



FCC RF Test Report

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

Model Number: HUAWEI M920

**Report No: SYBH(Z-RF)005112011-2003
FCC ID: QISM920**

Reliability Laboratory of Huawei Technologies Co., Ltd.

Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R. China

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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

Operator

Nov.26, 2011
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Signature

Contents

1	<u>General Information</u>	5
1.1	APPLIED STANDARD	5
1.2	TEST LOCATION	5
1.3	TEST ENVIRONMENT CONDITION	5
2	<u>Summary</u>	6
3	<u>Product Description</u>	7
3.1	PRODUCTION INFORMATION	7
4	<u>Test Description</u>	8
4.1	SUPPORTED FREQUENCY RANGE	8
4.2	TRANSMITTER / RECEIVER CHARACTERISTICS	8
4.3	ANTENNA GAIN	8
4.4	POWER SUPPLY	8
5	<u>General Test Conditions / Configurations</u>	9
5.1	RF CHANNELS UNDER TEST	9
5.2	TEST MODES	10
5.3	TEST ENVIRONMENTS	10
5.4	TEST SETUPS	11
5.5	TEST CONDITIONS	13
6	<u>Main Test Instruments</u>	15
7	<u>Test Results</u>	16
8	<u>Measurement Uncertainty</u>	17

1 General Information

1.1 Applied Standard

Applied Rules: 47 CFR FCC Part 2, Subpart J
47 CFR FCC Part 27, Subpart C&L
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

AWS Band			
Test Case	FCC Part No.	Requirements	Result
Transmitter Output Power	2.1046 & 27.50(d)	Peak EIRP not exceed 1 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 & 27.53(h)	Below -13 dBm/1%*EBW, in 1 MHz range	Pass
Spurious Emission at Antenna Terminals	2.1051 & 27.53(h)	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 & 27.53(h)	Below -13 dBm/1 MHz	Pass
Frequency Stability	2.1055 & 27.54	Stay within the authorized bands of operation	Pass

3 Product Description

3.1 Production Information

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 IV and AWS 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.

3.1.1 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

3.1.2 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

3.1.3 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	2110 to 2155 MHz
Uplink	1710 to 1755 MHz

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 (Cellular 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 (Cellular 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) to CDMA	-1.83
Antenna Gain(dBi) to LTE	-1.59

4.4 Power Supply

Specification	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 450	Channel 875
		1711.25MHz	1732.5MHz	1753.75MHz
	RX	Channel 25	Channel 450	Channel 875
		2111.25MHz	2132.5MHz	2153.75MHz
LTE	TX (1.4M)	Channel 19957	Channel 20175	Channel 20393
		1710.7 MHz	1732.5MHz	1754.3 MHz
	TX (3M)	Channel 19965	Channel 20175	Channel 20385
		1711.5 MHz	1732.5MHz	1753.5 MHz
	TX (5M)	Channel 19975	Channel 20175	Channel 20375
		1712.5 MHz	1732.5MHz	1752.5 MHz
	TX (10M)	Channel 20000	Channel 20175	Channel 20350
		1715.0 MHz	1732.5MHz	1750.0 MHz
	RX (1.4M)	Channel 1957	Channel 2175	Channel 2393
		2110.7 MHz	2132.5MHz	2154.3 MHz
	RX (3M)	Channel 1965	Channel 2175	Channel 2385
		2111.5 MHz	2132.5MHz	2153.5MHz
	RX (5M)	Channel 1975	Channel 2175	Channel 2375
		2112.5 MHz	2132.5MHz	2152.5 MHz
	RX (10M)	Channel 2000	Channel 2175	Channel 2350
		2115.0 MHz	2132.5MHz	2150.0 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

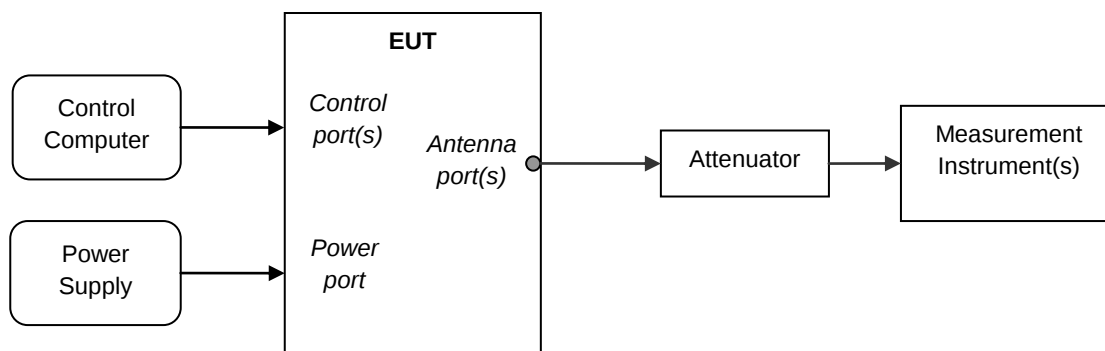
NOTE: VL= lower extreme test voltages
VN= nominal voltage
VH= upper extreme test voltage
TN= normal temperature

5.4 Test Setups

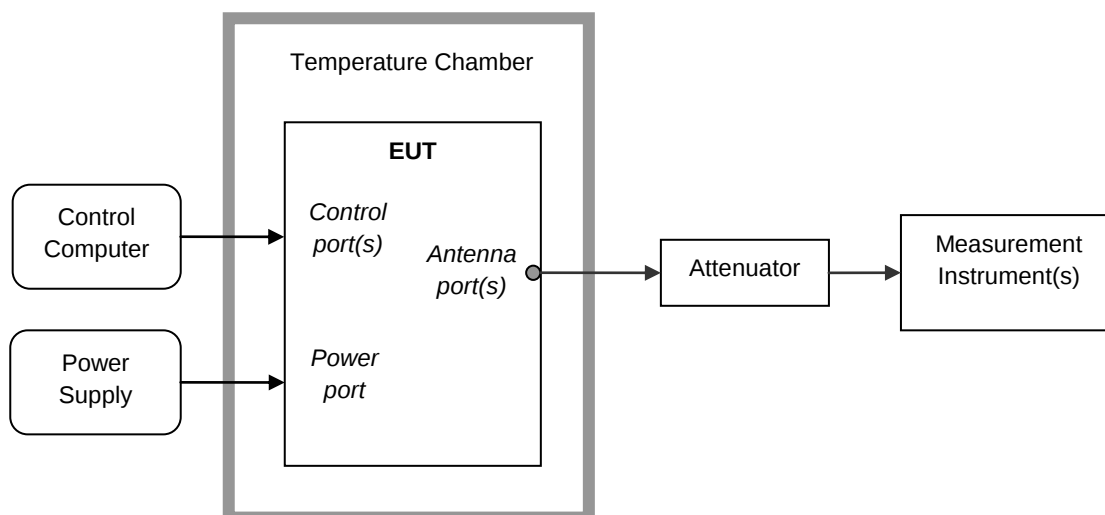
5.4.1 General Test Setup Configurations

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



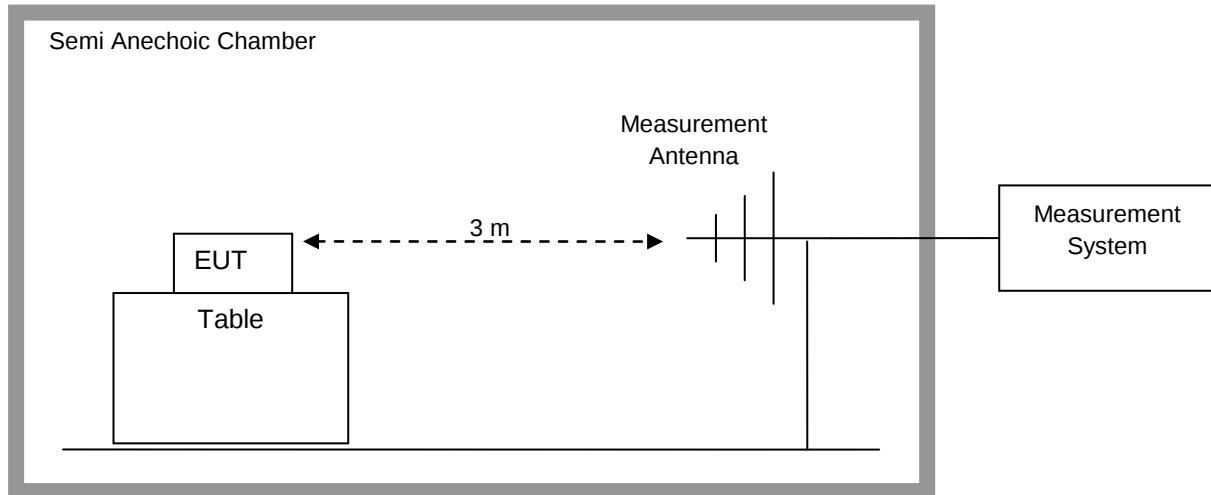
5.4.3 Test Setup 2



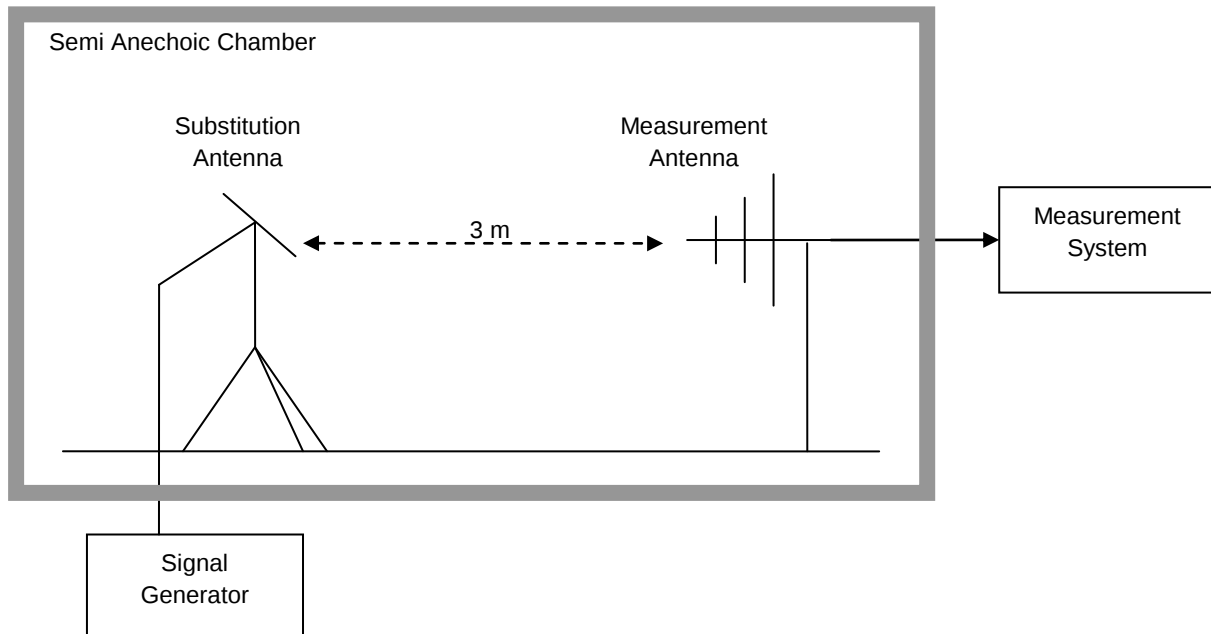
5.4.4 Test Setup 3

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 & Part 27.50



Conducted Power of Transmitter

Table 1 Measurement Results(CDMA)

TEST CONDITIONS (TN/VN)	RF Output Power(Conducted)					
	Channel 25(B) 1711.25MHz		Channel 450(M) 1732.50MHz		Channel 875(T) 1753.75MHz	
	dBm		dBm		dBm	
	Measure d	Limit	Measure d	Limit	Measure d	Limit
TM1	23.63	30.0	23.73	30.0	23.66	30.0
TM3	23.55	30.0	23.75	30.0	23.68	30.0
Subtype 0	23.33	30.0	23.57	30.0	23.49	30.0
Subtype 2	23.56	30.0	23.73	30.0	23.58	30.0



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	22.27	30.0
		1 RB/#max	22.32	30.0
		3 RB/#2	22.20	30.0
		Full	21.29	30.0
	16QAM	1 RB/#0	21.96	30.0
		1 RB/#max	21.88	30.0
		3 RB/#2	21.53	30.0
		Full	20.84	30.0
Channel (B) 3MHz(BW)	QPSK	1 RB/#0	22.34	30.0
		1 RB/#max	22.22	30.0
		8 RB/#4	21.04	30.0
		Full	21.21	30.0
	16QAM	1 RB/#0	21.86	30.0
		1 RB/#max	21.84	30.0
		8 RB/#4	20.88	30.0
		Full	20.72	30.0
Channel (B) 5MHz(BW)	QPSK	1 RB/#0	22.40	30.0
		1 RB/#max	22.34	30.0
		12 RB/#6	21.06	30.0
		Full	21.15	30.0
	16QAM	1 RB/#0	21.45	30.0
		1 RB/#max	21.27	30.0



		12 RB/#6	20.68	30.0
		Full	20.85	30.0
Channel (B) 10MHz(BW)	QPSK	1 RB/#0	22.23	30.0
		1 RB/#max	22.11	30.0
		25 RB/#13	21.07	30.0
		Full	21.13	30.0
	16QAM	1 RB/#0	21.78	30.0
		1 RB/#max	21.7	30.0
		25 RB/#13	20.71	30.0
		Full	20.76	30.0
Channel (M) 1.4MHz(BW)	QPSK	1 RB/#0	22.02	30.0
		1 RB/#max	22.06	30.0
		3 RB/#2	21.89	30.0
		Full	21.62	30.0
	16QAM	1 RB/#0	21.78	30.0
		1 RB/#max	21.65	30.0
		3 RB/#2	21.30	30.0
		Full	20.61	30.0
Channel (M) 3MHz(BW)	QPSK	1 RB/#0	22.13	30.0
		1 RB/#max	22.02	30.0
		8 RB/#4	20.92	30.0
		Full	20.95	30.0
	16QAM	1 RB/#0	21.61	30.0
		1 RB/#max	21.58	30.0
		8 RB/#4	20.5	30.0



		Full	20.44	30.0
Channel (M) 5MHz(BW)	QPSK	1 RB/#0	22.03	30.0
		1 RB/#max	22.19	30.0
		12 RB/#6	20.85	30.0
		Full	20.9	30.0
	16QAM	1 RB/#0	21.14	30.0
		1 RB/#max	21.1	30.0
		12 RB/#6	20.44	30.0
		Full	20.37	30.0
Channel (M) 10MHz(BW)	QPSK	1 RB/#0	21.81	30.0
		1 RB/#max	22.11	30.0
		25 RB/#13	20.93	30.0
		Full	20.77	30.0
	16QAM	1 RB/#0	21.53	30.0
		1 RB/#max	21.62	30.0
		25 RB/#13	20.32	30.0
		Full	20.21	30.0
Channel (T) 1.4MHz(BW)	QPSK	1 RB/#0	21.27	30.0
		1 RB/#max	21.32	30.0
		3 RB/#2	21.15	30.0
		Full	20.29	30.0
	16QAM	1 RB/#0	20.98	30.0
		1 RB/#max	20.86	30.0
		3 RB/#2	20.52	30.0
		Full	20.11	30.0



Channel (T) 3MHz(BW)	QPSK	1 RB/#0	21.64	30.0
		1 RB/#max	21.40	30.0
		8 RB/#4	20.2	30.0
		Full	20.41	30.0
	16QAM	1 RB/#0	21.08	30.0
		1 RB/#max	21.01	30.0
		8 RB/#4	20.01	30.0
		Full	19.95	30.0
Channel (T) 5MHz(BW)	QPSK	1 RB/#0	21.75	30.0
		1 RB/#max	21.47	30.0
		12 RB/#6	20.43	30.0
		Full	20.45	30.0
	16QAM	1 RB/#0	20.91	30.0
		1 RB/#max	20.55	30.0
		12 RB/#6	20.02	30.0
		Full	20.27	30.0
Channel (T) 10MHz(BW)	QPSK	1 RB/#0	22.30	30.0
		1 RB/#max	21.52	30.0
		25 RB/#13	20.69	30.0
		Full	20.71	30.0
	16QAM	1 RB/#0	21.85	30.0
		1 RB/#max	21.12	30.0
		25 RB/#13	20.31	30.0
		Full	20.41	30.0



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	6.55	13.0	6.72	13.0	6.42	13.0
TM3	6.43	13.0	6.51	13.0	6.63	13.0
Subtype 0	6.56	13.0	6.82	13.0	6.59	13.0
Subtype 2	6.63	13.0	6.63	13.0	6.57	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	6.42	13.0
		1 RB/#max	6.56	13.0
		3 RB/#2	6.37	13.0
		Full	6.29	13.0
	16QAM	1 RB/#0	6.29	13.0
		1 RB/#max	6.37	13.0
		3 RB/#2	6.48	13.0
		Full	6.53	13.0
Channel (B) 3MHz(BW)	QPSK	1 RB/#0	6.49	13.0
		1 RB/#max	6.50	13.0
		8 RB/#4	6.42	13.0
		Full	6.55	13.0
	16QAM	1 RB/#0	6.50	13.0
		1 RB/#max	6.36	13.0
		8 RB/#4	6.29	13.0
		Full	6.43	13.0
Channel (B) 5MHz(BW)	QPSK	1 RB/#0	6.52	13.0
		1 RB/#max	6.64	13.0
		12 RB/#6	6.45	13.0
		Full	6.37	13.0
	16QAM	1 RB/#0	6.46	13.0
		1 RB/#max	6.28	13.0



		12 RB/#6	6.15	13.0
		Full	6.19	13.0
Channel (B) 10MHz(BW)	QPSK	1 RB/#0	6.17	13.0
		1 RB/#max	6.43	13.0
		25 RB/#13	6.23	13.0
		Full	6.18	13.0
	16QAM	1 RB/#0	6.33	13.0
		1 RB/#max	6.19	13.0
		25 RB/#13	6.66	13.0
		Full	6.38	13.0
Channel (M) 1.4MHz(BW)	QPSK	1 RB/#0	6.36	13.0
		1 RB/#max	6.20	13.0
		3 RB/#2	6.18	13.0
		Full	6.42	13.0
	16QAM	1 RB/#0	6.22	13.0
		1 RB/#max	6.41	13.0
		3 RB/#2	6.42	13.0
		Full	6.64	13.0
Channel (M) 3MHz(BW)	QPSK	1 RB/#0	6.53	13.0
		1 RB/#max	6.46	13.0
		8 RB/#4	6.50	13.0
		Full	6.76	13.0
	16QAM	1 RB/#0	6.29	13.0
		1 RB/#max	6.60	13.0
		8 RB/#4	6.62	13.0



		Full	6.55	13.0
Channel (M) 5MHz(BW)	QPSK	1 RB/#0	6.28	13.0
		1 RB/#max	6.37	13.0
		12 RB/#6	6.31	13.0
		Full	6.26	13.0
	16QAM	1 RB/#0	6.19	13.0
		1 RB/#max	6.21	13.0
		12 RB/#6	6.57	13.0
		Full	6.63	13.0
Channel (M) 10MHz(BW)	QPSK	1 RB/#0	6.58	13.0
		1 RB/#max	6.47	13.0
		25 RB/#13	6.28	13.0
		Full	6.41	13.0
	16QAM	1 RB/#0	6.22	13.0
		1 RB/#max	6.39	13.0
		25 RB/#13	6.39	13.0
		Full	6.28	13.0
Channel (T) 1.4MHz(BW)	QPSK	1 RB/#0	6.44	13.0
		1 RB/#max	6.38	13.0
		3 RB/#2	6.44	13.0
		Full	6.49	13.0
	16QAM	1 RB/#0	6.38	13.0
		1 RB/#max	6.26	13.0
		3 RB/#2	6.53	13.0
		Full	6.42	13.0



Channel (T) 3MHz(BW)	QPSK	1 RB/#0	6.37	13.0
		1 RB/#max	6.48	13.0
		8 RB/#4	6.62	13.0
		Full	6.17	13.0
	16QAM	1 RB/#0	6.34	13.0
		1 RB/#max	6.57	13.0
		8 RB/#4	6.39	13.0
		Full	6.28	13.0
Channel (T) 5MHz(BW)	QPSK	1 RB/#0	6.31	13.0
		1 RB/#max	6.28	13.0
		12 RB/#6	6.19	13.0
		Full	6.64	13.0
	16QAM	1 RB/#0	6.48	13.0
		1 RB/#max	6.52	13.0
		12 RB/#6	6.50	13.0
		Full	6.42	13.0
Channel (T) 10MHz(BW)	QPSK	1 RB/#0	6.17	13.0
		1 RB/#max	6.39	13.0
		25 RB/#13	6.19	13.0
		Full	6.52	13.0
	16QAM	1 RB/#0	6.22	13.0
		1 RB/#max	6.43	13.0
		25 RB/#13	6.26	13.0
		Full	6.54	13.0



Test Plot of Peak-to-Average Ratio

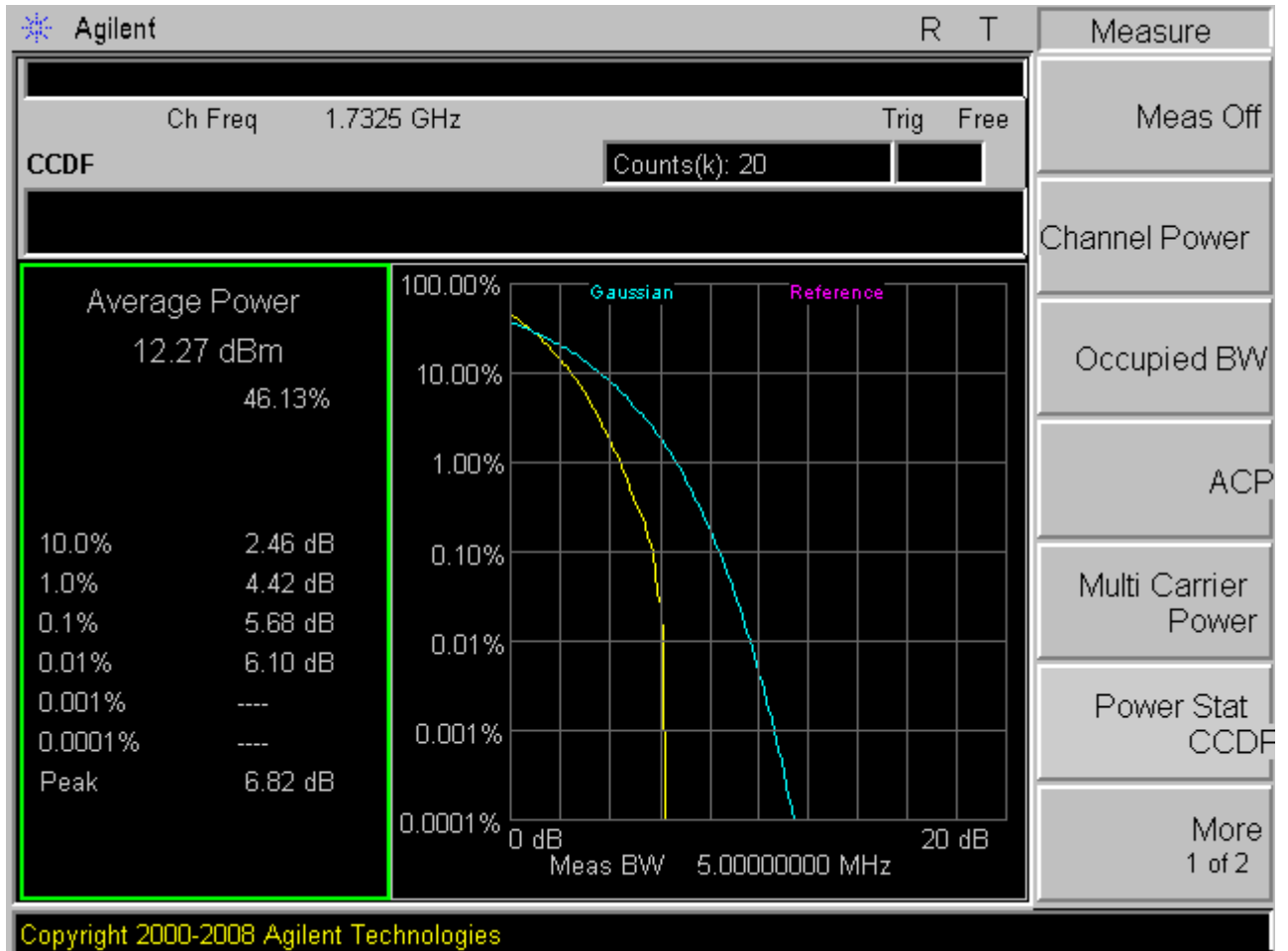
Note: All relevant operation modes have been tested, and the worst case Plot is included in this report.

CDMA





EVDO





LTE 1RB_5MHz(BW) 1 RB/#max





LTE 50%RB_10MHz(BW) 25 RB/#12





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	1711.25	21.80	Horn Ant.	18.32	4.5	1	21.82	30	Pass
TM1	1732.5	21.90	Horn Ant.	18.44	4.5	1	21.94	30	Pass
TM1	1753.75	21.83	Horn Ant.	18.07	4.8	1	21.87	30	Pass
TM3	1711.25	21.72	Horn Ant.	18.27	4.5	1	21.77	30	Pass
TM3	1732.5	21.92	Horn Ant.	18.48	4.5	1	21.98	30	Pass
TM3	1753.75	21.85	Horn Ant.	18.02	4.8	1	21.82	30	Pass
Subtype 0	1711.25	21.50	Horn Ant.	18.07	4.5	1	21.57	30	Pass
Subtype 0	1732.5	21.74	Horn Ant.	18.27	4.5	1	21.77	30	Pass
Subtype 0	1753.75	21.66	Horn Ant.	17.82	4.8	1	21.62	30	Pass
Subtype 2	1711.25	21.73	Horn Ant.	18.25	4.5	1	21.75	30	Pass
Subtype 2	1732.5	21.90	Horn Ant.	18.43	4.5	1	21.93	30	Pass
Subtype 2	1753.75	21.75	Horn Ant.	17.97	4.8	1	21.77	30	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	20.68	Horn Ant.	17.16	4.5	1	20.66	30	Pass
		1 RB/#max	20.73	Horn Ant.	17.25	4.5	1	20.75	30	Pass
		3 RB/#2	20.61	Horn Ant.	17.14	4.5	1	20.64	30	Pass
		Full	19.70	Horn Ant.	16.23	4.5	1	19.73	30	Pass
	16QAM	1 RB/#0	20.37	Horn Ant.	16.89	4.5	1	20.39	30	Pass
		1 RB/#max	20.29	Horn Ant.	16.77	4.5	1	20.27	30	Pass
		3 RB/#2	19.94	Horn Ant.	16.45	4.5	1	19.95	30	Pass
		Full	19.25	Horn Ant.	15.71	4.5	1	19.21	30	Pass
Channel (B) 3MHz(BW)	QPSK	1 RB/#0	20.75	Horn Ant.	17.27	4.5	1	20.77	30	Pass
		1 RB/#max	20.63	Horn Ant.	17.16	4.5	1	20.66	30	Pass
		8 RB/#4	19.45	Horn Ant.	15.98	4.5	1	19.48	30	Pass
		Full	19.62	Horn Ant.	16.17	4.5	1	19.67	30	Pass
	16QAM	1 RB/#0	20.27	Horn Ant.	16.73	4.5	1	20.23	30	Pass
		1 RB/#max	20.25	Horn Ant.	16.72	4.5	1	20.22	30	Pass
		8 RB/#4	19.29	Horn Ant.	15.71	4.5	1	19.21	30	Pass
		Full	19.13	Horn Ant.	15.67	4.5	1	19.17	30	Pass
Channel (B)	QPSK	1 RB/#0	20.81	Horn Ant.	17.38	4.5	1	20.88	30	Pass



5MHz(BW)		1 RB/#max	20.75	Horn Ant.	17.27	4.5	1	20.77	30	Pass
		12 RB/#6	19.47	Horn Ant.	15.92	4.5	1	19.42	30	Pass
		Full	19.56	Horn Ant.	16.07	4.5	1	19.57	30	Pass
	16QAM	1 RB/#0	19.86	Horn Ant.	16.32	4.5	1	19.82	30	Pass
		1 RB/#max	19.68	Horn Ant.	16.13	4.5	1	19.63	30	Pass
		12 RB/#6	19.09	Horn Ant.	15.52	4.5	1	19.02	30	Pass
		Full	19.26	Horn Ant.	15.71	4.5	1	19.21	30	Pass
Channel (B) 10MHz(BW)	QPSK	1 RB/#0	20.64	Horn Ant.	17.17	4.5	1	20.67	30	Pass
		1 RB/#max	20.52	Horn Ant.	17.05	4.5	1	20.55	30	Pass
		25 RB/#13	19.48	Horn Ant.	15.92	4.5	1	19.42	30	Pass
		Full	19.54	Horn Ant.	16.07	4.5	1	19.57	30	Pass
	16QAM	1 RB/#0	20.19	Horn Ant.	16.63	4.5	1	20.13	30	Pass
		1 RB/#max	20.11	Horn Ant.	16.68	4.5	1	20.18	30	Pass
		25 RB/#13	19.12	Horn Ant.	15.62	4.5	1	19.12	30	Pass
		Full	19.17	Horn Ant.	15.62	4.5	1	19.12	30	Pass
Channel (M) 1.4MHz(BW)	QPSK	1 RB/#0	20.43	Horn Ant.	16.95	4.5	1	20.45	30	Pass
		1 RB/#max	20.47	Horn Ant.	16.92	4.5	1	20.42	30	Pass
		3 RB/#2	20.30	Horn Ant.	16.83	4.5	1	20.33	30	Pass
		Full	20.03	Horn Ant.	16.57	4.5	1	20.07	30	Pass
	16QAM	1 RB/#0	20.19	Horn Ant.	16.65	4.5	1	20.15	30	Pass
		1 RB/#max	20.06	Horn Ant.	16.52	4.5	1	20.02	30	Pass



		3 RB/#2	19.71	Horn Ant.	16.27	4.5	1	19.77	30	Pass
		Full	19.02	Horn Ant.	15.55	4.5	1	19.05	30	Pass
Channel (M) 3MHz(BW)	QPSK	1 RB/#0	20.54	Horn Ant.	17.09	4.5	1	20.59	30	Pass
		1 RB/#max	20.43	Horn Ant.	16.96	4.5	1	20.46	30	Pass
		8 RB/#4	19.33	Horn Ant.	15.87	4.5	1	19.37	30	Pass
		Full	19.36	Horn Ant.	15.88	4.5	1	19.38	30	Pass
	16QAM	1 RB/#0	20.02	Horn Ant.	16.55	4.5	1	20.05	30	Pass
		1 RB/#max	19.99	Horn Ant.	16.42	4.5	1	19.92	30	Pass
		8 RB/#4	18.91	Horn Ant.	15.43	4.5	1	18.93	30	Pass
		Full	18.85	Horn Ant.	15.34	4.5	1	18.84	30	Pass
Channel (M) 5MHz(BW)	QPSK	1 RB/#0	20.44	Horn Ant.	16.97	4.5	1	20.47	30	Pass
		1 RB/#max	20.6	Horn Ant.	17.18	4.5	1	20.68	30	Pass
		12 RB/#6	19.26	Horn Ant.	15.73	4.5	1	19.23	30	Pass
		Full	19.31	Horn Ant.	15.82	4.5	1	19.32	30	Pass
	16QAM	1 RB/#0	19.55	Horn Ant.	16.00	4.5	1	19.50	30	Pass
		1 RB/#max	19.51	Horn Ant.	16.07	4.5	1	19.57	30	Pass
		12 RB/#6	18.85	Horn Ant.	15.30	4.5	1	18.80	30	Pass
		Full	18.78	Horn Ant.	15.22	4.5	1	18.72	30	Pass
Channel (M) 10MHz(BW)	QPSK	1 RB/#0	20.22	Horn Ant.	16.75	4.5	1	20.25	30	Pass
		1 RB/#max	20.52	Horn Ant.	17.05	4.5	1	20.55	30	Pass
		25 RB/#13	19.34	Horn Ant.	15.83	4.5	1	19.33	30	Pass



	16QAM	Full	19.18	Horn Ant.	15.64	4.5	1	19.14	30	Pass
		1 RB/#0	19.94	Horn Ant.	16.47	4.5	1	19.97	30	Pass
		1 RB/#max	20.03	Horn Ant.	16.58	4.5	1	20.08	30	Pass
		25 RB/#13	18.73	Horn Ant.	15.20	4.5	1	18.70	30	Pass
		Full	18.62	Horn Ant.	15.16	4.5	1	18.66	30	Pass
Channel (T) 1.4MHz(BW)	QPSK	1 RB/#0	19.68	Horn Ant.	15.82	4.8	1	19.62	30	Pass
		1 RB/#max	19.73	Horn Ant.	15.95	4.8	1	19.75	30	Pass
		3 RB/#2	19.56	Horn Ant.	15.77	4.8	1	19.57	30	Pass
		Full	18.70	Horn Ant.	14.99	4.8	1	18.79	30	Pass
	16QAM	1 RB/#0	19.39	Horn Ant.	15.52	4.8	1	19.32	30	Pass
		1 RB/#max	19.27	Horn Ant.	15.44	4.8	1	19.24	30	Pass
		3 RB/#2	18.93	Horn Ant.	15.15	4.8	1	18.95	30	Pass
		Full	18.52	Horn Ant.	14.74	4.8	1	18.54	30	Pass
Channel (T) 3MHz(BW)	QPSK	1 RB/#0	20.05	Horn Ant.	16.22	4.8	1	20.02	30	Pass
		1 RB/#max	19.81	Horn Ant.	16.07	4.8	1	19.87	30	Pass
		8 RB/#4	18.61	Horn Ant.	14.82	4.8	1	18.62	30	Pass
		Full	18.82	Horn Ant.	15.03	4.8	1	18.83	30	Pass
	16QAM	1 RB/#0	19.49	Horn Ant.	15.67	4.8	1	19.47	30	Pass
		1 RB/#max	19.42	Horn Ant.	15.65	4.8	1	19.45	30	Pass
		8 RB/#4	18.42	Horn Ant.	14.64	4.8	1	18.44	30	Pass
		Full	18.36	Horn Ant.	14.57	4.8	1	18.37	30	Pass



Channel (T) 5MHz(B W)	QPSK	1 RB/#0	20.16	Horn Ant.	16.32	4.8	1	20.12	30	Pass
		1 RB/#max	19.88	Horn Ant.	16.09	4.8	1	19.89	30	Pass
		12 RB/#6	18.84	Horn Ant.	15.00	4.8	1	18.80	30	Pass
		Full	18.86	Horn Ant.	15.02	4.8	1	18.82	30	Pass
	16QAM	1 RB/#0	19.32	Horn Ant.	15.57	4.8	1	19.37	30	Pass
		1 RB/#max	18.96	Horn Ant.	15.12	4.8	1	18.92	30	Pass
		12 RB/#6	18.43	Horn Ant.	14.67	4.8	1	18.47	30	Pass
		Full	18.68	Horn Ant.	14.87	4.8	1	18.67	30	Pass
Channel (T) 10MHz(B W)	QPSK	1 RB/#0	20.71	Horn Ant.	16.92	4.8	1	20.72	30	Pass
		1 RB/#max	19.93	Horn Ant.	16.16	4.8	1	19.96	30	Pass
		25 RB/#13	19.10	Horn Ant.	15.34	4.8	1	19.14	30	Pass
		Full	19.12	Horn Ant.	15.3	4.8	1	19.10	30	Pass
	16QAM	1 RB/#0	20.26	Horn Ant.	16.42	4.8	1	20.22	30	Pass
		1 RB/#max	19.53	Horn Ant.	15.77	4.8	1	19.57	30	Pass
		25 RB/#13	18.72	Horn Ant.	14.93	4.8	1	18.73	30	Pass
		Full	18.82	Horn Ant.	15.06	4.8	1	18.86	30	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



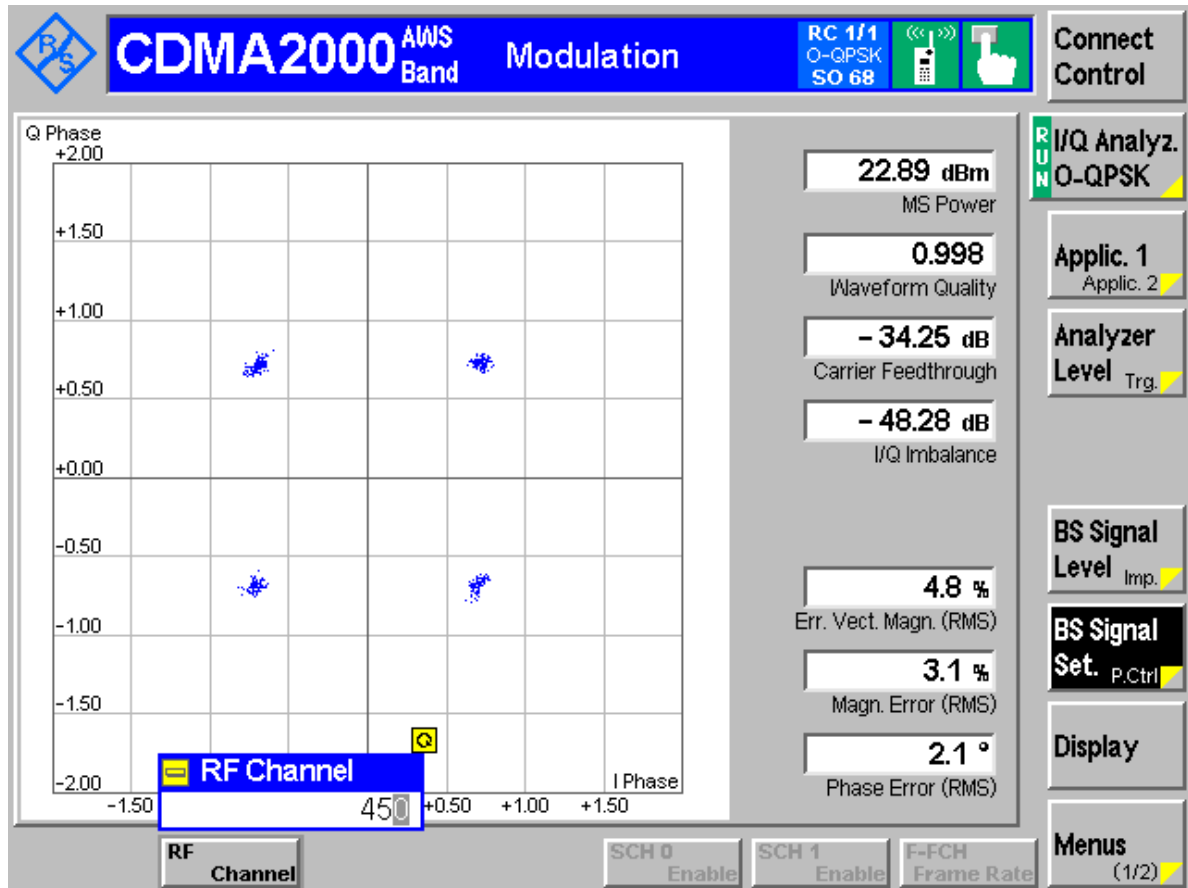
Appendix B

Modulation Characteristics

According to FCC Part 2.1047& Part 27 Subpart E

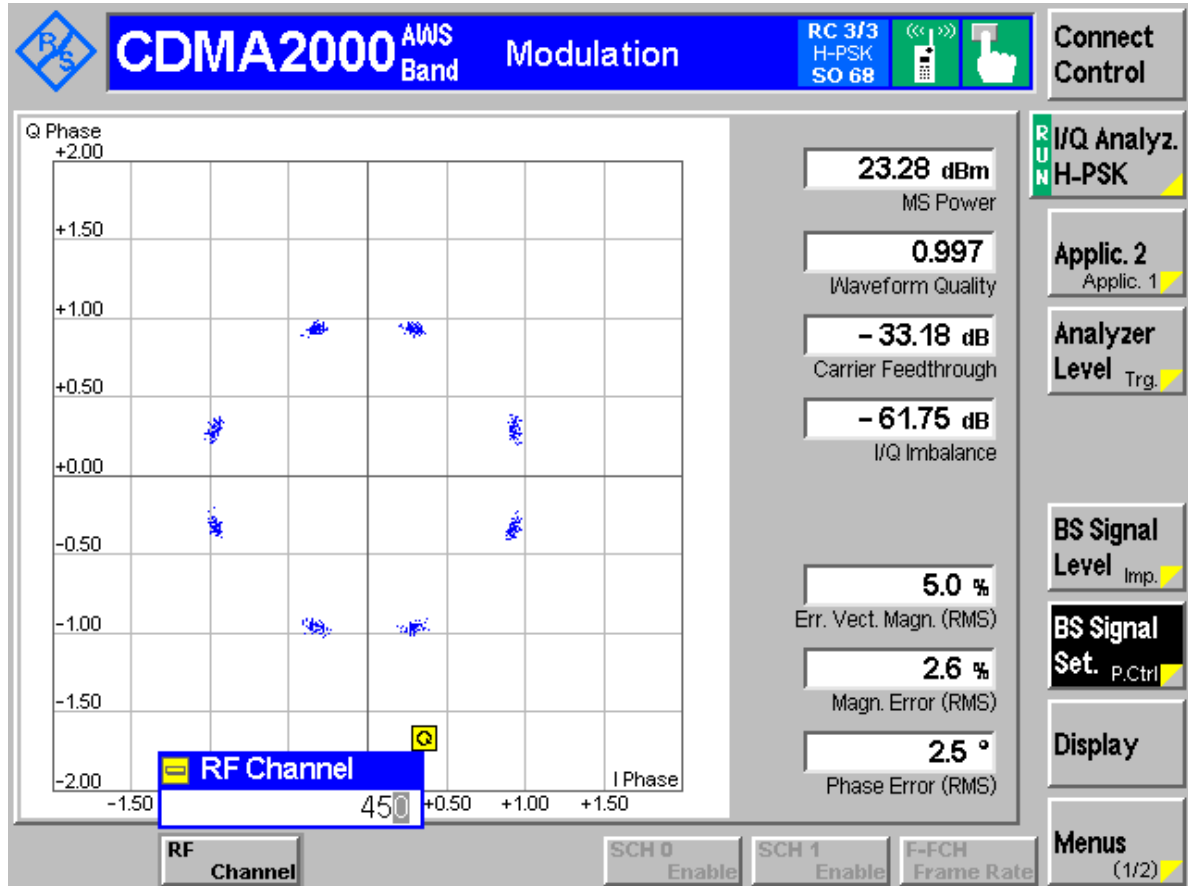


Channel 450 (TM1)



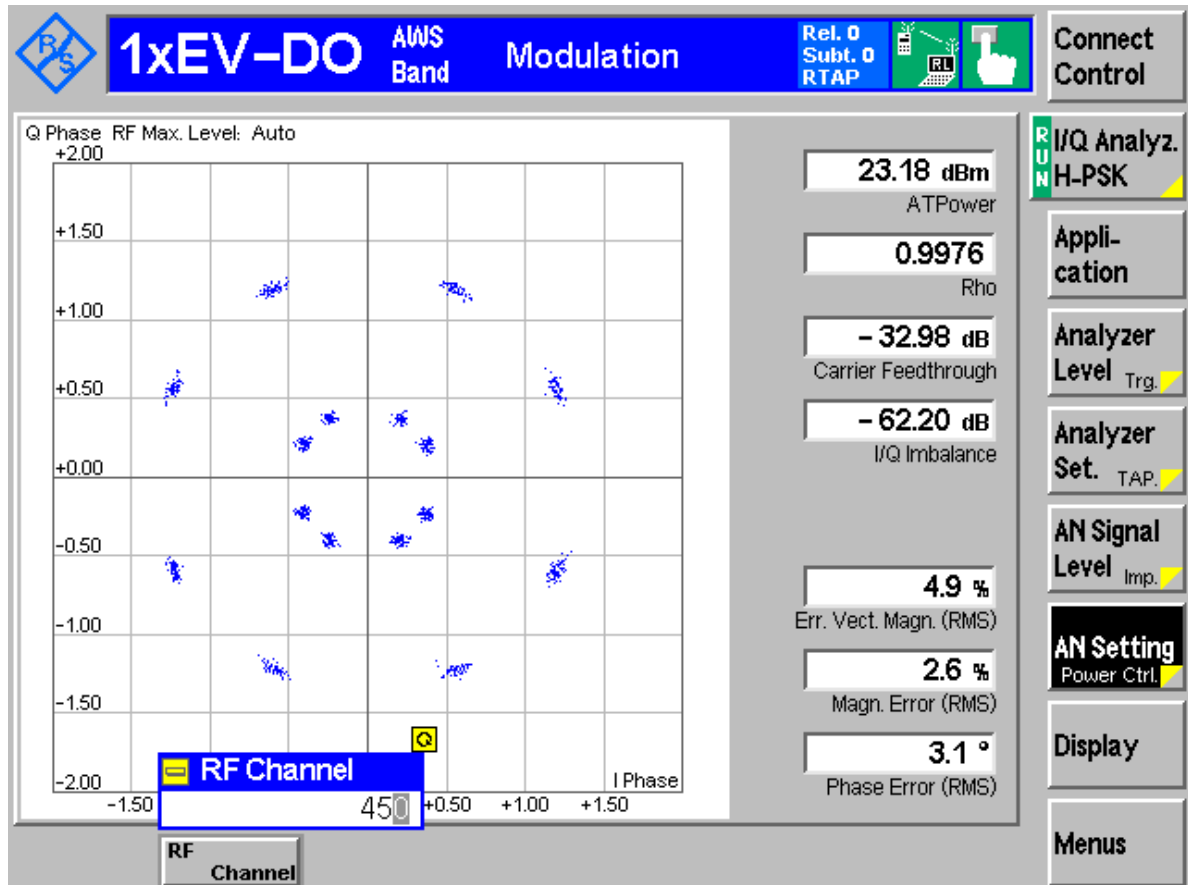


Channel 450 (TM3)





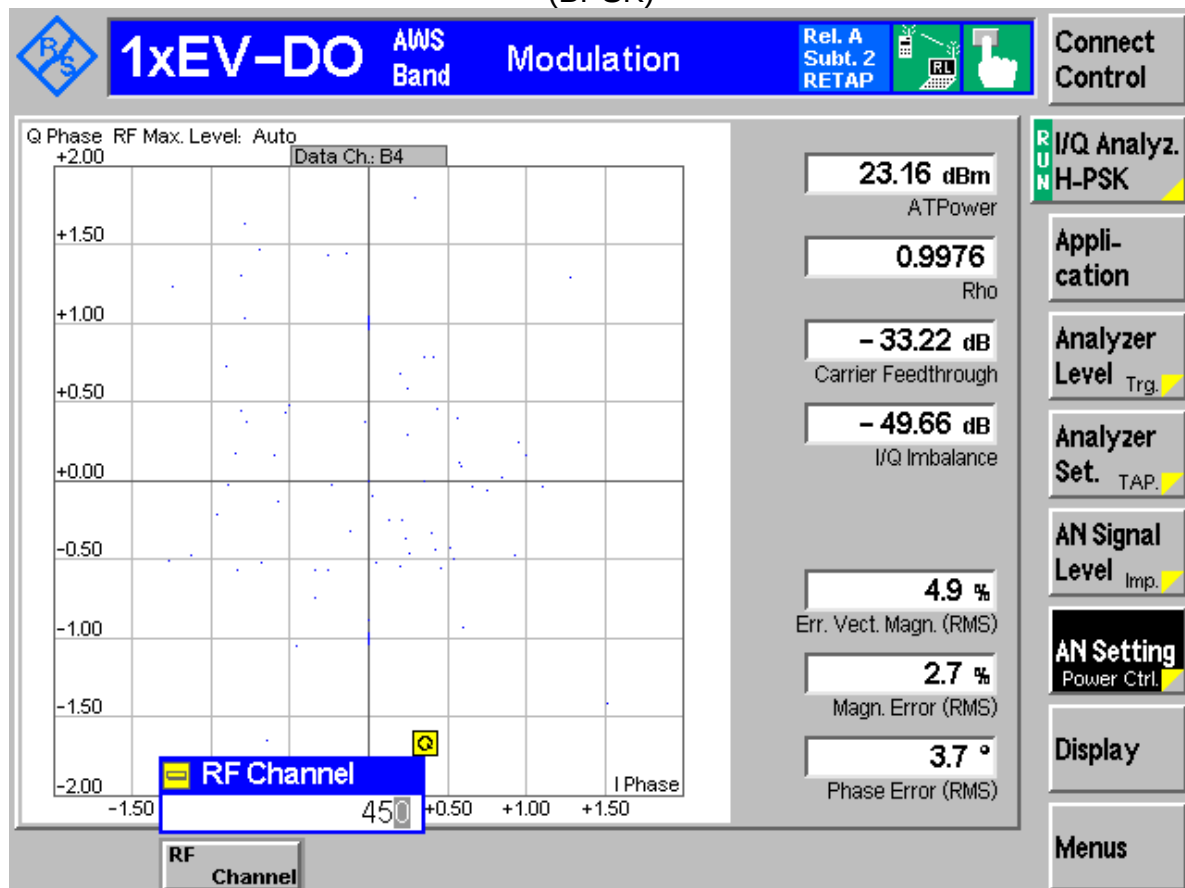
Channel450 (Subtype 0) (HPSK)





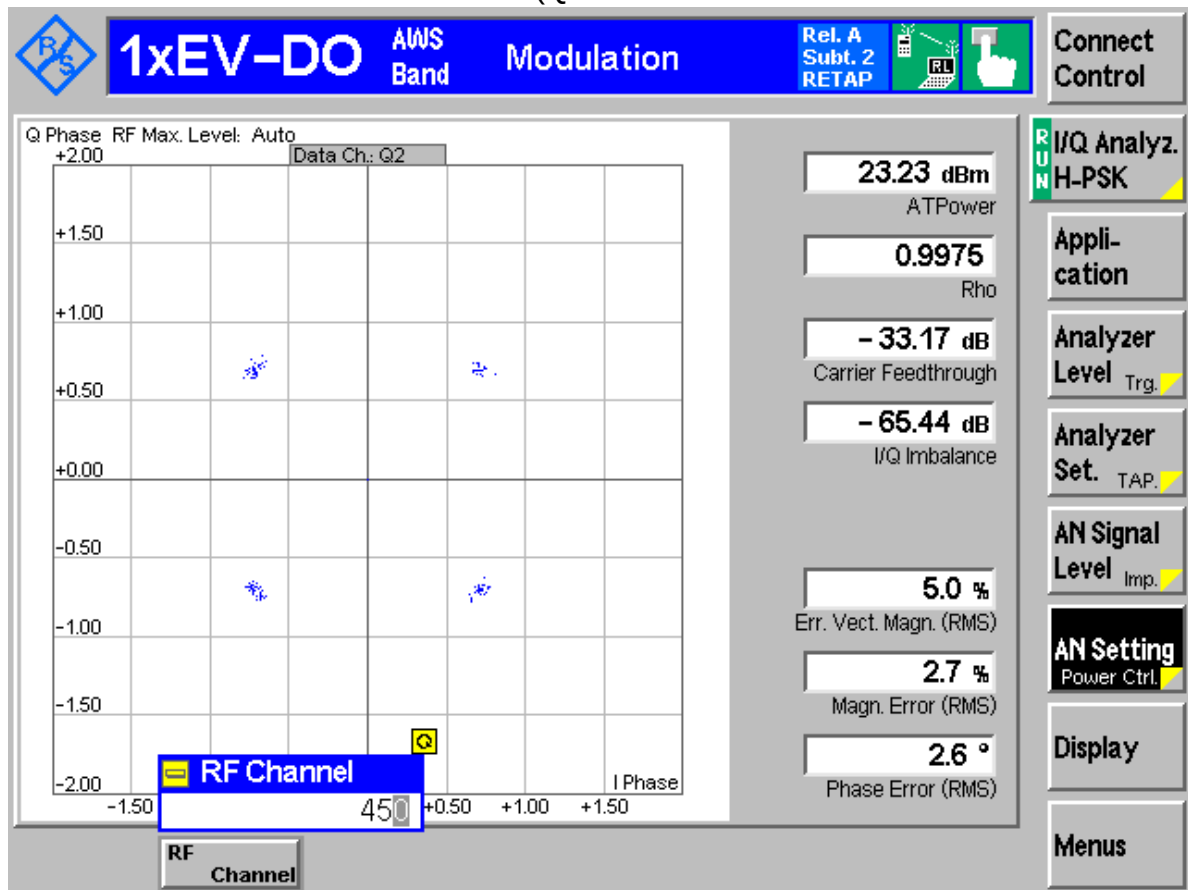
Channel450(Subtype 2)

The R-Data packet size determines the modulation format:
R-Data Pkt Size (256 bits)
(BPSK)



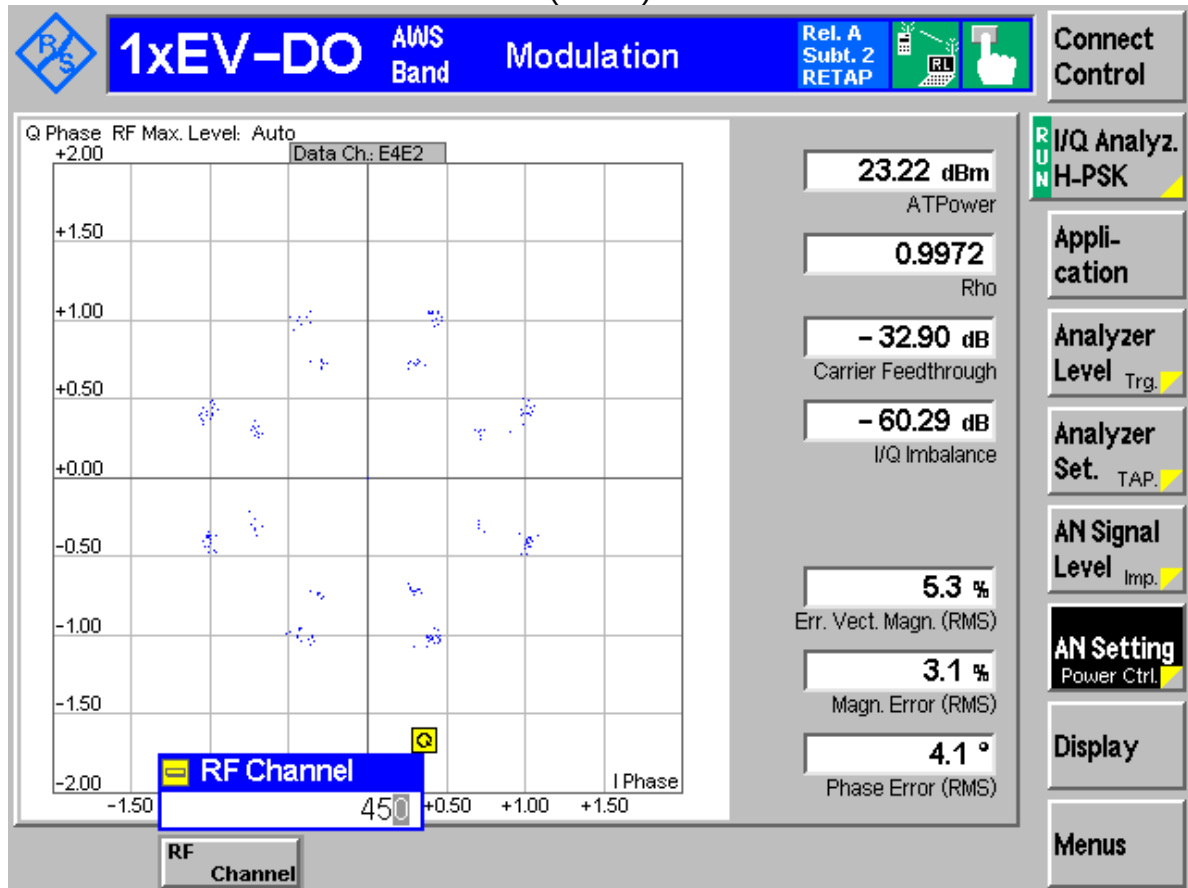


R-Data Pkt Size (4096 bits)
(QPSK)



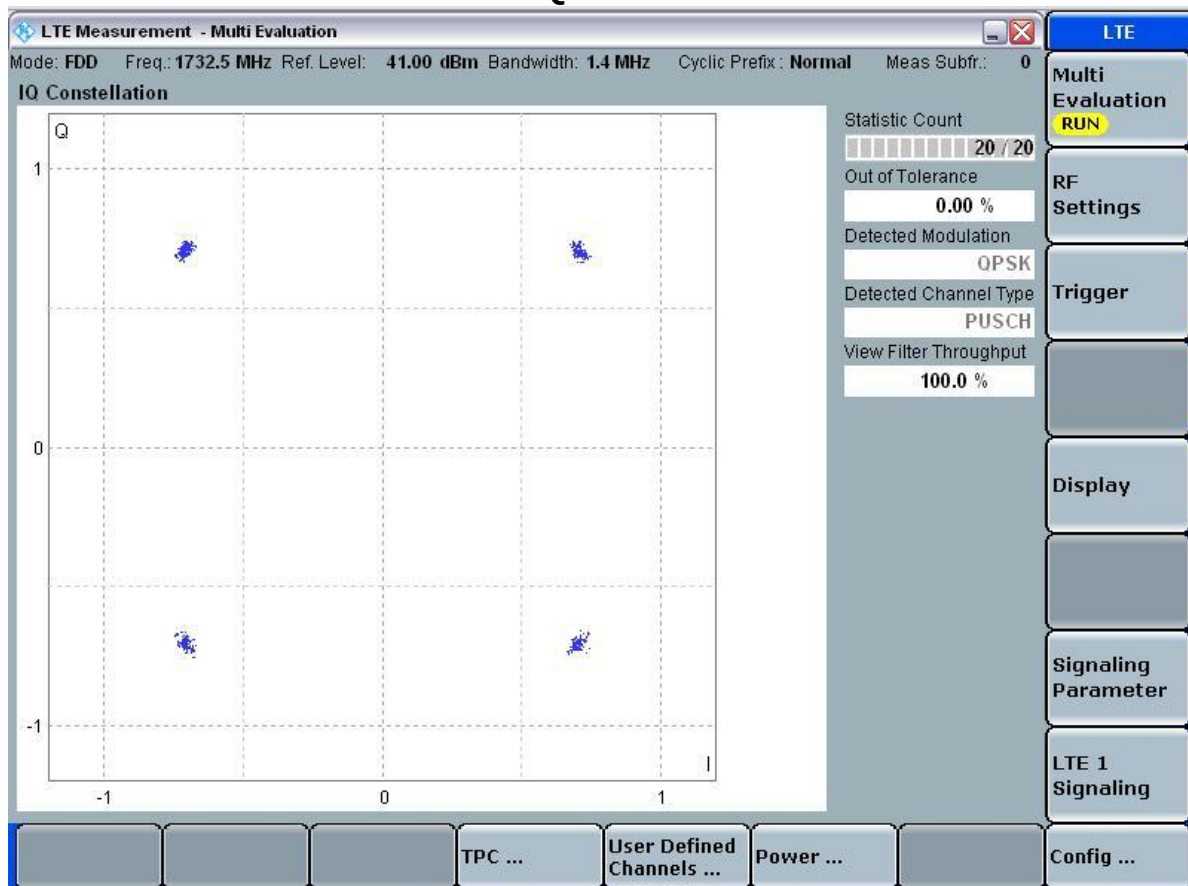


R-Data Pkt Size (12288 bits)
(8PSK)



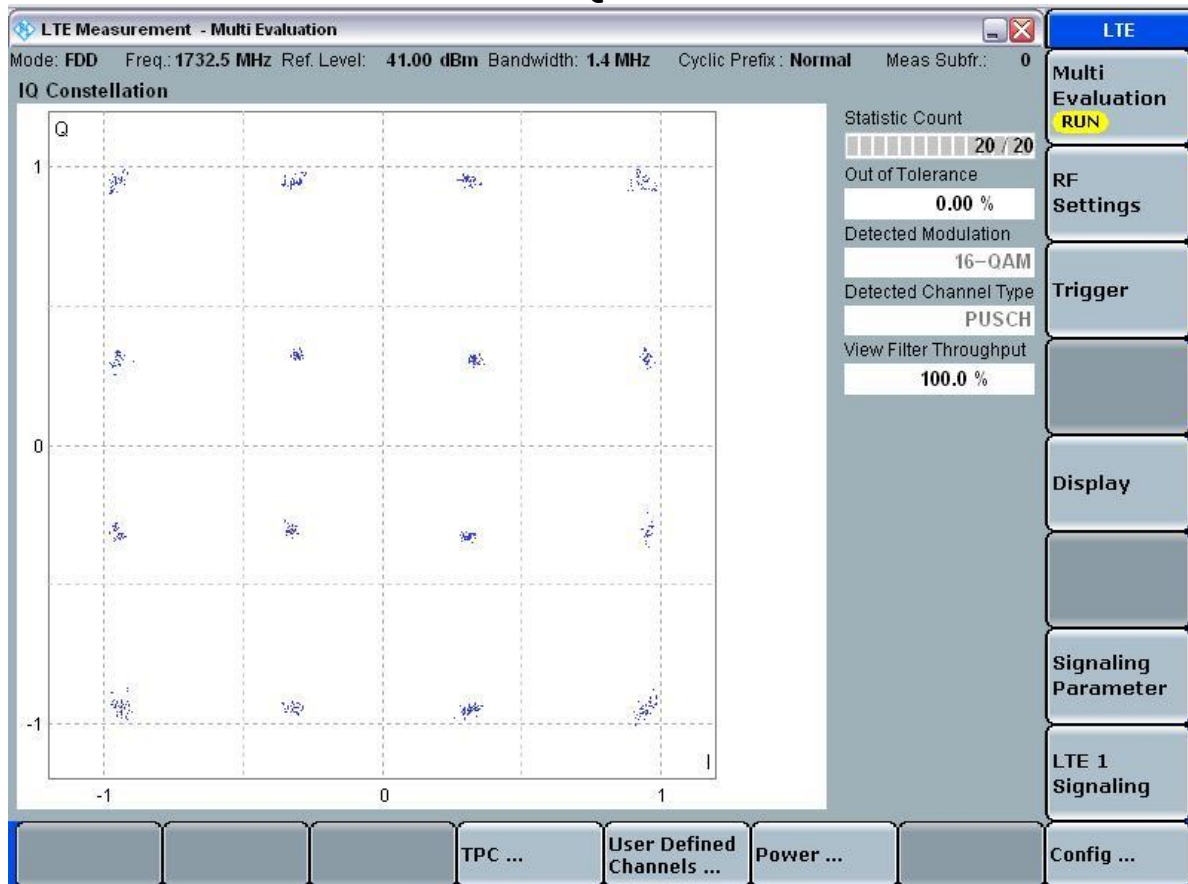


Channel 20175(TM4) 1.4MHz(BW) QPSK



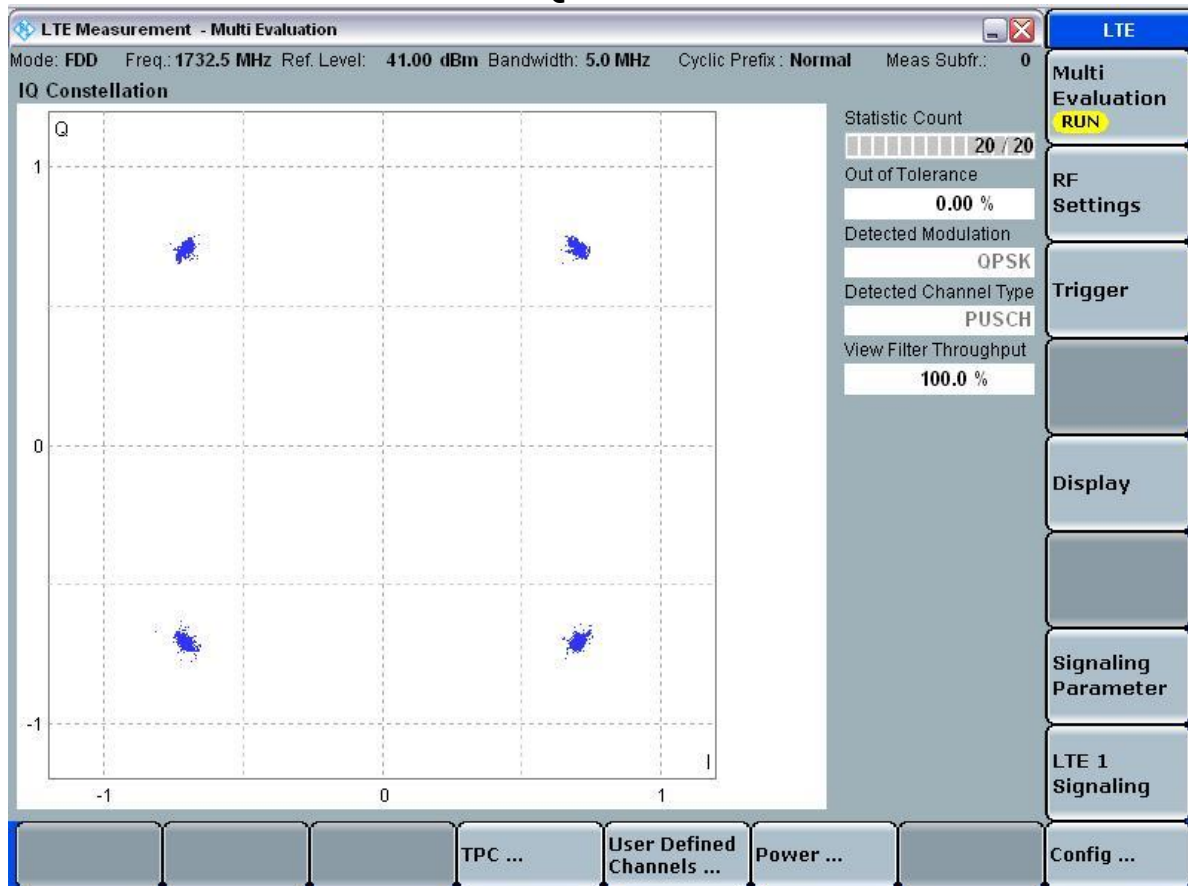


Channel 20175(TM5) 1.4MHz(BW) 16QAM



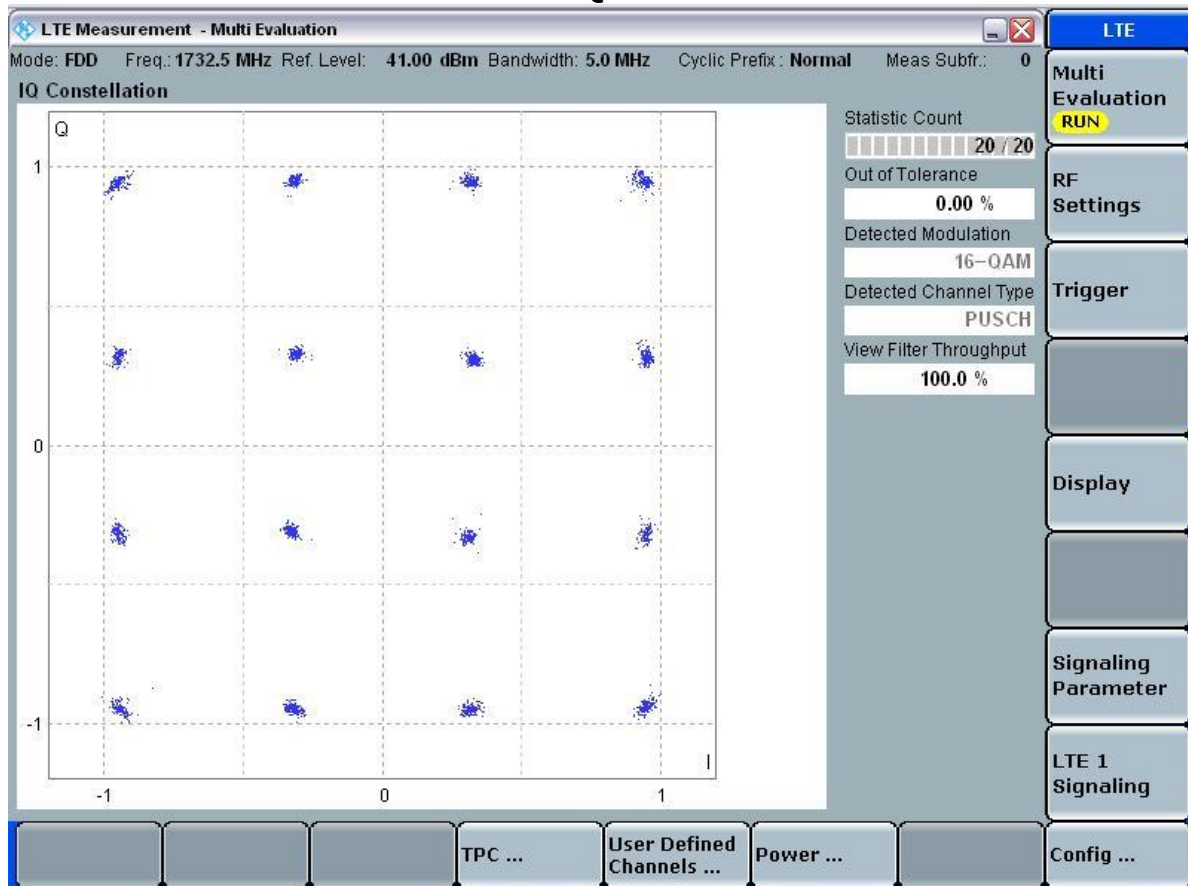


Channel 20175(TM4) 5MHz(BW) QPSK



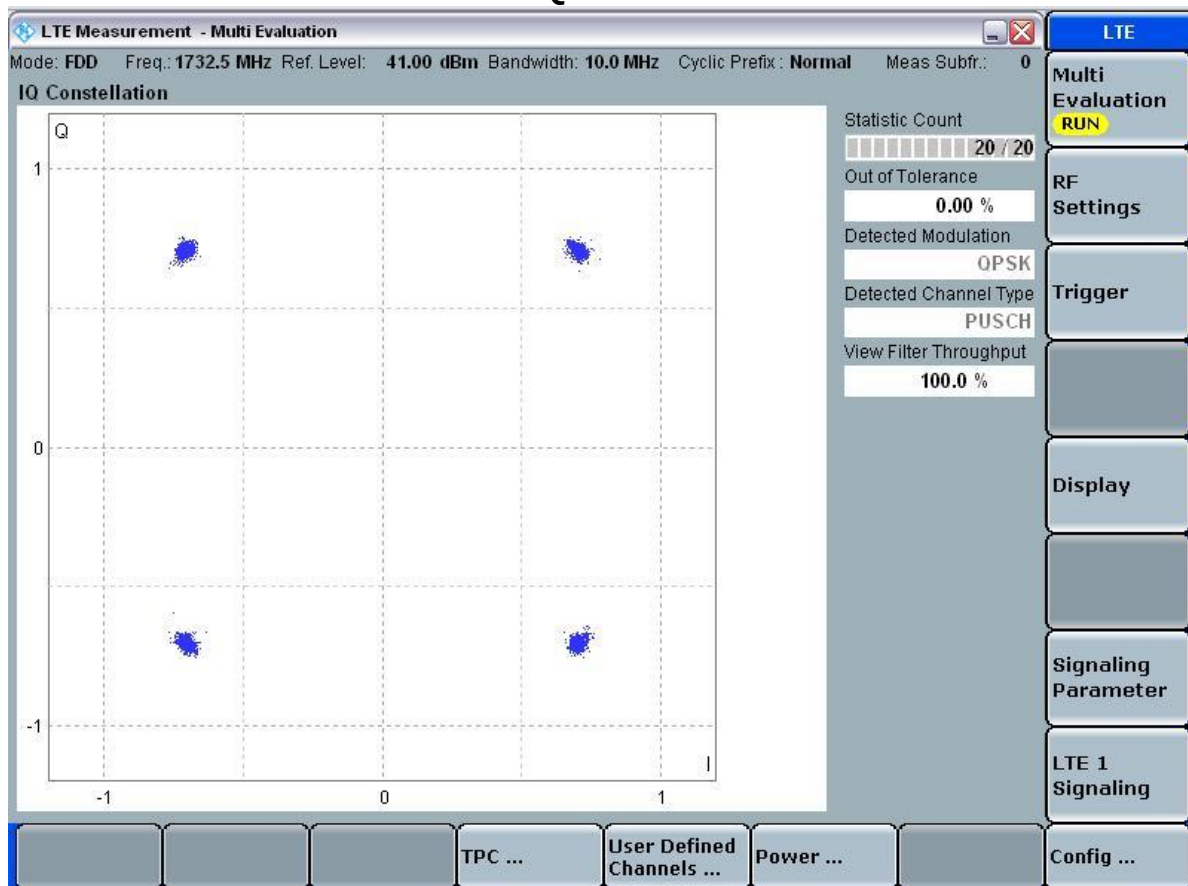


Channel 20175(TM5) 5MHz(BW) 16QAM



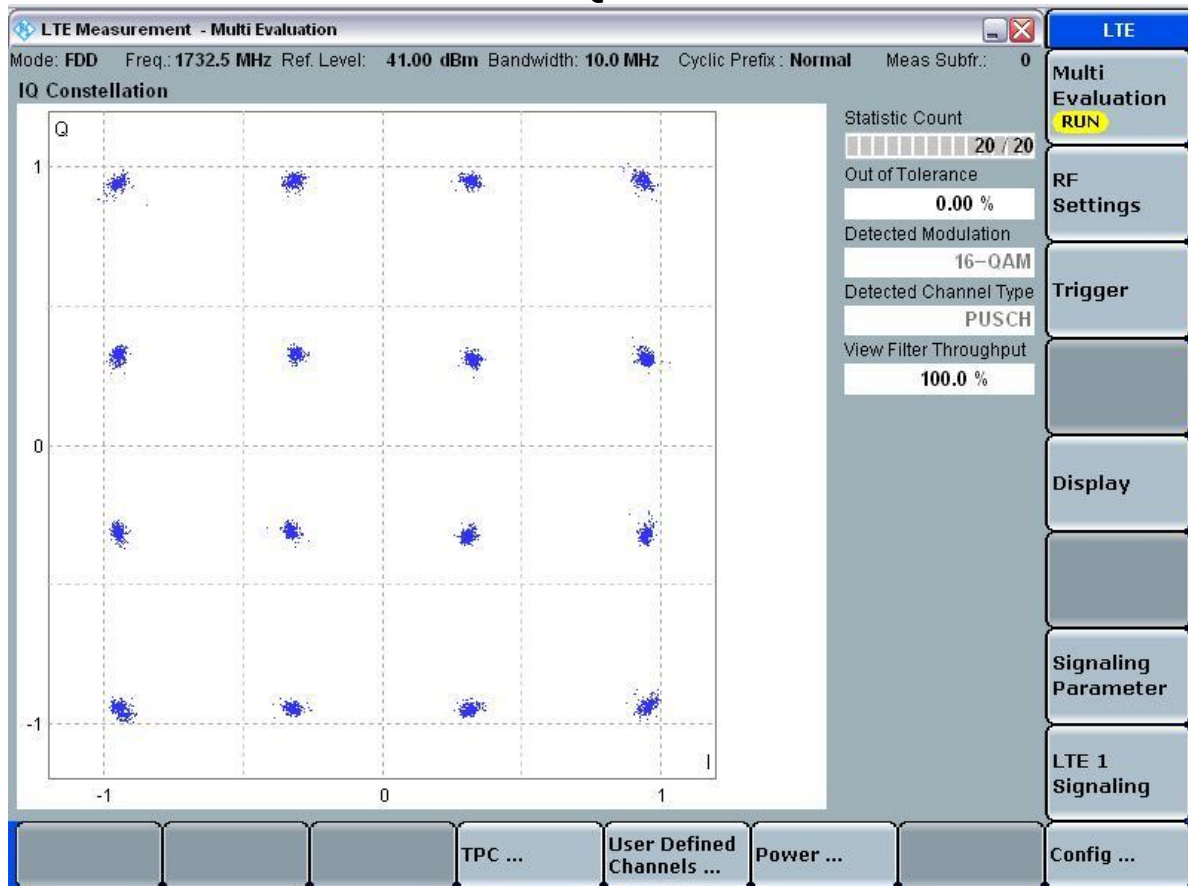


Channel 20175(TM4) 10MHz(BW) QPSK





Channel 20175(TM5) 10MHz(BW) 16QAM





Appendix C

Occupied Bandwidth According to FCC part 2.1049 & Part 27 Subpart E



Test Mode	RF Channel	99% BW [kHz] note1	-26dB BW [kHz] note2
TM1	25	1284	1434
	450	1284	1434
	875	1284	1432
TM3	25	1284	1434
	450	1284	1434
	875	1284	1430
Subtype 0	25	1286	1429
	450	1286	1429
	875	1280	1429
Subtype 2	25	1286	1428
	450	1286	1429
	875	1286	1428

Test Mode	Carrier Conf.	RF Ch.	RB/RB SIZE	99% BW [kHz] note1	-26dB BW [kHz] note2
TM4	1.4MHz	B	1/0	269	449
			1/5	256	445
			3/2	580	902
			6/0	1080	1215
		M	1/0	266	449
			1/5	253	449
			3/2	583	902
			6/0	1083	1216
		T	1/0	263	445
			1/5	256	445
			3/2	580	901
			6/0	1080	1216
	3 MHz	B	1/0	497	460
			1/14	529	458
			8/4	1490	2173
			15/0	2676	2789
		M	1/0	497	470
			1/14	545	470
			8/4	1514	2226
			15/0	2676	2882
		T	1/0	505	458
			1/14	545	432
			8/4	1506	2116
			15/0	2676	2780
	5 MHz	B	1/0	744	711
			1/24	667	711



Test Mode	Carrier Conf.	RF Ch.	RB/RB SIZE	99% BW [kHz] note1	-26dB BW [kHz] note2
			12/6	2218	3550
			25/0	4487	4680
		M	1/0	744	717
			1/24	756	717
			12/6	2218	3550
			25/0	4474	4773
			1/0	756	715
		T	1/24	705	710
			12/6	2218	3500
			25/0	4487	4770
			1/0	1611	1100
		B	1/49	1635	1112
			25/13	4615	6780
			50/0	8966	9500
	10 MHz	M	1/0	1394	1126
			1/49	1875	1126
			25/13	4615	6865
			50/0	8942	9557
		T	1/0	1635	1126
			1/49	1779	1120
			25/13	4591	6860
			50/0	8942	9550
TM5	1.4MHz	B	1/0	304	440
			1/5	298	442
			3/2	558	900
			6/0	1080	1210
		M	1/0	324	447
			1/5	298	440
			3/2	558	893
			6/0	1080	1216
		T	1/0	317	438
			1/5	292	438
			3/2	558	901
			6/0	1074	1200
	3 MHz	B	1/0	497	467
			1/14	601	446
			8/4	1498	2214
			15/0	2676	2882
		M	1/0	521	470
			1/14	601	470
			8/4	1506	2216
			15/0	2676	2880
		T	1/0	513	462



Test Mode	Carrier Conf.	RF Ch.	RB/RB SIZE	99% BW [kHz] note1	-26dB BW [kHz] note2
			1/14	585	464
			8/4	1498	2210
			15/0	2684	2800
	5 MHz	B	1/0	769	715
			1/24	654	716
			12/6	2218	3533
			25/0	4487	4726
		M	1/0	859	712
			1/24	782	710
			12/6	2231	3546
			25/0	4487	4769
		T	1/0	833	713
			1/24	744	709
			12/6	2231	3540
			25/0	4474	4768
	10 MHz	B	1/0	1707	1114
			1/49	1298	1123
			25/13	4591	6789
			50/0	8918	9540
		M	1/0	1466	1120
			1/49	1587	1118
			25/13	4615	6820
			50/0	8918	9542
		T	1/0	1755	1120
			1/49	1514	1120
			25/13	4615	6859
			50/0	8918	9548

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

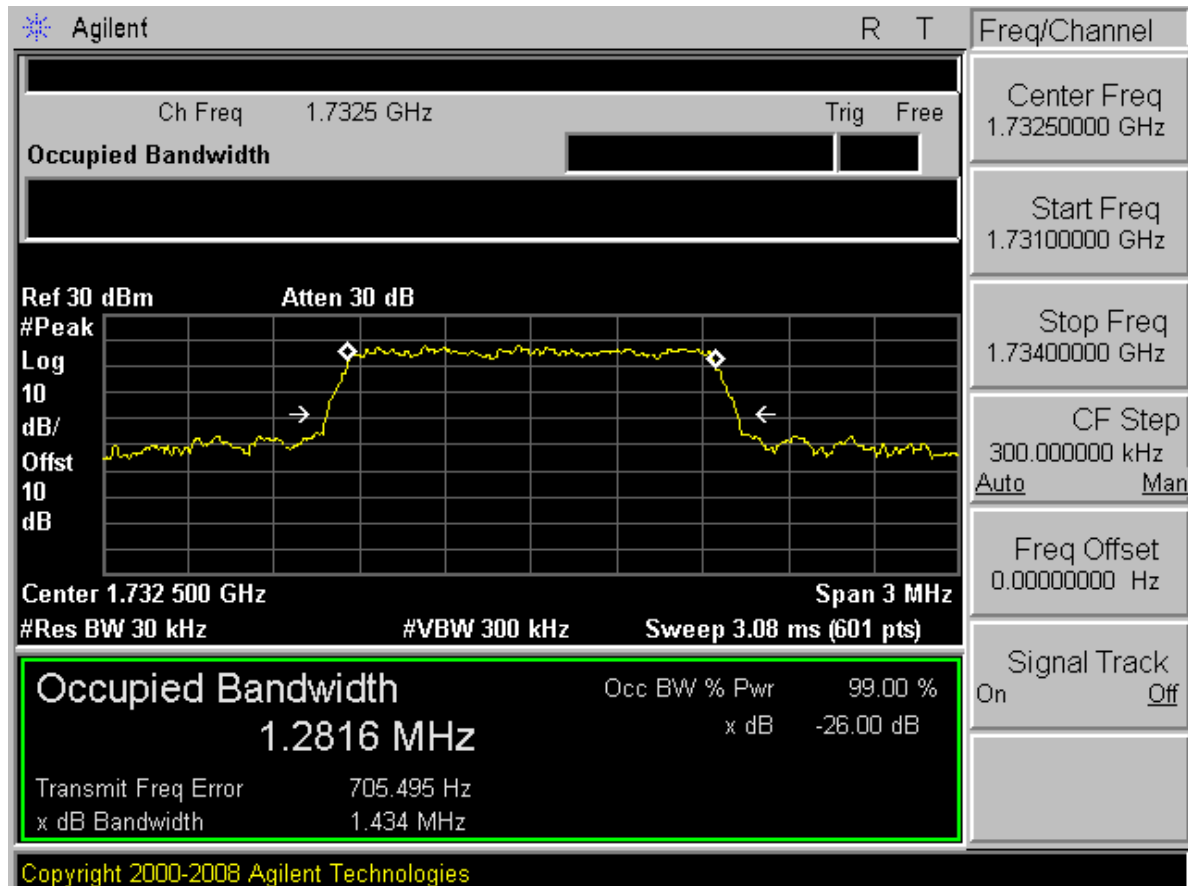
Note2: The -26dB BW test data refer to "Test Plot of -26dB Occupied Bandwidth".



