Test Report

Report Number: 3183595MPK-001
Project Number: 3183595
July 31, 2009

Testing performed on the
Quantum 1000 Base Station
Model Number: QUANTUM 1000
FCC ID: XN3-QUANTUM1000

to

FCC Part 90 Subpart Z

for

PUREWAVE NETWORKS

Test Performed by:	**Test Authorized by:**
Intertek Testing Services NA, Inc	PUREWAVE NETWORKS
1365 Adams Court	2660-C Marine Way
Menlo Park, CA 94025	Mountain View, CA 94043 USA

Prepared by: _____ **Date:** July 31, 2009
Krishna Vemuri, EMC Engineer

Reviewed by: _____ **Date:** July 31, 2009
Ollie Moyrong, Engineering Manager

Report No. 3183595MPK-001

Equipment Under Test:	Quantum 1000 Base Station
Trade Name:	PUREWAVE NETWORKS
Model No.:	QUANTUM 1000
Serial No.:	EMCProto1
FCC ID:	XN3-QUANTUM1000
Applicant:	PUREWAVE NETWORKS
Contact:	Mr. Jas Dhaliwal
Address:	2660-C Marine Way Mountain View, CA 94043
Country	USA
Tel. number:	650-528-5200
Fax number:	650-528-5222
Applicable Regulation:	FCC Part 90 Subpart Z
Test Site Location:	1365 Adams Court Menlo Park, CA 94025
Date of Test:	July 27 – July 31, 2009

We attest to the accuracy of this report:

Krishna Vemuri
EMC Engineer

Ollie Moyrong
Engineering Manager

TABLE OF CONTENTS

1.0 Introduction

1.1 Product Description

The Quantum 1000 employs an extremely flexible and versatile hardware architecture. The heart of the base station is a sophisticated and highly integrated ASIC that combines 6 DSP and general purpose processor cores along with specialized DSP hardware. A Linux-based subsystem supports applications, SNMP and other management functions. Finally,,the Quantum 1000 includes 2 RF transmitters and associated PAs, and 4 RF receivers

Important characteristics of the Quantum 1000 Base Station Sector are:

- Board-to-board communications for scaling up to 16 antennas.
- 10 MHz profile
- WiMAX OFDMA compliance
- All layers implemented in software.
- 2.3 – 2.7 GHz and 3.3 – 3.7 GHz operations.

PureWave has implemented a scalable architecture that lets service providers upgrade their Base Stations by:

- Adding more Base Station Sector to a location
- Adding antennas (and corresponding RF module sets) within a sector
- Adding processing capability in order to process traffic within additional spectrum
- Upgrading software to allow for changes in features and standards.

Specification of the EUT	
Maximum Measured RF Output Power	26.43 dBm
Frequency Ranges, MHz	3655 - 3695
Type of modulation	QPSK, 16QAM, 64QAM
Channel bandwidth	10 MHz
Antenna Gain	Varies[1]
Emission Designator	10M29W7D
Operating temperature	From -30^0C to $+50^0$C

[1] Peak EIRP Power allowed is 10W/10MHz for 10 MHz Channel Spacing.
The RF Output Power will be varied depending on the antenna system assembly gain employed to ensure the total Peak EIRP is less than 40.0 dBm.

EUT receive date: July 27, 2009
EUT receive condition: The prototype version of the EUT was received in good condition with no apparent damage. As declared by the Applicant it is identical to the production units.
Test start date: July 27, 2009
Test completion date: July 31, 2009

1.2 Summary of Test Results

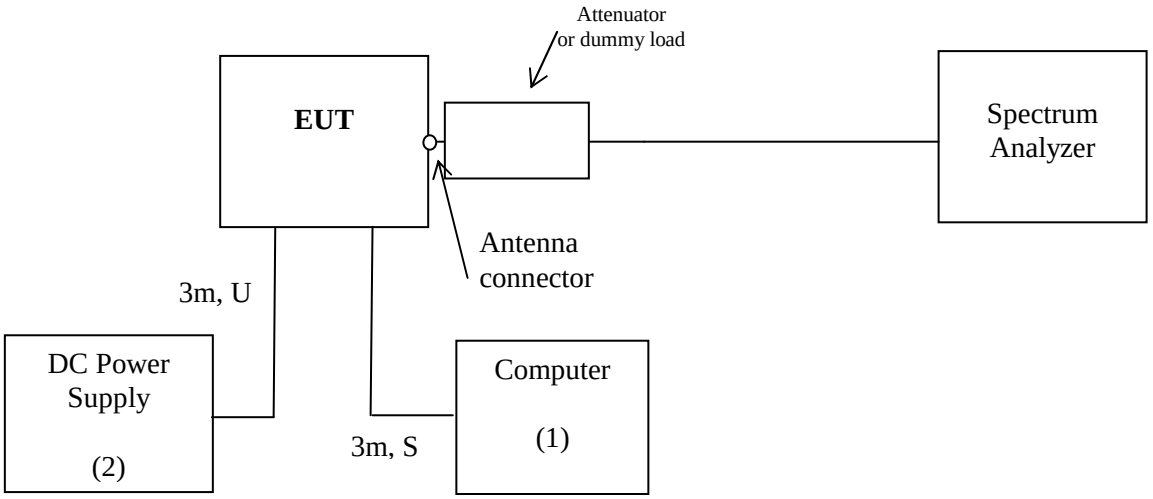
FCC Rule	Description of Test	Result
2.1046, 90.205, 90.1321	RF Power Output and Antenna Limits	Complies
2.1049, 90.209	Occupied Bandwidth	Complies
90.210	Emission masks	Complies
2.1051, 90.210	Out of Band Emissions at Antenna Terminals	Complies
2.1053, 90.210	Spurious Radiation	Complies
2.1055, 90.213	Frequency Stability vs. Temperature and Voltage	Complies
15.109, 15.111	Emission from digital part and receiver	Complies

1.3 Test Configuration

1.3.1 Support Equipment

Item #	Description	Model No.	S/N
1	Purewave computer	Not Labeled	Not Labeled
2	DC Power Supply	Not Labeled	Not Labeled

1.3.2 Block diagram of Test Setup



S = Shielded **U** = Unshielded	**F** = With Ferrite **m** = Length in Meters

1.4 Related Submittal(s) Grants

None

2.0 RF Power Output and Antenna Limits

FCC 2.1046, 90.205, 90.1321

Base and fixed stations are limited to 25 watts/25 MHz equivalent isotropically radiated power (EIRP). In any event, the peak EIRP power density shall not exceed 1 Watt in any one-megahertz slice of spectrum.

In addition to the provisions in paragraph (a) of this section, transmitters operating in the 3650–3700 MHz band that emit multiple directional beams, simultaneously or sequentially, for the purpose of directing signals to individual receivers or to groups of receivers provided the emissions comply with the following:

Different information must be transmitted to each receiver.

If the transmitter employs an antenna system that emits multiple directional beams but does not emit multiple directional beams simultaneously, the total output power conducted to the array or arrays that comprise the device, *i.e.* , the sum of the power supplied to all antennas, antenna elements, staves, etc. and summed across all carriers or frequency channels, shall not exceed the limit specified in paragraph (a) of this section, as applicable. The directional antenna gain shall be computed as follows:

The directional gain, in dBi, shall be calculated as the sum of 10 log (number of array elements or staves) plus the directional gain, in dBi, of the individual element or stave having the highest gain.

A lower value for the directional gain than that calculated in paragraph (b)(2)(i) of this section will be accepted if sufficient evidence is presented, *e.g.* , due to shading of the array or coherence loss in the beam-forming.

If a transmitter employs an antenna that operates simultaneously on multiple directional beams using the same or different frequency channels and if transmitted beams overlap, the power shall be reduced to ensure that the aggregate power from the overlapping beams does not exceed the limit specified in paragraph (b)(2) of this section. In addition, the aggregate power transmitted simultaneously on all beams shall not exceed the limit specified in paragraph (b)(2) of this section by more than 8 dB.

Transmitters that emit a single directional beam shall operate under the provisions of paragraph (b)(2) of this section.

Mobile and portable stations are limited to 1 watt/25 MHz EIRP. In any event, the peak EIRP density shall not exceed 40 milliwatts in any one-megahertz slice of spectrum.

2.1 Test Procedure

The EUT RF output was connected as shown on the diagram in report section 1.3.2. The EUT was setup to transmit continuously the maximum power.

The spectrum analyzer was setup to measure a peak power using the Channel Power Function. The attenuation and cable loss were added to the spectrum analyzer reading by using OFFSET function.

The EUT was set to transmit at maximum power. Measurements were performed at three frequencies (low, middle, and high channels).

2.2 Test Equipment

Rohde & Schwarz FSU26 Spectrum Analyzer

2.3 Test Results

Peak EIRP Power

Frequency (MHz)	Measured Power (dBm)	Antenna Gain (dBi)	Calculated Max EIRP (dBm)	EIRP Limit (dBm)	Graph
Modulation: QPSK					
3655	24.91	*	40	40	2.1
3675	26.43	*	40	40	2.2
3695	24.75	*	40	40	2.3
Modulation: 16 QAM					
3655	24.94	*	40	40	2.4
3675	26.18	*	40	40	2.5
3695	24.75	*	40	40	2.6
Modulation: 64 QAM					
3655	24.92	*	40	40	2.7
3675	26.08	*	40	40	2.8
3695	24.75	*	40	40	2.9

Notes: Peak EIRP Power allowed is 10W/10MHz for 10 MHz Channel Spacing.
*The RF Output Power will be varied depending on the antenna system assembly gain employed to ensure the total Peak EIRP is less than 40.0 dBm

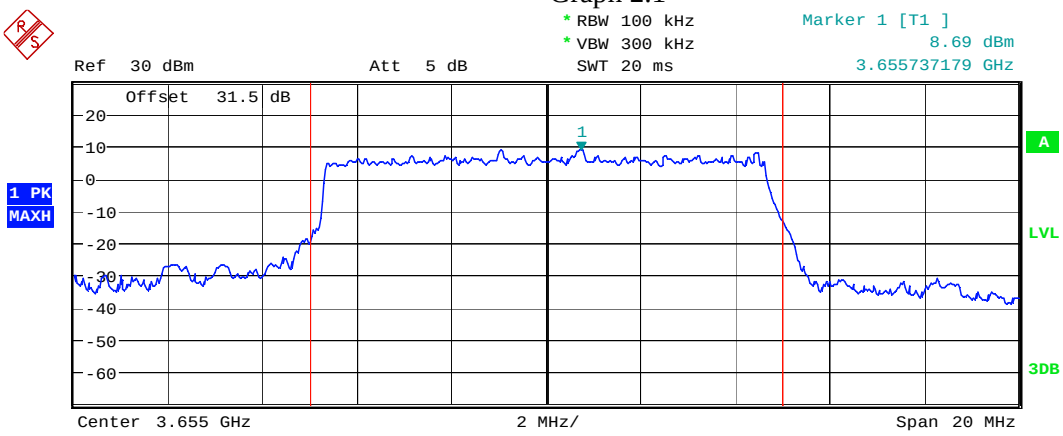
EIRP Power Density

Frequency (MHz)	Measured Power (dBm)	Antenna Gain (dBi)	Calculated Max EIRP (dBm)	EIRP Limit (dBm/MHz)	Graph
Modulation: QPSK					
3655	18.69	*	30	30	2.10
3675	18.79	*	30	30	2.12
3695	18.61	*	30	30	2.12
Modulation: 16 QAM					
3655	18.86	*	30	30	2.13
3675	18.68	*	30	30	2.14
3695	18.6	*	30	30	2.15
Modulation: 64 QAM					
3655	18.69	*	30	30	2.16
3675	18.67	*	30	30	2.17
3695	18.90	*	30	30	2.18

Notes: *The RF Output Power will be varied depending on the antenna system assembly gain employed to ensure the total EIRP Power Density is less than 30.0 dBm

For more details refer to the attached Graphs.

