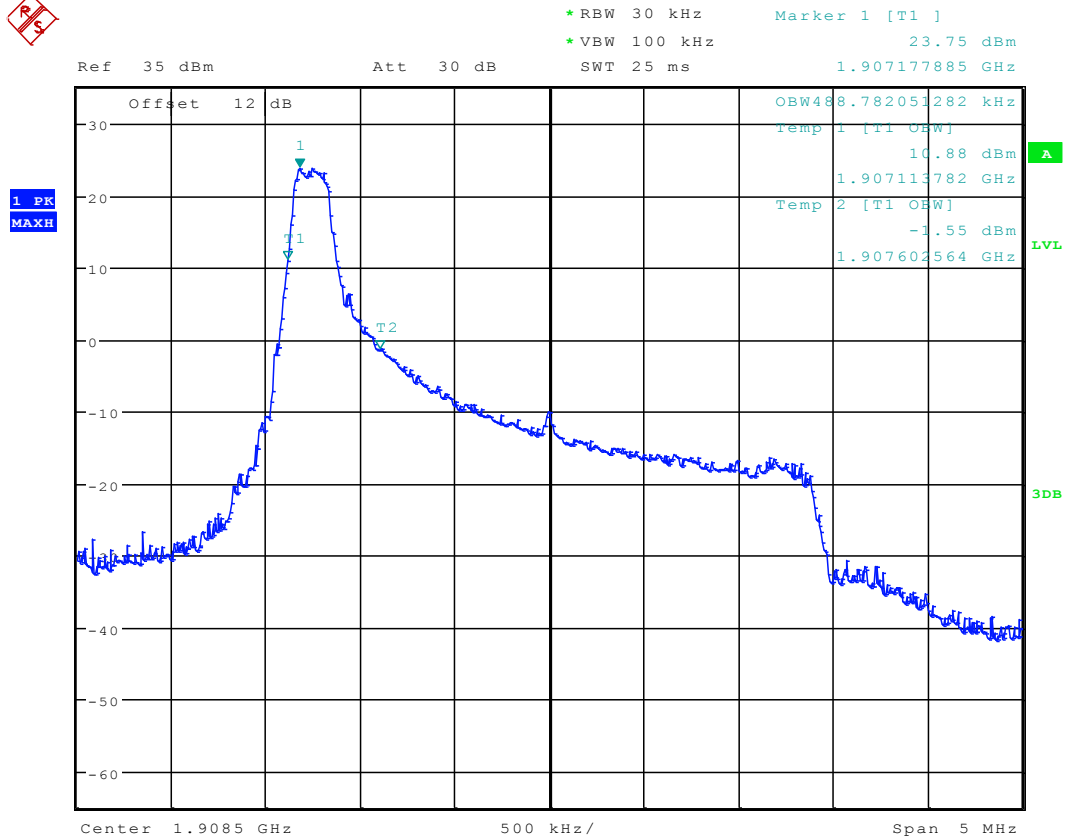
Date: 24.NOV.2011 16:36:08



Channel 19185

TM4

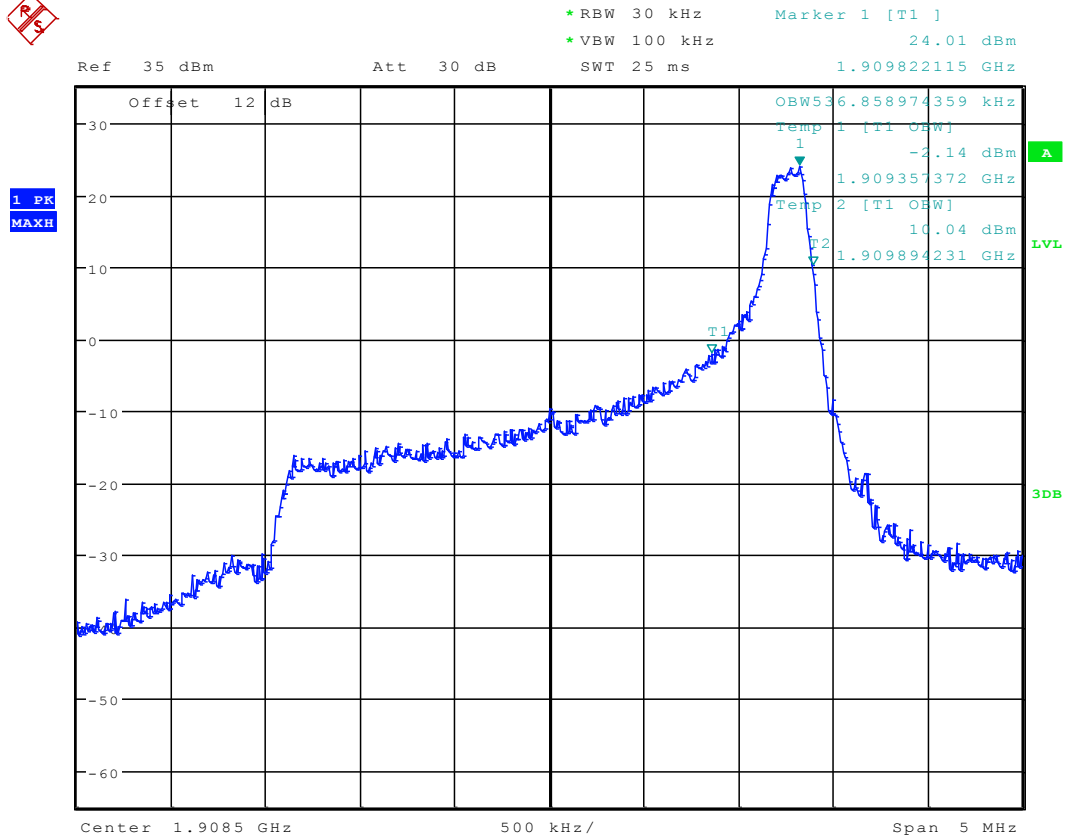
QPSK/1 RB/RB #0



Date: 25.NOV.2011 15:40:43



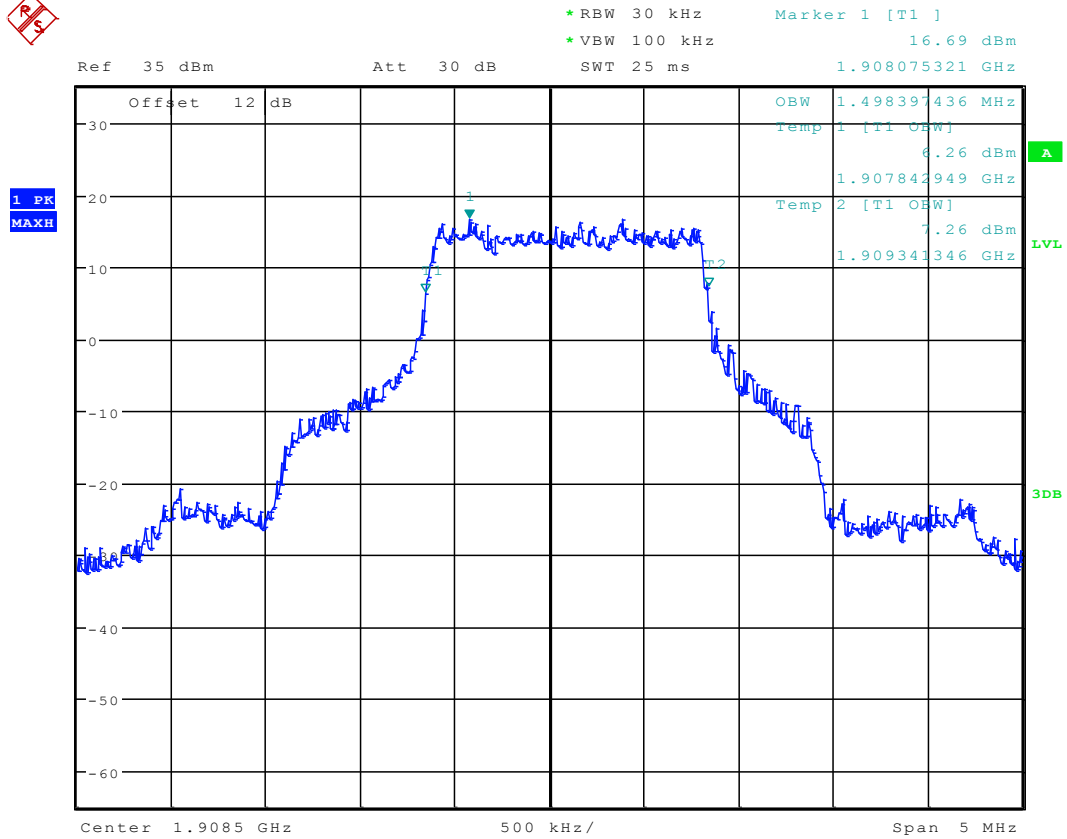
QPSK/1 RB/RB #max



Date: 25.NOV.2011 15:41:01



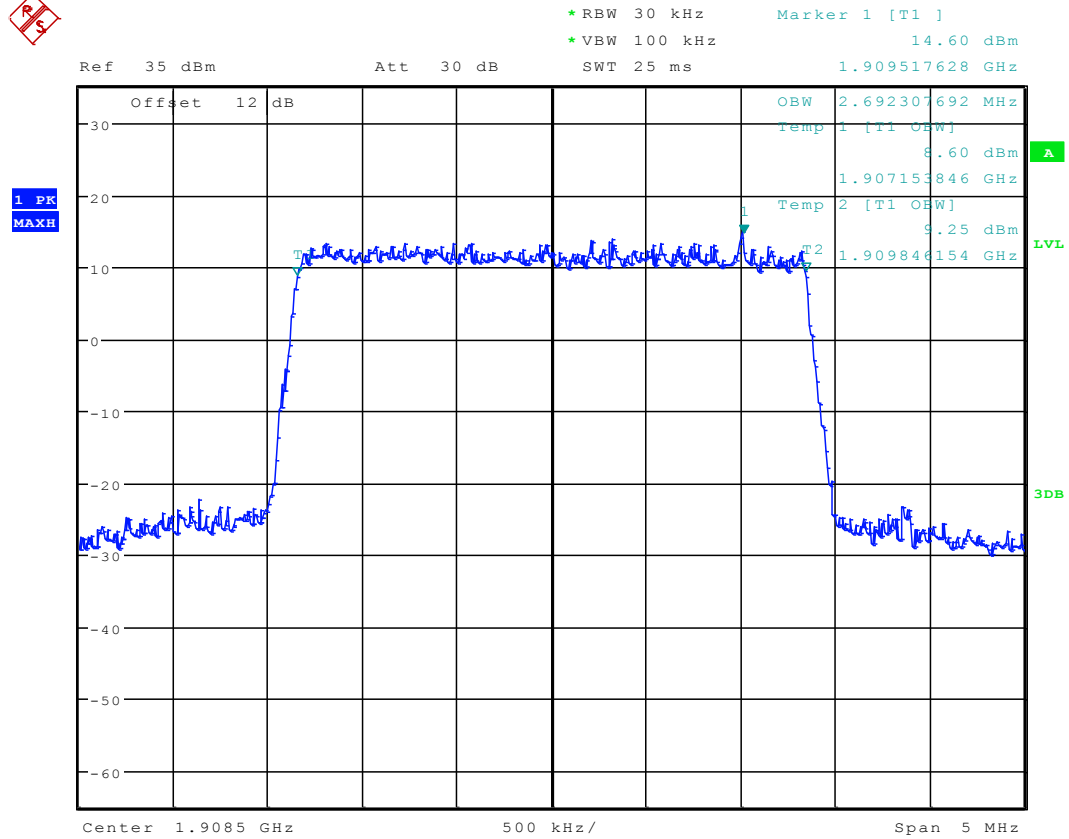
QPSK/8 RB/RB #4



Date: 25.NOV.2011 15:41:53

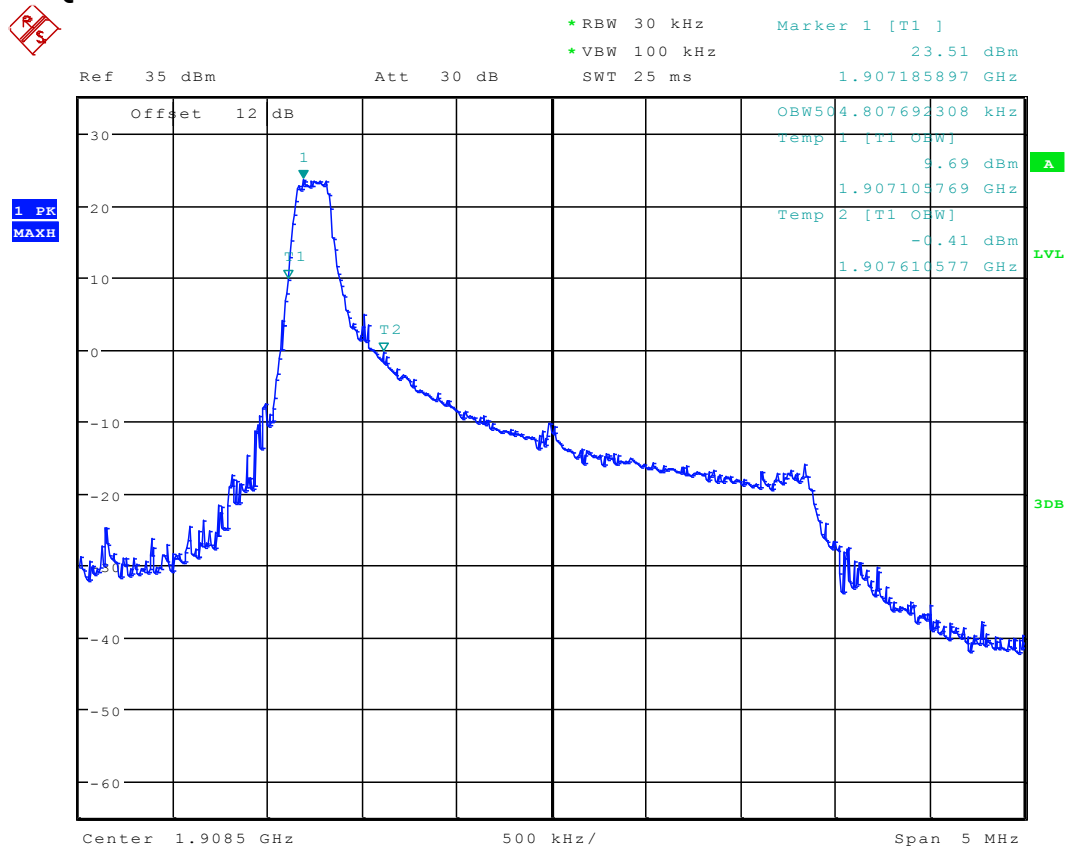


QPSK/ full RBs



Date: 25.NOV.2011 15:39:48

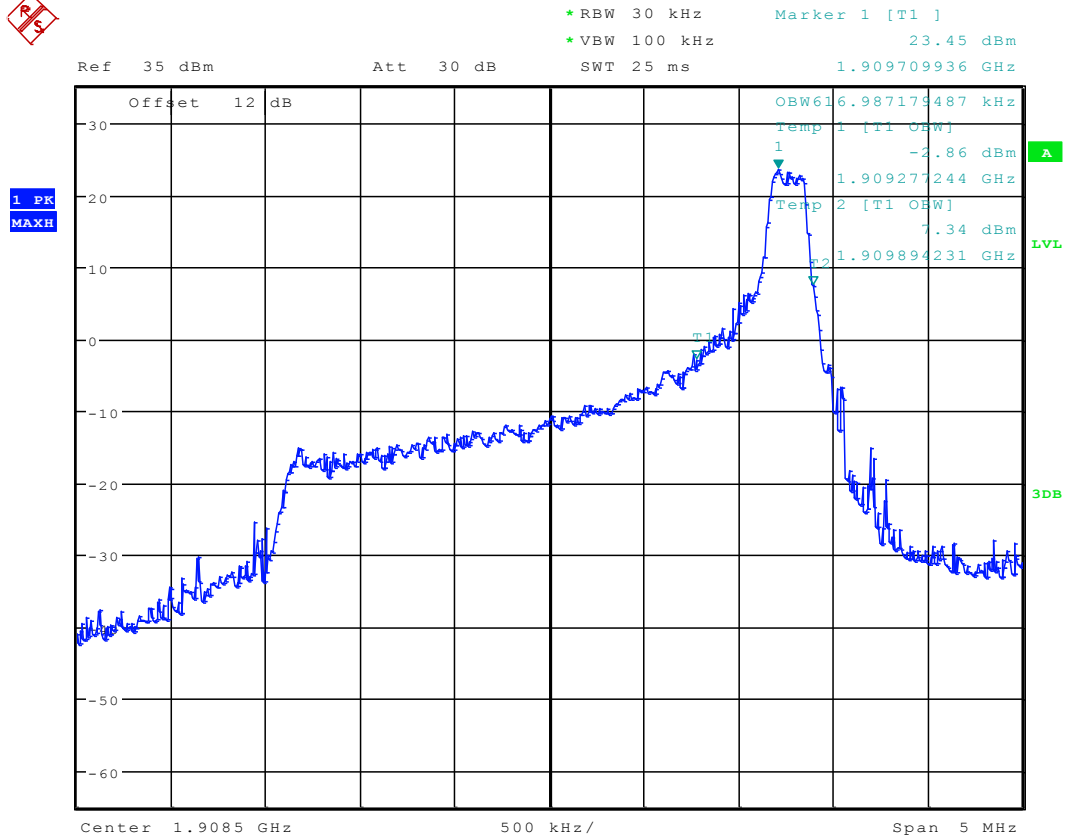
TM5
16QAM /1 RB/RB #0



Date: 25.NOV.2011 15:40:25



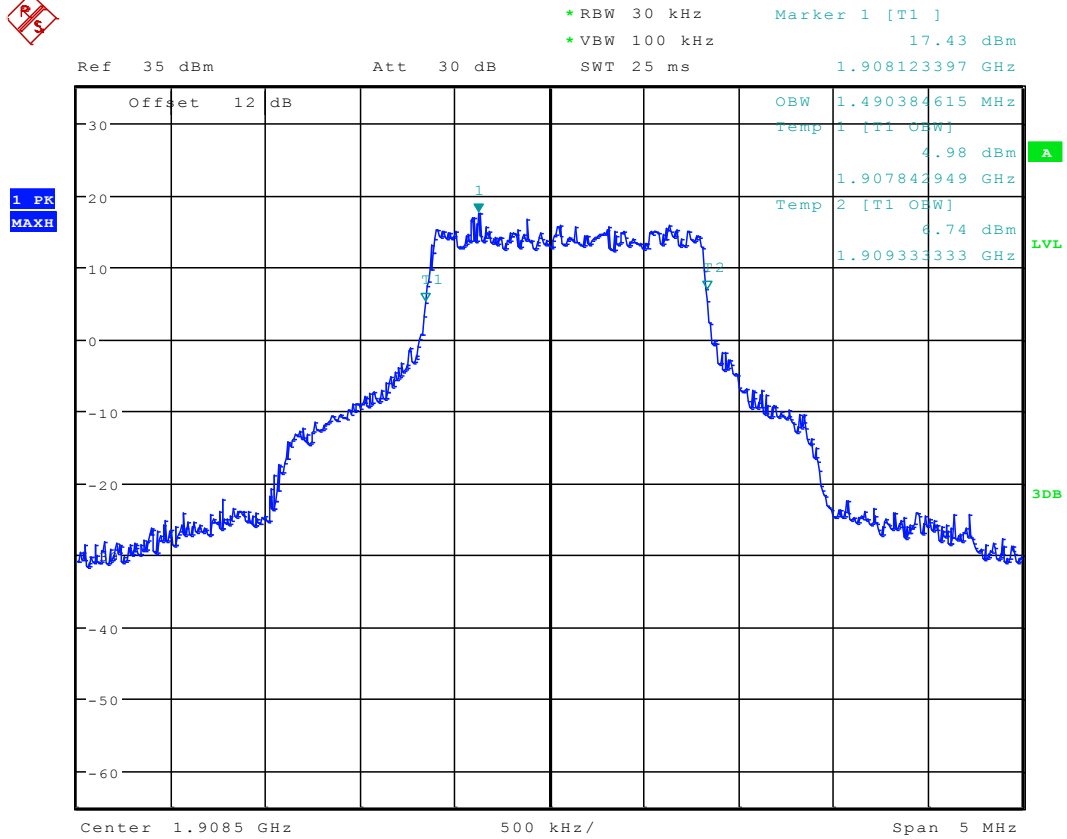
16QAM /1 RB/RB #max



Date: 25.NOV.2011 15:41:13



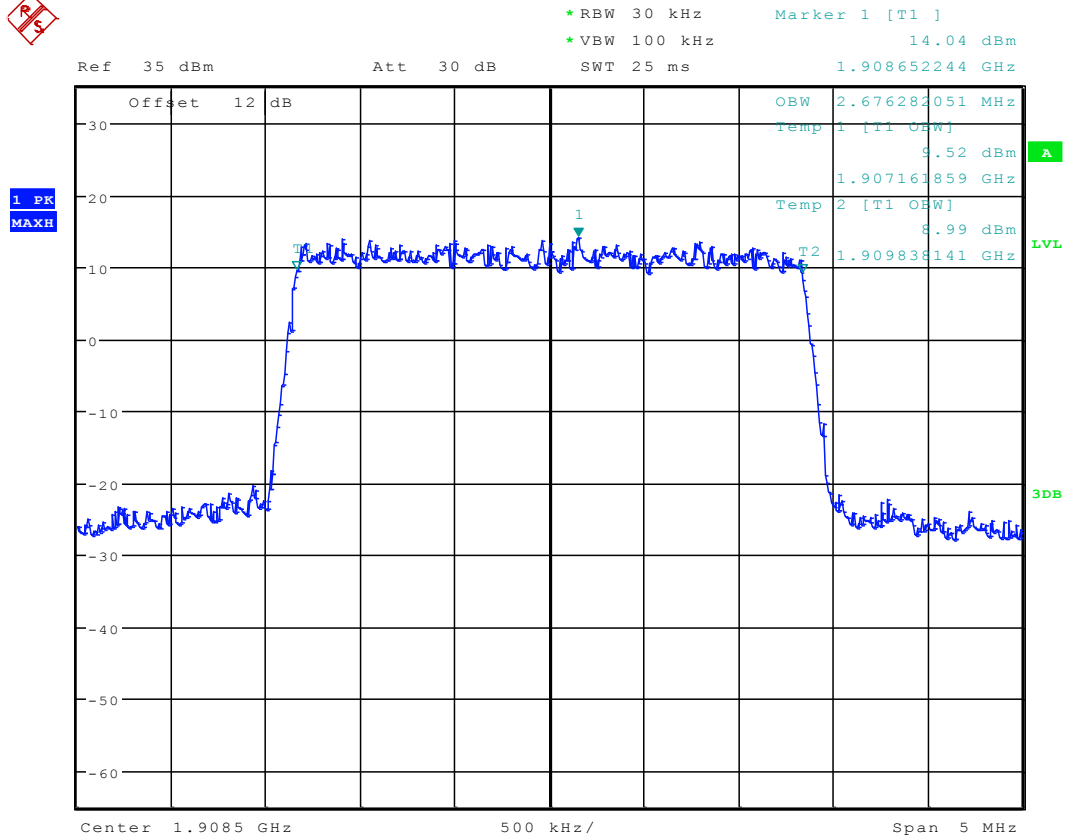
16QAM /8 RB/RB #4



Date: 25.NOV.2011 15:41:33



16QAM/full RBs



Date: 25.NOV.2011 15:40:09

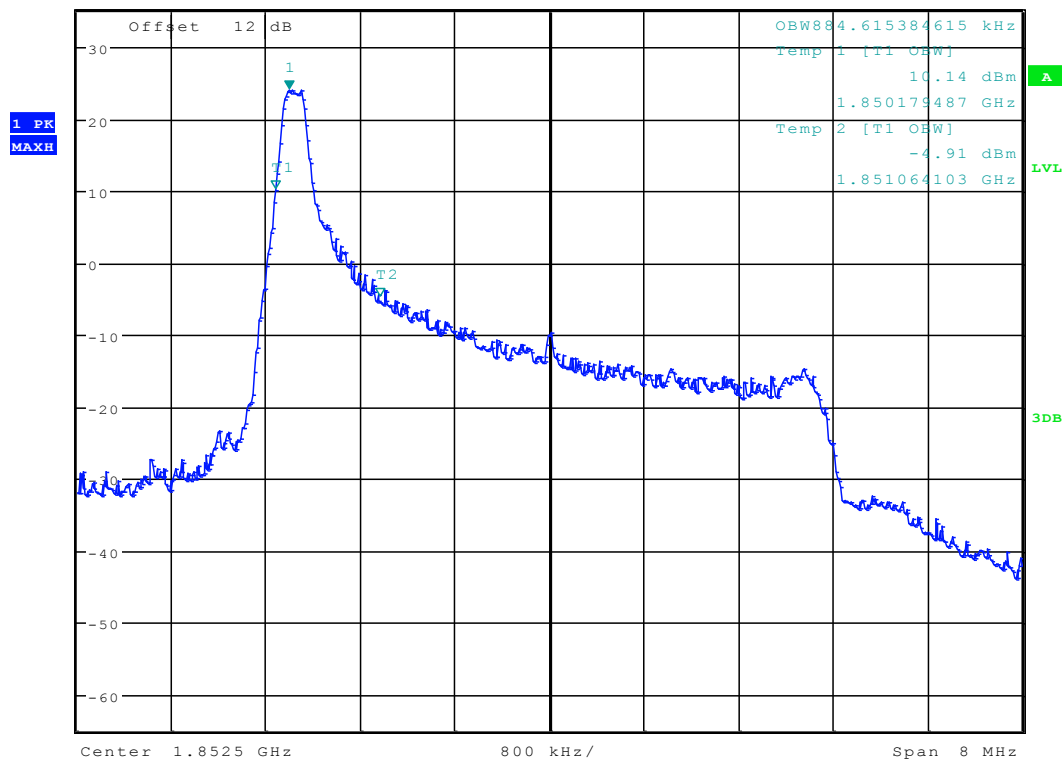
5MHz(BW)
Channel 18625

TM4

QPSK/1 RB/RB #0



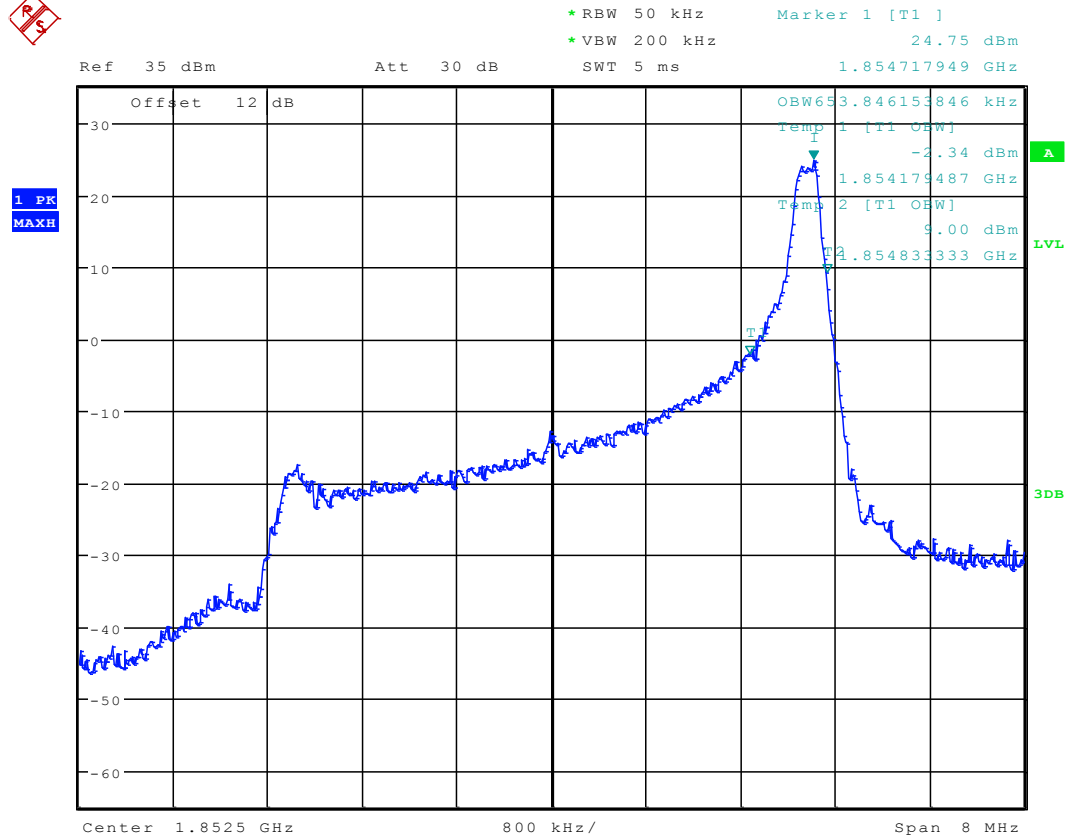
```
* RBW 50 kHz      Marker 1 [T1 ]
* VBW 200 kHz      23.93 dBm
  SWT 5 ms        1.850294872 GHz
```



