



Test report no. : 80817/2

Item tested : ASCOM CHAT

Type of equipment : Alarm Transceiver

FCC ID : BXZCHAT

Client : Ascom Sweden AB

FCC Part 90.217

Low Power Licensed Transmitter

RSS-119, Issue 8

Land Mobile and Fixed Radio Transmitters and Receivers
Operating in the Frequency Range 27.41-960 MHz

12 June 2007

Authorized by :

Egil Hauger

Egil Hauger
Technical Verificator



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1 GENERAL INFORMATION

1.1 Testhouse Info

Name : Nemko Comlab
Address : Gåsevikveien 8, Box 96
N-2027 Kjeller, NORWAY
Telephone : +47 64 84 57 00
Fax : +47 64 84 57 05
E-mail: comlab@nemko.com
FCC test firm registration # : 994405
IC OATS registration # : 4443
Total Number of Pages: 17

1.2 Client Information

Name : Ascom Sweden AB
Address : P.O. Box 8783, SE-402 76 Gothenburg, Sweden

Contact:

Name : Tania Ottebrink
Phone : +46 31 559 432
E-mail : tania.ottebrink@ascom.se

1.3 Manufacturer

Name : /
Address : /

2 Test Information

2.1 Test Item

Name :	ASCOM a71, ASCOM p71
FCC ID :	BXZCHAT
Industry Canada ID :	3724B-CHAT
Model/version :	CHAT-ABBADA CHAT-ABBBBA CHAT-ACBABA CHAT-ACBBBA CHAT-ABBACA CHAT-ABBADA CHAT-ABBBBA CHAT-ABBBDA CHAT-ACBACA CHAT-ACBADA CHAT-ACBBBA CHAT-ACBBDA
Serial number :	420MHz: 6366354 447MHz: 6366273 475MHz: 6366332
Hardware identity and/or version:	PA
Software identity and/or version :	1.1.2
Frequency Range :	420 – 475 MHz
Tunable Bands :	None
Number of Channels :	1
Type of Modulation :	5K10F1D (Frequency Shift Keying, Channel separation: 12.5 kHz)
User Frequency Adjustment :	None
Rated Output Power :	30 mW
Type of Power Supply :	Battery
Antenna Connector :	None
Desktop Charger :	/

Theory of Operation

The EUT is an alarm transmitter and transmits a short preprogrammed FSK-modulated alarm message when the user pushes the alarm button. The EUT also contains a receiver.

Exposure Evaluation

The EUT is a portable device and is designed to be worn in a belt clip and handheld when used.

The device is an alarm transceiver that transmits a digital alarm signal for 2 seconds when the alarm button is pressed. The alarm signal is then repeated every 15 minutes. This gives a duty cycle of about 0.2%.

The EUT is exempted from RF Exposure Evaluation to Industry Canada SAR requirements since the time averaged Output Power is below the limit in RSS-102 Issue 2, clause 2.5.1 for General Public Use.

2.2 Test Environment

2.2.1 Normal test condition

Temperature:	21 - 23 °C
Relative humidity:	30 - 50 %
Normal test voltage:	3.8 V DC

The values are the limit registered during the test period. All tests except the Frequency Stability Test, were performed with a fully charged battery.

The Frequency stability test was performed with a regulated DC Power Supply.

2.3 Test Period

Item received date:	2007-02-20
Test period:	from 2007-02-20 to 2007-05-21

3 TEST REPORT SUMMARY

3.1 General

Manufacturer: Ascom Sweden AB

Model No.: See paragraph 2.1

All measurements are traceable to national standards.

The tests were conducted for the purpose of demonstrating compliance with FCC CFR 47 Part 90.217 and Industry Canada RSS-119 Issue 8.

Radiated tests were conducted in accordance with ANSI C63.4-2003. The radiated tests were made in a semi-anechoic chamber at measuring distances of 3 and 10metres.

New Submission

Production Unit

Class II Permissive Change

Pre-production Unit

TNT Equipment Code

Family Listing

THIS TEST REPORT APPLIES ONLY TO THE ITEM(S) AND CONFIGURATIONS TESTED.

Deviations from, additions to, or exclusions from the test specifications are described in "Summary of Test Data".



