

EMC Test Report
FCCID: QRF-FMXLJD35UY
TR-WMX 3.5GHz PICO Base Station
Tranzeo Wireless Technologies Inc.

Testing body:	Tranzeo EMC Labs Inc. 19473 Fraser Way, Pitt Meadows, BC, Canada V3Y 2V4
Client:	Tranzeo Wireless Technologies Inc. 19473 Fraser Way, Pitt Meadows, BC, Canada V3Y 2V4

The test results indicated in this report refer exclusively to the equipment under test specified below. It is not permitted to transfer the results to other systems or configurations.

Order number: 69

Type of test: Testing of electromagnetic disturbances characteristics

Date the EUT was received: December 1st, 2008

Date of test: December 1st, 2008 to December 12th, 2008

Report No.: 121208.1

Pitt Meadows, 12 December, 2008



EMC Manager: Andrew Marles



EMC Engineer: Bruce Balston

Revision History

Table of Contents

1.0	General Information	5
1.1	EUT Description.....	5
1.2	Operational Description	6
1.3	EUT Testing Configuration.....	6
1.4	Standards Applied.....	6
1.5	Test Facilities	7
1.6	Test Equipment.....	7
1.7	Test System Details	7
2.0	RF Output Power.....	8
2.1	Test Standard.....	8
2.2	Test Limits	8
2.3	Method of measurement.....	8
2.4	Test Setup.....	8
2.5	Test Results	10
3.0	Modulation Characteristics / Occupied Bandwidth	12
3.1	Test Standard	12
3.2	Method of Measurement	12
3.3	Test Setup.....	12
3.4	Test Results	13
4.0	Spurious Emissions at Antenna Terminal	26
4.1	Test Standard.....	26
4.2	Test Limits	26
4.3	Method of measurement.....	26
4.4	Test Setup.....	26
4.5	Test Results	26
5.0	Field Strength of Spurious Radiation.....	28
5.1	Test Standard.....	28
5.2	Test Limits	28
5.3	Method of Measurement	28
5.4	Test Setup.....	28
5.5	Test Results	30
6.0	Frequency Stability	33
6.1	Test Standard.....	33
6.2	Test Limits	33
6.3	Method of Measurement	33
6.4	Test Setup.....	33
6.5	Test Results	33
7.0	RF Exposure Evaluation	34
7.1	Test Standard.....	34
7.2	Method of Measurement	34
7.3	EUT Operating Condition	34
7.4	RF exposure evaluation distance calculation.....	34
8.0	Test Photos	35
APPENDIX A.....		37

1.0 General Information

1.1 EUT Description

Product Name	WiMax Base Station
Company Name	Tranzeo Wireless Technologies Inc..
Model No.	TR-WMX-3.5-pBS
Rated RF Output Power	Adjustable, 17.31 dBm MAX
Frequency Range	3650 -3675 MHz
Channel Bandwidth	3.5/7.0 MHz
Frequency Resolution	250 kHz steps
Transmit Rate	14.0 Mbps maximum
Type of Modulation	OFDM (BPSK, QPSK, 16-QAM, 64-QAM)
Antenna Type	External gw2348-airsync-wimax-rel-253-1504-188-v2.2b93-r71
Product Software	
Test Software	Mikrotik test software; RS EMC32 software
Operator Channel Selection	By Software
Power Adapter	Model: Powertron PA1024-3DU Input: 100-240V 50-60Hz, 0.6A Output: 18V 1.1A 20W

Product sample tested:

Manufacturer	Model No.	Serial No.
Tranzeo Wireless	TR-WMX-3.5-pBS	TR-WMX-3.5-pBS-ENG001

As an IEEE 802.16 compliant wireless system, this device includes a 3.5 GHz receive function as well as a 3.5 GHz digital modulation transmit function. There are no user serviceable parts inside the unit. It is factory sealed in a one-time use manner and inaccessible to the end user. The TR-WMX-3.5-pBS is fitted with a standard Type N antenna connector. The tests were performed on a production sample model to demonstrate compliance with FCC Parts 2 and 90.

Frequencies tested in report:

Frequency (MHz)	Range (MHz)
Low 3650	3650-3675
Middle 3662	3650-3675
High 3675	3650-3675

1.2 Operational Description

The device is a WiMax Base Station designed specifically for wireless networks. The device has an IEEE 802.16 radio and a standard type N antenna connector. The transceiver operates in the frequency band 3650-3675 MHz. The device transmits digital network data and is mounted in fixed point-to-multi point installations.

The type of RF modulation is OFDM used at 3.5 GHz band. The device can transmit data at a real-world data rate of approximately 14.0 and 3.6 Mbps for 7.0 and 3.5 MHz bandwidth, appropriately. The device's standard compliance ensures that it can communicate with a corresponding WiMax CPE.

The product is used exclusively in a professionally installed, wireless network environment.

1.3 EUT Testing Configuration

The model TR-WMX-3.5-pBS was tested.

The EUT was mounted to a custom non-metallic stand to best represent a typical user installation. The EUT was wirelessly connected to a CPE to imitate a real world situation. Both the CPE and the EUT were also connected to a host PCs so that they could be cycled through the various test modes and channels.

The EUT was tested in the following modes:

Standby/Receive mode: In this mode the EUT beacons.

Data transfer mode: In this mode the EUT is exercised with commercially available bandwidth test software. A link is established between two host PCs through the EUT and CPE and the data is transmitted at the highest possible rate.

Data is presented for the worst case configuration.

1.4 Standards Applied

The following general standards were applied:

FCC CFR47 parts 2 and 90Z.

All tests have been performed in accordance with these test standards.

1.5 Test Facilities

19473 Fraser Way
 Pitt Meadows, BC V3Y 2V4
 Canada
 Phone: (604) 460-6002
 Fax: (604) 460-6005

FCC registration number: 960532
 Industry Canada Number: 5238A

1.6 Test Equipment

Manufacturer	Model	Description	Serial Number	Cal Due Date
Rohde & Schwarz	ESU 40	EMI Test Receiver	10011	29-Mar-09
Rohde & Schwarz	SMJ 100A	Vector Signal Generator	100645	12-Mar-09
ETS-Lindgren	2165	Turntable	00043883	N/R
ETS-Lindgren	2175	Mast Motor	00077487	N/R
Sunol Sciences	JB3	Antenna	A042004	05-May-09
Sunol Sciences	DRH-118	Antenna	A052804	02-Jun-09
Com-Power	LI-115	LISN	241037	30-Jan-09
Boonton	4200	Power Meter	430519BG	12-Aug-09
Boonton	51033	Power Sensor	15779	12-Aug-09
Thermo Keytek	CE Master	Waveform Generator	9610265	25-Feb-09
Thermo Keytek	MZ-15/EC	ESD Applicator	0402265	25-Feb-09
Chase	EMCell	RF Immunity Cell	1016	N/R
Agilent	8648C	Signal Generator	3623A03622	14-Feb-09
Instruments for Industry	Power Amplifier	Power Amplifier	5580-20	N/R
ETS Lindgren	HI-6005	Isotropic Field Probe	00034277	N/R
ETS Lindgren	2090	Multi-Device Controller	00058942	07-Dec-09
FCC	F-120-9A	Bulk Current Injection Probe	399	N/R

1.7 Test System Details

The following auxiliary equipment and cables were used for performing the tests:

Manufacturer	Model	Description	S/N
Compaq	Presario 2100	Laptop PC	F3261CYQ
Tranzeo	POE-1	DC injection unit	n/a

2.0 RF Output Power

2.1 Test Standard

Test Requirement: FCC CFR47 part 90 subpart Z Clause 90.205 (r), 90.1321

Test Method: FCC CFR47 part 2 subpart J Clause 2.1046

90.205 (r). The output power shall not exceed by more than 20 percent either the output power shown in the Radio Equipment List [available in accordance with §90.203(a)(1)] for transmitters included in this list or when not so listed, the manufacturer's rated output

90.1321 (a) ... 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.

Since the unit will only be used in a professional installation, the end-user of this product is to exercise proper engineering judgment in order to ensure that the EIRP limits are met.

The RF power of the EUT was measured at the antenna port with a modulated carrier.

2.2 Test Limits

The peak EIRP power density of the intentional radiator shall be less than 1 watt (30 dBm) in any 1 MHz slice of 25 MHz spectrum.

Frequency Range	Max Power/1 MHz
3650-3700 MHz	30 dBm

2.3 Method of measurement

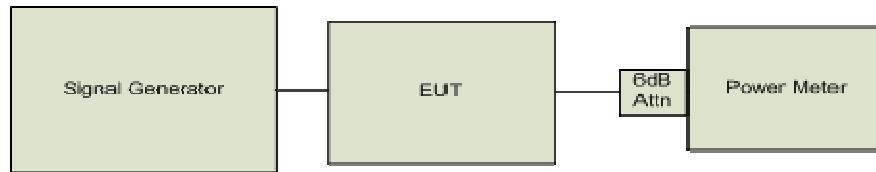
All test conditions and measurement procedures were performed in accordance with FCC CFR47 part 2 subpart J Clause 2.1046.

2.4 Test Setup

This test is performed on the sample unit equipped with a standard antenna connector. The power is measured using the power measurement feature of the spectrum analyzer. The link between the EUT and CPE is established invoking the EUT to transmit data. Communication is established by serial connection to the laptops. A solid Received Signal Level (RSL) is established by using the right value for the attenuator. This procedure will be used for all transmitter conducted measurements.

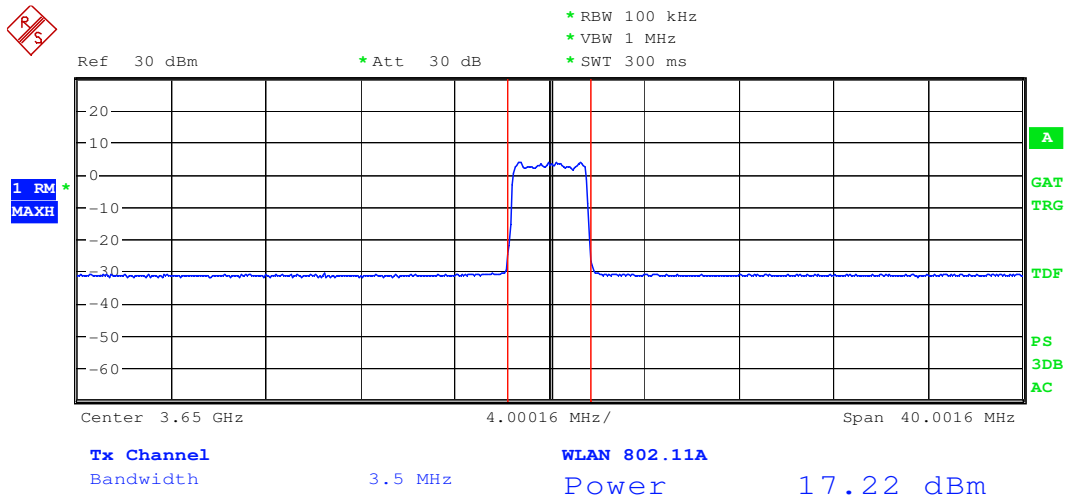
The test is performed at normal conditions according to FCC CER 47 2.1046.