Test Plot of 26dB Occupied Bandwidth

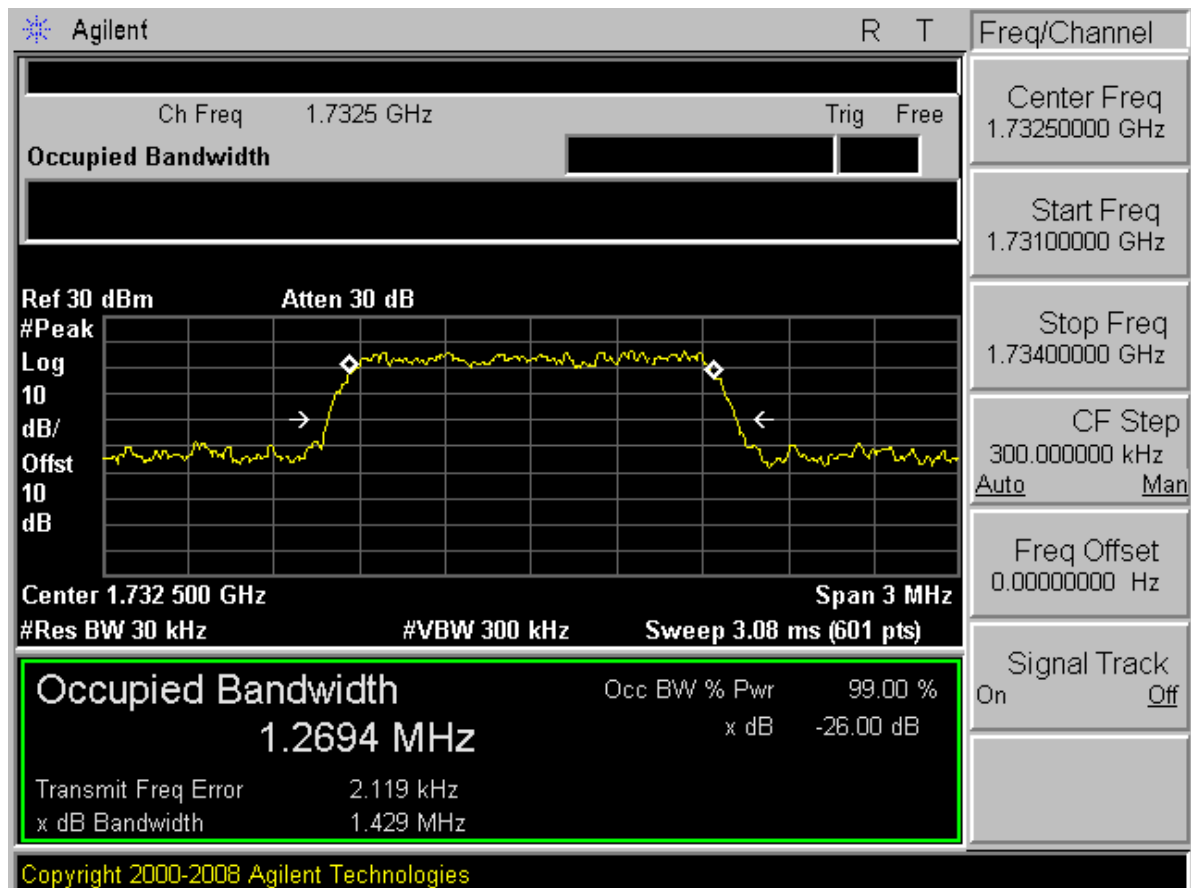
Note: All relevant operation modes have been tested, and the widest case Plot is included in this report.

Channel 450(TM1)





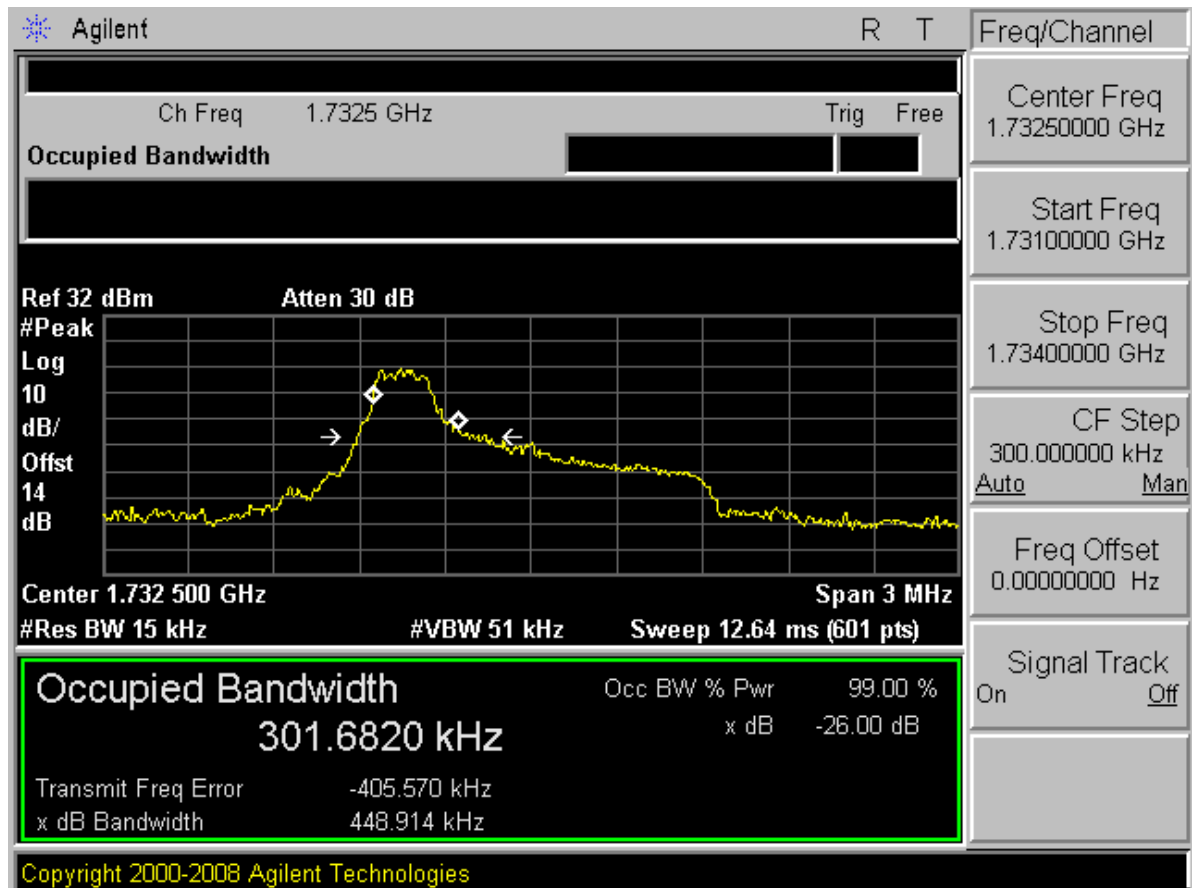
Channel 450 (EVDO subtype 2)





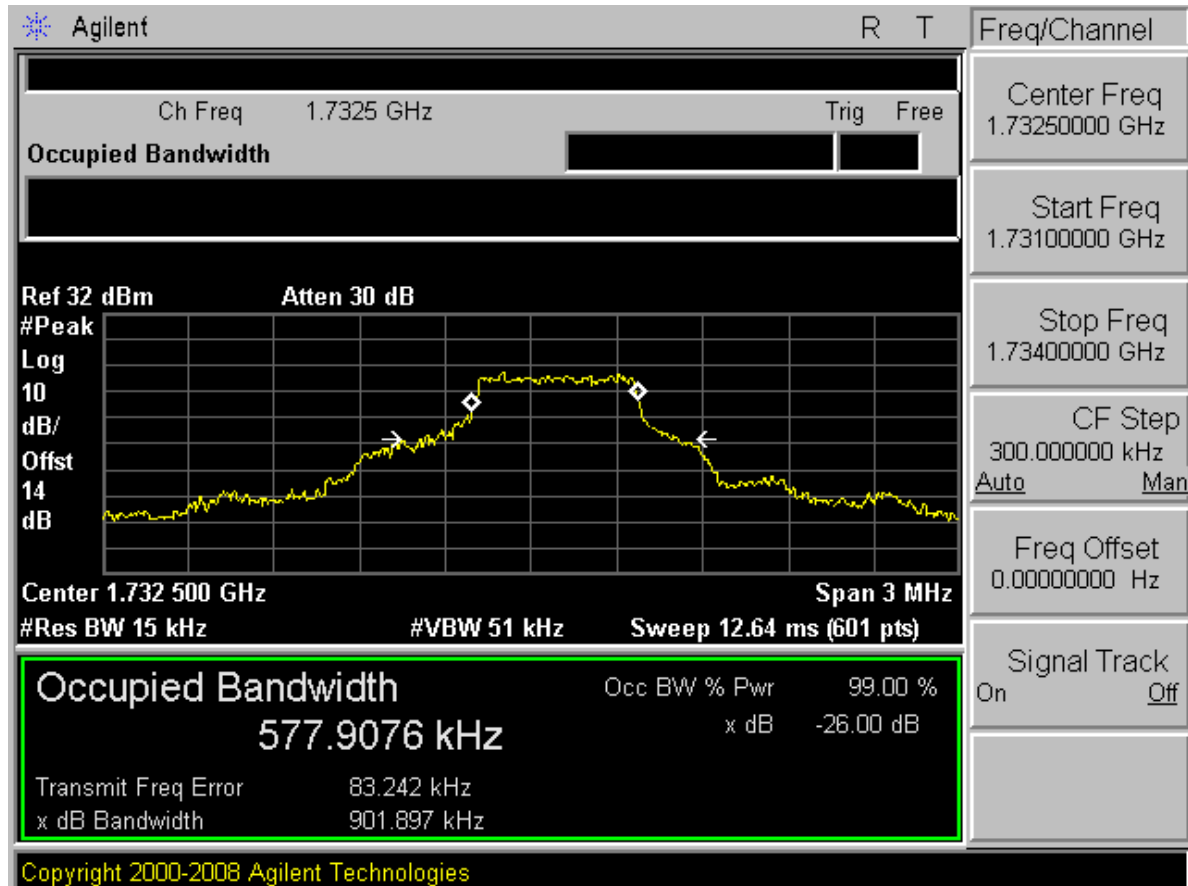
LTE MODE 1.4MHz(BW)

1RB/RB#0



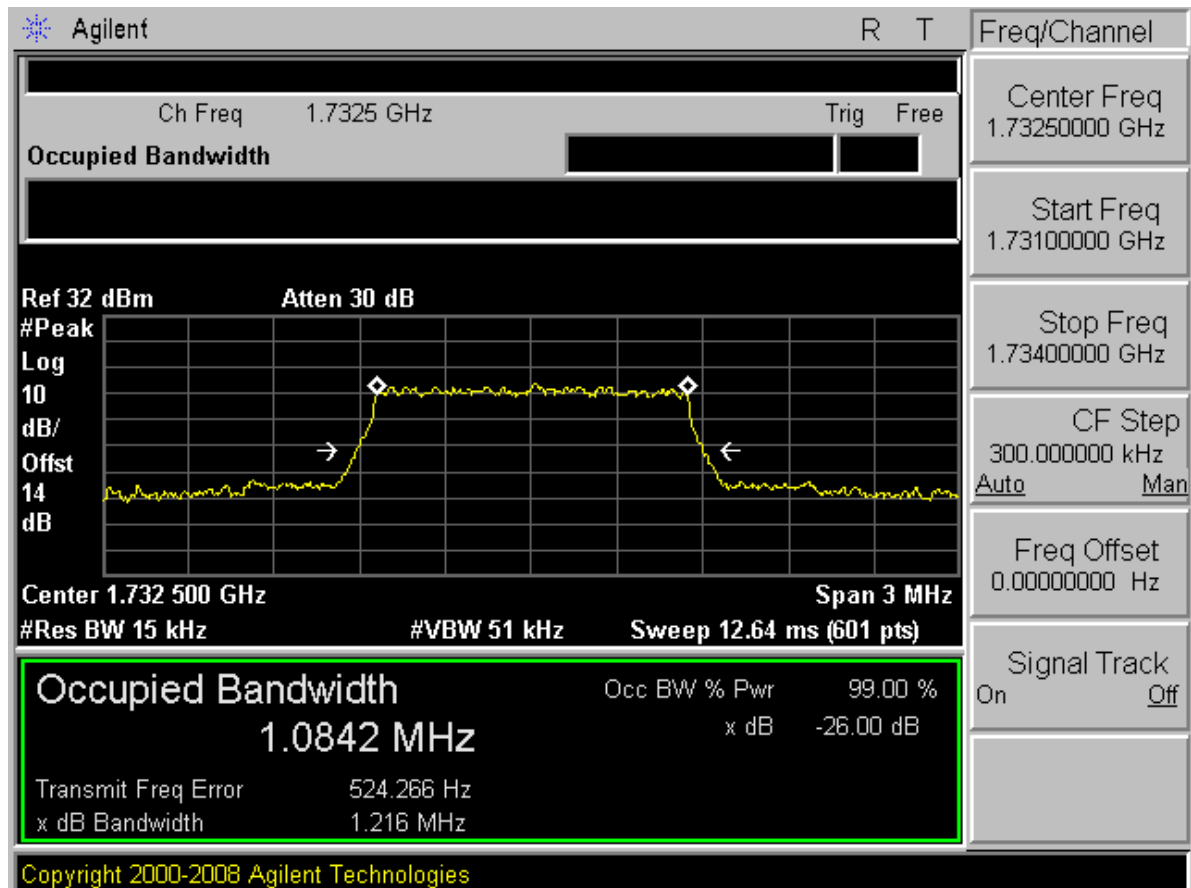


3 RB/RB #2





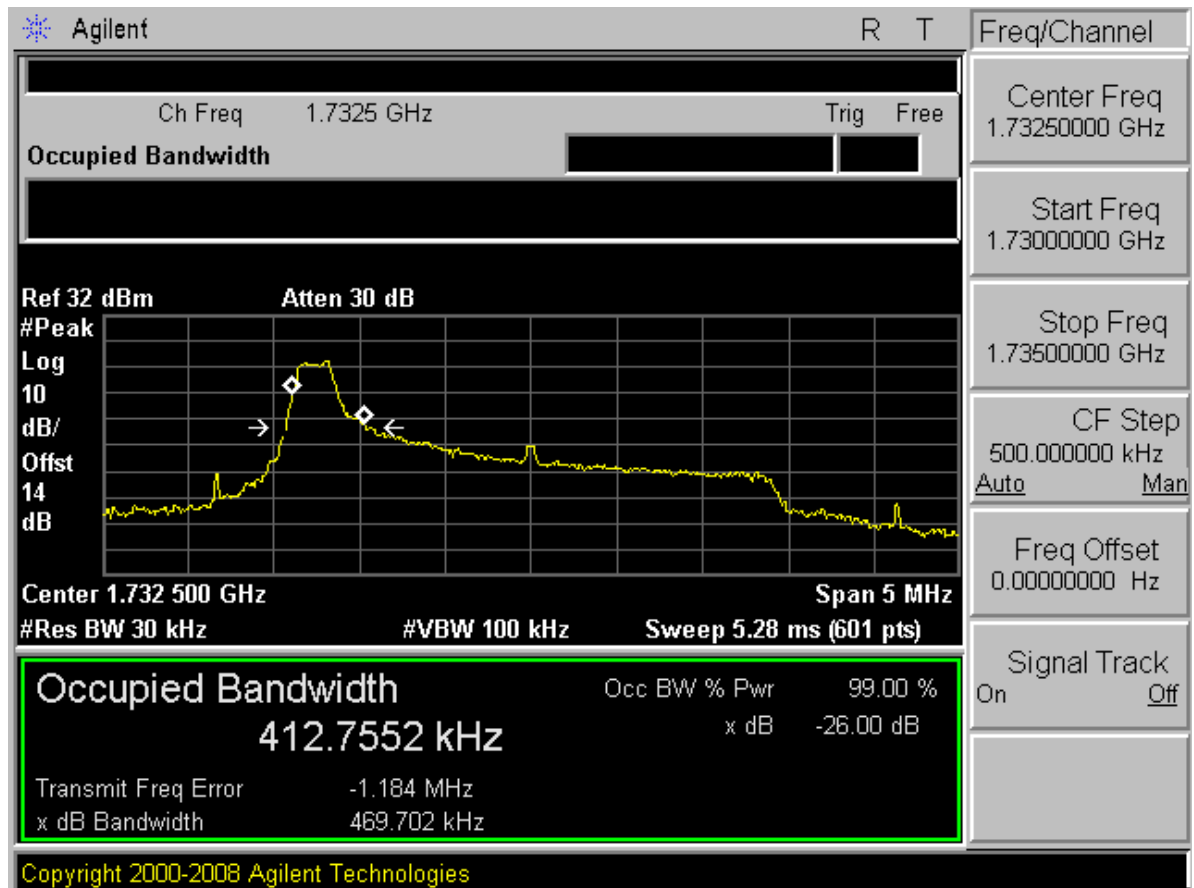
Full RBs





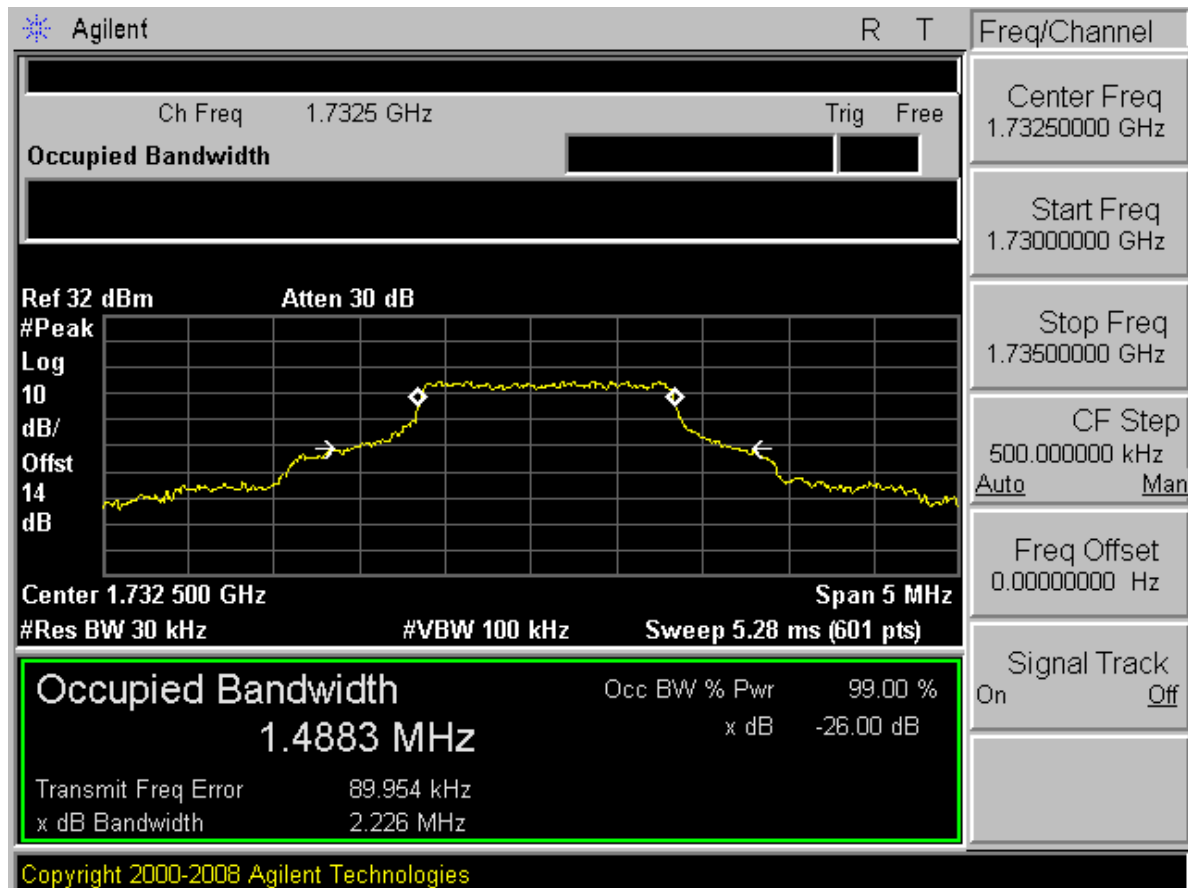
LTE MODE 3MHz(BW)

1RB/RB#0



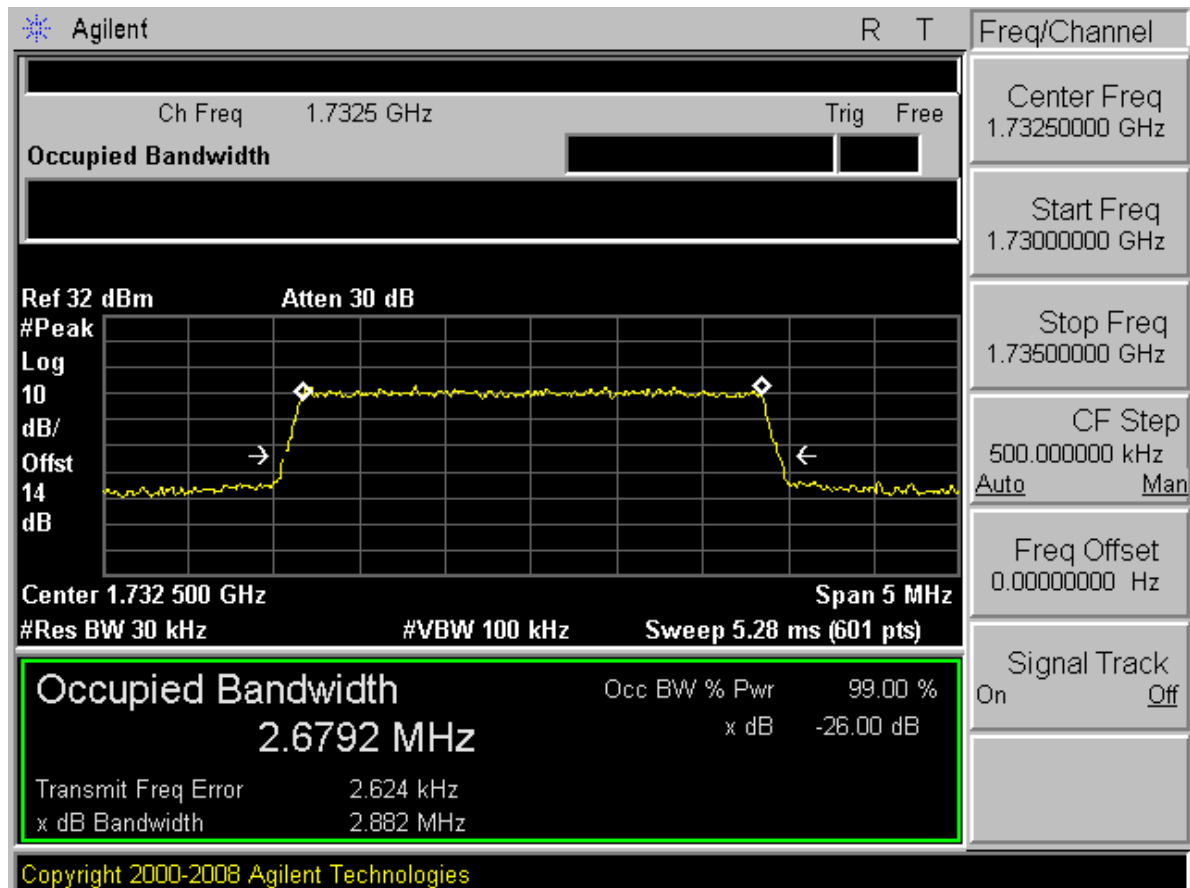


8RB/RB#4





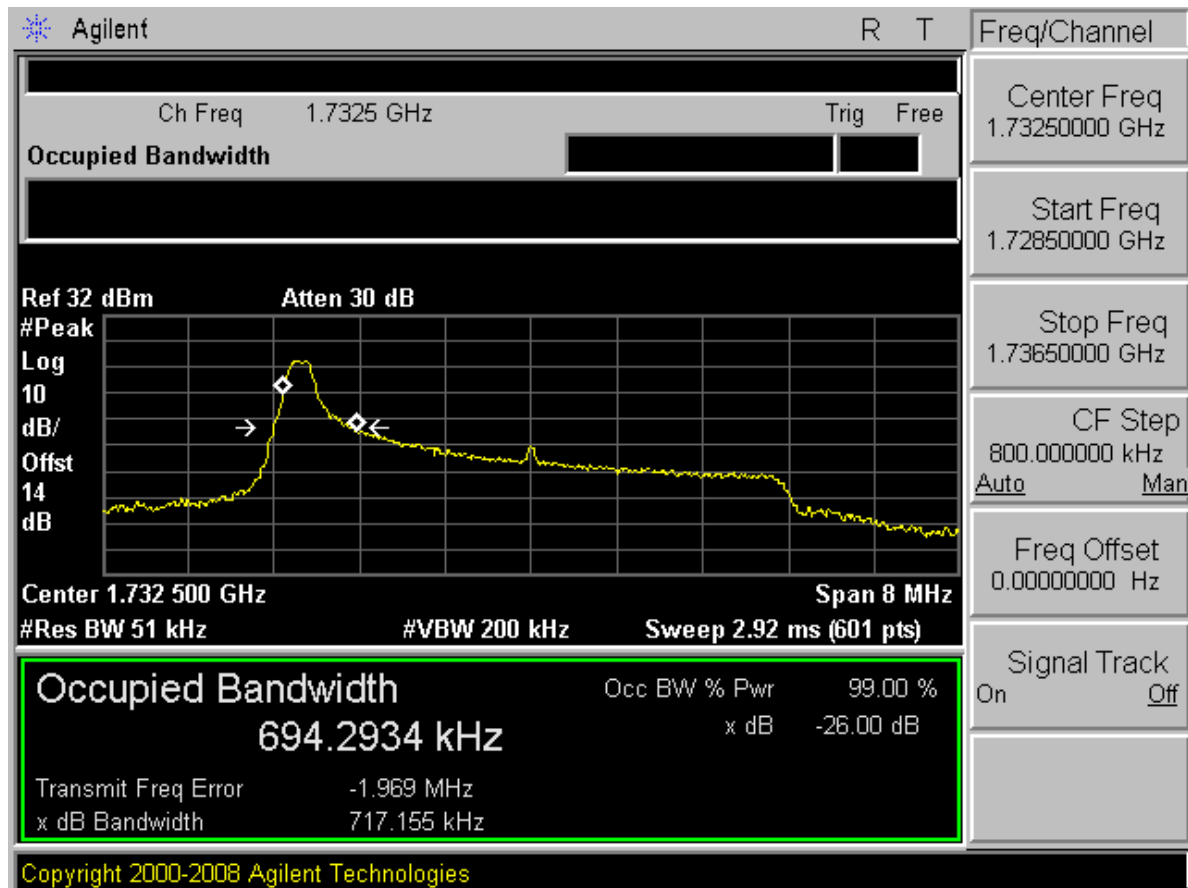
Full RBs





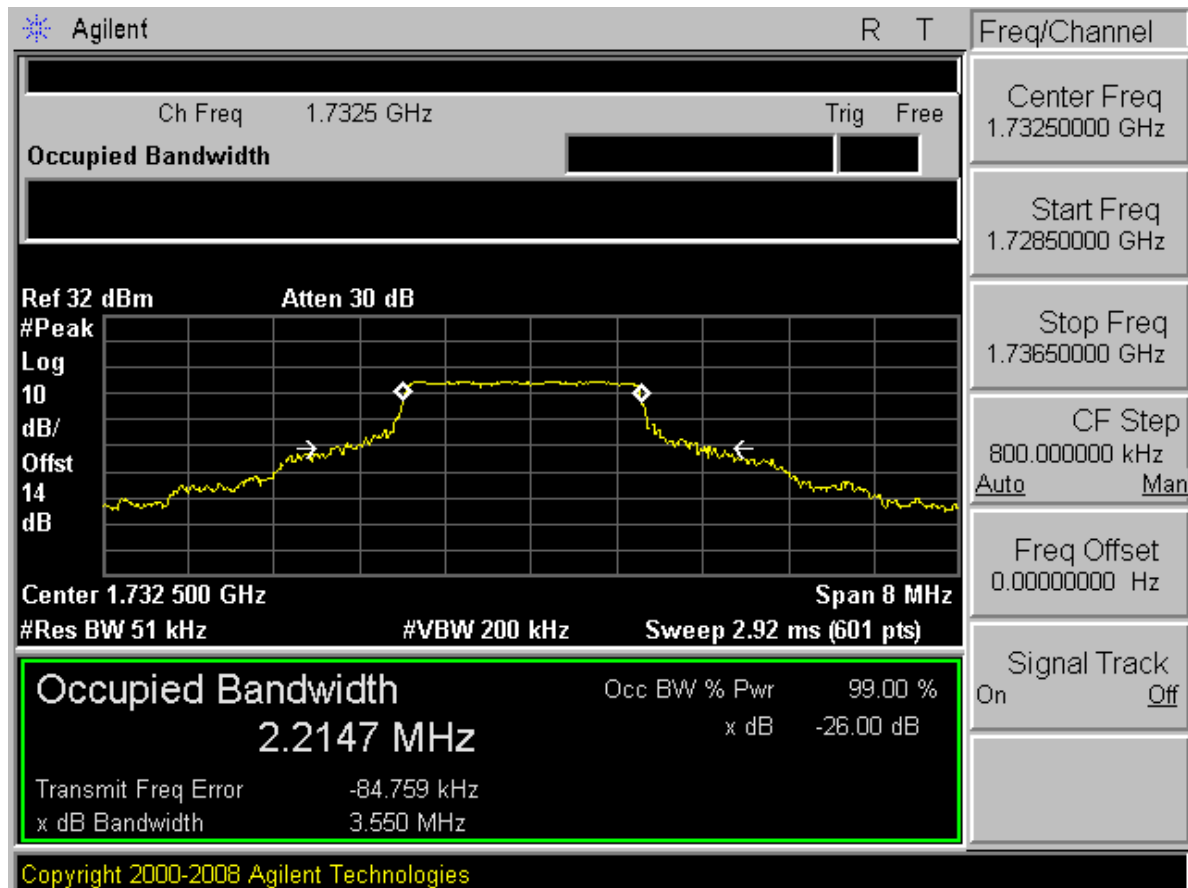
LTE MODE 5MHz(BW)

1RB/RB#0



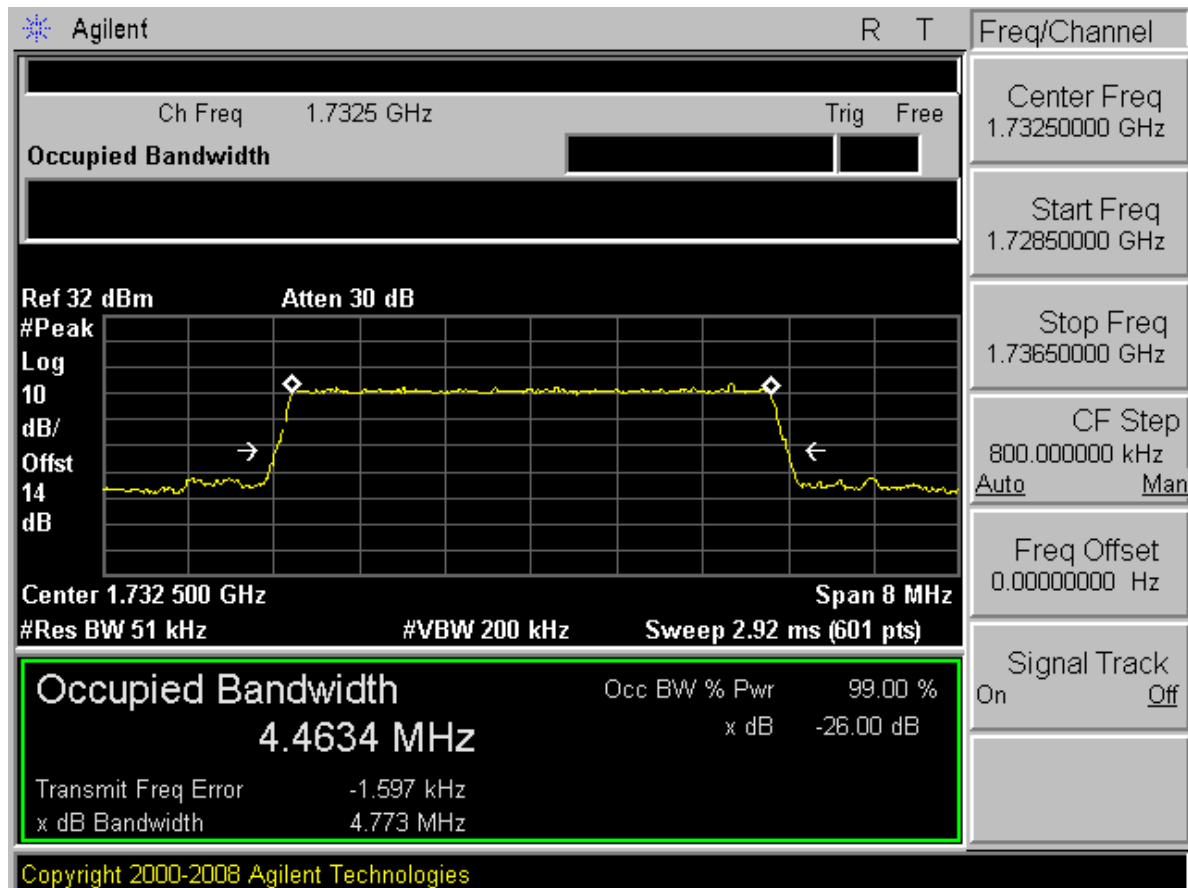


12RB/RB#6





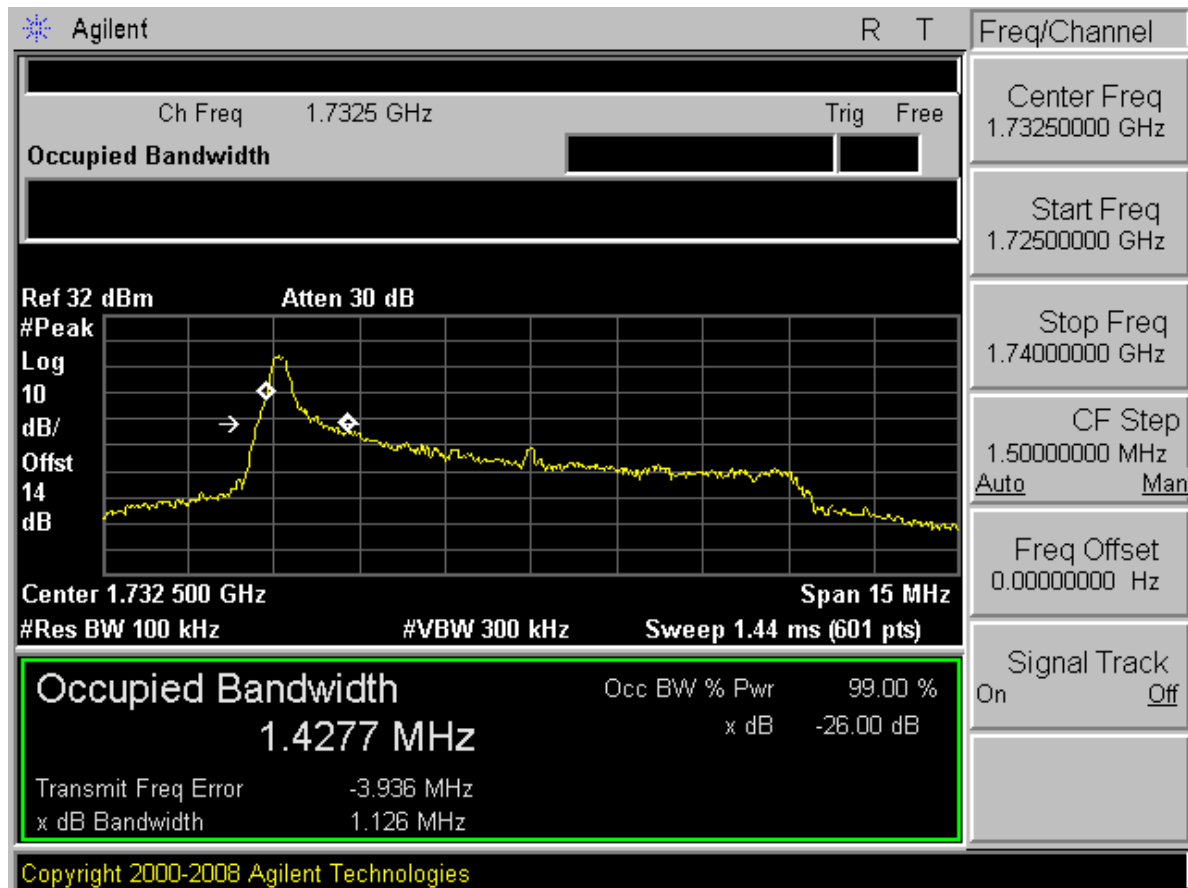
Full RBs





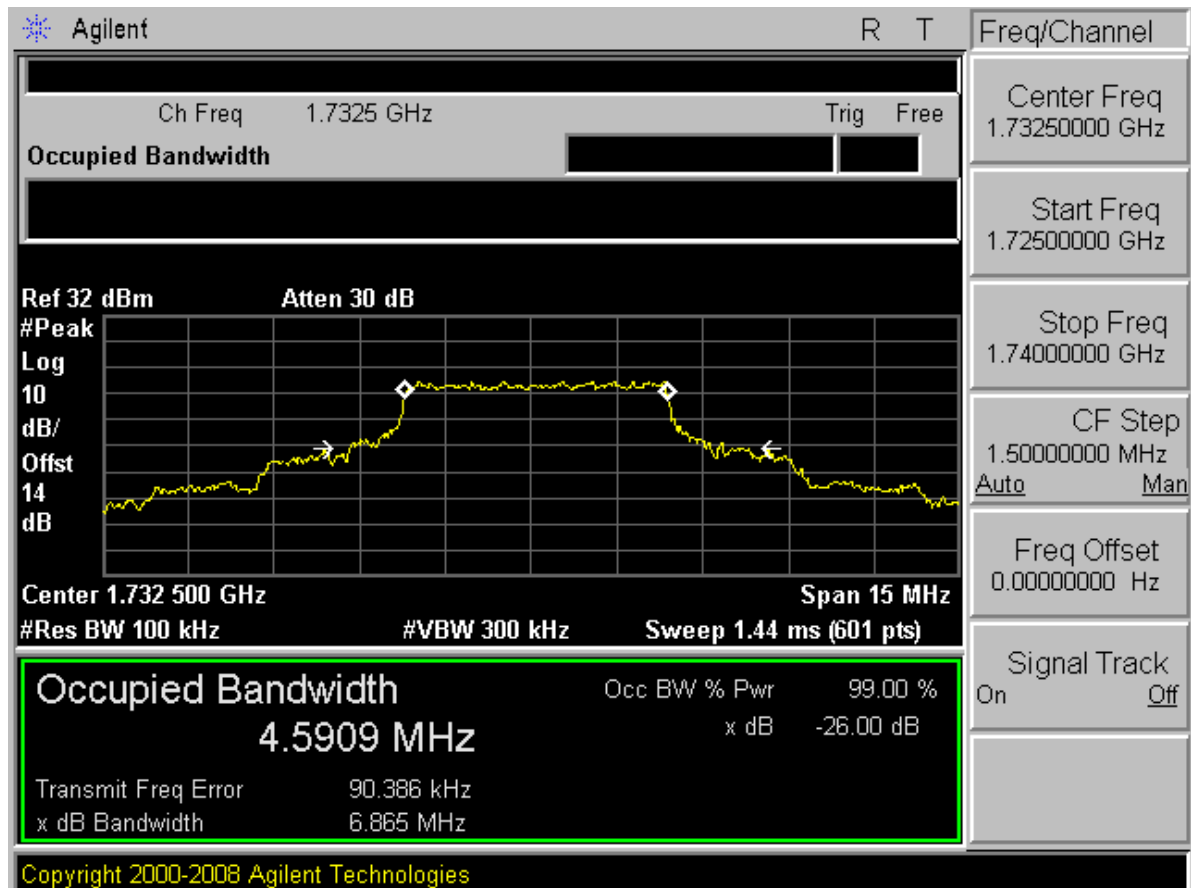
LTE MODE 10MHz(BW)

1RB/RB#0



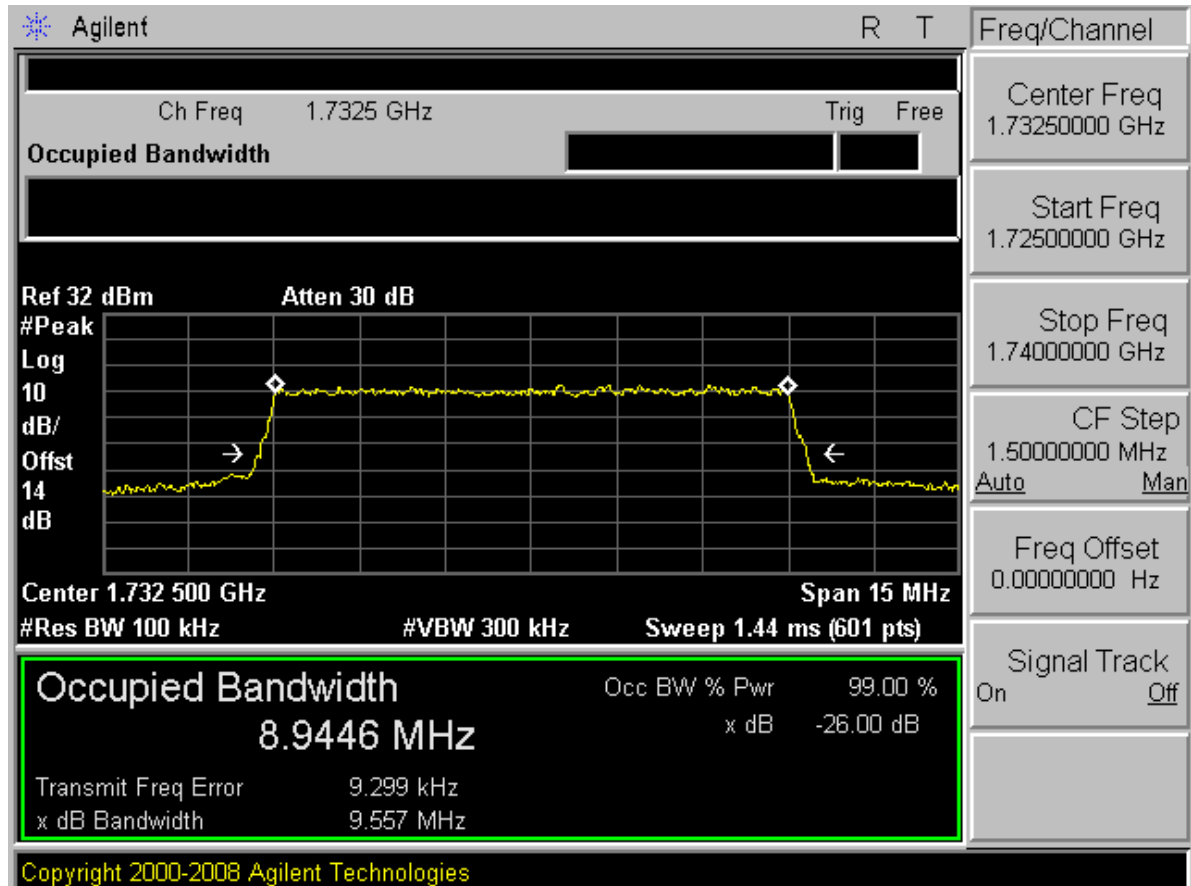


25 RB/RB#13





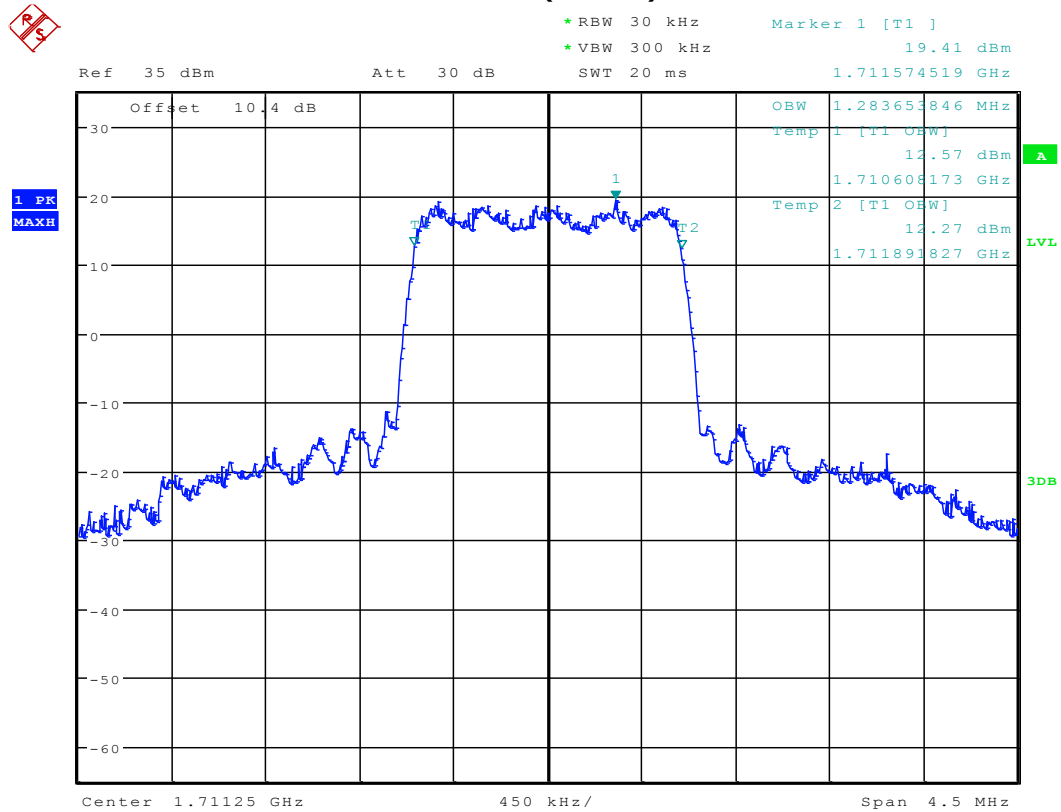
Full RBs





Test Plot of 99% Occupied Bandwidth

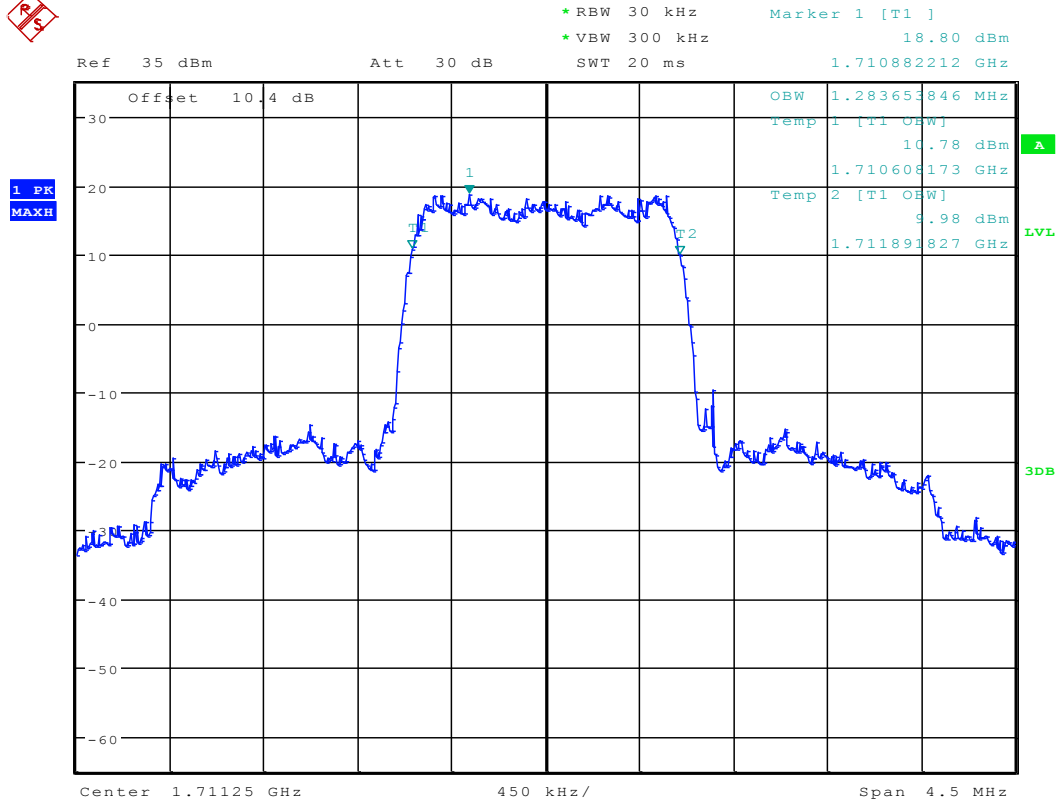
Channel 25 (TM1)



Date: 8.NOV.2011 23:45:25



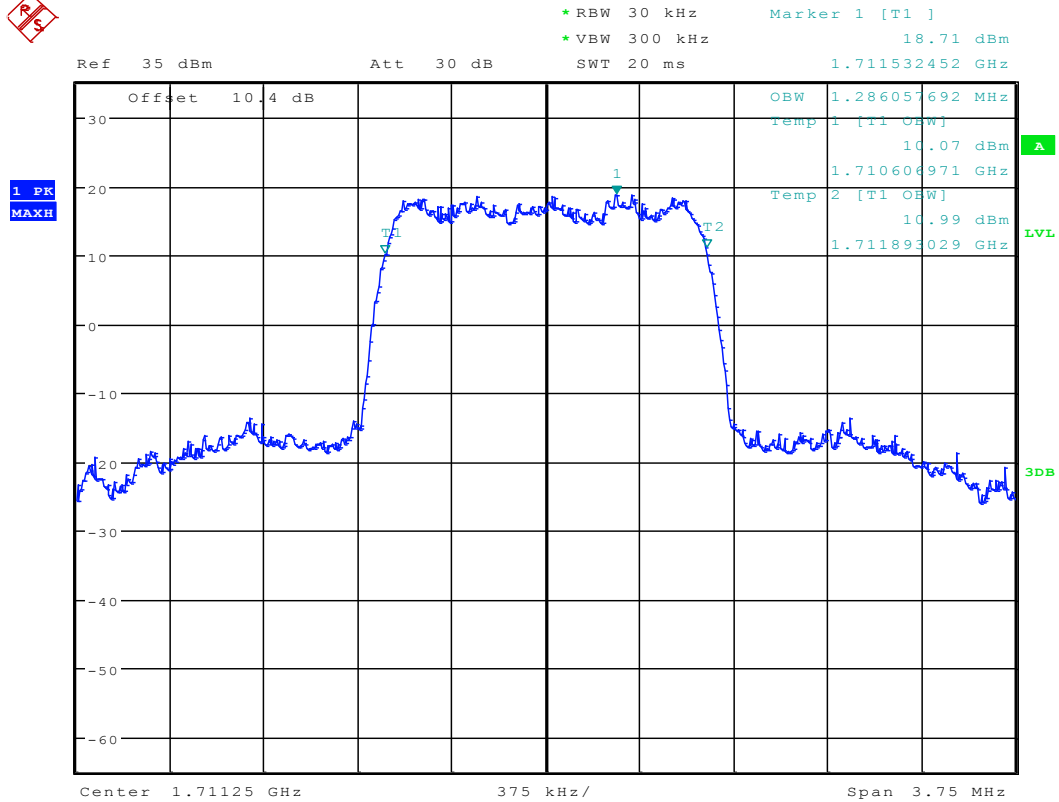
Channel 25 (TM3)



Date: 8.NOV.2011 23:46:08



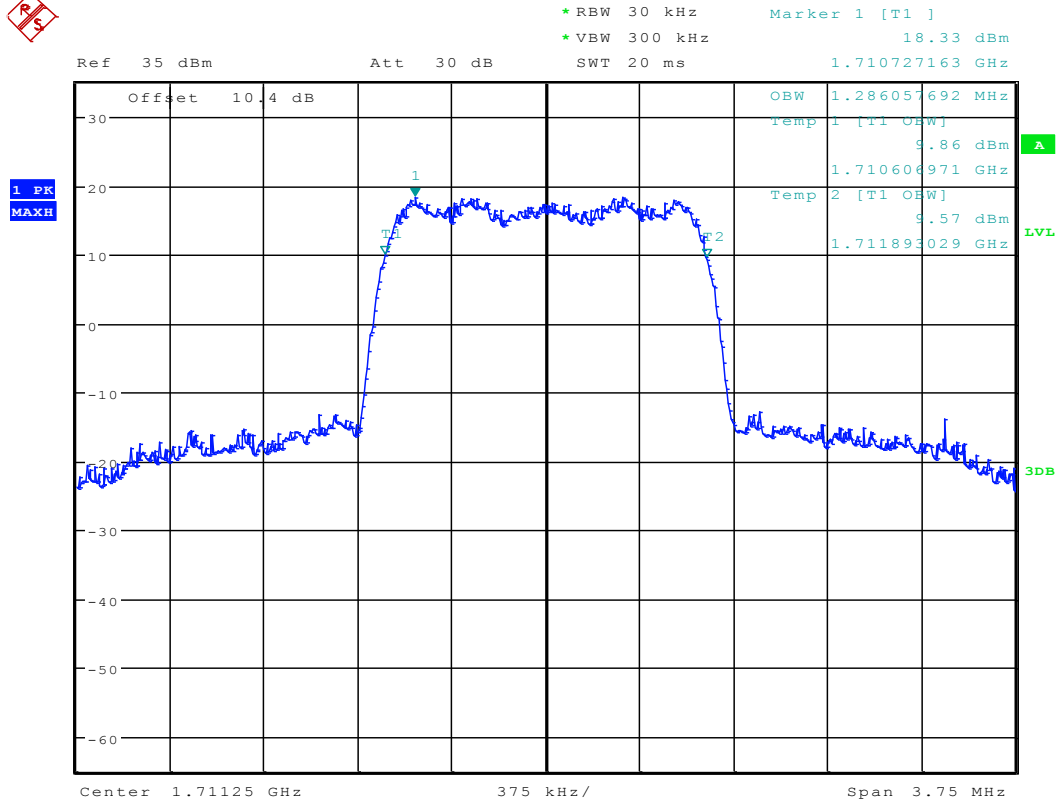
Channel 25(EVDO subtype 0)



Date: 8.NOV.2011 23:50:37



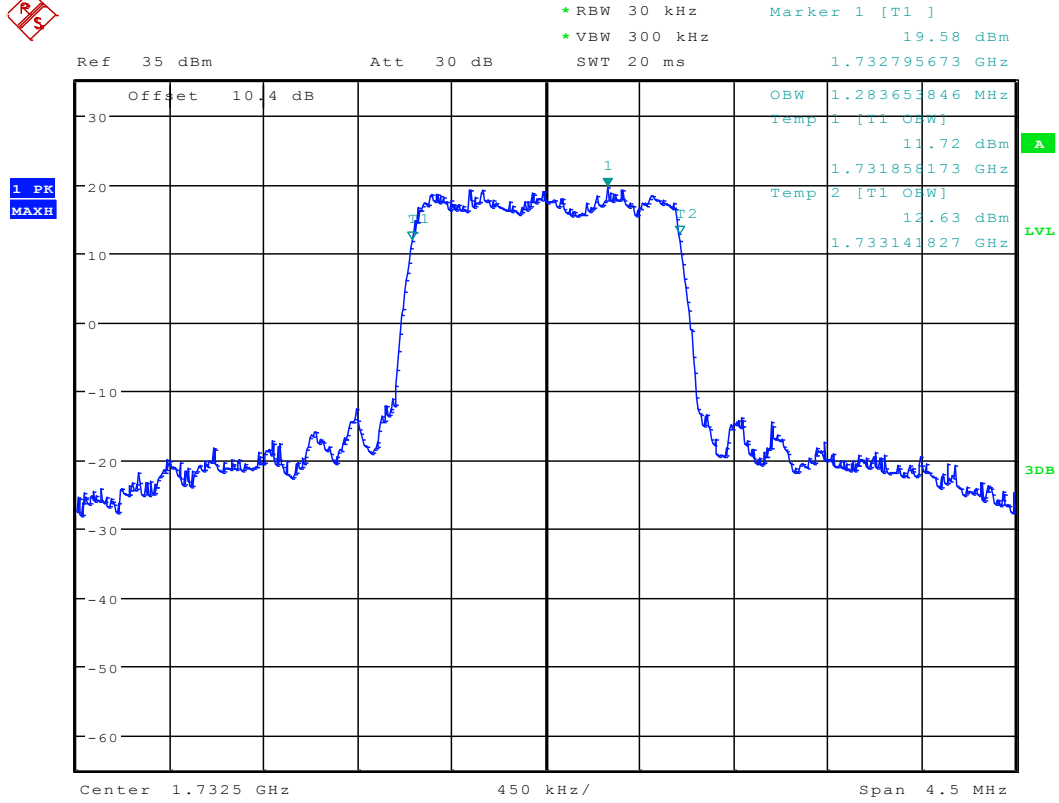
Channel 25 (EVDO Subtype 2)



Date: 8.NOV.2011 23:55:34



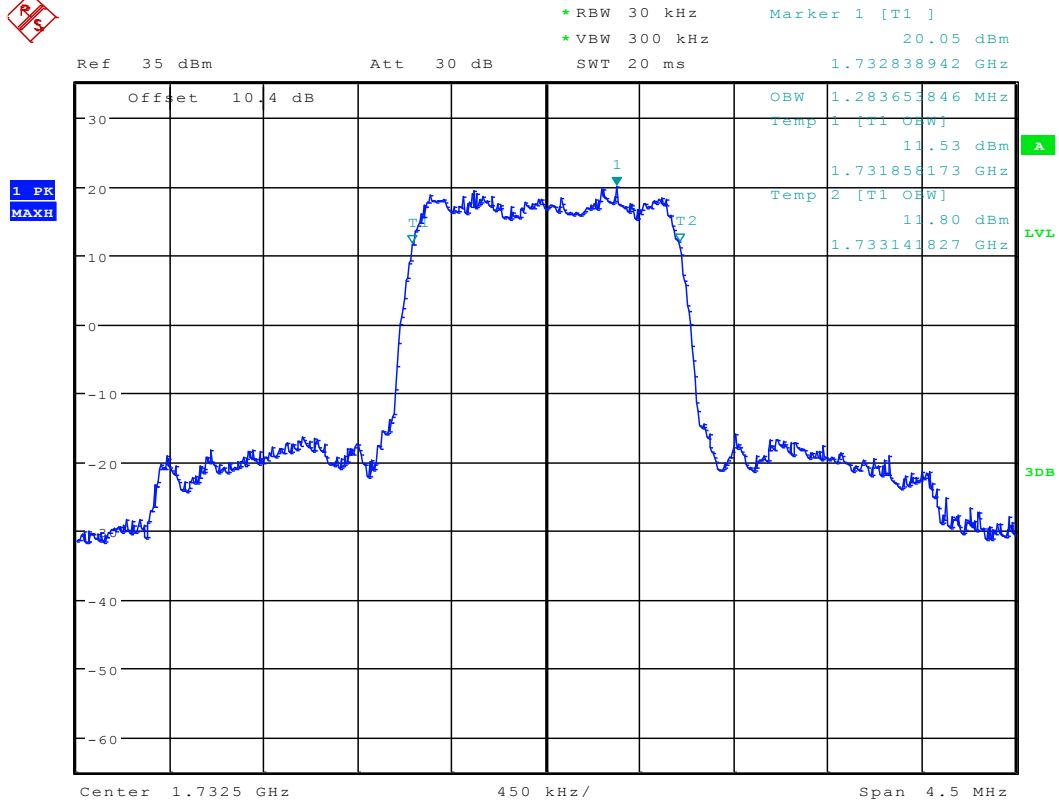
Channel 450(TM1)



Date: 8.NOV.2011 23:45:38



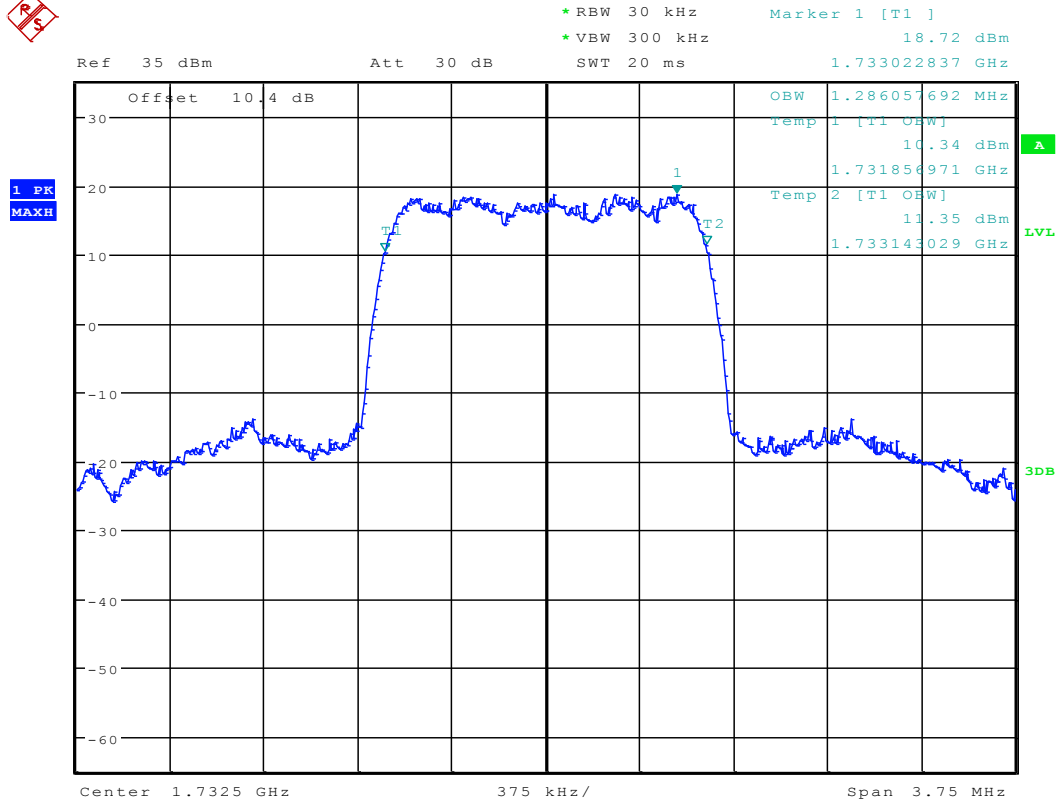
Channel 450(TM3)



Date: 8.NOV.2011 23:46:21



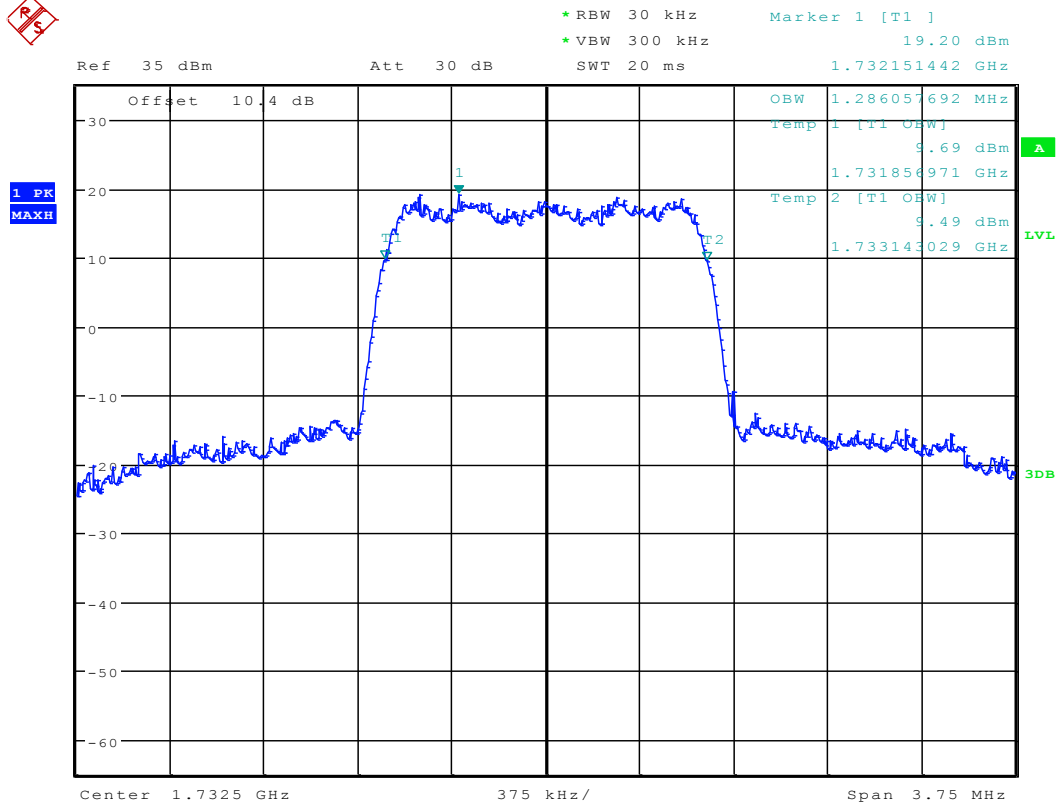
Channel 450 (EVDO subtype 0)



Date: 8.NOV.2011 23:50:51



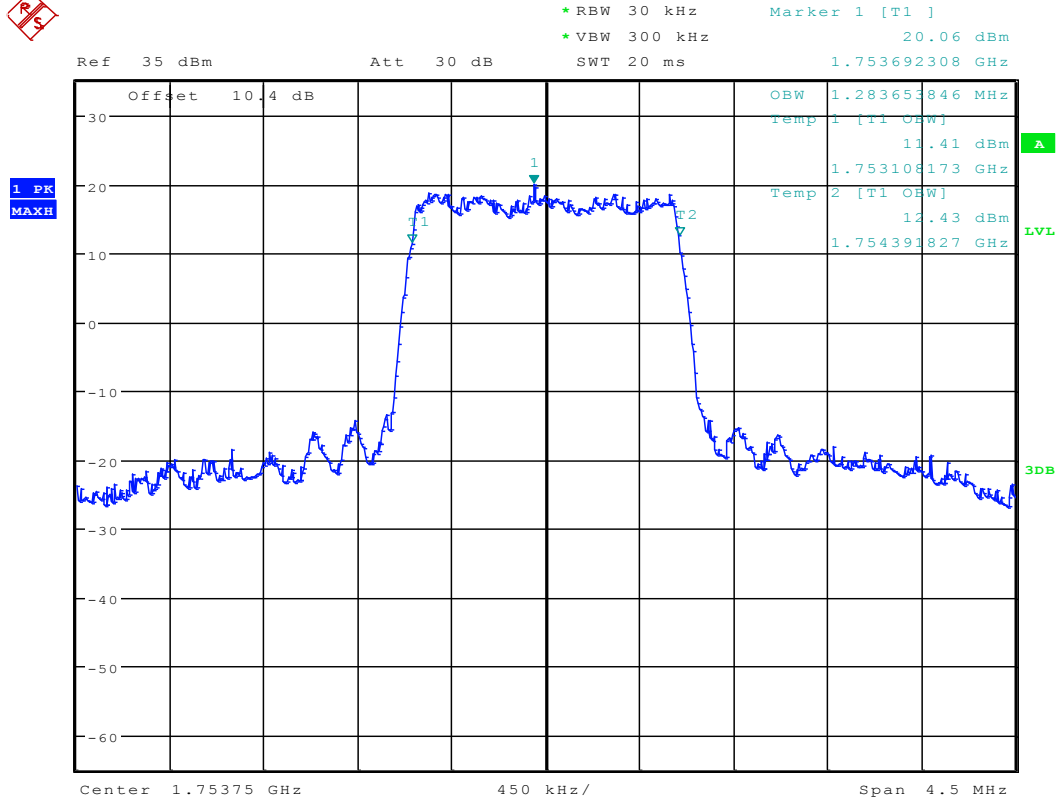
Channel 450 (EVDO subtype 2)



Date: 8.NOV.2011 23:55:46



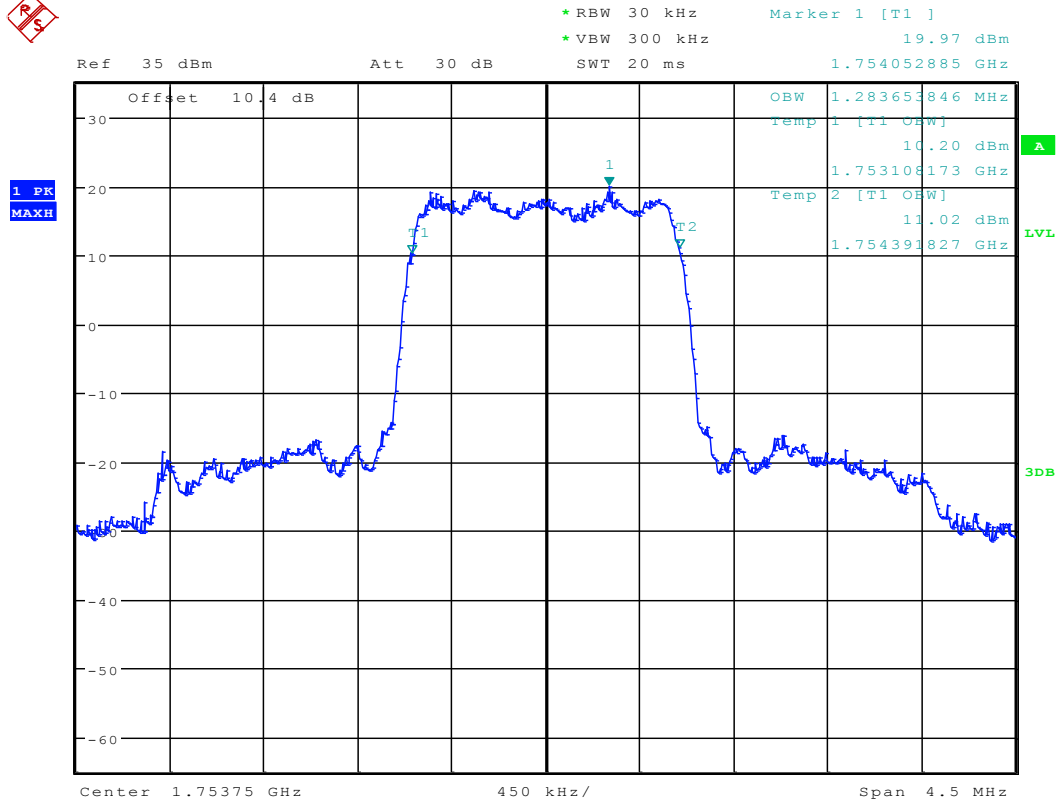
Channel 875(TM1)



Date: 8.NOV.2011 23:45:52



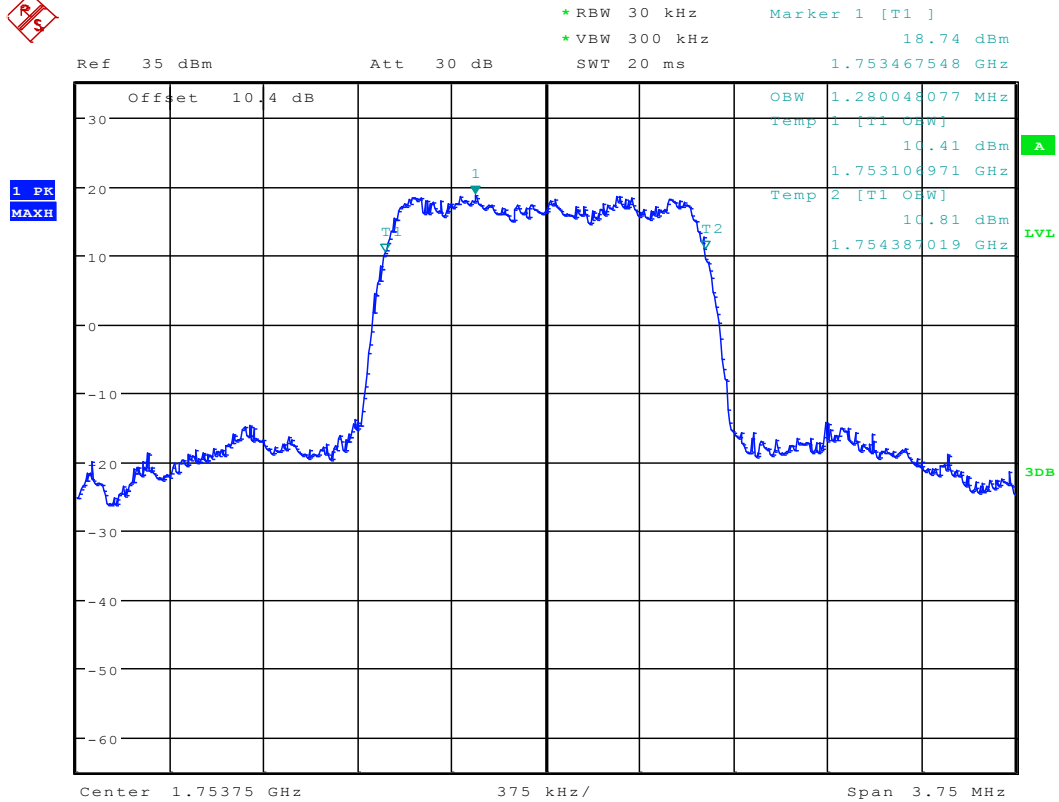
Channel 875(TM3)



Date: 8.NOV.2011 23:46:35



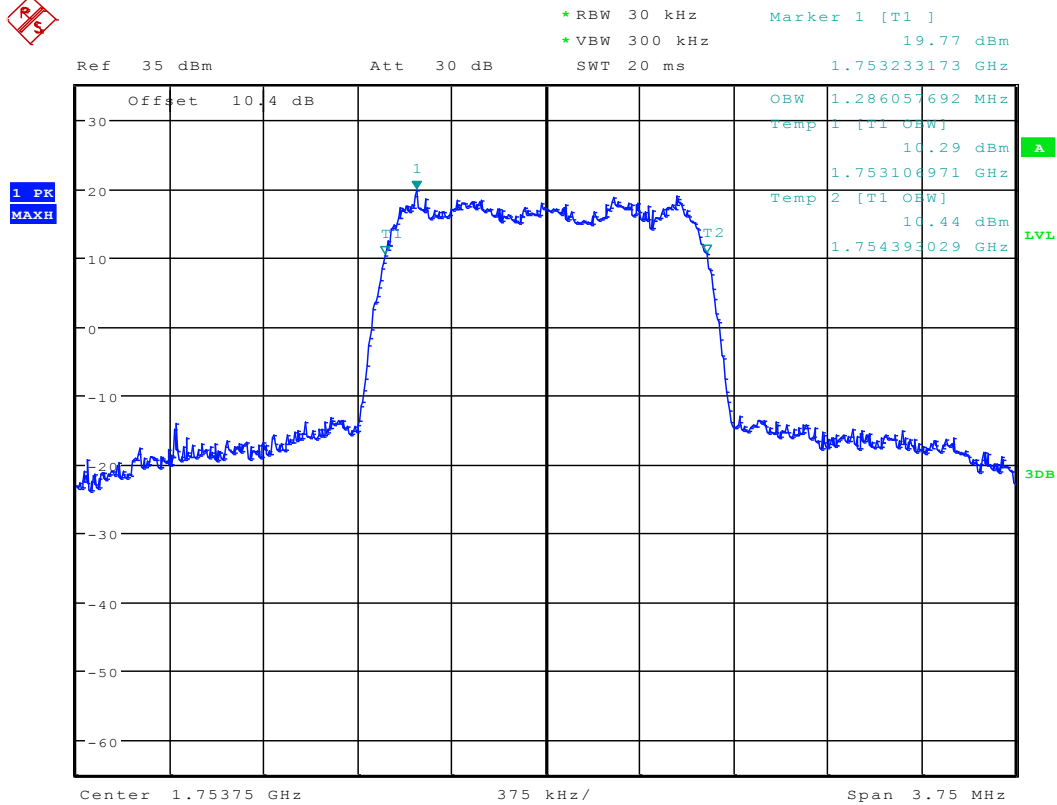
Channel 875(EVDO subtype 0)



Date: 8.NOV.2011 23:51:05



Channel 875 (EVDO subtype 2)