TEST REPORT #: 80817-2

TESTED BY: Frode Sveinsen

Frode Sveinsen, Chief Engineer

DATE: 21 May 2007

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3.2 Test Summary

Name of test	FCC Parts 2 and 90 reference	RSS-119 Issue 8 reference	Result
RF Power Output	2.1046, 90.217(b)	5.4	Pass
Modulation Characteristics	2.1047	5.10	NA ¹
Occupied Bandwidth	2.1049, 90.217(b)	5.11	Pass
Spurious Emissions at antenna terminals	2.1051	5.11	NA ²
Field Strength of Spurious Radiations	2.1053, 2.1057, 90.217(b)	5.11	Pass
Frequency Stability	2.1055, 90.217(b)	5.11	Pass
Exemption from technical standards	90.217(b)	5.11	Pass
Receiver Spurious Emissions	/	5.12	Pass

¹ The tested equipment only transmits messages and uses digital modulation.

² The tested equipment has integrated antennas only.

3.3 Description of modification for Modification Filing

Not applicable.

3.4 Comments

The tested equipment does not have any mechanism for frequency selection. The frequency is changed by programming the unit and by tuning the antenna.

3.5 Family List Rational

Not Applicable.

4 TEST RESULTS

4.1 RF Output Power, ERP

Para. No.: 2.1046, 90.217

Test Performed By: Frode Sveinsen	Date of Test: 20 February 2007
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Test Results: Complies

Measurement Data:

Frequency	Measured Value dBm	Generator Level* dBm	Correction Attenuation dB	Correction Ant. Gain dB	Maximum ERP dBm	Maximum ERP Watt
420 MHz	3.6	35.1	12.4	-8.1	14.6	0.029
447 MHz	3.8	35.3	12.4	-8.1	14.8	0.030
475 MHz	3.5	35.0	12.4	-8.1	14.5	0.028

* The actual generator level was 30dB lower than in table above when substituting for RF Power because of limitations of the maximum output level from the substitution generator.

Maximum ERP = Generator Level – Correction Attenuation + Correction Antenna Gain

The EUT always transmit at maximum output power.

This measurement was performed with a RBW of 100 kHz and Peak Detector.

The measurement is performed with the substitution method and with the EUT transmitting continuously and unmodulated.

The EUT was rotated in 3 planes during testing. The procedure was repeated with vertical and horizontal polarization.

The tested equipment has integral antenna only.

Requirements:

The maximum RF output power (ERP) shall not exceed 120mW in order to be eligible for certification to FCC part 90.217.