Test Setup Block Diagram



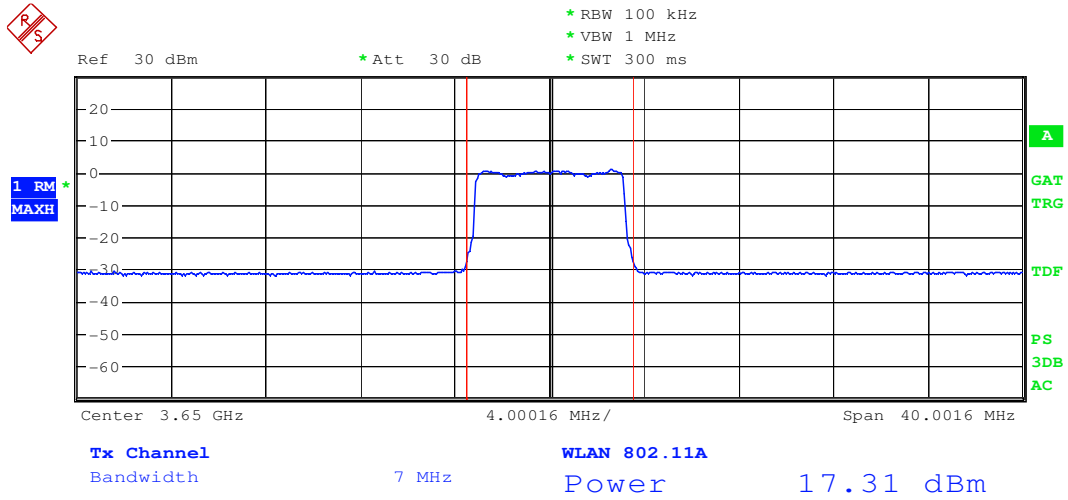
Data is presented for the worst case situation for 3.5 and 7 MHz bandwidths.

3.5 MHz



Date: 9.DEC.2008 20:04:13

7 MHz



Date: 9.DEC.2008 19:18:53

2.5 Test Results

3.5 MHz bandwidth

Freq (MHz)	Output Power, dBm	Bandwidth ,MHz	Meas Rdg (dBm/MHz)	Limit (dBm/M Hz)	Margin (dB)	Result
3650	17.22	3.5	19.78	30	-10.22	PASS
3662	16.90	3.5	19.46	30	-10.54	PASS
3675	16.83	3.5	19.39	30	-10.61	PASS

7.0 MHz bandwidth

Freq (MHz)	Output Power, dBm	Bandwidth ,MHz	Meas Rdg (dBm)	Limit (dBm)	Margin (dB)	Result
3650	17.31	7.0	16.86	30	-13.14	PASS
3662	16.79	7.0	16.34	30	-13.66	PASS
3675	16.83	7.0	16.38	30	-13.62	PASS

Calculation Sample

The EIRP output power limit (30 dBm/MHz) is calculated according to the following formula:

$$\text{EIRP} = P_T - L_C + G_A, \quad (1)$$

where P_T is output power at antenna port, $L_C \sim 2$ dB is power loss, G_A is antenna gain. Note that for 1 MHz range, the correction factor $C = 10 \log (10/1)$ should be added to P_T . In turn, correction parameters $R_{3.5} = 10 \log (3.5/1) = 5.44$ and $R_7 = 10 \log (7/1) = 8.45$ should be subtracted from P_T . Finally,

$$P_{Tf} = P_T + C - R \quad (2)$$

and from (12) and (2):

$$G_A = \text{EIRP} + L_C - P_T - C + R \quad (3)$$

Then according to (3), for 3.5 GHz bandwidth:

$$G_{(A) 3.5} = 30 + 2 - 17.22 - 10 + 5.44 = 10.22 \text{ dBi}$$

and for 7 MHz bandwidth:

$$G_{(A) 7} = 30 + 2 - 17.31 - 10 + 8.45 = 13.14 \text{ dBi.}$$

3.0 Modulation Characteristics / Occupied Bandwidth

3.1 Test Standard

Test Requirement: FCC CFR47 part 90 subpart Z Clause 90.1323

Test Method: FCC CFR47 part 2 subpart J Clause 2.1047, 2.1049

2.1047 (d) A curve or equivalent data which shows that the equipment will meet the modulation requirements of the rules under which the equipment is to be licensed.

2.1049. The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission...

90.1323 (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

§ 90.210 Emission masks.

Except as indicated elsewhere in this part, transmitters used in the radio services governed by this part must comply with the emission masks outlined in this section.

(c) Emission Mask C. For transmitters that are not equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier output power (P) as follows:

(3) 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.

3.2 Method of Measurement

All test conditions and measurement procedures were performed in accordance with CFR47 part 2 subpart J Clause 2.1047, 2.1049.

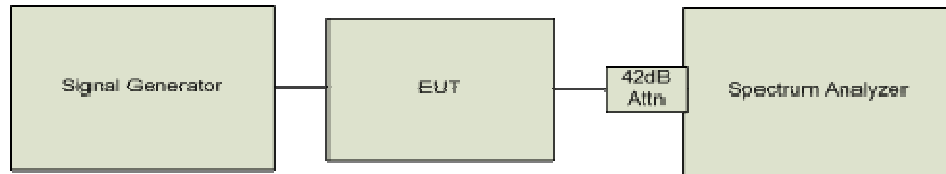
3.3 Test Setup

This test is performed conducted on the TR-WMX-3.5-pBS equipped with a standard N-connector. The occupied bandwidth is measured at the antenna port using the spectrum analyzer.

Data is presented in the worst case configuration.

Note: For testing purposes only, and to ensure worst case performance in all testing configurations, the radio is configured to transmit at the maximum possible RF power.