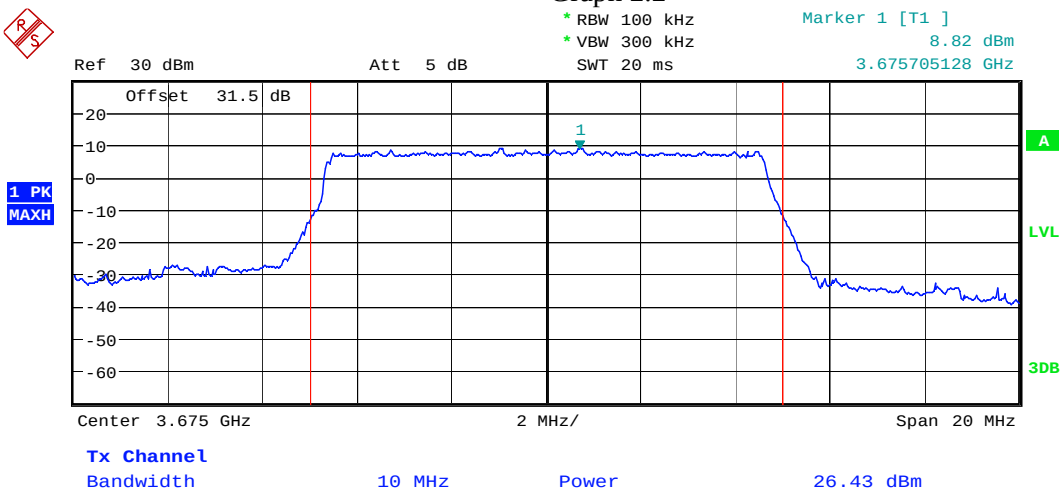
Output Power
Graph 2.1



LOW CHAN, QPSK, PWR

Date: 28.JUL.2009 21:28:02

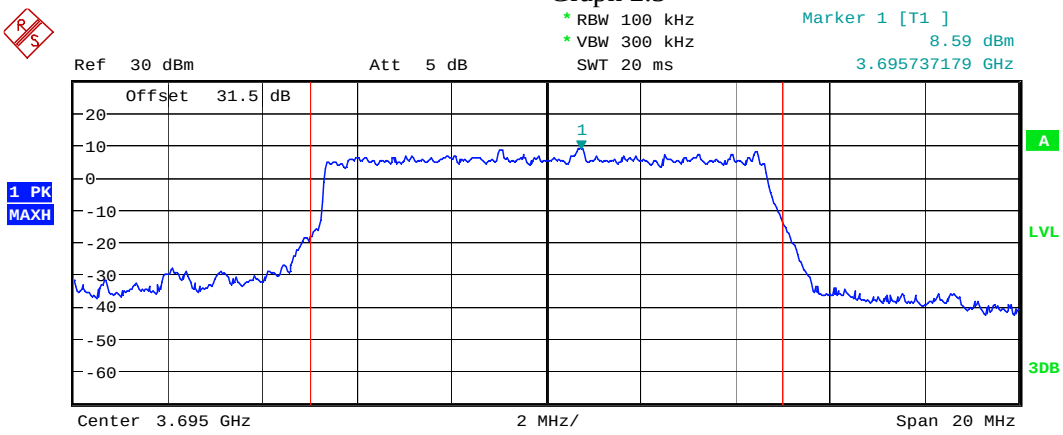
Graph 2.2



MID CHAN, QPSK, PWR

Date: 28.JUL.2009 21:25:40

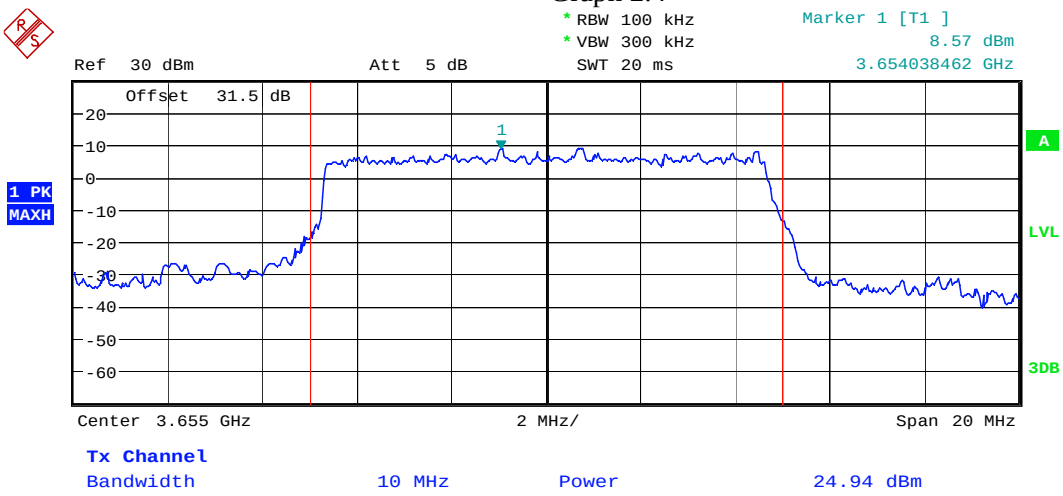
Graph 2.3



HIGH CHAN, QPSK, PWR

Date: 28.JUL.2009 21:29:26

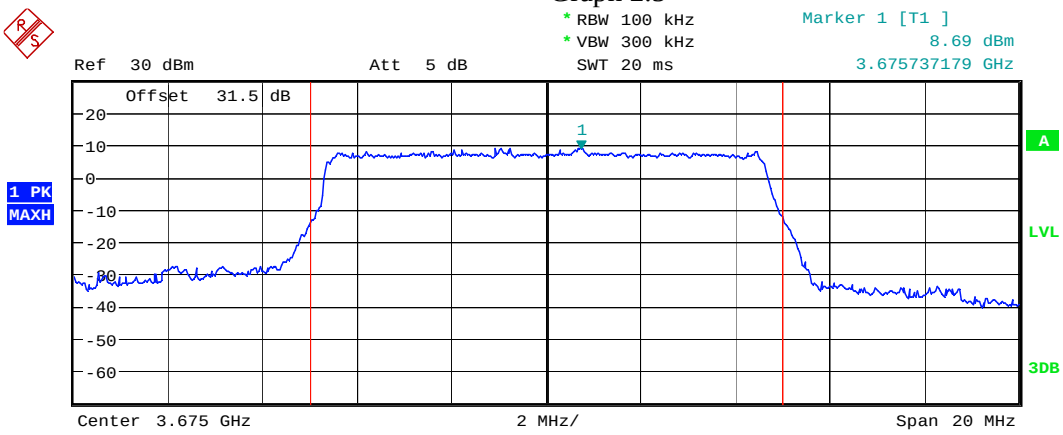
Graph 2.4



LOW CHAN, 16QAM, PWR

Date: 28.JUL.2009 21:37:26

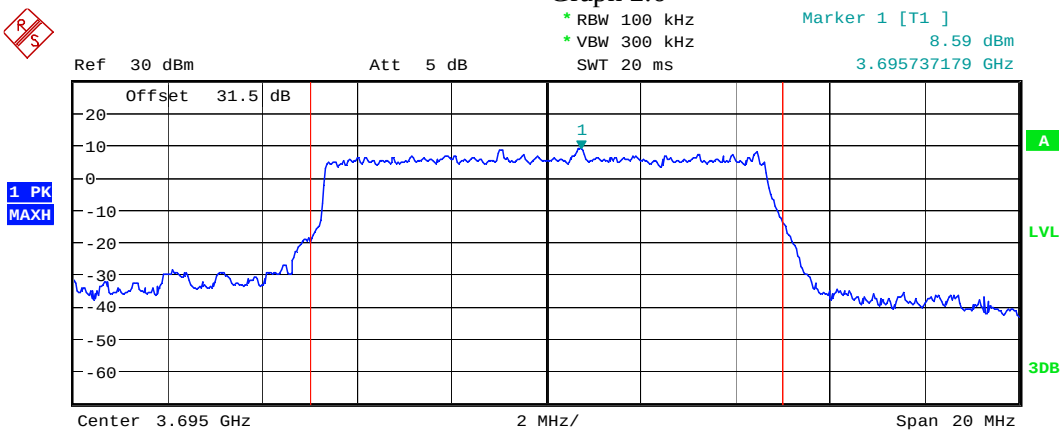
Graph 2.5



MID CHAN, 16QAM, PWR

Date: 28.JUL.2009 21:36:11

Graph 2.6



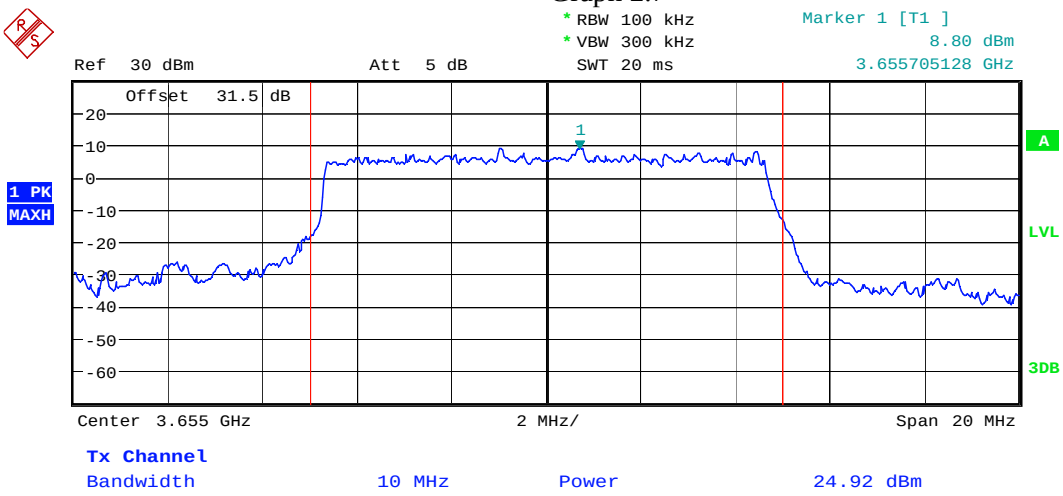
Tx Channel

Bandwidth 10 MHz Power 24.75 dBm

HIGH CHAN, 16QAM, PWR

Date: 28.JUL.2009 21:31:57

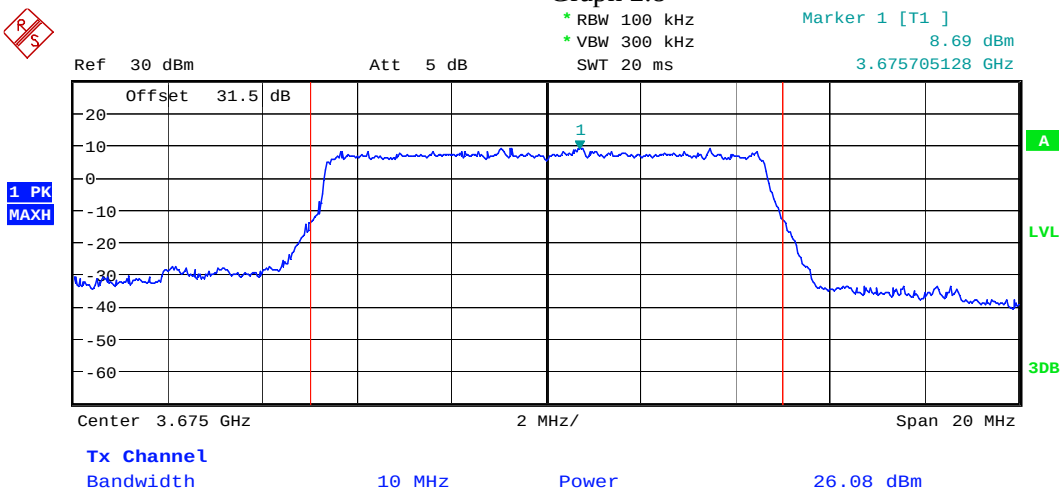
Graph 2.7



LOW CHAN, 64QAM, PWR

Date: 28.JUL.2009 21:38:23

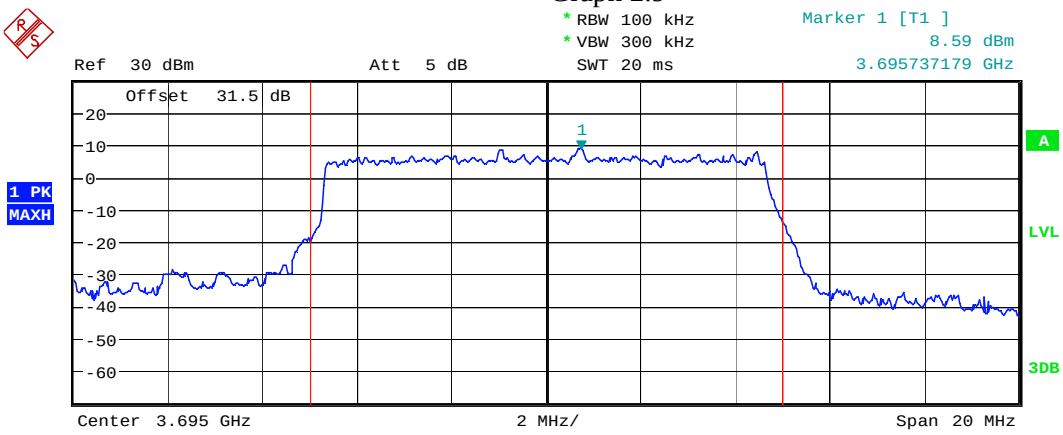
Graph 2.8



MID CHAN, 64QAM, PWR

Date: 28.JUL.2009 21:34:15

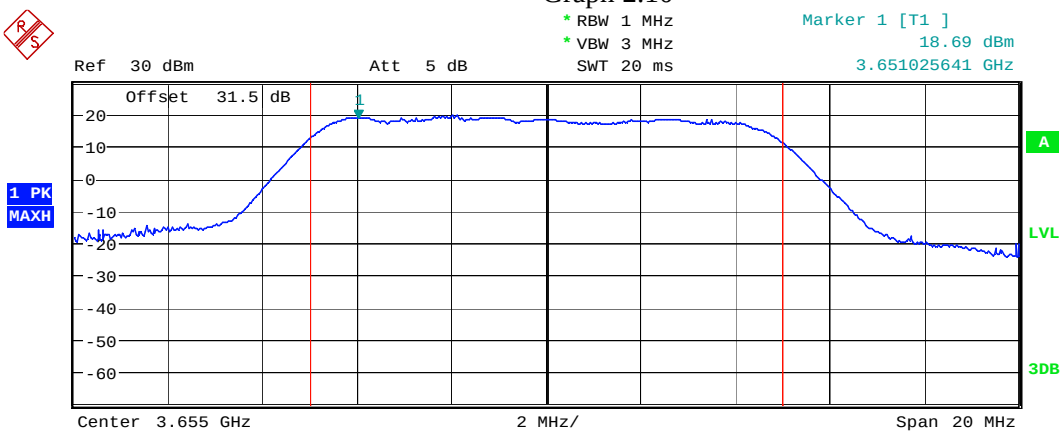
Graph 2.9



HIGH CHAN, 16QAM, PWR

Date: 28.JUL.2009 21:31:57

EIRP Power Density
Graph 2.10



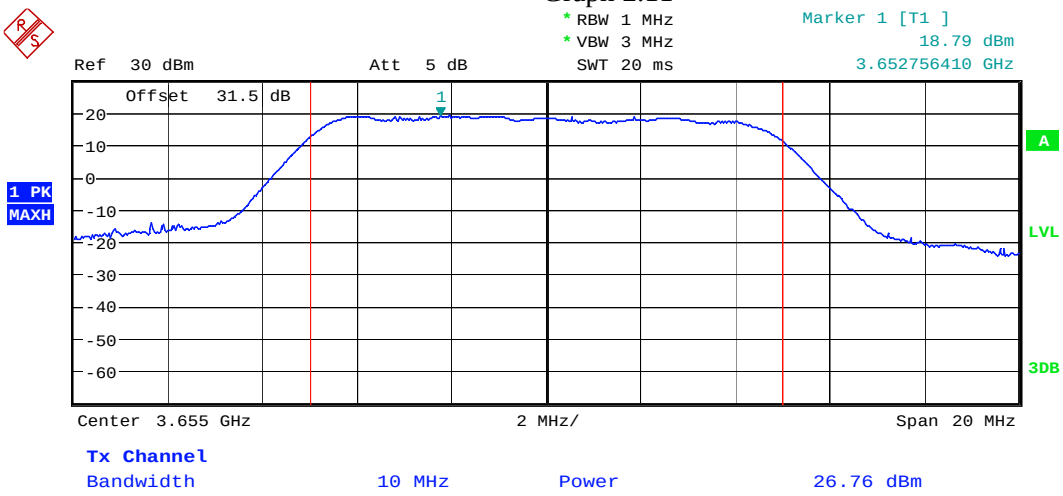
Tx Channel

Bandwidth	10 MHz	Power	26.79 dBm

LOW CHAN, QPSK, PSD

Date: 28.JUL.2009 22:40:41

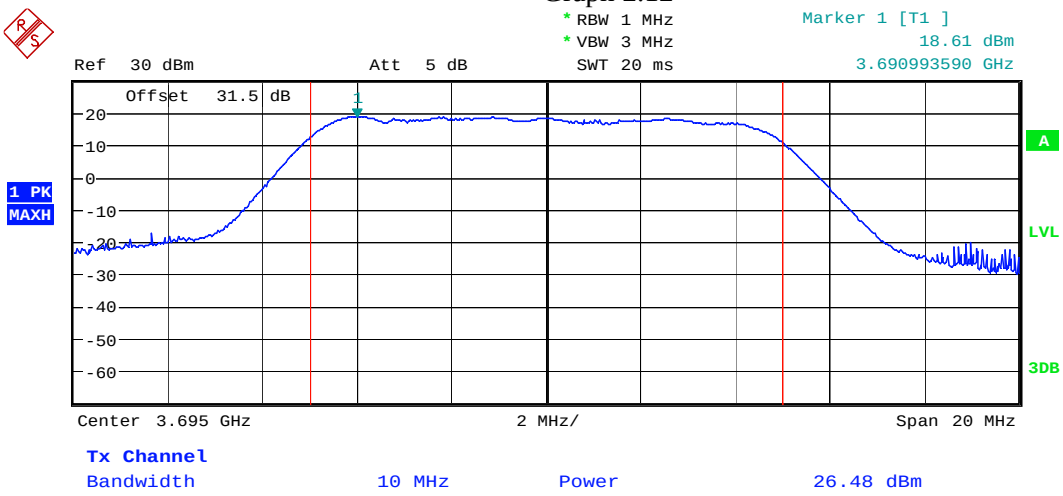
Graph 2.11



MID CHAN, QPSK, PSD

Date: 28.JUL.2009 22:42:23

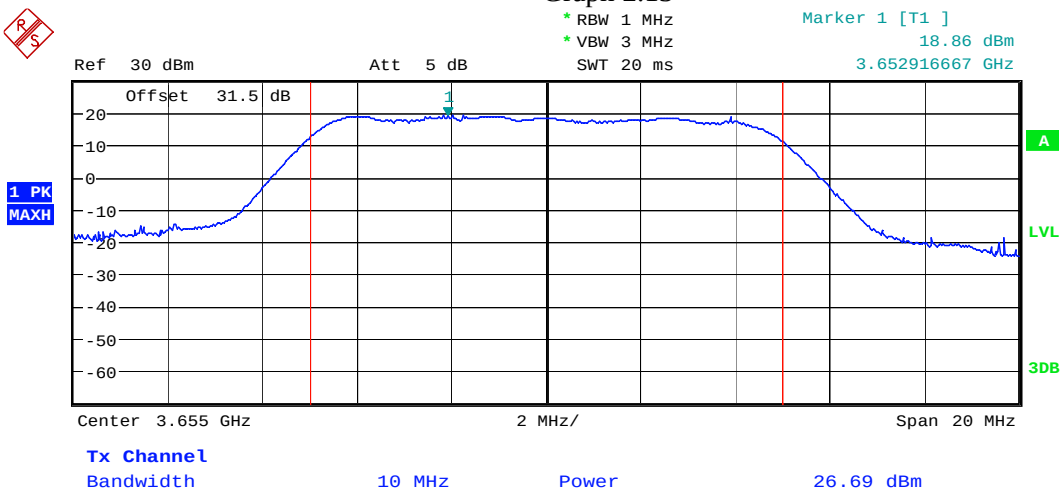
Graph 2.12



HIGH CHAN, QPSK, PSD

Date: 28.JUL.2009 22:48:42

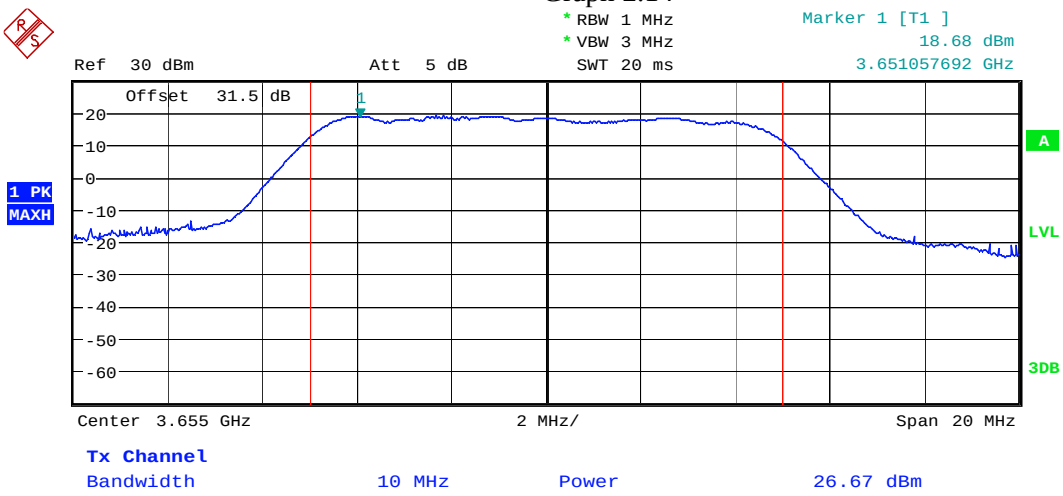