4.2 Occupied Bandwidth

Para. No.: 2.1049, 90.217

Test Performed By: Frode Sveinsen

Date of Test: 20 February 2007

Test Results: Complies

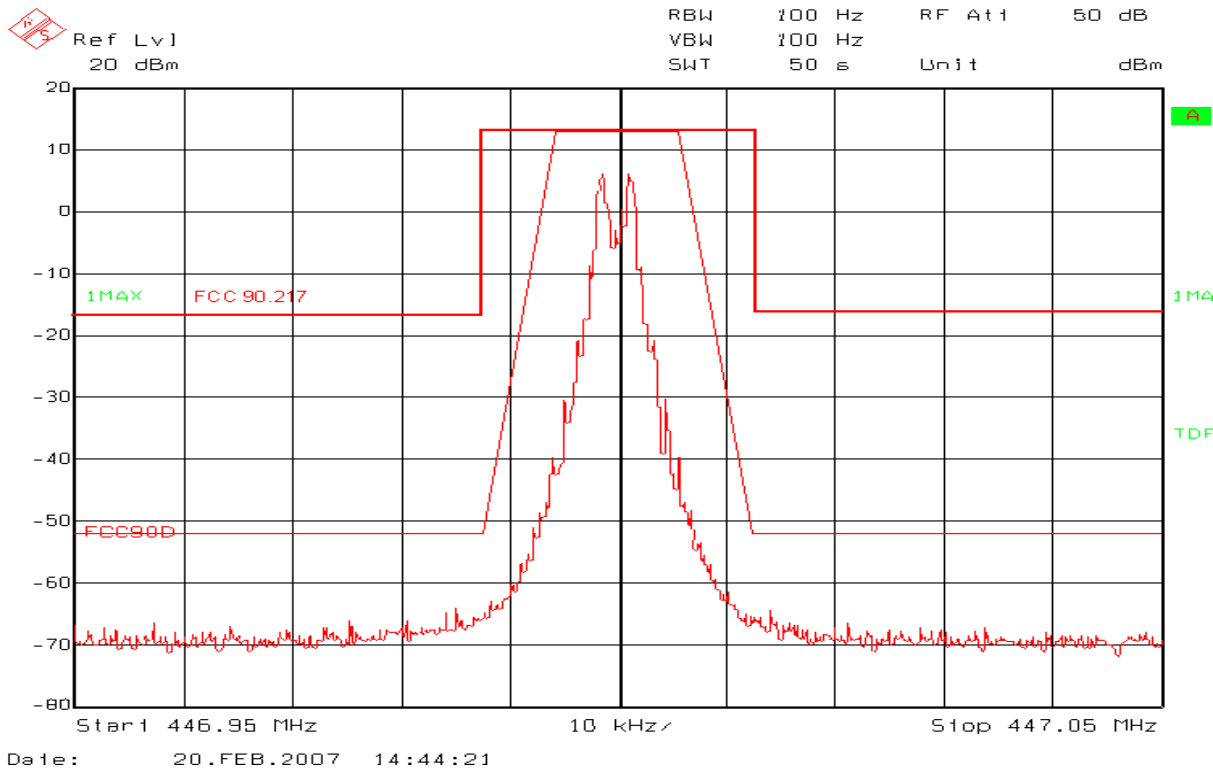
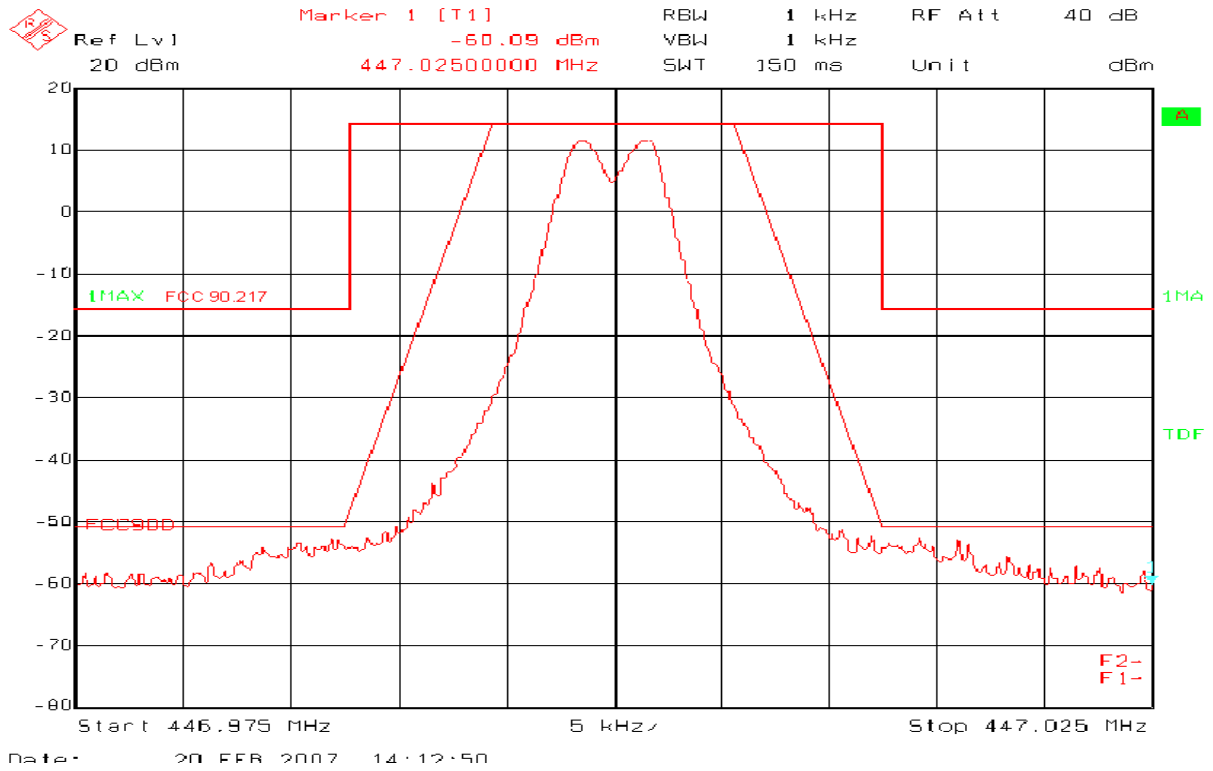
Measurement Data:

See attached graph.