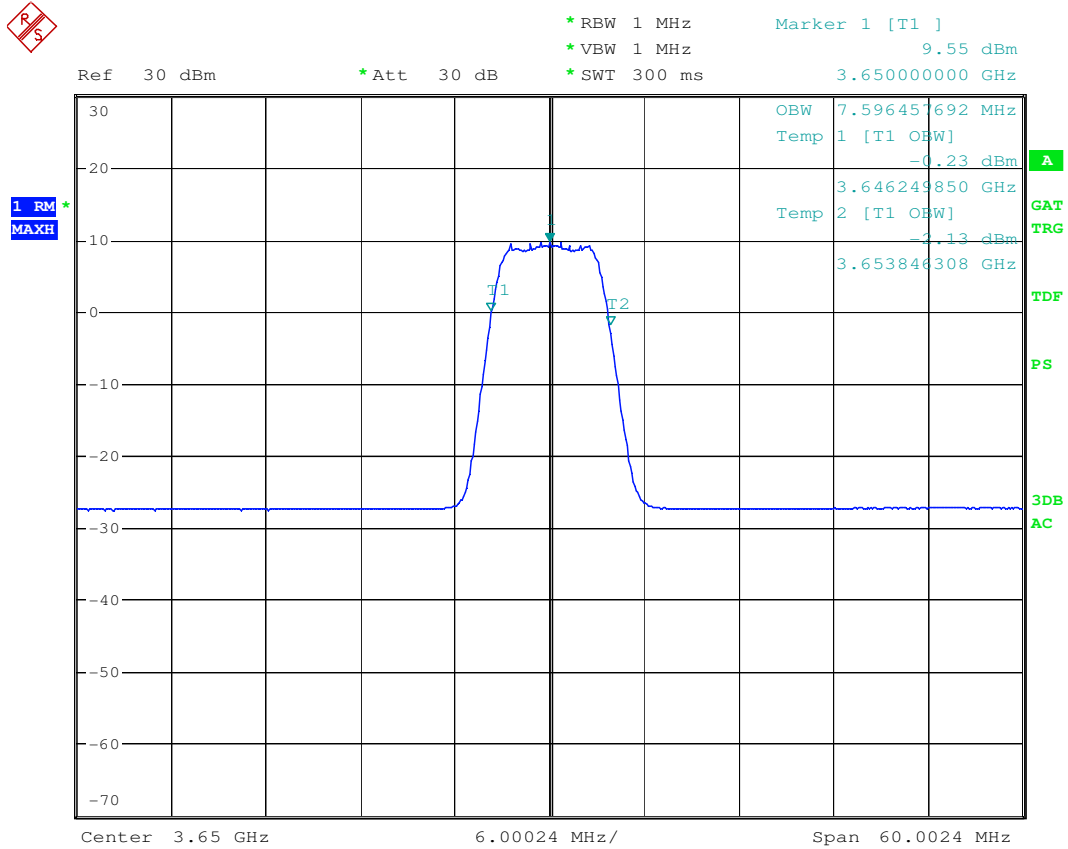
Test Setup Block Diagram



3.4 Test Results

Bandwidth 7.0 MHz

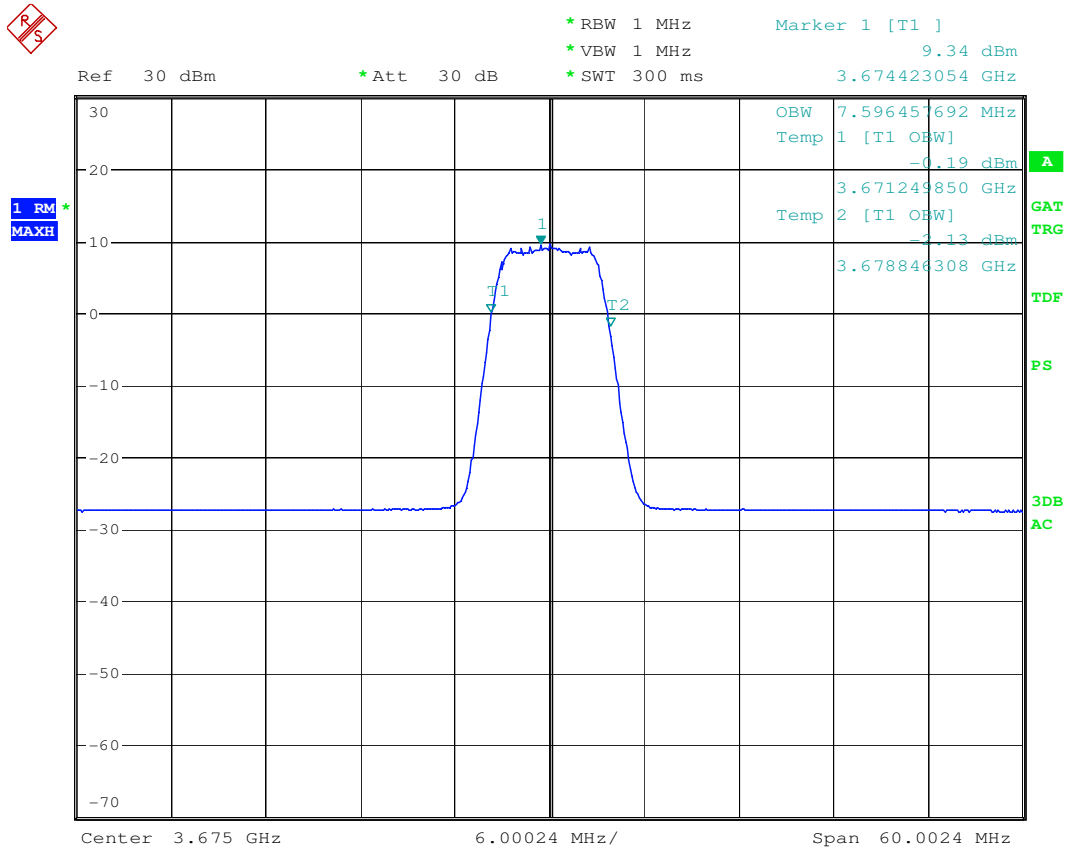
Modulation 64QAM $\frac{3}{4}$
Frequency 3650



Date: 10.DEC.2008 17:04:57

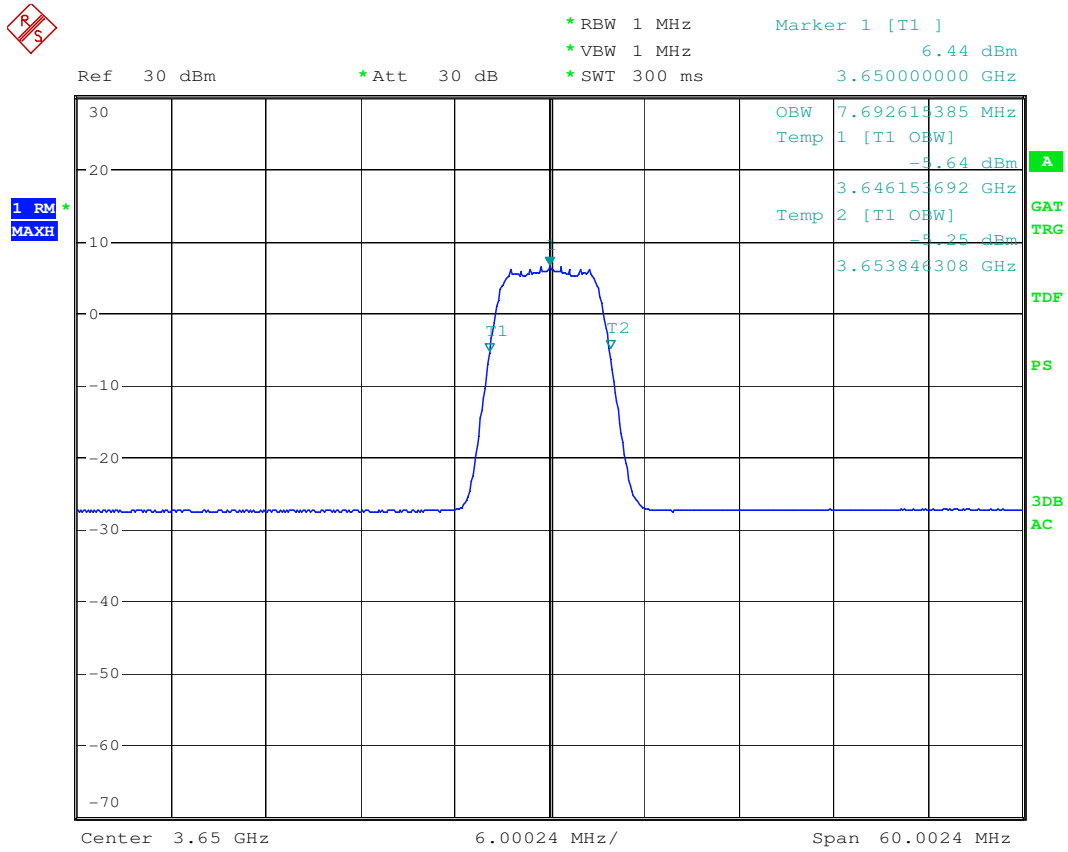
Modulation 64QAM $\frac{3}{4}$
Frequency 3675

Modulation Characteristics/Occupied Bandwidth



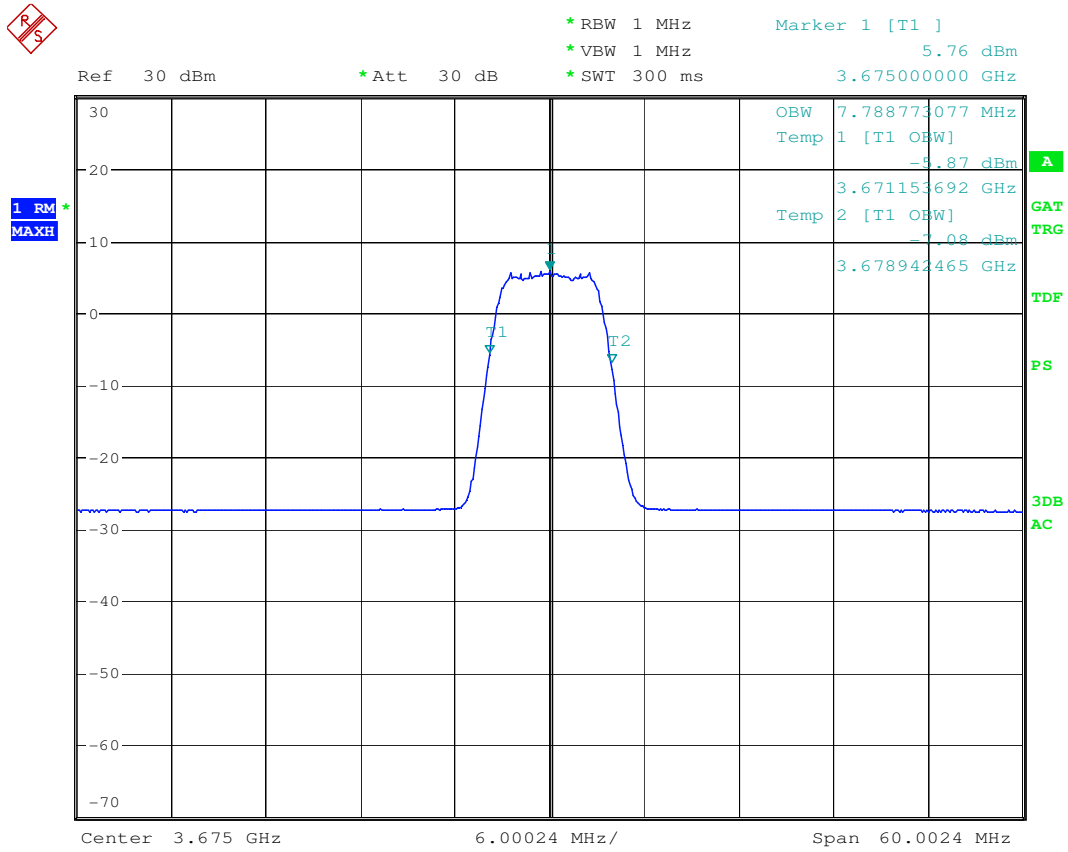
Date: 10.DEC.2008 17:08:01

Modulation 16QAM $\frac{3}{4}$
Frequency 3650



Date: 10.DEC.2008 15:25:47

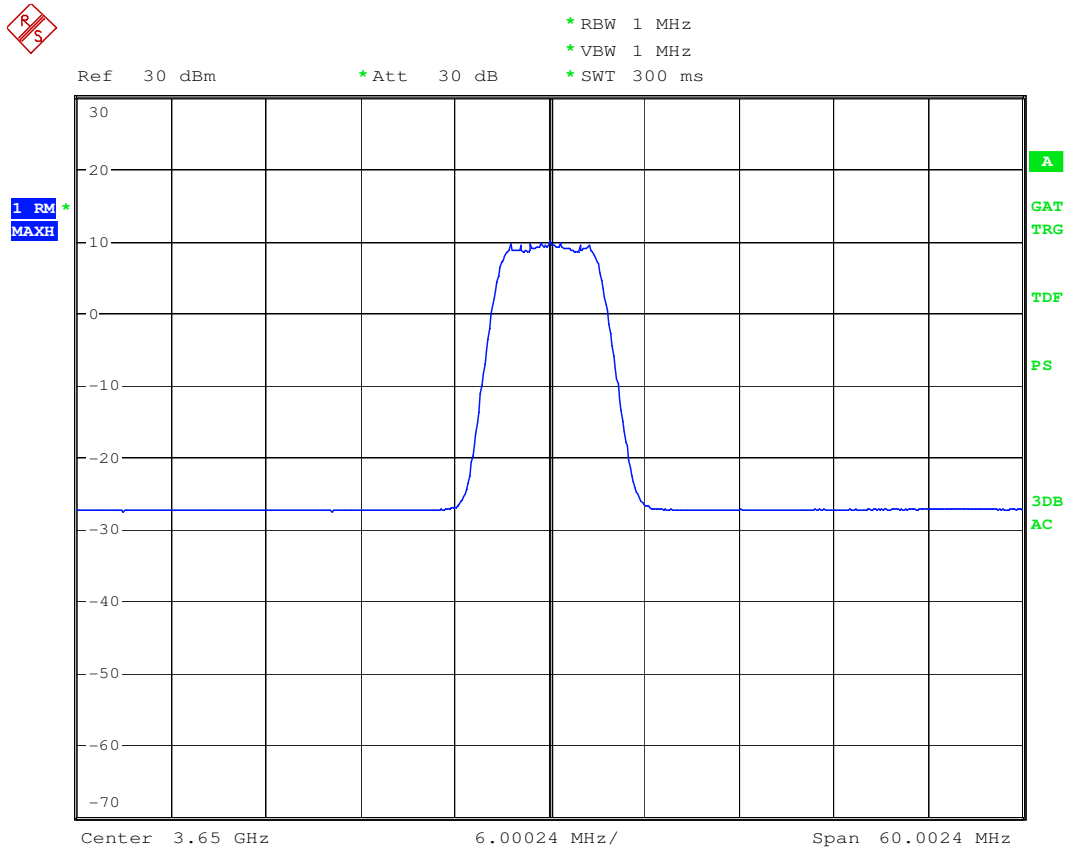
Modulation 16QAM $\frac{3}{4}$
Frequency 3675



