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Test Report: 106068TRFWL

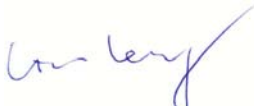
Applicant: Redline Communications
302 Town Centre Blvd., Suite 100
Markham, Ontario
L3R 0E8

Apparatus: AN-100UX 3638F7

FCC ID: QC8-AN100UXA

In Accordance With: FCC Part 90 Subpart Z
Wireless Broadband Services in the
3650–3700 MHz Band

Tested By: Nemko Canada Inc.
303 River Road
Ottawa, Ontario
K1V 1H2

Authorized By: 
Heng Lin, EMC/Wireless Specialist

Date: May 5, 2008

Total Number of Pages: 41

Report Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 90. Conducted measurements were performed in accordance with ANSI TIA-603-B-2002. Radiated tests were conducted in accordance with ANSI C63.4-2003. A description of the test facility is on file with the FCC.

The assessment summary is as follows:

Apparatus Assessed:	AN-100UX 3638F7
Specification:	FCC Part 90 Subpart Z - Wireless Broadband Services in the 3650–3700 MHz Band
Compliance Status:	Complies
Exclusions:	None
Non-compliances:	None
Report Release History:	Original Release

Author: Jason Nixon, Wireless/Telecom Specialist

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025.

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Section 1 : Equipment Under Test

1.1 Product Identification

The Equipment Under Test was identified as follows:

AN-100UX 3638F7, which contains the following sub-assemblies:

AN-100UX Terminal
HTB3638F7 Transceiver

1.2 Samples Submitted for Assessment

The following samples of the apparatus have been submitted for type assessment:

Sample No.	Description	Serial No.
1	HTB 3638F7 Transceiver ODU	Prototype
2	AN-100UX Terminal IDU	2335-0601-00007

The first samples were received on: April 25, 2008

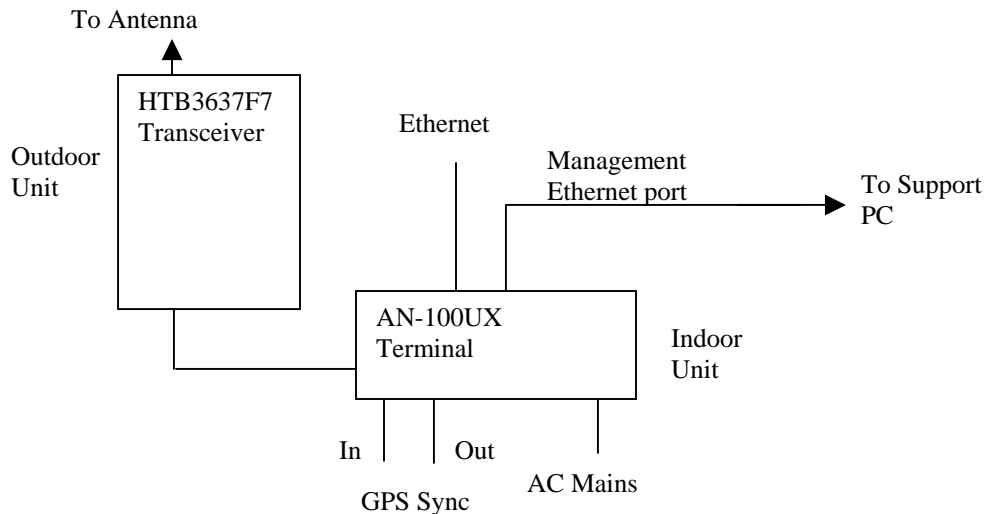
1.3 Theory of Operation

The EUT is a Point-to-Multipoint base station using WiMAX protocols. The EUT consists of an Indoor unit (IDU), the AN-100UX terminal which supplies 48VDC and a 70MHz IF to the outdoor unit (ODU), HTB3638F7 Transceiver, which houses all of the Radio circuitry.

1.4 Technical Specifications of the EUT

- Operating Frequency Band:** 3650-3675MHz
- Operating Frequency:** 3.5MHz Channel: 3651.75-3673.25MHz
7MHz Channel: 3653.5-3671.5MHz
- Emission Designator:** 3M19W7D (3.5MHz), 6M32W7D (7MHz)
- Maximum EIRP Measured:** 3.5MHz Channel: 2.38Watts
7MHz Channel: 5.40Watts
- Modulation:** OFDM using 64QAM, 16QAM, QPSK and BPSK modulation for sub-carriers
- Antenna Data:** 17dBi, 60° sector antenna (Redline P/N: PA1760EAS)
16dBi, 60° sector antenna (Redline P/N: PA1660EASH)
16dBi, 90° sector antenna (Redline P/N: PA1690EAS)
15dBi, 90° sector antenna (Redline P/N: PA1590EASH)
14.5dBi, 90° sector antenna (Redline P/N: A1490MTS)
14dBi, 120° sector antenna (Redline P/N: PA14120EAS)
14dBi, 120° sector antenna (Redline P/N: PA14120EASH)
11dBi, 360° sector antenna (Redline P/N: A11360EAO)
- Power Source:** 120VAC, 60Hz or -48VDC

1.5 Block Diagram of the EUT



Section 2 : Test Conditions

2.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 2 Subpart J, Equipment Authorization Procedures
FCC Part 90 Private Land Mobile Radio Services

2.2 Deviations From Laboratory Test Procedures

No deviations were made from laboratory test procedures.

2.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	15 – 30 °C
Humidity range	:	20 - 75 %
Pressure range	:	86 - 106 kPa
Power supply range	:	+/- 5% of rated voltages

2.4 Measurement Uncertainty

Nemko Canada measurement uncertainty has been calculated using guidance of UKAS LAB 34:2003 and TIA-603-B Nov 7, 2002. All calculations have been performed to provide a confidence level of 95% and can be found in Nemko Canada document MU-003.

2.5 Test Equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Next Cal.
Signal Generator	Rohde & Schwarz	SMR40	FA001879	Aug 8/08
Spectrum Analyzer	Rohde & Schwarz	FSU46	FA001877	Jan 23/09
Attenuator	Narda	769-20	FA001394	COU
Frequency Counter	HP	5352B	FA001915	Dec 3/08
Temperature Chamber	Thermotron	SM-16C	FA001030	NCR
Multimeter	Fluke	16	FA001831	Jan 14/09
Air probe	Fluke	None	FA001248	NCR
3m EMI Test Chamber	TDK	SAC-3	FA002047	May 19/08
Bilog	Sunol	JB3	FA002108	Jan. 21/09
Receiver/Spectrum Analyzer	Rohde & Schwarz	ESU 26	FA002043	Dec. 07/08
50 Coax cable	HUBER + SUHNER	None	FA002015	Sept. 19/08
50 Coax cable	HUBER + SUHNER	None	FA002074	July 03/08
Horn Antenna #2	EMCO	3115	FA000825	Jan. 15/09
1.0 – 2.0 GHz Amplifier	JCA	12-400	FA001498	Aug. 21/08
2.0 – 4.0 GHz Amplifier	JCA	24-600	FA001496	Aug. 21/08
4.0 – 8.0 GHz Amplifier	JCA	48-600	FA001497	Aug. 21/08
5.0 – 18.0 GHz Amplifier	NARDA	DWT-186N23U40	FA001409	COU
18.0 – 40.0GHz Horn Antenna	EMCO	3116	FA001847	May 9/08
18.0 – 26.0 GHz Amplifier	NARDA	BBS-1826N612	FA001550	COU
26 – 40.0 GHz Amplifier	NARDA	DBL-2640N610	FA001556	COU

COU – Calibrate on Use

NCR – No Calibration Required

Section 3 : Observations

3.1 Modifications Performed During Assessment

No modifications were performed during assessment.

3.2 Record Of Technical Judgements

No technical judgements were made during the assessment.

3.3 EUT Parameters Affecting Compliance

The user of the apparatus could not alter parameters that would affect compliance.

3.4 Test Deleted

No Tests were deleted from this assessment.

3.5 Additional Observations

There were no additional observations made during this assessment.

Section 4 : Results Summary

This section contains the following:

FCC Part 90 : Test Results

FCC Part 90 Subpart Z : Test Results

The column headed 'Required' indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

N No : not applicable / not relevant.

Y Yes : Mandatory i.e. the apparatus shall conform to these tests.

N/T Not Tested, mandatory but not assessed. (See section 3.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus as originally submitted.

4.1 FCC Part 90 : Test Results

Clause	Test Method	Test Description	Required	Result
90.205	2.1046	Output power and antenna limits	Y	PASS
90.207	2.1047	Modulation Characteristics	N	
90.209	2.1049	Occupied bandwidth	Y	
90.210	2.1051	Emission Limits	Y	
90.210	2.1053	Field strength of surious radiation	Y	
90.213	2.1055	Frequency stability	Y	
90.214	—	Transient Behavior	N	
90.219	—	Use of boosters	N	

4.2 FCC Part 90 Subpart Z : Test Results

Clause	Test Description	Required	Result
90.1319	Policies governing the use of the 3650-3700MHz Band	Y ¹	PASS
90.1321	Power and antenna limits	Y	PASS
90.1323	Emission Limits	Y	PASS
90.1333	Restrictions on the operation of mobile and portable stations	N	

Notes:

¹The EUT uses WiMAX protocol which inherently has a restricted Contention Based Protocol, therefore the EUT only uses the lower 25MHz of spectrum and complies with the requirements of 90.1319.

Appendix A : Test Results

Clause 90.205/90.1321 Power and antenna limits

- (a) 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.
- (b) 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:
- (1) Different information must be transmitted to each receiver.
 - (2) 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:
 - (i) 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.
 - (ii) 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.
 - (3) 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.
 - (4) Transmitters that emit a single directional beam shall operate under the provisions of paragraph (b)(2) of this section.
- (c) 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.

Test Conditions:

Sample Number:	1	Temperature:	21°C
Date:	May 2, 2008	Humidity:	31%
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	Wireless

Test Results:

The EUT operates with a maximum antenna gain of 17dBi.

The EUT is professionally installed and requires cables and a splitter from the Antenna output of the HTB unit and the antenna. This loss is required to be 10dB during installation.

Output power measurements were performed using a 100kHz RBW/300kHz VBW and a channel power function of the Spectrum analyzer. PSD measurements were performed using a 1MHz RBW/3MHz VBW.

**Output Power
3.5MHz Channel**

Frequency	Modulation	Power Setting (dBm)	Measured Power (dBm)	Cable/splitter loss (dB)	Antenna Gain (dBi)	Maximum EIRP (dBm)	EIRP Limit (dBm)
3651.75MHz	64QAM	27	26.34	10.0	17.0	33.34	35.4
	16QAM	27	26.71	10.0	17.0	33.71	35.4
	QPSK	27	26.40	10.0	17.0	33.40	35.4
	BPSK	27	26.54	10.0	17.0	33.54	35.4
3662.5MHz	64QAM	27	26.77	10.0	17.0	33.77	35.4
	16QAM	27	26.65	10.0	17.0	33.65	35.4
	QPSK	27	26.67	10.0	17.0	33.67	35.4
	BPSK	27	26.51	10.0	17.0	33.51	35.4
3673.25MHz	64QAM	27	26.62	10.0	17.0	33.62	35.4
	16QAM	27	26.77	10.0	17.0	33.77	35.4
	QPSK	27	26.67	10.0	17.0	33.67	35.4
	BPSK	27	26.64	10.0	17.0	33.64	35.4

7MHz Channel

Frequency	Modulation	Power Setting (dBm)	Measured Power (dBm)	Cable/splitter loss (dB)	Antenna Gain (dBi)	Maximum EIRP (dBm)	EIRP Limit (dBm)
3651.75MHz	64QAM	30	30.07	10.0	17.0	37.07	38.5
	16QAM	30	29.93	10.0	17.0	36.93	38.5
	QPSK	30	29.93	10.0	17.0	36.93	38.5
	BPSK	30	29.96	10.0	17.0	36.96	38.5
3662.5MHz	64QAM	30	30.14	10.0	17.0	37.14	38.5
	16QAM	30	30.14	10.0	17.0	37.14	38.5
	QPSK	30	30.17	10.0	17.0	37.17	38.5
	BPSK	30	30.20	10.0	17.0	37.20	38.5
3673.25MHz	64QAM	30	30.20	10.0	17.0	37.20	38.5
	16QAM	30	30.32	10.0	17.0	37.32	38.5
	QPSK	30	30.29	10.0	17.0	37.29	38.5
	BPSK	30	29.85	10.0	17.0	36.85	38.5