Graph 2.13



LOW CHAN, 16QAM, PSD

Date: 28.JUL.2009 22:38:58

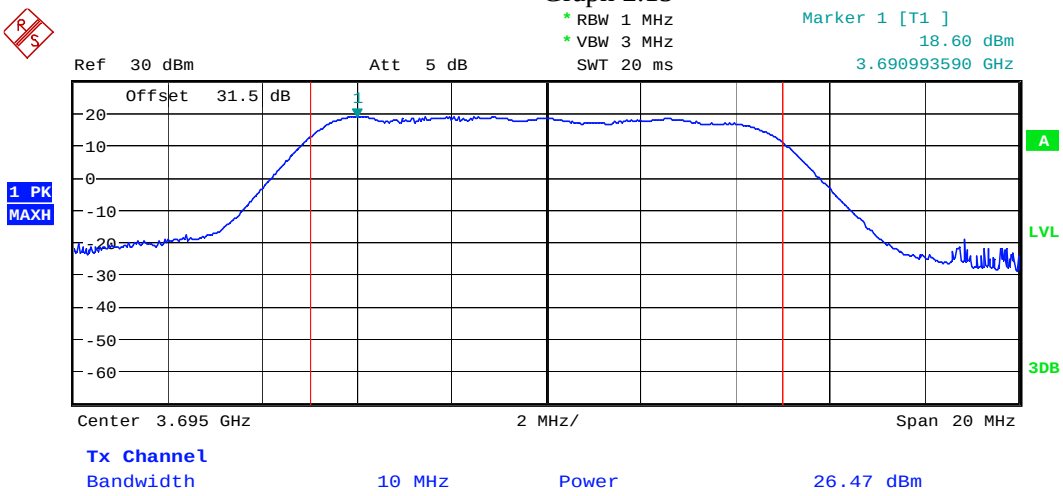
Graph 2.14



MID CHAN, 16QAM, PSD

Date: 28.JUL.2009 22:43:56

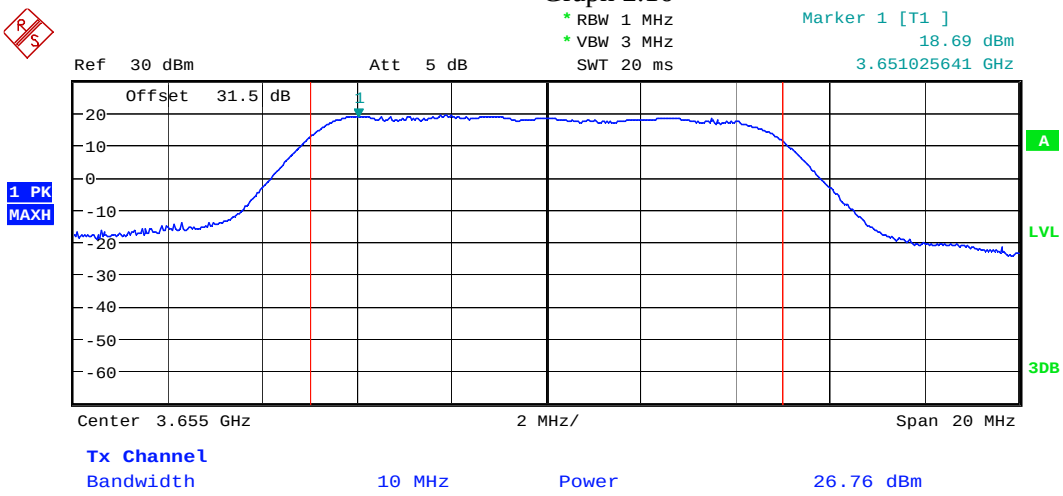
Graph 2.15



HIGH CHAN, 16QAM, PSD

Date: 28.JUL.2009 22:47:40

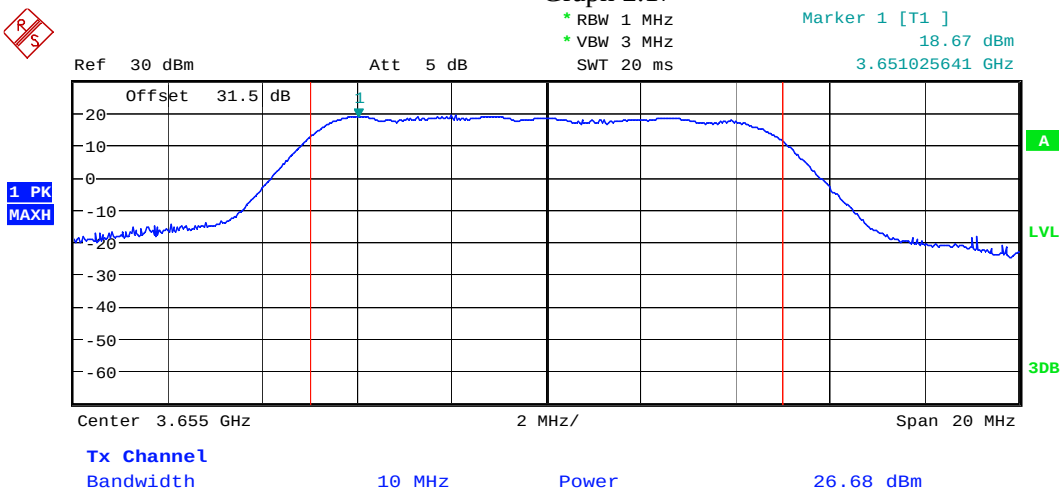
Graph 2.16



LOW CHAN, 64QAM, PSD

Date: 28.JUL.2009 22:38:14

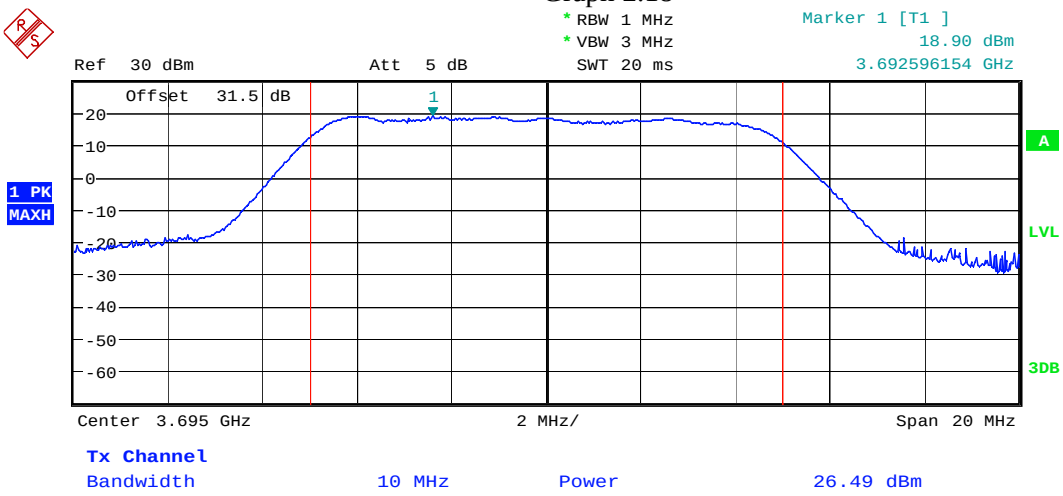
Graph 2.17



MID CHAN, 64QAM, PSD

Date: 28.JUL.2009 22:44:44

Graph 2.18



HIGH CHAN, 64QAM, PSD

Date: 28.JUL.2009 22:46:31

3.0 Occupied Bandwidth

FCC 2.1049, 90.209(b)(5)

3.1 Test Procedure

The EUT RF output was connected as shown on the diagram in report section 1.3.2. The EUT was setup to transmit the maximum power.

The spectrum analyzed was setup to measure the Occupied Bandwidth (defined as the 99% Power Bandwidth). The Occupied Bandwidth was measured at the low, middle and high channels for all types of modulation and authorized bandwidths.

3.2 Test Equipment

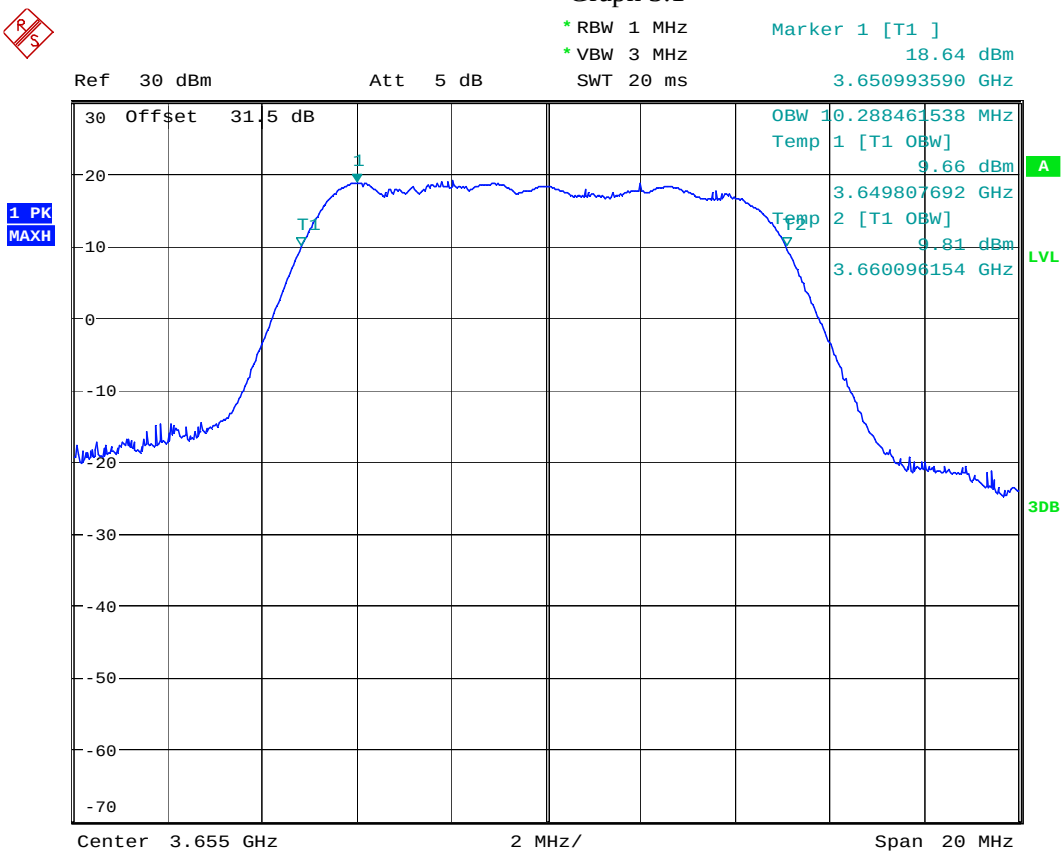
Rohde & Schwarz FSU26 Spectrum Analyzer

3.3 Test Results

Frequency (MHz)	Modulation	Channel Bandwidth (MHz)	Measured Occupied Bandwidth (MHz)	Graph
3655	QPSK	10	10.29	3.1
	16 QAM		10.26	3.2
	64 QAM		10.26	3.3
3675	QPSK	10	10.19	3.4
	16 QAM		10.19	3.5
	64 QAM		10.19	3.6
3695	QPSK	10	10.29	3.7
	16 QAM		10.29	3.8
	64 QAM		10.29	3.9

For more details refer to the attached Graphs.