Date: 10.DEC.2008 15:19:53

Modulation QPSK $\frac{3}{4}$
Frequency 3650

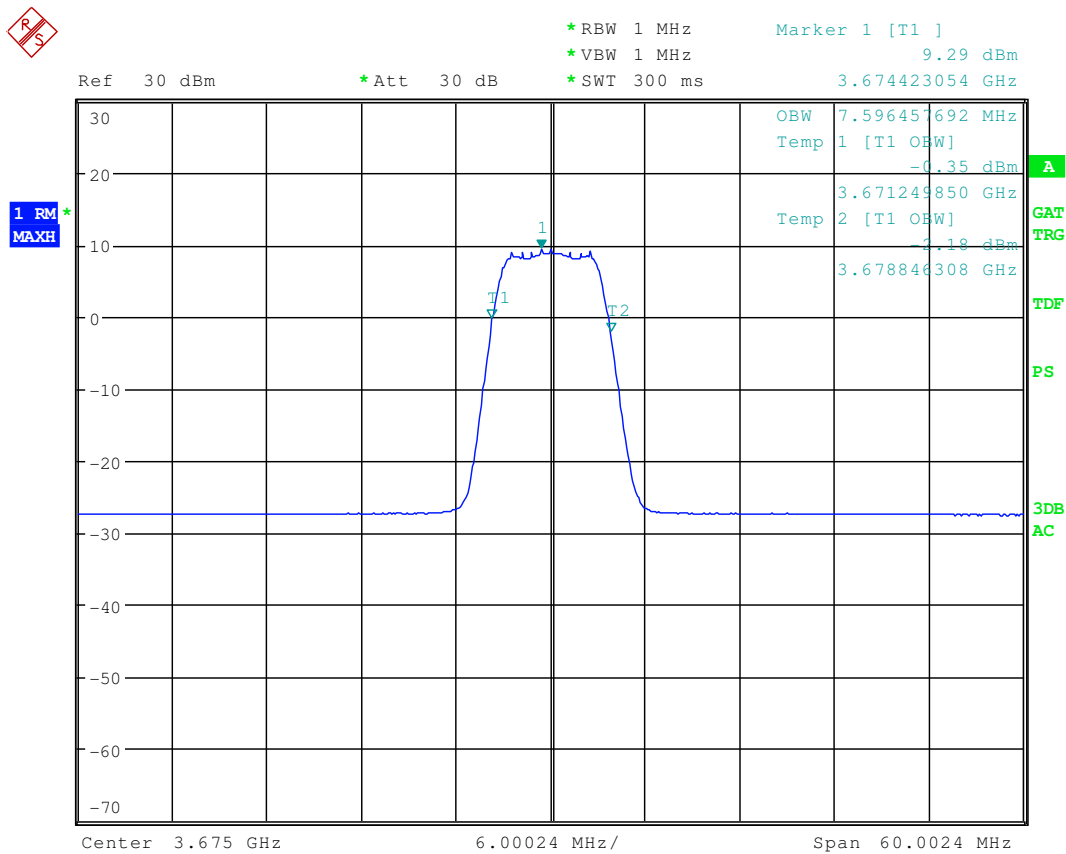
Modulation Characteristics/Occupied Bandwidth



Date: 10.DEC.2008 17:19:49

Modulation QPSK $\frac{3}{4}$
Frequency 3675

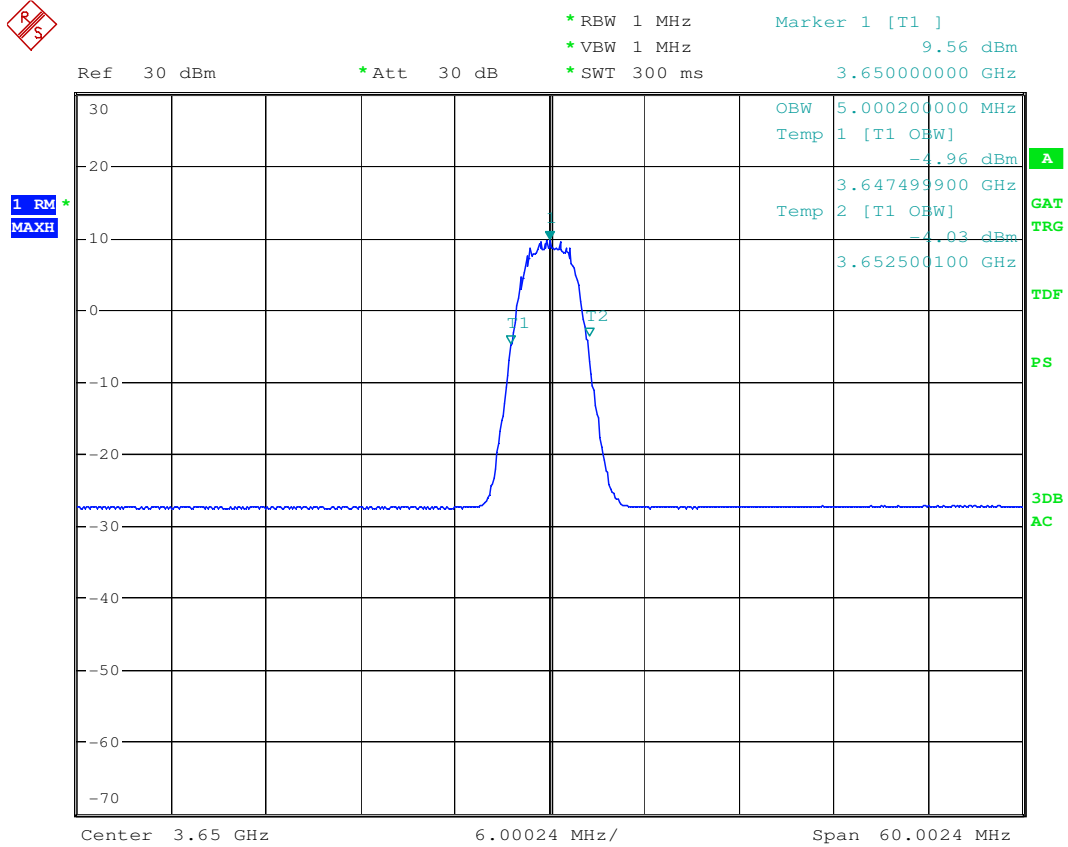
Modulation Characteristics/Occupied Bandwidth



Date: 10.DEC.2008 17:16:47

Bandwidth 3.5 MHz

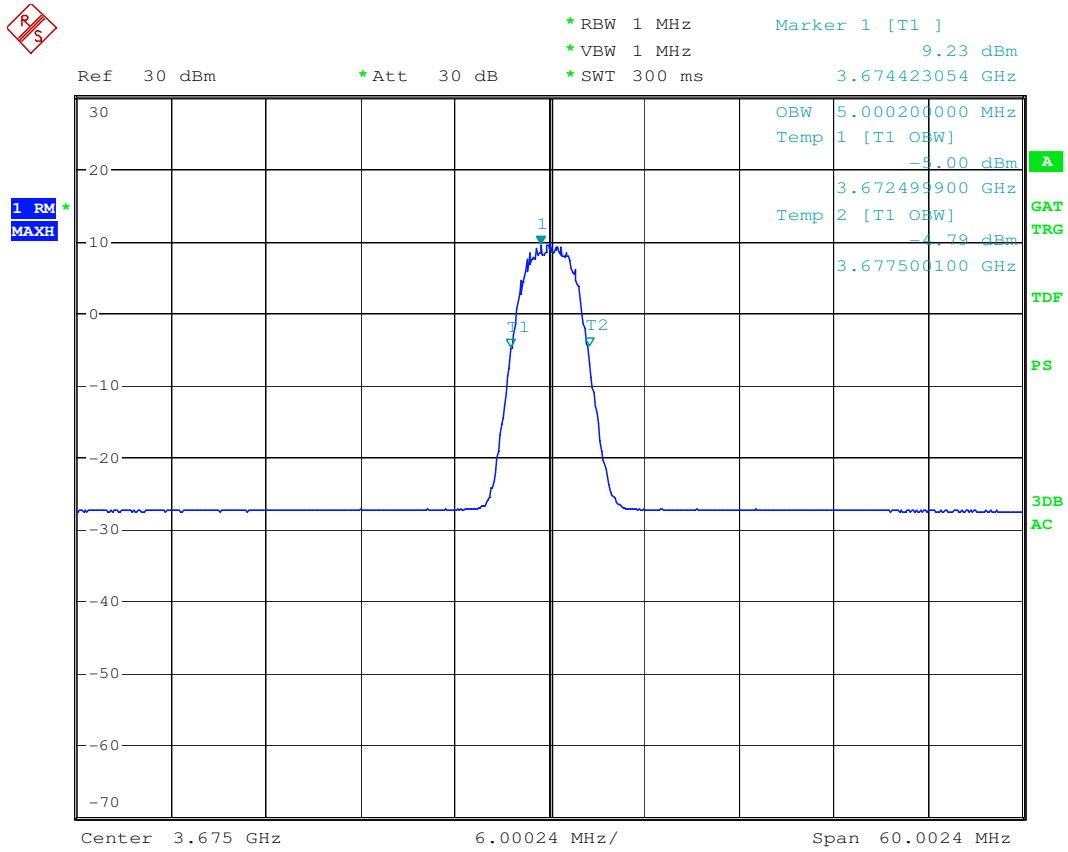
Modulation 64QAM $\frac{3}{4}$
Frequency 3650