PSD

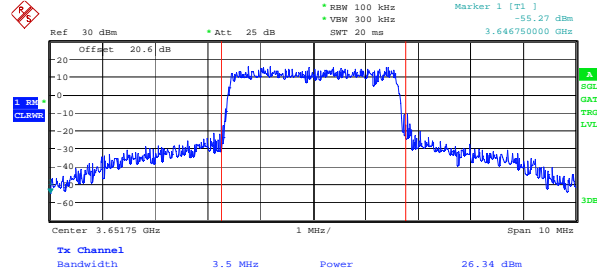
3.5MHz Channel

Frequency	Modulation	Power Setting (dBm)	Measured Power (dBm)	Cable/splitter loss (dB)	Antenna Gain (dBi)	Maximum EIRP PSD (dBm)	EIRP PSD Limit (dBm)
3651.75MHz	64QAM	27	22.01	10.0	17.0	29.01	30.0
	16QAM	27	21.87	10.0	17.0	28.87	30.0
	QPSK	27	22.18	10.0	17.0	29.18	30.0
	BPSK	27	22.17	10.0	17.0	29.17	30.0
3662.5MHz	64QAM	27	22.23	10.0	17.0	29.23	30.0
	16QAM	27	22.28	10.0	17.0	29.28	30.0
	QPSK	27	22.21	10.0	17.0	29.21	30.0
	BPSK	27	22.17	10.0	17.0	29.17	30.0
3673.25MHz	64QAM	27	22.47	10.0	17.0	29.47	30.0
	16QAM	27	22.35	10.0	17.0	29.35	30.0
	QPSK	27	22.32	10.0	17.0	29.32	30.0
	BPSK	27	22.23	10.0	17.0	29.23	30.0

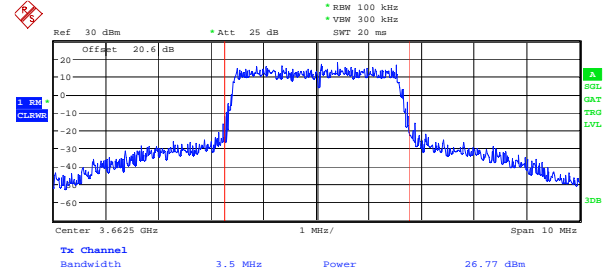
7MHz Channel

Frequency	Modulation	Power Setting (dBm)	Measured Power (dBm)	Cable/splitter loss (dB)	Antenna Gain (dBi)	Maximum EIRP PSD (dBm)	EIRP PSD Limit (dBm)
3651.75MHz	64QAM	30	22.75	10.0	17.0	29.75	30.0
	16QAM	30	22.70	10.0	17.0	29.70	30.0
	QPSK	30	22.64	10.0	17.0	29.64	30.0
	BPSK	30	22.97	10.0	17.0	29.97	30.0
3662.5MHz	64QAM	30	22.86	10.0	17.0	29.86	30.0
	16QAM	30	22.80	10.0	17.0	29.80	30.0
	QPSK	30	22.72	10.0	17.0	29.72	30.0
	BPSK	30	22.68	10.0	17.0	29.68	30.0
3673.25MHz	64QAM	30	22.78	10.0	17.0	29.78	30.0
	16QAM	30	22.82	10.0	17.0	29.82	30.0
	QPSK	30	22.69	10.0	17.0	29.69	30.0
	BPSK	30	22.93	10.0	17.0	29.93	30.0

Output Power
3.5MHz Channel
64QAM – low channel



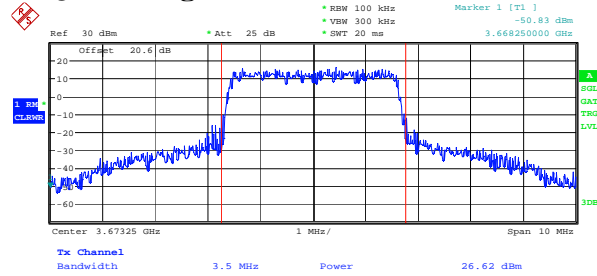
64QAM – mid channel



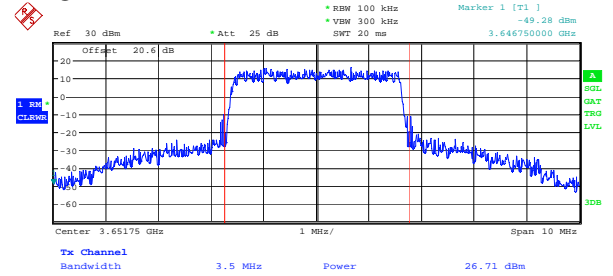
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64QAM – high channel



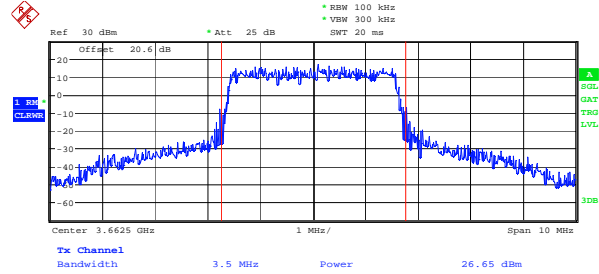
16QAM – low channel



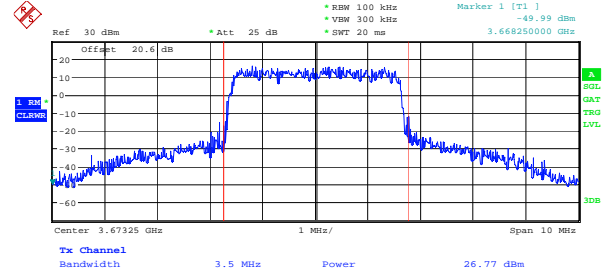
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16QAM – mid channel

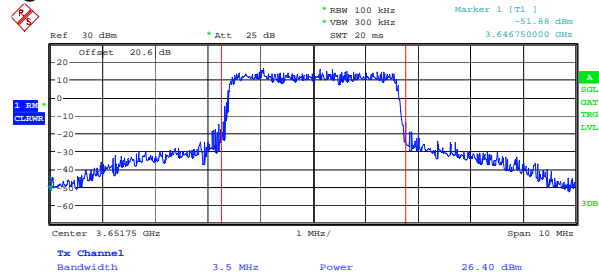


16QAM – high channel



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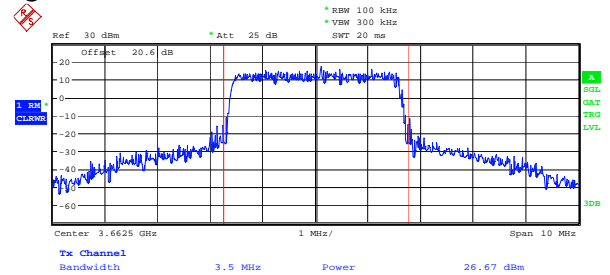
QPSK – low channel



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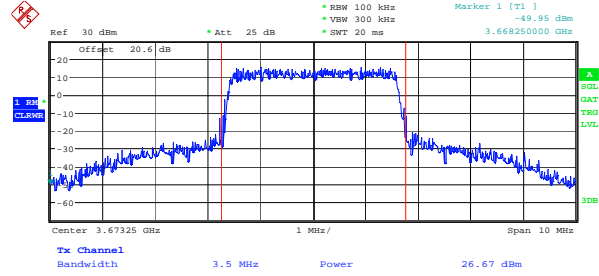
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QPSK – mid channel

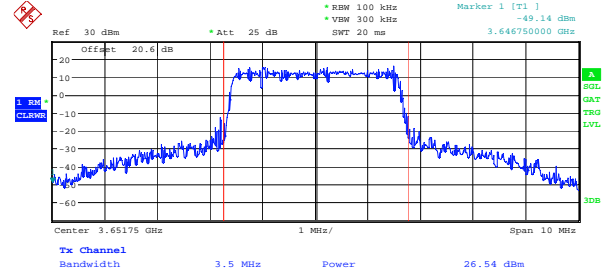


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QPSK – high channel

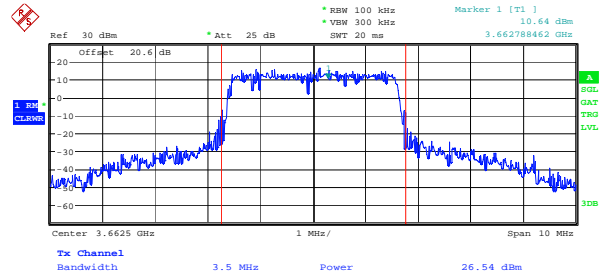


BPSK – low channel



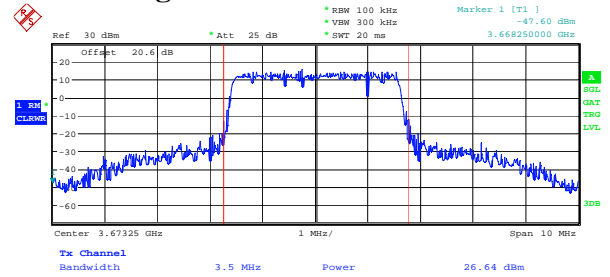
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BPSK – mid channel



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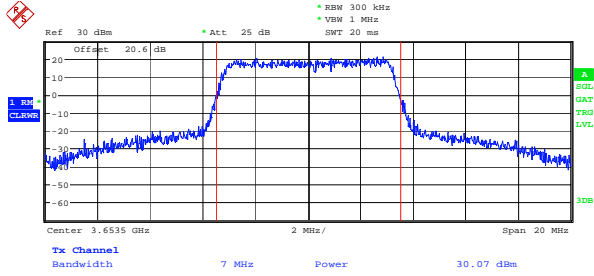
BPSK – high channel



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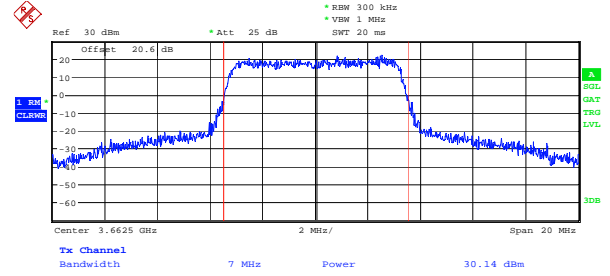
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**7MHz Channel
64QAM – low channel**



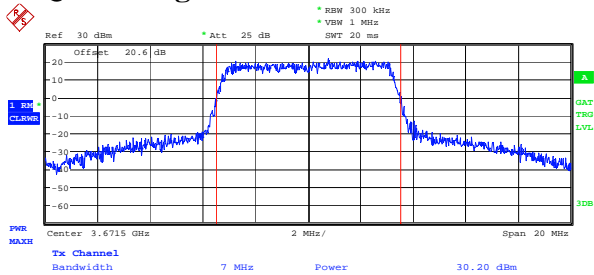
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64QAM – mid channel



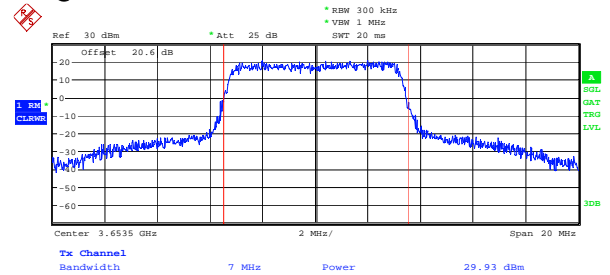
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64QAM – high channel