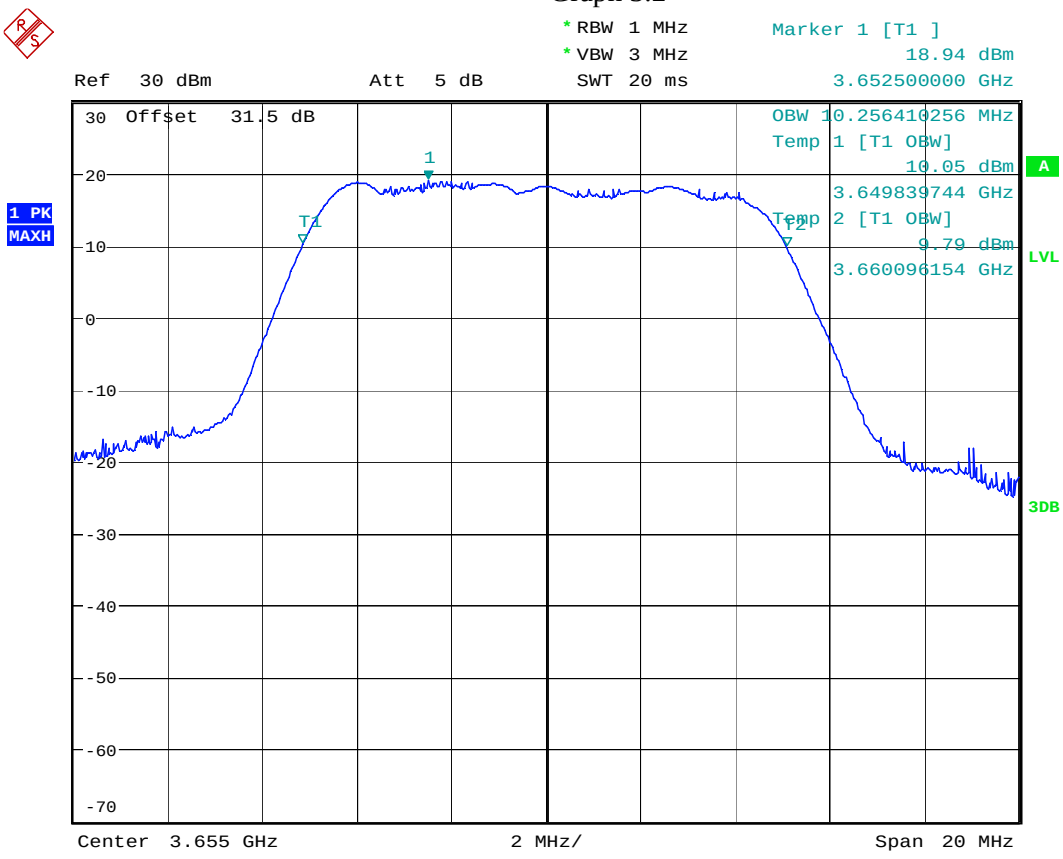
Graph 3.1



LOW CHAN, QPSK, BW

Date: 28.JUL.2009 23:01:11

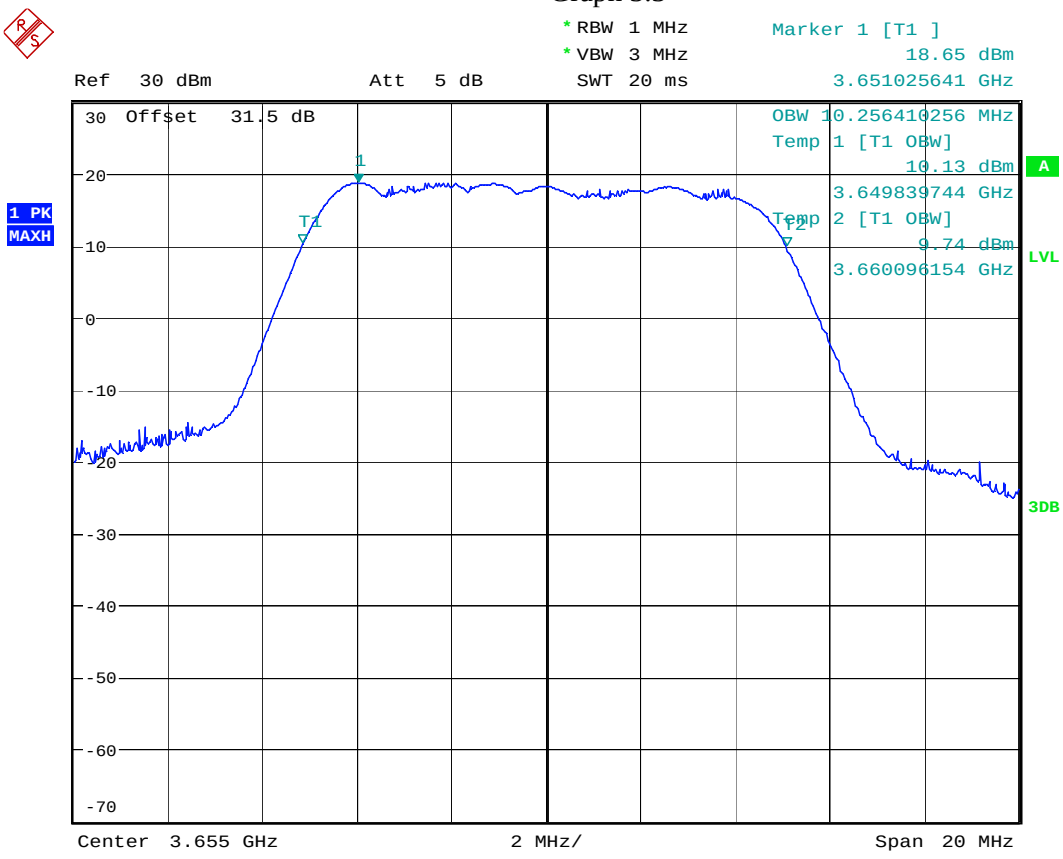
Graph 3.2



LOW CHAN, 16QAM, BW

Date: 28.JUL.2009 23:02:23

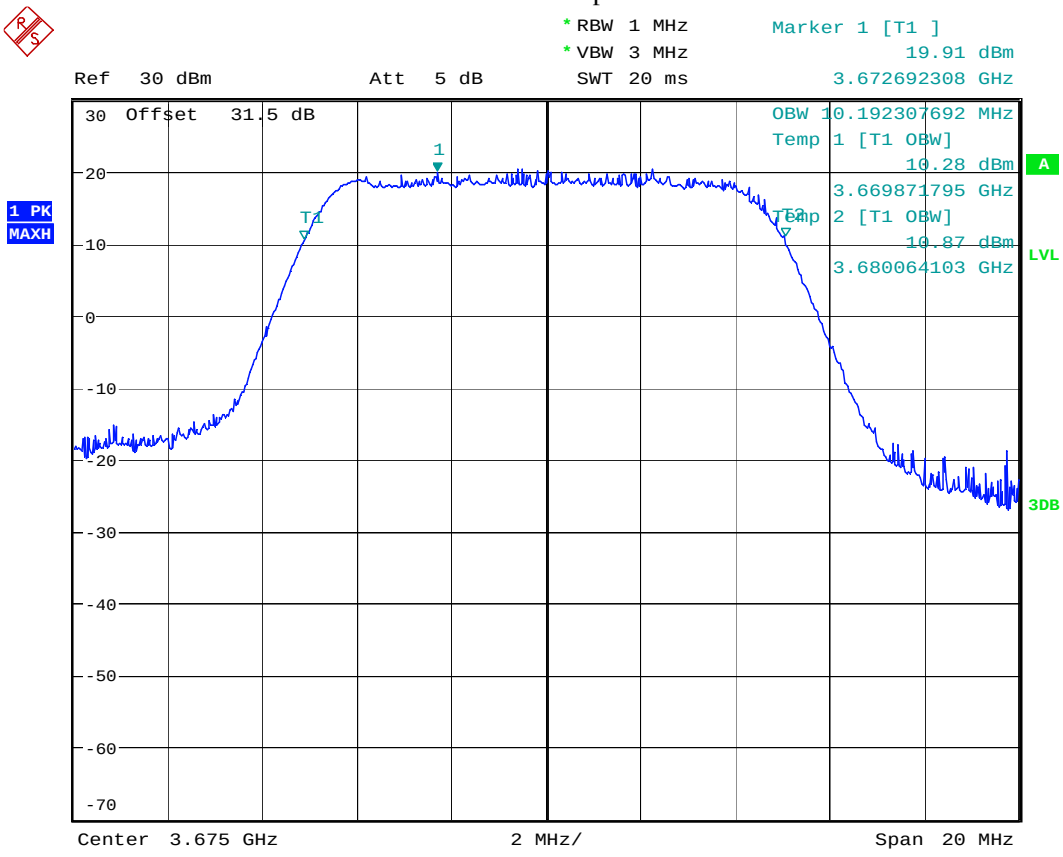
Graph 3.3



LOW CHAN, 64QAM, BW

Date: 28.JUL.2009 23:03:20

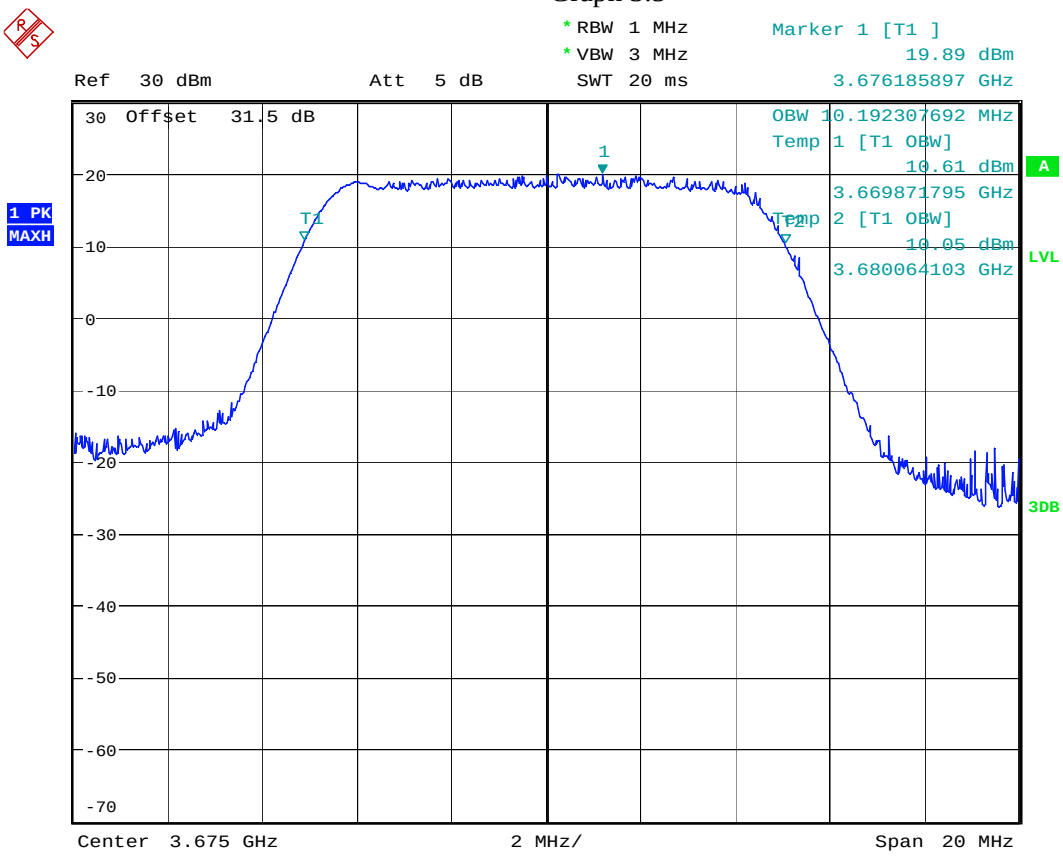
Graph 3.4



MID CHAN, QPSK, BW

Date: 28.JUL.2009 22:59:19

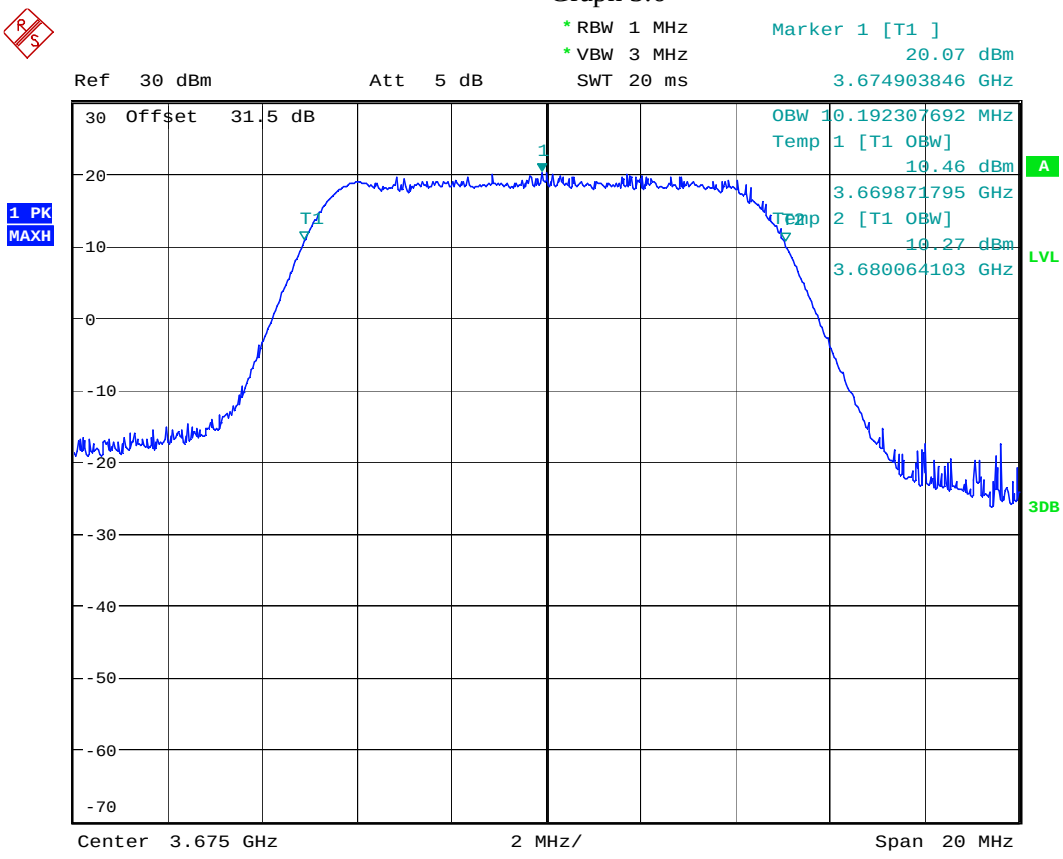
Graph 3.5



MID CHAN, 16QAM, BW

Date: 28.JUL.2009 22:58:39

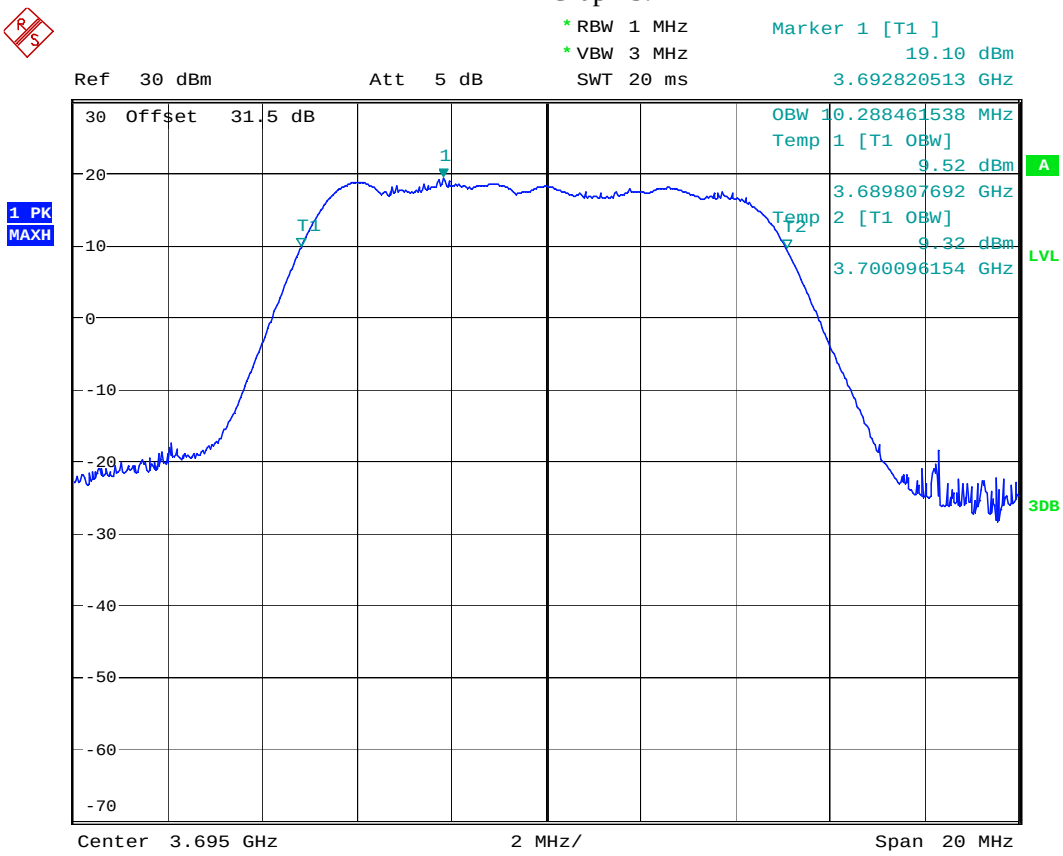
Graph 3.6



MID CHAN, 64QAM, BW

Date: 28.JUL.2009 22:57:56

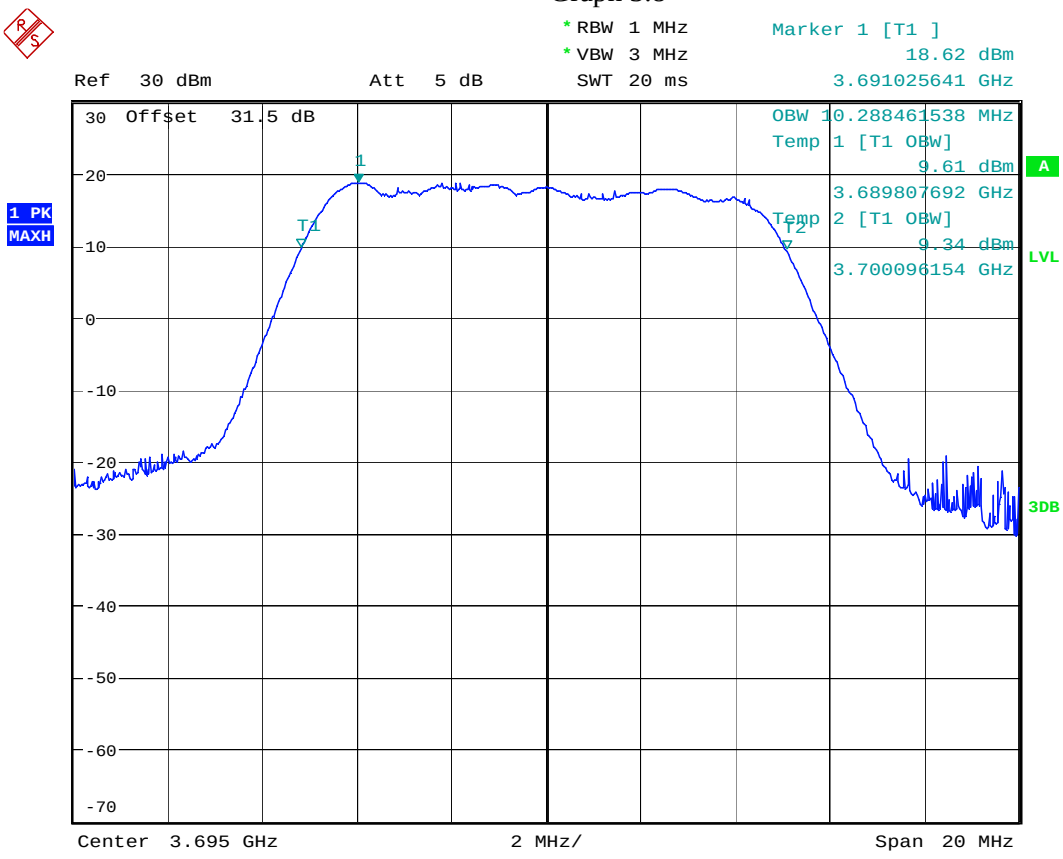
Graph 3.7



HIGH CHAN, QPSK, BW

Date: 28.JUL.2009 22:55:33

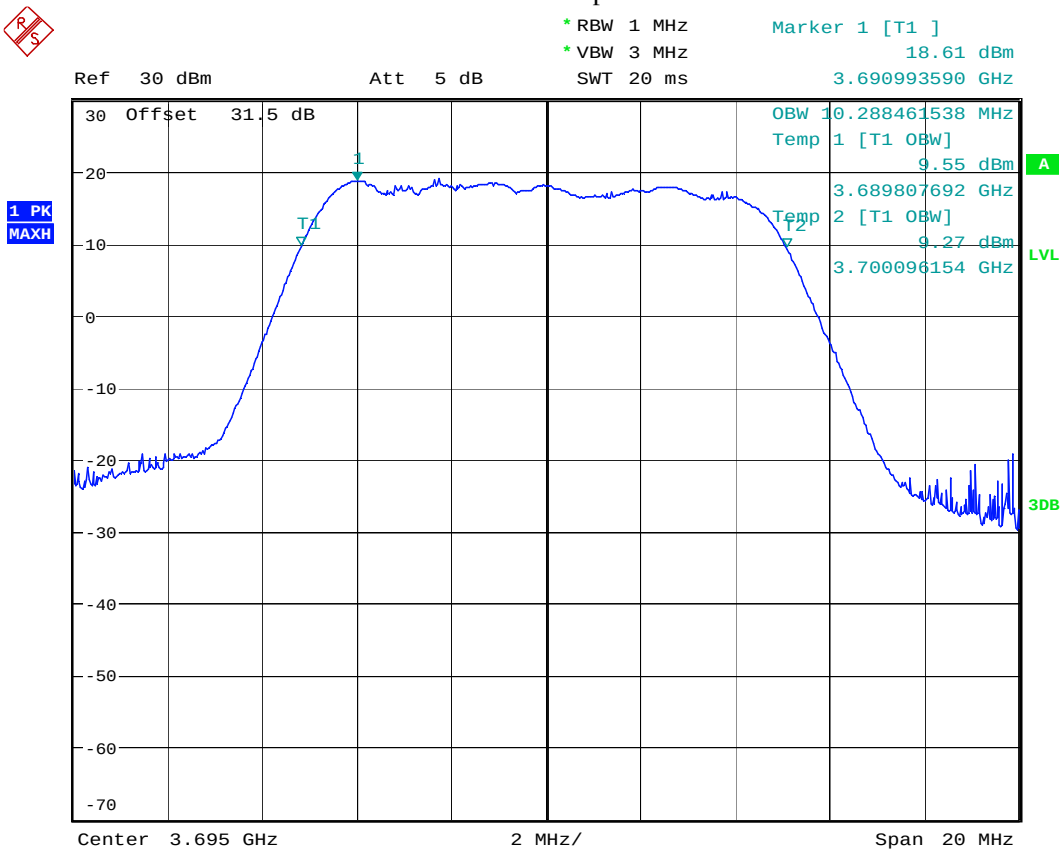
Graph 3.8



HIGH CHAN, 16QAM, BW

Date: 28.JUL.2009 22:56:18

Graph 3.9



HIGH CHAN, 64QAM, BW

Date: 28.JUL.2009 22:56:57

4.0 Spurious Emissions at Antenna Terminals

FCC 2.1051, 90.210, 90.1323

4.1 Requirement

90.210

*Emission Mask B. T*he power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

(1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.

(2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.

(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.

90.1323

The power of any emissions must be attenuated below the unmodulated carrier output power (P) on any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: at least (43 + 10 log P) dB.

Note: That corresponds to the level of -13 dBm for any out-of-band and spurious emissions.