Date: 10.DEC.2008 16:59:48

Modulation 64QAM $\frac{3}{4}$
Frequency 3675

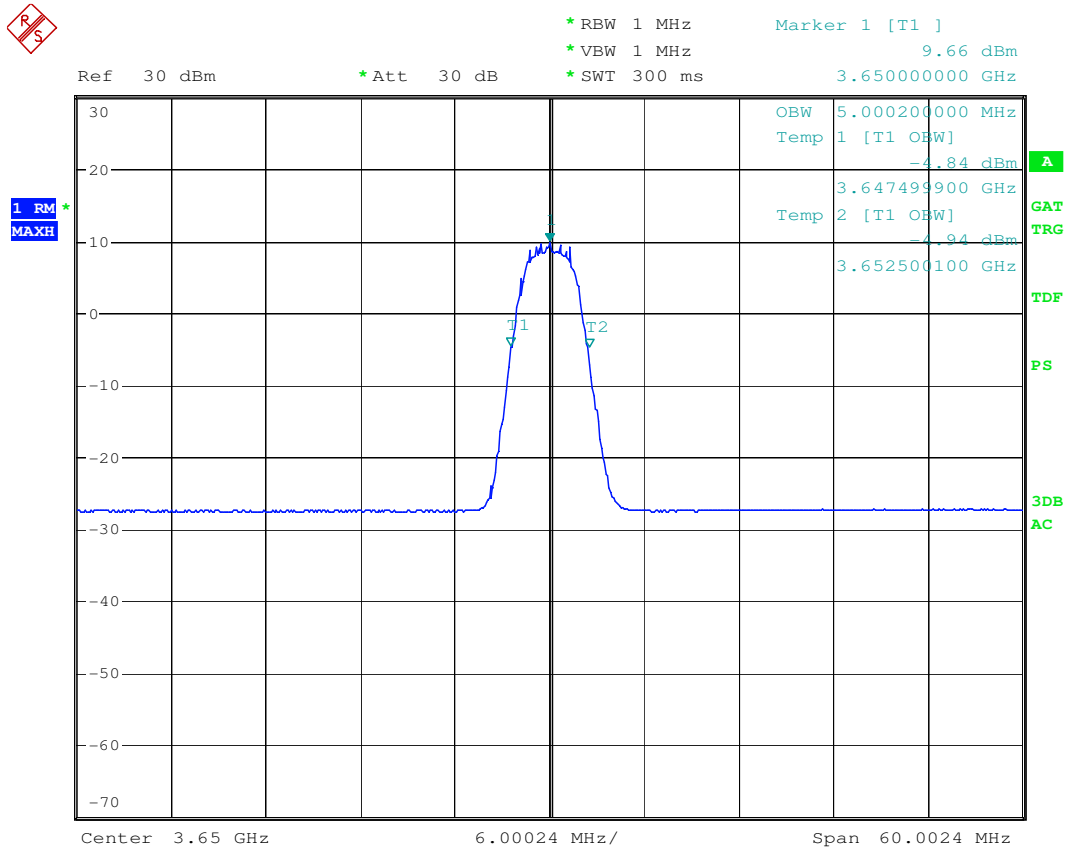
Modulation Characteristics/Occupied Bandwidth



Date: 10.DEC.2008 16:03:47

Modulation 16QAM $\frac{3}{4}$
Frequency 3650

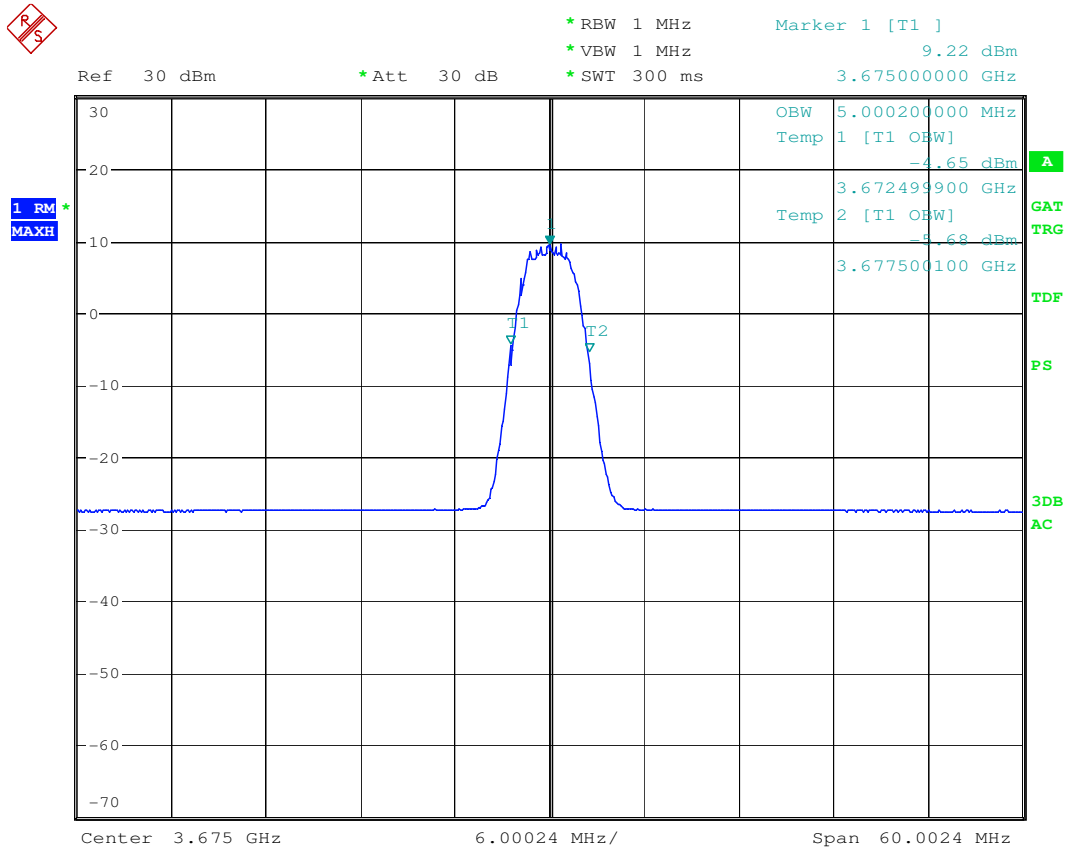
Modulation Characteristics/Occupied Bandwidth



Date: 10.DEC.2008 15:32:10

Modulation 16QAM $\frac{3}{4}$
Frequency 3675

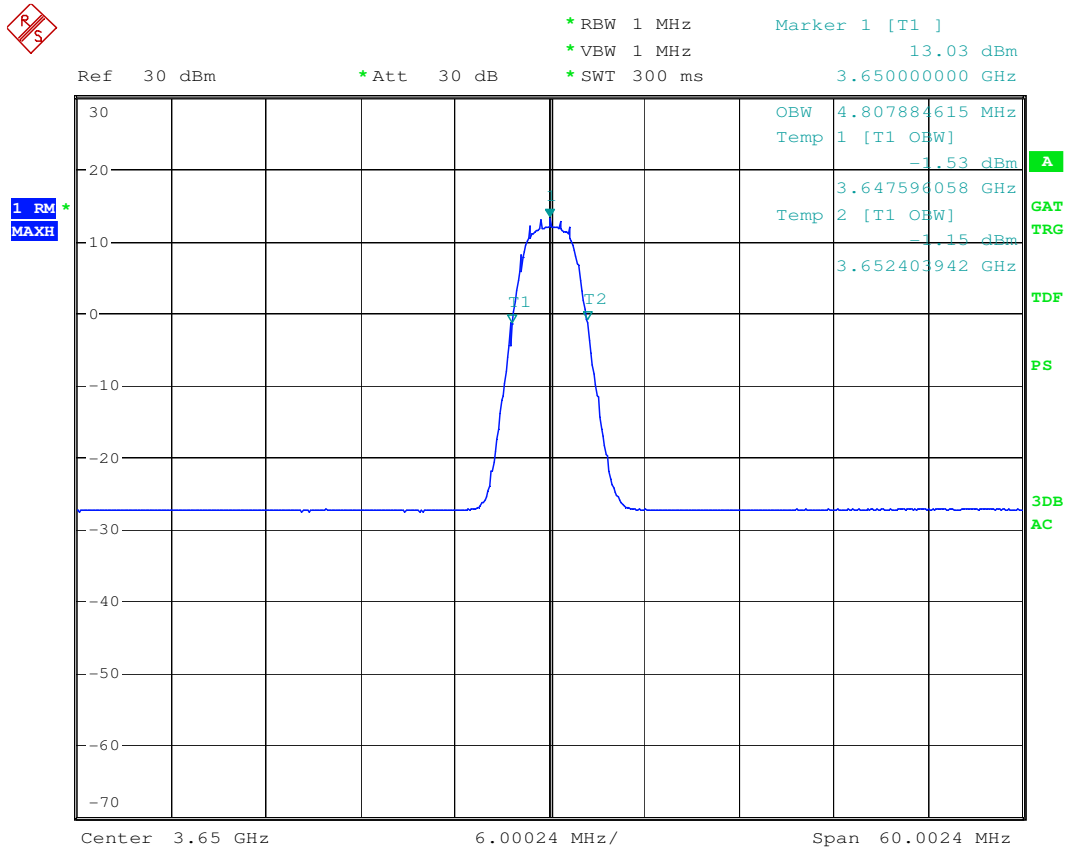
Modulation Characteristics/Occupied Bandwidth



Date: 10.DEC.2008 15:35:01

Modulation QPSK $\frac{3}{4}$
Frequency 3650

Modulation Characteristics/Occupied Bandwidth



Date: 10.DEC.2008 17:25:31

Modulation QPSK $\frac{3}{4}$
Frequency 3675



4.0 Spurious Emissions at Antenna Terminal

4.1 Test Standard

Test Requirement: FCC CFR47 part 90 subpart Z Clause 90.1321;

Test Method: FCC CFR47 part 2 subpart J Clause 2.1051

2.1051. The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in § 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

4.2 Test Limits

Required attenuation = $43 + 10 \log P$ dB

Conducted limit = -13 dBm

4.3 Method of measurement

All test conditions and measurement procedures were performed in accordance with FCC CFR47 part 2 subpart J Clause 2.1051.