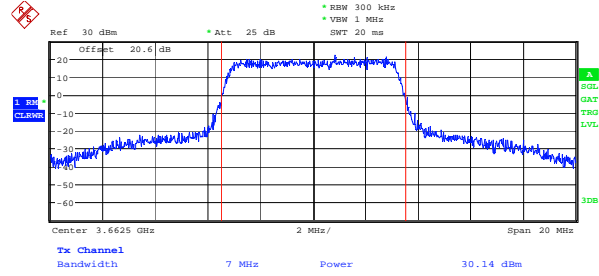
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16QAM – low channel

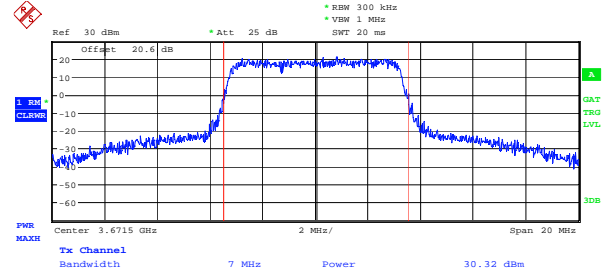


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16QAM – mid channel



16QAM – high channel



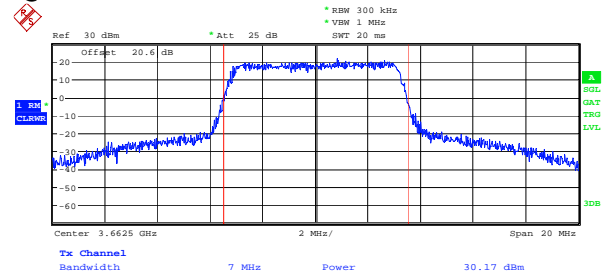
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QPSK – low channel



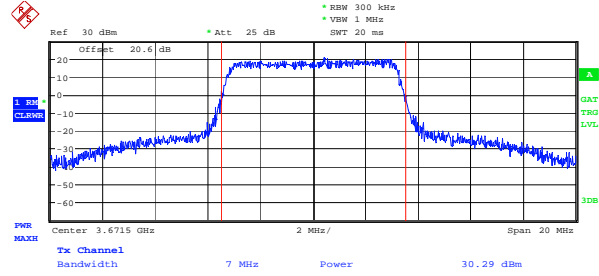
QPSK – mid channel



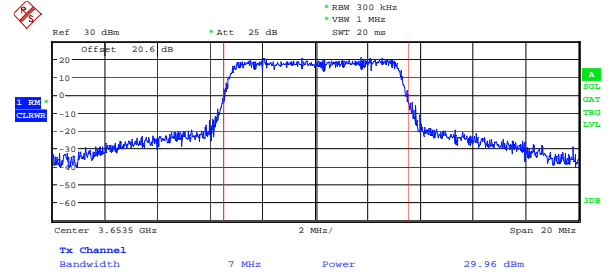
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QPSK – high channel



BPSK – low channel



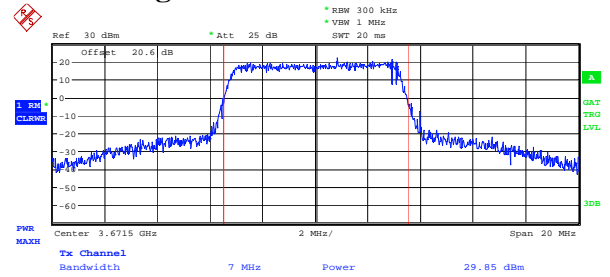
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BPSK – mid channel



BPSK – high channel



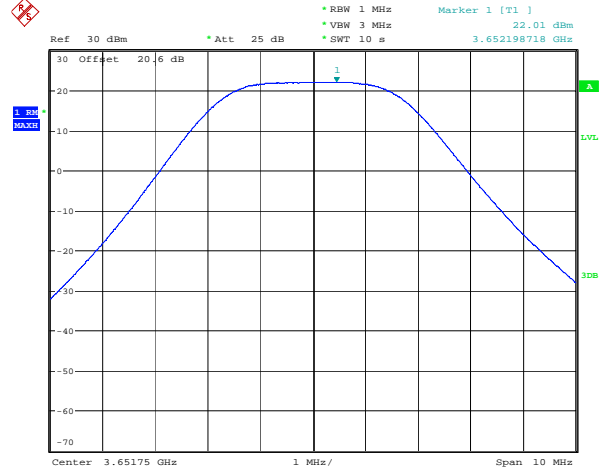
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PSD