4.3 Test Equipment

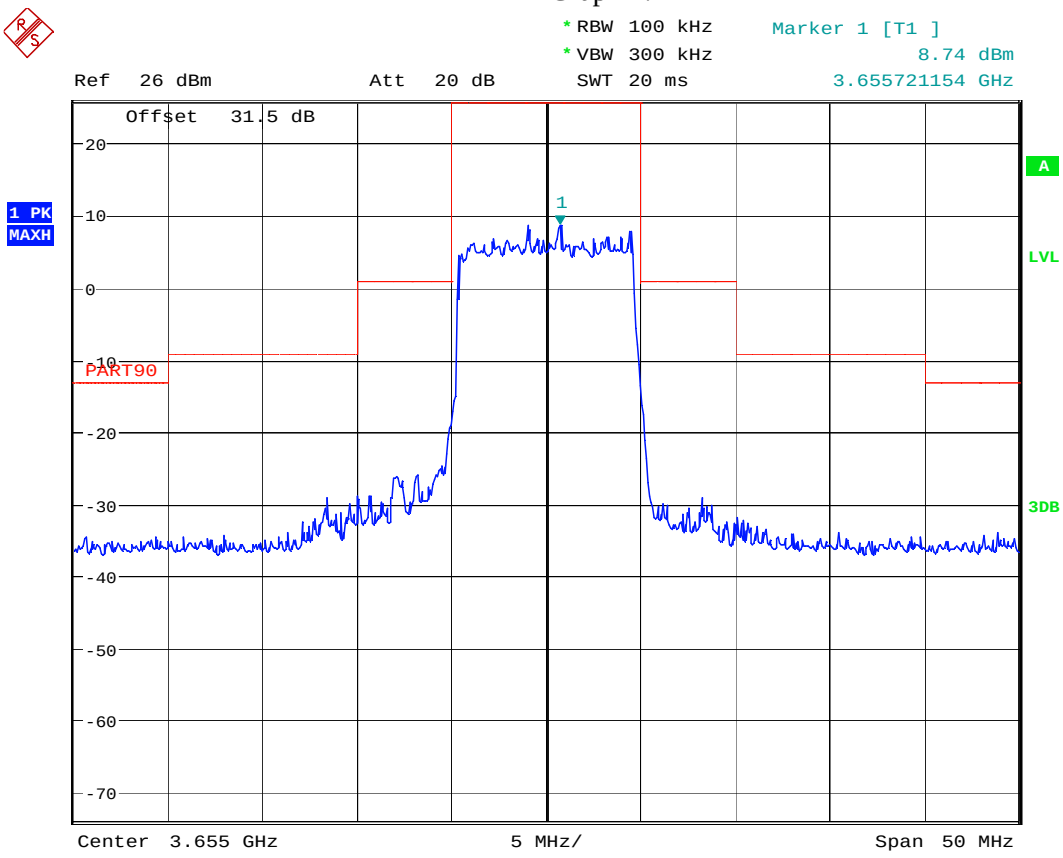
Rohde & Schwarz FSU26 and FSP40 Spectrum Analyzer

4.4 Test Results

Complies	Refer to the following Graphs

Measurements were made on the low, middle and high channels for all modulations. Data for out of band emissions is reported only for the modulation which had the worst case emissions which was QPSK.