4.4 Test Setup

The EUT was exercised with OFDM modulation. Measurements above 1 GHz were taken with RBW, VBW = 1 MHz. The EUT was exercised using bandwidth test software at the highest possible data rate. Testing was performed on low, middle and high channels in the 3.5 GHz frequency band. All emission bandwidths were tested.

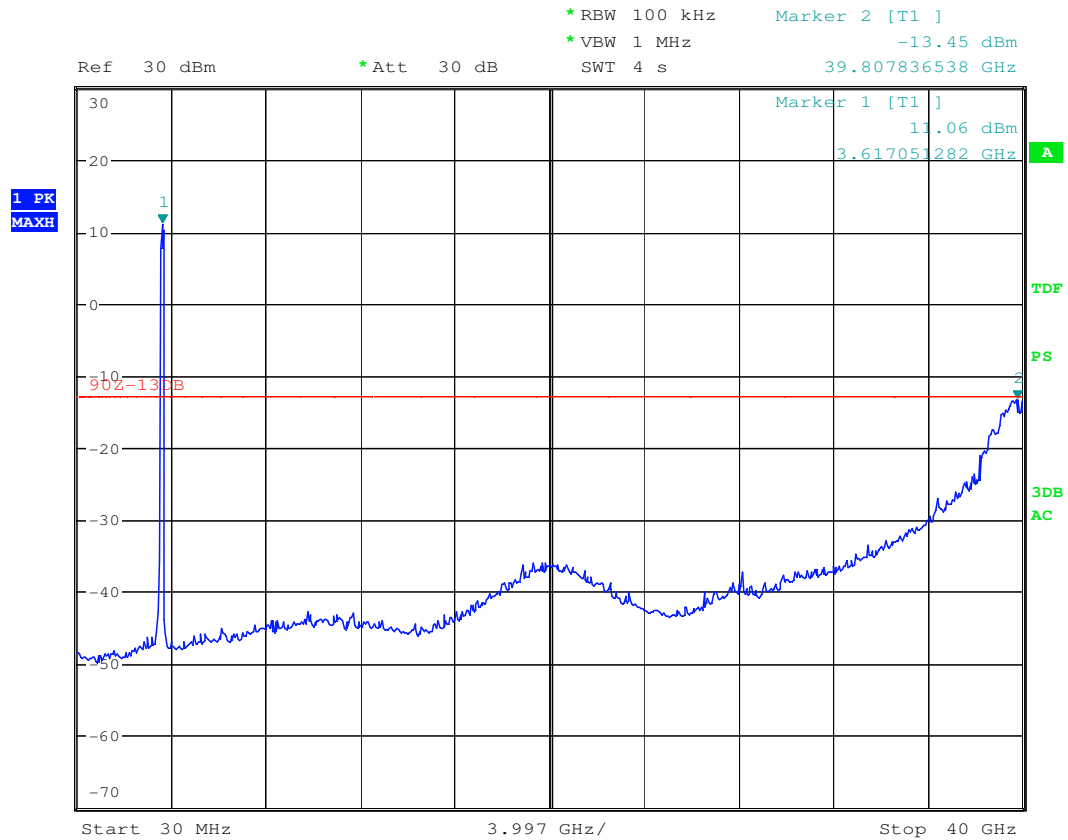
Note: For testing purposes only, to ensure worst case performance in all testing configurations, the radio is configured to transmit at the maximum possible RF power.

Test Setup Block Diagram



4.5 Test Results

Field Strength of Spurious Radiation



Date: 12.DEC.2008 17:32:27

Data for low, middle and high channel are presented.
There were not detected any other emissions with level exceeding 20 dBc limit.

5.0 Field Strength of Spurious Radiation

5.1 Test Standard

Test Requirement: FCC CFR47 part 90 subpart Z Clause 90.1321

Test Method: FCC CFR47 part 2 subpart J Clause 2.1053

1 (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. 1

5.2 Test Limits

Required attenuation = $43 + 10 \log P$ dB

Radiated limit = 84.5 dBuV

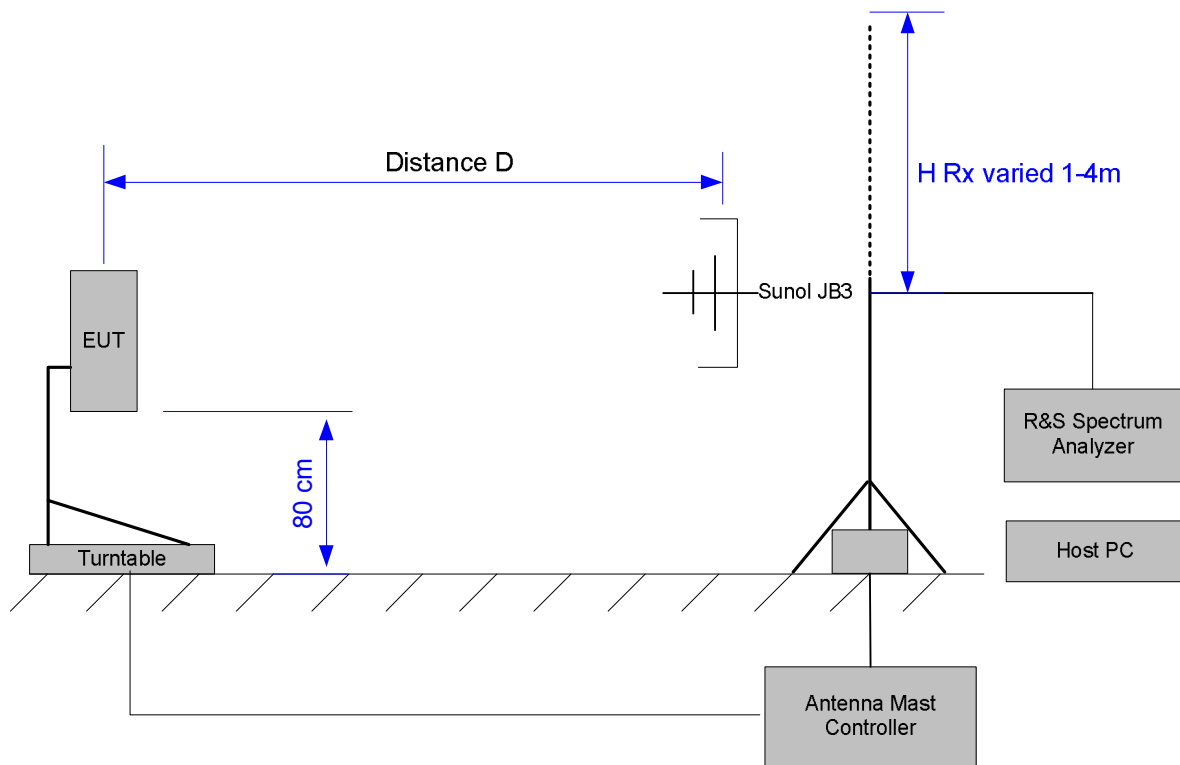
5.3 Method of Measurement

All test conditions and measurement procedures were performed in accordance with FCC CFR47 part 2 subpart J Clause 2.1053. Substitution method as prescribed under ANSI/TIA-603-C section 22.17 and 2.2.12 is required for all signals within 20 dB of limit.

5.4 Test Setup

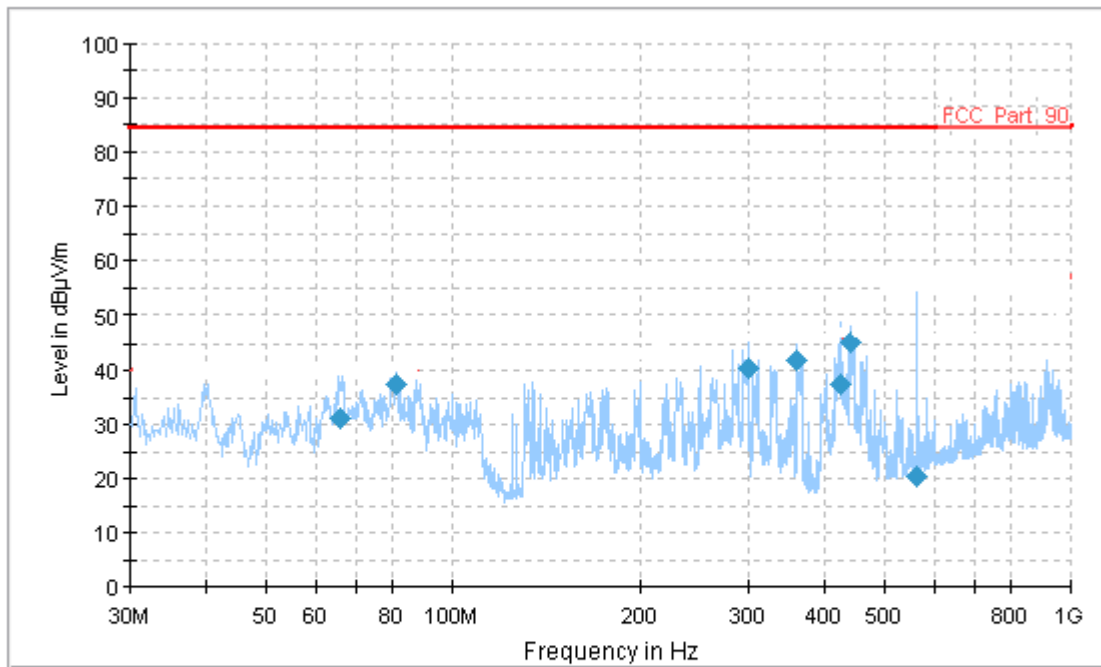
The output of the EUT is connected to the measurement equipment. Only worst case measurements are shown below.