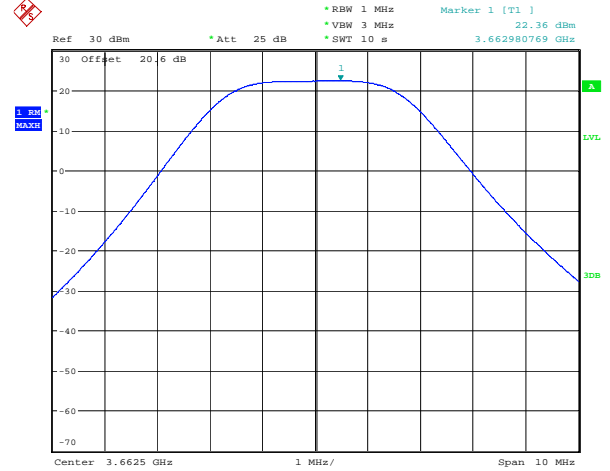
3.5MHz Channel

64QAM – low channel



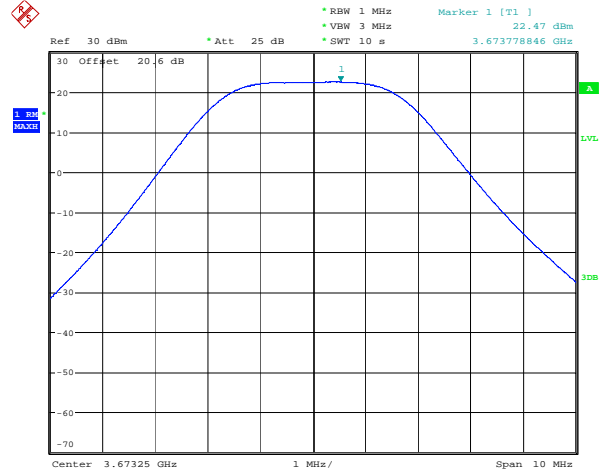
Date: 2.MAY.2008 14:55:34

64QAM – mid channel



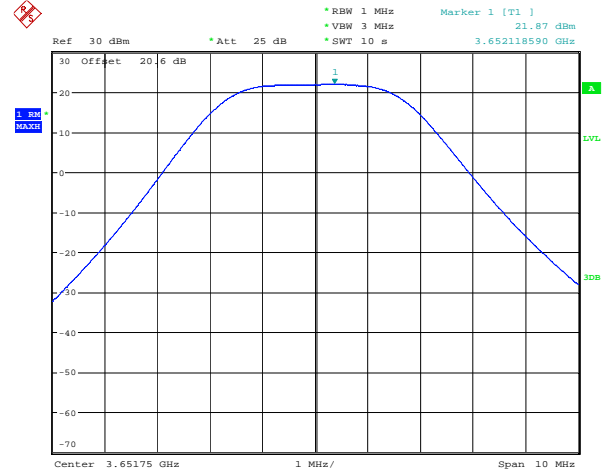
Date: 2.MAY.2008 14:45:42

64QAM – high channel



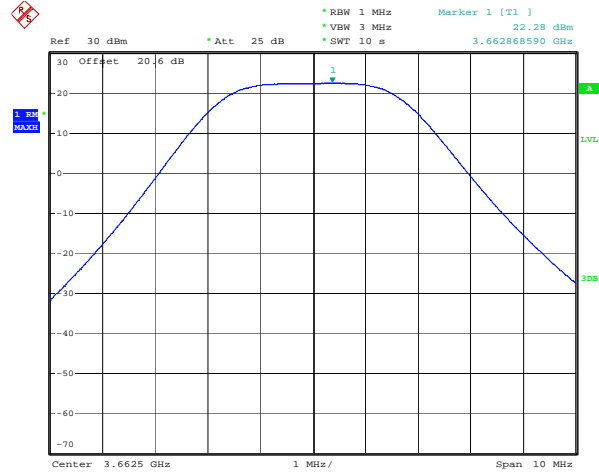
Date: 2.MAY.2008 14:32:57

16QAM – low channel

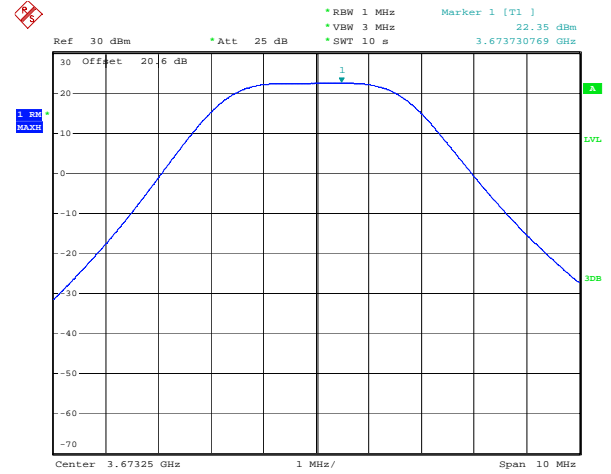


Date: 2.MAY.2008 14:56:15

16QAM – mid channel



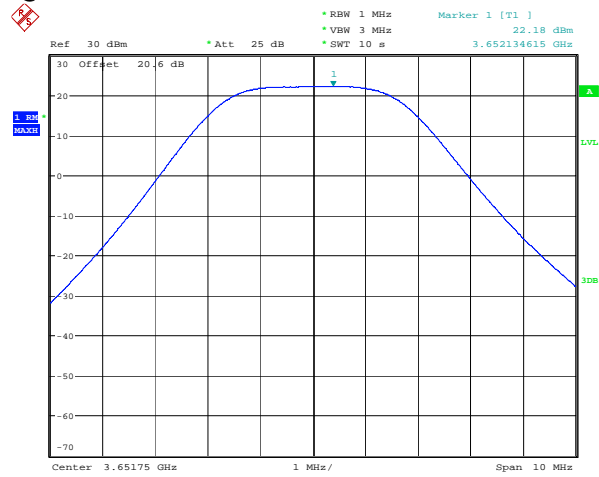
16QAM – high channel



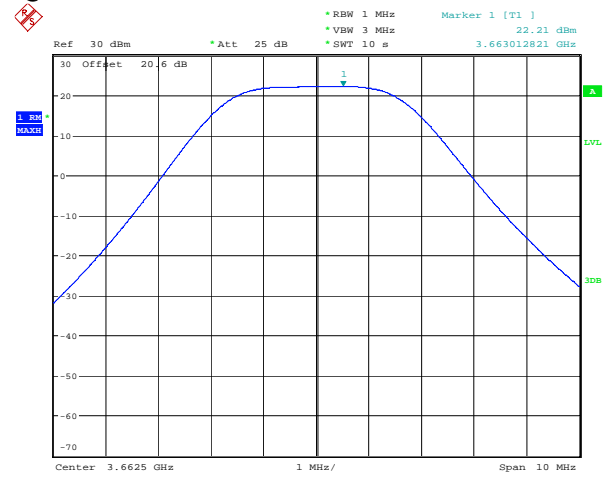
Date: 2.MAY.2008 14:46:35

Date: 2.MAY.2008 14:33:41

QPSK – low channel



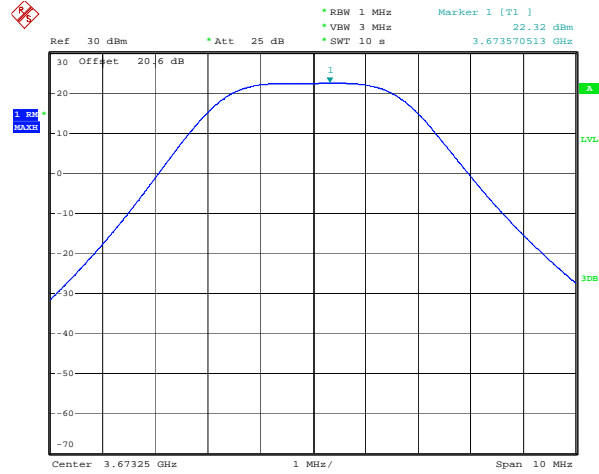
QPSK – mid channel



Date: 2.MAY.2008 14:57:07

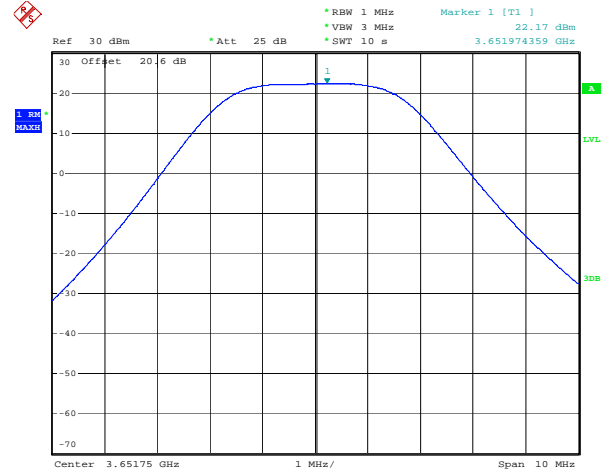
Date: 2.MAY.2008 14:47:22

QPSK – high channel



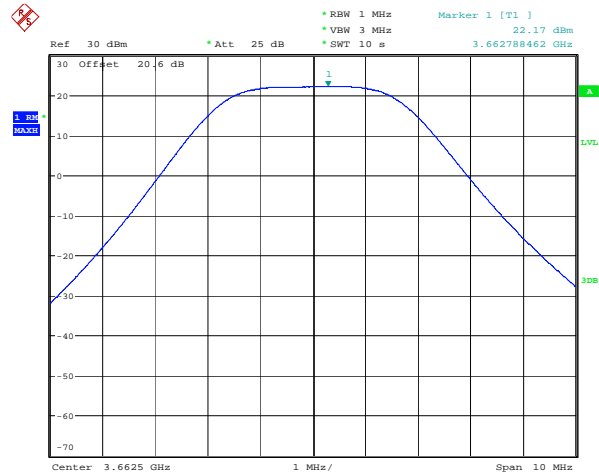
Date: 2.MAY.2008 14:34:12

BPSK – low channel



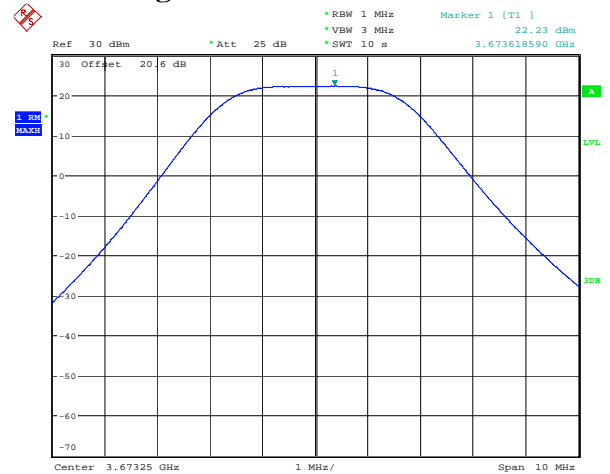
Date: 2.MAY.2008 14:57:48

BPSK – mid channel



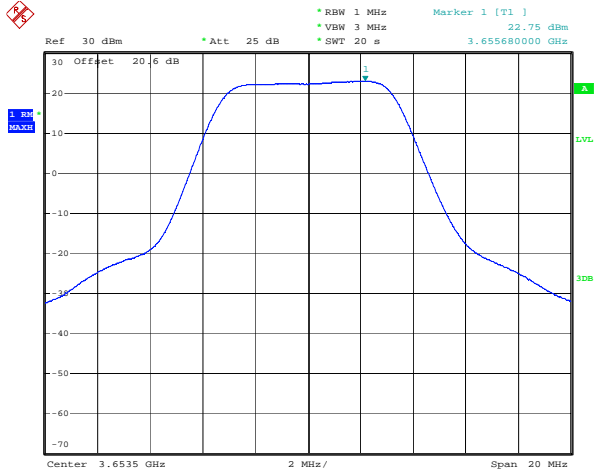
Date: 2.MAY.2008 14:48:09

BPSK – high channel



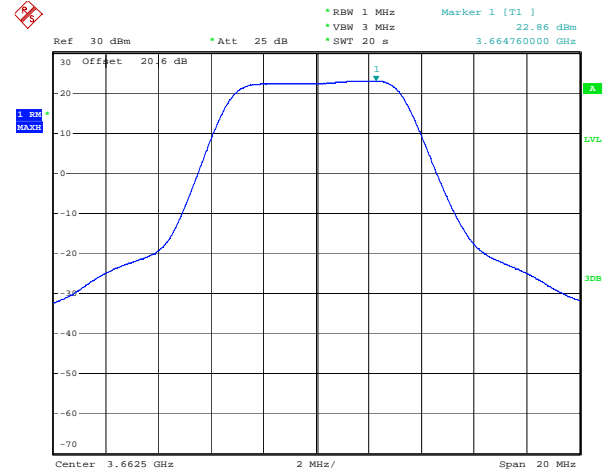
Date: 2.MAY.2008 14:35:00

7MHz Channel 64QAM – low channel



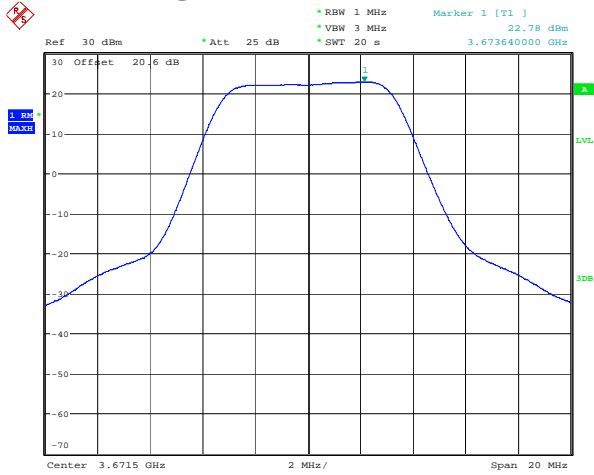
Date: 2.MAY.2008 16:08:50

64QAM – mid channel



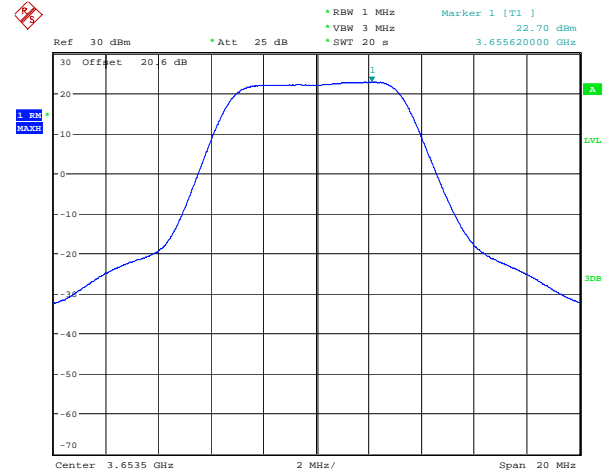
Date: 2.MAY.2008 16:18:21

64QAM – high channel



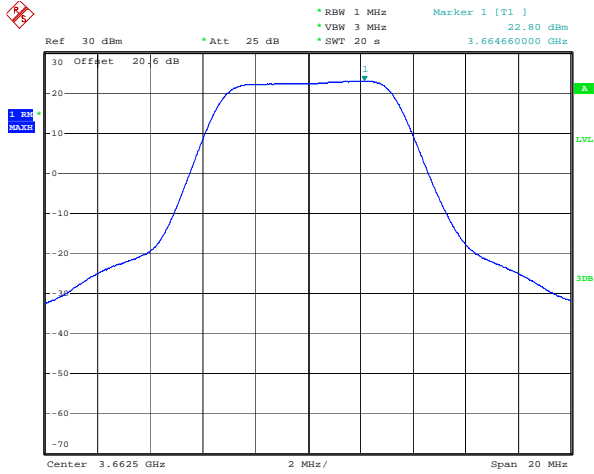
Date: 2.MAY.2008 16:34:07

16QAM – low channel



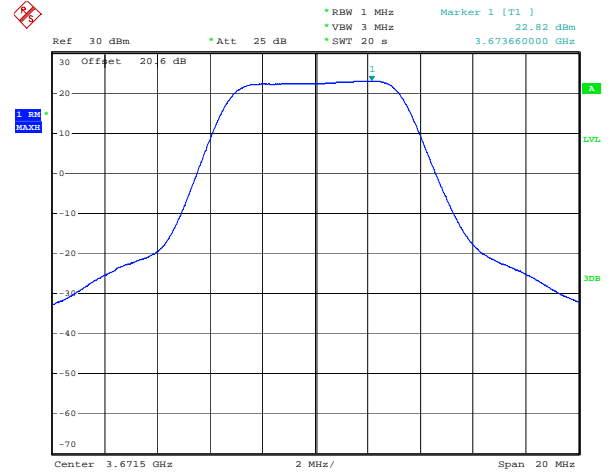
Date: 2.MAY.2008 16:09:27

16QAM – mid channel



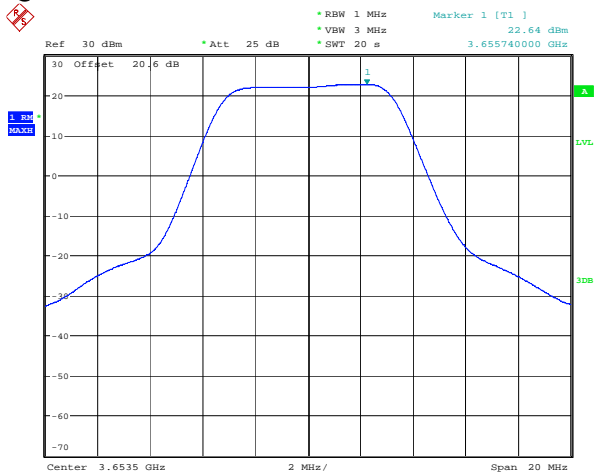
Date: 2.MAY.2008 16:19:31

16QAM – high channel



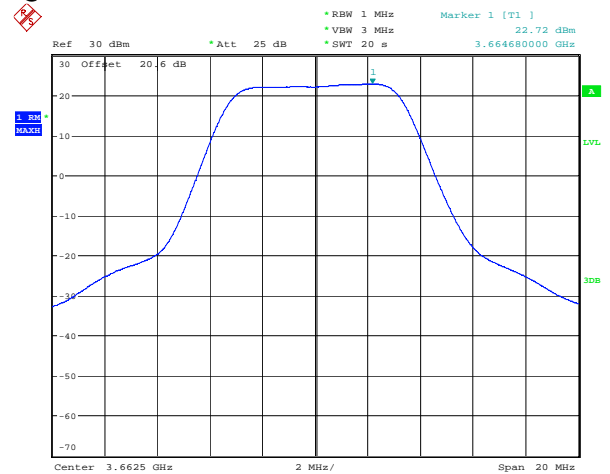
Date: 2.MAY.2008 16:37:21