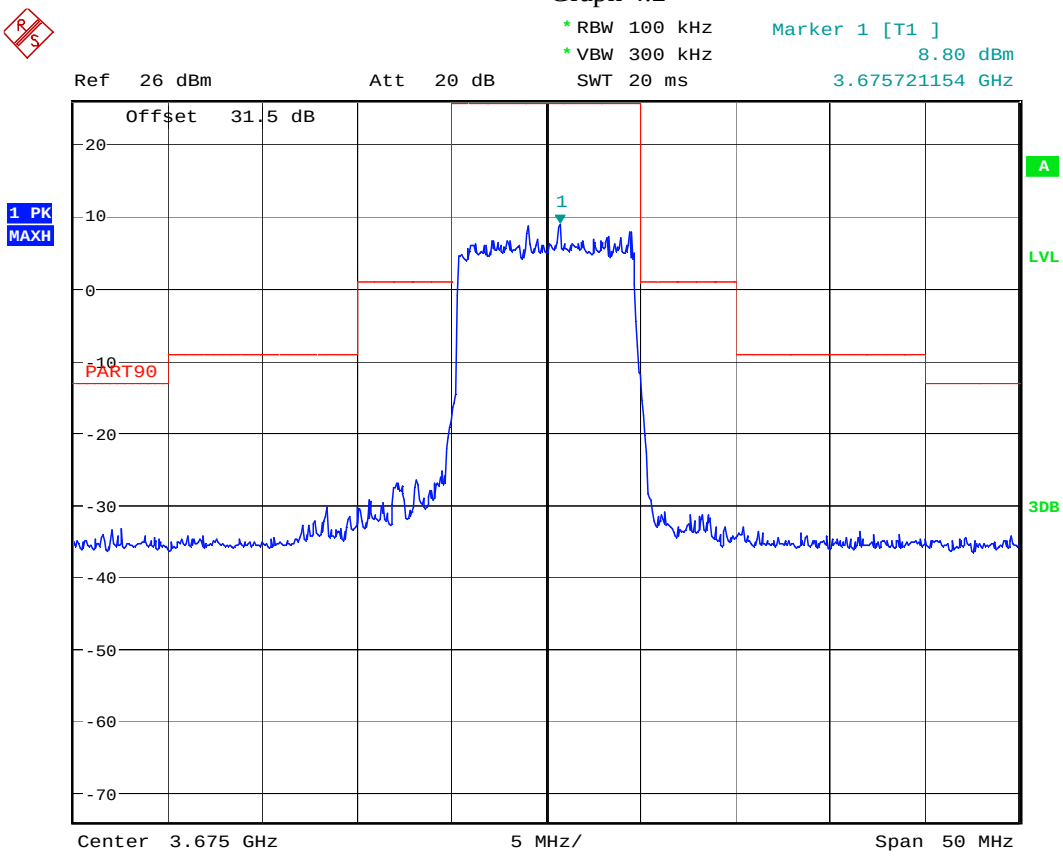
Emission Mask
Graph 4.1



LOW CHAN, QPSK, MASK

Date: 29.JUL.2009 19:32:20

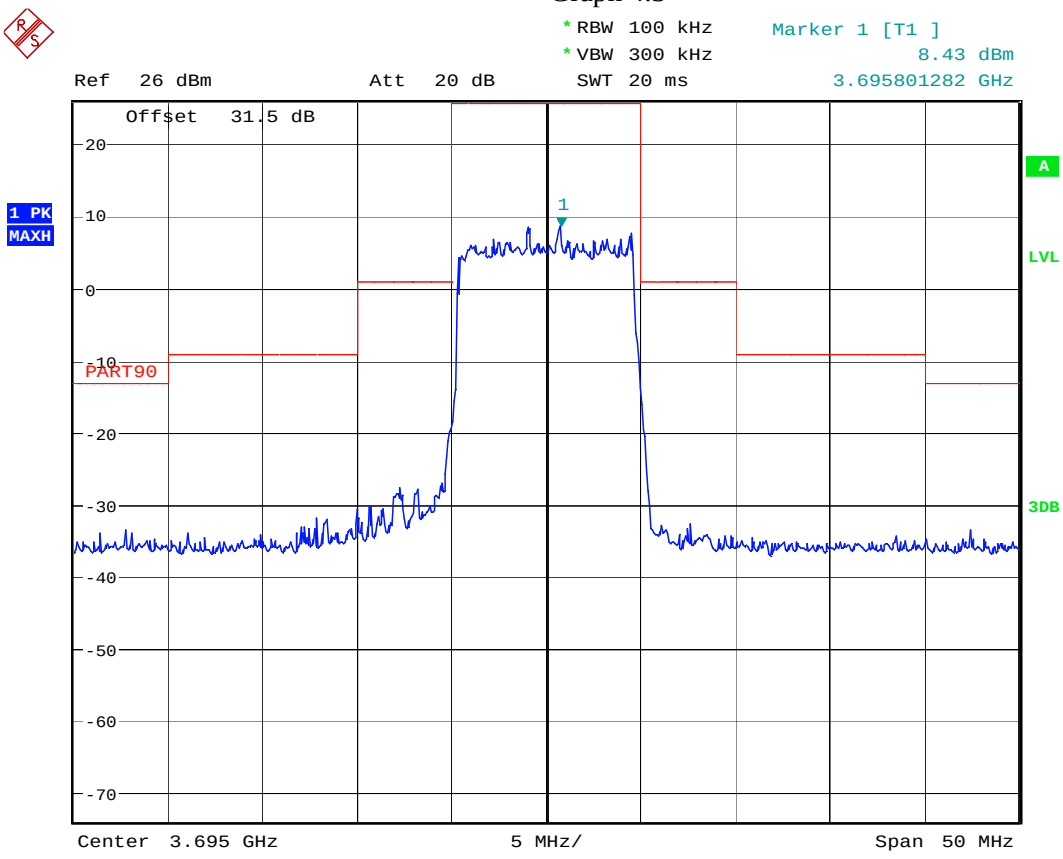
Graph 4.2



MID CHAN, QPSK, MASK

Date: 29.JUL.2009 19:34:33

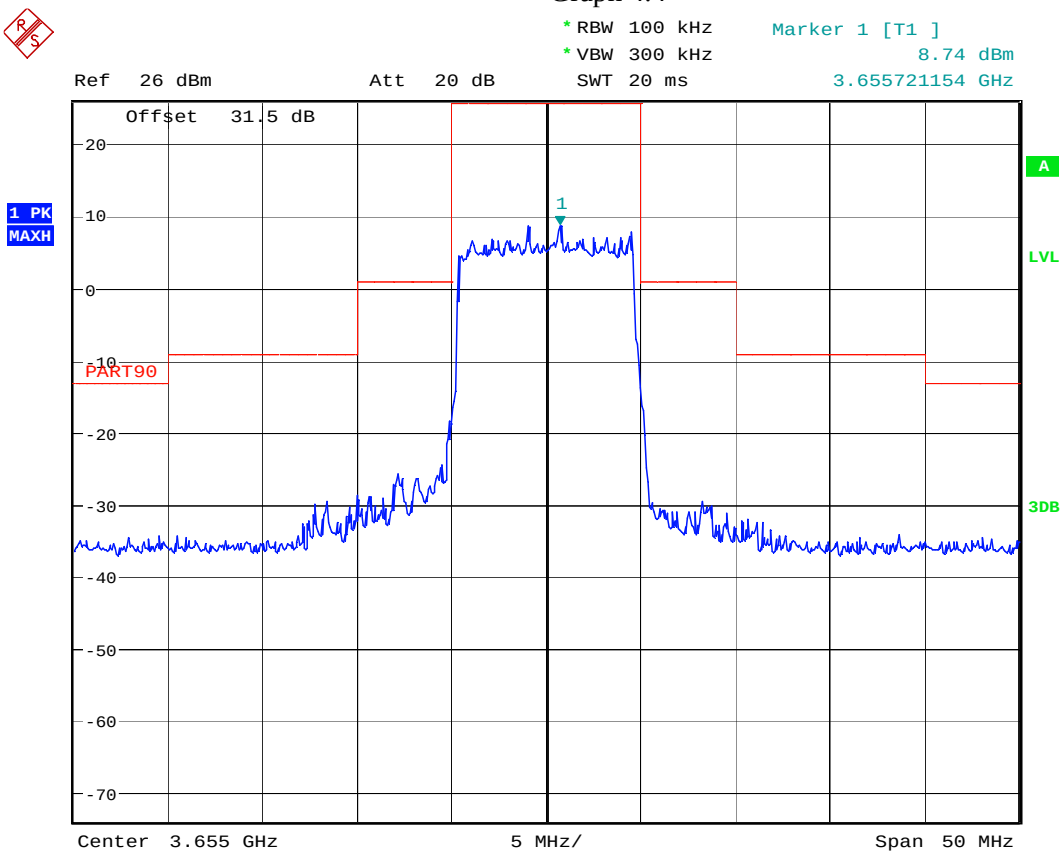
Graph 4.3



HIGH CHAN, QPSK, MASK

Date: 29.JUL.2009 19:42:51

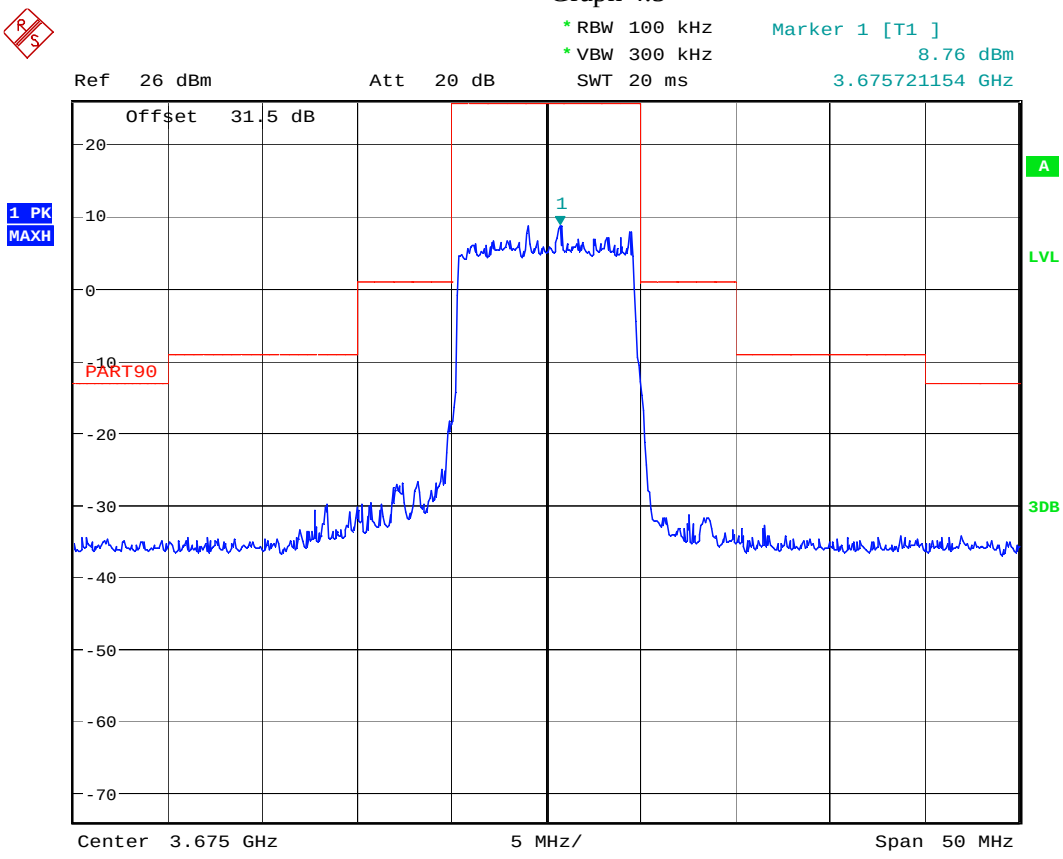
Graph 4.4



LOW CHAN, 16QAM, MASK

Date: 29.JUL.2009 19:31:25

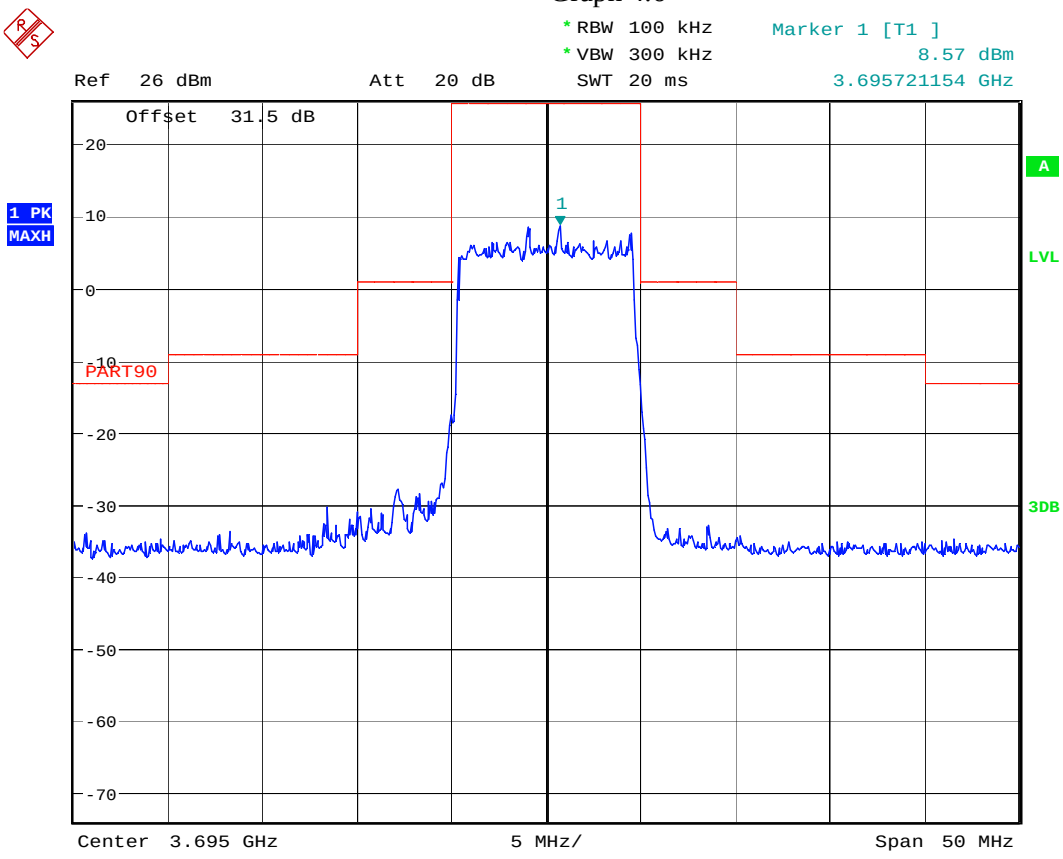
Graph 4.5



MID CHAN, 16QAM, MASK

Date: 29.JUL.2009 19:35:50

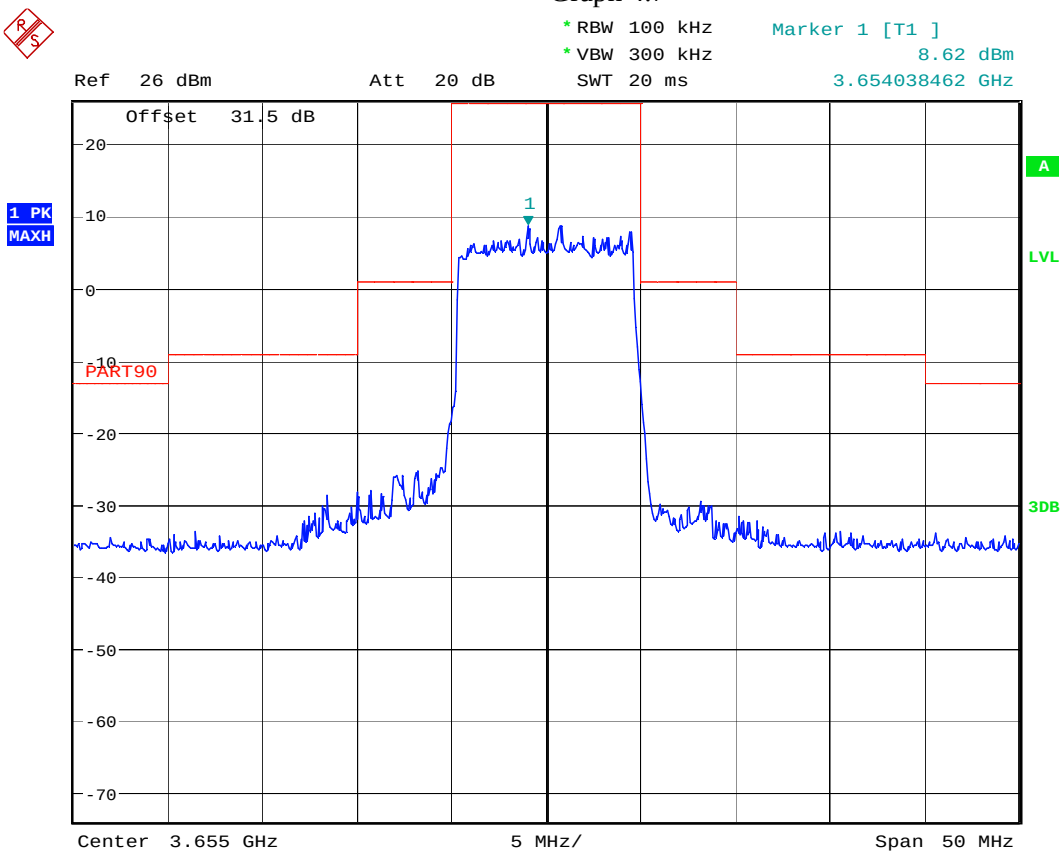
Graph 4.6



HIGH CHAN, 16QAM, MASK

Date: 29.JUL.2009 19:41:56

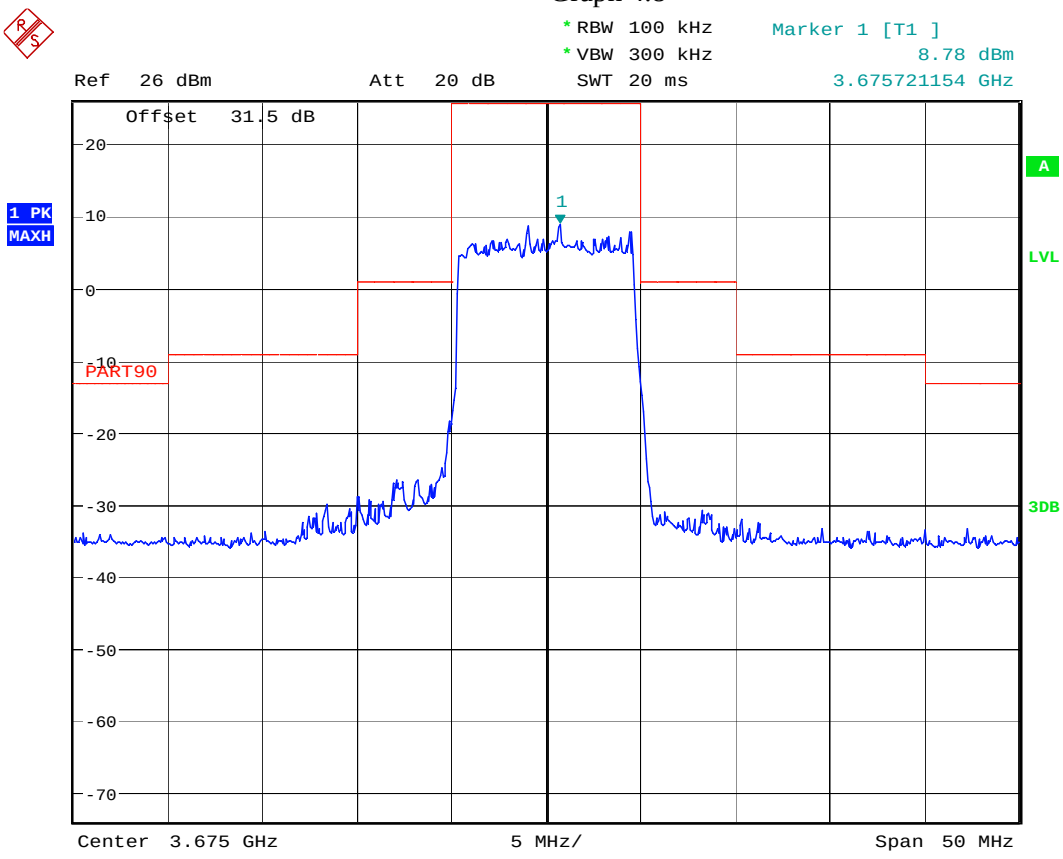
Graph 4.7



LOW CHAN, 64QAM, MASK

Date: 29.JUL.2009 19:30:31

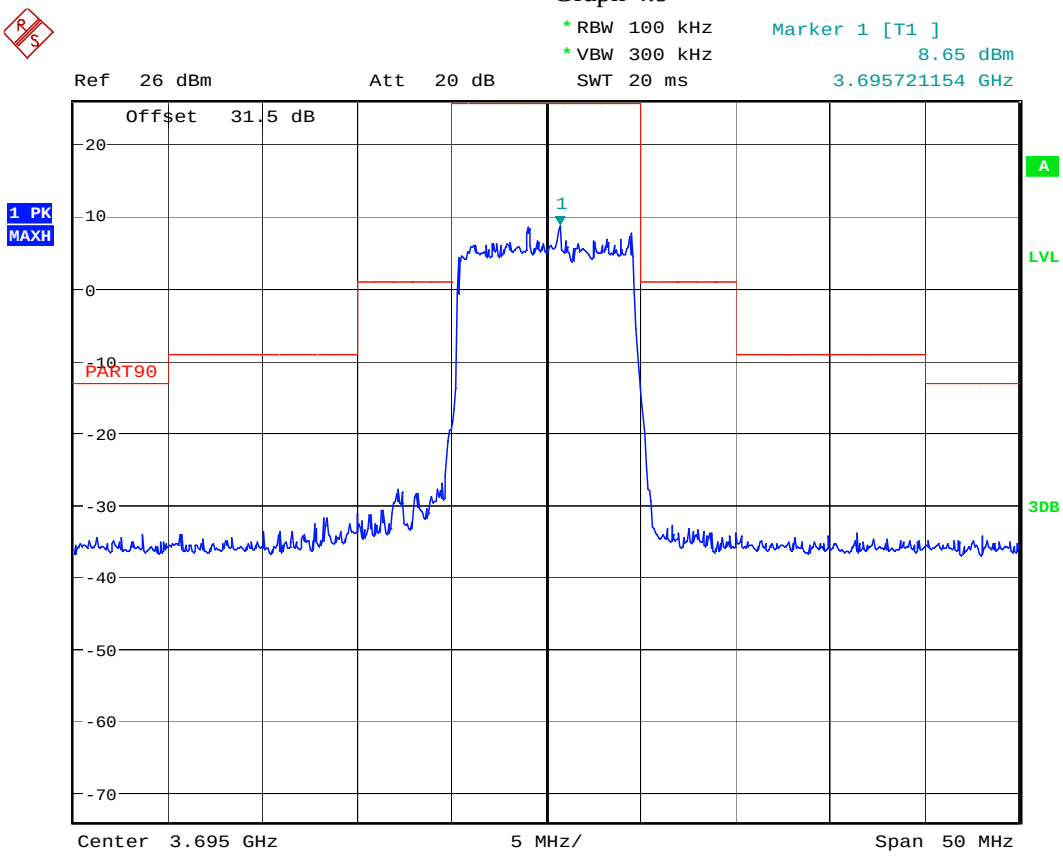
Graph 4.8



MID CHAN, 64QAM, MASK

Date: 29.JUL.2009 19:40:04

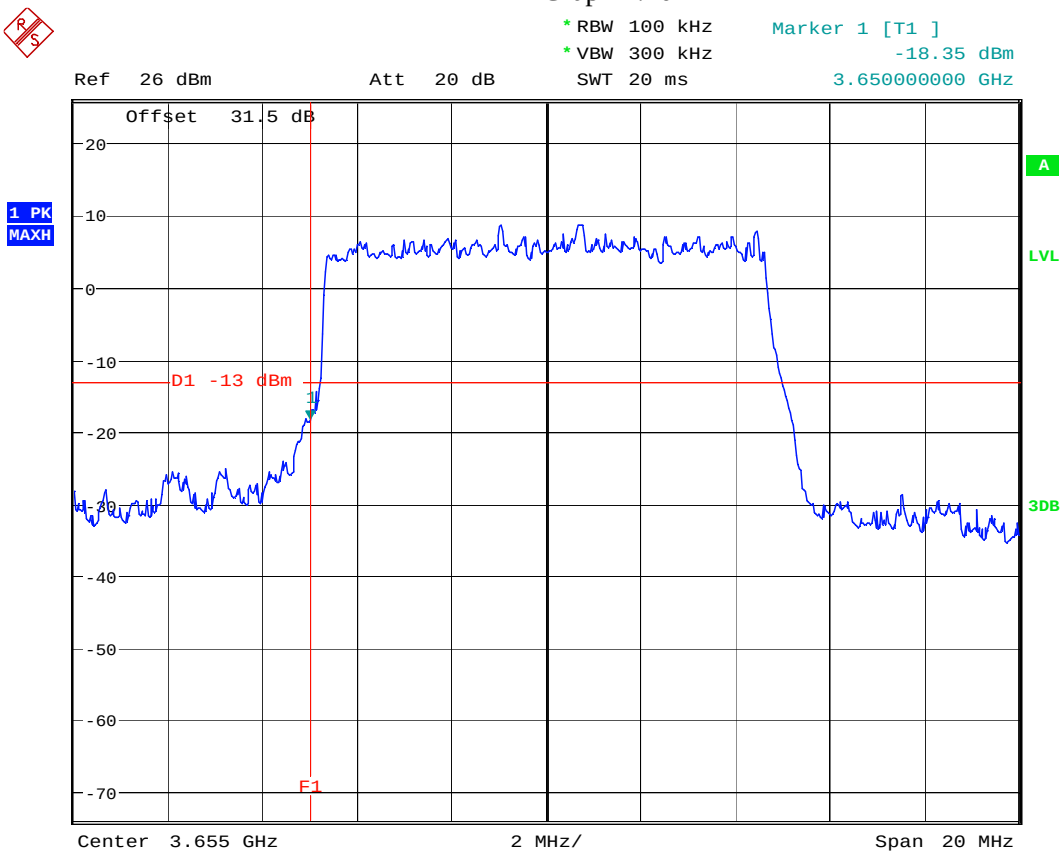
Graph 4.9



HIGH CHAN, 64QAM, MASK

Date: 29.JUL.2009 19:41:14

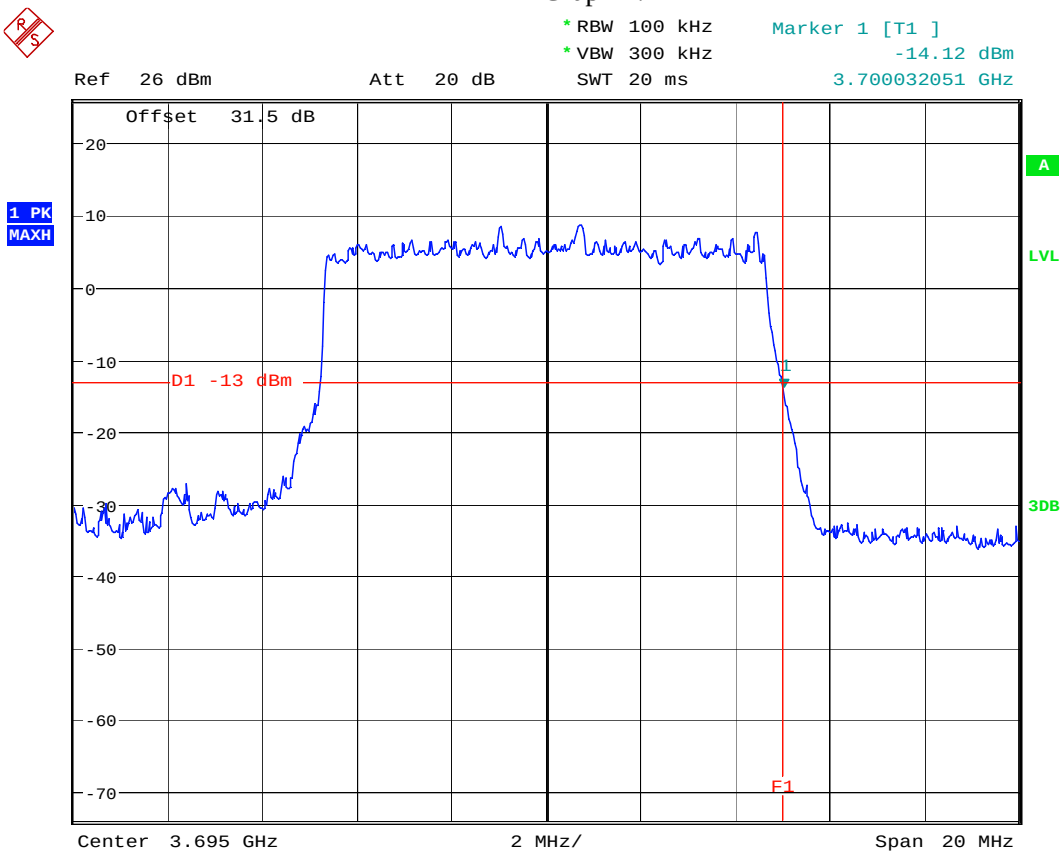
Lower Bandedge
Graph 4.10



LOW CHAN, QPSK, LOWER BANDEDGE

Date: 29.JUL.2009 20:07:39

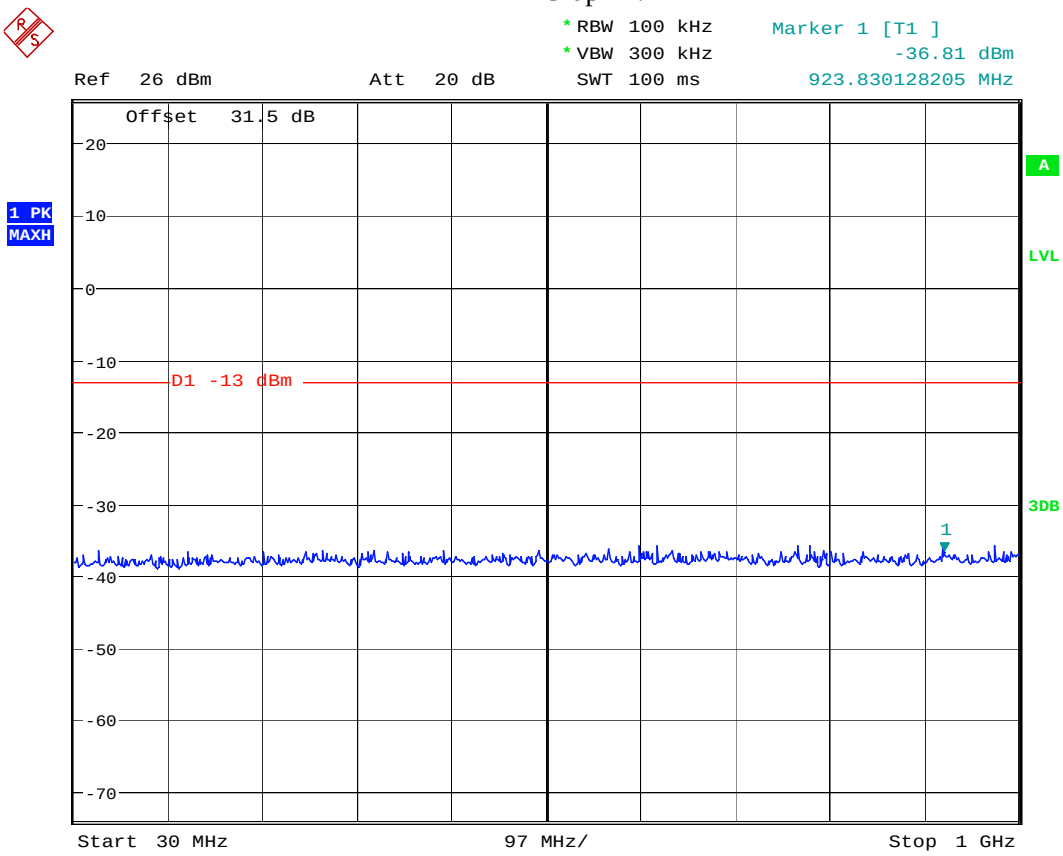
Upper Bandedge
Graph 4.11



HIGH CHAN, QPSK, UPPER BANDEDGE

Date: 29.JUL.2009 19:47:30

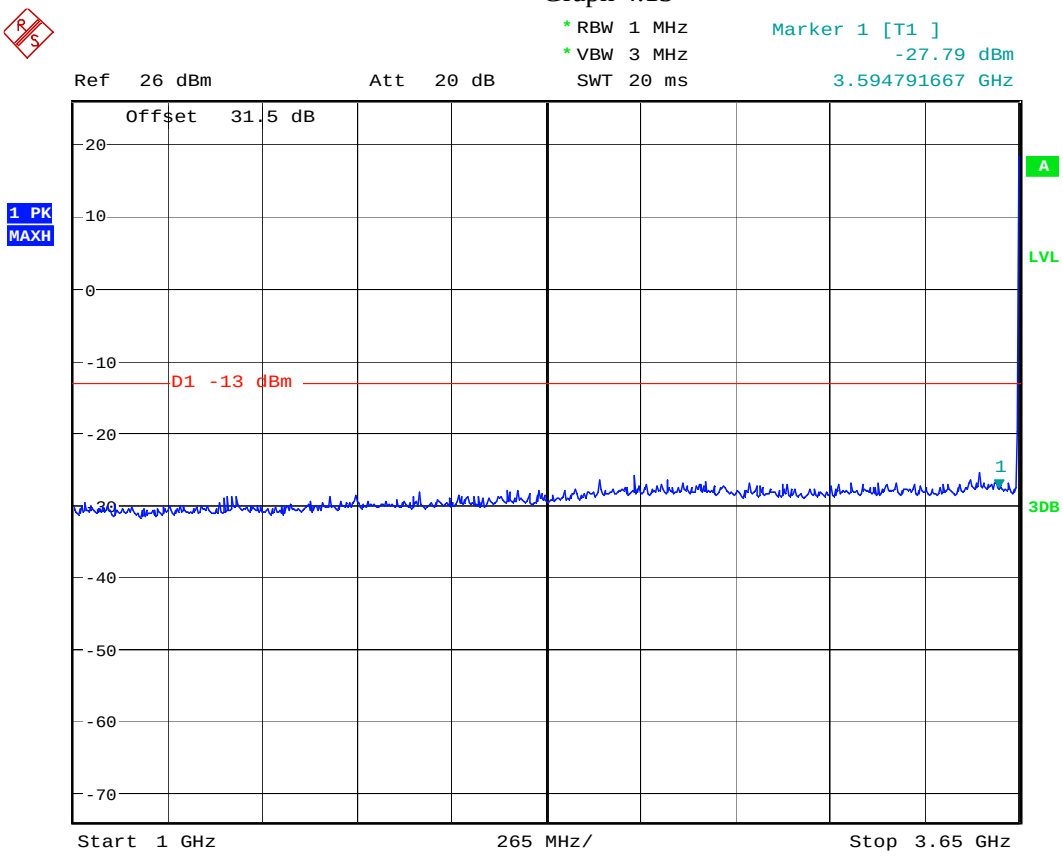
Conducted Spurious Emission
Graph 4.12



LOW CHAN, QPSK, SPURIOUS EMISSIONS

Date: 29.JUL.2009 20:15:20

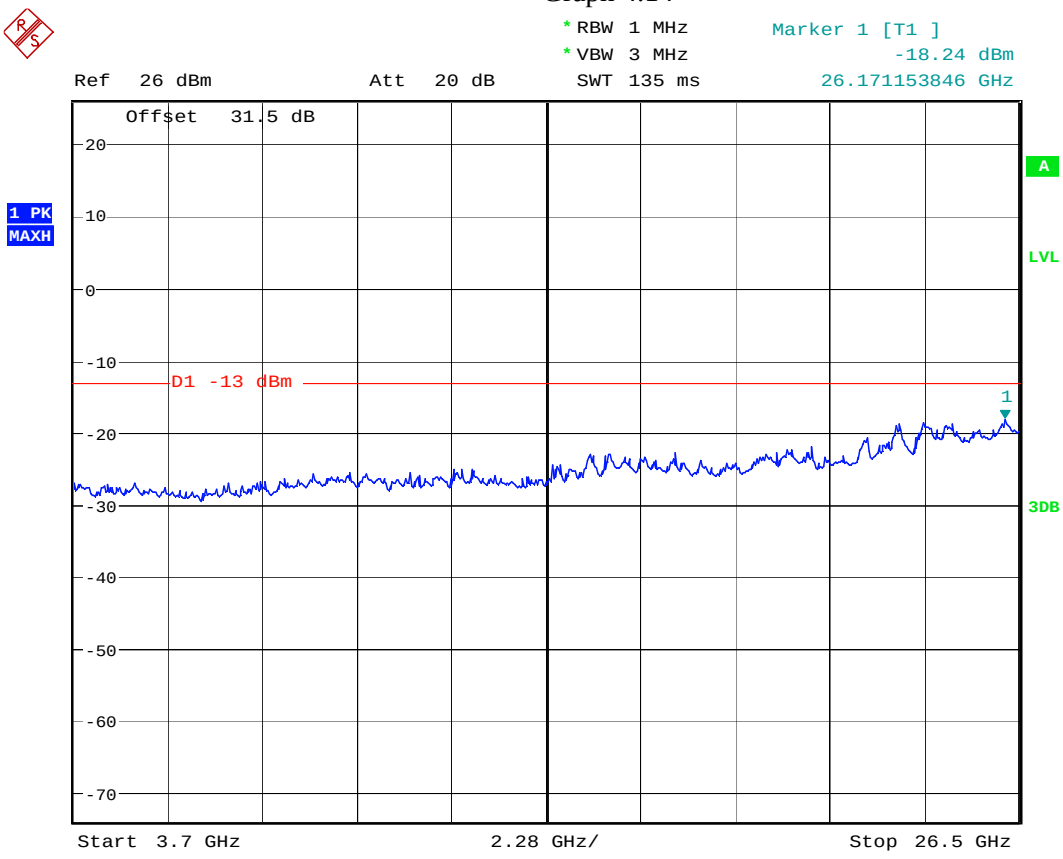
Graph 4.13



LOW CHAN, QPSK, SPURIOUS EMISSIONS

Date: 29.JUL.2009 20:14:33

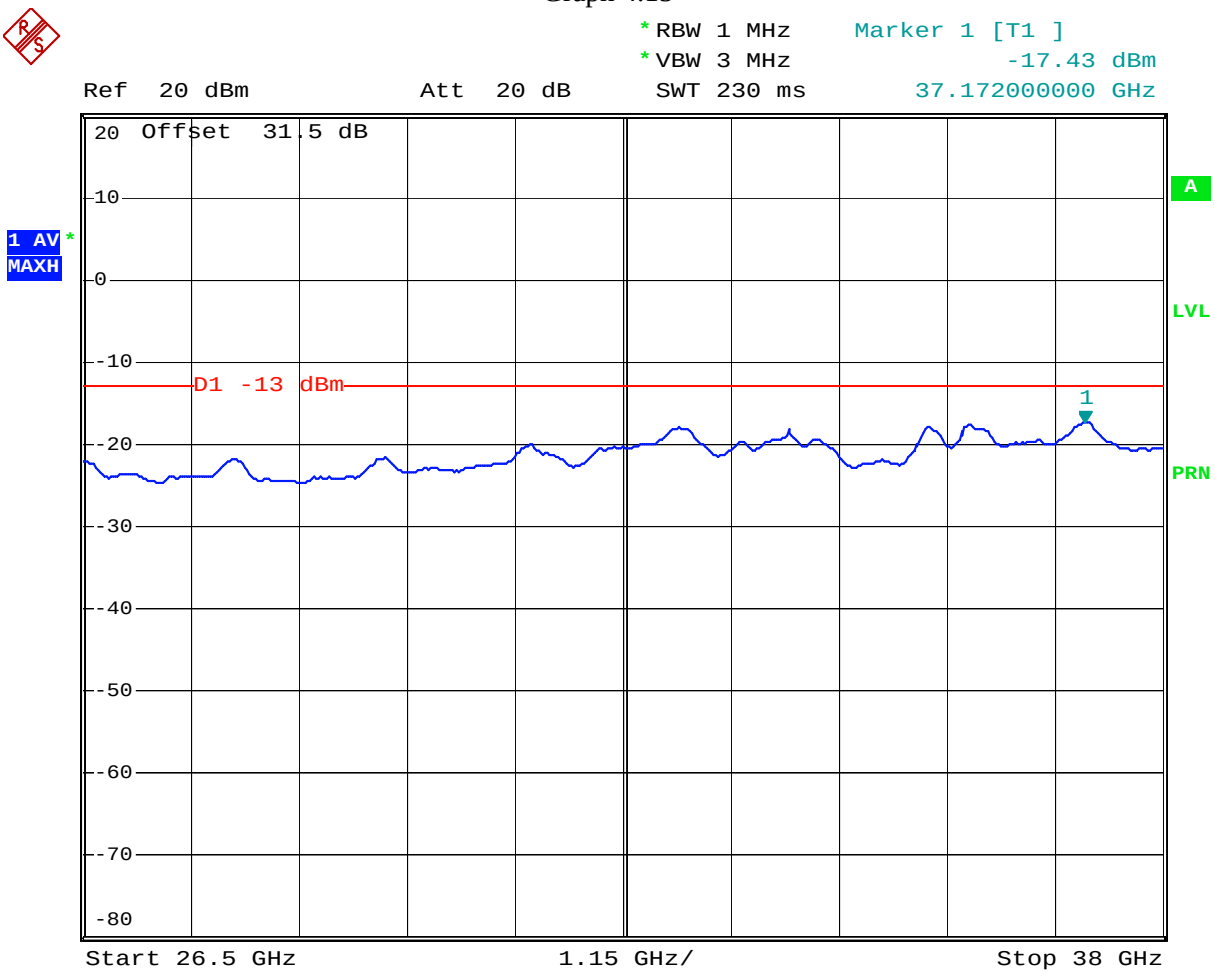
Graph 4.14



LOW CHAN, QPSK, SPURIOUS EMISSIONS

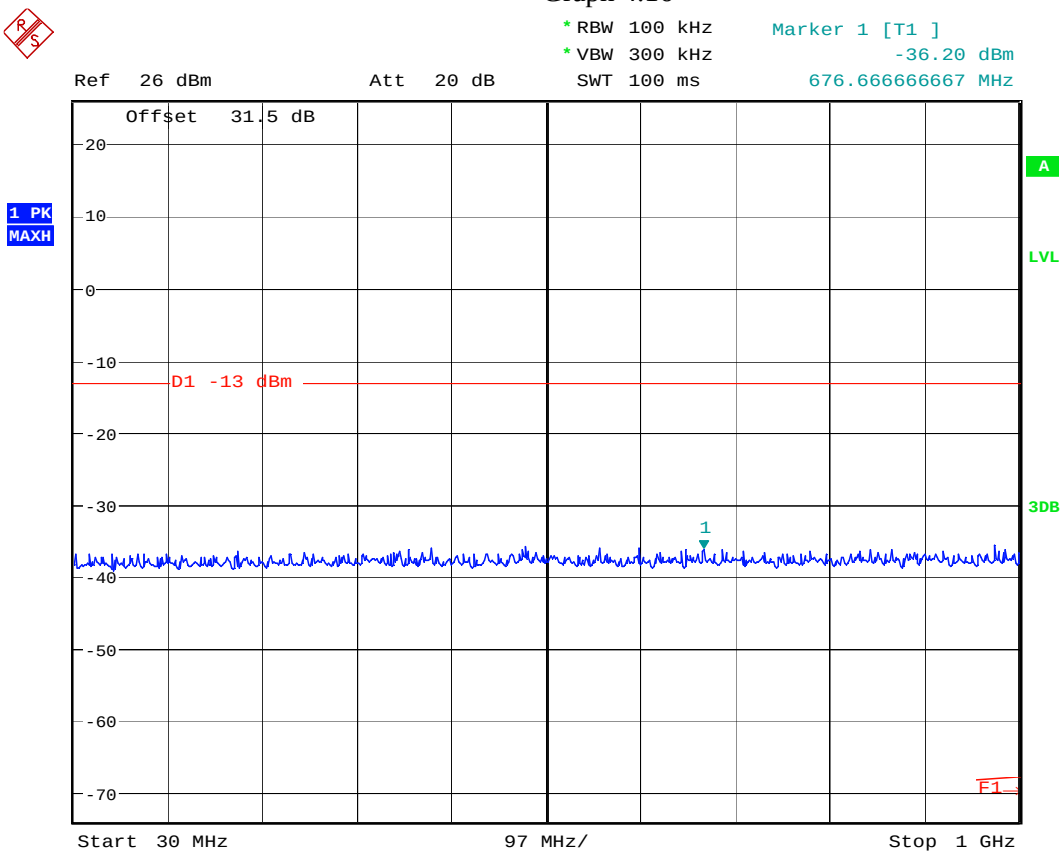
Date: 29.JUL.2009 20:17:13

Graph 4.15



Comment: LOW CHAN, QPSK, SPURIOUS EMISSIONS
Date: 29.JUL.2009 12:06:57

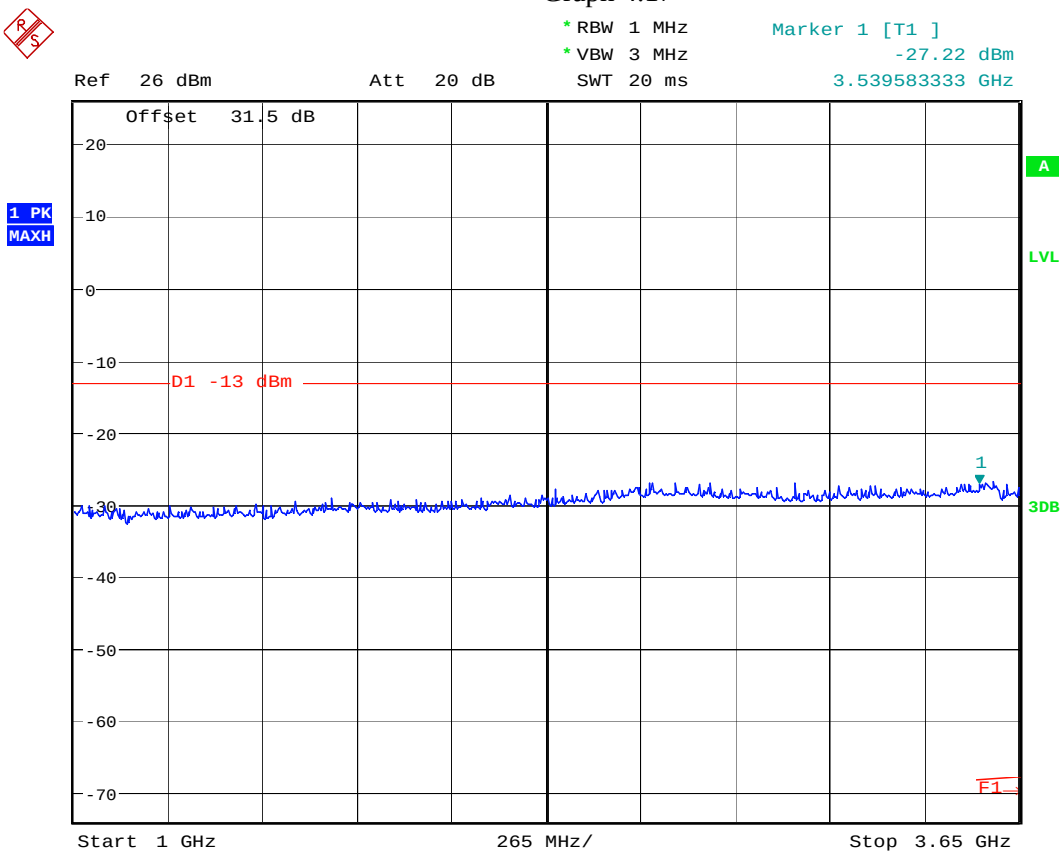
Graph 4.16



HIGH CHAN, QPSK, SPURIOUS EMISSIONS

Date: 29.JUL.2009 20:00:45

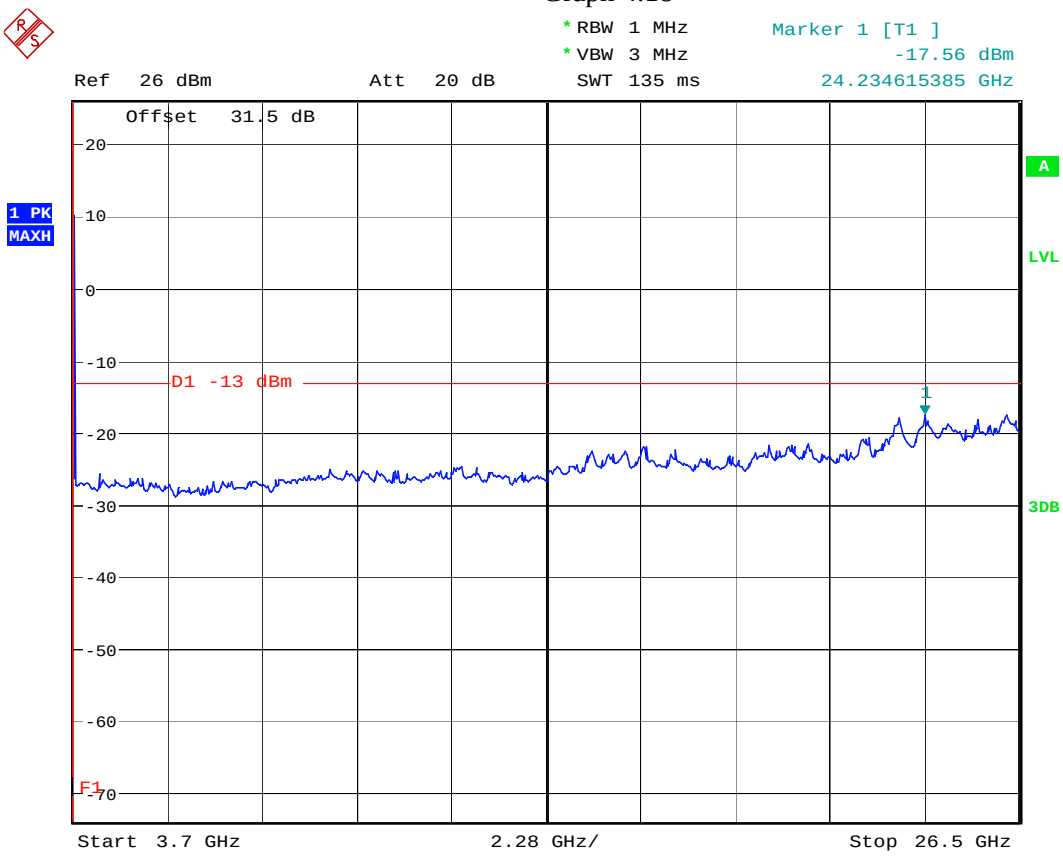
Graph 4.17



HIGH CHAN, QPSK, SPURIOUS EMISSIONS

Date: 29.JUL.2009 20:01:58

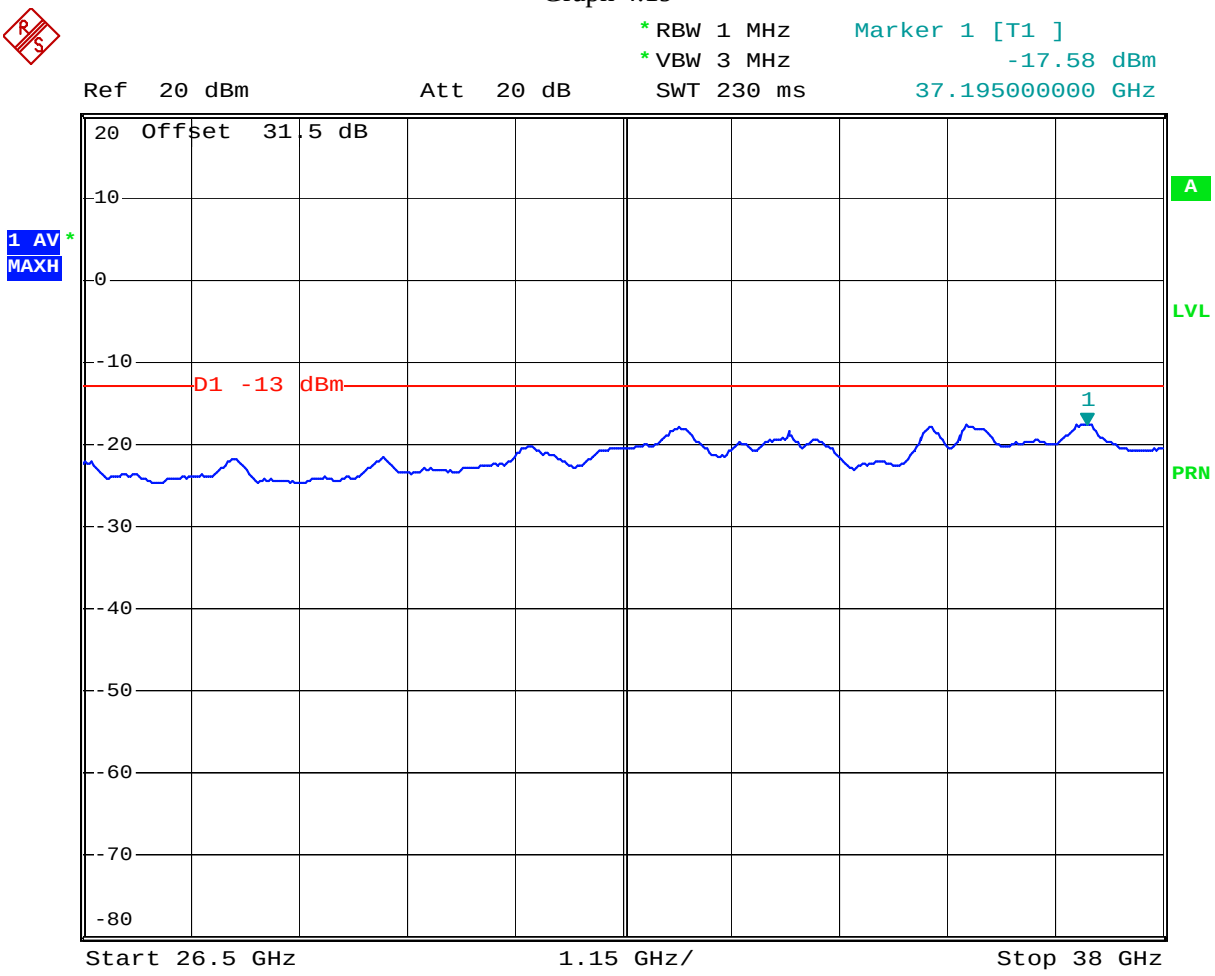
Graph 4.18



HIGH CHAN, QPSK, SPURIOUS EMISSIONS

Date: 29.JUL.2009 19:57:34

Graph 4.19



Comment: HIGH CHAN, QPSK, SPURIOUS EMISSIONS
Date: 29.JUL.2009 12:10:02

5.0 Spurious Radiation

FCC 2.1053, 90.210, 90.1323

5.1 Requirement

The power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or less, but at least one percent of the emission bandwidth of the fundamental emission of the transmitter, provided the measured energy is integrated over a 1 MHz bandwidth.

5.2 Test Procedure

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

The frequency range up to 10th harmonic of each of the three fundamental frequency (low, middle, and high channels) was investigated. The worst case of emissions was reported.

5.3 Test Equipment

Roberts Antenna
EMCO 3115 Horn Antennas
Rohde & Schwarz FSP40 Spectrum Analyzer
Low Pass Filter
Preamplifiers

5.4 Test Results

Spurious Radiated Emissions

Intertek Testing Services
Radiated Emissions
(Pk-Horizontal)
Operator: AK Model Number: Quantum 1000

Current Time - 11:39:31 AM, Thursday, July 30, 2009 Company: PureWave Networks

Frequency	Pk Level	Limit@3m	Pk Margin	Raw	Cable	Preamp	AF
Hz	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(dB)	(dB)	dB(1/m)
7310.0	47.2	84.1	-36.9	33.7	9.5	33.4	37.4
120965.0	51.5	84.1	-32.6	32.9	12.4	34.0	40.2

Test mode: Low Channel
Temperature: 20 C
Humidity: 50 %

Intertek Testing Services
Radiated Emissions
(Pk-Horizontal)
Operator: AK Model Number: Quantum 1000

Current Time - 11:39:31 AM, Thursday, July 30, 2009 Company: PureWave Networks