Date: 25.NOV.2011 15:24:39



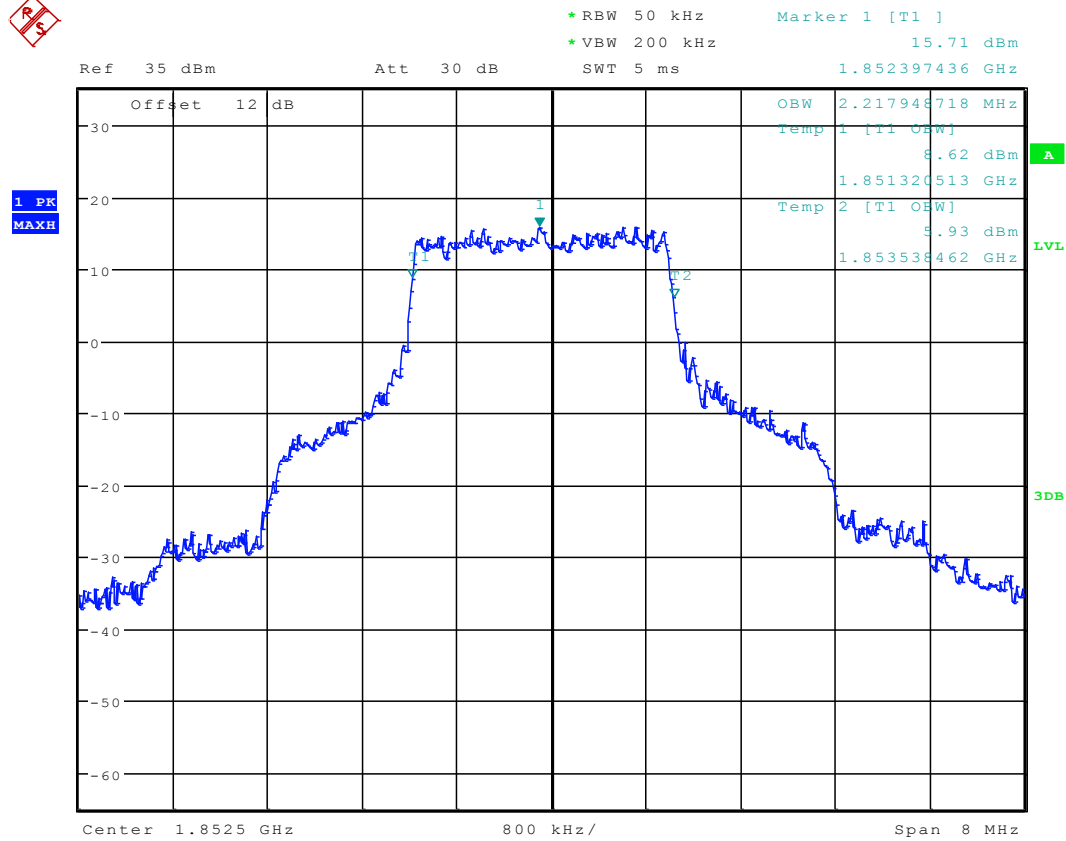
QPSK/1 RB/RB #max



Date: 25.NOV.2011 15:25:34



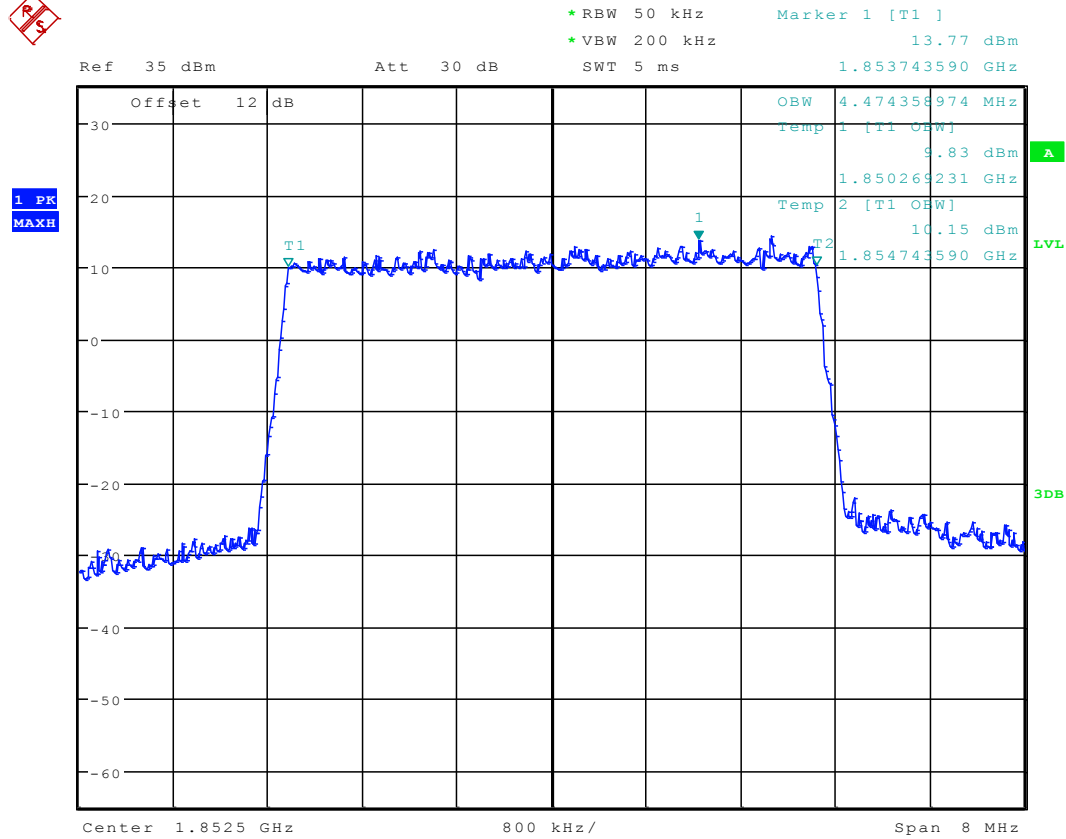
QPSK/12 RB/RB #6



Date: 25.NOV.2011 15:26:25



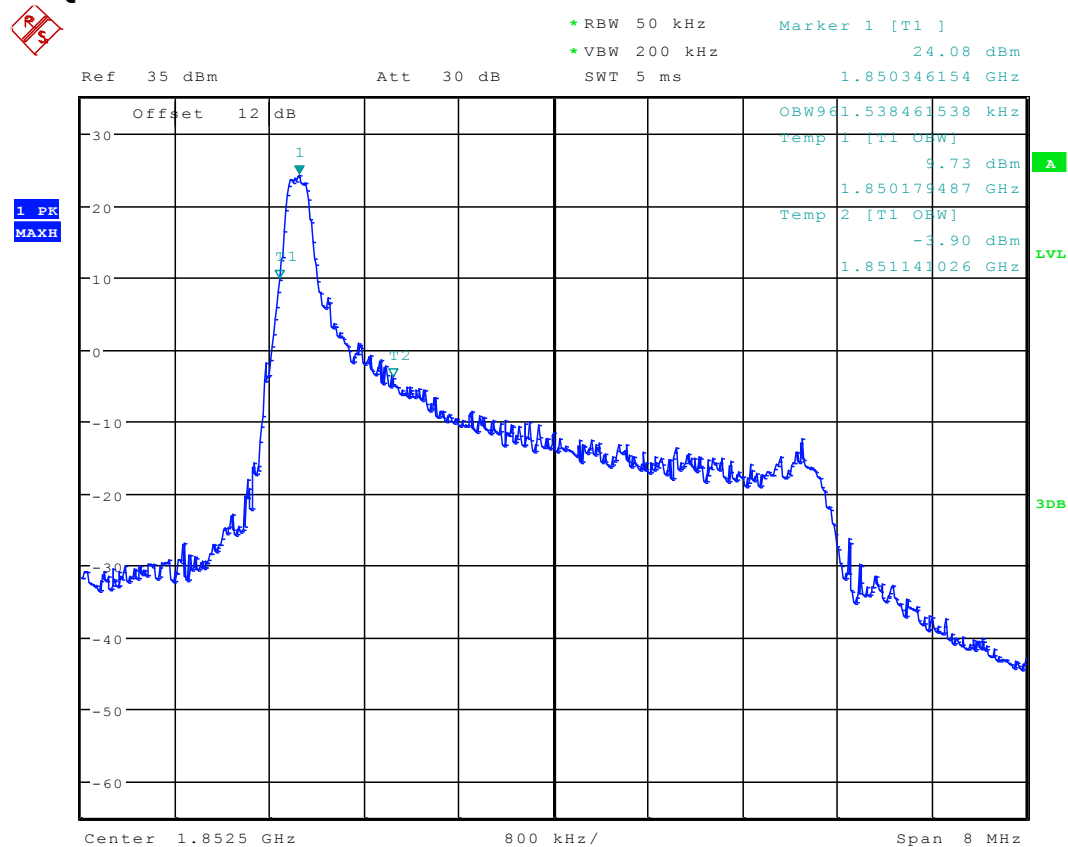
QPSK/ full RBs



Date: 25.NOV.2011 15:22:01

TM5

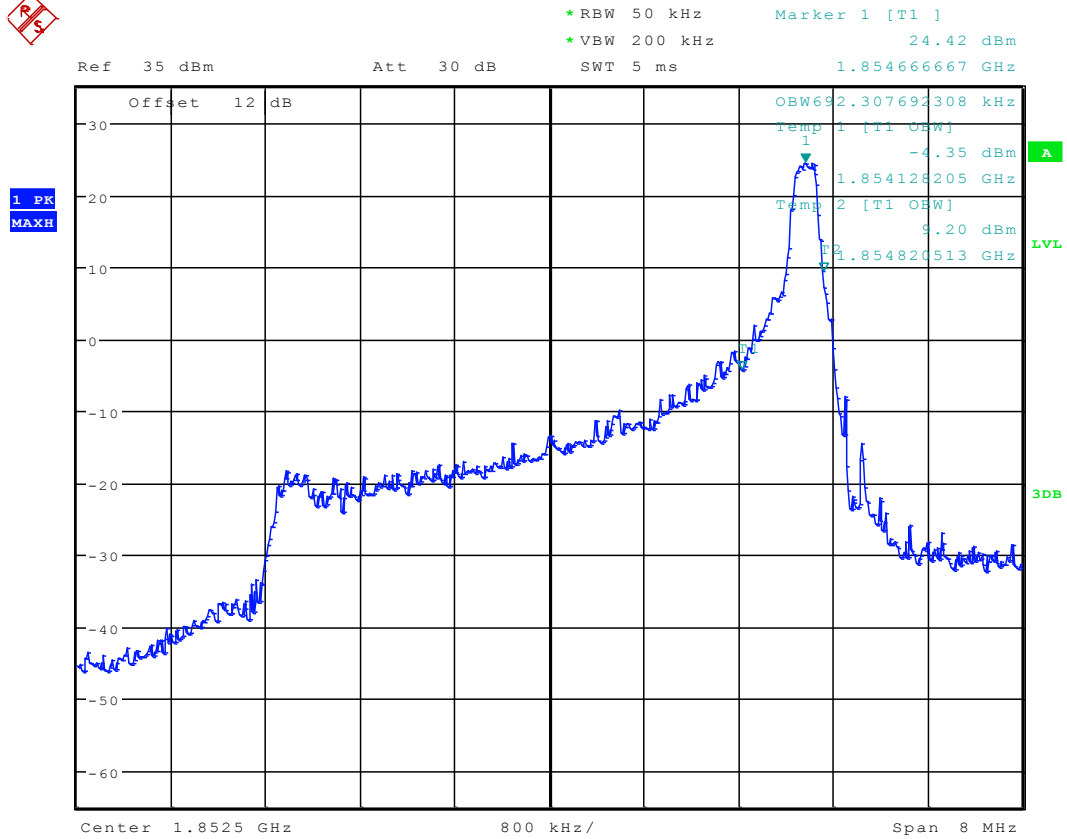
16QAM /1 RB/RB #0



Date: 25.NOV.2011 15:22:35

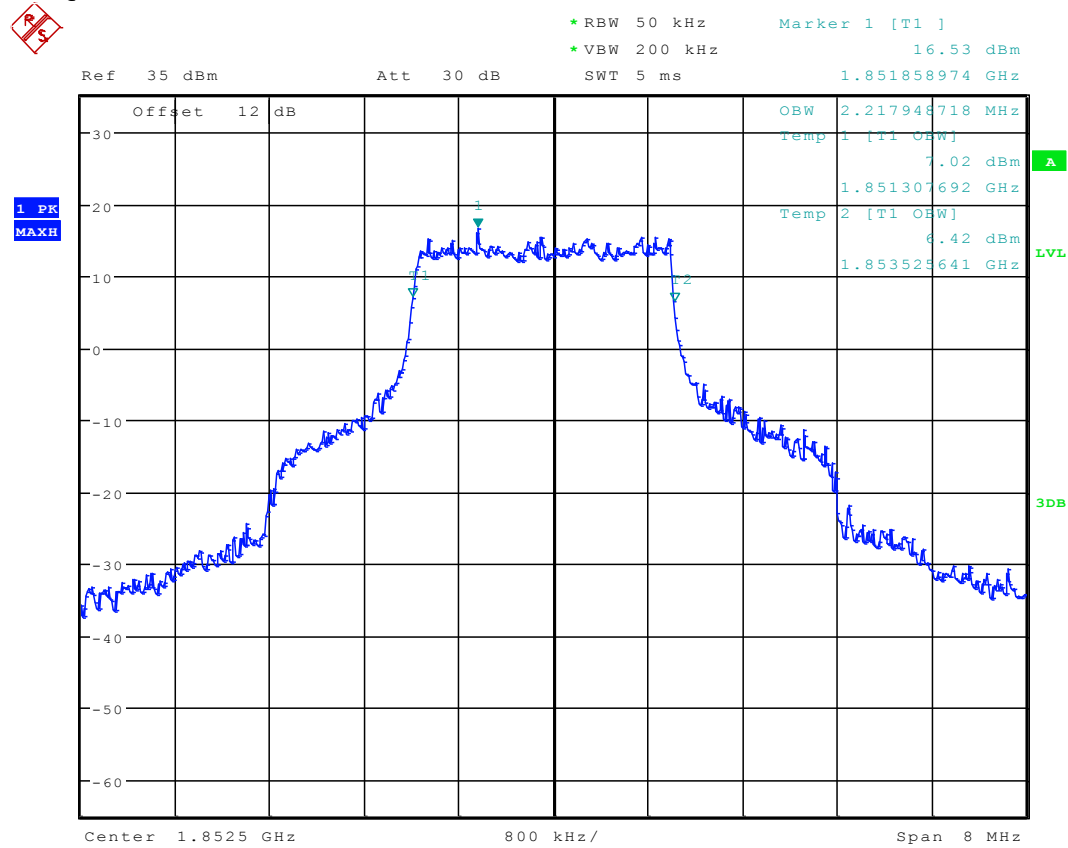


16QAM /1 RB/RB #max



Date: 25.NOV.2011 15:25:49

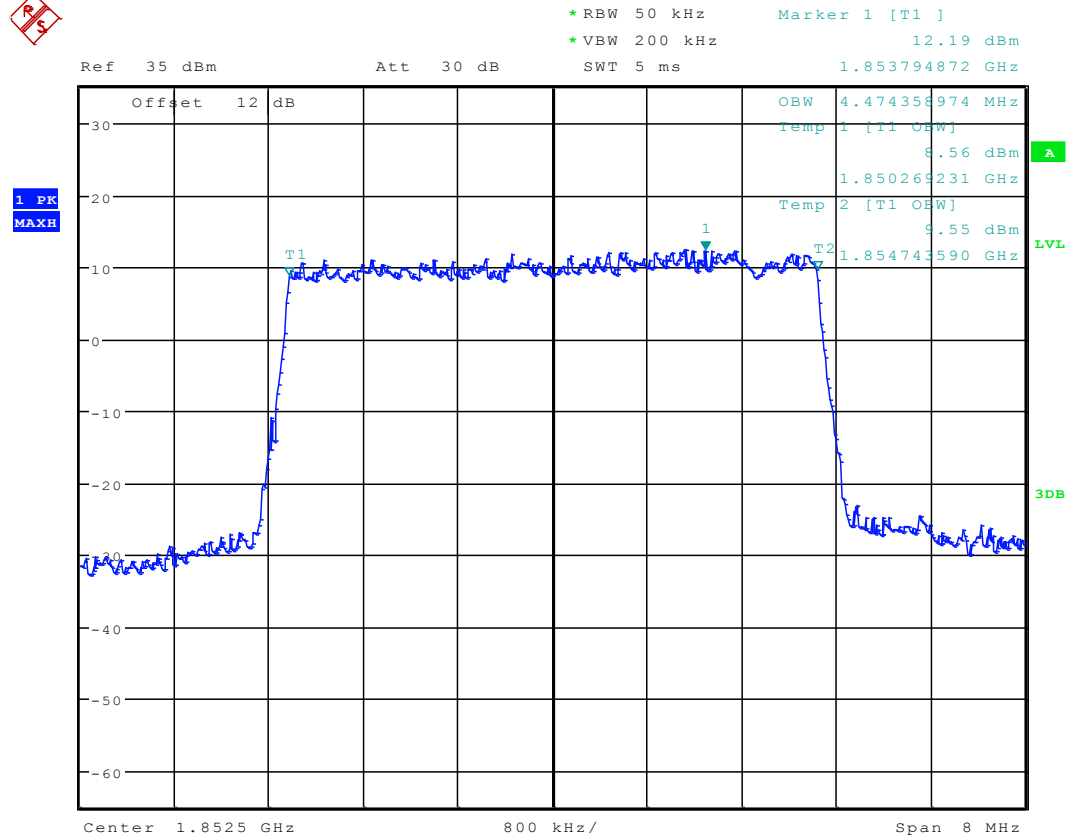
16QAM /12 RB/RB #6



Date: 25.NOV.2011 15:26:09



16QAM/full RBs

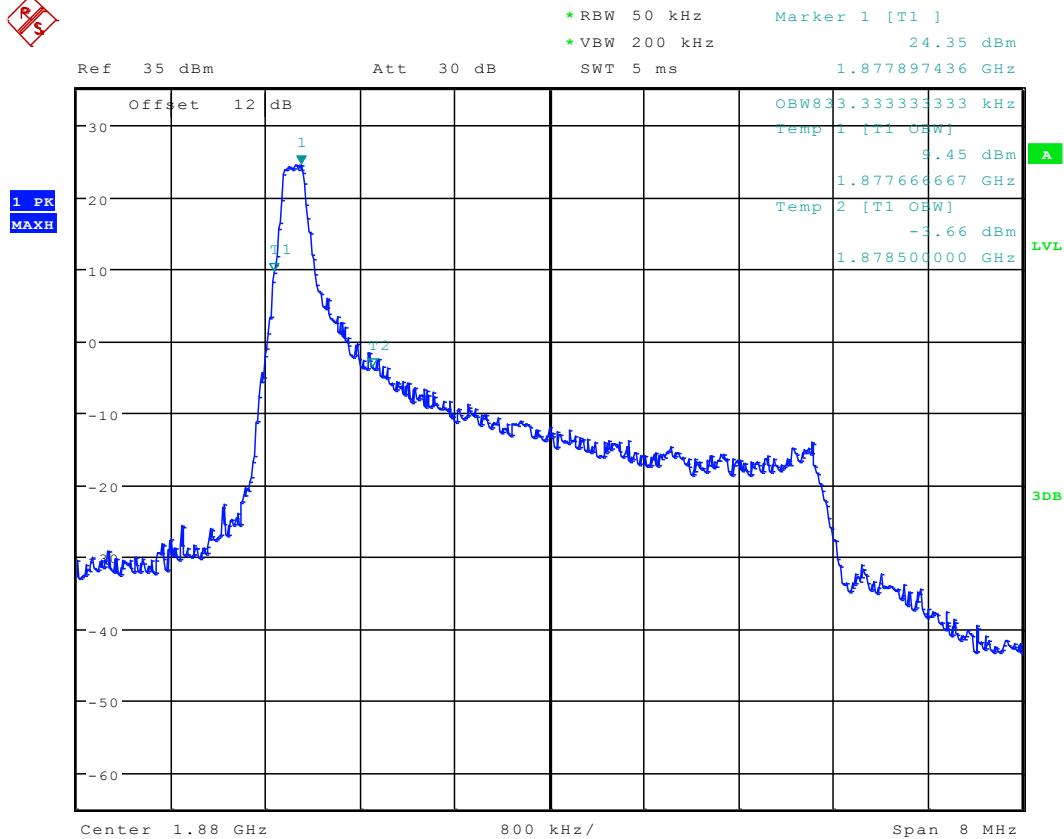


Date: 25.NOV.2011 15:22:17

Channel 18900

TM4

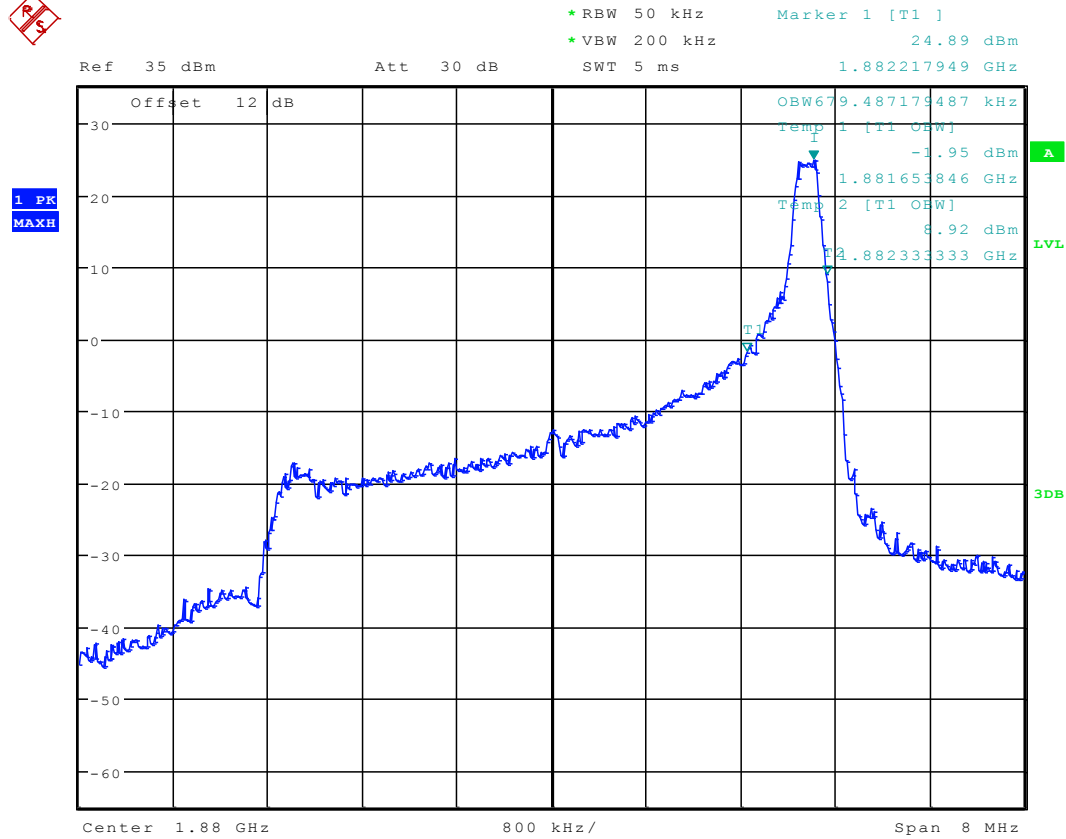
QPSK/1 RB/RB #0



Date: 25.NOV.2011 15:08:02



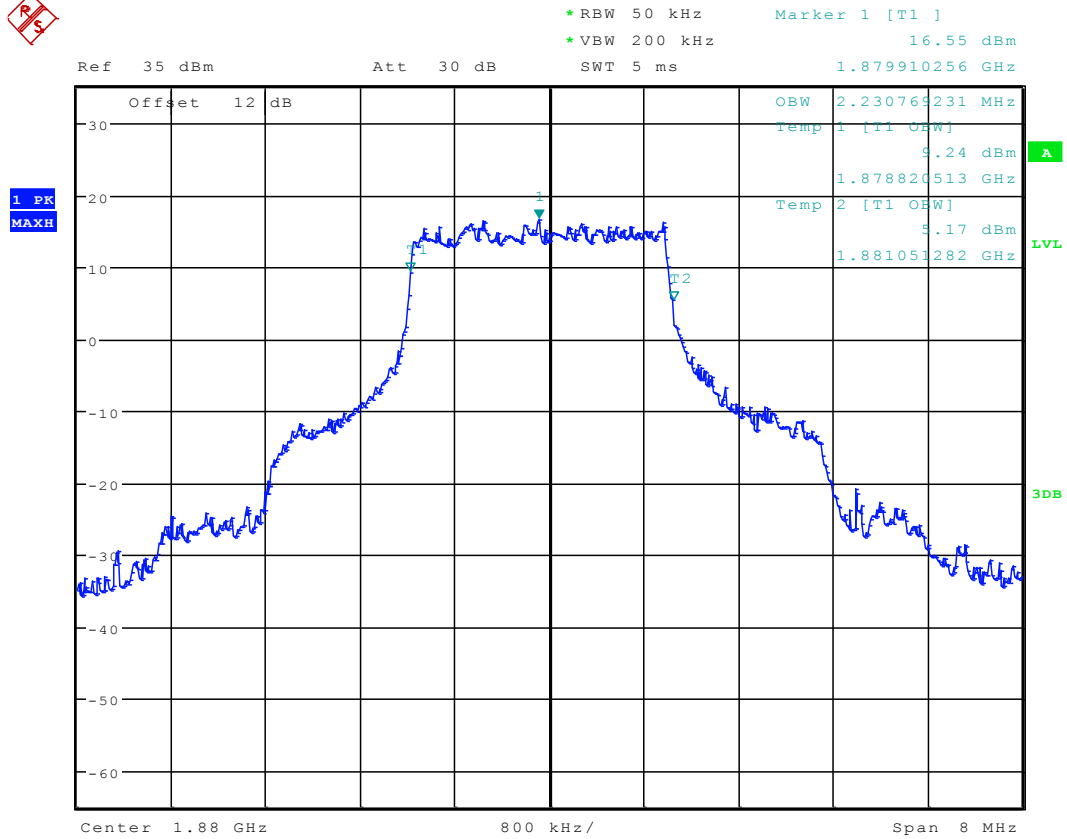
QPSK/1 RB/RB #max



Date: 25.NOV.2011 15:09:05



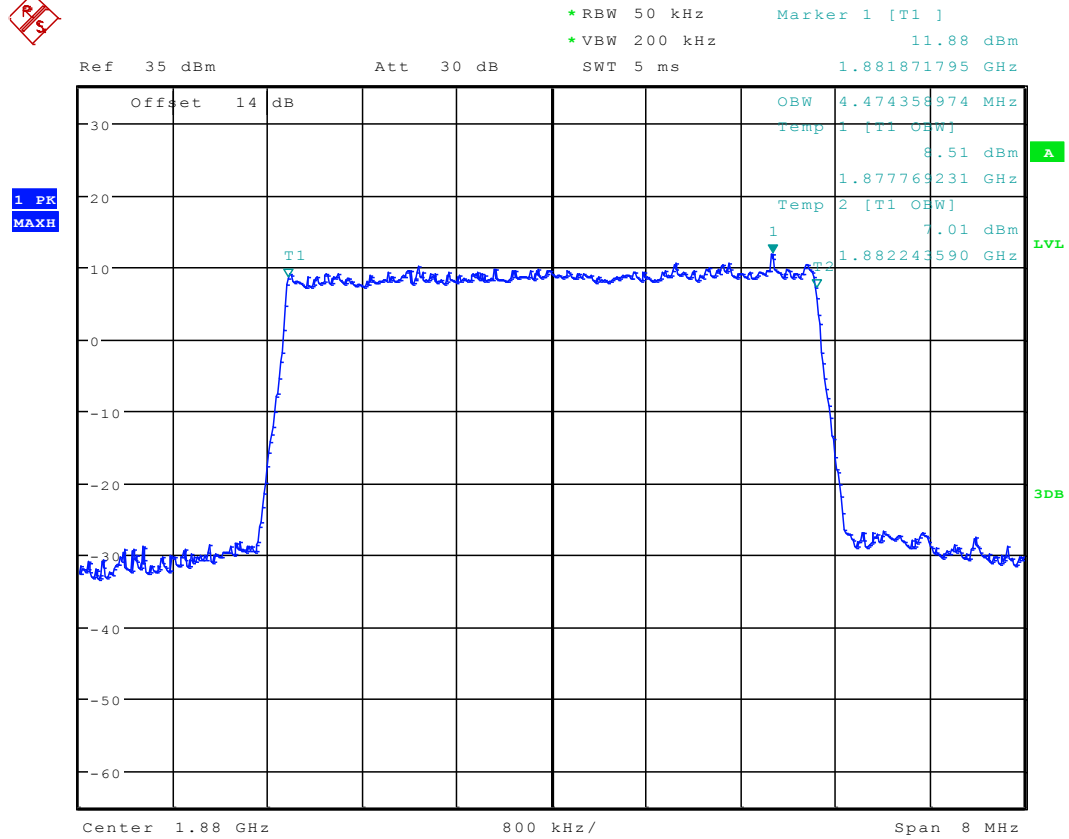
QPSK/12 RB/RB #6



Date: 25.NOV.2011 15:09:29



QPSK/ full RBs



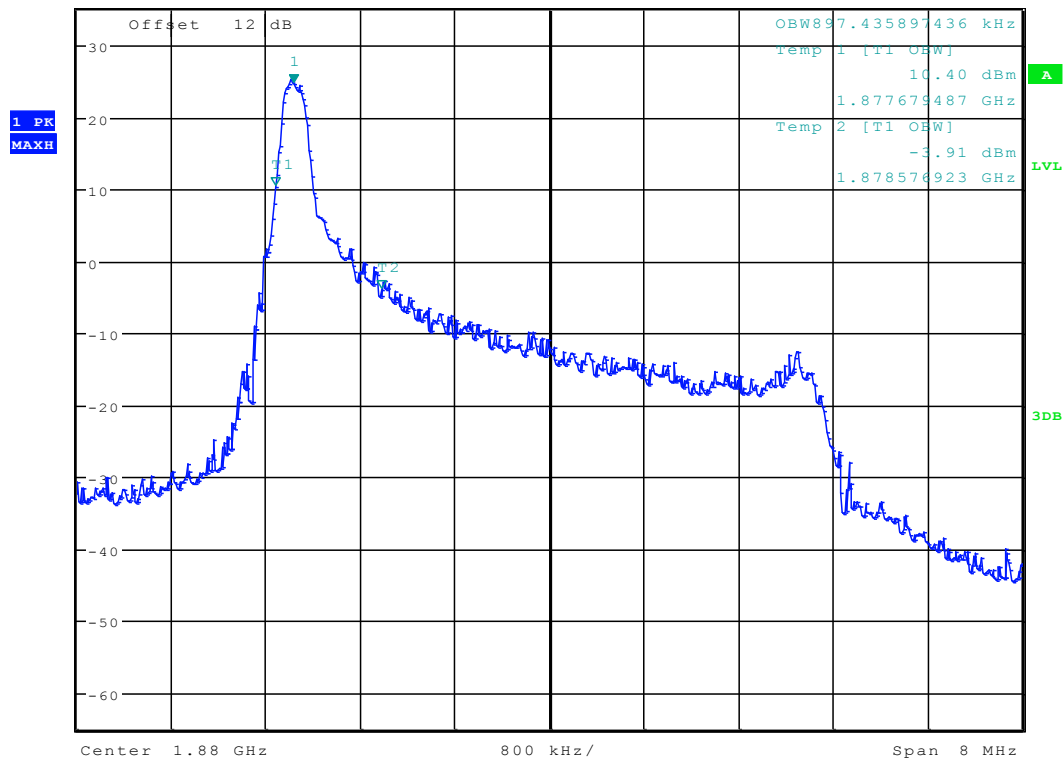
Date: 13.NOV.2011 18:38:18

TM5
16QAM /1 RB/RB #0



```
* RBW 50 kHz           Marker 1 [T1 ]
* VBW 200 kHz           24.70 dBm
  SWT 5 ms              1.877833333 GHz
```

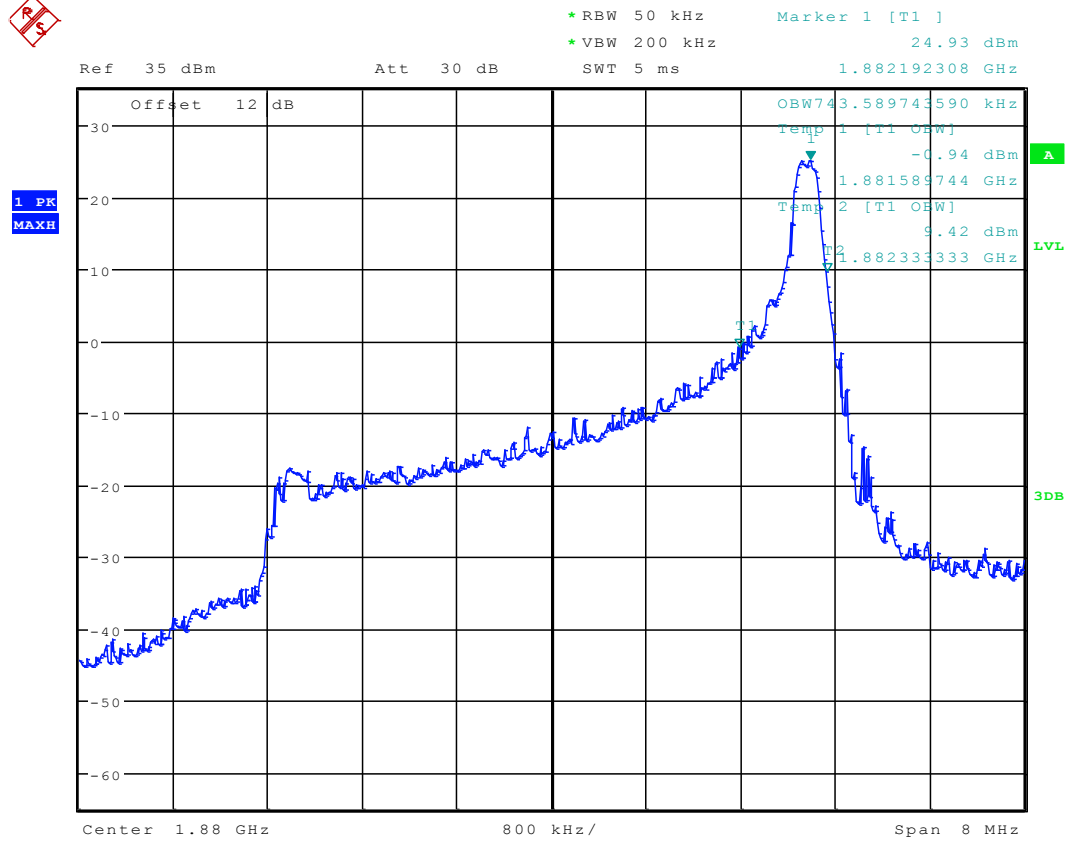
Ref	35 dBm	Att	30 dB	SWT	5 ms	1.877833333 GHz
-----	--------	-----	-------	-----	------	-----------------