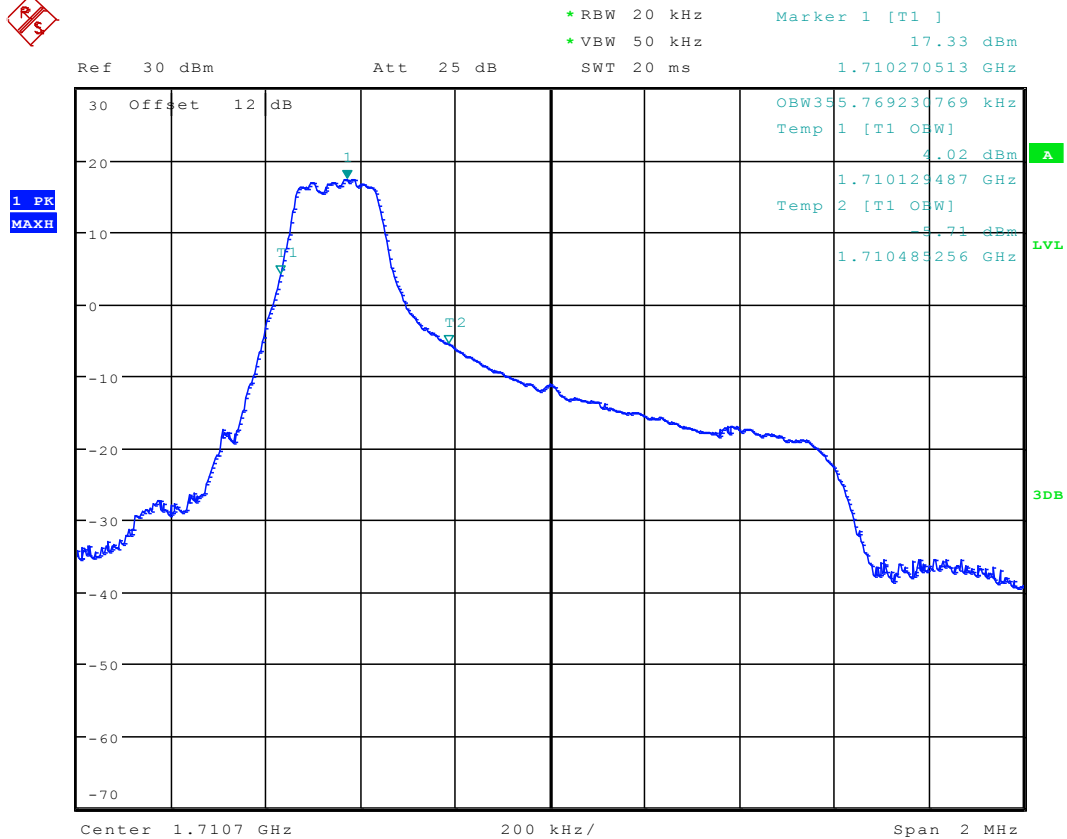
Date: 8.NOV.2011 23:55:58



1.4MHz(BW) Channel 19957

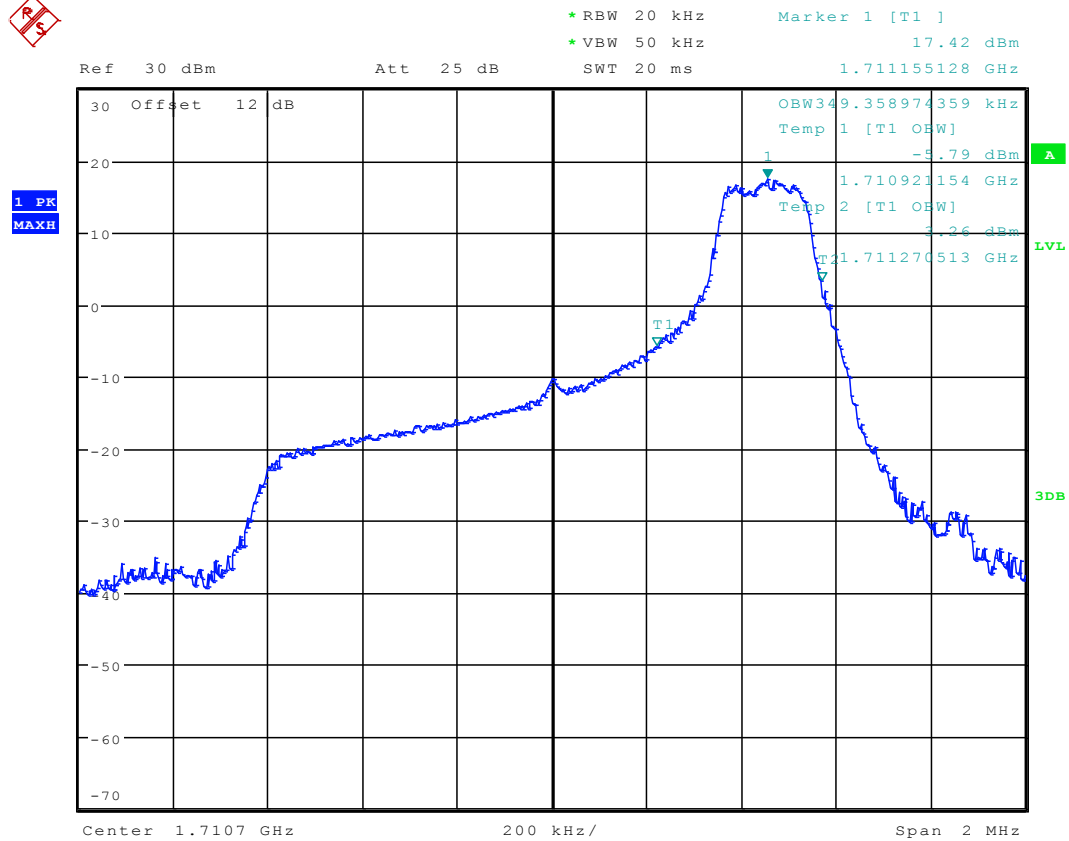
TM4

QPSK/1 RB/RB #0



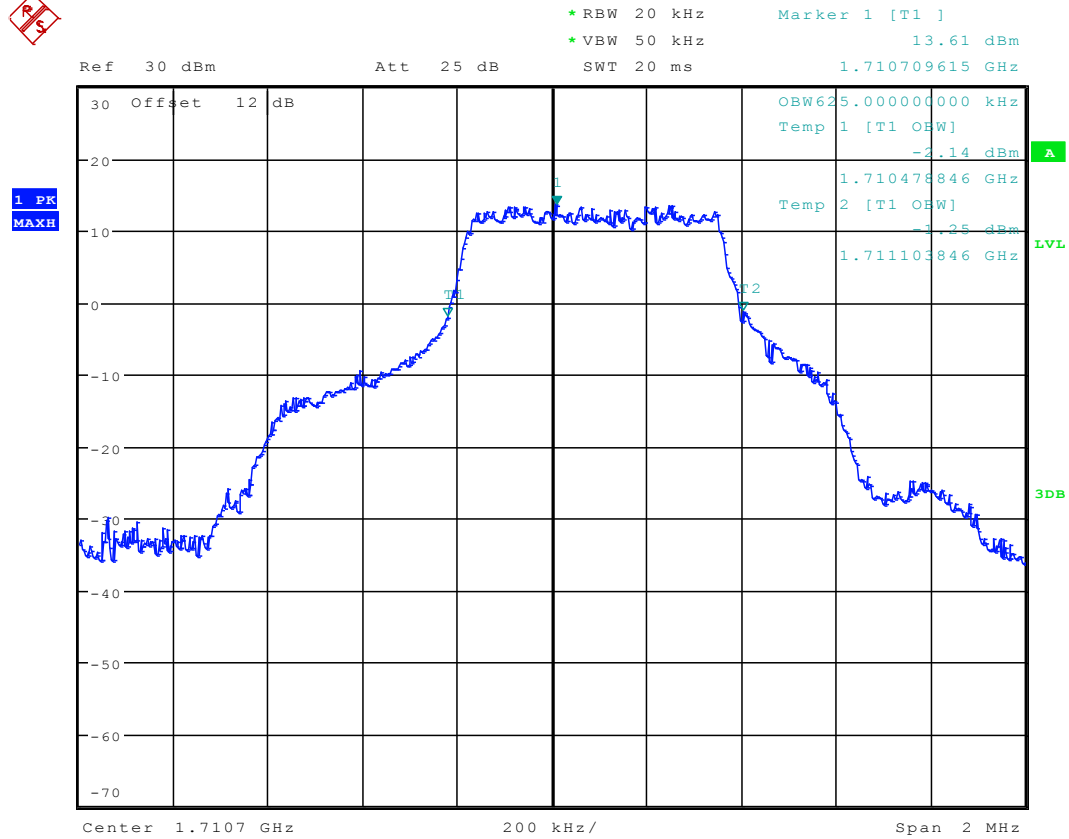


QPSK/1 RB/RB #max



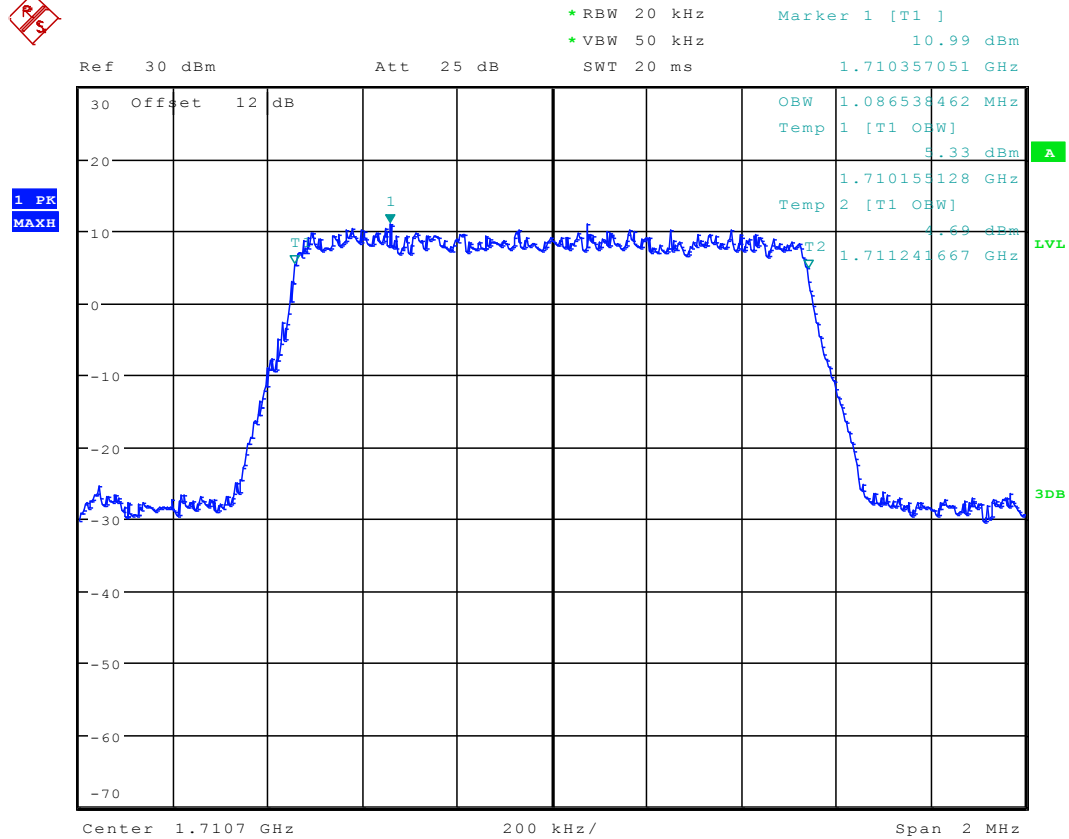


QPSK/3 RB/RB #2





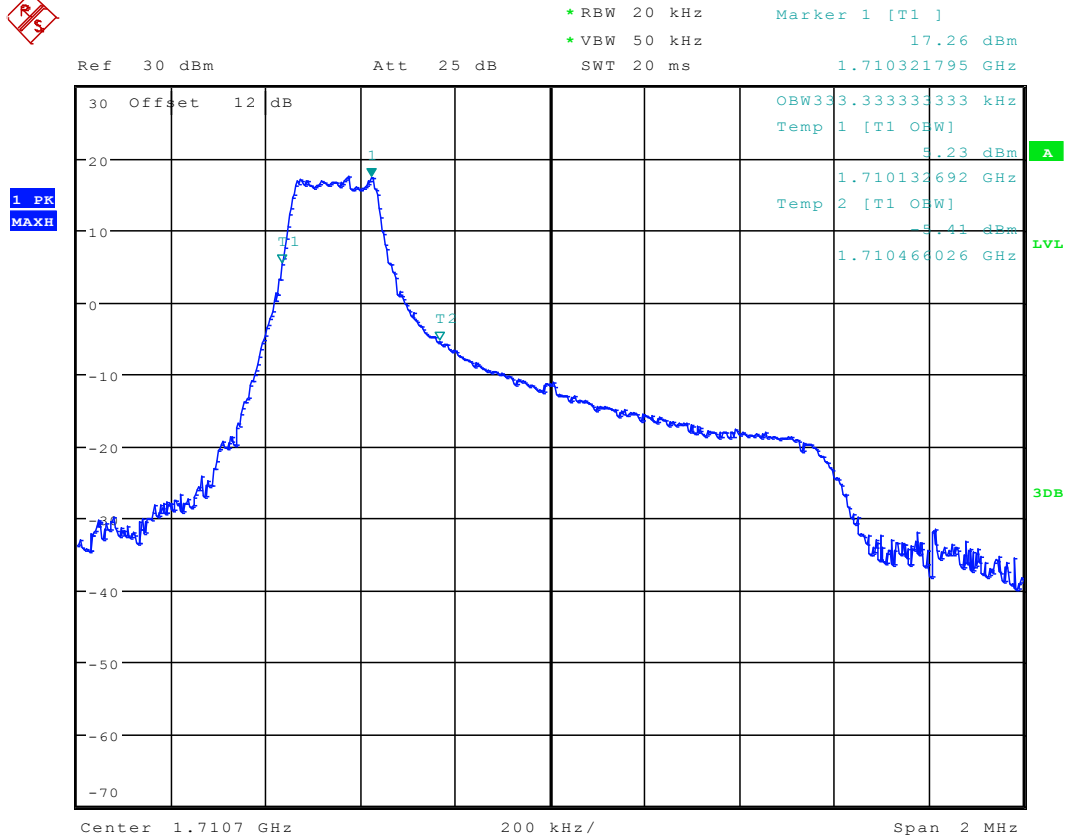
QPSK/ full RBs





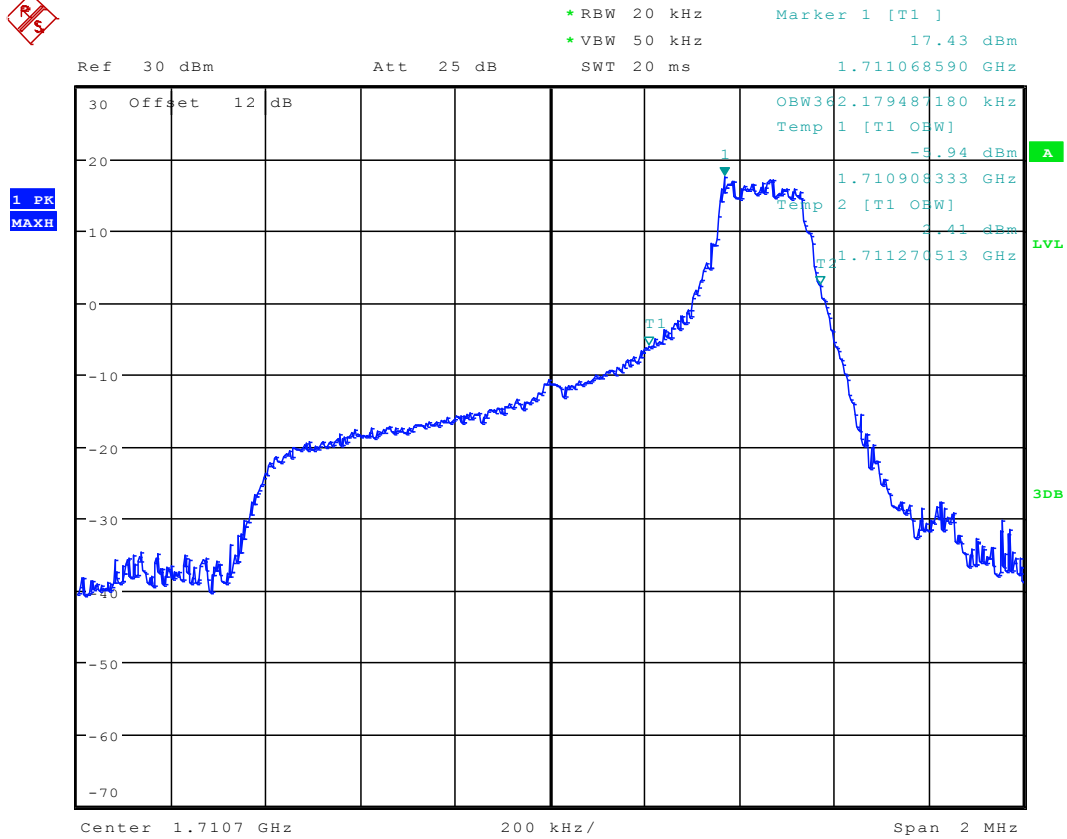
TM5

16QAM /1 RB/RB #0



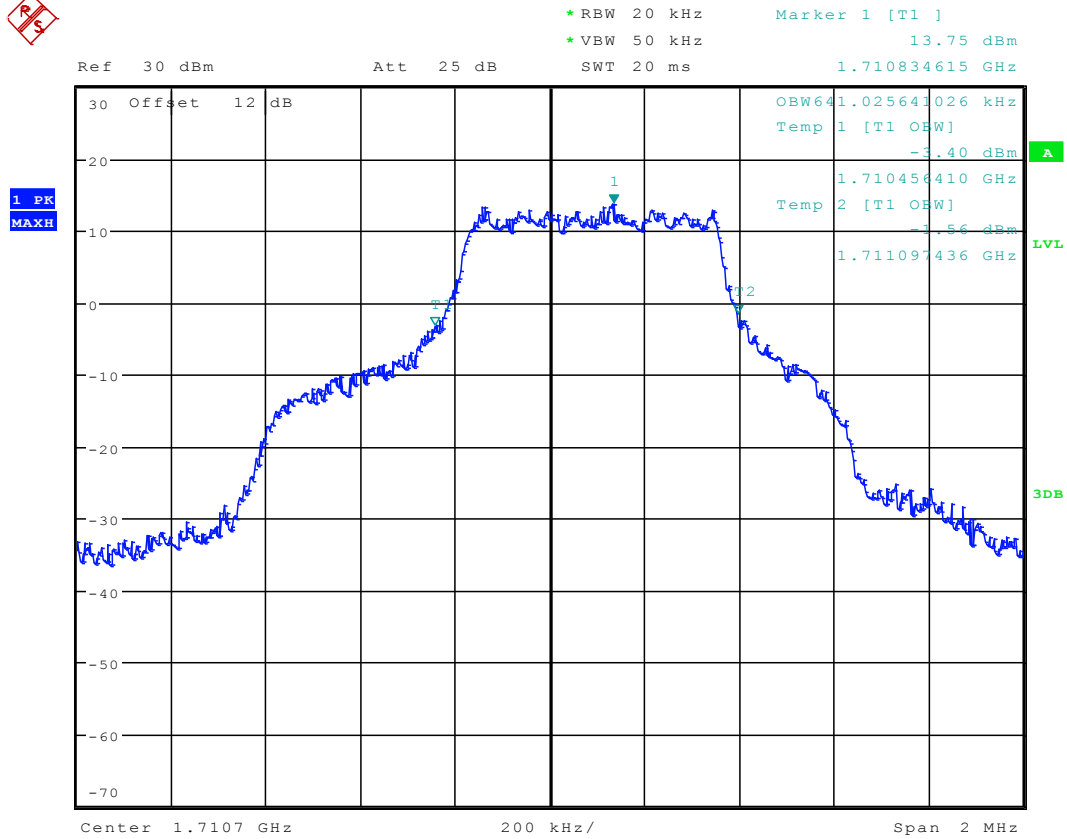


16QAM /1 RB/RB #max



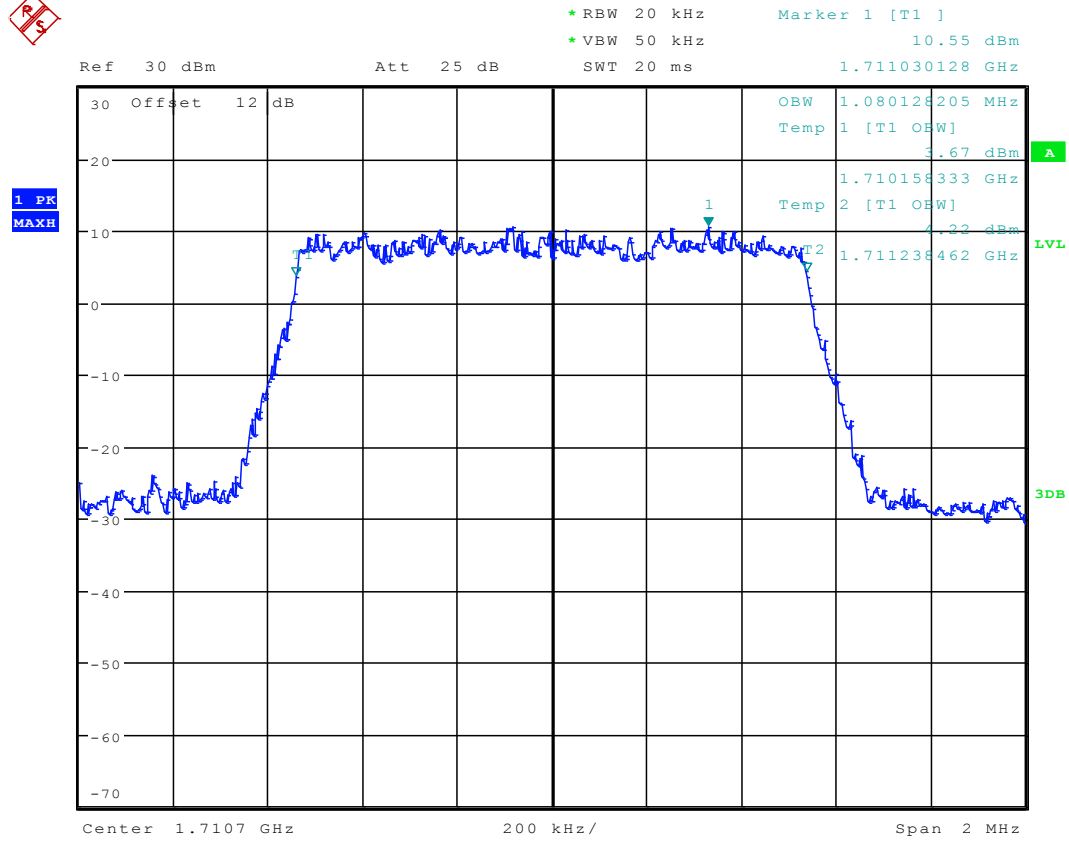


16QAM /3 RB/RB #2





16QAM/full RBs

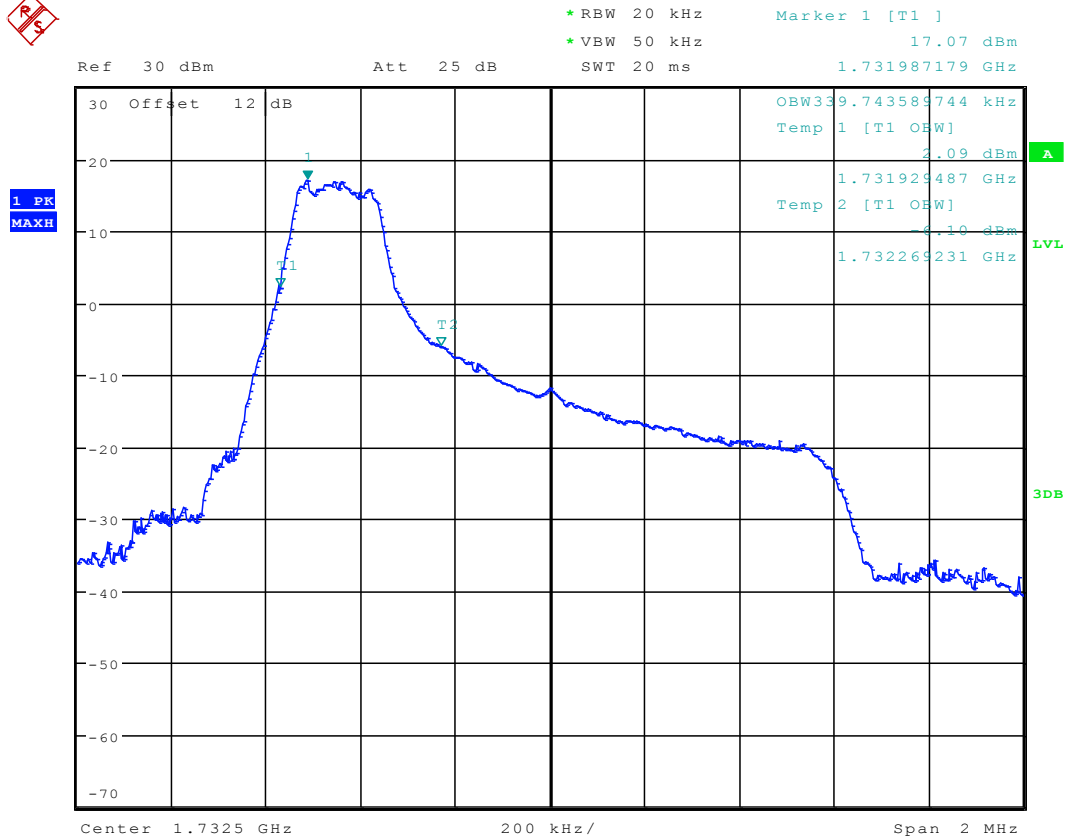




Channel 20175

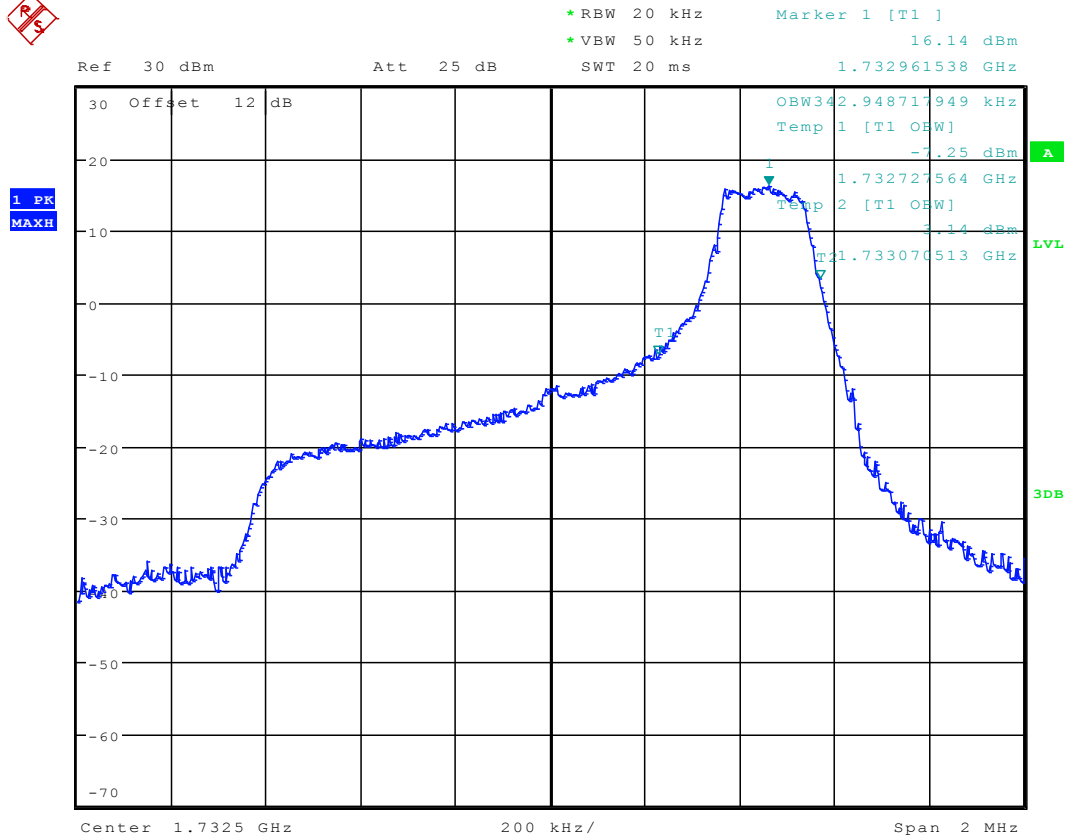
TM4

QPSK/1 RB/RB #0



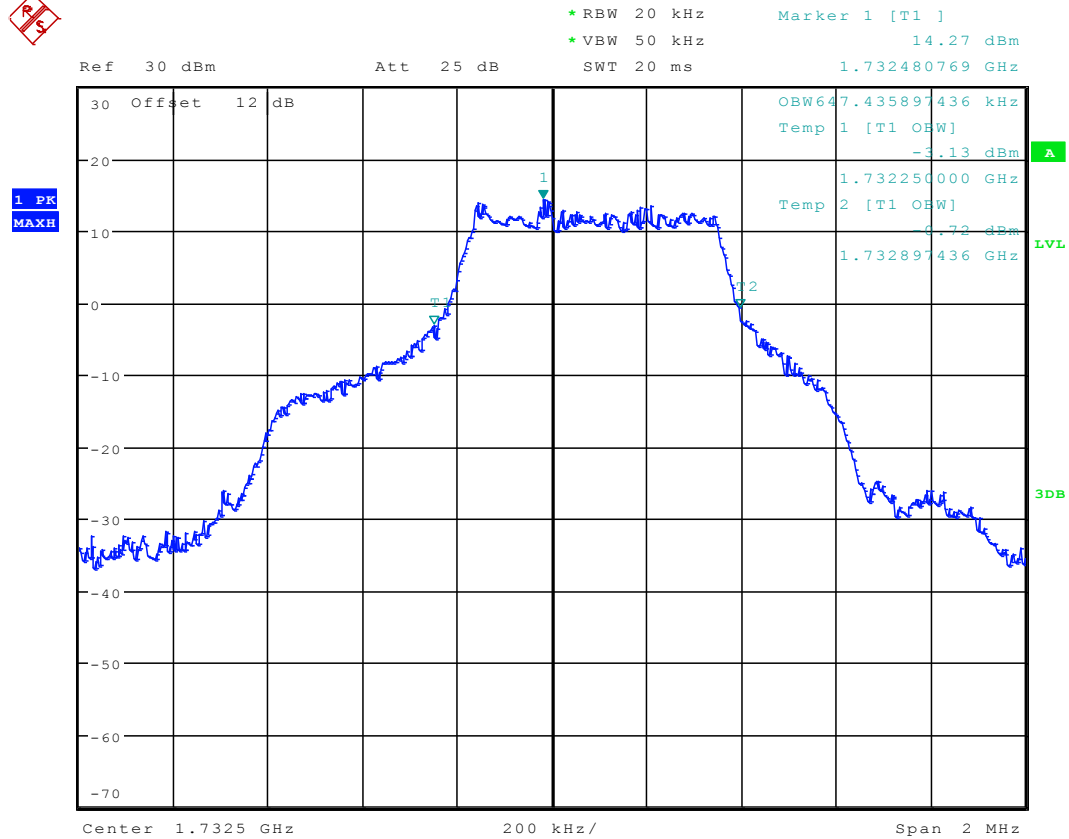


QPSK/1 RB/RB #max



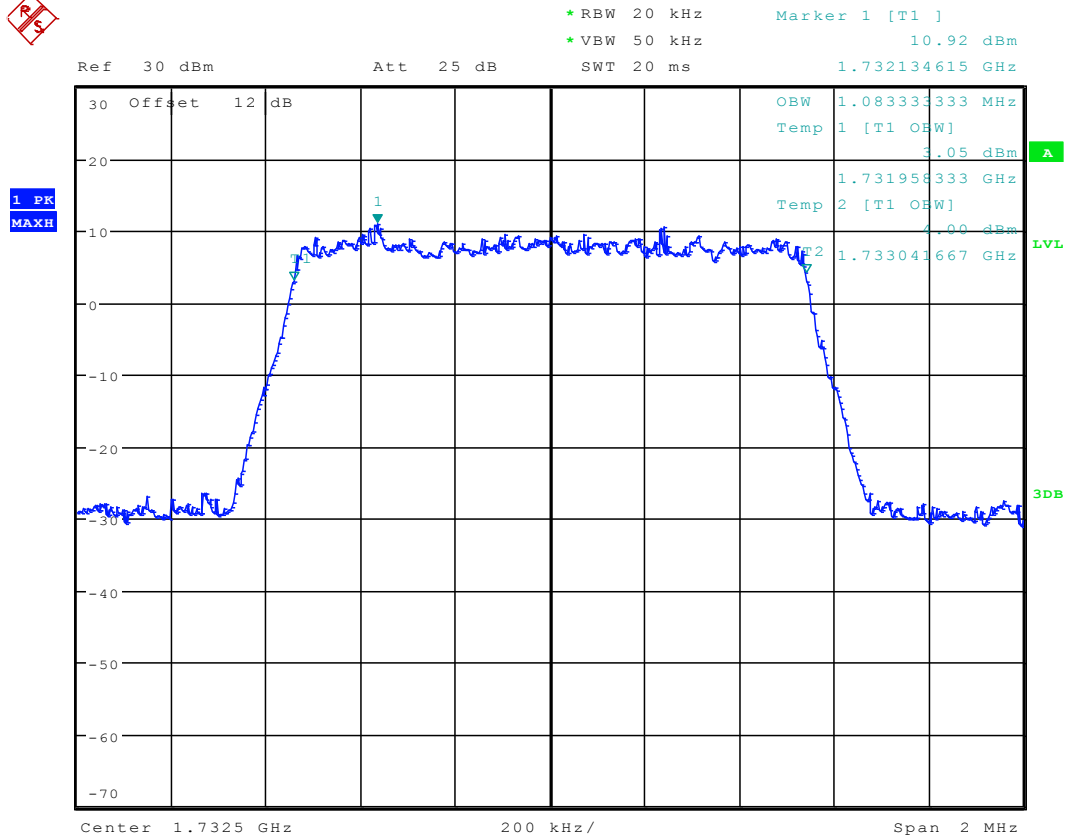


QPSK/3 RB/RB #2





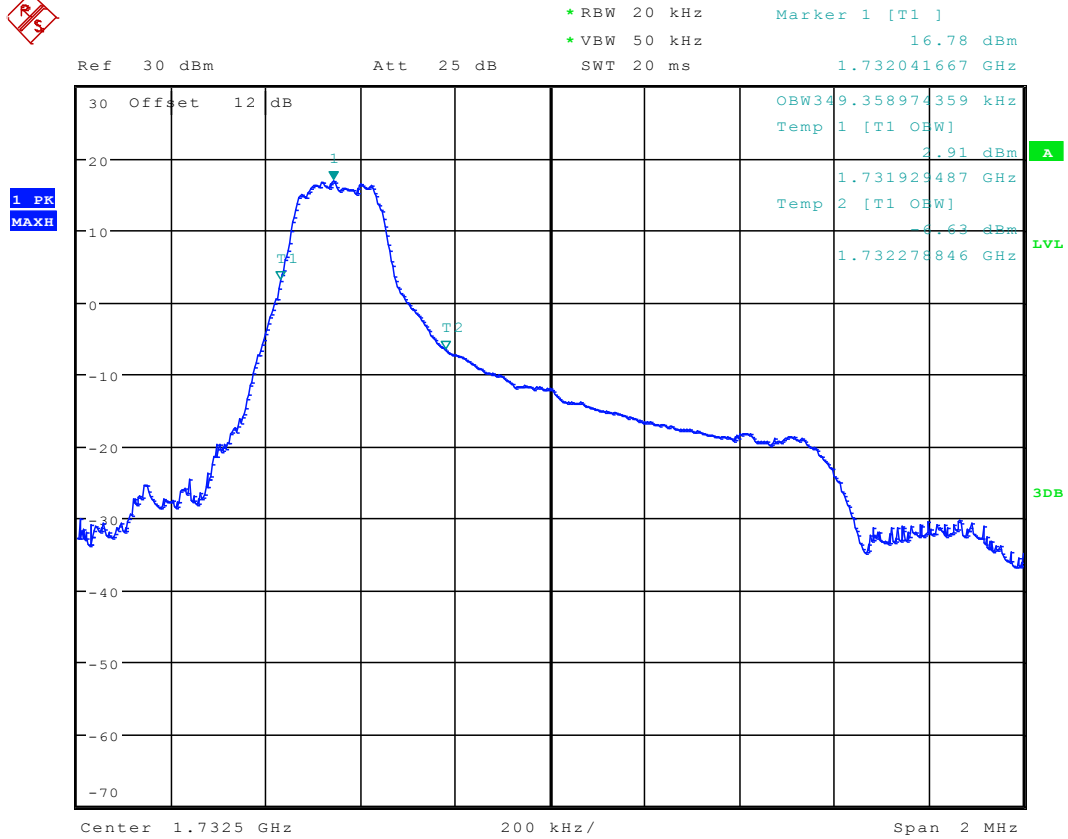
QPSK/ full RBs





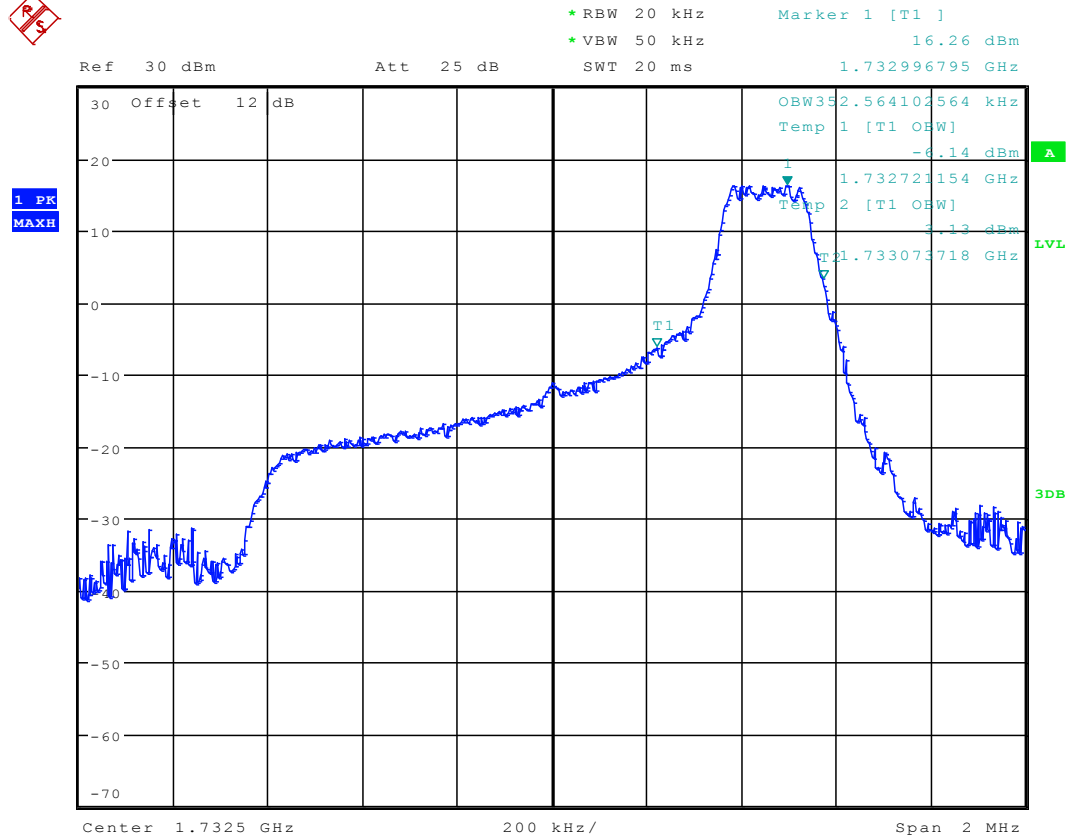
TM5

16QAM /1 RB/RB #0



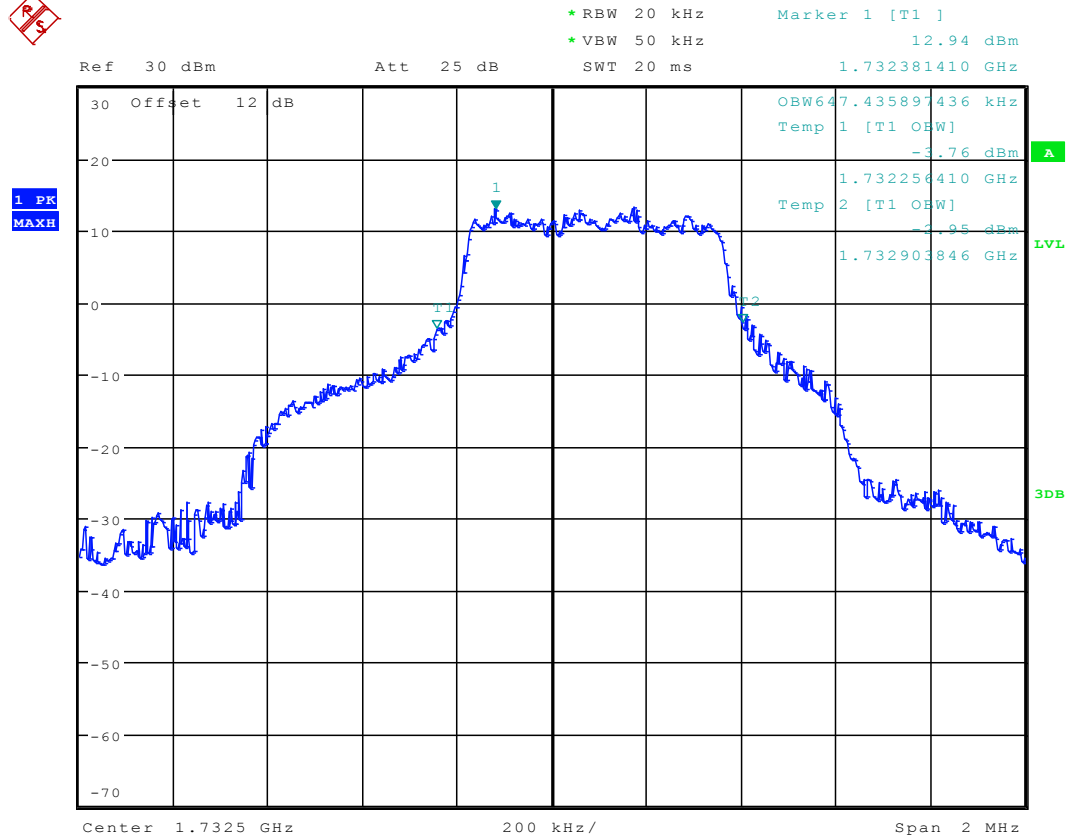


16QAM /1 RB/RB #max



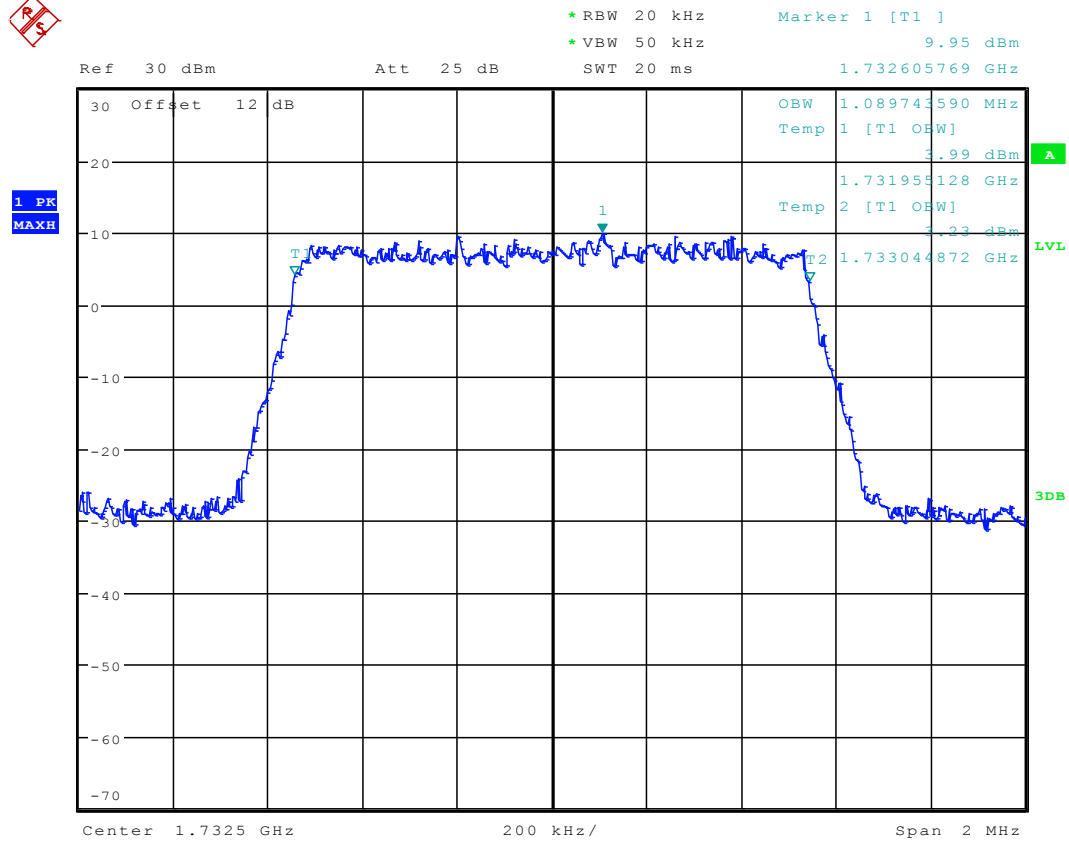


16QAM /3 RB/RB #2





16QAM/full RBs

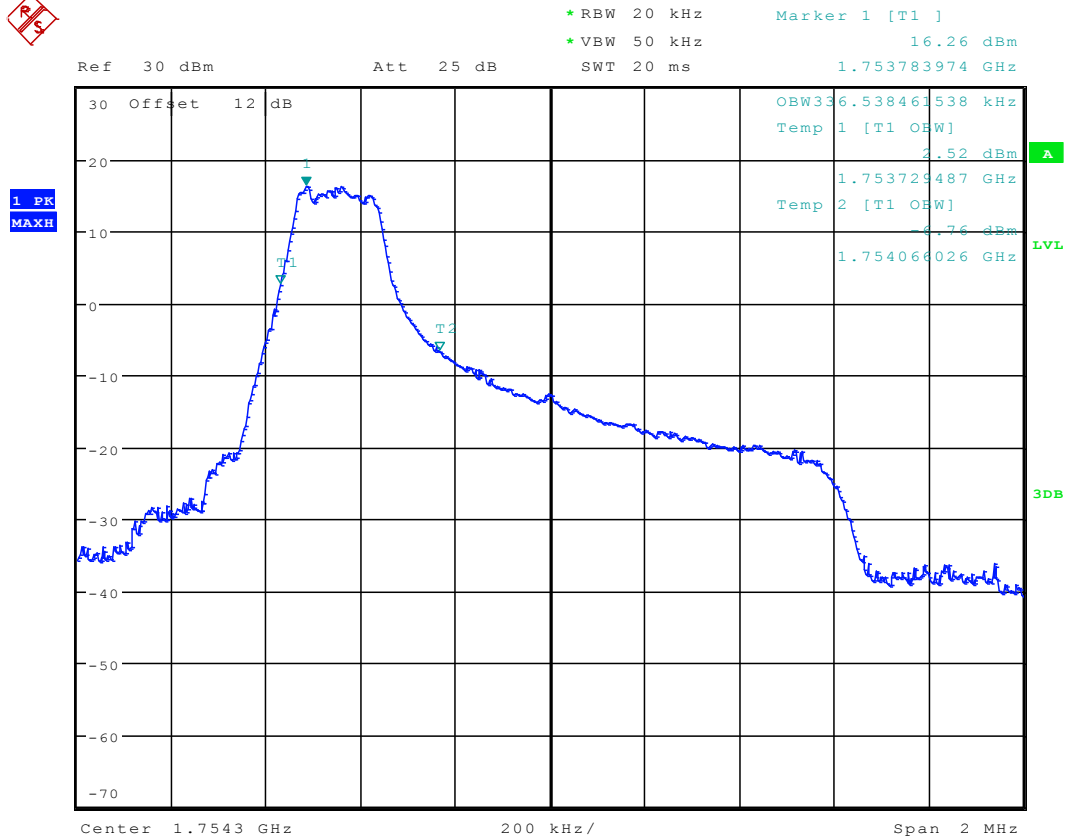




Channel 20393

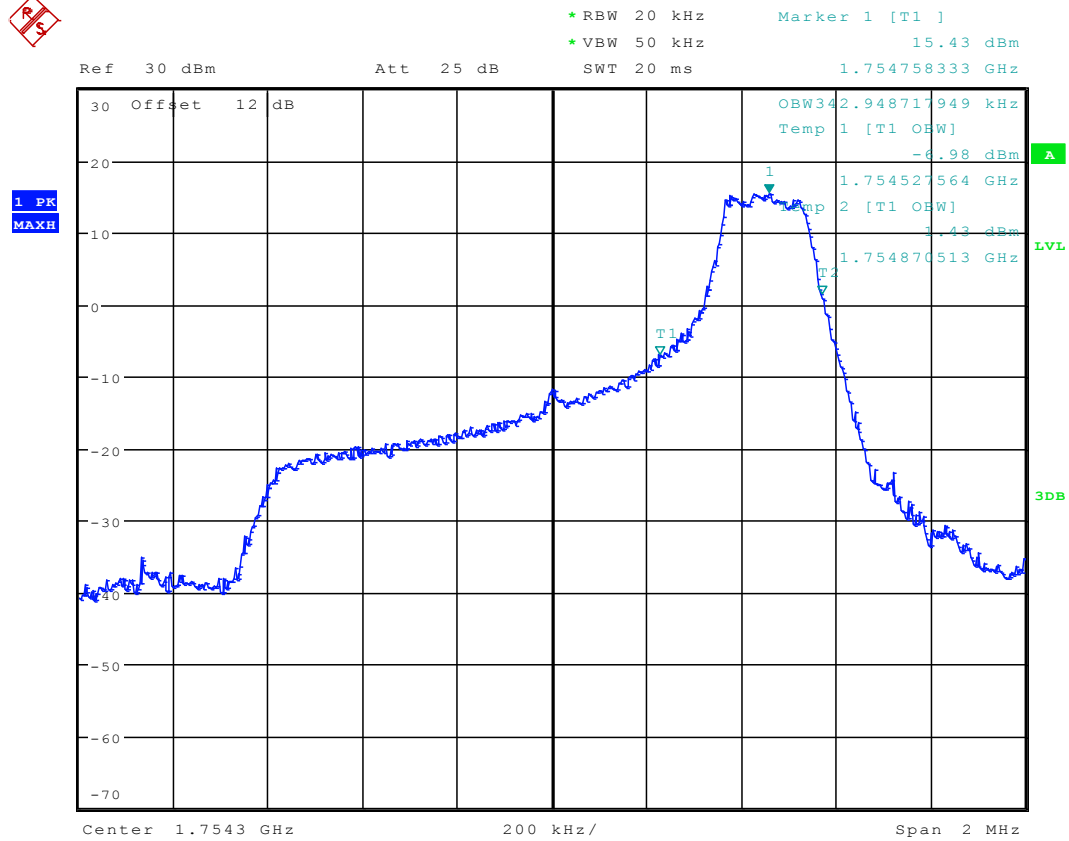
TM4

QPSK/1 RB/RB #0



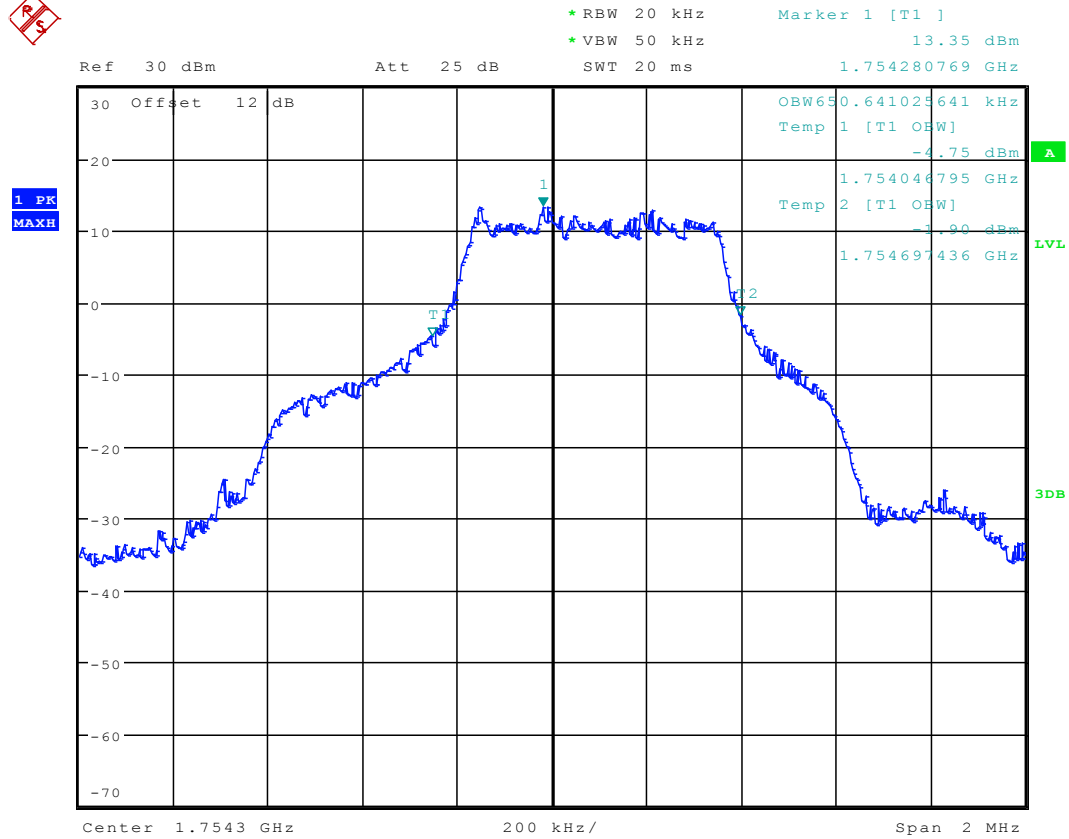


QPSK/1 RB/RB #max



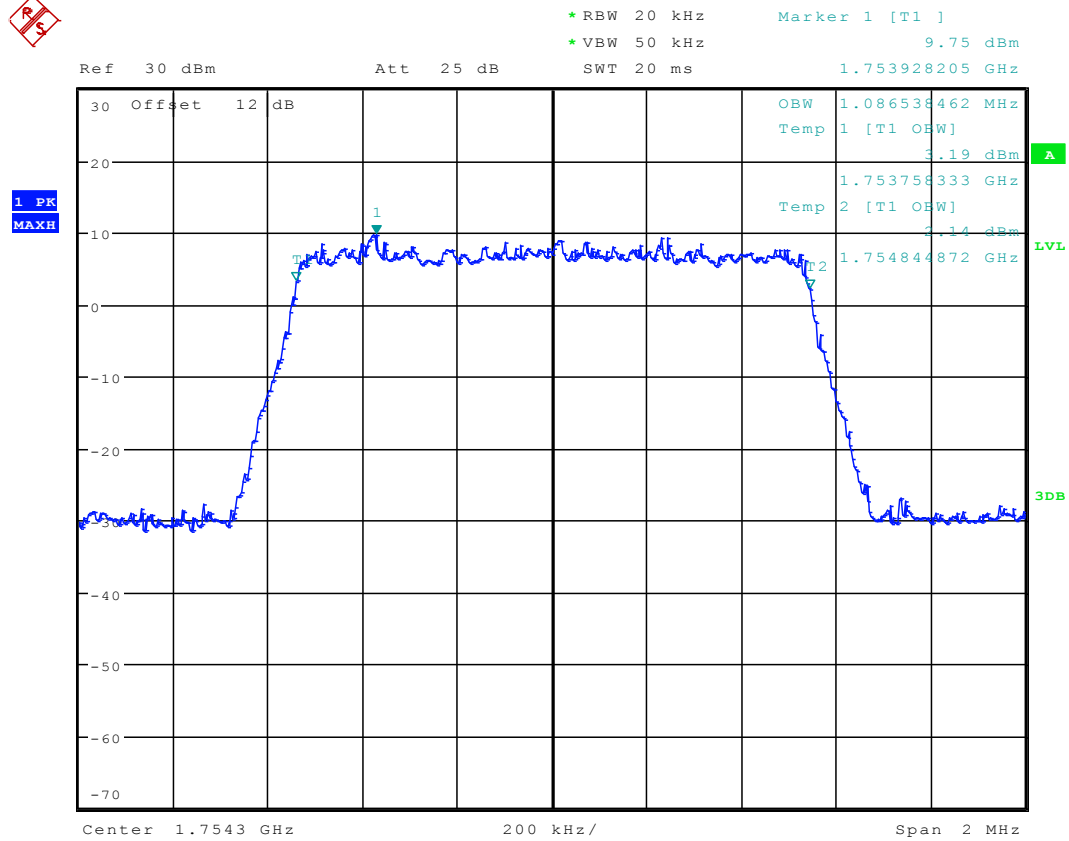


QPSK/3 RB/RB #2





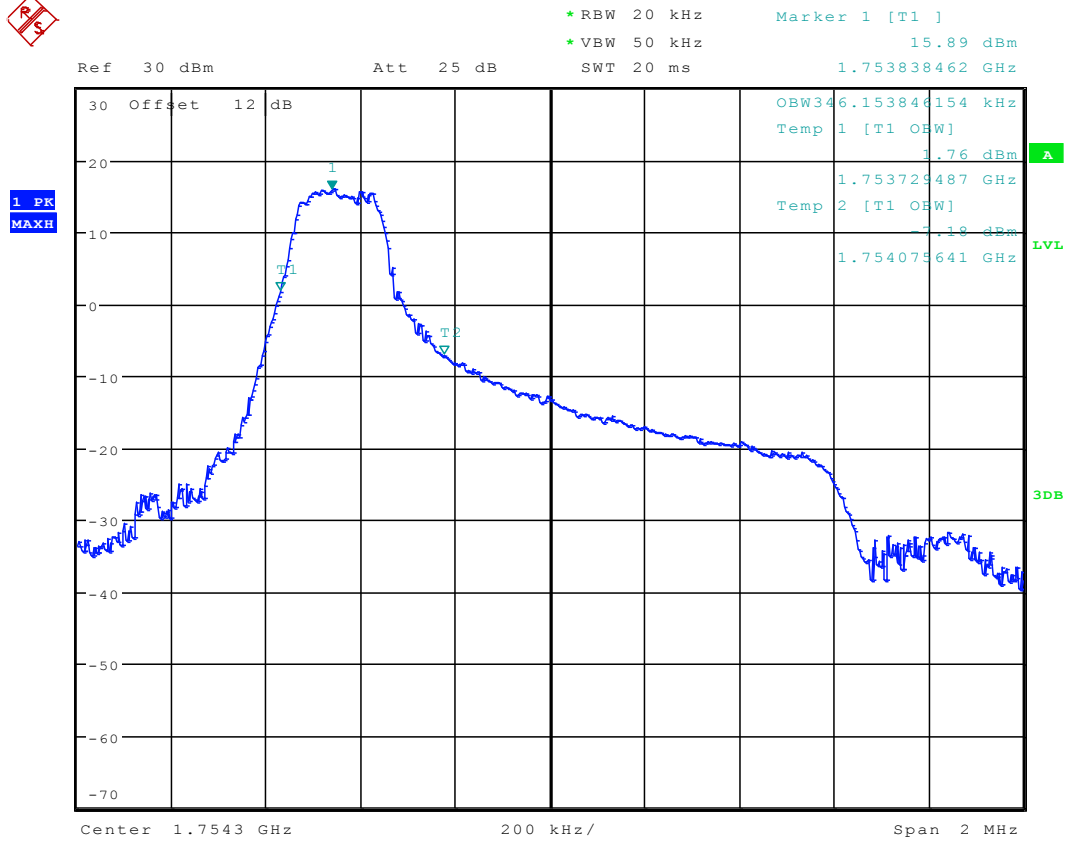
QPSK/ full RBs





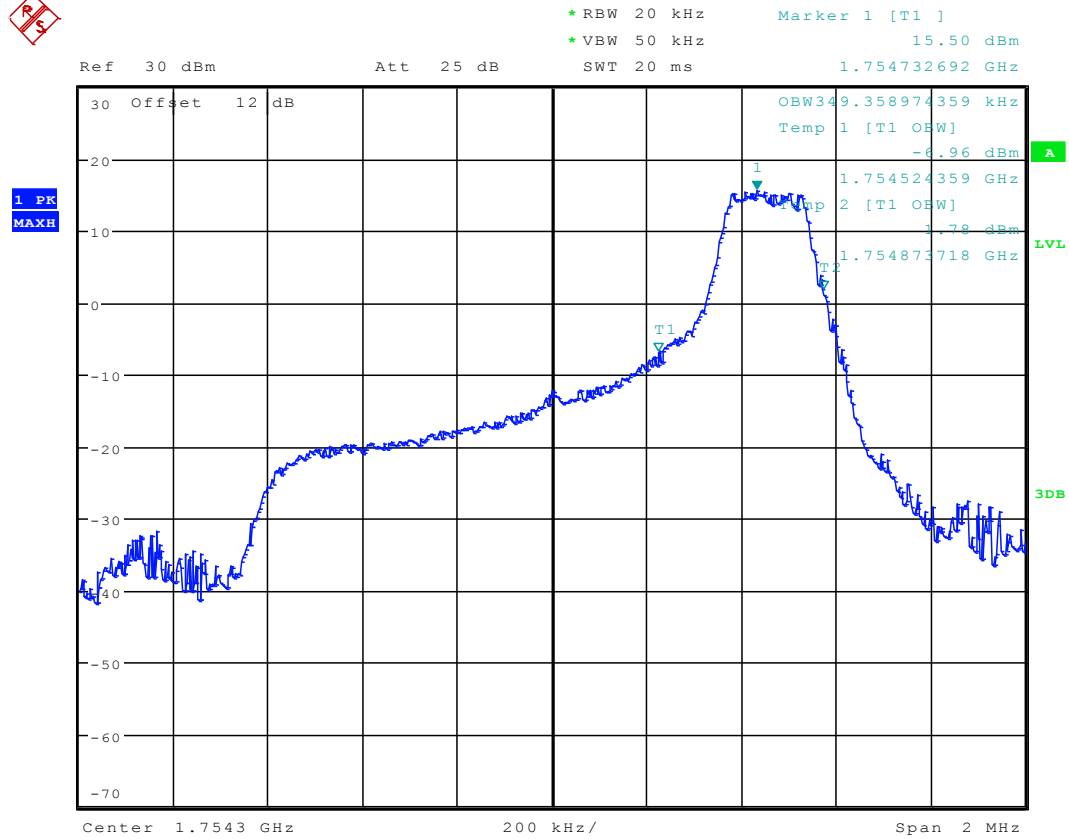
TM5

16QAM /1 RB/RB #0



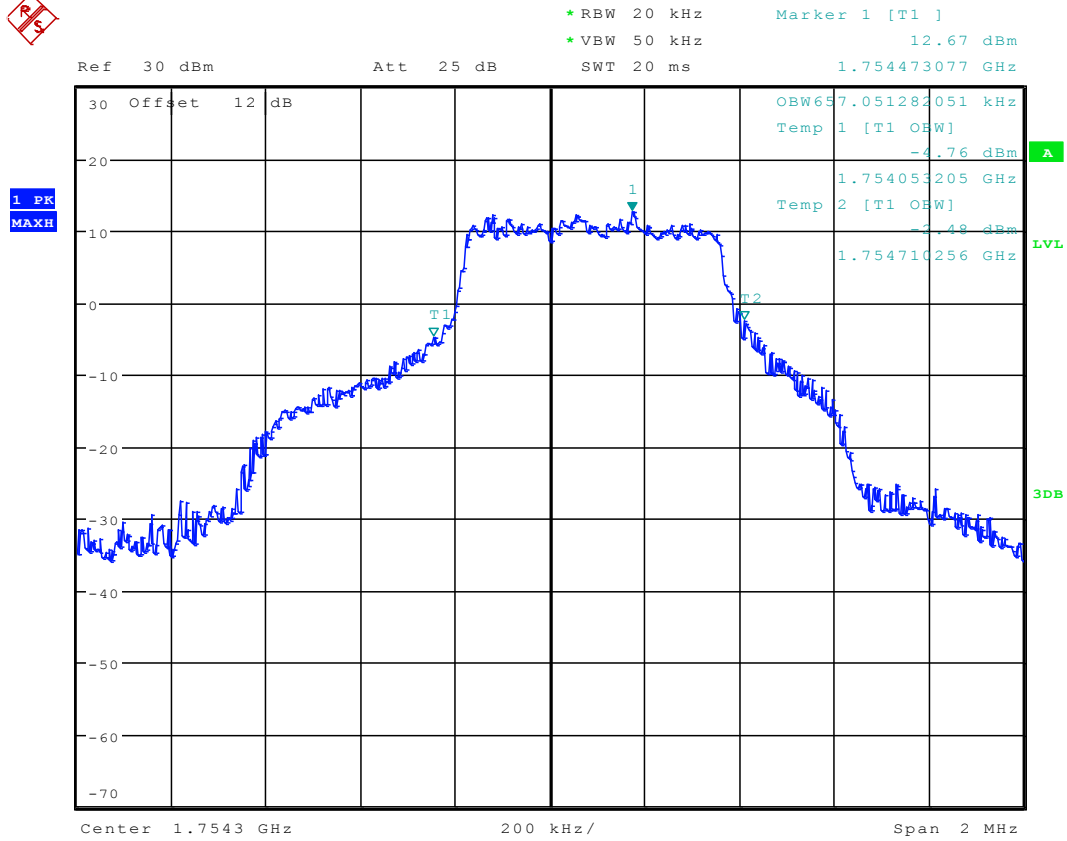


16QAM /1 RB/RB #max



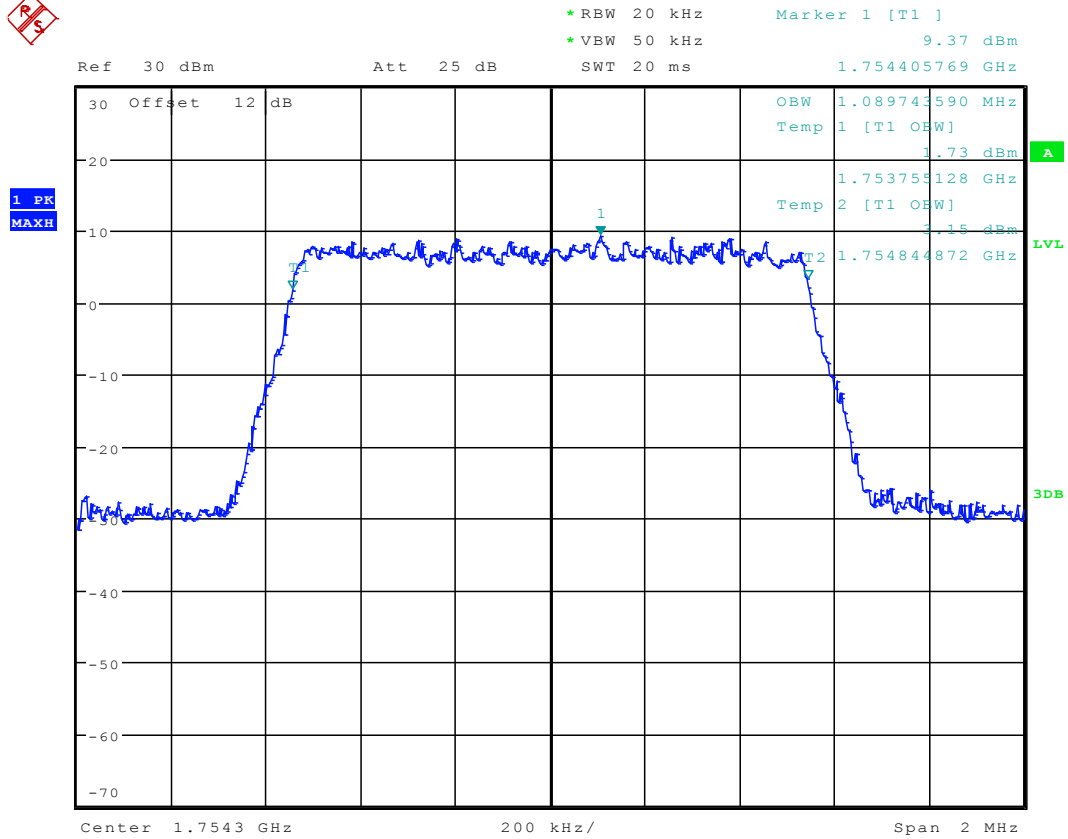


16QAM /3 RB/RB #2





16QAM/full RBs



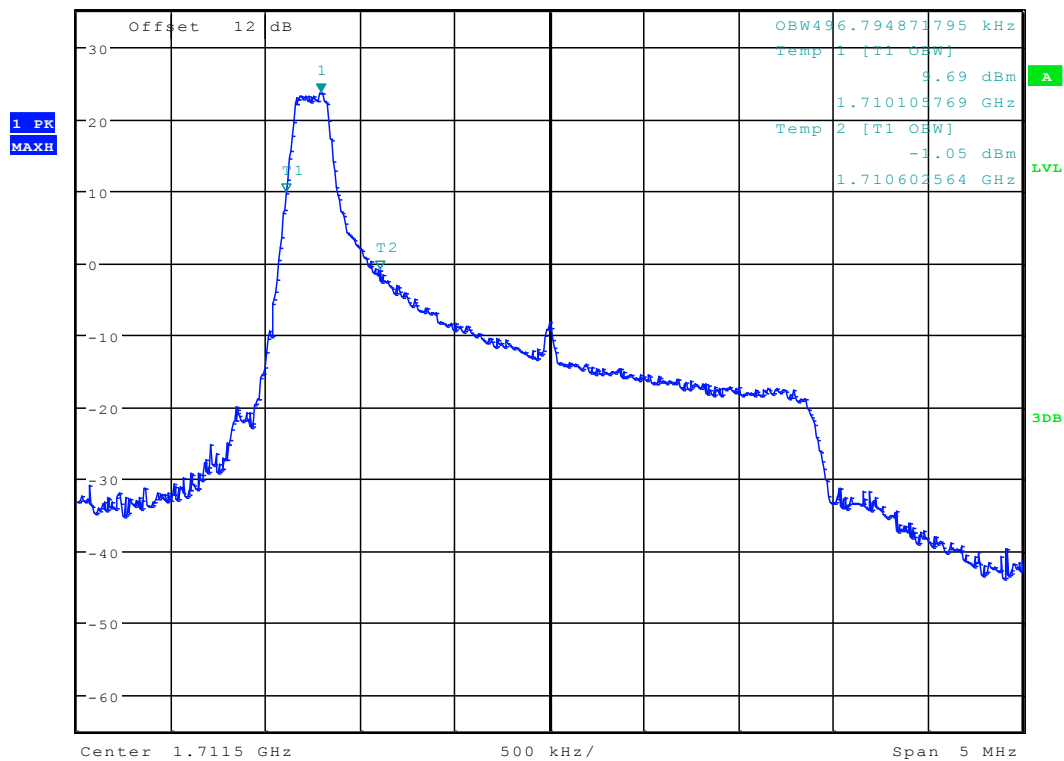
3MHz(BW)
Channel 19965

TM4

QPSK/1 RB/RB #0



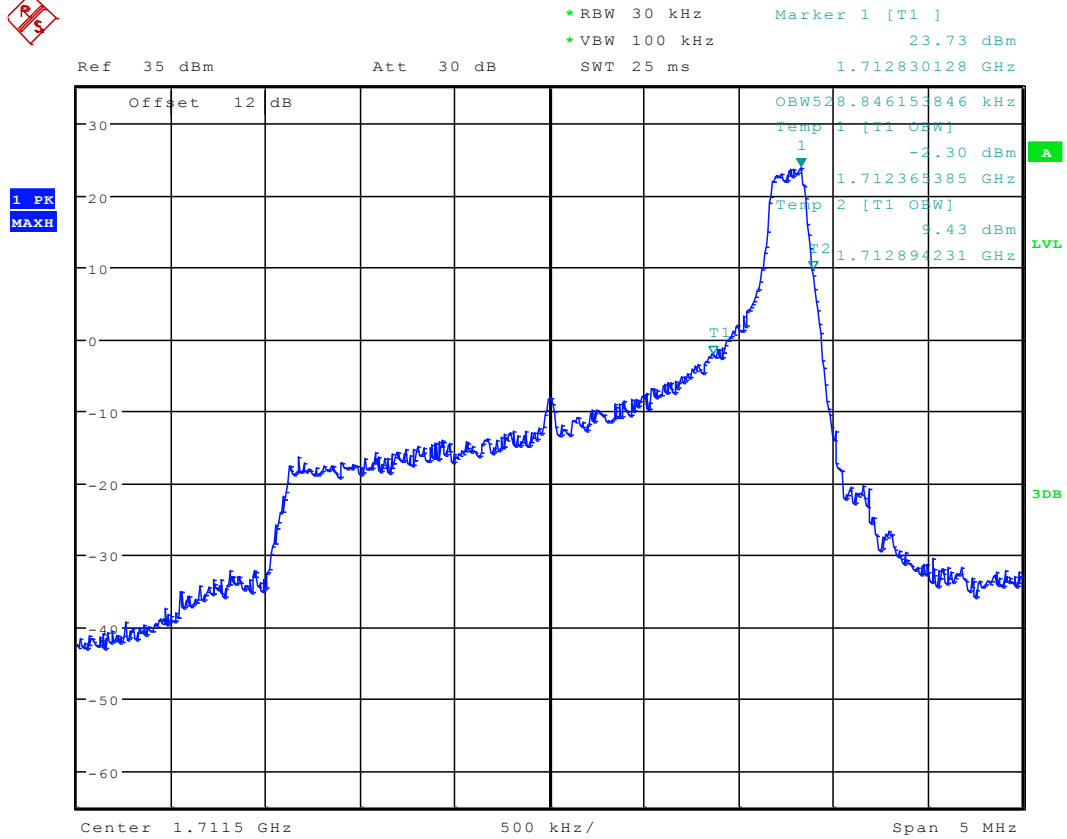
```
* RBW 30 kHz      Marker 1 [T1 ]
* VBW 100 kHz      23.64 dBm
SWT 25 ms          1.710290064 GHz
```