For this test the EUT was made to transmit continuously with modulation activated.

Requirements:

For equipment designed to operate with a 12.5 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 25 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier.



FCC 90.217 requirement

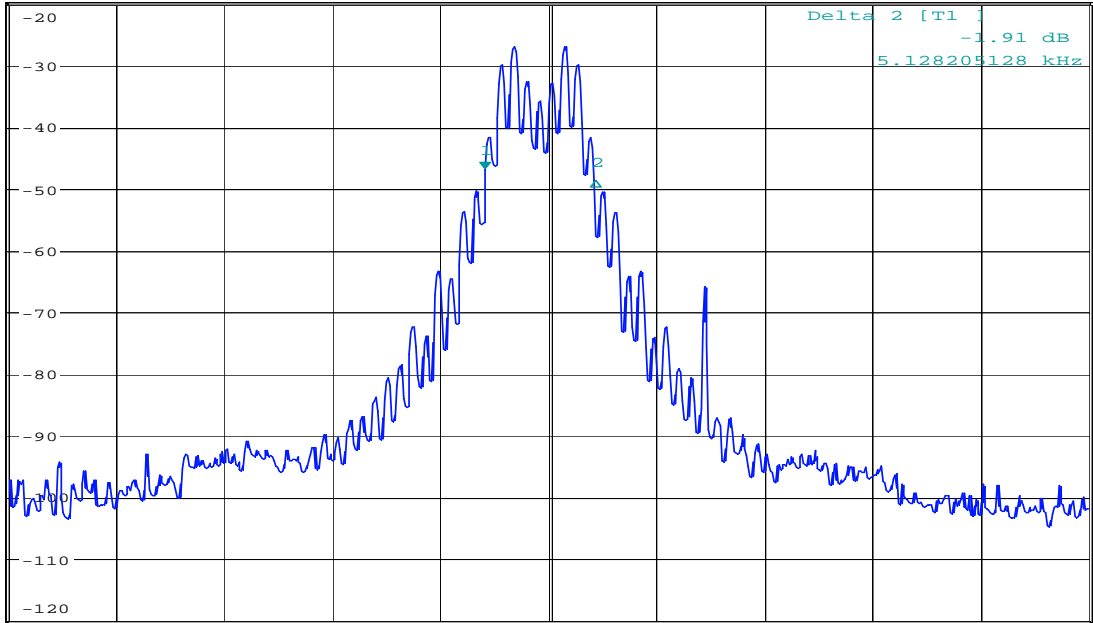


MARKER 1
 446.9970353 MHz
 Ref -20 dBm Att 5 dB

*RBW 200 Hz
 VBW 500 Hz
 SWT 1.25 s

Marker 1 [T1]
 -47.08 dBm
 446.997035256 MHz

1 PK
 MAXH



Center 447 MHz 5 kHz/ Span 50 kHz

Date: 21.MAY.2007 18:52:15

20 dB Bandwidth

4.3 Field Strength of Spurious Radiations

Para. No.: 2.1053, 2.1057, 90.217(b)

Test Performed By: Frode Sveinsen	Date of Test: 21 February 2007
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Test Results: Complies

Measurement Data:

Carrier Frequency MHz	Spurious Frequency MHz	Measured Value dBm	Limit dBm	Margin dB
447	894	-54.7	-15.2	39.5
447	1341	-55.4	-15.2	40.2
447	2235	-63.4	-15.2	48.2
447	All other harmonics	< -40	-15.2	>25

The 2nd, 3rd and 5th harmonic are checked with RBW of 100 kHz and Peak Detector. All other harmonics from 1 to 5 GHz are measured with 1 MHz RBW and Peak Detector.

The measurement was performed at 10m with transducer factor programmed in the spectrum analyzer. All other harmonics were lower than the ones reported above.