Test Setup Block Diagram – Radiated Measurements (Spurious)



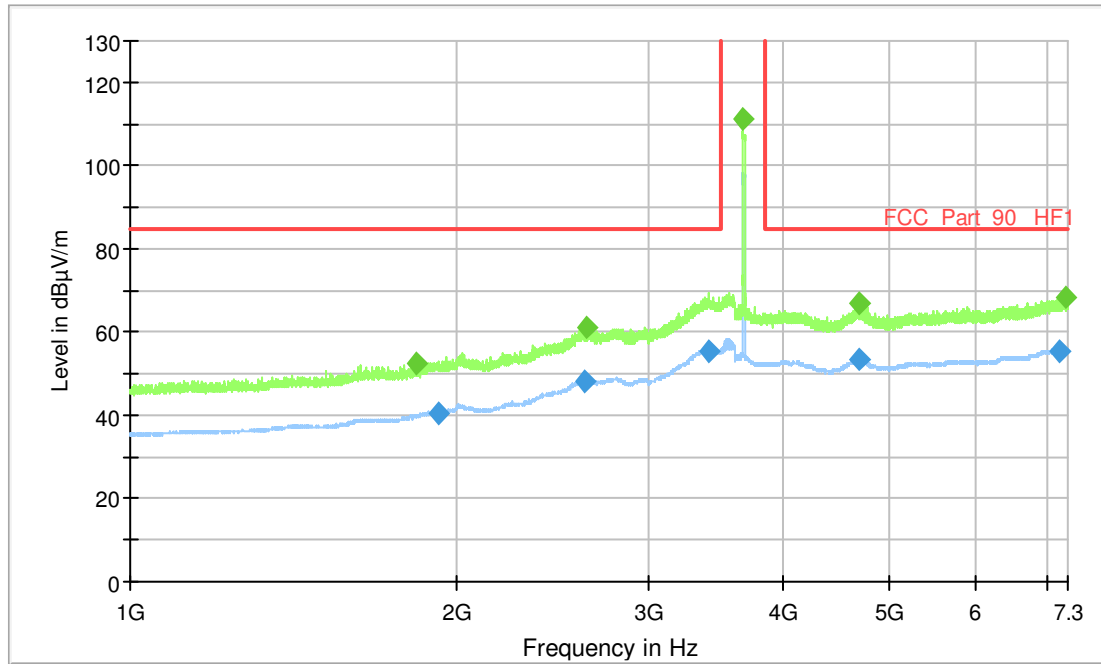
5.5 Test Results

30 MHz - 1 GHz



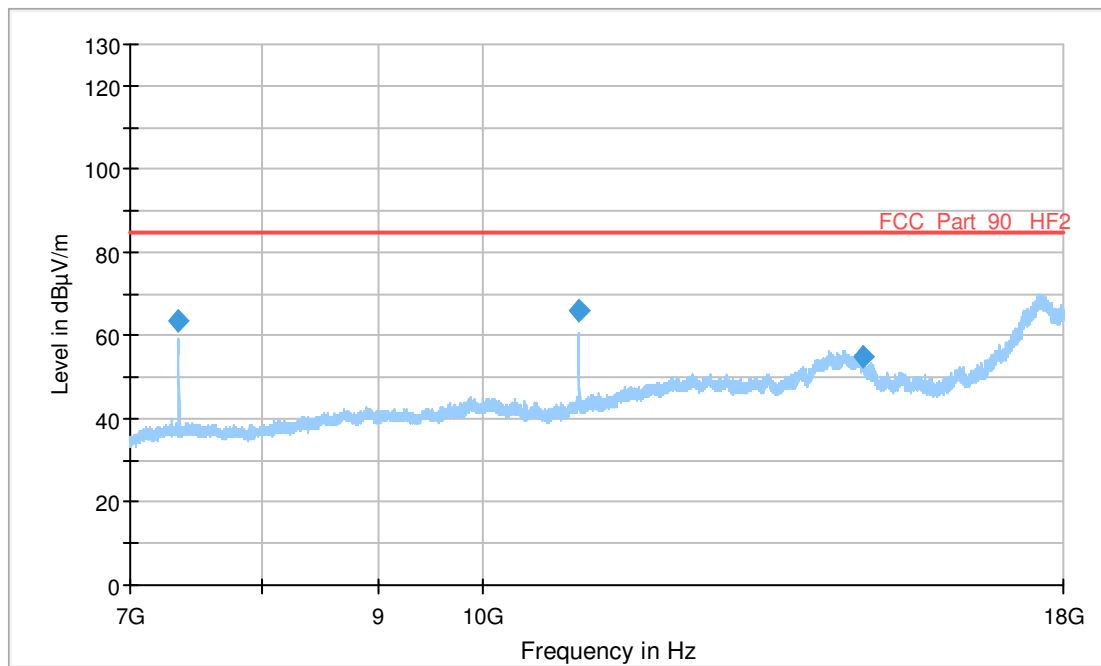
No emissions were found within 20 dB of limit.

1 GHz-7.3 GHz



No emissions were found within 20 dB of limit.

7GHz-18GHz



No emissions were found within 20 dB of limit.

6.0 Frequency Stability

6.1 Test Standard

Test Requirement: FCC CFR47 part 90 subpart Z Clause 90.1321

Test Method: FCC CFR47 part 2 subpart J Clause 2.1055

6.2 Test Limits

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
...above 2450 MHz ... frequency stability is to be specified in the station authorization

The frequency stability shall be measured with variation of ambient temperature as follows from -30° to +50° centigrade for all equipment... Vary primary supply voltage from 85 to 115 percent of the nominal value...

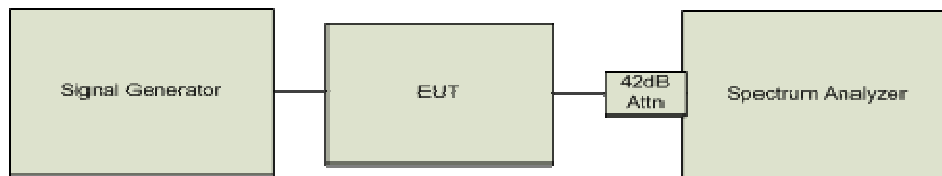
6.3 Method of Measurement

All test conditions and measurement procedures were performed in accordance with FCC CFR47 part 2 subpart J Clause 2.1055.

6.4 Test Setup

Test Setup Block Diagram

Conducted Setup



6.5 Test Results

Frequency	Bandwidth	Deviation (kHz)	Deviation (ppm)
3650	3.5	0	0.00
	7	21	5.75
3675	3.5	21	5.71
	7	21	5.71
3700	3.5	21	5.68
	7	21	5.68

Detailed test results of ambient temperatures to be found in appendix A.

7.0 RF Exposure Evaluation

7.1 Test Standard

Test Requirement: FCC 1.1310

FCC 1.1310 states the criteria listed in the table below shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in Section 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of Section 2.1093 of this chapter. Further information on evaluating compliance with these limits can be found in the FCC's OST/OET Bulletin Number 65, "Evaluating Compliance with FCC-Specified Guidelines for Human Exposure to Radiofrequency Radiation".

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/M)	Power Density (mW/cm ²)	Average Time
(A) Limits for Occupational/Control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/Uncontrolled Exposures				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

7.2 Method of Measurement

All test conditions and measurement procedures were performed in accordance with FCC 1.1310.

7.3 EUT Operating Condition

The maximum antenna gain is 10.22 dBi at 3.65 GHz.

7.4 RF exposure evaluation distance calculation

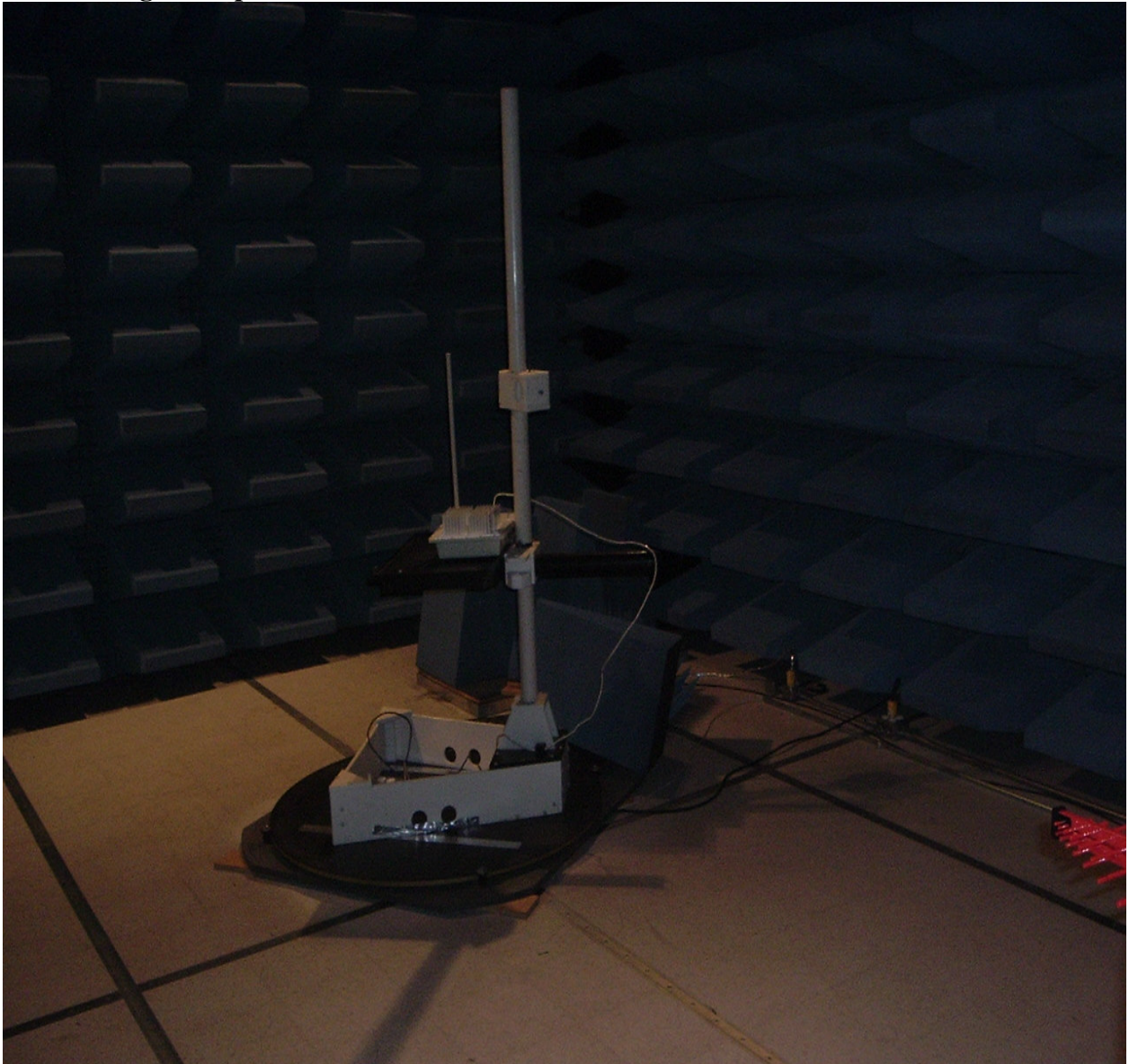
EUT with 10.22 dBi antenna

Mode OFDM/ Channel BW = 3.5 MHz			
Freq (MHz)	Output Power to Antenna (dBm)	Antenna Gain (dBi)	r (cm)
3650	17.22	10.22	6.7
3662	16.90	10.54	6.4
3675	16.83	10.61	6.3

As shown above, the minimum distance where the MPE limit is reached is 6.7 cm for the EUT.