Frequency	Pk Level	Limit@3m	Pk Margin	Raw	Cable	Preamp	AF
Hz	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(dB)	(dB)	dB(1/m)
7350.0	47.6	84.1	-36.5	34.1	9.5	33.4	37.4
11025.0	48.4	84.1	-35.7	29.8	12.4	34.0	40.2

Test mode: Mid Channel
Temperature: 20 C
Humidity: 50 %

Spurious Radiated Emissions

Intertek Testing Services
Radiated Emissions 1 GHz - 10 GHz
(Pk-Horizontal)
Operator: AK Model Number: Quantum 1000

Current Time - 11:39:31 AM, Thursday, July 30, 2009 Company: PureWave Networks

Frequency	Pk Level	Limit@3m	Pk Margin	Raw	Cable	Preamp	AF
Hz	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(dB)	(dB)	dB(1/m)
7390.0	47.4	84.1	-36.7	33.9	9.5	33.4	37.4
11085.0	50.1	84.1	-34.0	31.5	12.4	34.0	40.2

Test mode: High Channel
Temperature: 20 C
Humidity: 50 %

All other emission are at least 20dB below the limit.

Result	Complies

6.0 Frequency Stability vs Temperature and Voltage

FCC 2.1055, 90.213

6.1 Requirement

The frequency stability shall be measured with variation of ambient temperature as follows:

From −30° to +50° centigrade. Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10° centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement.

The frequency stability shall be measured with variation of primary supply voltage as follows:

Vary primary supply voltage from 85 to 115 percent of the nominal value.

6.2 Test Procedure

The EUT was placed inside the temperature chamber. The RF power output was connected to frequency counter. The EUT was setup to transmit the maximum power.

After the temperature stabilized for approximately 20 minutes, the transmitting frequency was measured by the frequency counter and recorded.

At the room temperature, the frequency was measured when the EUT was powered with the nominal voltage and with 85% and 115% of the nominal voltage.

6.3 Test Equipment

Temperature Chamber
Frequency counter

6.4 Test Results

Nominal frequency: 3,676,000,240 Hz

Temperature (°C)	**Measured Frequency** Hz	**Maximum deviation from nominal at 20°C Hz**
-30	3,676,000,280	+40
-20	3,676,000,318	+78
-10	3,676,000,484	+244
0	3,676,000,051	-189
10	3,676,000,802	+562
20	**3,676,000,240**	**0**
30	3,676,000,670	+430
40	3,676,000,339	+99
50	3,676,000,446	+206

DC Voltage	**Measured Frequency Hz**	**Maximum deviation from nominal at 20°C Hz**
-48V Nominal	**3,676,000,240**	**-**
85%	3,676,000,242	+2
115%	3,676,000,243	+3

Result	Complies

7.0 RF Exposure evaluation

FCC 2.1091

The maximum calculated EIRP is 10W.

Using the formula for the Power Density, $S = EIRP/ 4\pi D^2$, D = distance, where the Maximum Permissible Exposure (MPE) satisfies the FCC 1.1310 limit for General Population/Uncontrolled Exposure, can be calculated as:

$$D \geq \sqrt{(EIRP/ 4\pi S)}$$

The MPE Limit is 1 mW/cm^2, therefore $D \geq 28$ cm

The Statement that a minimum separation distance of 28 cm between the antenna and persons must be maintained is included in the User's manual.

8.0 Emission from Digital Parts and Receiver

8.1 Radiated emissions
FCC 15.109

8.1.1 Test Limit

Radiated Emission Limit for FCC Part 15 Subpart B

Radiated Emission Limits for Class A at 10 meters	
Frequency (MHz)	**Quasi-Peak limits, dB (μV/m)**
30 to 88	39.1
88 to 216	43.5
216 to 960	46.4
960 and up	49.5
Radiated Emission Limits for Class B at 3 meters	
Frequency (MHz)	**Quasi-Peak limits, dB (μV/m)**
30 to 88	40.0
88 to 216	43.5
216 to 960	46.0
960 and up	54.0

8.1.2 Test Procedure

Measurements are conducted with a quasi-peak detector instrument in the frequency range of 30 MHz to 1000 MHz and with the average detector instrument in the frequency range above 1000 MHz. The measuring receiver meets the requirements of Section One of CISPR 16 and the measuring antenna correlates to a balanced dipole.