Date: 25.NOV.2011 15:56:32



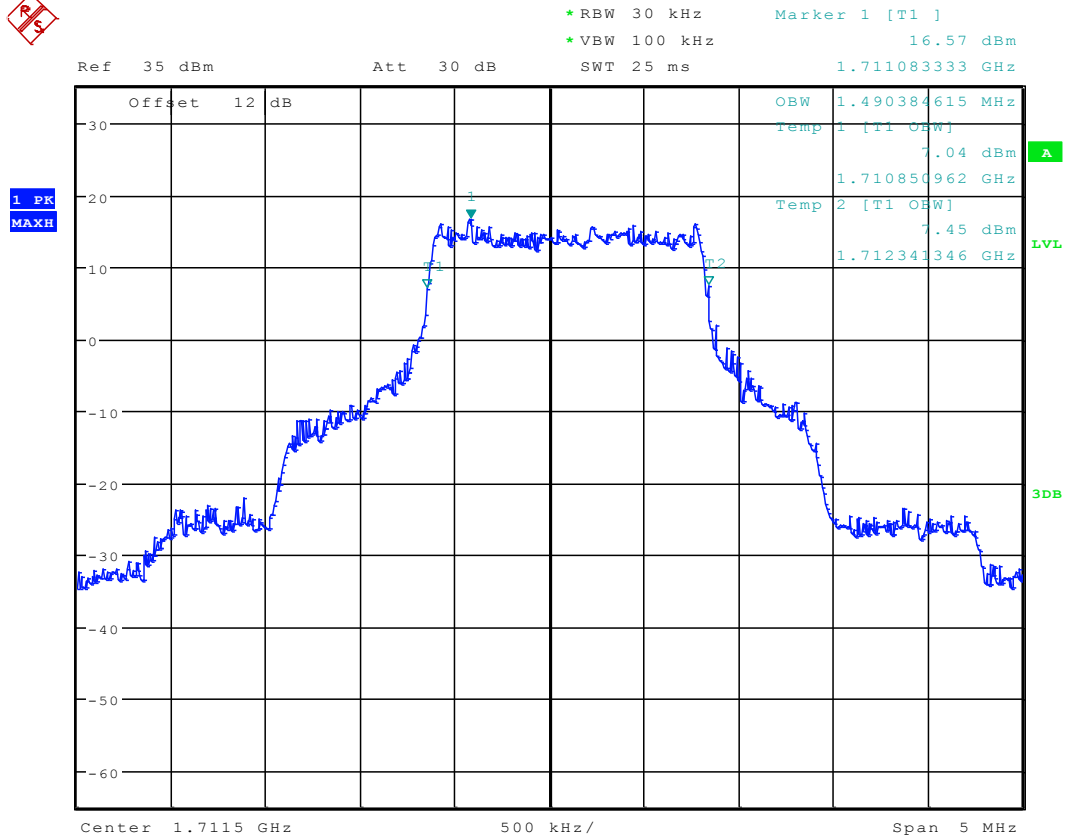
QPSK/1 RB/RB #max



Date: 25.NOV.2011 15:56:48



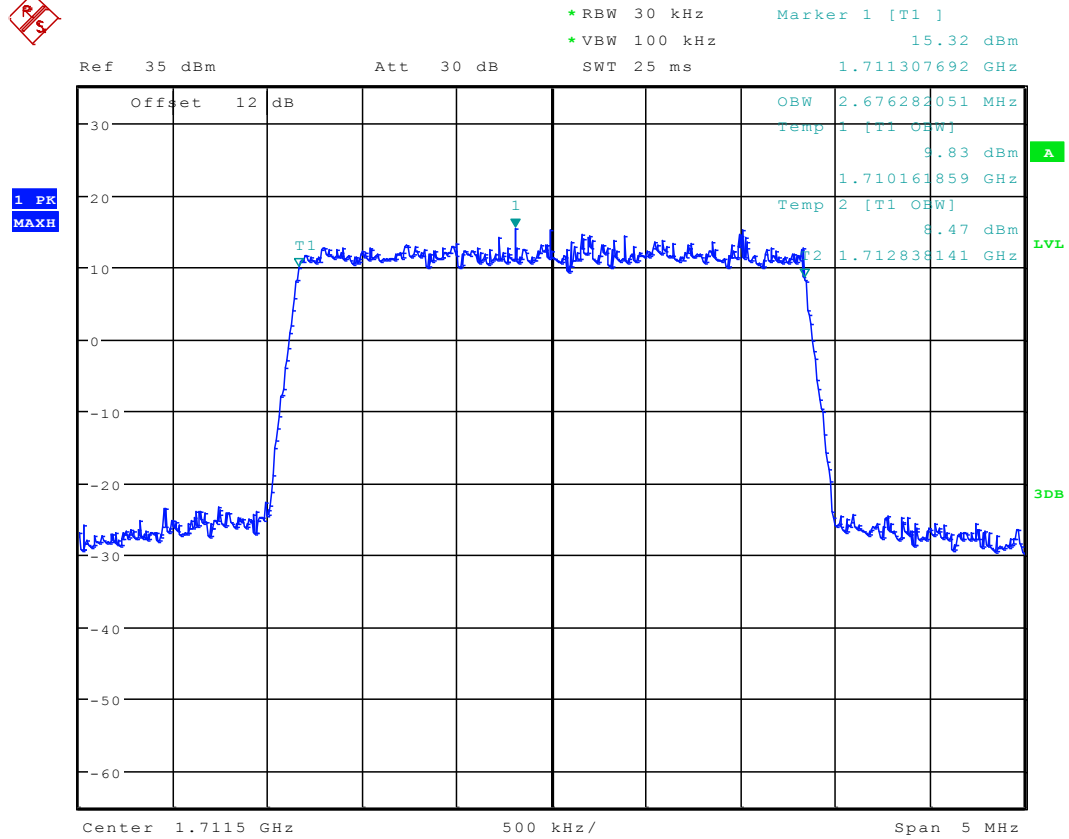
QPSK/8 RB/RB #4



Date: 25.NOV.2011 15:57:42

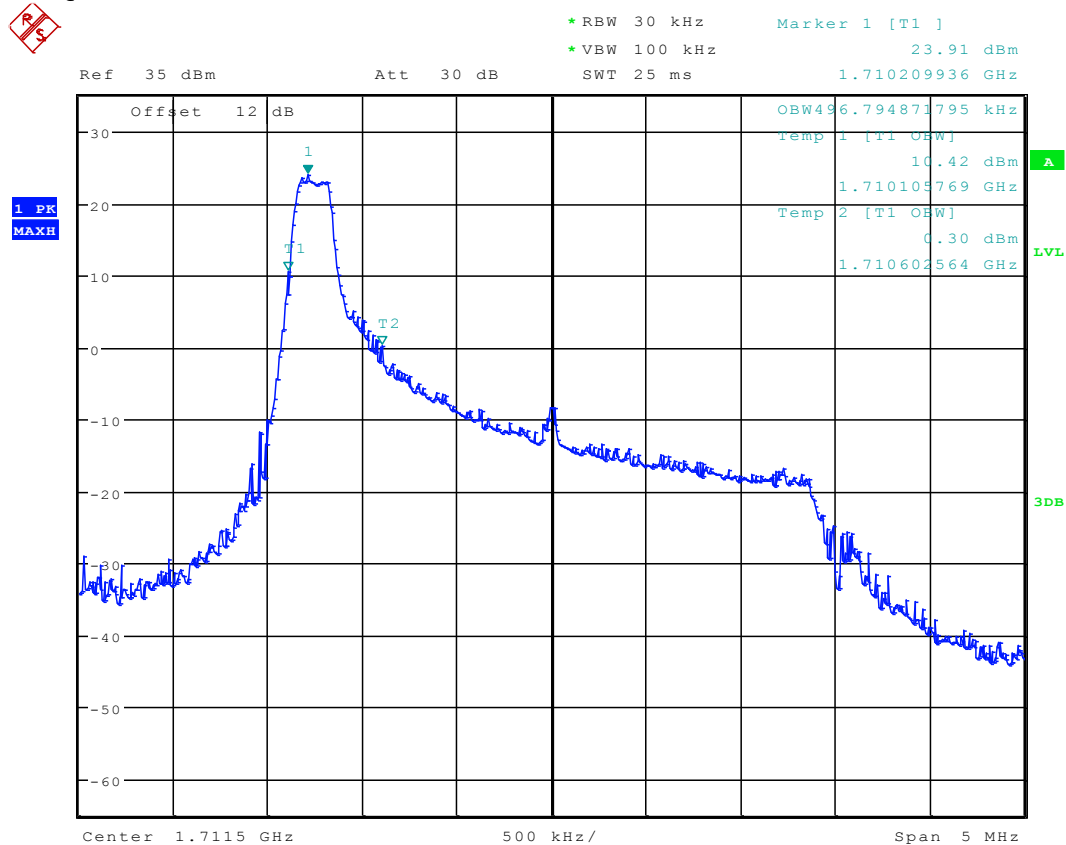


QPSK/ full RBs



Date: 25.NOV.2011 15:55:34

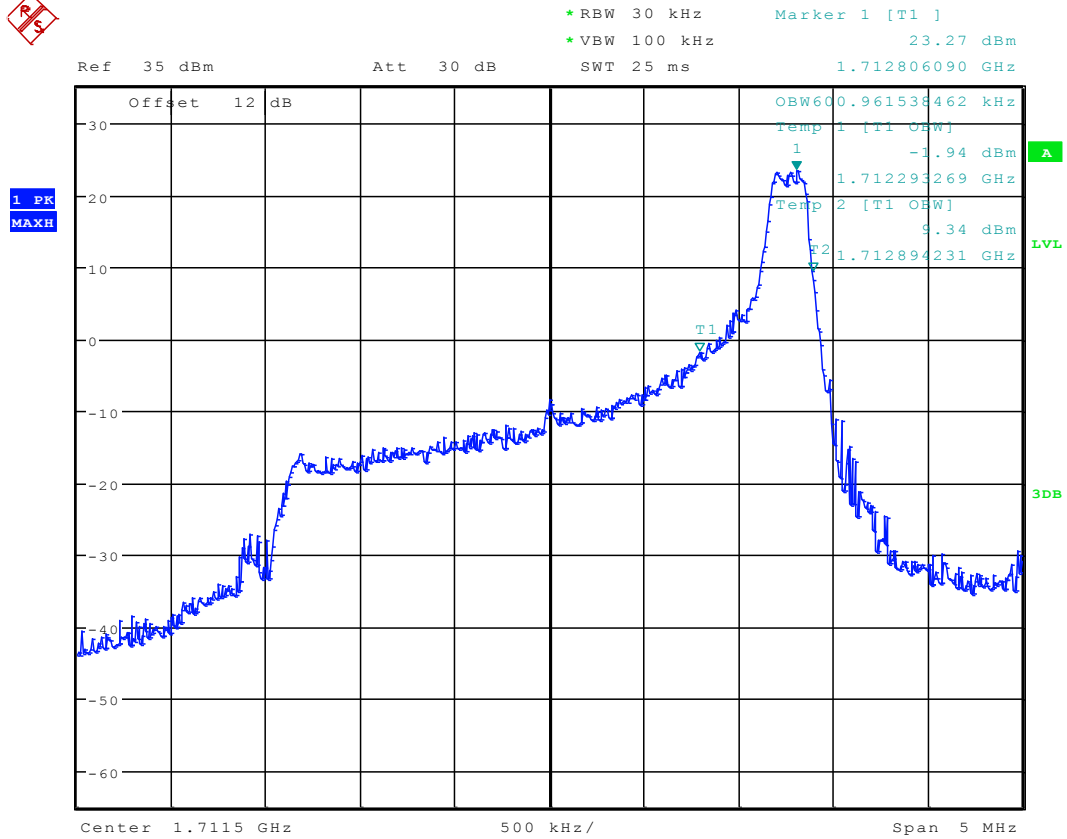
TM5
16QAM /1 RB/RB #0



Date: 25.NOV.2011 15:56:13



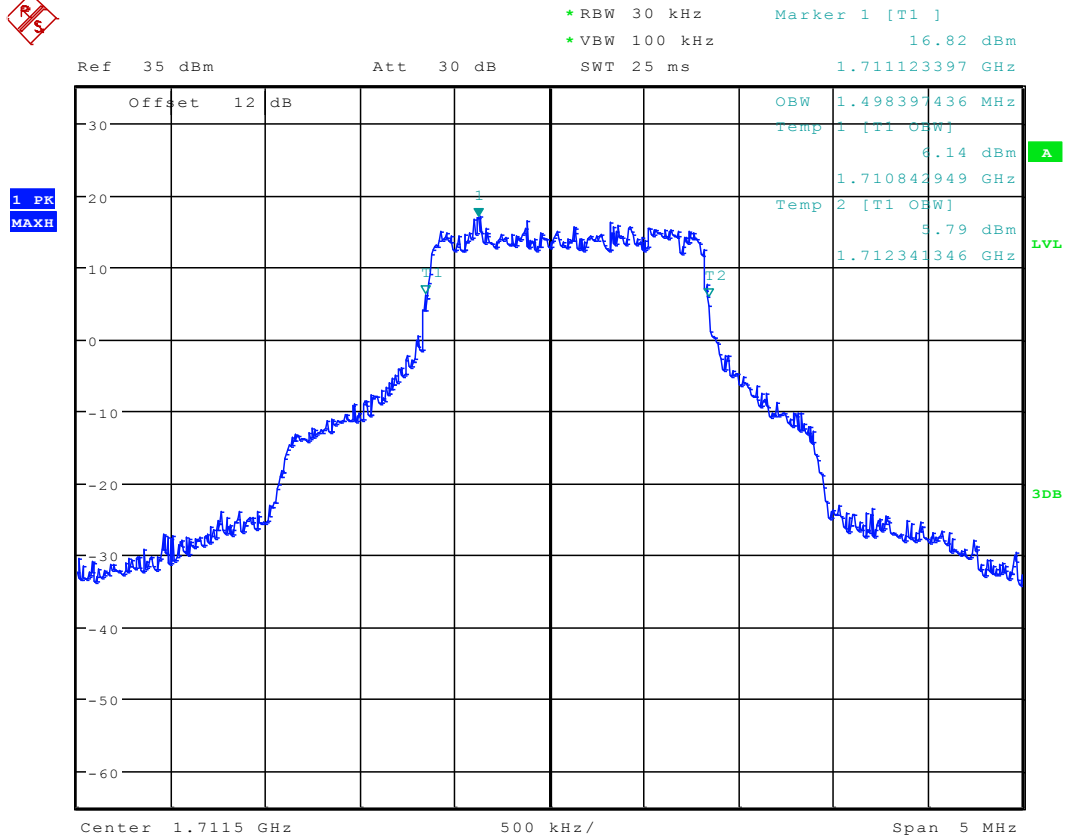
16QAM /1 RB/RB #max



Date: 25.NOV.2011 15:57:02



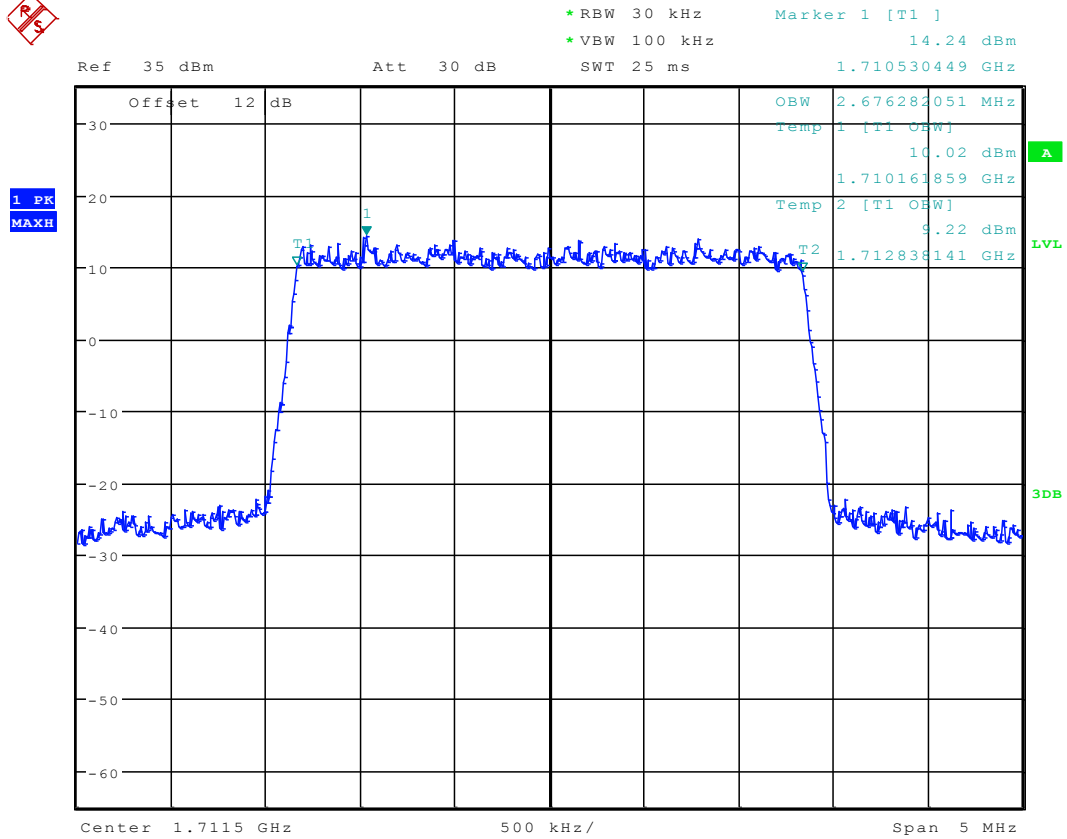
16QAM /8 RB/RB #4



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



16QAM/full RBs



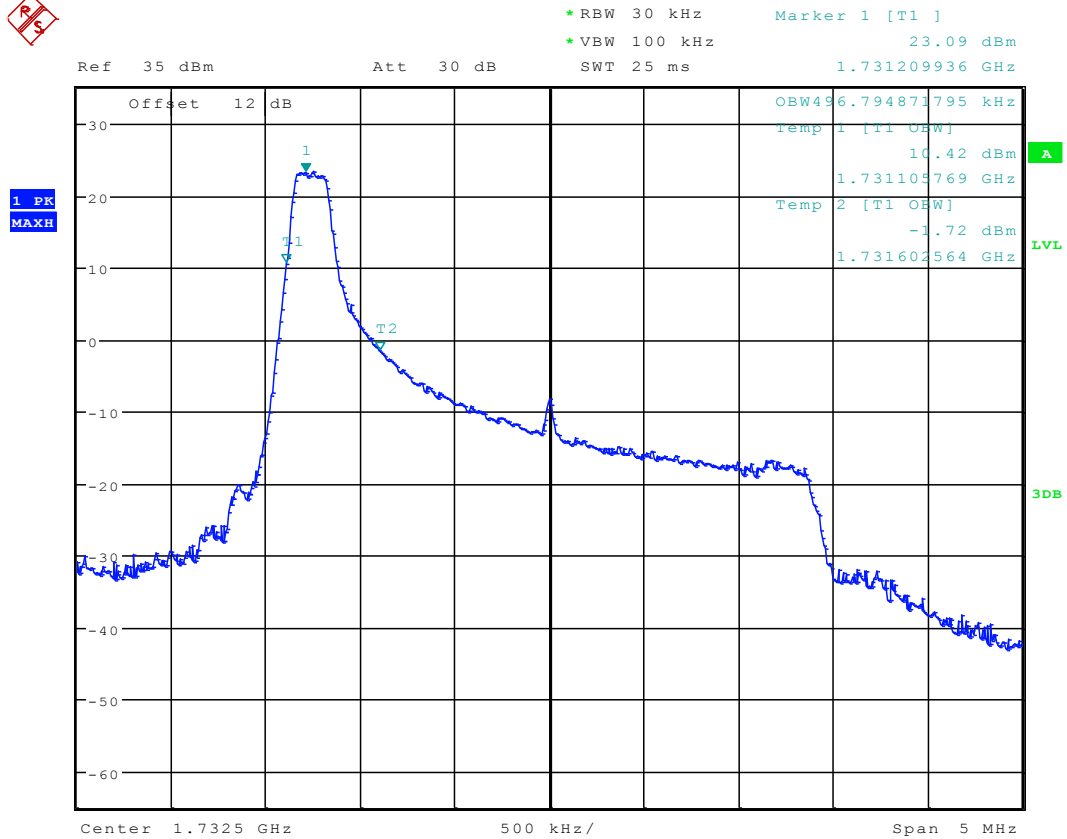
Date: 25.NOV.2011 15:55:55



Channel 20175

TM4

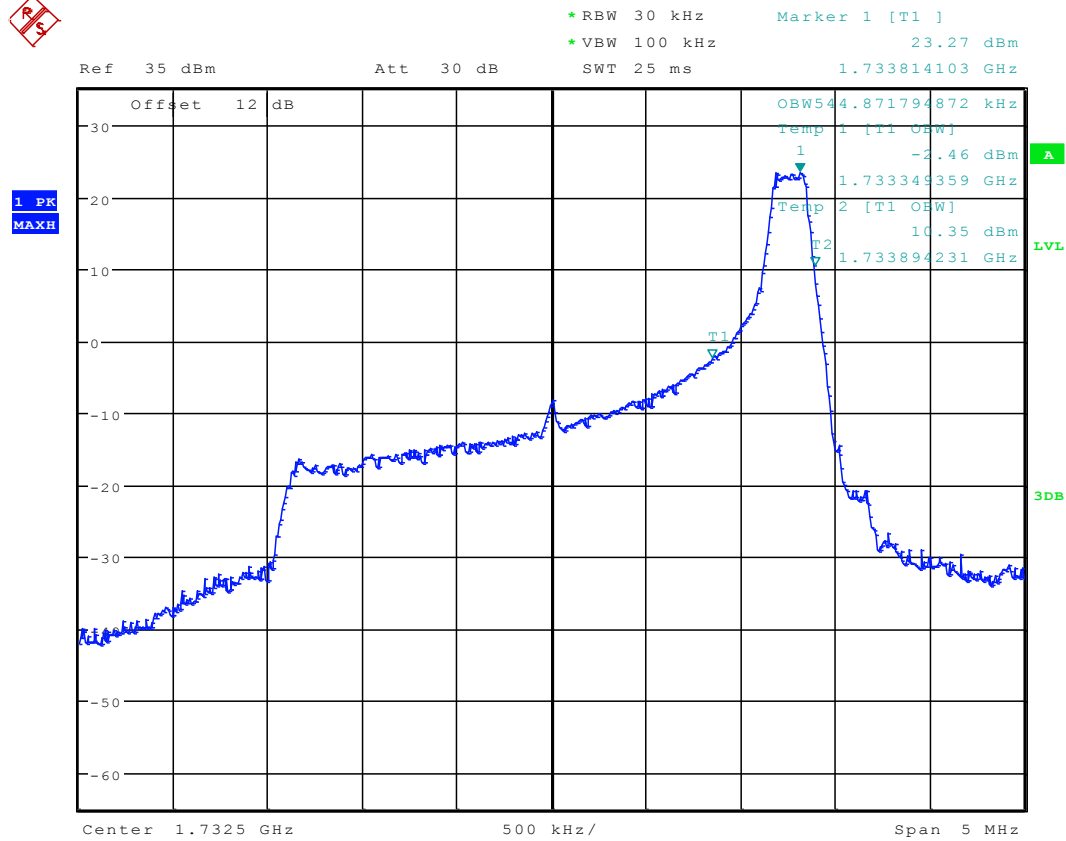
QPSK/1 RB/RB #0



Date: 25.NOV.2011 16:28:52



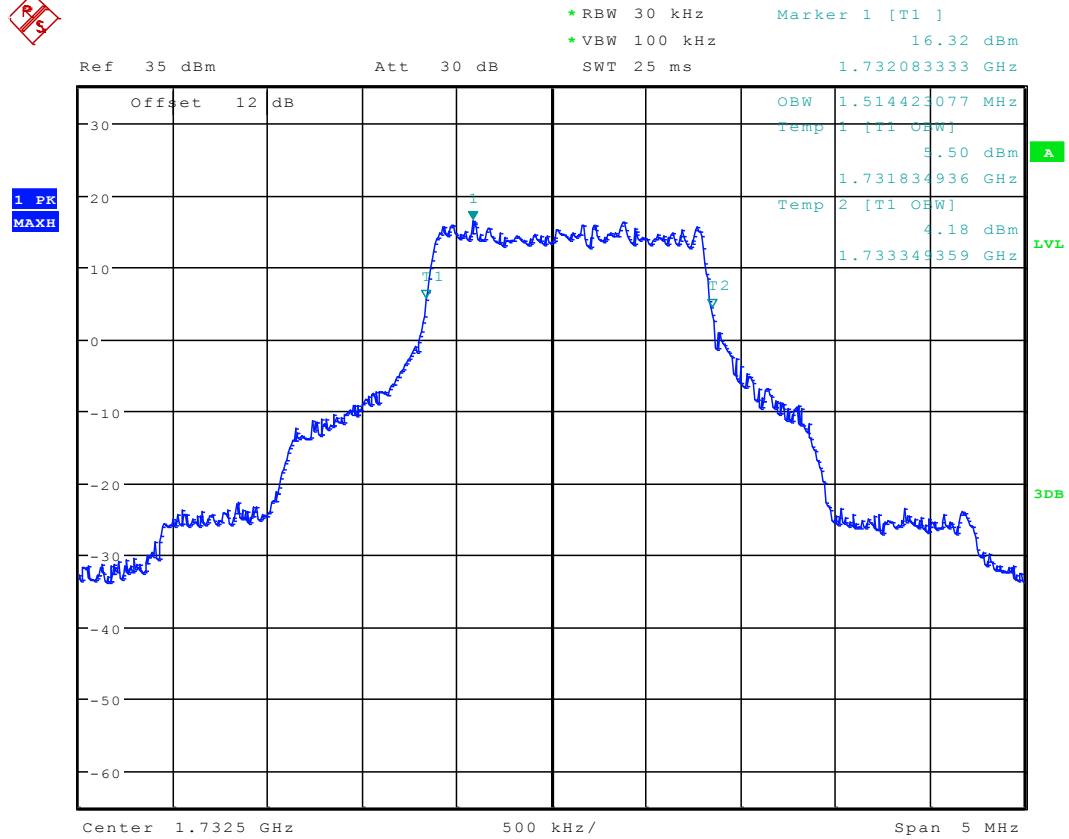
QPSK/1 RB/RB #max



Date: 25.NOV.2011 16:30:00



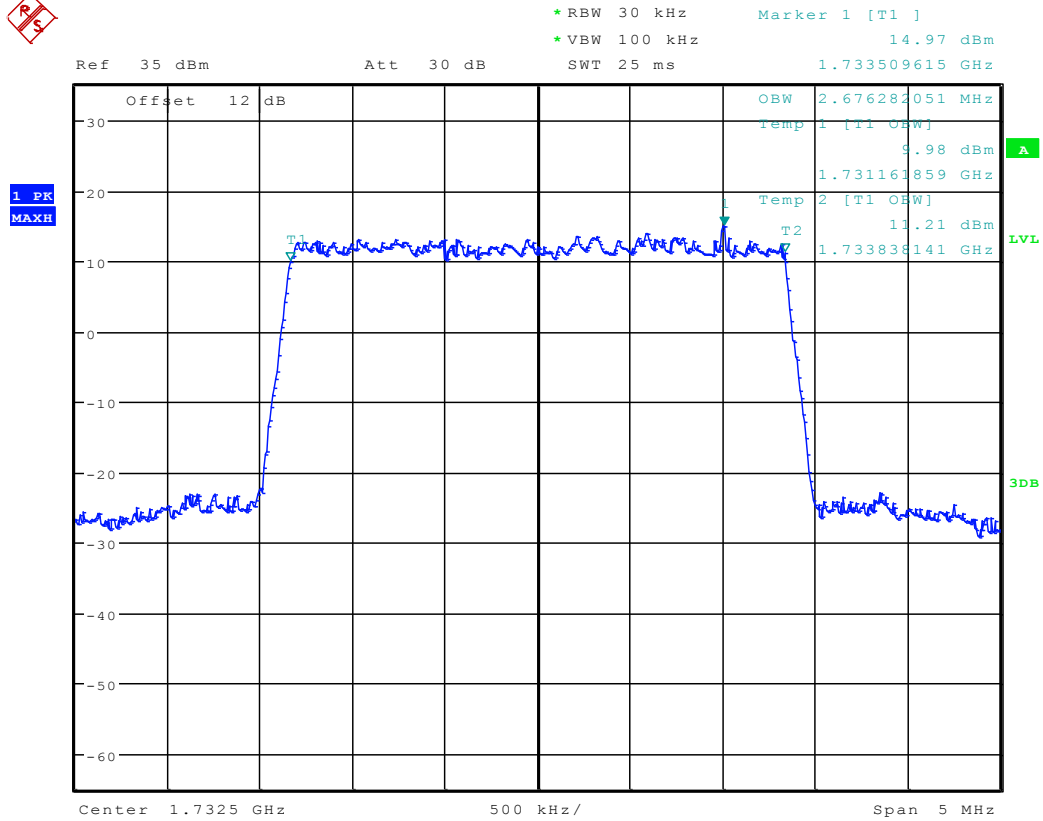
QPSK/8 RB/RB #4



Date: 25.NOV.2011 16:35:11

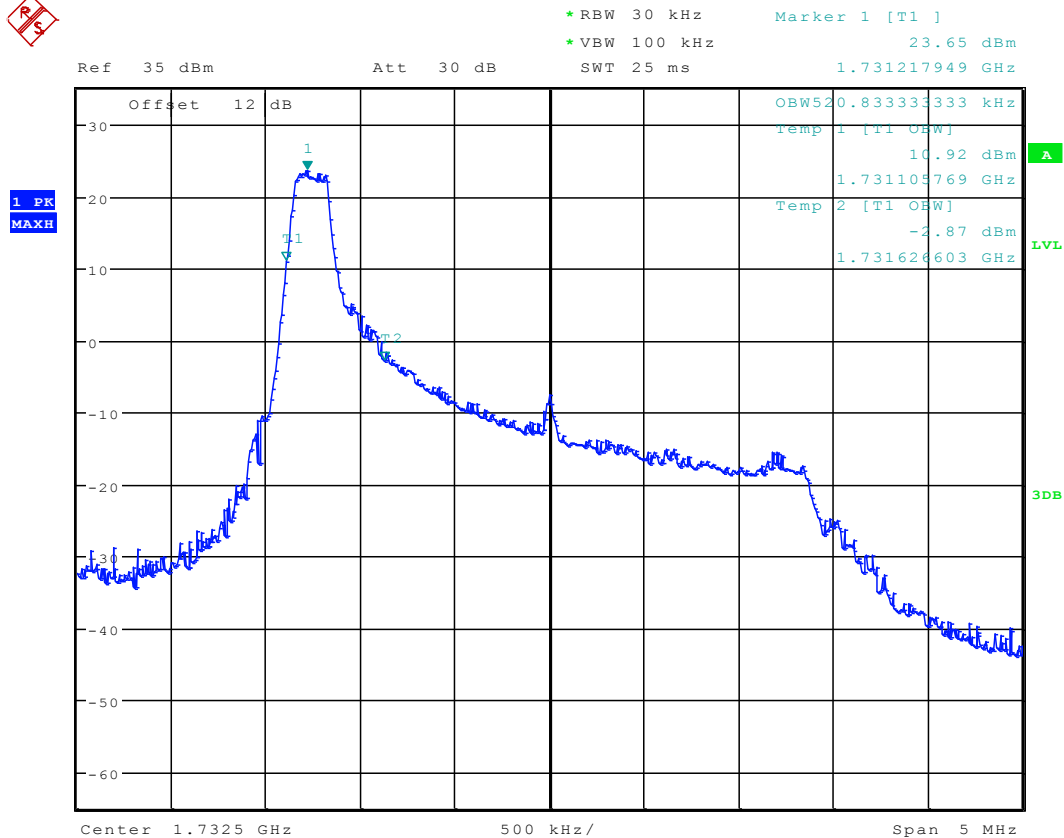


QPSK/ full RBs



Date: 24.NOV.2011 16:24:43

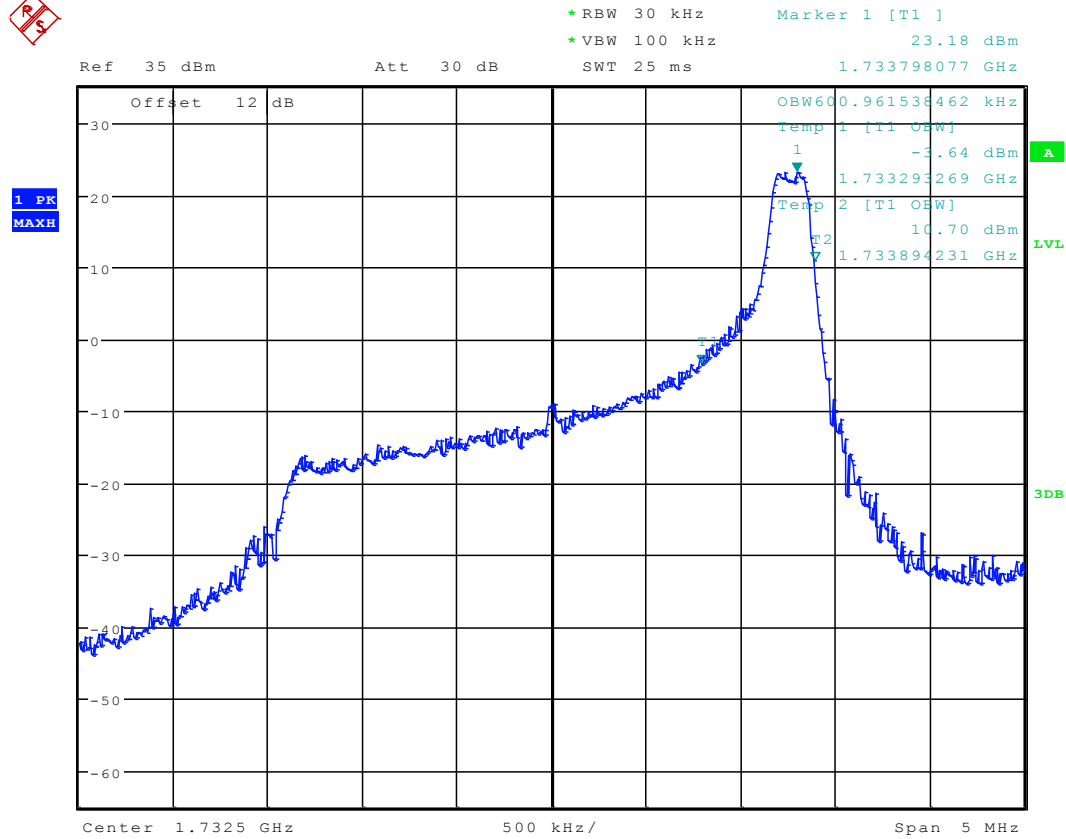
TM5
16QAM /1 RB/RB #0



Date: 25.NOV.2011 16:29:11



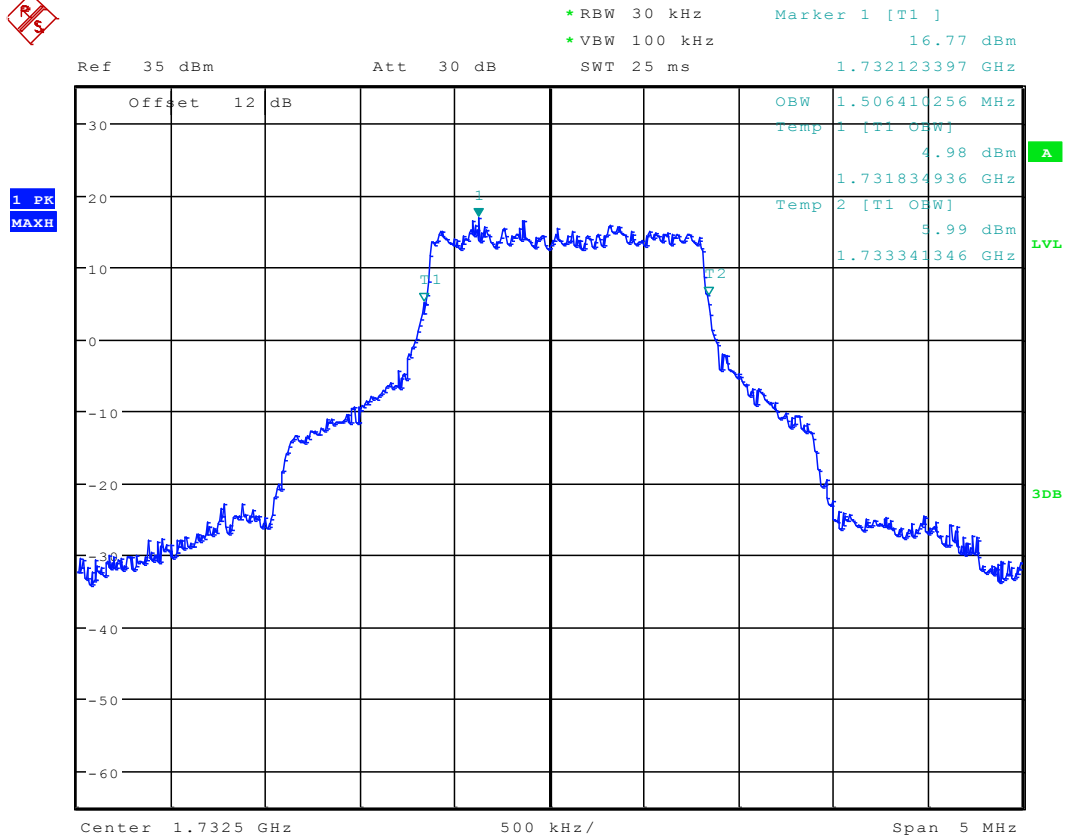
16QAM /1 RB/RB #max



Date: 25.NOV.2011 16:29:33



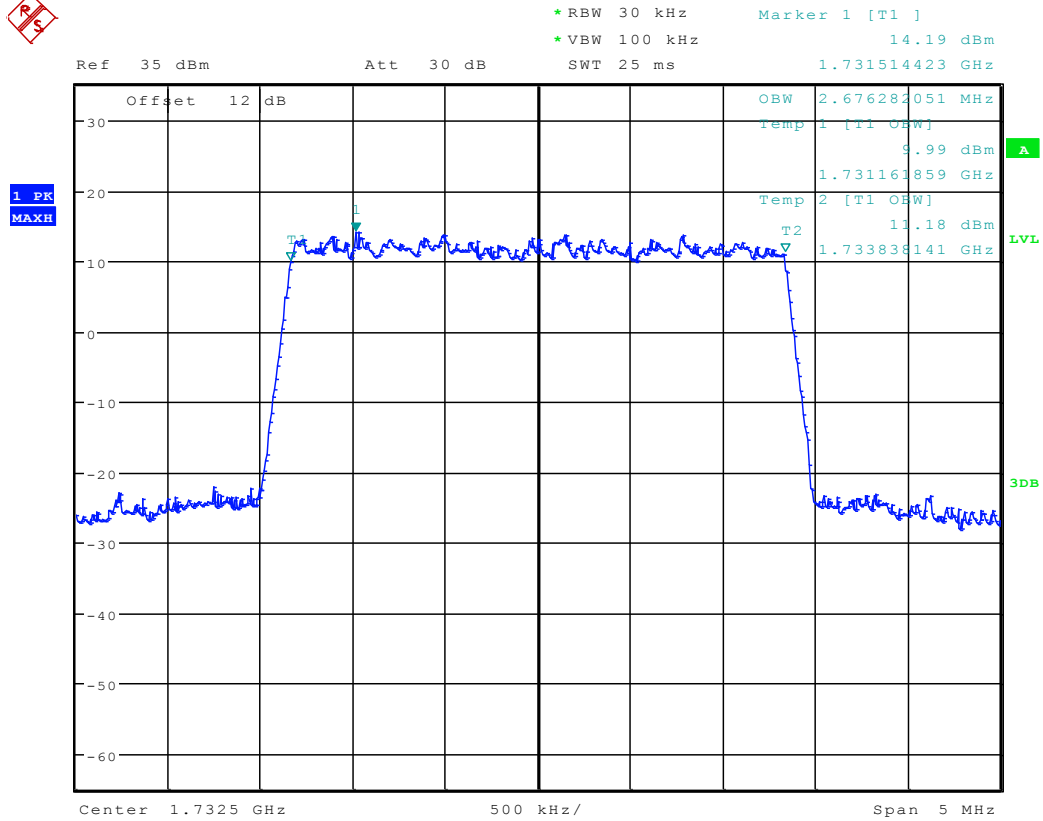
16QAM /8 RB/RB #4



Date: 25.NOV.2011 16:35:31



16QAM/full RBs



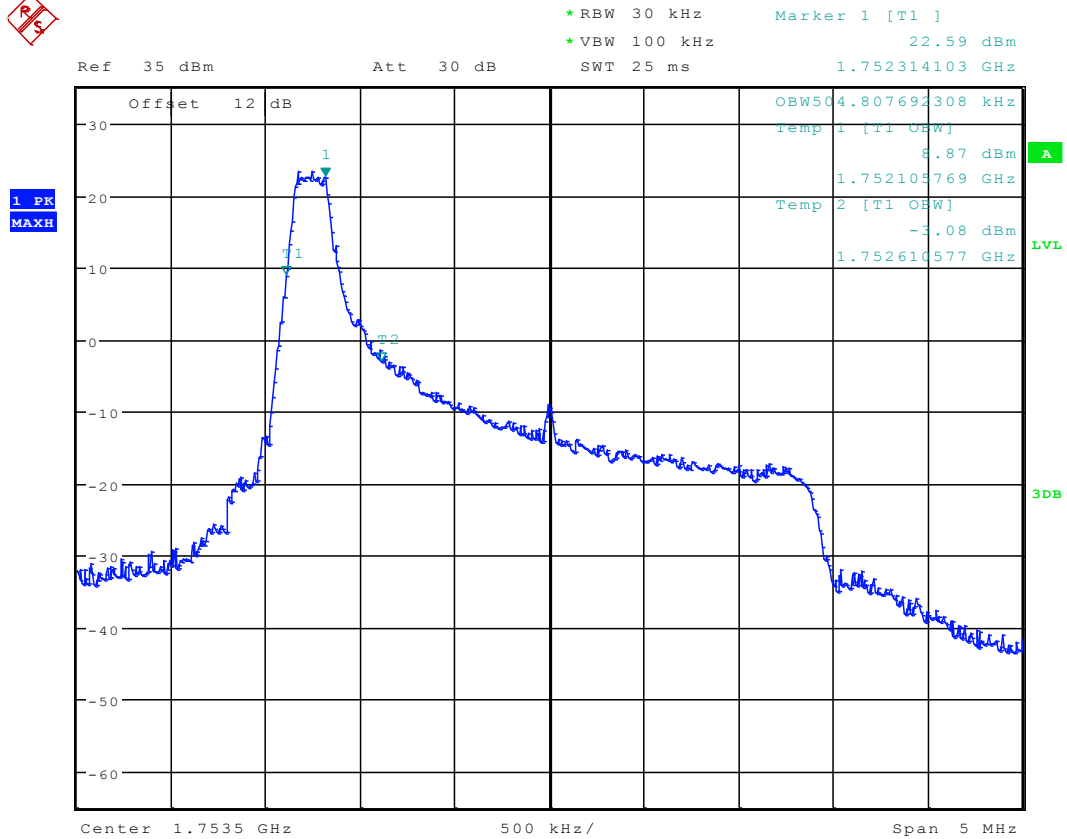
Date: 24.NOV.2011 16:24:17



Channel 20385

TM4

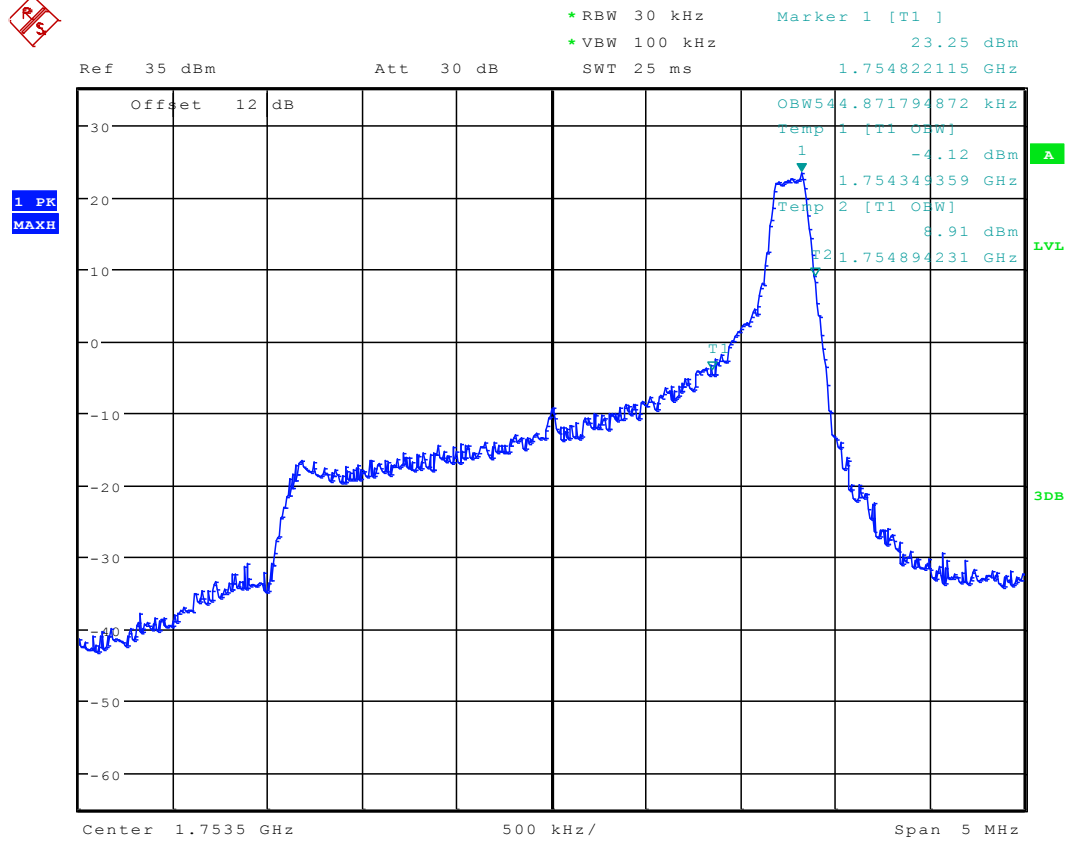
QPSK/1 RB/RB #0



Date: 25.NOV.2011 17:08:13



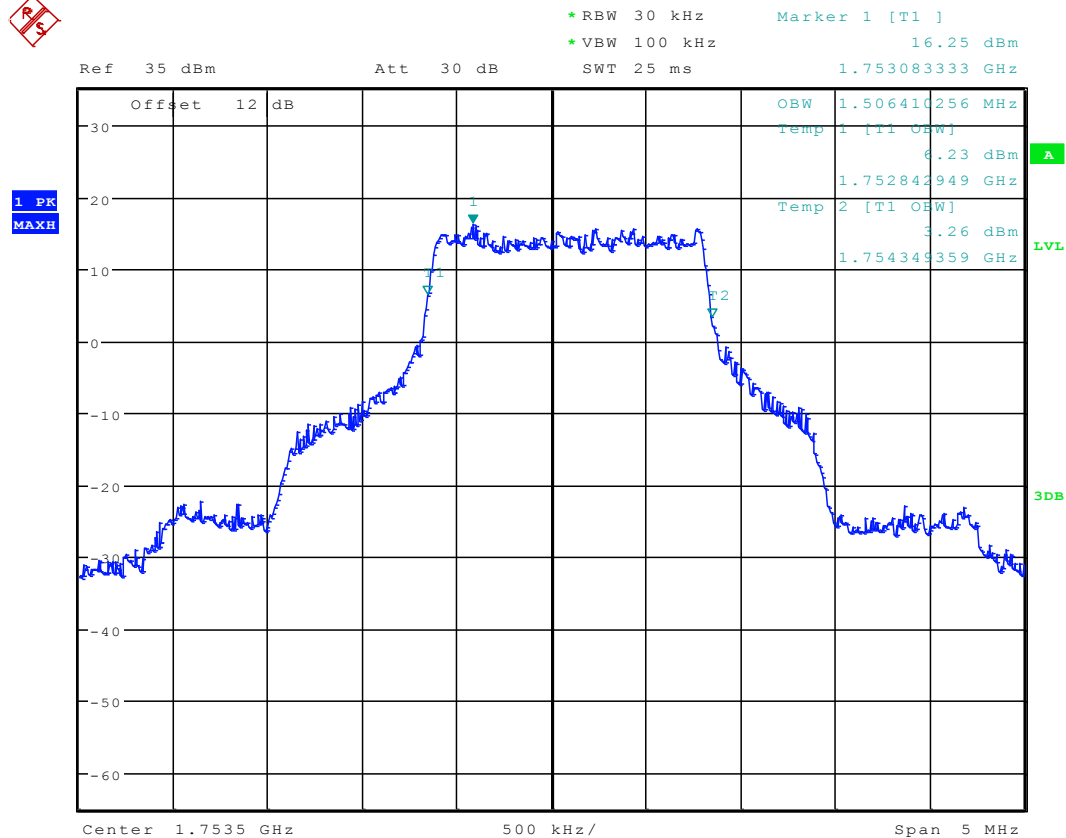
QPSK/1 RB/RB #max



Date: 25.NOV.2011 17:08:31



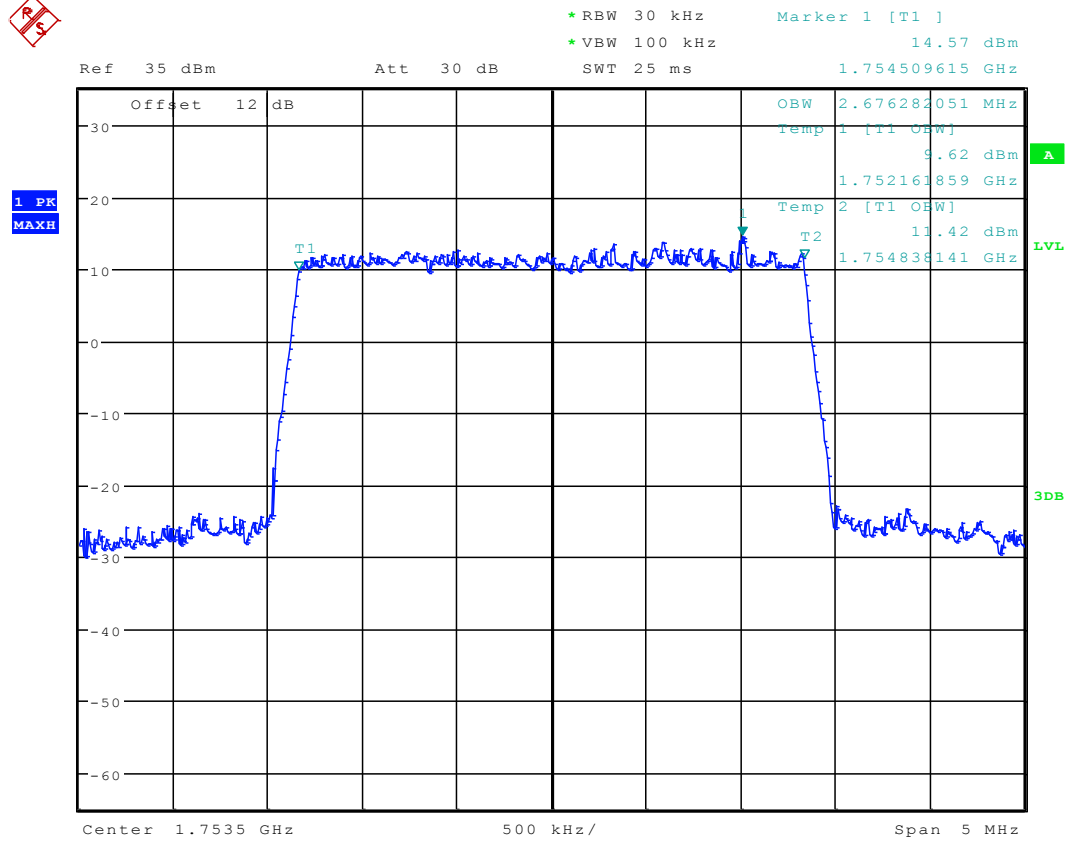
QPSK/8 RB/RB #4



Date: 25.NOV.2011 17:09:20

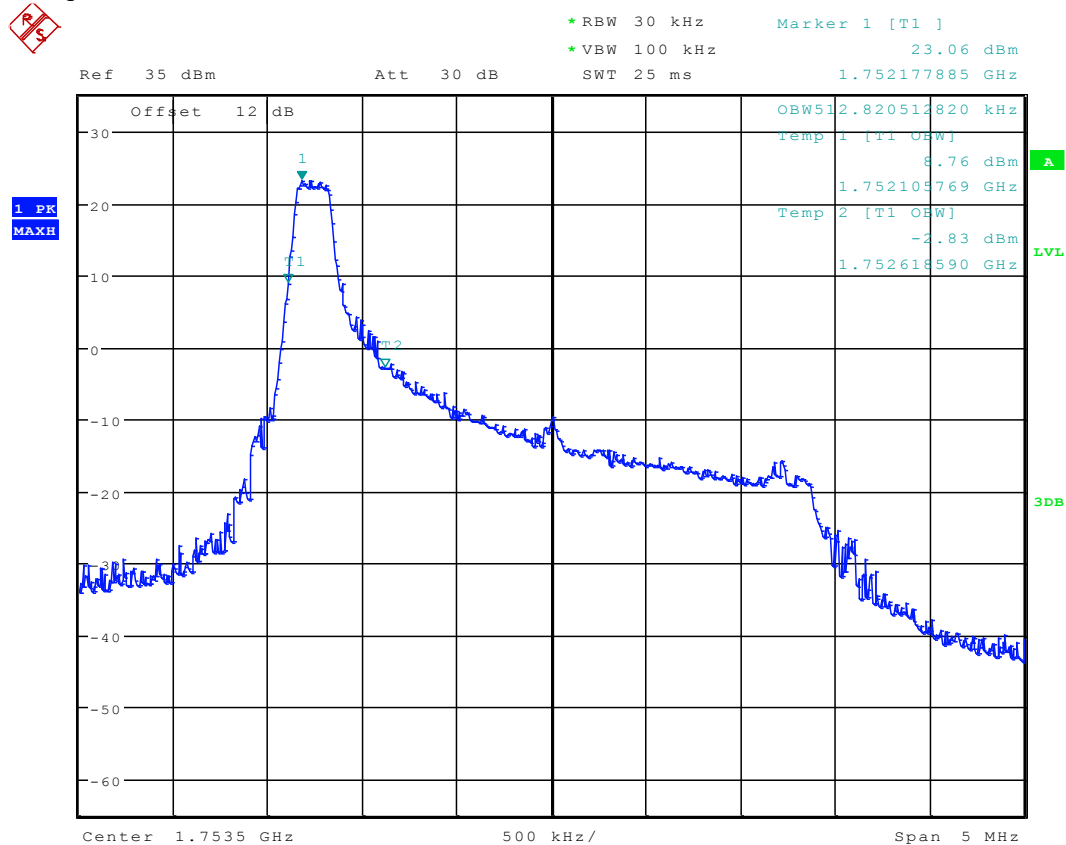


QPSK/ full RBs



Date: 25.NOV.2011 17:07:28

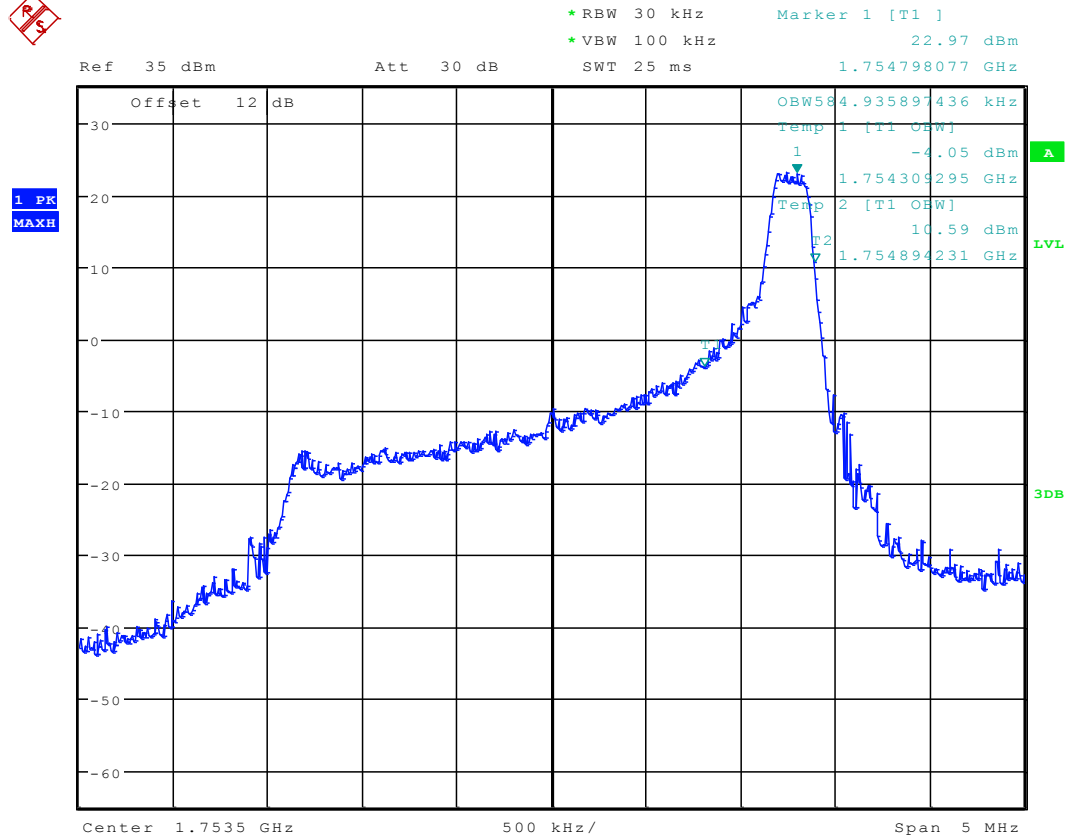
TM5
16QAM /1 RB/RB #0



Date: 25.NOV.2011 17:07:59



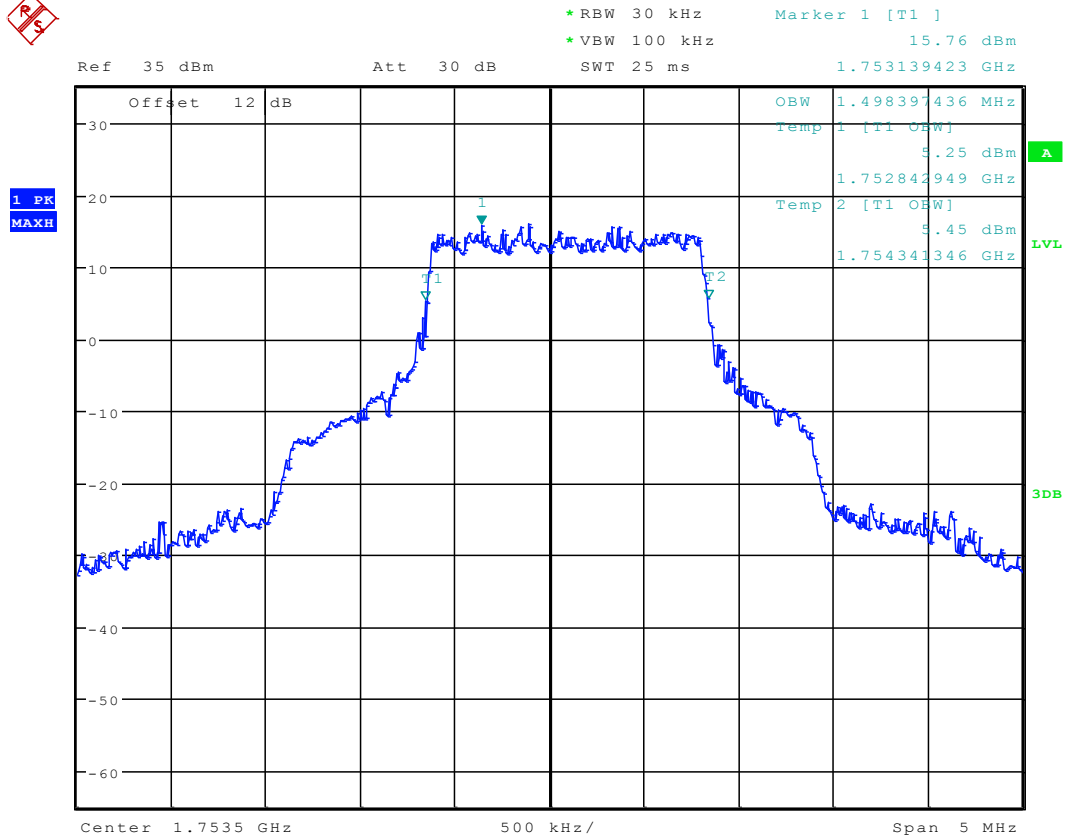
16QAM /1 RB/RB #max



Date: 25.NOV.2011 17:08:45



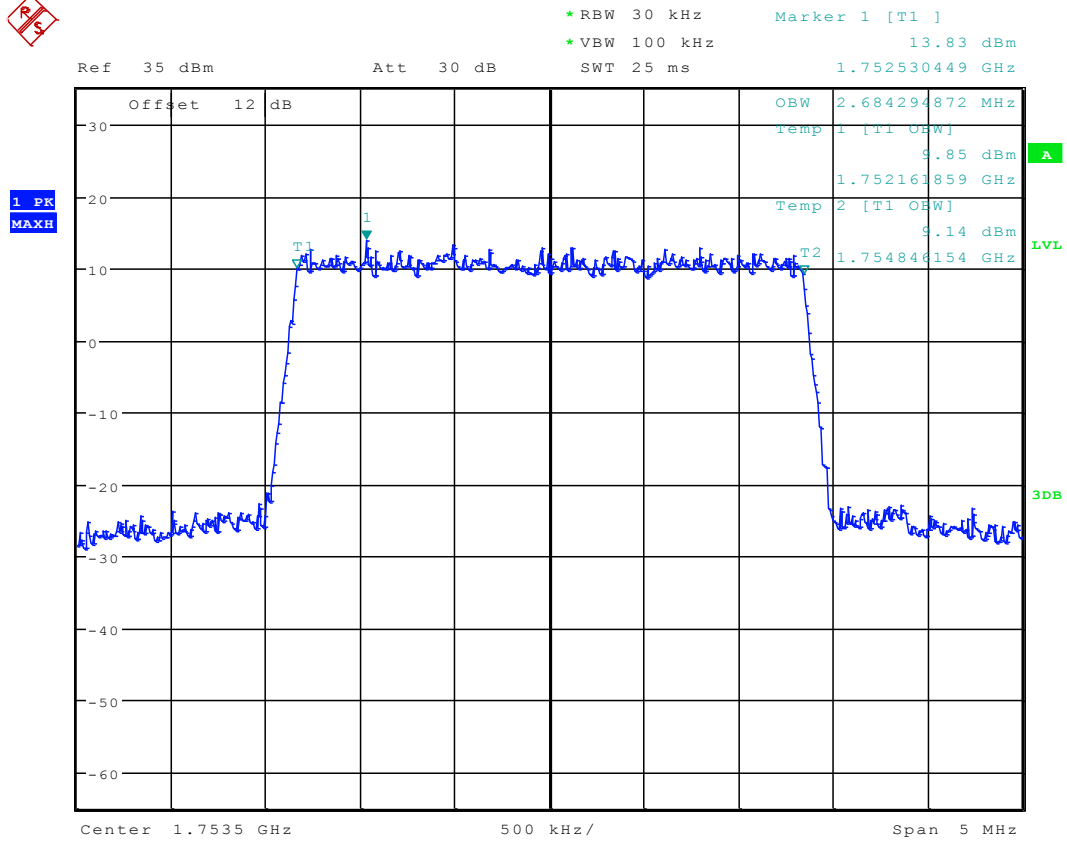
16QAM /8 RB/RB #4



Date: 25.NOV.2011 17:09:04



16QAM/full RBs



Date: 25.NOV.2011 17:07:41

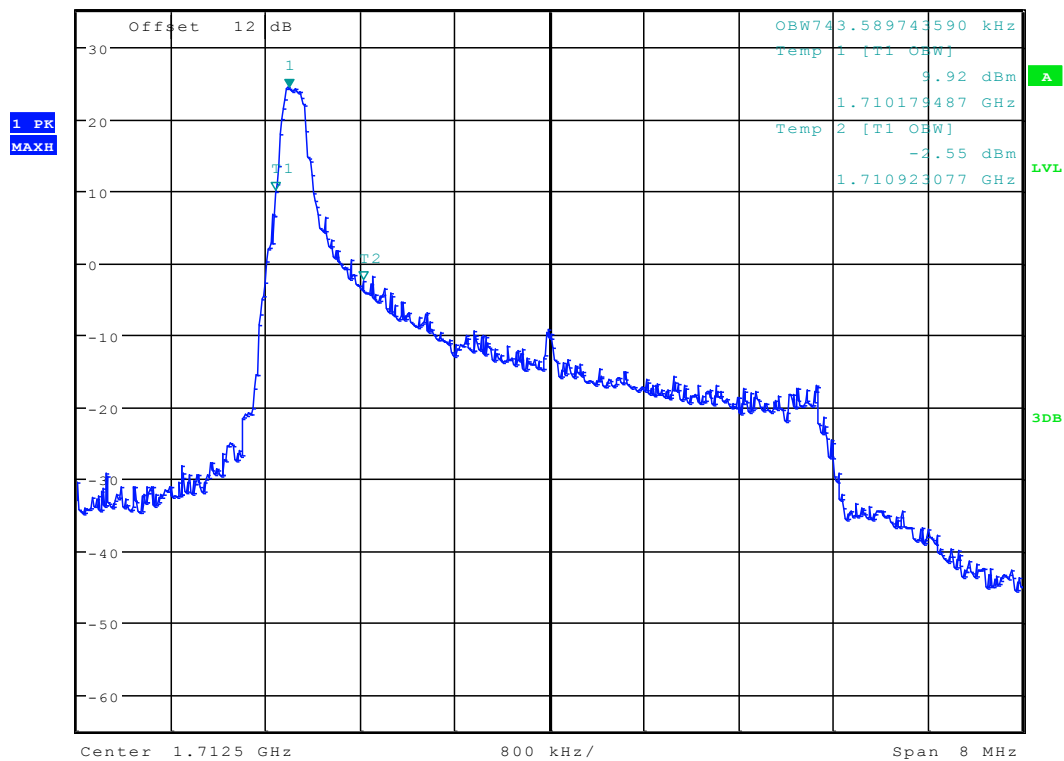
5MHz(BW)
Channel 19975

TM4

QPSK/1 RB/RB #0



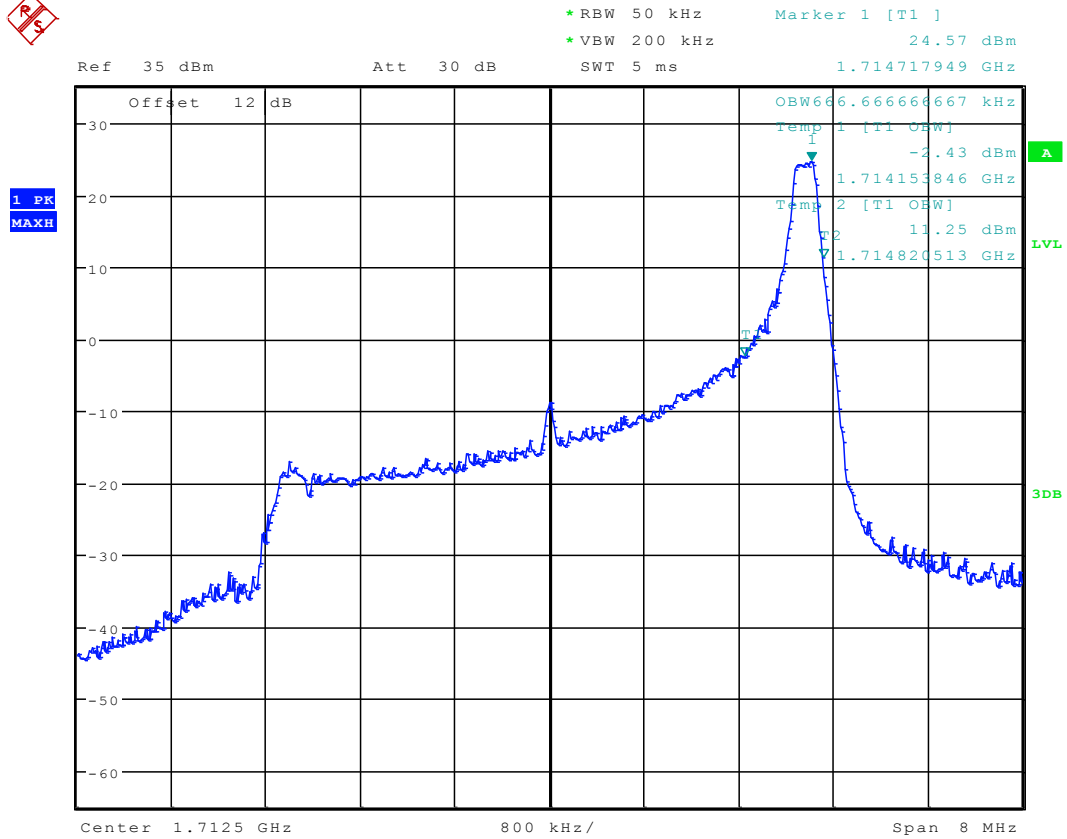
```
* RBW 50 kHz      Marker 1 [T1 ]
* VBW 200 kHz      24.21 dBm
  SWT 5 ms        1.710294872 GHz
```