8.0 Test Photos

Field Strength of Spurious Radiation



Frequency Stability



APPENDIX A

Temperature	F1	F2	FCntr	Fdev, kHz	PPM Limit	Voltage, V	Frequency, MHz	Bandwidth
50	3.67332	3.6766	3.67496	-40	73.50	15.3	3675	3.5
50	3.67331	3.6766	3.674955	-45	73.50	18	3675	3.5
50	3.673333	3.6766	3.674967	-33.5	73.50	20.7	3675	3.5
50	3.648360	3.6516	3.64998	-20	73.00	15.3	3650	3.5
50	3.648362	3.6516	3.649981	-19	73.00	18	3650	3.5
50	3.648364	3.65159	3.649977	-23	73.00	20.7	3650	3.5
50	3.64713	3.65296	3.650045	45	73.00	15.3	3650	7
50	3.64712	3.652961	3.650041	40.5	73.00	18	3650	7
50	3.64712	3.653	3.65006	60	73.00	20.7	3650	7
50	3.67208	3.67788	3.67498	-20	73.50	15.3	3675	7
50	3.67208	3.67787	3.674975	-25	73.50	18	3675	7
50	3.67207	3.67788	3.674975	-25	73.50	20.7	3675	7
40	3.67331	3.6766	3.674955	-45	73.50	15.3	3675	3.5
40	3.673333	3.6766	3.674967	-33.5	73.50	18	3675	3.5
40	3.673333	3.6767	3.675017	16.5	73.50	20.7	3675	3.5
40	3.648363	3.6516	3.649982	-18.5	73.00	15.3	3650	3.5
40	3.648365	3.6516	3.649983	-17.5	73.00	18	3650	3.5
40	3.648364	3.65162	3.649992	-8	73.00	20.7	3650	3.5
40	3.647	3.65296	3.64998	-20	73.00	15.3	3650	7
40	3.6469	3.652961	3.649931	-69.5	73.00	18	3650	7
40	3.64712	3.653	3.65006	60	73.00	20.7	3650	7
40	3.67208	3.67789	3.674985	-15	73.50	15.3	3675	7
40	3.67207	3.67787	3.67497	-30	73.50	18	3675	7
40	3.67207	3.67791	3.67499	-10	73.50	20.7	3675	7
30	3.67331	3.6768	3.675055	55	73.50	15.3	3675	3.5
30	3.673333	3.67655	3.674942	-58.5	73.50	18	3675	3.5
30	3.673335	3.6767	3.675018	17.5	73.50	20.7	3675	3.5
30	3.648331	3.6516	3.649966	-34.5	73.00	15.3	3650	3.5
30	3.648365	3.6517	3.650033	32.5	73.00	18	3650	3.5
30	3.648357	3.65162	3.649989	-11.5	73.00	20.7	3650	3.5
30	3.6469	3.65296	3.64993	-70	73.00	15.3	3650	7
30	3.6471	3.652961	3.650031	30.5	73.00	18	3650	7
30	3.64712	3.6529	3.65001	10	73.00	20.7	3650	7
30	3.67205	3.67789	3.67497	-30	73.50	15.3	3675	7
30	3.67207	3.67789	3.67498	-20	73.50	18	3675	7
30	3.6721	3.67791	3.675005	5	73.50	20.7	3675	7
20	3.67334	3.6768	3.67507	70	73.50	15.3	3675	3.5
20	3.673333	3.67654	3.674937	-63.5	73.50	18	3675	3.5
20	3.67334	3.6767	3.67502	20	73.50	20.7	3675	3.5
20	3.648331	3.65157	3.649951	-49.5	73.00	15.3	3650	3.5
20	3.648369	3.6517	3.650035	34.5	73.00	18	3650	3.5
20	3.648357	3.65159	3.649974	-26.5	73.00	20.7	3650	3.5

20	3.64687	3.65299	3.64993	-70	73.00	15.3	3650	7
20	3.64708	3.652961	3.650021	20.5	73.00	18	3650	7
20	3.64712	3.6529	3.65001	10	73.00	20.7	3650	7
20	3.672	3.67789	3.674945	-55	73.50	15.3	3675	7
20	3.67207	3.67783	3.67495	-50	73.50	18	3675	7
20	3.67204	3.67791	3.674975	-25	73.50	20.7	3675	7
10	3.67335	3.67677	3.67506	60	73.50	15.3	3675	3.5
10	3.673339	3.67654	3.67494	-60.5	73.50	18	3675	3.5
10	3.67334	3.67663	3.674985	-15	73.50	20.7	3675	3.5
10	3.648329	3.65157	3.64995	-50.5	73.00	15.3	3650	3.5
10	3.648369	3.6517	3.650035	34.5	73.00	18	3650	3.5
10	3.648357	3.65152	3.649939	-61.5	73.00	20.7	3650	3.5
10	3.64686	3.65301	3.649935	-65	73.00	15.3	3650	7
10	3.64708	3.65296	3.65002	20	73.00	18	3650	7
10	3.64711	3.6529	3.650005	5	73.00	20.7	3650	7
10	3.672	3.67788	3.67494	-60	73.50	15.3	3675	7
10	3.67201	3.67789	3.67495	-50	73.50	18	3675	7
10	3.67204	3.6779	3.67497	-30	73.50	20.7	3675	7
0	3.67335	3.6767	3.675025	25	73.50	15.3	3675	3.5
0	3.67333	3.67654	3.674935	-65	73.50	18	3675	3.5
0	3.67334	3.67662	3.67498	-20	73.50	20.7	3675	3.5
0	3.648329	3.65154	3.649935	-65.5	73.00	15.3	3650	3.5
0	3.648362	3.6517	3.650031	31	73.00	18	3650	3.5
0	3.648357	3.6515	3.649929	-71.5	73.00	20.7	3650	3.5
0	3.6469	3.65296	3.64993	-70	73.00	15.3	3650	7
0	3.64708	3.65296	3.65002	20	73.00	18	3650	7
0	3.64711	3.65288	3.649995	-5	73.00	20.7	3650	7
0	3.6721	3.67788	3.67499	-10	73.50	15.3	3675	7
0	3.67201	3.67785	3.67493	-70	73.50	18	3675	7
0	3.67204	3.67789	3.674965	-35	73.50	20.7	3675	7
-10	3.67337	3.6767	3.675035	35	73.50	15.3	3675	3.5
-10	3.67333	3.67653	3.67493	-70	73.50	18	3675	3.5
-10	3.67335	3.67662	3.674985	-15	73.50	20.7	3675	3.5
-10	3.648329	3.65154	3.649935	-65.5	73.00	15.3	3650	3.5
-10	3.648362	3.65157	3.649966	-34	73.00	18	3650	3.5
-10	3.648355	3.6515	3.649928	-72.5	73.00	20.7	3650	3.5
-10	3.6469	3.65296	3.64993	-70	73.00	15.3	3650	7
-10	3.64708	3.65296	3.65002	20	73.00	18	3650	7
-10	3.647118	3.65288	3.649999	-1	73.00	20.7	3650	7
-10	3.6721	3.677883	3.674992	-8.5	73.50	15.3	3675	7
-10	3.67202	3.67785	3.674935	-65	73.50	18	3675	7
-10	3.67204	3.6779	3.67497	-30	73.50	20.7	3675	7
-20	3.67337	3.67669	3.67503	30	73.50	15.3	3675	3.5
-20	3.67333	3.67653	3.67493	-70	73.50	18	3675	3.5
-20	3.67335	3.67662	3.674986	-14	73.50	20.7	3675	3.5

-20	3.648329	3.65154	3.649935	-65.5	73.00	15.3	3650	3.5
-20	3.648360	3.65157	3.649965	-35	73.00	18	3650	3.5
-20	3.648355	3.65151	3.649933	-67.5	73.00	20.7	3650	3.5
-20	3.64691	3.65296	3.649935	-65	73.00	15.3	3650	7
-20	3.64708	3.65297	3.650025	25	73.00	18	3650	7
-20	3.647119	3.65288	3.65	-0.5	73.00	20.7	3650	7
-20	3.6721	3.677881	3.674991	-9.5	73.50	15.3	3675	7
-20	3.67202	3.67784	3.67493	-70	73.50	18	3675	7
-20	3.67205	3.6779	3.674975	-25	73.50	20.7	3675	7
-30	3.67336	3.67652	3.67494	-60	73.50	15.3	3675	3.5
-30	3.67333	3.676529	3.67493	-70.5	73.50	18	3675	3.5
-30	3.67333	3.67662	3.674986	-14	73.50	20.7	3675	3.5
-30	3.648400	3.65156	3.64998	-20	73.00	15.3	3650	3.5
-30	3.648360	3.651569	3.649965	-35.5	73.00	18	3650	3.5
-30	3.64712	3.653	3.650009	9	73.00	20.7	3650	3.5
-30	3.64692	3.65295	3.649935	-65	73.00	15.3	3650	7
-30	3.64708	3.65297	3.650025	25	73.00	18	3650	7
-30	3.647119	3.65288	3.65	-0.5	73.00	20.7	3650	7
-30	3.67208	3.67788	3.67498	-20	73.50	15.3	3675	7
-30	3.67202	3.677838	3.674929	-71	73.50	18	3675	7
-30	3.67201	3.6779	3.674955	-45	73.50	20.7	3675	7