QPSK – low channel



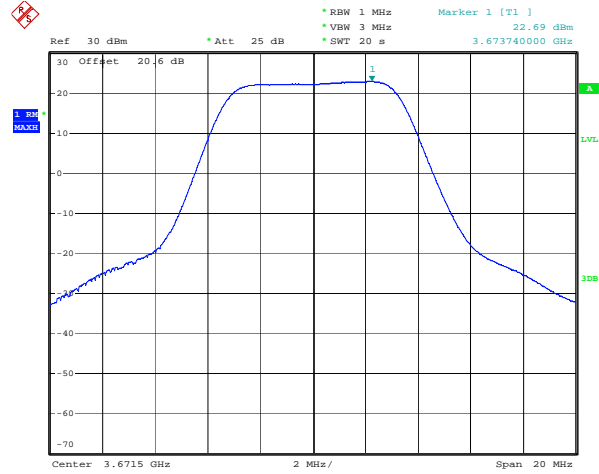
Date: 2.MAY.2008 16:10:05

QPSK – mid channel



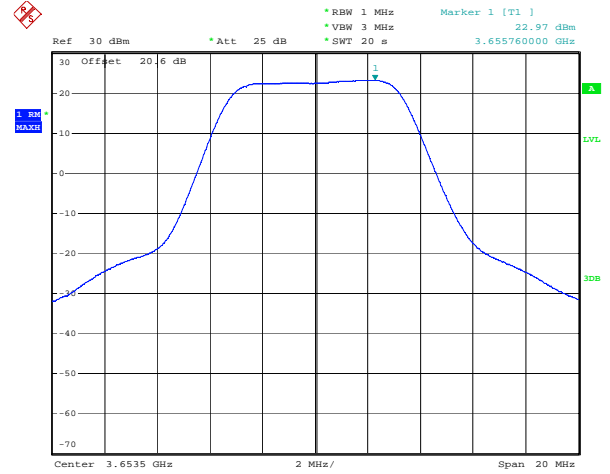
Date: 2.MAY.2008 16:20:35

QPSK – high channel



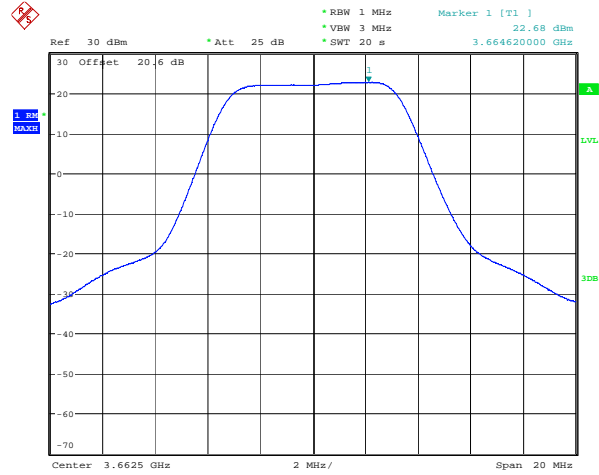
Date: 2.MAY.2008 16:38:04

BPSK – low channel



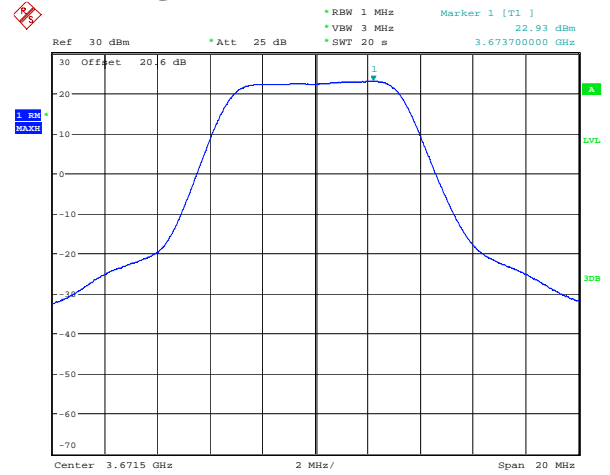
Date: 2.MAY.2008 16:10:51

BPSK – mid channel



Date: 2.MAY.2008 16:21:18

BPSK – high channel



Date: 2.MAY.2008 16:44:43

Clause 90.209 Occupied Bandwidth

(5) Unless specified elsewhere, channel spacings and bandwidths that will be authorized in the following frequency bands are given in the following Table.

Standard Channel Spacing/Bandwidth

Frequency Band (MHz)	Channel Spacing (kHz)	Authorized Bandwidth (kHz)
Below 25	--	--
25-50	20	20
72-76	20	20
150-174	7.5	20/11.25/6
216-220	6.25	20/11.25/6
220-222	5	4
406-512	6.25	20/11.25/6
806-809/851-854	12.5	20
809-824/854-869	25	20
896-901/935-940	12.5	13.6
902-928	--	--
929-930	25	20
1427-1432	12.5	12.5
2450-2483.5	--	--
Above 2500	--	--

Test Conditions:

Sample Number:	1	Temperature:	21°C
Date:	April 28, 2008	Humidity:	32%
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	Wireless

Test Results:

See Attached Plots. Measurement values are 99% Occupied bandwidth.

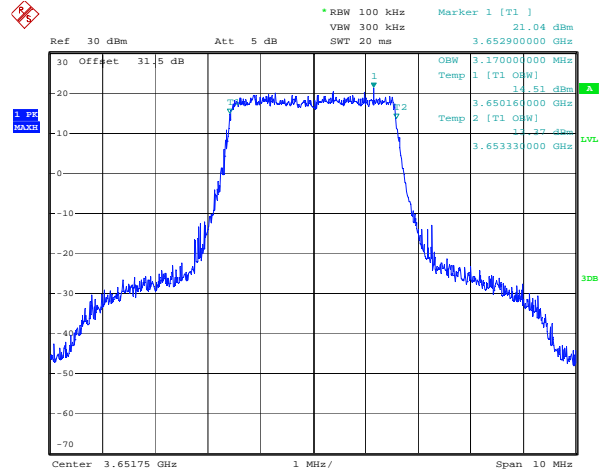
3.5MHz Channel

Modulation	3651.75MHz	3662.5MHz	3673.25MHz
64QAM	3.17MHz	3.17MHz	3.18MHz
16QAM	3.16MHz	3.16MHz	3.19MHz
QPSK	3.18MHz	3.16MHz	3.18MHz
BPSK	3.17MHz	3.19MHz	3.17MHz

7MHz Channel

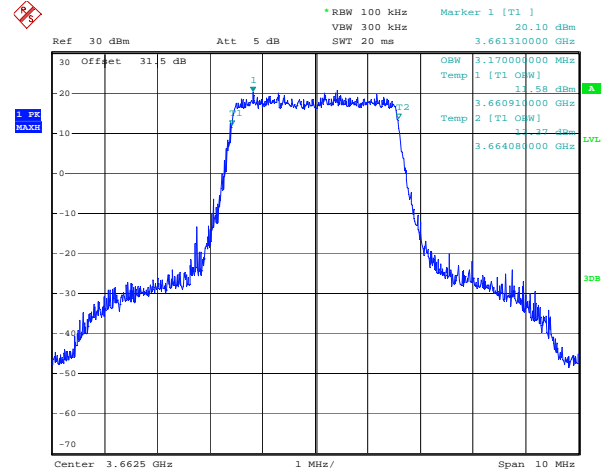
Modulation	3653.5MHz	3662.5MHz	3671.5MHz
64QAM	6.30MHz	6.32MHz	6.28MHz
16QAM	6.30MHz	6.32MHz	6.30MHz
QPSK	6.30MHz	6.32MHz	6.30MHz
BPSK	6.30MHz	6.30MHz	6.30MHz