Date: 25.NOV.2011 15:08:29



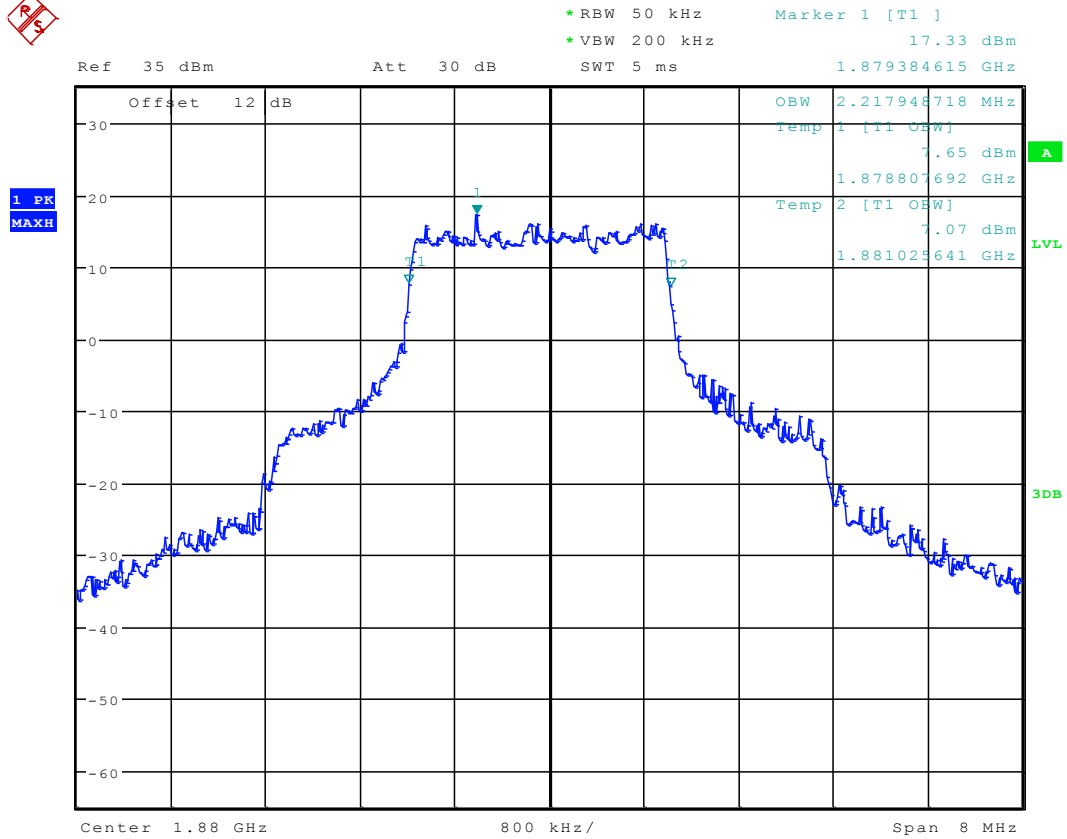
16QAM /1 RB/RB #max



Date: 25.NOV.2011 15:08:52



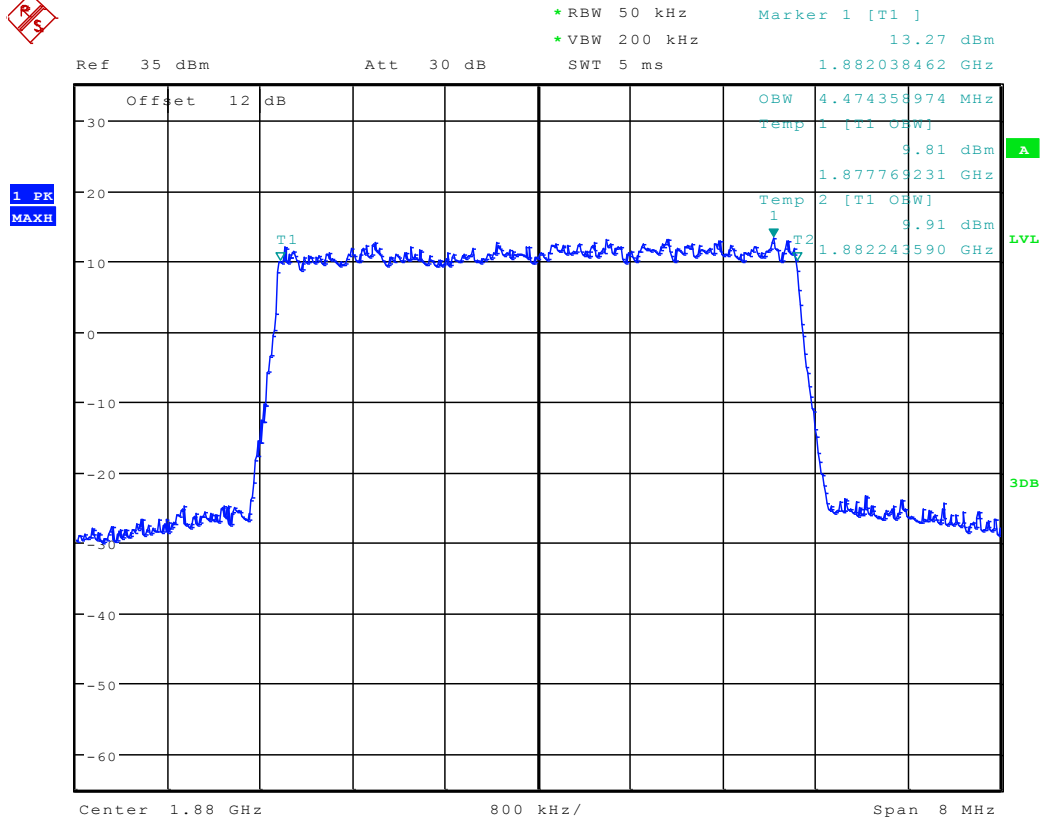
16QAM /12 RB/RB #6



Date: 25.NOV.2011 15:09:47



16QAM/full RBs



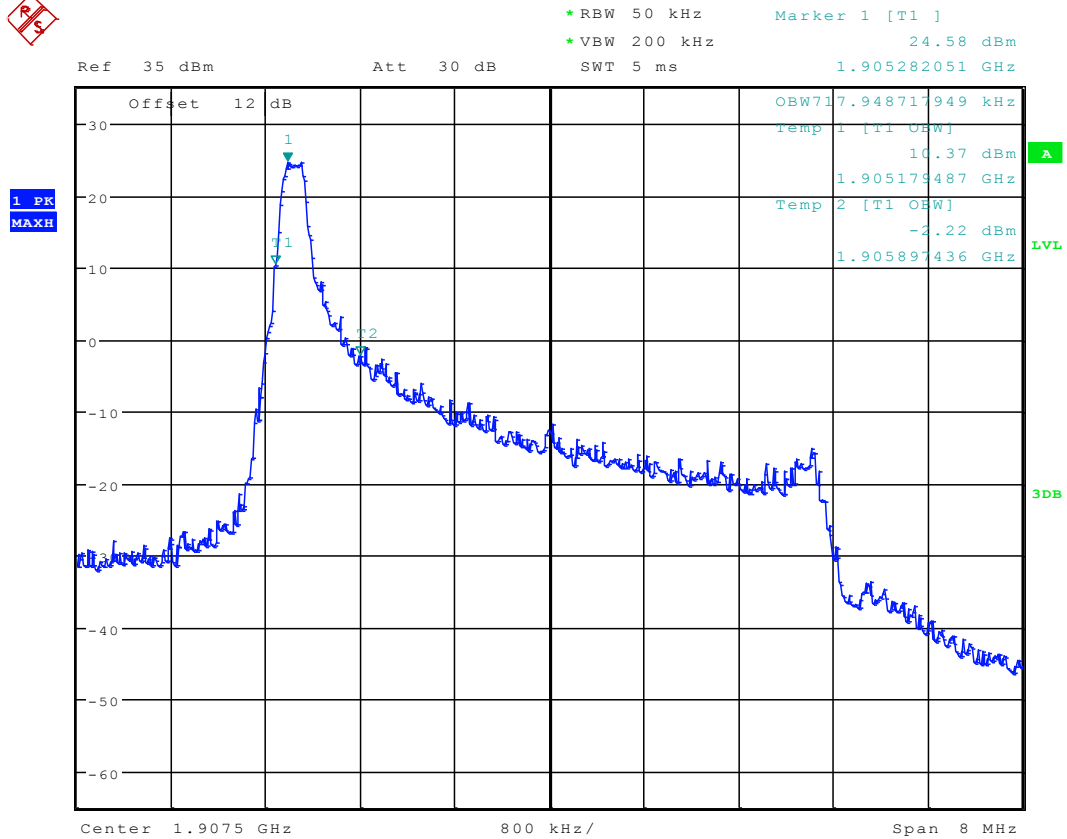
Date: 24.NOV.2011 16:34:02



Channel 19175

TM4

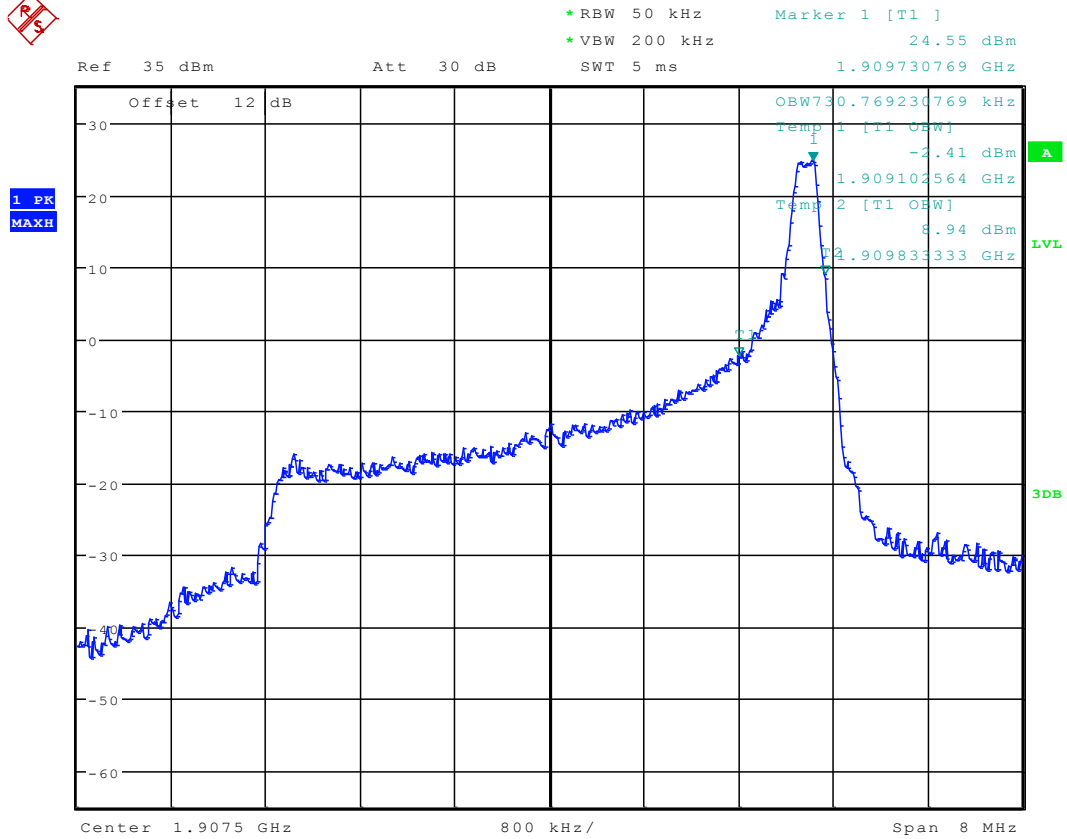
QPSK/1 RB/RB #0



Date: 25.NOV.2011 15:37:37



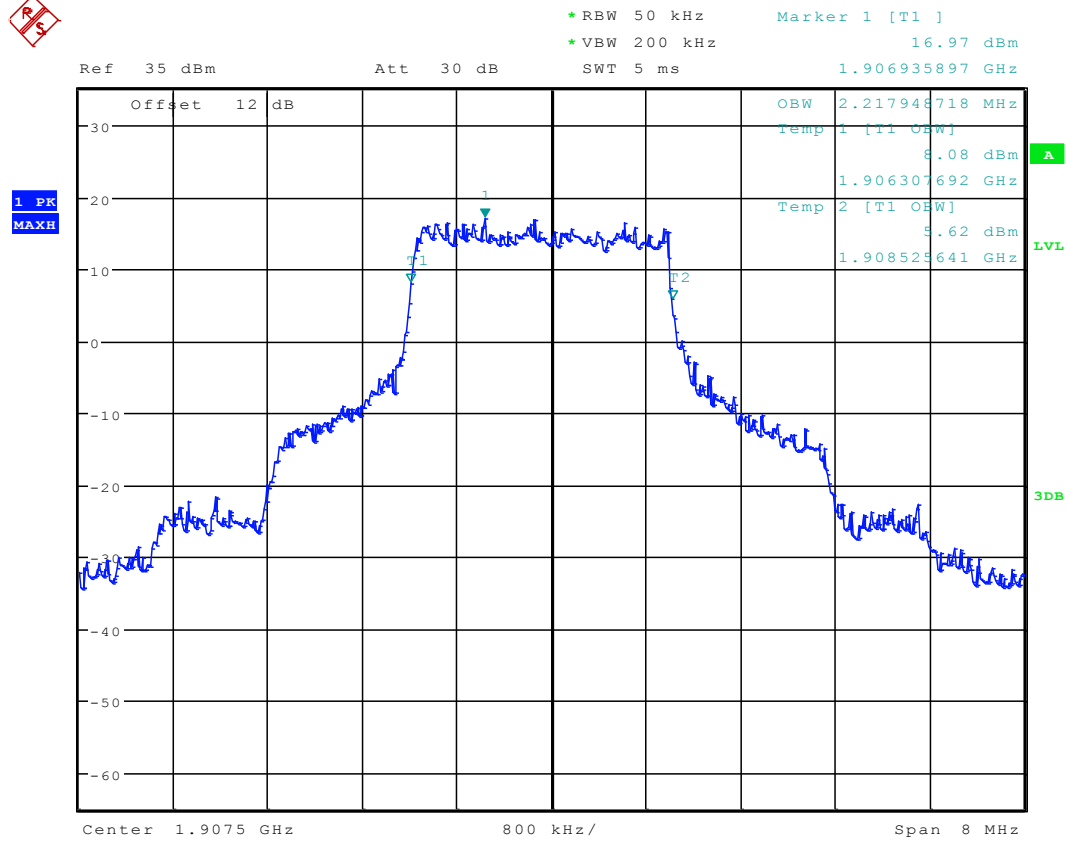
QPSK/1 RB/RB #max



Date: 25.NOV.2011 15:37:58



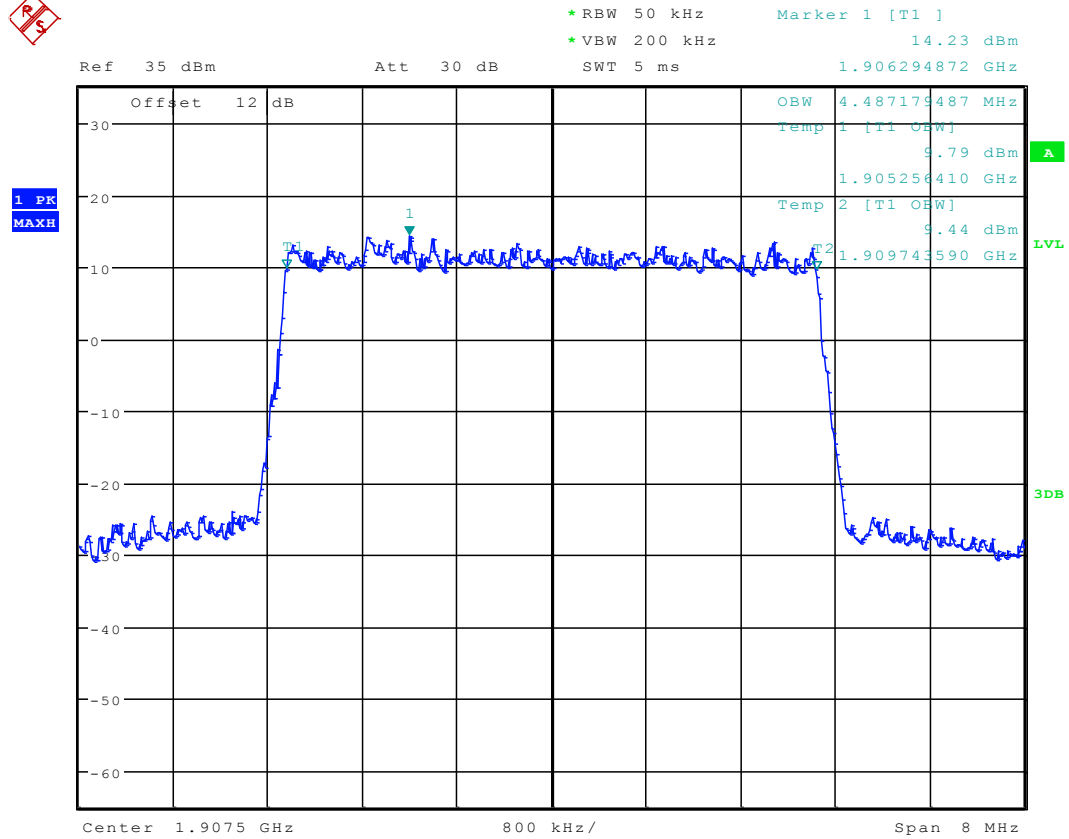
QPSK/12 RB/RB #6



Date: 25.NOV.2011 15:38:57

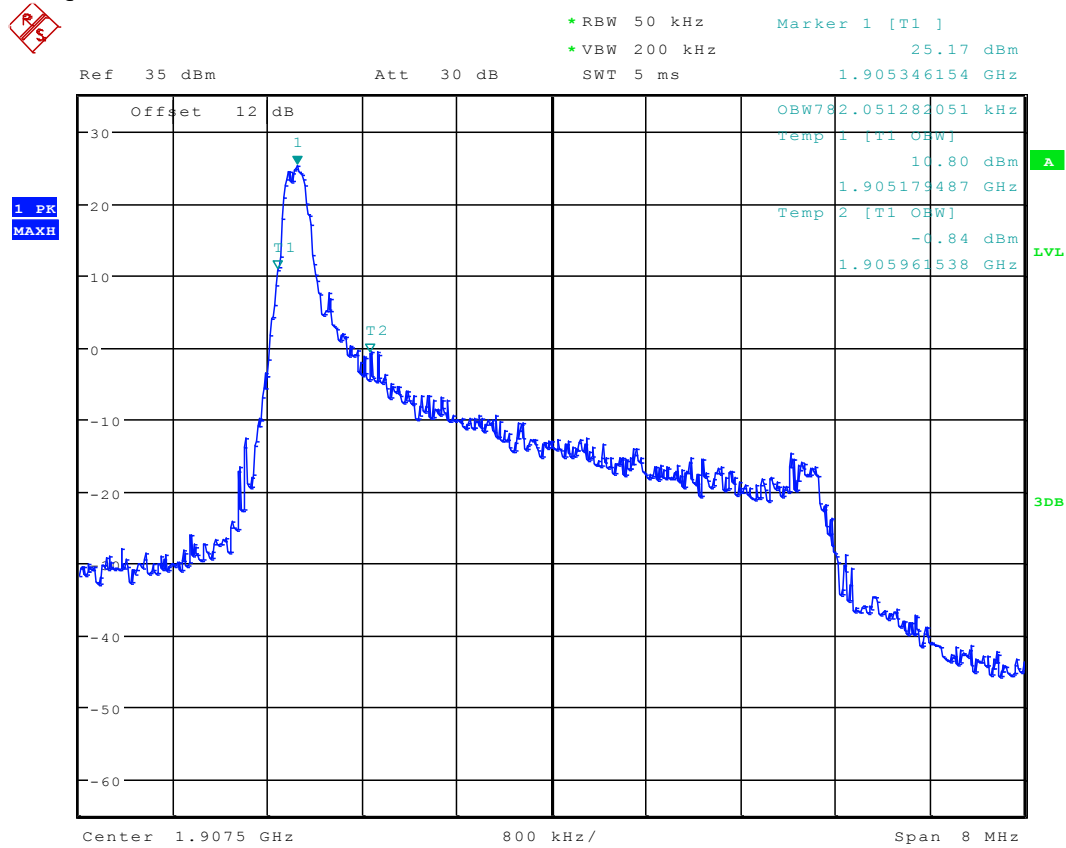


QPSK/ full RBs



Date: 25.NOV.2011 15:36:16

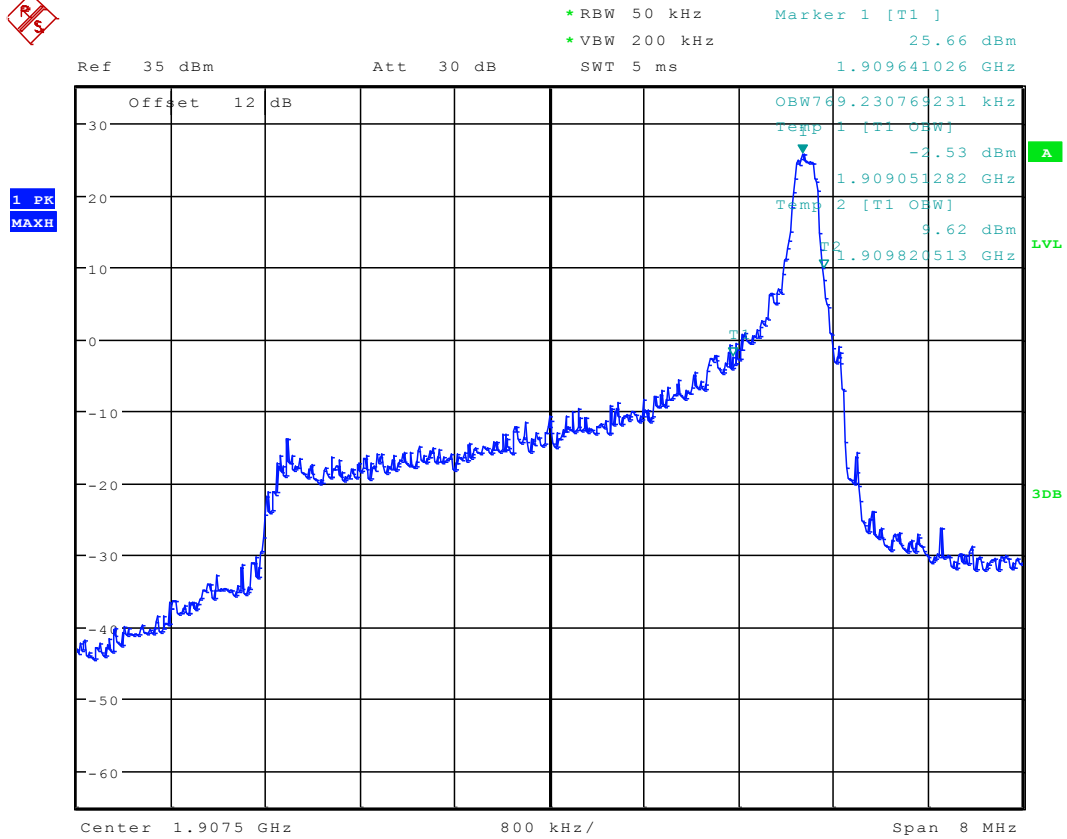
TM5
16QAM /1 RB/RB #0



Date: 25.NOV.2011 15:37:21



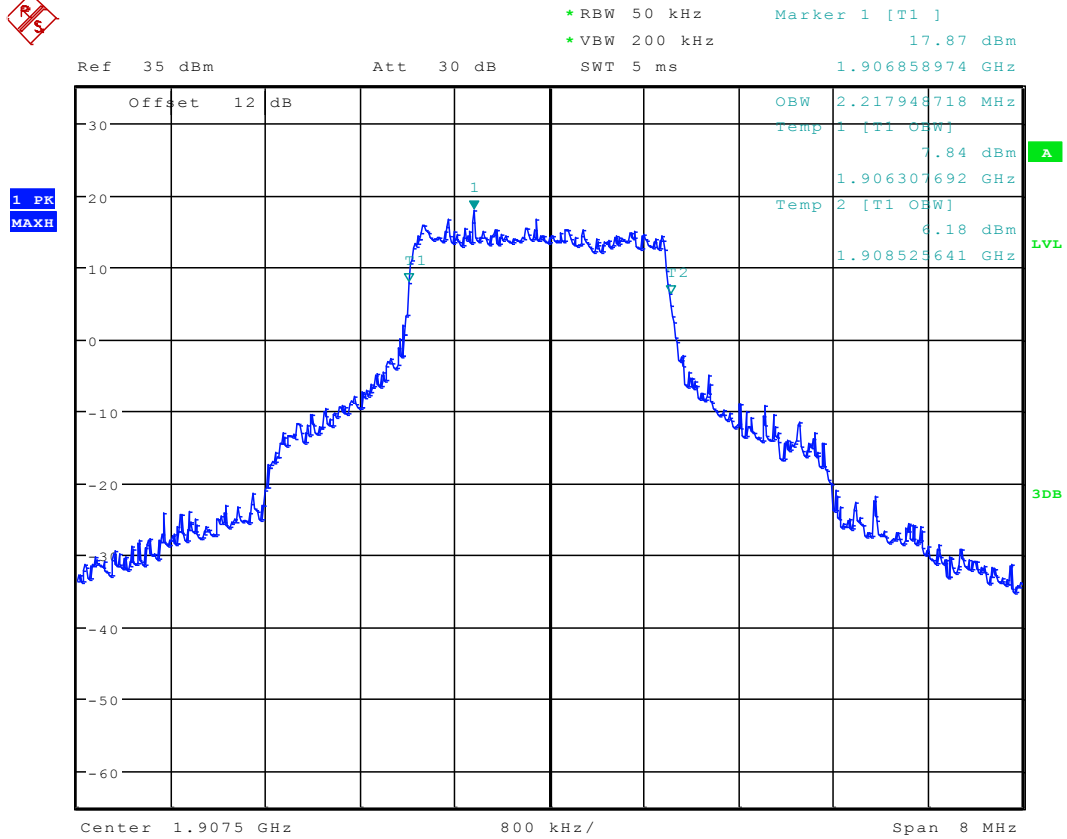
16QAM /1 RB/RB #max



Date: 25.NOV.2011 15:38:16



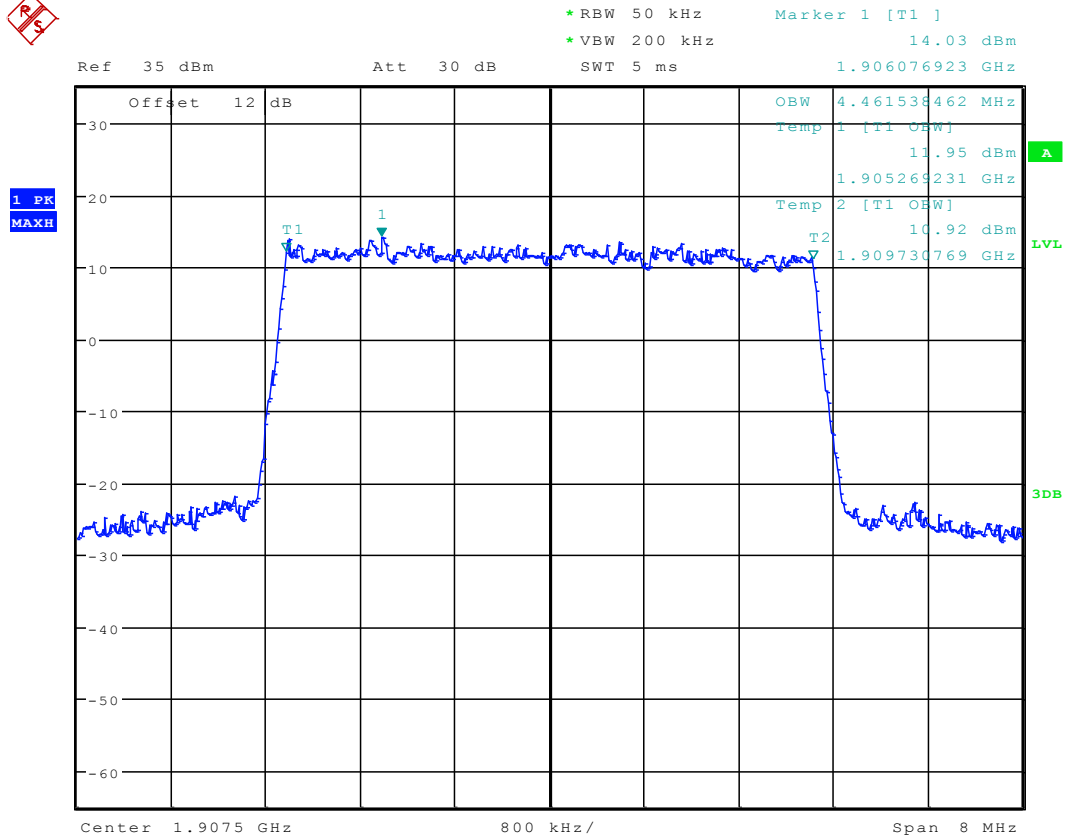
16QAM /12 RB/RB #6



Date: 25.NOV.2011 15:38:37



16QAM/full RBs



Date: 25.NOV.2011 15:37:02

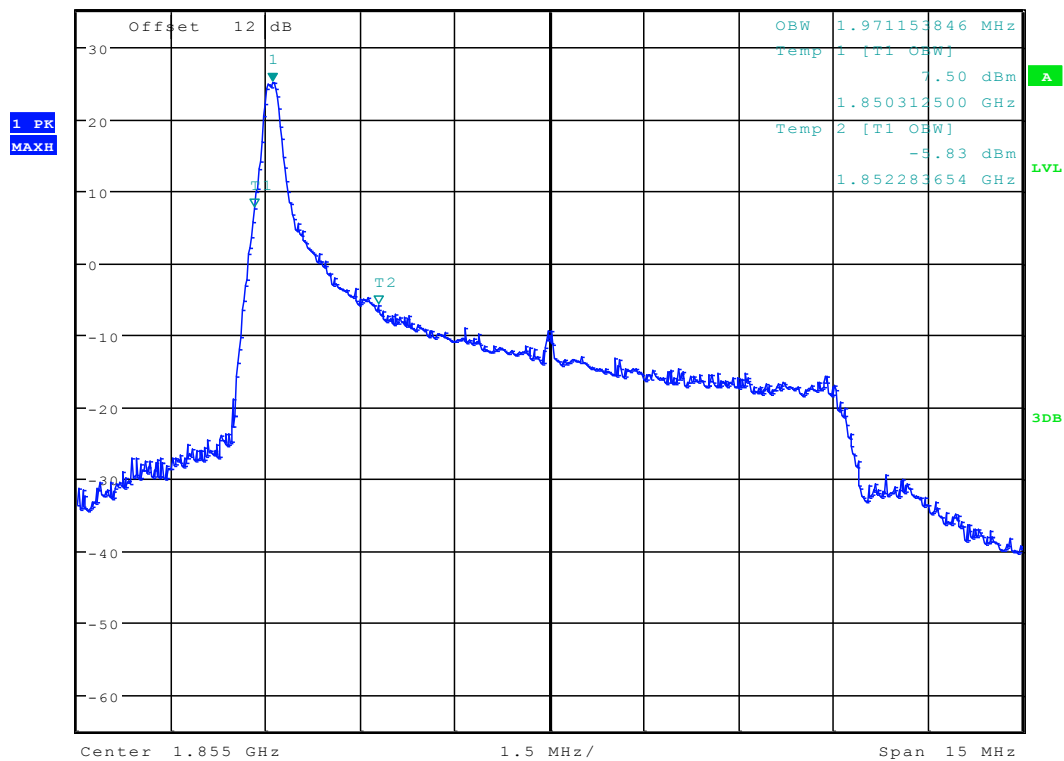
10MHz(BW)
Channel 18650

TM4

QPSK/1 RB/RB #0



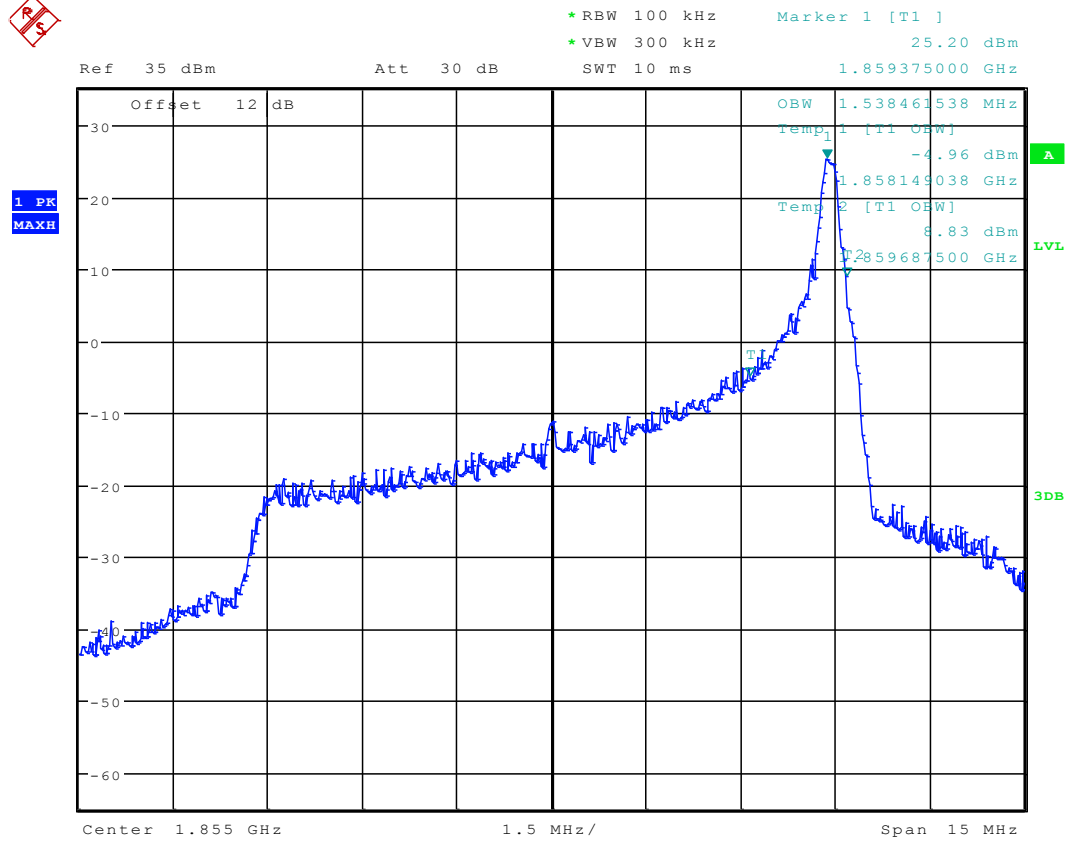
```
* RBW 100 kHz      Marker 1 [T1 ]
* VBW 300 kHz      24.95 dBm
SWT 10 ms          1.850600962 GHz
```



Date: 25.NOV.2011 15:28:29



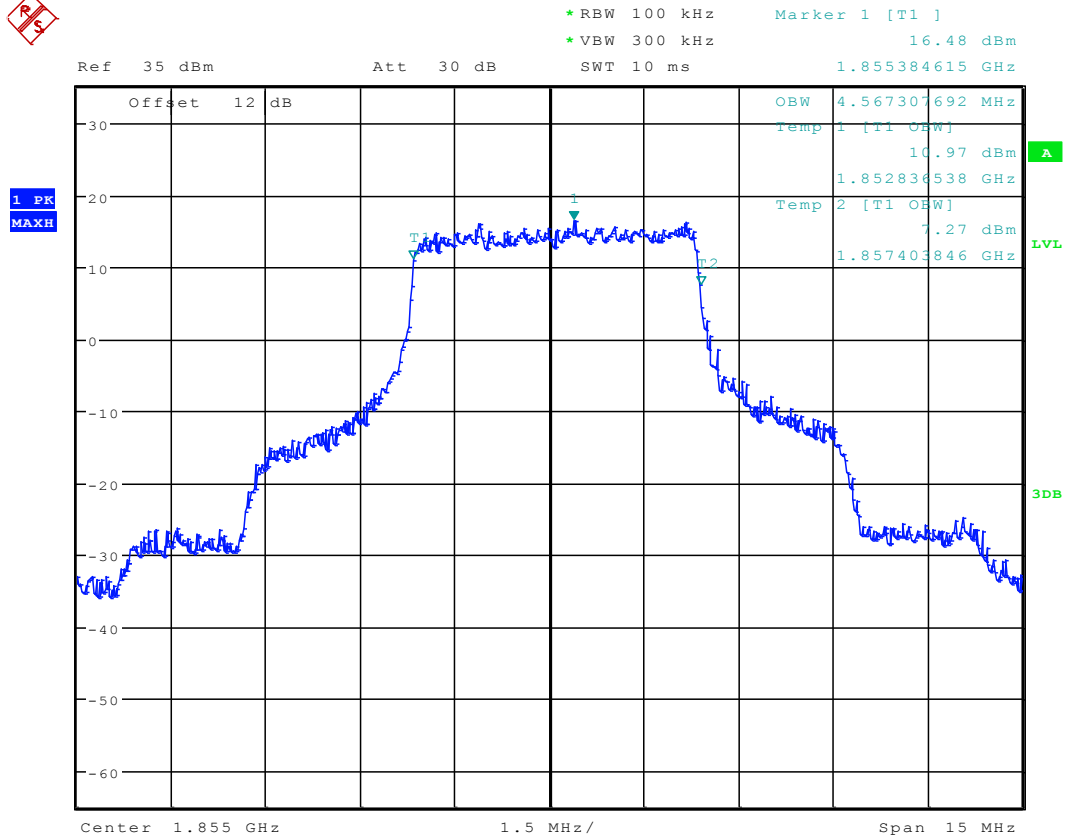
QPSK/1 RB/RB #max



Date: 25.NOV.2011 15:28:48



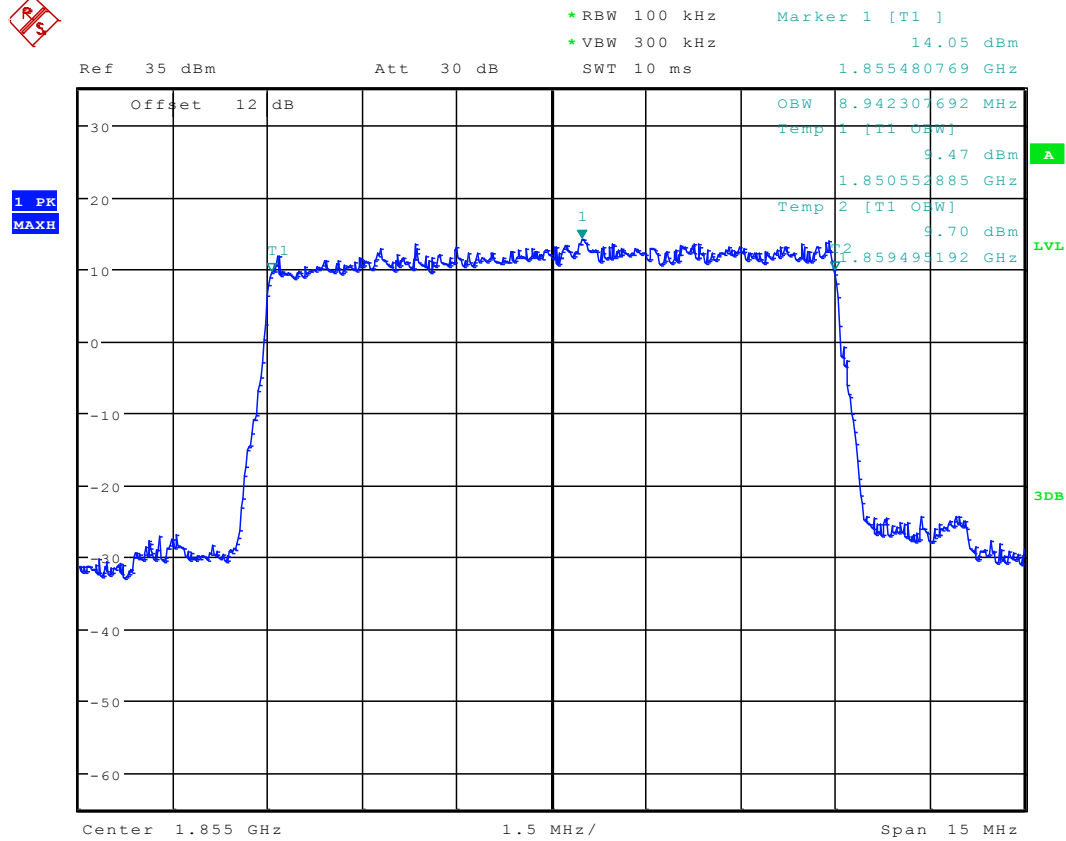
QPSK/25 RB/RB #13



Date: 25.NOV.2011 15:29:43



QPSK/ full RBs

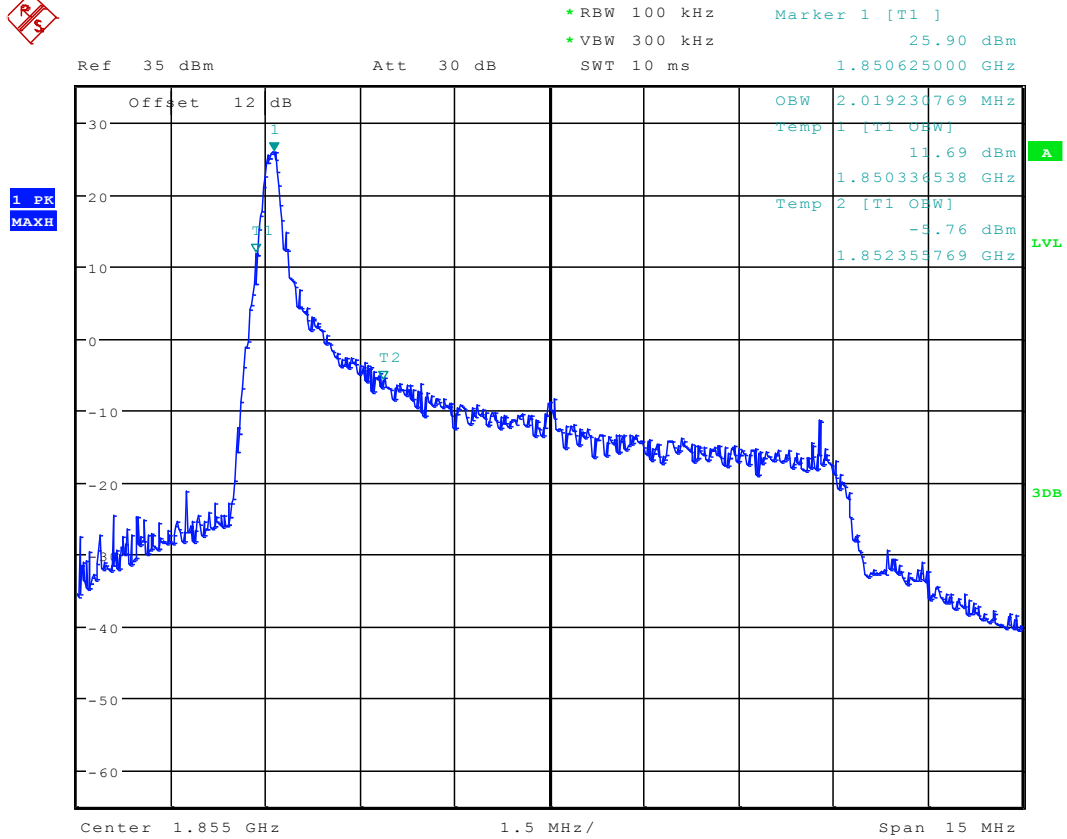


Date: 25.NOV.2011 15:27:21



TM5

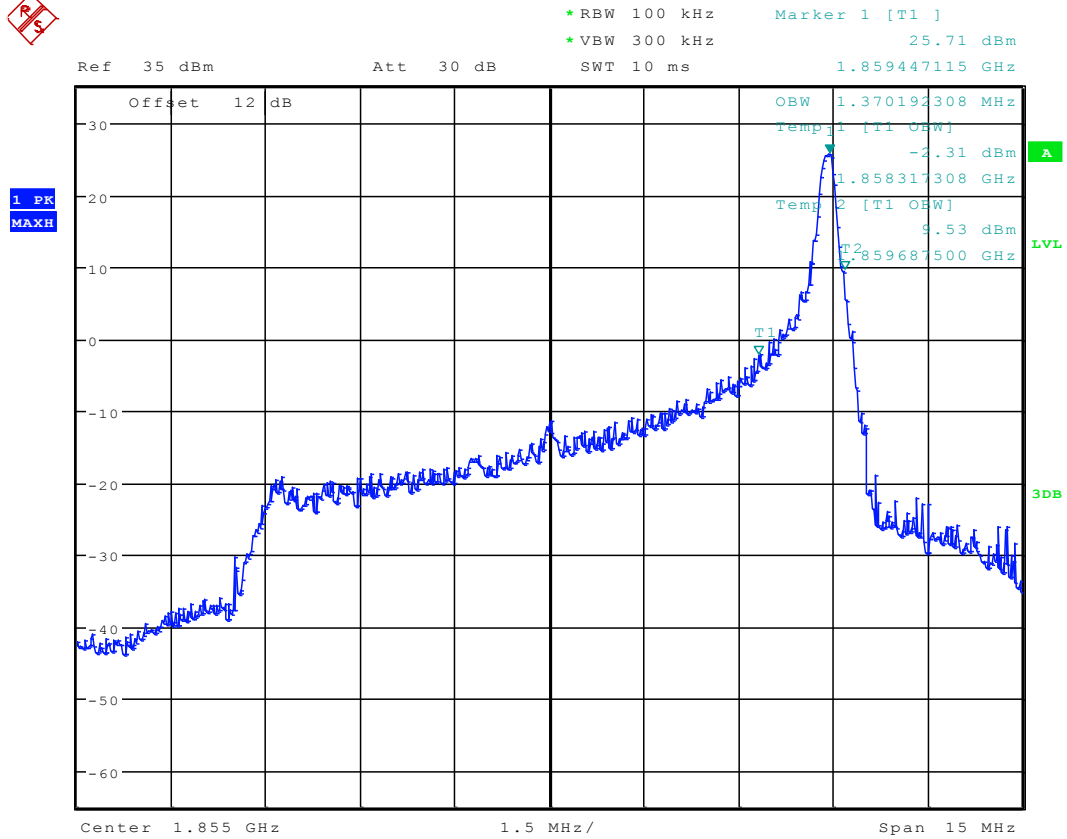
16QAM /1 RB/RB #0



Date: 25.NOV.2011 15:28:13



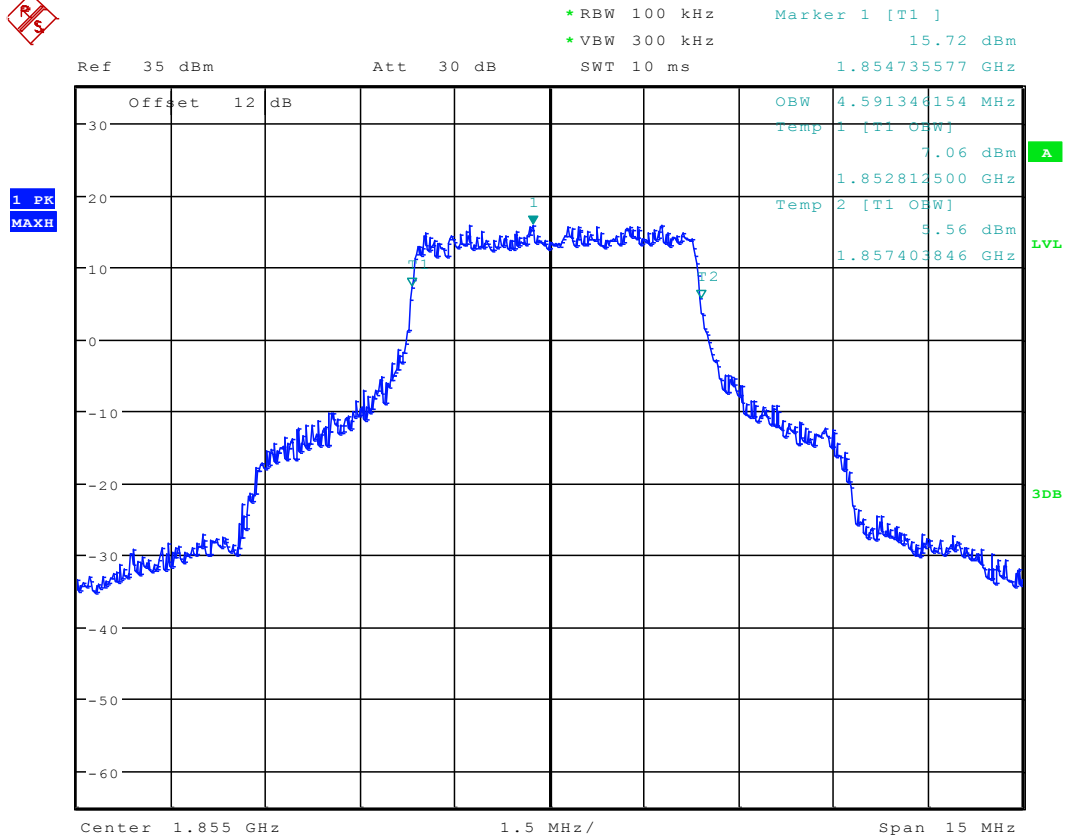
16QAM /1 RB/RB #max



Date: 25.NOV.2011 15:29:05



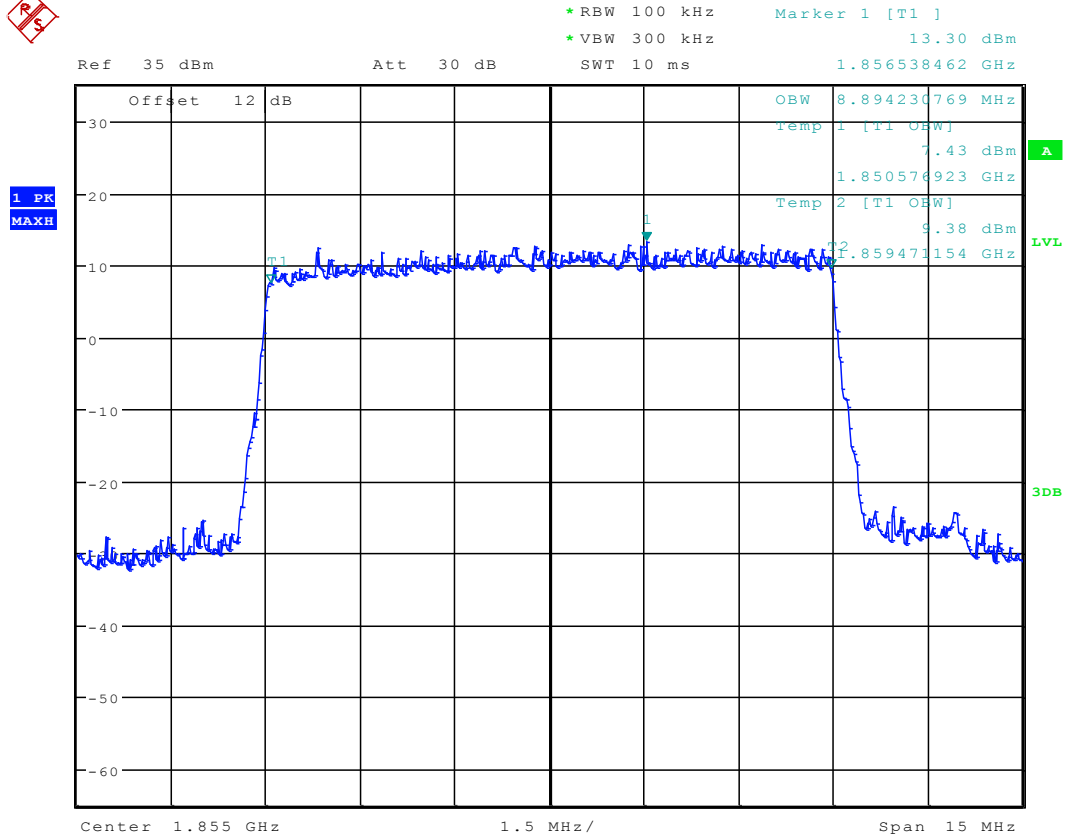
16QAM /25 RB/RB #13



Date: 25.NOV.2011 15:29:25



16QAM/full RBs



Date: 25.NOV.2011 15:27:40

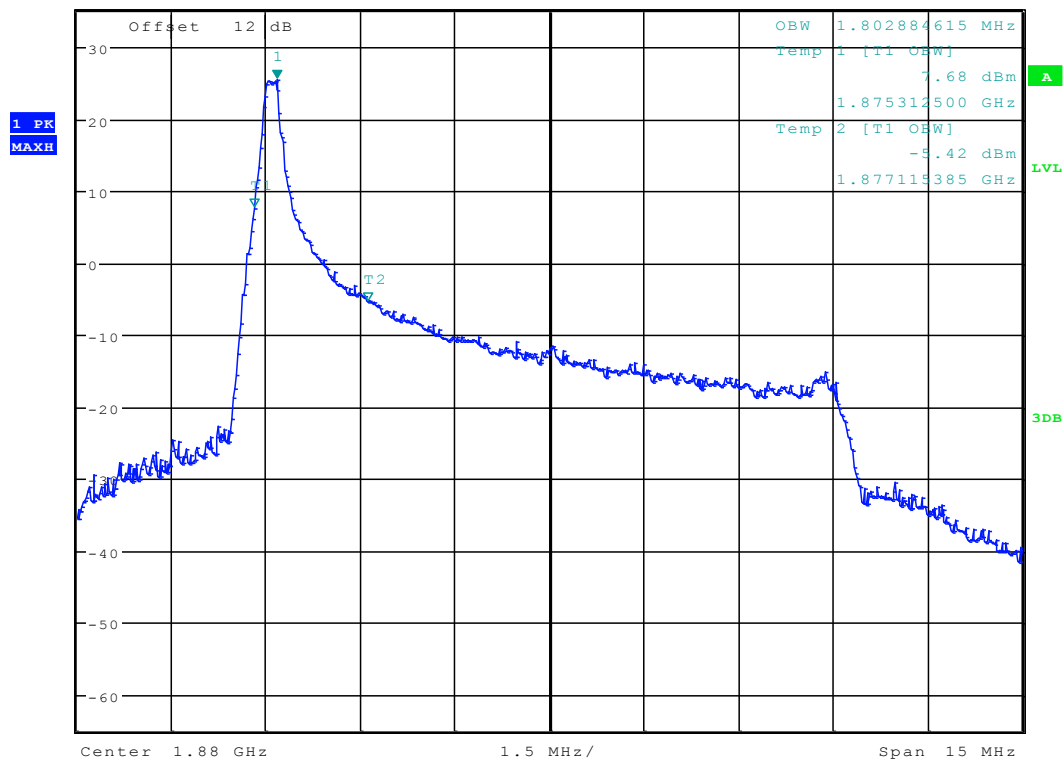
Channel 18900

TM4

QPSK/1 RB/RB #0



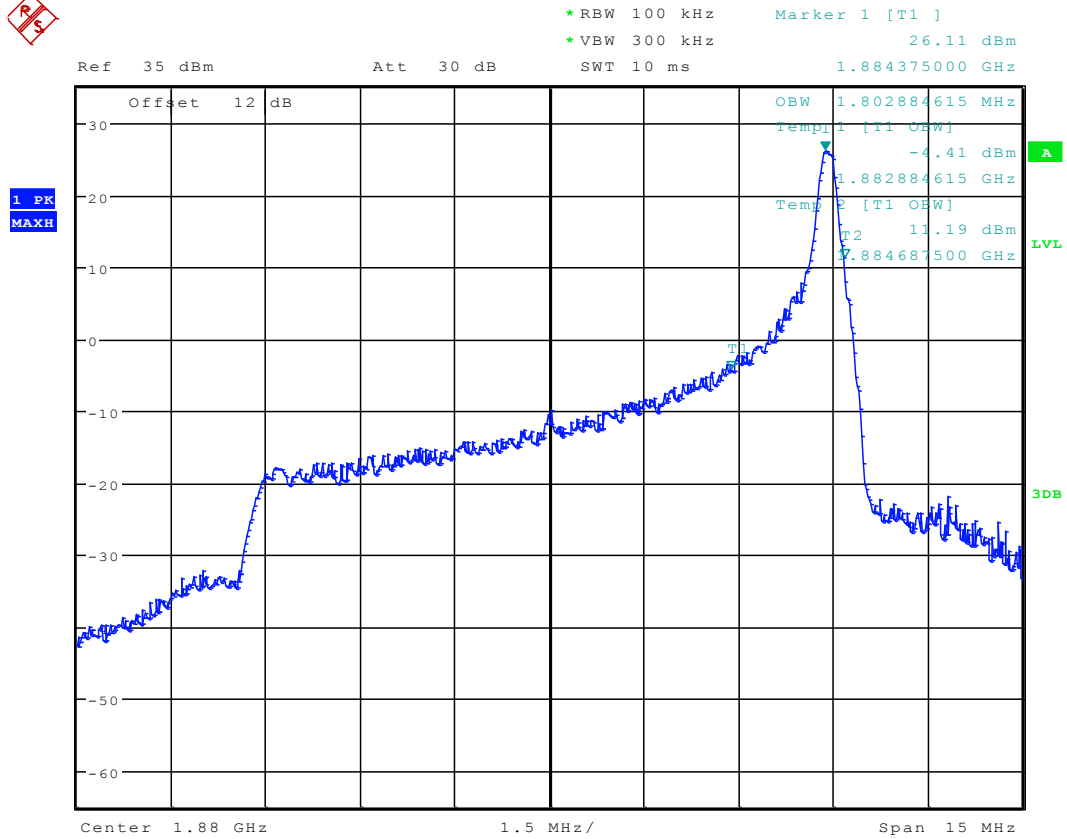
```
* RBW 100 kHz      Marker 1 [T1 ]
* VBW 300 kHz      25.35 dBm
SWT 10 ms          1.875673077 GHz
```