Measurements of the radiated field are made with the antenna located at a distance of 10 meters from the EUT. If the field-strength measurements at 10m cannot be made because of high ambient noise level or for other reasons, measurements of Class B equipment may be made at a closer distance, for example 3m. An inverse proportionality factor of 20 dB per decade should be used to normalize the measured data to the specified distance for determining compliance.

The antenna is adjusted between 1m and 4m in height above the ground plane for maximum meter reading at each test frequency.

The antenna-to-EUT azimuth is varied during the measurement to find the maximum field-strength readings.

The antenna-to-EUT polarization (horizontal and vertical) is varied during the measurements to find the maximum field-strength readings.

The EUT, where intended for tabletop use, is placed on a table whose top is 0.8m above the ground plane. The table is constructed of non-conductive materials. Its dimensions are 1m by 1.5m, but may be extended for a larger EUT.

Floor standing EUTs are placed on a horizontal metal ground plane and isolated from the ground plane by 3 to 12 mm of insulating material.

Equipment setup for radiated emission tests followed the guidelines of ANSI C63.4 (2003).

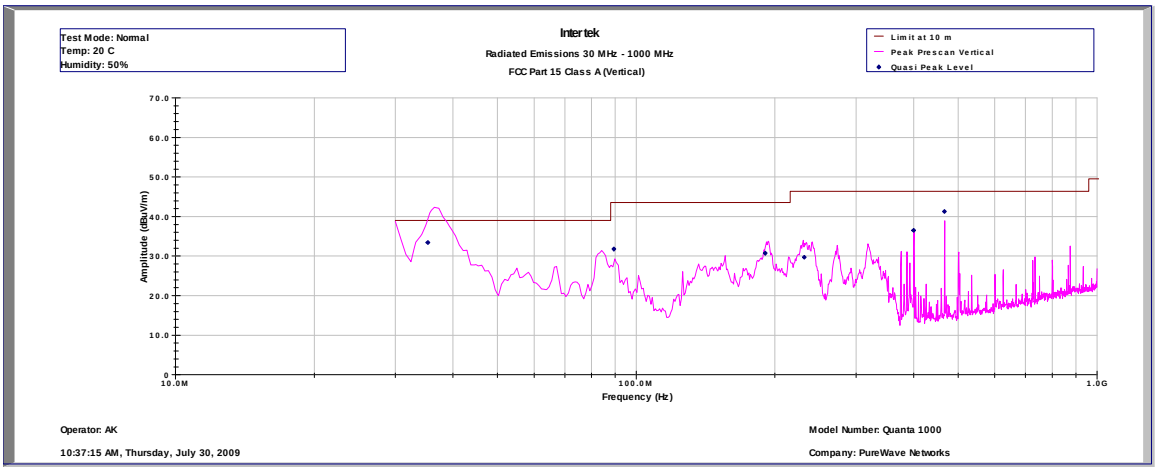
Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG + DF

Where FS = Field Strength in dB(µV/m)
RA = Receiver Amplitude (including preamplifier) in dB(µV)
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB(1/m)
AG = Amplifier Gain in dB

8.1.3 Test Results



Intertek Testing Services
Radiated Emissions 30 MHz - 1000 MHz
FCC Part 15 Class A (QP-Vertical)

Operator: AK

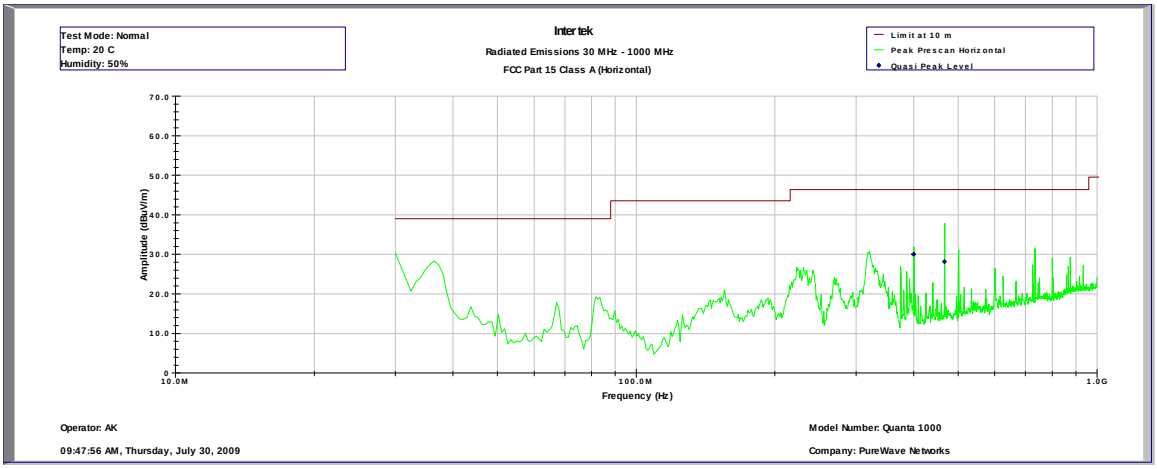
Model Number: Quantum 1000

10:37:15 AM, Thursday, July 30, 2009

Company: PureWave Networks

Frequency	Quasi Pk FS	Limit@10m	Margin	RA	CF	AG	AF
Hz	dB(uV/m)	dB(uV/m)	dB	dB	dB	dB	dB(1/m)
3.53E+07	33.4	39	-5.6	58.3	0.6	32	6.5
8.94E+07	31.8	43.5	-11.7	55.7	1	32	7.1
1.91E+08	30.7	43.5	-12.8	50.3	1.4	31.9	10.9
2.31E+08	29.7	46.4	-16.7	47.7	1.6	31.9	12.3
4.00E+08	36.5	46.4	-9.9	49.8	2.1	32	16.6
4.67E+08	41.3	46.4	-5.1	52.9	2.3	32.1	18.2

Test Mode: Normal
Temp: 20 C
Humidity: 50%



Intertek Testing Services
Radiated Emissions 30 MHz - 1000 MHz
FCC Part 15 Class A (QP-Horizontal)

Operator: AK

Model Number: Quantum 1000

09:47:56 AM, Thursday, July 30, 2009

Company: PureWave Networks

Frequency	Quasi Pk FS	Limit@10m	Margin	RA	CF	AG	AF
Hz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB(1/m)
4.00E+08	30	46.4	-16.4	43.5	2.1	32	16.4
4.67E+08	28.2	46.4	-18.2	40	2.3	32.1	18

Test Mode: Normal
Temp: 20 C
Humidity: 50%

Result	Complies

9.0 List of Test Equipment

Measurement equipment used for compliance testing utilized the equipment on the following list:

Equipment	Manufacturer	Model/Type	Serial #	Cal Int	Cal Due
RF Filter Section	Hewlett Packard	85460A	3448A00267	12	07/01/10
EMI Receiver	Hewlett Packard	8546A	3710A00373	12	07/01/10
Spectrum Analyzer	Rohde&Schwarz	FSP40	036612004	12	10/03/09
BI-Log Antenna	EMCO	3143	9509	12	11/07/09
Pre-Amplifier	Sonoma	310N	185634	12	11/10/09
Pre-Amplifier	Miteq	AMF-4D-001180-24-10P	799159	12	07/28/10
Spectrum Analyzer	Rohde&Schwarz	FSU26	200482	12	11/20/09
Horn Antenna	EMCO	3115	9107-3712	12	10/22/09

10.0 Document History

Revision/ Job Number	Writer Initials	Date	Change
1.0 / 3183595	OM	July 31, 2009	Original document