3.5MHz Channel 64QAM – low channel



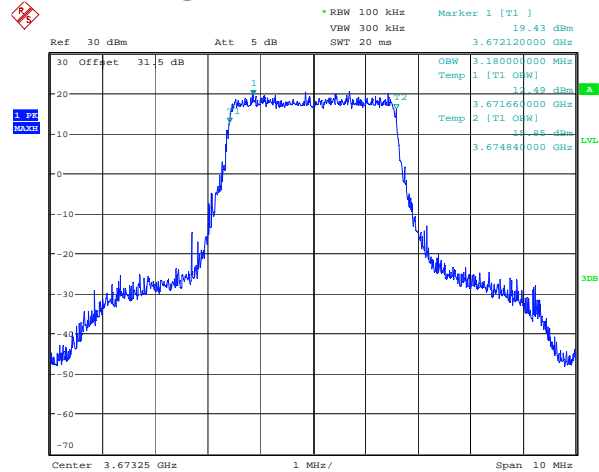
Date: 28.APR.2008 15:47:43

64QAM – mid channel



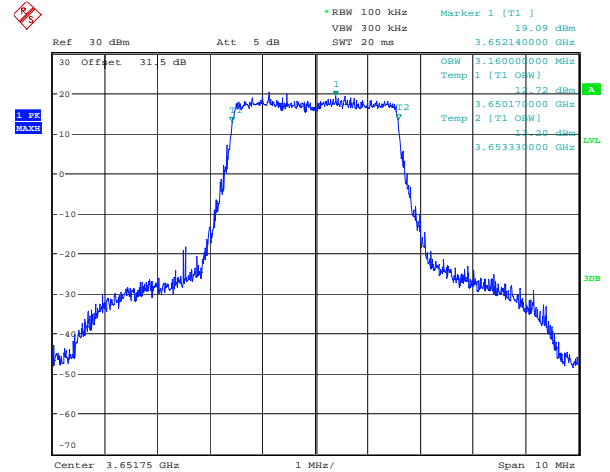
Date: 28.APR.2008 15:40:45

64QAM – high channel



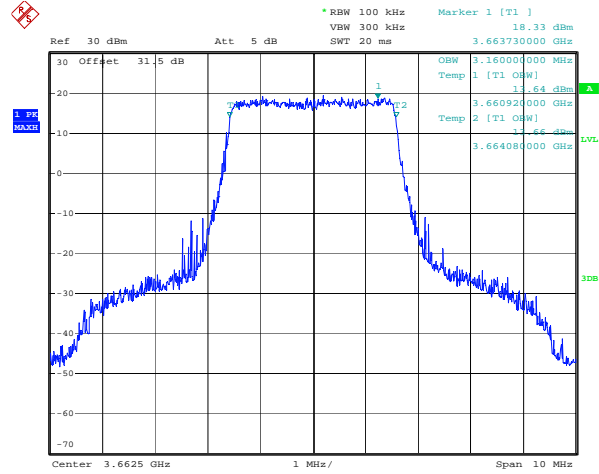
Date: 28.APR.2008 15:35:33

16QAM – low channel



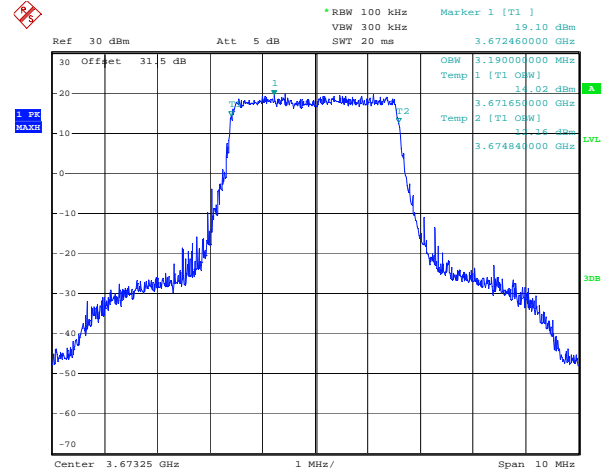
Date: 28.APR.2008 15:48:11

16QAM – mid channel



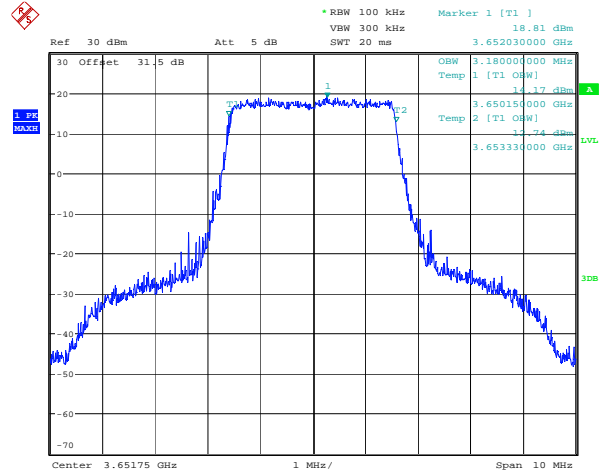
Date: 28.APR.2008 15:41:06

16QAM – high channel



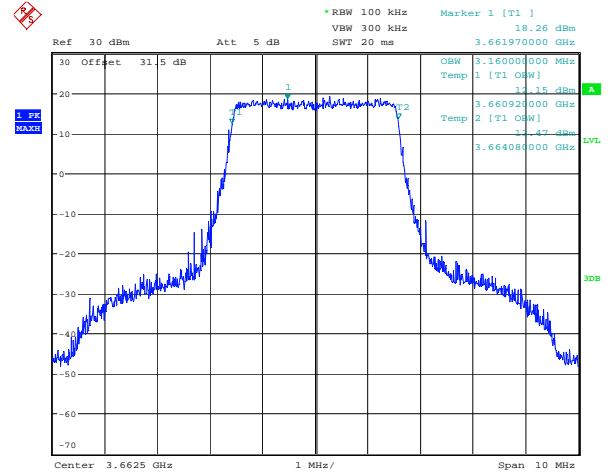
Date: 28.APR.2008 15:35:57

QPSK – low channel



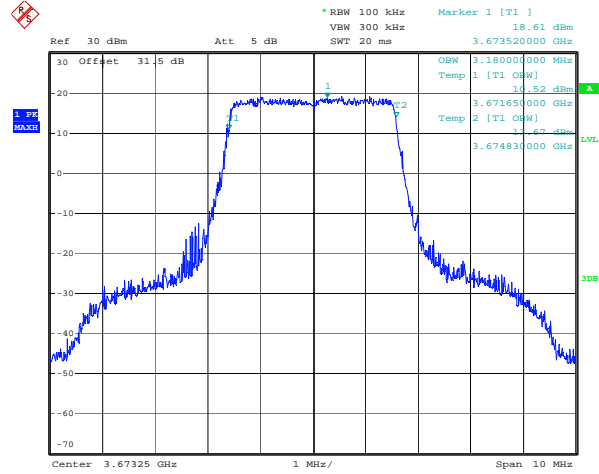
Date: 28.APR.2008 15:48:35

QPSK – mid channel

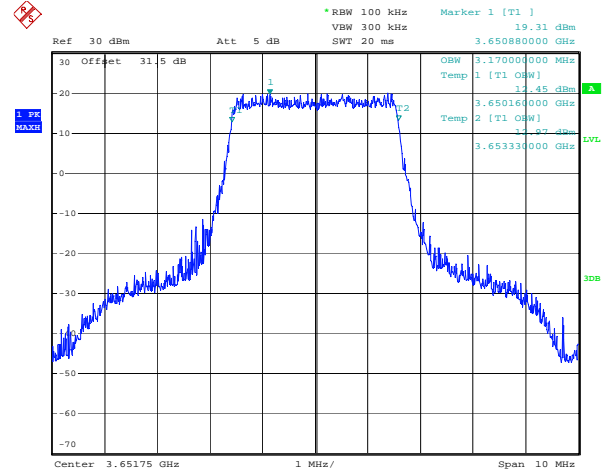


Date: 28.APR.2008 15:41:30

QPSK – high channel



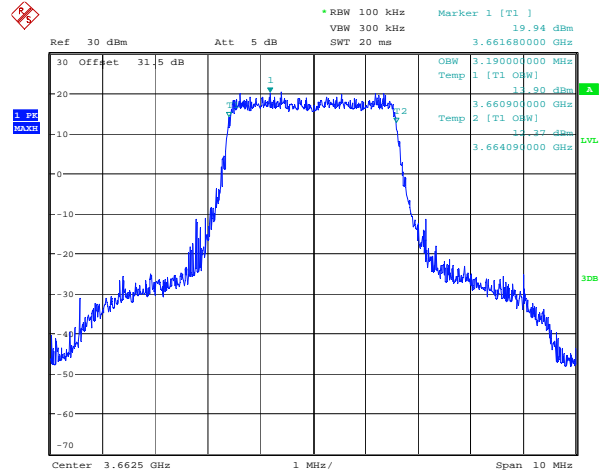
BPSK – low channel



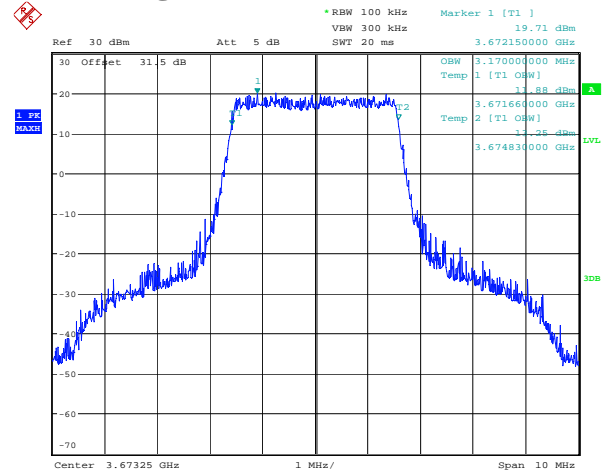
Date: 28.APR.2008 15:36:26

Date: 28.APR.2008 15:49:02

BPSK – mid channel



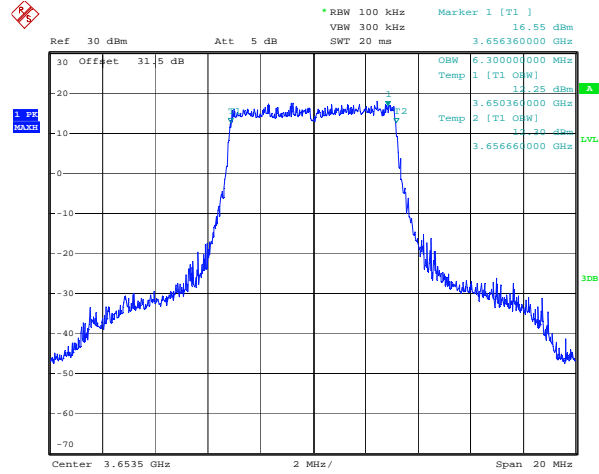
BPSK – high channel



Date: 28.APR.2008 15:41:51

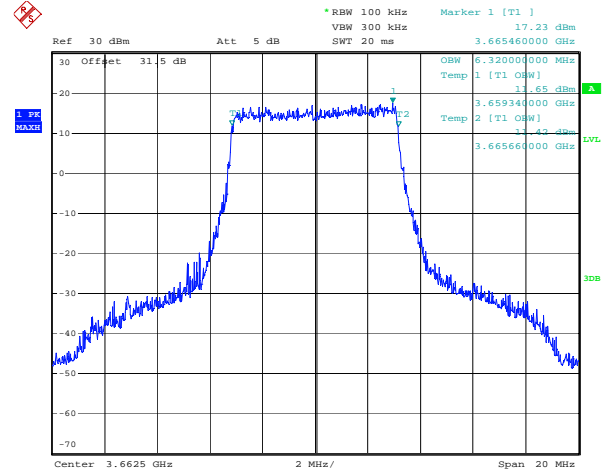
Date: 28.APR.2008 15:36:52

7MHz Channel
64QAM – low channel



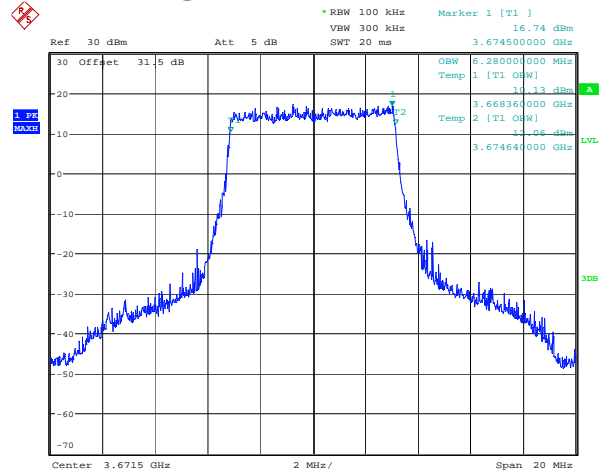
Date: 28.APR.2008 15:22:42

64QAM – mid channel



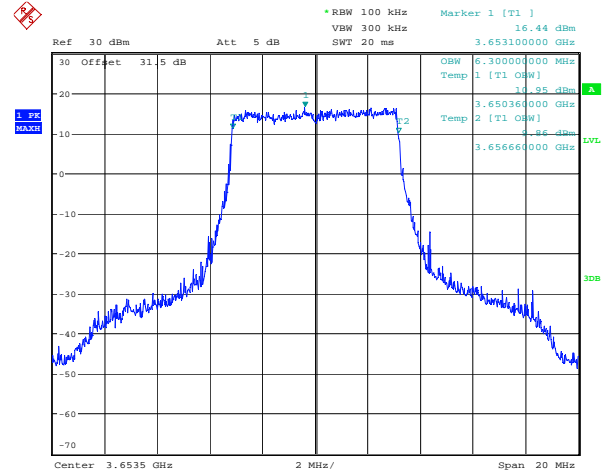
Date: 28.APR.2008 15:28:07

64QAM – high channel



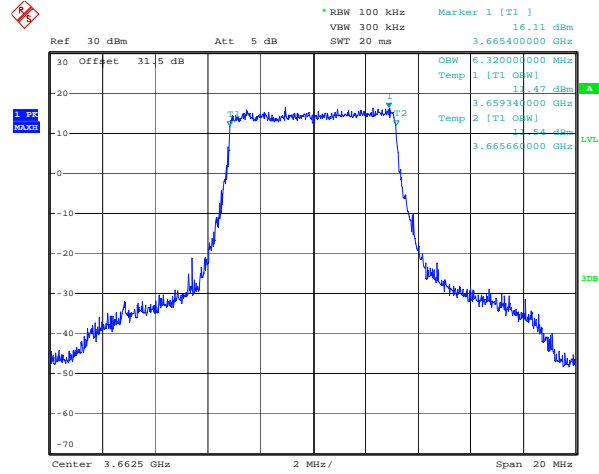
Date: 28.APR.2008 15:32:08

16QAM – low channel

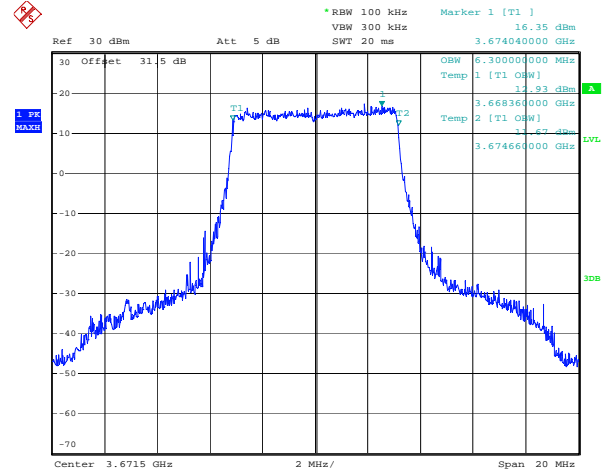


Date: 28.APR.2008 15:23:10

16QAM – mid channel