Date: 25.NOV.2011 15:59:47



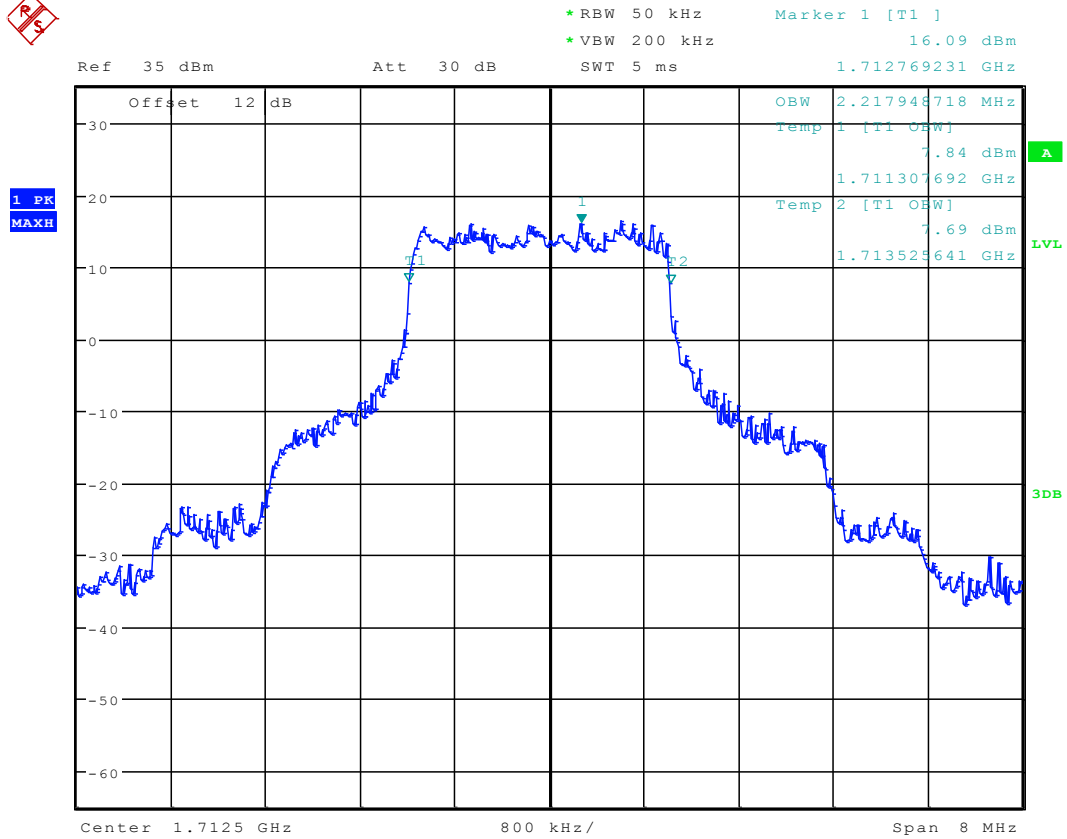
QPSK/1 RB/RB #max



Date: 25.NOV.2011 16:00:11



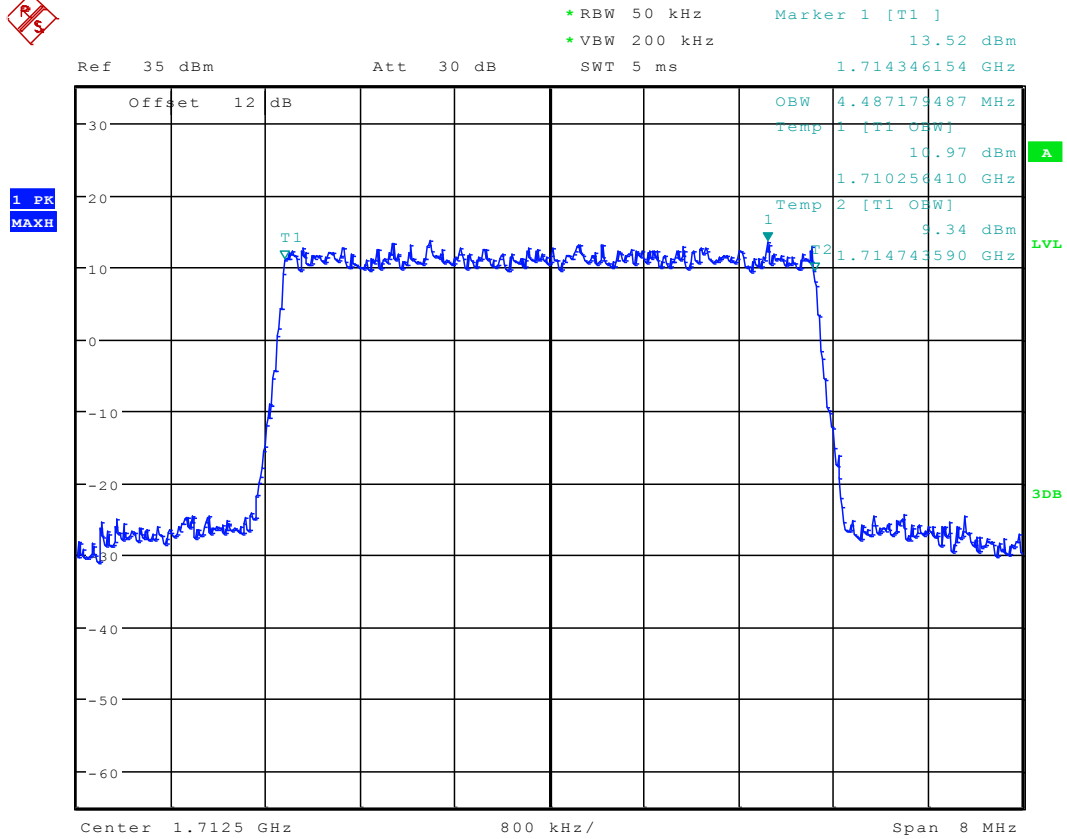
QPSK/12 RB/RB #6



Date: 25.NOV.2011 16:01:04

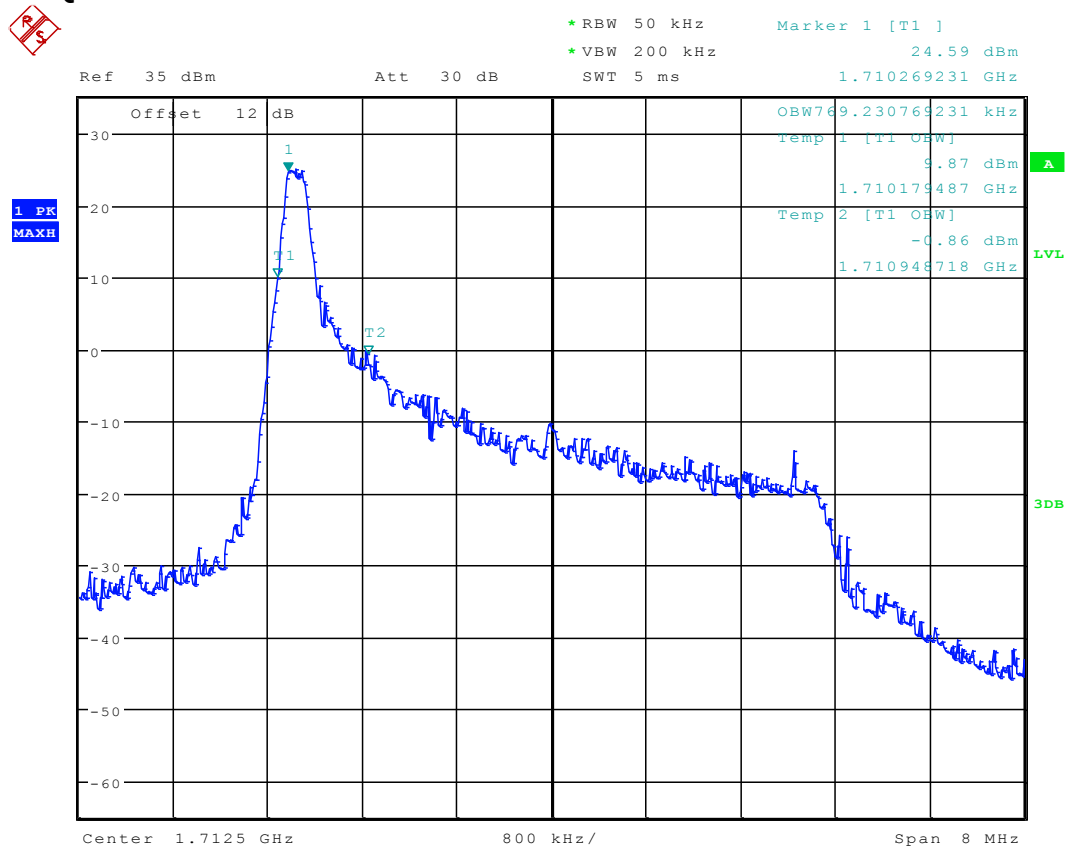


QPSK/ full RBs



Date: 25.NOV.2011 15:58:42

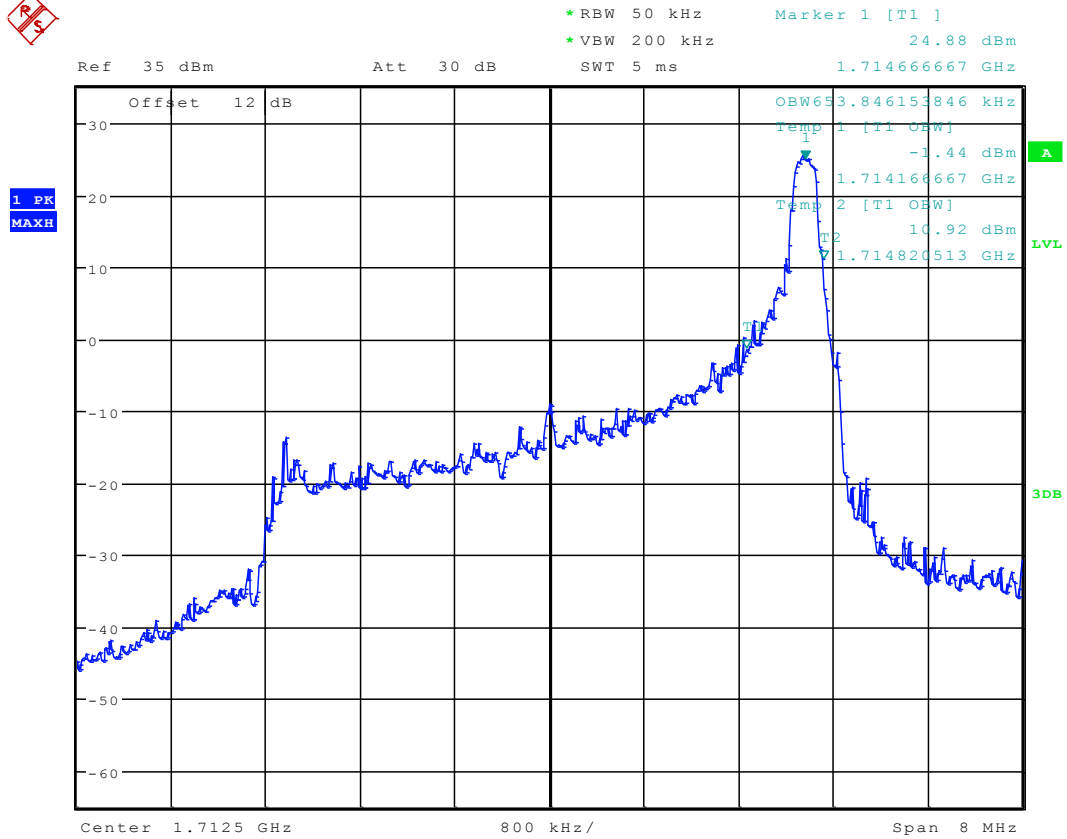
TM5
16QAM /1 RB/RB #0



Date: 25.NOV.2011 15:59:23



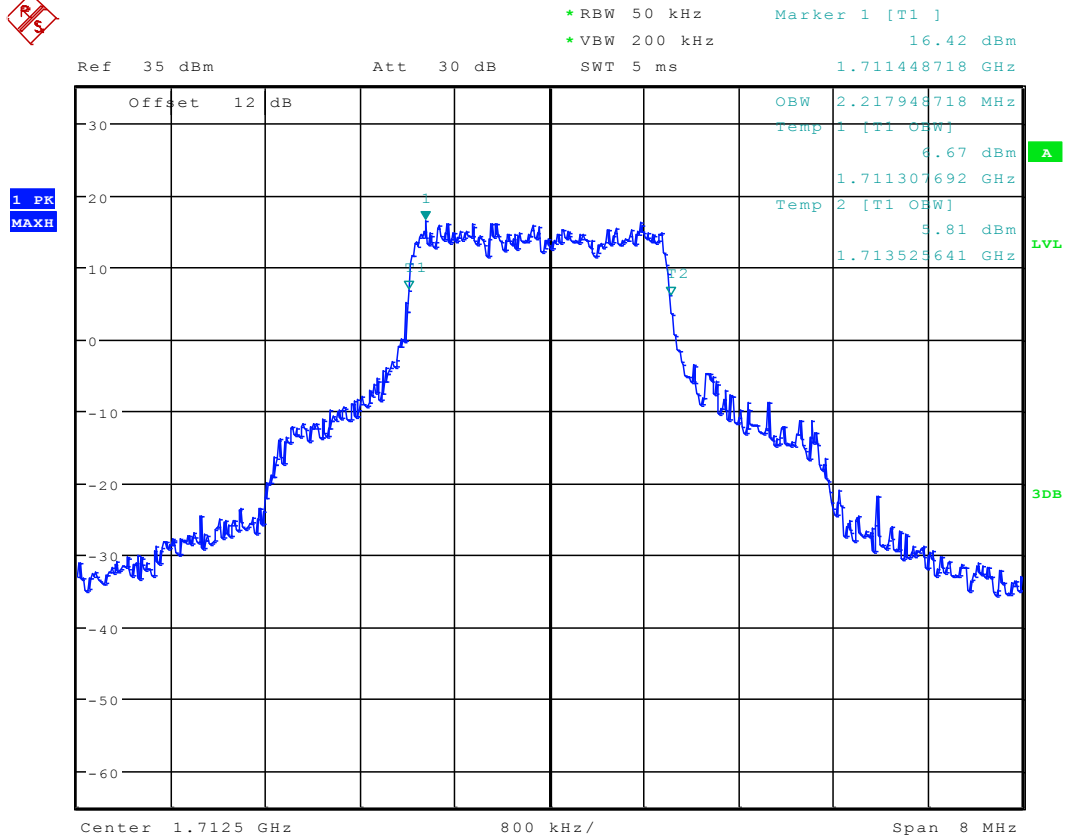
16QAM /1 RB/RB #max



Date: 25.NOV.2011 16:00:26

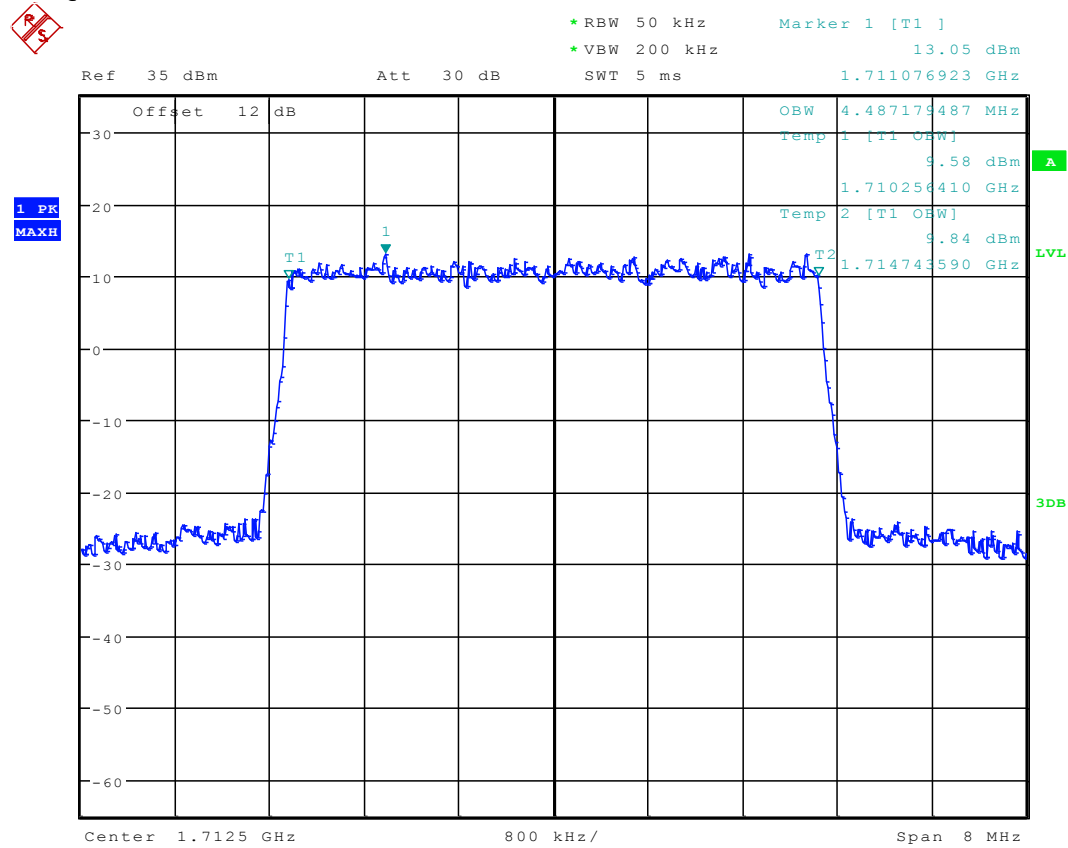


16QAM /12 RB/RB #6



Date: 25.NOV.2011 16:00:50

16QAM/full RBs



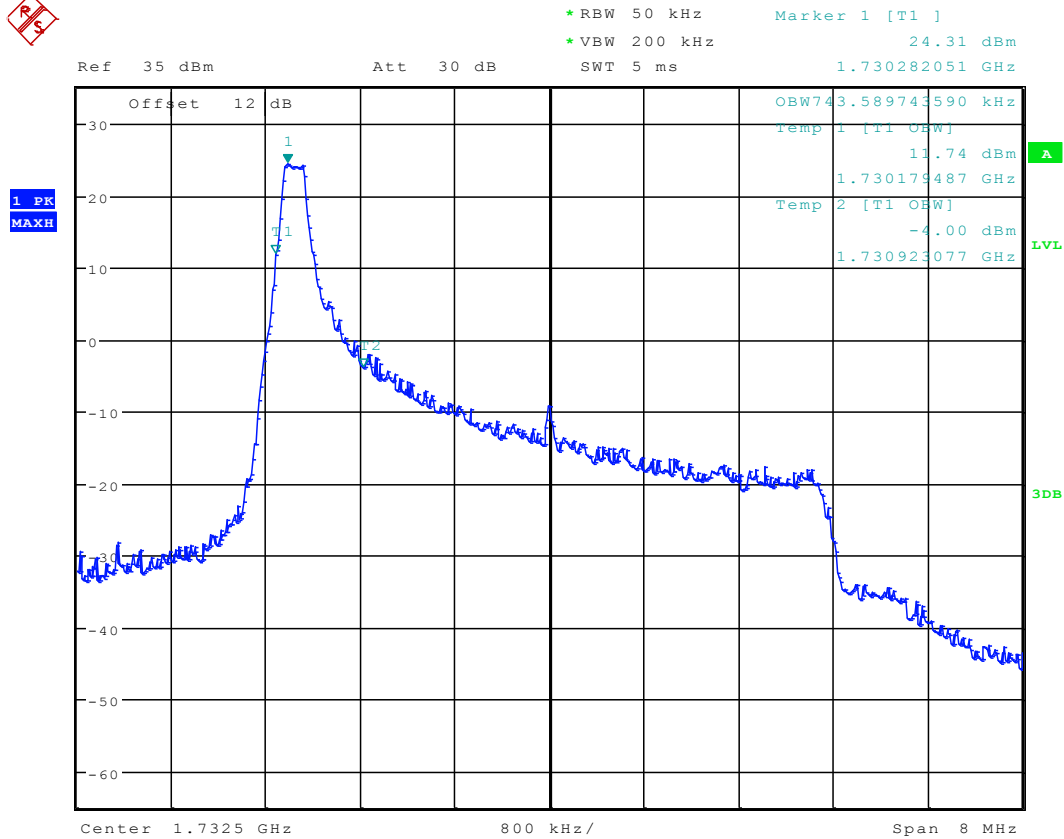
Date: 25.NOV.2011 15:59:03



Channel 20175

TM4

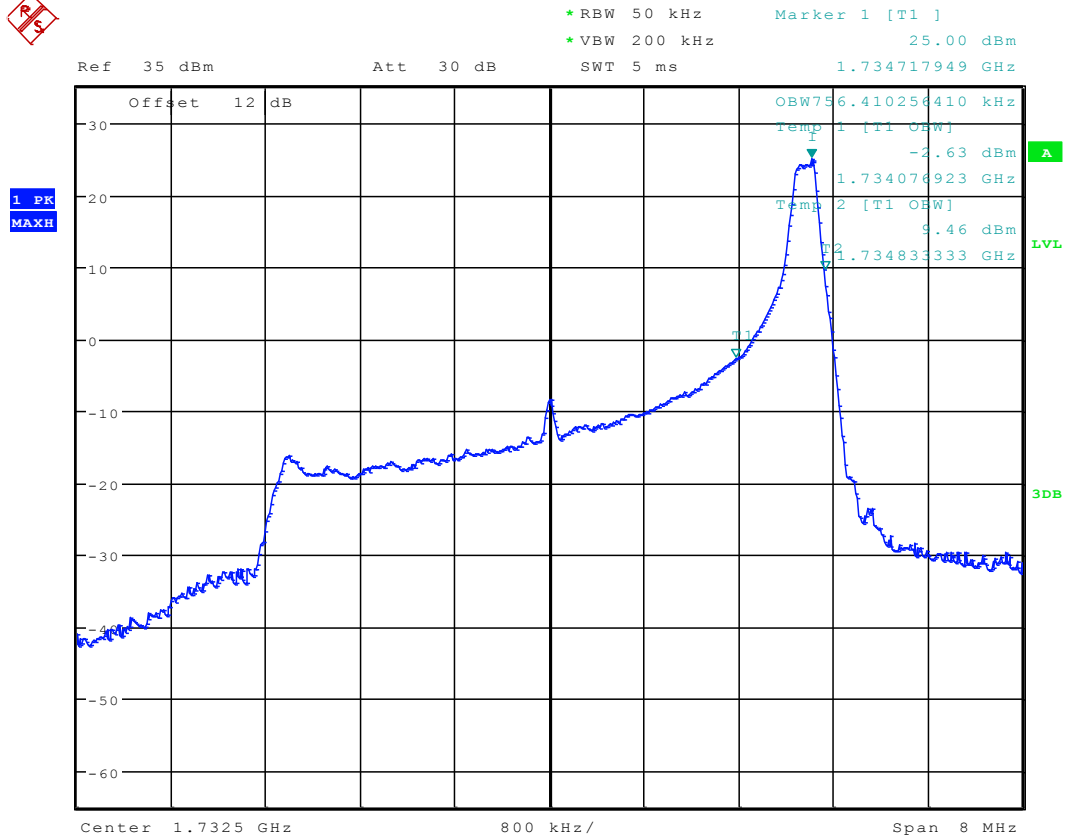
QPSK/1 RB/RB #0



Date: 25.NOV.2011 16:23:03



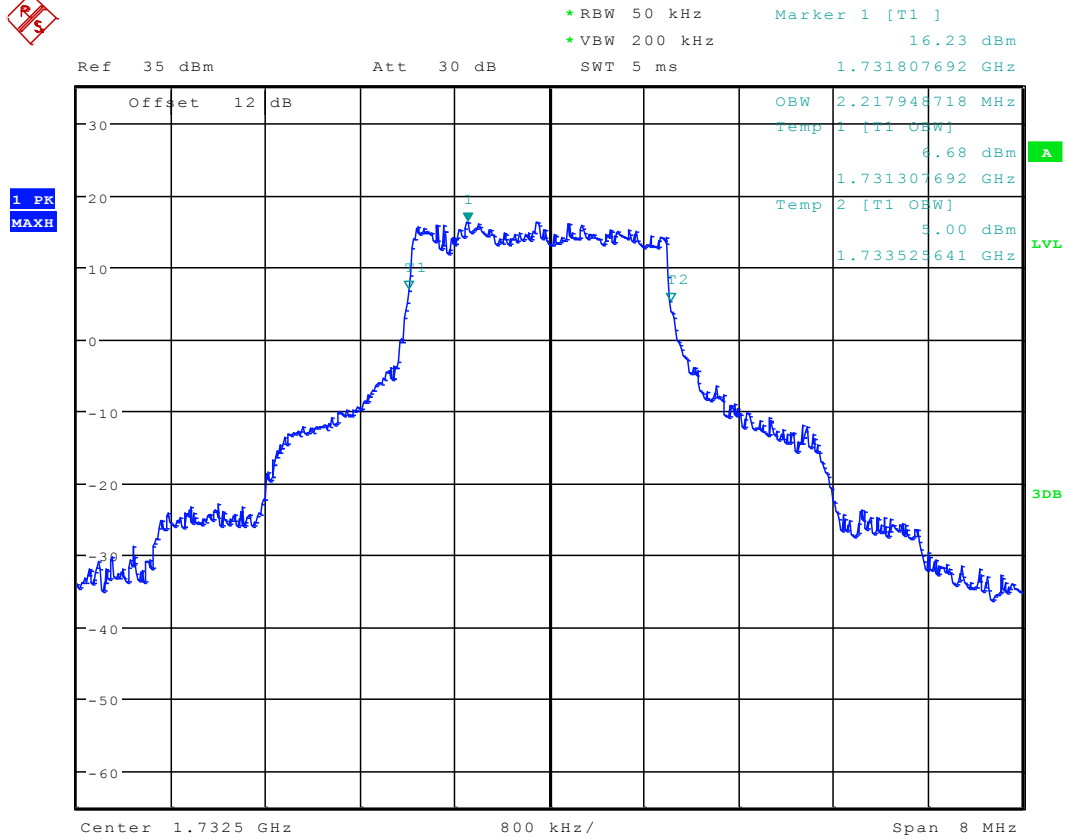
QPSK/1 RB/RB #max



Date: 25.NOV.2011 16:24:44



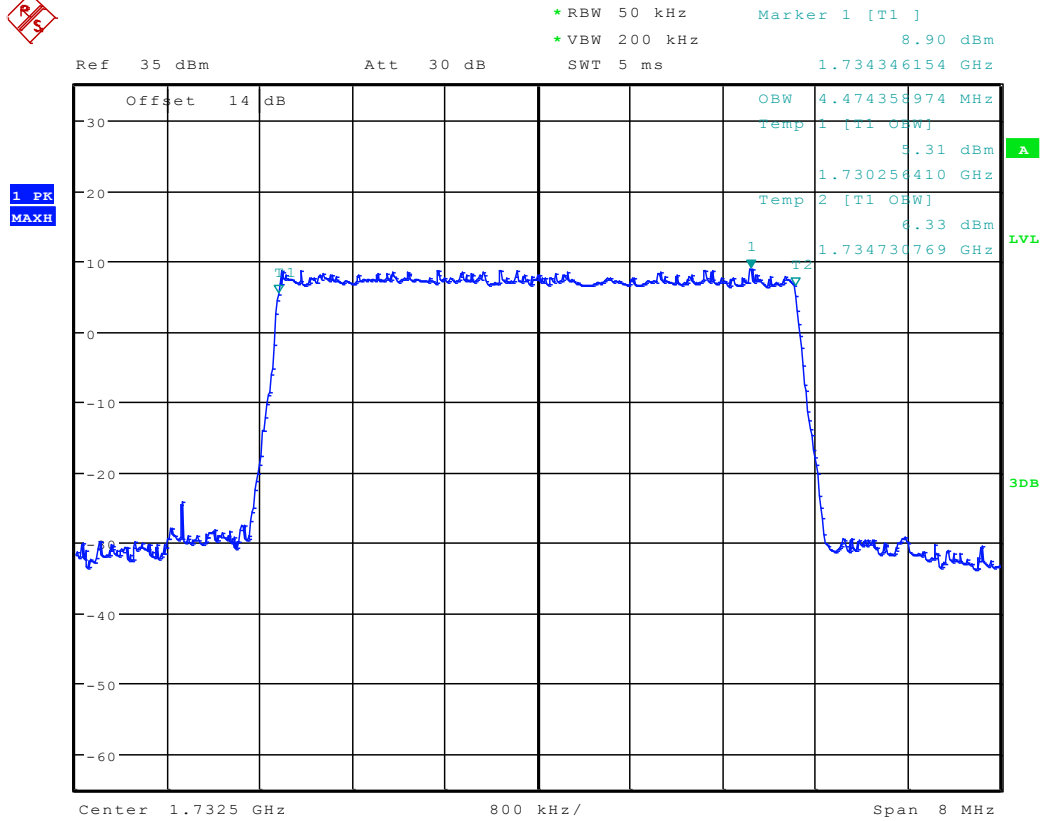
QPSK/12 RB/RB #6



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



QPSK/ full RBs

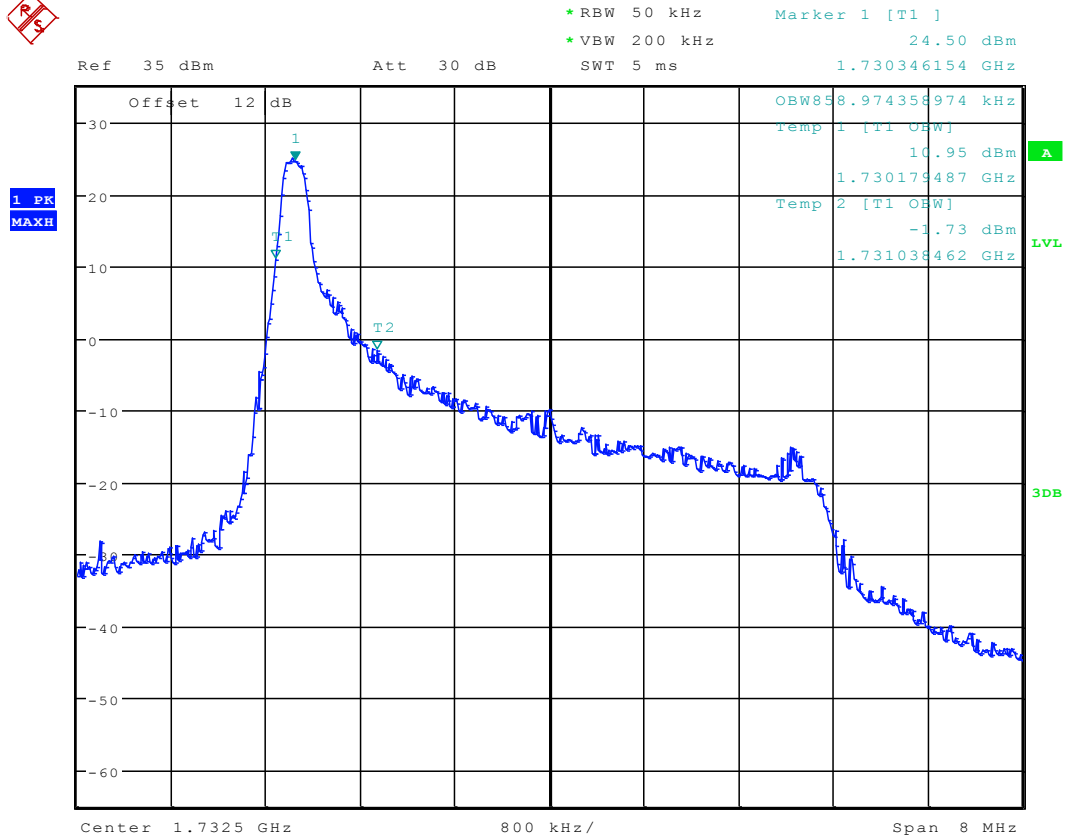


Date: 13.NOV.2011 19:01:07



TM5

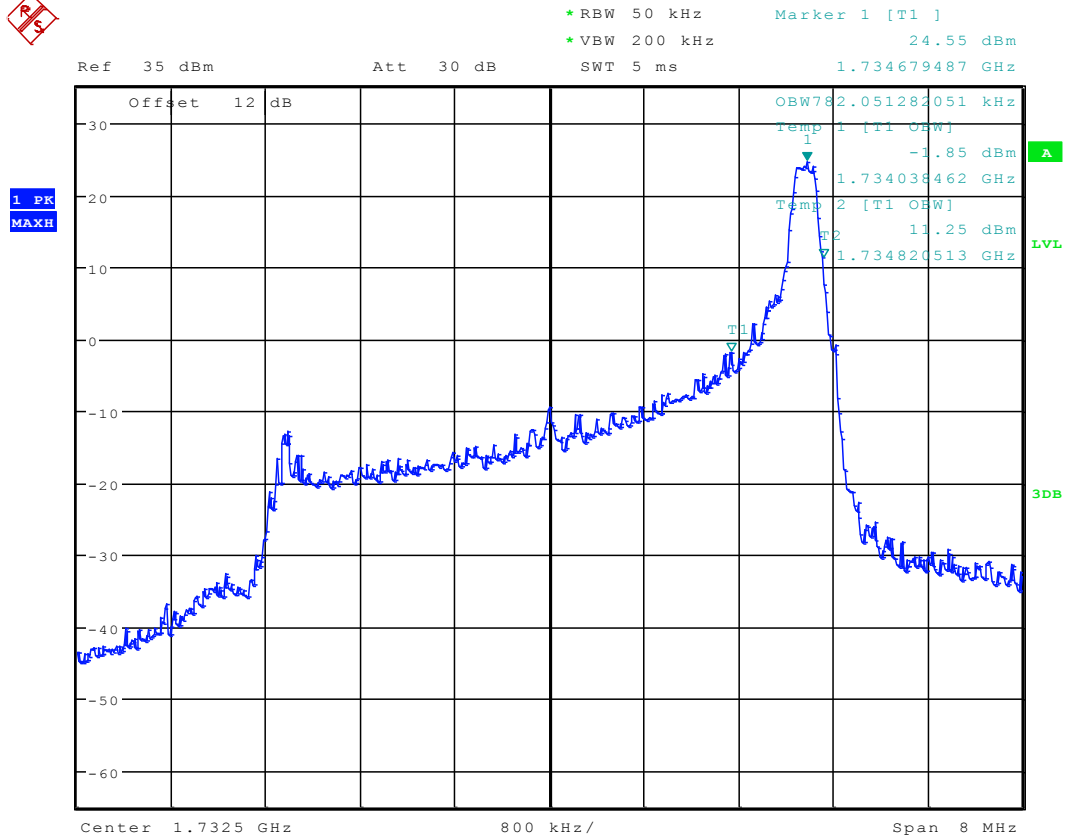
16QAM /1 RB/RB #0



Date: 25.NOV.2011 16:22:21



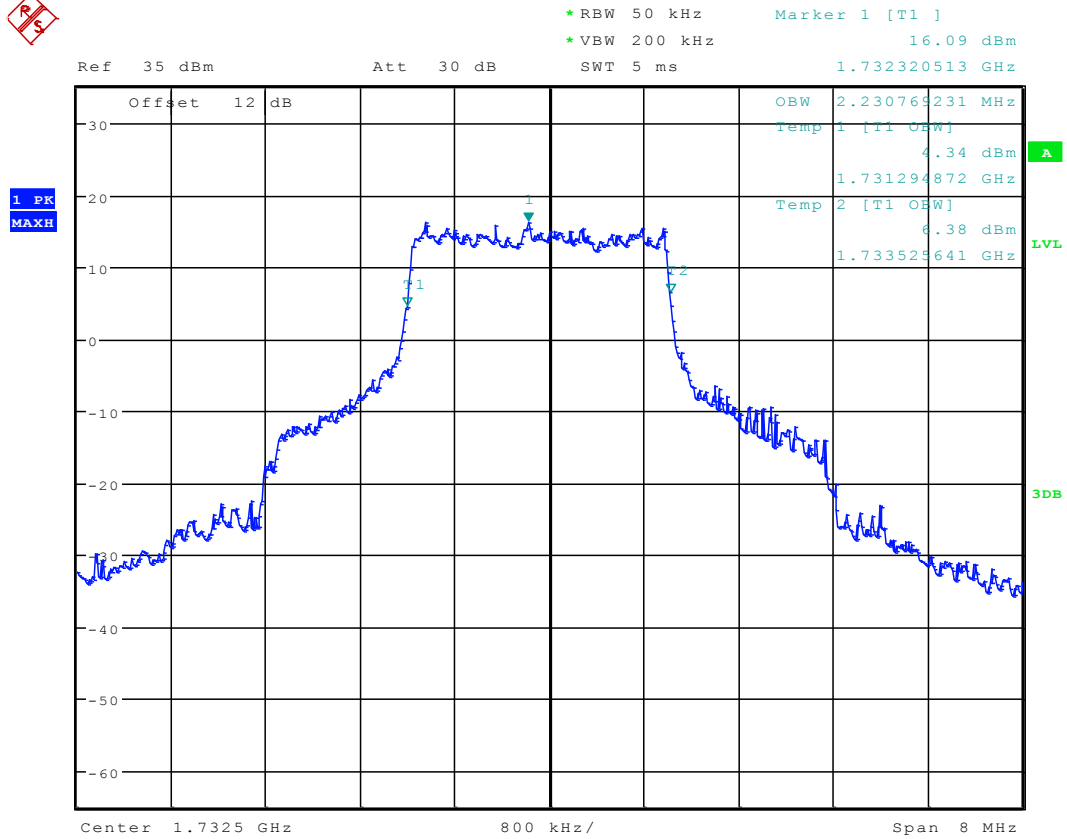
16QAM /1 RB/RB #max



Date: 25.NOV.2011 16:25:03



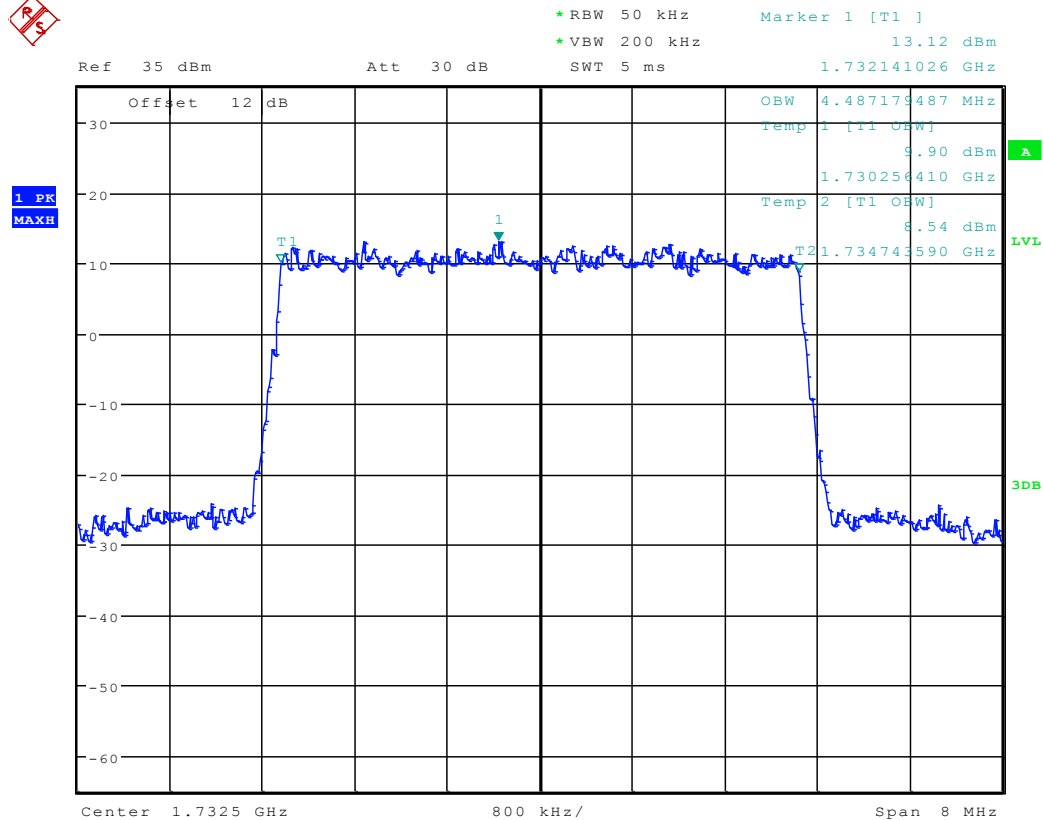
16QAM /12 RB/RB #6



Date: 25.NOV.2011 16:25:23



16QAM/full RBs



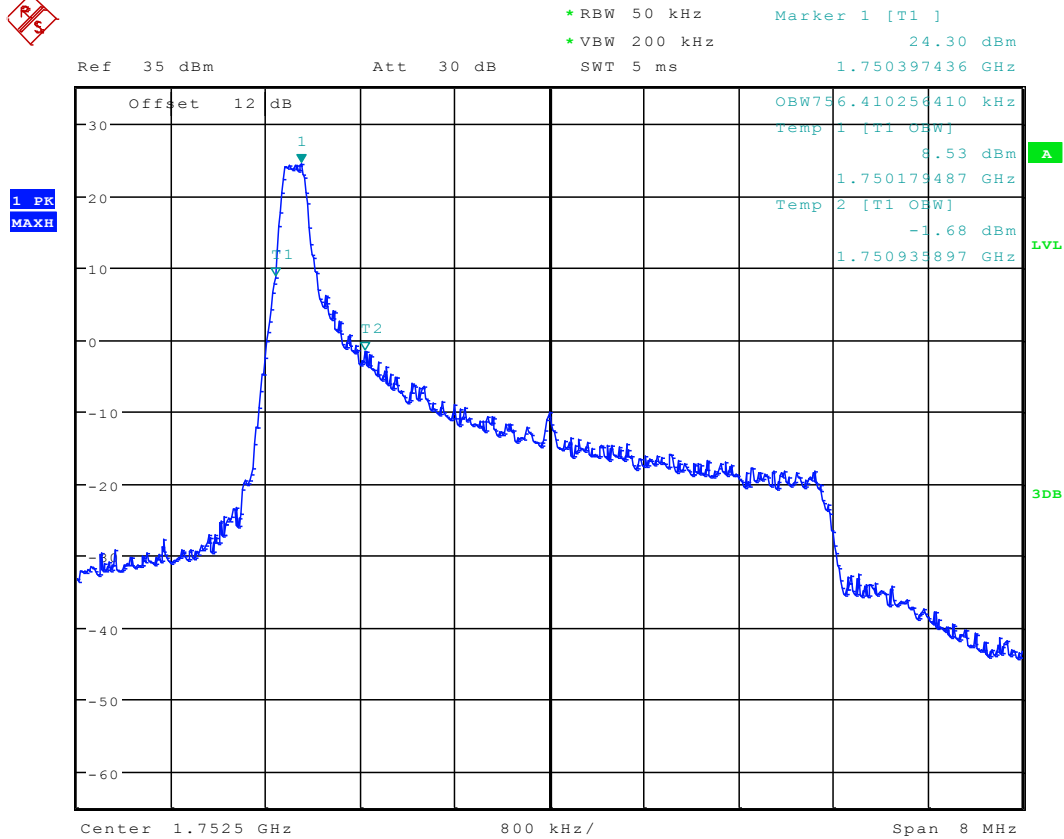
Date: 24.NOV.2011 16:26:40



Channel 20375

TM4

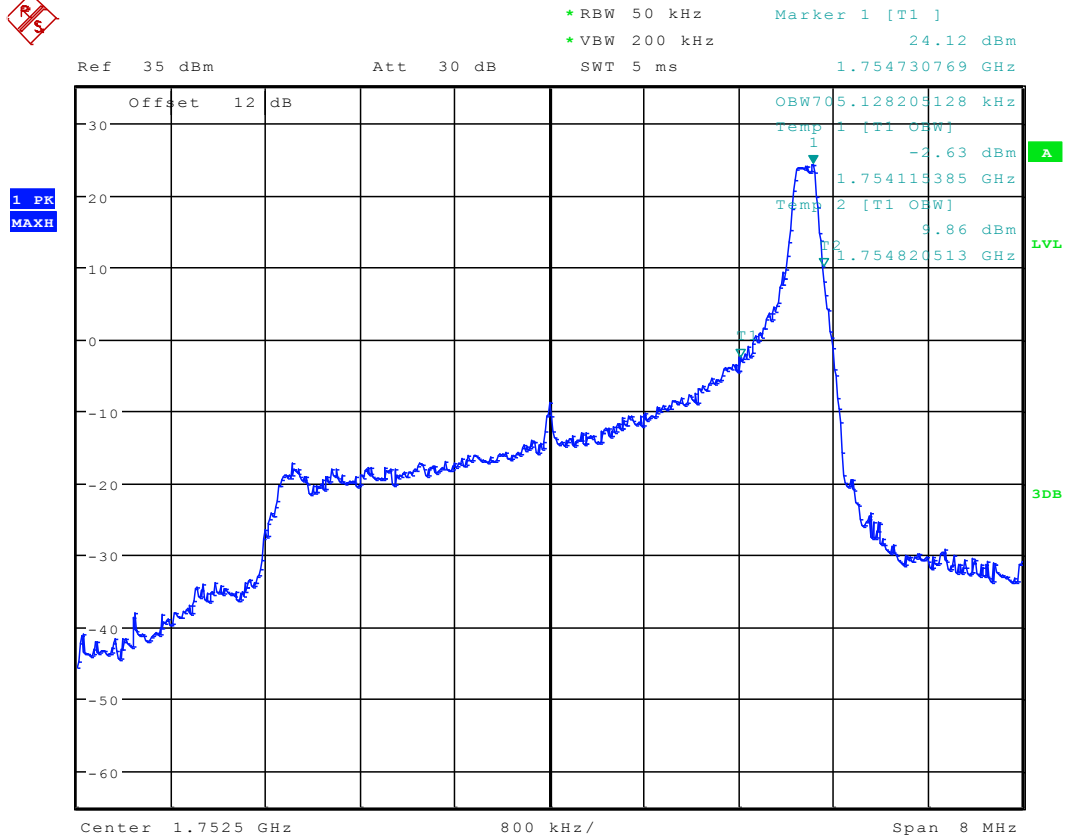
QPSK/1 RB/RB #0



Date: 25.NOV.2011 17:11:32



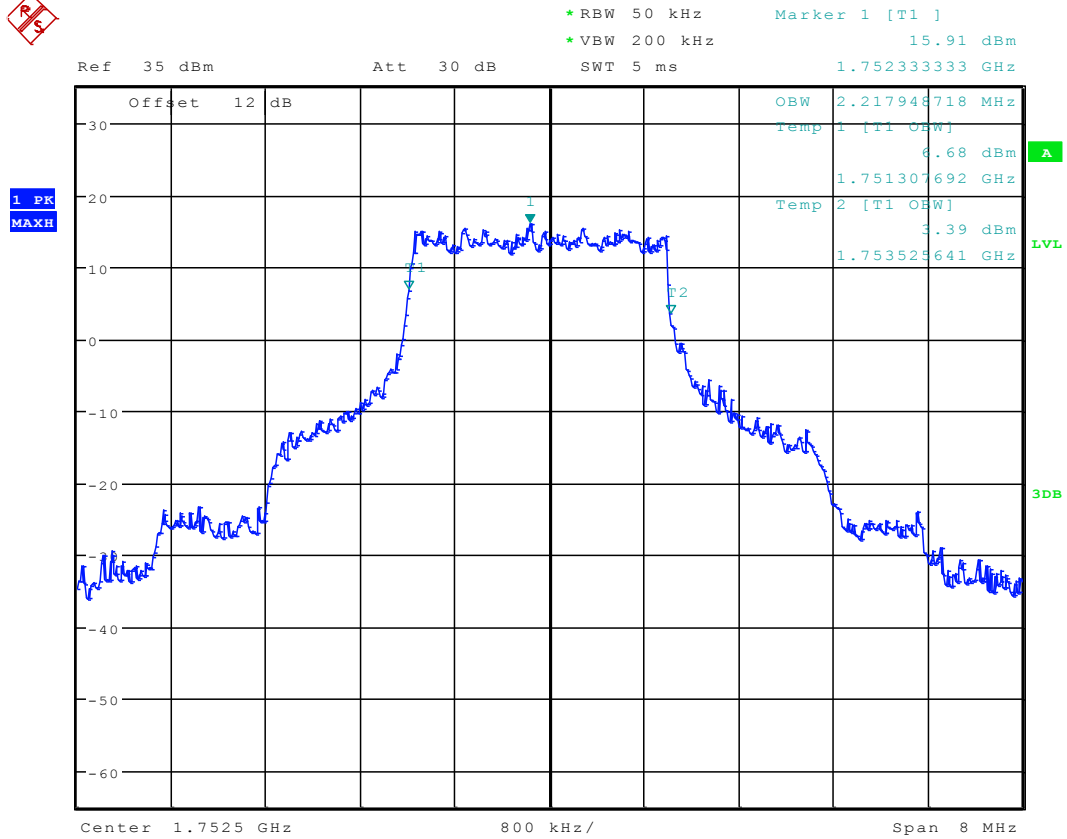
QPSK/1 RB/RB #max



Date: 25.NOV.2011 17:11:51



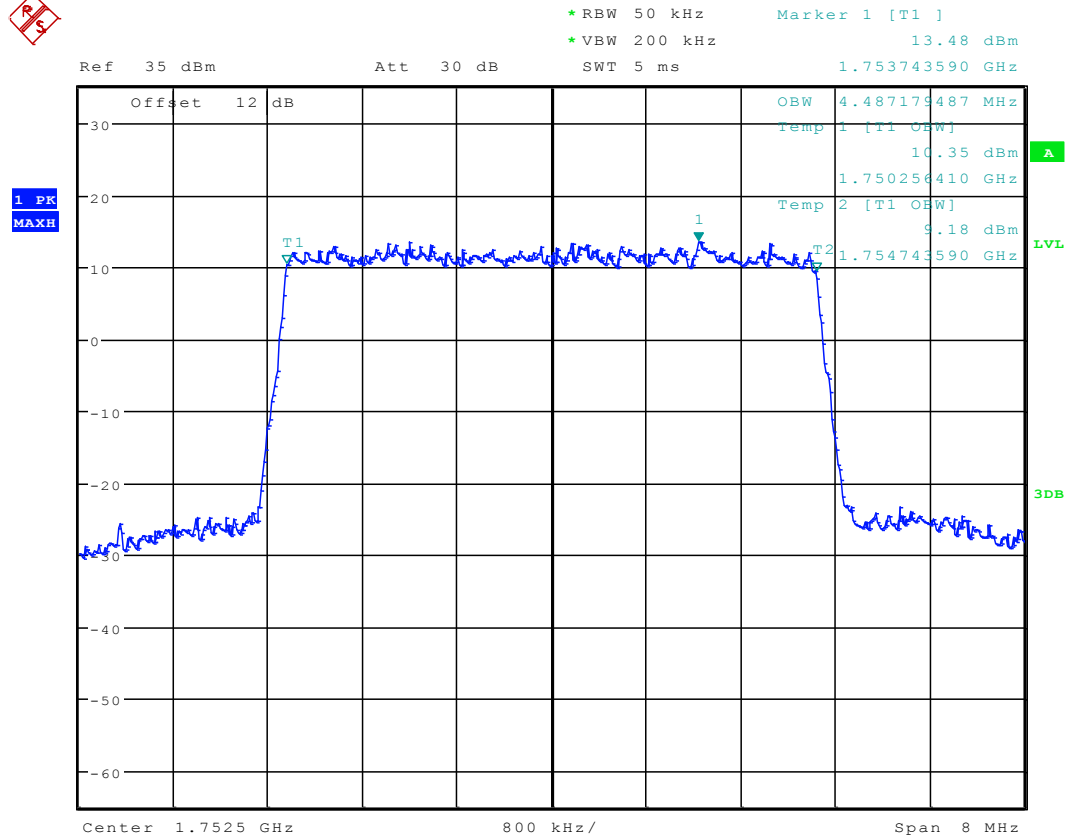
QPSK/12 RB/RB #6



Date: 25.NOV.2011 17:12:51

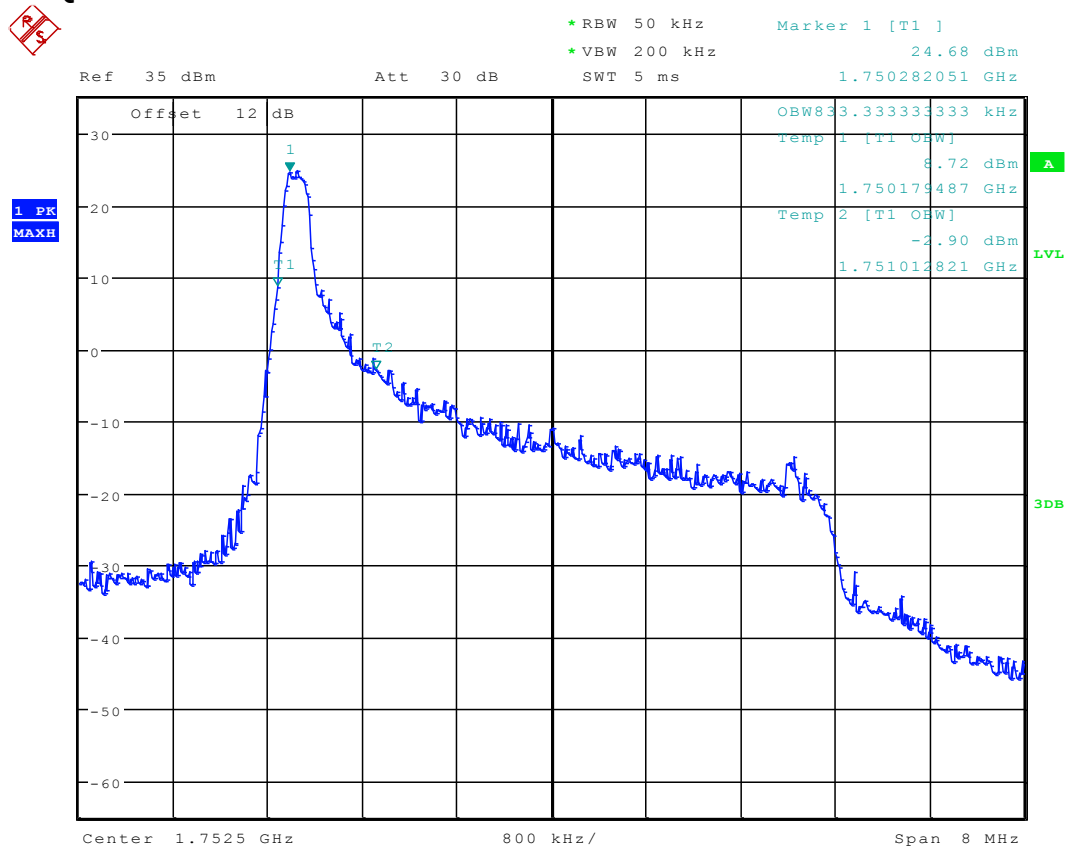


QPSK/ full RBs



Date: 25.NOV.2011 17:10:22

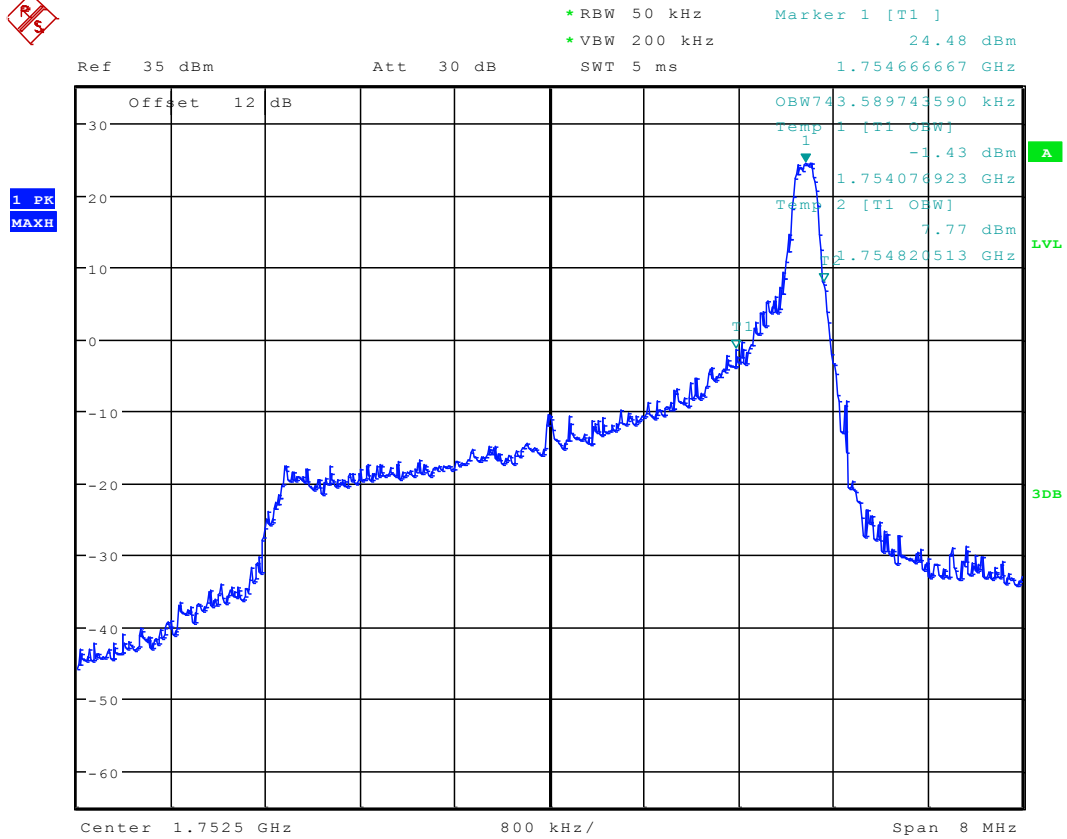
TM5
16QAM /1 RB/RB #0



Date: 25.NOV.2011 17:11:10

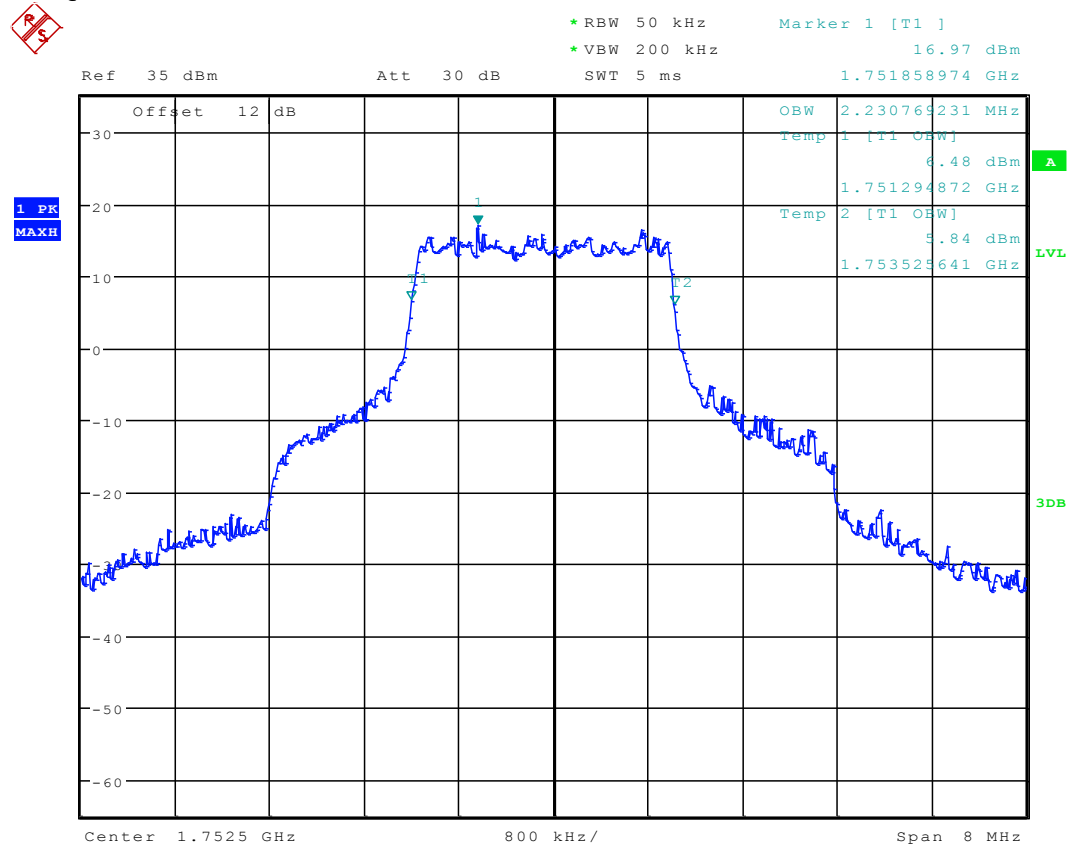


16QAM /1 RB/RB #max



Date: 25.NOV.2011 17:12:05

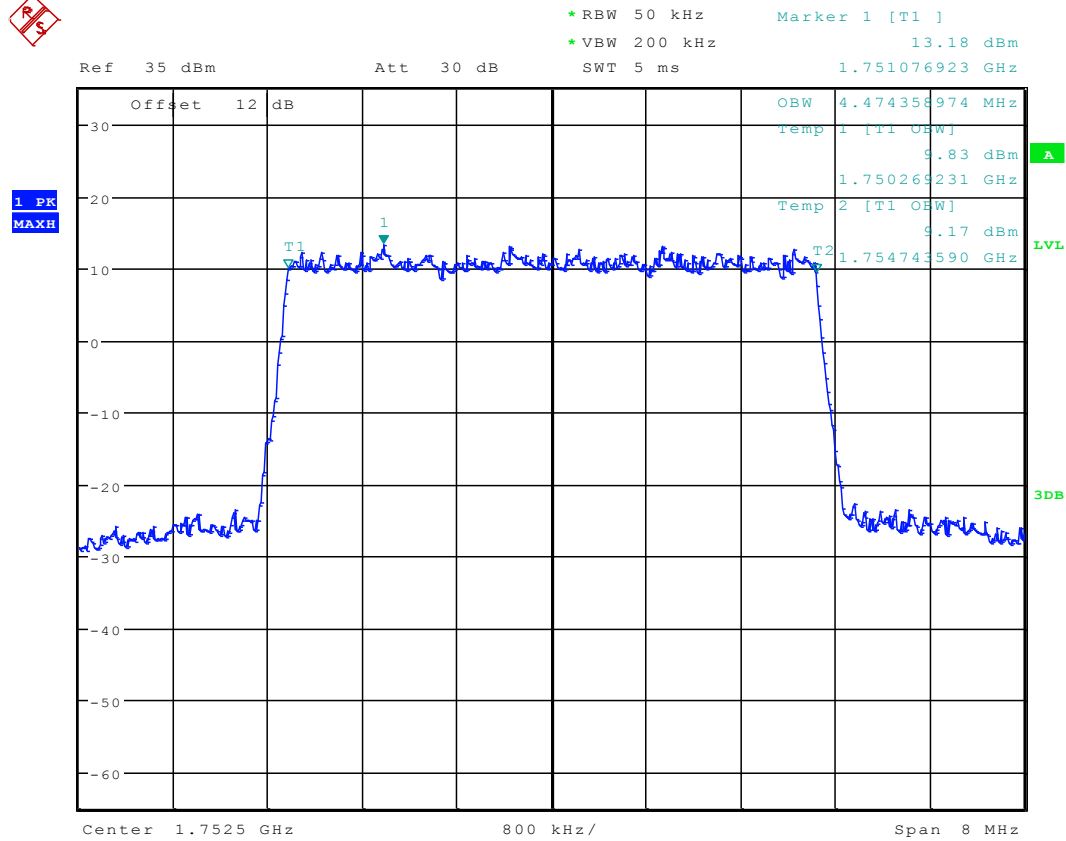
16QAM /12 RB/RB #6



Date: 25.NOV.2011 17:12:35



16QAM/full RBs

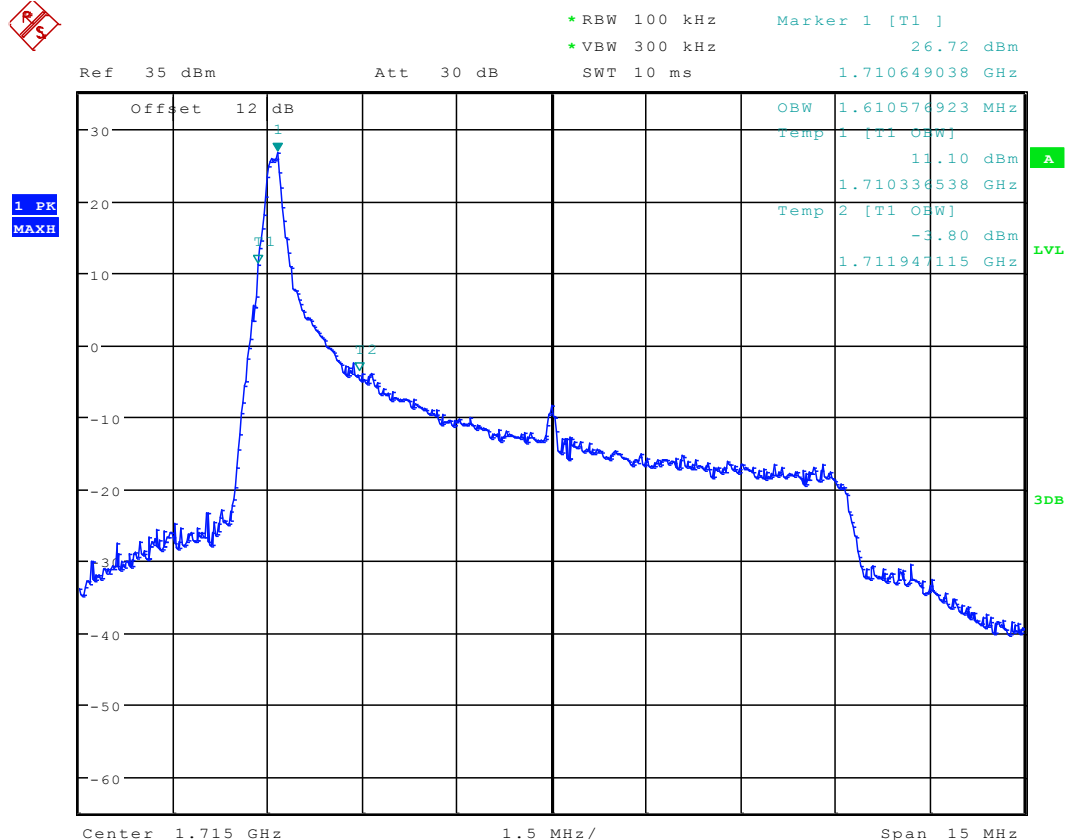


Date: 25.NOV.2011 17:10:51



10MHz(BW) Channel 20000

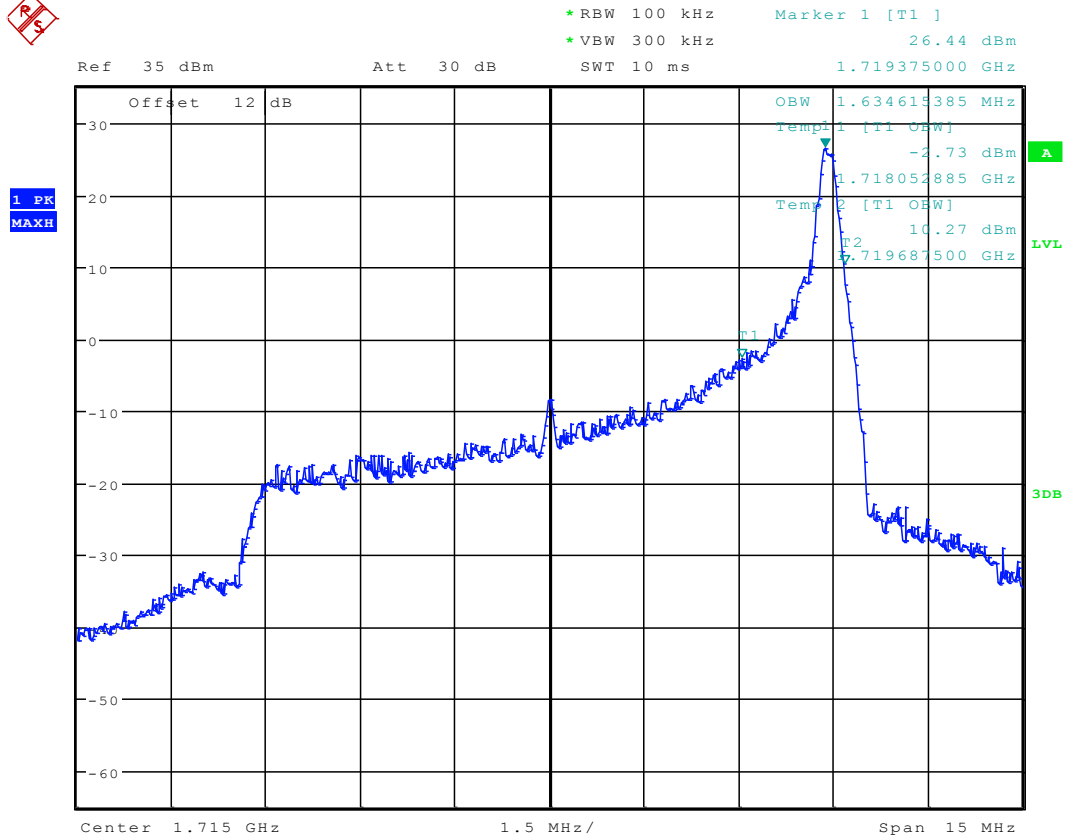
TM4
QPSK/1 RB/RB #0



Date: 25.NOV.2011 16:07:24



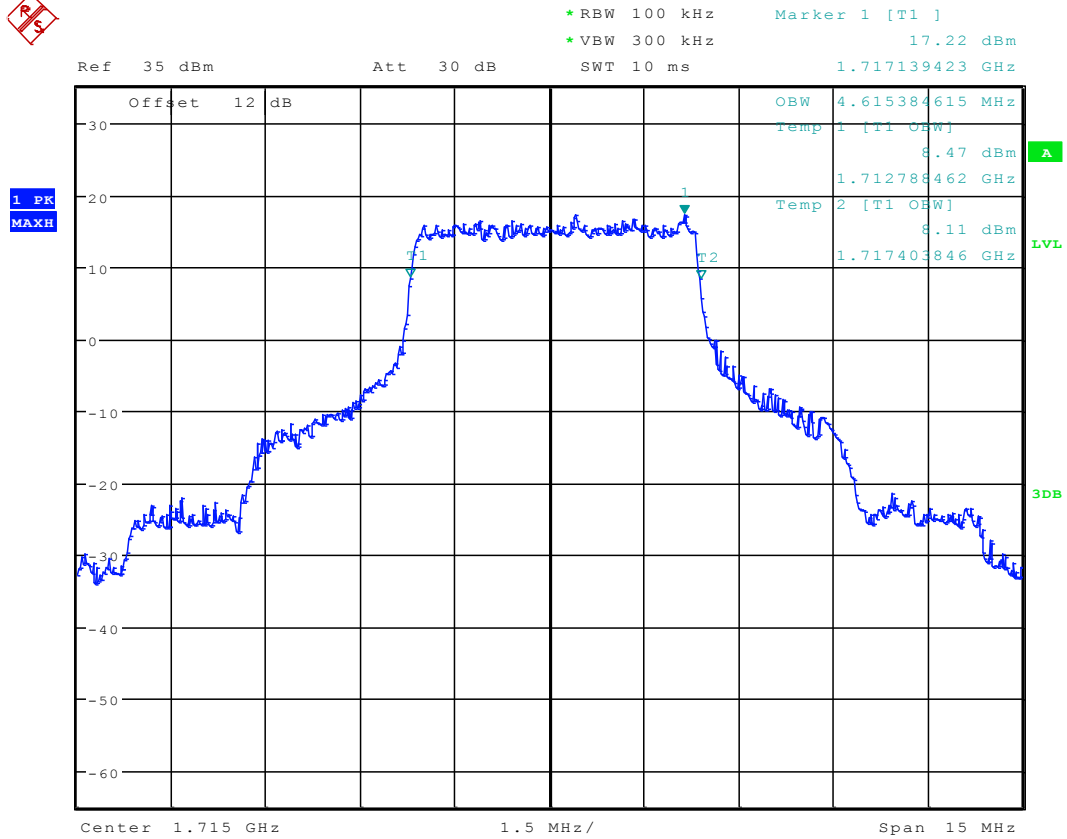
QPSK/1 RB/RB #max



Date: 25.NOV.2011 16:07:56



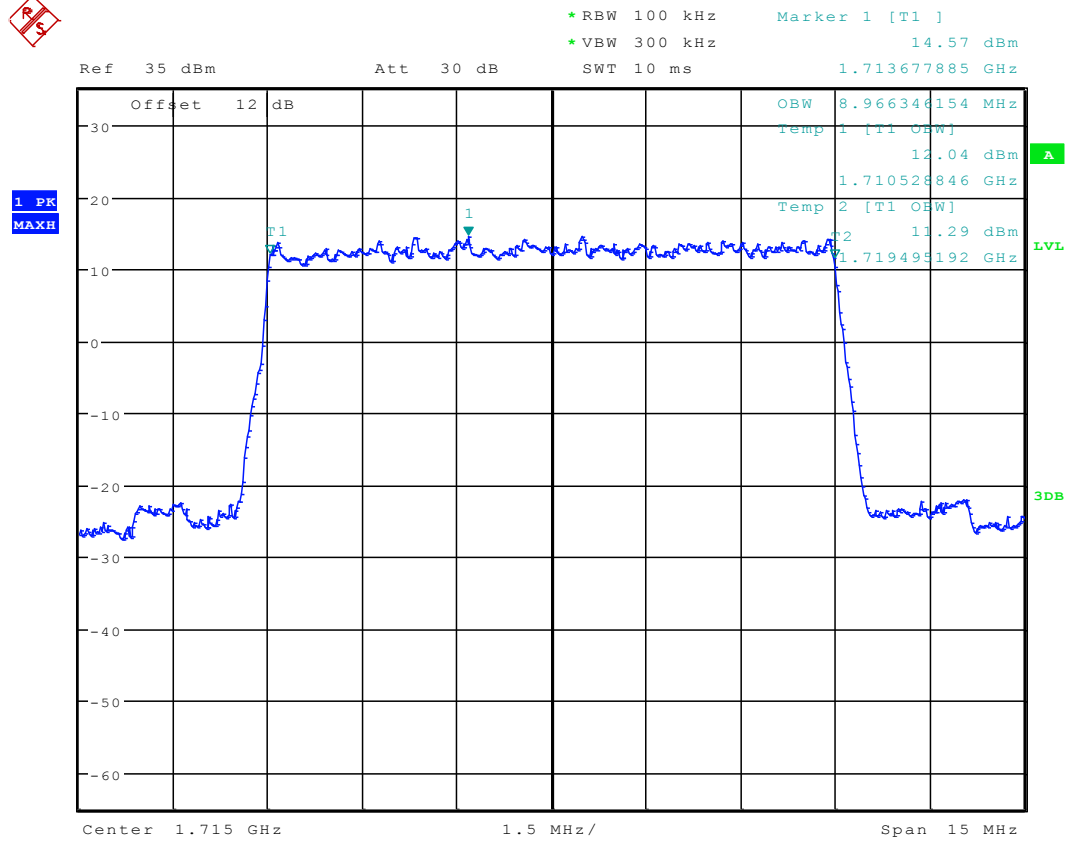
QPSK/25 RB/RB #13



Date: 25.NOV.2011 16:09:05

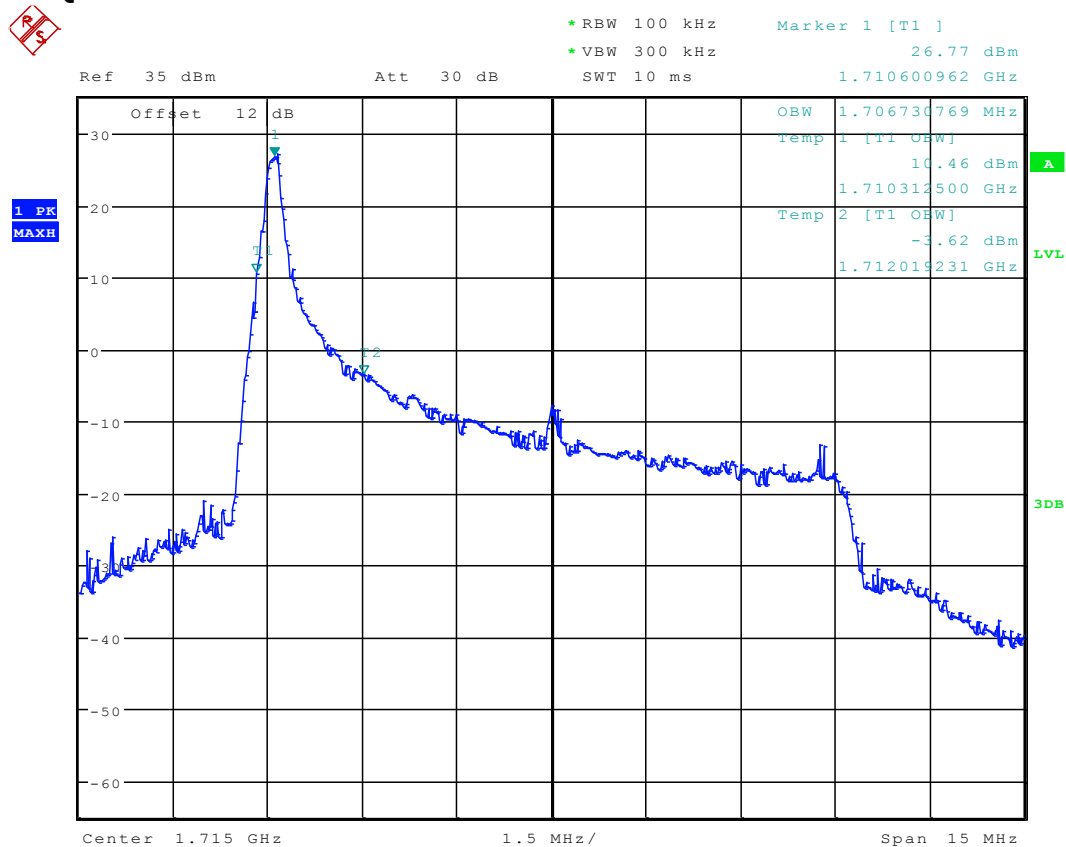


QPSK/ full RBs



Date: 25.NOV.2011 16:06:22

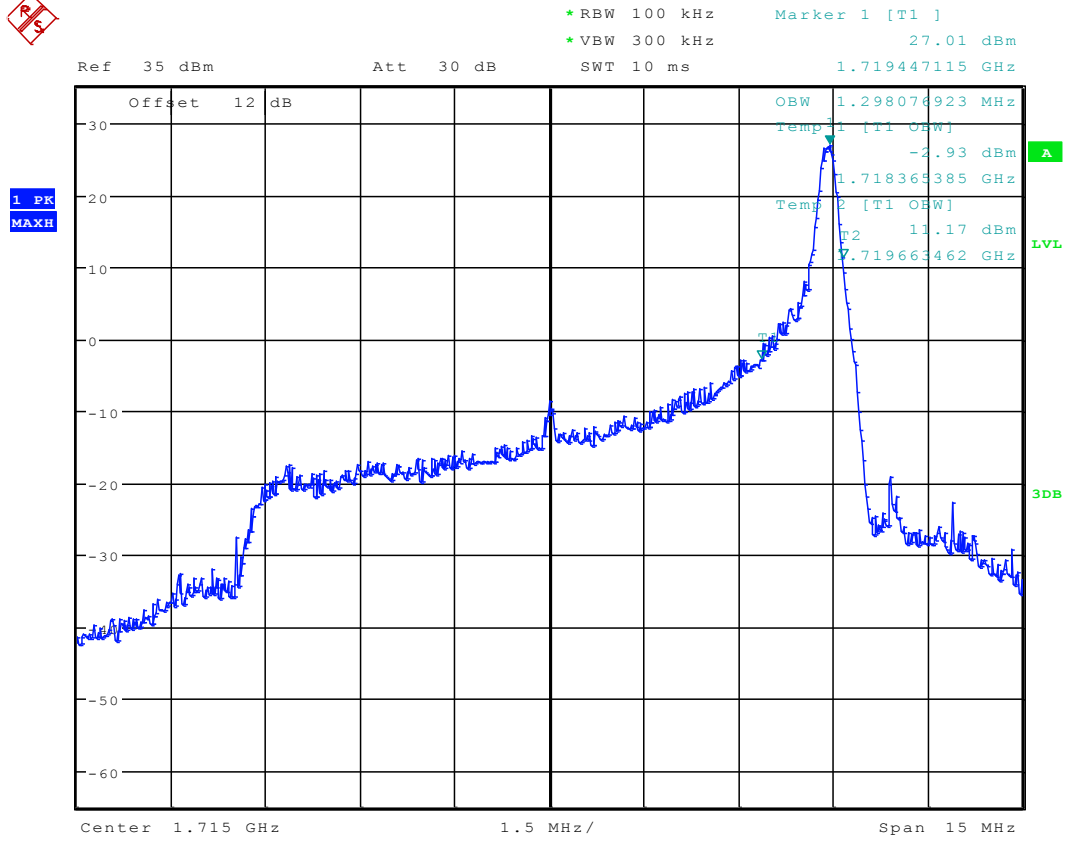
TM5
16QAM /1 RB/RB #0



Date: 25.NOV.2011 16:07:06



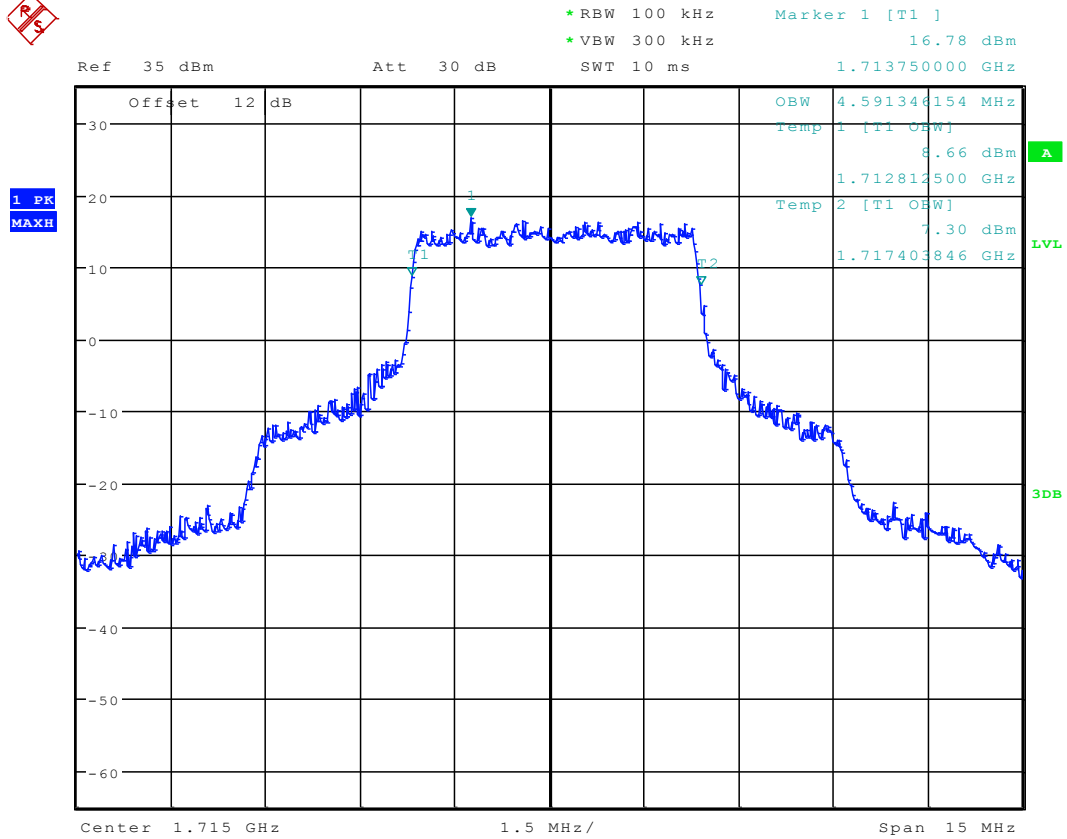
16QAM /1 RB/RB #max



Date: 25.NOV.2011 16:08:12



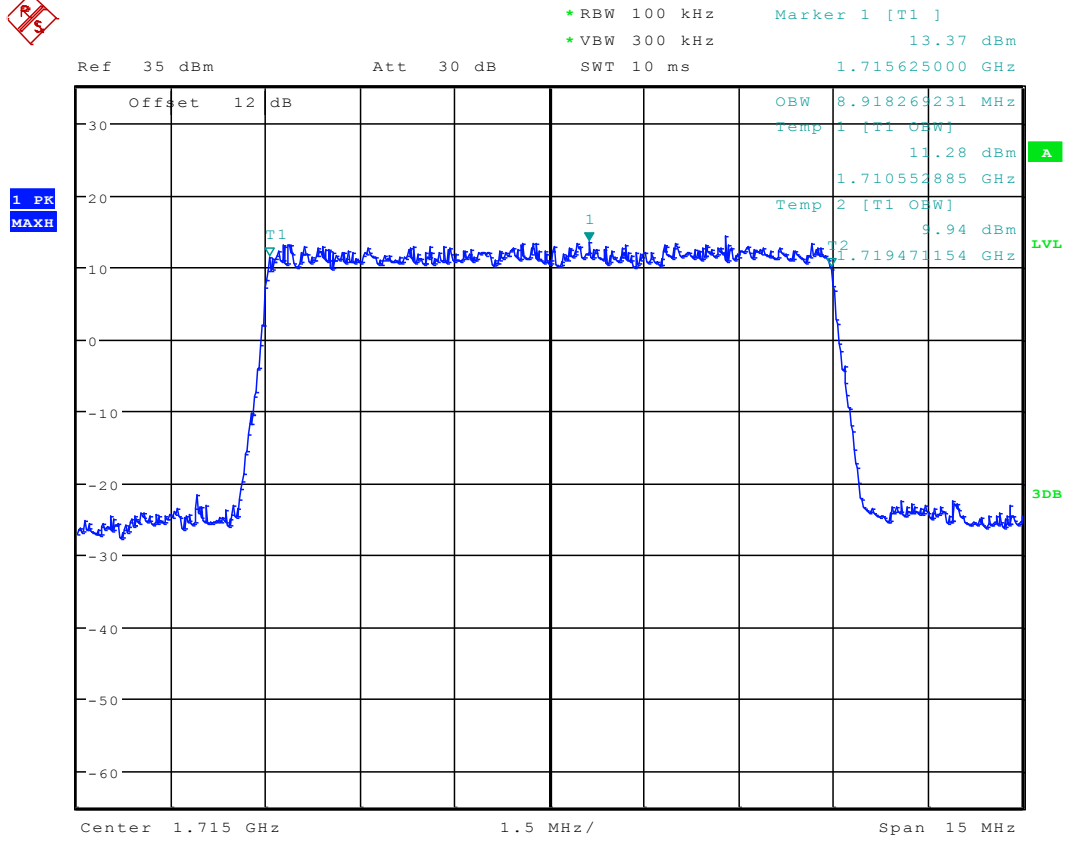
16QAM /25 RB/RB #13



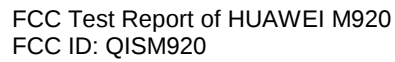
Date: 25.NOV.2011 16:08:41



16QAM/full RBs



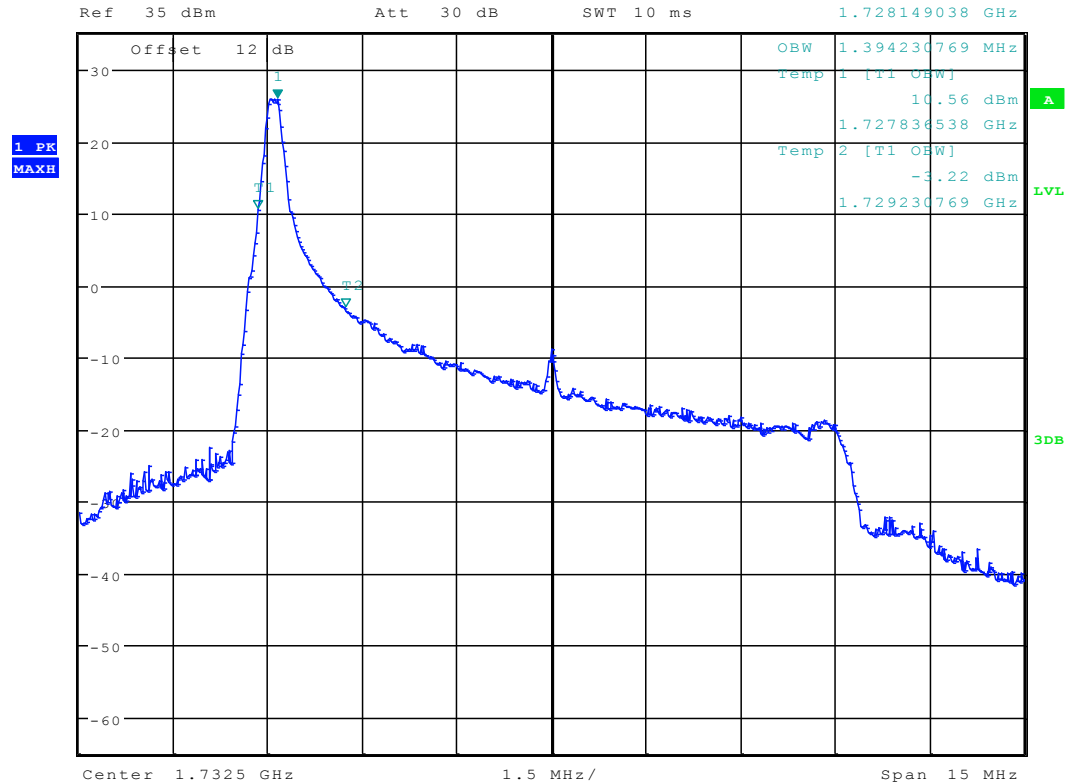
Date: 25.NOV.2011 16:06:44



QPSK/1 RB/RB #0



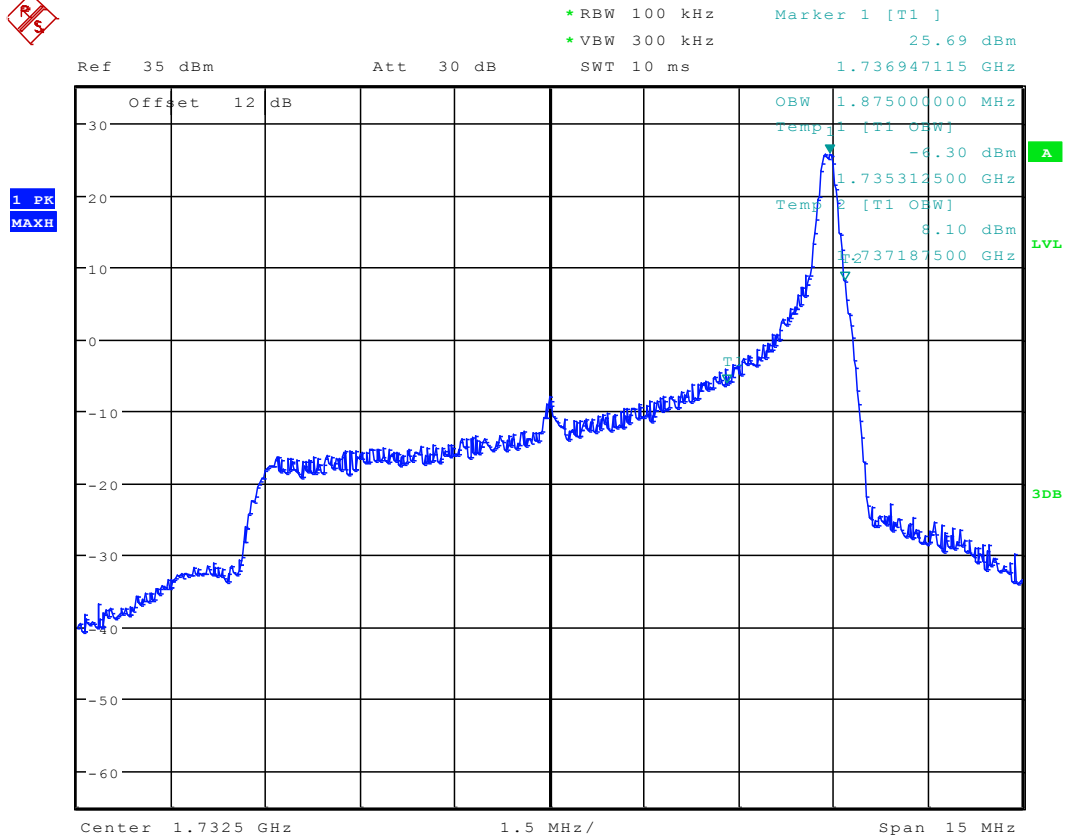
```
* RBW 100 kHz      Marker 1 [T1 ]
* VBW 300 kHz      25.88 dBm
SWT 10 ms          1.728149038 GHz
```