Date: 25.NOV.2011 15:12:11



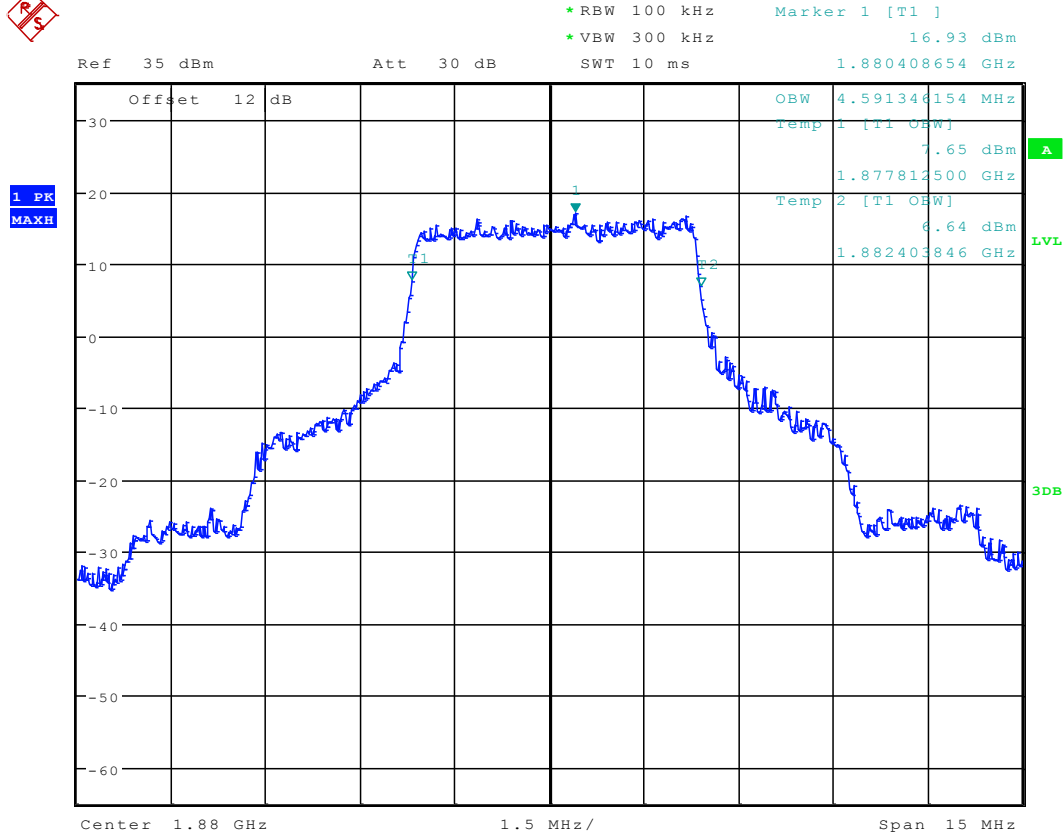
QPSK/1 RB/RB #max



Date: 25.NOV.2011 15:12:33



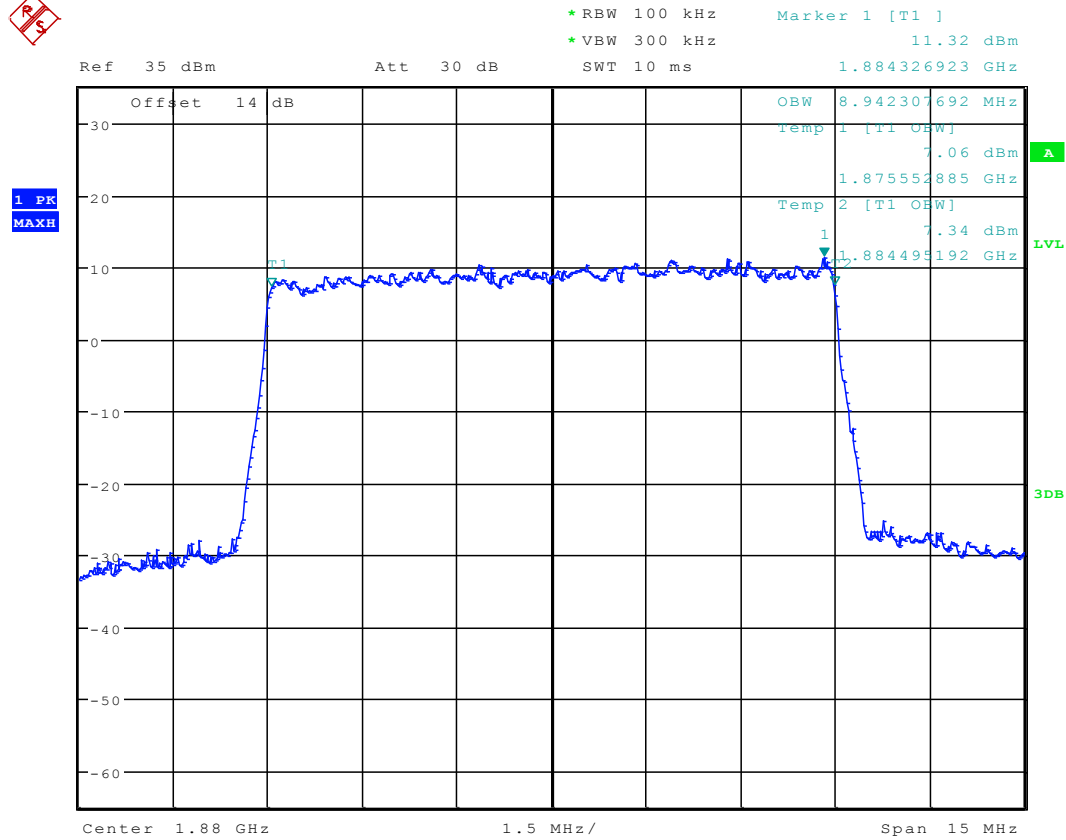
QPSK/25 RB/RB #13



Date: 25.NOV.2011 15:13:30



QPSK/ full RBs

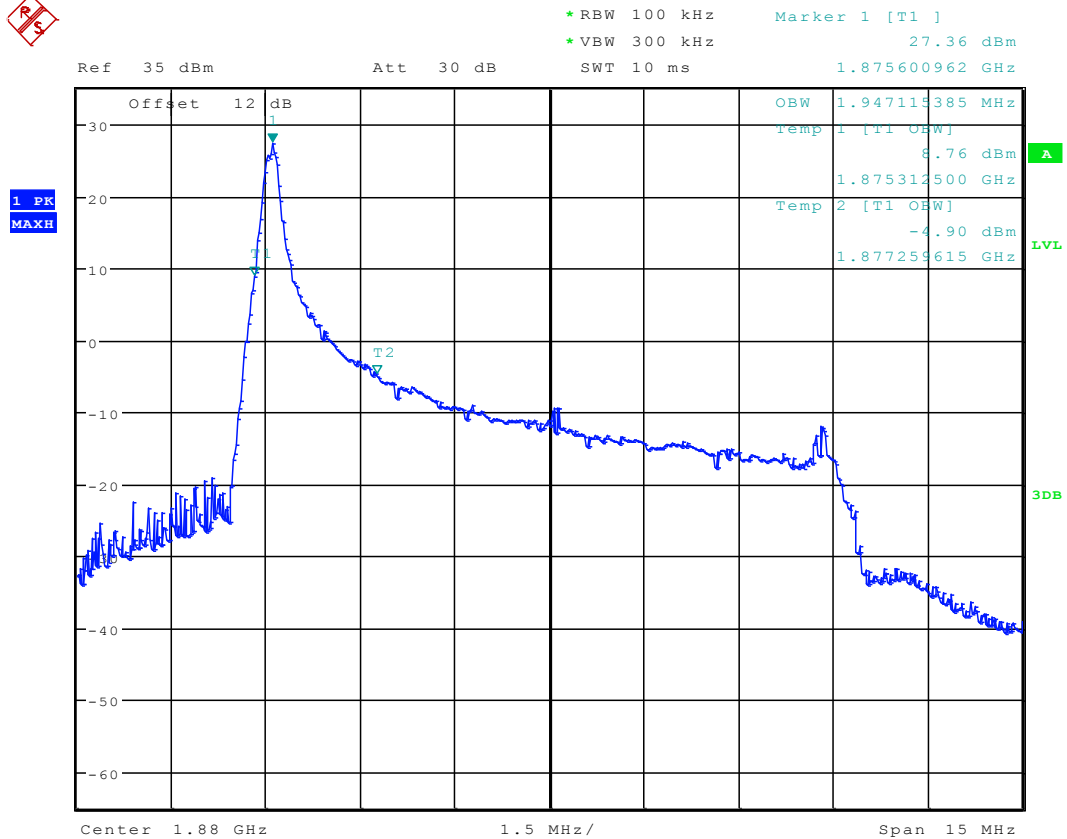


Date: 13.NOV.2011 18:49:28



TM5

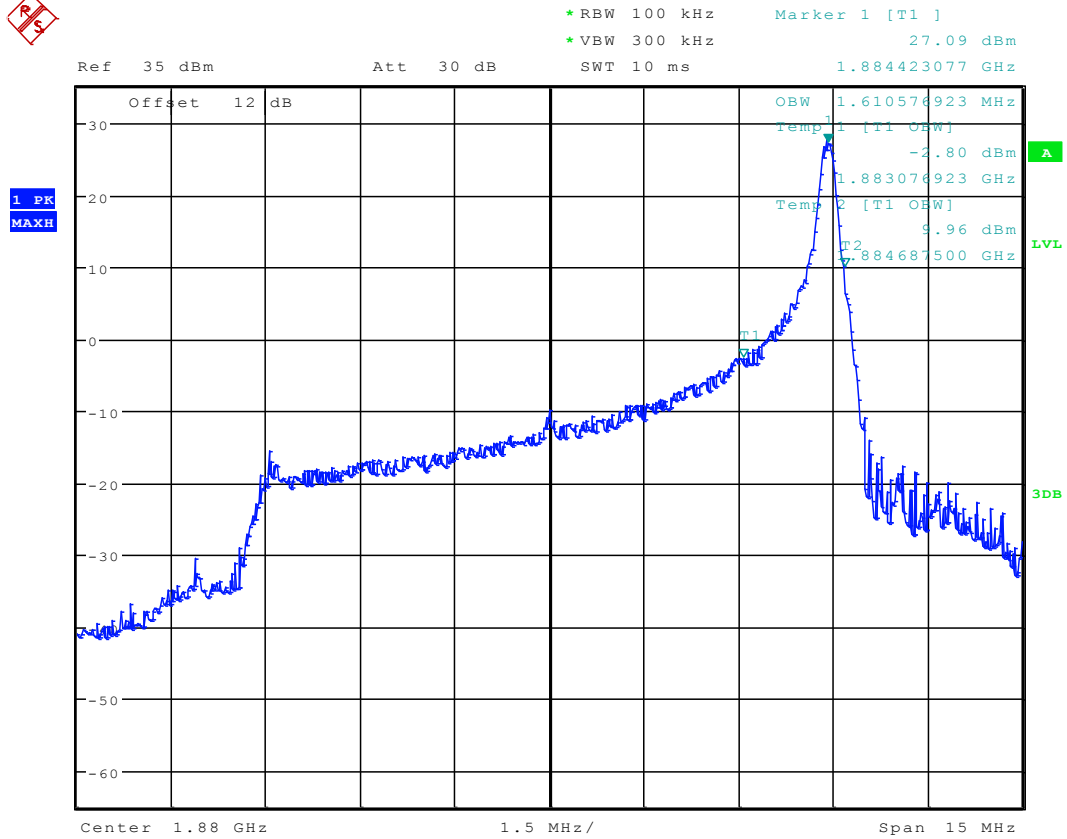
16QAM /1 RB/RB #0



Date: 25.NOV.2011 15:11:51



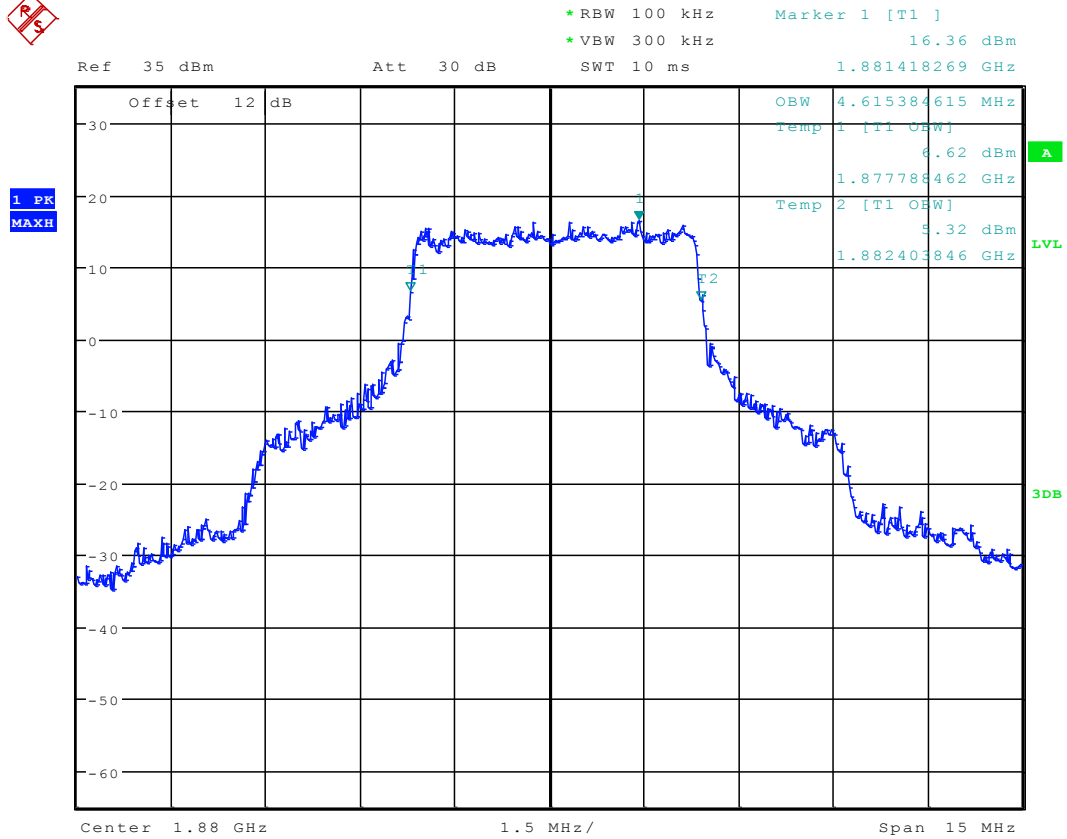
16QAM /1 RB/RB #max



Date: 25.NOV.2011 15:12:50



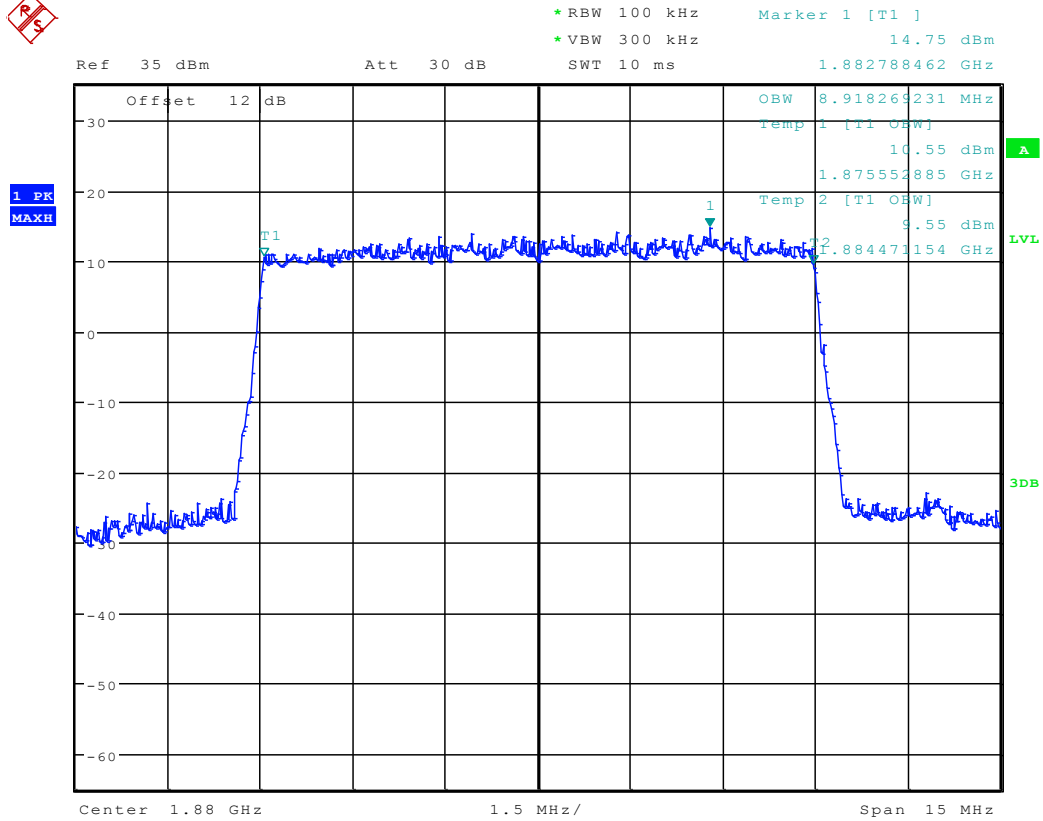
16QAM /25 RB/RB #13



Date: 25.NOV.2011 15:13:10



16QAM/full RBs



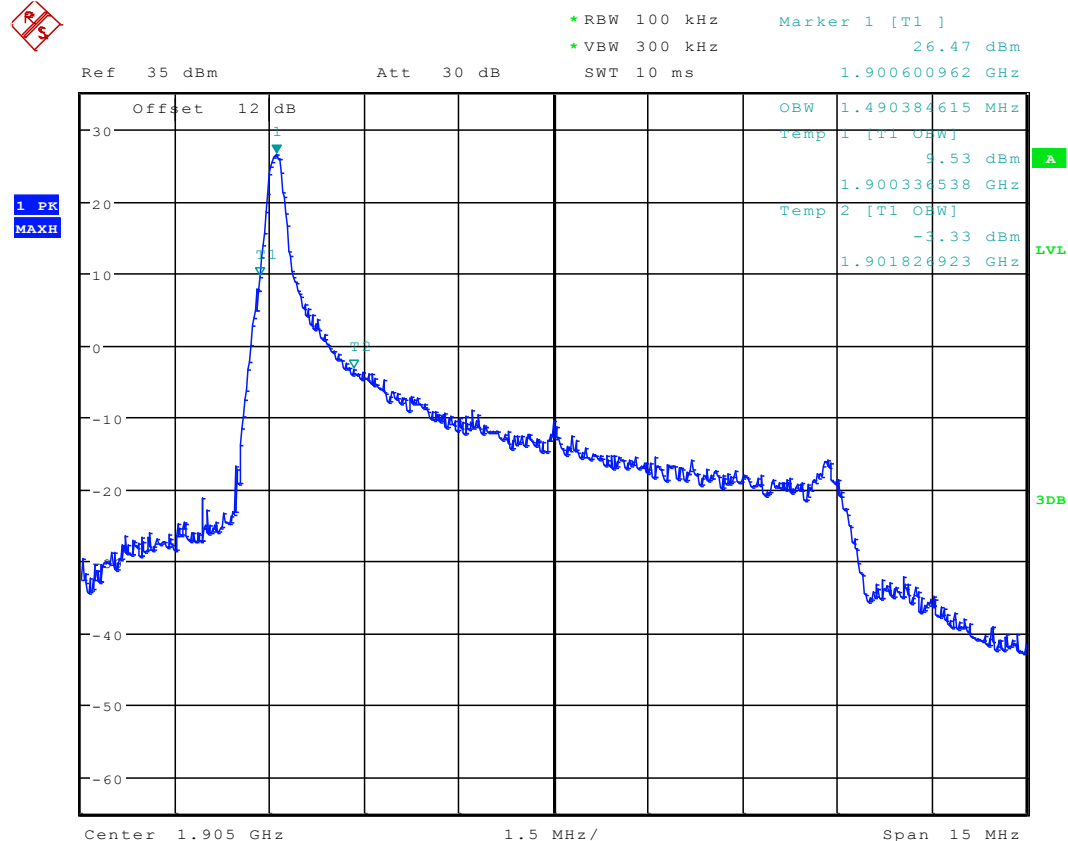
Date: 24.NOV.2011 16:31:08



Channel 19150

TM4

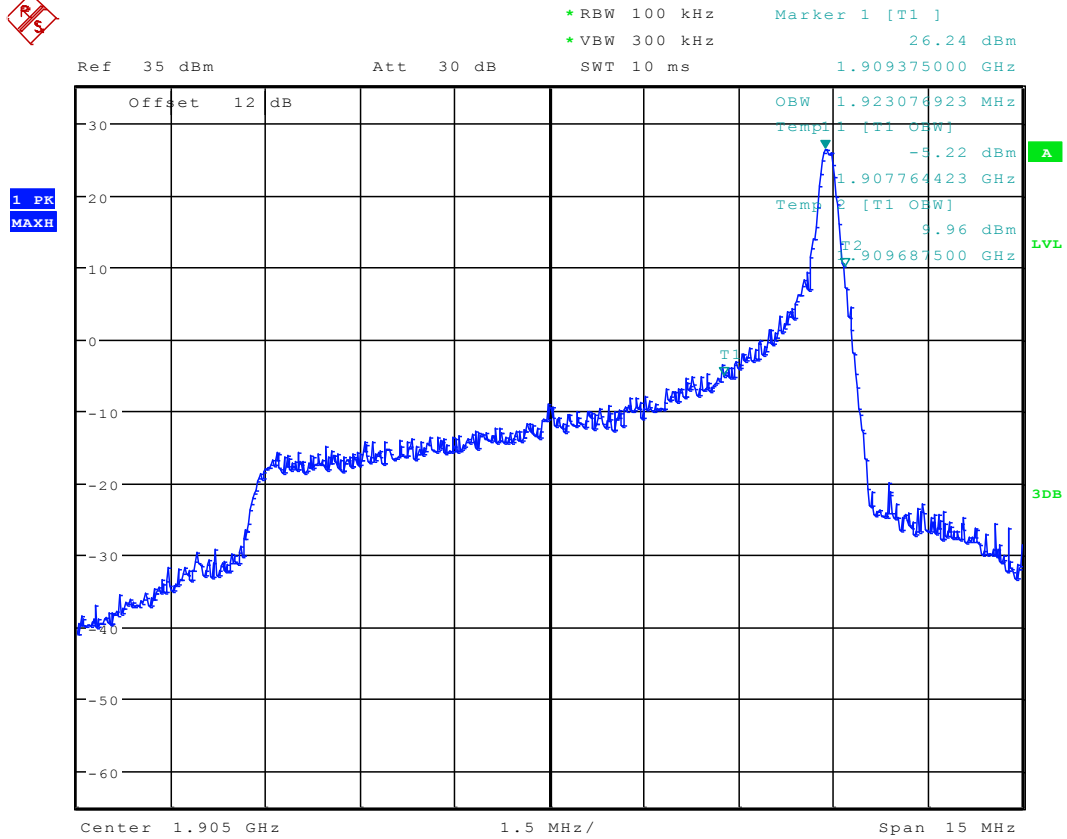
QPSK/1 RB/RB #0



Date: 25.NOV.2011 15:31:56



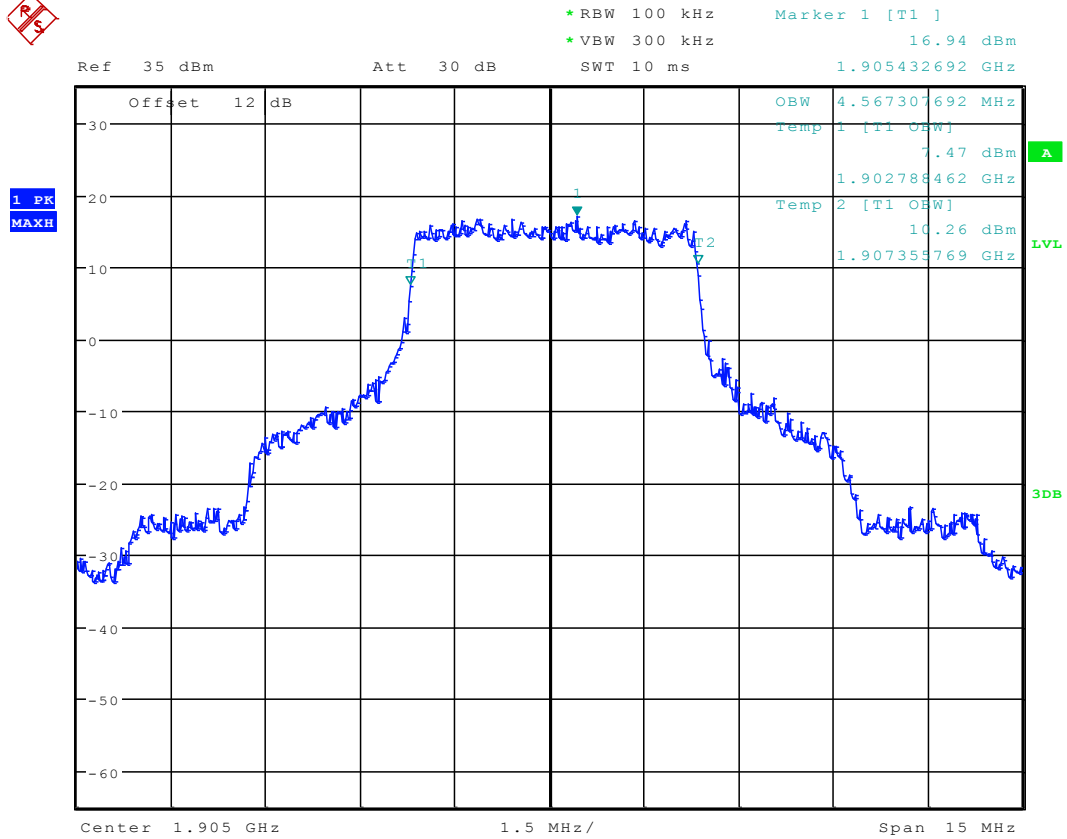
QPSK/1 RB/RB #max



Date: 25.NOV.2011 15:32:14



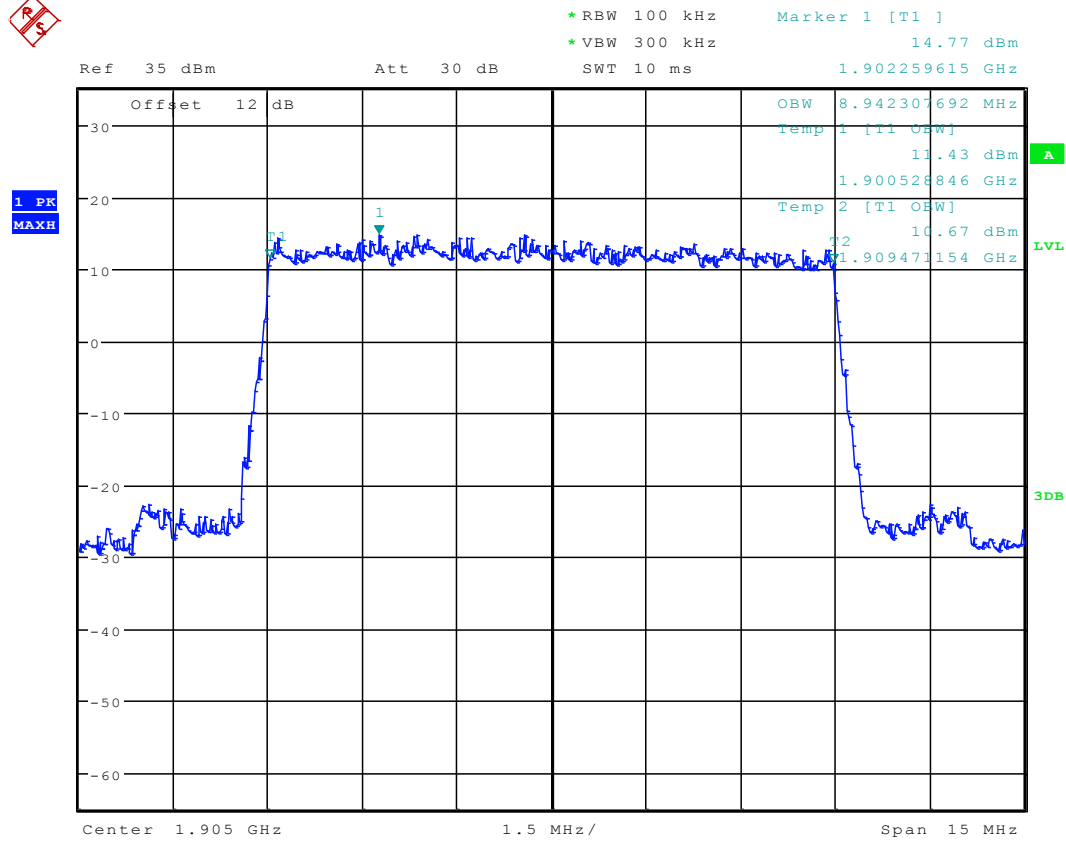
QPSK/25 RB/RB #13



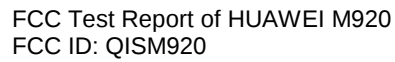
Date: 25.NOV.2011 15:33:21



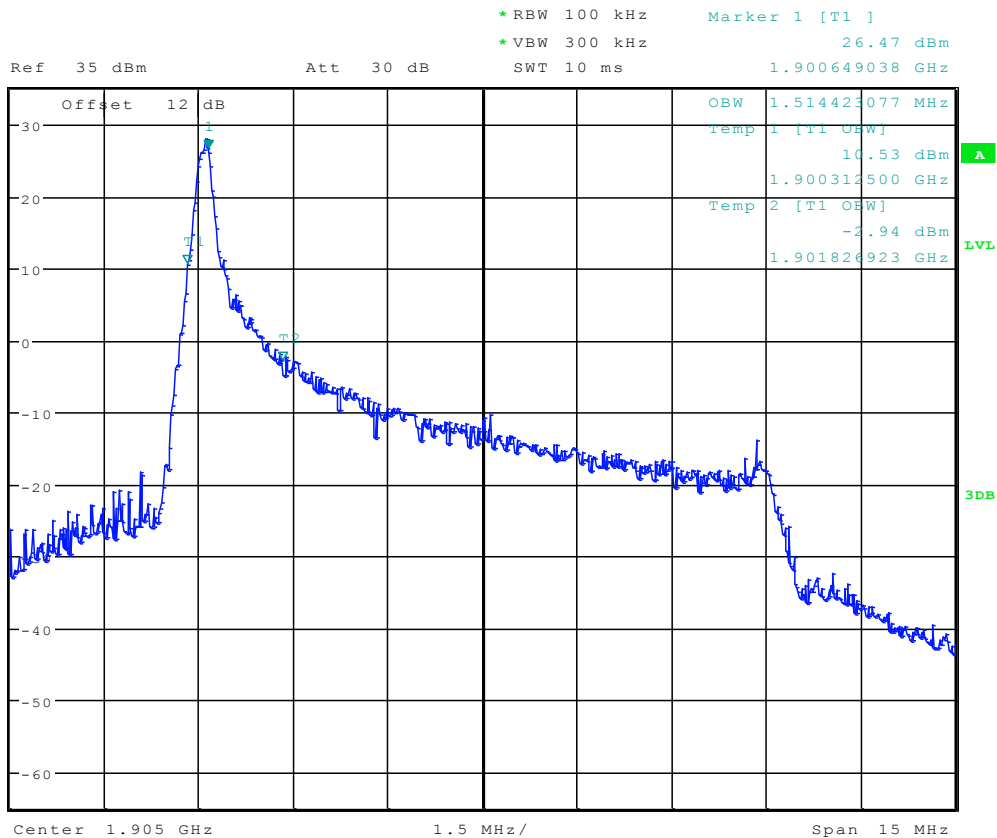
QPSK/ full RBs



Date: 25.NOV.2011 15:31:01



TM5
16QAM /1 RB/RB #0



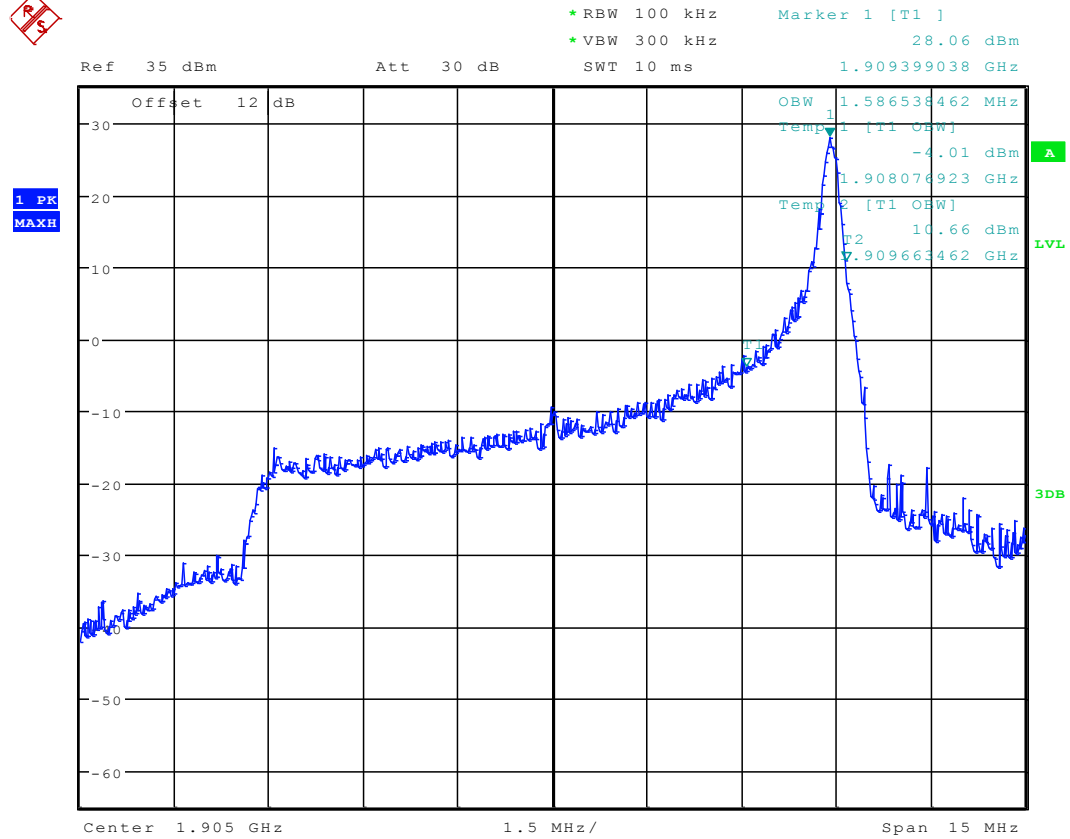
Report No:
SYBH(Z-RF)005112011-2002

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Distribution without Permission

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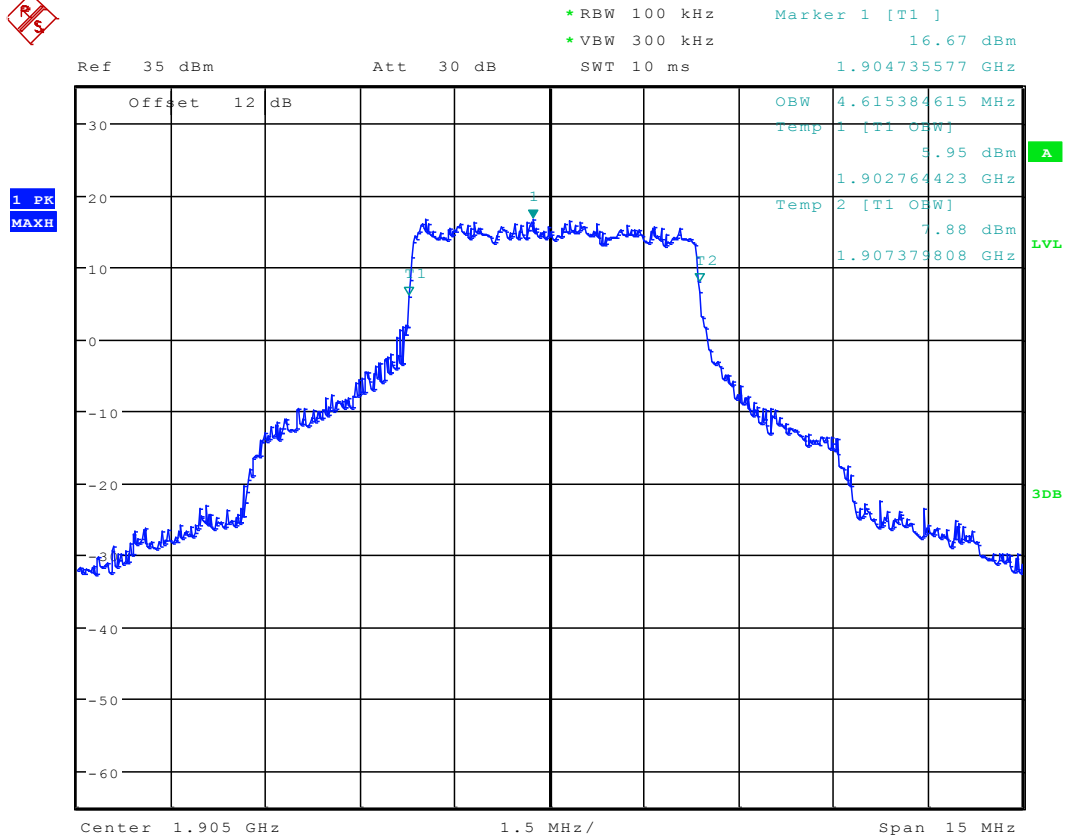
16QAM /1 RB/RB #max



Date: 25.NOV.2011 15:32:30



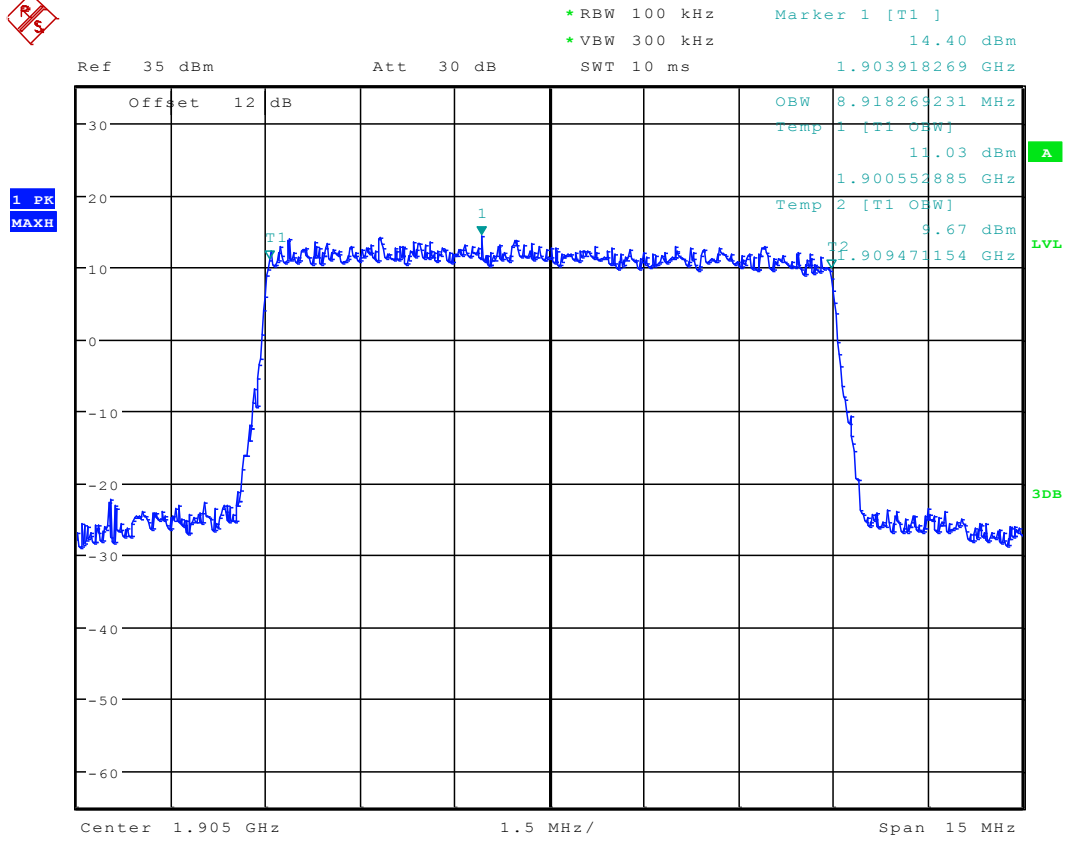
16QAM /25 RB/RB #13



Date: 25.NOV.2011 15:33:03



16QAM/full RBs



Date: 25.NOV.2011 15:31:25



Appendix D

Band Edges Compliance According to FCC Part 2.1051 & 24.238



26dB Occupied Bandwidth

Note: All relevant operation modes have been tested, and the widest case data is included in this table.

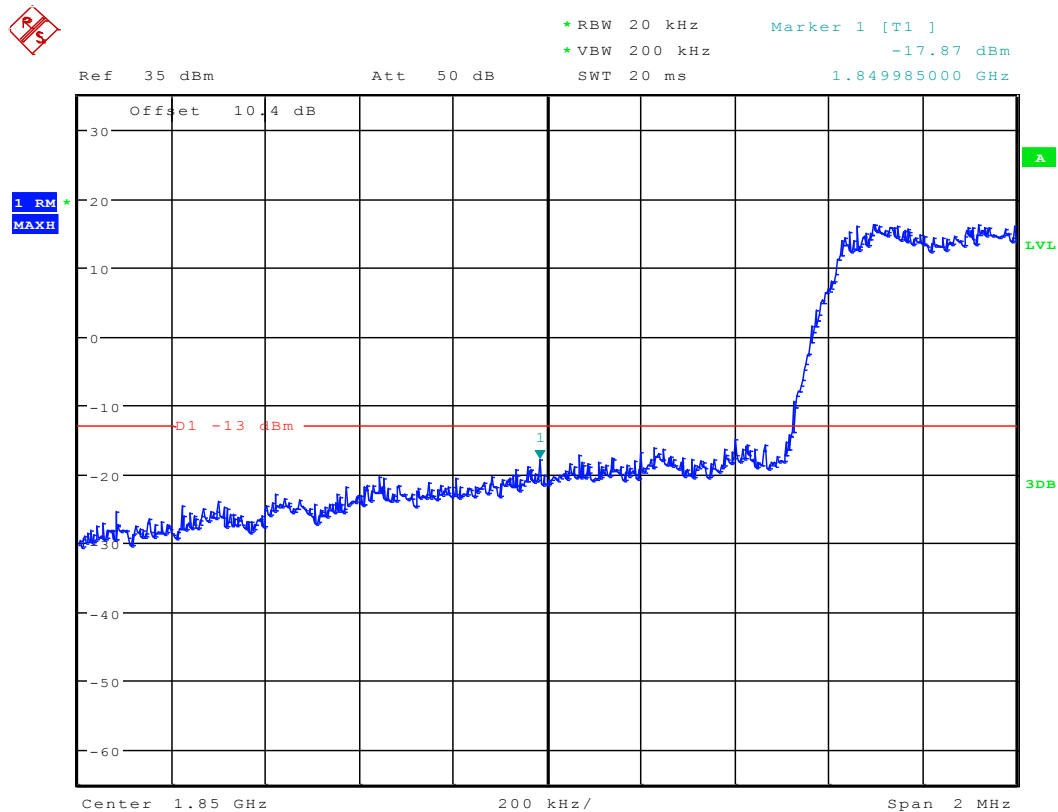
Table 1 Measurement Results

Mode	26dB BW	RBW to Measure Band Edge
CDMA, TM1, TM3	1450 KHz	≥15k, used 20k
EVDO	1421kHz	≥15k, used 20k
LTE QPSK 1RB (1.4MHz channel)	389 kHz	≥14k, used 20k
LTE QPSK 3RB (1.4MHz channel)	1035 kHz	≥14k, used 20k
LTE QPSK 6RB (1.4MHz channel)	1227 kHz	≥14k, used 20k
LTE QPSK 1RB (3.0MHz channel)	520 kHz	≥30k, used 30k
LTE QPSK 8RB (3.0MHz channel)	2172 kHz	≥30k, used 30k
LTE QPSK 15RB (3.0MHz channel)	2883 kHz	≥30k, used 30k
LTE QPSK 1RB (5.0MHz channel)	719 kHz	≥50k, used 50k
LTE QPSK 12RB (5.0MHz channel)	3430 kHz	≥50k, used 50k
LTE QPSK 25RB (5.0MHz channel)	4781 kHz	≥50k, used 50k
LTE QPSK 1RB (10MHz channel)	1229 kHz	≥100k, used 100k
LTE QPSK 25RB (10MHz channel)	6040 kHz	≥100k, used 100k
LTE QPSK 50RB (10MHz channel)	9566 kHz	≥100k, used 100k