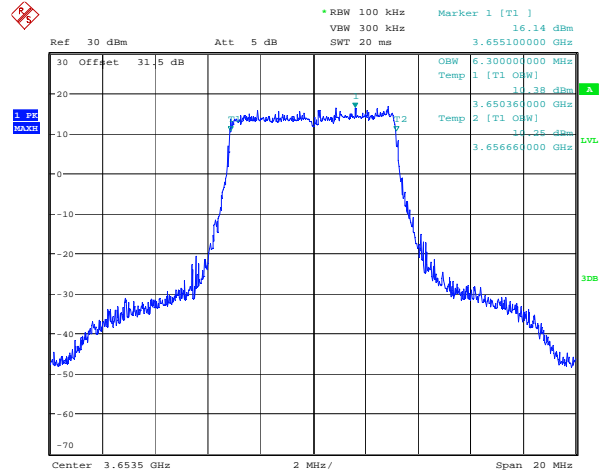
16QAM – high channel



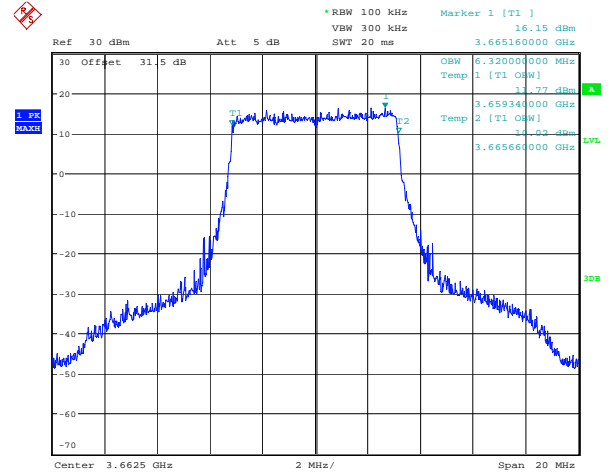
Date: 28.APR.2008 15:28:29

Date: 28.APR.2008 15:32:32

QPSK – low channel



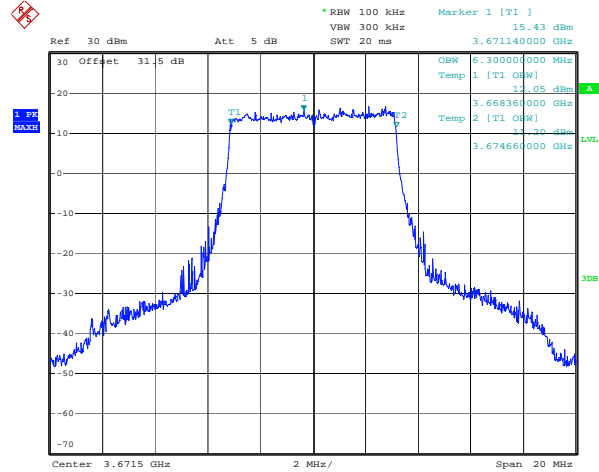
QPSK – mid channel



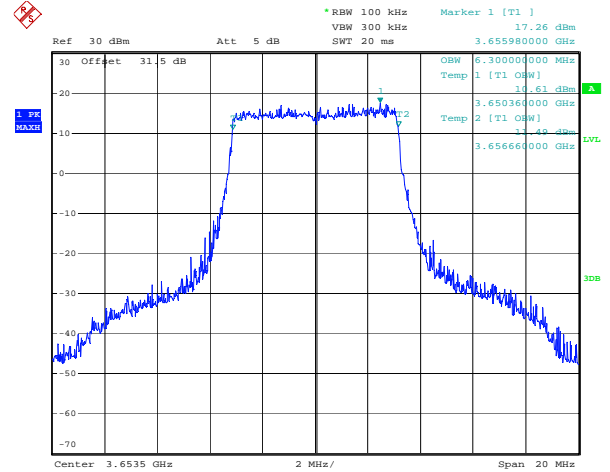
Date: 28.APR.2008 15:23:34

Date: 28.APR.2008 15:28:51

QPSK – high channel



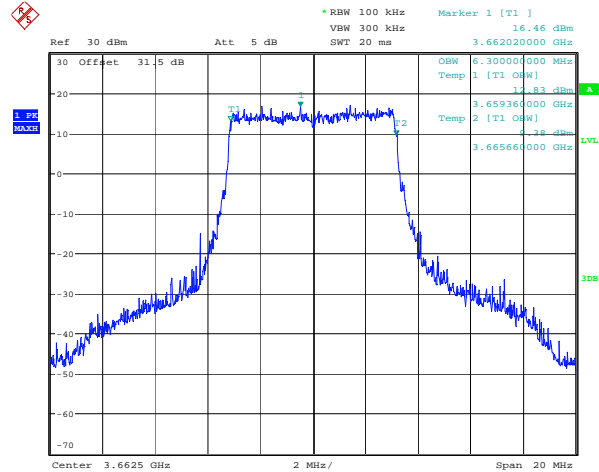
BPSK – low channel



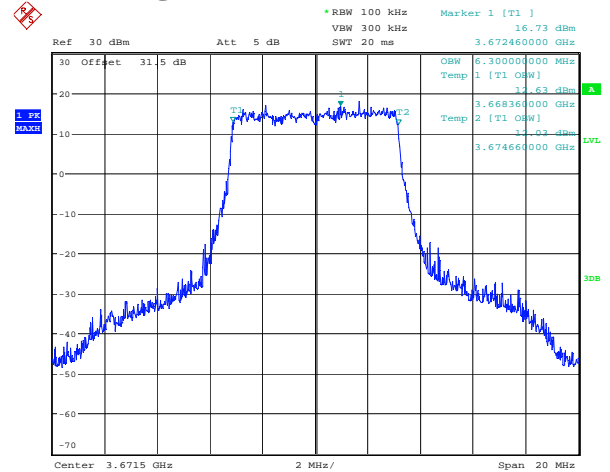
Date: 28.APR.2008 15:32:53

Date: 28.APR.2008 15:24:03

BPSK – mid channel



BPSK – high channel



Date: 28.APR.2008 15:29:12

Date: 28.APR.2008 15:33:11

Clause 90.210(n)/90.1323 Emission Limits Spurious emissions at the antenna terminal

90.210 (n) Other frequency bands. Transmitters designed for operation under this part on frequencies other than listed in this section must meet the emission mask requirements of Emission Mask B. Equipment operating under this part on frequencies allocated to but shared with the Federal Government, must meet the applicable Federal Government technical standards.

Emission Mask B. For transmitters that are equipped with an audio low-pass filter, the 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 (a) 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.

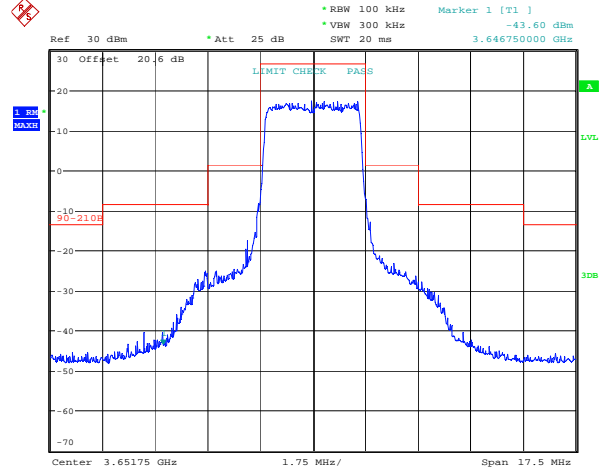
Test Conditions:

Sample Number:	1	Temperature:	22°C
Date:	April 29, 2008	Humidity:	30%
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	Wireless

Test Results:

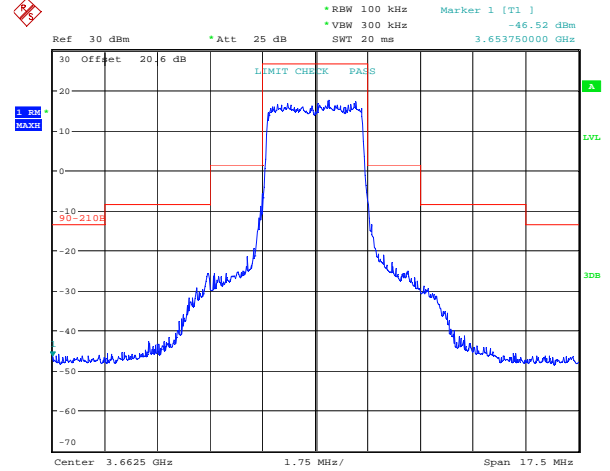
See Attached Plots.