Date: 25.NOV.2011 16:12:27



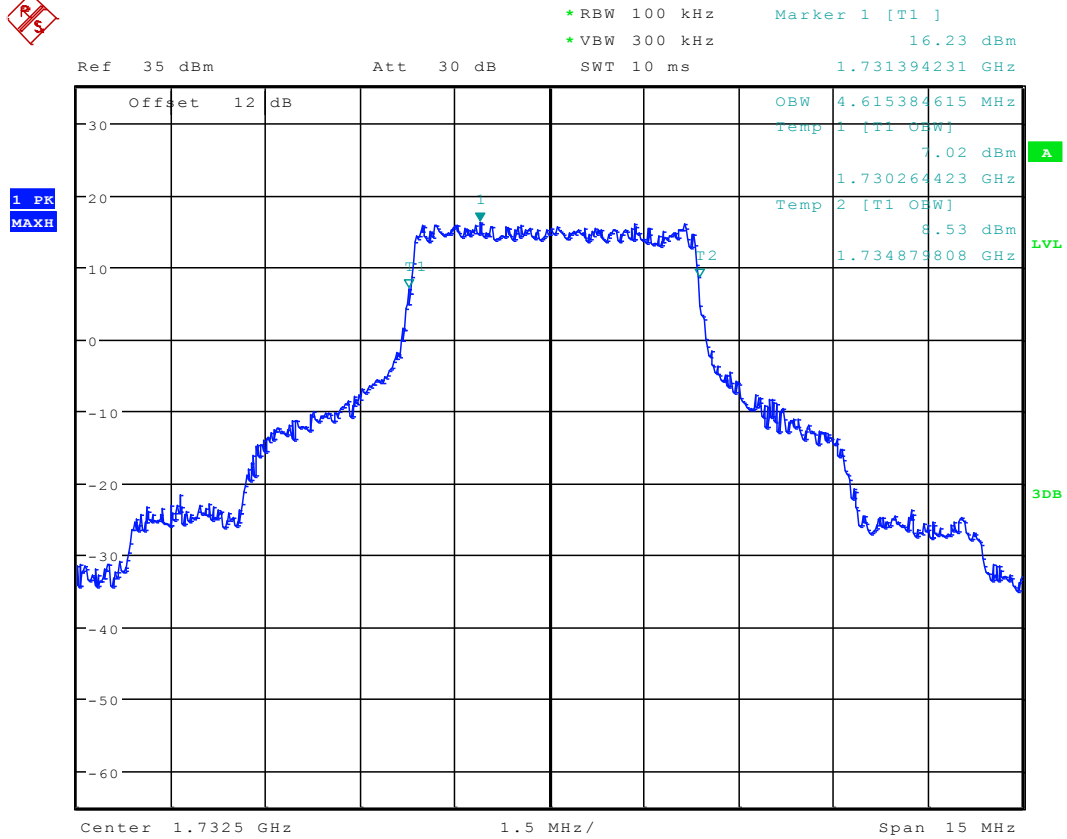
QPSK/1 RB/RB #max



Date: 25.NOV.2011 16:13:31



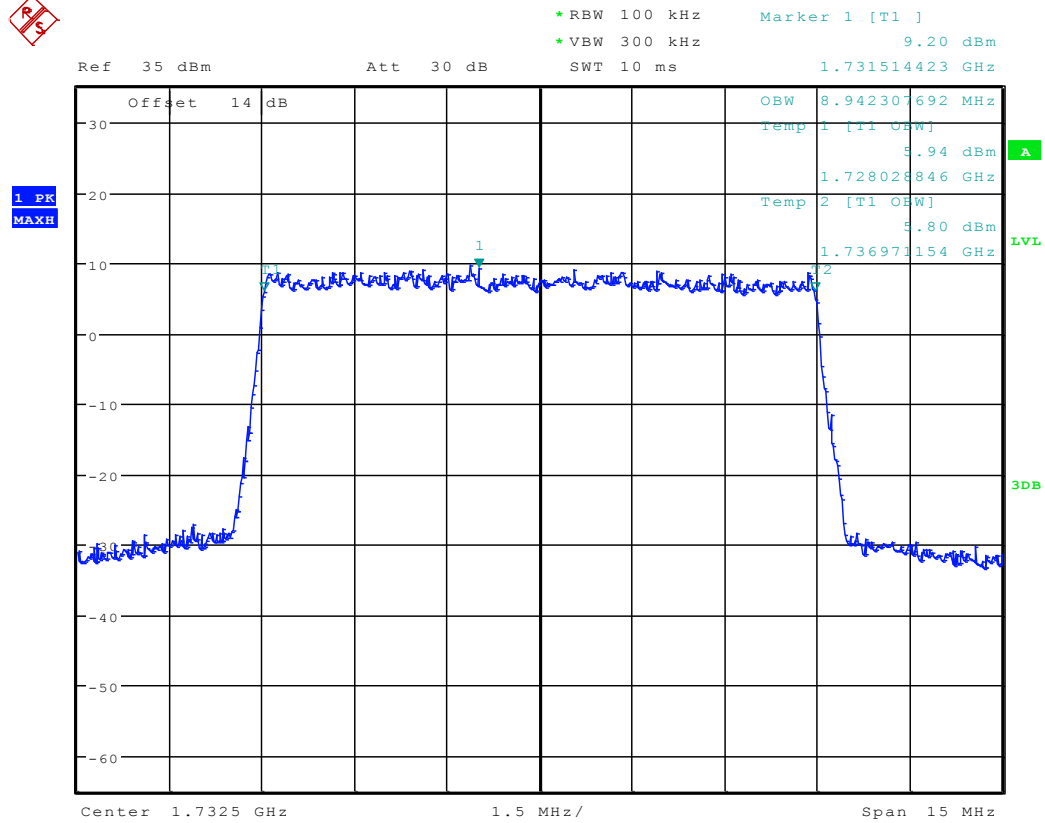
QPSK/25 RB/RB #13



Date: 25.NOV.2011 16:13:57

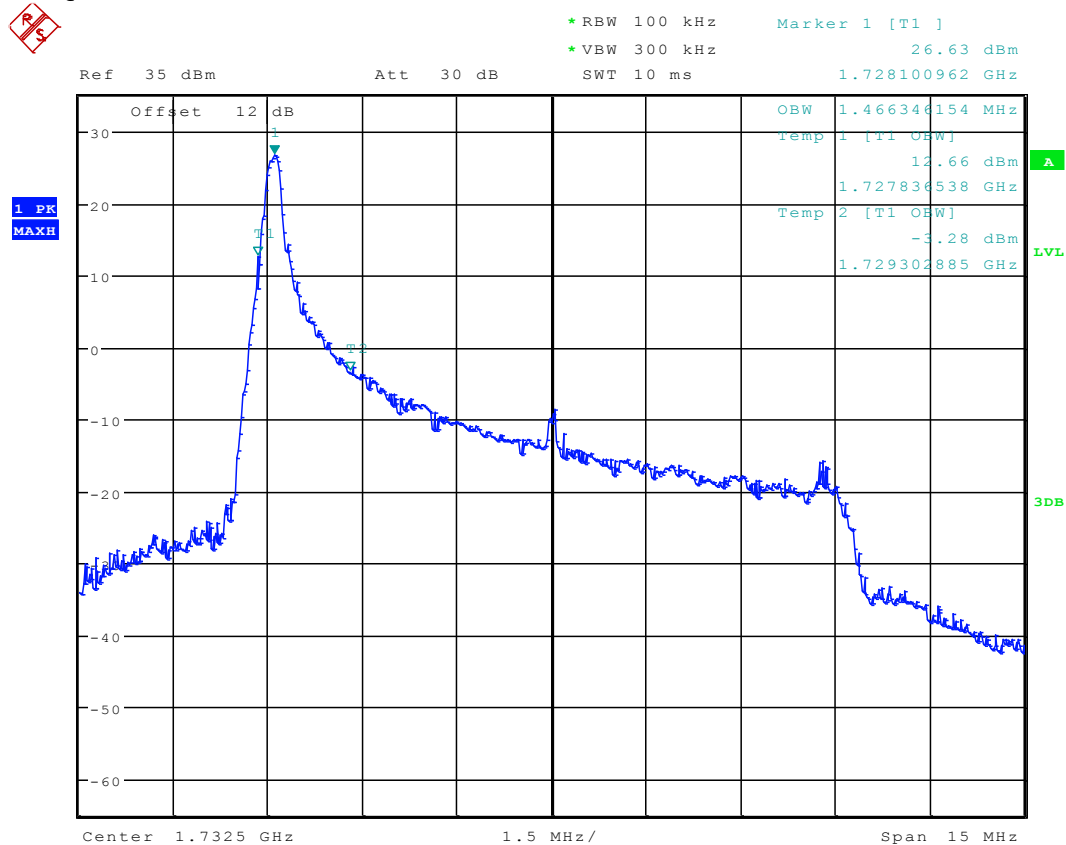


QPSK/ full RBs



Date: 13.NOV.2011 19:03:14

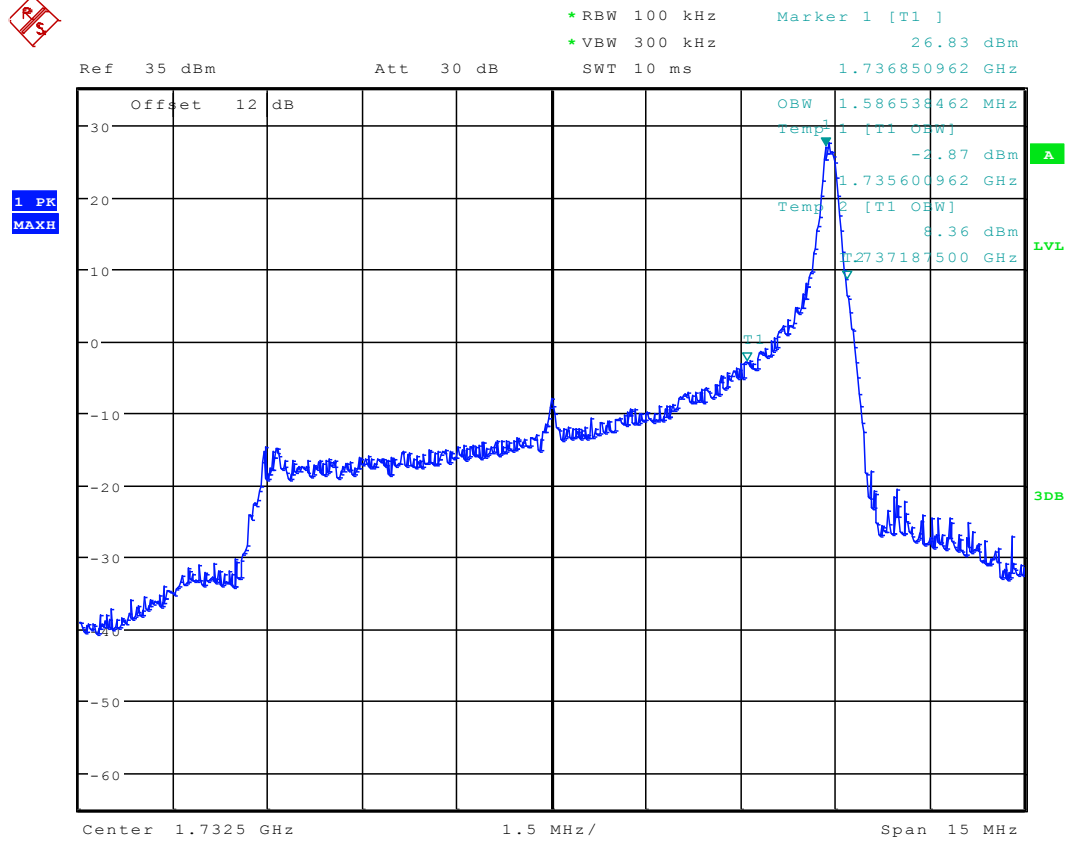
TM5
16QAM /1 RB/RB #0



Date: 25.NOV.2011 16:12:50



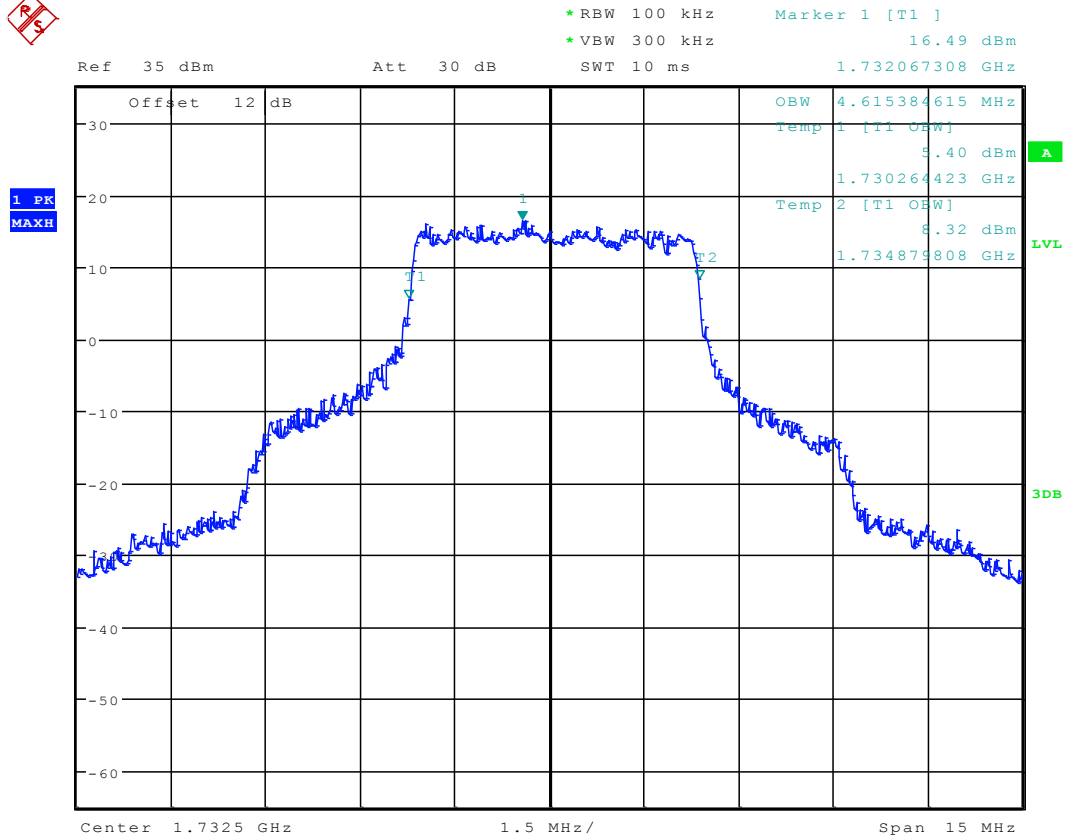
16QAM /1 RB/RB #max



Date: 25.NOV.2011 16:13:10



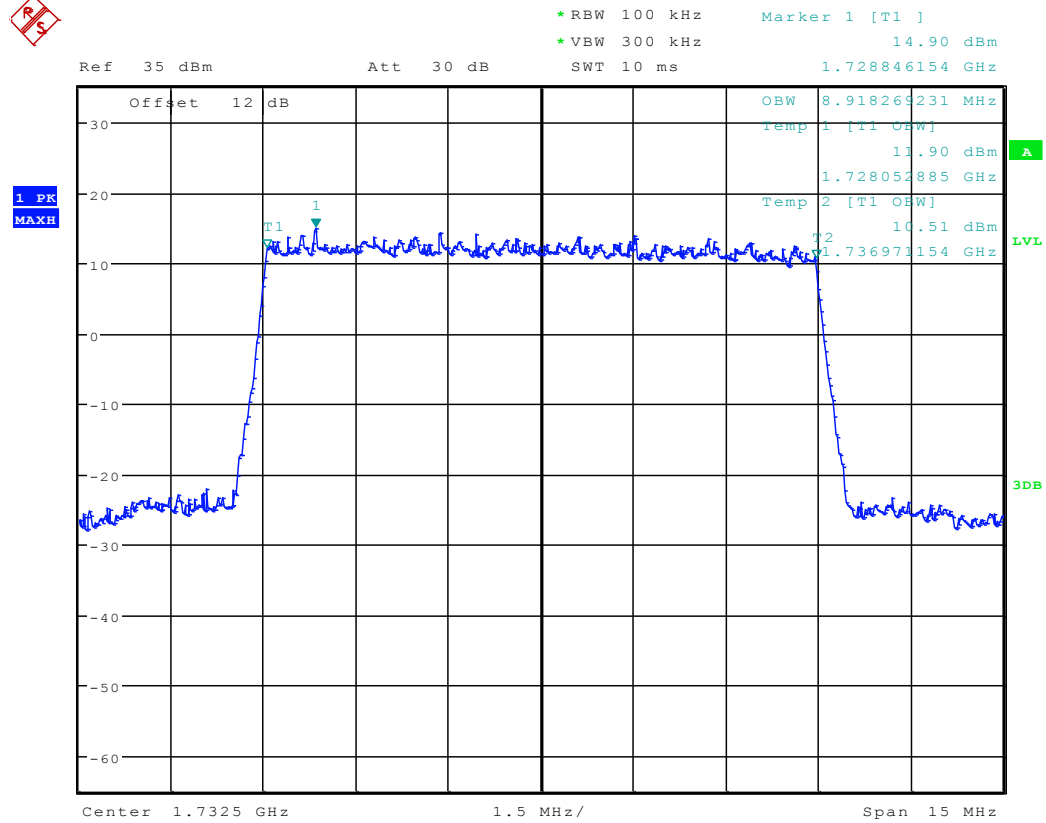
16QAM /25 RB/RB #13



Date: 25.NOV.2011 16:14:17



16QAM/full RBs



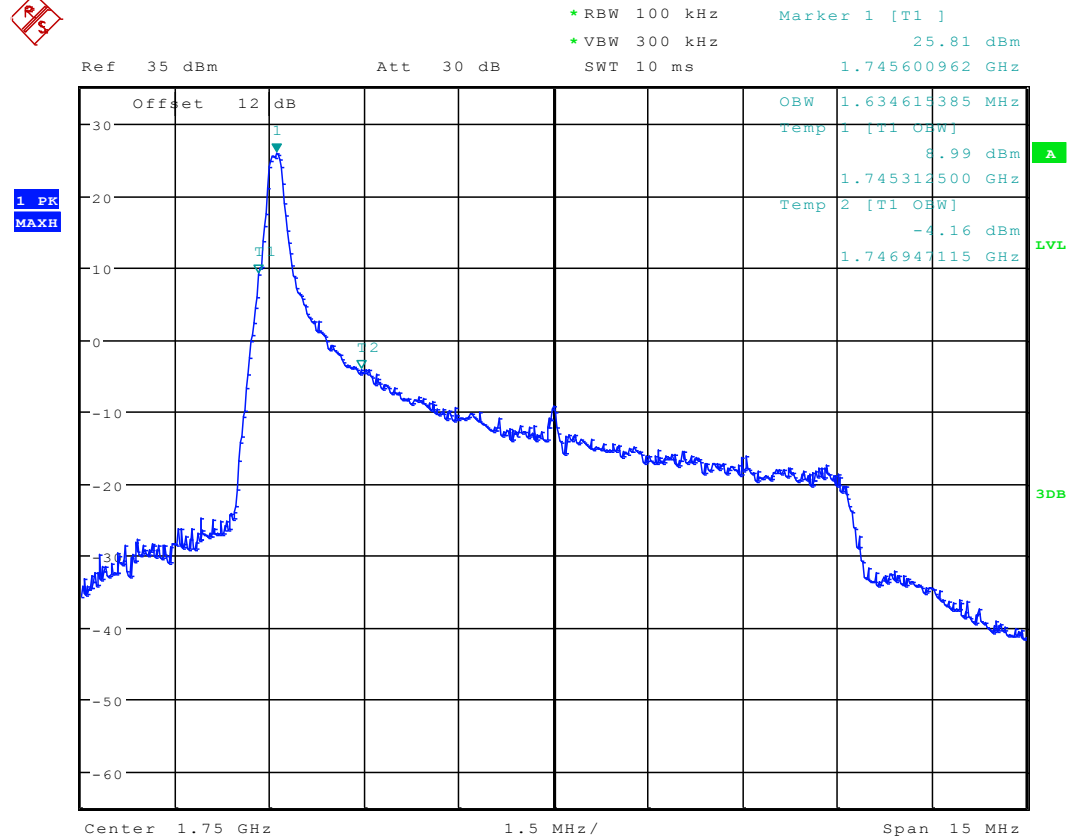
Date: 24.NOV.2011 16:30:14



Channel 20350

TM4

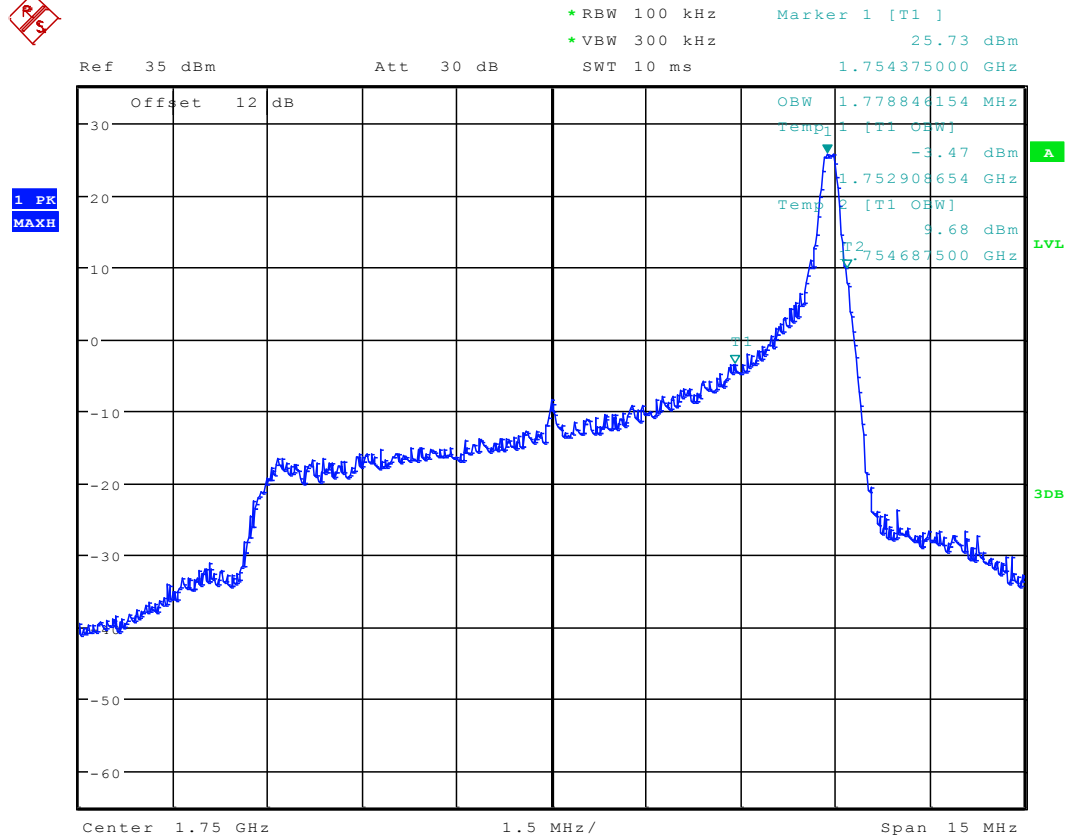
QPSK/1 RB/RB #0



Date: 25.NOV.2011 17:21:33



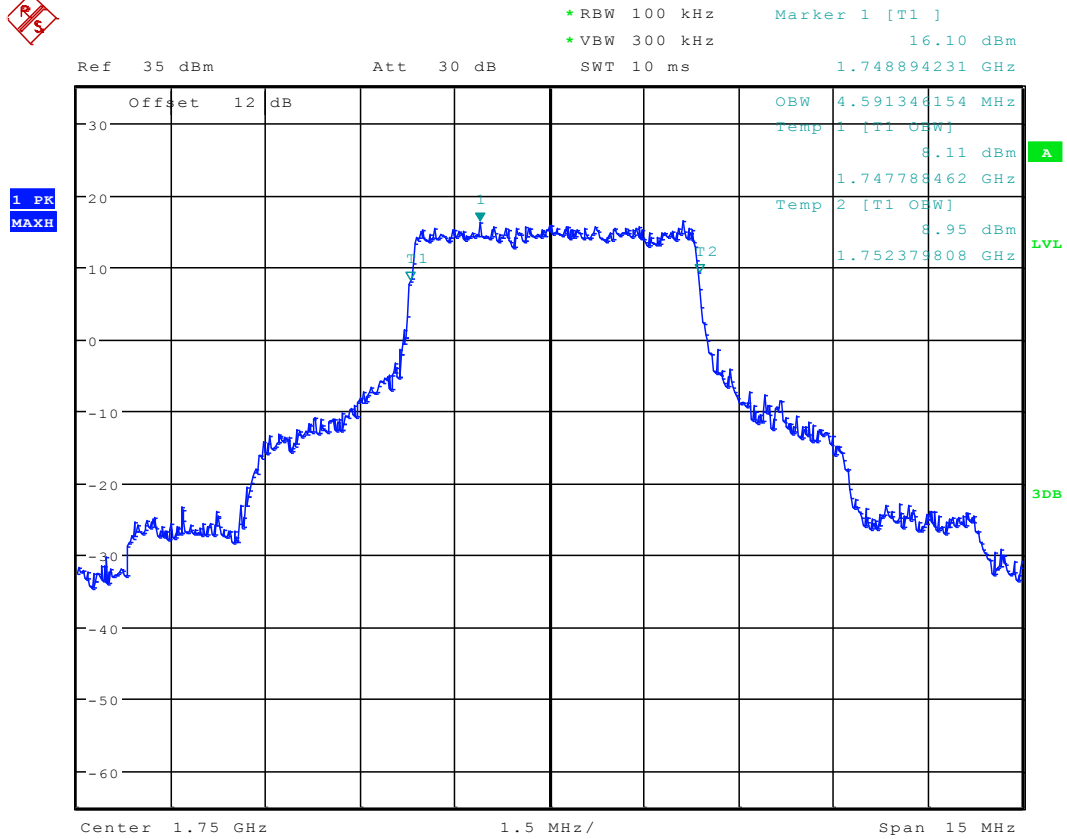
QPSK/1 RB/RB #max



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



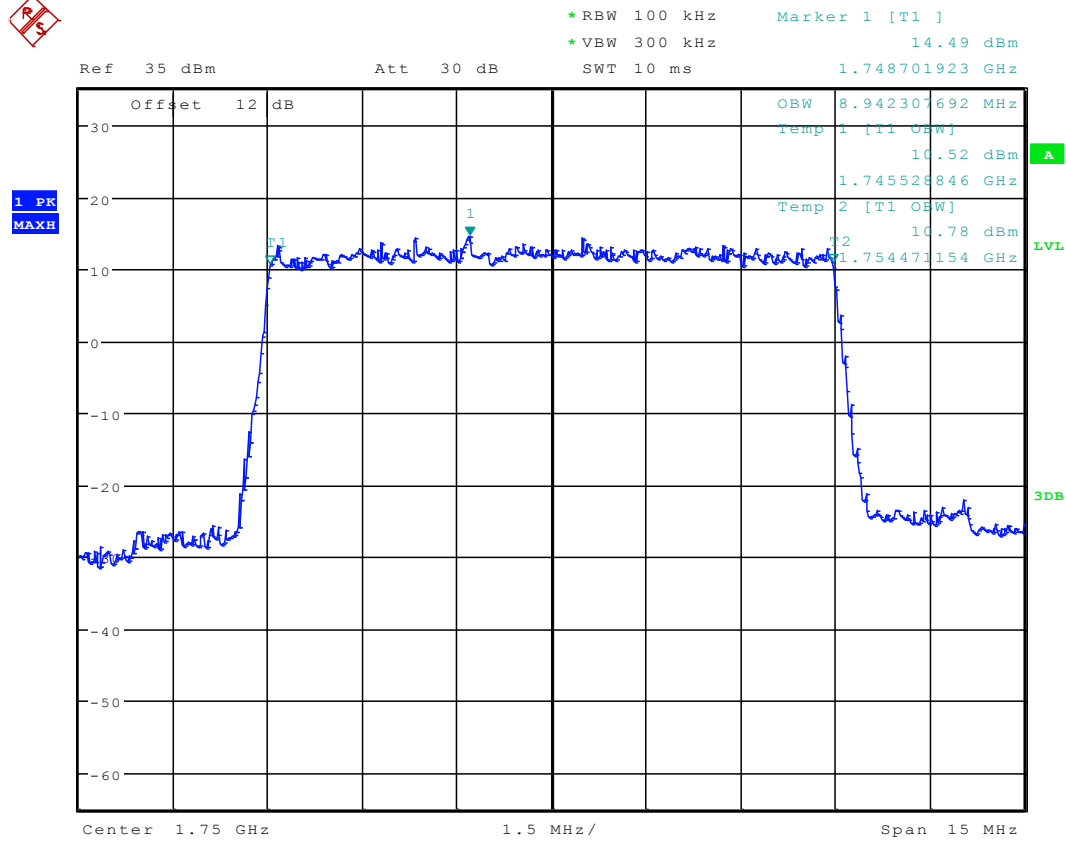
QPSK/25 RB/RB #13



Date: 25.NOV.2011 17:23:42

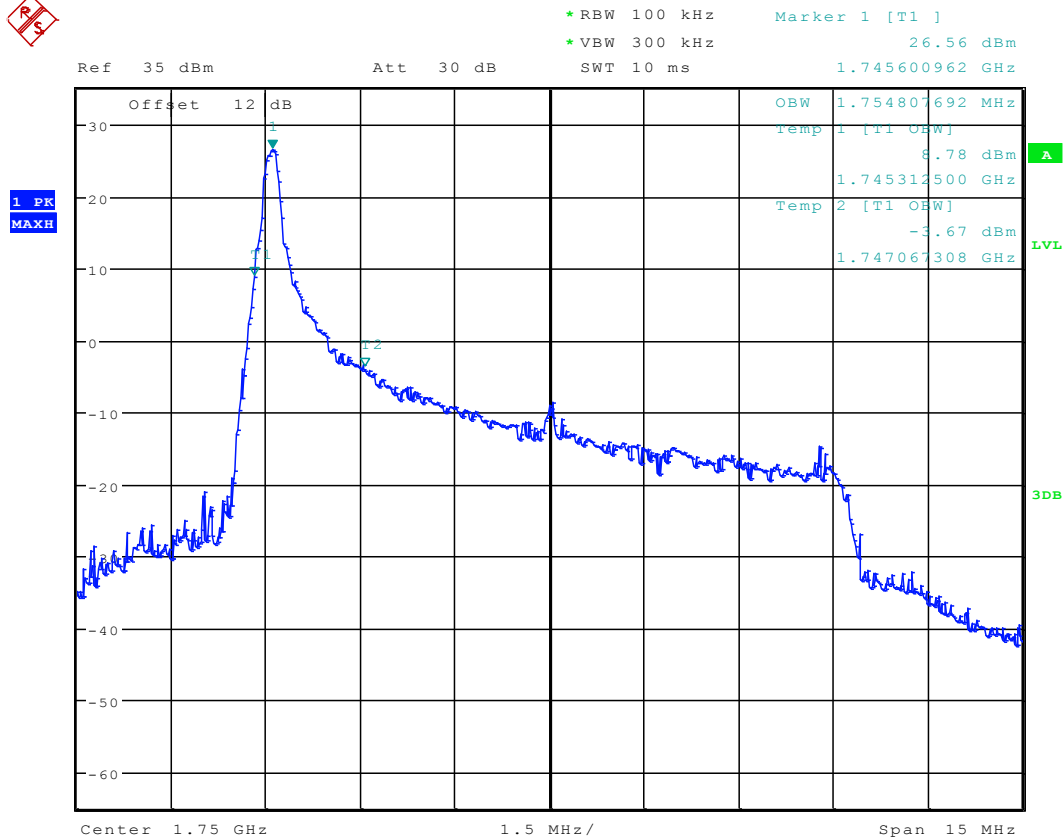


QPSK/ full RBs



Date: 25.NOV.2011 17:14:20

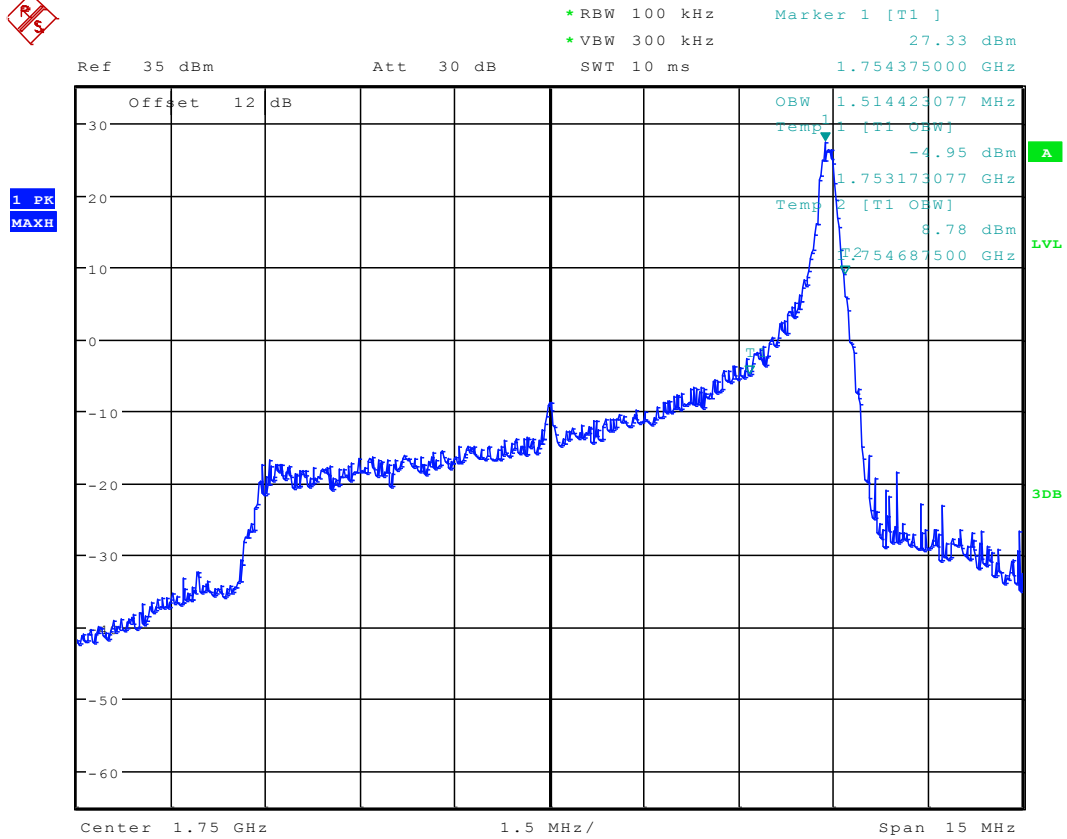
TM5
16QAM /1 RB/RB #0



Date: 25.NOV.2011 17:21:16



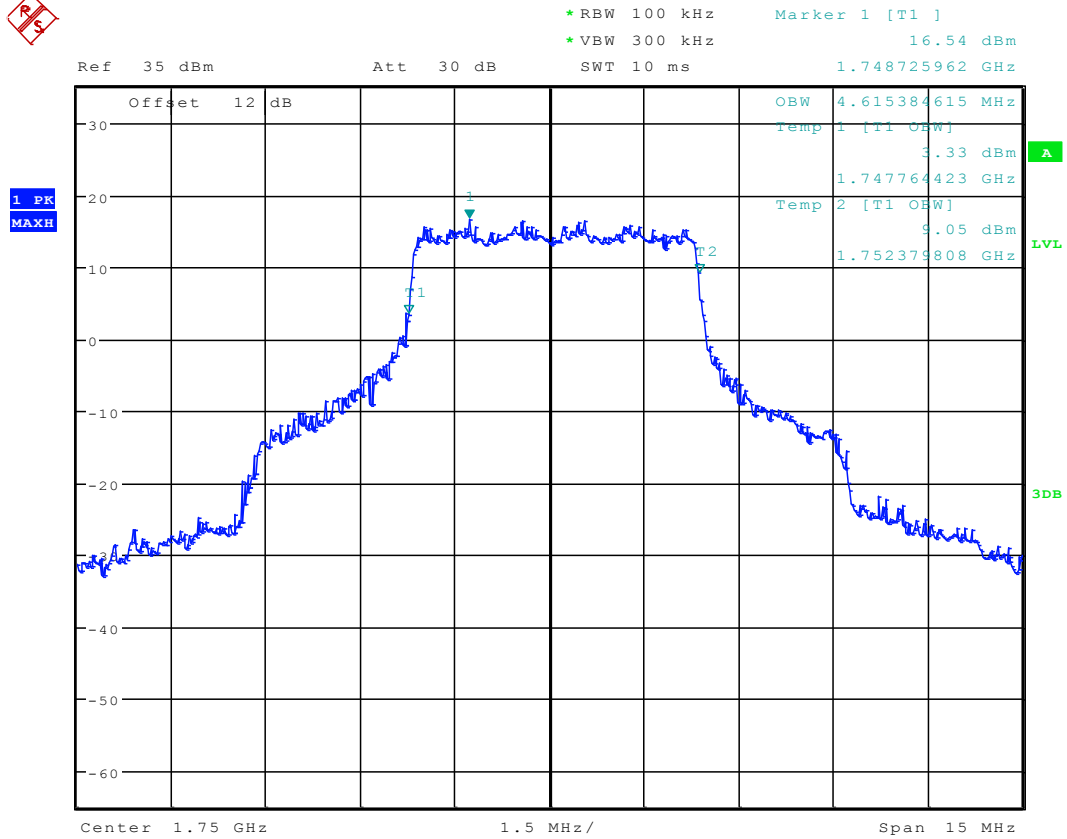
16QAM /1 RB/RB #max



Date: 25.NOV.2011 17:22:53



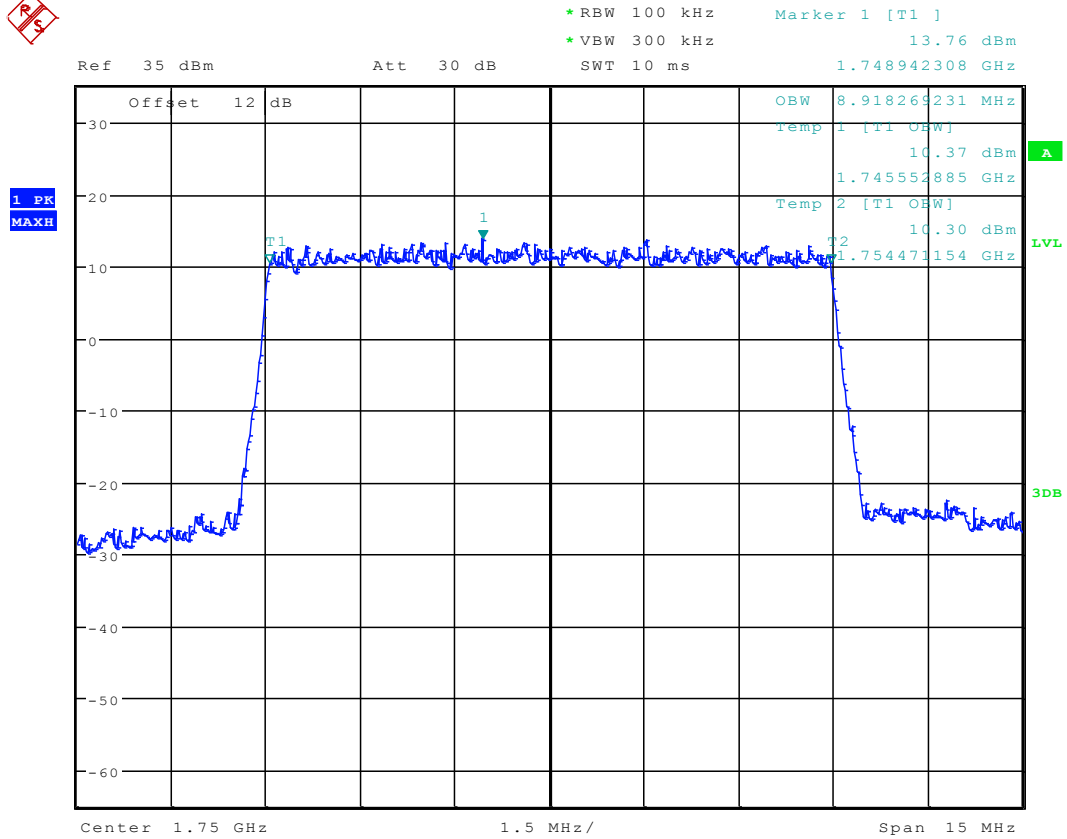
16QAM /25 RB/RB #13



Date: 25.NOV.2011 17:23:26



16QAM/full RBs



Date: 25.NOV.2011 17:16:37



Appendix D

Band Edges Compliance According to FCC Part 2.1051 & 27.53



26dB Occupied Bandwidth

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

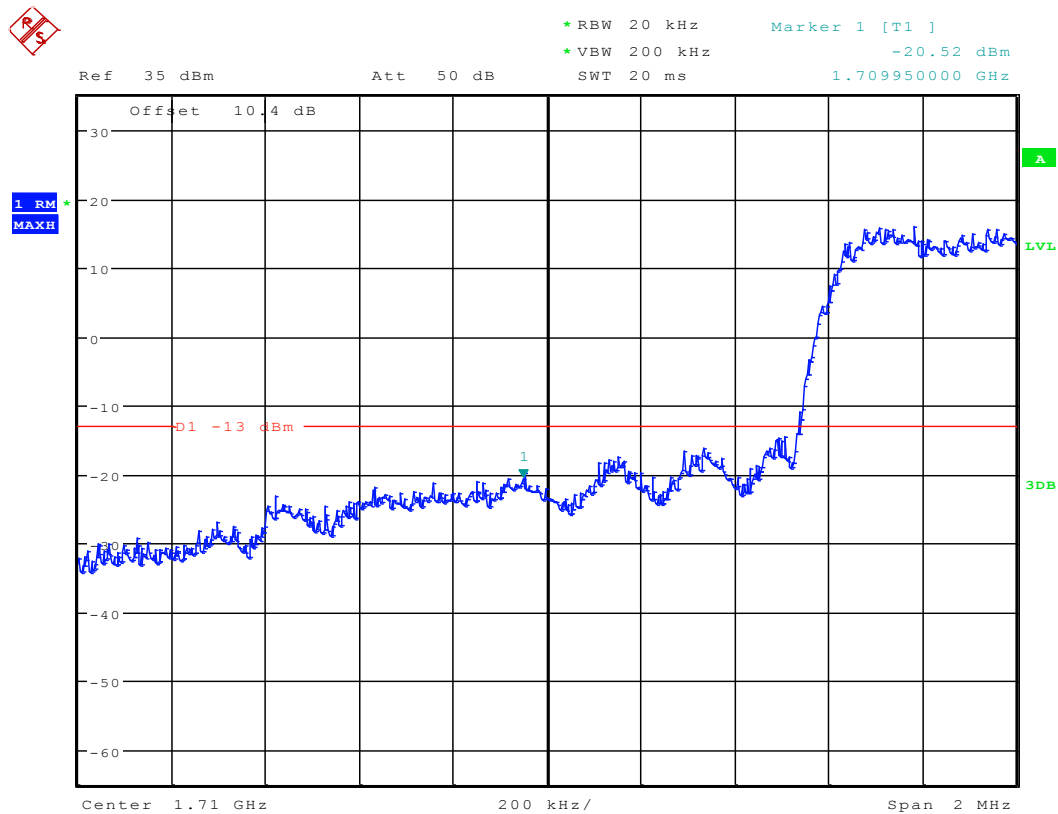
Table 1 Measurement Results

Mode	-26dB BW	RBW to Measure Band Edge
CDMA, TM1, TM3	1434 KHz	≥15k, used 20k
EVDO	1429kHz	≥15k, used 20k
LTE QPSK 1RB (1.4MHz channel)	449 kHz	≥14k, used 20k
LTE QPSK 3RB (1.4MHz channel)	902 kHz	≥14k, used 20k
LTE QPSK 6RB (1.4MHz channel)	1216 kHz	≥14k, used 20k
LTE QPSK 1RB (3.0MHz channel)	470 kHz	≥30k, used 30k
LTE QPSK 8RB (3.0MHz channel)	2226 kHz	≥30k, used 30k
LTE QPSK 15RB (3.0MHz channel)	2882 kHz	≥30k, used 30k
LTE QPSK 1RB (5.0MHz channel)	717 kHz	≥50k, used 50k
LTE QPSK 12RB (5.0MHz channel)	3550 kHz	≥50k, used 50k
LTE QPSK 25RB (5.0MHz channel)	4773 kHz	≥50k, used 50k
LTE QPSK 1RB (10MHz channel)	1126 kHz	≥100k, used 100k
LTE QPSK 25RB (10MHz channel)	6865 kHz	≥100k, used 100k
LTE QPSK 50RB (10MHz channel)	9557 kHz	≥100k, used 100k



Test Plot of Band Edges Compliance

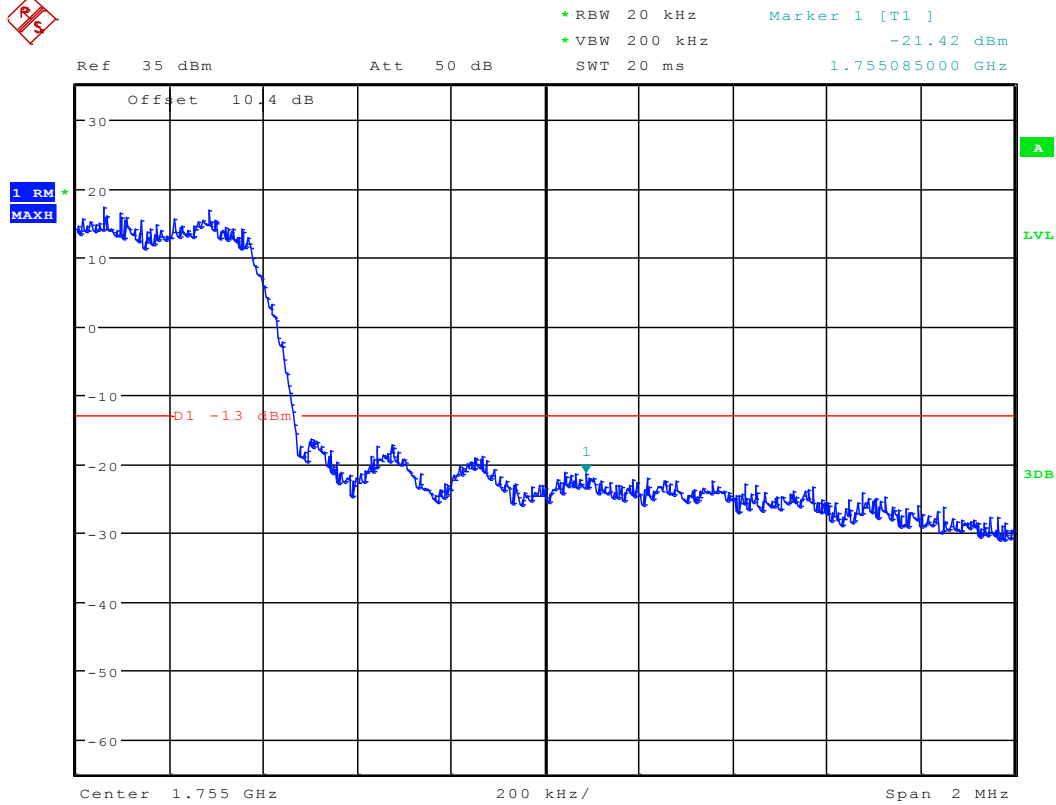
Left Edge (1710 MHz) Channel 25



Date: 8.NOV.2011 23:44:24



Right Edge (1755MHz) Channel 875

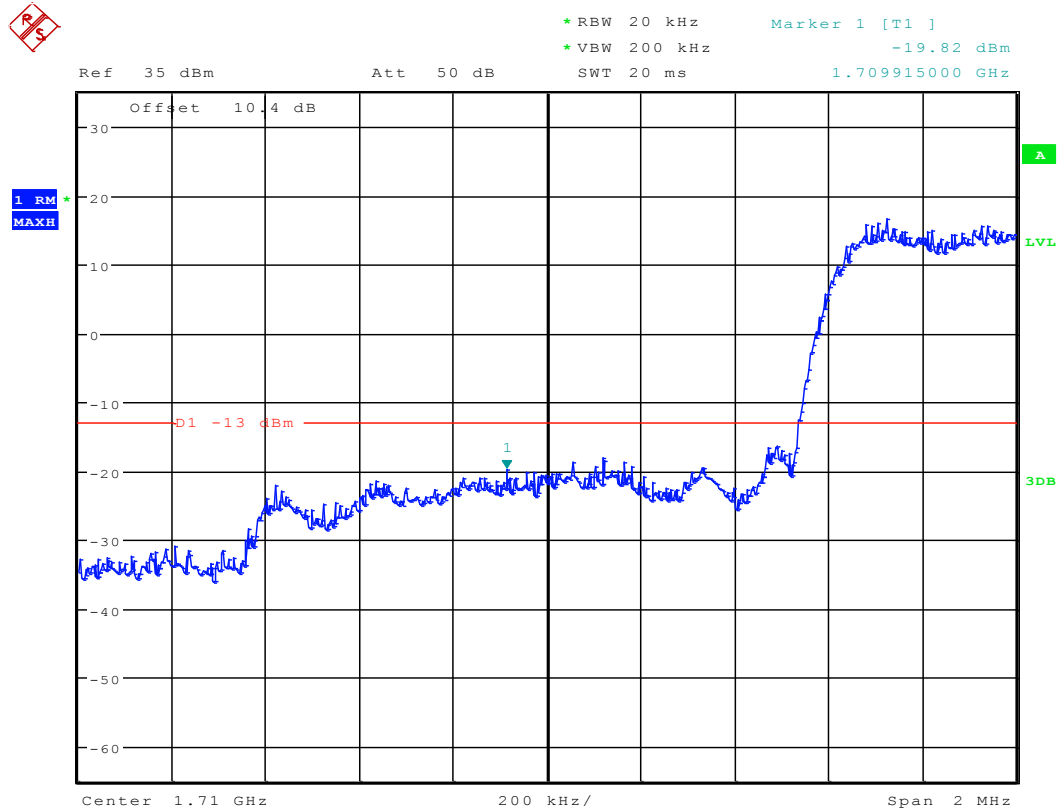


Date: 8.NOV.2011 23:44:39



TM3

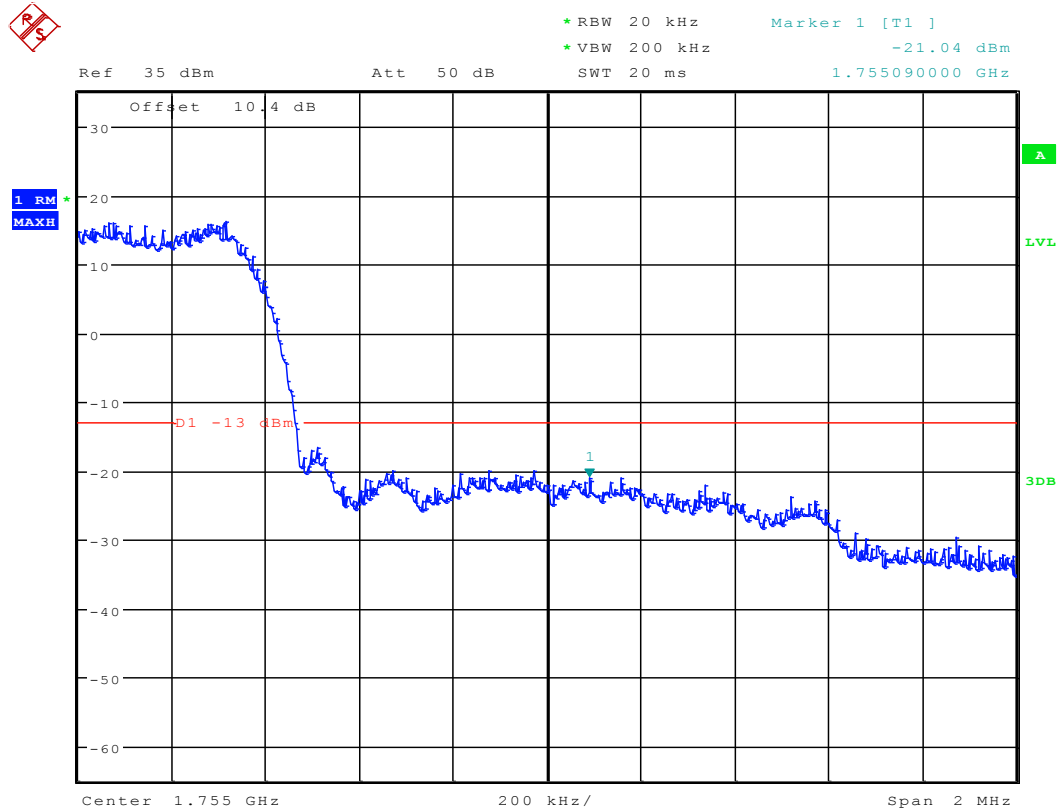
Left Edge (1710 MHz) Channel 25



Date: 8.NOV.2011 23:44:55



Right Edge (1755MHz) Channel 875

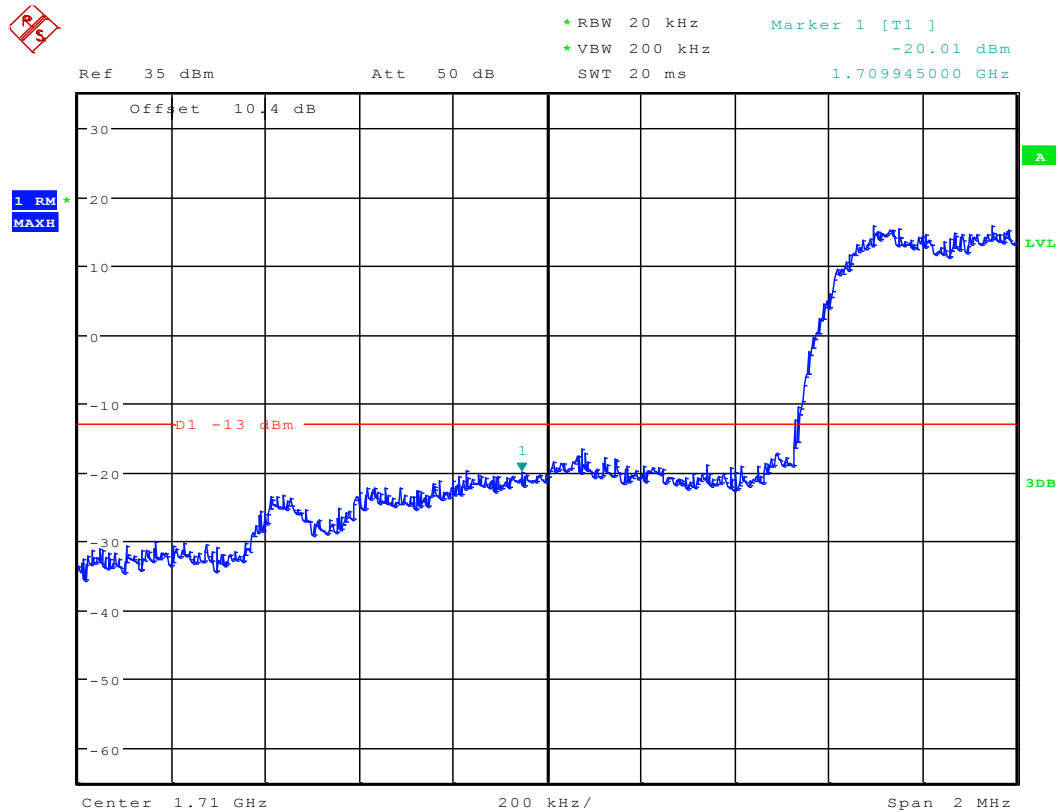


Date: 8.NOV.2011 23:45:09



EVDO subtype 0

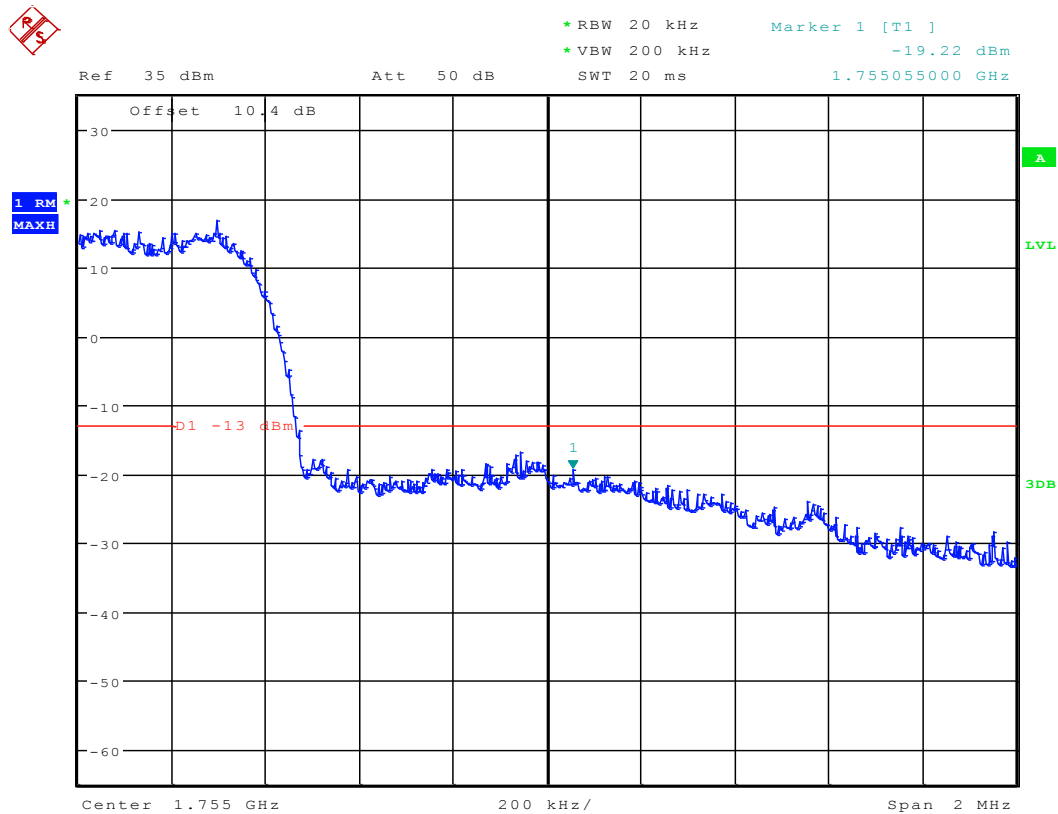
Left Edge (1710 MHz) Channel 25



Date: 8.NOV.2011 23:50:07



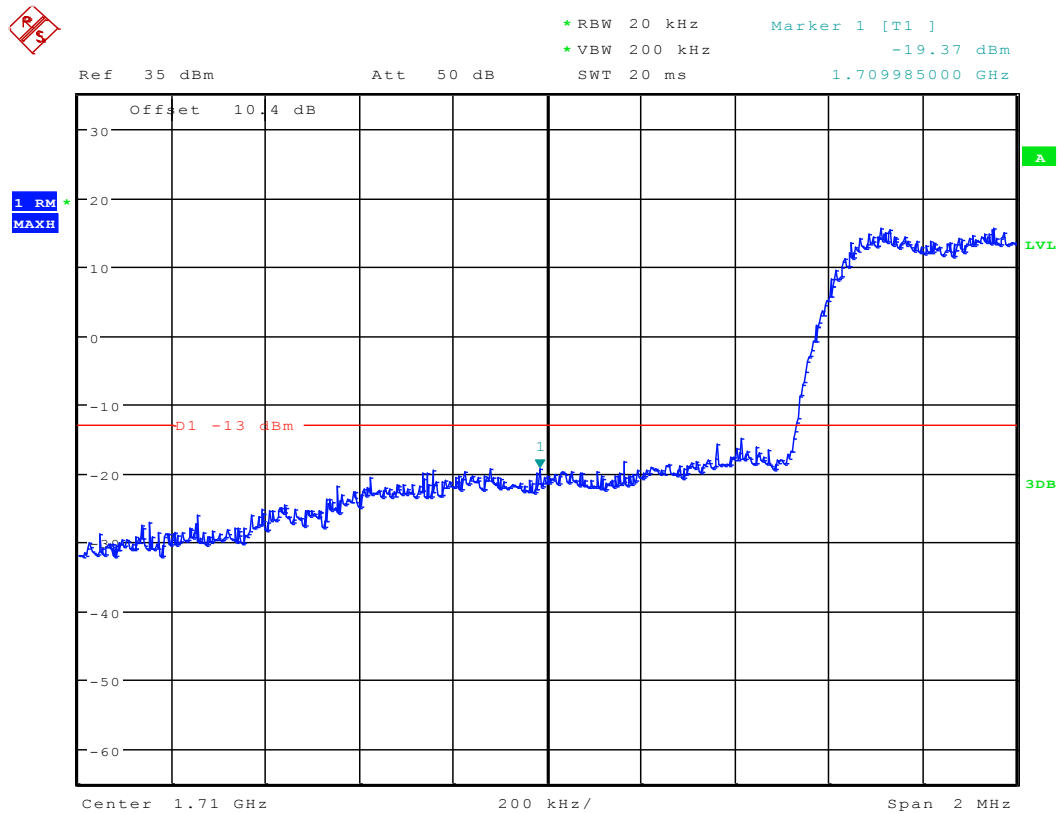
Right Edge (1755MHz) Channel 875



Date: 8.NOV.2011 23:50:21



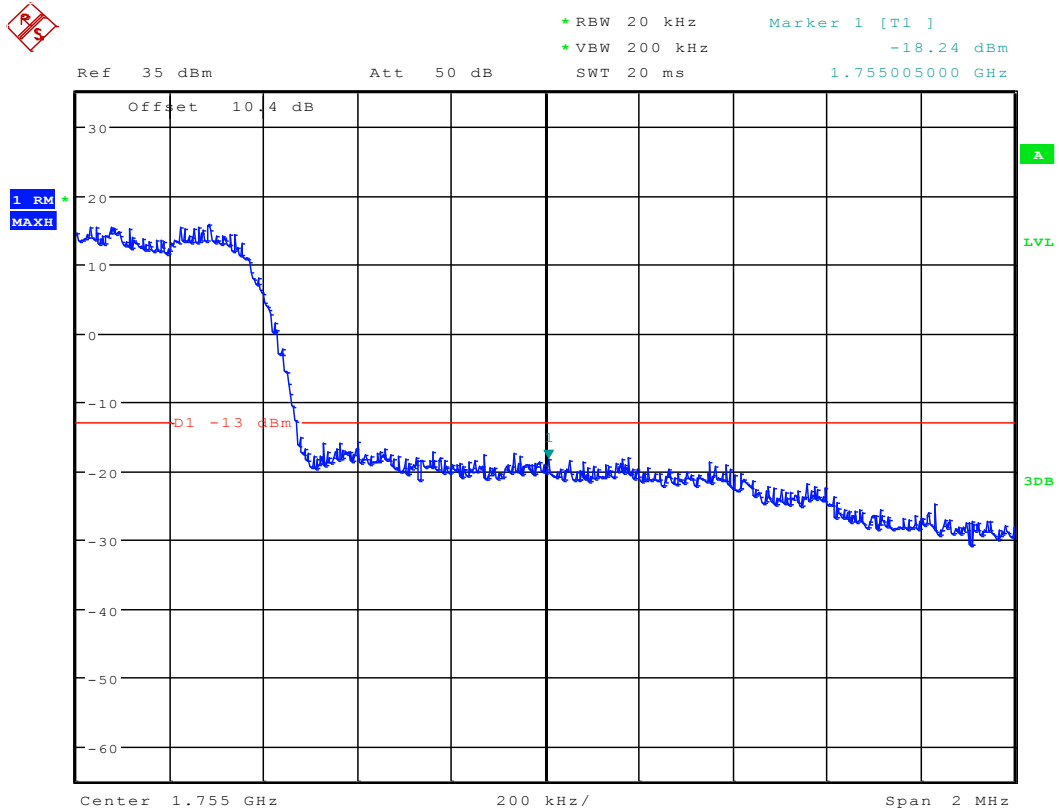
EVDO subtype 2
Modulation: BPSK
Left Edge (1710 MHz)
Channel 25



Date: 8.NOV.2011 23:54:12



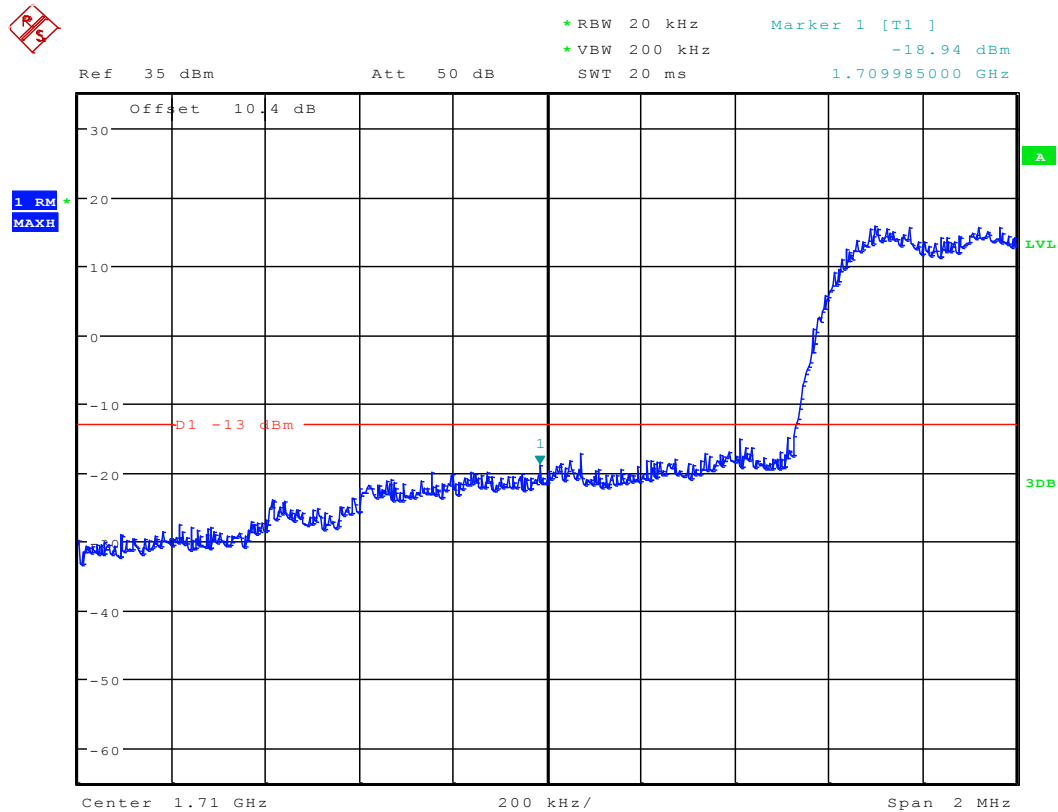
Right Edge (1755MHz) Channel 875



Date: 8.NOV.2011 23:54:26



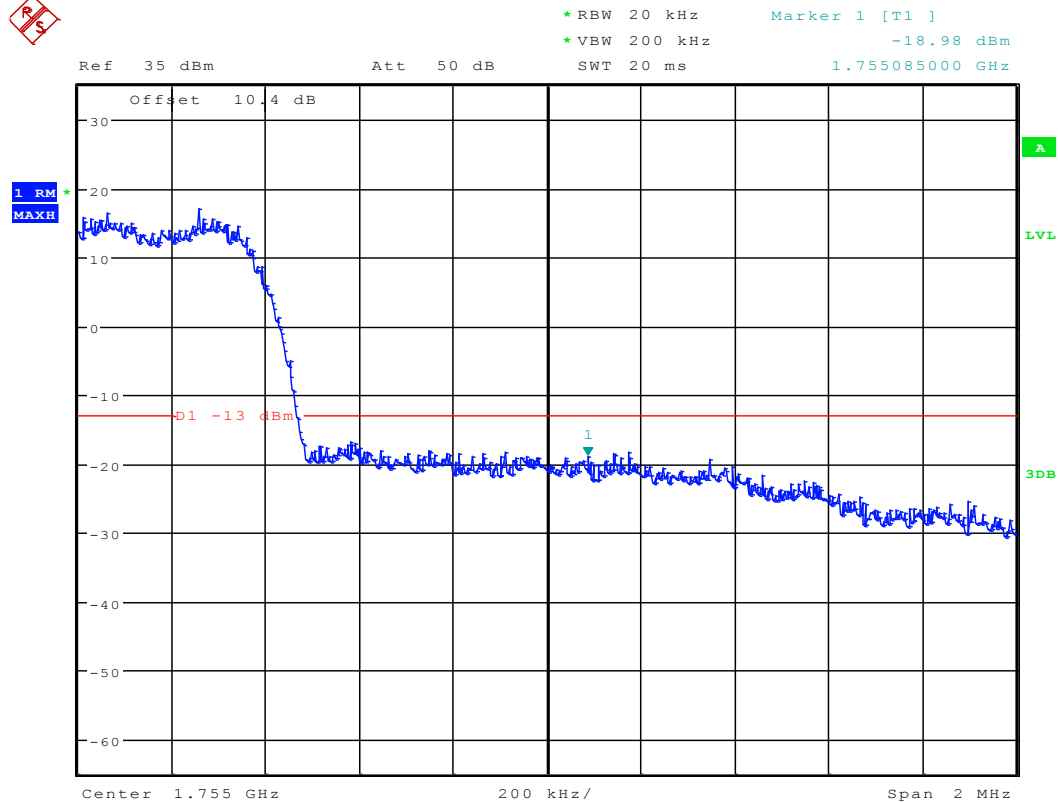
Modulation: QPSK
Left Edge (1710 MHz)
Channel 25



Date: 8.NOV.2011 23:54:40



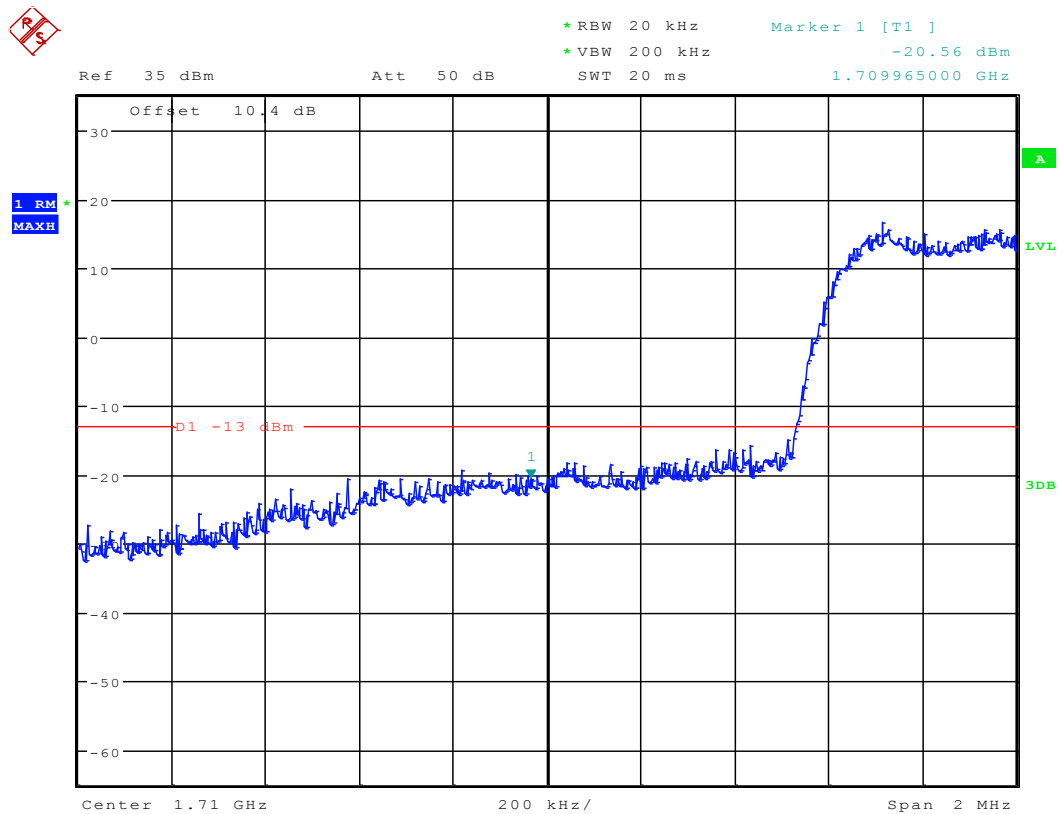
Right Edge (1755MHz) Channel 875



Date: 8.NOV.2011 23:54:54



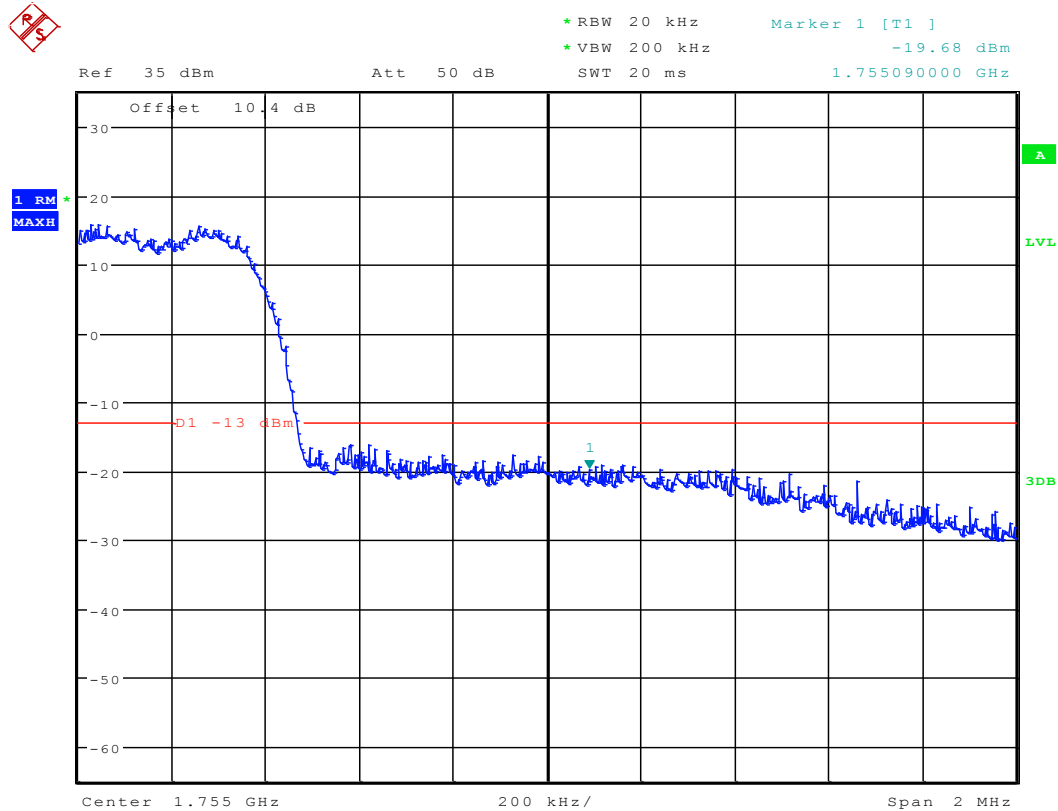
Modulation: 8PSK
Left Edge (1710 MHz)
Channel 25