Test Plot of Band Edges Compliance

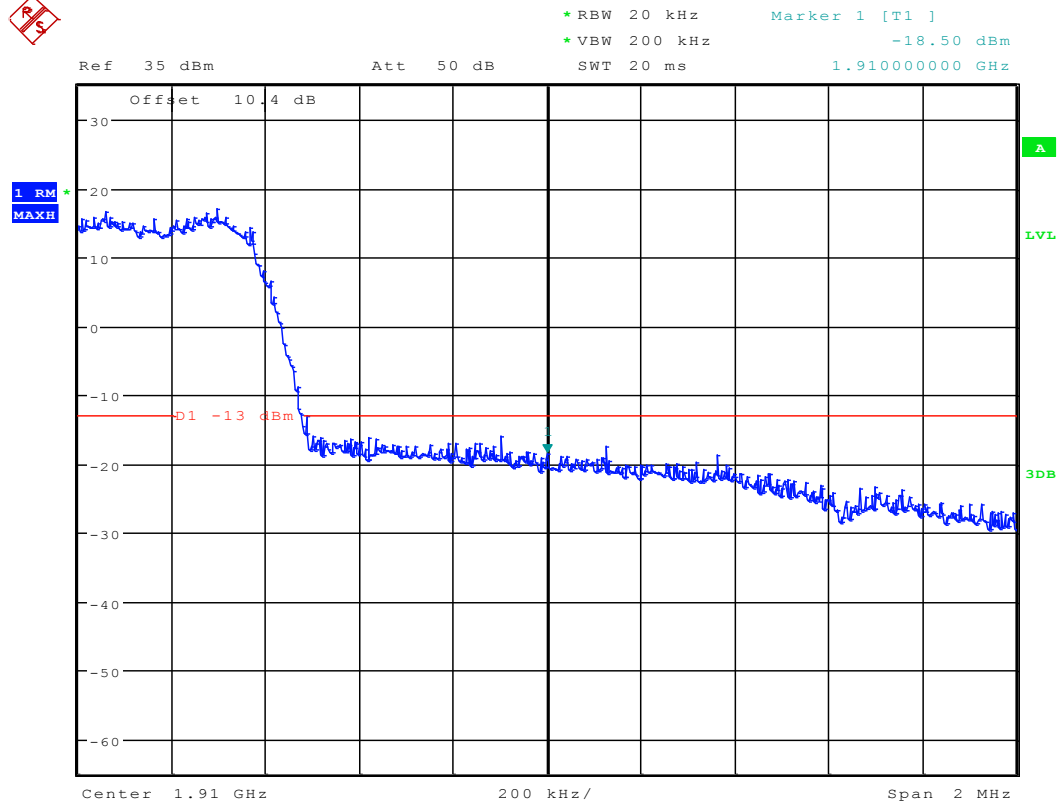
TM1
Left Edge (1850 MHz)
Channel 25



Date: 8.NOV.2011 23:12:42



Right Edge (1910MHz) Channel 1175

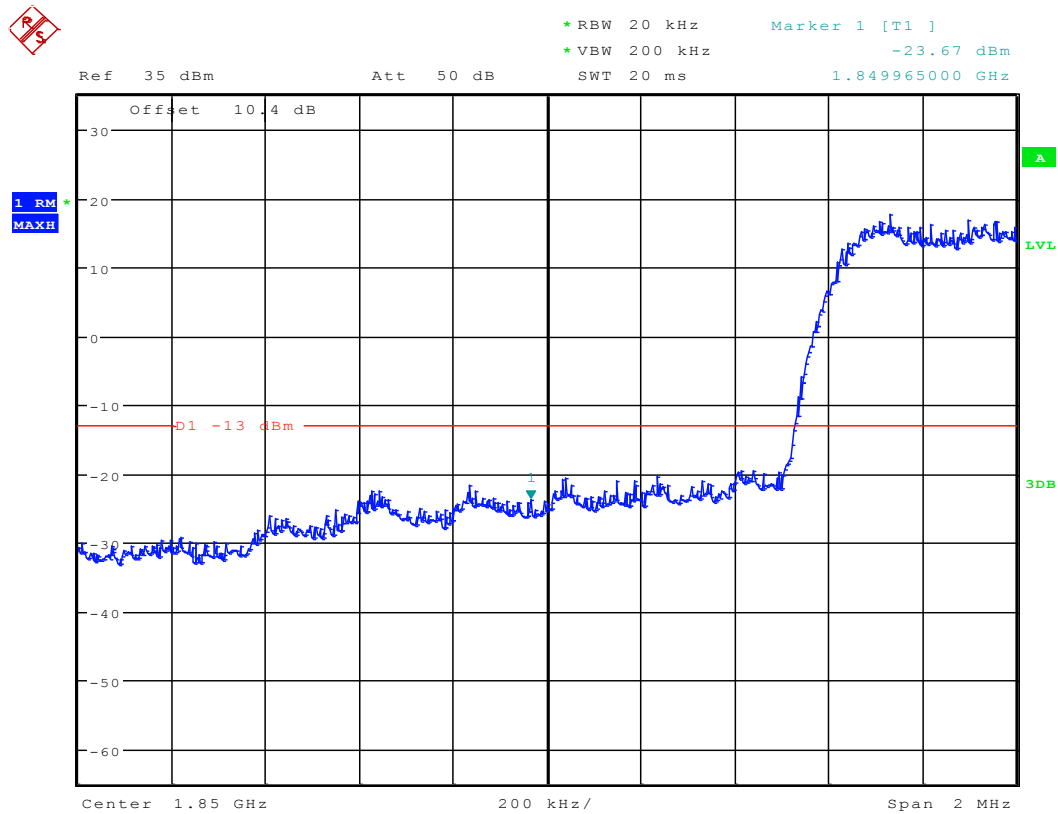


Date: 8.NOV.2011 23:12:56



TM3

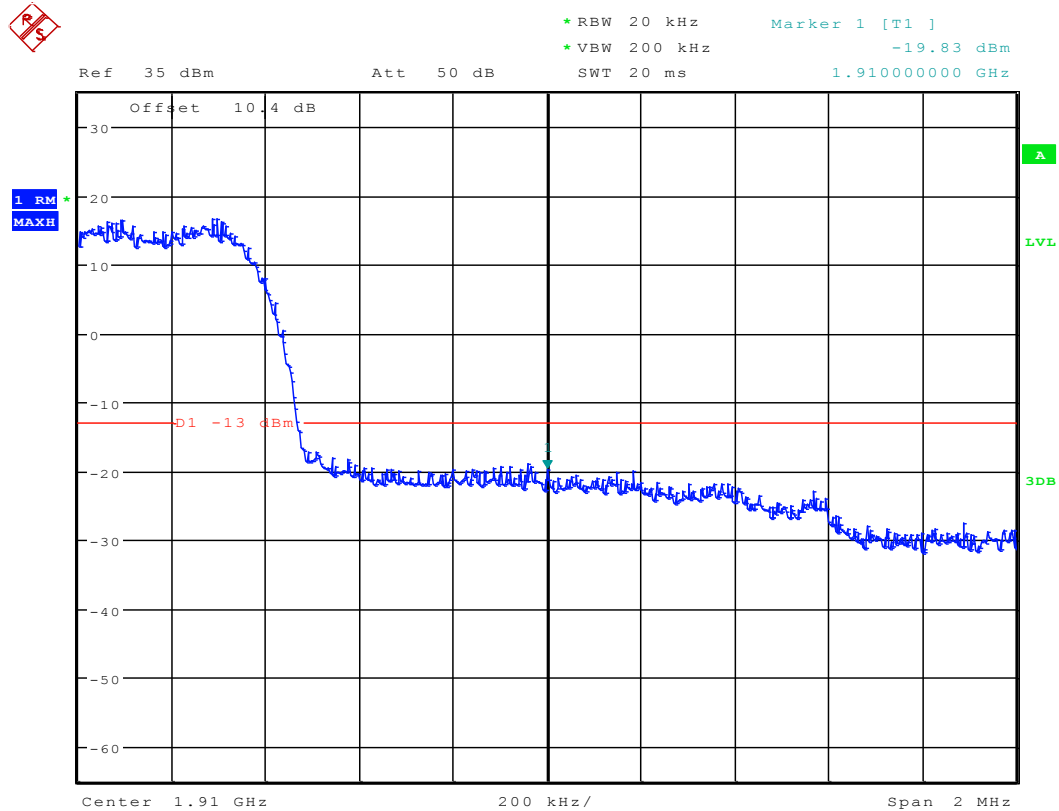
Left Edge (1850 MHz) Channel 25



Date: 8.NOV.2011 23:13:12



Right Edge (1910MHz) Channel 1175

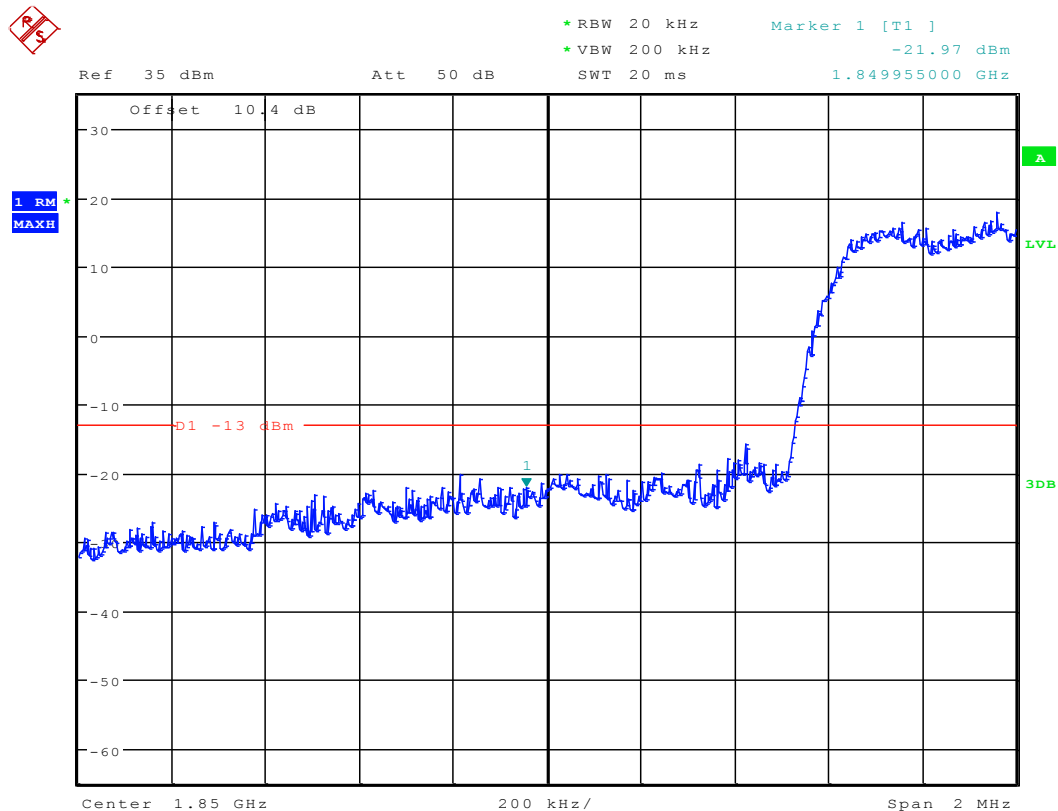


Date: 8.NOV.2011 23:13:26



EVDO subtype 0

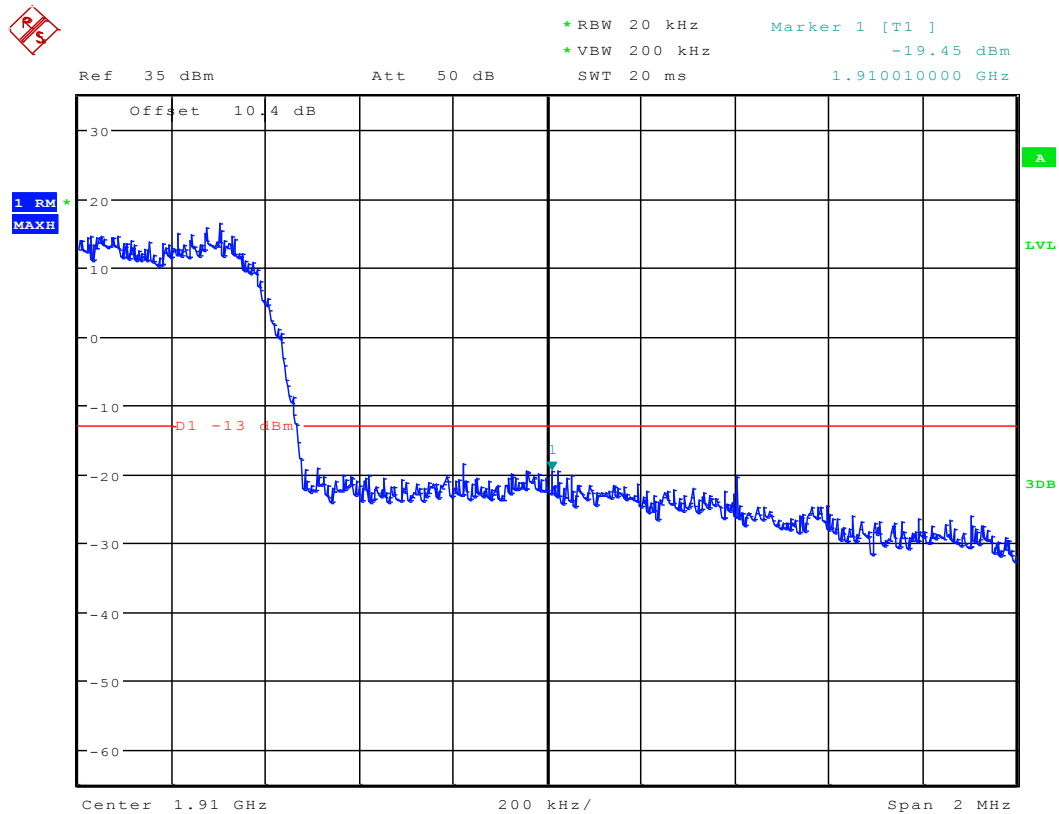
Left Edge (1850 MHz) Channel 25



Date: 8.NOV.2011 23:39:37



Right Edge (1910MHz) Channel 1175



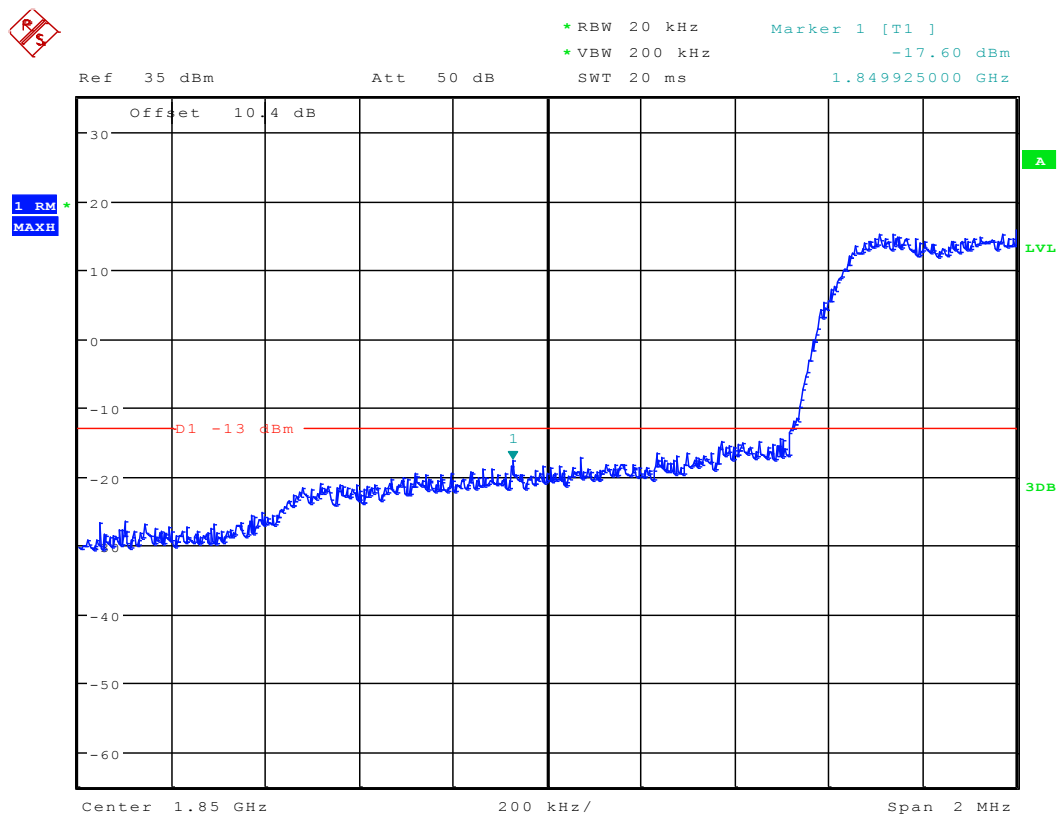
Date: 8.NOV.2011 23:36:22



EVDO subtype 2

Modulation: BPSK

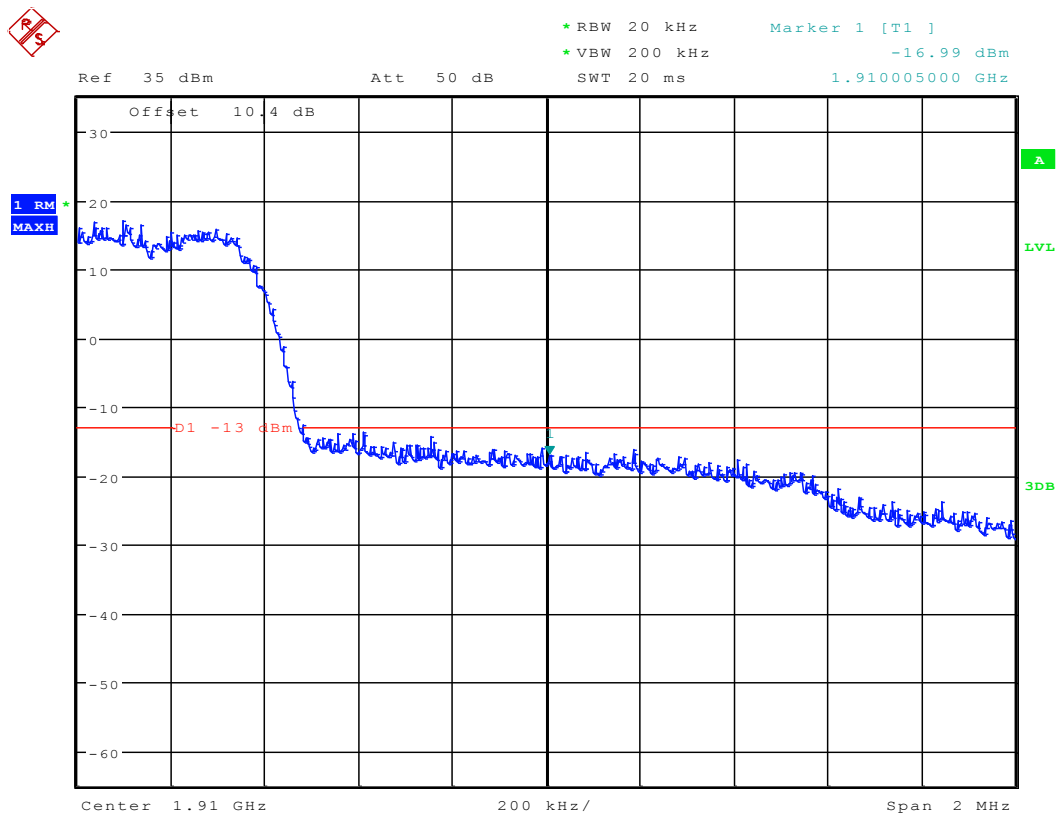
Left Edge (1850 MHz)
Channel 25



Date: 10.NOV.2011 10:05:45



Right Edge (1910MHz) Channel 1175

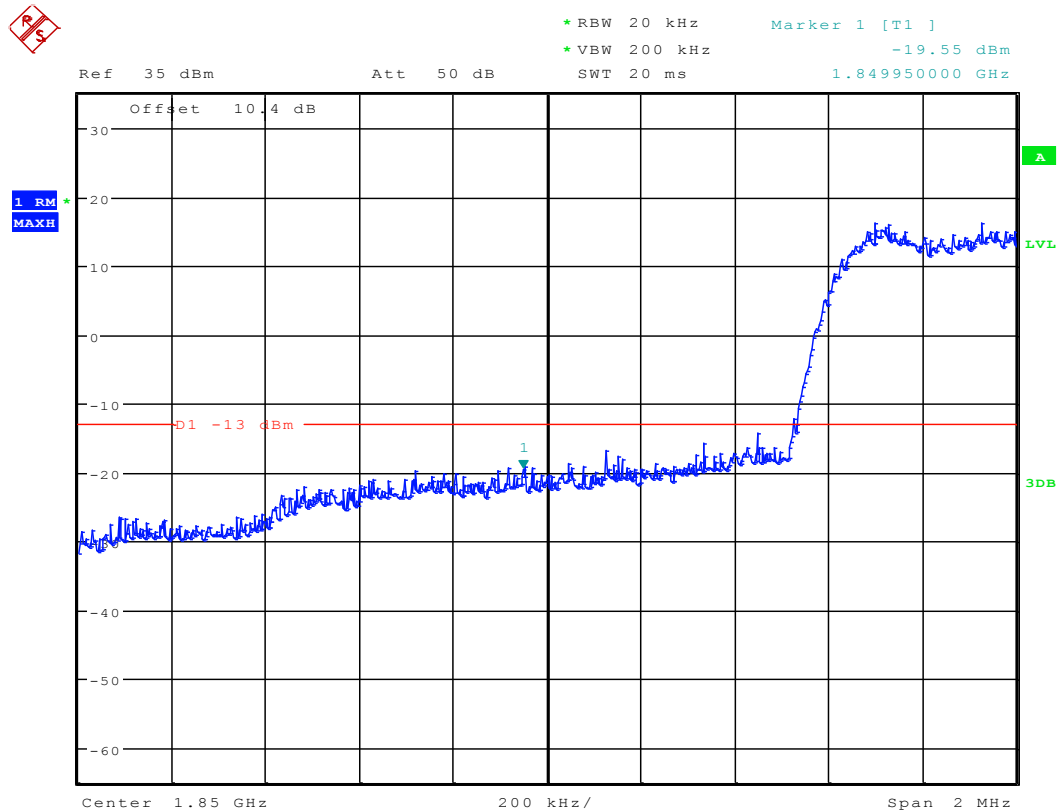


Date: 10.NOV.2011 10:05:59



Modulation: QPSK

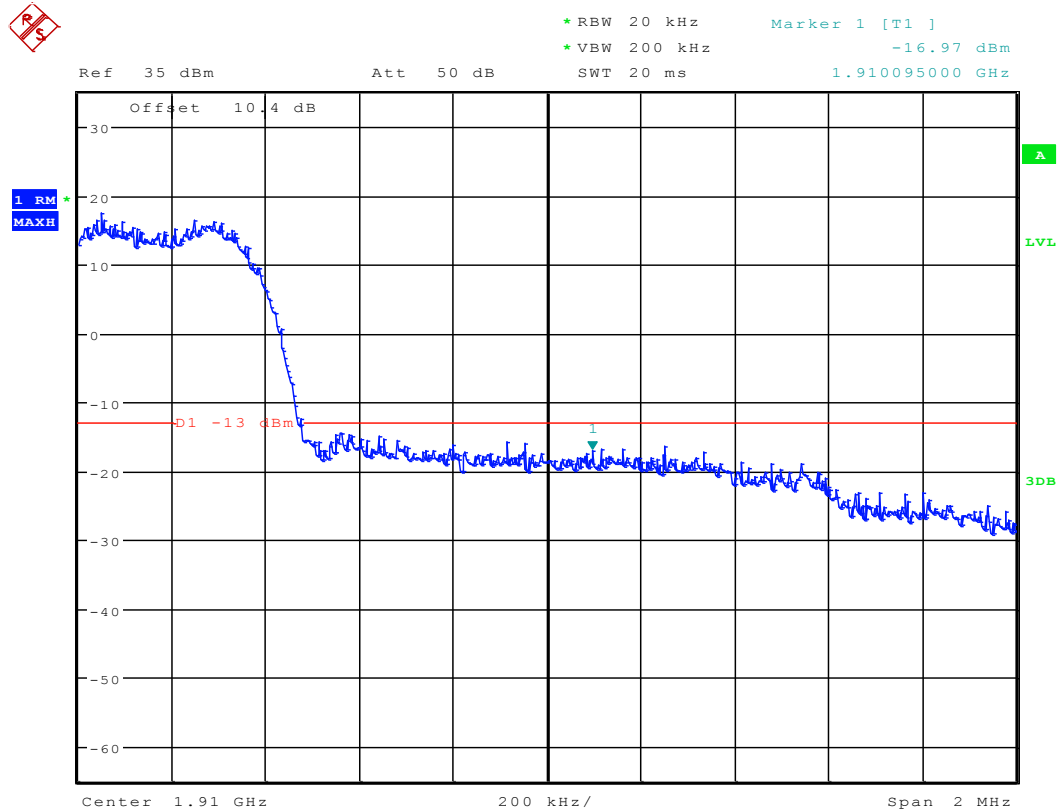
Left Edge (1850 MHz) Channel 25



Date: 10.NOV.2011 10:06:13



Right Edge (1910MHz) Channel 1175

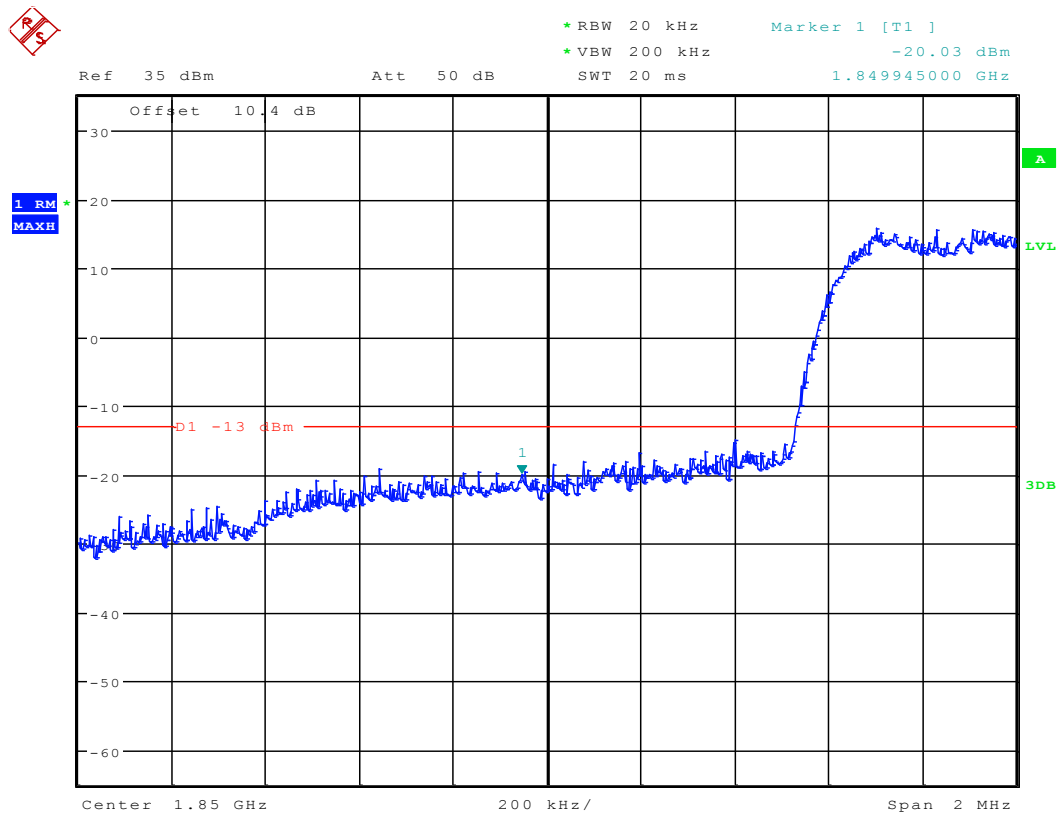


Date: 10.NOV.2011 10:06:26



Modulation: 8PSK

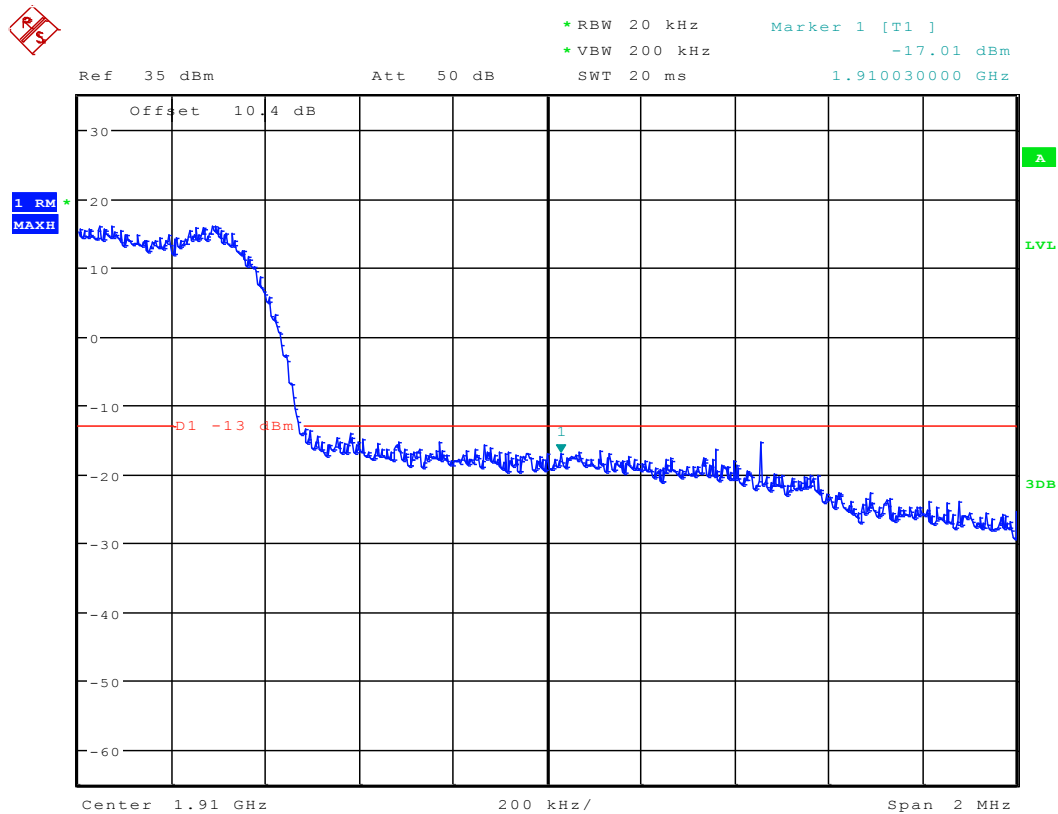
Left Edge (1850 MHz) Channel 25



Date: 10.NOV.2011 10:06:40



Right Edge (1910MHz) Channel 1175



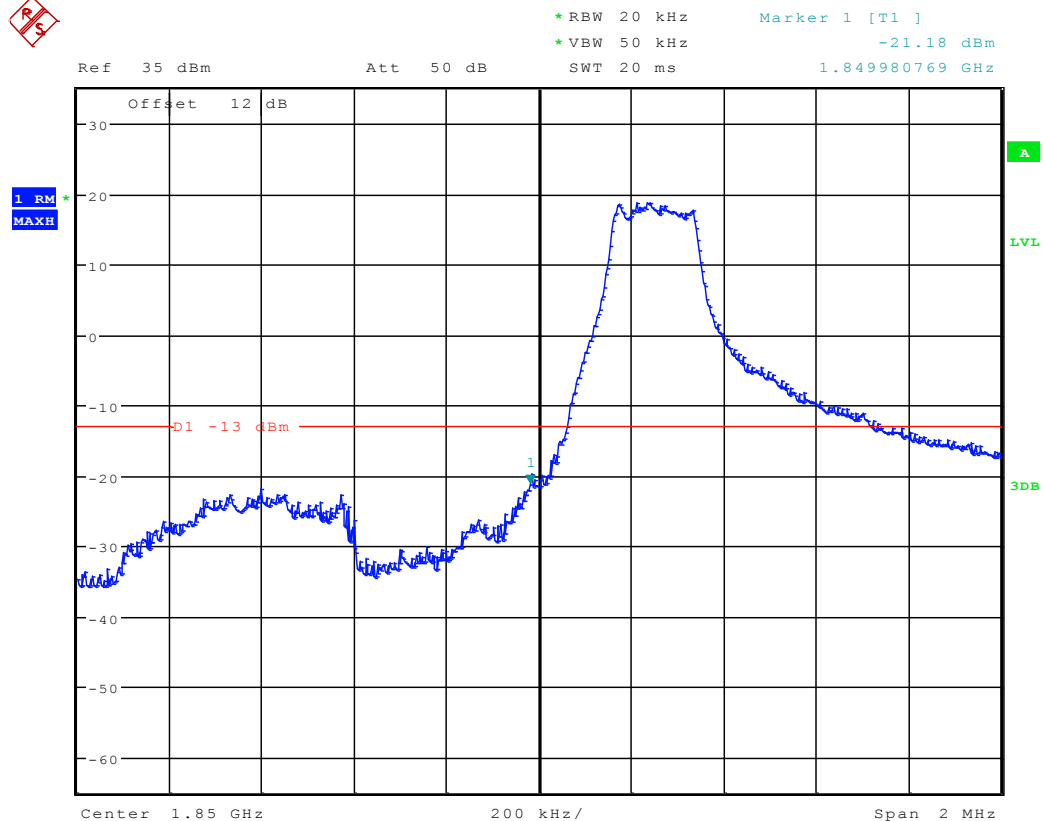
Date: 10.NOV.2011 10:06:54



TM4

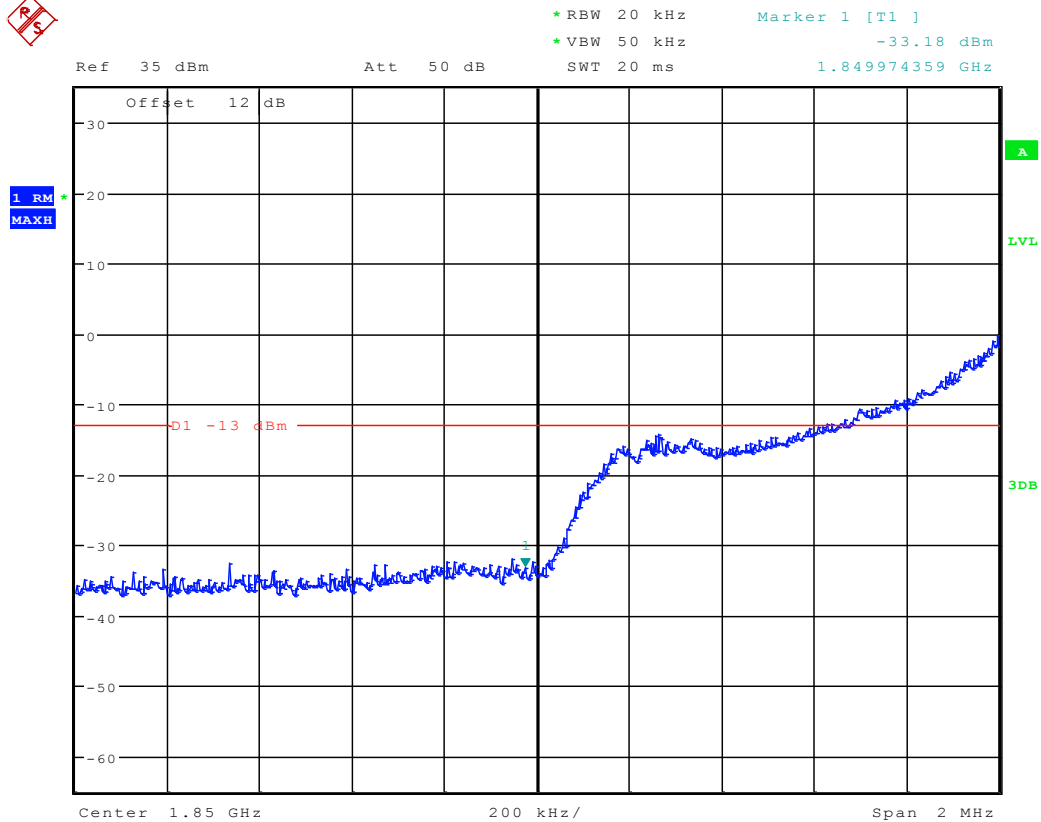
Left Edge 1.4MHz(BW) Channel 18607

QPSK/1 RB/RB #0



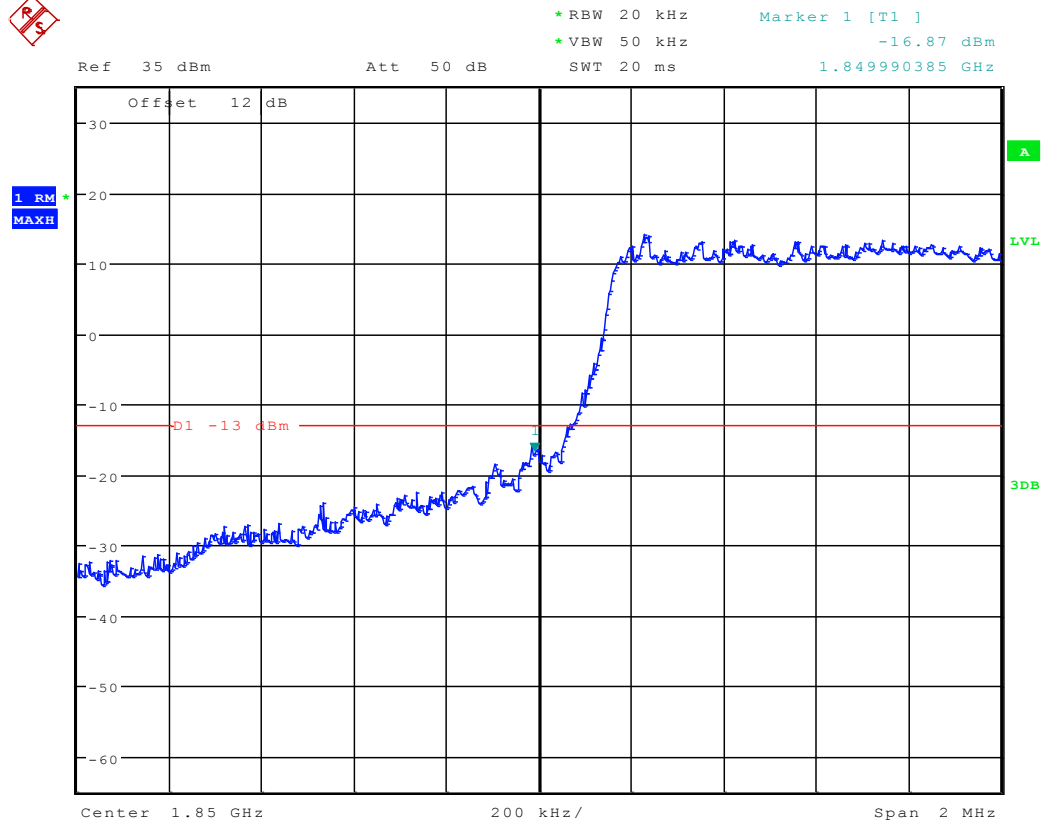


QPSK/1 RB/RB #max



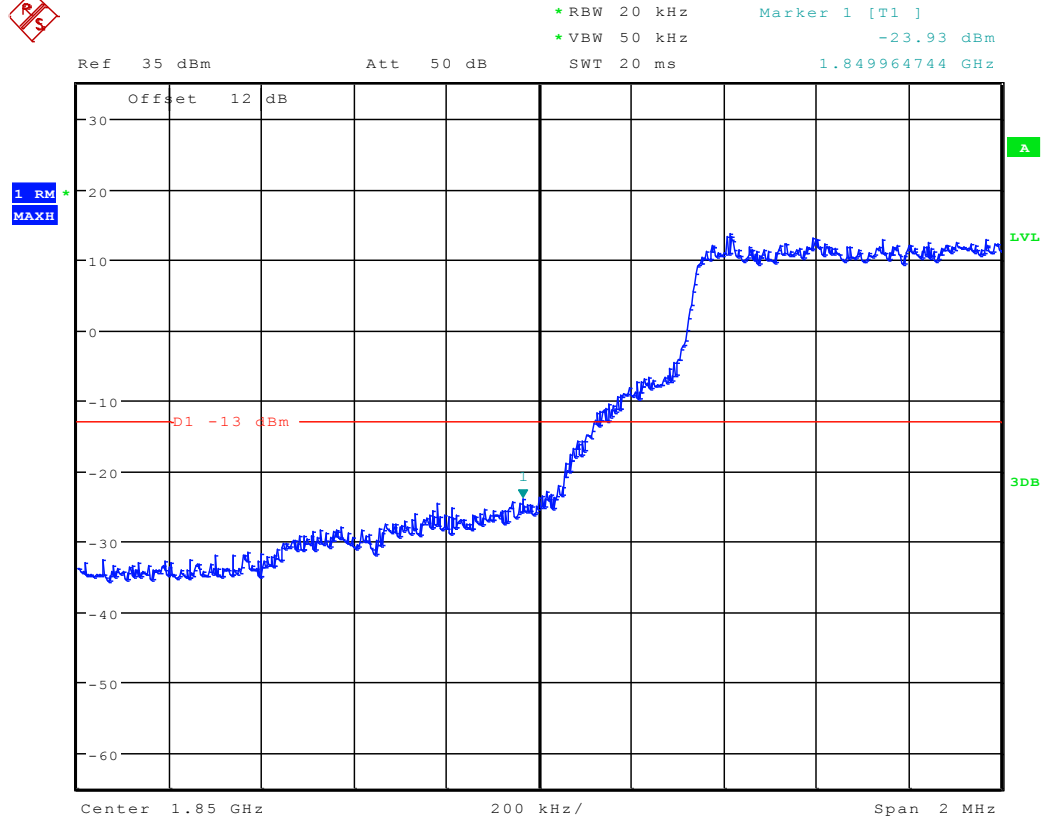


QPSK/partial RBs/RB #0



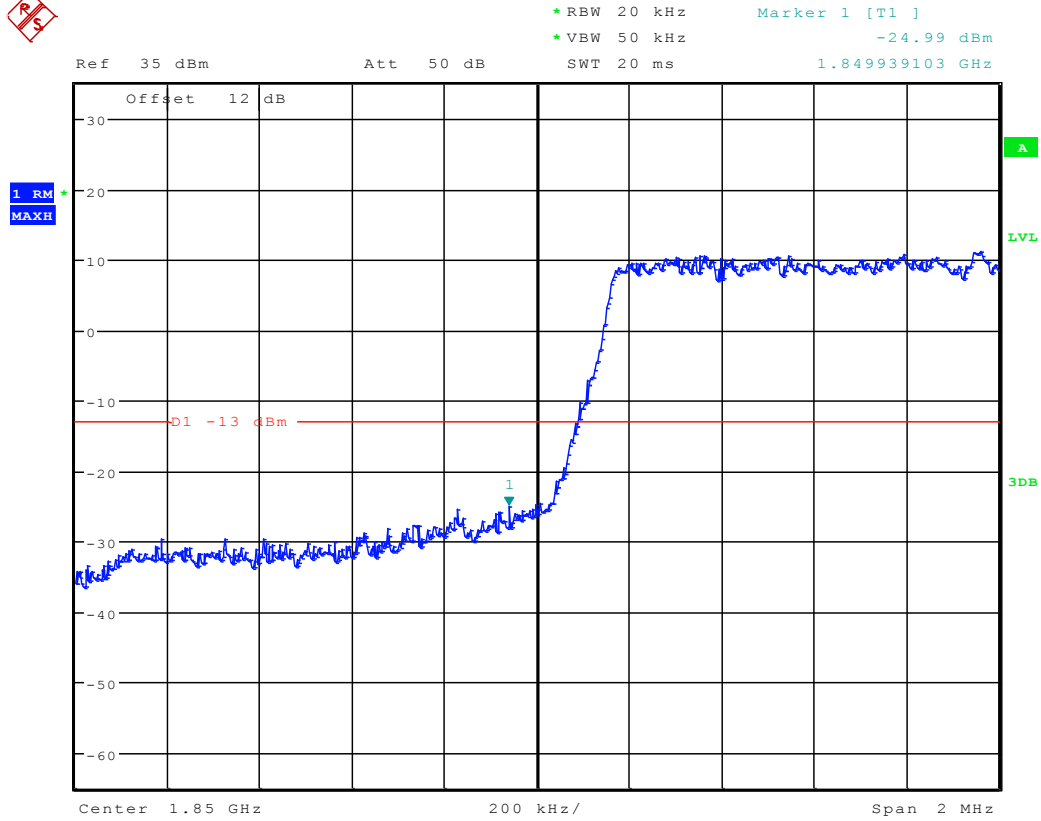


QPSK/partial RBs/RB #max





QPSK/ full RBs

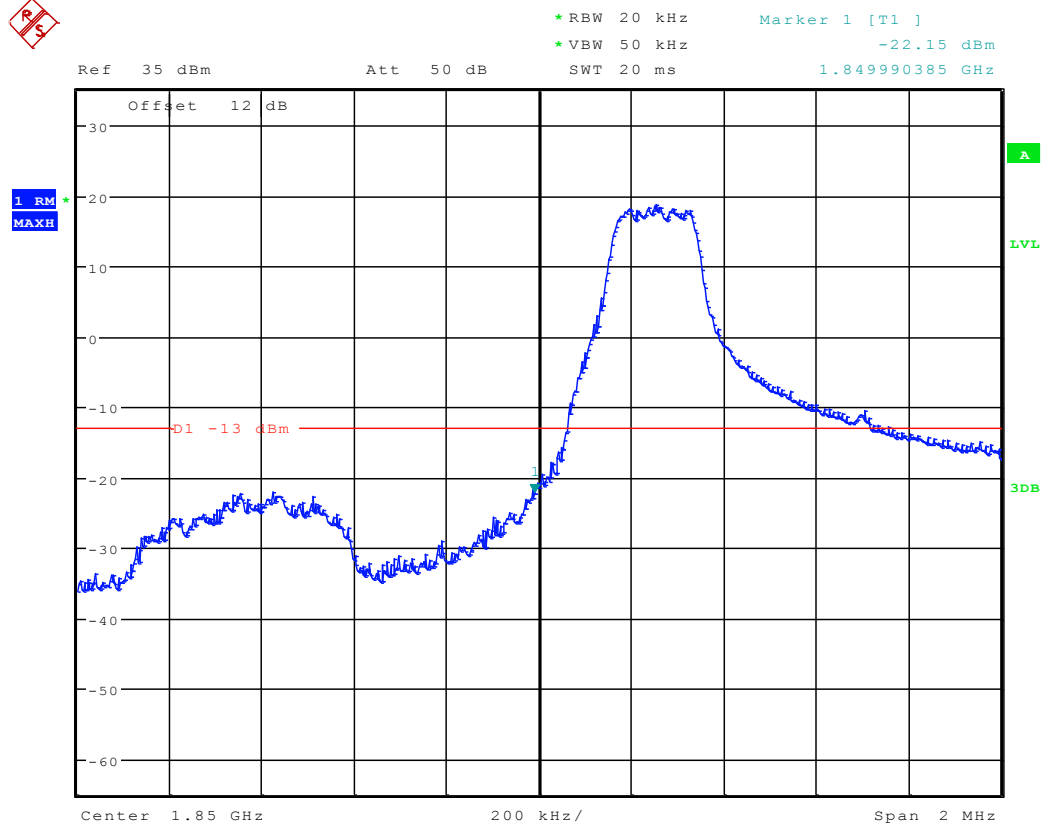




TM5

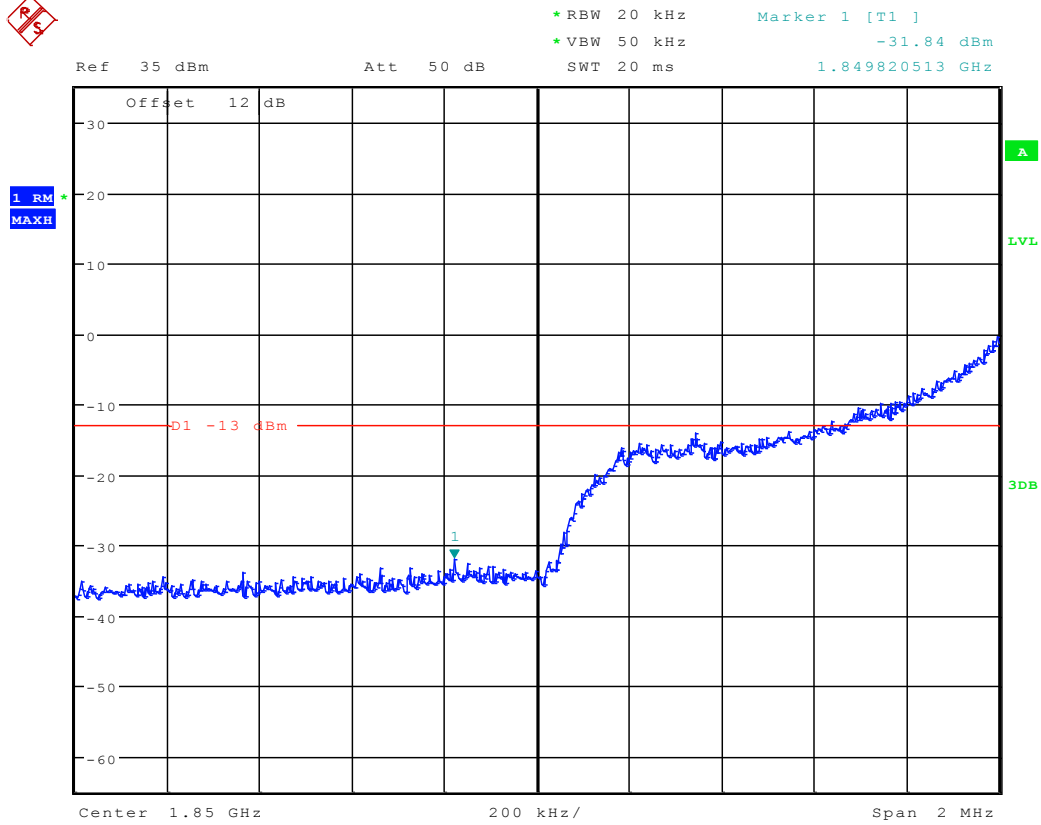
Left Edge
1.4MHz(BW)
Channel 18607

16QAM /1 RB/RB #0



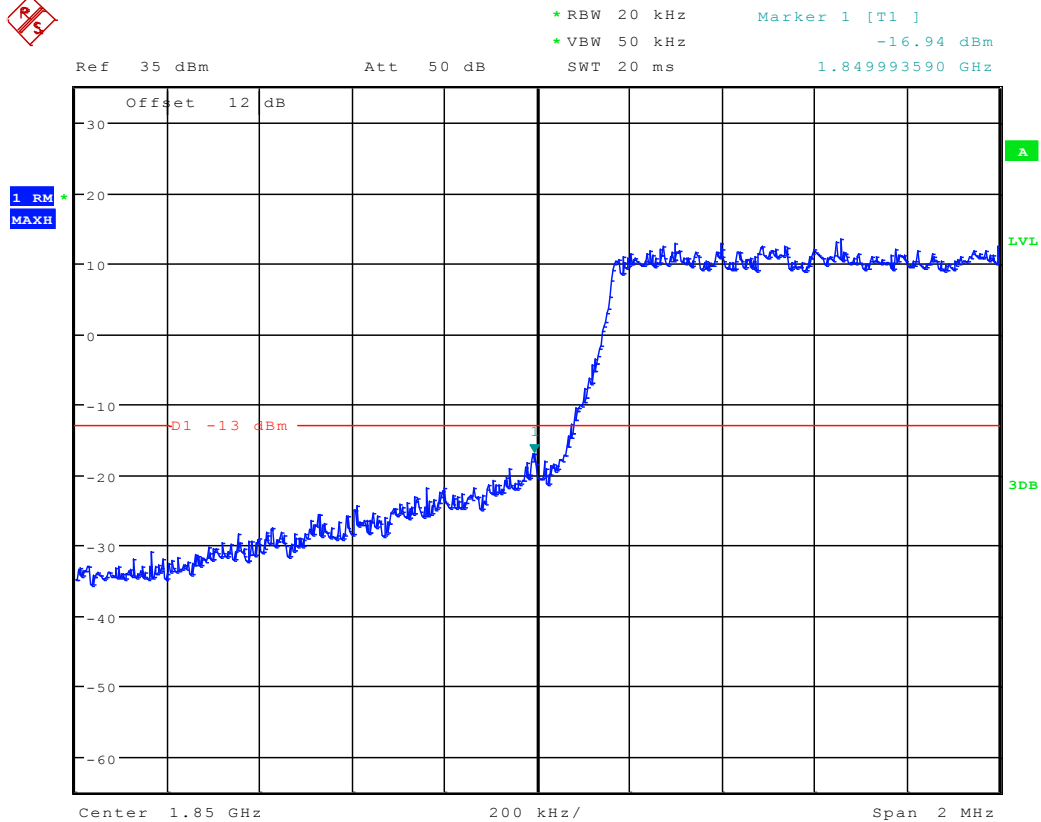


16QAM /1 RB/RB #max



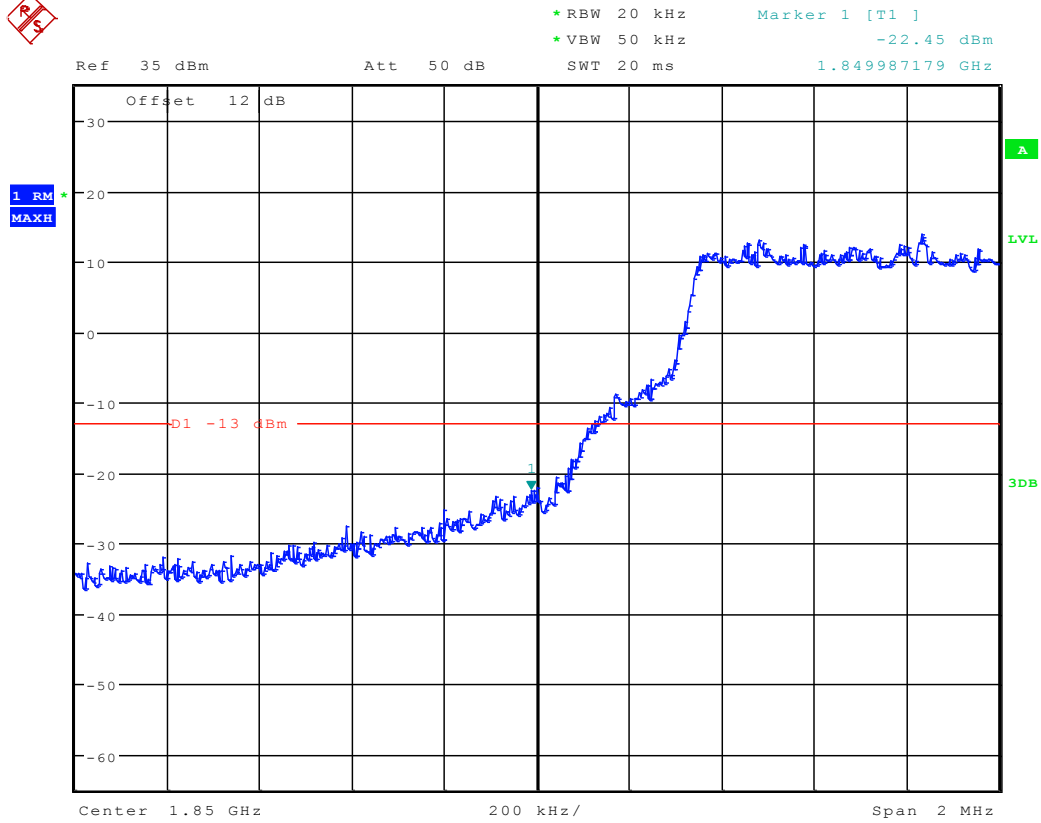


16QAM /partial RBs/RB #0



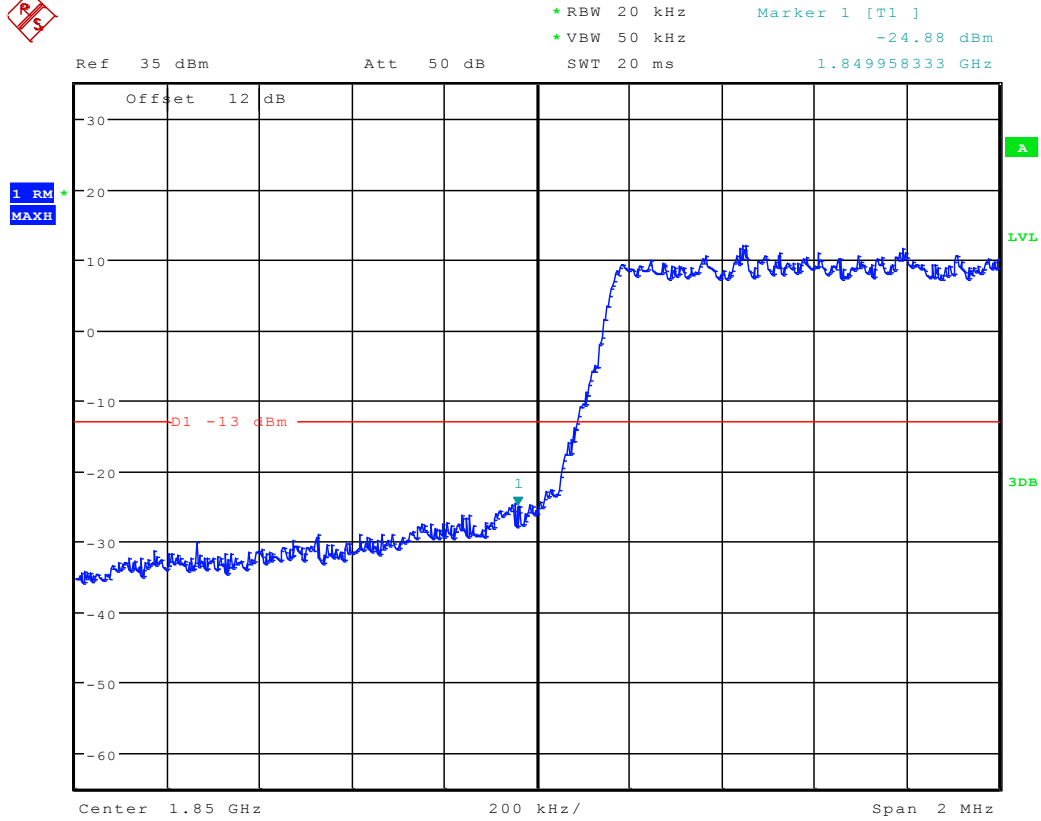


16QAM /partial RBs/RB #max





16QAM/full RBs

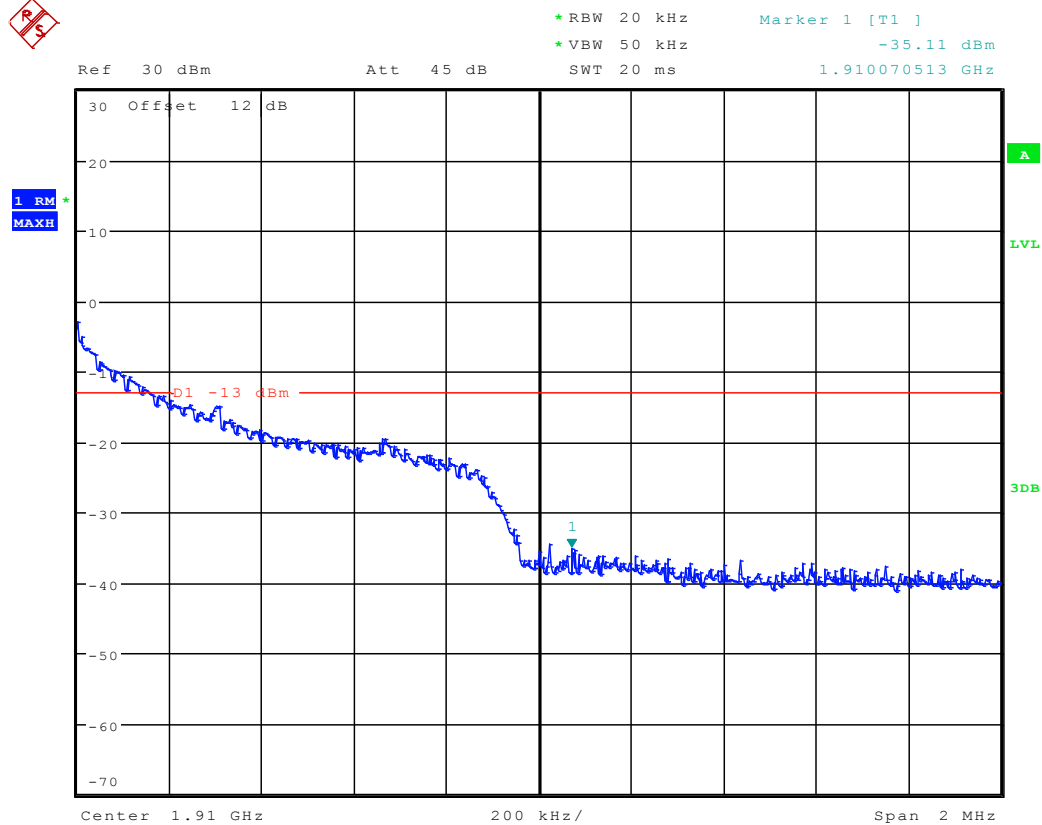




TM4

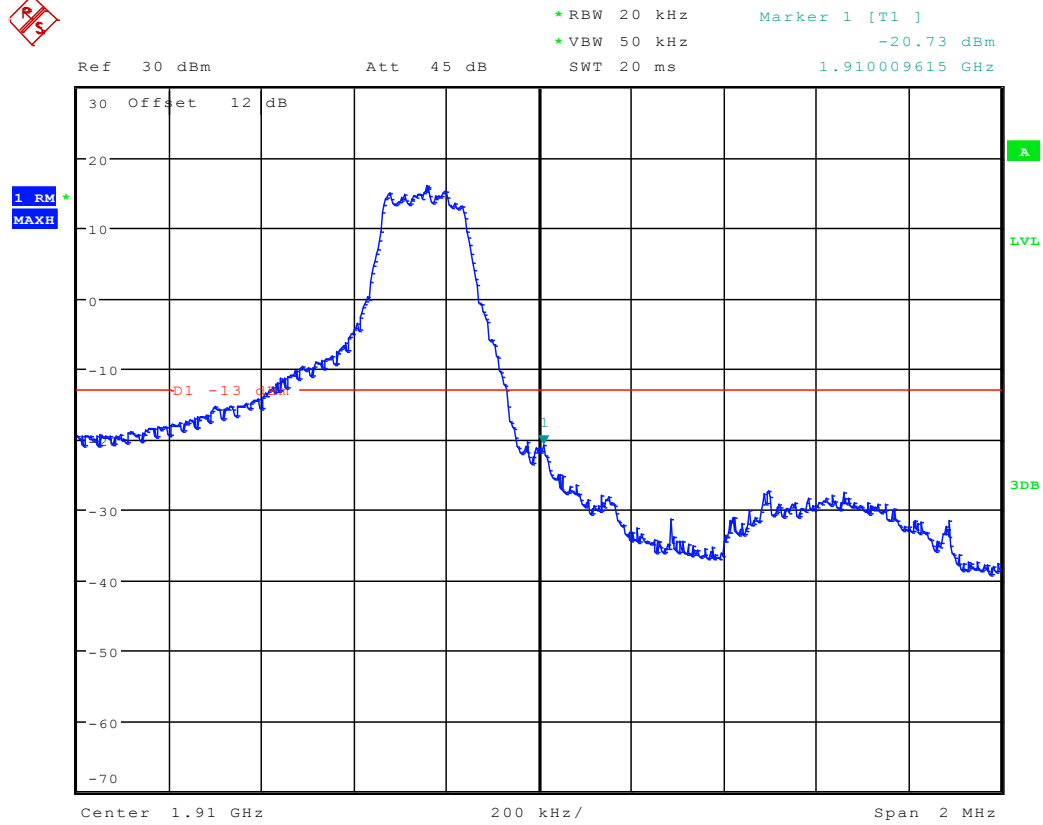
Right Edge
1.4MHz(BW)
Channel 19193

QPSK/1 RB/RB #0

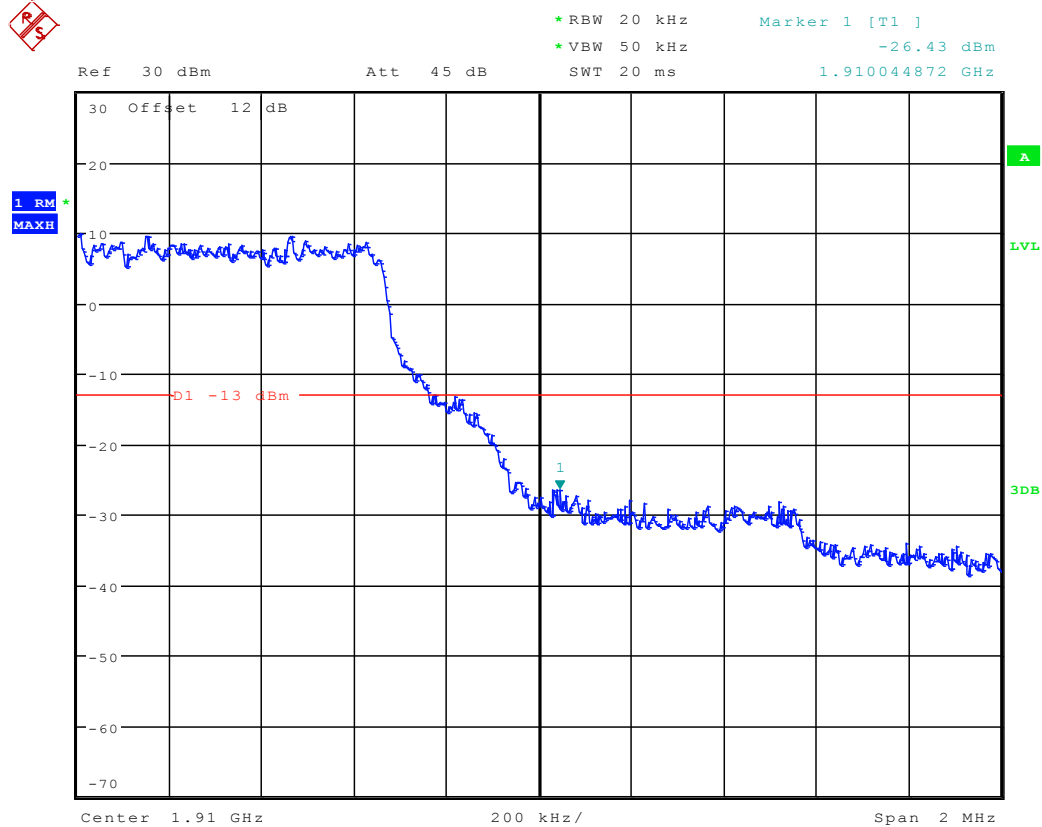




QPSK/1 RB/RB #max

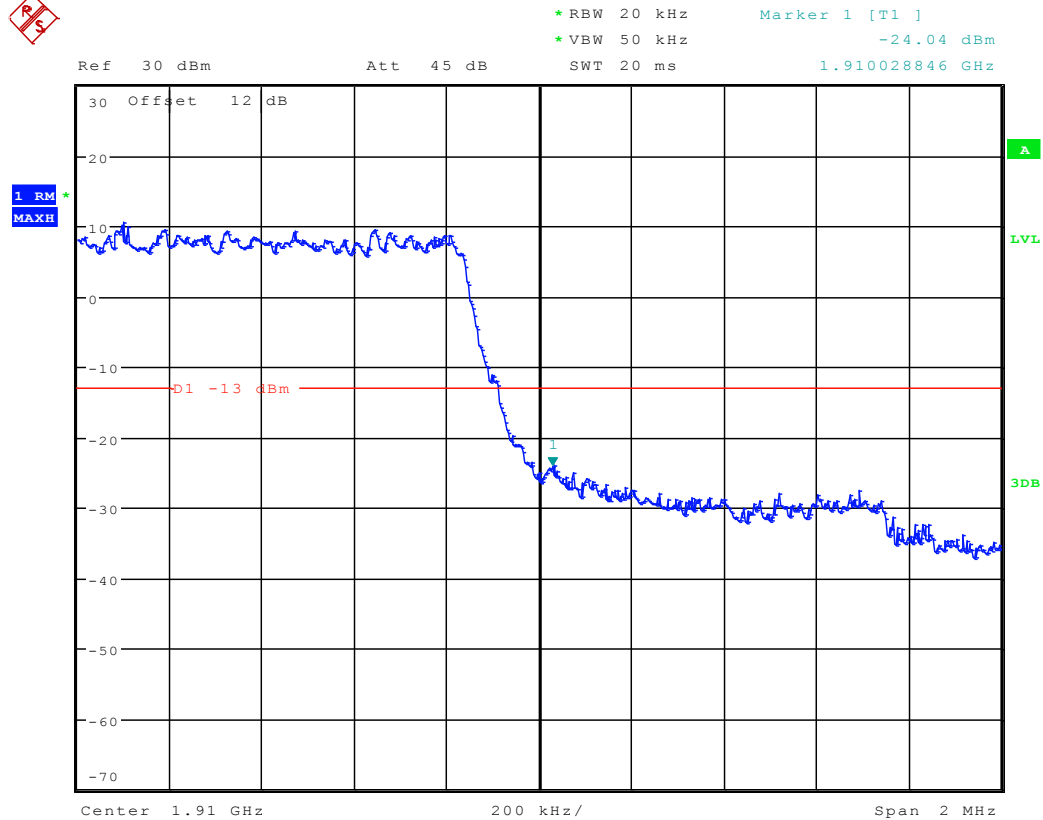


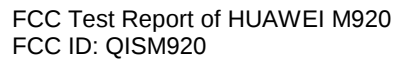
QPSK/partial RBs/RB #0





QPSK/partial RBs/RB #max





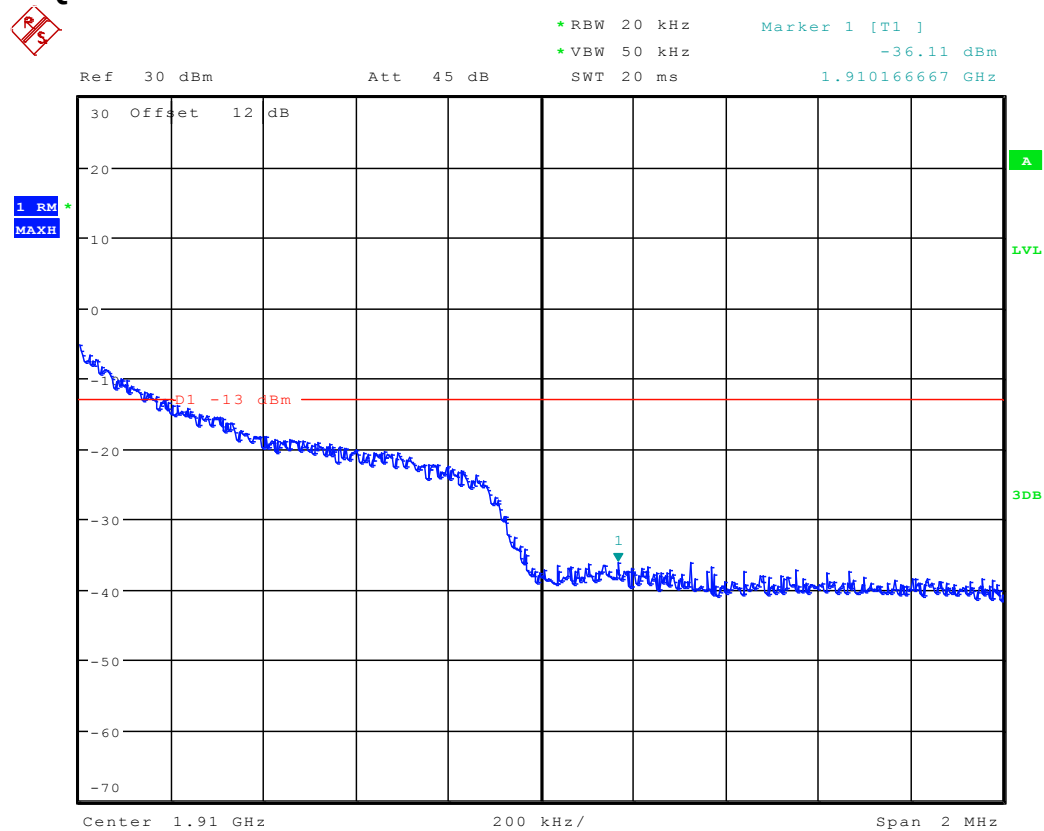
Ref 30 dBm Att 45 dB SWT 20 ms 1.910044872 GHz