Emission Mask – 90.210(b) 3.5MHz Channel Low Channel



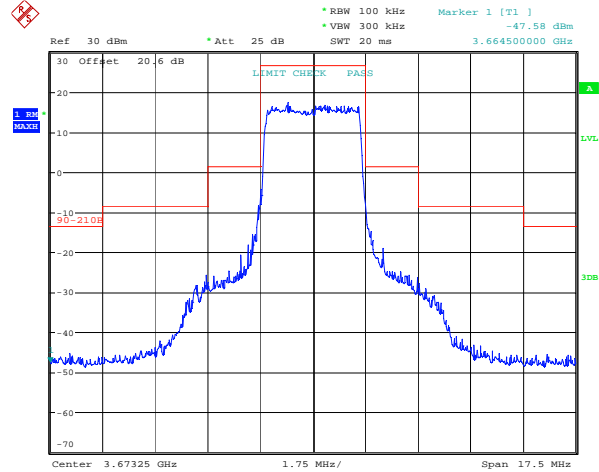
Date: 2.MAY.2008 15:07:07

Mid Channel



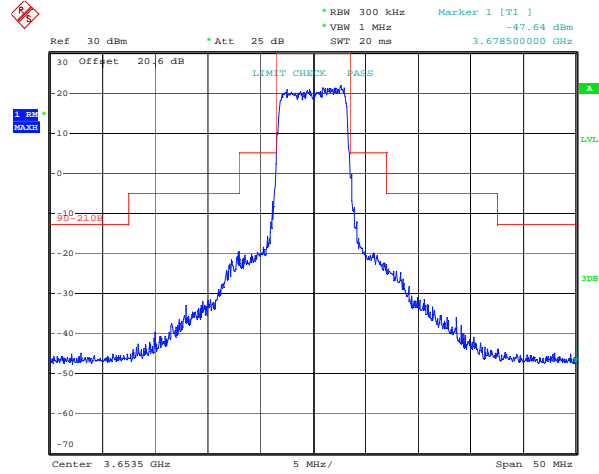
Date: 2.MAY.2008 15:11:24

High Channel



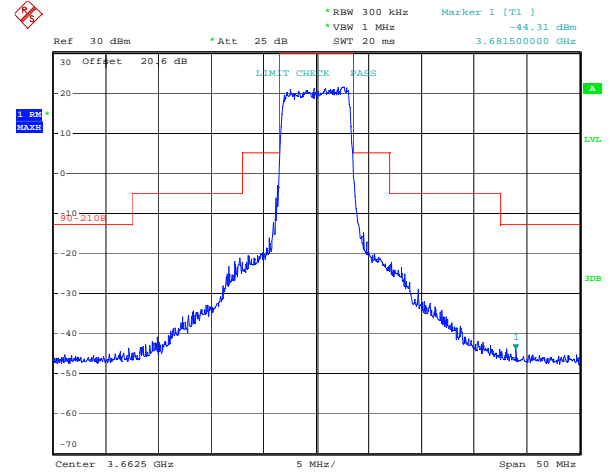
Date: 2.MAY.2008 15:16:52

7MHz Channel Low Channel



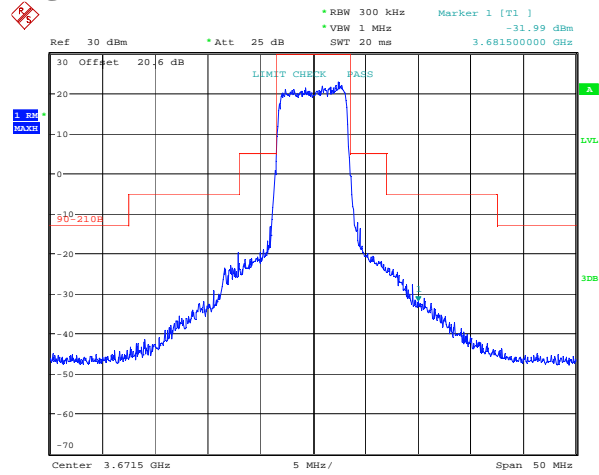
Date: 2.MAY.2008 17:18:55

Mid Channel



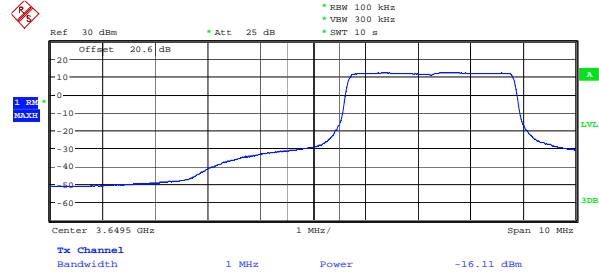
Date: 2.MAY.2008 17:17:13

High Channel



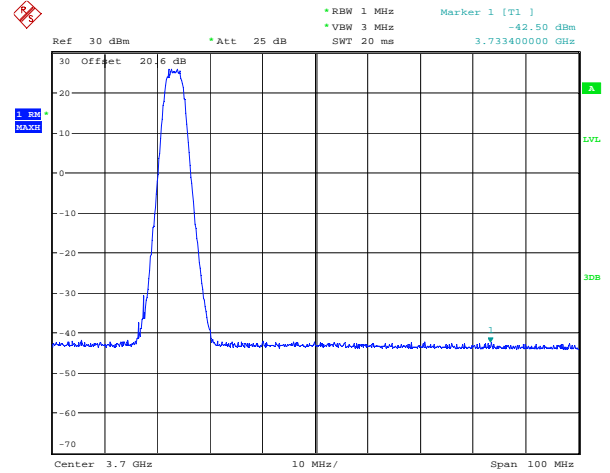
Date: 2.MAY.2008 17:14:44

Bandedge 3.5MHz Channel Lower Bandedge



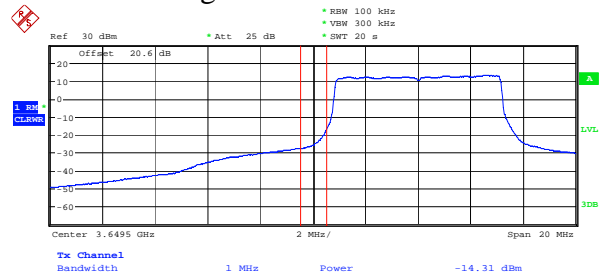
Date: 2.MAY.2008 15:38:08

Upper Bandedge



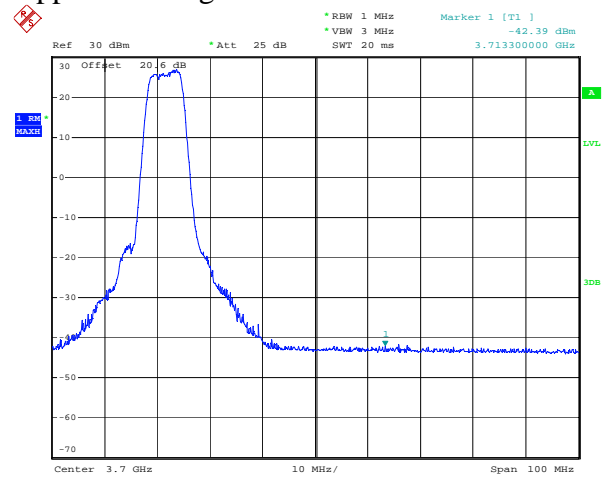
Date: 2.MAY.2008 17:20:56

7MHz Channel Lower Bandedge



Date: 2.MAY.2008 17:04:34

Upper Bandedge



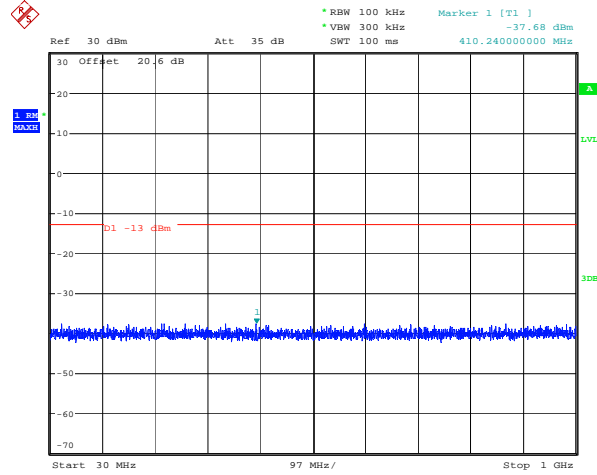
Date: 2.MAY.2008 17:12:10

Conducted Emissions

Conducted emissions were performed on low, mid and high channels using Max power setting of 36dBm. Only worst-case4 results are included.

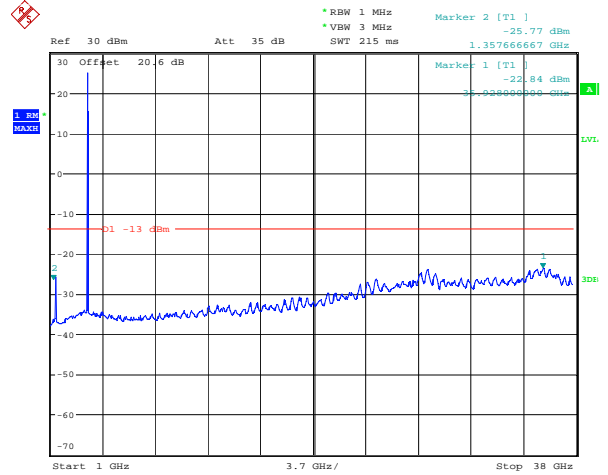
3.5MHz channel

30MHz-1GHz



Date: 29.APR.2008 17:26:20

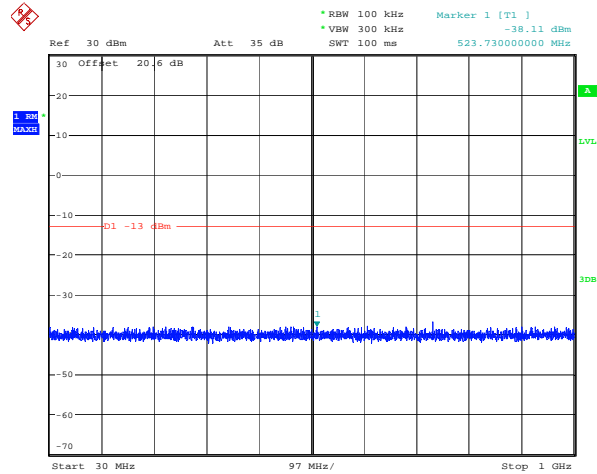
1GHz-38GHz



Date: 29.APR.2008 17:25:59

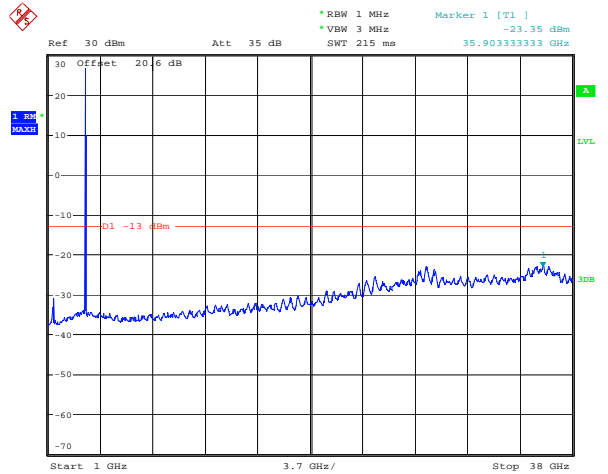
7MHz channel

30MHz-1GHz



Date: 29.APR.2008 17:18:50

1GHz-38GHz



Date: 29.APR.2008 17:18:23

Clause 90.210/90.1323 Field Strength of spurious radiation

90.1323 (a) 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.

Test Conditions:

Sample Number:	1	Temperature:	22°C
Date:	April 29, 2008	Humidity:	30%
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	3m Chamber

Test Results:

See Attached Table for Results

Additional Observations:

The Spectrum was searched from 30MHz to 38GHz.

All measurements were performed using a Peak Detector with 100kHz RBW below 1GHz and a 1MHz RBW above 1GHz at a distance of 3 meters. Measurements above 10GHz were performed at 1m.

The EUT was tested with output power set to maximum, 36dBm, set to low, mid and high channels.

Frequency MHz	Emission (RMS) dBm	Antenna height cm	Polarity	Turntable position deg	Corr. dB	Limit dBm	Margin dB
7302.238000	-30.1	100.0	V	239.0	-97.2	-13.0	17.1
7302.238000	-29.0	282.1	H	151.0	-98.2	-13.0	16.0
7326.722000	-31.3	99.9	H	160.0	-98.2	-13.0	18.3
7326.722000	-29.8	100.1	V	247.0	-97.2	-13.0	16.8
7348.253000	-28.3	100.0	V	246.0	-97.3	-13.0	15.3
7348.253000	-32.1	99.9	H	152.0	-98.3	-13.0	19.1

Clause 90.213 Frequency Stability

a) Unless noted elsewhere, transmitters used in the services governed by this part must have a minimum frequency stability as specified in the following Table.

Minimum Frequency Stability parts per million (ppm)

Frequency range (MHz)	Fixed and base stations 2 watts output power	Mobile stations Over power	2 watts or less output
Below 25	100	100	200
25-50	20	20	50
72-76	5	---	50
150-174	50	5	50
216-220	1.0	---	1.0
220-222	0.1	1.5	1.5
421-512	2.5	5	5
806-809	1.0	1.5	1.5
809-824	1.5	2.5	2.5
851-854	1.0	1.5	1.5
854-869	1.5	2.5	2.5
896-901	0.1	1.5	1.5
902-928	2.5	2.5	2.5
929-930	1.5	---	---
935-940	0.1	1.5	1.5
1427-1435	300	300	300
Above 2450	---	---	---

Test Conditions:

Sample Number:	1	Temperature:	21°C
Date:	April 28, 2008	Humidity:	32%
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	Wireless

Condition	Offset (Hz)	Offset (ppm)
+50°C, Nominal Voltage	-1000	-0.27
+40°C, Nominal Voltage	0	0.00
+30°C, Nominal Voltage	-1000	-0.27
+20°C, +15% Nominal Voltage	250	0.07
+20°C, Nominal Voltage	---	---
+20°C, -15% Nominal Voltage	-2250	-0.62
+10°C, Nominal Voltage	-2250	-0.62
0°C, Nominal Voltage	-2250	-0.62
-10°C, Nominal Voltage	-1500	-0.41
-20°C, Nominal Voltage	500	0.14
-30°C, Nominal Voltage	4750	1.30

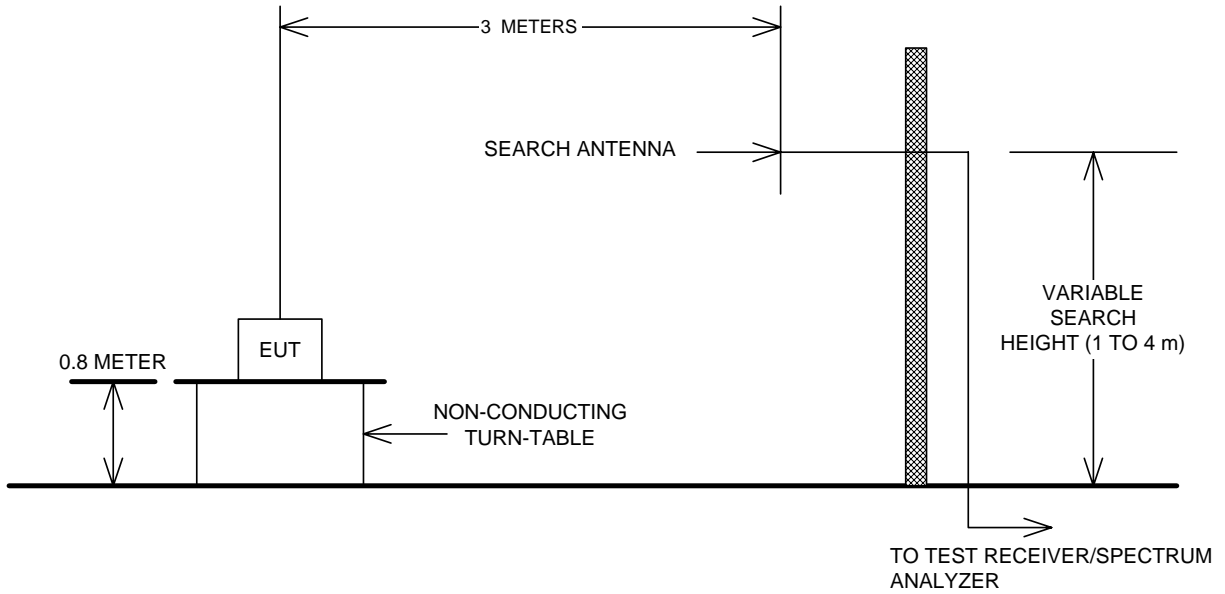
Appendix B : Setup Photographs

Radiated Spurious Emissions Setup:



Appendix C : Block Diagram of Test Setups

Test Site For Radiated Emissions



Conducted Emissions, Output power, Occupied Bandwidth