Date: 8.NOV.2011 23:55:07



Right Edge (1755MHz) Channel 875



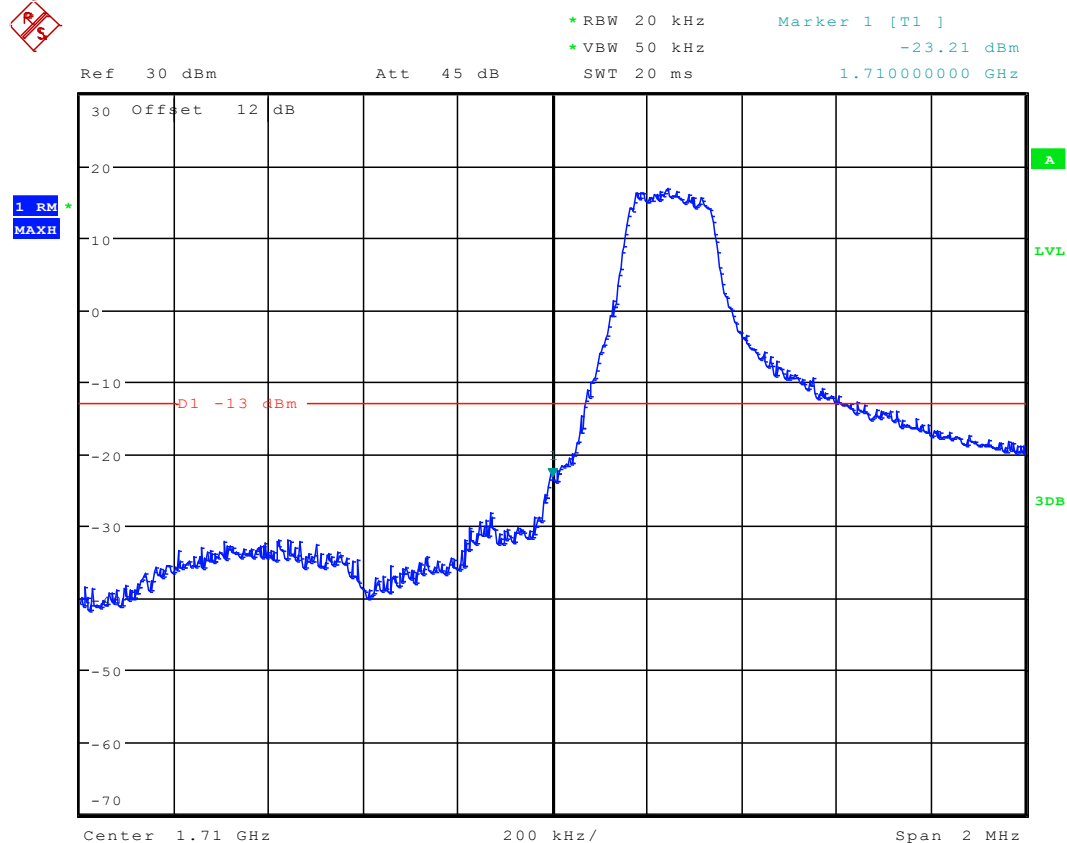
Date: 8.NOV.2011 23:55:21



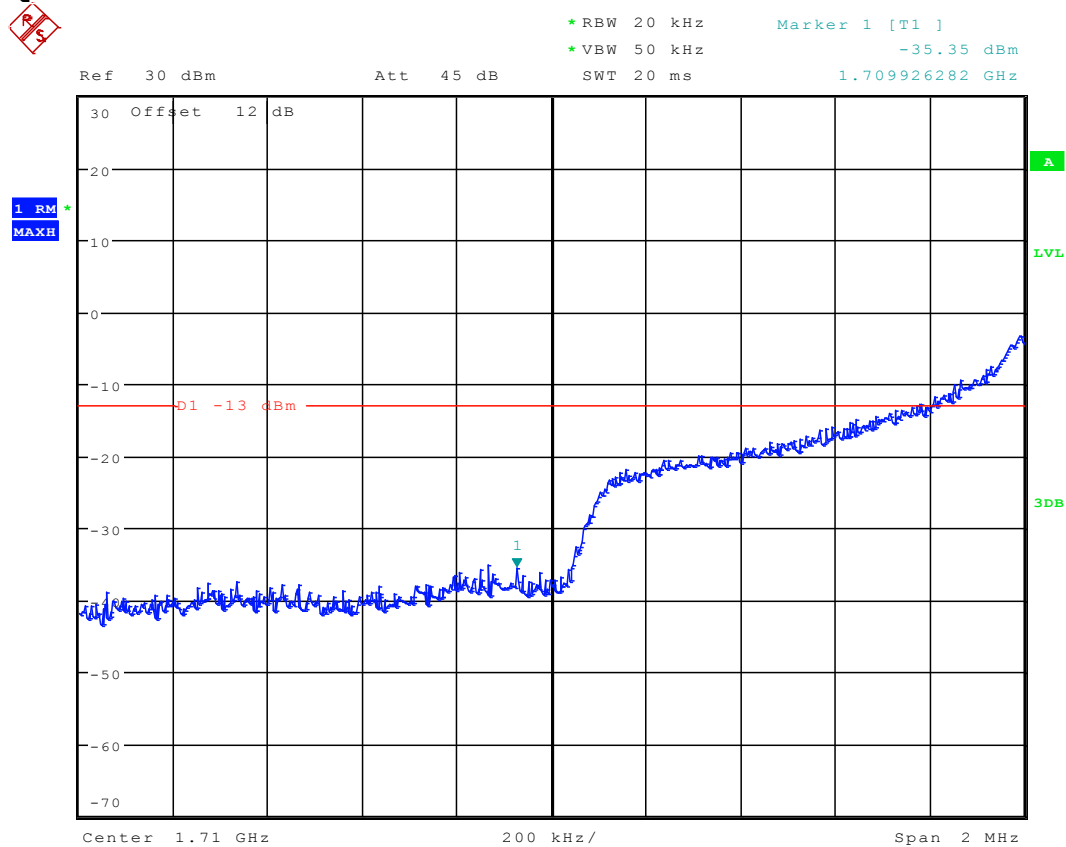
TM4

Left Edge 1.4MHz(BW) Channel 19957

QPSK/1 RB/RB #0

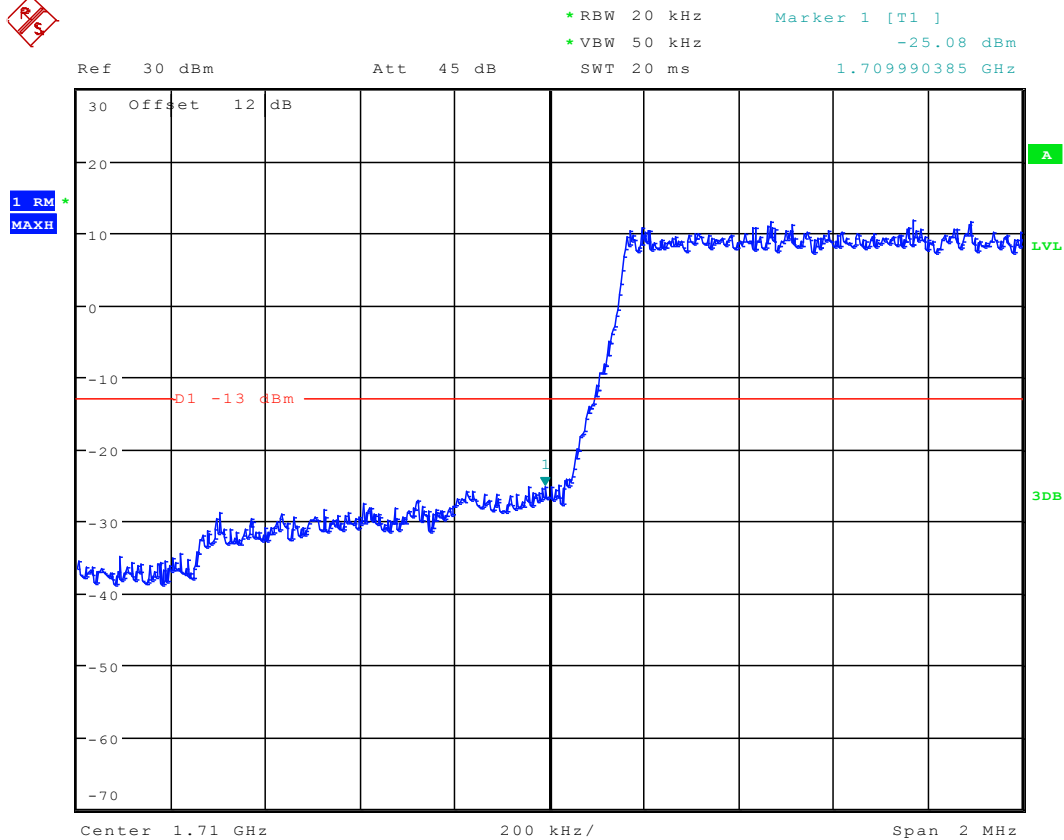


QPSK/1 RB/RB #max

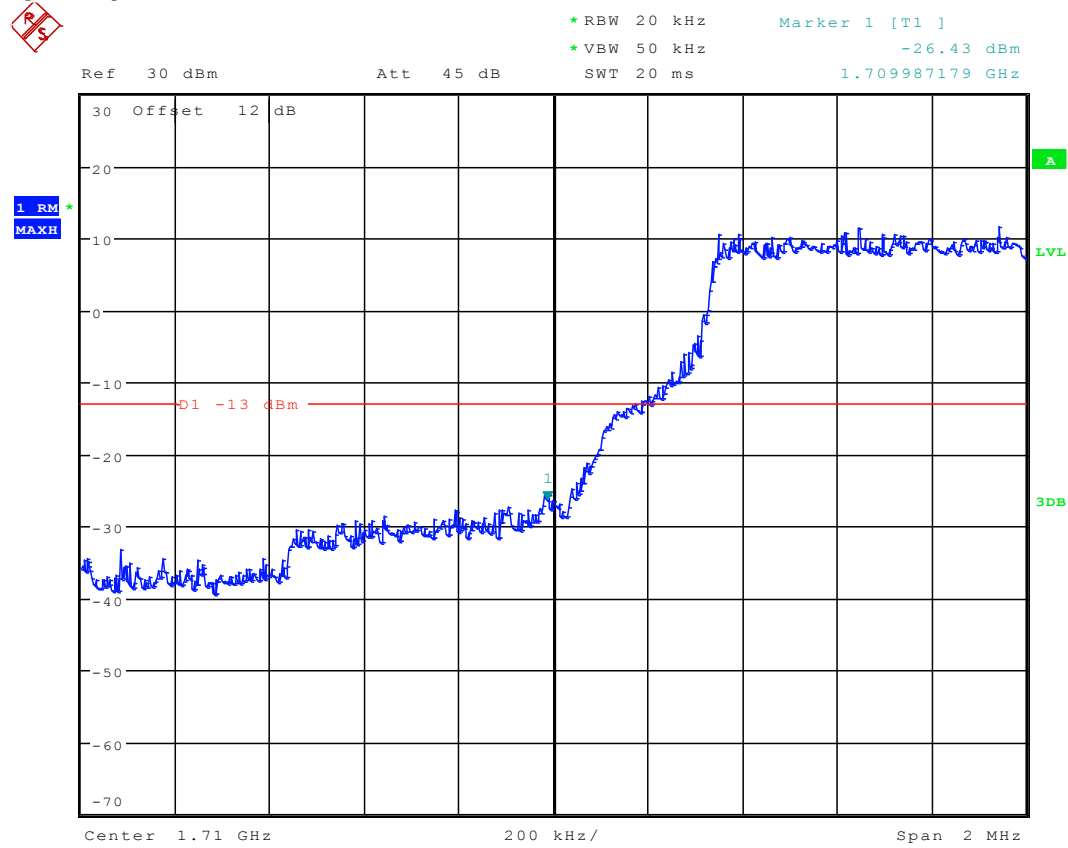




QPSK/partial RBs/RB #0

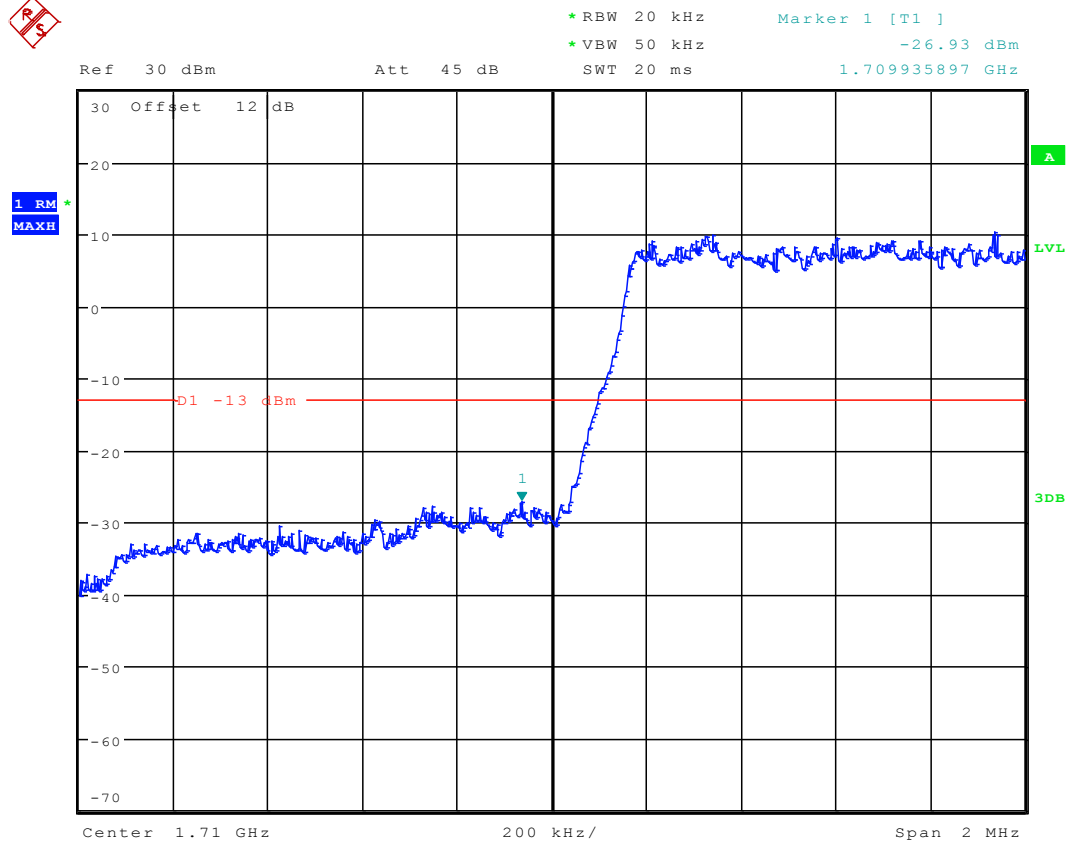


QPSK/partial RBs/RB #max





QPSK/ full RBs

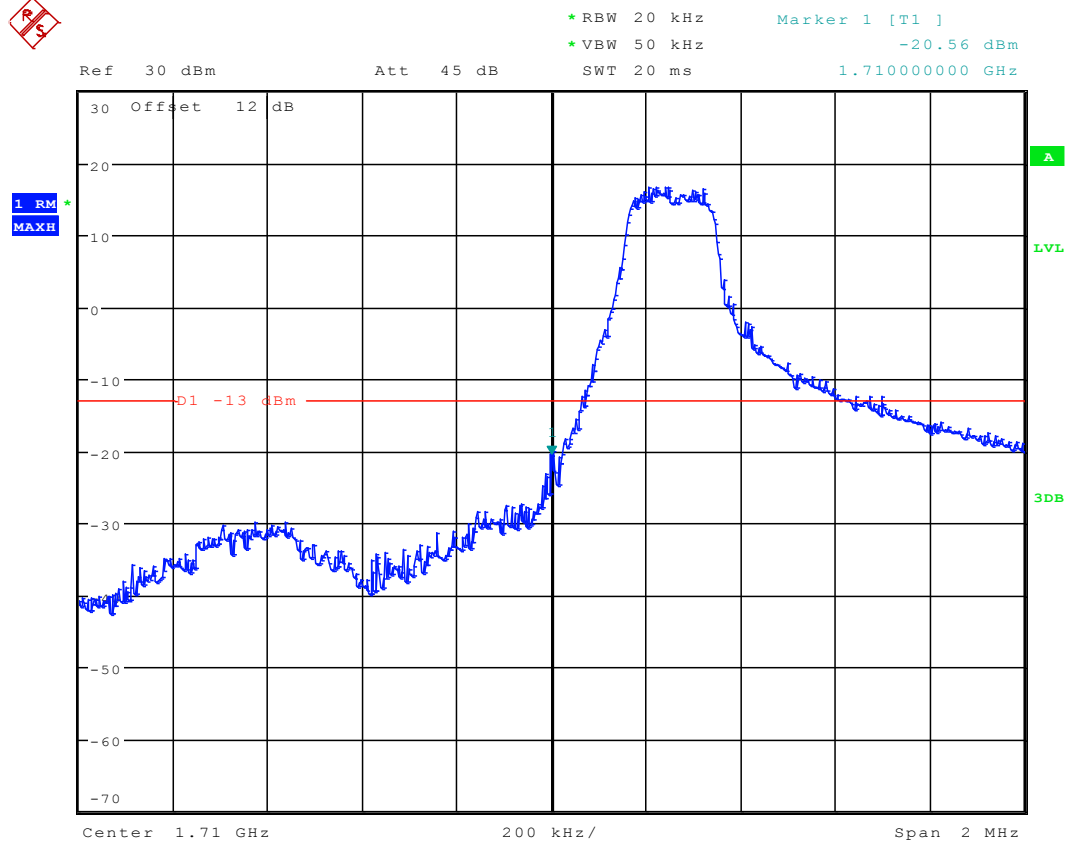




TM5

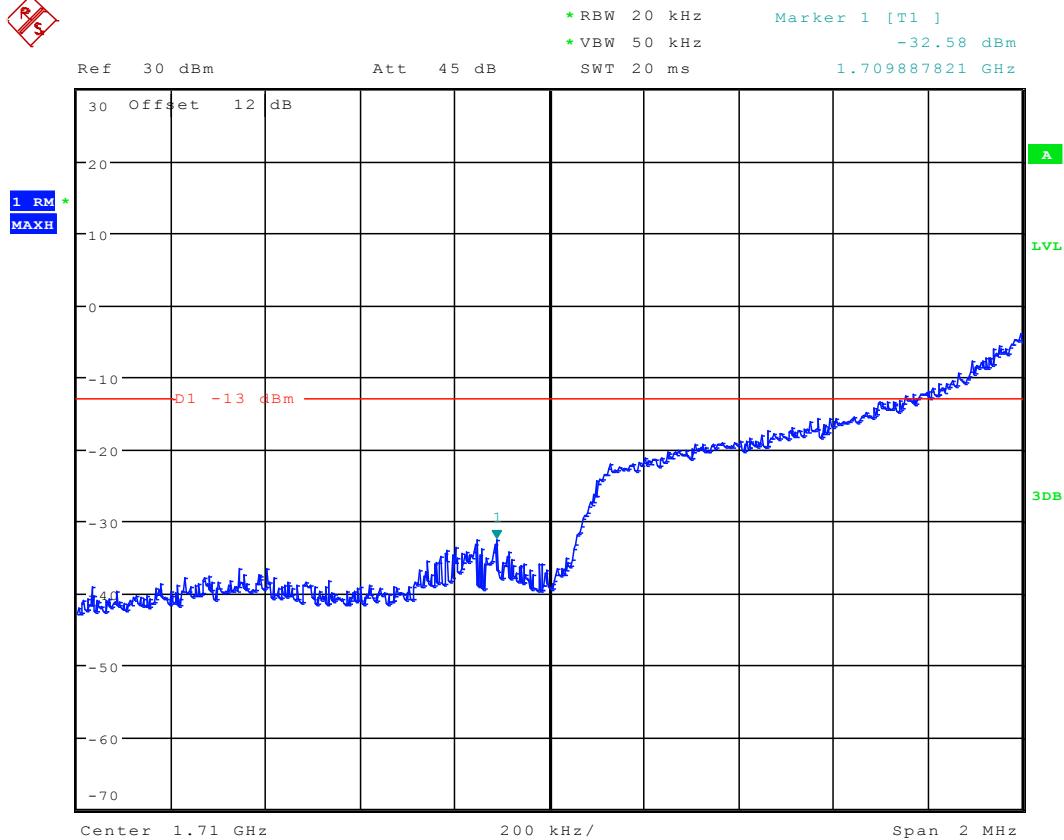
Left Edge 1.4MHz(BW) Channel 19957

16QAM /1 RB/RB #0



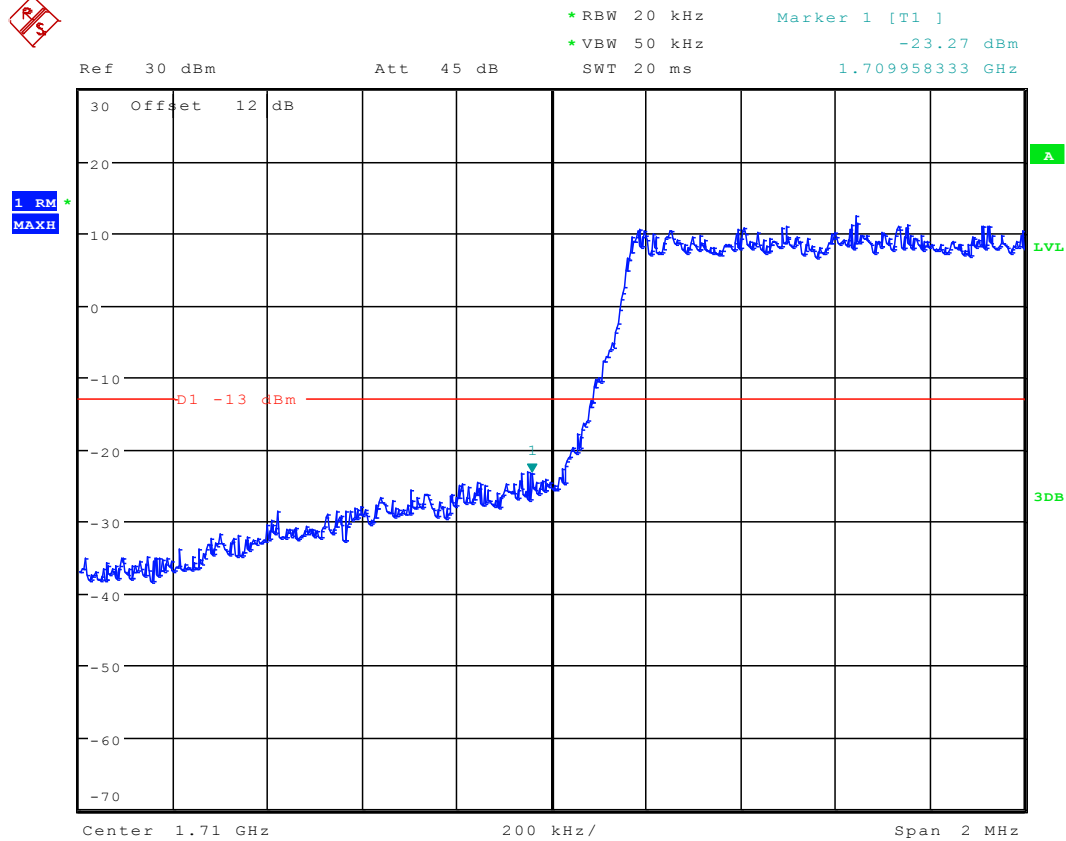


16QAM /1 RB/RB #max



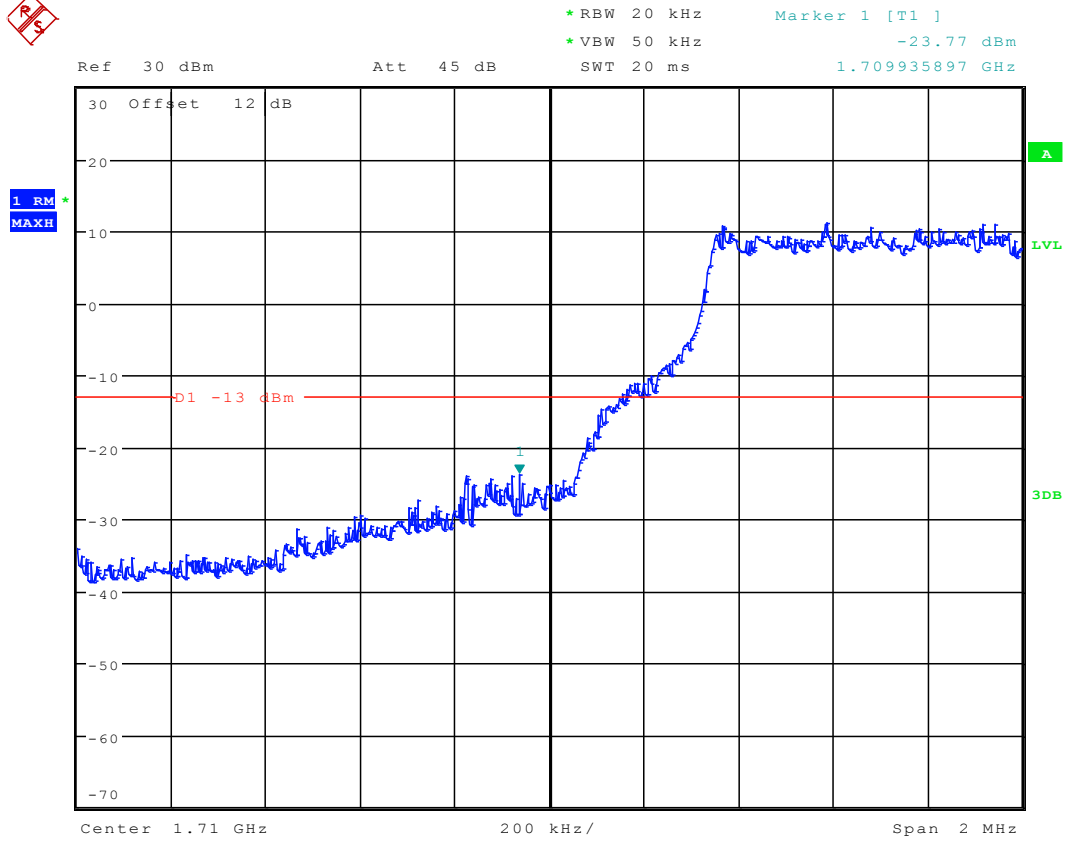


16QAM /partial RBs/RB #0



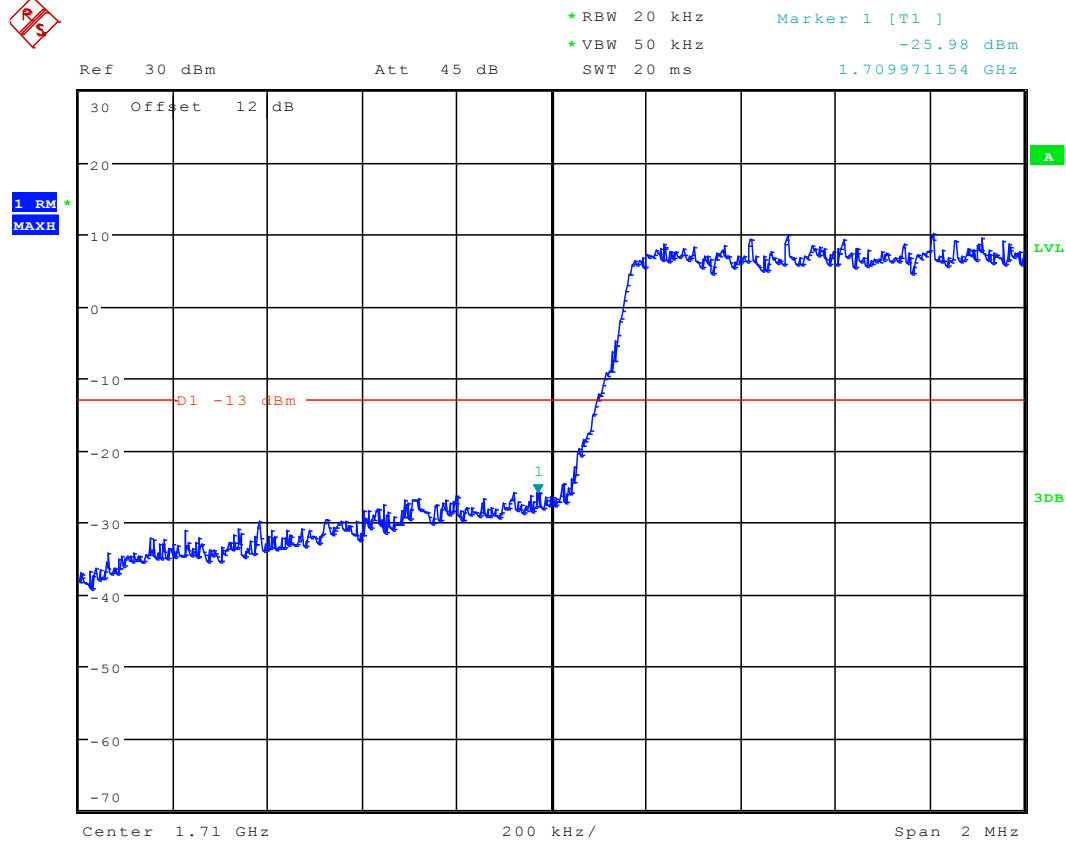


16QAM /partial RBs/RB #max





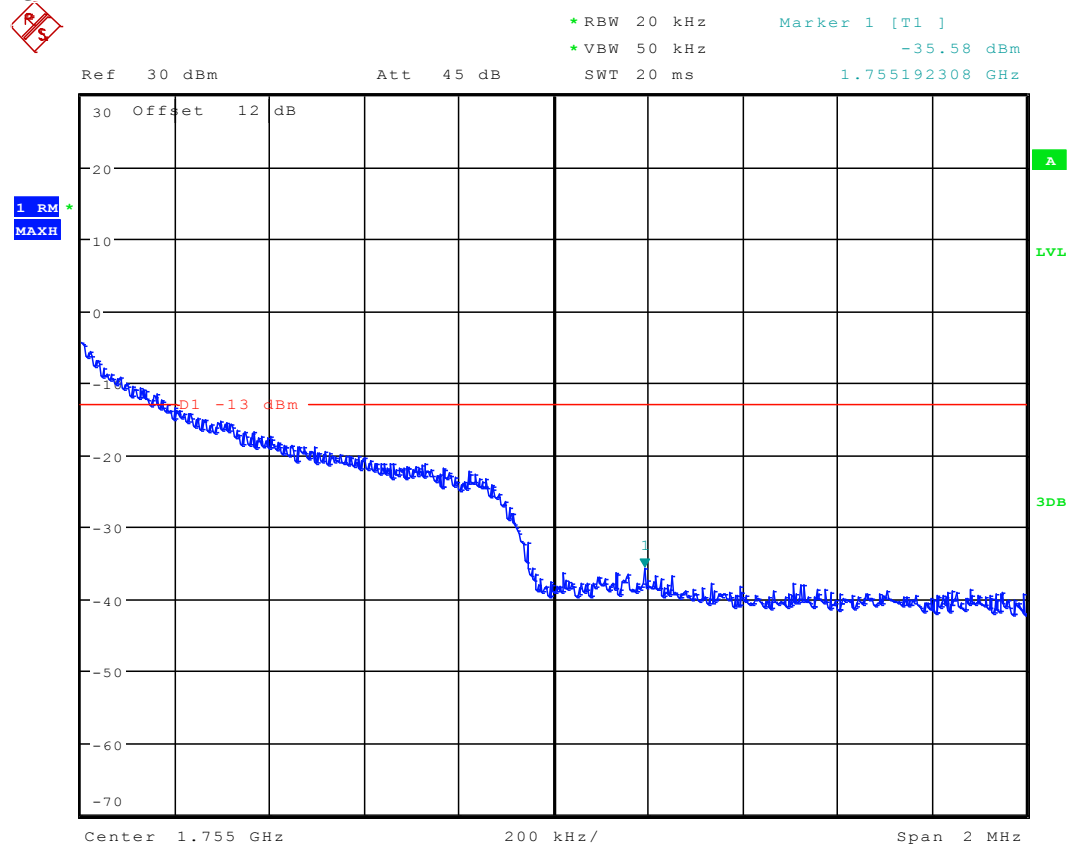
16QAM/full RBs



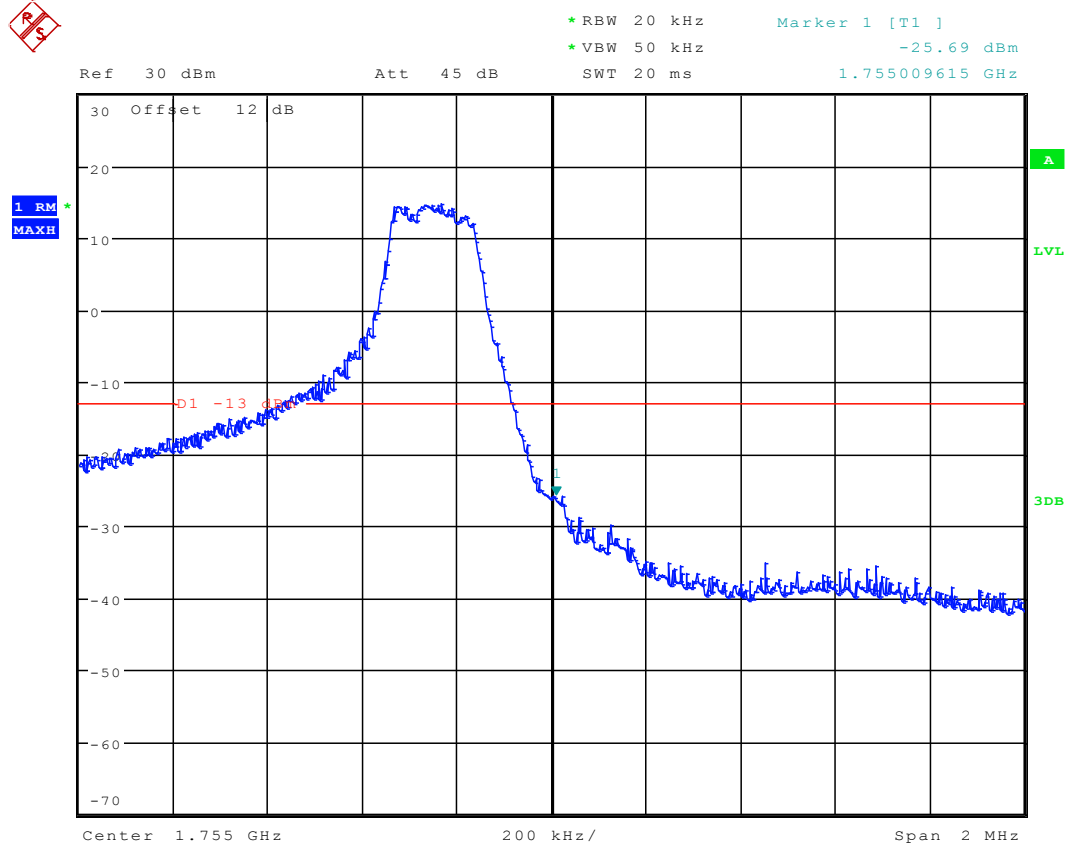
TM4

Right Edge
1.4MHz(BW)
Channel 20393

QPSK/1 RB/RB #0

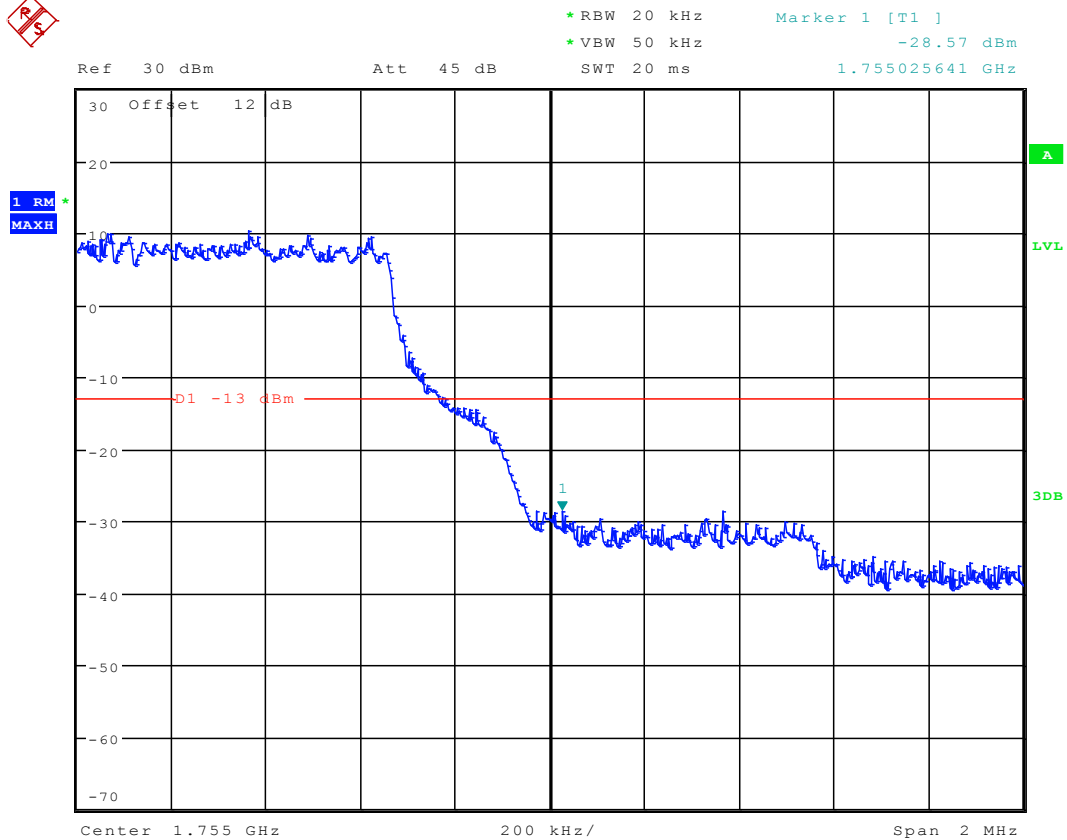


QPSK/1 RB/RB #max



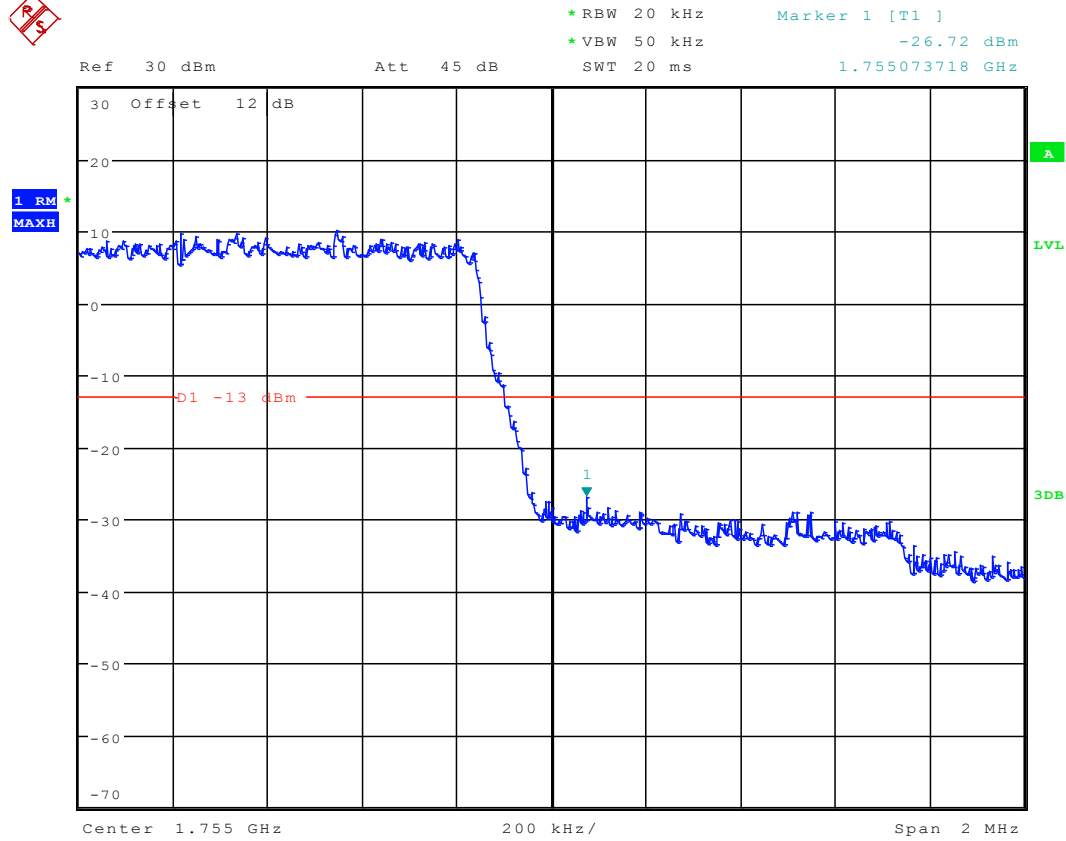


QPSK/partial RBs/RB #0



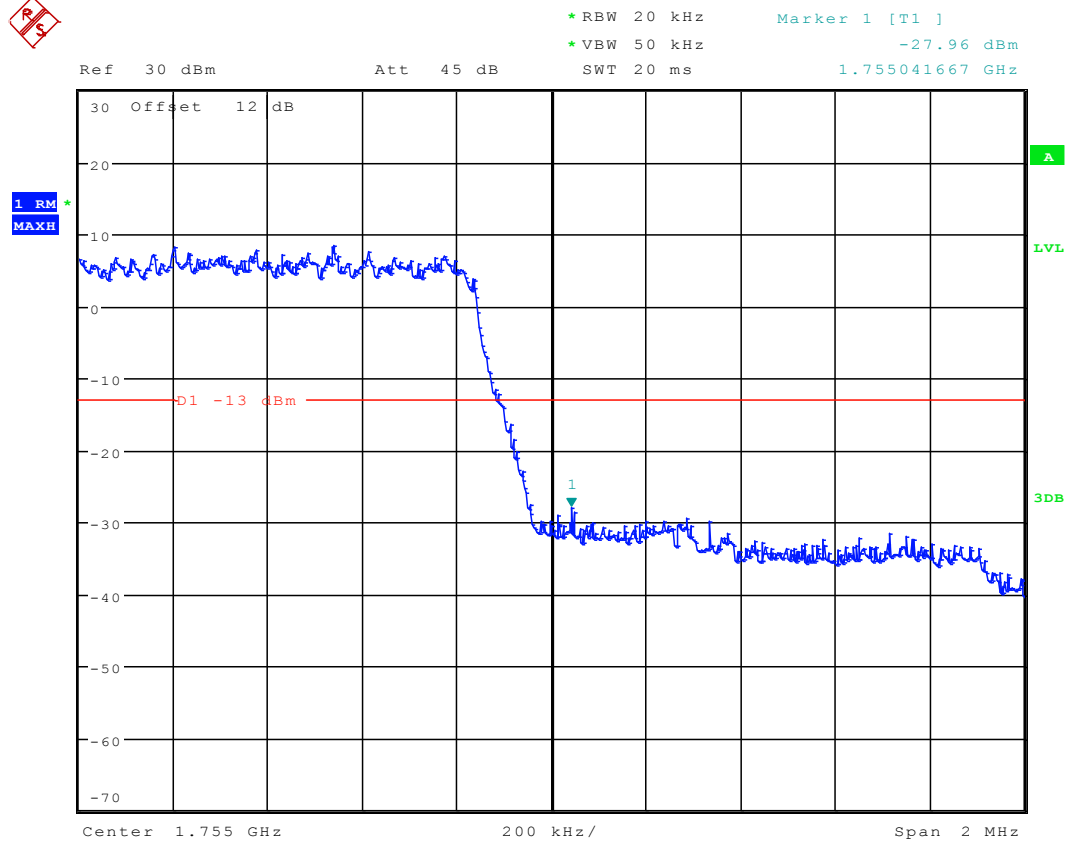


QPSK/partial RBs/RB #max





QPSK/ full RBs

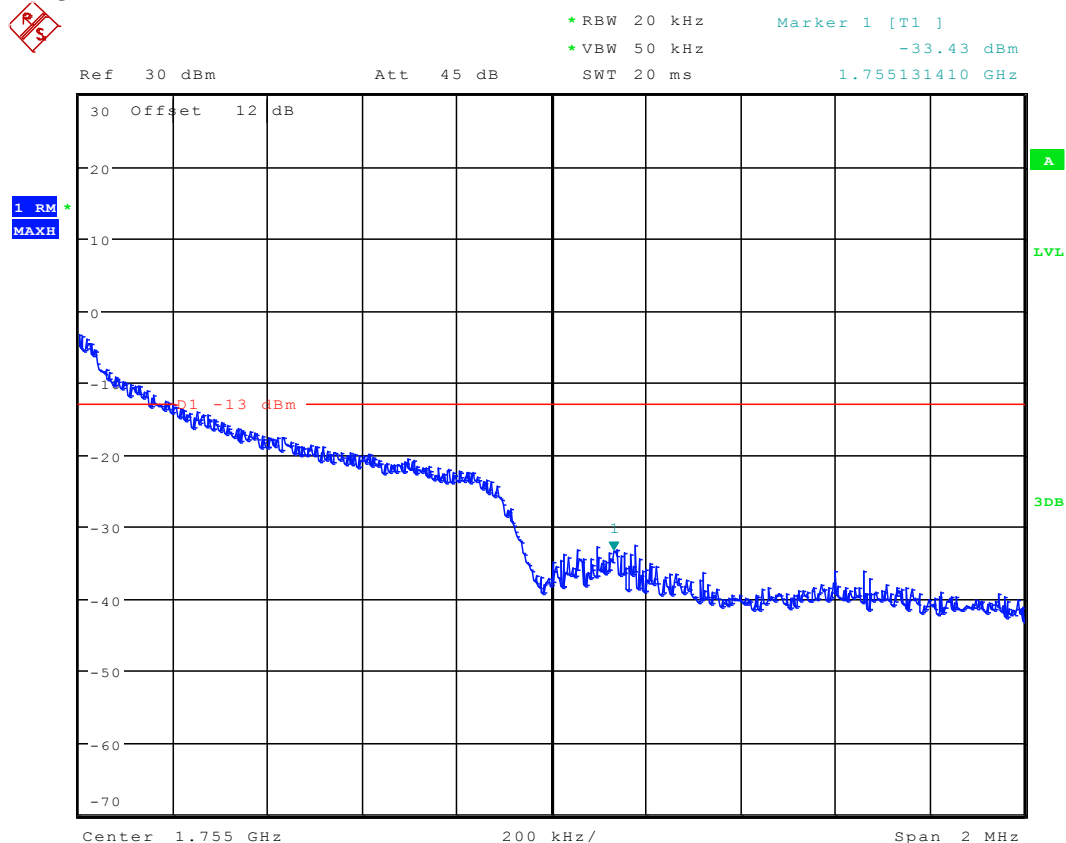




TM5

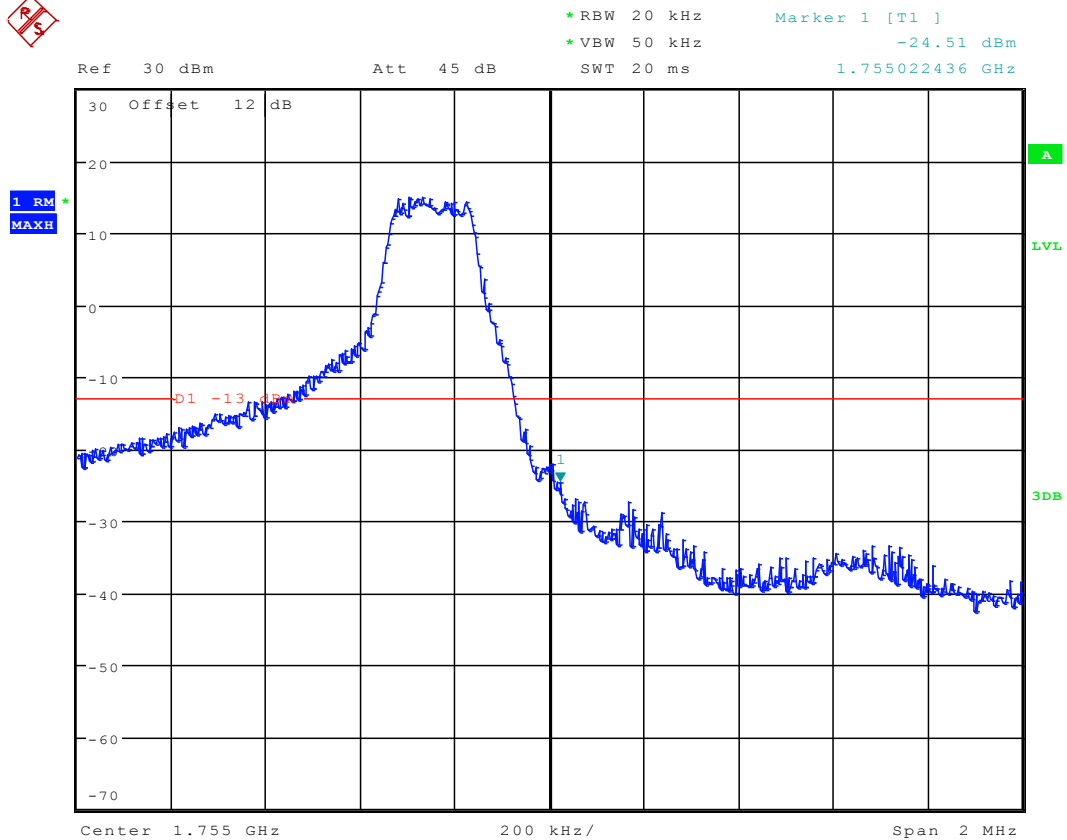
Right Edge
1.4MHz(BW)
Channel 20393

16QAM /1 RB/RB #0



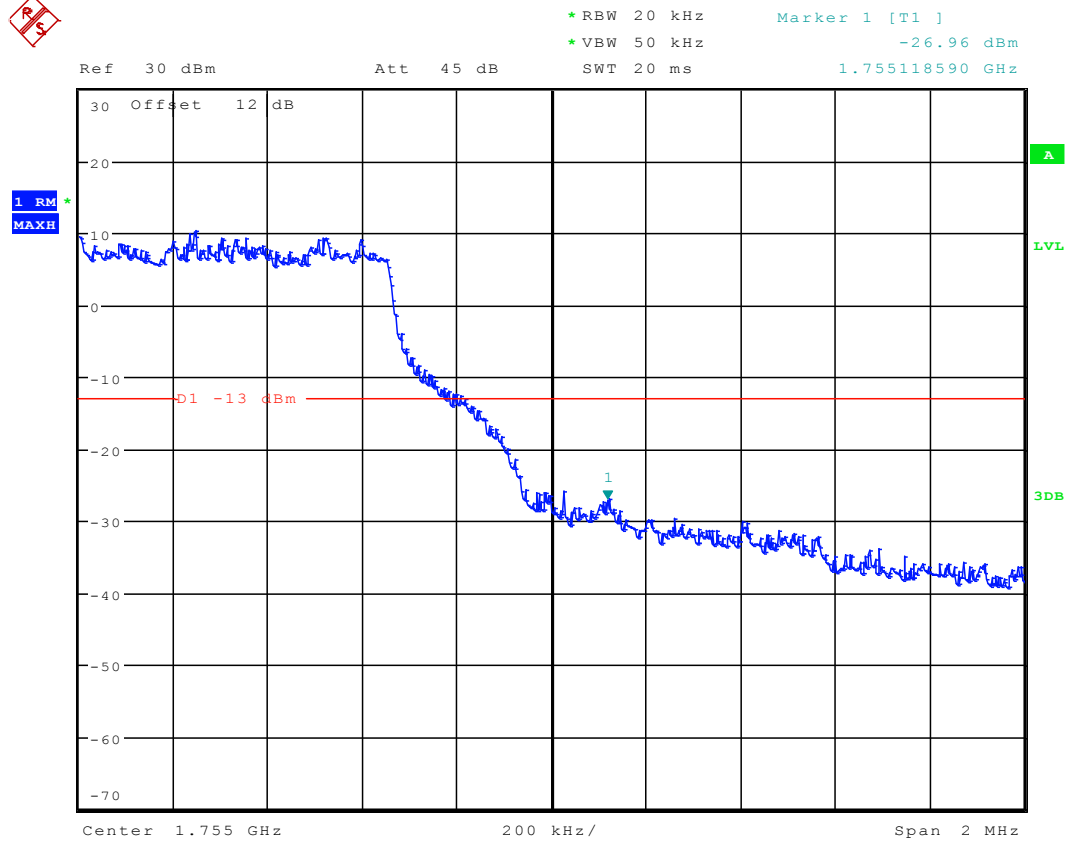


16QAM /1 RB/RB #max



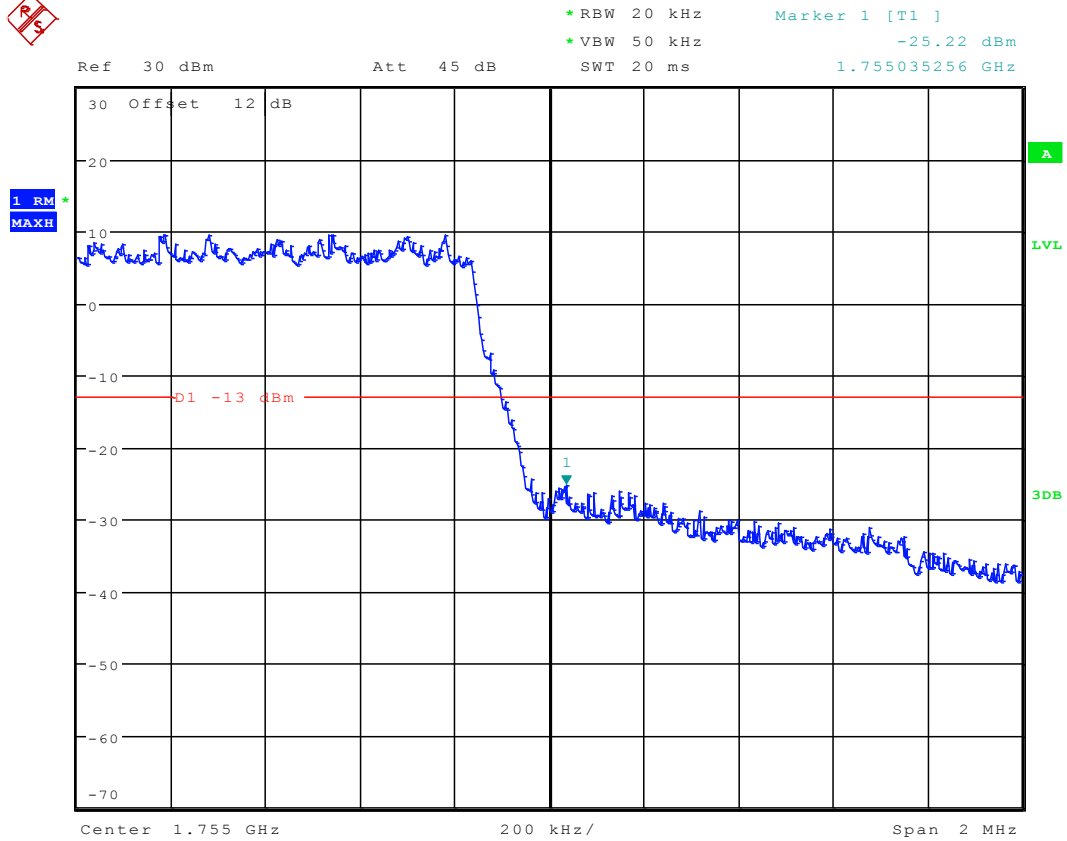


16QAM /partial RBs/RB #0



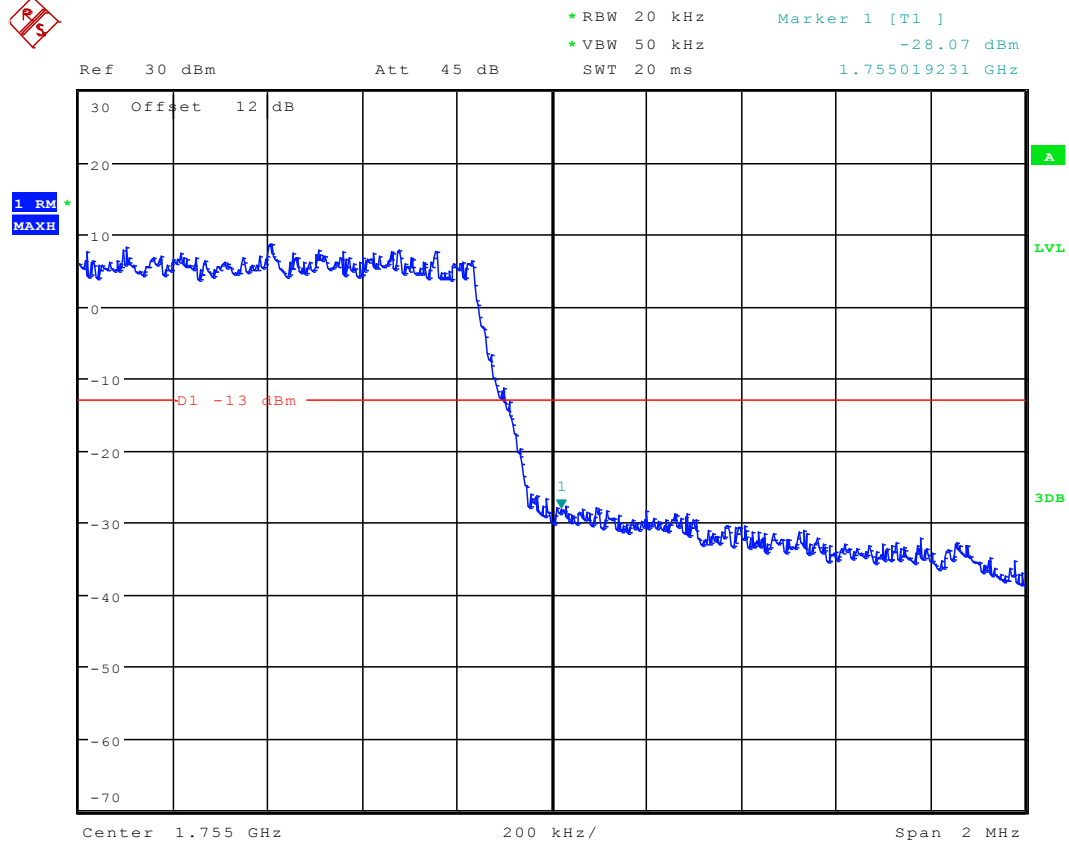


16QAM /partial RBs/RB #max





16QAM/full RBs

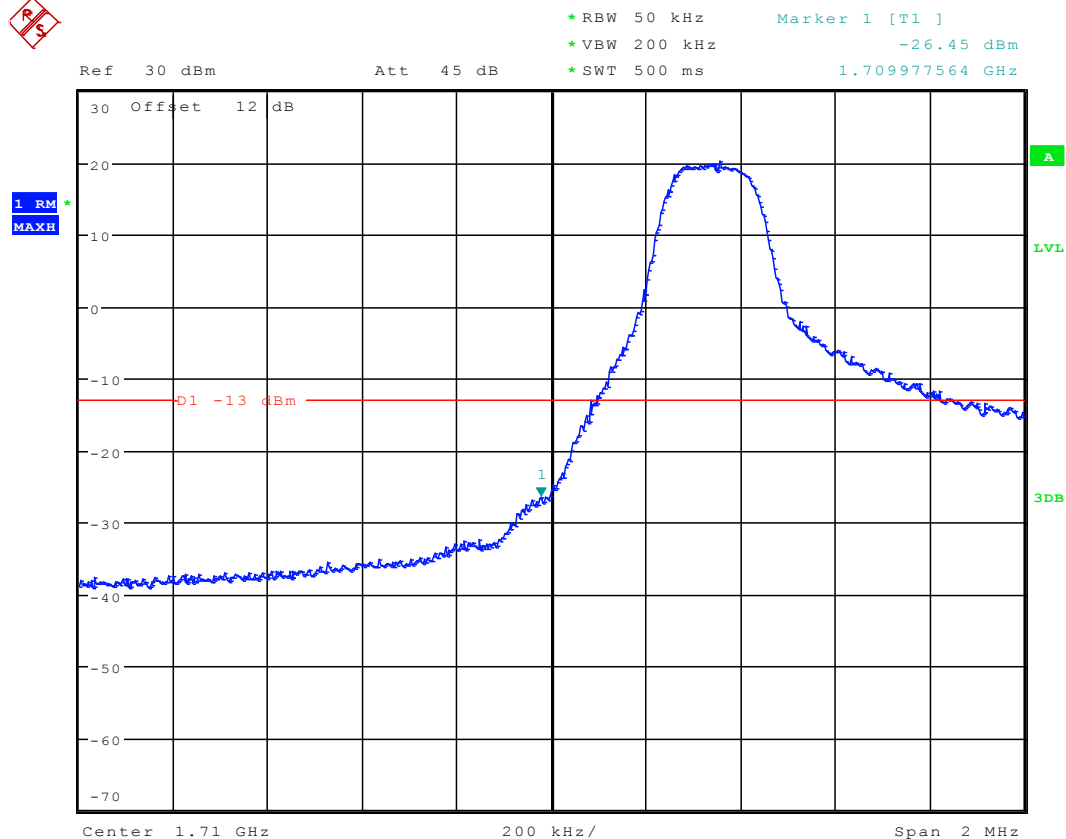




TM4

Left Edge 5MHz(BW) Channel 19975

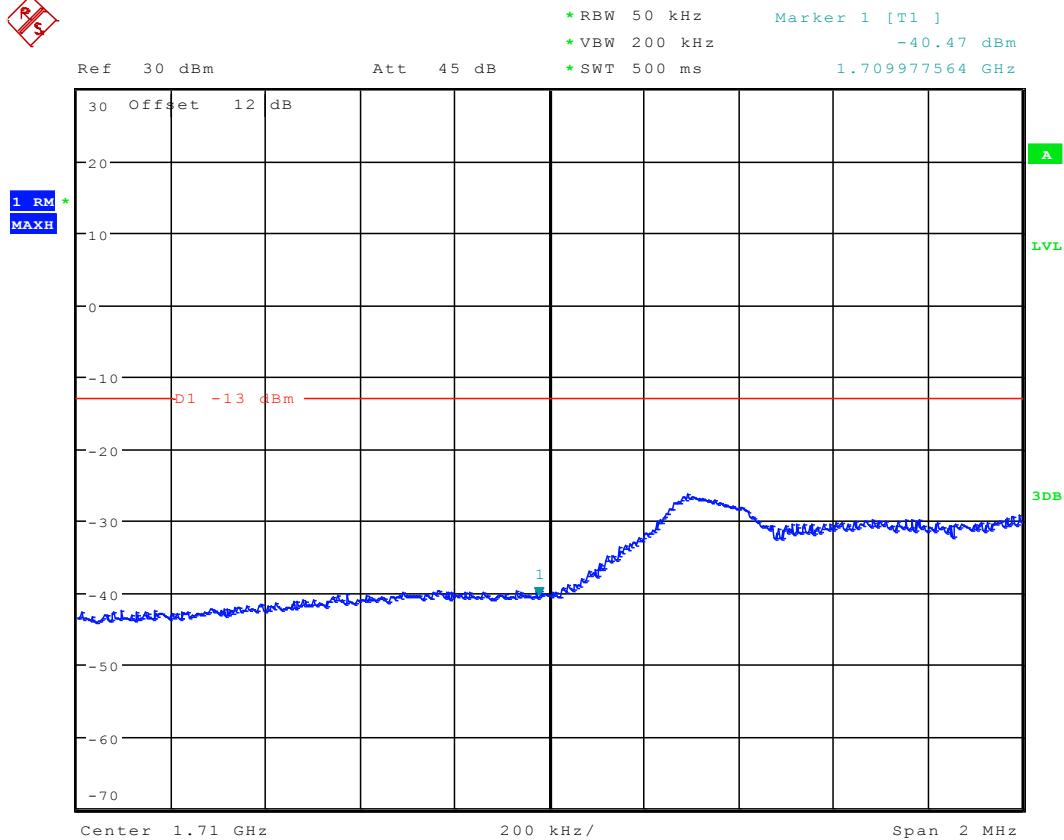
QPSK/1 RB/RB #0



Date: 24.NOV.2011 15:14:53



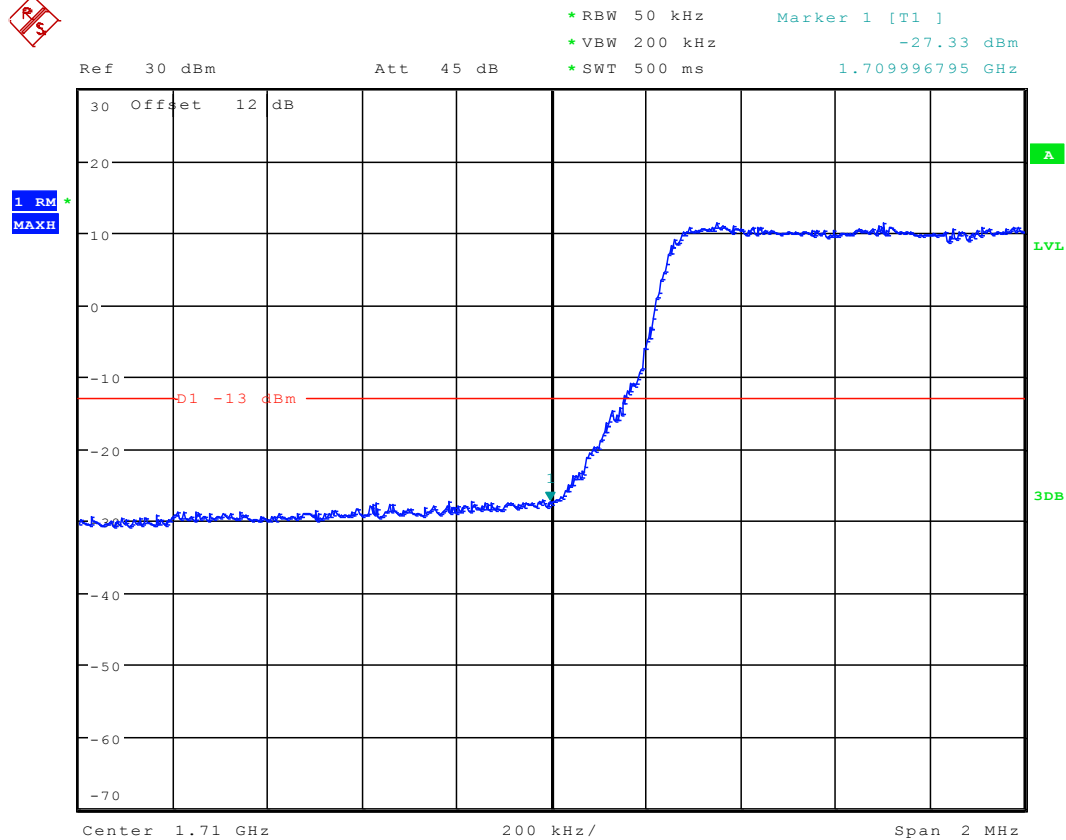
QPSK/1 RB/RB #max



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



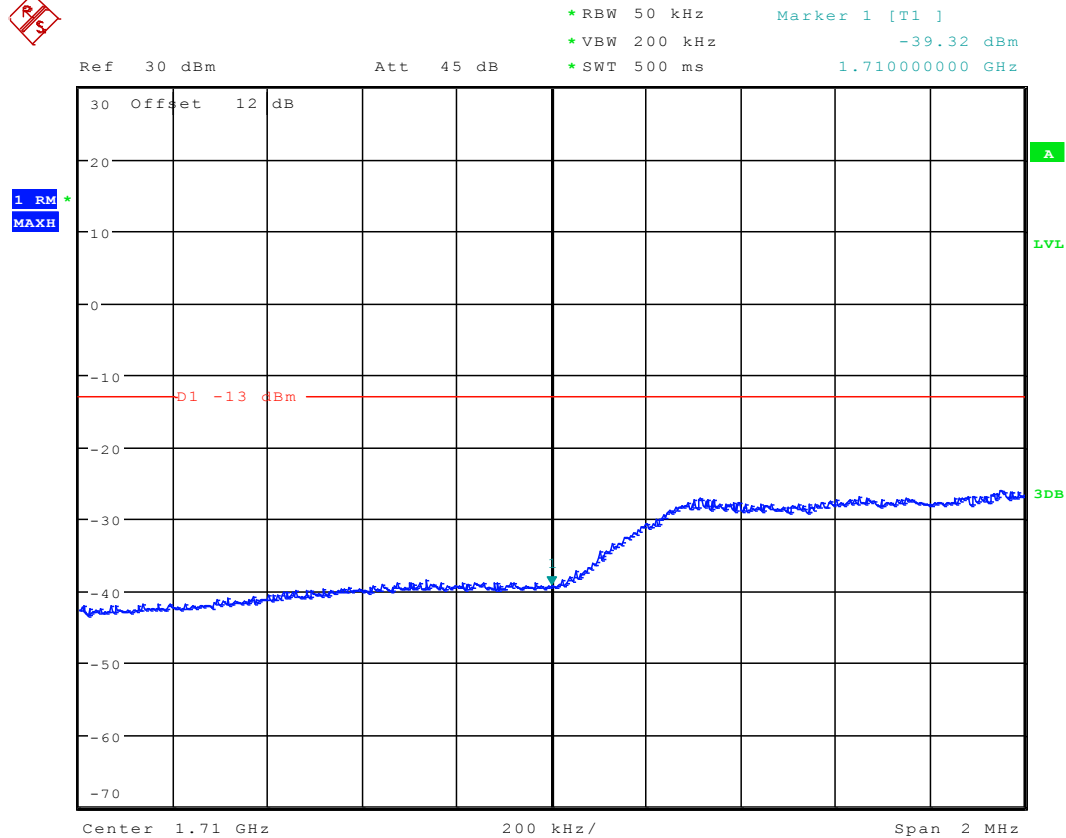
QPSK/partial RBs/RB #0



Date: 24.NOV.2011 15:42:16



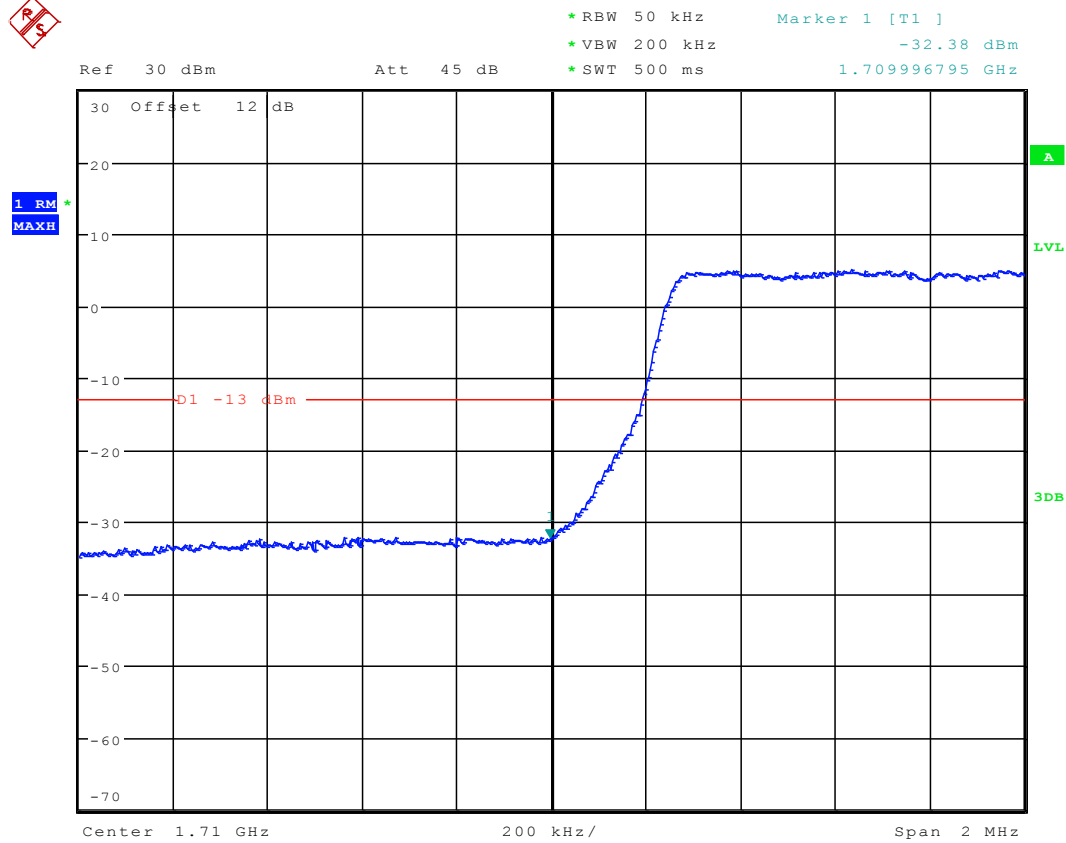
QPSK/partial RBs/RB #max



Date: 24.NOV.2011 15:41:22



QPSK/ full RBs



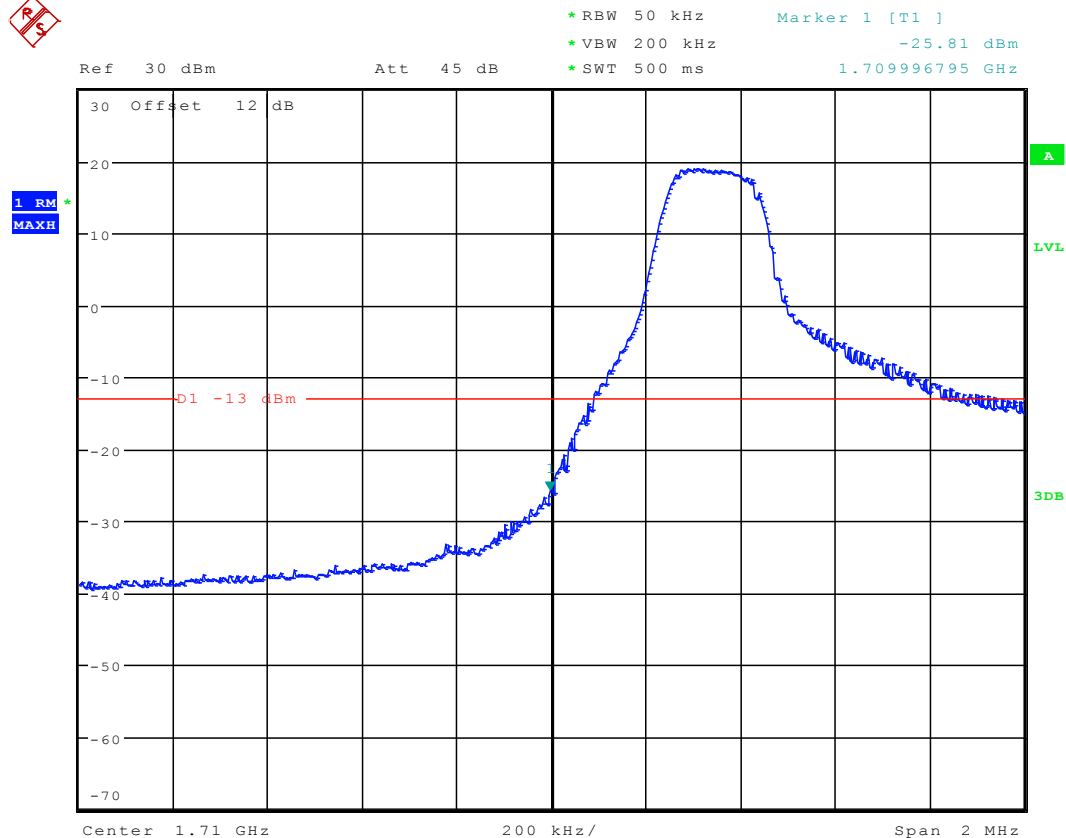
Date: 24.NOV.2011 15:13:40



TM5

Left Edge 5MHz(BW) Channel 19975

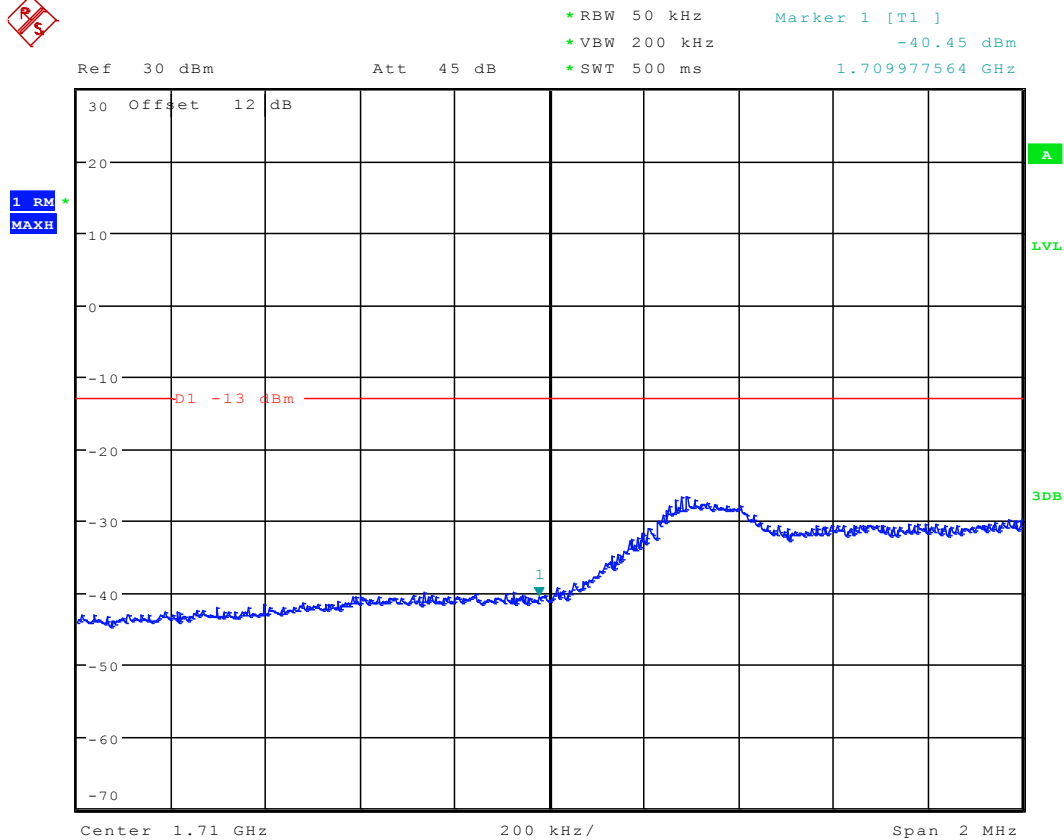
16QAM /1 RB/RB #0



Date: 24.NOV.2011 15:14:31



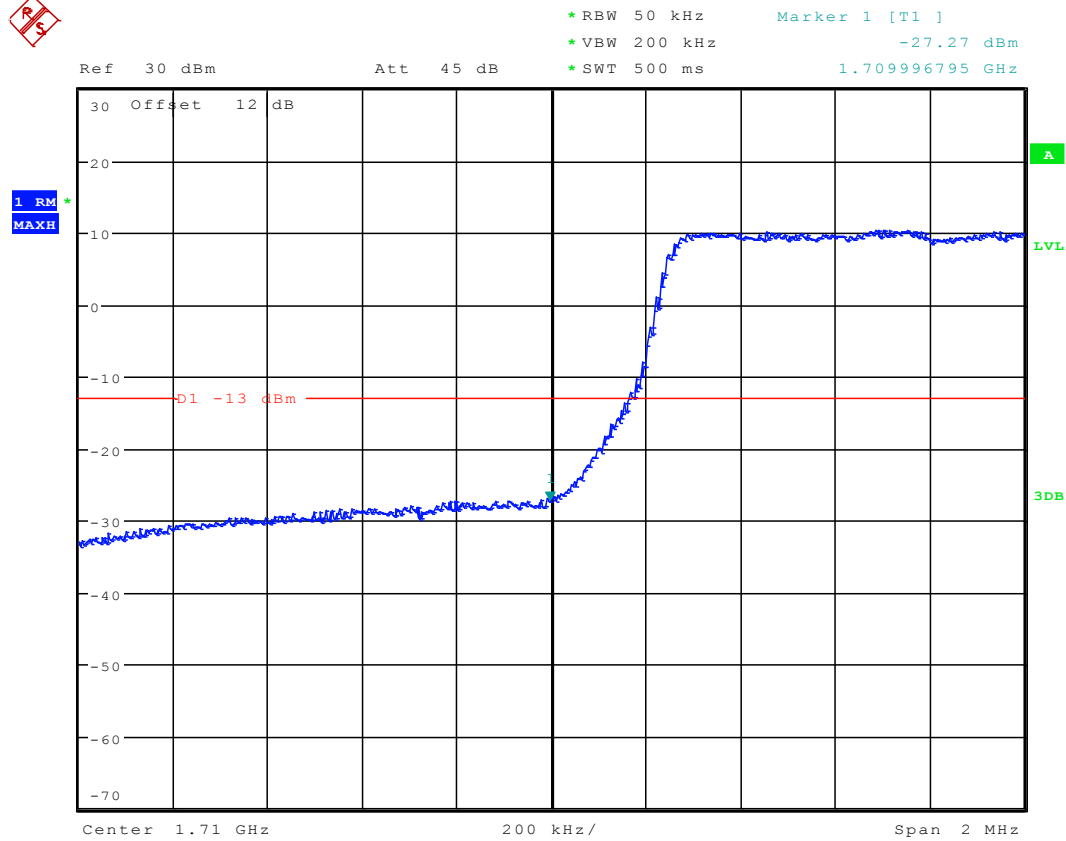
16QAM /1 RB/RB #max



Date: 24.NOV.2011 15:15:35



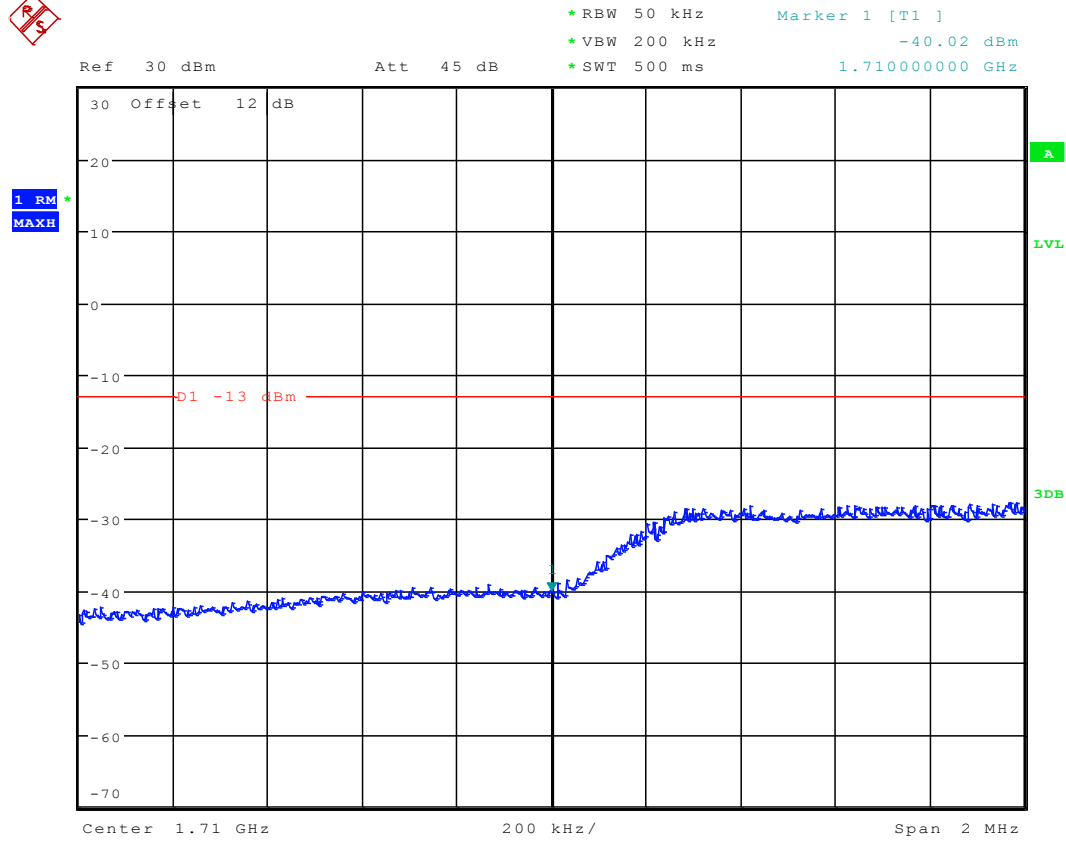
16QAM /partial RBs/RB #0



Date: 24.NOV.2011 15:42:00



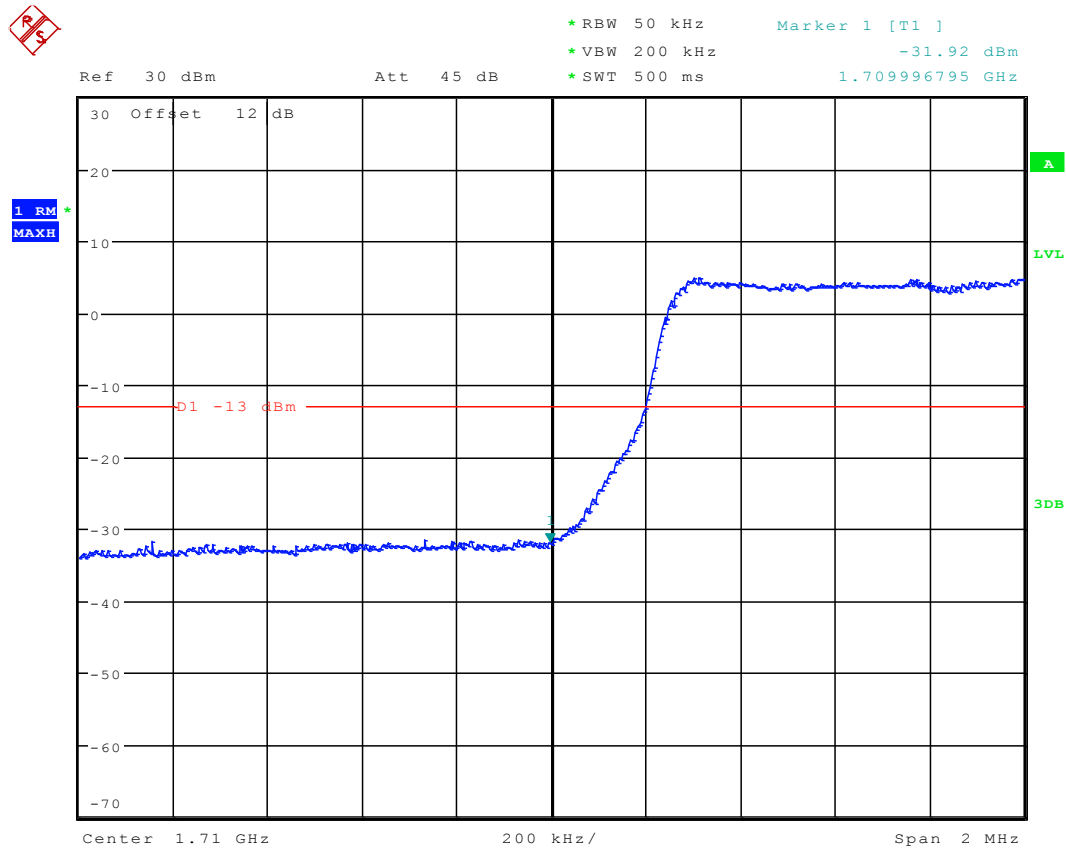
16QAM /partial RBs/RB #max



Date: 24.NOV.2011 15:41:44



16QAM/full RBs



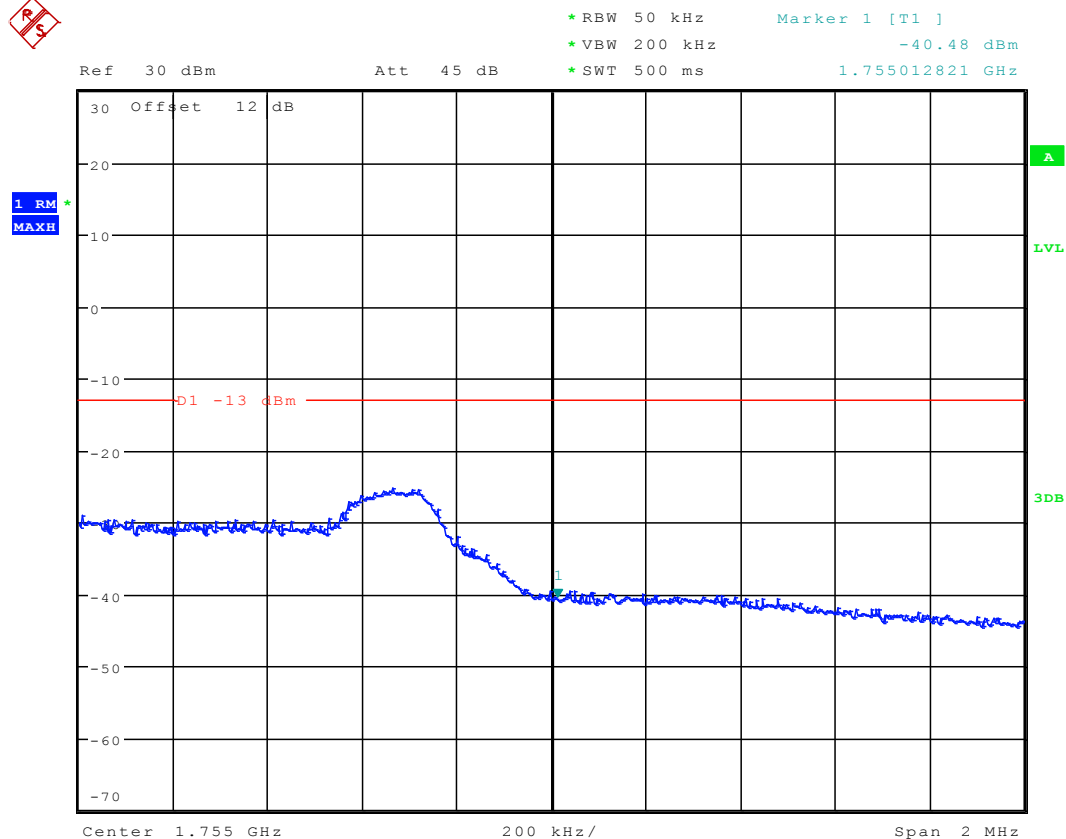
Date: 24.NOV.2011 15:14:06



TM4

Right Edge 5MHz(BW) Channel 20375

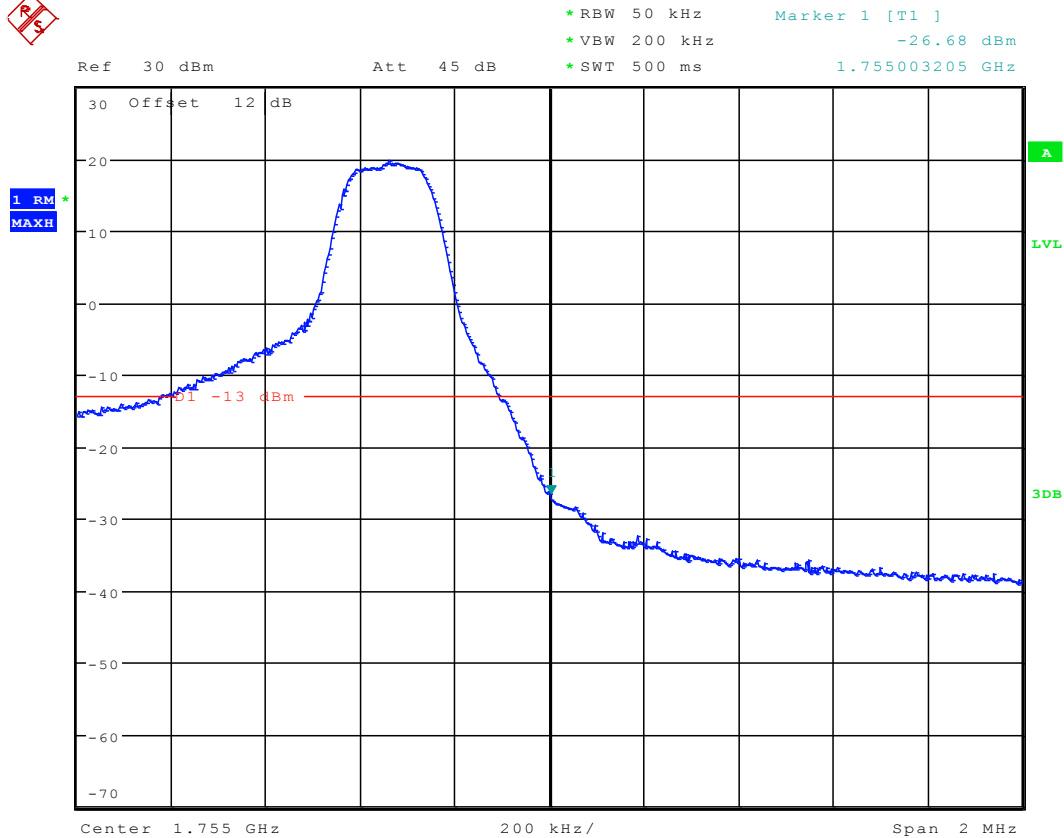
QPSK/1 RB/RB #0



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



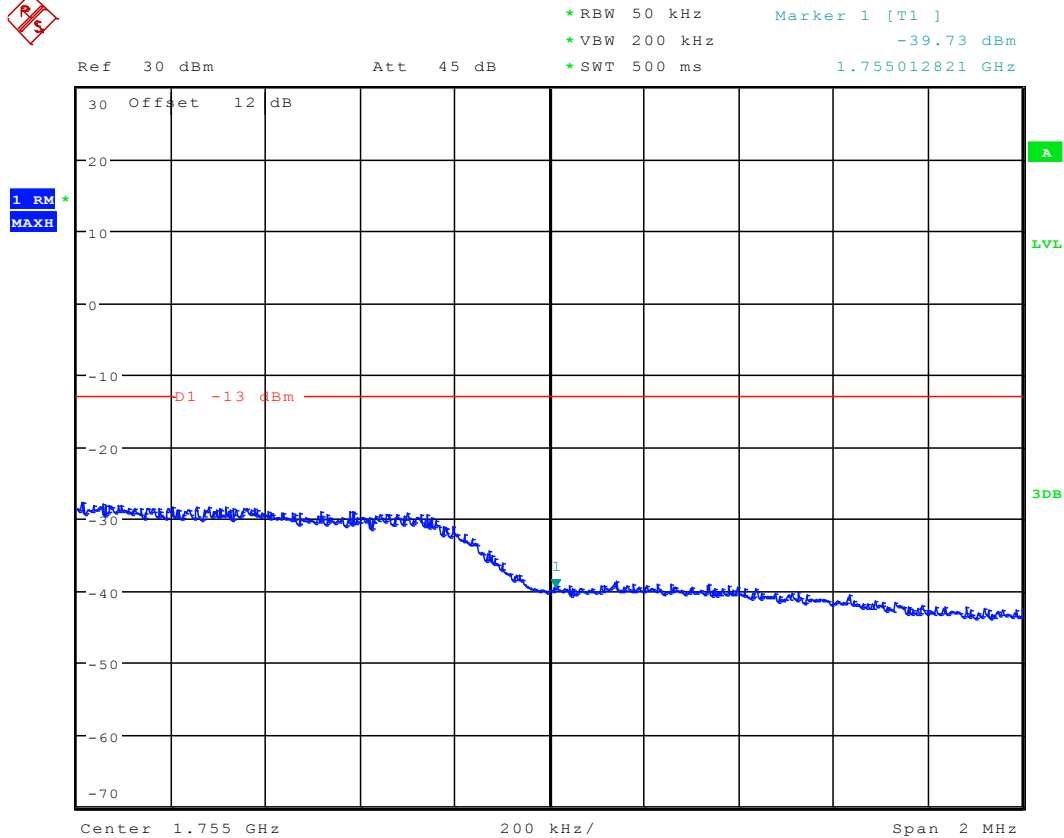
QPSK/1 RB/RB #max