TM5

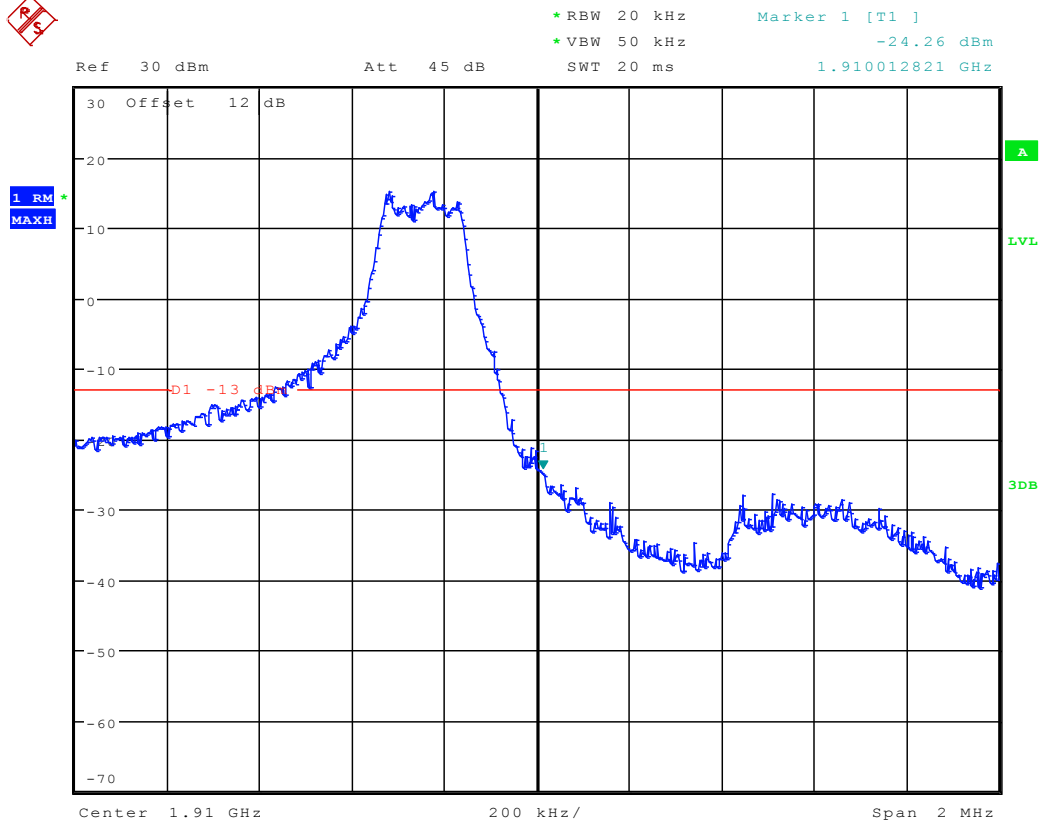
Right Edge
1.4MHz(BW)
Channel 19193

16QAM /1 RB/RB #0

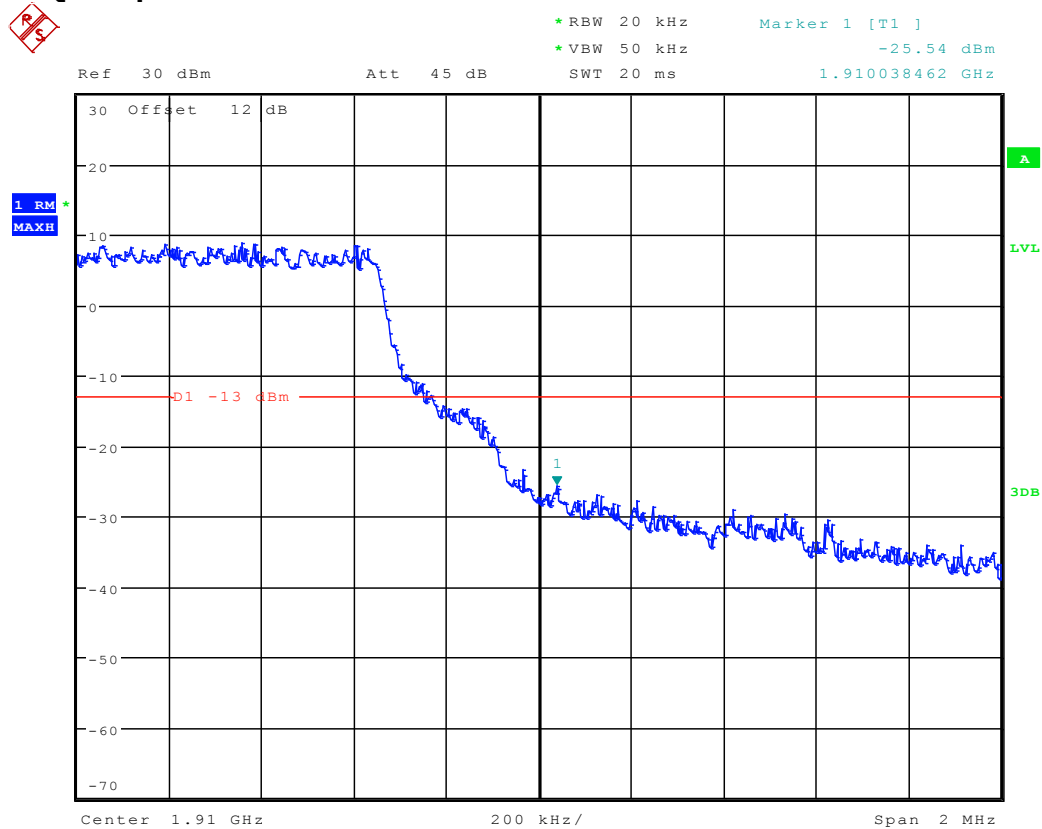




16QAM /1 RB/RB #max

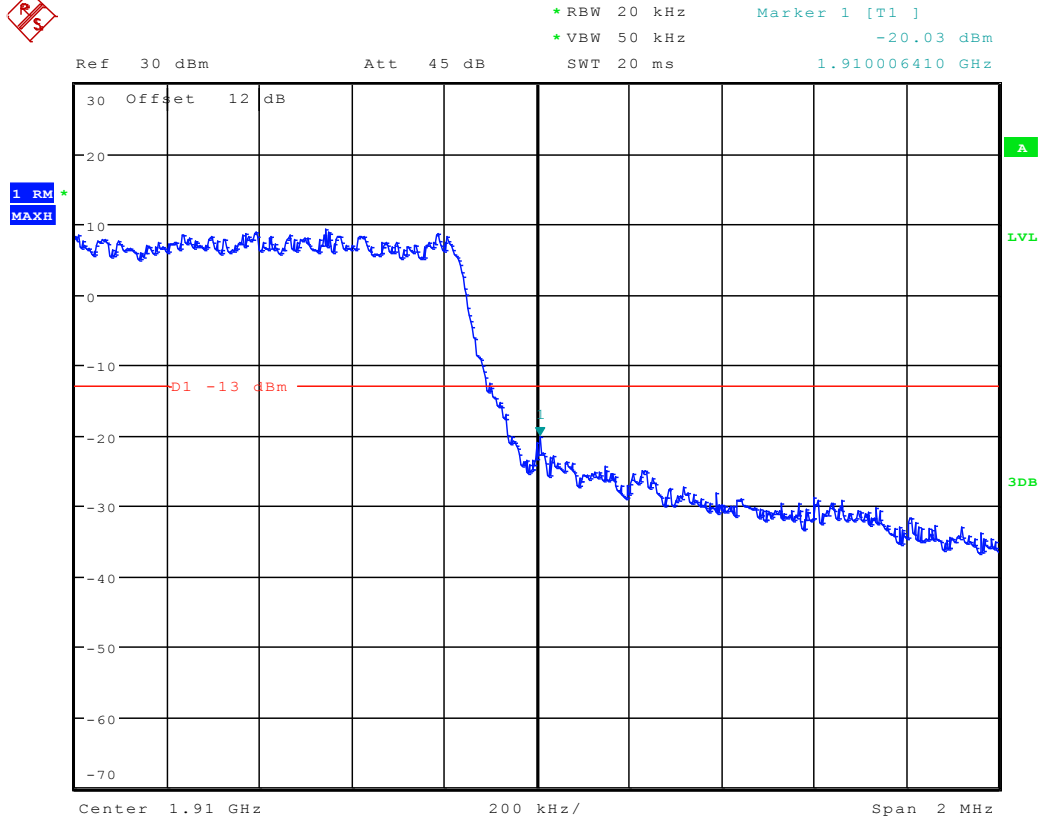


16QAM /partial RBs/RB #0



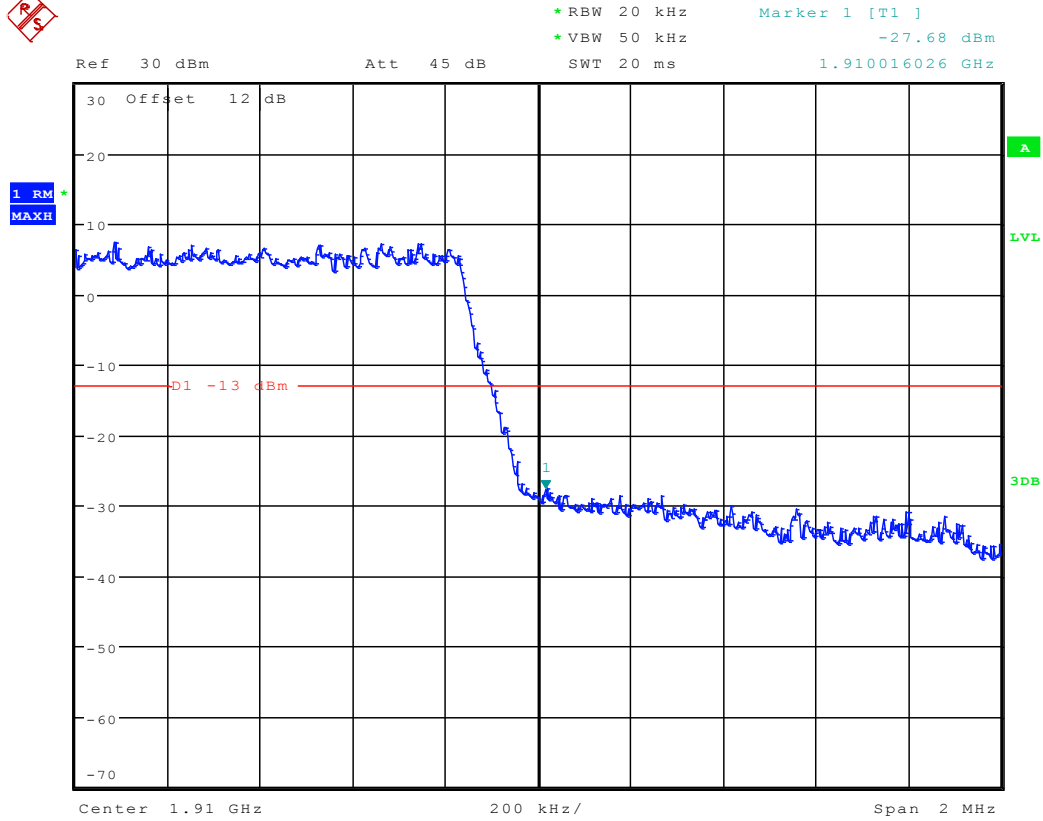


16QAM /partial RBs/RB #max





16QAM/full RBs

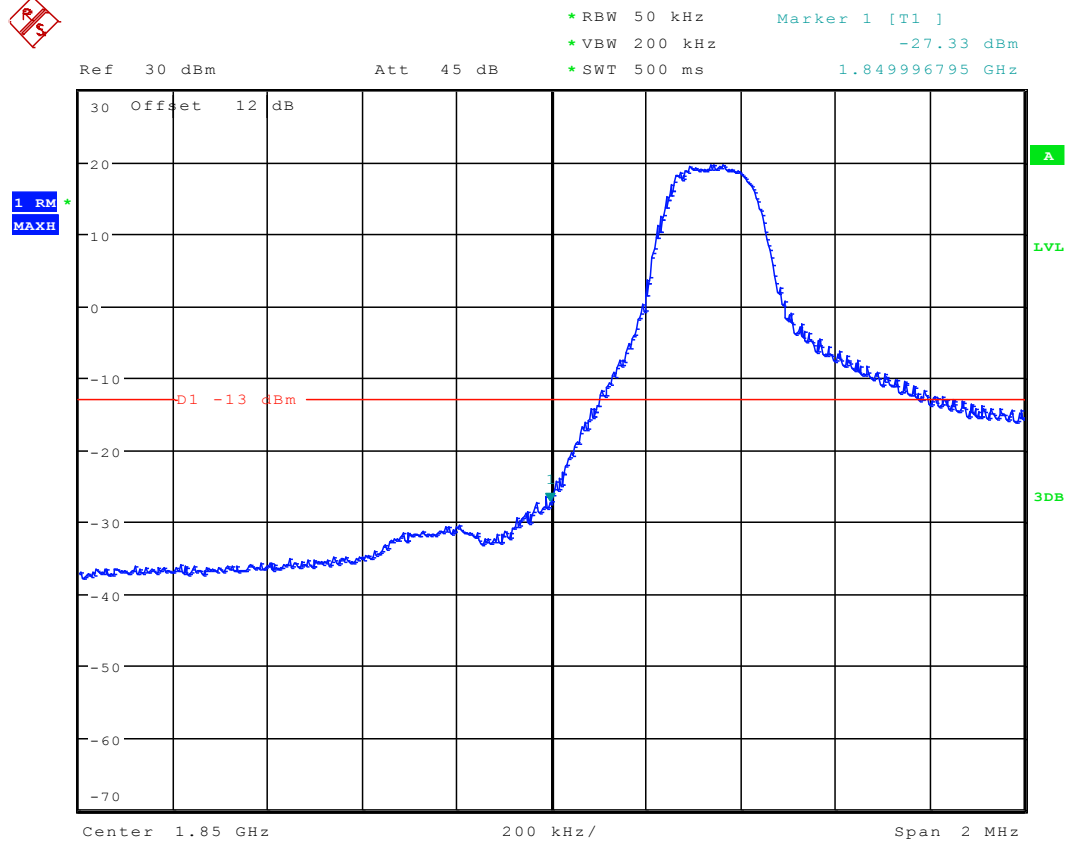




TM4

Left Edge 5MHz(BW) Channel 18625

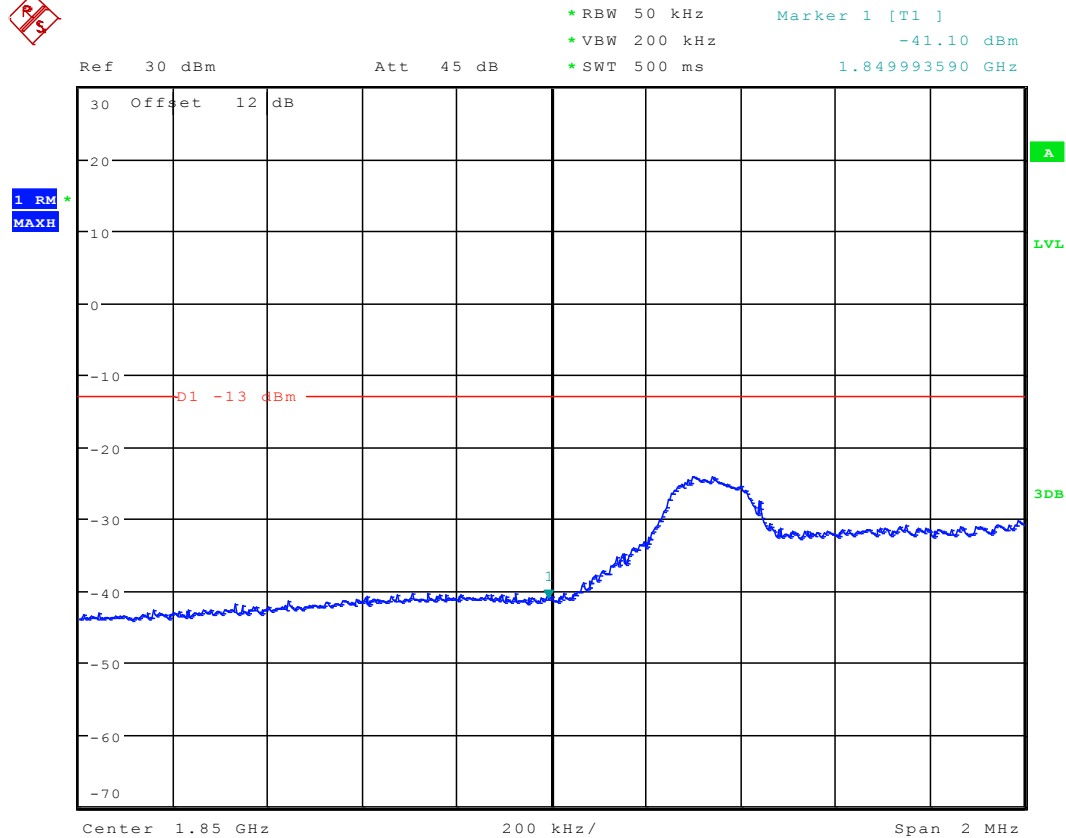
QPSK/1 RB/RB #0



Date: 24.NOV.2011 12:31:25



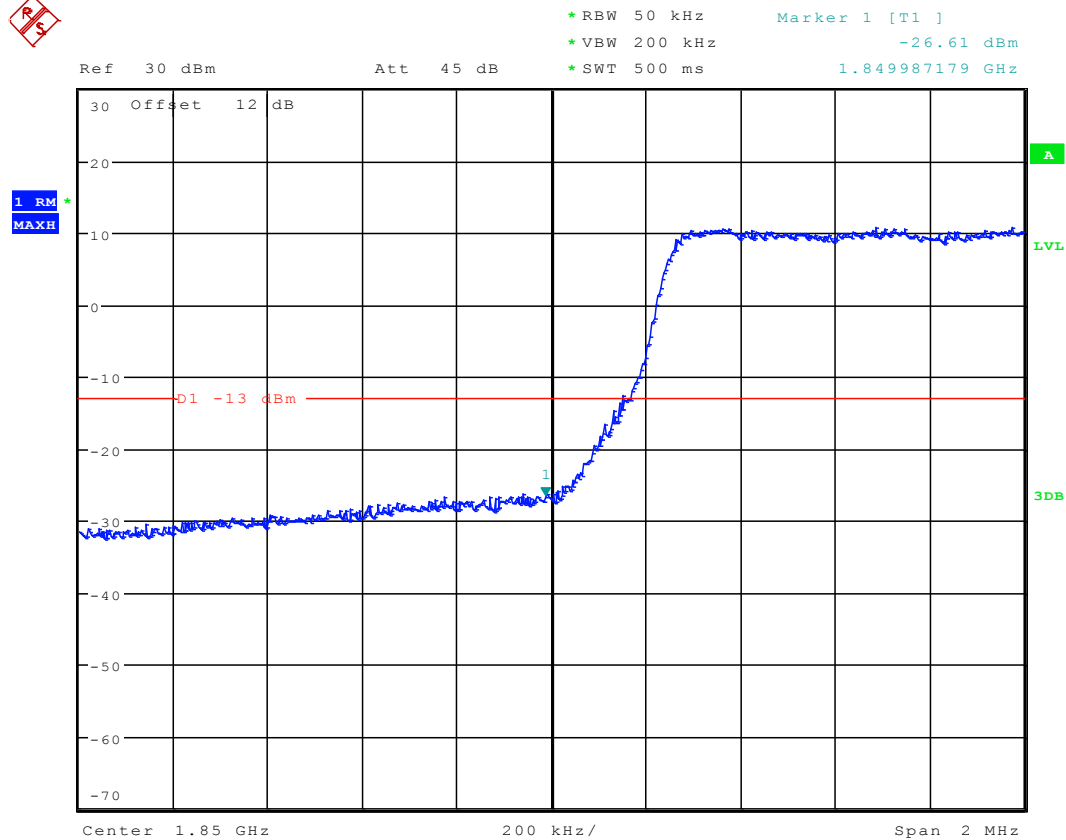
QPSK/1 RB/RB #max



Date: 24.NOV.2011 12:31:56



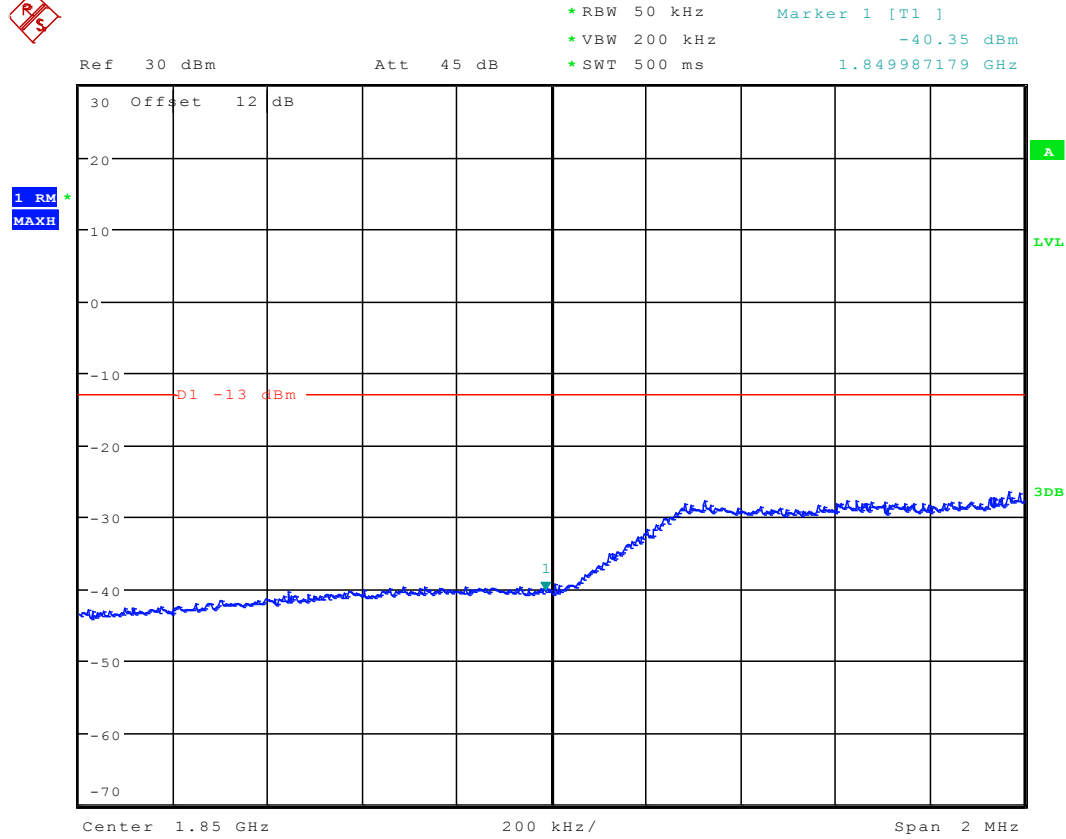
QPSK/partial RBs/RB #0



Date: 24.NOV.2011 16:01:32



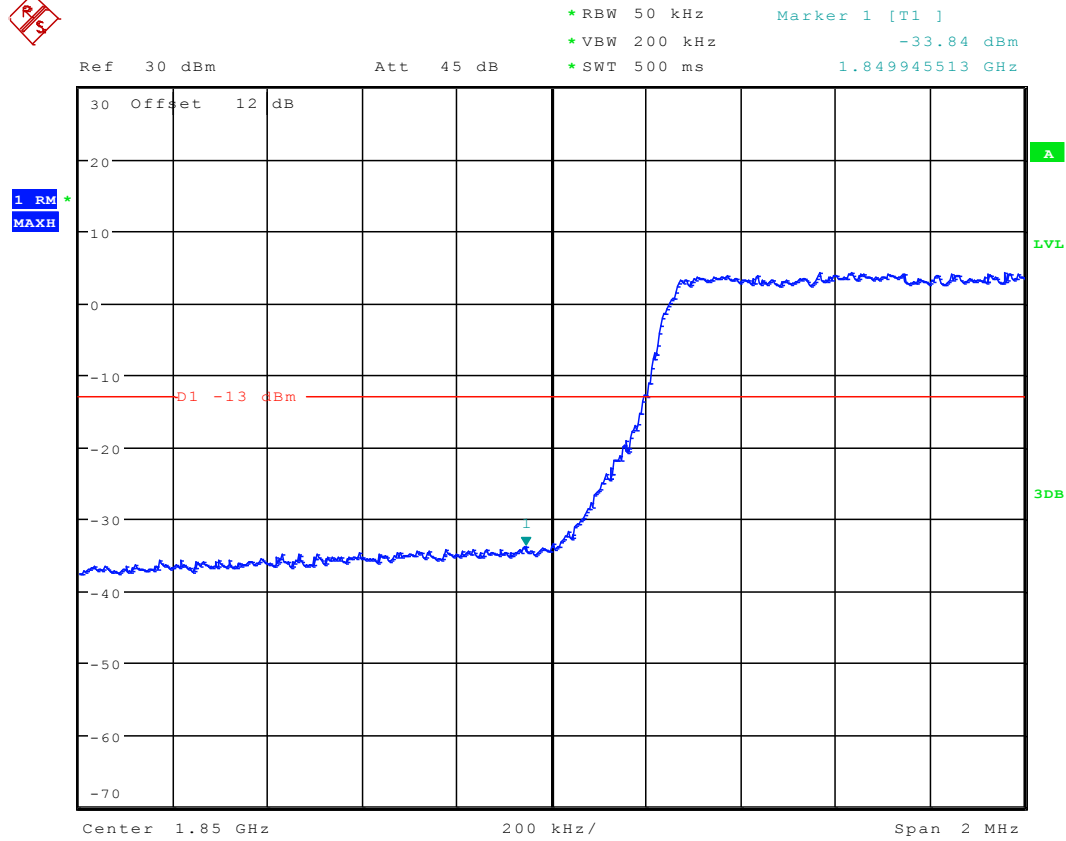
QPSK/partial RBs/RB #max



Date: 24.NOV.2011 16:00:46



QPSK/ full RBs



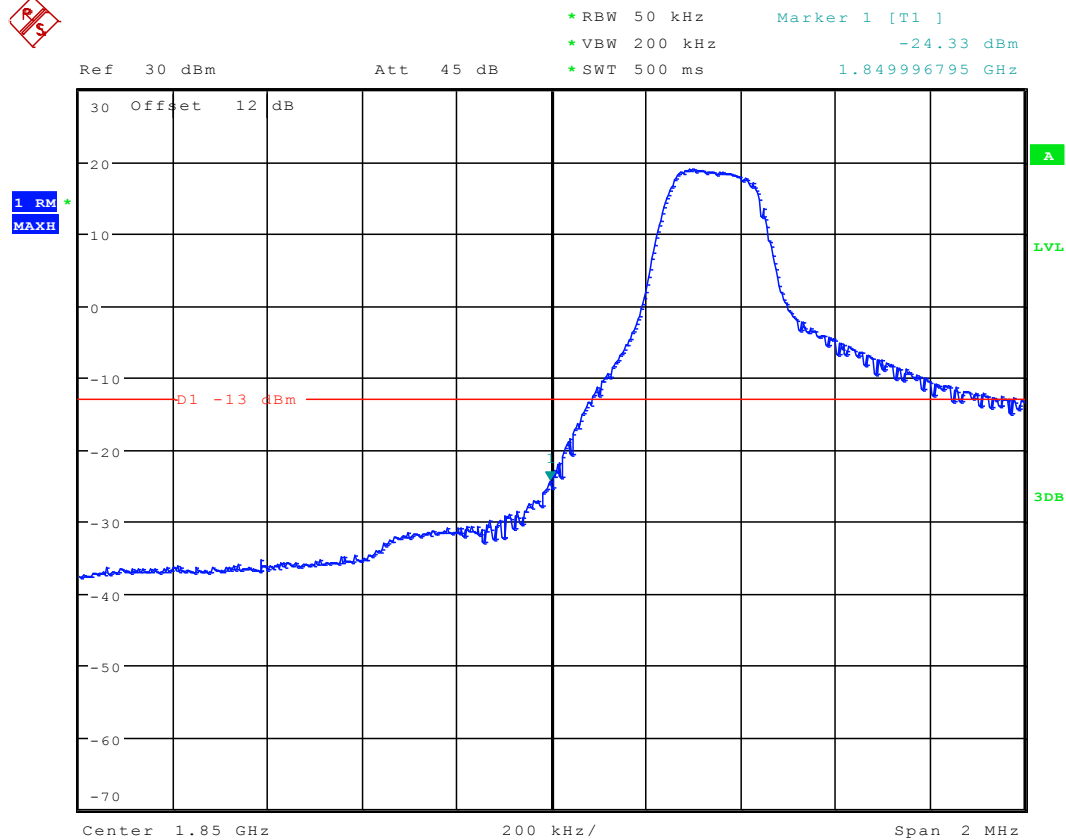
Date: 24.NOV.2011 12:33:56



TM5

Left Edge
5MHz(BW)
Channel 18625

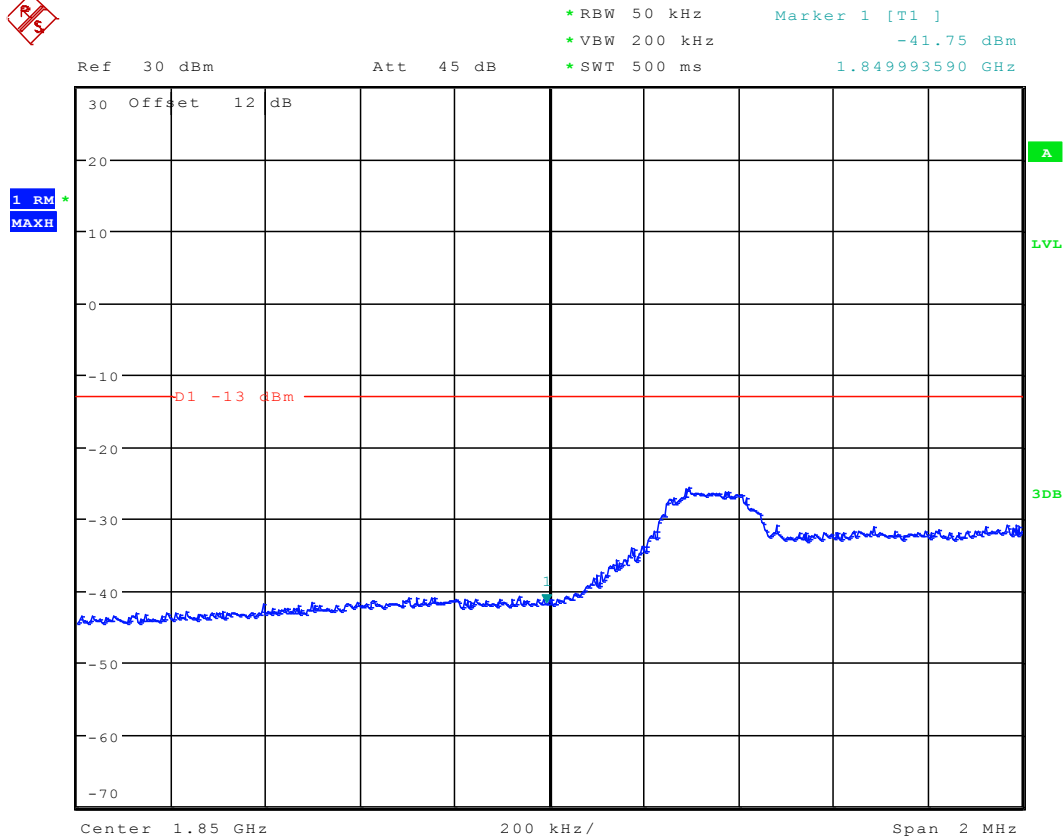
16QAM /1 RB/RB #0



Date: 24.NOV.2011 12:30:58

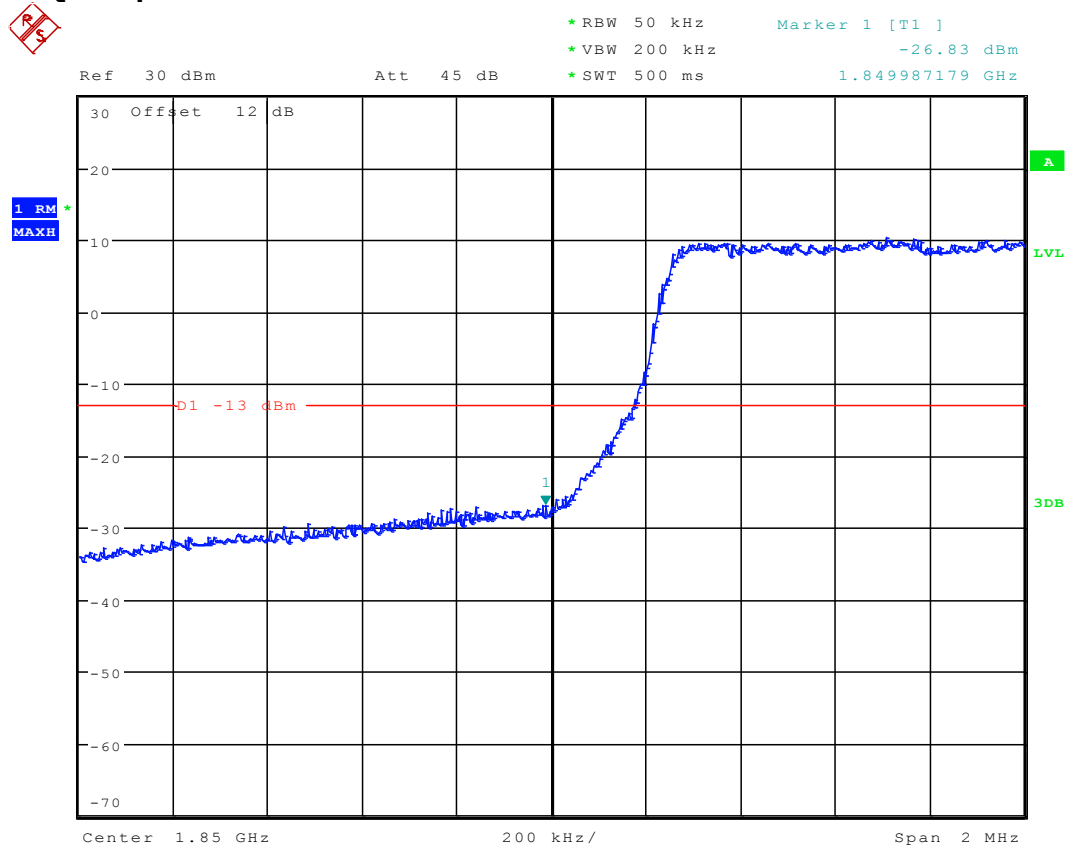


16QAM /1 RB/RB #max



Date: 24.NOV.2011 12:32:16

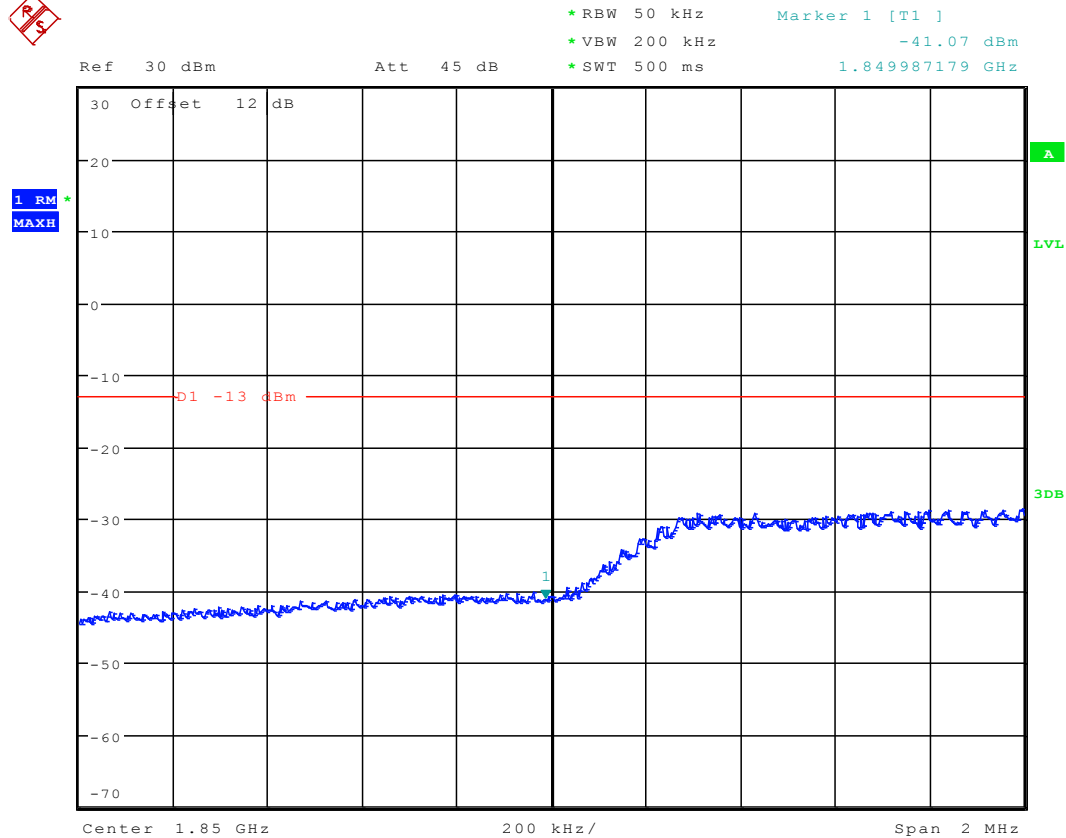
16QAM /partial RBs/RB #0



Date: 24.NOV.2011 16:01:19



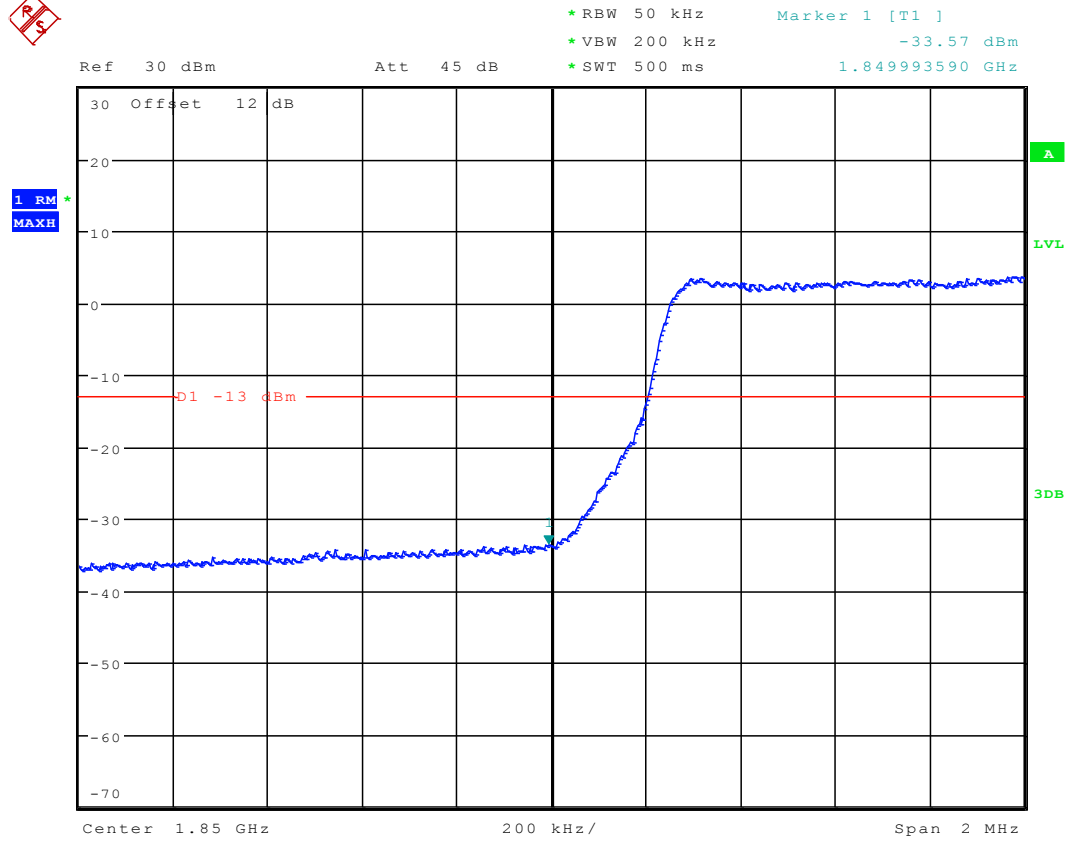
16QAM /partial RBs/RB #max



Date: 24.NOV.2011 16:01:05



16QAM/full RBs



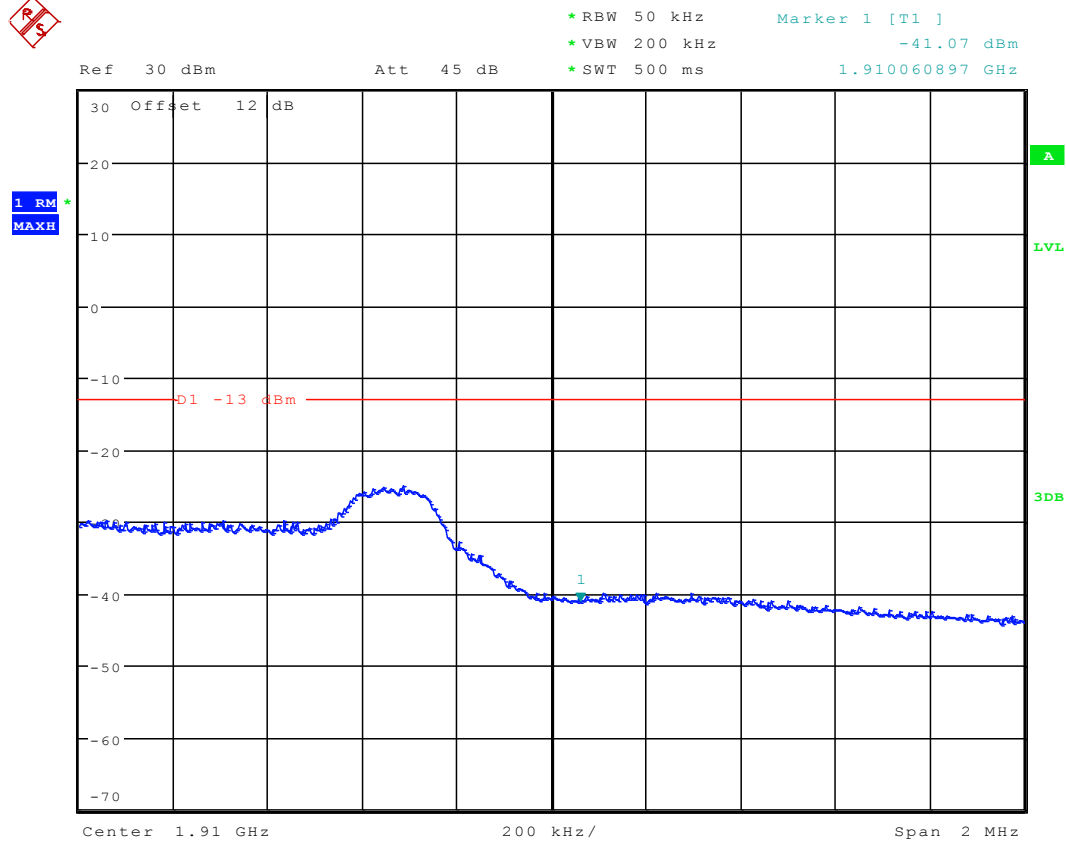
Date: 24.NOV.2011 12:33:18



TM4

Right Edge 5MHz(BW) Channel 19175

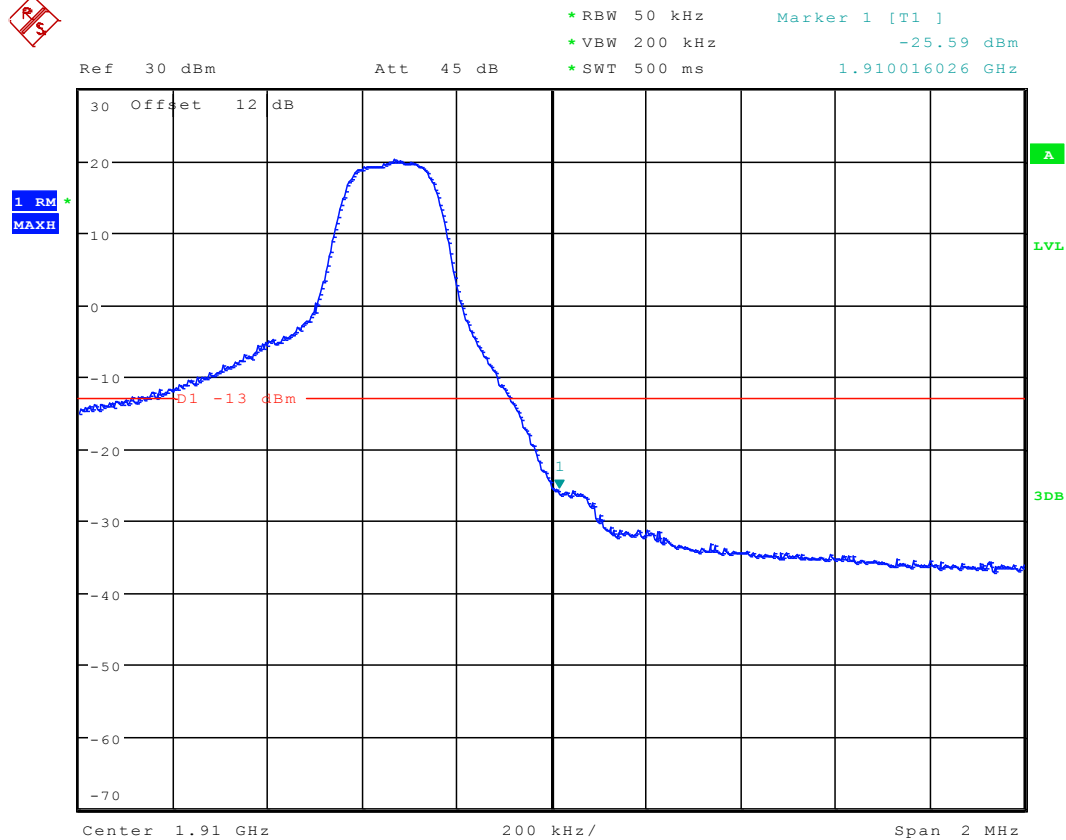