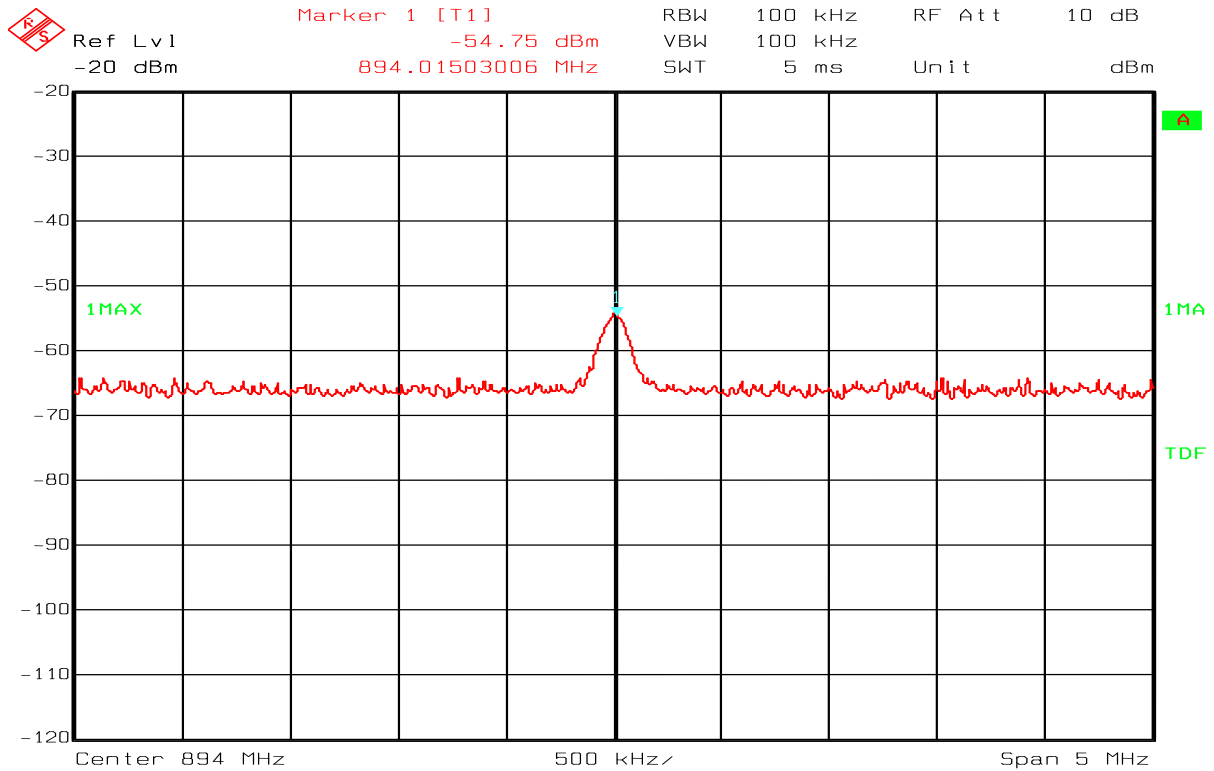
The harmonics for the units on highest and lowest frequency did not differ significantly from the values reported above.

EUT was transmitting continuously with modulation activated. The EUT was rotated in 3 planes for this test.

Requirements:

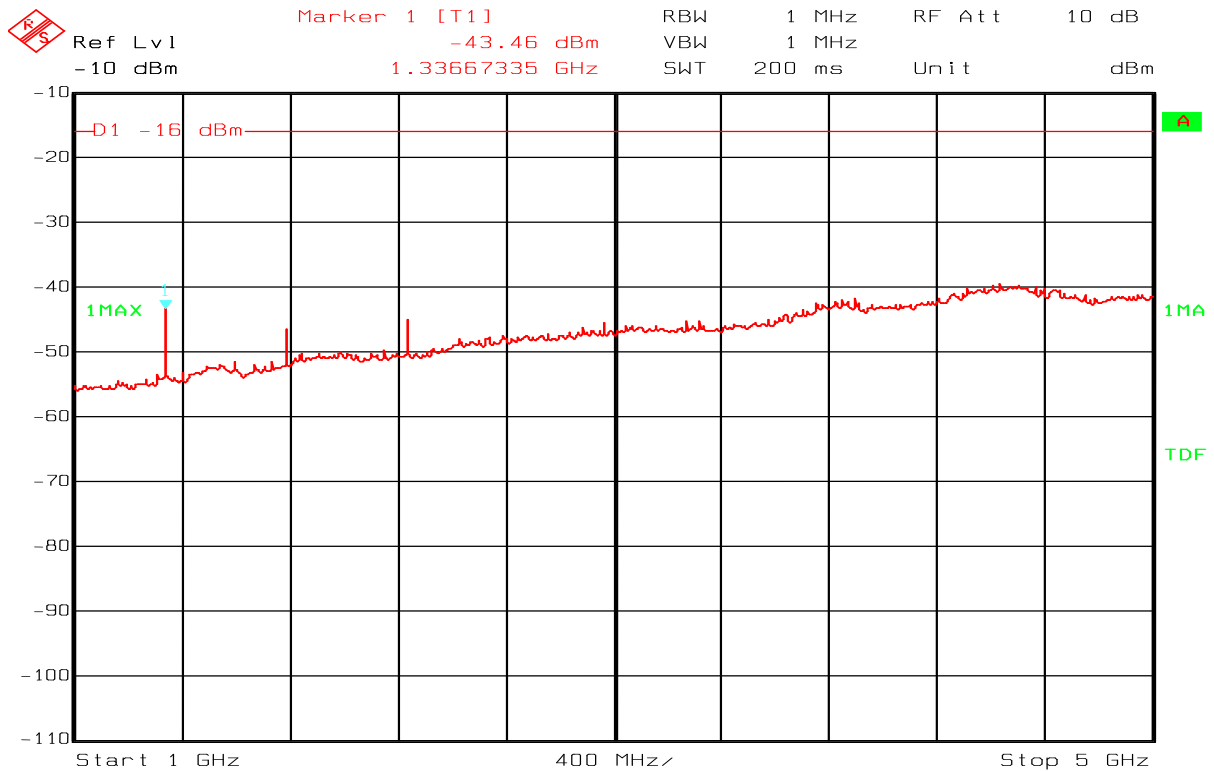
For equipment designed to operate with a 12.5 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 25 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier.

In all of the measurements set forth in 2.1051 and 2.1053, the spectrum shall be investigated from the lowest radio frequency signal generated in the equipment, without going below 9 kHz, up to at least the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.



Date: 20.FEB.2007 13:12:21

Spurious Radiatons, 2nd Harmonic



Date: 21.FEB.2007 8:47:16

Spurious Radiations 1 – 5 GHz

4.4 Frequency Stability

Para. No.: 2.1055, 90.217(b)

Test Performed By: Frode Sveinsen	Date of Test: 21 February / 21 May 2007
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Test Results: Complies

Measurement Data:

Temperature	Measured Frequency (MHz)	Deviation (kHz)	Deviation (ppm)
+50 degrees C	447.000031	0.234	0.523
+40 degrees C	446.999926	0.129	0.289
+30 degrees C	446.999851	0.054	0.121
+20 degrees C	446.999797	Reference	Reference
+10 degrees C	446.999670	-0.127	-0.284
0 degrees C	446.999535	-0.262	-0.586
-10 degrees C	446.999475	-0.322	-0.720
-20 degrees C	446.999530	-0.267	-0.597
-30 degrees C	446.999658	-0.139	-0.311

Voltage	Measured Frequency (MHz)	Deviation (kHz)	Deviation (ppm)
4.0 Volts	446.999614	0.009	0.020
3.9 Volts (Nominal)	446.999605	Reference	Reference
3.5 Volts (lowest operating voltage)	446.999477	-0.128	-0.286

Comment: The Occupied Bandwidth Plots show that the margin to the power mask is about 10kHz, the Frequency Stability is within this limit.

Requirements:

For equipment designed to operate with a 12.5 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 25 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier.