Date: 24.NOV.2011 15:11:27



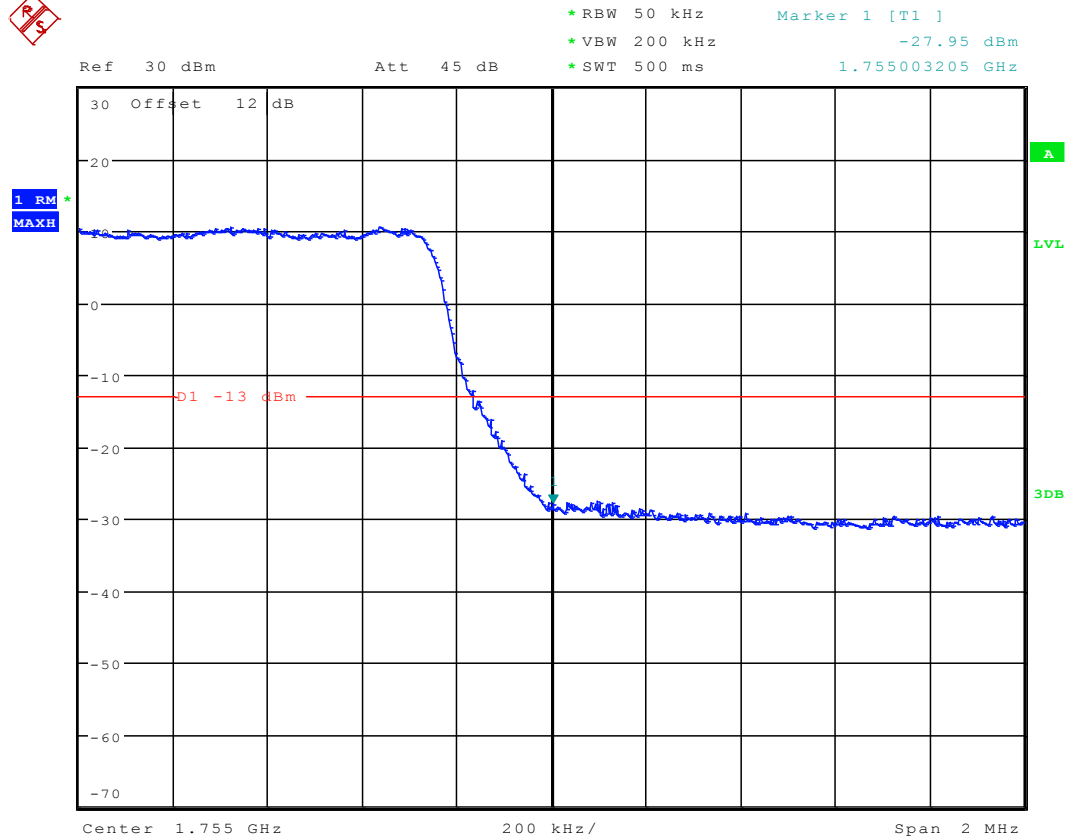
QPSK/partial RBs/RB #0



Date: 24.NOV.2011 15:39:11



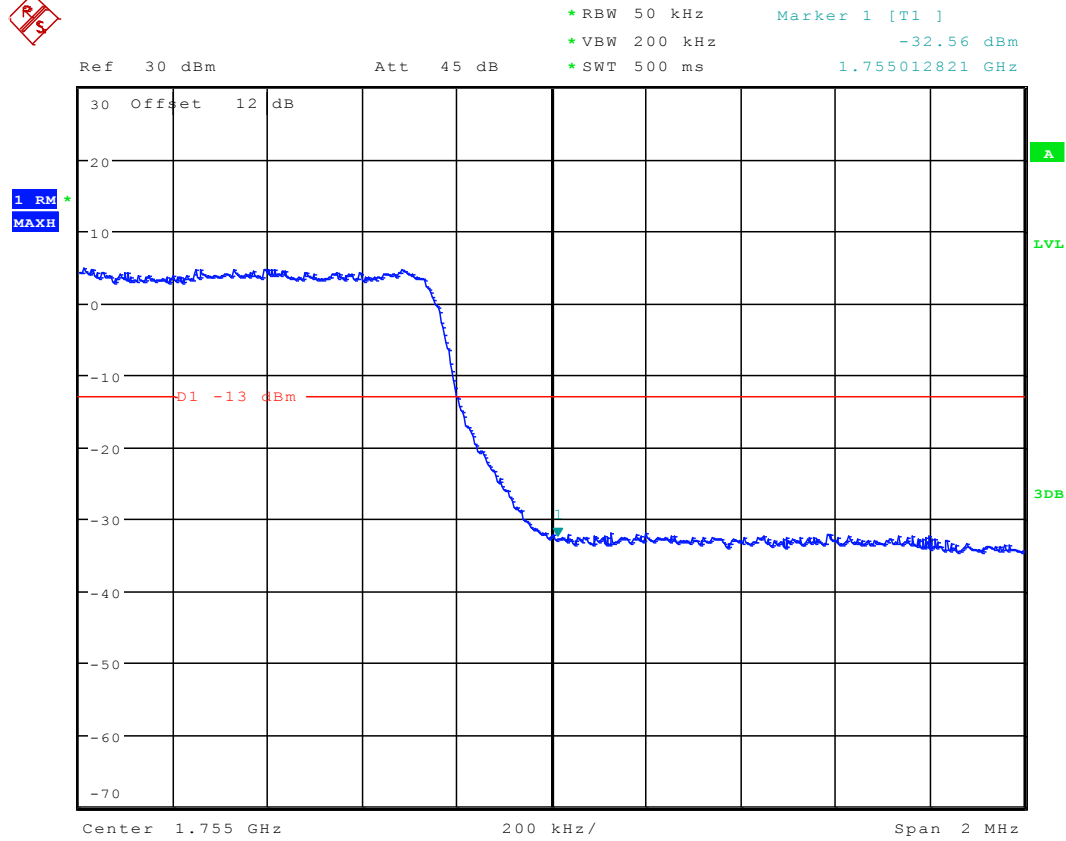
QPSK/partial RBs/RB #max



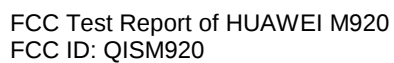
Date: 24.NOV.2011 15:40:19



QPSK/ full RBs

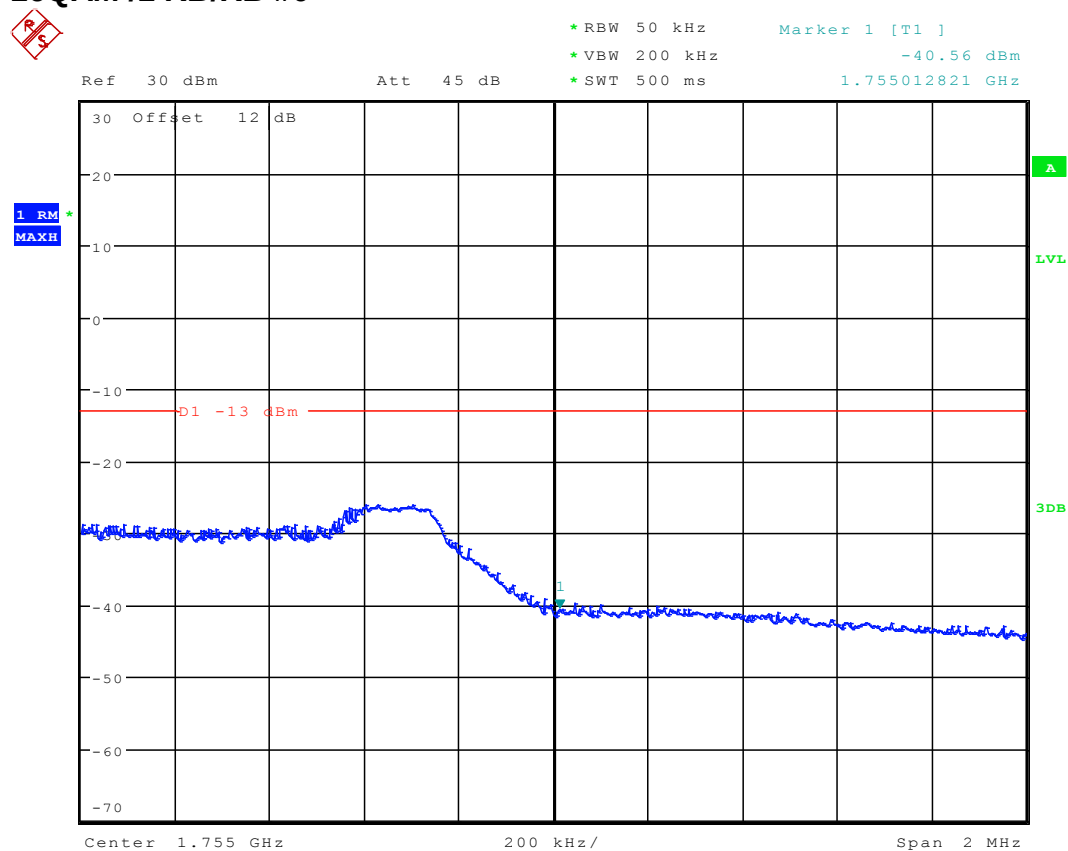


Date: 24.NOV.2011 15:10:11

**TM5**

Right Edge
5MHz(BW)
Channel 20375

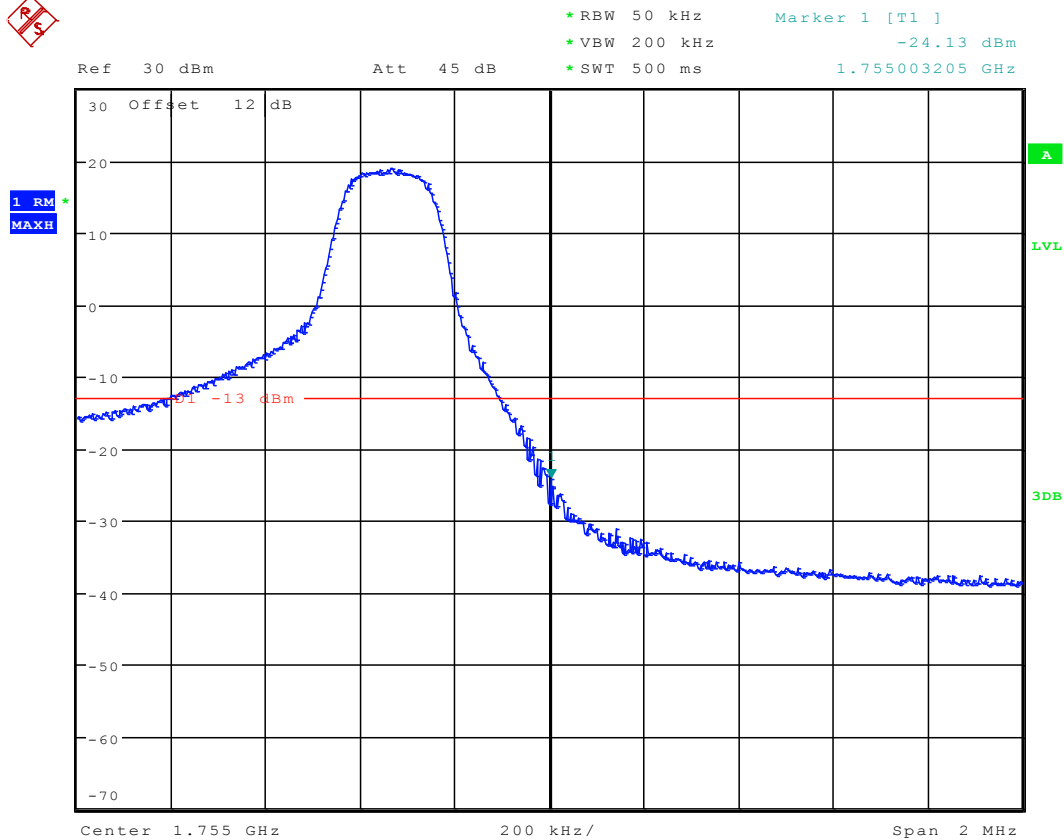
16QAM /1 RB/RB #0



Date: 24.NOV.2011 15:10:44



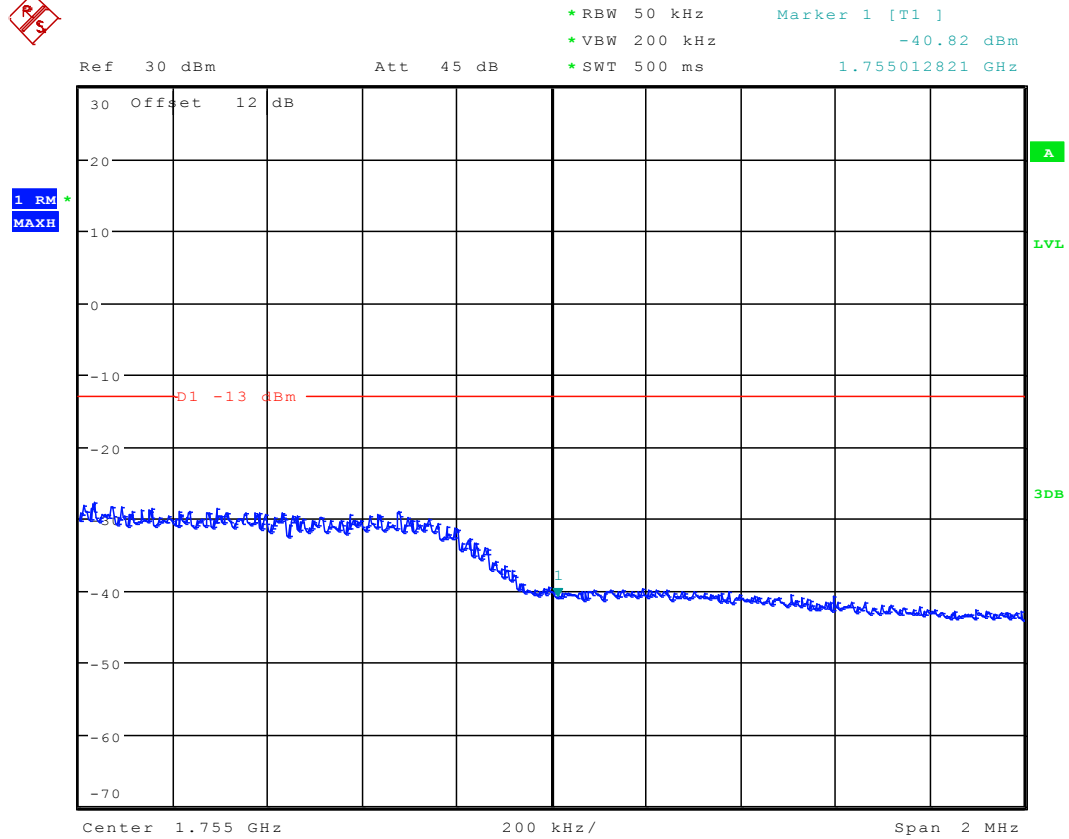
16QAM /1 RB/RB #max



Date: 24.NOV.2011 15:11:07

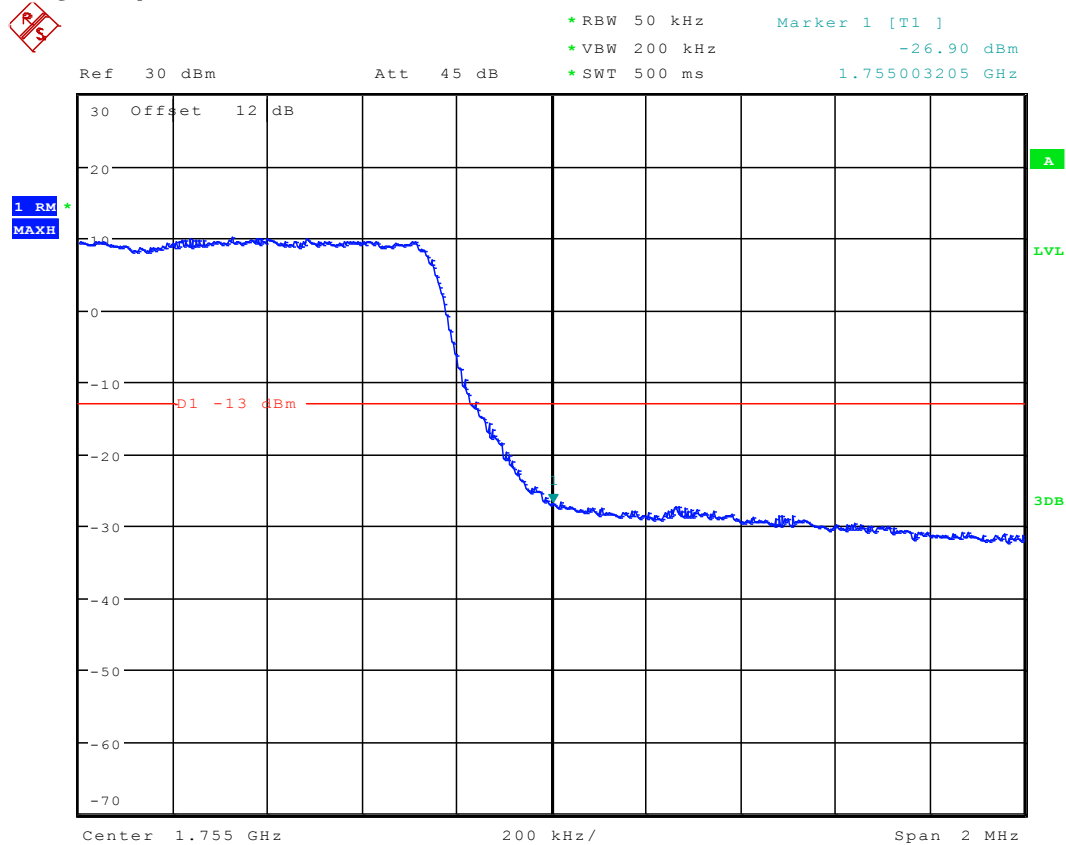


16QAM /partial RBs/RB #0



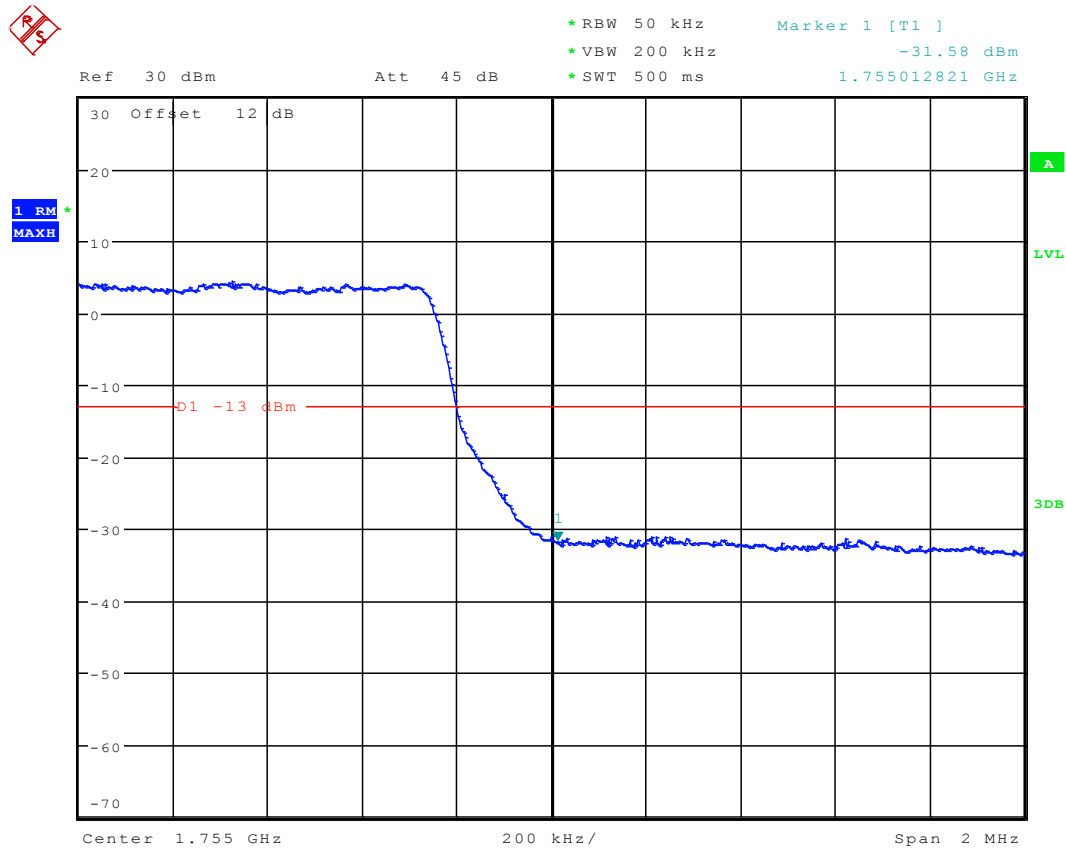
Date: 24.NOV.2011 15:39:37

16QAM /partial RBs/RB #max



Date: 24.NOV.2011 15:39:54

16QAM/full RBs



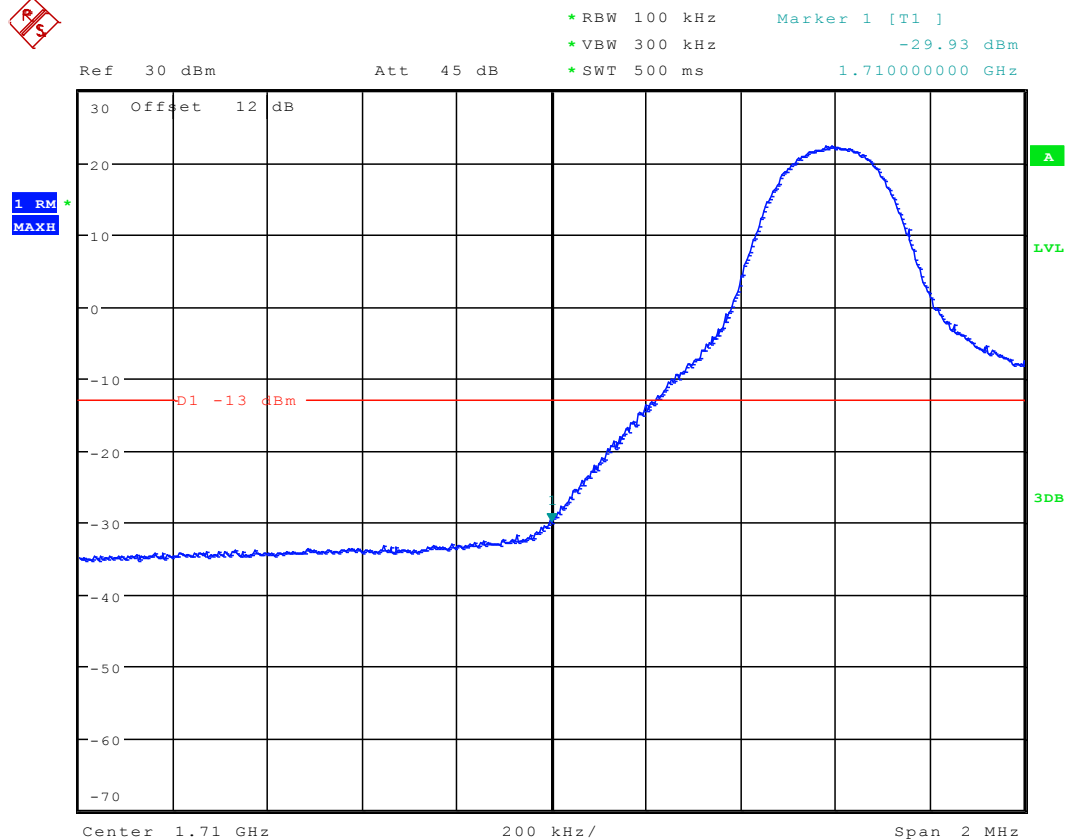
Date: 24.NOV.2011 15:09:46



TM4

Left Edge 10MHz(BW) Channel 20000

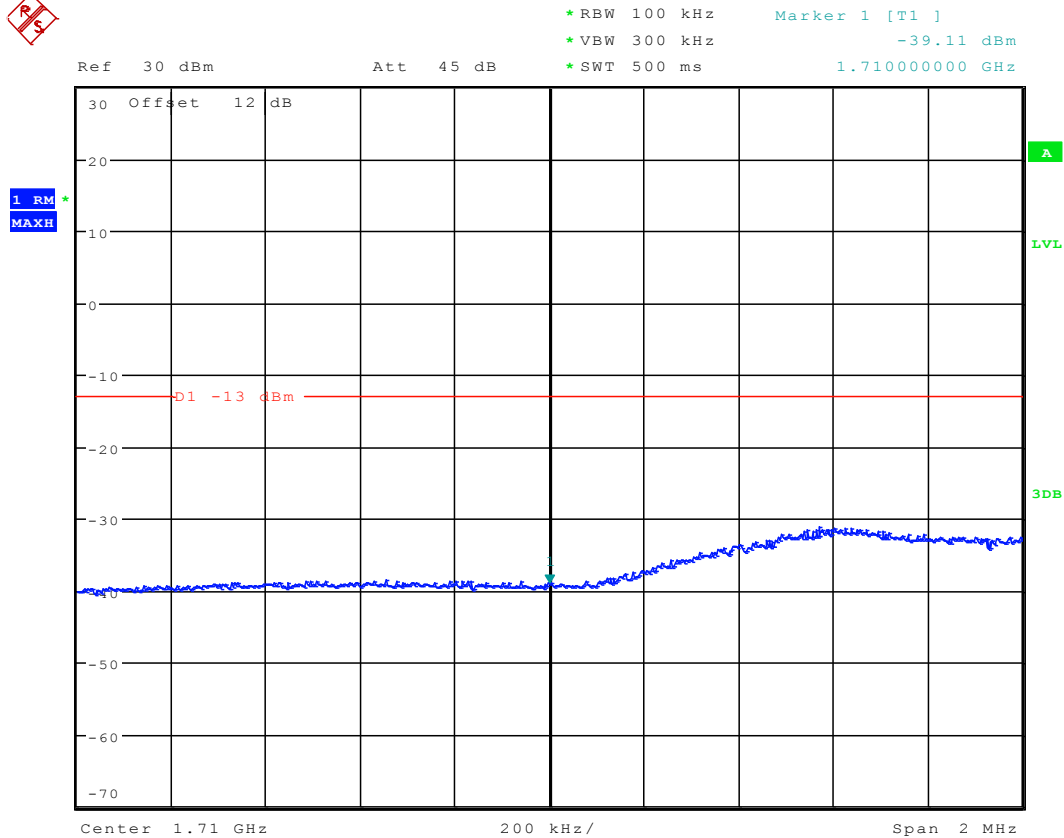
QPSK/1 RB/RB #0



Date: 24.NOV.2011 15:17:27

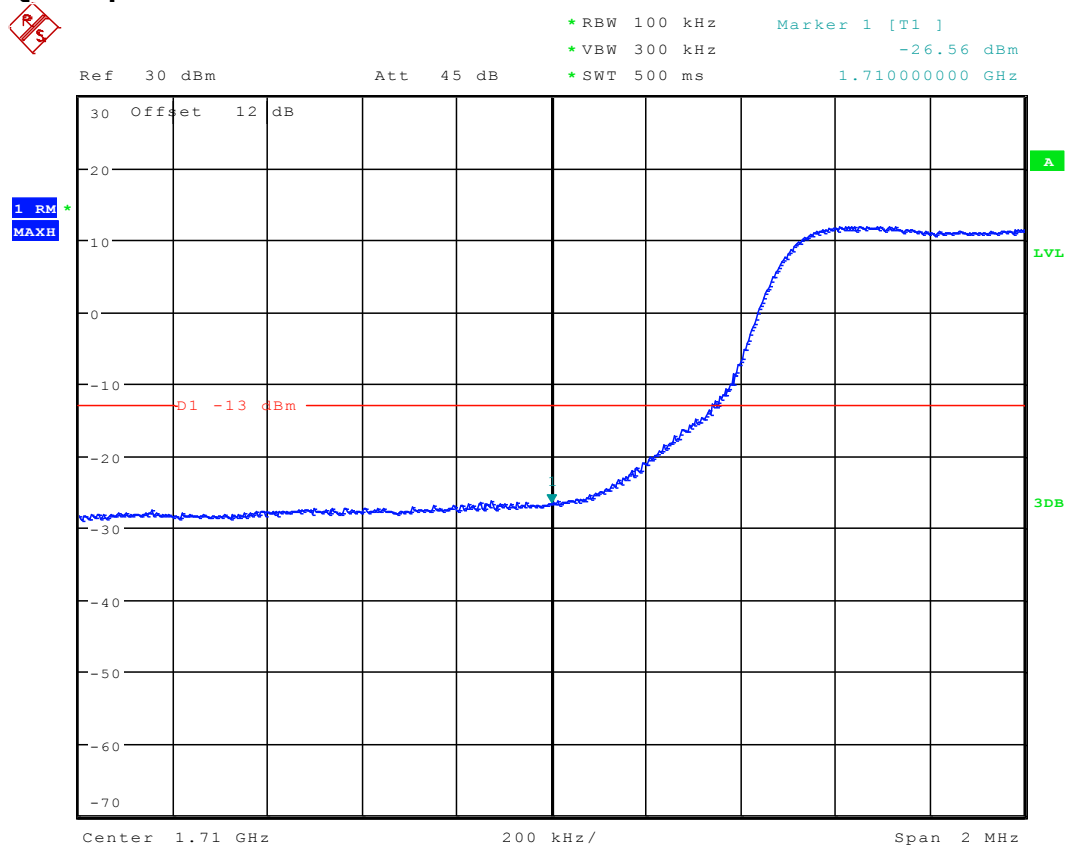


QPSK/1 RB/RB #max



Date: 24.NOV.2011 15:18:33

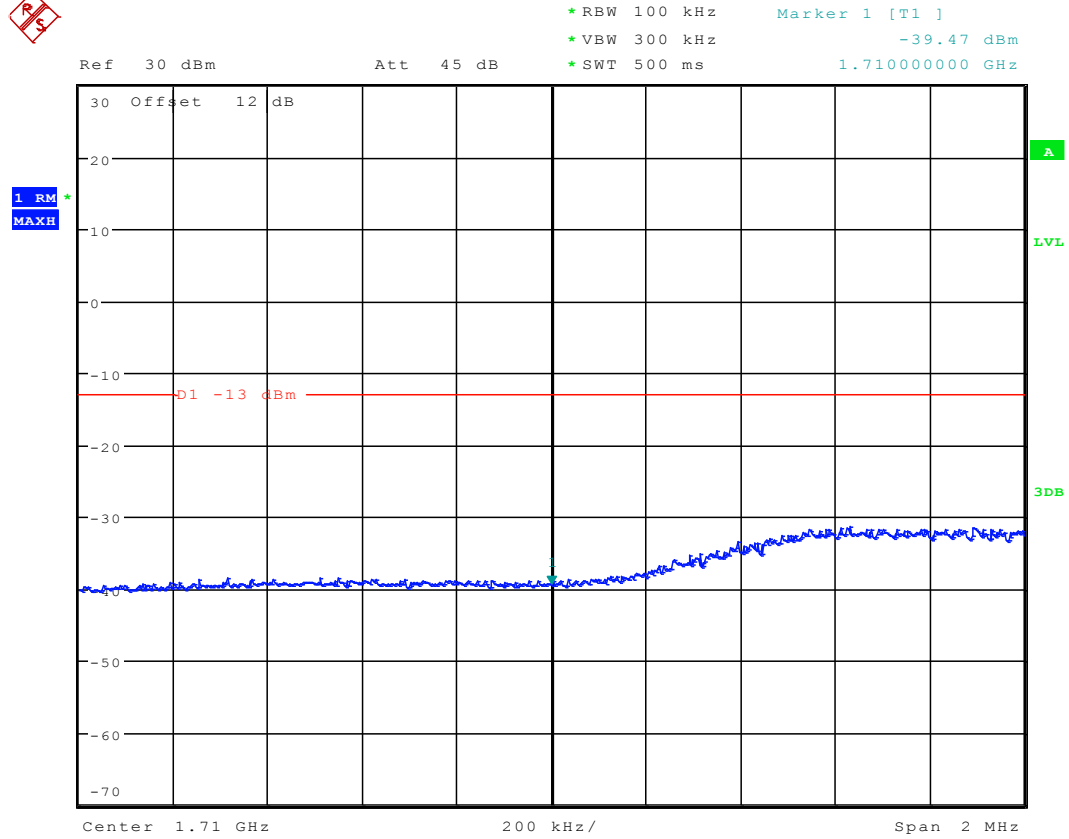
QPSK/partial RBs/RB #0



Date: 24.NOV.2011 15:34:13



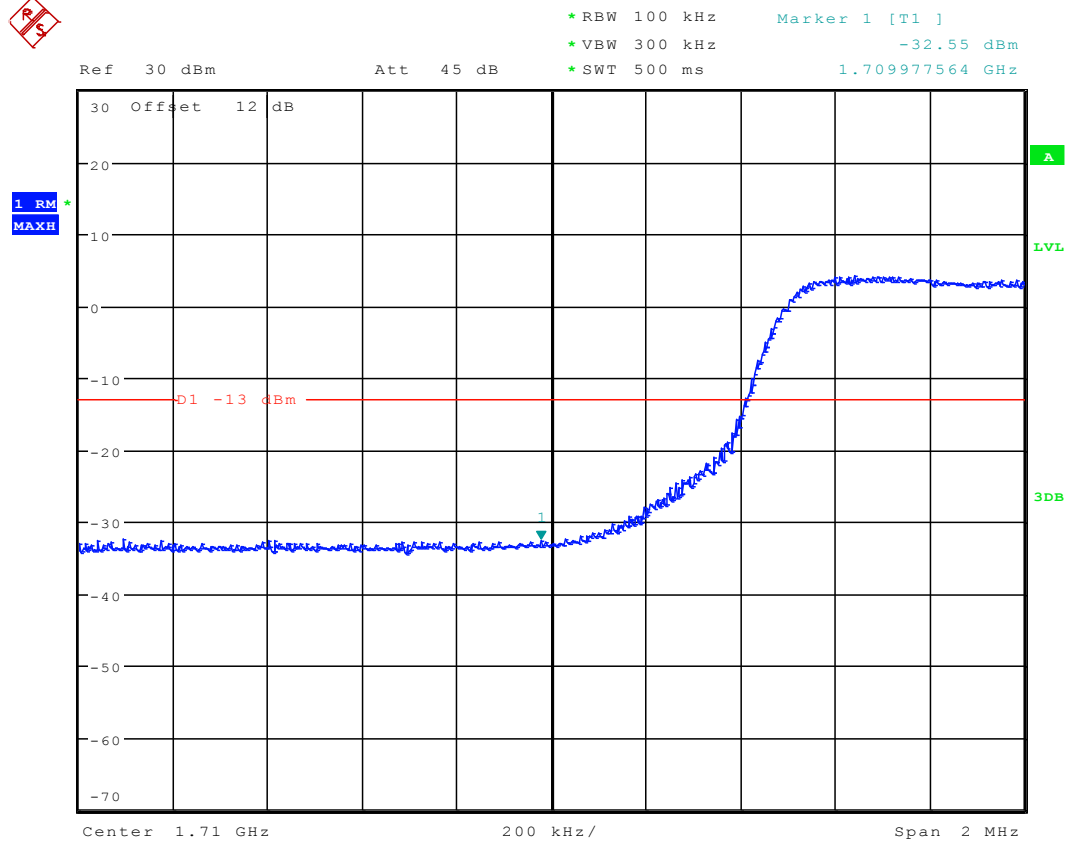
QPSK/partial RBs/RB #max



Date: 24.NOV.2011 15:36:09



QPSK/ full RBs



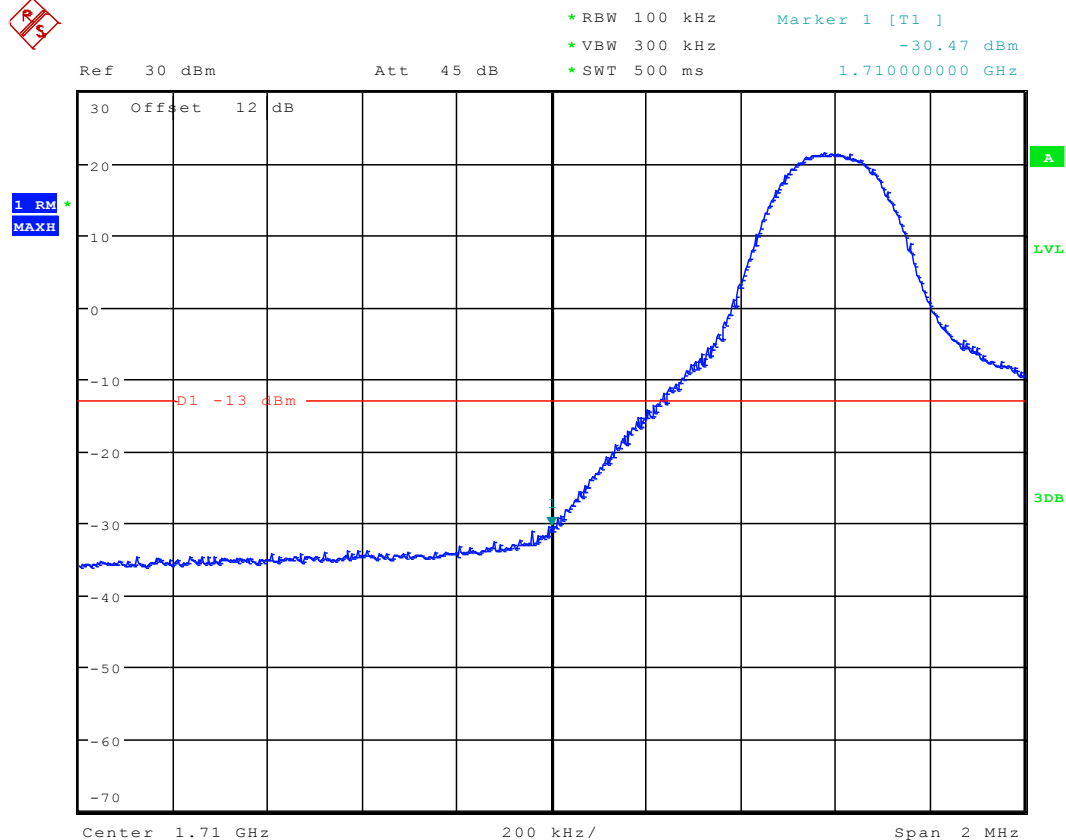
Date: 24.NOV.2011 15:17:02



TM5

Left Edge 10MHz(BW) Channel 20000

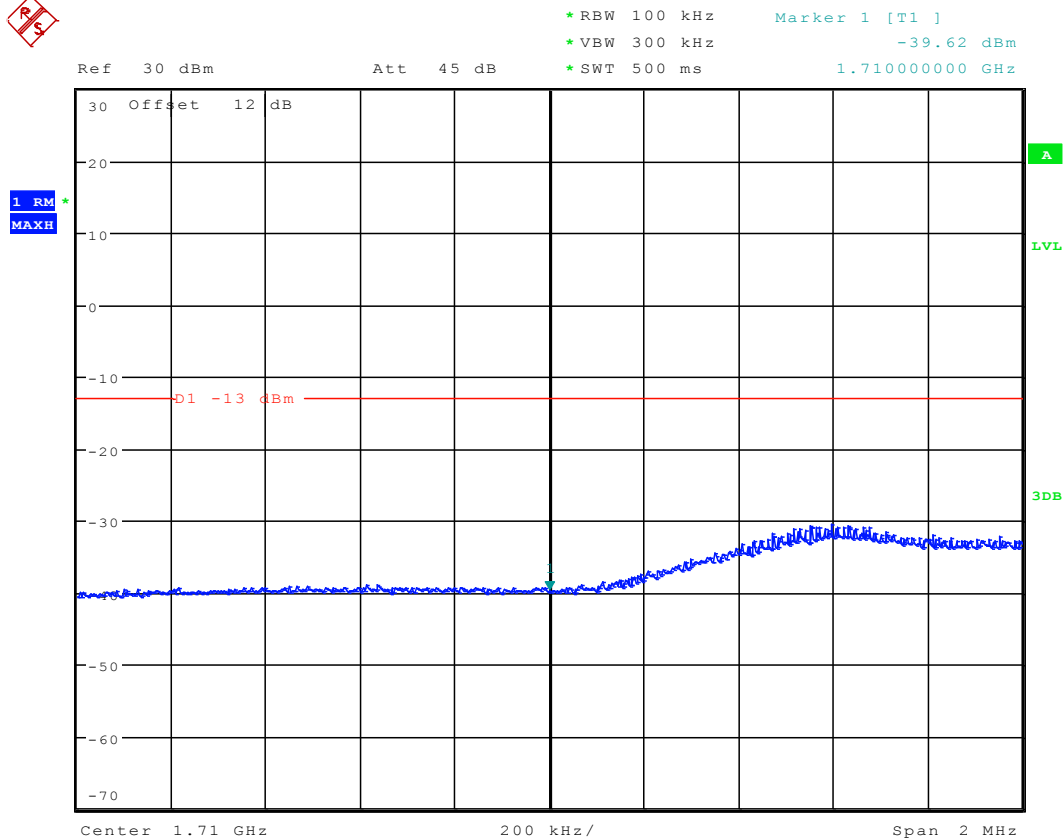
16QAM /1 RB/RB #0



Date: 24.NOV.2011 15:17:47



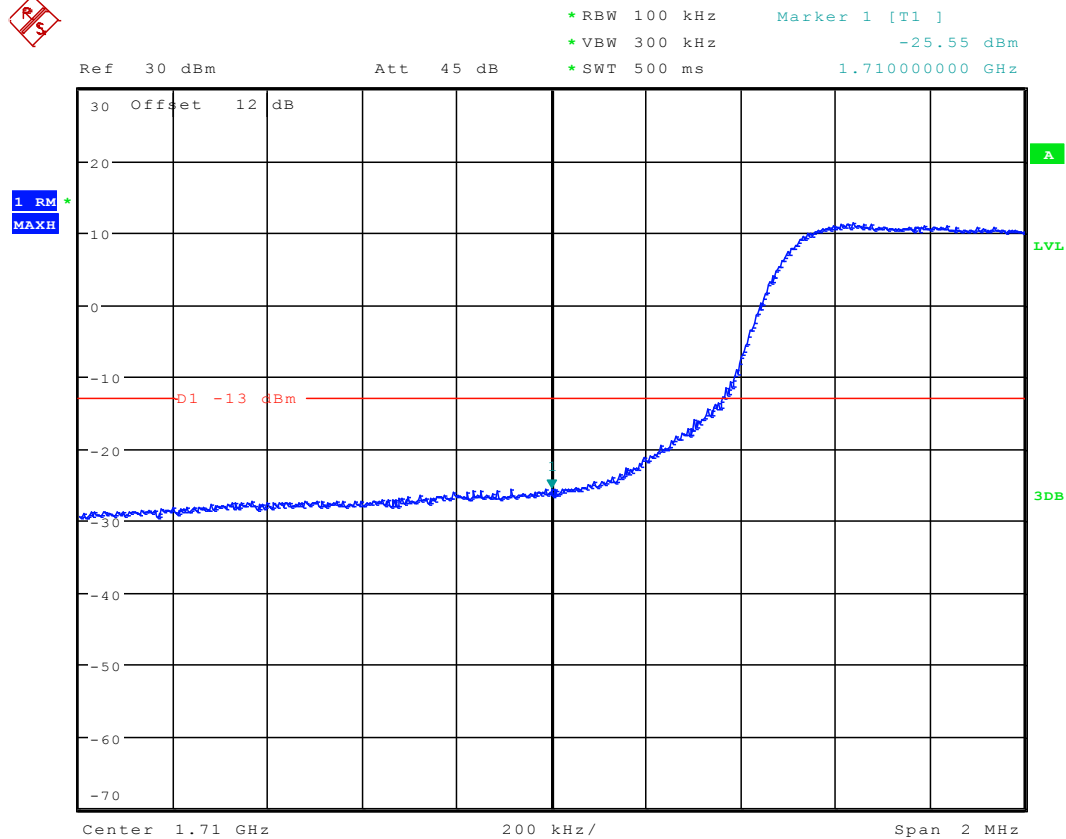
16QAM /1 RB/RB #max



Date: 24.NOV.2011 15:18:11



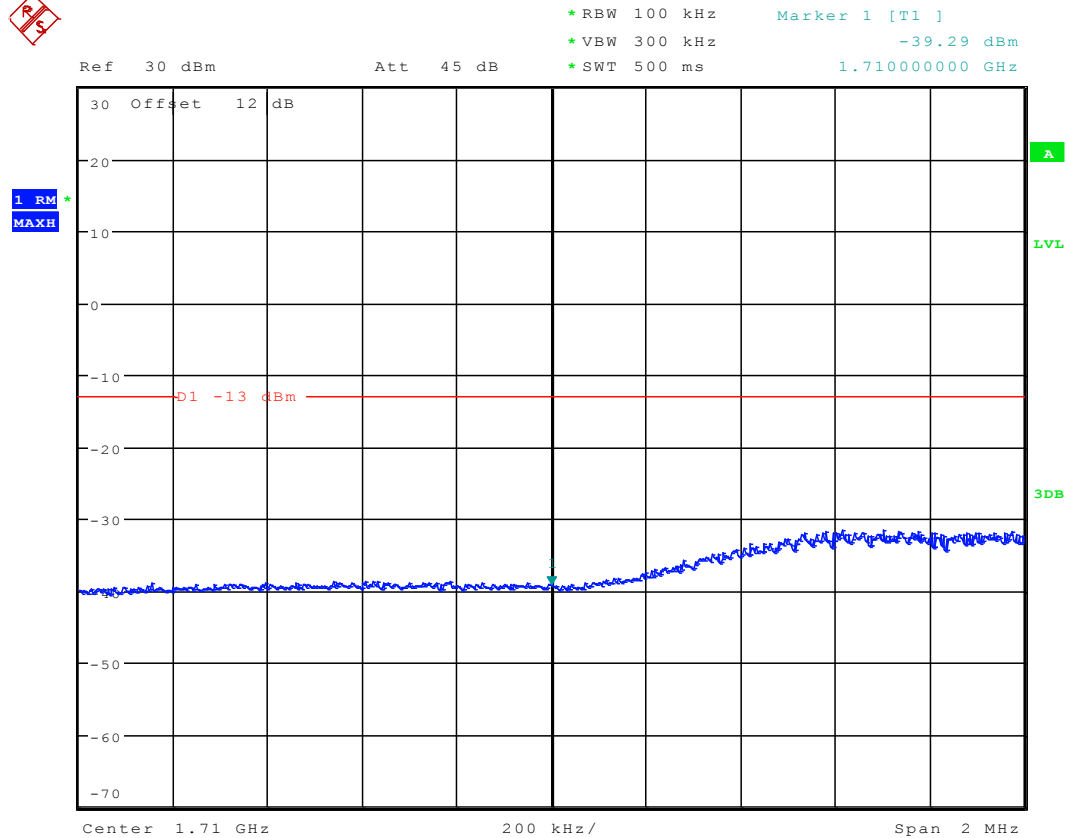
16QAM /partial RBs/RB #0



Date: 24.NOV.2011 15:34:56



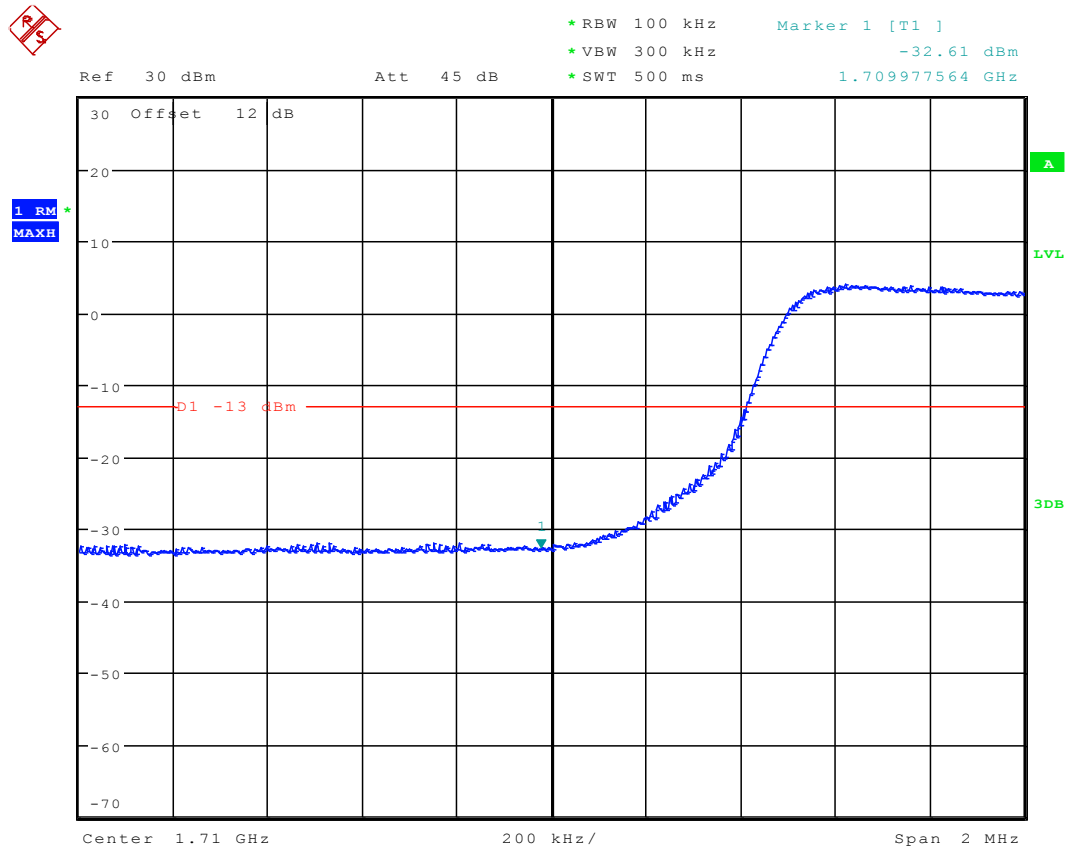
16QAM /partial RBs/RB #max



Date: 24.NOV.2011 15:35:19



16QAM/full RBs

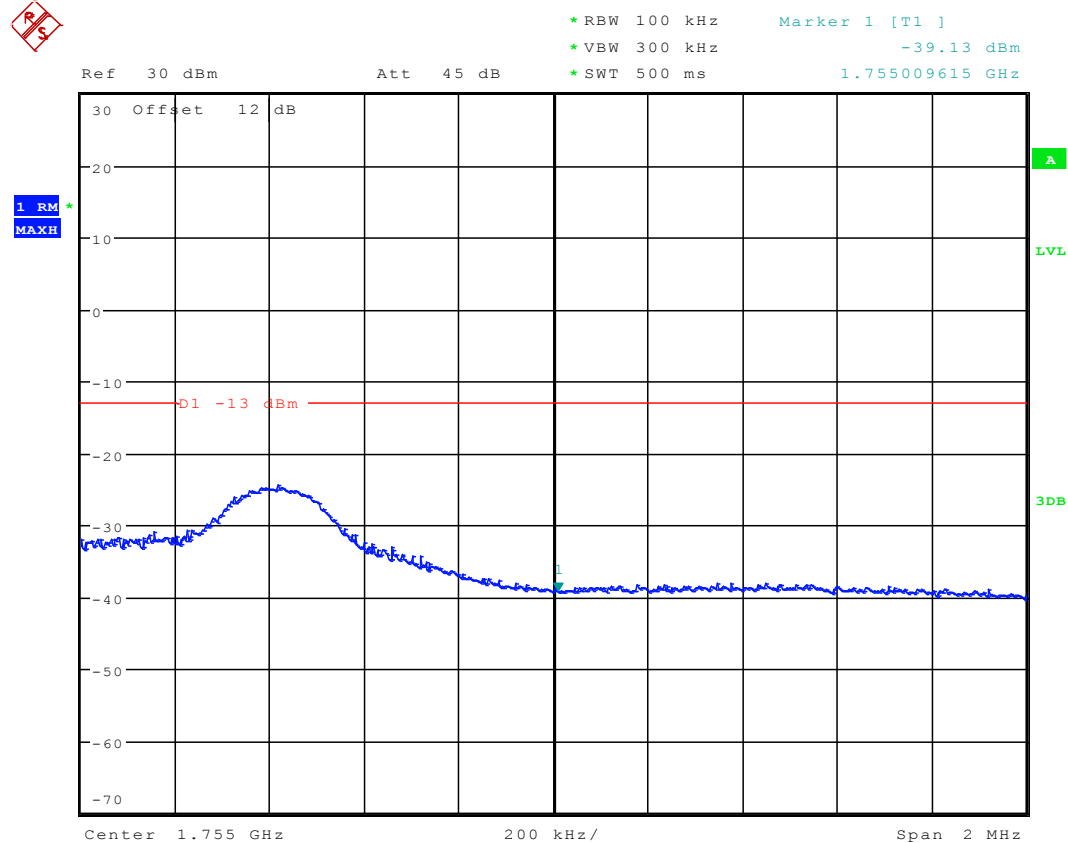


Date: 24.NOV.2011 15:16:40

TM4

Right Edge
10MHz(BW)
Channel 20350

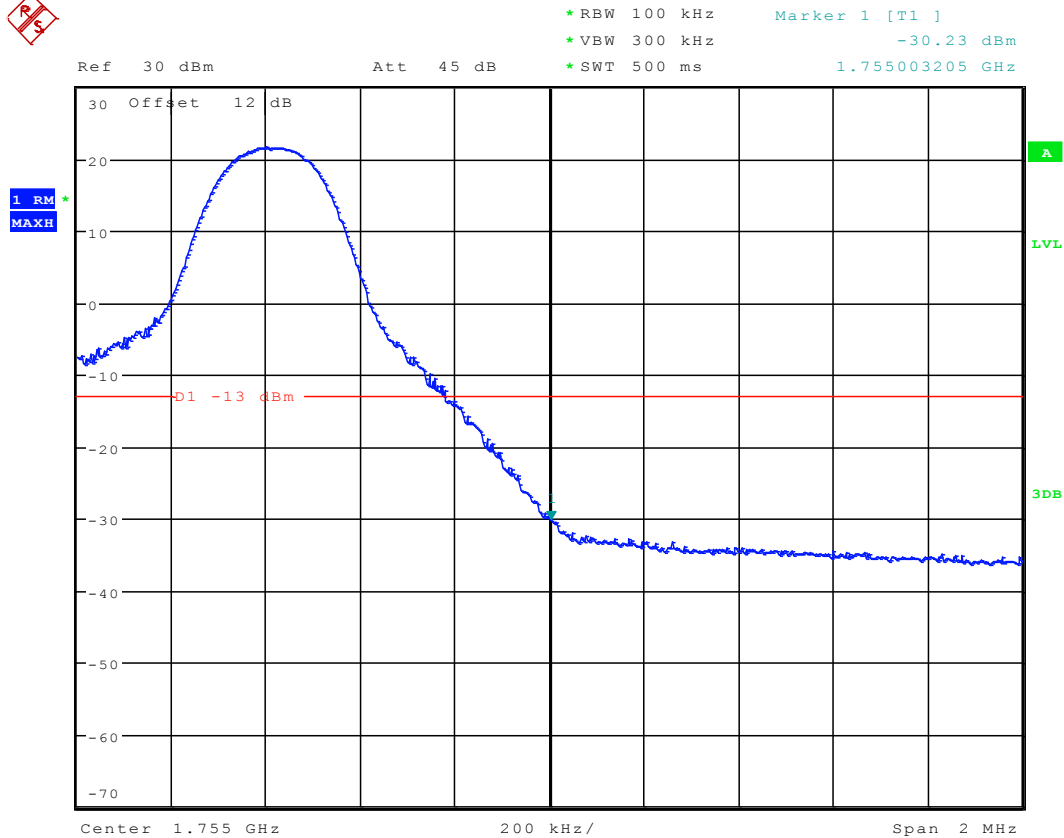
QPSK/1 RB/RB #0



Date: 24.NOV.2011 15:20:32



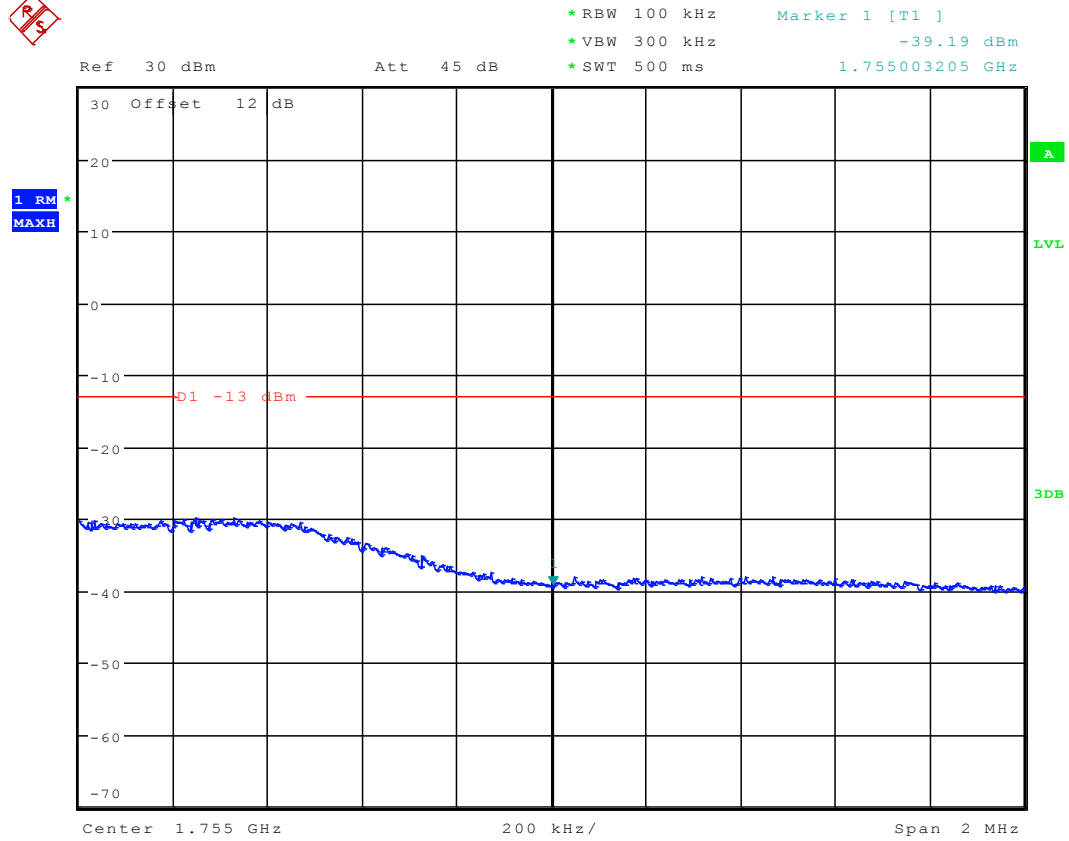
QPSK/1 RB/RB #max



Date: 24.NOV.2011 15:20:51



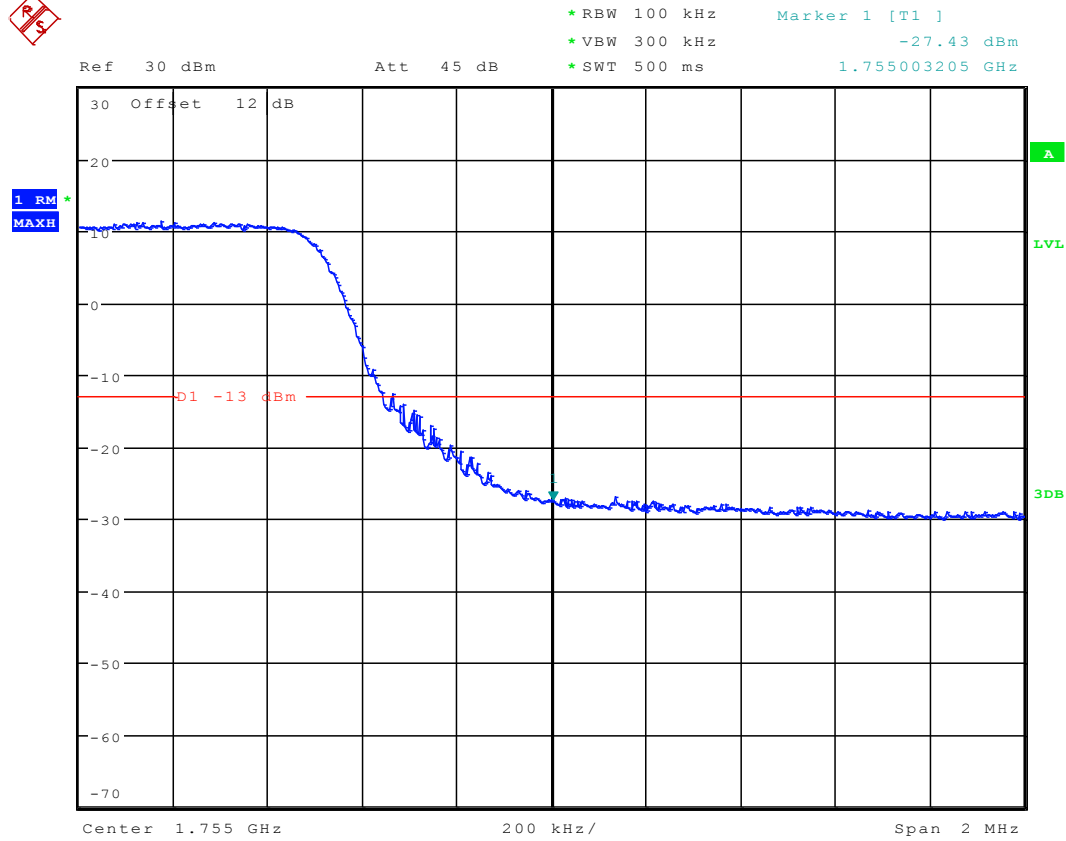
QPSK/partial RBs/RB #0



Date: 24.NOV.2011 15:28:26



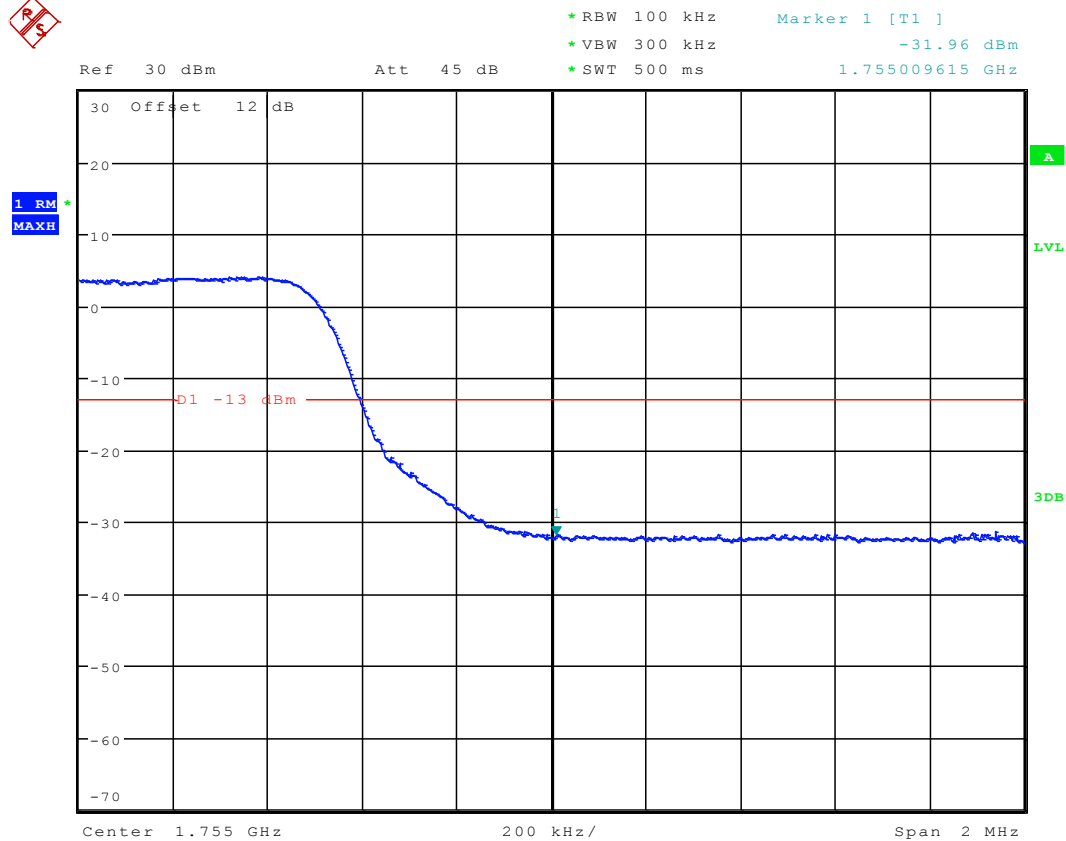
QPSK/partial RBs/RB #max



Date: 24.NOV.2011 15:28:42



QPSK/ full RBs



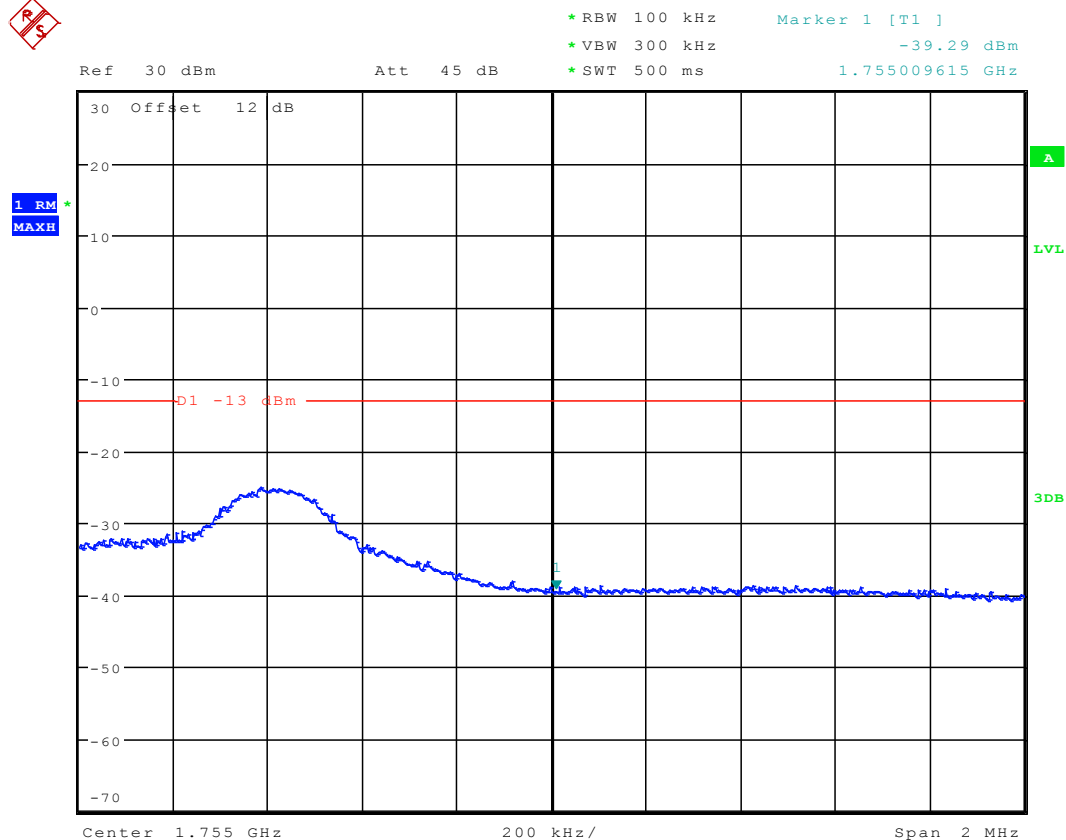
Date: 24.NOV.2011 15:19:31



TM5

Right Edge 10MHz(BW) Channel 20350

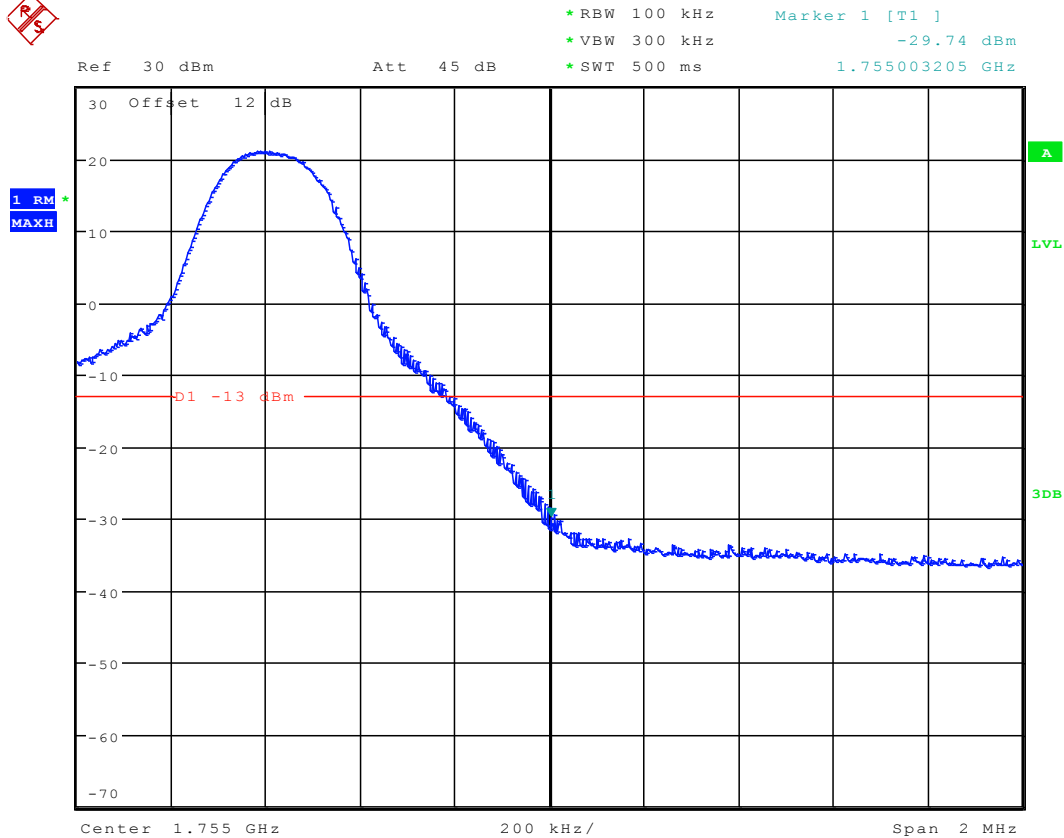
16QAM /1 RB/RB #0



Date: 24.NOV.2011 15:20:14



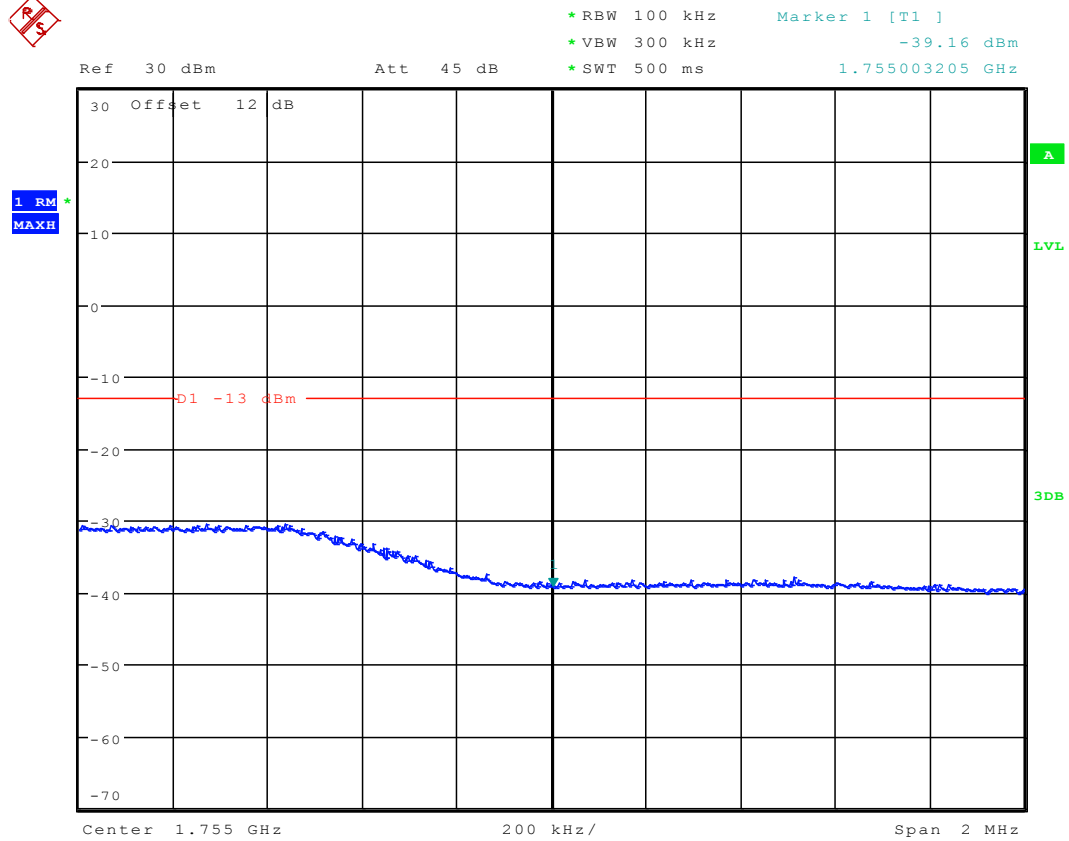
16QAM /1 RB/RB #max



Date: 24.NOV.2011 15:21:11



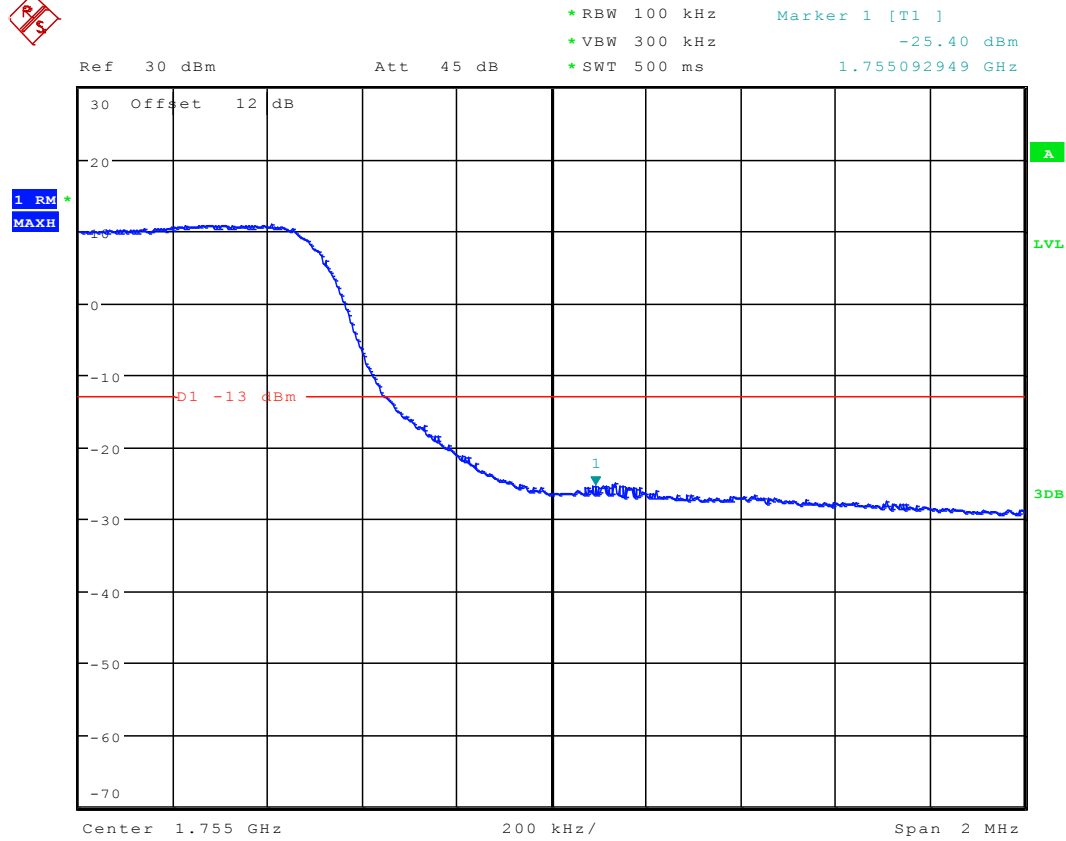
16QAM /partial RBs/RB #0



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



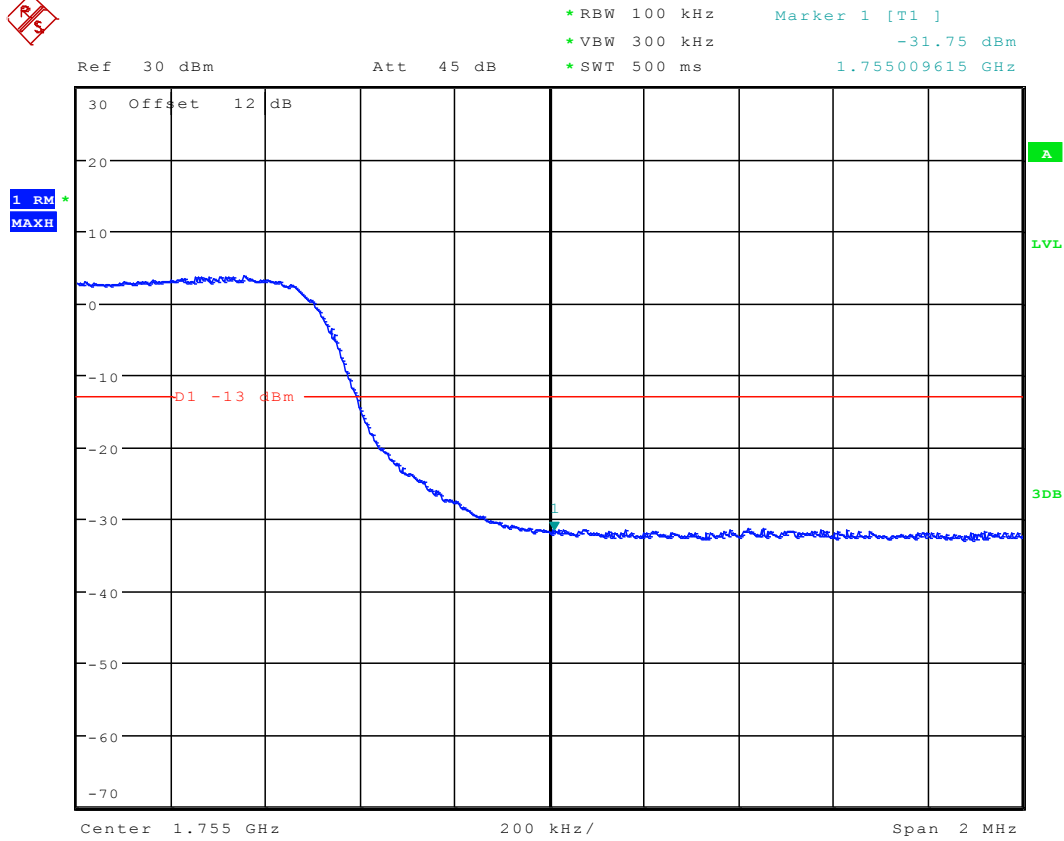
16QAM /partial RBs/RB #max



Date: 24.NOV.2011 15:29:04



16QAM/full RBs



Date: 24.NOV.2011 15:19:54