QPSK/1 RB/RB #0



Date: 24.NOV.2011 12:36:07



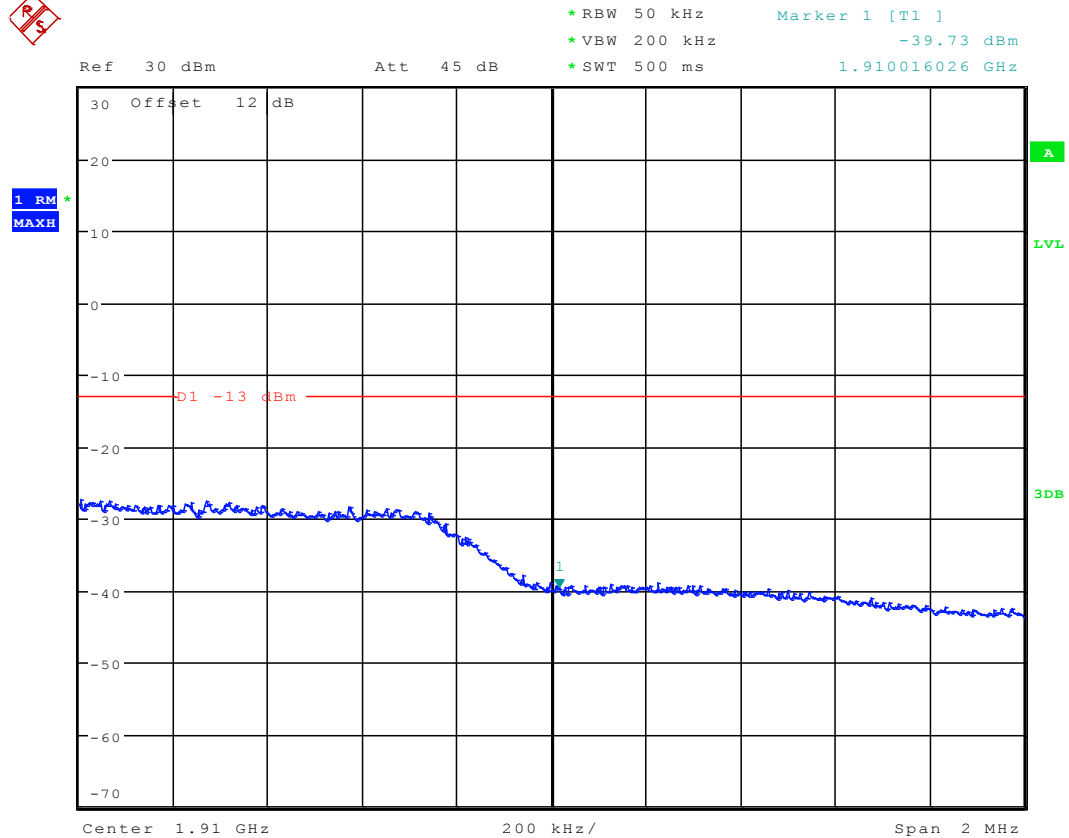
QPSK/1 RB/RB #max



Date: 24.NOV.2011 12:36:28



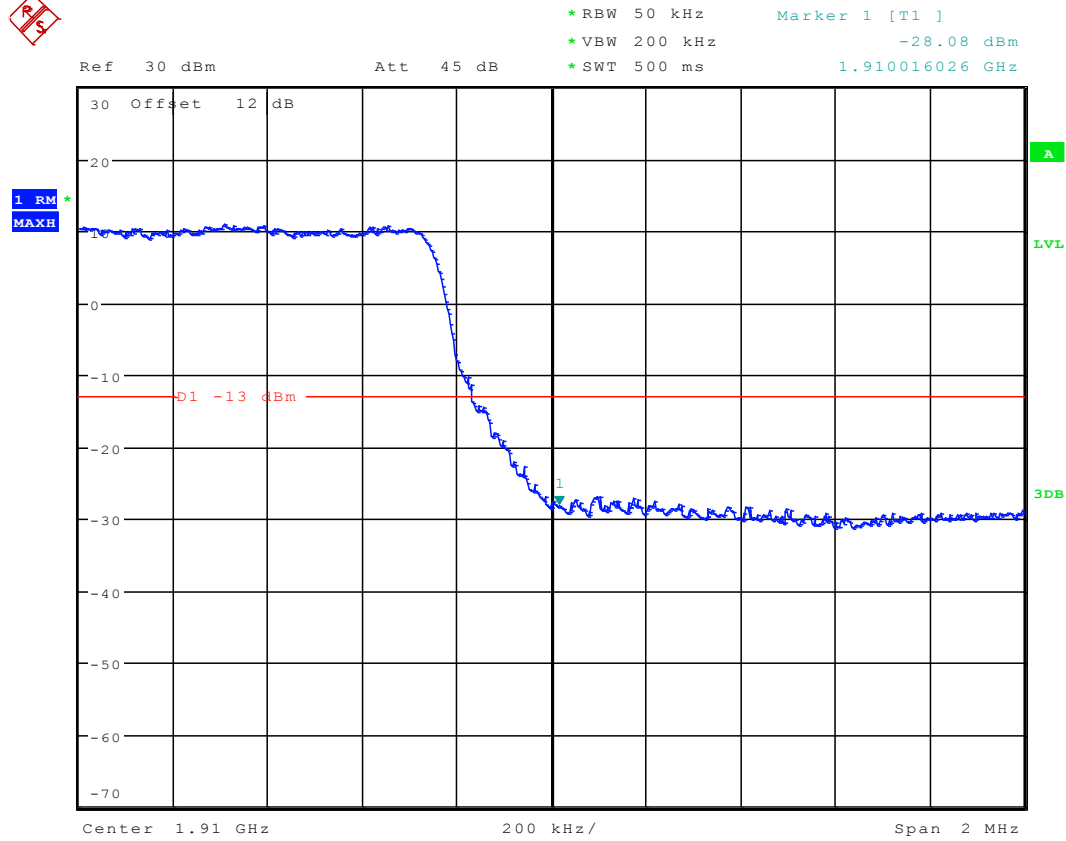
QPSK/partial RBs/RB #0



Date: 24.NOV.2011 15:58:56



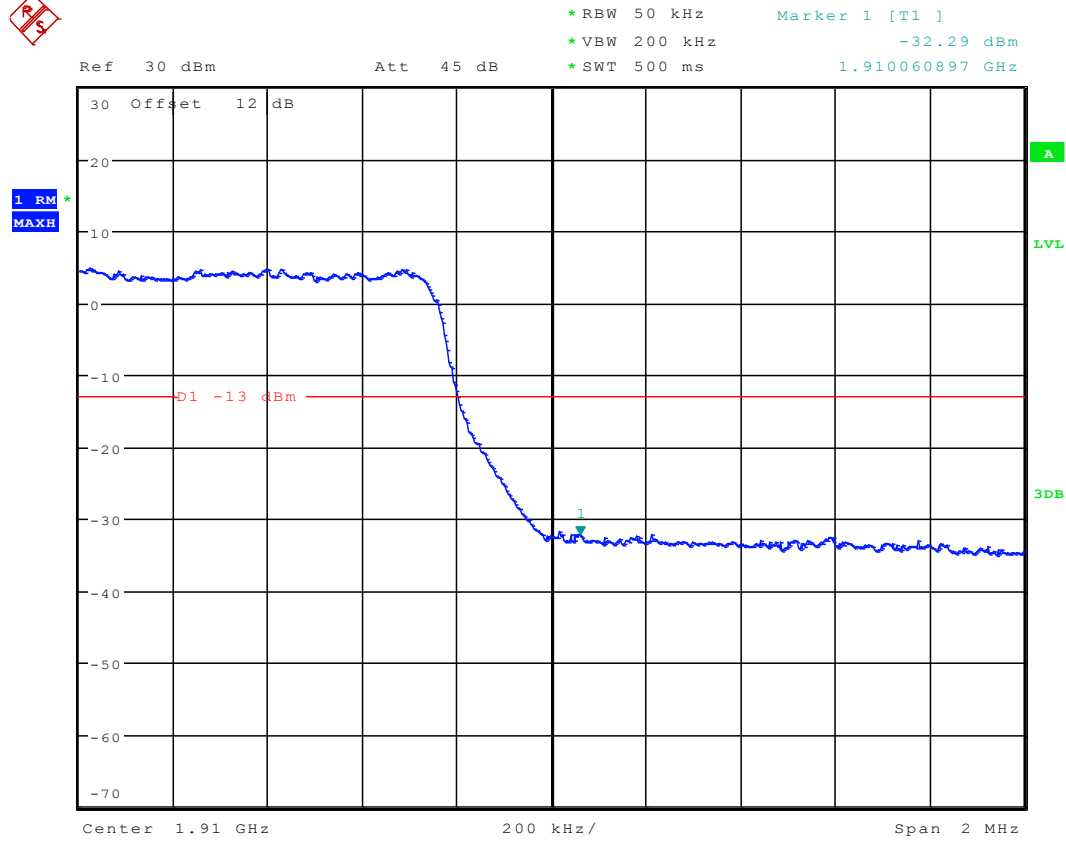
QPSK/partial RBs/RB #max



Date: 24.NOV.2011 15:59:56



QPSK/ full RBs



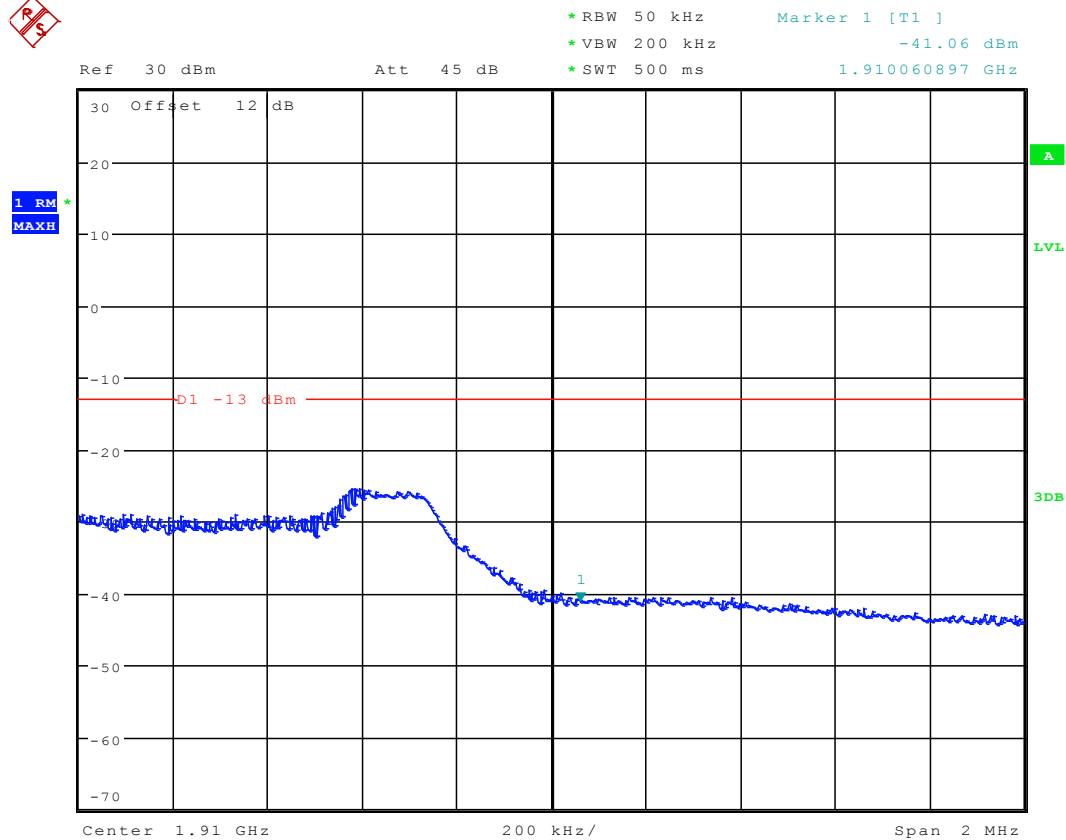
Date: 24.NOV.2011 12:34:59



TM5

Right Edge 5MHz(BW) Channel 19175

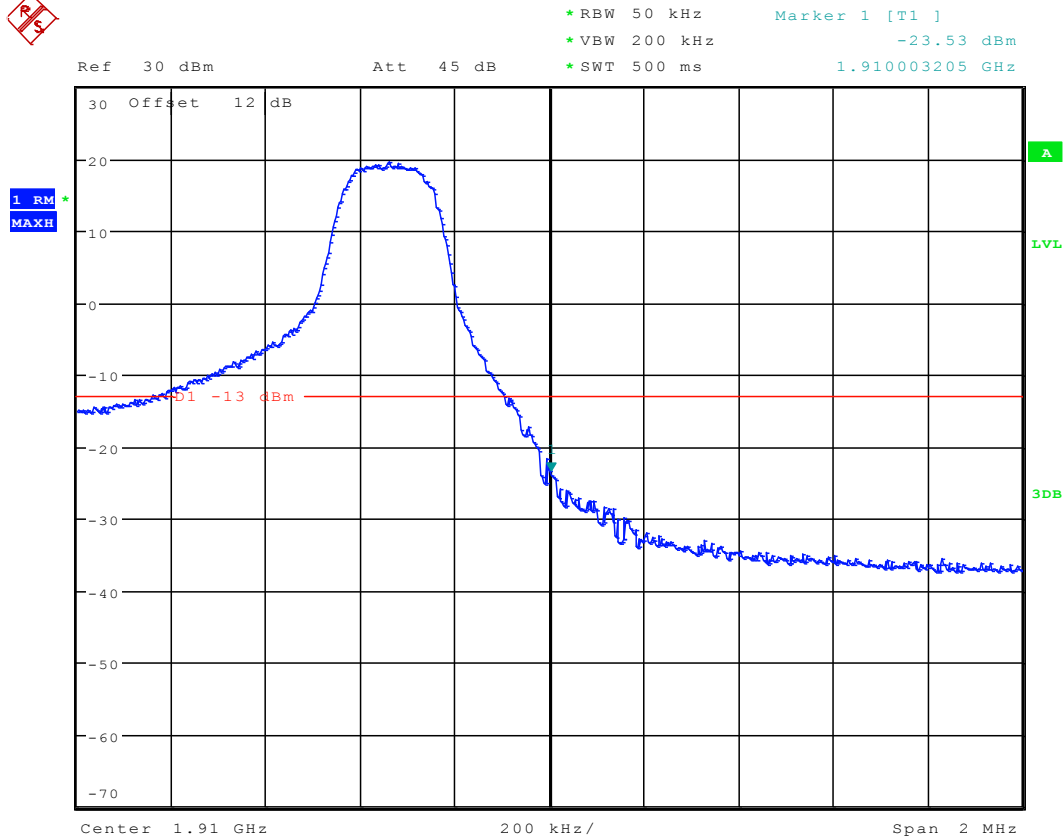
16QAM /1 RB/RB #0



Date: 24.NOV.2011 12:35:43



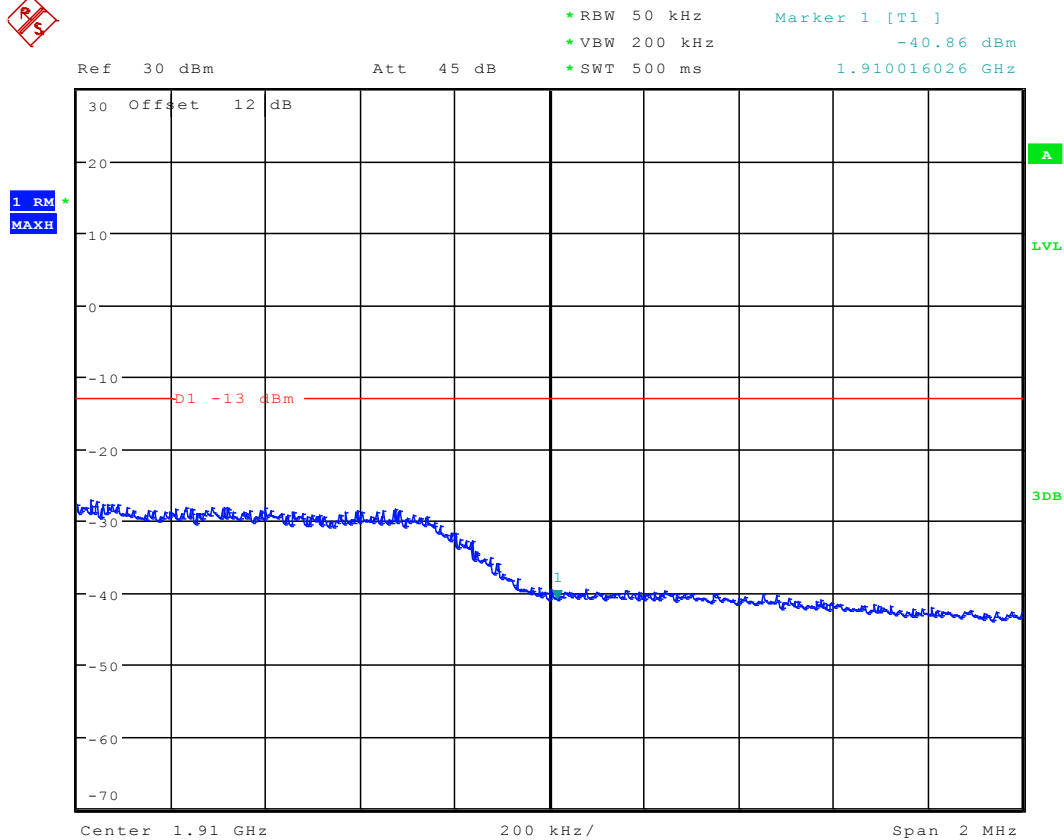
16QAM /1 RB/RB #max



Date: 24.NOV.2011 12:36:50



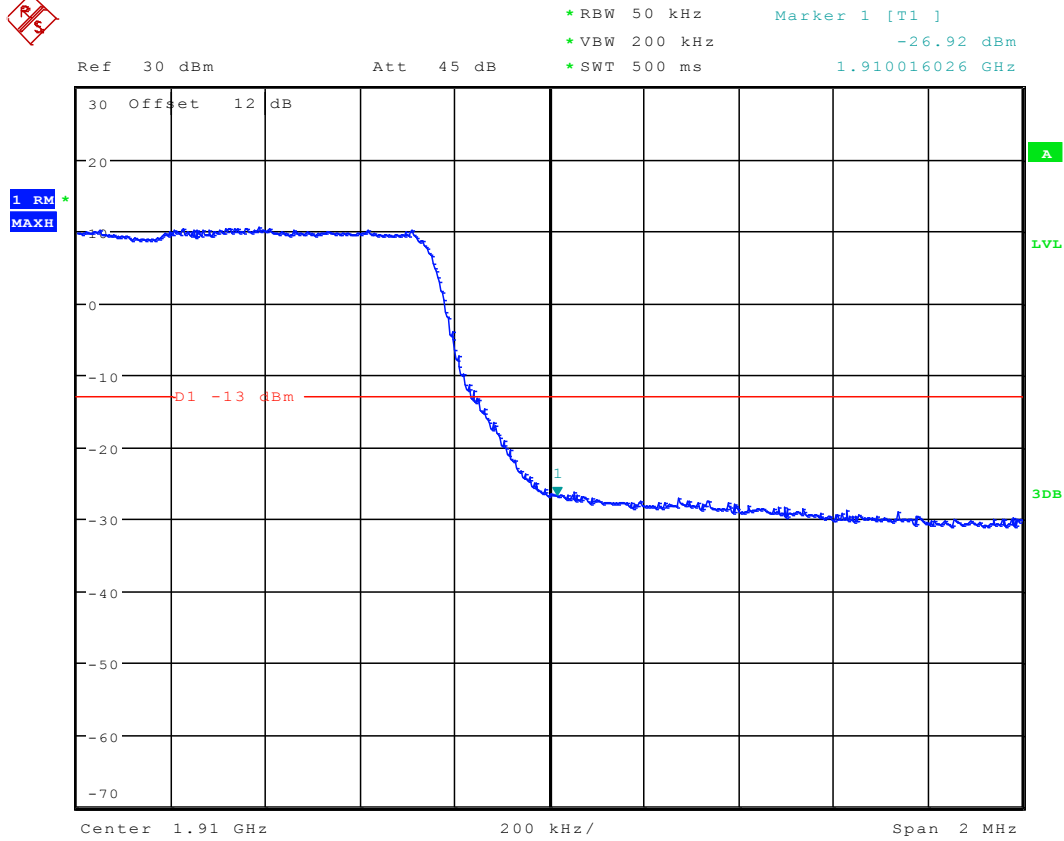
16QAM /partial RBs/RB #0



Date: 24.NOV.2011 15:59:19



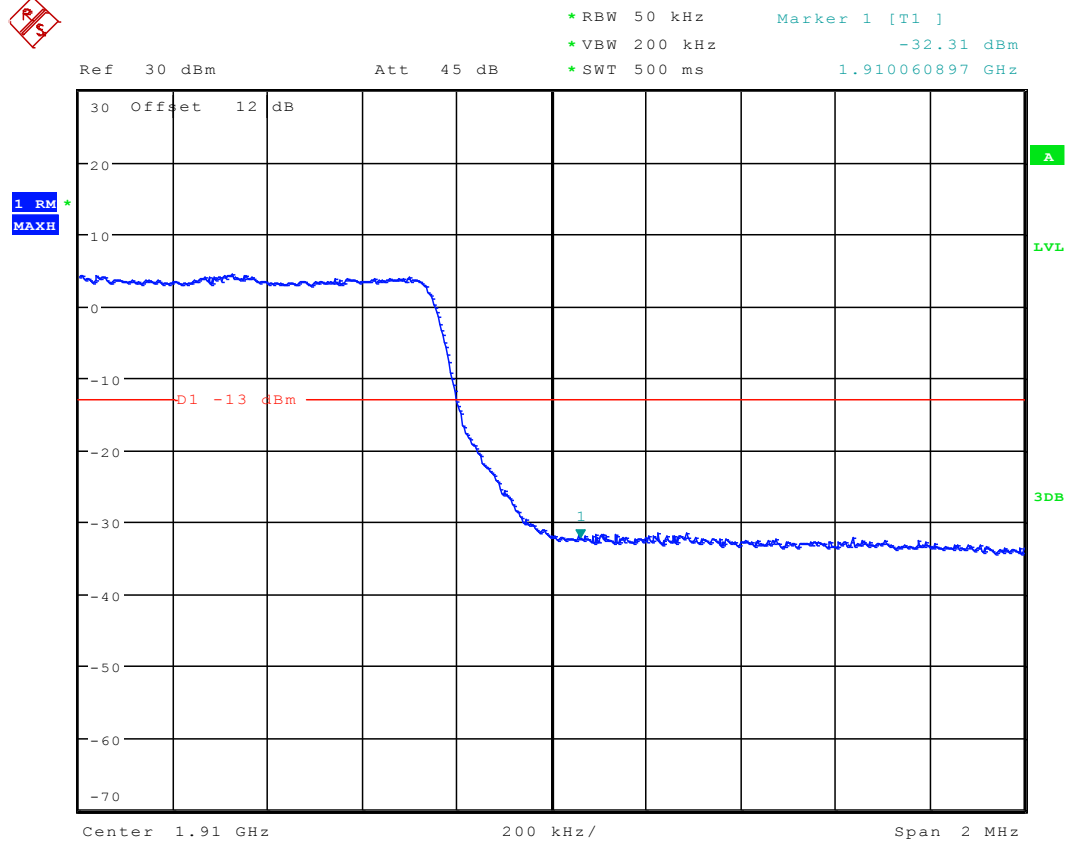
16QAM /partial RBs/RB #max



Date: 24.NOV.2011 15:59:42



16QAM/full RBs



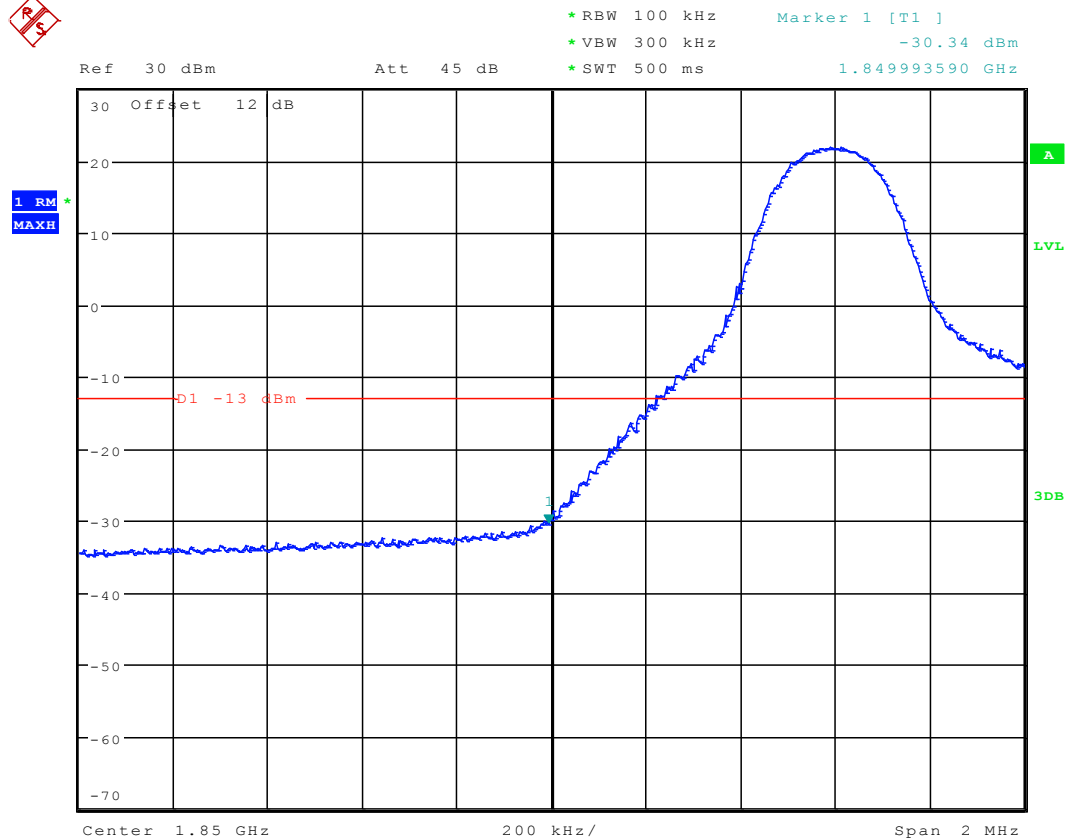
Date: 24.NOV.2011 12:35:23



TM4

Left Edge 10MHz(BW) Channel 18650

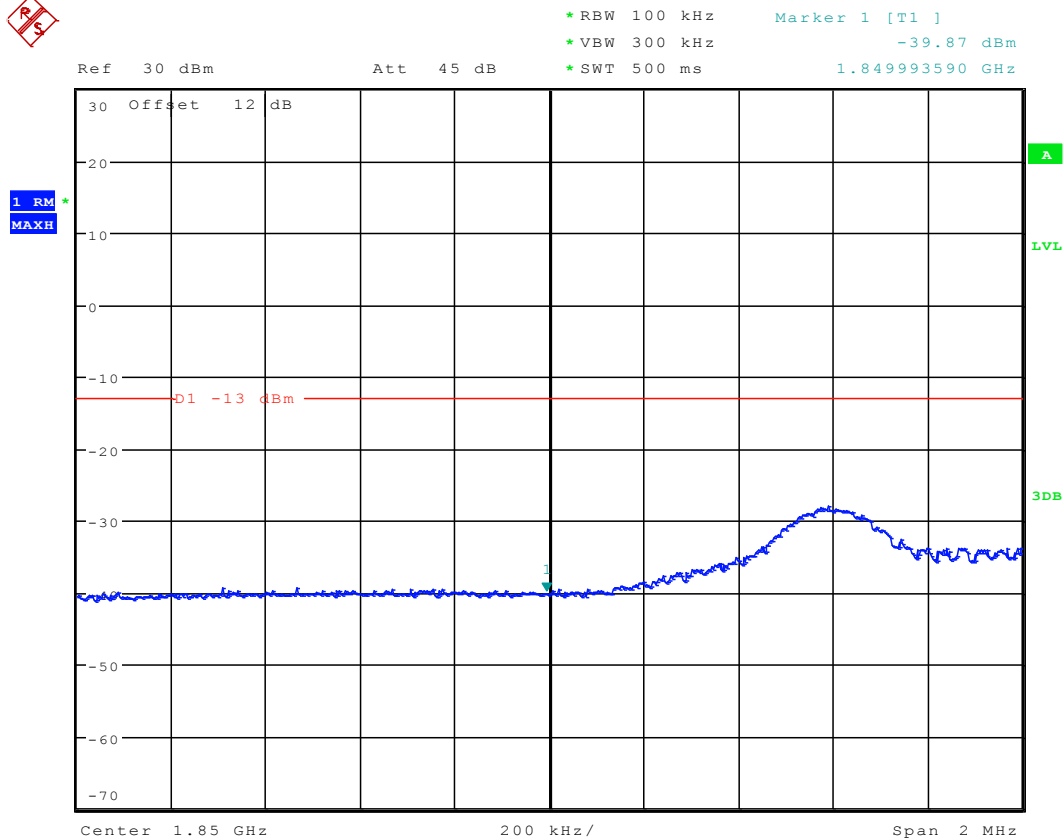
QPSK/1 RB/RB #0



Date: 24.NOV.2011 12:48:22



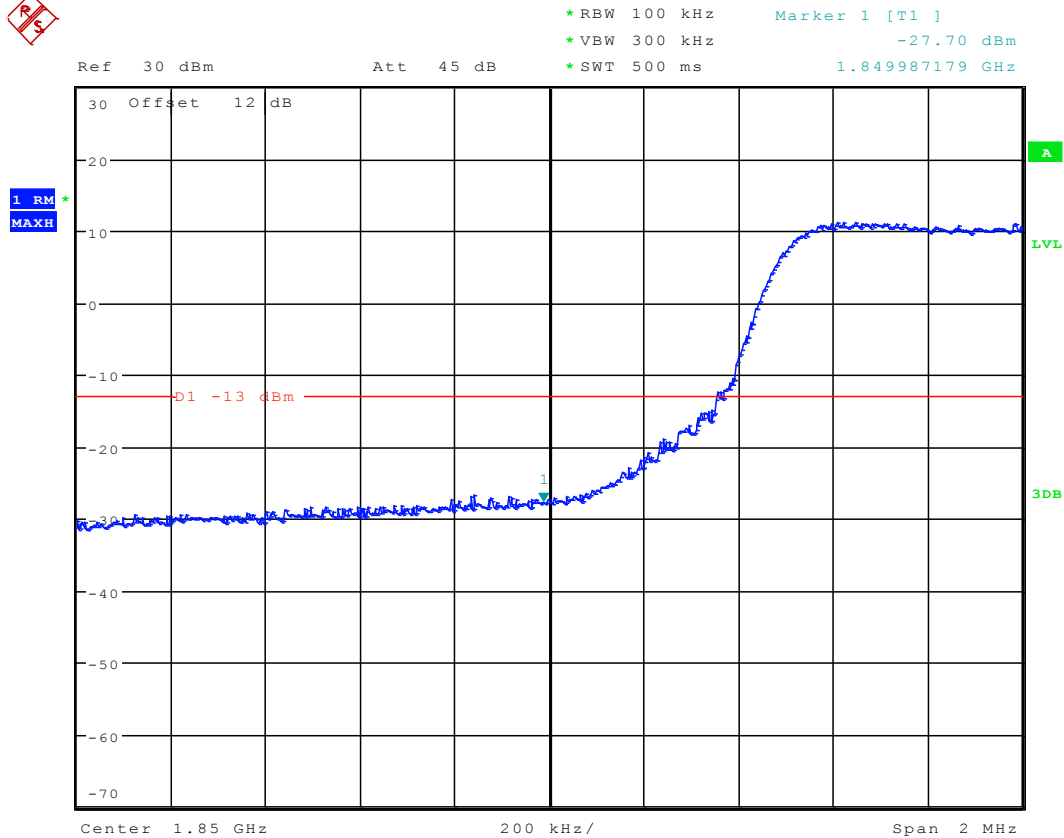
QPSK/1 RB/RB #max



Date: 24.NOV.2011 12:49:11



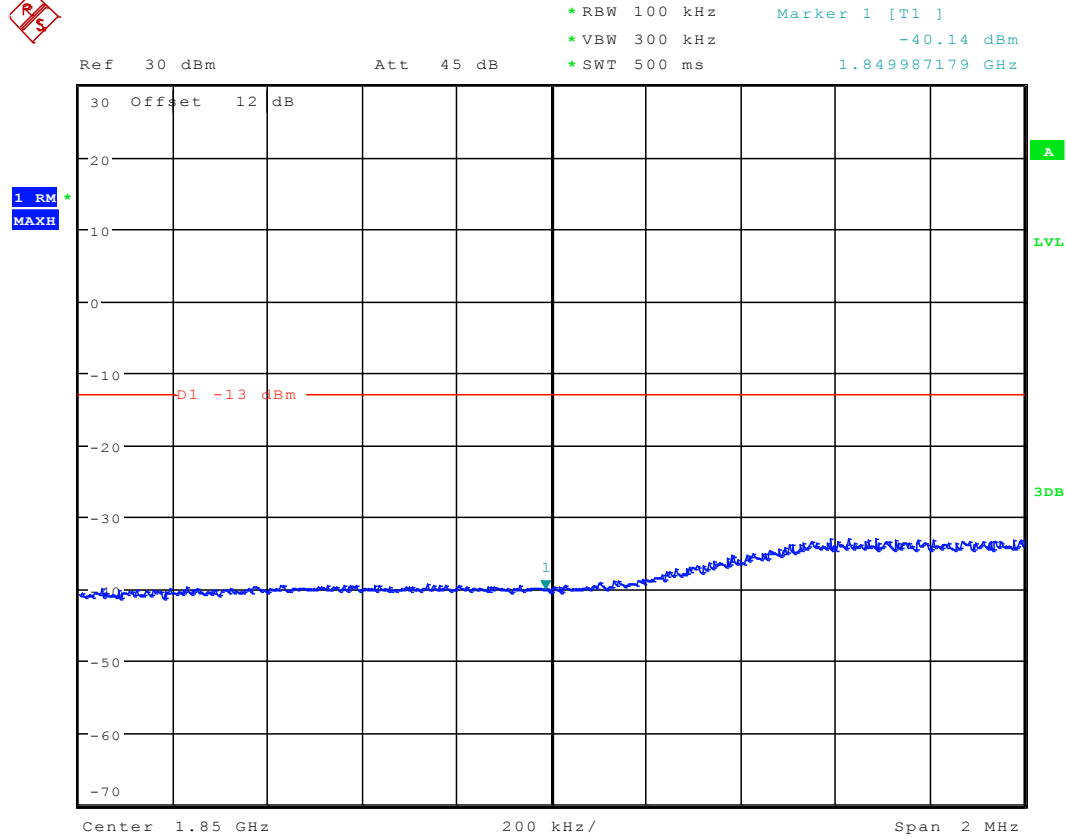
QPSK/partial RBs/RB #0



Date: 24.NOV.2011 16:03:14



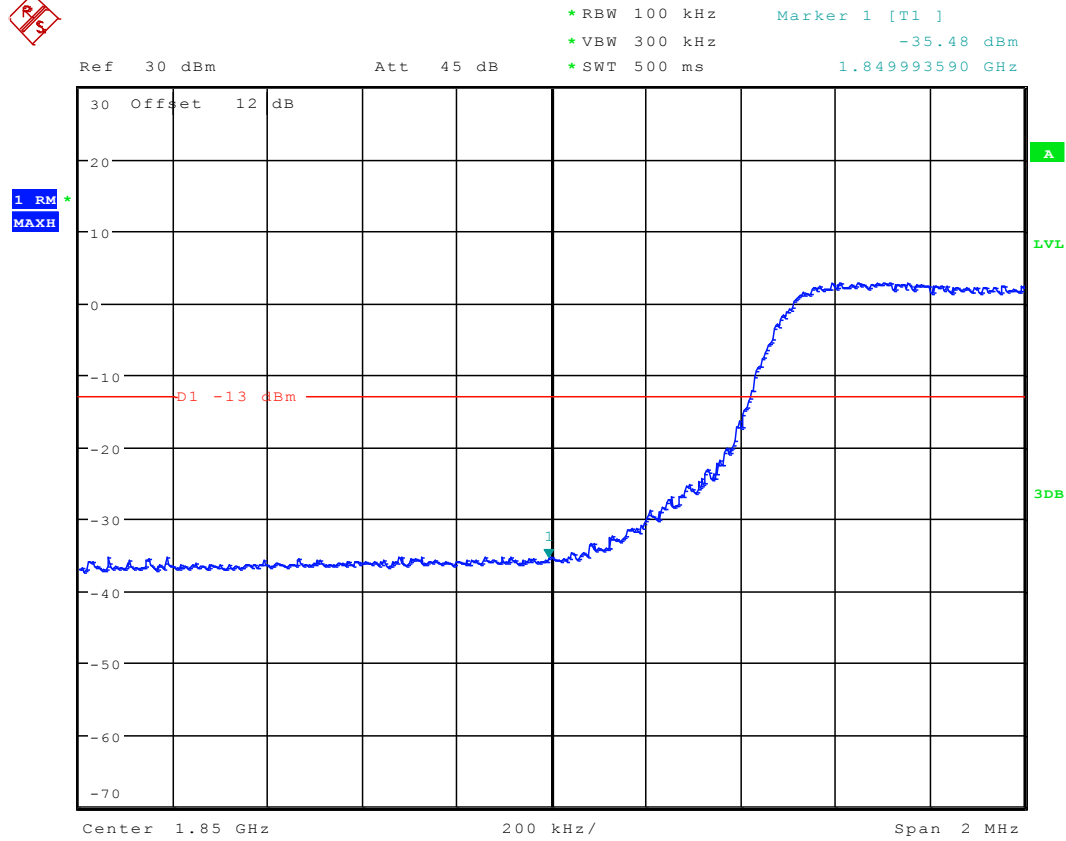
QPSK/partial RBs/RB #max



Date: 24.NOV.2011 16:04:14



QPSK/ full RBs



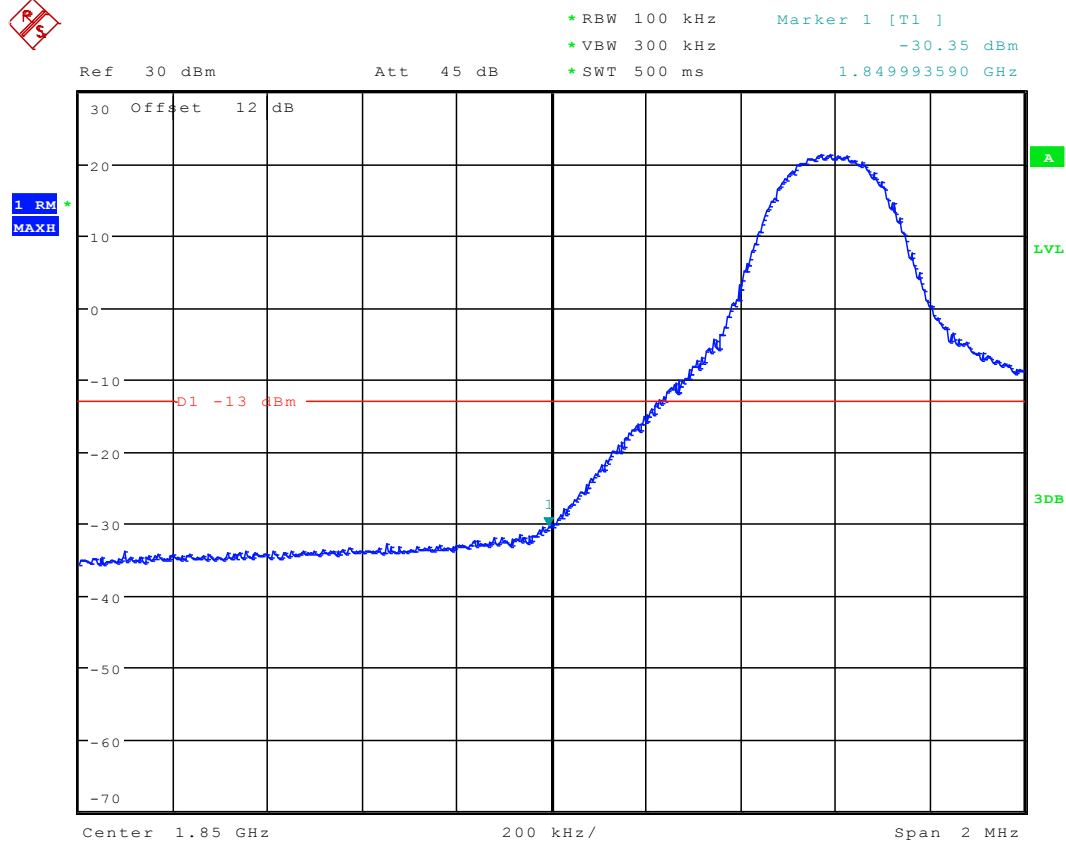
Date: 24.NOV.2011 12:47:59



TM5

Left Edge
10MHz(BW)