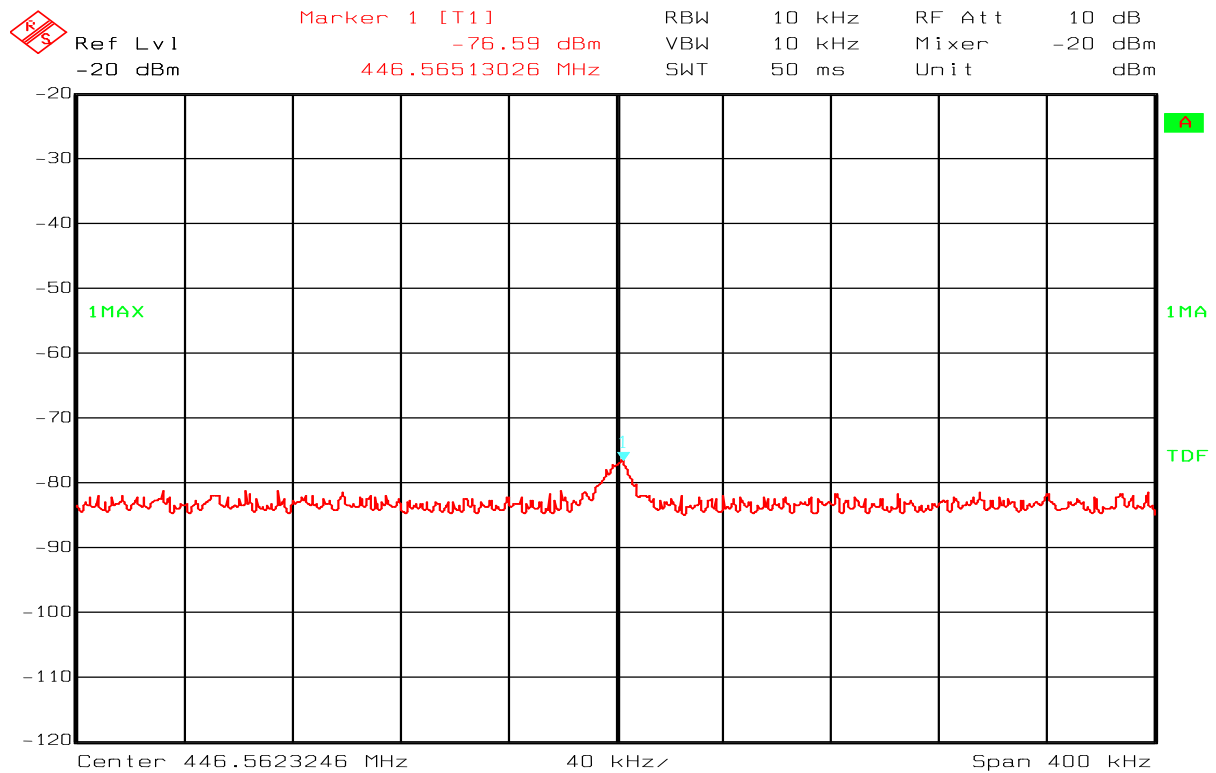
4.5 Receiver Spurious Emissions

Measurement Procedure:

Industry Canada RSS-119 paragraph 5.12 and RSS-GEN paragraphs 4.8 and 6.

Test results:

See plot. No other Spurious Emissions from the Receiver were detected.



Date: 20.FEB.2007 14:53:04

Maximum Spurious from Oscillator, ERP, CW

5 LIST OF TEST EQUIPMENT

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment and ancillaries are identified (numbered) by the Test Laboratory.

No.	Instrument/ancillary	Type of instrument/ancillary	Manufacturer	Ref. no.
1	FSEK	Spectrum Analyzer	Rohde & Schwarz	LR 1337
2	SMP04	Signal Generator	Rohde & Schwarz	LR 1336
3	3115	Antenna horn	EMCO	LR 1330
4	643	Antenna horn	Narda	LR 093
5	642	Antenna horn	Narda	LR 220
6	PM7320X	Antenna horn	Siverts lab	LR 103
7	DBF-520-20	Antenna horn	Systron Donner	LR 101
8	638	Antenna horn	Narda	LR 098
9	5VF500/1000	Bandpass filter	Trilithic	LR 1170
10	6HC1000/10000	Highpass filter	Trilithic	LR 1363
11	8449B	Amplifier	Hewlett Packard	LR 1322
12	10855A	Amplifier	Hewlett Packard	LR 1445
13	HL223	Antenna log.per	Rohde & Schwarz	LR 1261
14	HK116	Antenna biconic	Rohde & Schwarz	LR 1260

6 BLOCK DIAGRAM

6.1 Test Site Radiated Emission