Channel 18650

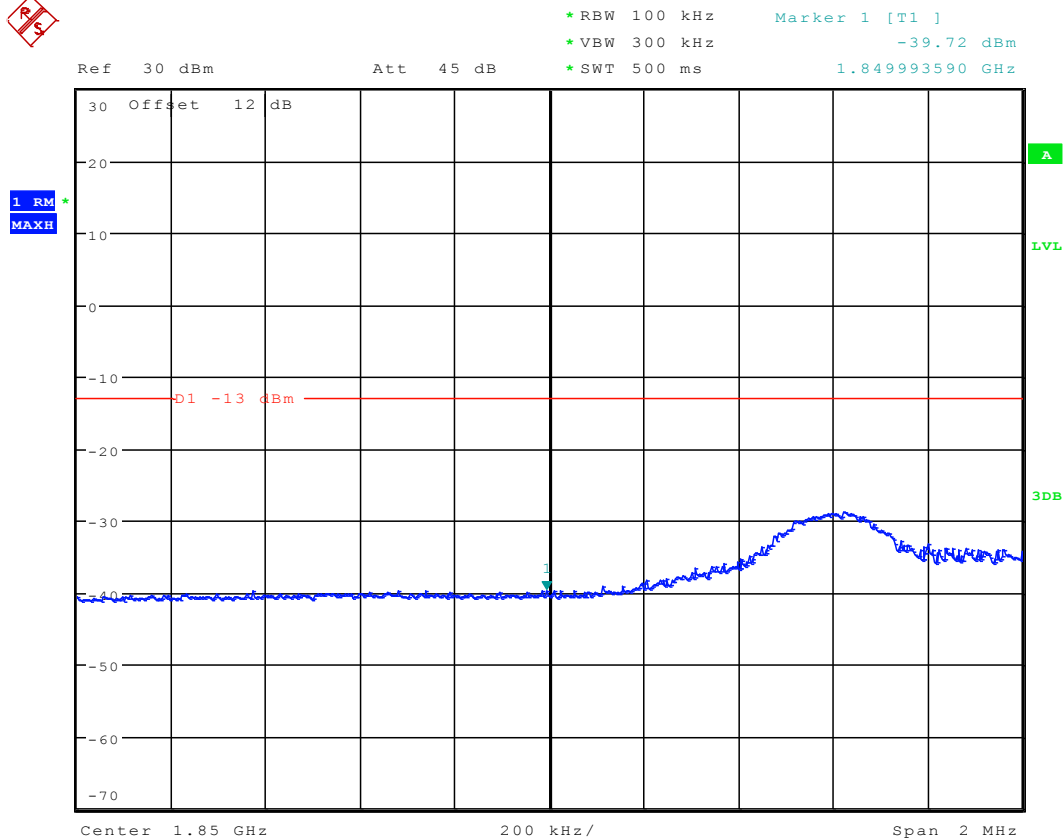
16QAM /1 RB/RB #0



Date: 24.NOV.2011 12:48:40



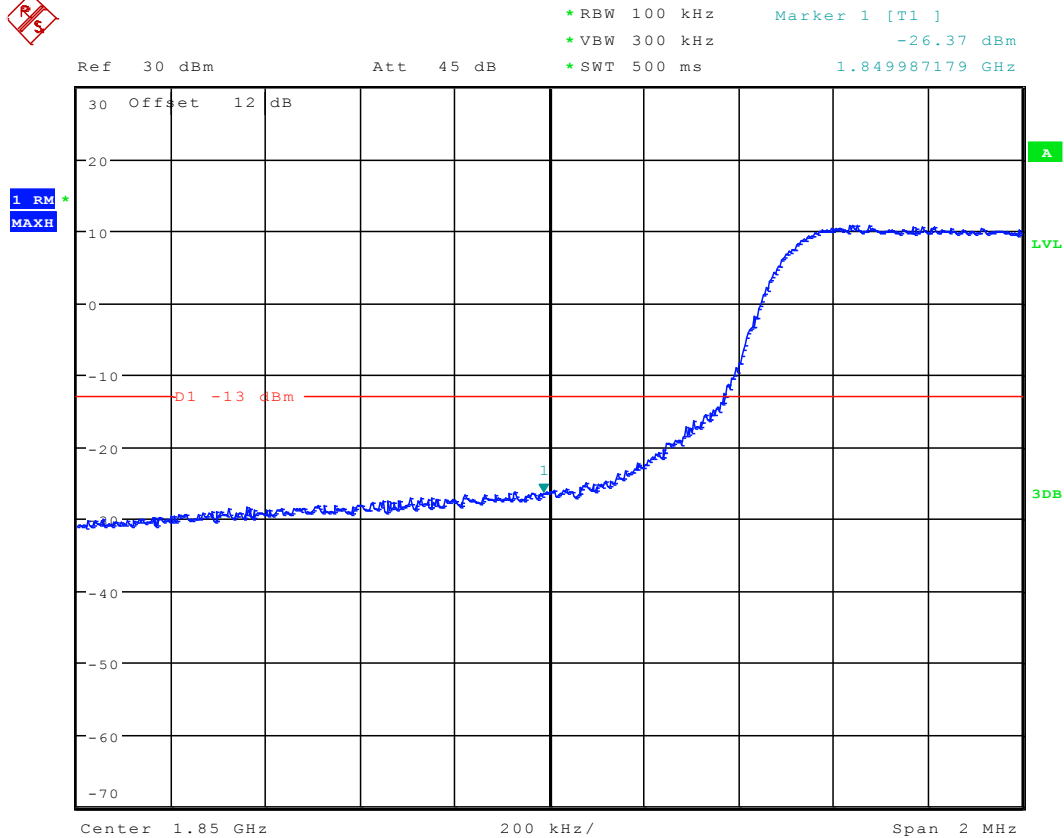
16QAM /1 RB/RB #max



Date: 24.NOV.2011 12:48:58



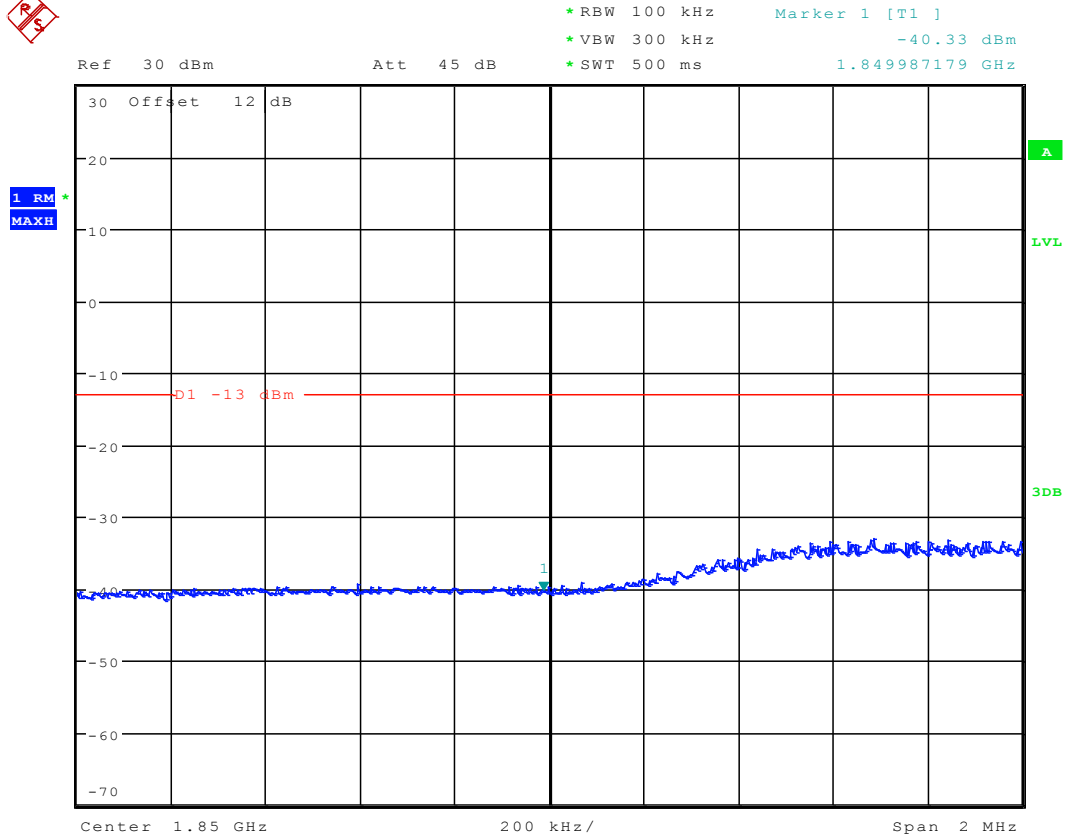
16QAM /partial RBs/RB #0



Date: 24.NOV.2011 16:03:37



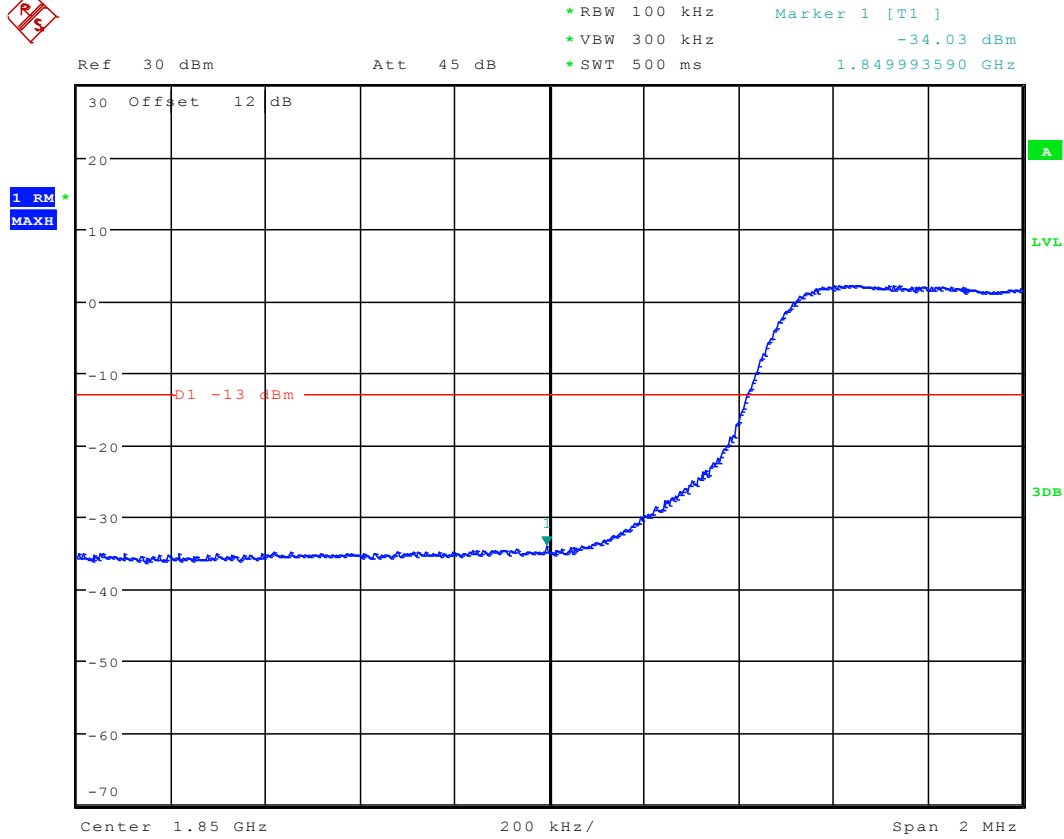
16QAM /partial RBs/RB #max



Date: 24.NOV.2011 16:04:01



16QAM/full RBs



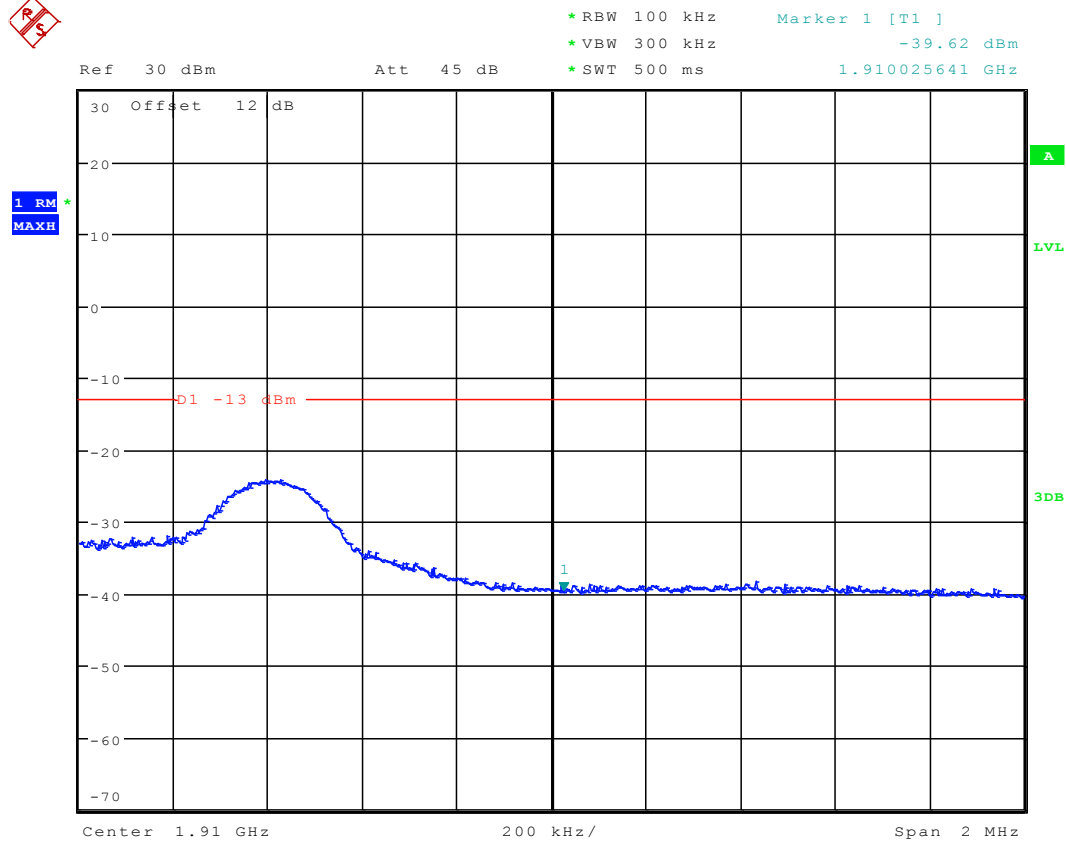
Date: 24.NOV.2011 12:47:15



TM4

Right Edge 10MHz(BW) Channel 19150

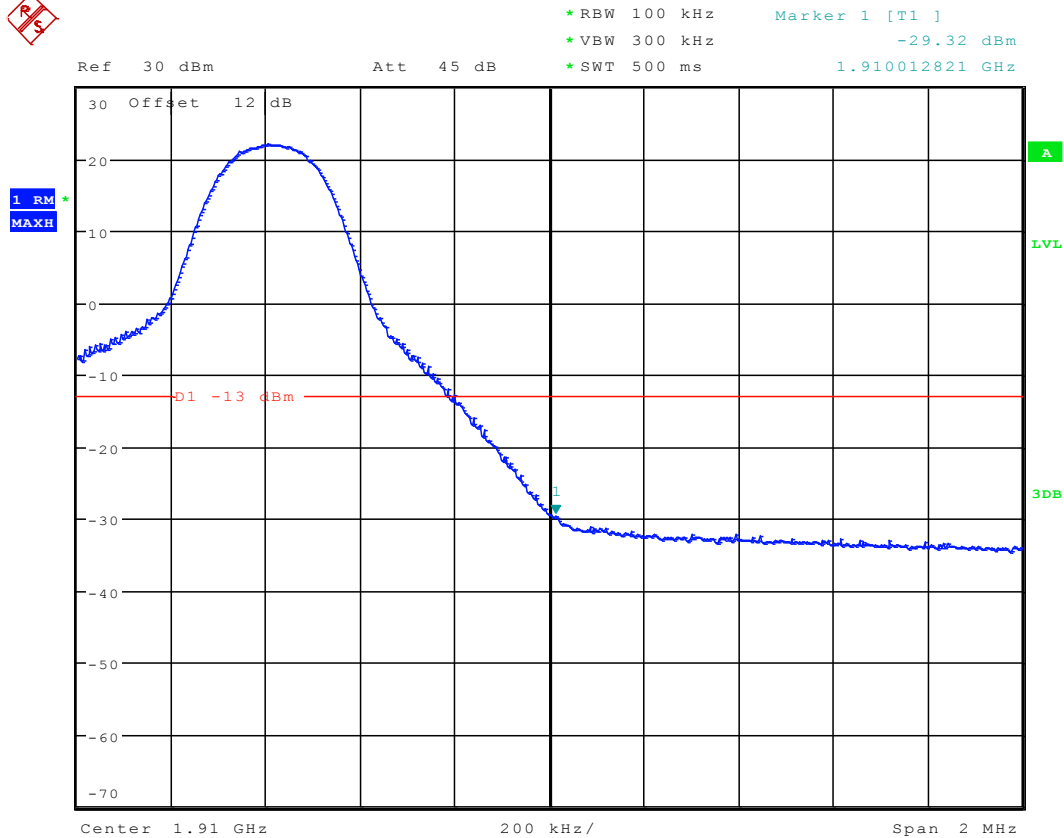
QPSK/1 RB/RB #0



Date: 24.NOV.2011 14:56:07



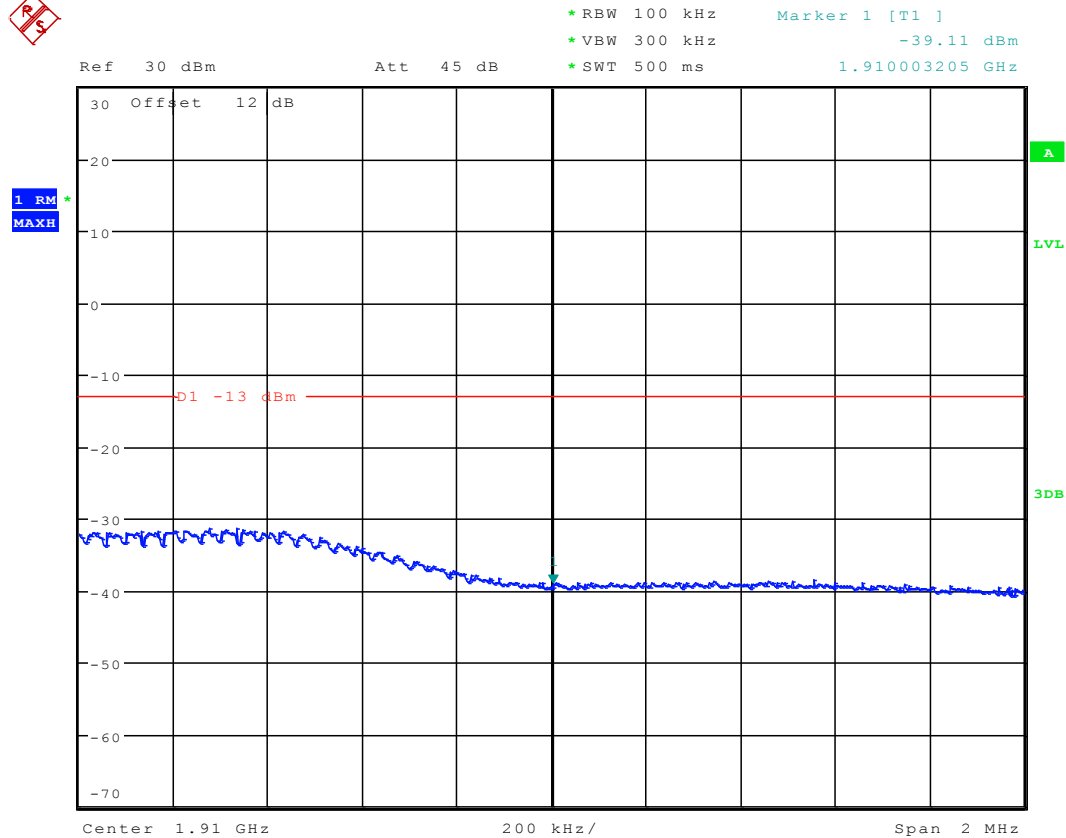
QPSK/1 RB/RB #max



Date: 24.NOV.2011 14:56:26



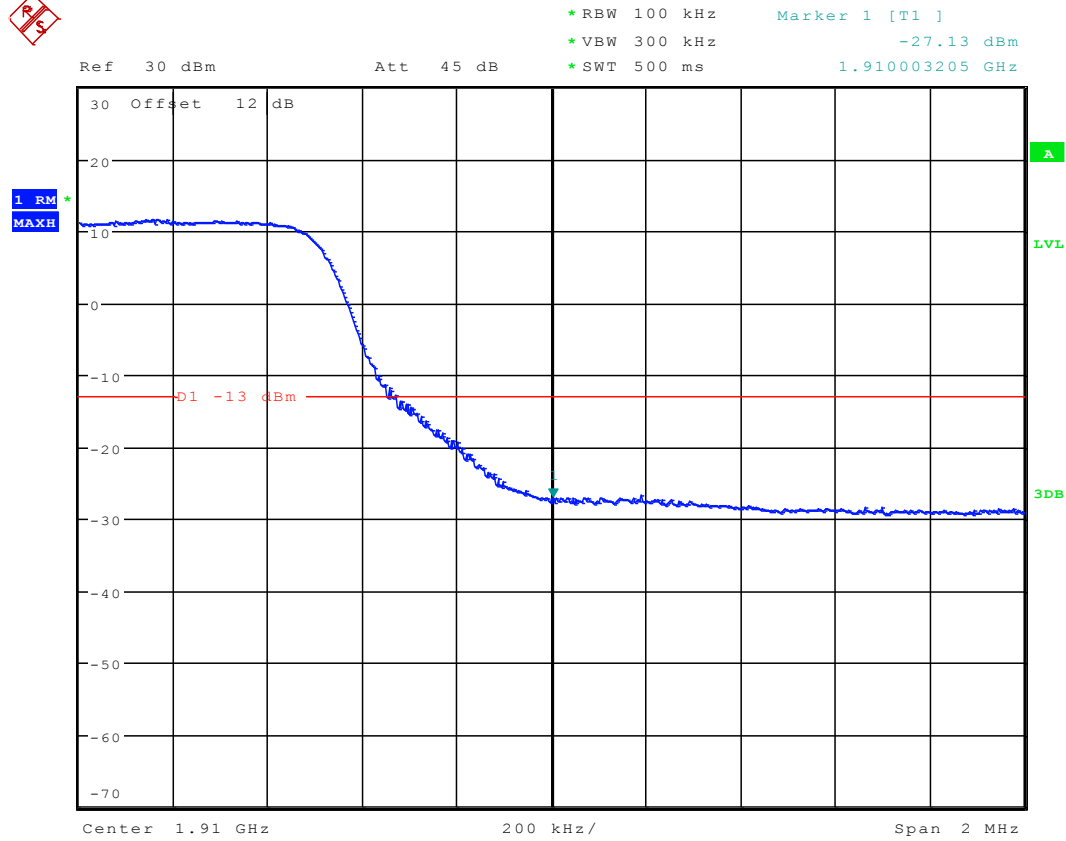
QPSK/partial RBs/RB #0



Date: 24.NOV.2011 16:06:21



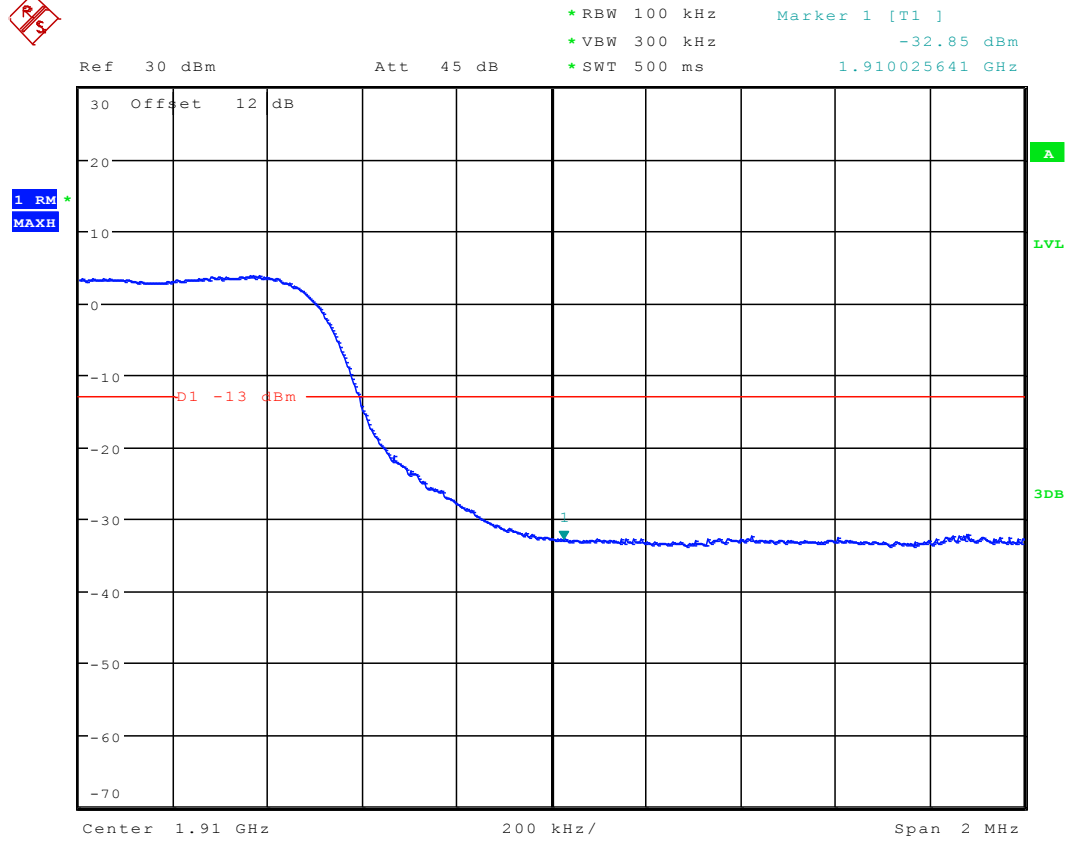
QPSK/partial RBs/RB #max



Date: 24.NOV.2011 16:05:22



QPSK/ full RBs



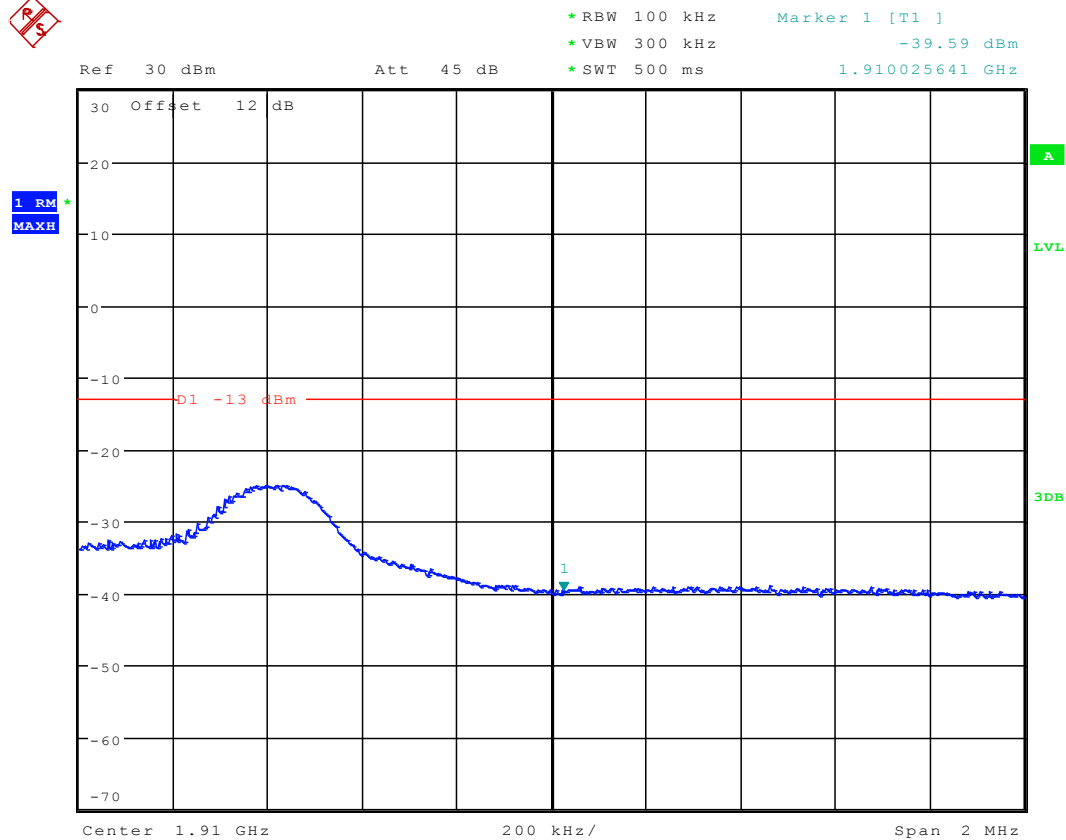
Date: 24.NOV.2011 14:55:09



TM5

Right Edge
10MHz(BW)
Channel 19150

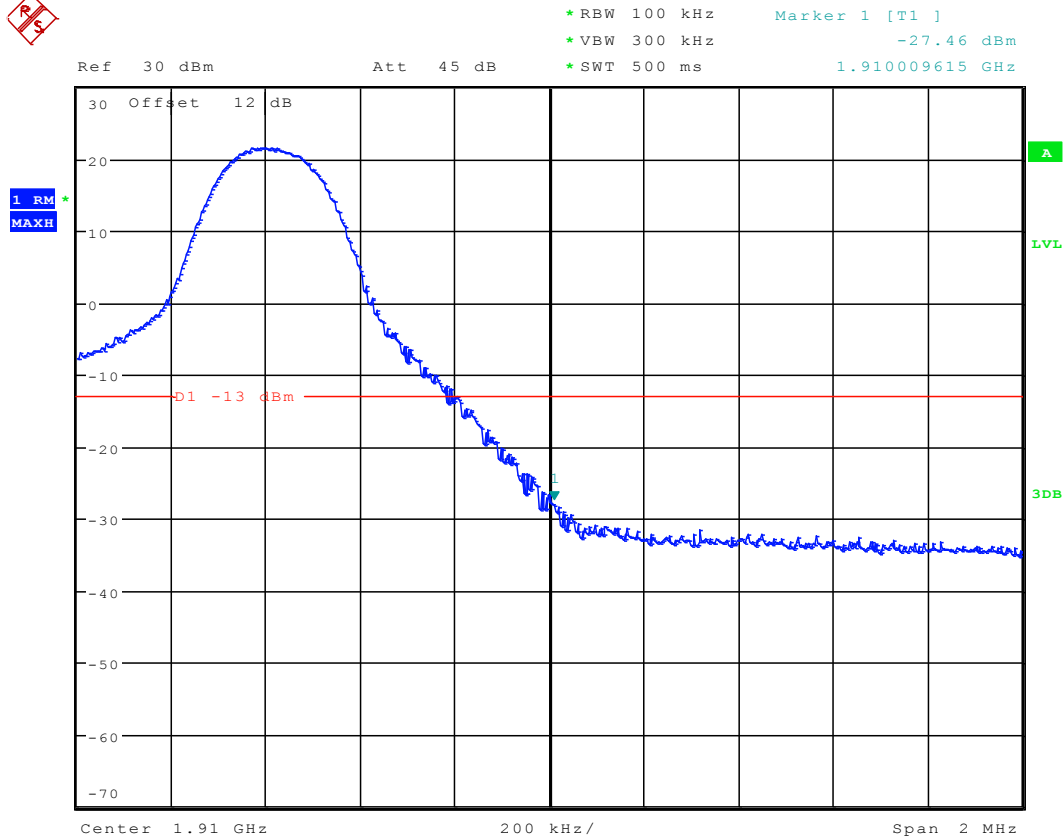
16QAM /1 RB/RB #0



Date: 24.NOV.2011 14:55:47



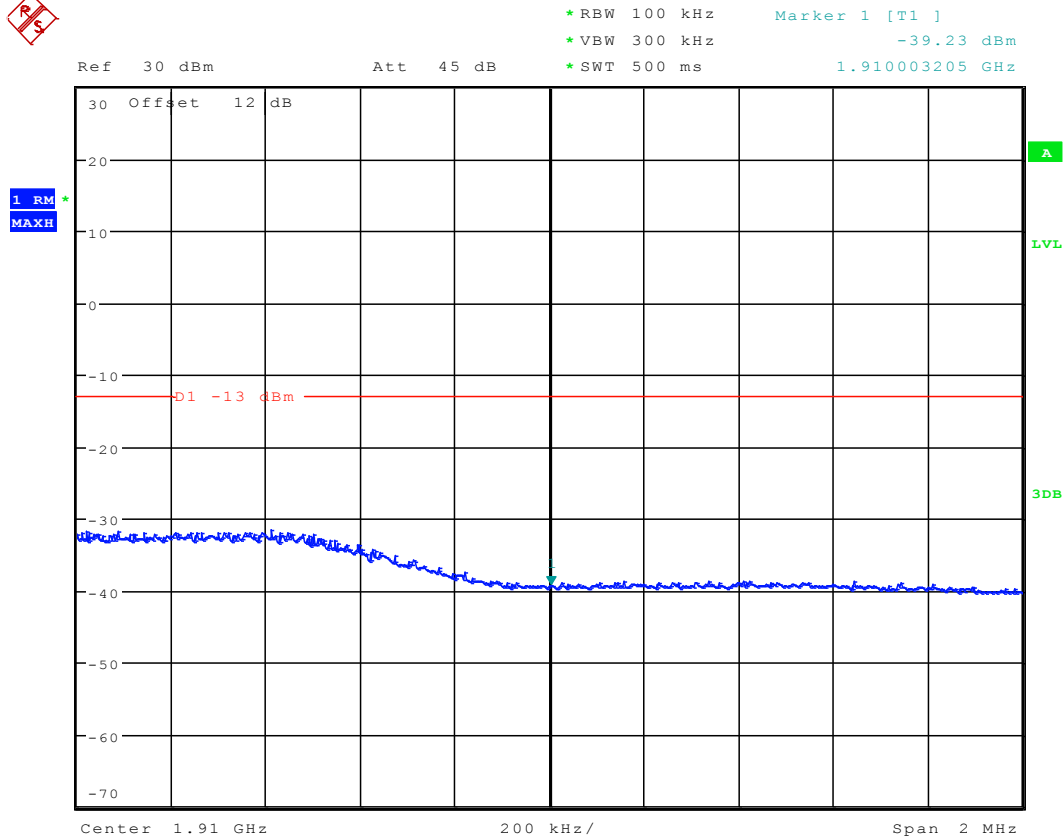
16QAM /1 RB/RB #max



Date: 24.NOV.2011 14:56:46



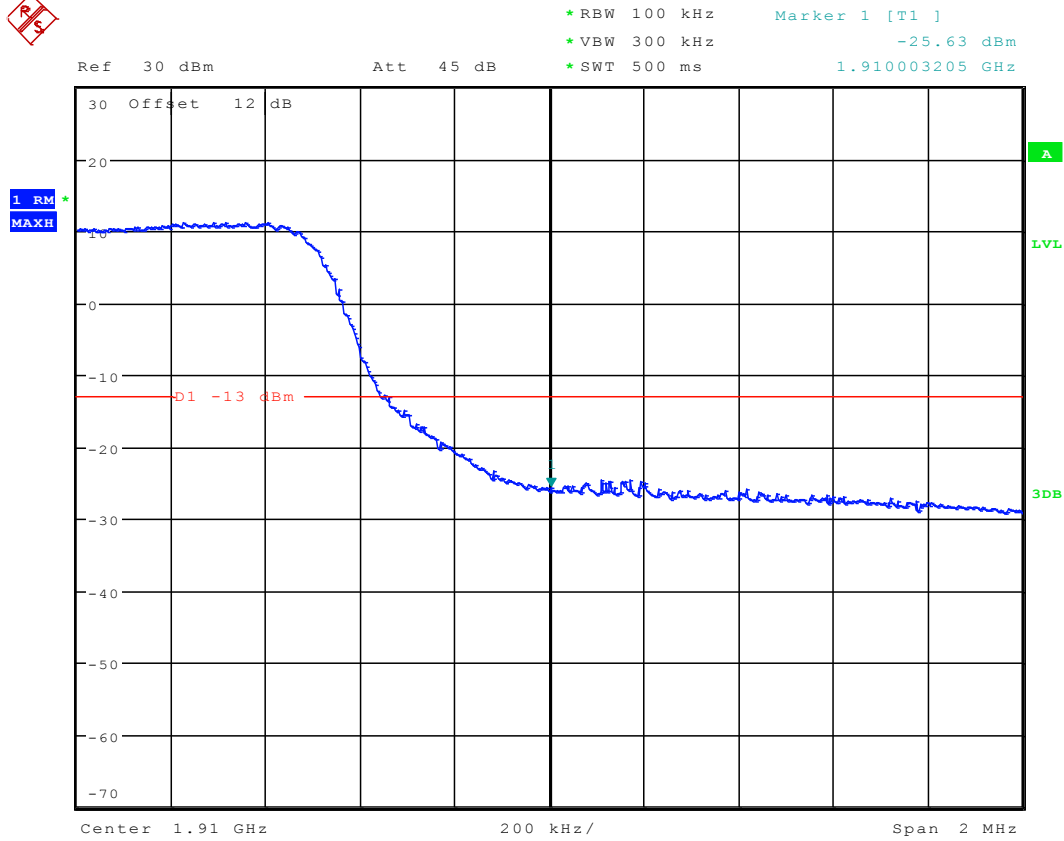
16QAM /partial RBs/RB #0



Date: 24.NOV.2011 16:06:05



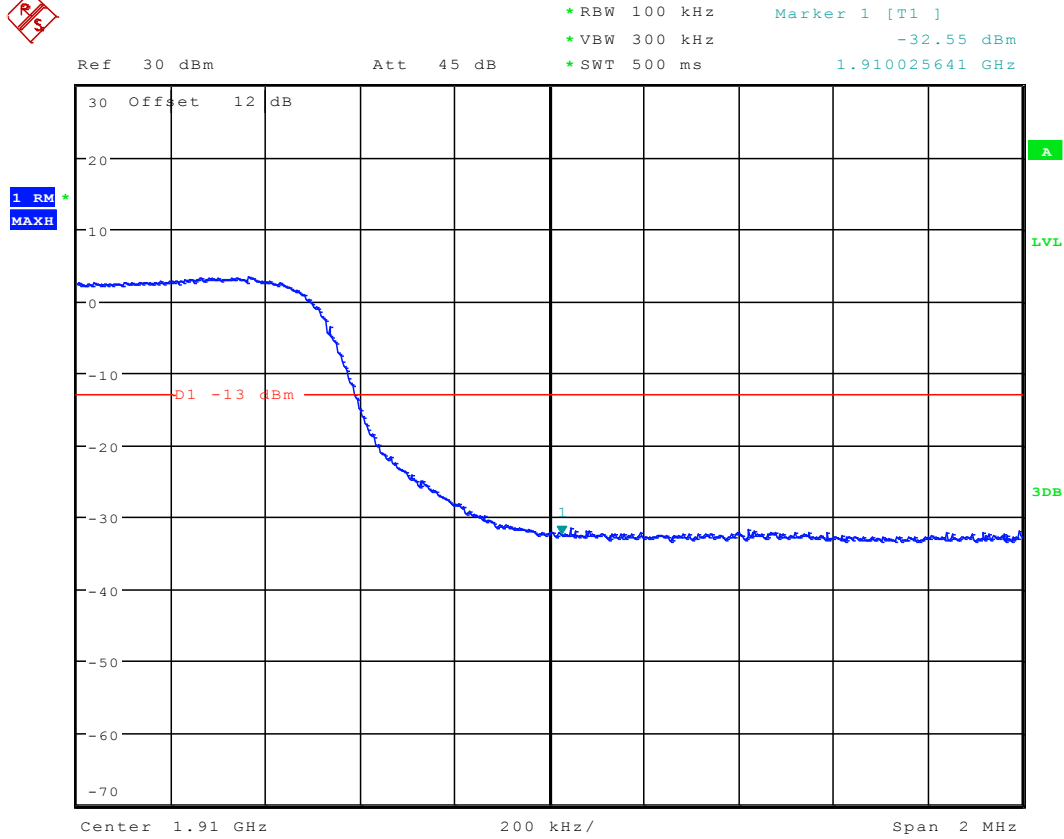
16QAM /partial RBs/RB #max



Date: 24.NOV.2011 16:05:44



16QAM/full RBs



Date: 24.NOV.2011 14:55:30